March 15, 2024

City of Mercedes

ADDENDUM NO. 2024 – 003 (A)

Request for Proposals for

Plumbing & Sewer/Water Leak Repairs

Prospective Proposers and all concerned are hereby notified of the following changes in the Request for Proposals document for the above-listed RFP. These changes shall be incorporated in and shall become an integral part of the RFP documents.

1. The City of Mercedes is seeking vendors to be on a rotation for plumbing and sewer/water leak repairs as needed.
2. Included are the bid sheet and specifications.
3. The deadline to submit the RFP has been changed to March 29, 2024 at 3:00 pm.
4. New point of contact is Javier Ramirez. Contact information is listed below.

If you need additional clarification, you may contact Javier Ramirez at (956) 565-3114 ext. 132, Email: jramirez@cityofmercedes.com and cc'd Rey Trevino at rtrevino@cityofmercedes.com.

End of Addendum

City Hall at 400 S. Ohio Ave, Mercedes, Texas 78570
(956)565-3114/Fax (956)565-8592
www.cityofmercedes.com

RFB 24-00 – BID SCHEDULE

ANNUAL LABOR AND EQUIPMENT ONLY FOR CONSTRUCTION OF WATER MAIN AND SEWER COLLECTION SYSTEM IMPROVEMENTS FOR THE CITY OF MERCEDES, TX

Item No.	Description of work performed	Unit	Quantity Totals	Unit Price Bid (Dollars and Cents)	Total Price Bid (Dollars and Cents)
1.	**Erosion and Sedimentation Control**				
a.	Construction Exit	EA	5		
b.	Silt Fence (non-reinforced)	LF	1,000		
c.	Silt Fence (reinforced)	LF	1,000		
e.	Riprap	SY	400		
f.	Sodding	SF	1,000		
2.	**Water Main**				
a.	12-Inch C900 DR18 PVC Pipe	LF	1,000		
b.	10-Inch C900 DR18 PVC Pipe	LF	1,000		
c.	8-Inch C900 DR18 PVC Pipe	LF	1,000		
d.	6-Inch C900 DR18 PVC Pipe	LF	1,000		
3.	**Ductile Iron Fittings**				
a.	6- through 12-Inch	EA	20		
4.	**Valves**				
a.	12-Inch Gate Valve	EA	10		
b.	10-Inch Gate Valve	EA	10		
c.	8-Inch Gate Valve	EA	10		
d.	6-Inch Gate Valve	EA	10		

Item No.	Description	Unit	Quantity Totals	Unit Price Bid (Dollars and Cents)	Total Price Bid (Dollars and Cents)
5.	**Fire Hydrants**				
a.	5-1/4-Inch Hydrant	EA	10		
b.	Vertical Extensions	VF	10		
6.	**Connection to Existing Water Main**				
a.	12x8-Inch - TS&V	EA	5		
b.	12x6-Inch - TS&V	EA	5		
c.	12x10-Inch – TS&V	EA			
c.	8x8-Inch - TS&V	EA	5		
d.	8x6-Inch - TS&V	EA	5		
e.	6x6-Inch - TS&V	EA	5		
f.	10x8-Inch – TS&V	EA	5		
g.	10x6-Inch – TS&V	EA	5		
f.	12-Inch Wet Cut-In w/ Solid Sleeve	EA	5		
g.	8-Inch Wet Cut-In w/ Solid Sleeve	EA	5		
h.	6-Inch Wet Cut-In w/ Solid Sleeve	EA	5		
i.	10-Inch Wet Cut-In w/Solid Sleeve	EA	5		
j.	4-Inch Wet Cut-In w/Solid Sleeve	EA	5		
7.	**Water Service Connections (S/D)**				
a.	3/4-Inch Municipex Short Side Service	EA	10		
b.	3/4-Inch Municipex Long Side Service	EA	10		
c.	1-Inch Municipex Short Side Service	EA	10		
d.	1-Inch Municipex Long Side Service	EA	10		
e.	2-Inch Municipex Short Side Service	EA	10		
f.	2-Inch Municipex Long Side Service	EA	10		
8.	**Bored Road Crossings (Water)**				
a.	20-Inch Jack and Bored Steel Casing	LF	100		
b.	16-Inch Jack and Bored Steel Casing	LF	100		
c.	12-inch Jack and Bored Steel Casing	LF	100		
d.	8-inch Jack and Bored Steel Casing	LF	100		
e.	6-inch Jack and Bored Steel Casing	LF	100		

Item No.	Description	Unit	Quantity Totals	Unit Price Bid (Dollars and Cents)	Total Price Bid (Dollars and Cents)
9.	**Manholes**				
a.	Standard 4' Manhole	EA	10		
b.	Standard 5' Manhole	EA	10		
c.	Additional Vertical Feet of Manhole 5'<	EA	1		
10.	**Sanitary Sewer**				
a.	8"-12" PVC Gravity Sewer Construction, 0.00'-6.00' Cut	LF	500		
b.	8"-12" PVC Gravity Sewer Construction, 6.01'-8.00' Cut	LF	500		
c.	8"-12" PVC Gravity Sewer Construction, 8.01'-10.00' Cut	LF	500		
d.	8"-12" PVC Gravity Sewer Construction, 10.01'-12.00' Cut	LF	500		
e.	8"-12" PVC Gravity Sewer Construction, 12.01'-14.00' Cut	LF	500		
f.	4"- 6" PVC Gravity Sewer Service	LF	25		
11.	**Encasement and Thrust Collars**				
a	Concrete	CY	300		
12.	**Removing and Replacing Pavement**				
a.	Asphalt (4'wide cut)	LF	300		
b.	Concrete (4' wide cut)	LF	200		
c.	Removal of Asphalt (street wide section)	SY	500		
c.	Asphalt Resurfacing, 1-1/2"-2"	SY	500		
13.	**Removing and Replacing Sidewalk**				
a.	Removal of 4'-5' sidewalk	LF	200		
b.	Installation of 4' wide sidewalk	LF	200		
c.	Installation of 5' wide sidewalk	LF	200		
d.	Installation of ADA Ramp 4' wide	LF	100		
14.	**Mobilization**				
a.	Task Value < $10,000.00	EA	1		
b.	Task Value $10,000.00 - $49,999.99	EA	1		
c.	Task Value $50,000.00 - $99,999.99	EA	1		
d.	Task Value $100,000.00 and above	EA	1		

** UNIT PRICE MULTIPLER FOR DEGREE OF TASK DIFFICULTY **

15. **Unit Price Degree of Difficulty Multiplier by InstallationType**

a.	Rural Road Right-of-Way	MULTIPLIER	_	**1.0**
b.	Residential Subdivision	MULTIPLIER	_	**1.05**
c.	Urban/Commercial Corridor	MULTIPLIER	_	**1.15**

TOTAL AMOUNT OF BID – ITEMS 1 THROUGH 14, INCLUSIVE

Dollars & Cents ($_____)

BIDDER hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" from the City of Mercedes. The WORK shall be completed within the time allowed and agreed upon in the specific project contract.

BIDDER hereby agrees that this agreement may be renewed upon the approval of the Mercedes City Commission up to two (2) one-year renewal periods.

BIDDER agrees to perform all of the construction of the project complete with appurtenances and accessory work described in the above scheduled price(s).

The above scheduled price(s) shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for.

BIDDER understands that The City reserves the right to reject any or all bids and to waive any informalities in the bidding.

BIDDER agrees that his bid shall be good and may not be withdrawn for a period of sixty (60) calendar days after the scheduled closing time for receiving bids.

Upon receipt of the written notice of the acceptance of this bid, BIDDER will execute the formal Contract attached within ten (10) days and deliver a surety bond or bonds, as required by the General Conditions.

Respectfully Submitted:

Name:

_____

Address:

_____

_____

Phone:

_____

FEDERAL TAX NO.

_____

Signature:

_____

Title:

_____

Date:

_____

Section 7
Water Improvements

7.1 General

The purpose of this section is to outline the general requirements for the design of water improvements and provide typical details for construction. The City of Mercedes's City Engineer should be consulted if any deviations from these standards are anticipated before and during construction. In cases where design limitations or physical barriers restrict compliance with the provisions of this section, alternatives are to be considered by the City Engineer prior to construction and final acceptance of the improvements.

7.2 Design Standards

All water mains extended or proposed to the City of Mercedes's water distribution systems shall be designed and constructed in accordance to the following requirements.

A. All water mains must be designed in accordance with ***Subchapter D: Rules and Regulations for Public Water Systems*** of the Texas Commission on Environmental Quality (TCEQ), current edition.

B. Water improvements to the City of Mercedes water distribution system are to be designed by a Professional Engineer licensed to practice in the State of Texas.

C. Water mains are to be designed and installed with a minimum cover of four (4) feet unless approved by the City Engineer.

D. Water mains shall be a minimum of 8 inches in diameter. Fire Hydrant lead line shall be no less than 6 inches in diameter. The City may require larger diameter lines based on several factors including demand, service areas, Fire Marshal requirements, and historical data.

E. On cul-de-sac streets less than 400 feet, fire hydrants should be located at the entrance of the cul-de-sac. The City Fire Marshals has final authority regarding the quantity and location of proposed fire hydrants. Additional installations may also be required by the City Engineer for future developments.

F. Valves shall be spaced at a maximum of 800 feet or as directed by the City Engineer. Valves should also be installed on any stub-outs for future line extensions.

G. Water line pipe shall conform to AWWA C900, C905, or C909 requirements and have a minimum Pressure Class or Pressure Rating of no less than 150 psi. Pipe diameters 12 inches or smaller shall be AWWA C900 PVC DR18. Pipe diameters 14 inches and larger shall conform to AWWA C905.

H. Water jetting is not allowed under any circumstance for utility crossings or within a roadway. Water jetting for water lines outside of roadways may be considered if a licensed geotechnical engineer has determined the soil is suitable for jetting AND if approved by the City Engineer.

I. Tapping sleeves and valves shall meet AWWA specifications with a minimum working pressure of 150 psi.

J. All fittings shall be Ductile Iron, meeting the specifications of A.N.S.I/AWWA C110

K. Deflections and bends shall utilize the Mega-lug, Mega-flange, and joint resistant fittings.

L. Galvanized pipe or fittings are not allowed, with the exception of a 2-inch riser on blow-offs.

M. Fire Hydrants shall be located with a maximum spacing of 500 feet between fire hydrants in areas with a residential land use, and a maximum 300 feet spacing between fire hydrants in areas with a non-residential land use.

N. The design of a water distribution system shall incorporate a means to achieve a two-source water line loop. This may require extensions or off-site utility improvements. Exceptions to the looped water line requirement will be evaluated on a case by case basis.

O. Blue reflective markers shall be installed on the centerline of access road to indicate the location of a fire hydrant.

P. Concrete thrust blocks on water main fittings should be placed to withstand the test pressure of 150 psi.

Q. Project Close-out documents shall include an electronic and (or) hard copy of Final Record Drawings. Electronic drawings are preferred.

R. Water Main – Sanitary Sewer Crossings:

Primary Condition	**Proposed Water Existing Sanitary**				**Proposed Water Proposed Sanitary or Existing Water Proposed Sanitary**			
Secondary Condition	Water Over Sanitary		Water Under Sanitary		Water Over Sanitary		Water Under Sanitary	
If the Clearance Is	Less Than 2'	Greater Than 2' But Less Than 9'	Less Than 2'	Greater Than 2' But Less Than 9'	Less Than 2'	Greater Than 2' But Less Than 9'	Less Than 2'	Greater Than 2' But Less Than 9'
*Protection Requirement	1	2	3	4	5	6	3	6

Protection requirements for sanitary sewer crossings (Unless variance is granted by the TCEQ) (All clearances shall be measured from outside wall to outside wall)

1. Center one (1) 20-foot joint of C-900 PVC DR-18, Class 150, waterline pipe over sanitary sewer; 6-inch absolute minimum clearance.

2. If no evidence of sanitary sewer leakage, center one joint of water line over sanitary sewer: 24-inch absolute minimum clearance. If the sewer line is leaking, the sewer line shall be replaced with 150 psi lined ductile iron or PVC pipe with appropriate adapters on all lined ductile iron or PVC pipe with appropriate adapters on all portions of the sanitary sewer within 9-feet of the water main.

3. Not allowed

4. Auger 9-feet minimum each side of sanitary sewer, place one 20-foot joint of C-900 PVC, 150 psi, centered under sanitary sewer. Fill bored hole with bentonite/clay mixture: 2-foot absolute minimum clearance or replace the existing sanitary sewer with 150 psi line ductile iron or PVC pipe with appropriate adapters on all portions of the sanitary within 9-feet of the water main.
5. Minimum 18-foot joint of sanitary sewer, 150 psi lined ductile iron or PVC pipe centered at the water line; 6-inch absolute minimum clearance.

6. If clearance is between 2 to 9-feet:

a. Center a minimum 18-foot joint of 150 psi lined ductile iron or PVC pipe at water line.

b. Use cement-stabilized sand backfill (minimum 2 sacks cement per cubic yard of sand) starting at a point ¼ of the pipe diameter above the bottom of the sanitary sewer to 1-foot above the top of sanitary sewer, or one sanitary sewer diameter, whichever is larger. Center one joint of sanitary sewer pipe about the water main.

7.3 Testing Requirements

A. Water mains shall be tested for leakage in accordance with AWWA Standard C-900 (150 psi) for two hours. Air from the water line shall be removed before the start of testing.

B. Water mains and service lines shall be chlorinated before it can begin service. The chlorinating substance shall be applied at the beginning of each pipe section for testing.

C. Water mains and service lines should be flushed before testing by City inspector for bacteria. All costs associated with bacterial testing is to be paid by the Contractor, including retests.

7.4 Right of Way Crossings

A. Water distribution mains that are located within state right of way must conform to the requirements of the Texas Department of Transportation (TxDOT). Water distribution mains that cross railroads must conform to the requirements of the railroad company whose right-of-way is being crossed. Water distribution mains crossing creeks or drainage channels regulated by FEMA shall require encasement. Below grade crossings are preferred; however, aerial crossings may be considered. Thrust restraint shall be provided at points of transition from buried to exposed pipe and at changes in alignment of exposed pipe. Air release valves shall be provided at the high point of all crossings. Below grade crossings of creeks and drainage channels shall have a minimum cover of 3.5-feet below the creek flowline at the time of construction. All below grade crossings will require steel encasement with all ends capped and sealed. The casing shall be carried into the bank a distance that should consider changes in the creek channel. This distance shall be beyond the high bank, outside of a projected 1H:1V slope from the high bank away from the channel.

7.5 Encasement

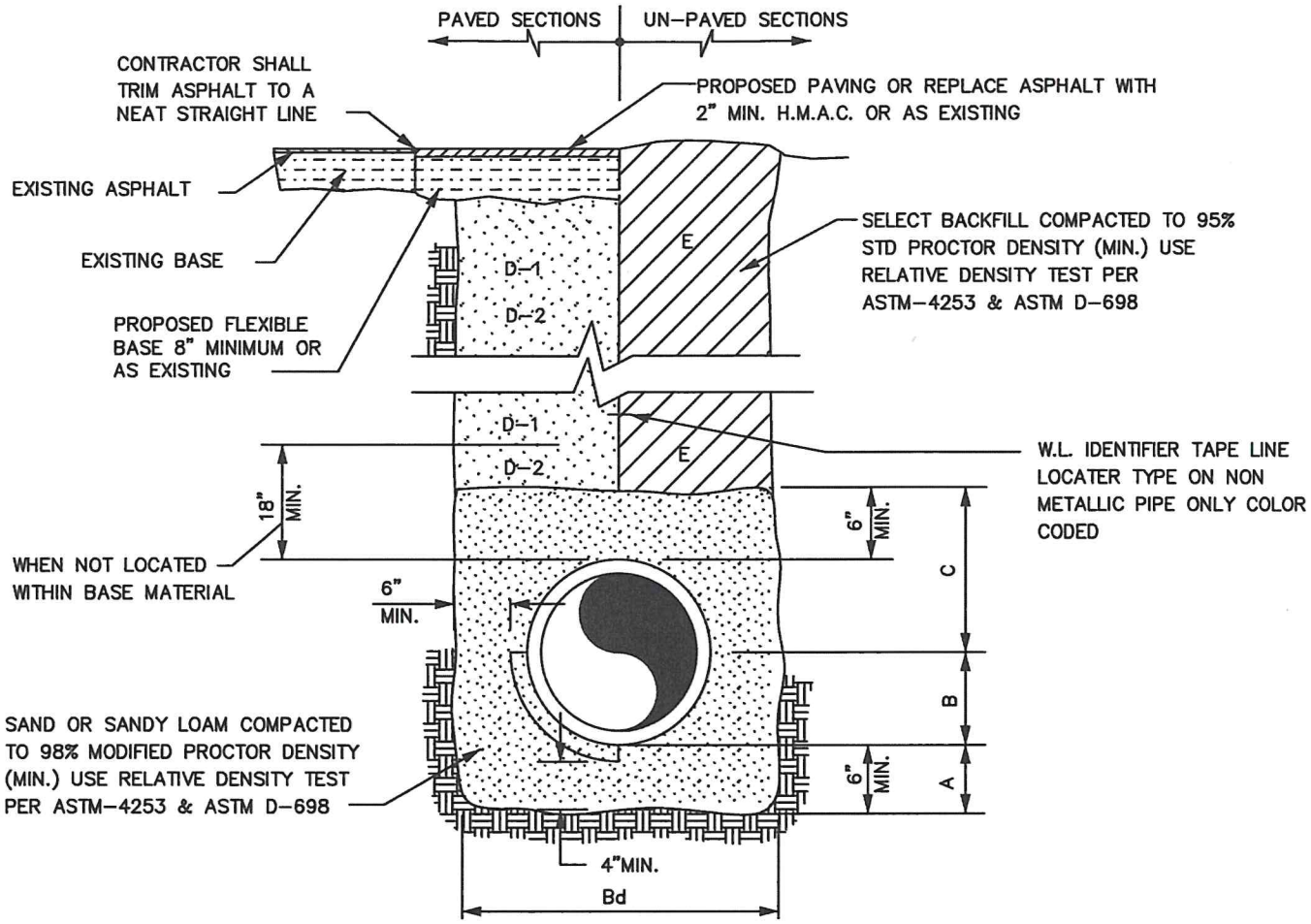
A. Steel cylinder pipe shall be used for all encasement pipe. Other encasement pipe material may be used per TCEQ requirements and City specifications. Carrier pipes sized less than 30 inches shall use an encasement pipe with a wall thickness of no less than 3/8-inch. For carrier pipes 30 inches and larger, a wall thickness of no less than 1/2-inch shall be used. Coating of encasement pipe may be required in special soil conditions. All carrier pipes will be supported by casing spacers in accordance with the specifications and details, and shall have joints restrained by an approved method that will allow the removal of the

carrier pipe from the encasement pipe in a single direction by means of tension on the carrier pipe only.

7.6 Easements

A. Water mains constructed outside of public rights of way shall be in easements of not less than 10 feet in width except for the following: if the water main is deeper than 6 feet, the easement width shall be not less than 20 feet; and if the water main depth is greater than 14 feet, the easement width shall be 30 feet. If both water and wastewater mains are located within the same easement, the width shall not be less than 25 feet (larger widths will be required depending on the depth of the sewer main). Where water lines will be near or adjacent to building structures, easement width shall be increased.

7.7 Water Improvement Details



A. SAND OR SANDY LOAM BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE. (MIN. THICKNESS= 6")

B. SAND OR SANDY LOAM BACKFILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE. (4" LIFTS, HAND TAMPED) Bd TRENCH WIDTHS SHALL BE PIPE O.D. + 12" OR IN ACCORDANCE WITH ASTM 2321 FOR PVC PIPE.

C. SAND OR SANDY LOAM BACKFILL PLACED FROM SPRING LINE OF PIPE TO 6" ABOVE TOP OF PIPE. (6" LIFTS, HAND TAMPED)

D-1. (CITY STREETS, PARKING AREA, SELECT EXCAVATED BACKFILL MATERIAL COMPACTED TO 98% SPD. (8" LIFTS, MECHANICAL COMPACTION)

D-2. (STATE MAINTAINED ROADWAY) COMPACTED SAND/CEMENT STABILIZED BACKFILL WITH 7% PORTLAND CEMENT COMPACTED AS PER ASTM D-4253 AND ASTM D-698.

E. SELECT EARTH BACKFILL COMPACTED TO 92% SPD. (12" LIFTS, MECHANICAL COMPACTION) FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE, BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO 95% STD. PROCTOR DENSITY (USE RELATIVE DENSITY TEST PER ASTM D-4253 & ASTM D-698). THE THICKNESS OF EACH LOOSE LAYER SHALL NOT EXCEED 6". STRUCTURE BACKFILL MATERIAL SHALL BE SAND, APPROVED SITE SOIL, OR OTHER APPROVED SUBSTITUTE.

city of mercedes
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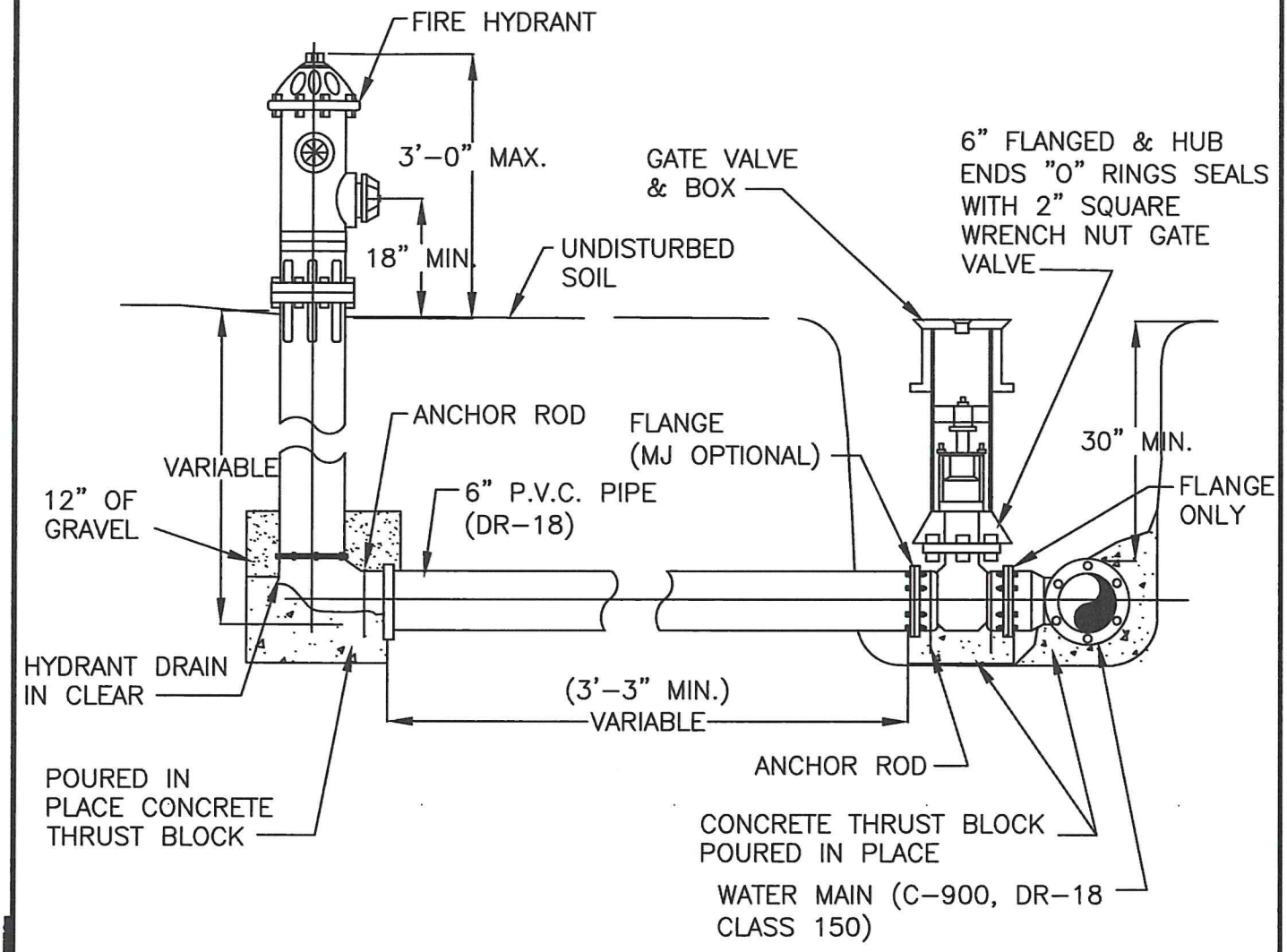
(956) 565 – 3114

WATER IMPROVEMENT DETAILS **WATERLINE TRENCH BEDDING**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. W - 1	01/2021



NOTES:

1. FIRE HYDRANT ELEVATIONS WILL BE SET BY THE ENGINEER.
2. FLANGE MUST BE AT FINISHED GRADE OR 3" TO 6" ABOVE 2. FLANGE MUST BE AT FINISHED GRADE OR 3" TO 6" ABOVE TOP OF CURB.
3. FLANGED GATE VALVE INSTALLATION TO BE USED WITH 10" WATER LINES OR GREATER.
4. BBF TEES TO BE USED WITH 10" WATER LINE OR GREATER BBF TEES TO BE UED WITH SMALLER DIA. PIPES.
5. ACCEPTABLE HYDRANT BRANDS ARE MUELLER, AMERICAN DARLING AND KENNEDY.

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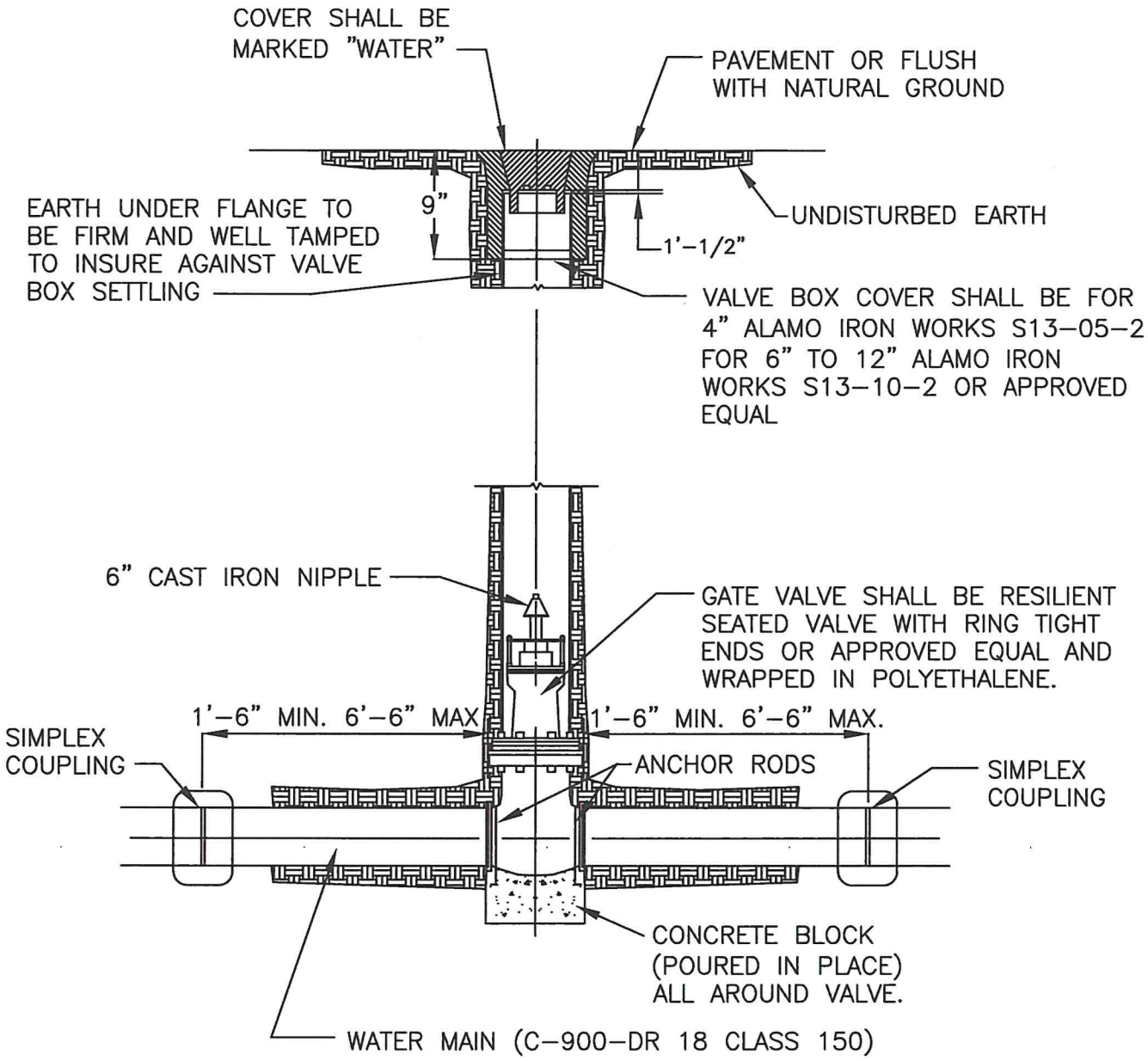
WATER IMPROVEMENT DETAILS FIRE HYDRANT INSTALLATION	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. W - 2	01/2021



NOTES:

1. CAST IRON BOOT TO BE USED IN HEAVY TRAFFIC AREAS CONCRETE BLOCK (POURED IN PLACE)

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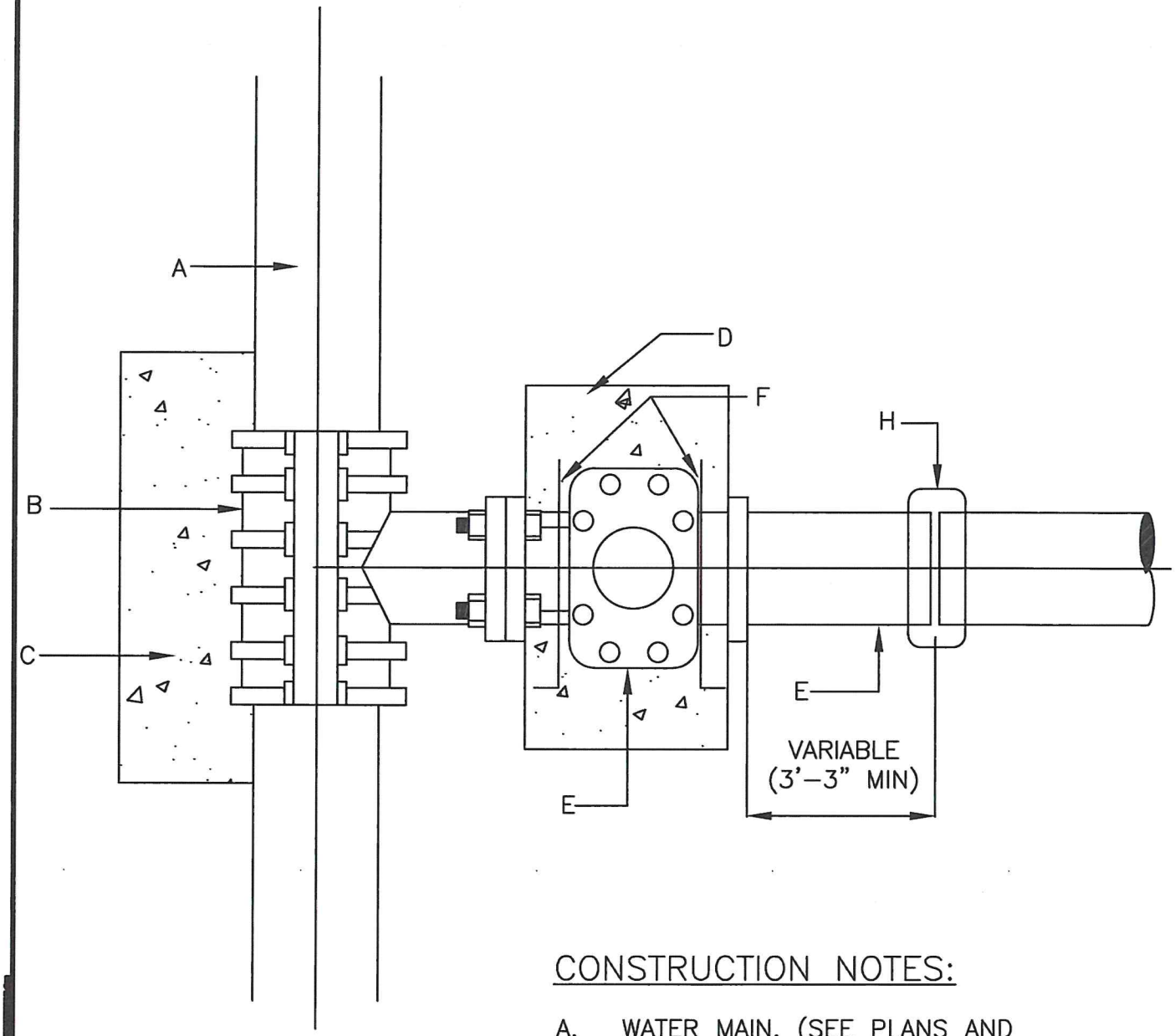
WATER IMPROVEMENT DETAILS GATE VALVE AND BOX	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. W - 3	01/2021



GENERAL NOTES:

1. ALL CONCRETE TO HAVE A MINIMUM OF 28 DAYS COMPRESSIVE STRENGTH OF 3,000 P.S.I.

CONSTRUCTION NOTES:

A. WATER MAIN. (SEE PLANS AND SPECIFICATION)
B. TAPPING SLEEVE (SIZE AS REQUIRED).
C. CONCRETE SUPPORT UNDER TAPPING SLEEVE AND BEHIND.
D. THRUST BLOCK AS PER SPECIFICATIONS.
E. FLANGED AND HUB ENDS "O" RING SEALS WITH 2" SQUARE WRENCH NUT GATE VALVE.
F. ANCHOR RODS.
G. PVC PIPE.
H. SIMPLEX COUPLING.

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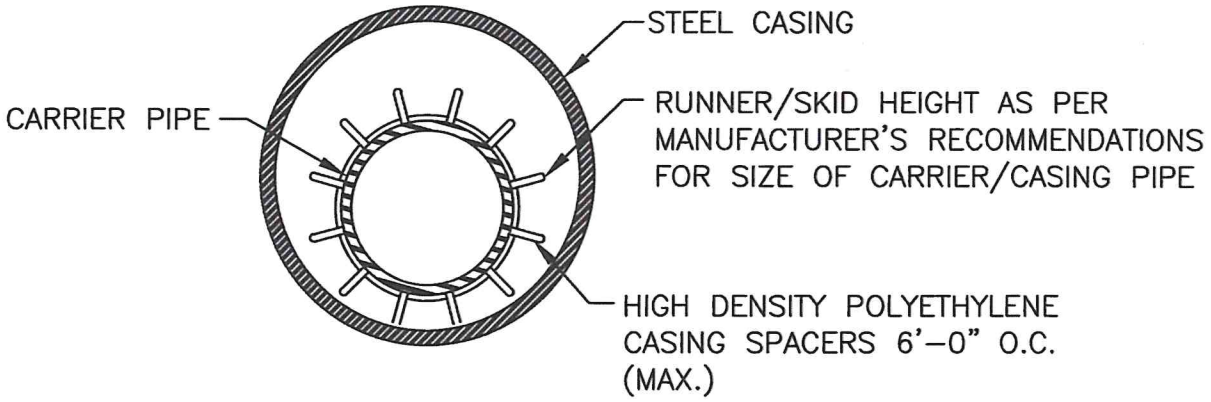
WATER IMPROVEMENT DETAILS **WATER TAPPING SLEEVE & VALVE INSTALLATION**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. W - 4	01/2021



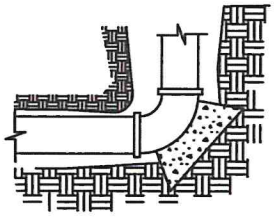
BORING INSTALLATION		
CARRIER PIPE SIZE	PIPE CASING SIZE	MIN. WALL THICKNESS
6"	14"	0.3125"
8"	16"	0.3125"
10"	18"	0.3125"
12"	21"	0.3750"
14", 15"	24"	0.4375"
16"	26"	0.4375"
18"	30"	0.5000"
24"	36"	0.5625"
36"	48"	0.6250"

GENERAL NOTES:

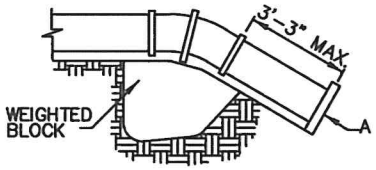
1. ALL STEEL CASING SHALL BE WELDED.
2. STEEL CASING SHALL BE CLOSED AT EACH END USING USING SYNTHETIC RUBBER END SEALS.
3. CASING SPACERS SHALL BE USED TO INSTALL THE CARRIER PIPE INSIDE THE ENCASEMENT PIPE. CASING SPACERS SHALL FASTEN TIGHTLY ON THE CARRIER PIPE TO PREVENT RELATIVE MOVEMENT ON PIPE DURING INSTALLATION. CASING SPACERS SHALL BE DOUBLED ON EACH END OF THE ENCASEMENT.
4. PROJECTION TYPE CASING SPACERS SHALL BE CONSTRUCTED SECTIONS OF HIGH DENSITY POLYETHYLENE.
5. INSTALLATION AND SIZE OF SPACERS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.

CONSTRUCTION NOTES

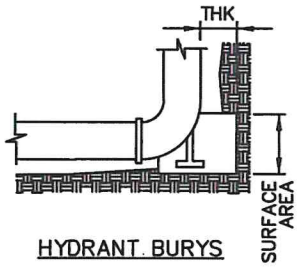
A. SIMPLEX COUPLING
B. ANCHOR ROD



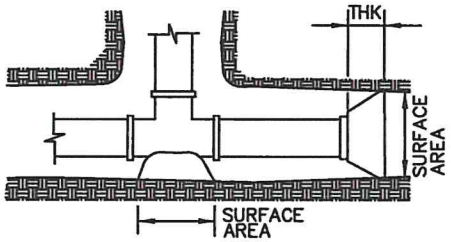
HORIZONTAL BENDS



VERTICAL BENDS



HYDRANT BURYS



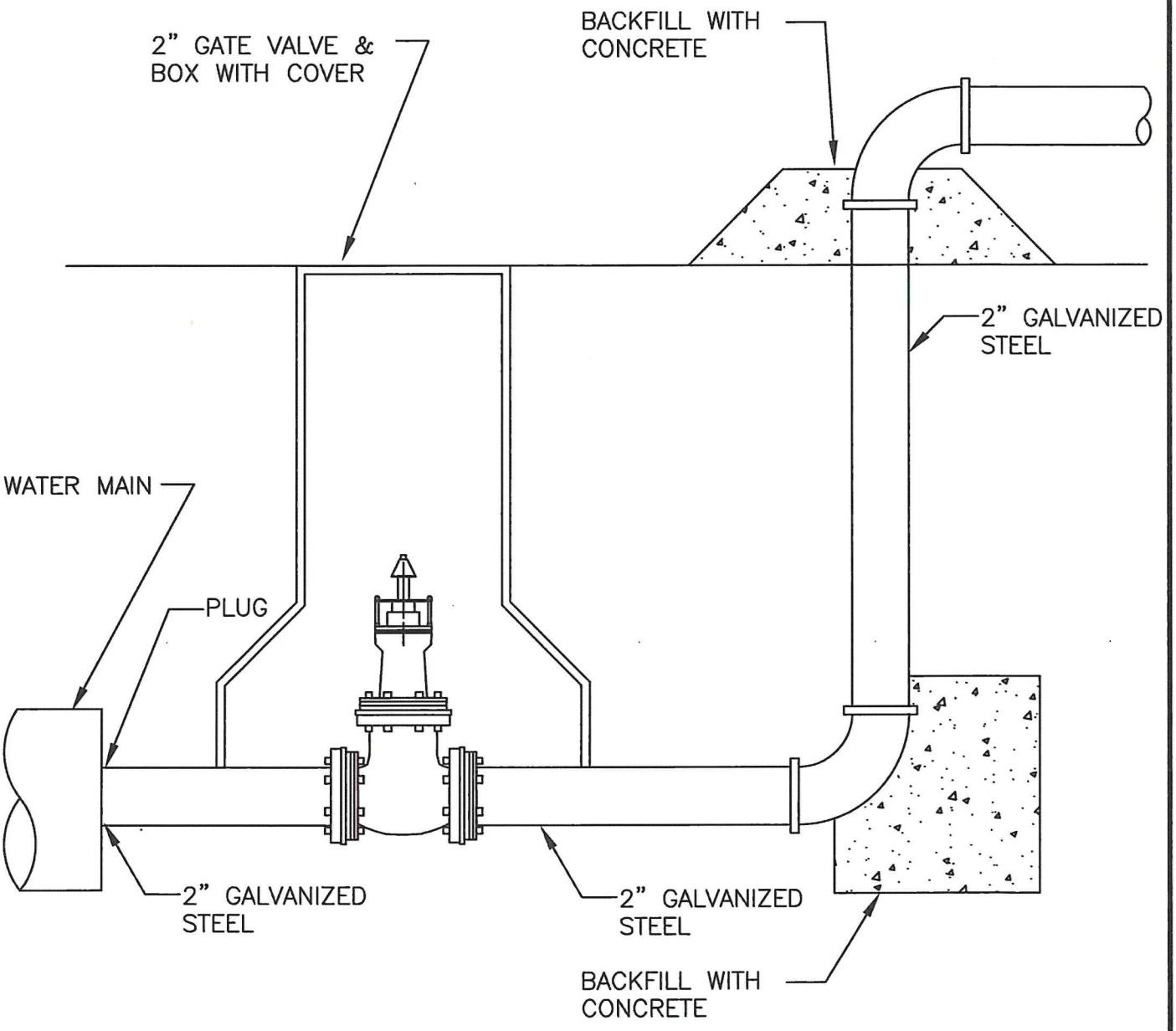
TEES & DEAD ENDS

GENERAL NOTES

1. SEE THRUST BLOCK SIZE CHART FOR PROPER THICKNESS AND SURFACE AREAS. (SHEET 2 OF 2)
2. THE LOCATION OF THRUST BLOCKS DEPENDS UPON THE DIRECTION OF THRUST AND TYPE FITTINGS.

THRUST BLOCK SIZE

DIAMETER OF PIPE INCHES	HORIZONTAL BEND		WEIGHT AT VERTICAL BENDS–LBS.
	SURFACE AREA SQ. FEET	THICKNESS INCHES	
22–1/2° BENDS			
6 OR LESS	2	8	1700
8	3	8	3,000
10	3.5	12	4,500
12	4	14	6,600
14	5	18	9,000
16	6	18	11,800
45° BENDS			
6 OR LESS	4	12	3,200
8	5	14	5,800
10	6	18	9,000
12	7	18	13,000
14	8	24	17,000
16	11.5	24	23,200
90° BENDS			
6 OR LESS	6	12	6,000
8	8	15	10,700
10	10	18	16,700
12	12	18	24,000
14	18	24	32,600
16	21	24	42,700
TEES & DEAD ENDS			
6 OR LESS	3	12	
8	4	15	
10	6	18	
12	8.5	18	
14	11.5	24	
16	15	24	



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WATER IMPROVEMENT DETAILS
2" BLOW OFF VALVE

HCE PROJECT NO.
P241-01

STANDARD DESIGN MANUAL
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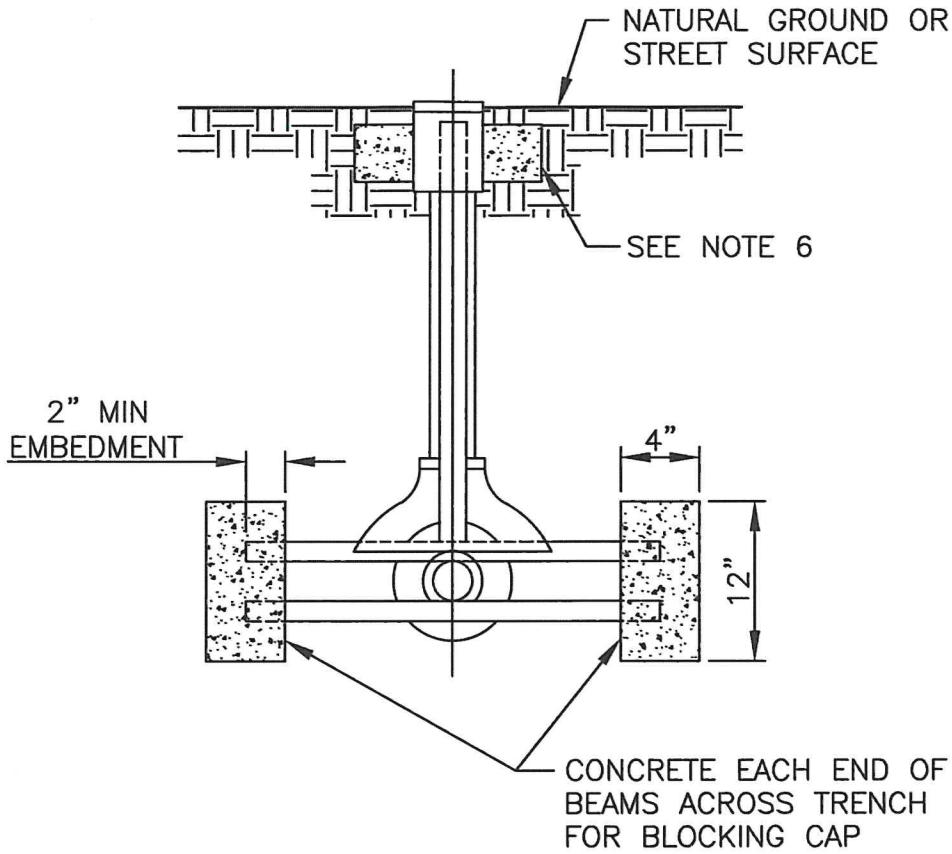
SHEET NO.
W - 7

01/2021



NOTES:

1. ALL DEAD–ENDS ON NEW WATER LINES SHALL BE EQUIPPED WITH A SUITABLE BLOW–OFF FACILITY, OR AS DIRECTED BY THE ENGINEER.
2. EMBED ALL C.I. FITTINGS IN SAND.
3. BEAM SCHEDULE SHALL BE USED FOR END CAPS AND PLUGS, OMITTING BLOW–OFF FITTINGS.
4. BEAMS SHALL EXTEND BEYOND TRENCH WALLS.
5. ALL CONCRETE TO HAVE A MIN. 28 DAYS COMPRESSIVE STRENGTH 3,000 P.S.I.
6. MIN. OF 9 SY. COMPACTION AROUND INSTALLATION.

BEAM SCHEDULE		
SIZE MAIN	SIZE AND TYPE BEAM	No.OF BEAMS
2"	2" STEEL PIPE	2
8"	3" STEEL PIPE	2
12"	5" I 10.0#	2
16"	6" I 17.25#	2
20"	8" I 18.4#	2
24"	10" I 25.4#	2
30"	12" I 35.0#	2
36"	15" I 50.0#	2

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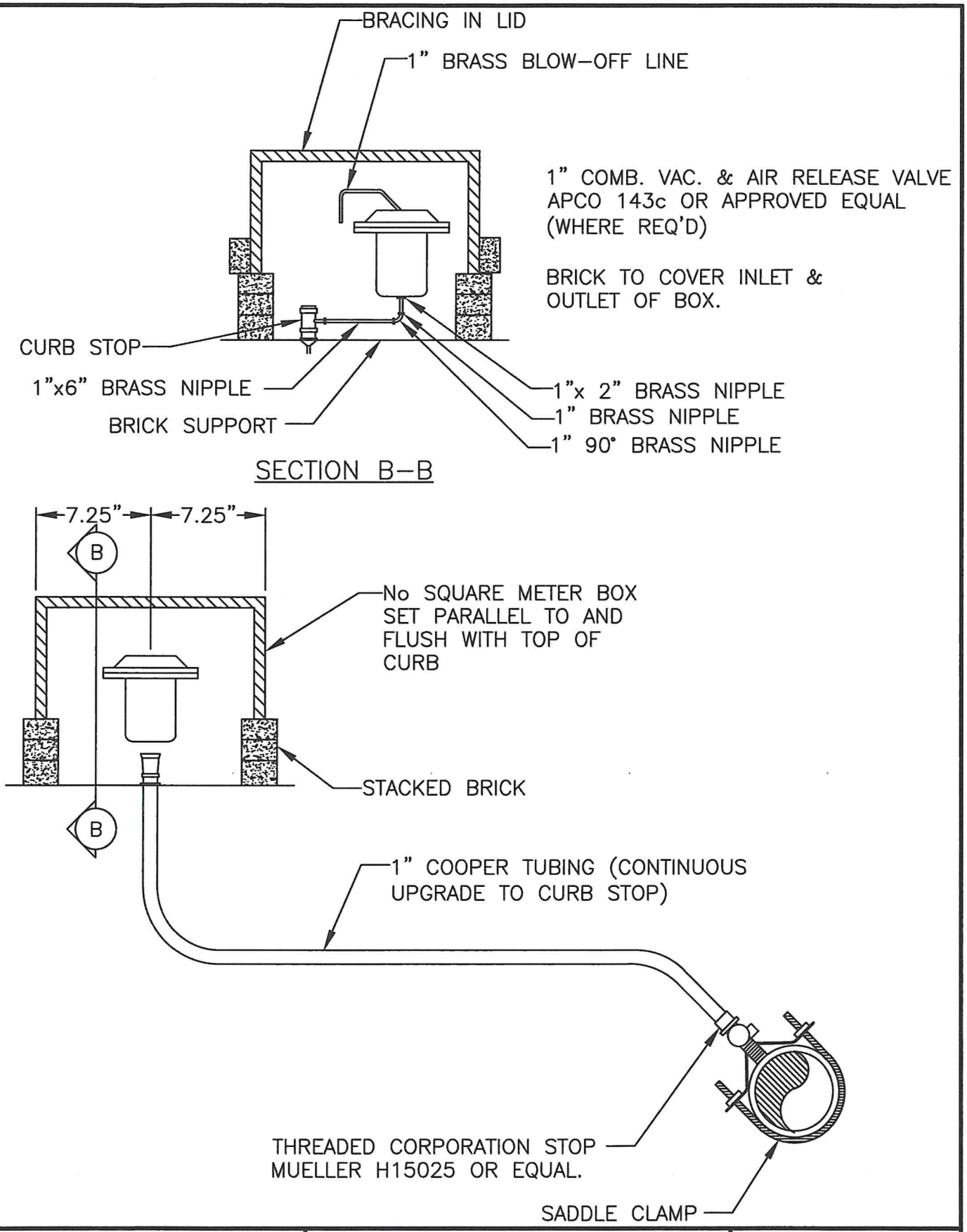
WATER IMPROVEMENT DETAILS
1" AIR RELEASE VALVE

HCE PROJECT NO.
P241-01

STANDARD DESIGN MANUAL
CITY OF MERCEDES

SHEET NO.
W - 8

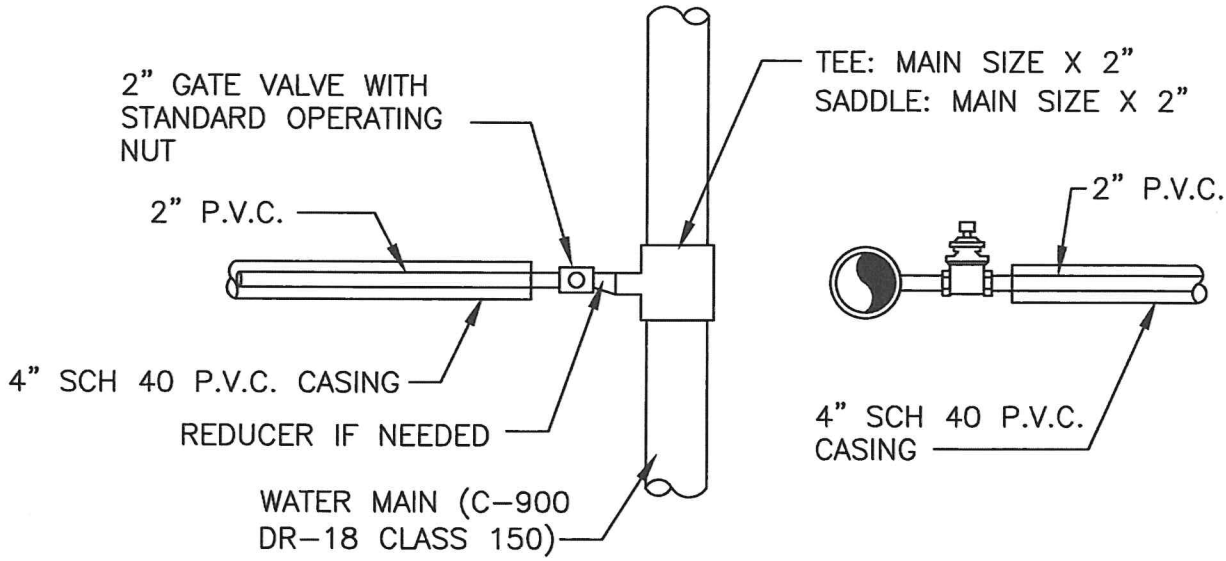
01/2021



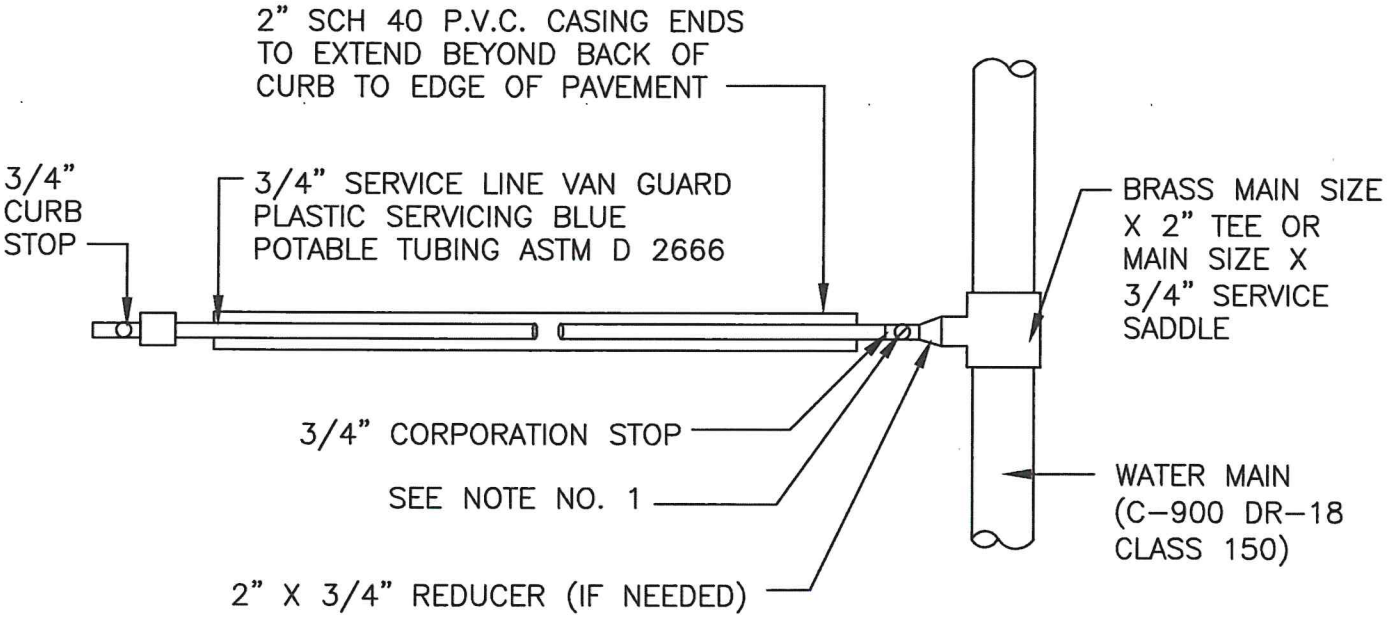
city of mercedes 400 South Ohio, Mercedes, Texas 78570 (956) 565 – 3114	**WATER IMPROVEMENT DETAILS** **1" AIR RELEASE VALVE**	HCE PROJECT NO. P241-01	
	STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. W - 9	01/2021

NOTES:

1. ON ALL SERVICE LINES GREATER THAN 1" (2" P.V.C. SCHEDULE 40), A 2" VALVE WILL BE REQUIRED.
2. ONE SERVICE PER EACH LOT.



2" SERVICE LINE



SINGLE CONNECTION

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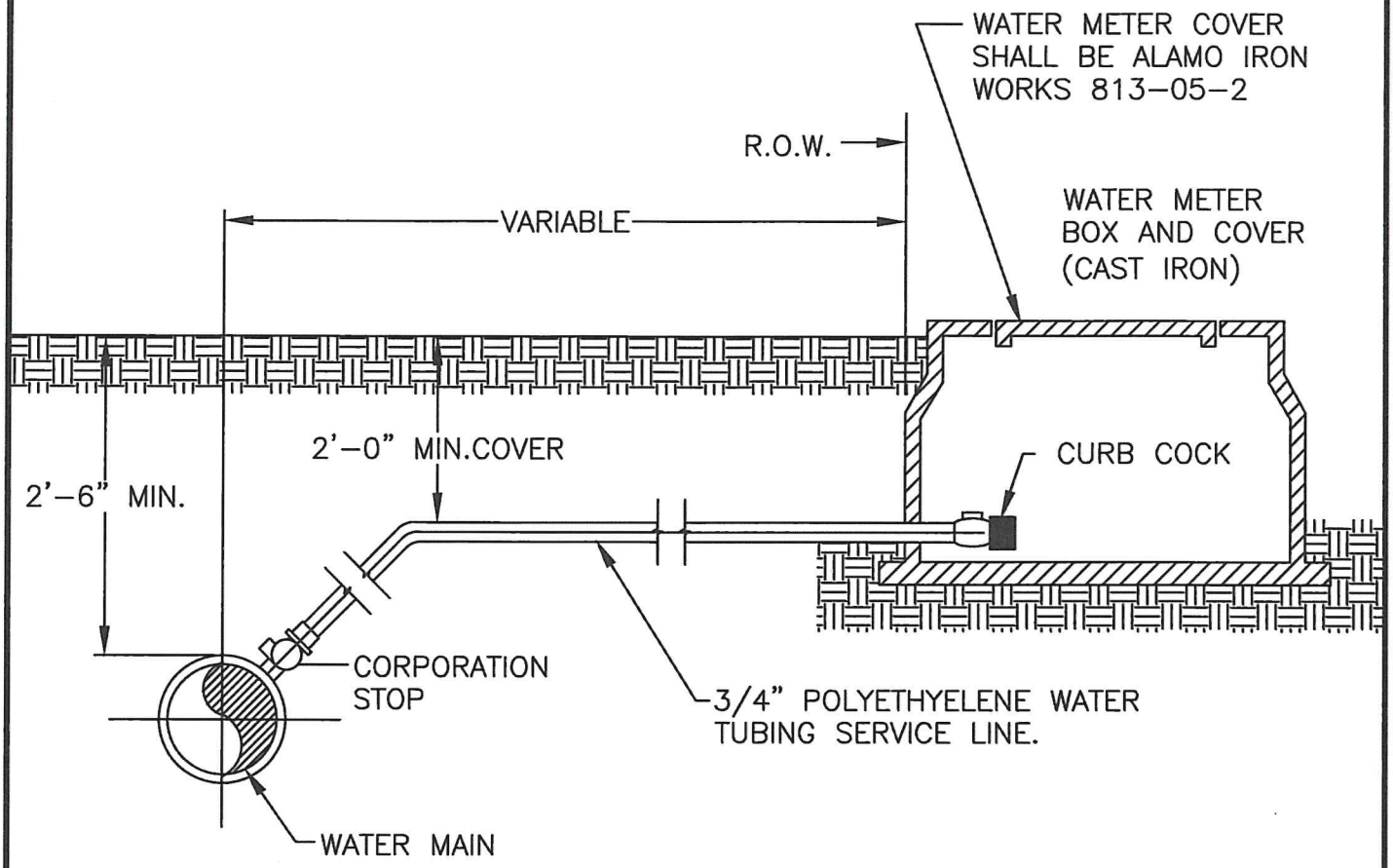
WATER IMPROVEMENT DETAILS **WATER SERVICE STREET CROSSING**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. W - 10	01/2021



NOTES:

1. ALL SERVICE CONNECTIONS NEED TO HAVE A MIN. 2'–0" COVER FROM FINISHED GRADE.
2. WATER METER COVER SHALL BE ALAMO IRON WORKS 813–05–2.
3. ALL WATER MAINS HAVE 30 INCHES OF COVER FROM FINISHED GRADE.
4. METER BOX SHALL BE CAST IRON.
5. ALL CONCRETE TO HAVE A MIN. 28 DAYS COMPRESSIVE STRENGHT OF 3,000 P.S.I.
6. 2" GATE VALVE ONLY REQUIRED FOR 2" SERVICE.
7. POLYETHYLENE TUBING ACCEPTABLE FOR LINE SIZES 1" OR LESS, SCHEDULE 40 PVC REQUIRED FOR LINE SERVICES GREATER THAN 1".

CONSTRUCTION NOTES:

A. WATER VALVE COVER
B. CURB COCK
C. METER BOX & METER PROVIDED
D. WATER TUBING SERVICE LINE
E. CORPORATION STOP
F. WATER MAIN

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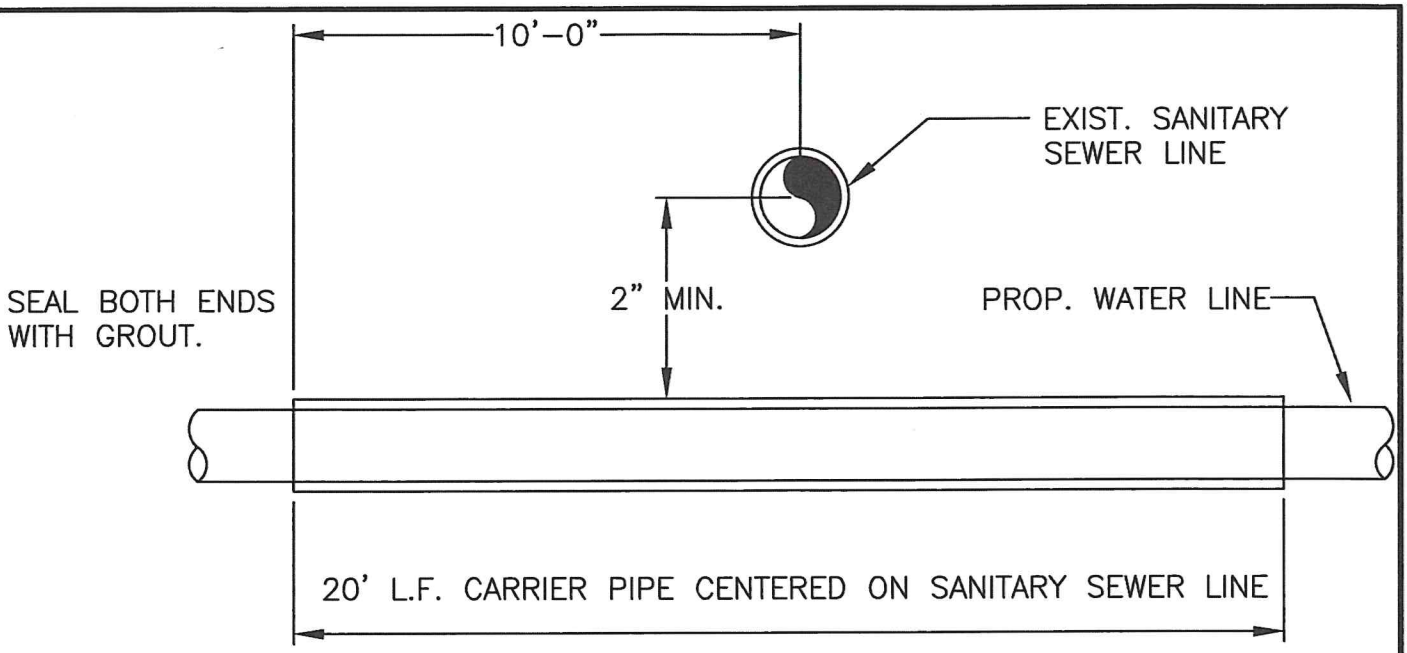
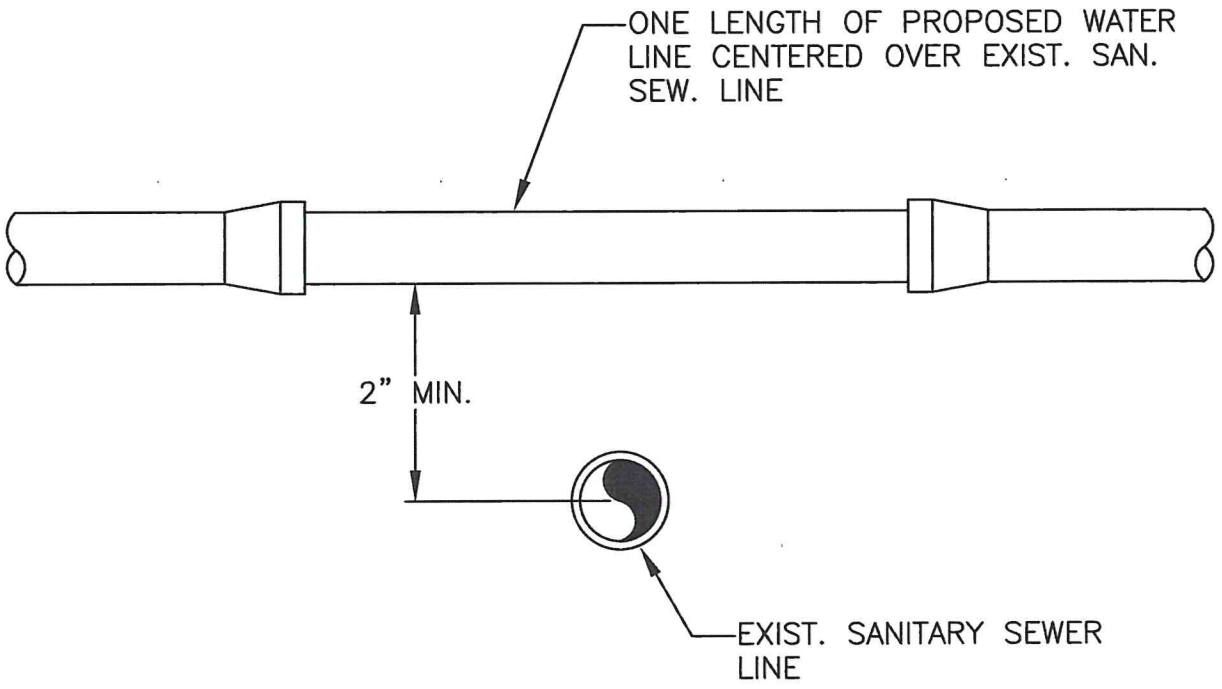
WATER IMPROVEMENT DETAILS TYPICAL SERVICE CONNECTION W/ METER BOX	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. W - 11	01/2021



WATER LINE CROSSING
UNDER EXIST. S.S. LINE



WATER LINE CROSSING
OVER EXIST. S.S. LINE

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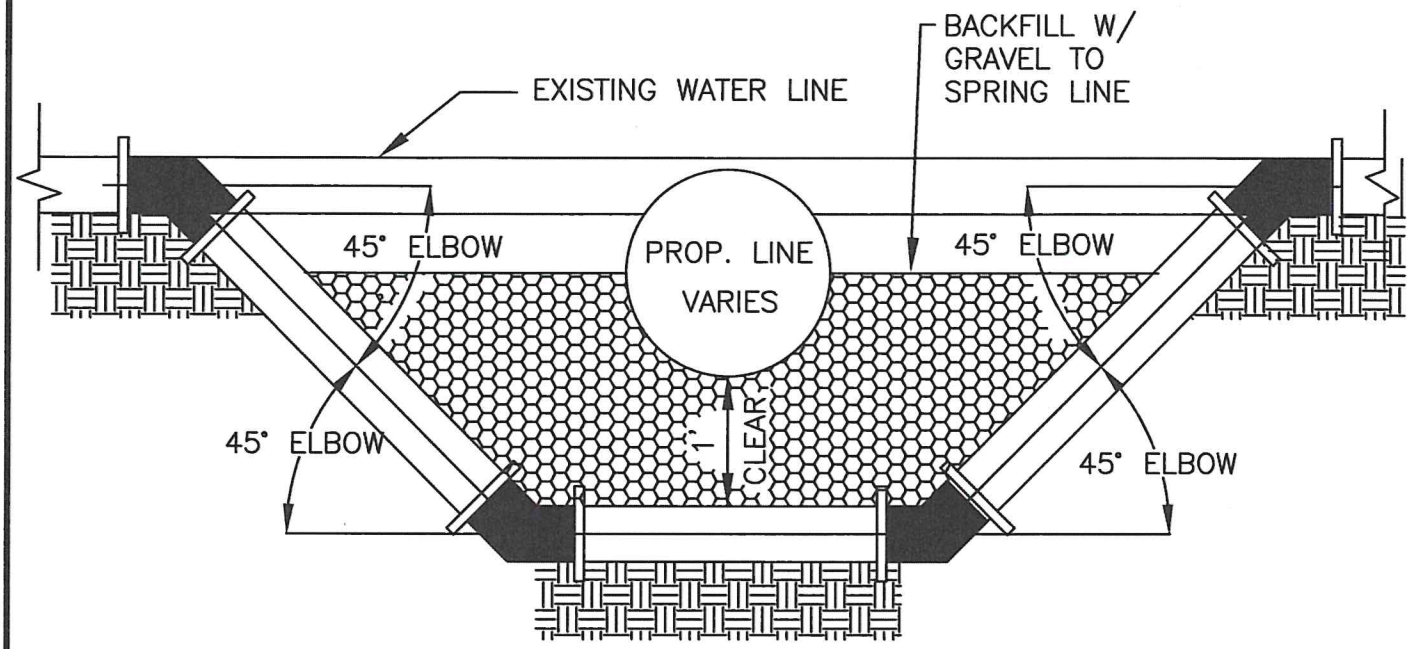
WATER IMPROVEMENT DETAILS WATERLINE CROSSING	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. W - 12	01/2021



WATER LINE ADJUSTMENT PVC

NOTE:

ALL BENDS AND JOINTS MUST BE SUPPORTED BY A CONC. THRUST BLOCK, APPROVED EQUAL,OR AS DIRECTED BY ENGINEER

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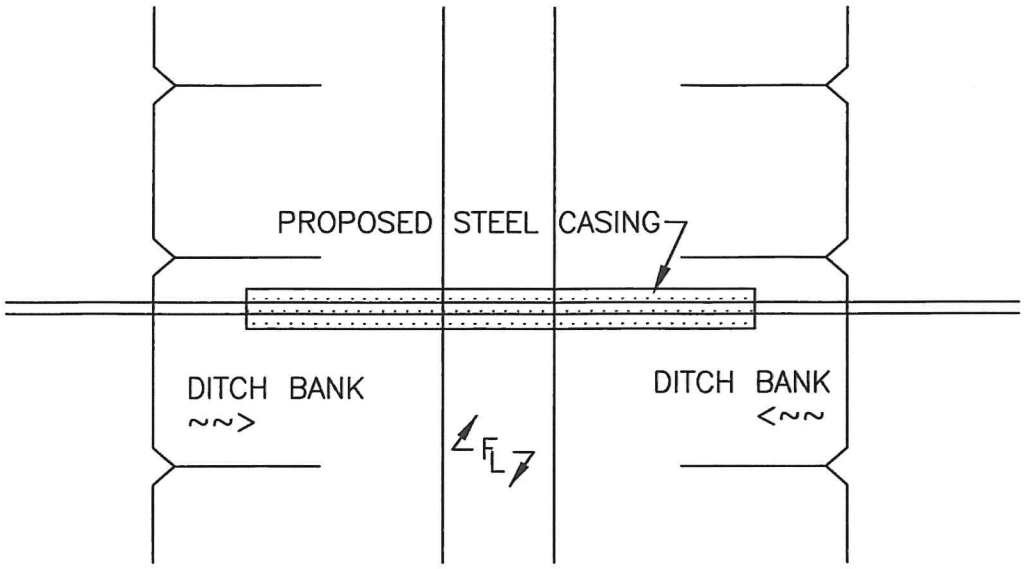
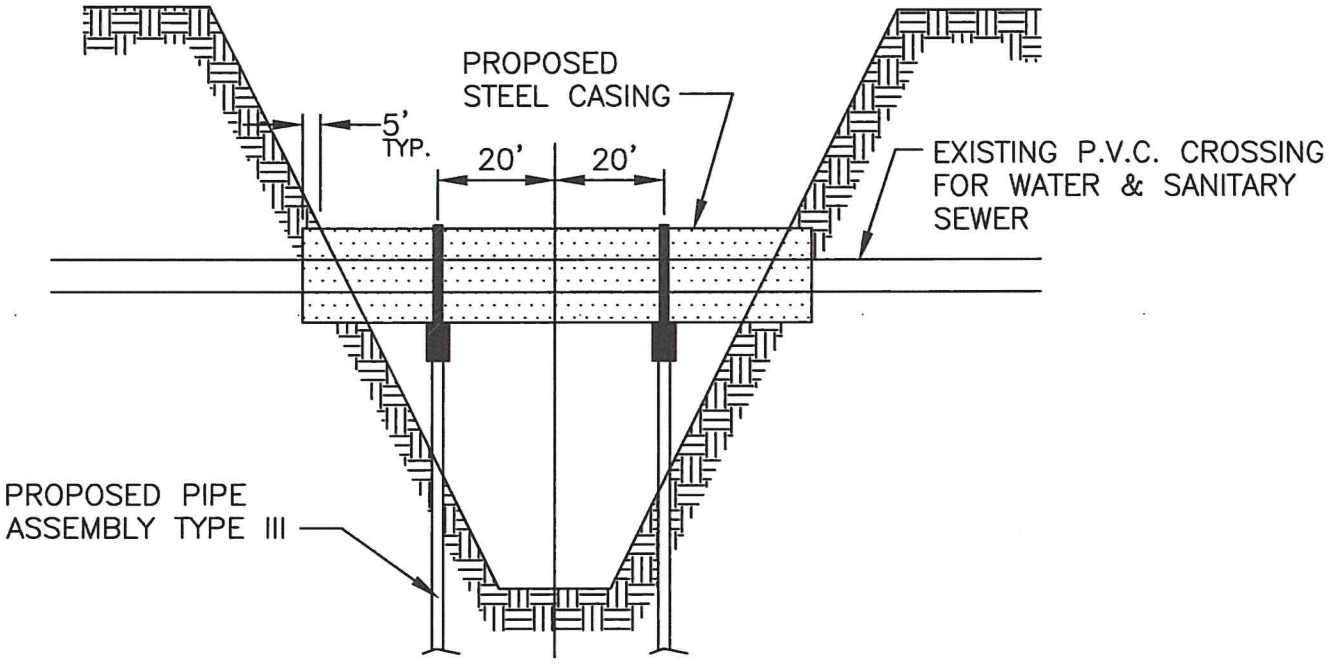
	WATER IMPROVEMENT DETAILS **WATERLINE ADJUSTMENT**	HCE PROJECT NO. P241-01
	STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. W - 13 / 01/2021





NOTE:

FOUNDATION DESIGN TO BE SUBMITTED BY ENGINEER AND APPROVED BY THE CITY OF MERCEDES

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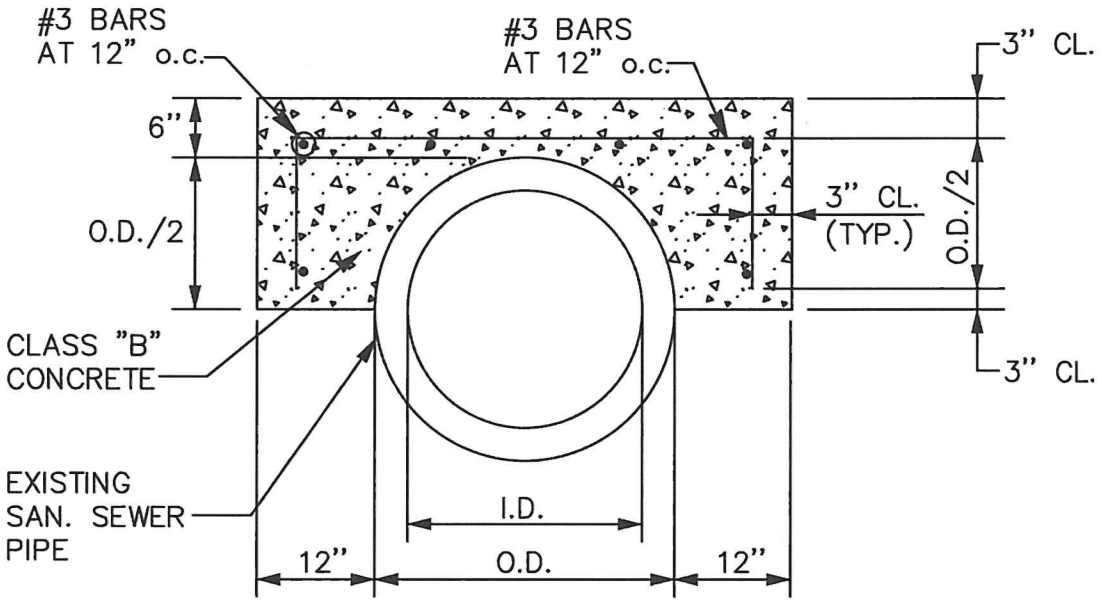
WATER IMPROVEMENT DETAILS **WATERLINE DRAINAGE DITCH CROSSING**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. W -14	01/2021



NOTE: CRADLE SHALL EXTEND A MINIMUM OF 24" ALONG PROPOSED PIPE.

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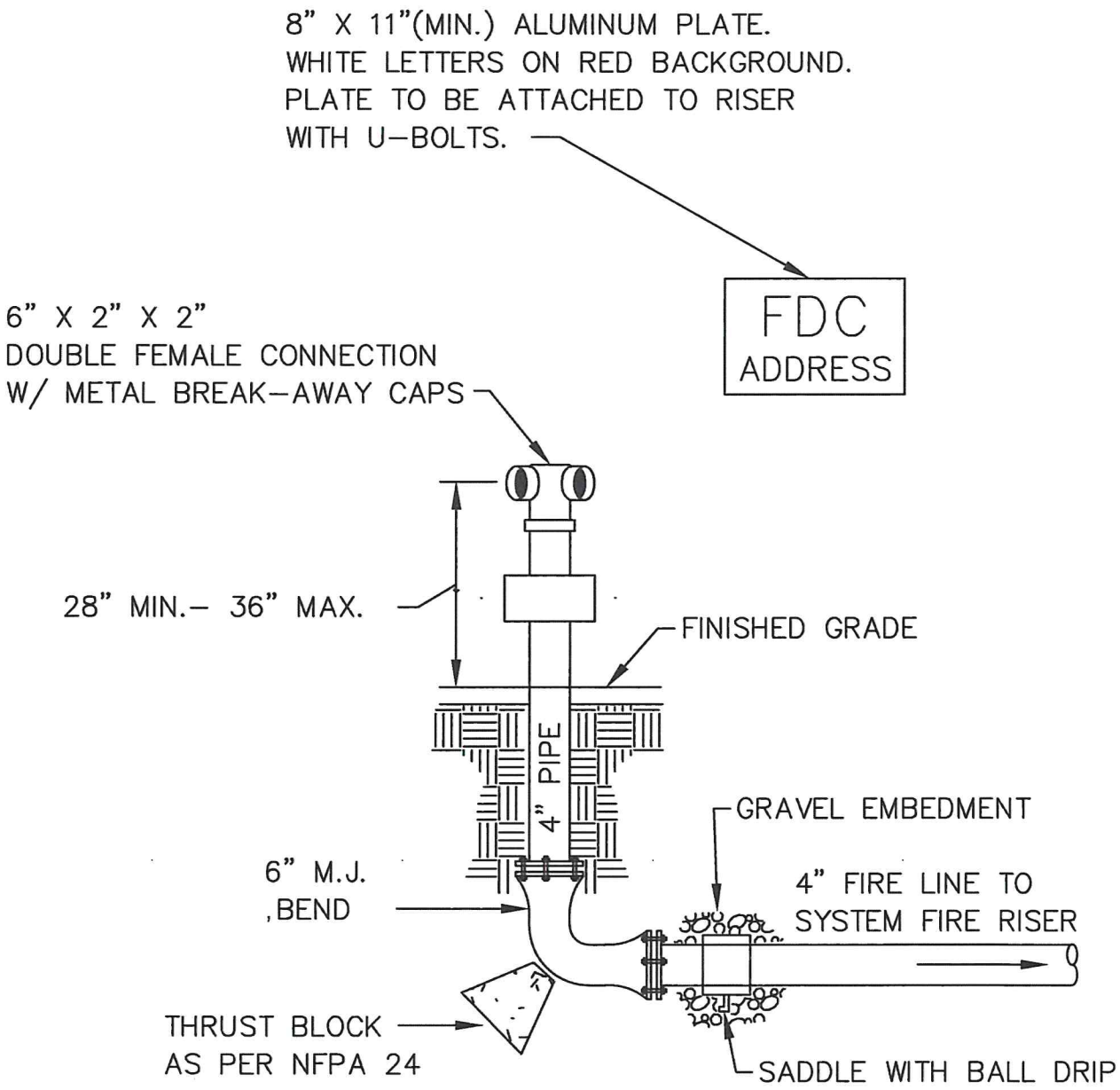
WATER IMPROVEMENT DETAILS **TYPICAL CONCRETE SADDLE**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. W - 15	01/2021



NOTE: FIRE DEPARTMENT CONNECTION AND SIGN
AS PER CITY OF MERCEDES FIRE MARSHAL.

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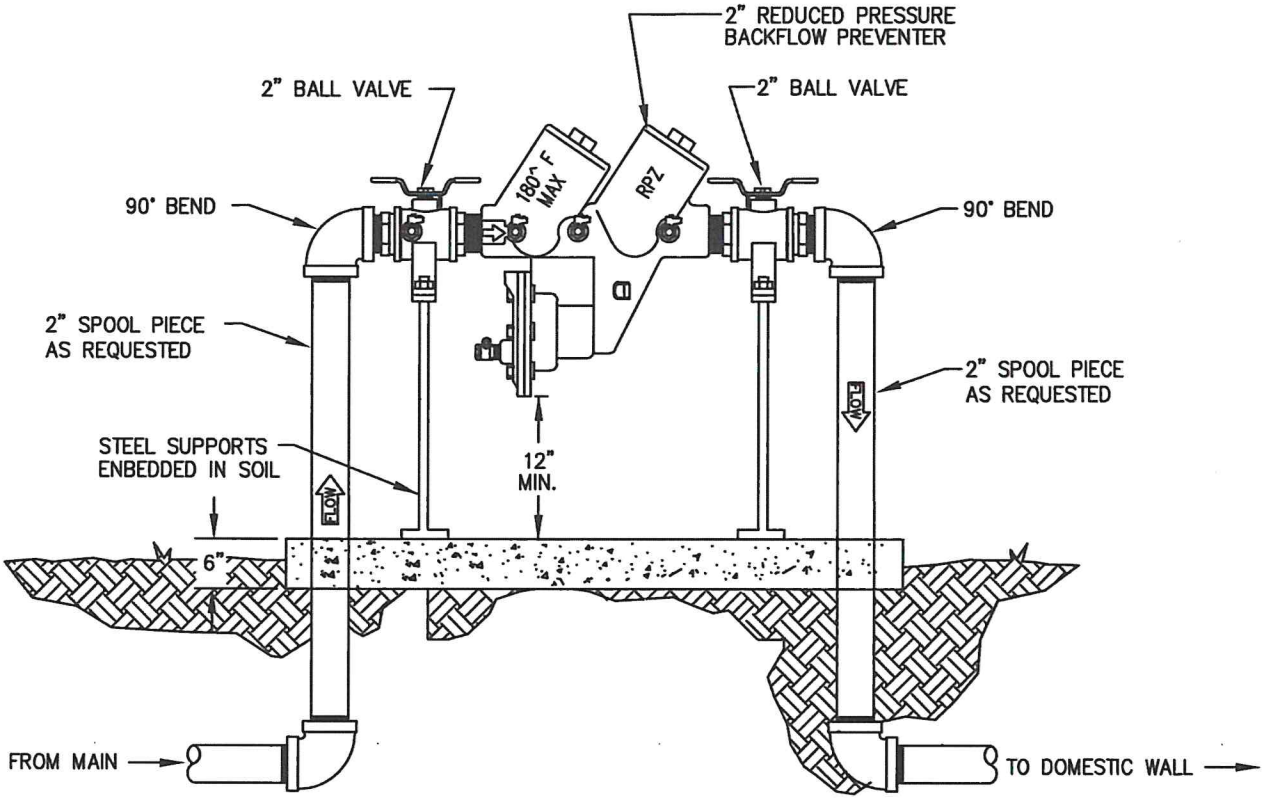
WATER IMPROVEMENT DETAILS **TYPICAL FIRE DEPARTMENT CONNECTION (FDC)**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. W - 16	01/2021



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WATER IMPROVEMENT DETAILS **REDUCED PRESSURE BACKFLOW PREVENTER**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. W - 17	01/2021

Section 8
Wastewater Improvements

8.1 General

The purpose of this section is to outline the general requirements for the design of wastewater improvements and provide typical details for construction. The City of Mercedes's City Engineer should be consulted if any deviations from these standards are anticipated before and during construction. In cases where design limitations or physical barriers restrict compliance with the provisions of this section, alternatives are to be considered by the City Engineer prior to construction and final acceptance of the improvements.

8.2 Design Standards

A. All wastewater mains must be designed in accordance with Design Criteria for Sewage Systems by the Texas Commission on Environmental Quality (TCEQ) TAC 217, current edition.

B. Wastewater improvements to the City of Mercedes wastewater collection systems are to be designed by a Professional Engineer licensed to practice in the State of Texas.

C. Wastewater mains are to be designed and installed with minimum cover of four (4) feet unless approved by the City Engineer.

D. Sanitary Sewer lines shall be a minimum of eight (8) inches in diameter, except laterals and force mains. The City may require larger diameter lines based on several factors including demand, service areas, and historical data.

E. Gravity sewer lines shall be designed with a straight alignment and a uniform grade between manholes. Horizontal curvature between manholes is not allowed. The table below shows the minimum and maximum pipe slopes for waste water lines.

Table 2-1 Minimum and Maximum Sanitary Sewer Pipe Slopes

Size of Pipe (inches)	Minimum Slope (%)	Maximum Slope (%)
8	0.33	8.40
10	0.25	6.23
12	0.20	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.30
24	0.08	1.93
27	0.06	1.65
30	0.055	1.43
33	0.05	1.26
36	0.045	1.12
39	0.04	1.01
Greater than 39	*	*

* Pipes larger than 39 inches in diameter slopes are determined by Manning's formula to maintain a velocity greater than 2.0 (ft/s) and less than 10.0 (ft/s) when flowing full.

Manning's Formula

$$V = \frac{1.49}{n} \, x \, R_h^{0.67} \, x \, \sqrt{S}$$

V = velocity (ft/s)
n = Manning's roughness coefficient (0.013)
R_h = hydraulic radius (ft)
S = slope (ft/ft)
Reference: *TCEQ Chapter 217, Subchapter C: Conventional Collection Systems*

F.

Wastewater pipe diameters shall be designed to serve the anticipated development, but shall not be less than the following requirements:

1. Single Family 8 inches
2. Commercial, Retail, Multi-Family 8 inches
3. Industrial 12 inches
4. Educational Facilities 12 inches

G. Water jetting is not allowed under any circumstance for sewers crossing or within a roadway. Water jetting for sewers outside of roadways may be considered if a licensed

geotechnical engineer has determined the soil is suitable for jetting AND if approved by the City Engineer.

H. Sanitary Sewer manholes shall be placed at a maximum of 500 foot spacing or as directed by the City Engineer. The table below shows the maximum manhole spacing as required by TCEQ.

Table 2-2 Maximum Sanitary Sewer Manhole Spacing

Pipe Diameter (inches)	Maximum Manhole Spacing (feet)
6-15	500
18-30	800
36-48	1000
54 or greater	2000
Reference: *TCEQ Chapter 217, Subchapter C: Conventional Collection Systems*	

I. Sewer main and service line pipe shall conform to SDR26 meeting requirements of ASTM D-3034. Force mains shall conform to SDR21.

J. All lots must be serviced with single service stub-outs, including a clean-out located at the right of way or within an easement. Service locations should be marked on the curb or gutter with an "S" not less than (4) inches in size or in a manner approved by the City of Mercedes.

K. Single service connections shall be extended for each lot and a cleanout shall be installed at the right of way or within an easement. For land use other than single family residential, individual services shall be provided for each unit or suite. If a shell building is proposed, the project engineer shall provide a reasonable assumption to the number of suites that the shell building may hold.

L. Single-family residential private service connections shall be a minimum of four (4) inches in diameter. Multi-family residential, commercial, and industrial private service connections shall be a minimum of six (6) inches in diameter. Location of service lines shall be in the center of the lots' frontage; unless the sewer main is located at another juncture.

M. Rubber gaskets shall conform to ASTM D-1869, D-361 or C-443. A maximum of twelve (12) inches of manhole grade adjustment rings is allowed and a minimum of one (1) grade ring is required between the manhole and the rings.

N. Manhole rings and covers shall have a minimum 30 inch opening and include the City of Mercedes logo provided in the details sections and rain guards. Manhole cover is to be hinged and traffic rated fiber composite. (See details at the end of this section)

O. Project Close-out documents shall include an electronic and hard copy of Final Record Drawings. Electronic drawings are preferred.

8.3 Testing Requirements

A. Infiltration/Exfiltration: The total infiltration or exfiltration, as determined by test, shall not exceed 200 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of 2 feet. If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, remedial action shall be undertaken in order to reduce the infiltration or exfiltration to an amount within limits as specified. Infiltration or exfiltration tests shall be performed on the total footage on the project. Copies of all tests results shall be made available to the city. The air test shall conform to the procedure described in ASTM C 828 or other appropriate procedures.

B. Deflection: Deflection tests shall be performed on all flexible and semi-rigid pipes. The test shall be conducted after the final backfill has been placed. No pipe shall exceed a deflection of 5%. The deflection test should be performed using a rigid ball or mandrel and have a diameter equal to 95% of the inside diameter of the pipe being tested. The test should not be performed using mechanical pulling devices. The city's construction inspector must be present at the time of testing.

C. Pressure Test:

Table 2-3 Minimum Testing Times for Low-Pressure Air Test

Pipe Diameter (inches)	Minimum Time (seconds)	Maximum Length for Minimum Time (feet)	Time for Longer Length (seconds/foot)
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309

30	1700	80	21.369
33	1870	72	25.856
Reference: *TCEQ Chapter 217, Subchapter C: Conventional Collection Systems*			

D. Video Camera Inspection: The City of Mercedes may perform a video inspection prior to final acceptance of work but is not necessary for approval. Any defects including but not limited to, sagging, leaking, infiltration, separation of joints, service connection, defects, or loss of roundness shall require repair and must be reported to the City Engineer and the Public Works Director.

8.4 Manholes

A. Manholes will be required to facilitate maintenance, cleaning, and inspection at changes in horizontal alignment (including at the center of horizontally curved sections of main where the included angle equals or exceeds 45-degrees), changes in grade, changes in pipe size and at junctions with other wastewater mains or collection lines. Manholes will be required at the junctions where service leads, 6-inch diameter or larger, join mains.

B. Manholes will be equipped with rain guards (see typical manhole detail).

C. Manhole covers will have the City of Mercedes Logo in the center.

D. When a change in the size of a wastewater main or collection line occurs without a change in grade, the inside top of pipe (soffit) elevations will be matched in the manhole. Elevation differences between pipes at a manhole will require a drop manhole if >2' above FL.

E. A 0.1-foot drop through the manhole is desired.

F. At the end of a main or collection line, the line shall be terminated with a manhole or clean out as per TCEQ requirements. Clean-outs shall only be allowed when there is no physical means for an extension and the line is less than 4 feet in depth. If an extension is anticipated, a plugged stub-out of one full pipe joint with a clean-out is required.

G. Manholes shall be constructed of fiberglass. Watertight sealed manholes with bolt-down lids shall be provided in creek beds and in floodplains

H. Manhole sizes shall be as follows:

Manhole Diameter	Main Size
4 ft	<18 in.
5 ft	≥18 in. < 30 in.
6 ft	≥36 in.

I. Manholes 10 feet to 20 feet deep shall be at least 5 feet in diameter and manholes over 20 feet deep shall be at least 6 feet in diameter and covers customized for Mercedes.

8.5 Right of Way Crossings

A. Wastewater collection mains located within state right of way must conform to the requirements of the Texas Department of Transportation (TxDOT).

B. Wastewater collection mains that cross railroads must conform to the requirements of the railroad company whose right-of-way is being crossed.

C. For wastewater collection mains crossing creeks or drainage channels, the mains shall be encased in steel casing; piers must support the elevated sections of such crossings. Dry bore all crossings of existing streets unless otherwise authorized by the Director of Public Works.

D. Below grade crossings of creeks and drainage channels shall have a minimum cover of 3.5-feet below the flowline at the time of construction. All below grade crossings will require encasement with steel encasement pipe and all ends shall be capped and sealed. The casing shall be carried into the bank a distance that should consider changes in the creek channel. This distance shall be beyond the high bank, outside of a projected 1H:1V slope from the high bank away from the channel. If the pipe is less than 3.5-feet in depth, steel encasement and concrete capping shall be required.

8.6 Encasement

A. Steel cylinder pipe shall be used for all encasement pipe. Other encasement pipe material may be used per TCEQ requirements and City Specifications. Carrier pipes sized less than 30 inches shall use an encasement pipe with a wall thickness no less than 3/8-inch. For carrier pipes 30 inches and larger, a wall thickness of no less than 1/2-inch shall be used. Coating of encasement pipe may be required in special soil conditions.

B. When required, encasement pipe diameter shall be as specified in the specifications and details. Encasement pipes shall extend 2-feet beyond the back of both curbs on the street. Ends of encasement pipes shall be sealed to prevent the intrusion and collection of groundwater.

C. All carrier pipes will be supported by casing spacers in accordance with the specifications and details, and shall have joints restrained by an approved method that will allow the removal of the carrier pipe from the encasement pipe in a single direction by means of tension on the carrier pipe only.

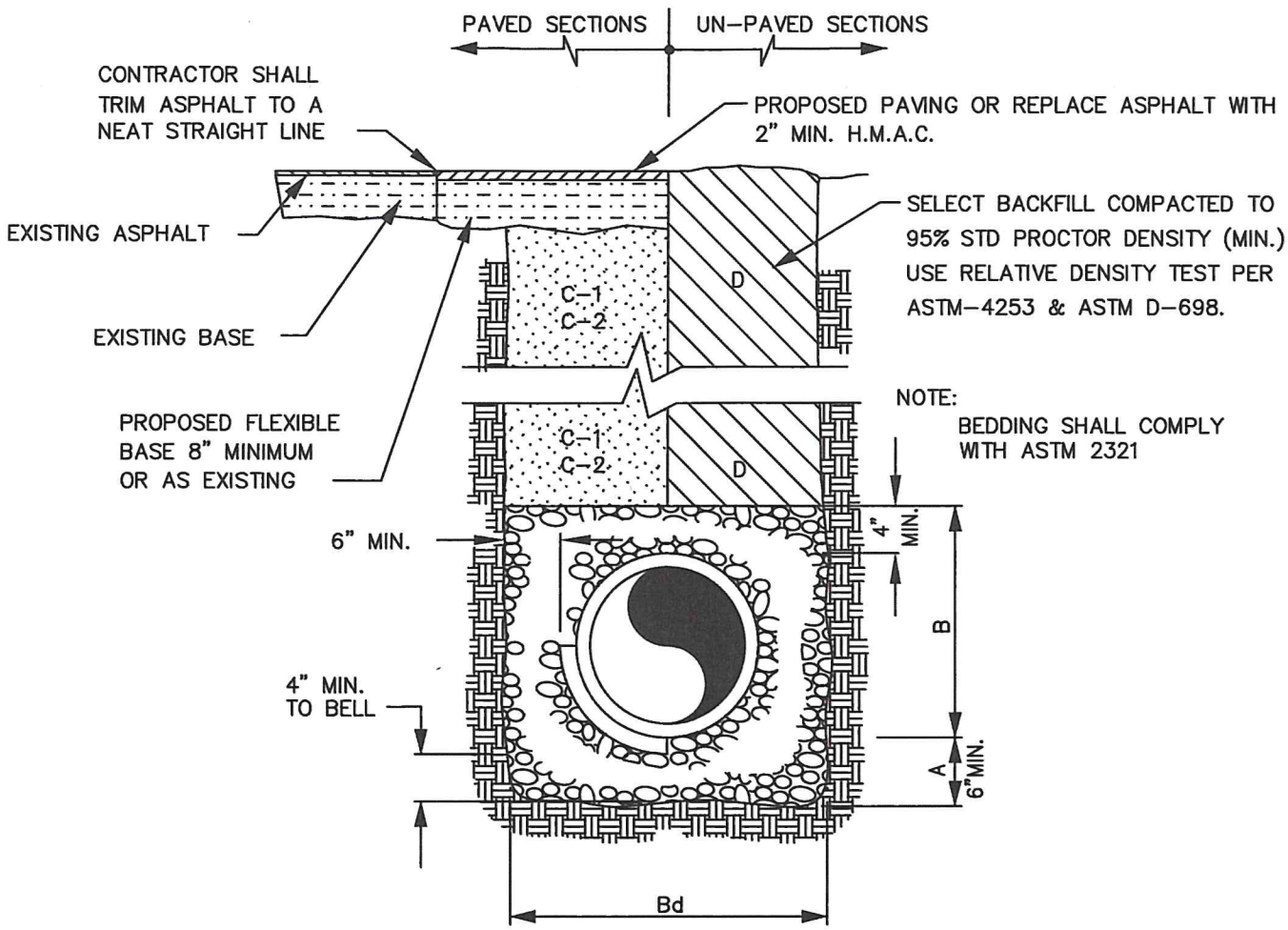
8.7 Easements

A. Wastewater lines constructed outside of or not adjacent to public rights-of-way shall be in easements of not less than 10 feet in width except for the following: if the sewer main

bury is deeper than 10 feet, the easement width shall be not less than 20 feet: and if the sewer main bury is greater than 14 feet, the easement width shall be 30 feet. If both wastewater and water mains are located within the same easement, the width shall not be less than 25 feet (larger widths will be required depending on the depth of the sewer main).

B. The easement must be located such that the centerline of the wastewater line is no closer than 5.5-feet to the closest edge of the easement.

8.8 Wastewater Improvement Details



A. GRAVEL BEDDING PLACED BEFORE PIPE IS LAID (MIN. THICKNESS = 6"). PIT RUN GRAVEL 3/4" MAX. SIZE.

B. GRAVEL PLACED AFTER PIPE IS LAID, FROM BOTTOM OF PIPE TO 4" ABOVE THE TOP OF PIPE. PIT RUN GRAVEL 3/4" MAX. SIZE.

Bd. TRENCH WIDTHS SHALL BE EQUAL TO PIPE BELL O.D. + 12" OR IN ACCORDANCE WITH ASTM 2321.

C-1. CITY STREETS, PARKING AREA, DRIVEWAYS: SELECTED BACKFILL SHALL BE PLACED IN 8" LIFTS MECHANICALLY COMPACTED TO 98% MODIFIED PROCTOR DENSITY,

C-2. STATE MAINTAINED ROADWAYS: SAND/CEMENT STABILIZED BACKFILL, WITH 7% PORTLAND CEMENT, COMPACTED AS PER ASTM D-4253 AND ASTM D-698.

D. SELECTED EARTH BACKFILL MECHANICALLY COMPACTED TO 95% STD. PROCTOR DENSITY (12" LIFTS). FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE. BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO 95% STD. PROCTOR DENSITY (USE RELATIVE DENSITY TEST PER ASTM D-4253 & ASTM D-698). THE THICKNESS OF EACH LOOSE LAYER SHALL NOT EXCEED 6". STRUCTURAL BACKFILL MATERIAL SHALL BE AS APPROVED BY THE ENGINEER.

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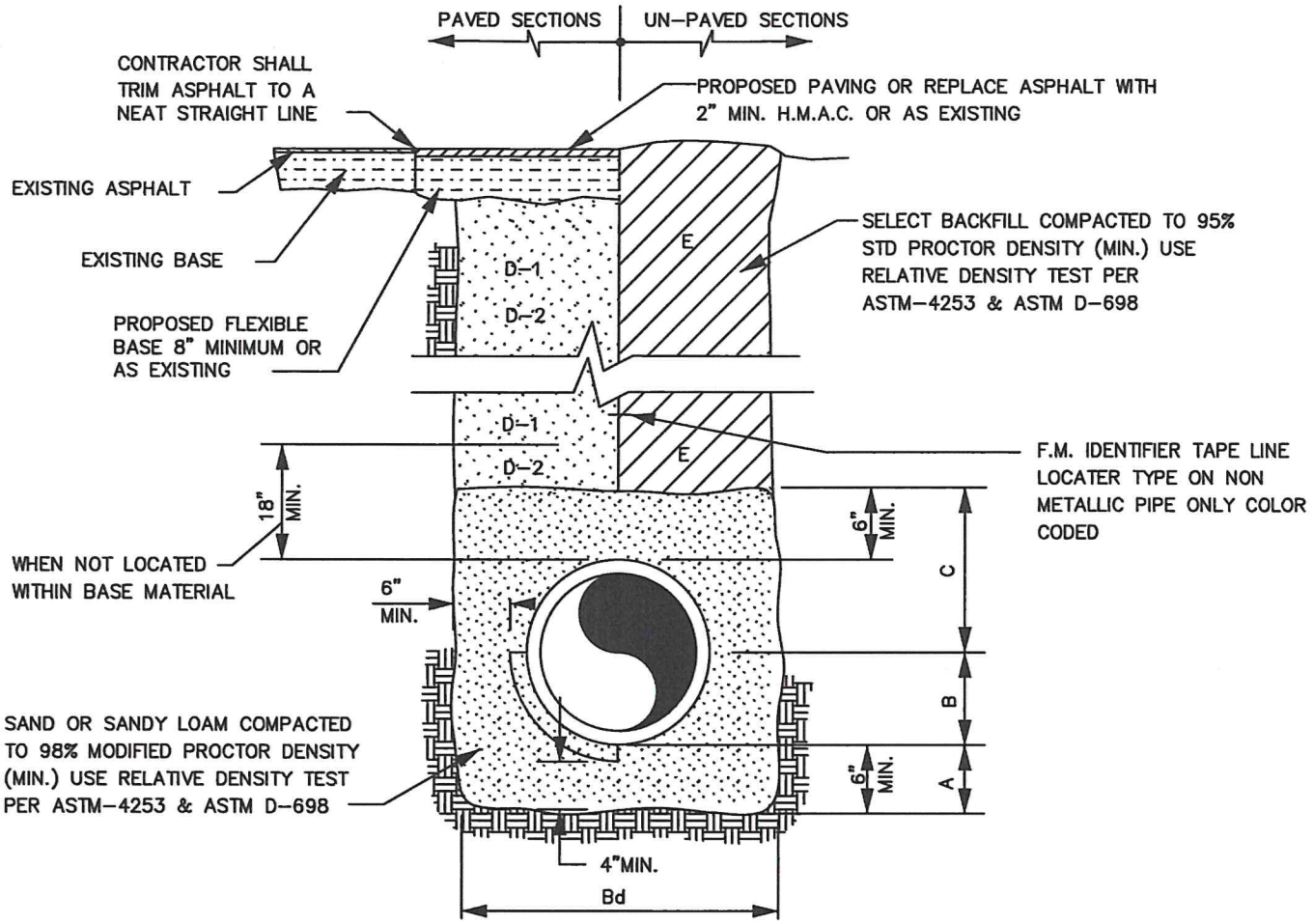
WASTE WATER IMPROVEMENT DETAILS SEWER LINE TRENCH BEDDING (NON-FORCEMAIN)	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. WW - 1	01/2021



A. SAND OR SANDY LOAM BEDDING PLACED BEFORE PIPE IS LAID UP TO FLOW LINE OF PIPE. (MIN. THICKNESS= 6")

B. SAND OR SANDY LOAM BACKFILL PLACED AFTER PIPE IS LAID FROM BOTTOM OF PIPE TO SPRING LINE OF PIPE. (4" LIFTS, HAND TAMPED) Bd TRENCH WIDTHS SHALL BE PIPE O.D. + 12" OR IN ACCORDANCE WITH ASTM 2321 FOR PVC PIPE.

C. SAND OR SANDY LOAM BACKFILL PLACED FROM SPRING LINE OF PIPE TO 6" ABOVE TOP OF PIPE. (6" LIFTS, HAND TAMPED)

D–1. (CITY STREETS, PARKING AREA, SELECT EXCAVATED BACKFILL MATERIAL COMPACTED TO 98% SPD. (8" LIFTS, MECHANICAL COMPACTION)

D–2. (STATE MAINTAINED ROADWAY) COMPACTED SAND/CEMENT STABILIZED BACKFILL WITH 7% PORTLAND CEMENT COMPACTED AS PER ASTM D–4253 AND ASTM D–698.

E. SELECT EARTH BACKFILL COMPACTED TO 92% SPD. (12" LIFTS, MECHANICAL COMPACTION) FOUNDATION PREPARATION (WELLPOINTS, GRAVEL OR CEMENT STABILIZATION, OR APPROVED SUBSTITUTE) SHALL BE REQUIRED WHEN TRENCH BOTTOM IS UNSTABLE, BACKFILLING AT STRUCTURES SHALL BE PLACED IN UNIFORM LAYERS, MOISTENED AS REQUIRED TO APPROXIMATE OPTIMUM MOISTURE CONTENT, AND COMPACTED TO 95% STD. PROCTOR DENSITY (USE RELATIVE DENSITY TEST PER ASTM D–4253 & ASTM D–698). THE THICKNESS OF EACH LOOSE LAYER SHALL NOT EXCEED 6". STRUCTURE BACKFILL MATERIAL SHALL BE SAND, APPROVED SITE SOIL, OR OTHER APPROVED SUBSTITUTE.

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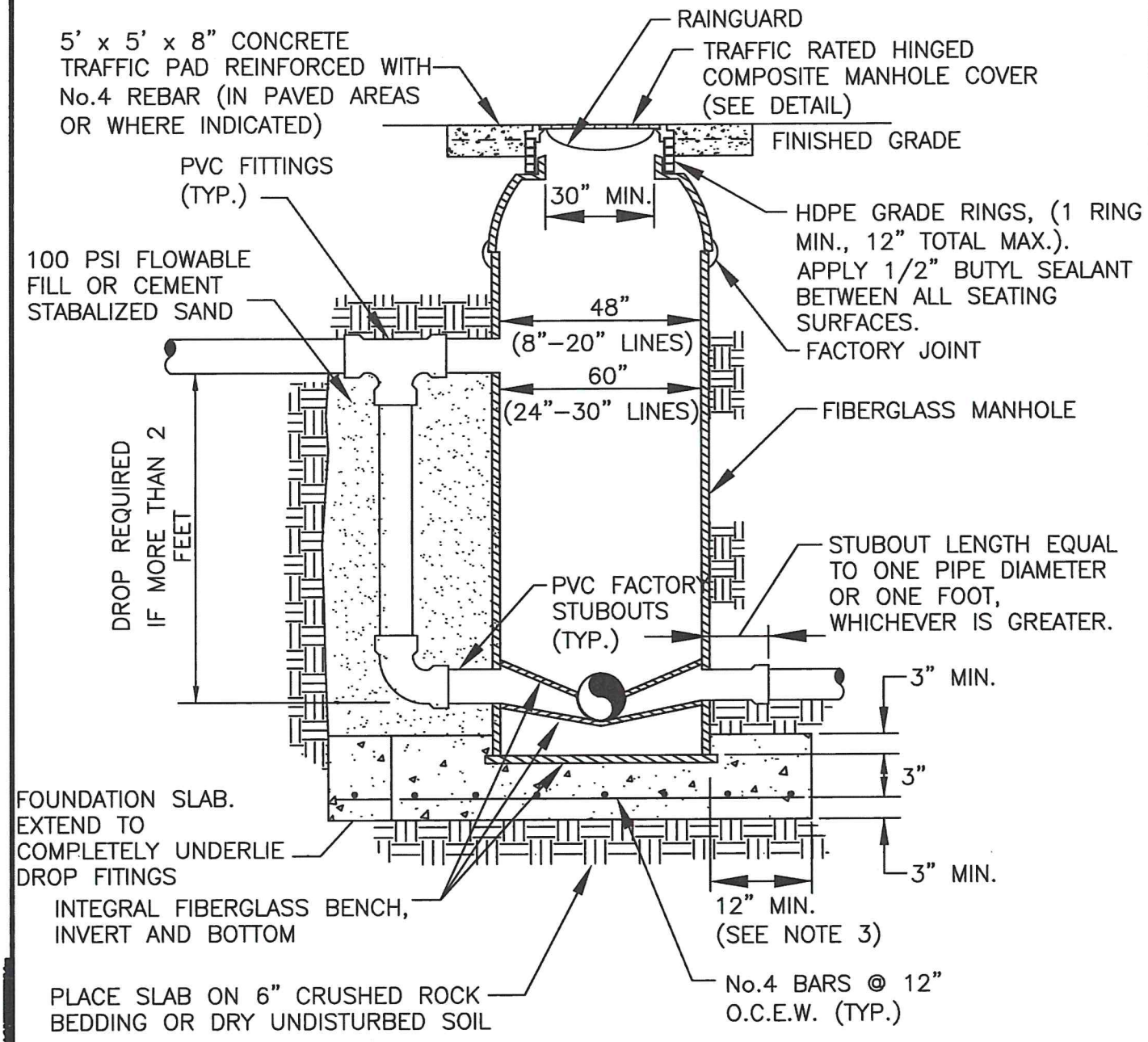
WASTE WATER IMPROVEMENT DETAILS FORCE MAIN TRENCH BEDDING	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. WW - 2	01/2021



NOTES

1. INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. BACKFILL SHALL BE SAND COMPACTED TO 95% STANDARD PROCTOR.
3. BASE SLAB SHALL BE 4 FT. LARGER THAN MANHOLE DIAMETER WHERE SOIL BEARING CAPACITY < 2000 PSF, WATER TABLE < 5 FT., OR DEPTH > 20 FT. SLAB SHALL BE DESIGNED TO PREVENT FLOTATION OF MANHOLE.
4. COAT ALL INTERNAL CEMENTITIOUS AND METALLIC SURFACES WITH COAL TAR EPOXY.
5. OUTLET STUBOUT SHALL BE SPIGOT END. INLET STUBOUTS SHALL BE BELL END EXCEPT FOR DROP CONNECTIONS.

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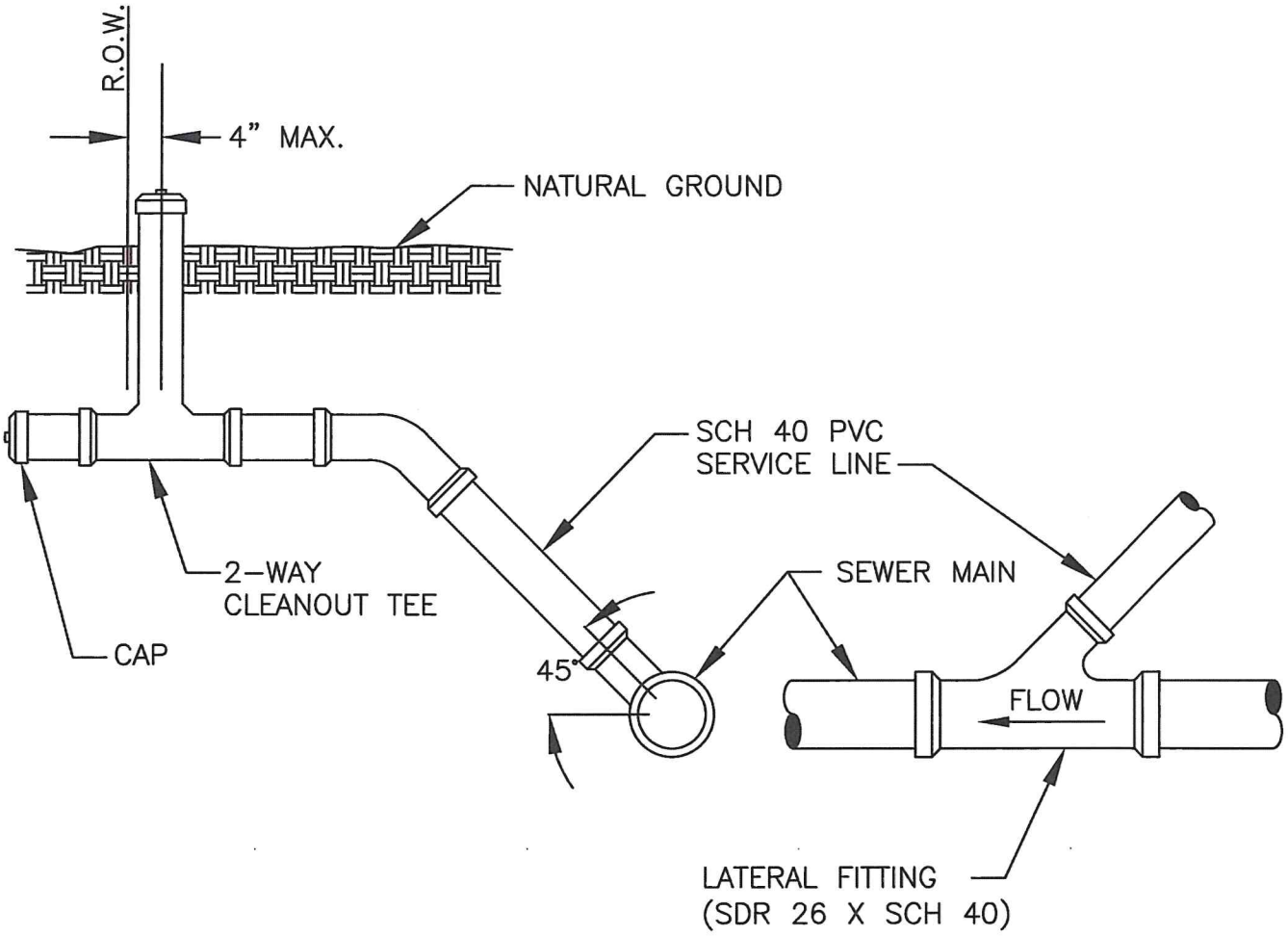
WASTE WATER IMPROVEMENT DETAILS SANITARY SEWER MANHOLE	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. WW - 3	01/2021



NOTES

1. INDIVIDUAL SERVICE LATERALS TO BE PROVIDED TO EACH LOT.
2. SINGLE FAMILY SERVICE SHALL BE 4" MIN. MULTI-FAMILY, COMMERCIAL, AND INDUSTRIAL SERVICE SHALL BE 6" OR GREATER AS REQUIRED.

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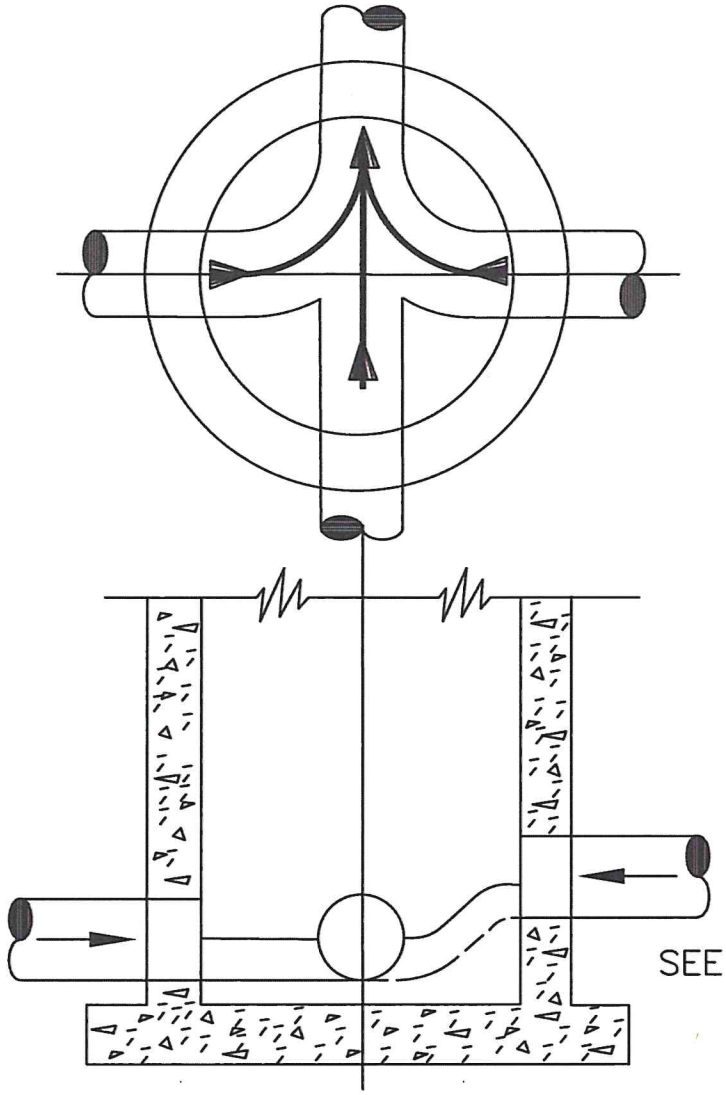
WASTE WATER IMPROVEMENT DETAILS **TYPICAL SANITARY SEWER SERVICE CONNECTION**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. WW - 4	01/2021



NOTES:

1. ALL INVERT CHANNELS ARE TO BE CONSTRUCTED FOR SMOOTH FLOW WITHOUT OBSTRUCTION.
2. PROPERLY SHAPED SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS TO PROVIDE FOR SMOOTH FLOWS.
3. SERVICE LATERALS SHALL NOT ENTER MANHOLES UNLESS SPECIFIED ON PLANS AND THEN MUST BE TREATED AS MAINS (ELEVATIONS SHOWN, PRECAST HOLE, FLOW CHANNEL)
4. APPROVED PRECAST CONCRETE OR FIELD INSTALLED CONCRETE FLOW CHANNEL IS REQUIRED.
5. SIDEWALLS OF FLOW CHANNEL SHALL BE AT LEAST HALF OF PIPE HEIGHT AT ALL POINTS.
6. NO INSIDE DROP LARGER THAN 6" SHALL BE ALLOWED WHEN THERE ARE MORE THAN 2 INVERTS OR WHEN THERE IS A CHANGE OF DIRECTION OF FLOW GREATER THAN 45 DEGREES.
7. THE FIELD APPLIED CORROSION BARRIER SYSTEM SHALL BE INSTALLED AFTER INVERT CHANNEL CONSTRUCTION, THE CORROSION BARRIER SHALL NOT BE APPLIED TO THE FLOW CHANNEL

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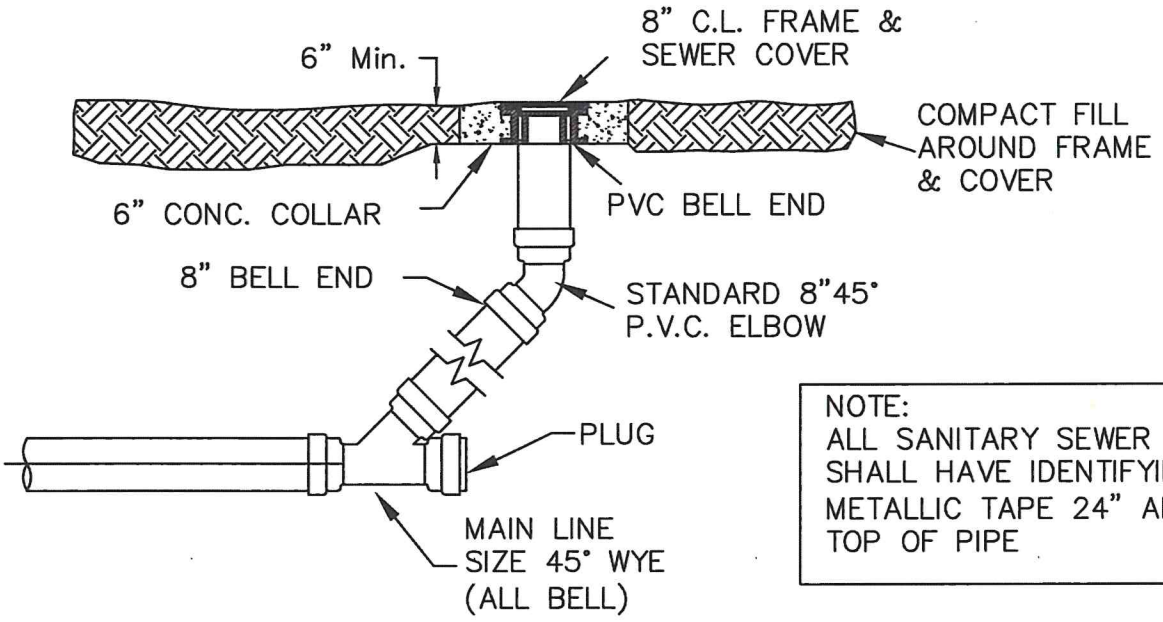
WASTE WATER IMPROVEMENT DETAILS SANITARY SEWER MANHOLE INVERT	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. WW - 5	01/2021



NOTE:
ALL SANITARY SEWER LINE SHALL HAVE IDENTIFYING METALLIC TAPE 24" ABOVE TOP OF PIPE

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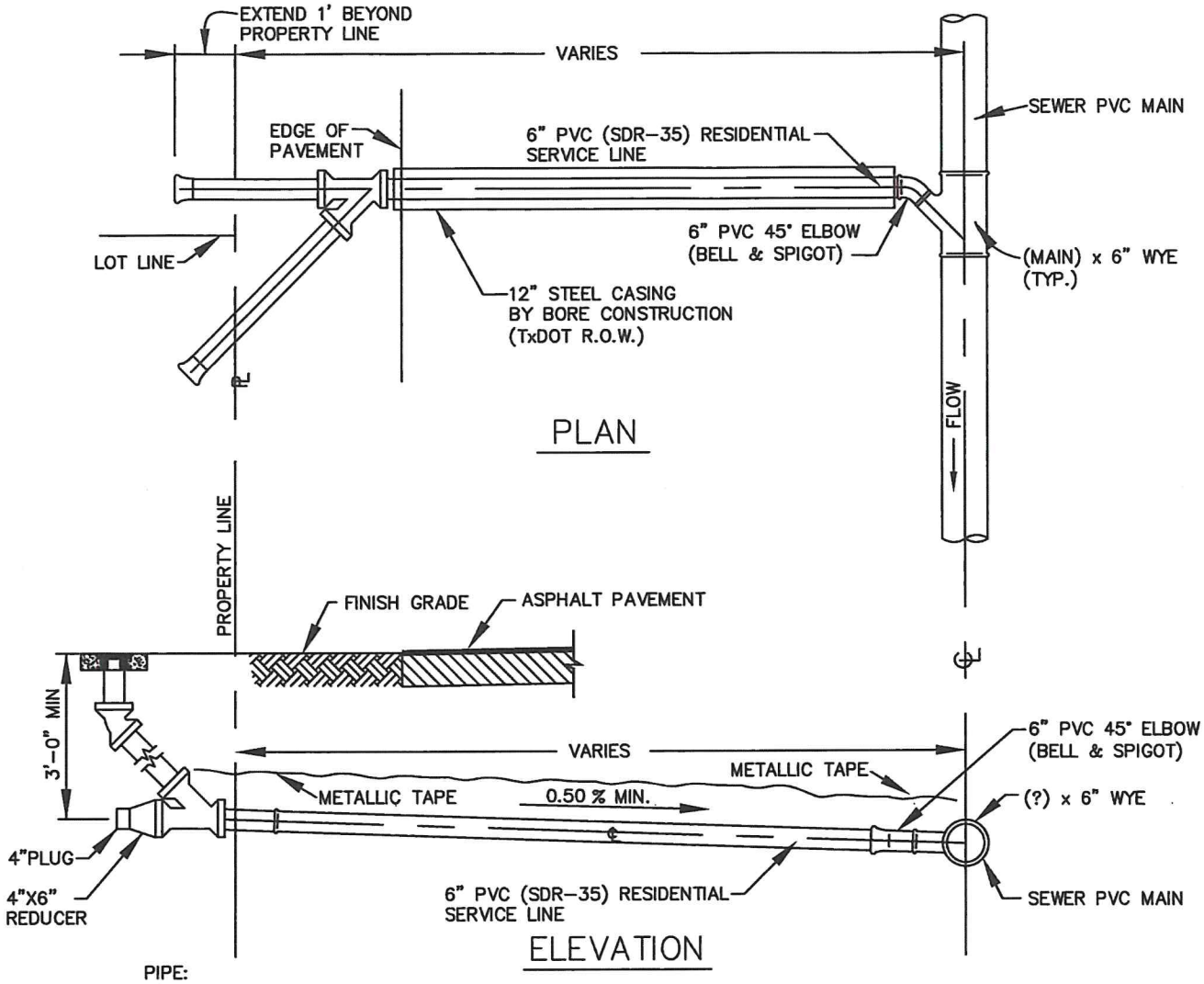
WASTE WATER IMPROVEMENT DETAILS **SANITARY SEWER CLEANOUT DETAIL**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. WW - 6	01/2021



PIPE:
POLYVINYLCHLORIDE (PVC) SEWER PIPE SHALL CONFORM TO REQUIREMENTS OF ASTM D-3034-73-JOHNS-MANVILLE "RING TITE" PVC (SDR-35) SEWER PIPE.

NOTE:
1.) ALL SANITARY SEWER LINE SHALL HAVE IDENTIFYING METALLIC TAPE 24" ABOVE TOP OF

2.) CONTRACTOR SHALL NOT CONNECT PROPOSED SERVICE LINE TO AN EXISTING MAIN SANITARY SERVICE LINE UNTIL APPROVED BY ENGINEER.

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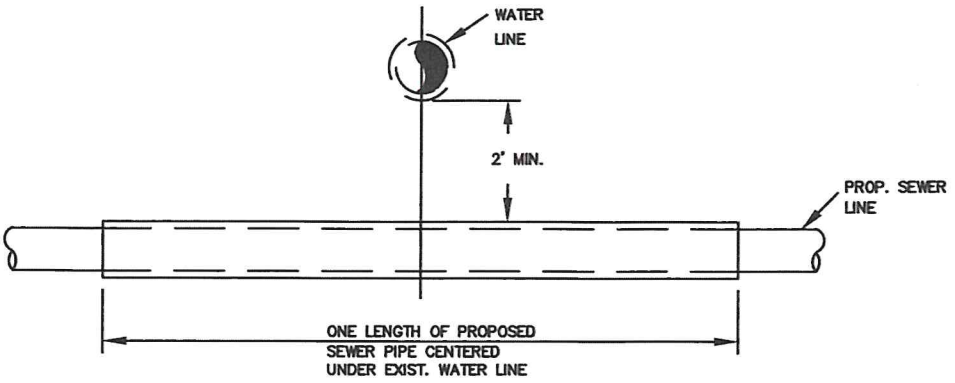
WASTE WATER IMPROVEMENT DETAILS TYPICAL SANITARY SEWER SERVICE INSTALLATION	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. WW - 7	01/2021



NOTES:

(1) WHEN NEW POTABLE WATER DISTRIBUTION LINES ARE CONSTRUCTED, THEY SHALL BE INSTALLED NO CLOSER THAN NINE FEET IN ALL DIRECTIONS TO WASTEWATER COLLECTION FACILITIES. ALL SEPARATION DISTANCES SHALL BE MEASURED FROM THE OUTSIDE SURFACE OF EACH OF THE RESPECTIVE PIECES.

(2) POTABLE WATER DISTRIBUTION LINES AND WASTEWATER MAINS OR LATERALS THAT FORM PARALLEL UTILITY LINES SHALL BE INSTALLED IN SEPARATE TRENCHES.

(3) NO PHYSICAL CONNECTION SHALL BE MADE BETWEEN A DRINKING WATER SUPPLY AND A SEWER LINE. ANY APPURTENANCE SHALL BE DESIGNED AND CONSTRUCTED SO AS TO PREVENT ANY POSSIBILITY OF SEWAGE ENTERING THE DRINKING WATER SYSTEM.

(4) WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE FOLLOWING CRITERIA SHALL APPLY.

(A) NEW WATERLINE INSTALLATION - PARALLEL LINES.

(i) WHERE A NEW POTABLE WATERLINE PARALLELS AN EXISTING, NON-PRESSURE OR PRESSURE RATED WASTEWATER MAIN OR LATERAL AND THE LICENSED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TEXAS IS ABLE TO DETERMINE THAT THE EXISTING WASTEWATER MAIN OR LATERAL IS NOT LEAKING, THE NEW POTABLE WATERLINE SHALL BE LOCATED AT LEAST TWO FEET ABOVE THE EXISTING WASTEWATER MAIN OR LATERAL, MEASURED VERTICALLY, AND AT LEAST FOUR FEET AWAY, MEASURED HORIZONTALLY, FROM THE EXISTING WASTEWATER MAIN OR LATERAL. EVERY EFFORT SHALL BE EXERTED NOT TO DISTURB THE BEDDING AND BACKFILL OF THE EXISTING WASTEWATER MAIN OR LATERAL.

(ii) WHERE A NEW POTABLE WATERLINE PARALLELS AN EXISTING PRESSURE-RATED WASTEWATER MAIN OR LATERAL AND IT CANNOT BE DETERMINED BY THE LICENSED PROFESSIONAL ENGINEER IF THE EXISTING LINE IS LEAKING, THE EXISTING WASTEWATER MAIN OR LATERAL SHALL BE REPLACED WITH AT LEAST 150 PSI PRESSURE-RATED PIPE. THE NEW POTABLE WATERLINE SHALL BE LOCATED AT LEAST TWO FEET ABOVE THE NEW WASTEWATER LINE, MEASURED VERTICALLY, AND AT LEAST FOUR FEET AWAY, MEASURED HORIZONTALLY, FROM THE REPLACED WASTEWATER MAIN OR LATERAL.

(iii) WHERE A NEW POTABLE WATERLINE PARALLELS A NEW WASTEWATER MAIN, THE WASTEWATER MAIN OR LATERAL SHALL BE CONSTRUCTED OF AT LEAST 150 PSI PRESSURE-RATED PIPE. THE NEW POTABLE WATERLINE SHALL BE LOCATED AT LEAST TWO FEET ABOVE THE WASTEWATER MAIN OR LATERAL, MEASURED VERTICALLY, AND AT LEAST FOUR FEET AWAY, MEASURED HORIZONTALLY, FROM THE WASTEWATER MAIN OR LATERAL.

(B) NEW WATERLINE INSTALLATION - CROSSING LINES.

(i) WHERE A NEW POTABLE WATERLINE CROSSES ABOVE A WASTEWATER MAIN OR LATERAL, THE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER AND MUST BE PERPENDICULAR TO THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. WHEN CROSSING AN EXISTING WASTEWATER MAIN OR LATERAL AND IT IS DISTURBED OR SHOWS SIGNS OF LEAKING, THE WASTEWATER MAIN OR LATERAL SHALL BE REPLACED FOR AT LEAST NINE FEET IN BOTH DIRECTIONS (18 FEET TOTAL) WITH AT LEAST 150 PSI PRESSURE-RATED PIPE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE (V) OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

(ii) THE POTABLE WATERLINE SHALL BE AT LEAST TWO FEET ABOVE AN EXISTING, NON-PRESSURE RATED WASTEWATER MAIN OR LATERAL.

(iii) THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE AN EXISTING, PRESSURE-RATED WASTEWATER MAIN OR LATERAL.

(iv) WHERE A NEW POTABLE WATERLINE CROSSES A NEW, NON-PRESSURE RATED WASTEWATER MAIN OR LATERAL, THE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER AND SHALL BE PERPENDICULAR TO THE WASTEWATER MAIN OR LATERAL SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTERLINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST TWO FEET ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 115 PSI AT 5.0% DEFLECTION. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE (V) OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END. THE MATERIALS AND METHOD OF INSTALLATION SHALL CONFORM TO ONE OF THE FOLLOWING OPTIONS:

(I) WITHIN NINE FEET HORIZONTALLY OF EITHER SIDE OF THE WATERLINE, THE WASTEWATER PIPE AND JOINTS SHALL BE CONSTRUCTED WITH PIPE MATERIAL HAVING A MINIMUM PRESSURE RATING OF AT LEAST 150 PSI. AN ABSOLUTE MINIMUM VERTICAL SEPARATION DISTANCE OF TWO FEET SHALL BE PROVIDED. THE WASTEWATER MAIN OR LATERAL SHALL BE LOCATED BELOW THE WATERLINE.

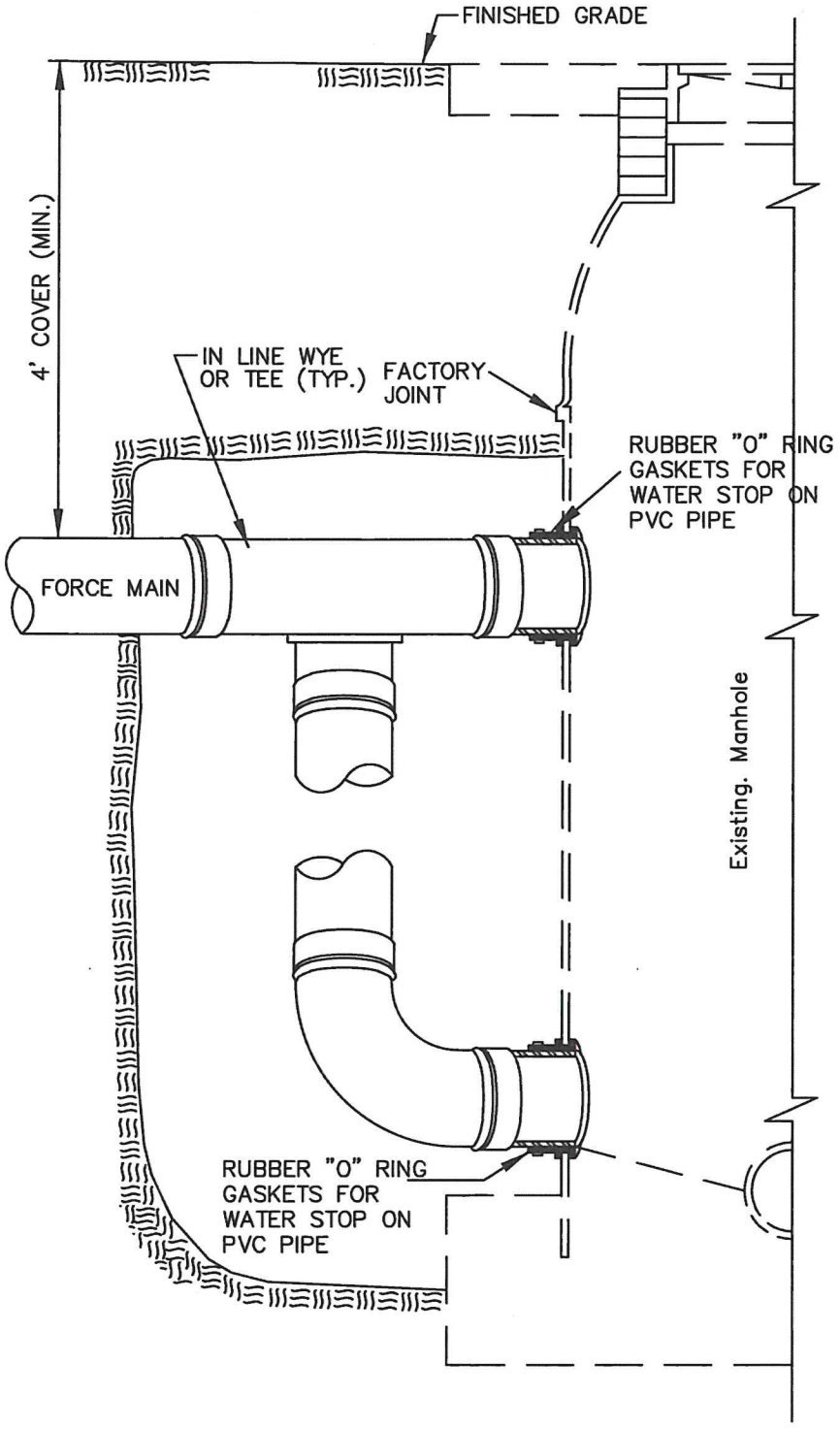
(II) ALL SECTIONS OF WASTEWATER MAIN OR LATERAL WITHIN NINE FEET HORIZONTALLY OF THE WATERLINE SHALL BE ENCASED IN AN 18-FOOT (OR LONGER) SECTION OF PIPE. FLEXIBLE ENCASING PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 115 PSI AT 5.0% DEFLECTION. THE ENCASING PIPE SHALL BE CENTERED ON THE WATERLINE AND SHALL BE AT LEAST TWO NOMINAL PIPE DIAMETERS LARGER THAN THE WASTEWATER MAIN OR LATERAL. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT (OR LESS) INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. EACH END OF THE CASING SHALL BE SEALED WITH WATERTIGHT NON-SHRINK CEMENT GROUT OR A MANUFACTURED WATERTIGHT SEAL. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF SIX INCHES BETWEEN THE ENCASEMENT PIPE AND THE WATERLINE SHALL BE PROVIDED. THE WASTEWATER LINE SHALL BE LOCATED BELOW THE WATERLINE.

(III) WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN OR LATERAL, THE WATERLINE SHALL BE ENCASED AS DESCRIBED FOR WASTEWATER MAINS OR LATERALS IN CLAUSE (II) OF THIS SUBPARAGRAPH OR CONSTRUCTED OF DUCTILE IRON OR STEEL PIPE WITH MECHANICAL OR WELDED JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF ONE FOOT BETWEEN THE WATERLINE AND THE WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED. WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN, THE PROCEDURES IN §217.53(D) OF THIS TITLE (RELATING TO PIPE DESIGN) MUST BE FOLLOWED.

(v) WHERE A NEW POTABLE WATERLINE CROSSES A NEW, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER AND SHALL BE PERPENDICULAR TO THE WASTEWATER LINE SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTER LINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST SIX INCHES ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF AT LEAST 150 PSI. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE (V) OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

(v) WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.6 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.

(5) WATERLINE AND WASTEWATER MAIN MANHOLE OR LATERAL MANHOLE OR CLEANOUT SEPARATION. THE SEPARATION DISTANCE FROM A POTABLE WATERLINE TO A WASTEWATER MAIN MANHOLE OR LATERAL MANHOLE OR CLEANOUT SHALL BE A MINIMUM OF NINE FEET. WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE POTABLE WATERLINE SHALL BE ENCASED IN A JOINT OF AT LEAST 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHALL BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEALANT.



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WASTE WATER IMPROVEMENT DETAILS
TYPICAL FORCE MAIN TIE IN DETAIL

HCE PROJECT NO.
P241-01

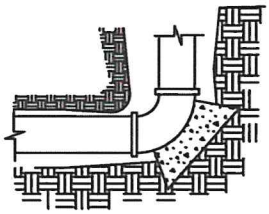
STANDARD DESIGN MANUAL
CITY OF MERCEDES

SHEET NO.
WW - 9

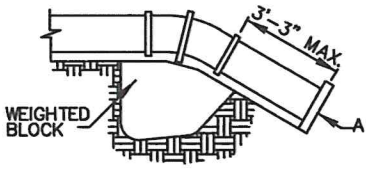
01/2021

CONSTRUCTION NOTES

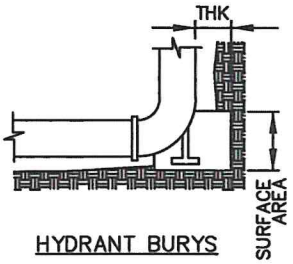
A. SIMPLEX COUPLING
B. ANCHOR ROD



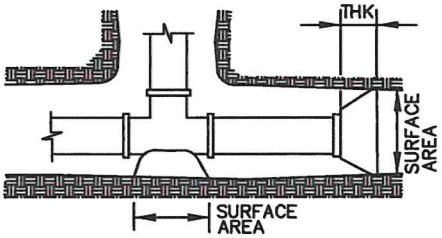
HORIZONTAL BENDS



VERTICAL BENDS



HYDRANT BURYS



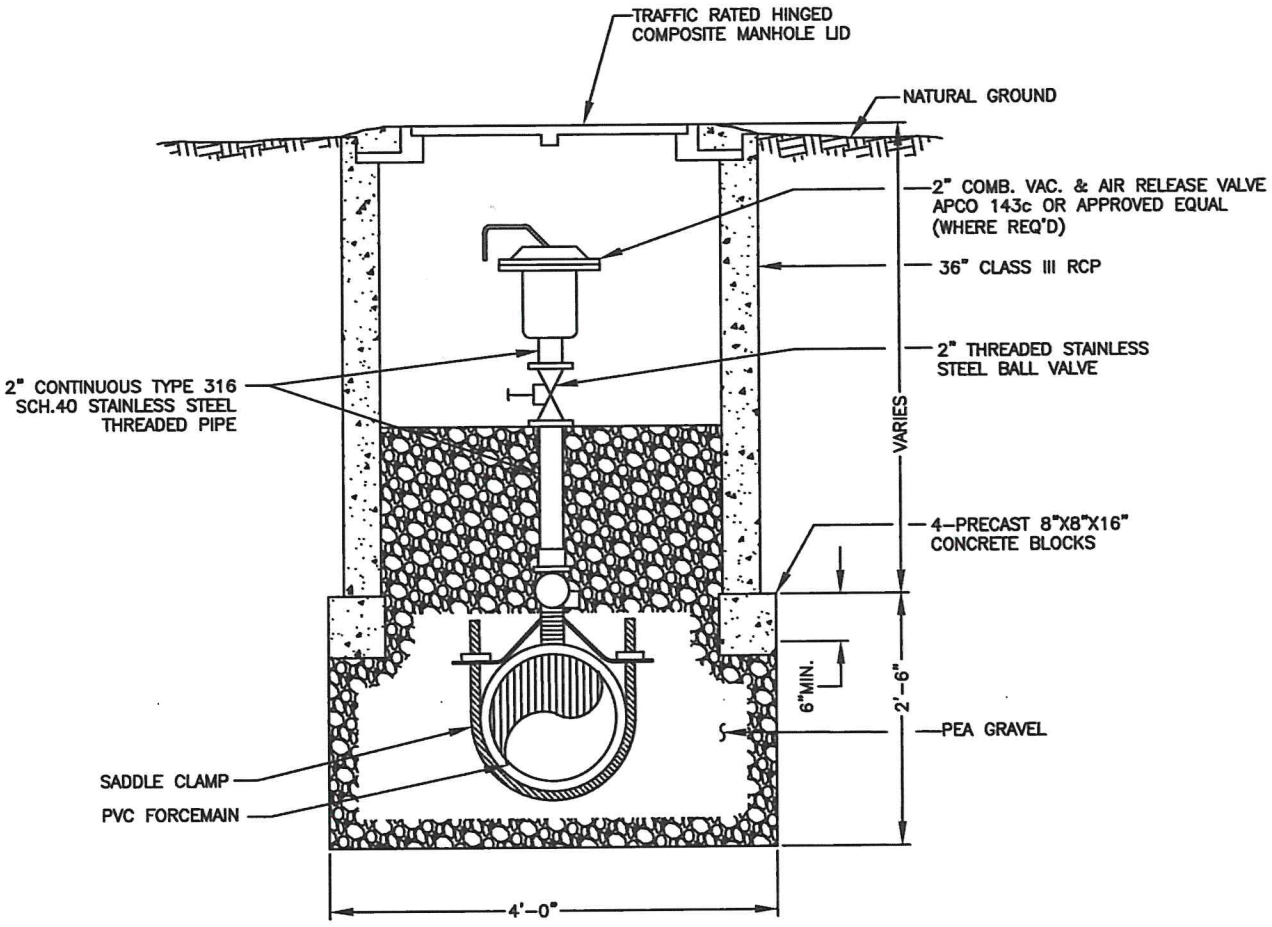
TEES & DEAD ENDS

GENERAL NOTES

1. SEE THRUST BLOCK SIZE CHART FOR PROPER THICKNESS AND SURFACE AREAS. (SHEET 2 OF 2)
2. THE LOCATION OF THRUST BLOCKS DEPENDS UPON THE DIRECTION OF THRUST AND TYPE FITTINGS.

THRUST BLOCK SIZE

DIAMETER OF PIPE INCHES	HORIZONTAL BEND		WEIGHT AT VERTICAL BENDS–LBS.
	SURFACE AREA SQ. FEET	THICKNESS INCHES	
22–1/2° BENDS			
6 OR LESS	2	8	1700
8	3	8	3,000
10	3.5	12	4,500
12	4	14	6,600
14	5	18	9,000
16	6	18	11,800
45° BENDS			
6 OR LESS	4	12	3,200
8	5	14	5,800
10	6	18	9,000
12	7	18	13,000
14	8	24	17,000
16	11.5	24	23,200
90° BENDS			
6 OR LESS	6	12	6,000
8	8	15	10,700
10	10	18	16,700
12	12	18	24,000
14	18	24	32,600
16	21	24	42,700
TEES & DEAD ENDS			
6 OR LESS	3	12	
8	4	15	
10	6	18	
12	8.5	18	
14	11.5	24	
16	15	24	



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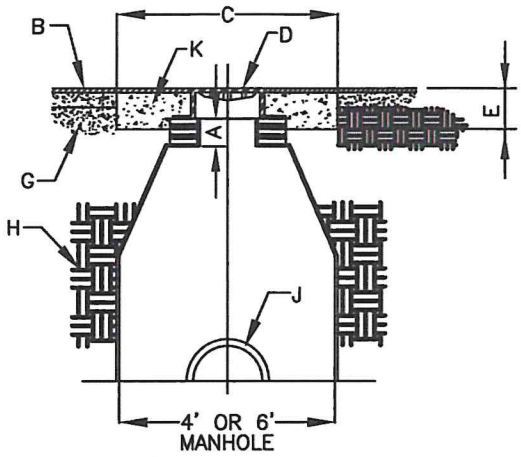
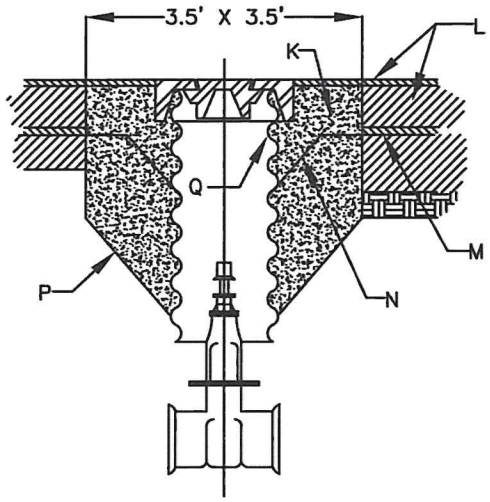
WASTE WATER IMPROVEMENT DETAILS **SEWER AIR RELEASE VALVE W/ MANHOLE**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. WW - 11	01/2021



MANHOLE REGRADING DETAIL



VALVE BOX REGRADING DETAIL

GENERAL NOTES:

1. ADJUSTMENT TO GRADE OF FRAME AND COVER SHALL BE MADE BY VARYING NUMBER OF HDPE GRADE RINGS DIRECTLY UNDER FRAME USING A MINIMUM OF ONE RING UP TO A MAXIMUM OF 12 INCHES TOTAL. IF ADJUSTMENT REQUIRES MORE THAN 12 INCHES, THE CONE SHALL BE REMOVED, BARREL HEIGHT ADJUSTED AND CONE REPLACED.
2. FOR SHALLOW ADJUSTMENTS, WATER VALVE EXTENSION COLLAR & INSERT MAY BE USED.
3. ALL SEATING SURFACES BETWEEN INDIVIDUAL GRADE RINGS, FRAME, AND MANHOLE BRICK LEDGE SHALL BE SEALED USING 1/2" BUTYL SEALANT.

CONSTRUCTION NOTES:

A. HDPE GRADE RINGS, ONE RING MINIMUM, 12" MAX. TOTAL
B. OVERLAY
C. USE A REINFORCED CONCRETE PAD 5' X 5' X 8" IN ALL PAVED AREAS
D. MANHOLE FRAME & COVER
E. STANDARD PAVING SECTION
G. FLEX BASE
H. SUBGRADE
J. SEWER LINE
K. NEW PORTLAND CEMENT CONCRETE.
L. NEW PAVING MATERIAL
M. EXISTING PAVEMENT
N. CUT LINE
P. EXISTING CONCRETE
Q. VALVE BOX EXTENSION

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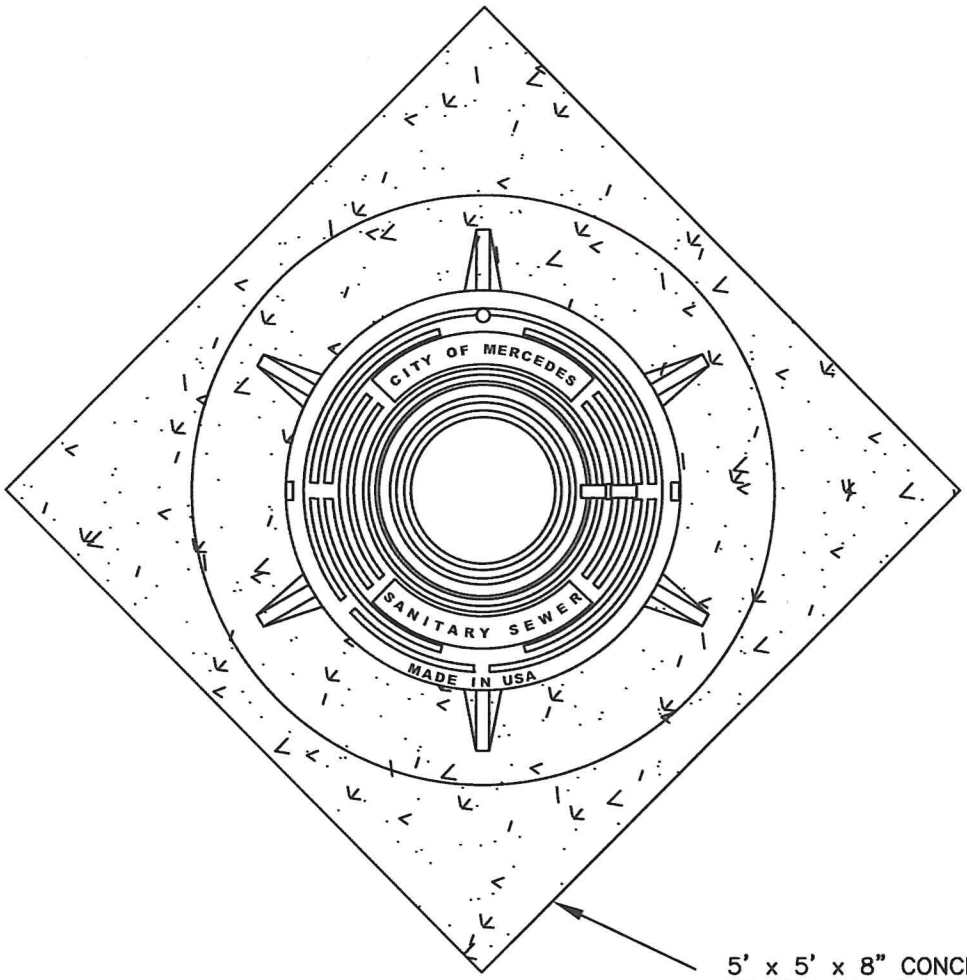
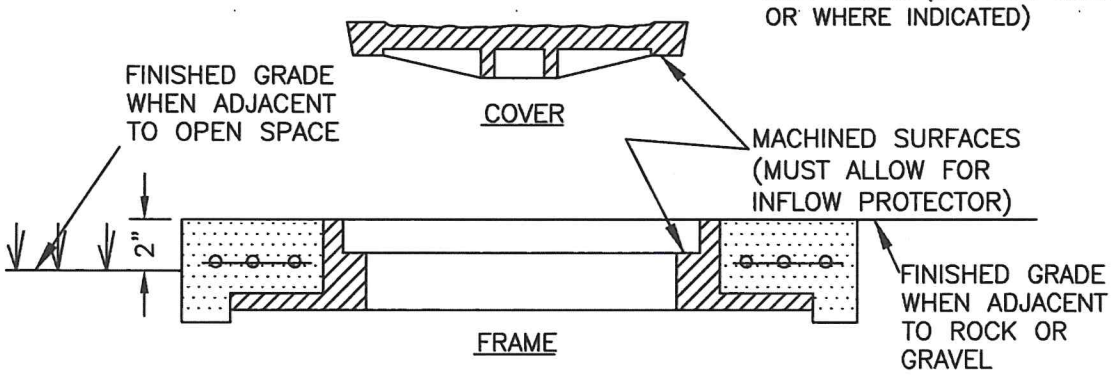
WASTE WATER IMPROVEMENT DETAILS MANHOLE AND VALVE BOX REGRADING	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. WW - 12	01/2021



5' x 5' x 8" CONCRETE TRAFFIC PAD REINFORCED WITH No.4 REBAR (IN PAVED AREAS OR WHERE INDICATED)



NOTES:

1. STANDARD FRAME AND COVER SIZE SHALL BE USED.
2. APPROVED HDPE ADJUSTING RINGS MAY BE USED TO ELEVATE EXISTING MANHOLE COVERS TO RESURFACED GRADE (MAX. 4" HEIGHT).
3. COVER SHALL FIT FLUSH WITH THE FRAME WITH THE INFLOW PROTECTOR INSTALLED.

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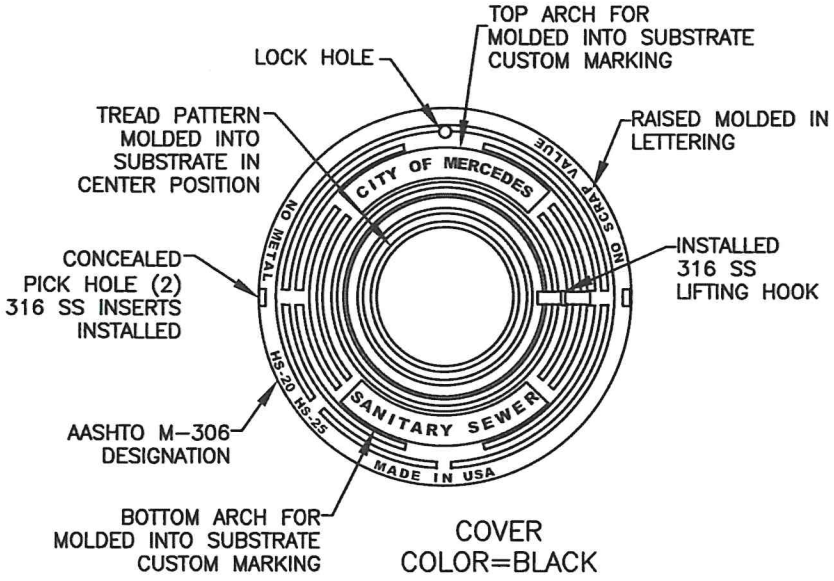
WASTE WATER IMPROVEMENT DETAILS CONCRETE COLLAR FOR SANITARY SEWER MANHOLES	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL CITY OF MERCEDES	SHEET NO. WW - 13	01/2021



COVER
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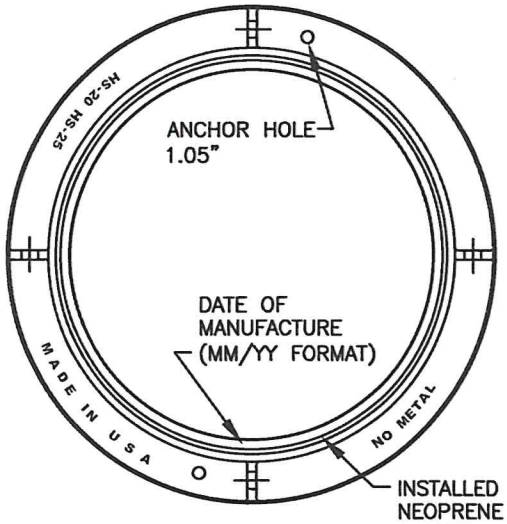

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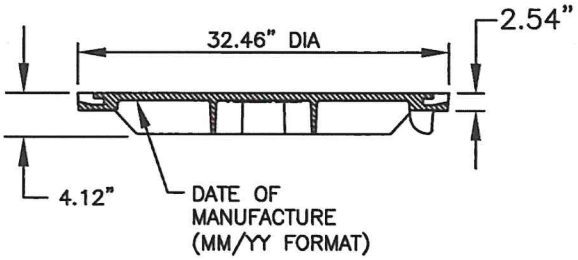
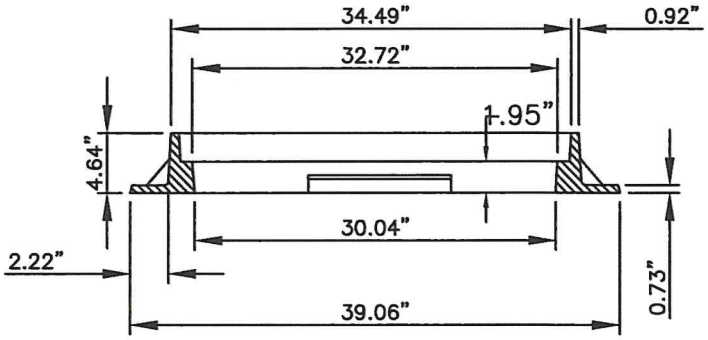


SECTION VIEW



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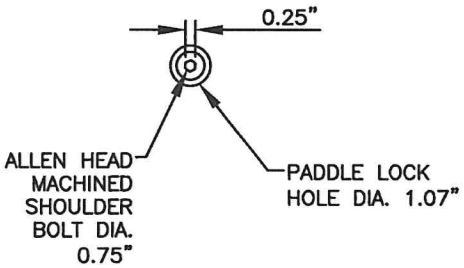
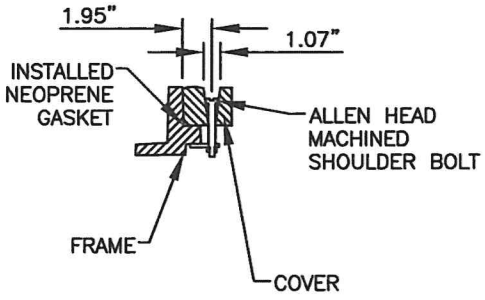
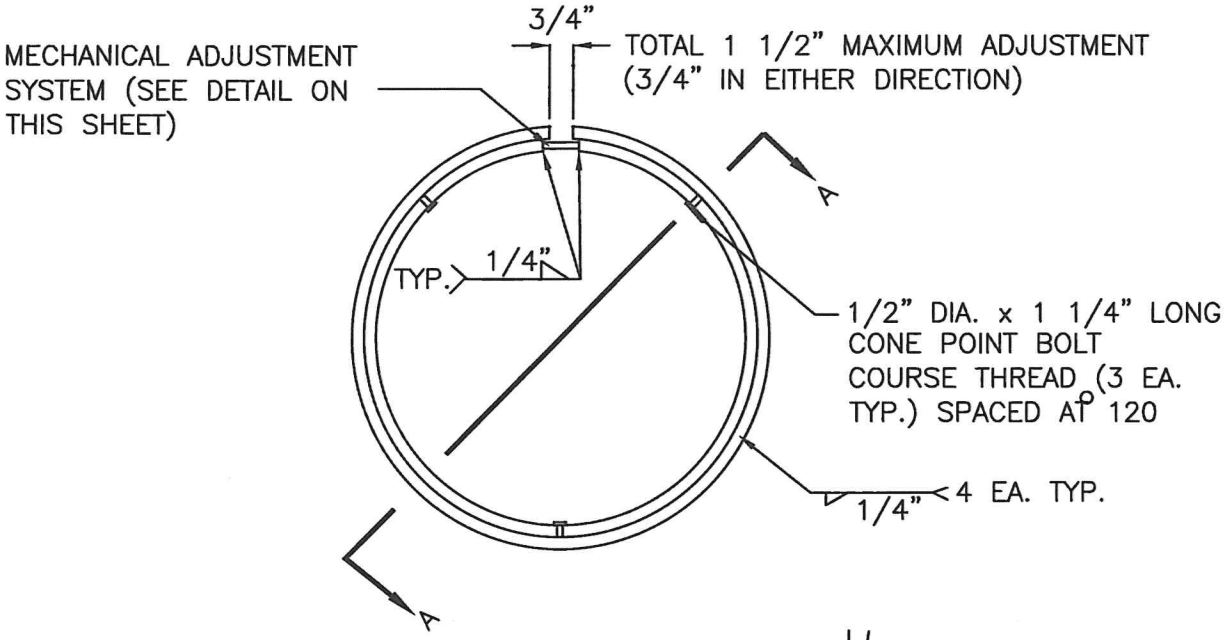




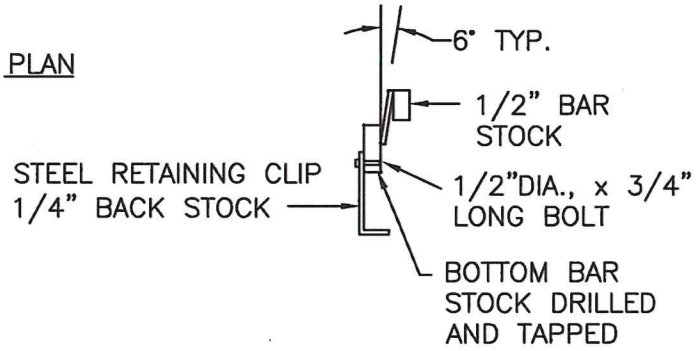
NOTES:

1. ALL HARDWARE IS 316 STAINLESS STEEL.
2. DETECTABLE BY STANDARD METAL DETECTORS.
3. COMPRESSION MOLDED THERMOSET COMPOSITE – NO METAL REINFORCEMENT.
4. PASSED M306 H20/H25 PROOF LOAD.

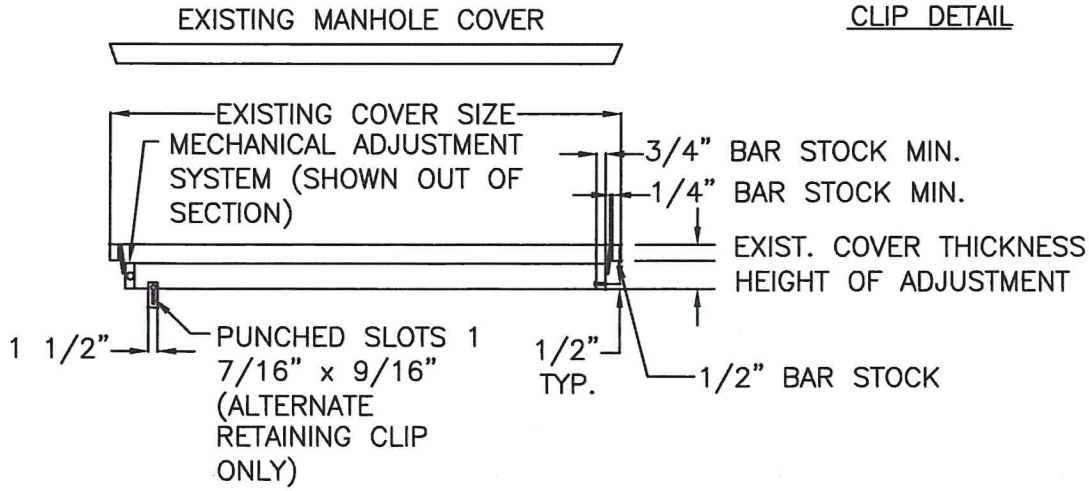
city of mercedes 400 South Ohio, Mercedes, Texas 78570 (956) 565 – 3114	**WASTE WATER IMPROVEMENT DETAILS** **SANITARY SEWER MAHNOLE COMPOSITE MATERIAL** **STANDARD RING & COVER**	HCE PROJECT NO. P241-01	
	STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. WW - 14	01/2021



PLAN



ALTERNATE RETAINING
CLIP DETAIL



SECTION A–A

city of mercedes
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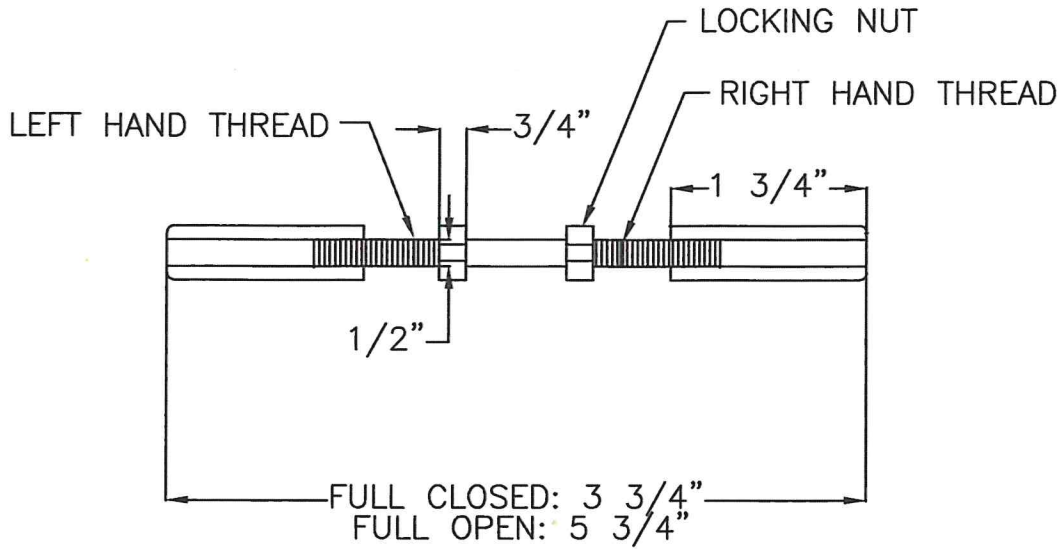
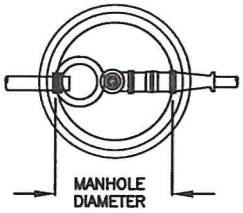
WASTE WATER IMPROVEMENT DETAILS **MAHNOLE COVER ADJUSTMENT DETAIL** **1 OF 2**	HCE PROJECT NO. P241-01	
STANDARD DESIGN MANUAL **CITY OF MERCEDES**	SHEET NO. WW - 15	01/2021



MECHANICAL ADJUSTMENT SYSTEM

NOTES:

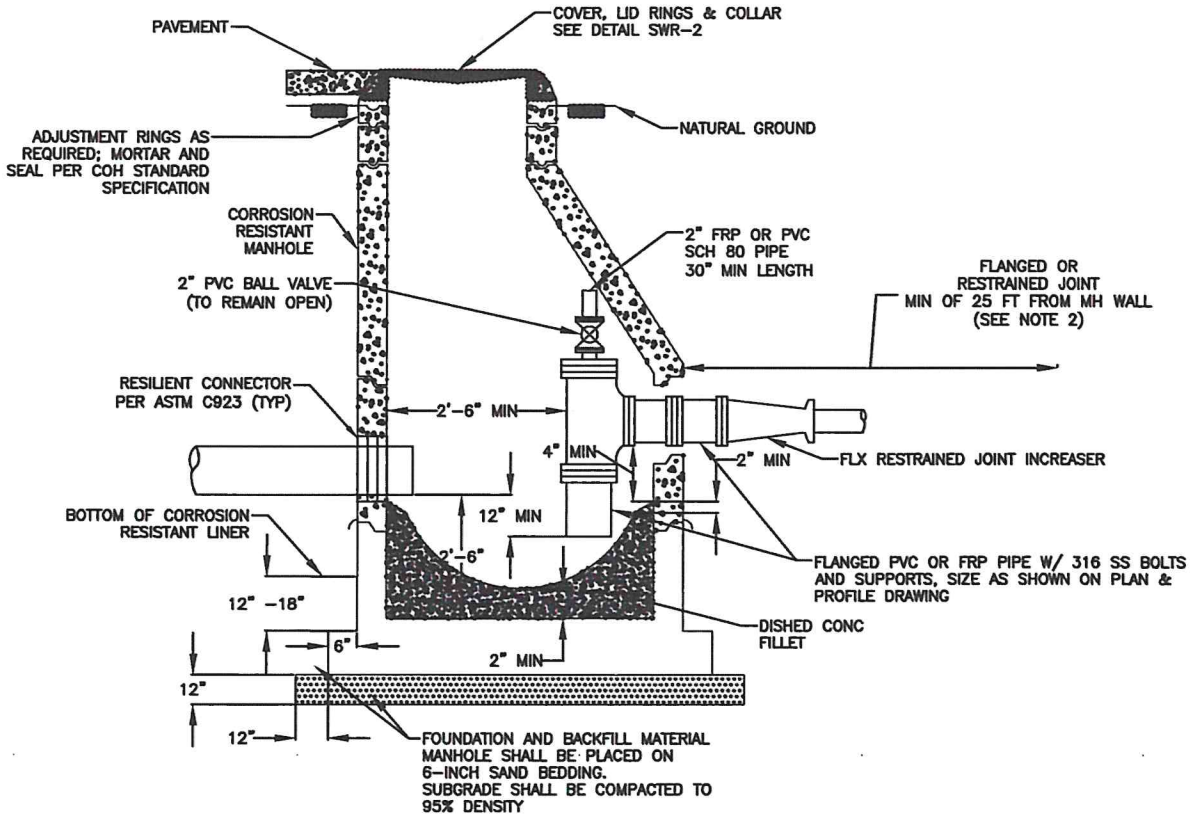
1. ALL COMPONENTS ARE MANUFACTURED FROM U.S. MADE CARBON STEEL MEETING OR EXCEEDING THE MINIMUM REQUIREMENTS OF A.S.T.M. A–36.
2. 4 INCH WELDS ON 12 INCH CENTERS ARE MADE BETWEEN THE TOP AND BOTTOM LIDS FOR SUPERIOR STRENGTH AND DURABILITY.
3. MECHANICAL ADJUSTMENT STUD IS MADE FROM TYPE 304 STAINLESS STEEL.
4. EACH ADJUSTMENT RING IS CUSTOM FABRICATED FROM MEASUREMENTS PROVIDED WITH EACH ORDER, REQUIRED MEASUREMENTS INCLUDE:
   A. EXISTING MANHOLE COVER DIAMETER AND THICKNESS.
   B. REQUIRED HEIGHT OF ADJUSTMENTS FROM TOP OF EXISTING LID TO FINISHED ELEVATION. MAXIMUM RECOMMENDED HEIGHT OF ADJUSTMENTS IS 6 INCHES. HEIGHT ADJUSTMENTS ARE AVAILABLE IN 1/4" INCREMENTS.
   C. REQUIRED LENGTH AND TYPE OF RETAINER CLIP FOR ALTERNATE RETAINING CLIP ONLY.
   D. WIDTH OF EXISTING CASTING BEARING SURFACE.
5.. DURING INSTALLATION, CHECK FOR FULL BEARING OF LOWER FRAME SECTION ON EXISTING CASTING. OVER TIGHTENING ADJUSTMENT DEVICE MAY CAUSE UPLIFTING OF RISER.
6. DIMENSIONS MAY VARY TO MEET EXISTING FIELD CONNECTIONS. ANY CHANGES IN DIMENSIONS SHOULD BE APPROVED BY PROJECT OWNER.
7. AVAILABLE OPTIONS IN LIEU OF CONE POINT BOLTS FOR ATTACHING RETAINING CLIP INCLUDE DRILL AND TAPPED BAR STOCK WITH 1/2" AND 3/4" LONG BOLT.



PLAN VIEW
NOT TO SCALE

TABLE

MANHOLE DIAMETER	4'–0"	5'0"	6'–0"
MAX DISCHARGE SIZE	6"	14"	24"



ELEVATION VIEW
NOT TO SCALE

NOTES:

1. SEAT MANHOLE FRAME IN SEALANT PER STANDARD SPECIFICATION.
2. IF FORCE MAIN HAS BENDS WITHIN 25 FT OF MANHOLE, EXTEND RESTRAINED JOINTS TO 25 FT MINIMUM UPSTREAM OF BEND.
3. OMIT CEMENT MORTAR WHEN MANHOLE IS LOCATED IN PAVED AREA.
4. MINIMUM REINFORCING IN BASE SHALL BE 5 @ 8 E W.
5. PRECAST RINGS SHALL BE PROVIDED FOR A COMBINED ADJUSTMENT HEIGHT OF AT LEAST 12". THE TOTAL HEIGHT OF THE ADJUSTMENT RINGS SHALL NOT EXCEED 1'–6".

NOTES TO SPECIFIER:

1. INDICATE SIZE OF FORCE MAIN, INCREASER AND DISCHARGE EITHER ON THIS DETAIL OR ON PLAN AND PROFILE.
2. PROVIDE INVERT ELEVATIONS OR FORCE MAIN AND SEWER CONNECTIONS TO MH, ON THIS DETAIL OR PLAN AND PROFILE.
3. THIS DETAIL IS TO BE USED ONLY WHEN THERE ARE NO INTERSECTING GRAVITY SEWERS.
4. DETAIL MAY BE REVISED TO ORIENT INCOMING FORCE MAIN AT OTHER ANGLES RELATIVE TO GRAVITY SEWER.
5. IF LENGTH OF DISCHARGE DROP BELOW FLANGED TEE FITTING EXCEEDS 7 TIMES DISCHARGE DIAMETER PROVIDE STAINLESS STEEL OR FRP PIPE SUPPORT.

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WASTE WATER IMPROVEMENT DETAILS
SANITARY SEWER CORROSION RESISTANT
MANHOLE FOR FORCE MAIN DISCHARGE

HCE PROJECT NO.
P241-01

STANDARD DESIGN MANUAL
CITY OF MERCEDES

SHEET NO.
WW - 17

01/2021