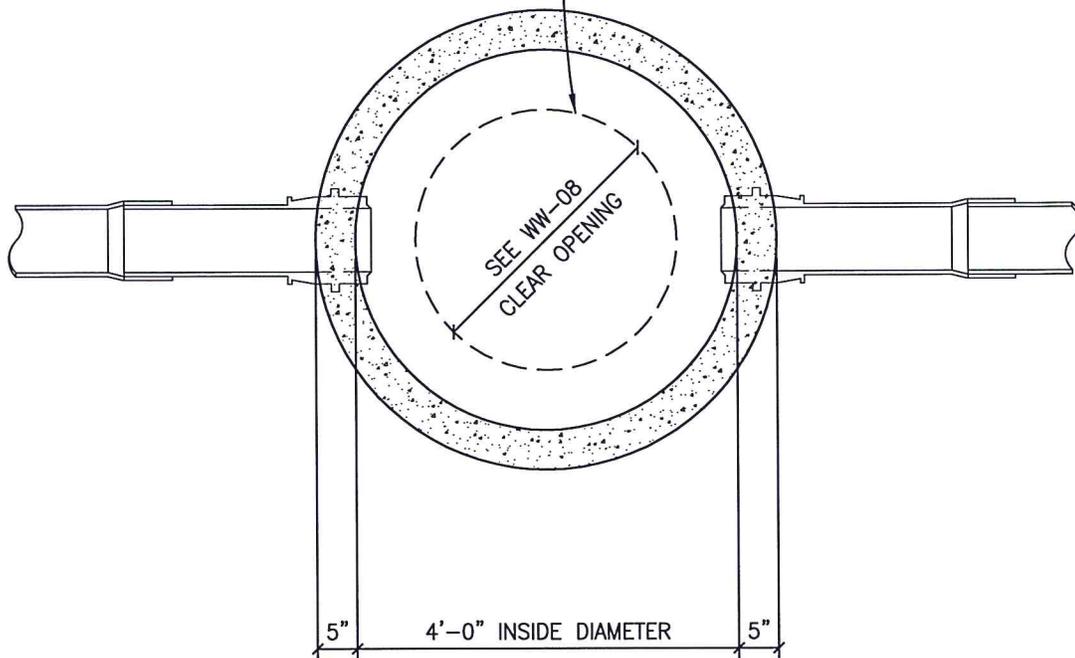


STANDARD CASTING AND COVER, AS SPECIFIED.
(BOLTED WHERE SHOWN ON PLANS)



NOTES:

1. ALL MANHOLES SHALL BE 48" I.D., WITH RUBBER GASKET JOINTS CONFORMING TO ASTM C478 AND C433, UNLESS OTHERWISE APPROVED.
2. ALL MANHOLES SHALL HAVE FRAME AND COVER, AS MANUFACTURED BY EAST JORDAN IRON WORKS (AS PER DETAIL # WW-08) OR APPROVED EQUIVALENT.
3. ALL MANHOLES SHALL BE CONCRETE WITH CAST IRON FRAME AND COVER. (CONFORMING TO ASTM SPECIFICATION A 48, CLASS 30).
4. ALL MANHOLES SHALL HAVE AN CONCENTRIC CONE. WHERE CONFLICT WITH OTHER UTILITIES OCCURS ECCENTRIC CONE IS ALLOWED.
5. MANHOLES MAY HAVE A FLAT LID, IF APPROVED BY THE CITY, WITH A MINIMUM 30" OPENING, CONFORMING TO ASTM C478, 5000 P.S.I. CONCRETE, TRAFFIC BEARING, AND RUBBER GASKET JOINT CONFORMING TO ASTM C443.
6. INVERTS AND FLEXIBLE SEAL BOOTS, PER ASTM C-923, SHALL BE CAST INTO BASE SECTION.
7. MINIMUM DROP BETWEEN INVERTS SHALL BE ONE-TENTH OF A FOOT (0.1').
8. GRADE RINGS WITH AN I.D. TO MATCH FRAMES MINIMUM CLEAR OPENING WITH A MAXIMUM GRADE RING HEIGHT OF 1'-0", 4" MINIMUM PAVED AREAS.
9. REFER TO ADDITIONAL WASTEWATER NOTES ON WW-06.

CITY OF KILLEEN
DEPARTMENT OF PUBLIC WORKS

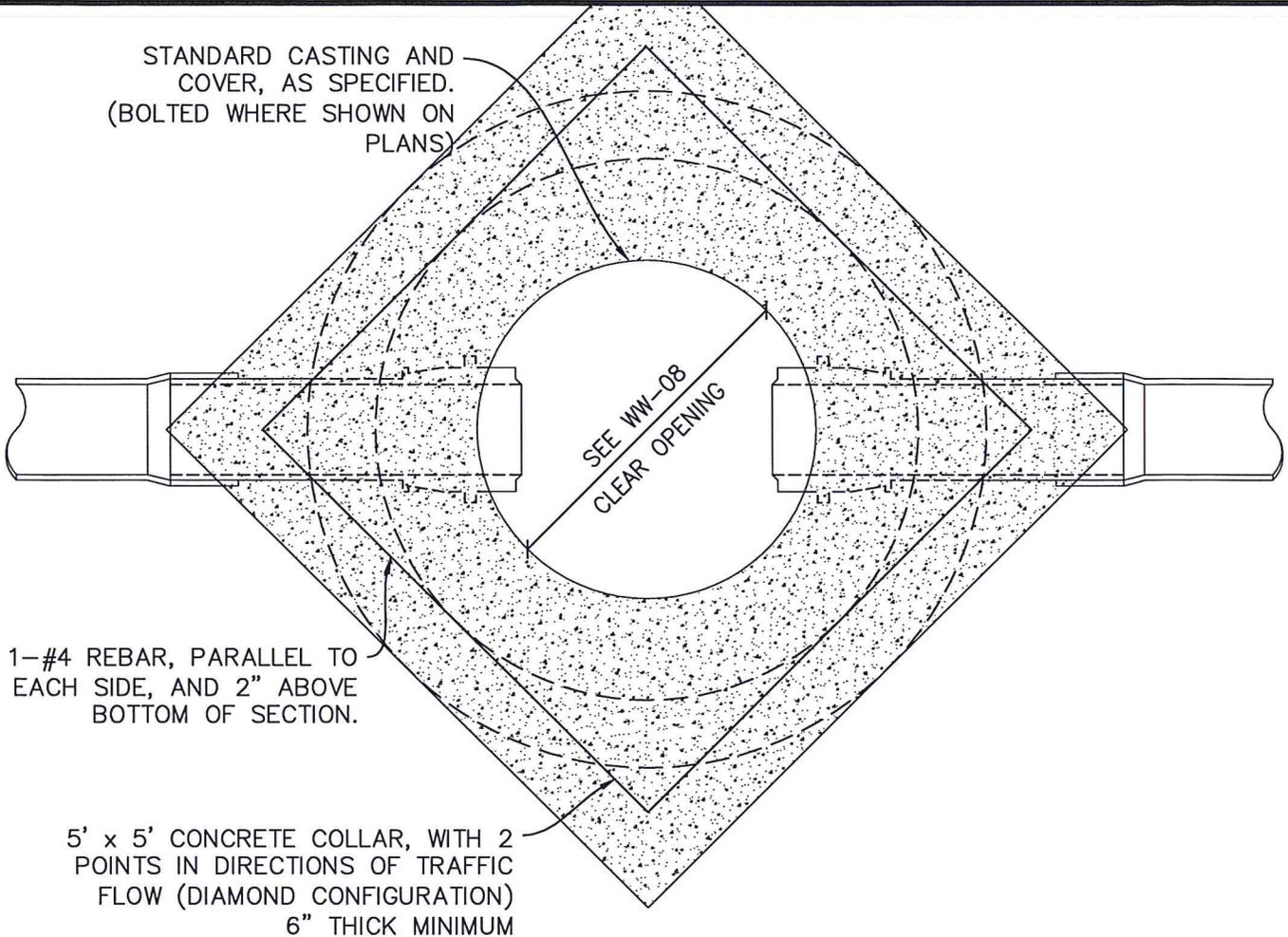
STANDARD MANHOLE PLAN
OUTSIDE ROADWAY

CONSTRUCTION STANDARDS AND DETAILS



WW-01
SCALE: N.T.S.
ISSUE DATE: 08-01-13

STANDARD CASTING AND COVER, AS SPECIFIED.
(BOLTED WHERE SHOWN ON PLANS)



1-#4 REBAR, PARALLEL TO EACH SIDE, AND 2" ABOVE BOTTOM OF SECTION.

5' x 5' CONCRETE COLLAR, WITH 2 POINTS IN DIRECTIONS OF TRAFFIC FLOW (DIAMOND CONFIGURATION)
6" THICK MINIMUM

NOTES:

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2. ALL MANHOLES SHALL HAVE FRAME AND COVER, AS MANUFACTURED BY EAST JORDAN IRON WORKS (AS PER DETAIL # WW-08) OR APPROVED EQUIVALENT.
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6. INVERTS AND FLEXIBLE SEAL BOOTS, PER ASTM C-923, SHALL BE CAST INTO BASE SECTION.
7. MINIMUM DROP BETWEEN INVERTS SHALL BE ONE-TENTH OF A FOOT (0.1').
8. GRADE RINGS WITH AN I.D. TO MATCH FRAMES MINIMUM CLEAR OPENING WITH A MAXIMUM GRADE RING HEIGHT OF 1'-0", 4" MINIMUM PAVED AREAS.
9. REFER TO ADDITIONAL WASTEWATER NOTES ON WW-06.

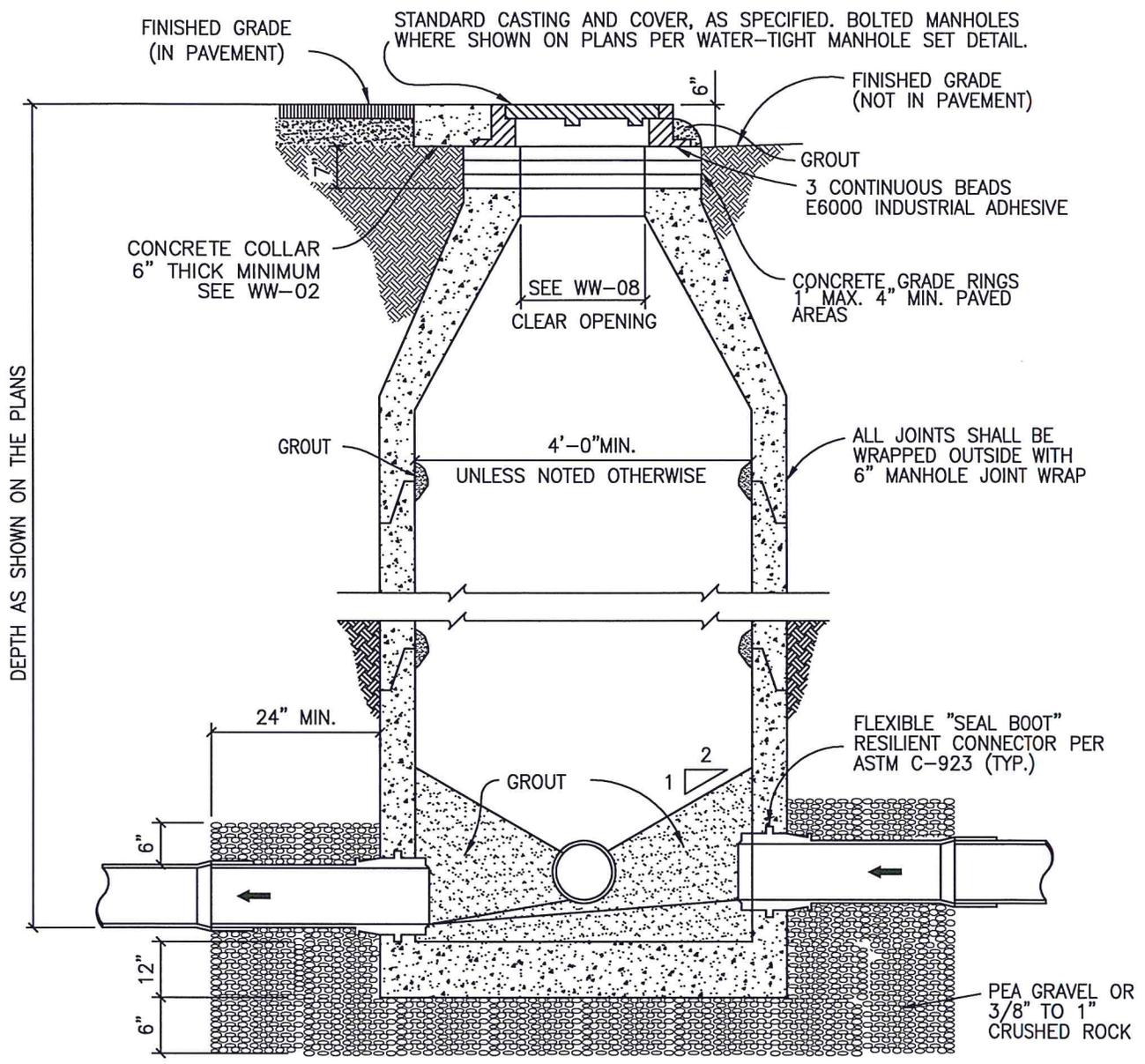
CITY OF KILLEEN
DEPARTMENT OF PUBLIC WORKS

STANDARD MANHOLE PLAN
INSIDE ROADWAY

CONSTRUCTION STANDARDS AND DETAILS



WW-02
SCALE: N.T.S.
ISSUE DATE: 08-01-13



REFER TO ADDITIONAL WASTEWATER NOTES ON WW-06.

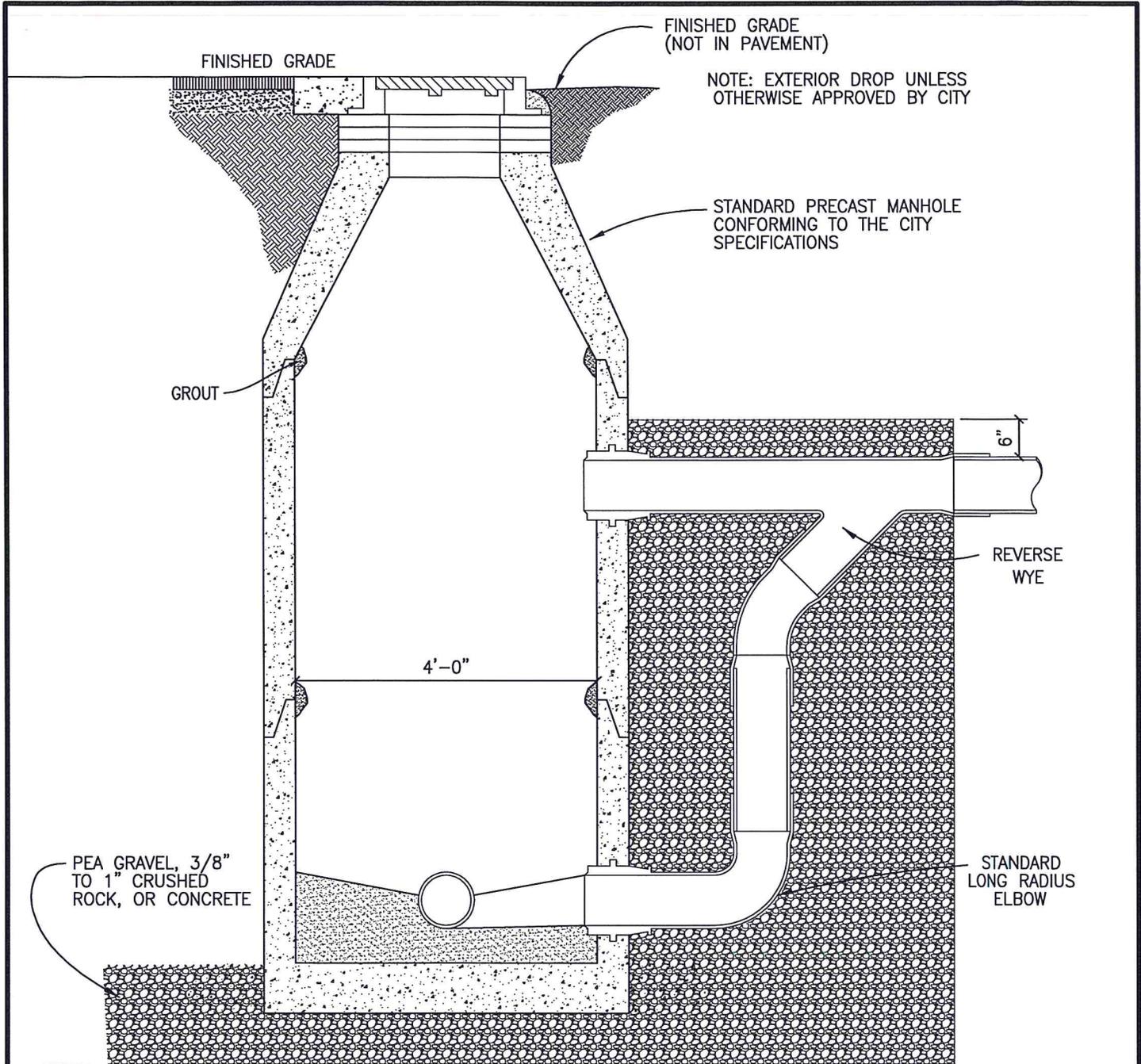
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 DEPARTMENT OF PUBLIC WORKS

STANDARD MANHOLE SECTION

CONSTRUCTION STANDARDS AND DETAILS



WW-03
 SCALE: N.T.S.
 ISSUE DATE: 08-01-13



NOTES:

1. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT SEWER IS LOCATED TWENTY FOUR INCHES (24") OR MORE ABOVE THE MAIN INVERT CHANNEL.
2. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
3. WHEN P.V.C. IS USED IN SANITARY SEWER LINES, SOLVENT TYPE JOINT P.V.C. FITTINGS MAY BE UTILIZED IN THE DROP ASSEMBLY ONLY.
4. SEE STANDARD MANHOLE DETAIL (DWG. # WW-03) FOR ADDITIONAL REQUIREMENTS.
5. INTERNAL DROP CONNECTION PERMITTED ONLY WITH WRITTEN APPROVAL FROM THE CITY.
6. REFER TO ADDITIONAL WASTEWATER NOTES ON WW-06.

CITY OF KILLEEN
DEPARTMENT OF PUBLIC WORKS

DROP CONNECTION
PRECAST MANHOLE

CONSTRUCTION STANDARDS AND DETAILS



WW-04

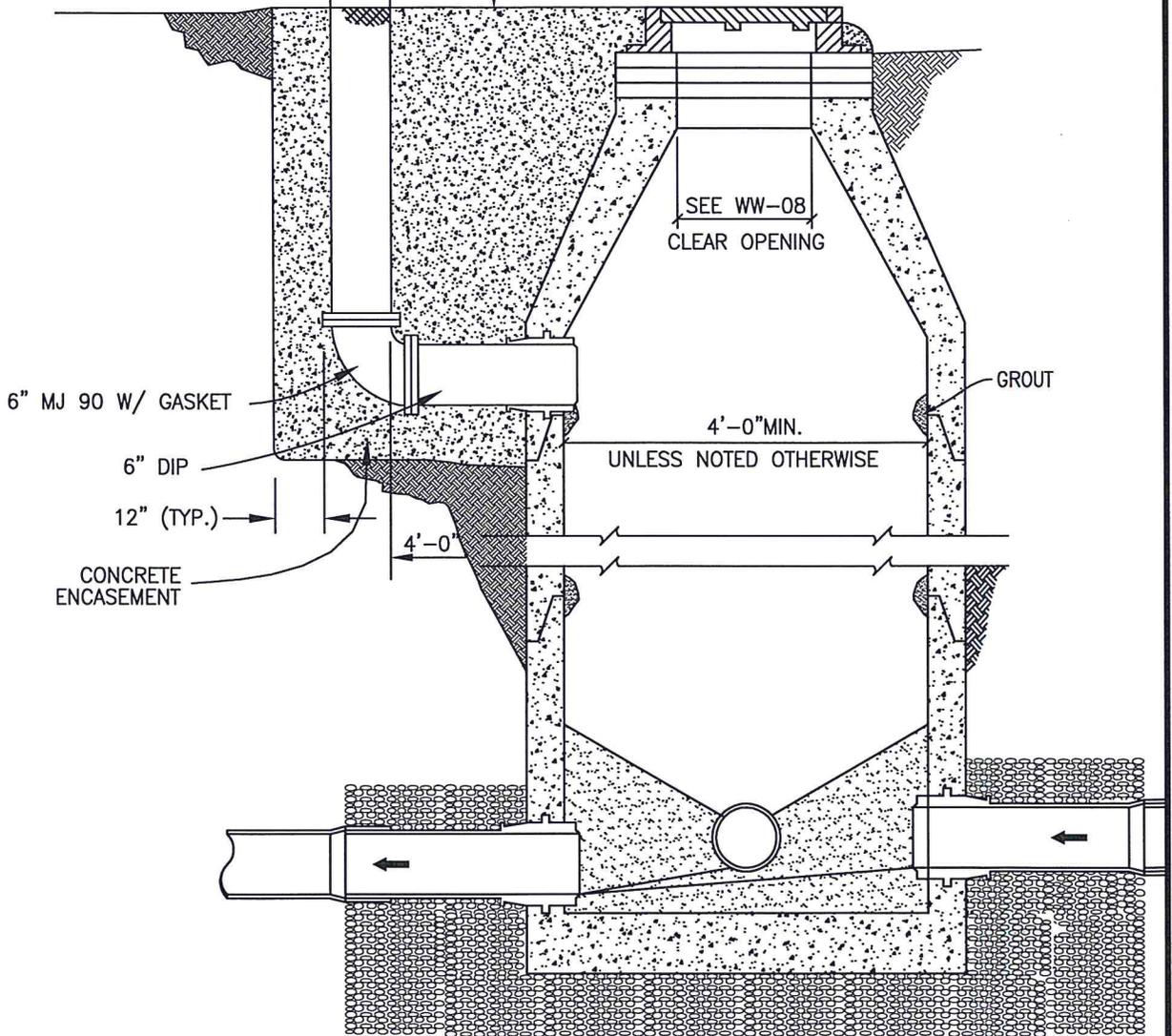
SCALE: N.T.S.

ISSUE DATE: 08-01-13

LONG RADIUS STANDARD WEIGHT 90° ELBOWS
 PAINTED 4 MIL EPOXY PAINT
 FLANGED IF REQUIRED FOR BACK WATER VALVE
 S.S. SCREEN TACKED IN
 6" DIP

NOTES:

1. SEE STANDARD MANHOLE DETAIL (WW-03) FOR ADDITIONAL REQUIREMENTS.
2. VENT OPENING TO BE MIN. 4' ABOVE FINISHED GRADE OR MIN. 1' ABOVE 100 YEAR FLOOD ELEVATION, WHICHEVER IS HIGHER.
3. REFER TO ADDITIONAL WASTEWATER NOTES ON WW-06.



CITY OF KILLEEN
 DEPARTMENT OF PUBLIC WORKS

MANHOLE
 VENT

CONSTRUCTION STANDARDS AND DETAILS



WW-05
 SCALE: N.T.S.
 ISSUE DATE: 08-01-13

NOTES:

1. MANHOLES SHALL BE PRECAST ASTM C-478 BELL WITH RUBBER GASKET JOINTS PER ASTM C443.
2. SEE PLANS AND MANHOLE SCHEDULE, FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZE AND TYPES.
3. SEE SPECIFICATIONS ON MATERIALS AND CONSTRUCTION.
4. A MIN. 100 MIL COAT OF RAVEN LINING SYSTEMS, RAVEN 405 ULTRA HIGH BUILD EPOXY COATING, SEWERCOAT, OR APPROVED EQUAL, TO BE APPLIED TO ENTIRE INTERIOR OF EACH WASTEWATER MANHOLE AND UNDERSIDE OF FLAT TOPS AS NOTED IN PLANS, TYPICALLY WHERE ACCEPTING INFLUENT FROM FORCE MAINS.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETED WHEN MANHOLES ARE LOCATED IN THE FLOODPLAIN. VENTING SHALL BE PROVIDED IN ACCORDANCE WITH TCEQ CHP. 217 REGULATIONS
6. MANHOLES TO BE VENTED ARE IDENTIFIED IN PLANS. REFERENCE MANHOLE VENT DETAIL.
7. MANHOLES ARE TO BE DESIGNED TO RESIST LATERAL AND VERTICAL SOIL FORCES RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR HS-20 TRAFFIC LOADS.
8. ALL MANHOLE JOINTS SHALL BE WRAPPED ON OUTSIDE WITH 12" MASTIC TAPE.
9. ALL MANHOLES SHALL BE VACUUM TESTED PER ASTM C1244. GROUTING SHALL OCCUR AFTER VACUUM TESTING.
10. ALL MANHOLE PENETRATIONS SHALL BE CAST OR CORED AND A SEAL BOOT INSTALLED.
11. MINIMUM MANHOLE DIAMETERS SHALL BE AS FOLLOWS:

| <u>PIPE DIAMETER</u> | <u>MANHOLE DIA.</u> |
|----------------------|---------------------|
| ≤18" | 4'-0" |
| 21" TO 36" | 5'-0" |
| ≥42" | 6'-0" |

CITY OF KILLEEN
DEPARTMENT OF PUBLIC WORKS

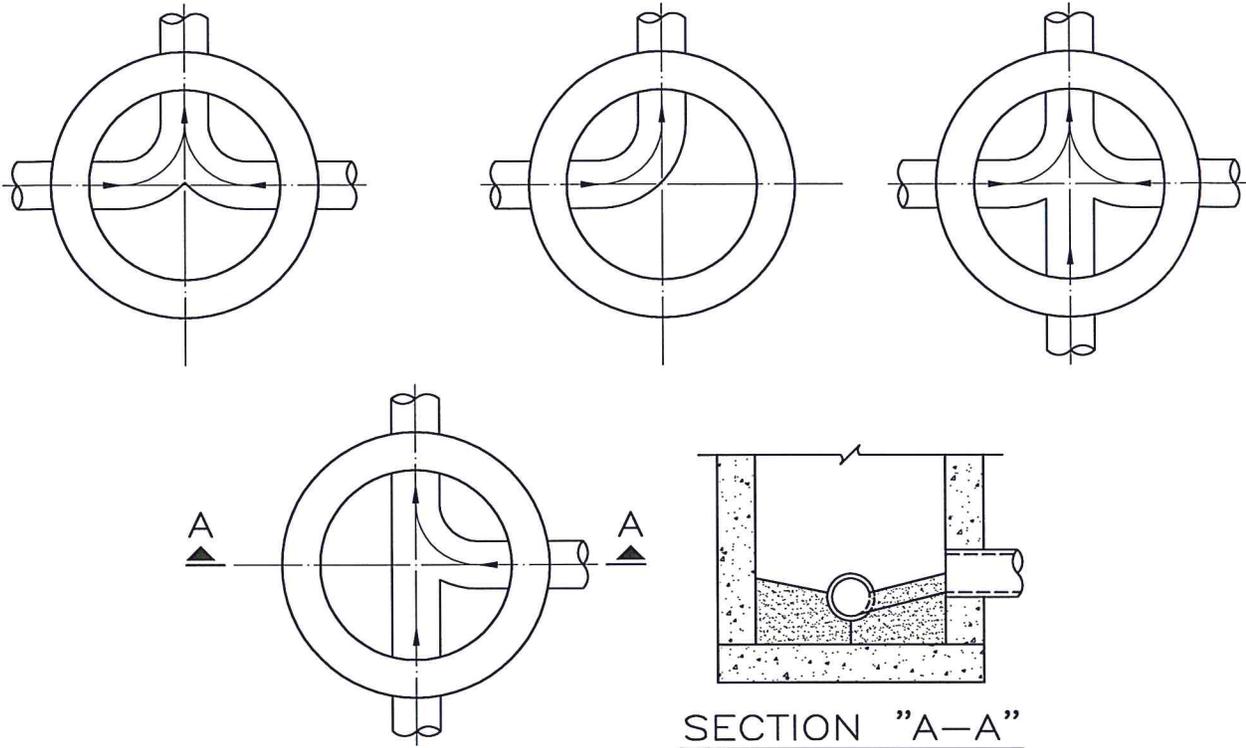
**MANHOLE
NOTES**

CONSTRUCTION STANDARDS AND DETAILS



WW-06
SCALE: N.T.S.
ISSUE DATE: 08-01-13

FLOW PATTERNS FOR INVERT CHANNELS



NOTES:

1. INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
2. HYDRAULIC SLIDES SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING FOR SMOOTH FLOW.
3. CHANNELS FOR FUTURE CONSTRUCTION (STUBS) SHALL BE CONSTRUCTED, FILLED WITH SAND, AND COVERED WITH 1" OF MORTAR.
4. SLOPE MANHOLE BENCH WITH A 1:2 SLOPE FROM MANHOLE WALL TO CHANNEL.
5. INVERT DEPTHS SHALL BE AS FOLLOWS:

PIPE DIAMETER

< 15"
 15" TO 24"
 > 24"

INVERT DEPTH (BENCH)

1/2 LARGEST PIPE DIA.
 3/4 LARGEST PIPE DIA.
 EQUAL TO LARGEST PIPE DIA.

CITY OF KILLEEN
 DEPARTMENT OF PUBLIC WORKS

**FLOW PATTERNS
 FOR INVERT CHANNELS**

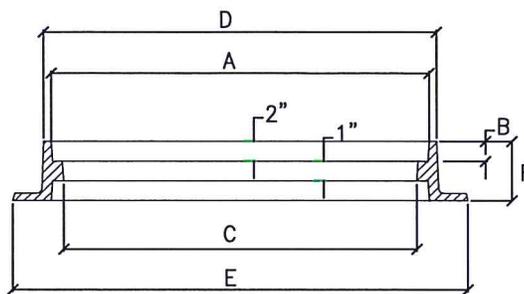
CONSTRUCTION STANDARDS AND DETAILS



WW-07
 SCALE: N.T.S.
 ISSUE DATE: 08-01-13

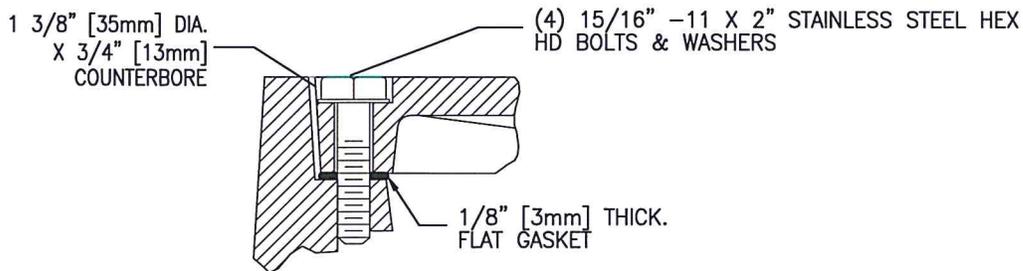


NOTE:
 LID SHALL HAVE TWO (2)
 TYPE 4 PICK BARS AND
 THE CITY LOGO AND LABELED
 "SANITARY SEWER". NO PICK
 HOLES IN CASTING.



- 1432 - LID
- 1480 - RING
- 2432 - WATERTIGHT

THE WATER-TIGHT MANHOLE SETS FEATURE 4 STAINLESS STEEL BOLTS IN COUNTERSUNK POCKETS AND A SEALING FLAT GASKET IN THE RING SET. BOLTING PADS REDUCE THE STANDARD CLEAR OPENING BY TWO TO THREE INCHES.



WATER-TIGHT DETAIL

| DIMENSIONS | | | | | | TOTAL |
|------------|-------|----|--------|--------|-------|---------|
| A | B | C | D | E | F | WEIGHT |
| 32 3/16 | 1 1/2 | 30 | 33 1/4 | 40 3/4 | 4 1/2 | 345 LBS |

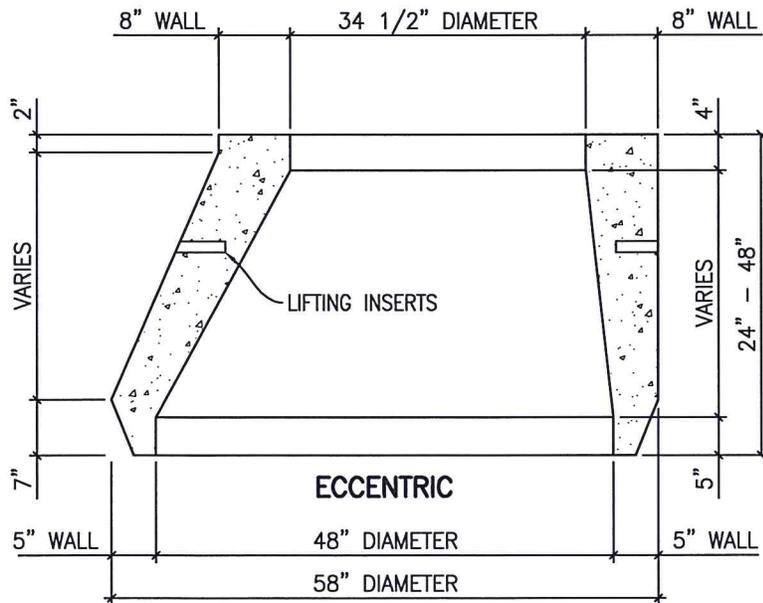
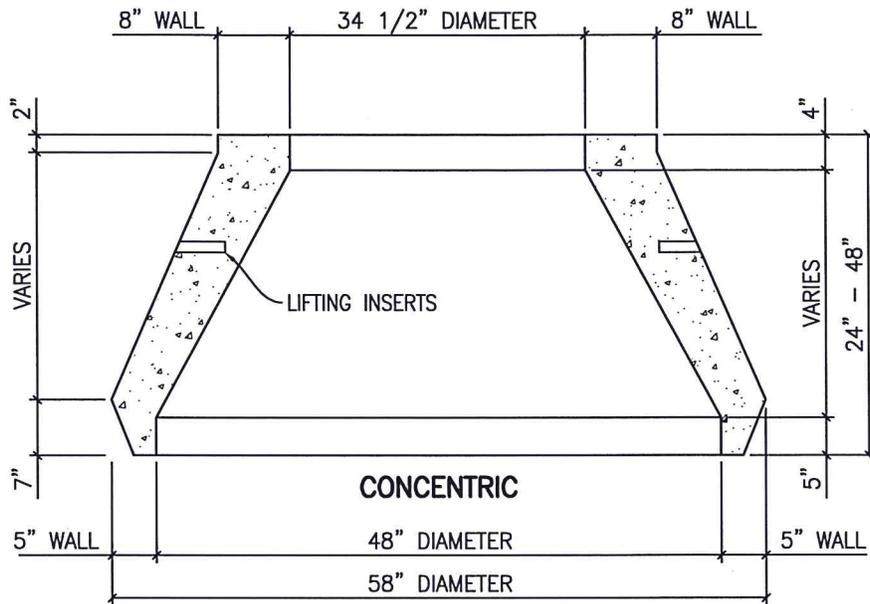
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**STANDARD WASTEWATER
 MANHOLE SET**

CONSTRUCTION STANDARDS AND DETAILS



WW-08
 SCALE: N.T.S.
 ISSUE DATE: 08-01-13



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DEPARTMENT OF PUBLIC WORKS

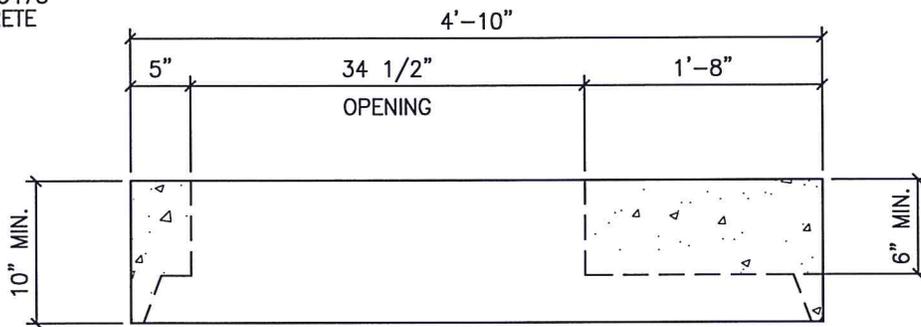
CONCRETE
CONE SECTIONS

CONSTRUCTION STANDARDS AND DETAILS



WW-09
SCALE: N.T.S.
ISSUE DATE: 08-01-13

M.F.G. PER ASTM-C478
5000 P.S.I. CONCRETE
TRAFFIC BEARING
JOINT PER C443



NOTES:

1. AVAILABLE WITH CAST IRON RING AND COVER CAST IN PLACE.
2. PERMITTED ONLY WITH WRITTEN APPROVAL FROM THE CITY.
3. REINFORCEMENT SHALL MEET DESIGN REQUIREMENTS FOR AASHTO HS-20 LOADING.

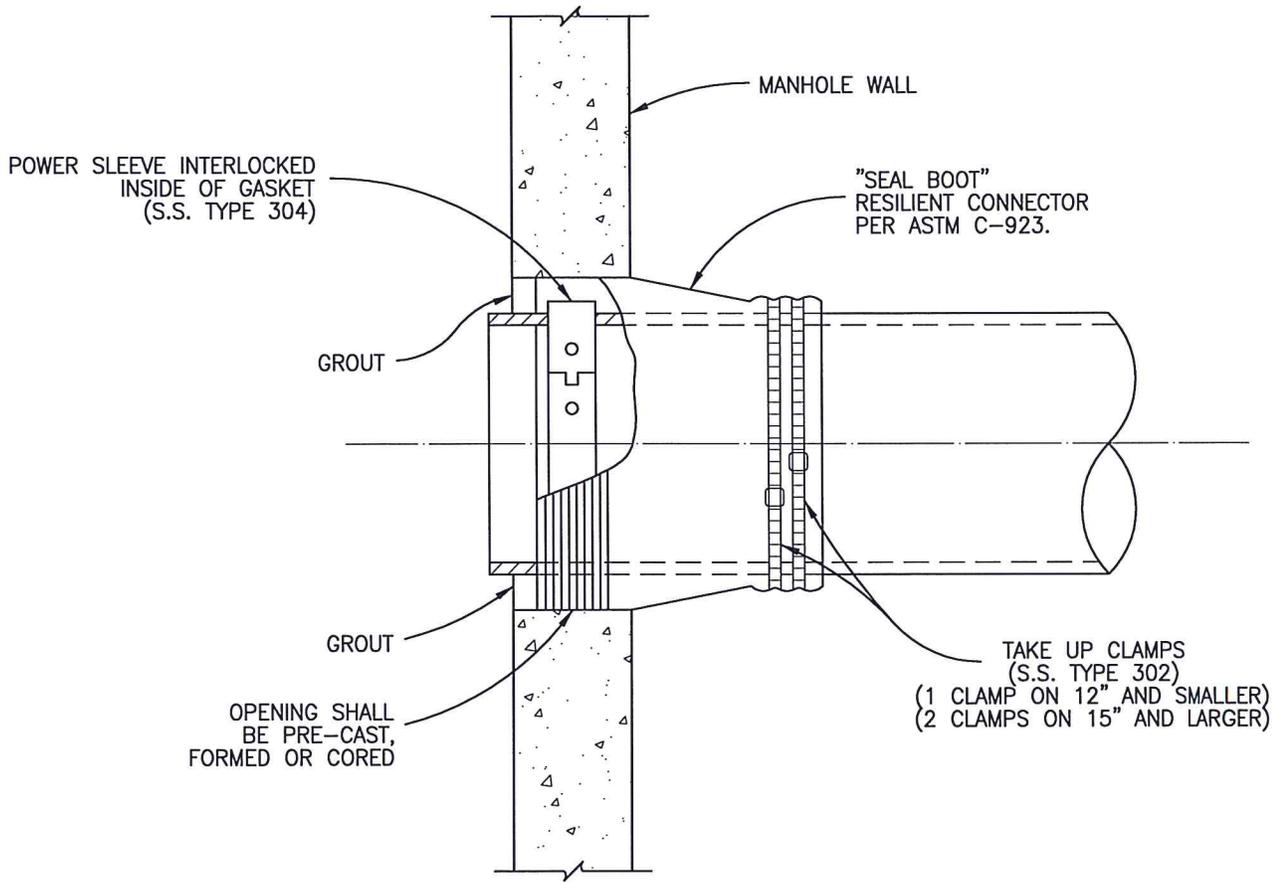
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DEPARTMENT OF PUBLIC WORKS

**48" MANHOLE FLAT
LID SECTION**

CONSTRUCTION STANDARDS AND DETAILS



WW-10
SCALE: N.T.S.
ISSUE DATE: 08-01-13



NOTE:

1. INSERT-A-TEE MAY BE USED IN LIEU OF SEAL BOOT FOR FIBERGLASS MANHOLES.

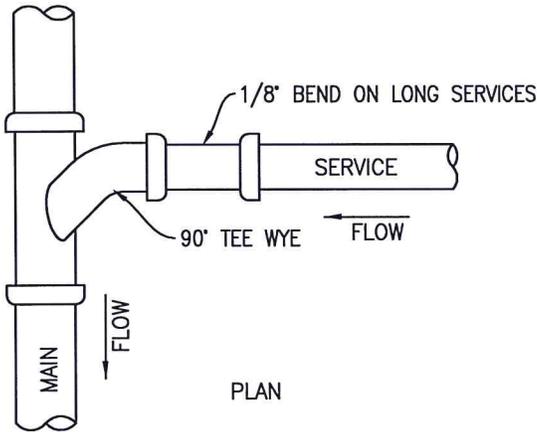
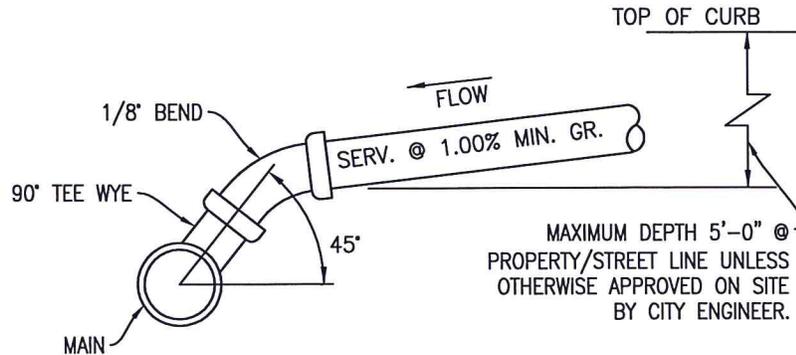
CITY OF KILLEEN
DEPARTMENT OF PUBLIC WORKS

FLEXIBLE "SEAL BOOT"
CONNECTOR

CONSTRUCTION STANDARDS AND DETAILS



WW-11
SCALE: N.T.S.
ISSUE DATE: 08-01-13



NOTES:

1. SERVICE LINE TO BE 4" SDR-26 P.V.C. (A.S.T.M. 2665) WITH GASKETED COUPLINGS WHERE NEEDED UNLESS OTHERWISE NOTED.
2. SERVICE LINES SHALL BE WITHIN 10 FEET OF PROPERTY CORNER, TERMINATING AT PROPERTY LINES.
3. TEE WYE SHALL BE ORIENTED AT 45° TO MAIN.
4. SERVICE CONNECTIONS SHALL BE PLUGGED WATERTIGHT UNTIL PLACED IN SERVICE.
5. SERVICE CONNECTION LOCATIONS SHALL BE STAMPED WITH AN "S" IN CURB.
6. IF SEWER SERVICE IS IN VERTICAL CONFLICT WITH WATER MAIN, WATER MAIN MAY BE RAISED ACCORDINGLY, WITH NO LESS THAN 30" MINIMUM COVER.

CITY OF KILLEEN
DEPARTMENT OF PUBLIC WORKS

**SEWER SERVICE
CONNECTION**

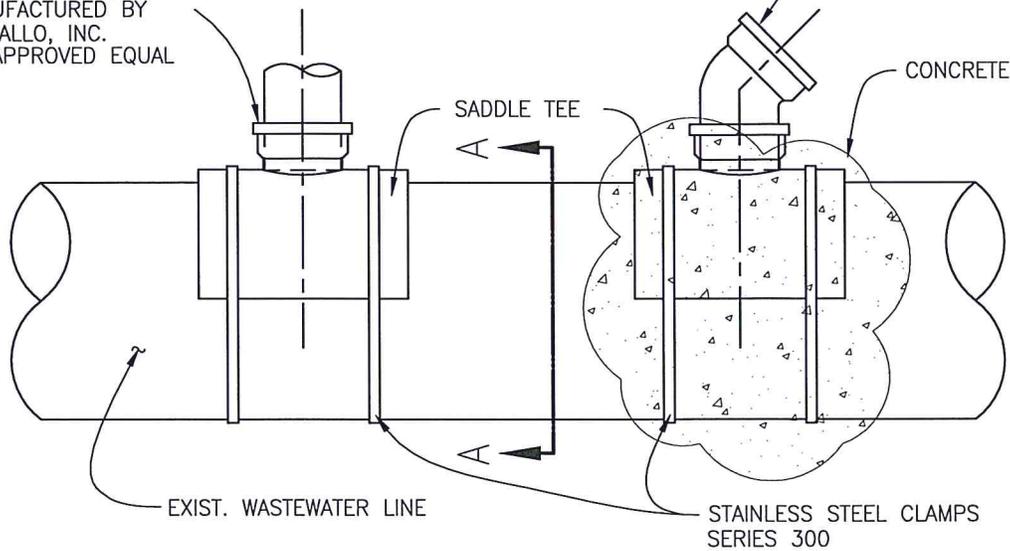
CONSTRUCTION STANDARDS AND DETAILS



WW-13
SCALE: N.T.S.
ISSUE DATE: 08-01-13

GASKETED SEWER FITTING
NO. 52635 (6") AS
MANUFACTURED BY
VASSALLO, INC.
OR APPROVED EQUAL

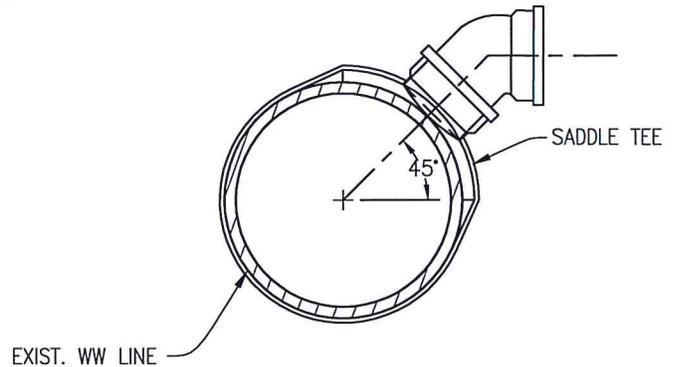
1/8 BEND-SPIGOT



PLAN VIEW

| SADDLE TEE | | | | |
|------------|-------|-------|-------|-------|
| PART NO. | SIZE | L1 | H | P |
| 52635 | 8"X6" | 5.625 | 5.659 | 1.448 |

| PLASTIC TRENDS INC. - 1/8 BEND - SPIGOT | | | | | |
|-----------------------------------------|------|--------|-------|-------|-------|
| PART NO. | SIZE | A | B | C | D |
| G 406 | 6 | 11.270 | 6.146 | 1.870 | 6.090 |



SECTION A-A

- NOTES:
1. FLEXIBLE SADDLE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
 2. SADDLE TEE SHALL BE ORIENTATED 45° TO MAIN.
 3. EXCAVATE AROUND EXISTING 8-INCH PIPE, EXPOSING SUFFICIENT ROOM FOR S.S. CLAMPS.
 4. THOROUGHLY CLEAN AND DRY THE MATING SURFACE WITH RAG OR PAPER TOWEL MAKE SURE THEY ARE FREE OF DUST AND MOISTURE.
 5. MARK THE SIZE OF THE HOLE TO BE CUT USING THE GASKET SKIRT OR THE SADDLE ITSELF AS THE TEMPLATE.
 6. SAW OUT THE SECTION OF THE PIPE WHERE THE SADDLE WILL BE LOCATED, WITH A SABER OR KEY HOLE SAW.
 7. TEST TO MAKE SURE SADDLE FITS HOLE PROPERLY.
 8. SERVICE PIPE SHALL NOT EXTEND MORE THAN ONE-HALF INCH INTO THE MAIN.
 9. PLACE GASKET SKIRT AND SADDLE OVER OPENING AND TIGHTEN BAND CLAMPS EVENLY UNTIL SADDLE IS FIRMLY ATTACHED TO THE PIPE. APPLY PRESSURE ON THE SADDLE AGAINST THE PIPE WHILE TIGHTENING THE CLAMPS AS INDICATED ABOVE. DO NOT OVER TIGHTEN, DO NOT STRIP THREAD.
 10. REPLACE THE BEDDING AND BACKFILL IN ACCORDANCE WITH THE TRENCH EMBEDMENT DETAIL.
 11. CONCRETE SHALL BE PLACED AROUND SADDLE.

CITY OF KILLEEN
DEPARTMENT OF PUBLIC WORKS

**GASKETED SEWER FITTING FOR SEWER
SERVICE CONNECTIONS TO EXISTING MAINS**
CONSTRUCTION STANDARDS AND DETAILS



WW-14
SCALE: N.T.S.
ISSUE DATE: 08-01-13

