



**CITY OF LIBERTY
WATER/WASTEWATER
DEPARTMENT STANDARD
SPECIFICATIONS**

STANDARD DETAILS

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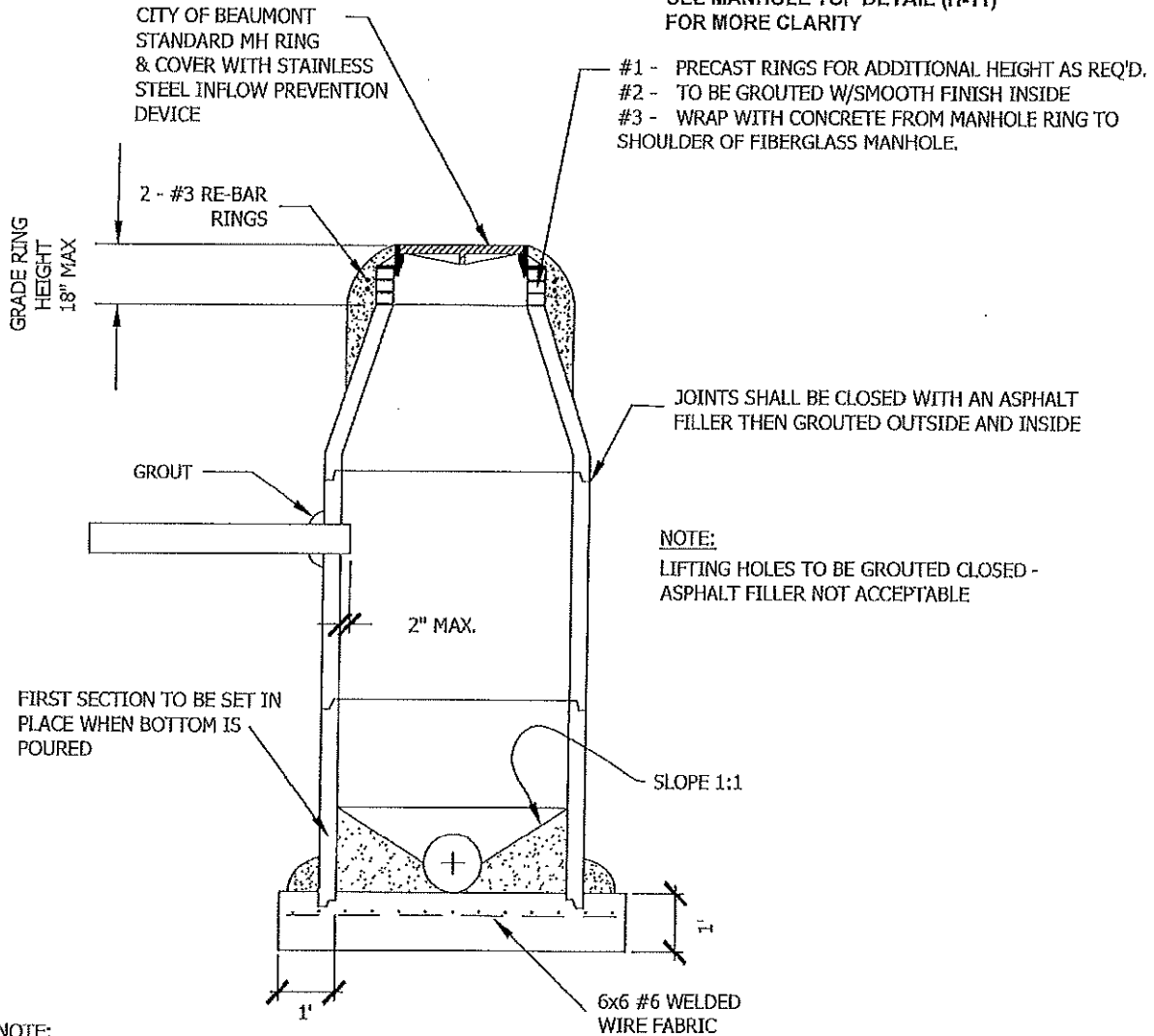
**CITY OF LIBERTY
WATER/WASTEWATER
DEPARTMENT STANDARD
SPECIFICATIONS**

**STANDARD DETAILS
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NOTE:

**** SEE MANHOLE TOP DETAIL (H-11)
FOR MORE CLARITY**



NOTE:

1. HANSON PIPE PRECAST BASE OR EQUAL (OPTIONAL)
2. IF A MANHOLE IS PLACED WITHIN A DITCH, THEN IT MUST BE PRE-CAST AND THE TOP OF THE MANHOLE MUST BE FOUR (4) INCHES ABOVE FINISHED DITCH GRADE.

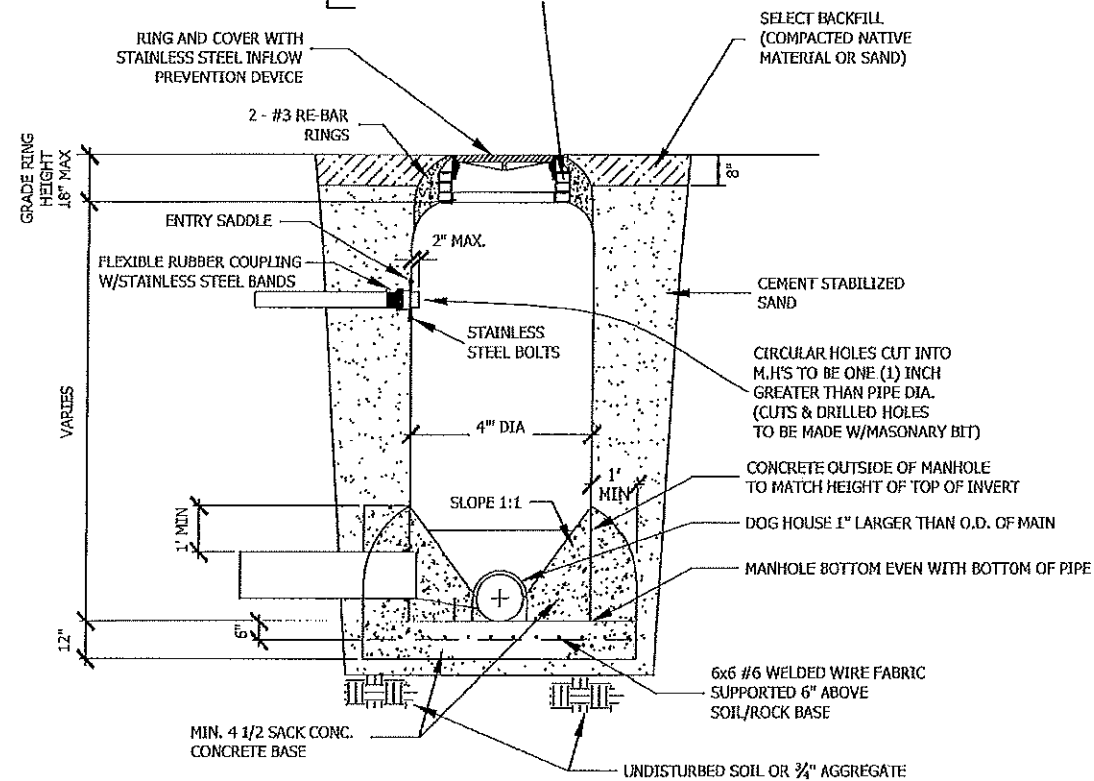
TIE INTO EXISTING PRECAST MANHOLE DETAIL

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

NOTE: CITY OF LIBERTY
** SEE MANHOLE TOP DETAIL (H-11)
FOR MORE CLARITY

CITY OF LIBERTY
** SEE MANHOLE TOP DETAIL (H-11)
FOR MORE CLARITY

- NOTE:** CITY OF LIBERTY
 ** SEE MANHOLE TOP DETAIL (H-11)
 FOR MORE CLARITY
- #1 - PRECAST RINGS FOR ADDITIONAL HEIGHT AS REQ'D.
 #2 - TO BE GROUTED W/SMOOTH FINISH INSIDE
 #3 - WRAP WITH CONCRETE FROM MANHOLE RING TO
 SHOULDER OF FIBERGLASS MANHOLE.



NOTE:

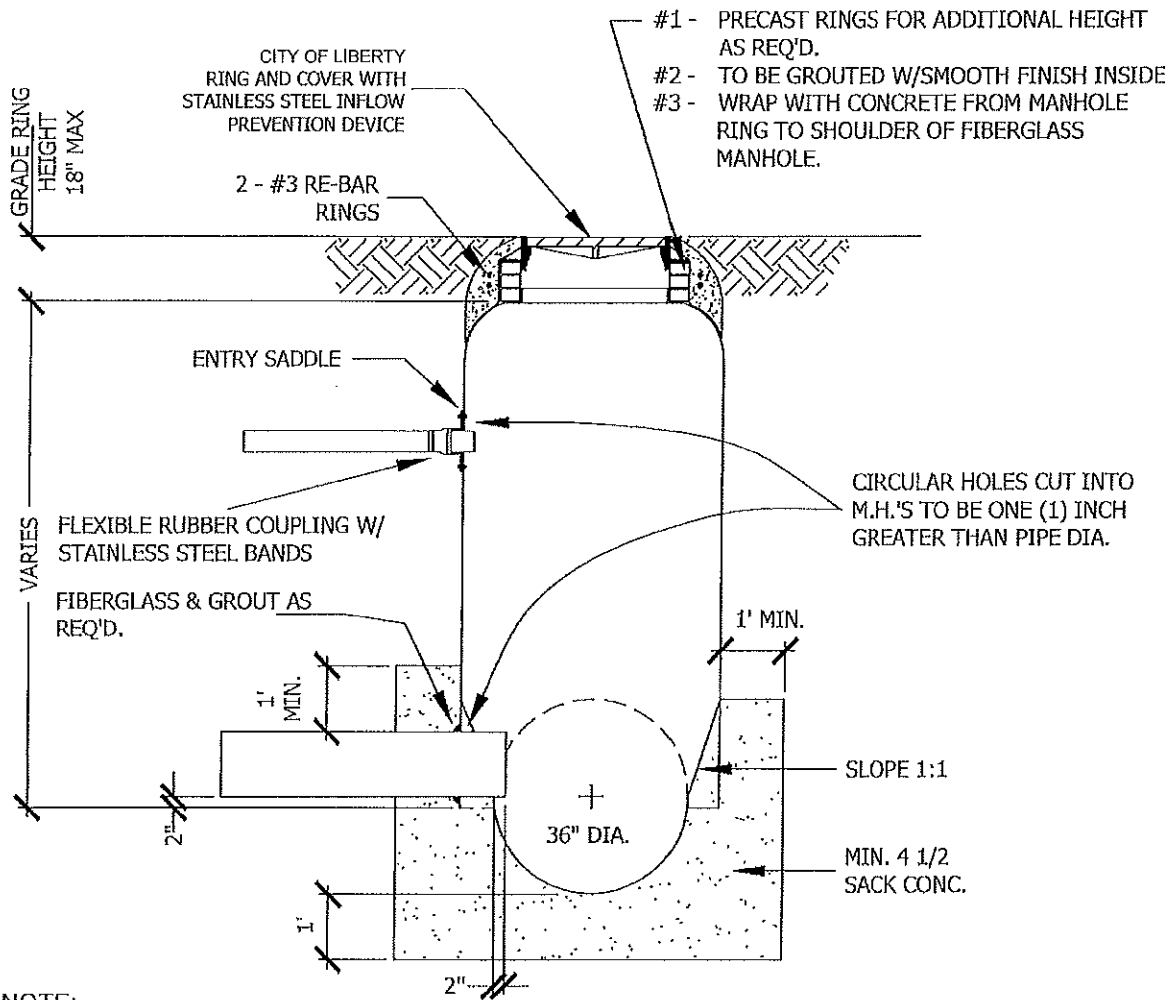
1. INSTALLATION SHALL BE COMPLY WITH MANUFACTURES RECOMMENDED INSTALLATION INSTRUCTIONS.
2. IF FIBERGLASS MANHOLE IS INSTALLED WITHIN 5' OF THE ROADWAY THEN STABILIZED SAND NEEDS TO BE USED.
3. IF FIBERGLASS MANHOLE IS INSTALLED BEYOND 5' THEN SELECT BACKFILL CAN BE USED.
4. IF MANHOLE IS PLACED IN THE DITCH, SEE H-1 (PRECAST MANHOLE DETAIL)

TYPICAL FIBERGLASS MANHOLE

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

NOTE:

**** SEE MANHOLE TOP DETAIL (H-11)
FOR MORE CLARITY**



NOTE:

IF MANHOLE IS PLACED IN THE DITCH,
SEE H-1 (PRECAST MANHOLE DETAIL)

TYPICAL FIBERGLASS MANHOLE

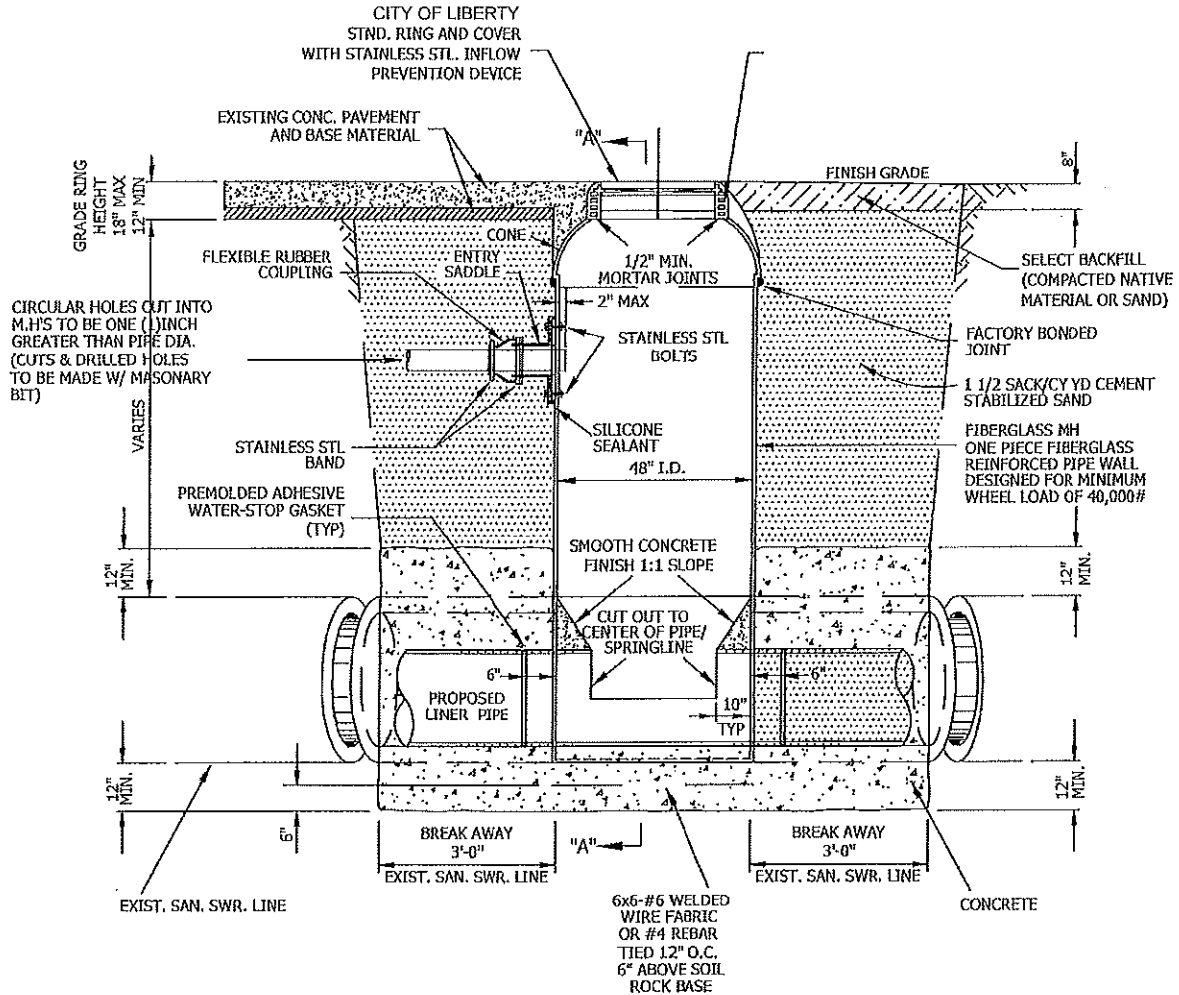
CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-3

NOTE:

** SEE MANHOLE TOP DETAIL (H-11) FOR MORE CLARITY

- #1 - PRECAST RINGS FOR ADDITIONAL HEIGHT AS REQ'D.
- #2 - TO BE GROUTED W/SMOOTH FINISH INSIDE
- #3 - WRAP WITH CONCRETE FROM MANHOLE RING TO SHOULDER OF FIBERGLASS MANHOLE.



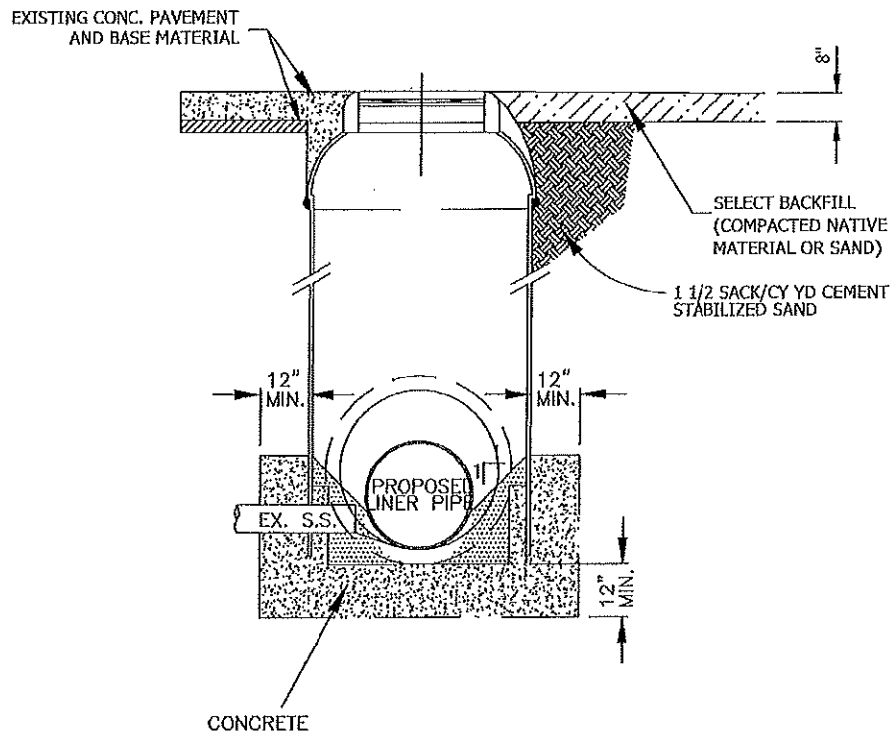
TYPICAL LINER CONNECTION TO NEW MANHOLE

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-5

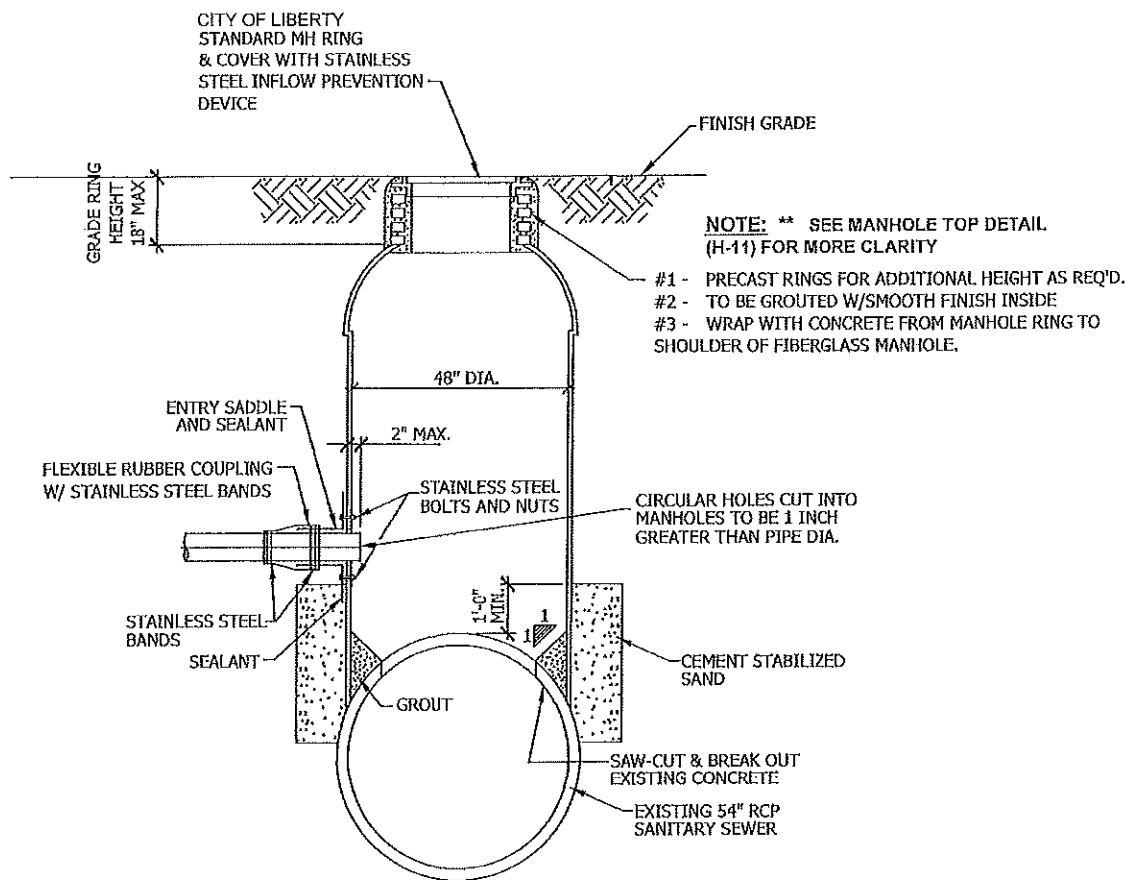
NOTE:

INVERT SHOULD BE SHAPED TO FORM A SMOOTH TRANSITION FROM MANHOLE WALLS TO INVERT OF EFFLUENT PIPE. ALL CORNERS SHALL BE FILLED WITH GROUT AND SHAPED SO AS TO CHANNEL FLOW TO INVERT OF EFFLUENT PIPE WITH NO OBSTRUCTIONS.



SECTION "A-A" OF
TYPICAL LINER CONNECTION
TO NEW MANHOLE

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.



NOTE:

IF MANHOLE IS PLACED IN THE DITCH, SEE
H-1 (PRECAST MANHOLE DETAIL)

MANHOLE OVER EXISTING LARGE LINE (36" AND UP)

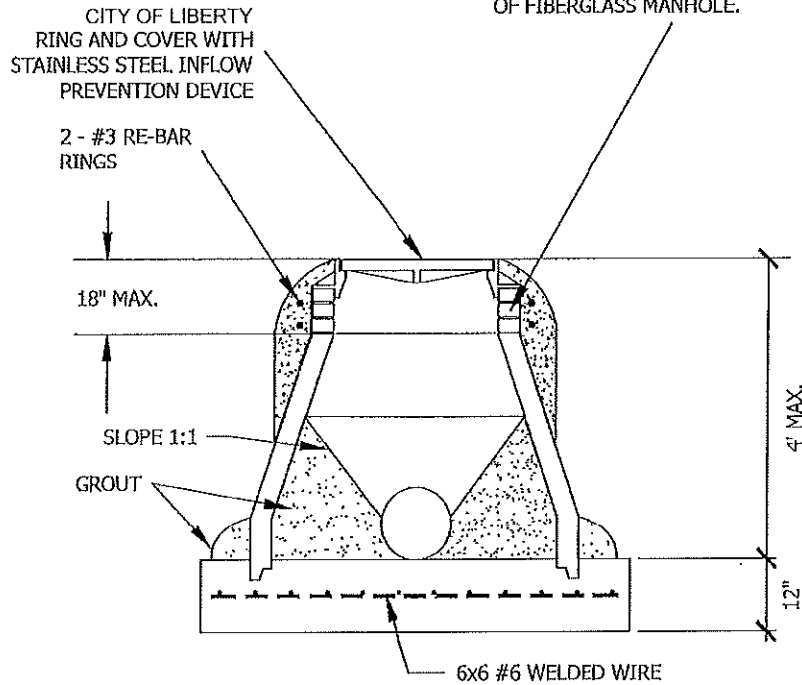
CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-7

NOTE:

**** SEE MANHOLE TOP DETAIL (H-11) FOR MORE CLARITY**

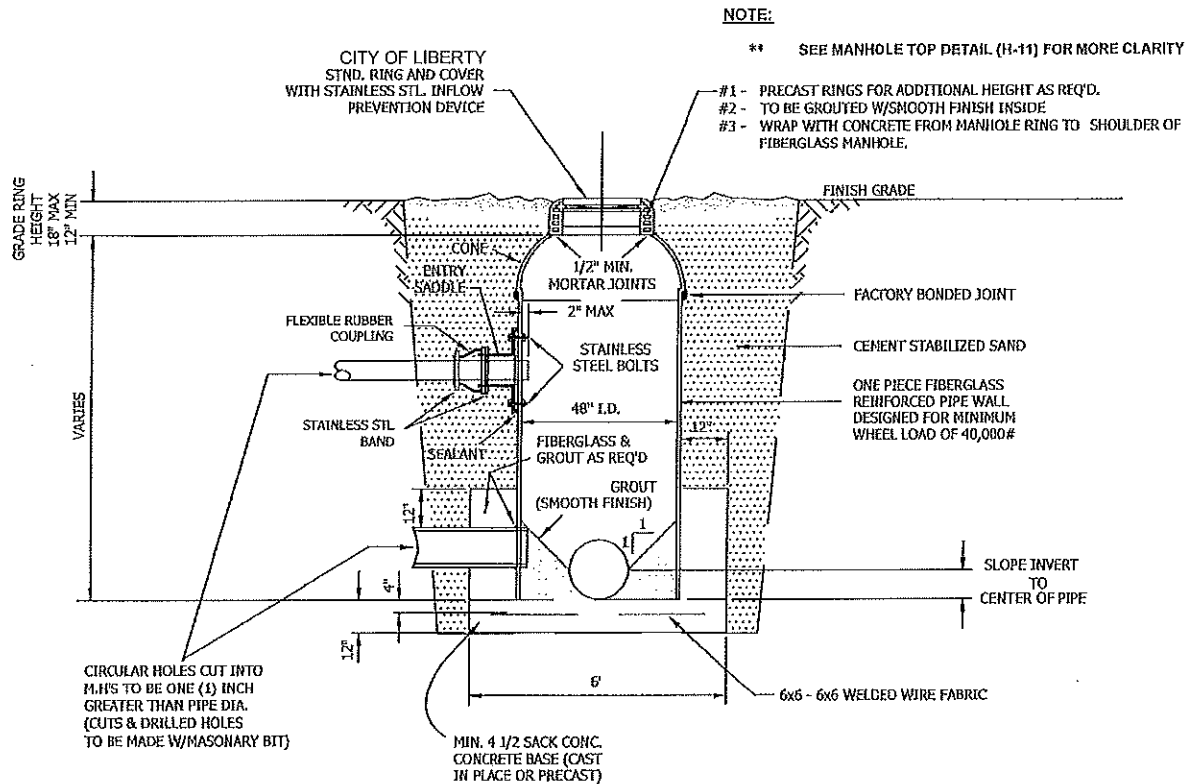
- #1 - PRECAST RINGS FOR ADDITIONAL HEIGHT AS REQ'D.
- #2 - TO BE GROUTED W/SMOOTH FINISH INSIDE
- #3 - WRAP WITH CONCRETE FROM MANHOLE RING TO SHOULDER OF FIBERGLASS MANHOLE.



SHALLOW MANHOLE DETAIL

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-8



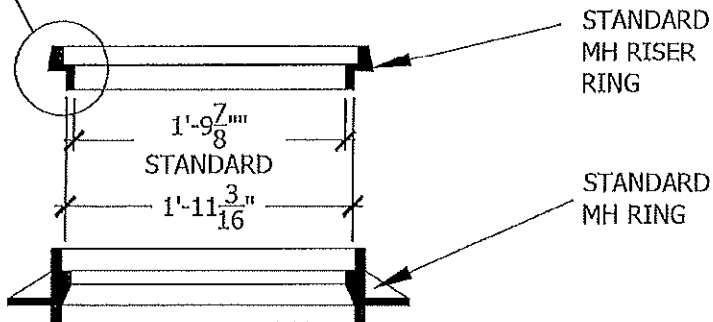
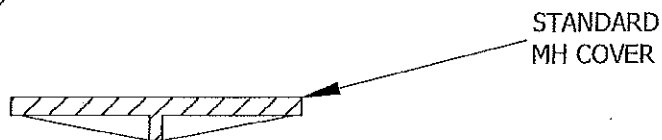
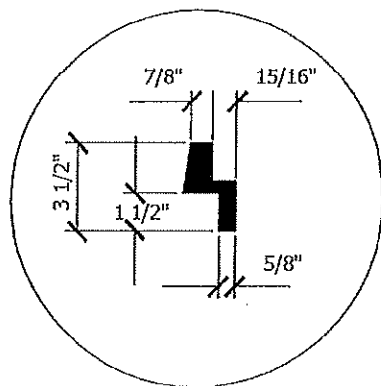
NOTES:
D3753-79 (STANDARD SPECIFICATION FOR GLASS FIBER-REINFORCED
POLYESTER MANHOLES). ALL MANHOLES SUPPLIED WITH CONES SHALL
BE CERTIFIED TO COMPLY WITH ANSI/ASTM. INSTALLATION SHALL COMPLY
WITH MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTIONS.

FIBERGLASS MANHOLE STIFFNESS - THICKNESS				
DEPTH	3'- 6'	7'- 12'	13'- 20'	21'- 25'
NOMINAL WALL THICKNESS	.25	.30	.48	.48
MIN. STIFFNESS F _Y , PSI (kPa)	.72 (4.96)	1.26 (8.69)	2.01 (13.86)	3.02 (20.82)

TYPICAL MANHOLE FOR PIPEBURSTING

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-9

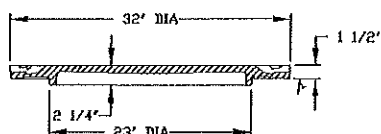
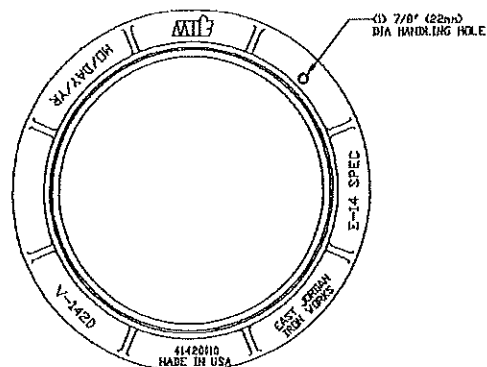
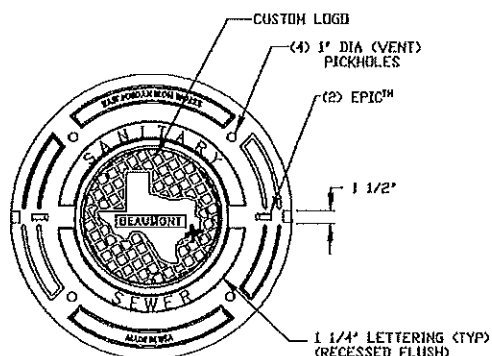


MANHOLE INCREASER RING DETAIL FOR STANDARD MANHOLE FRAME AND COVER

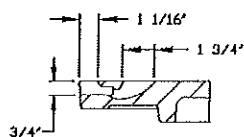
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N.T.S.

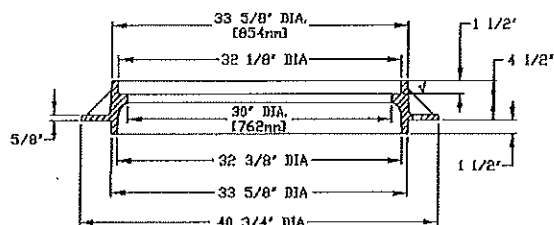


COVER SECTION



PICKHOLE DETAIL

FRAME TOP VIEW



FRAME SECTION

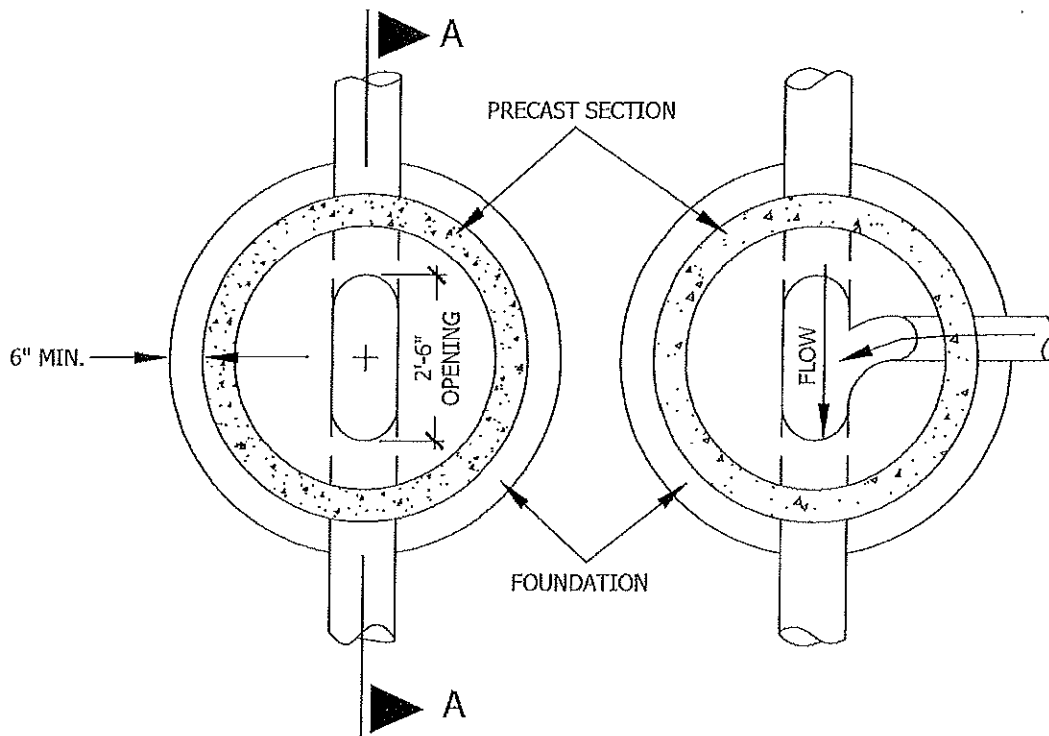
√ DENOTES MACHINED SURFACE

SPECIFICATIONS:

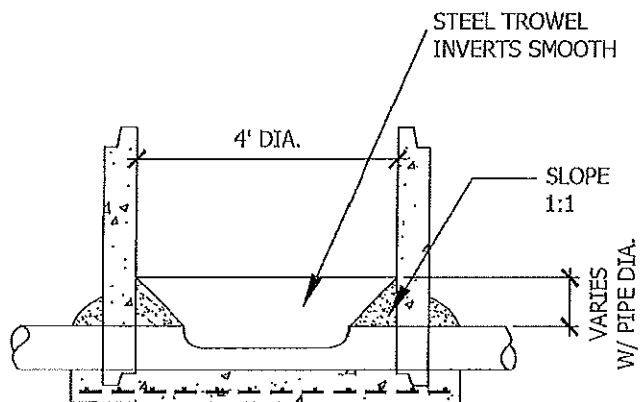
1. MATERIAL: RING: CAST IRON A. S. T. M. A-48, CLASS NO. 35, COVER: DUCTILE IRON, ASTM A536, MASHTO M305
2. ALL CASTINGS SHALL BE FIRST QUALITY, SMOOTH CASTINGS, FREE FROM FLAWS, BLOW HOLES, SAND HOLES OR OTHER IMPERFECTIONS.
3. THE BEARING SURFACES OF ALL FRAMES AND COVERS BOTH SHALL BE MACHINED FINISHED FOR FULL PERIPHERY EVEN BEARINGS.
4. ALL CASTINGS MUST BE SAND BLASTED CLEAN OF SCALE OR SAND SO AS TO PRESENT A SMOOTH, CLEAN AND UNIFORM SURFACE.
5. THE WEIGHT OF THE MANHOLE RING SHOULD NOT EXCEED 235 LBS.
6. THE WEIGHT OF THE MANHOLE COVER SHOULD NOT EXCEED 175 LBS.

STANDARD MANHOLE FRAME AND COVER

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WATER UTILITIES DEPARTMENT
N.T.S.



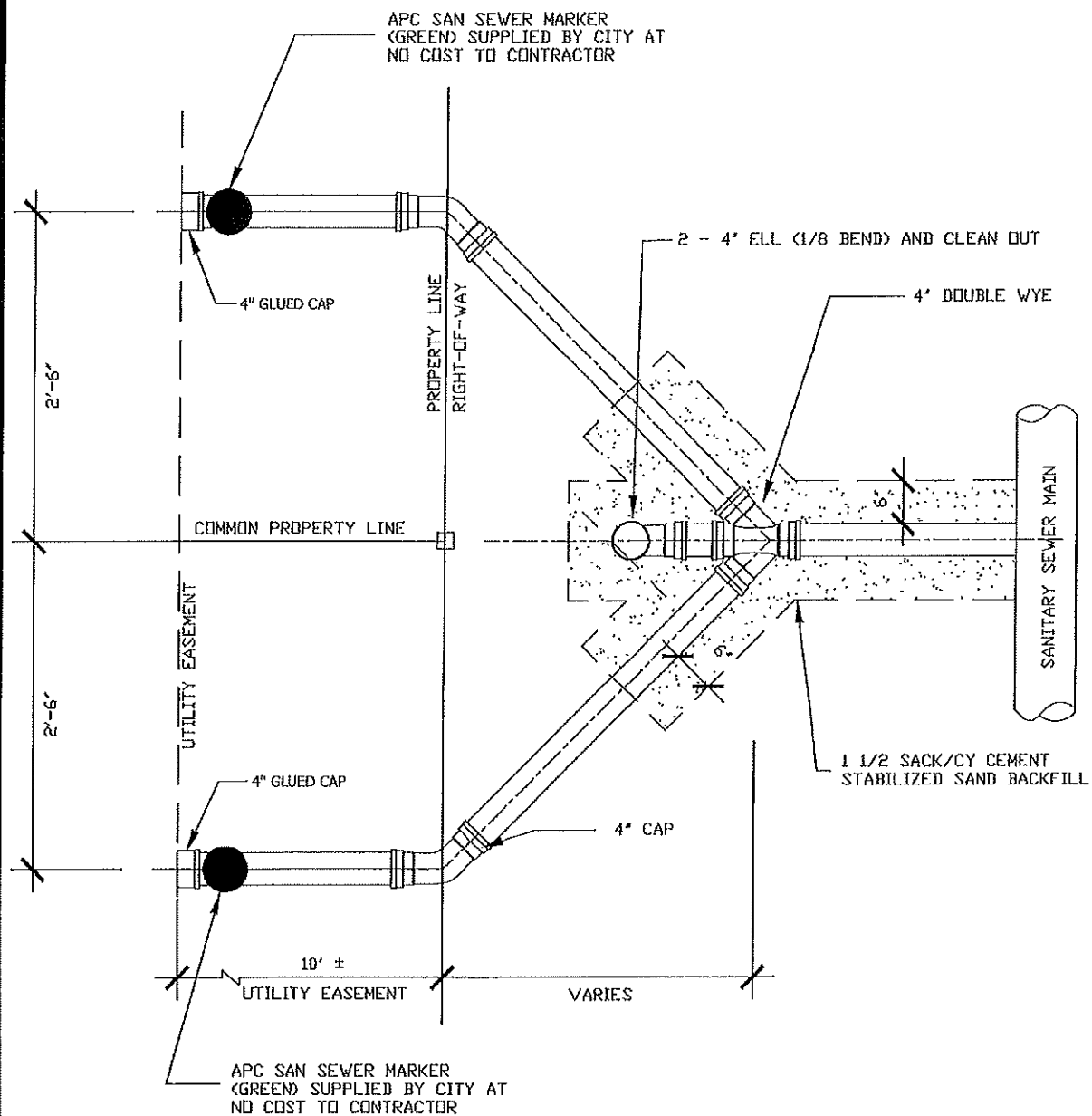
PLAN VIEW



SECTION A-A

TYPICAL INVERT SHAPING

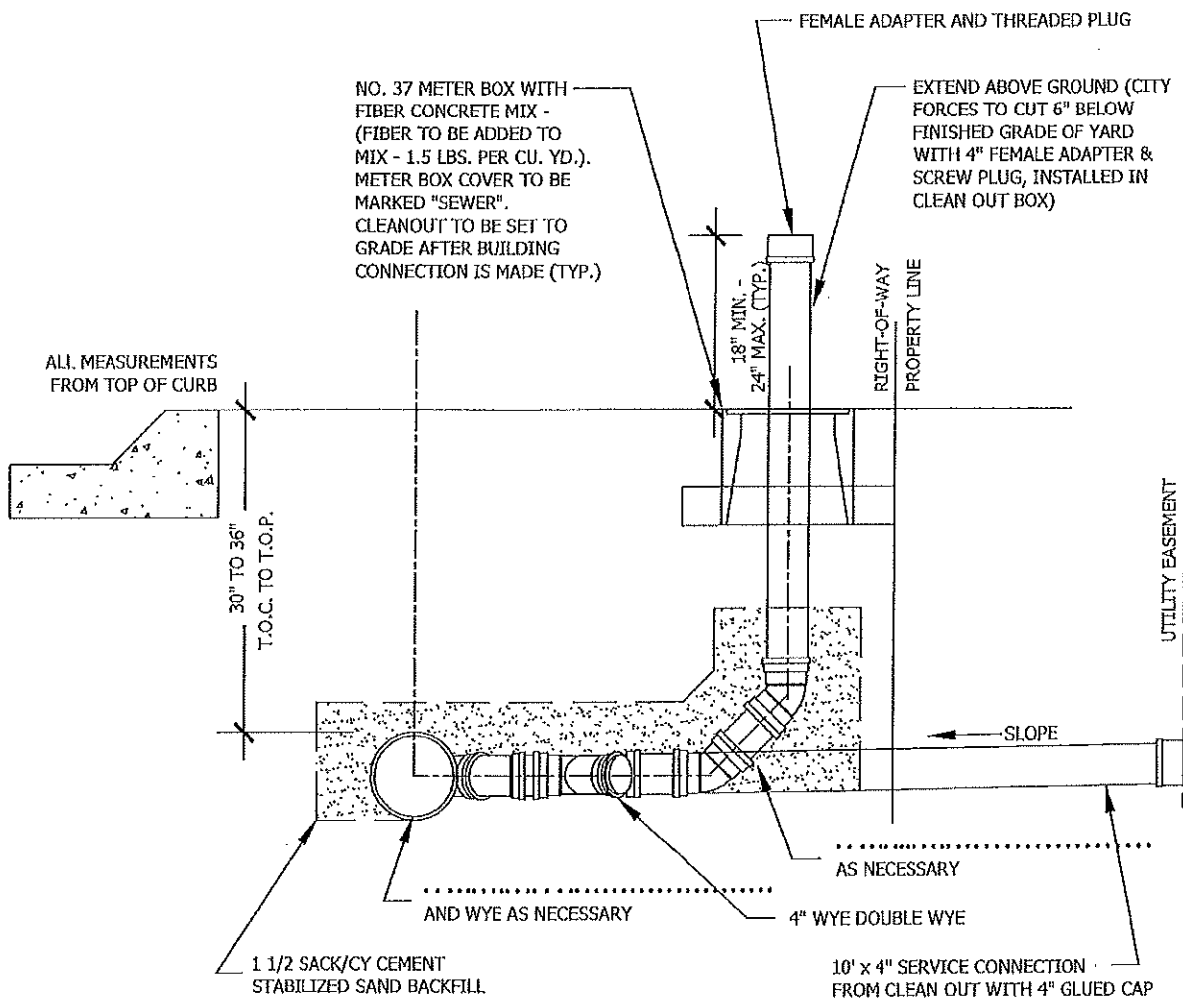
CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.



PLAN VIEW
TYPICAL SHORT SIDE TAP DETAIL
FOR SEWER MAINS LESS THAN 6' DEEP

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
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H-14

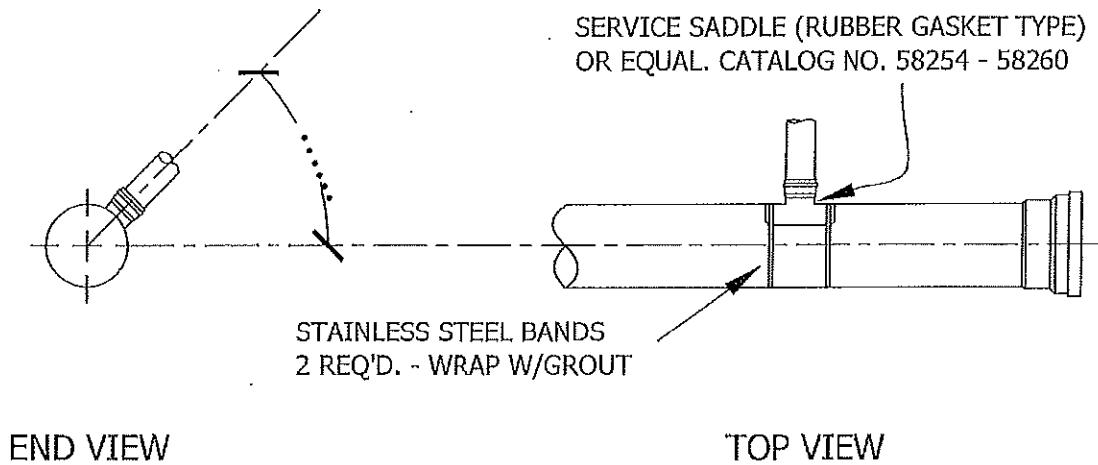


PROFILE VIEW
TYPICAL SHORT SIDE TAP DETAIL
WITH SERVICE CONNECTION
FOR SEWER MAINS LESS THAN 6' DEEP

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-15

FOR SADDLE LIP.



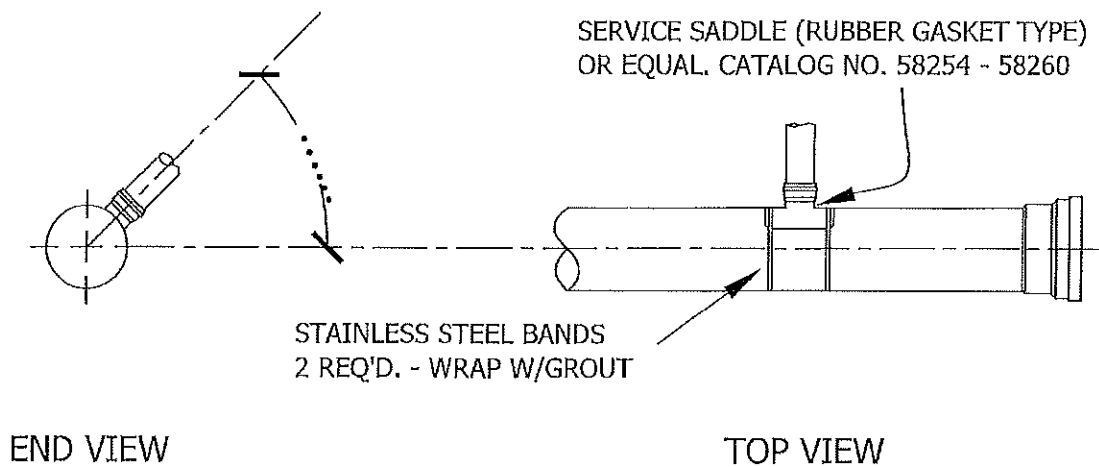
TYPICAL SERVICE TAP
CONNECTION ONLY ON HDPE PIPE

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-17

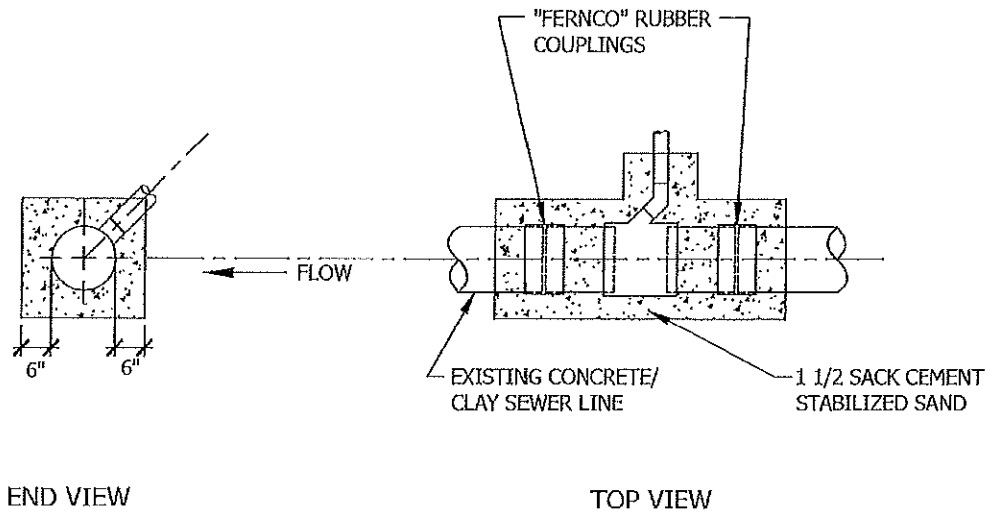
NOTE:

- * TO BE DRILLED WITH HOLE SAW AND GUIDE BIT. USE CORRECT DIAMETER FOR SADDLE LIP.



TYPICAL SERVICE TAP
CONNECTION FOR PVC PIPE

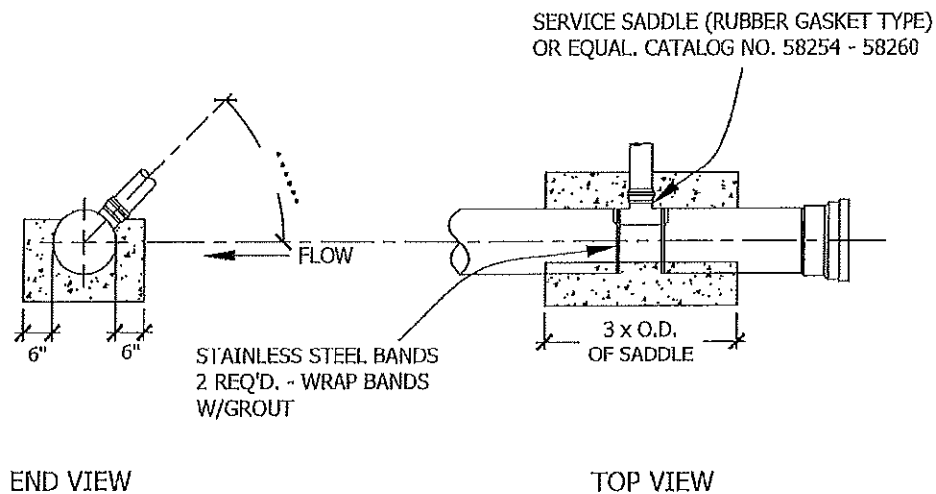
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WATER UTILITIES DEPARTMENT
N.T.S.



STANDARD TYPICAL SERVICE
TAP CONNECTION FOR
CONCRETE/CLAY PIPE

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

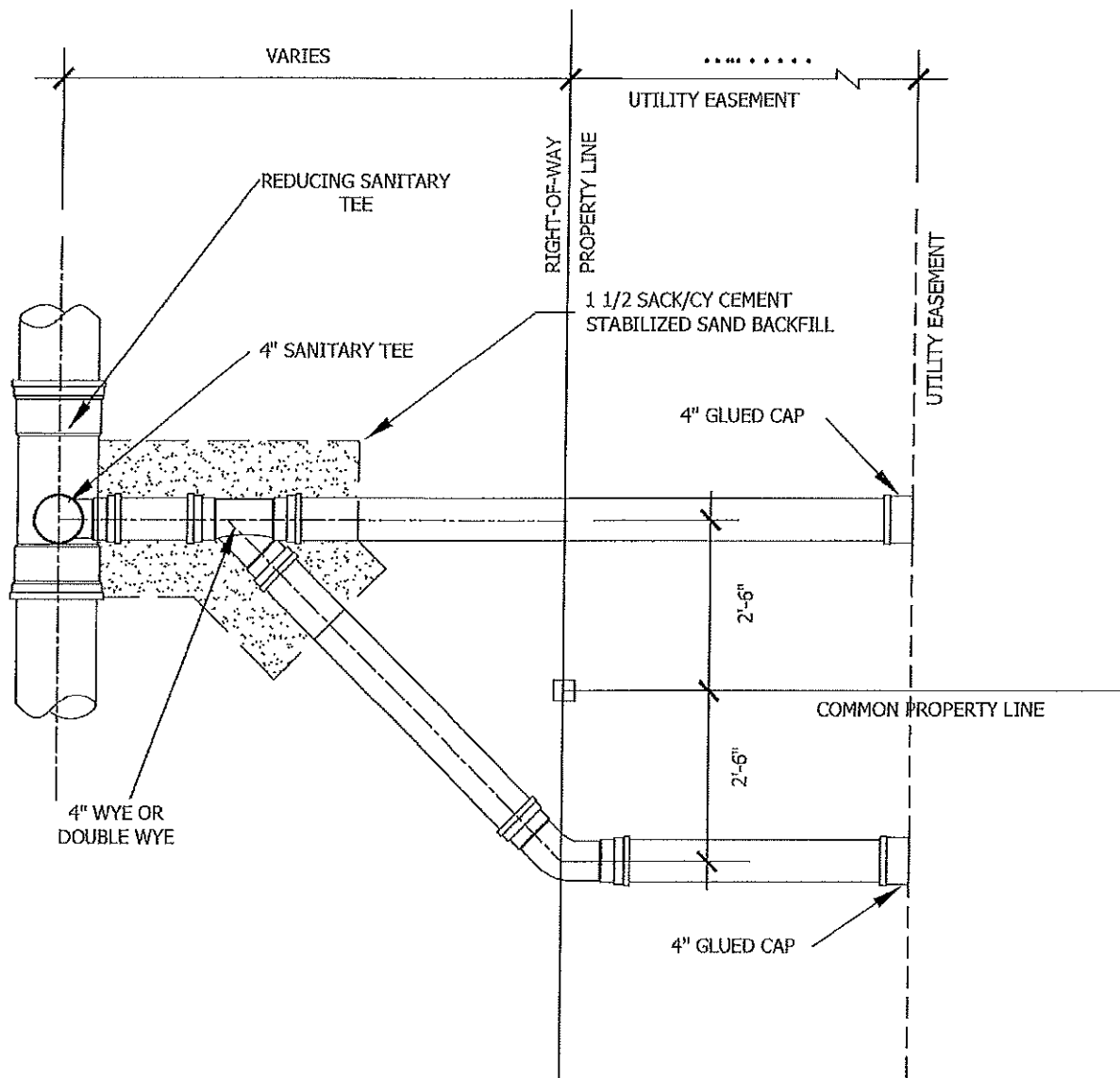
H-19



TYPICAL SERVICE TAP CONNECTION
FOR CONCRETE/CLAY PIPE WITH SADDLE
(TO BE USED ONLY WHEN APPROVED BY
WATER UTILITIES ENGINEER)

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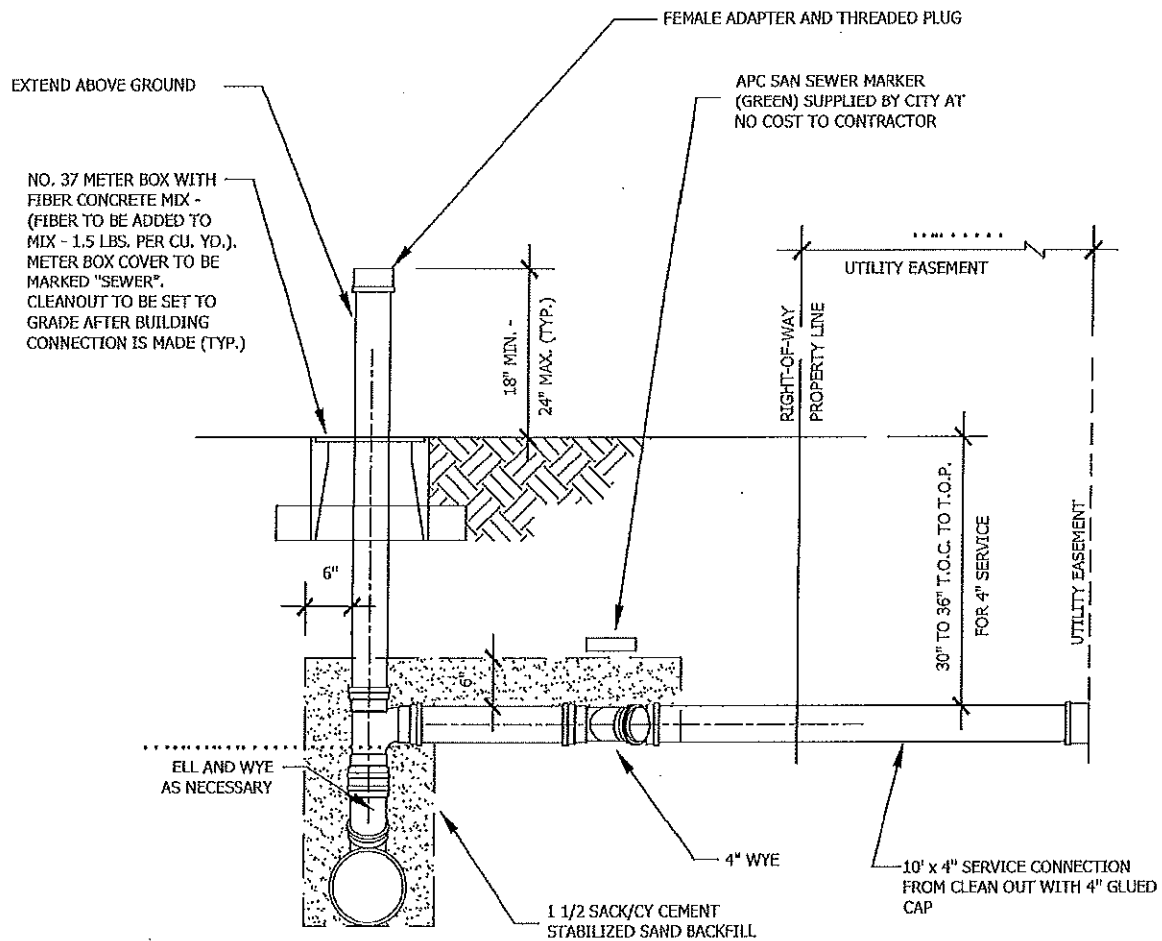
H-20



PLAN VIEW
TYPICAL SHORT SIDE TAP DETAIL
FOR SEWER MAINS DEEPER THAN 6'

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-21

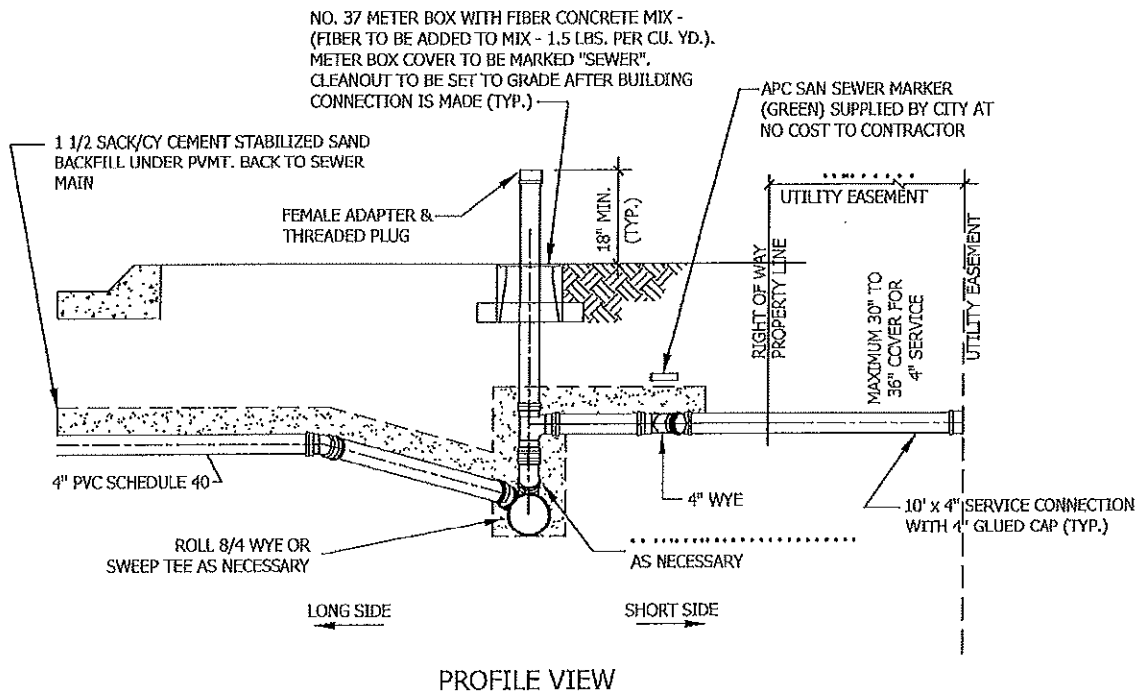
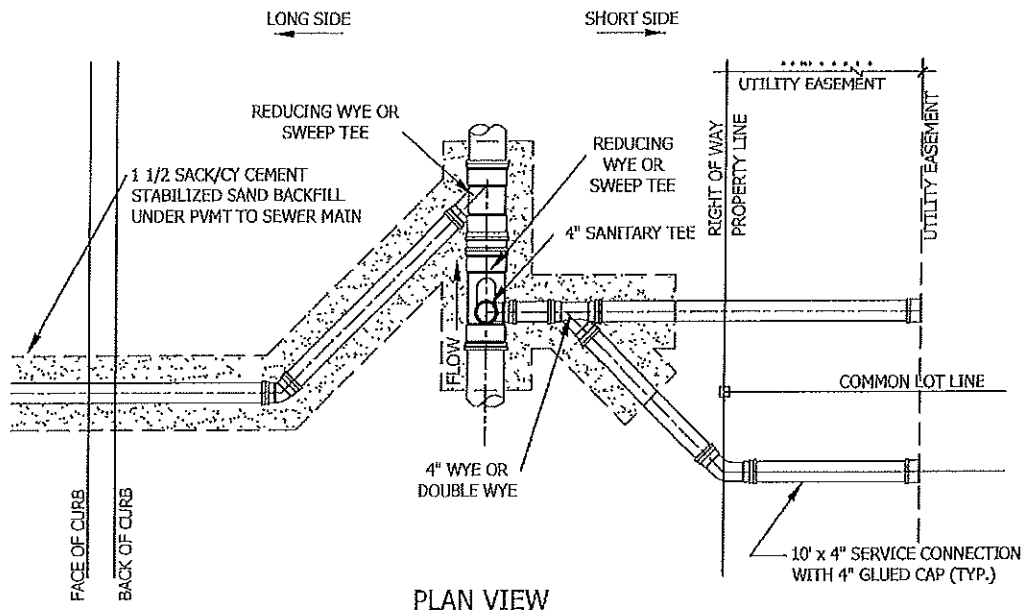


PROFILE VIEW TYPICAL SHORT SIDE TAP DETAIL FOR SEWER MAINS DEEPER THAN 6'

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.



H-23



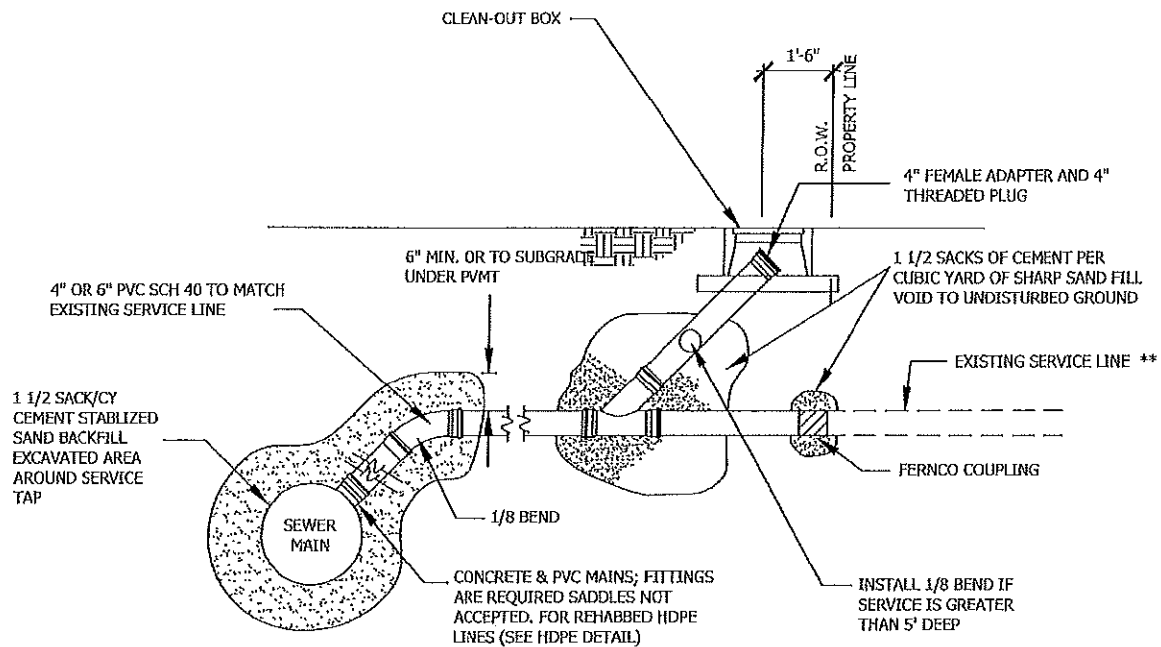
NOTE:

CLEAN OUT TO BE LOWERED TO 6" BELOW TOP OF CLEAN OUT BOX BY CITY FORCES AFTER BOTH SERVICE CONNECTIONS ARE IN SERVICE.

SANITARY SEWER SERVICE LINE DETAIL FOR SEWER MAINS OVER 6' DEEP

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-24



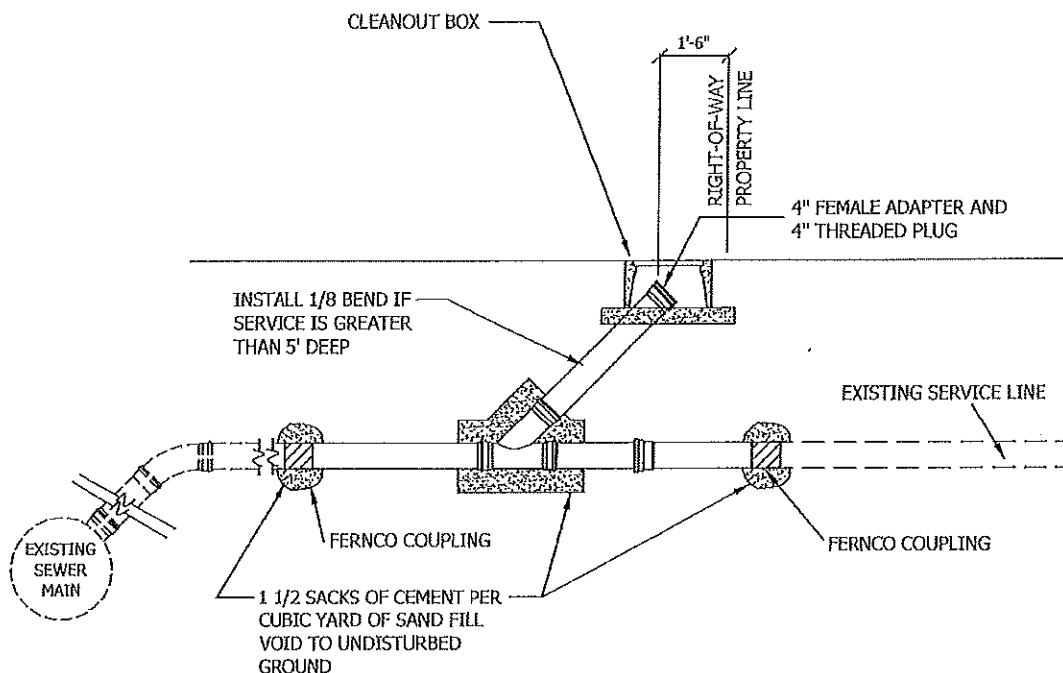
NOTE:

- * CLEAN OUT TO BE ACCESSABLE FROM PROPERTY IT SERVES
- * NO. 37 METER BOX WITH FIBER CONCRETE MIX - (FIBER TO BE ADDED TO MIX - 1.5 LBS. PER CU. YD.). METER BOX COVER TO BE MARKED "SEWER". CLEAN-OUT TO BE SET TO GRADE AFTER BUILDING CONNECTION IS MADE. (TYP.)
- ** MIRROR THE EXISTING CONCRETE SEWER SERVICE LINE, IF PVC IS VISIBLE AND OUT OF EASEMENT, CONTACT YOUR SUPERVISOR FOR APPROVAL TO DIG BACK TO PVC FOR TIE-IN.

SANITARY SEWER CLEAN OUT DETAIL

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H-25



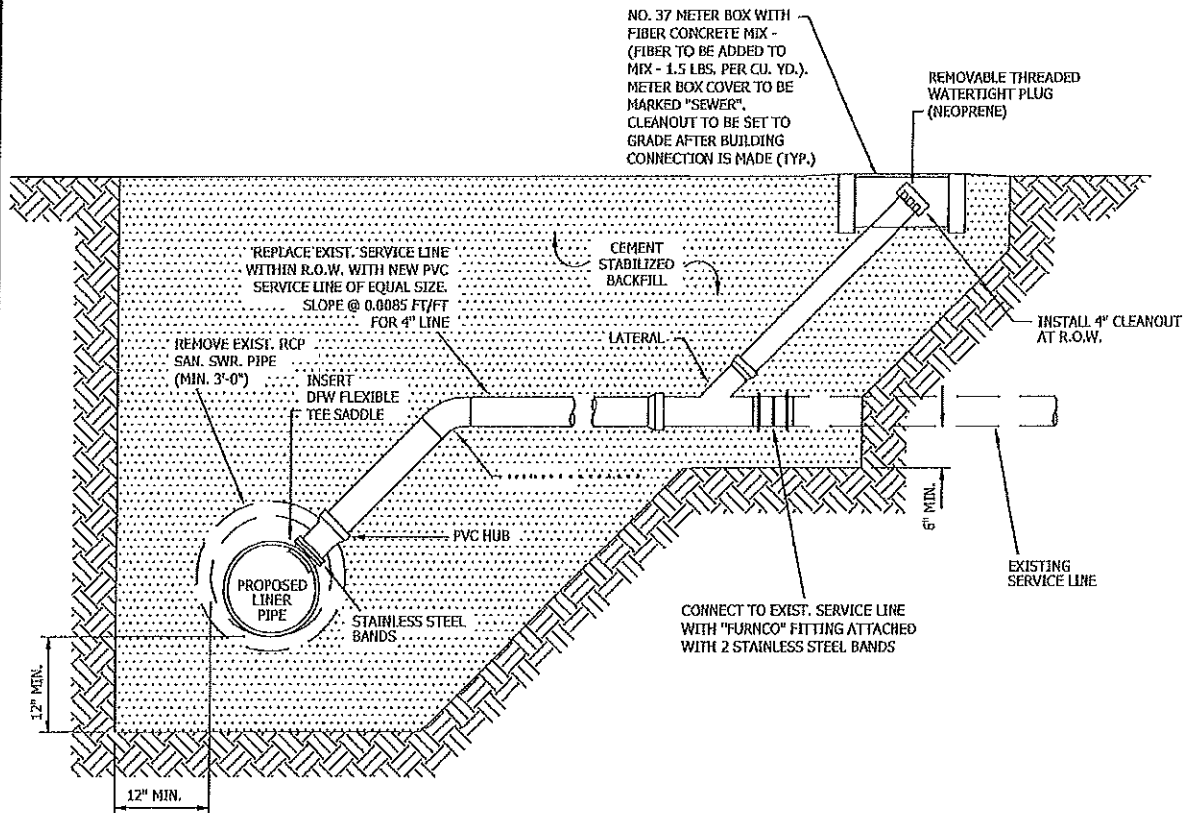
NOTE:

- * REPLACE 5FT OF EXISTING SERVICE LINE ON BOTH SIDES OF WYE. USE 4" OR 6" PVC SCH 40 TO MATCH EXISTING SERVICE LINE.
- * CLEAN OUT TO BE ACCESSABLE FROM PROPERTY IT SERVES
- * WRAP FERNCO'S AND 2-WAY CLEANOUT IN STABILIZED SAND OR DRY SACKRETE
- * NO. 37 METER BOX WITH FIBER CONCRETE MIX - (FIBER TO BE ADDED TO MIX - 1.5 LBS. PER CU. YD.). METER BOX COVER TO BE MARKED "SEWER". CLEAN OUT TO BE SET TO GRADE AFTER BUILDING CONNECTION IS MADE. (TYP)

INSTALLATION OF A CLEAN OUT ON AN EXISTING SANITARY SEWER SERVICE CONNECTION

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

H-26

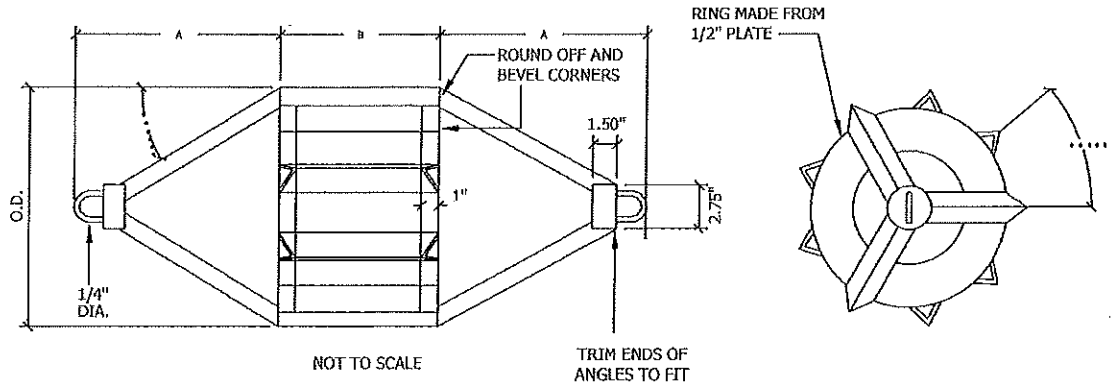


TYPICAL SANITARY SEWER SERVICE LINE REPLACEMENT ON SLIP LINED SEWER MAIN

CITY OF LIBERTY
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H-27

GO, NO-GO DEFLECTION TESTING MANDREL
CONSTRUCTED FROM 1/2 - INCH ANGLE IRON



NOTE:

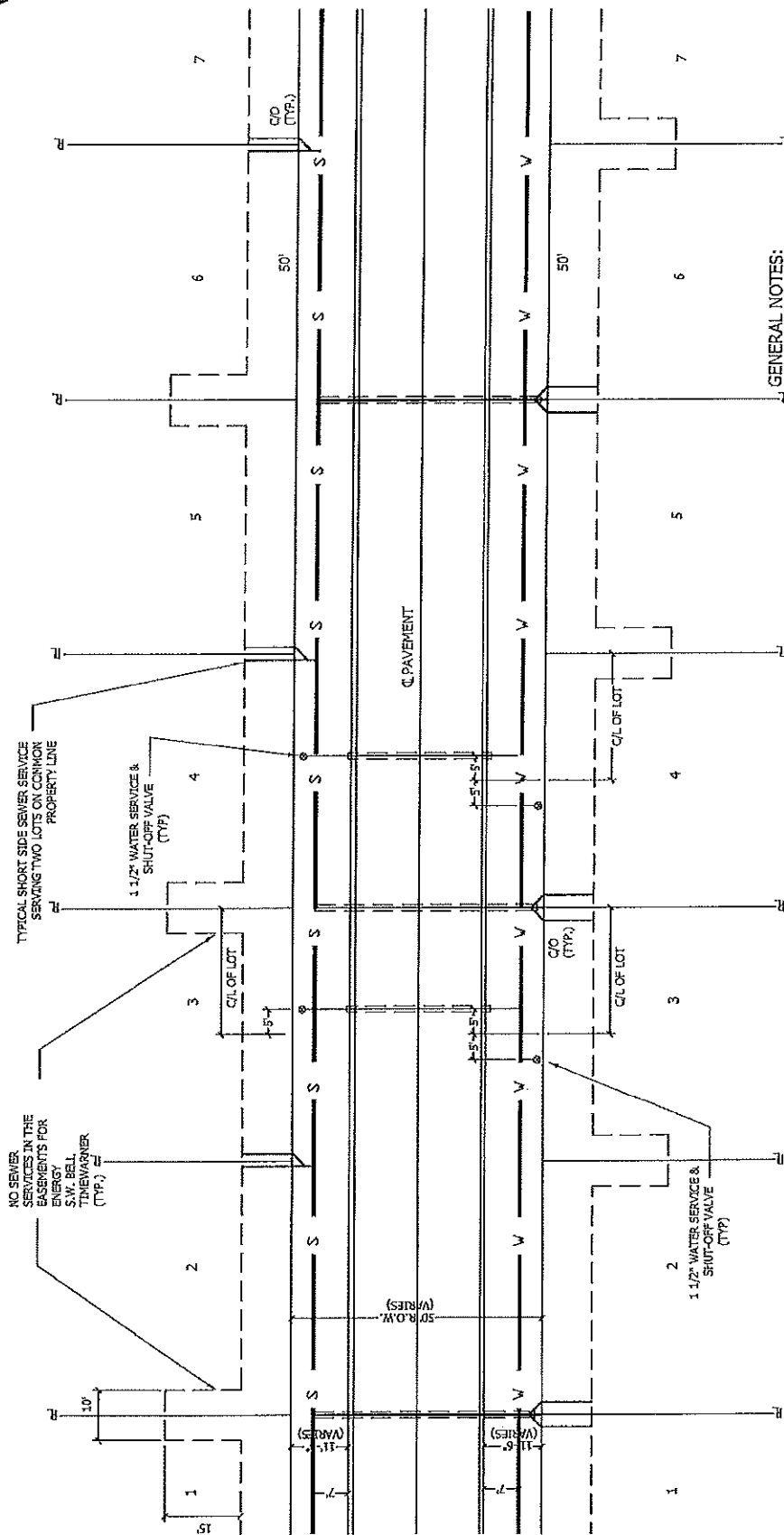
AFTER WELDING IS COMPLETED, TRUE THE OUTSIDE
DIAMETER DIMENSION FOR THE FULL LENGTH OF "B"
TO (+/-) 0.010" BY TOOL AND LATHE OR GRINDING

SIZE	A (inch)	B (inch)	Mandrel Outside Diameter (in.) For 7 1/2 % Deflection			Ring Outside Diameter (in.)			For Straight Wall-PVC	
			PSP DR 42	PSM DR 42	PSM DR 35	PSP DR 41	PSM DR 42	PSM DR 35	NOMINAL SIZE	MIN. I.D. OF PIPE
4	2.24	4	3.55		3.59	2.84		2.84	4	3.88
6	3.76	4	5.35		5.34	4.62		4.59	6	5.77
8	5.33	6	6.96	7.18	7.15	6.25	6.47	6.39	8	7.73
10	6.88	6	8.70	8.97	8.94	7.99	8.26	8.17	10	9.666
12	8.35	8	10.45	10.60	10.64	9.74	9.97	9.86	12	11.50
15	10.52	9	13.05		13.15				15	14.22
18	12.92	10			15.92				18	17.21
21	15.39	10			18.77				21	20.29
24	17.42	10			21.11				24	22.826
27	19.75	10			23.80				27	25.725

TYPICAL MANDREL DETAIL

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
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GENERAL NOTES:

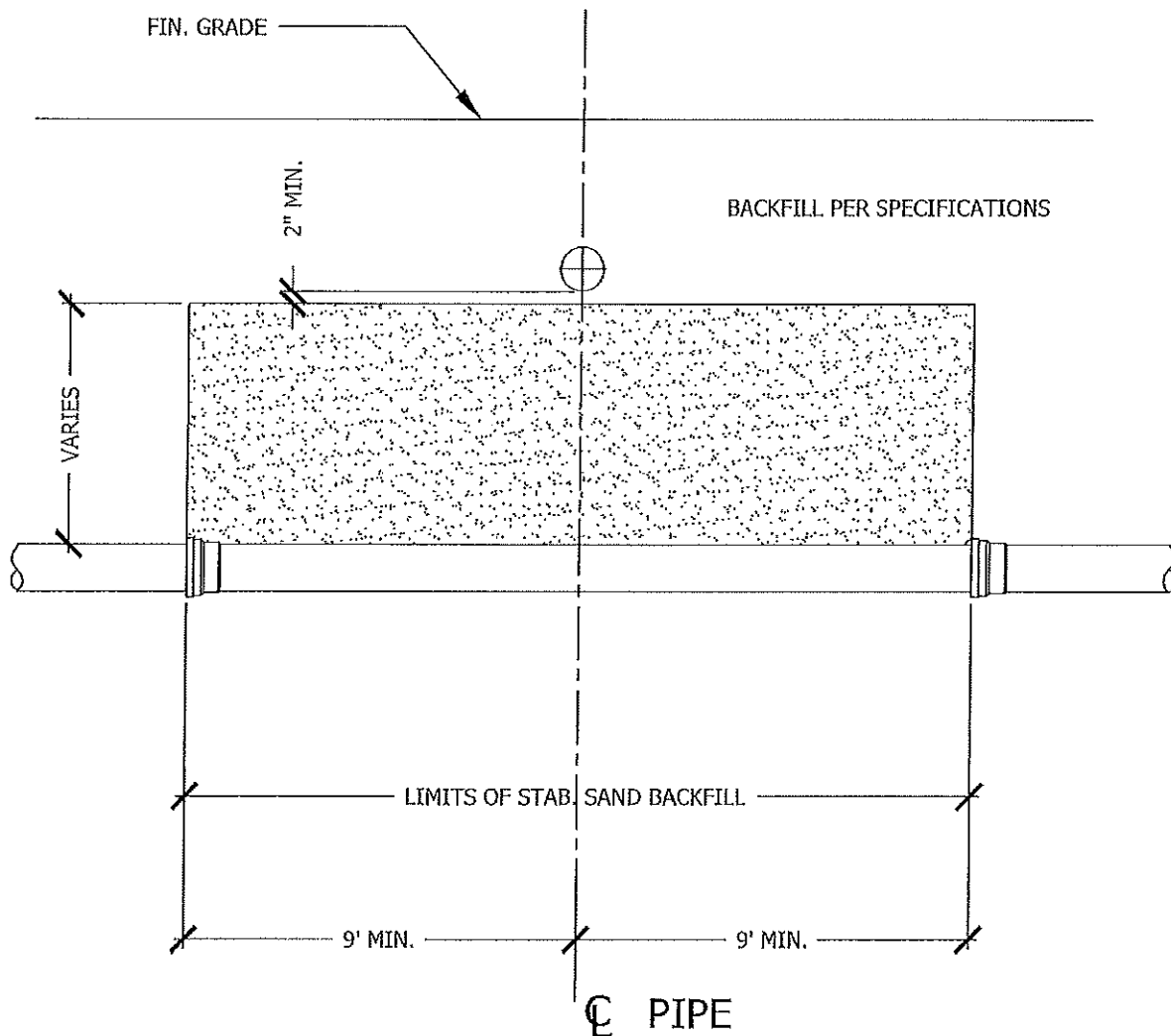
1. ALTERNATE SANITARY SEWER CONNECTIONS WITH ENERGY, S.W. BELL, AND TIMEWARNER EASEMENTS.
2. WATER SERVICES ARE TO BE LOCATED 5' TO THE RIGHT OF THE CENTER LINE OF THE LOT.
3. SEE APPENDIX II FOR ALL OTHER DESIGNATED UTILITY LOCATIONS.

TYPICAL LONG AND SHORT SIDE WATER AND SANITARY SEWER SERVICE CONNECTION

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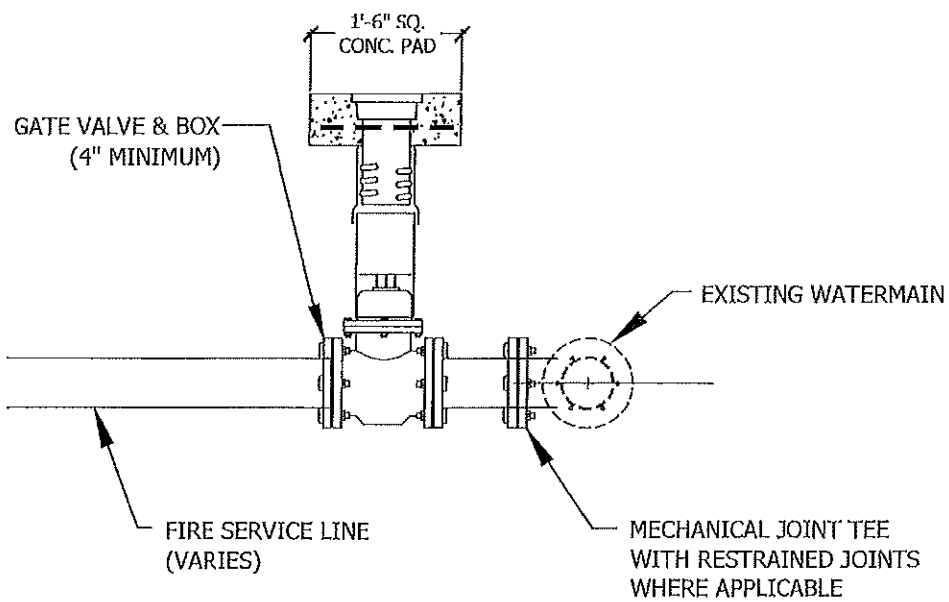
NOTE:

SEPARATION DISTANCES SHALL BE BASED ON
STATE AND FEDERAL REGULATIONS.



**TYPICAL WATER AND SANITARY SEWER
MAIN CROSSING**

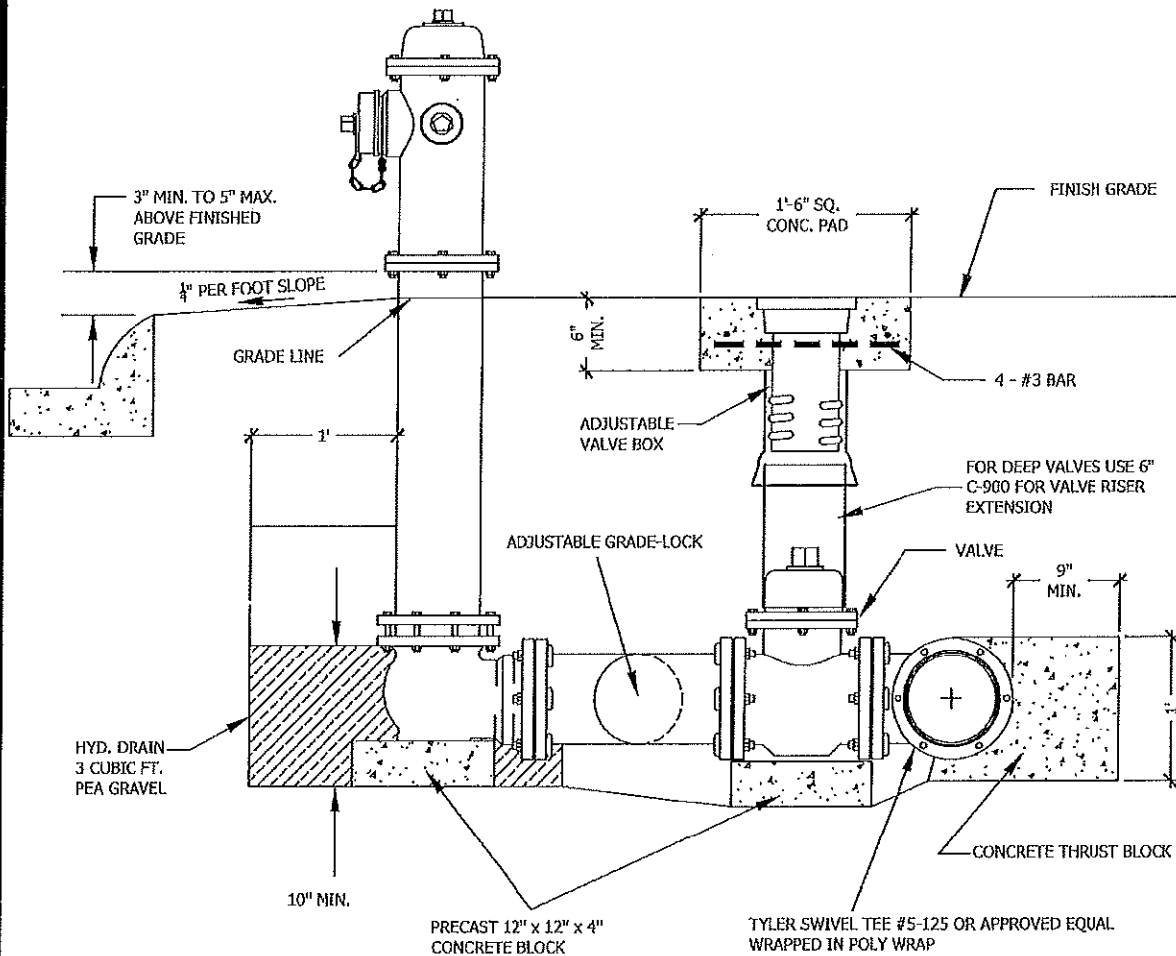
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N.T.S.



TYPICAL FIRE SERVICE LINE CONNECTION

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

SEE SPEC. SHEET 808.01
SPECIAL REQUIREMENTS FOR
APPROVED FIRE HYDRANT



TYPICAL FIRE HYDRANT INSTALLATION

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
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H-32

NOTE:

SET TOP OF METER BOX EVEN WITH GRADE IF ALREADY LANDSCAPED. IF NOT LANDSCAPED SET TOP OF BOX 2 INCHES ABOVE TOP OF CURB. (BY CITY FORCES).

THE PLUMBING CONTRACTOR IS TO MARK THE METER BOX LOCATION WITH A STAKE & FLAGGING. LABEL WHAT SIZE METER WILL BE INSTALLED ON THE STAKE.

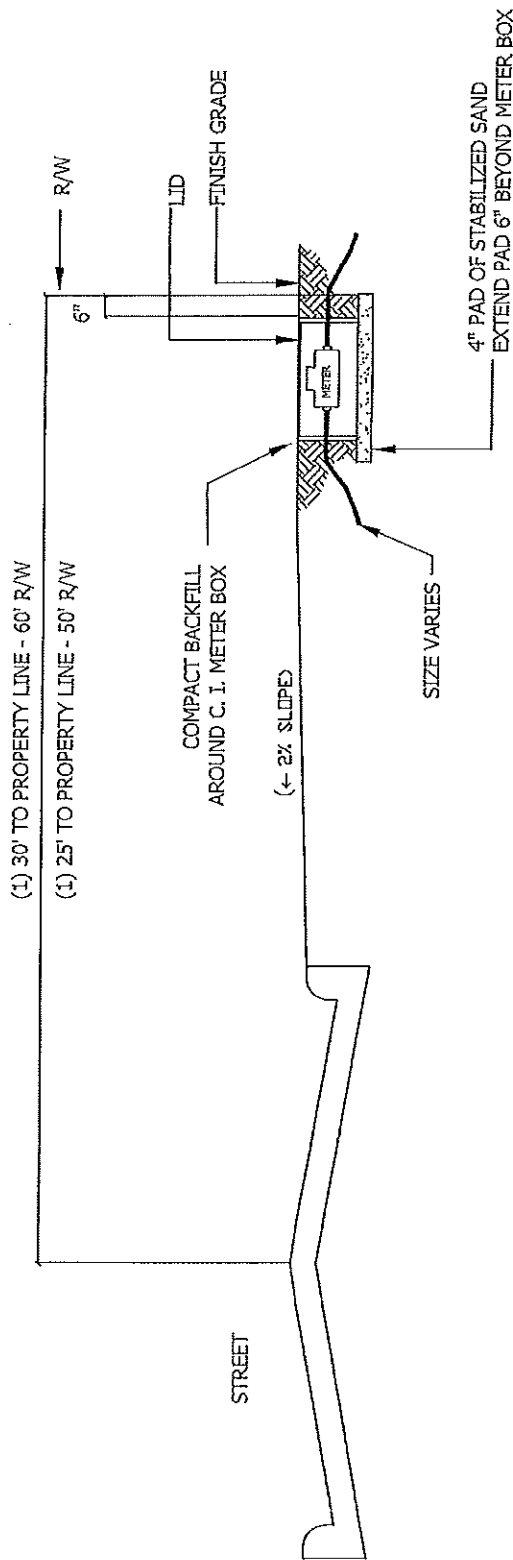
NOTE:

SERVICE LINE SIZES WILL VARY DEPENDING ON THE SIZE OF METER:

1" METER = 1 1/2" SERVICE LINE

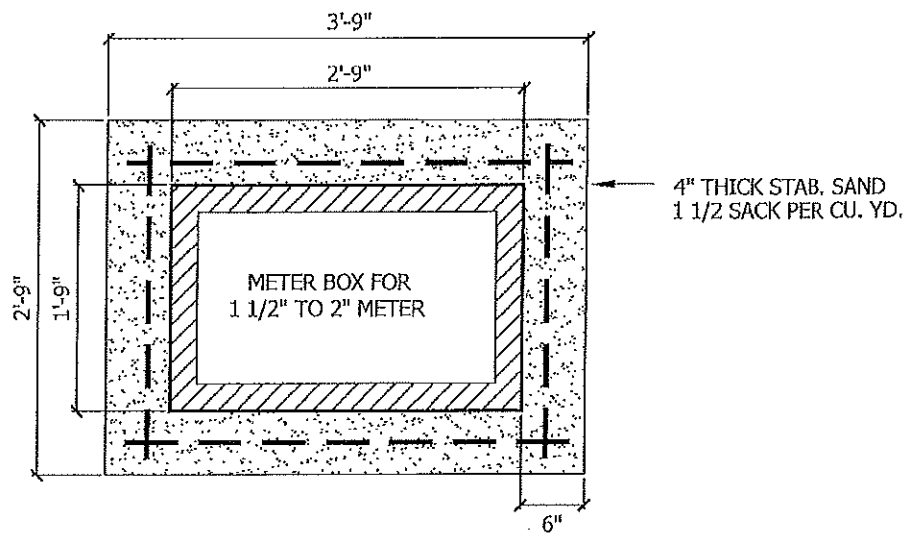
1 1/2" METER = 2" SERVICE LINE

2" METER = 2" SERVICE LINE

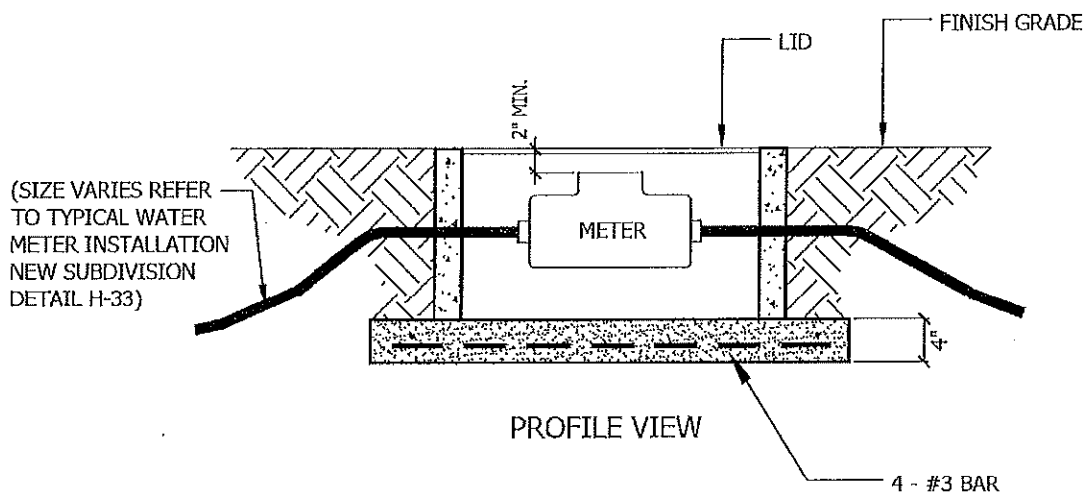


TYPICAL WATER METER INSTALLATION NEW SUBDIVISION

CITY OF LIBERTY
WATER UTILITIES DEPARTMENT
N.T.S.

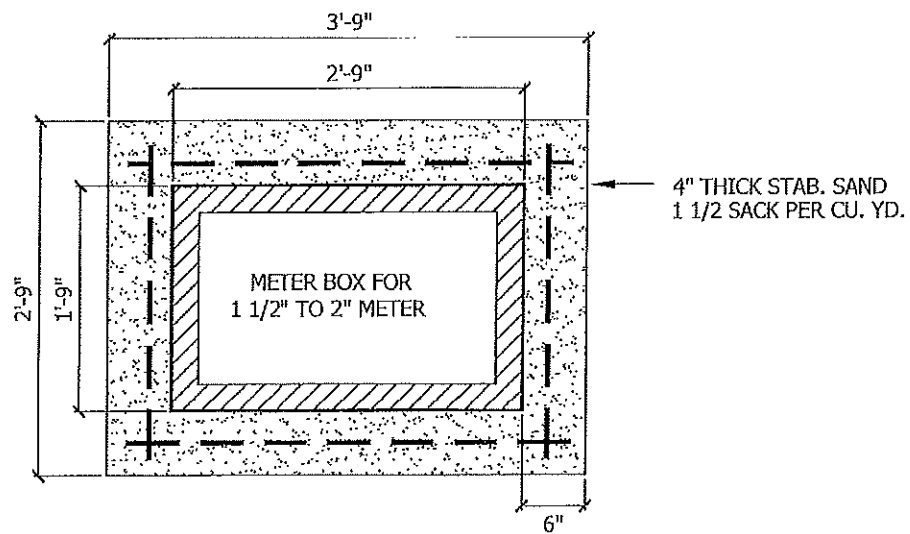


PLAN VIEW

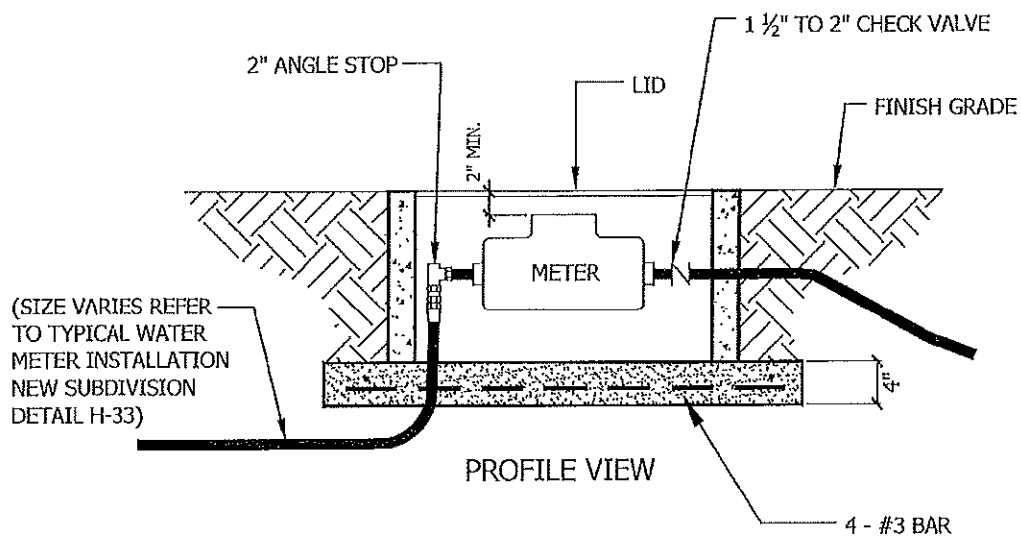


TYPICAL METER INSTALLATION OF 1 1/2" TO 2" METER USING A CAST IRON METER BOX

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PLAN VIEW

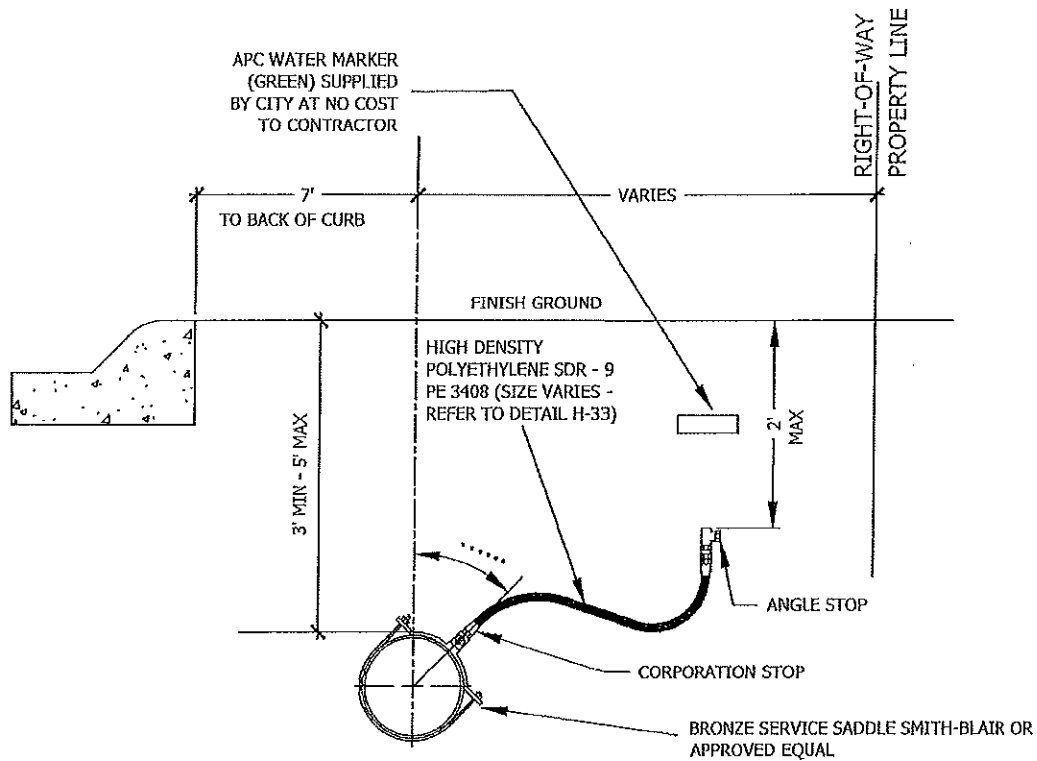


PROFILE VIEW

TYPICAL METER INSTALLATION OF 1 1/2" TO 2" METER USING A CONCRETE METER BOX

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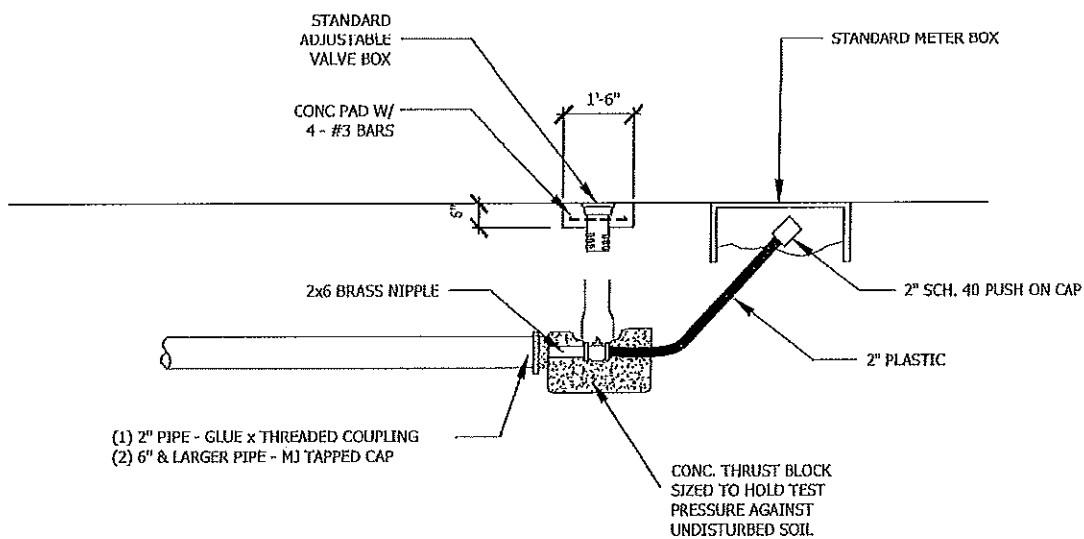
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GENERAL NOTES:

1. DOUBLE STRAP ALL 1 1/2" & 2" ON 6" PIPE AND ABOVE.
2. CLOY TWIN SEAL TAPPING SADDLE STYLE 3401 OR APPROVED EQUAL FOR 2" OR 3" PVC PIPE.
3. FOR 2" SDR-26 MAINS; USE A BRASS TEE AND A CURB STOP.

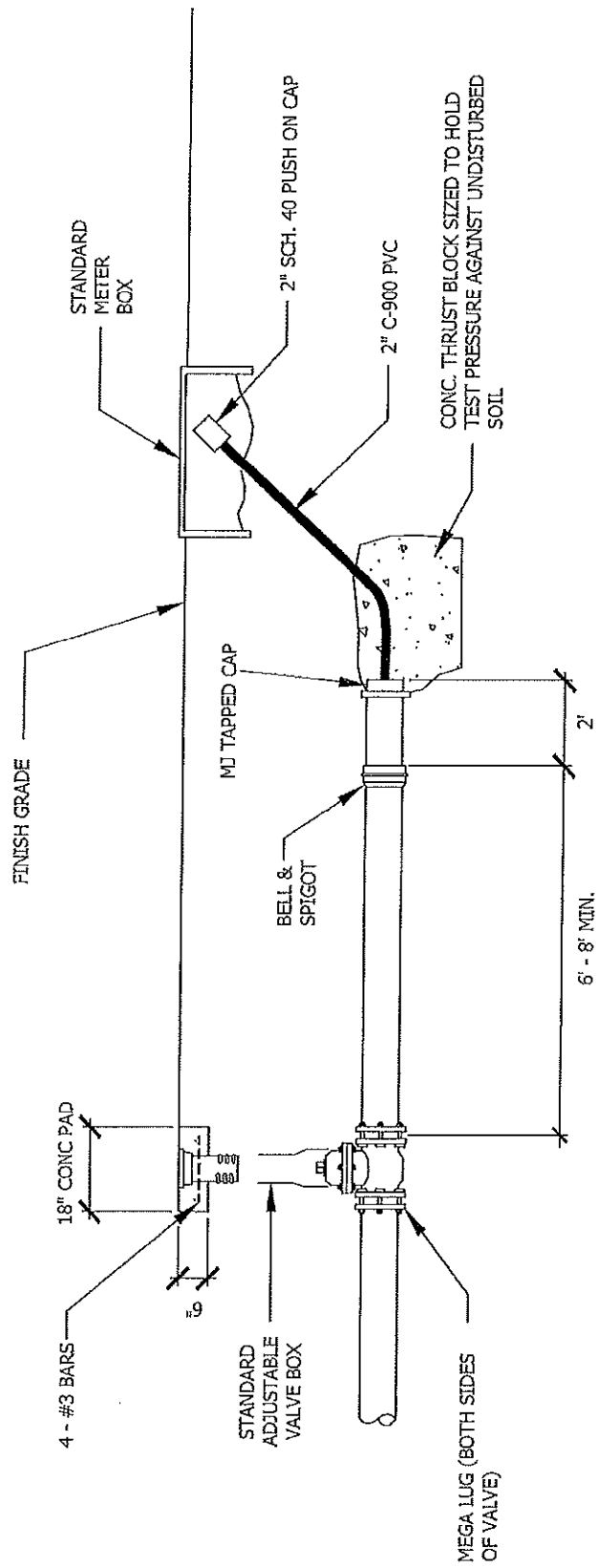
TYPICAL WATER SERVICE CONNECTION



PERMANENT FLUSH OUT DETAIL

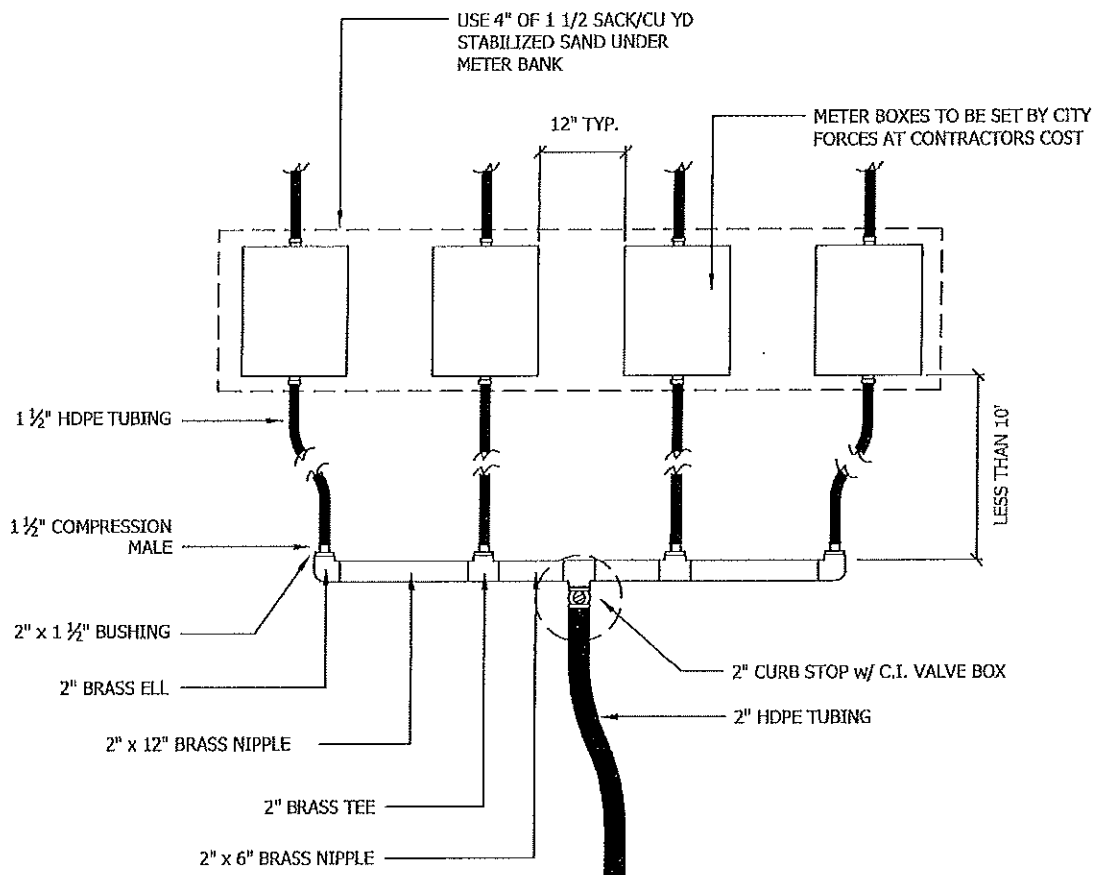
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TEMPORARY FLUSH OUT DETAIL

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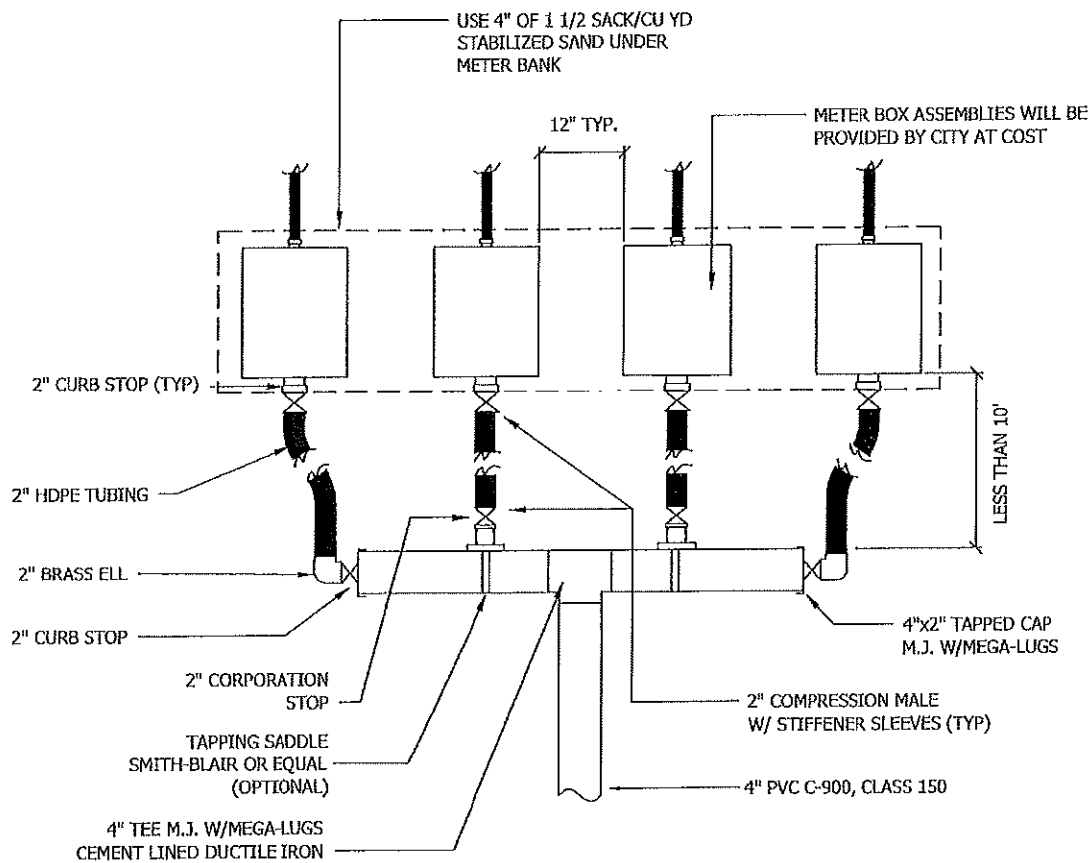
NOTES:

- ALL FITTINGS MUST BE BRASS
- NO MORE THAN 8 METERS ON MANIFOLD
- PLACE TOPS OF ALL METER BOXES AND VALVE BOX AT SAME ELEVATION, EVEN WITH GRADE
- IF METER AREA IS SURROUNDED BY CONCRETE THEN METER BANK AREA IS TO BE BACKFILLED WITH SAND & GRAVEL.
- BOLLARDS ARE TO BE SET AT EACH CORNER.

TYPICAL METER BANK INSTALLATION FOR 1" METERS

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NOTES:

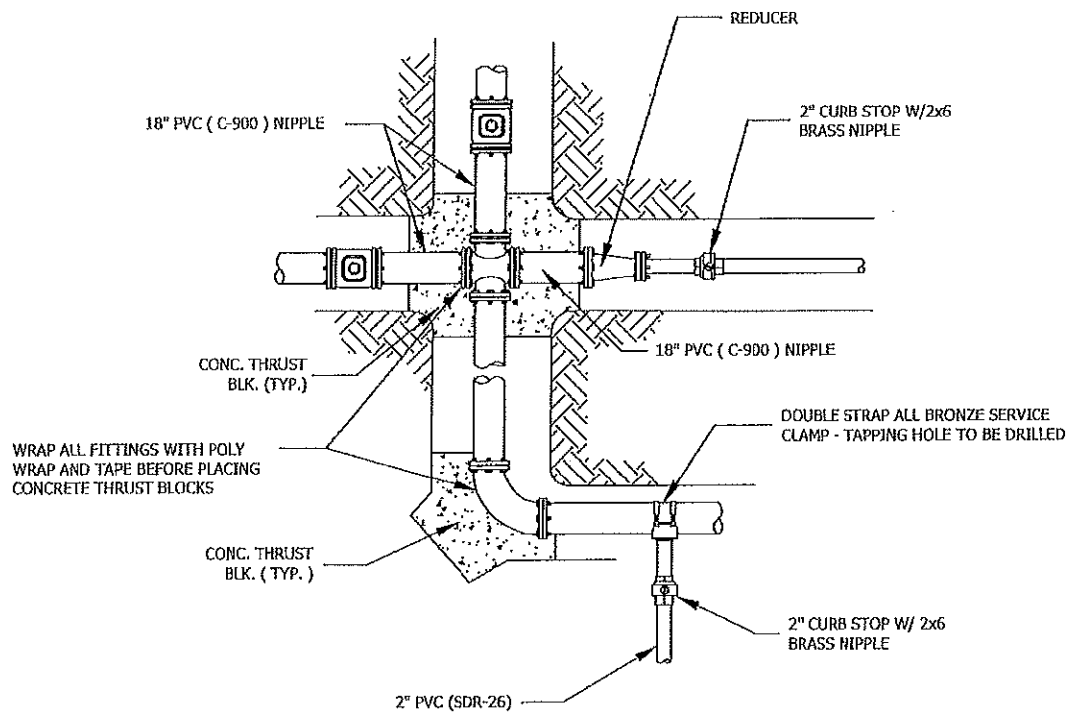
- ALL FITTINGS MUST BE BRASS OR CEMENT LINED DUCTILE IRON
- NO MORE THAN 8 METERS ON MANIFOLD
- PLACE TOPS OF ALL METER BOXES AND VALVE BOXES AT SAME ELEVATION, EVEN WITH GRADE
- IF METER AREA IS SURROUNDED BY CONCRETE THEN METER BANK AREA IS TO BE BACKFILLED WITH SAND & GRAVEL.
- BOLLARDS ARE TO BE SET AT EACH CORNER.

TYPICAL METER BANK INSTALLATION

FOR 1 1/2" AND 2" METERS

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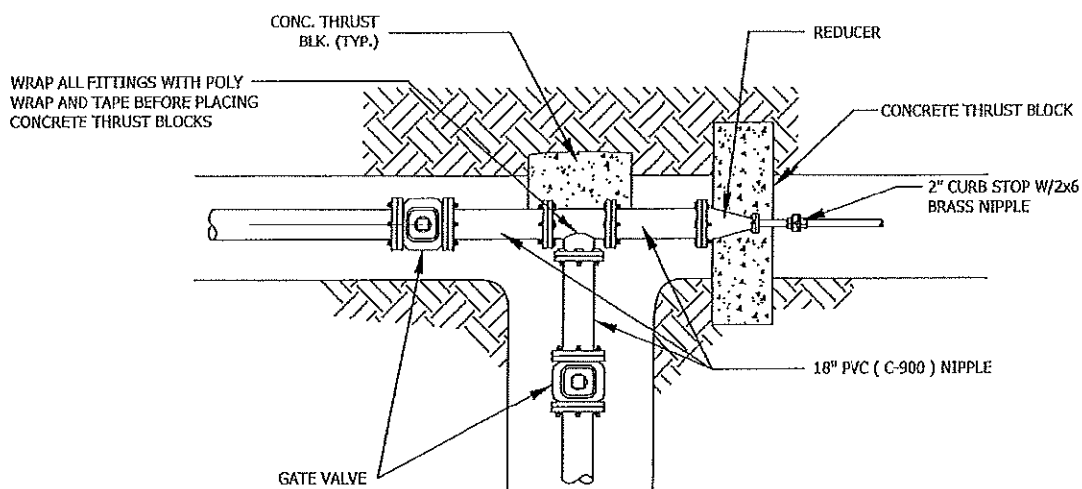
NOTE:

WRAP ALL FITTINGS WITH POLY WRAP AND TAPE

TYPICAL FITTINGS & CONCRETE THRUST BLOCK INSTALLATION

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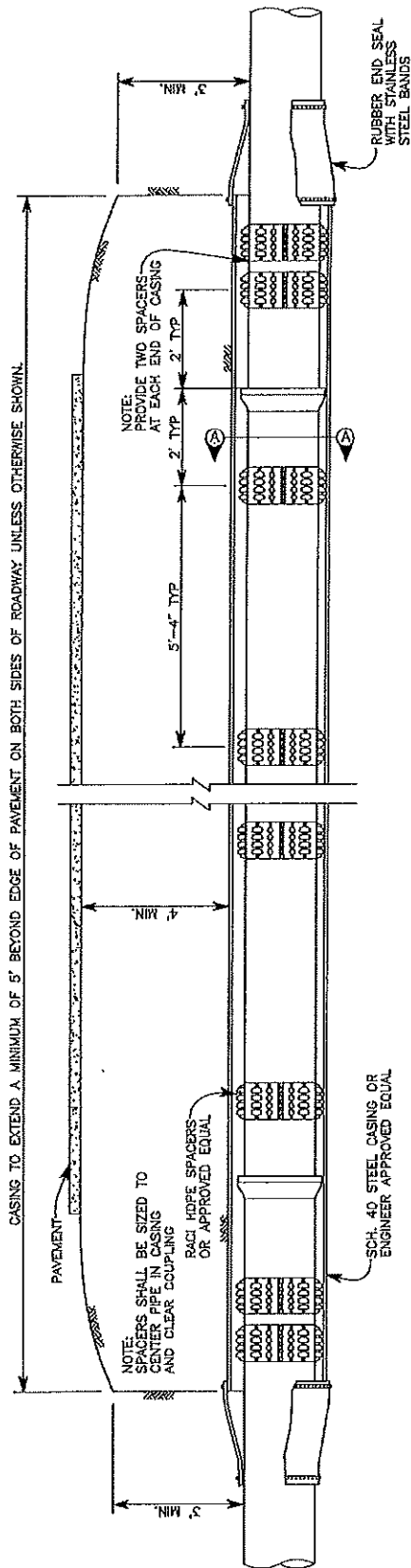
NOTE:

1. ALL BLOCKING TO UNDISTURBED TRENCH WALL
2. WRAP ALL FITTINGS WITH POLY WRAP AND TAPE

TYPICAL FITTINGS & CONCRETE THRUST BLOCK INSTALLATION

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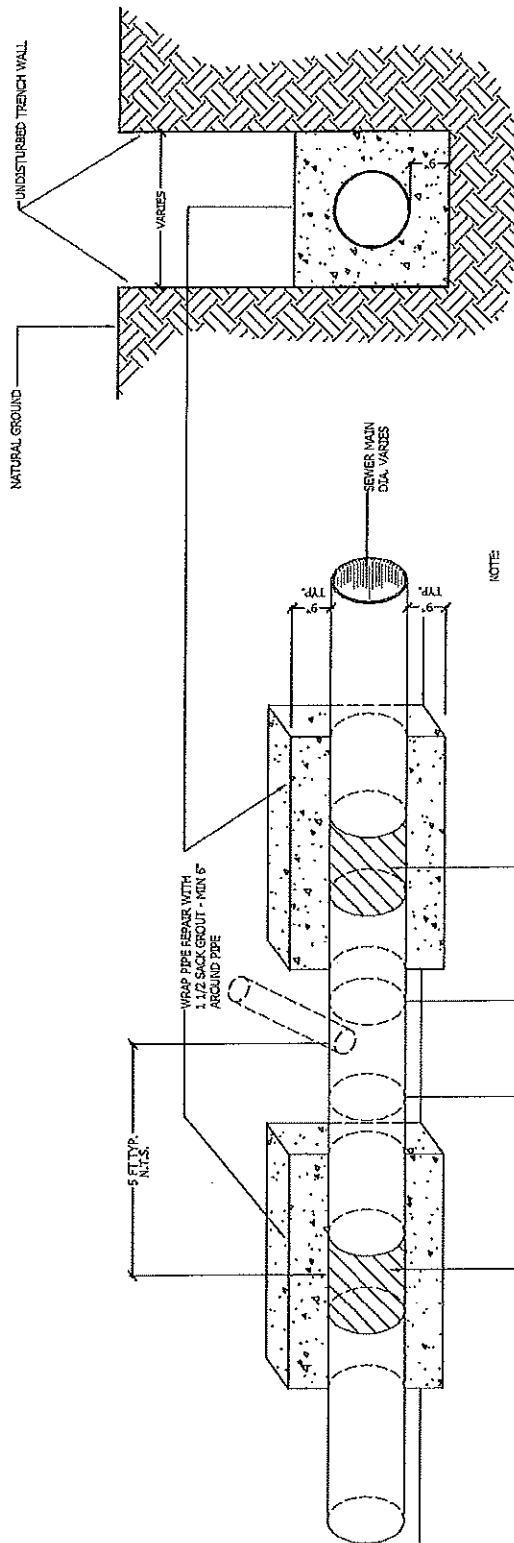


CASING DETAIL
TYPICAL LONGITUDINAL SECTION
(TUNNEL CONSTRUCTION)

NOTE:
 CASING PIPE SIZE TO BE DETERMINED BY THE
 PROPOSED SIZE OF PIPE.

TYPICAL CASING DETAIL

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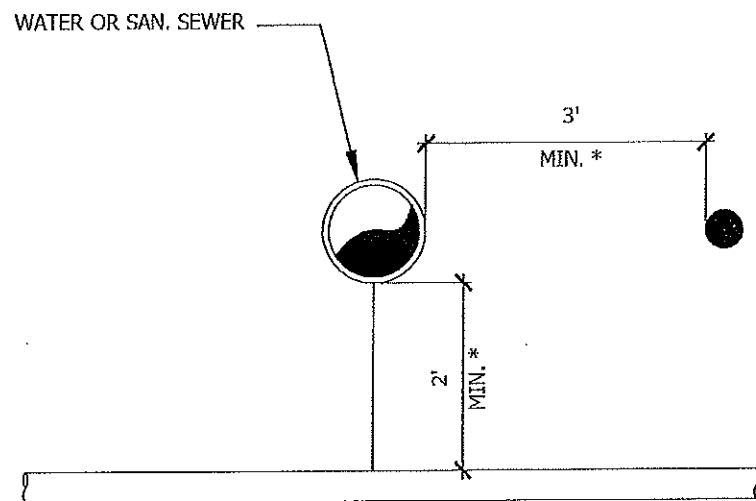
NOTE
 WRAP CUTTING IN A WYE OR TEE ON
 THE MAIN SEWER LINE REPAIRS
 OF EXISTING MAIN LINE ON EACH SIDE OF
 THE WYE OR TEE AND WRAP WITH
 GROUT 5' AROUND PIPE

1 - TYPICAL MAIN LINE REPAIR

2 - END VIEW

MAIN LINE REPAIR DETAIL

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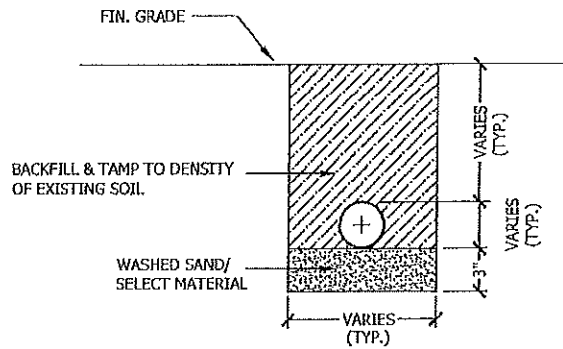


* MINIMUM CLEARANCE ON ALL UTILITY CROSSINGS

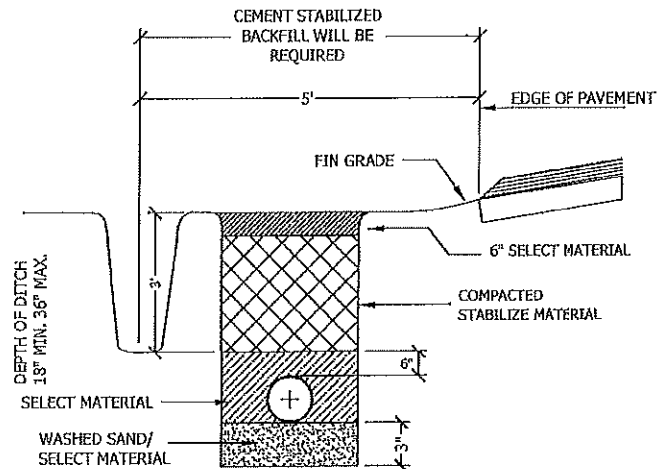
TYPICAL UTILITY CROSSING

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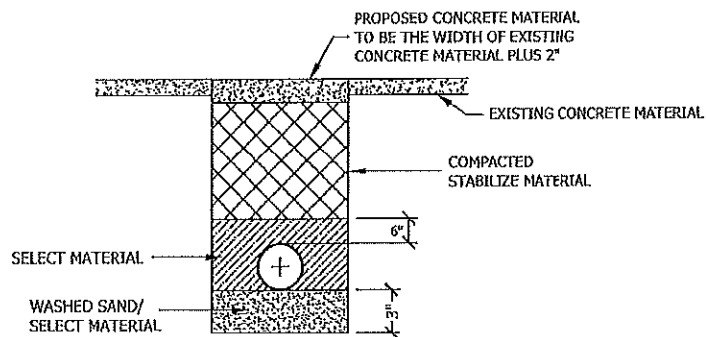
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TYPICAL TRENCH BACKFILLING
(AWAY FROM ROAD
RIGHT-OF-WAY)



TYPICAL SECTION AT
EDGE OF ROADWAY



TYPICAL TRENCH BACKFILLING
(UNDER CONCRETE PAVEMENT)

TYPICAL ROAD & TRENCH BACKFILLING

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