

NOTES:

1. CONTRACTOR TO ADJUST FIRE HYDRANT TO FINISHED GRADE.
2. HYDRANT CONNECTORS OR D.I.P. SPOOLS WITH MEGALUG JOINT RESTRAINTS OR APPROVED EQUAL ON ALL JOINTS OF FIRE HYDRANT ASSEMBLY
3. TAPPING SLEEVE SHALL MEET CITY OF CALLAWAY STANDARDS AND FURNISHED WITH FACTORY APPLIED 18 MIL. EPOXY COATING.

FIRE HYDRANT INSTALLATION

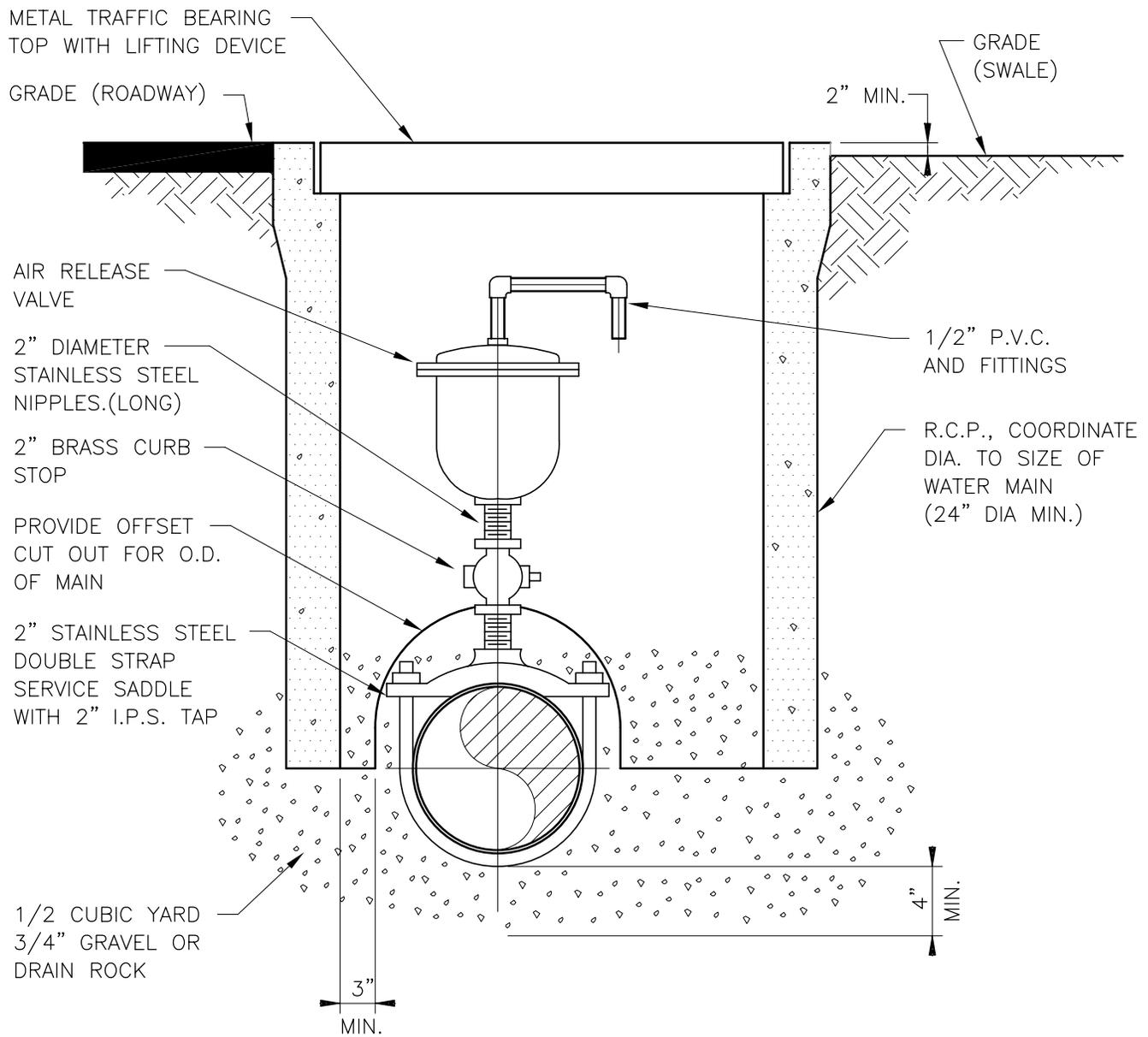
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Figure 1-1
City of Callaway
Fire Hydrant Installation

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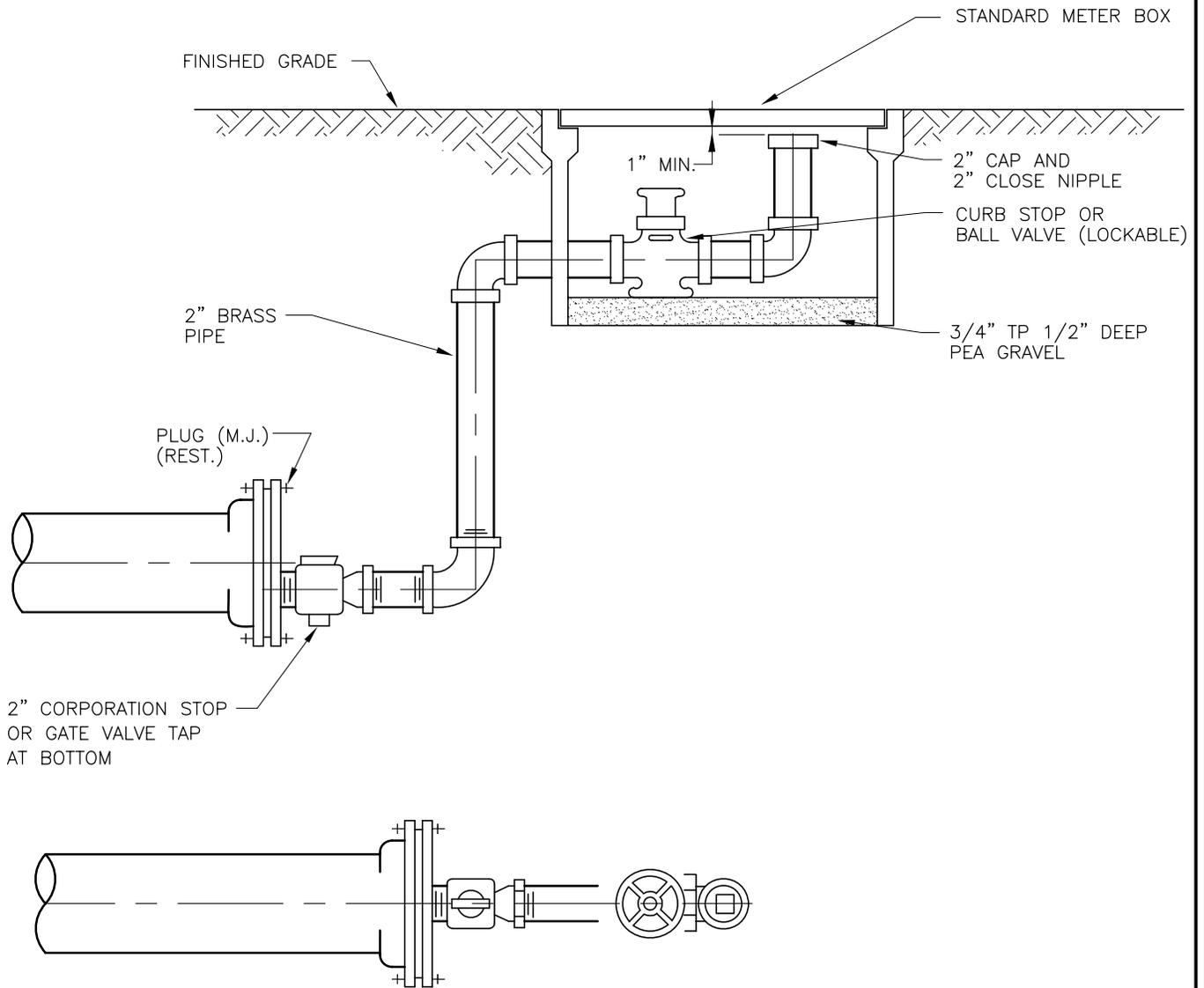
NOTE:
 INSTALL IN LOCATIONS AS DIRECTED BY THE
 ENGINEER IN FIELD.

AIR RELEASE VALVE
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Figure 1-2
 City of Callaway
 Air Release Valve

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NOTE:

1. COAT ALL EXPOSED THREADS WITH COAL TAR ENAMEL BEFORE BACKFILL.

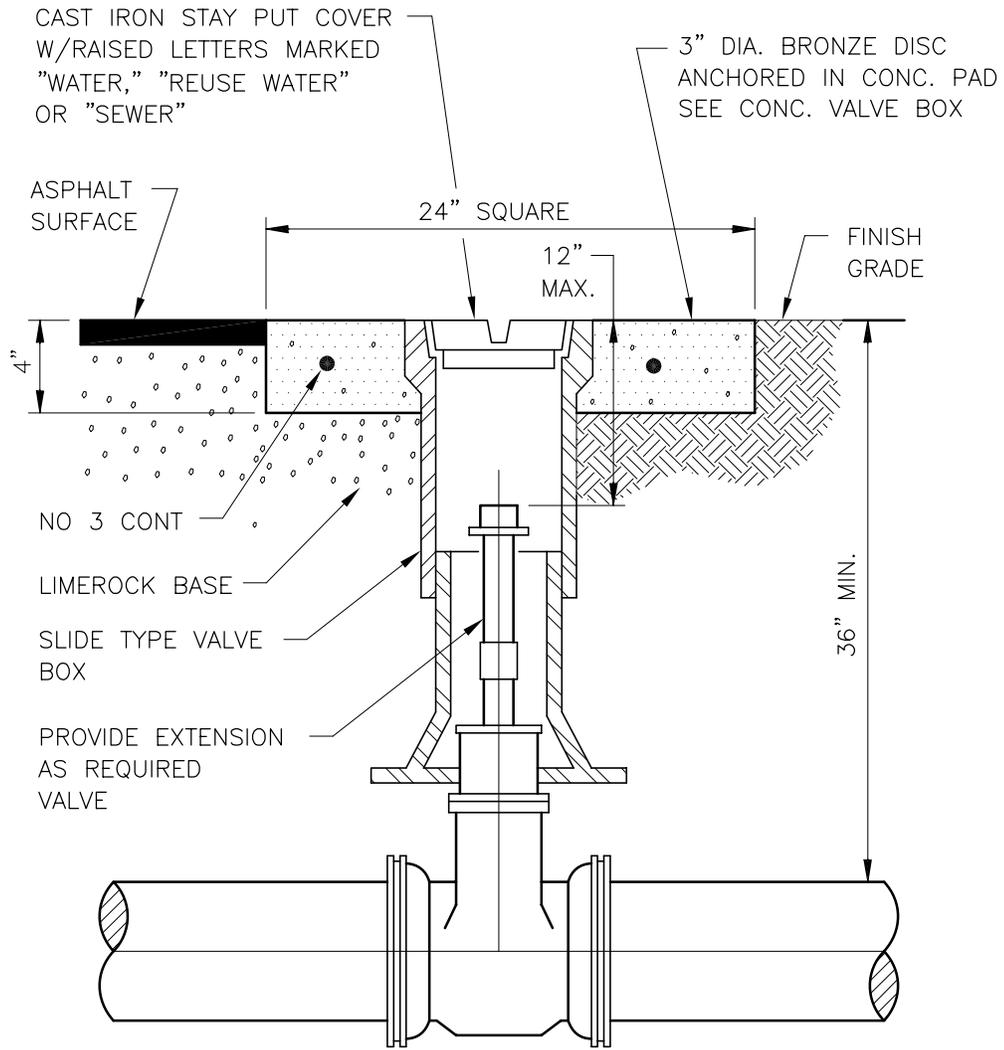
2" BLOW-OFF

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Figure 1-3
City of Callaway
2" Blow-off

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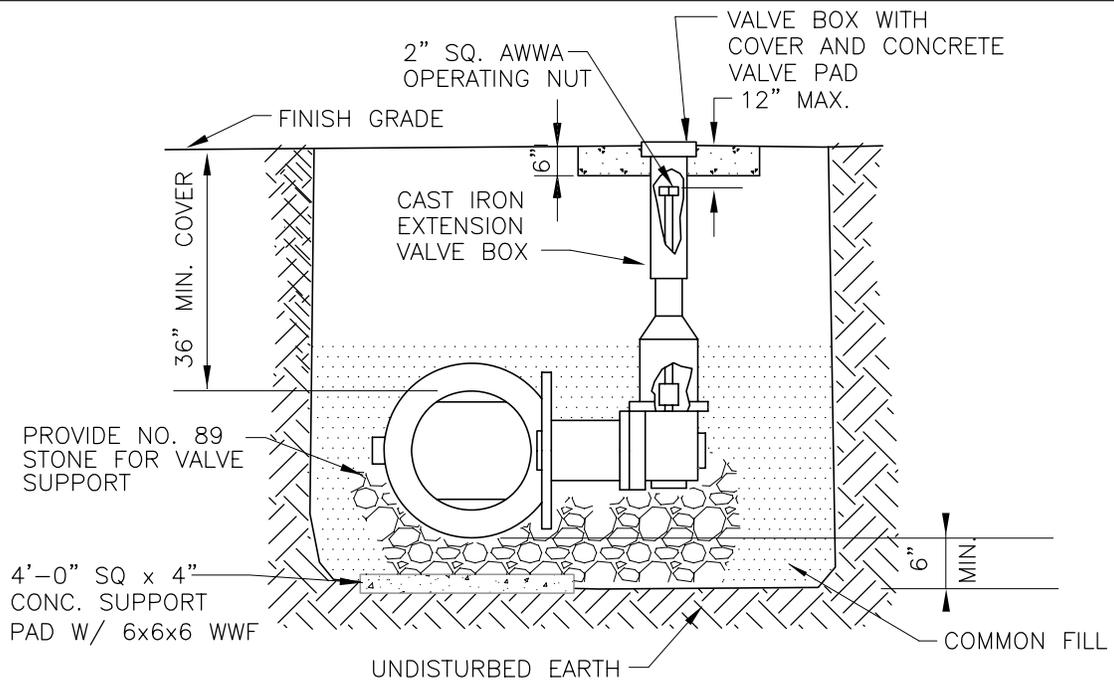


VERTICAL GATE VALVE AND BOX

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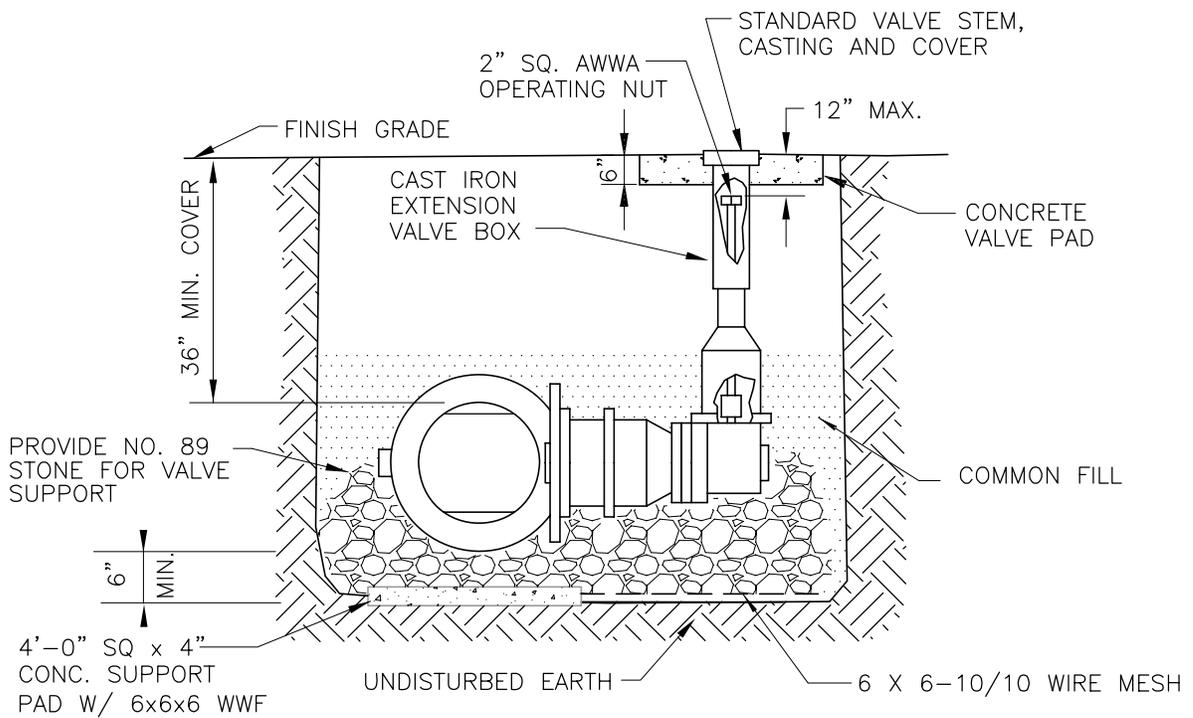


Figure 1-4
City Of Callaway
Vertical Gate Valve and Box



HORIZONTAL BUTTERFLY VALVE INSTALLATION

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HORIZONTAL GATE VALVE INSTALLATION

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NOTE:

ALL VALVE INSTALLATION OF 16" AND LARGER SHALL BE INSTALLED HORIZONTAL

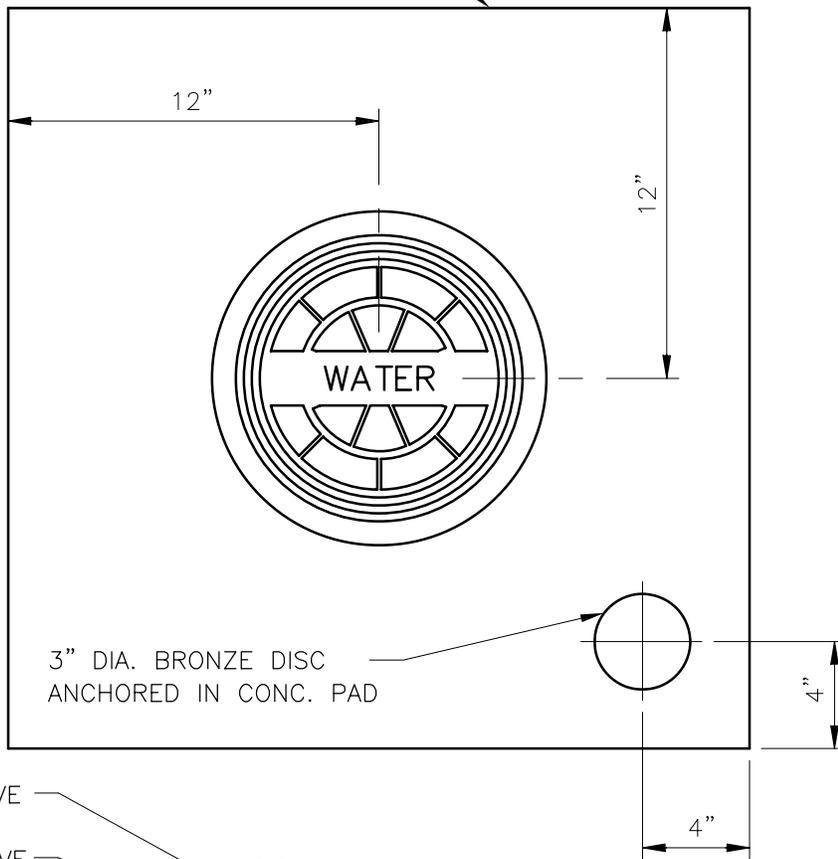
VALVE INSTALLATION SMALLER THAN 16" SHALL BE INSTALLED VERTICAL UNLESS APPROVED BY THE CITY

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Figure 1-5
City Of Callaway
Horizontal Butterfly Valve & Gate Valve Installation

24" x 24" x 4" THICK CONCRETE PAD
AT EACH VALVE BOX WITH 1-NO.3
CONT.

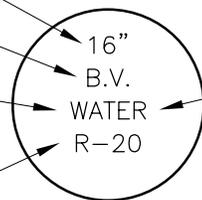


SIZE OF VALVE

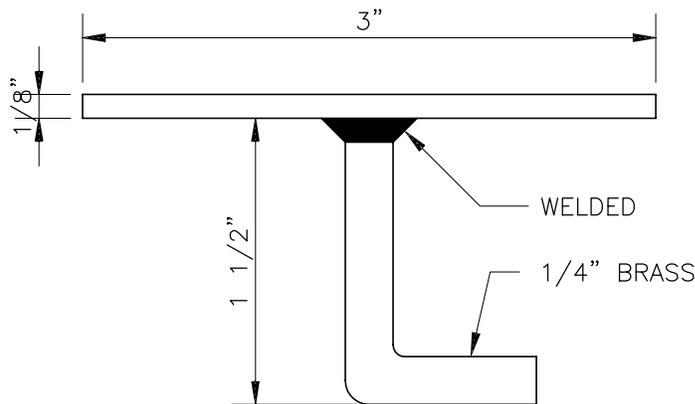
TYPE OF VALVE

SERVICE

DIRECTION & NUMBER
OF TURNS TO OPEN



1/8" RAISED LETTERS
TO BE CAST WITH 3" DIA.
BRONZE DISC AS MFG.
BY SHEIDOW BRONZE CO.



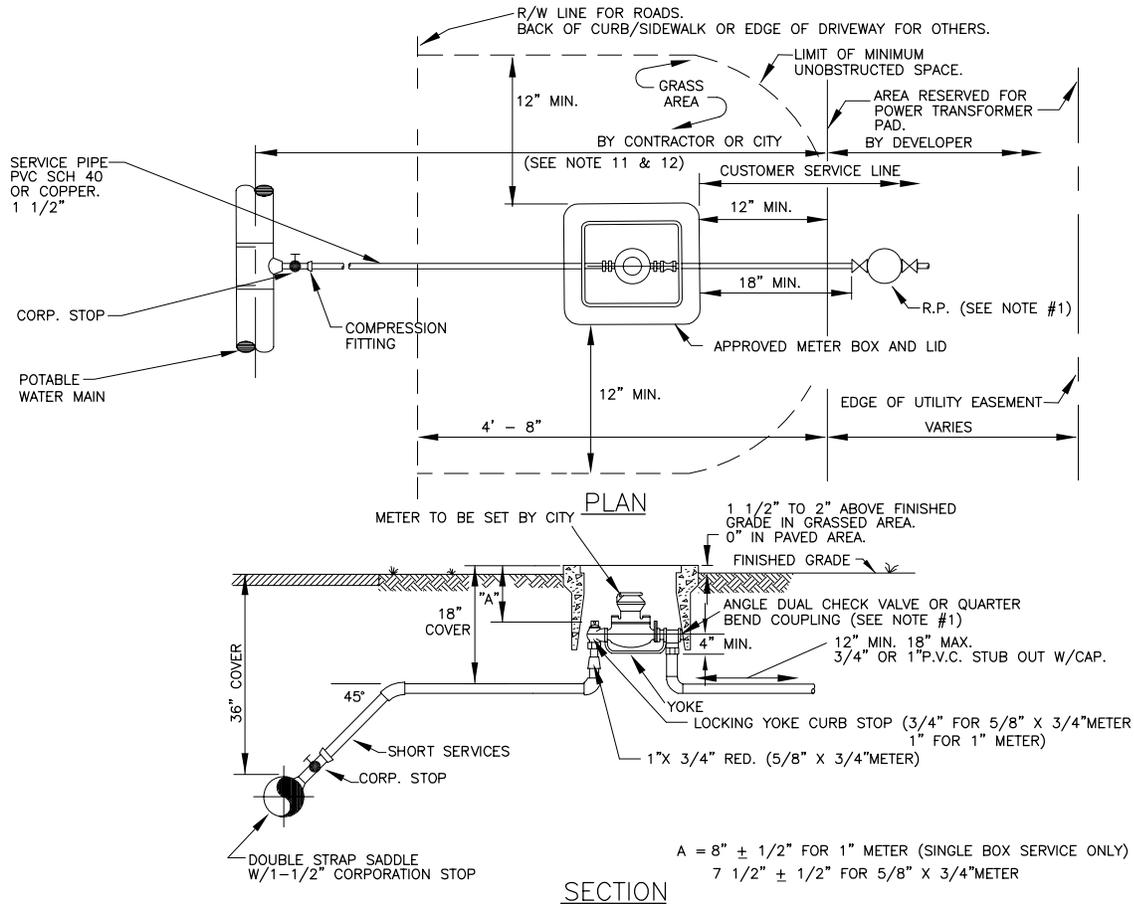
CONCRETE VALVE PAD / IDENT. DISC.

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Figure 1-6
City Of Callaway
Concrete Valve Pad / Ident. Disc.



NOTES:

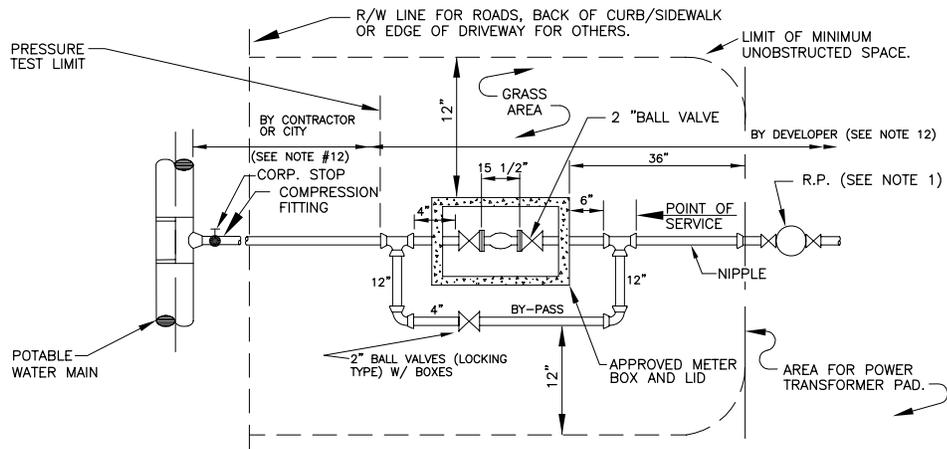
1. BACKFLOW PREVENTERS SHALL BE REQUIRED AS DETAILED IN CITY ORDINANCE 452.
2. 12" MINIMUM CLEARANCE TO BE MAINTAINED BETWEEN METER BOX AND ANY OBSTRUCTION.
3. USE 90° BENDS FOR LONG SERVICES (ROAD CROSSINGS ETC.) AND 45° BENDS FOR SHORT SERVICES.
4. FOR INSTALLATION OF SERVICES UNDER DRIVEWAYS AND ROADWAYS USE MIN. 2" PVC SCH 40 CASING. CASING SHALL EXTEND MIN. 24" BEYOND EDGE OF PAVEMENT. END OF CASING TO BE SEALED WITH CEMENT.
5. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" APART AND SHALL NOT BE ON A COMMON LINE PARALLEL TO THE LONGITUDINAL AXIS OF THE PIPE.
6. METER SHALL NOT BE PLACED IN SIDEWALK OR DRIVEWAY AREAS. SERVICE LINES AND TAPS SHALL NOT BE PLACED UNDER DRIVEWAYS WHENEVER POSSIBLE..
7. COPPER SHALL BE "TYPE K" CONTINUOUS AND SUITABLE FOR UNDERGROUND SERVICE WITH FLARED CONNECTIONS. HDPE SHALL CONFORM TO AWWA 901 AND ASTM 02737.
8. MAXIMUM SERVICE LENGTH IS 100' TO METER.
9. BEDDING (MIN. 4") AND COVER (MIN. 4") OVER SERVICE LINE OR CASING SHALL CONSIST OF FINE GRANULAR MATERIAL. UNSUITABLE IN-SITU MATERIALS SUCH AS MUCK, DEBRIS AND LARGER ROCKS SHALL BE REMOVED WITH 2" MAXIMUM SIZE.
10. METER/SERVICE WILL NOT BE INSTALLED/ACTIVATED UNTIL:
 - A. - FORM BOARDS FOR DRIVEWAY AND/OR SIDEWALK ARE IN PLACE OR
 - DRIVEWAY OR SIDEWALK IS IN PLACE
 - B. "MINIMUM UNOBSTRUCTED SPACE" (AS SHOWN) IS PROVIDED.
 - C. - THE REQUIRED BACKFLOW PREVENTION ASSEMBLY/DEVICE IS INSTALLED AND HAS PASSED THE INITIAL TEST.
11. METER TO BE SET BY THE CITY.
12. THE DEVELOPER/PROPERTY OWNER OR ASSIGNEE SHALL BE RESPONSIBLE FOR INSTALLATION OF SERVICES BEYOND PRESSURE TEST LIMITS AS SPECIFIED BY THE CITY.
13. THREADED AREAS OF CORPORATION STOP AND OTHER FITTINGS SHALL BE SPIRAL WRAPPED WITH TWO (2) WRAPS OF TEFLON TAPE.
14. METER BOXES FOR NON-RESIDENTIAL SERVICES AND METER BOXES IN NON-GRASS AREAS SHALL HAVE DUCTILE IRON LIDS.
15. A 12" THICK COMPACTED 3/4" ROCK BASE IS REQUIRED FOR METER BOXES OUTSIDE OF GRASS AREA. THE BASE SHALL EXTEND MIN. 12" BEYOND THE METER BOX PERIMETER.

**POTABLE WATER SERVICE SINGLE 5/8" X 3/4" &
1" METER INSTALLATION DETAIL**

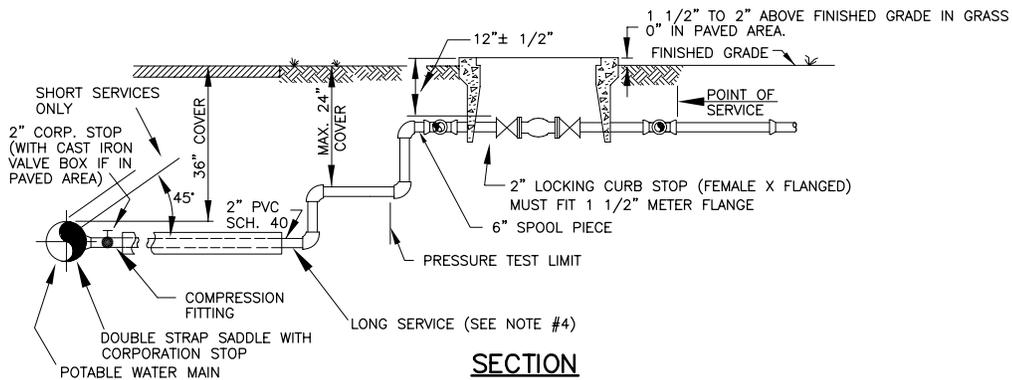
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Figure 1-7
City Of Callaway
Potable Water Service Single 5/8" x 3/4"
& 1" Meter Installation Detail



PLAN



SECTION

NOTES:

1. BACKFLOW PREVENTERS SHALL BE REQUIRED AS DETAILED IN CITY ORDINANCE 452
2. 12" MINIMUM CLEARANCE TO BE MAINTAINED BETWEEN METER BOX/BYPASS AND ANY OBSTRUCTION.
3. USE 90° BENDS FOR LONG SERVICES (ROAD CROSSINGS ETC.) AND 45° BENDS FOR SHORT SERVICES.
4. FOR INSTALLATION OF SERVICES UNDER DRIVEWAYS AND ROADWAYS USE MIN. 4" DIAMETER PVC SCH 40 CASING. CASING SHALL EXTEND MIN. 24" BEYOND EDGE OF PAVEMENT. CASING TO BE SEALED WITH CEMENT.
5. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" APART. TAPS SPACED BETWEEN 18" TO 48" SHALL BE OFFSET TO EACH SIDE OF THE MAIN.
6. METER SHALL NOT BE PLACED IN SIDEWALK OR DRIVEWAY AREAS. SERVICE LINES AND TAPS SHALL NOT BE PLACED UNDER DRIVEWAYS WHENEVER POSSIBLE.
7. MAXIMUM SERVICE LENGTH IS 100' TO METER.
8. BEDDING (MIN. 4") AND COVER (MIN. 4") OVER SERVICE LINE OR CASING SHALL CONSIST OF FINE GRANULAR MATERIAL. UNSUITABLE IN-SITU MATERIALS SUCH AS MUCK, DEBRIS AND LARGER ROCKS SHALL BE REMOVED WITH 2" MAXIMUM SIZE.
9. METER/SERVICE WILL NOT BE INSTALLED/ACTIVATED UNTIL:
 - A. - FORM BOARDS FOR DRIVEWAY AND/OR SIDEWALK ARE IN PLACE OR - DRIVEWAY OR SIDEWALK IS IN PLACE
 - B. "MINIMUM UNOBSTRUCTED SPACE" (AS SHOWN) IS PROVIDED.
 - C. REQUIRED BACKFLOW PREVENTION ASSEMBLY IS INSTALLED AND HAS PASSED THE INITIAL TEST.
10. SERVICE COMPONENTS SHALL BE CONSTRUCTED FOR THE METER TO BE INSTALLED "TRUE" AND "PLUMB" AND TO ALLOW METER READING THROUGH THE METER READER LID.
11. BYPASS PIPING SHALL BE INSTALLED ON THE RIGHT SIDE OF METER IN DIRECTION OF FLOW UNLESS OTHERWISE APPROVED BY THE CITY.
12. METER TO BE INSTALLED BY THE DEPARTMENT. THE PIPING BEYOND THE CONTROL VALVE SHALL BE INSTALLED BY THE DEVELOPER OR THE CITY, DEPENDING ON THE TYPE OF SERVICE INSTALLATION REQUESTED.
13. ALL HARDWARE FOR FLANGED CONNECTIONS (BOLTS ETC.) TO BE STAINLESS STEEL.
14. THREADED AREAS OF CORPORATION STOP AND OTHER FITTINGS SHALL BE SPIRAL WRAPPED WITH TWO (2) WRAPS OF TEFLON TAPE.

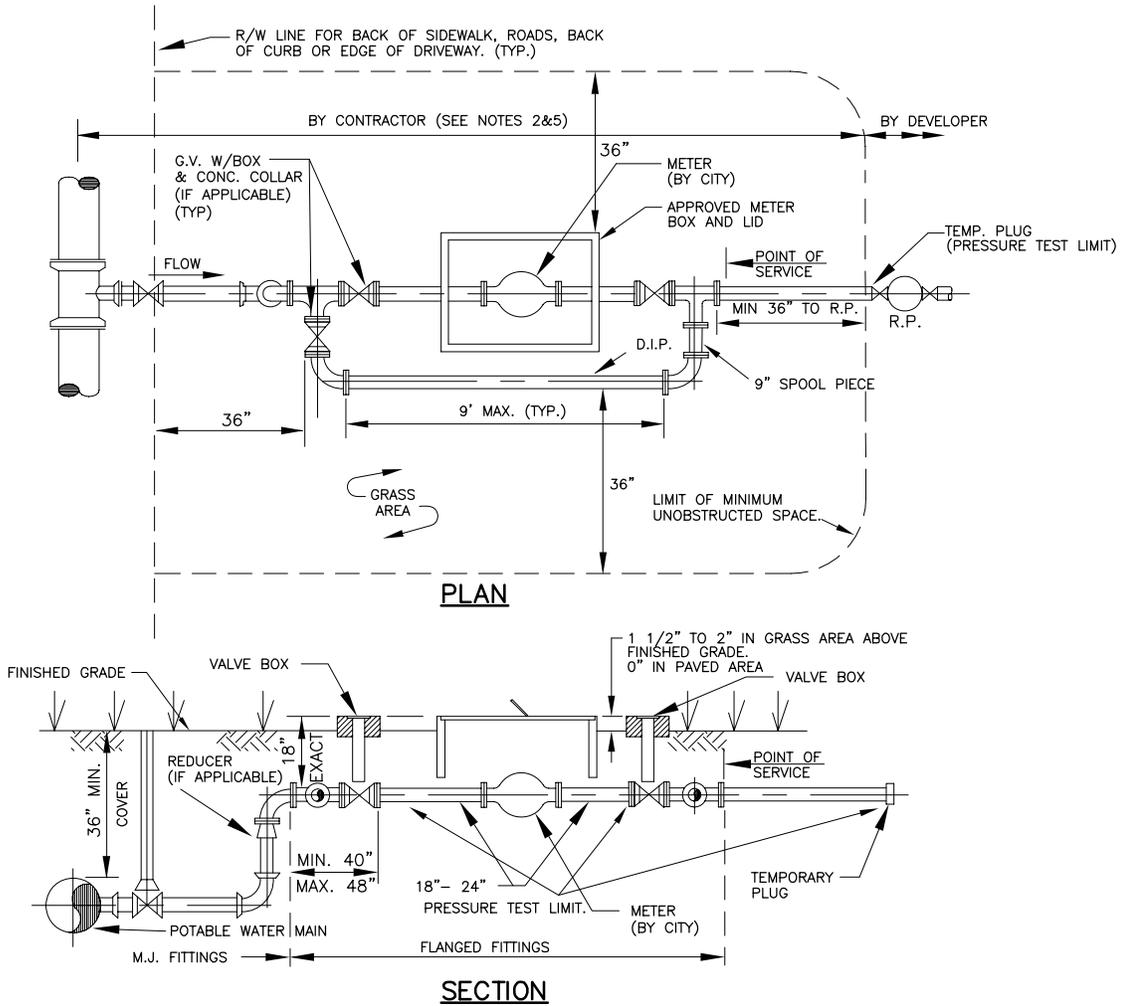
POTABLE WATER SERVICE 2" METER INSTALLATION DETAIL

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Figure 1-8
City Of Callaway
Potable Water Service 2"
Meter Installation Detail

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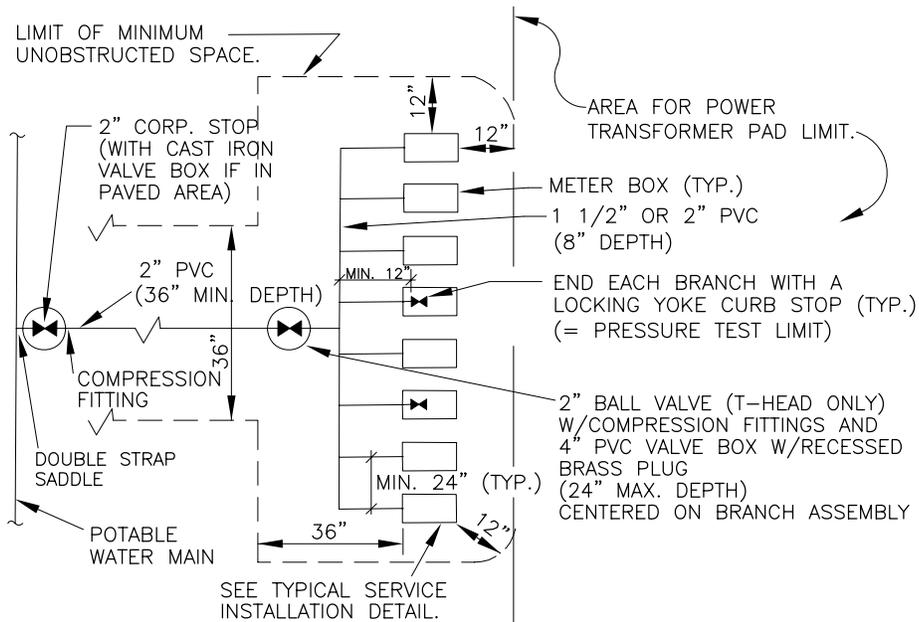
1. ALL SERVICE PIPING SHALL BE DUCTILE IRON WITH GATE VALVES AND LOCKING TYPE VALVE BOXES THE SAME SIZE AS THE METER TO BE INSTALLED.
2. ONLY APPROVED METER BOXES SHALL BE USED. THE BOX SHALL BE PROVIDED BY CUSTOMER AND PLACED ABOVE GROUND NEAR THE METER LOCATION. PROPERTY OWNER SHALL EXCAVATE THE METER BOX AREA, EXPOSE THE BYPASS PIPING, THEN INSTALL THE BOX, AND BACKFILL THE AREA AFTER METER INSTALLATION.
3. ALL FITTINGS FLANGED WITH UNIFLANGE OR EQUAL.
4. BACKFLOW PREVENTERS SHALL BE REQUIRED AS DETAILED IN CITY ORDINANCE 452.
5. WATER METER SHALL BE INSTALLED BY THE CITY.
6. CONTRACTOR SHALL CONSTRUCT SERVICE SO THE METER CAN BE INSTALLED "TRUE" AND "PLUMB" AND TO ALLOW METER READING THROUGH THE METER READER LID.
7. THE ENTIRE ASSEMBLY (WITHOUT METER/SPOOL PIECES AS SHOWN) SHALL BE PRESSURE TESTED AS REQUIRED.
8. METER/SERVICE WILL NOT BE INSTALLED/ACTIVATED UNTIL:
 - A. - FORM BOARDS FOR DRIVEWAY AND/OR SIDEWALK ARE IN PLACE OR
 - DRIVEWAY OR SIDEWALK IS IN PLACE
 - B. - "MINIMUM UNOBSTRUCTED SPACE" (AS SHOWN) IS PROVIDED.
 - C. - THE REQUIRED BACKFLOW PREVENTION ASSEMBLY IS INSTALLED AND HAS PASSED THE INITIAL TEST.
9. BY-PASS PIPING SHALL BE INSTALLED ON THE RIGHT SIDE OF METER IN DIRECTION OF FLOW UNLESS OTHERWISE APPROVED BY THE CITY.
10. ALL HARDWARE FOR FLANGED FITTINGS (BOLTS, ETC.) TO BE STAINLESS STEEL.

POTABLE WATER SERVICE 4", 6" AND LARGER METER INSTALLATION DETAIL

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Figure 1-9
City Of Callaway
Potable Water Service 4", 6" And
Larger Meter Installation Detail



NOTES:

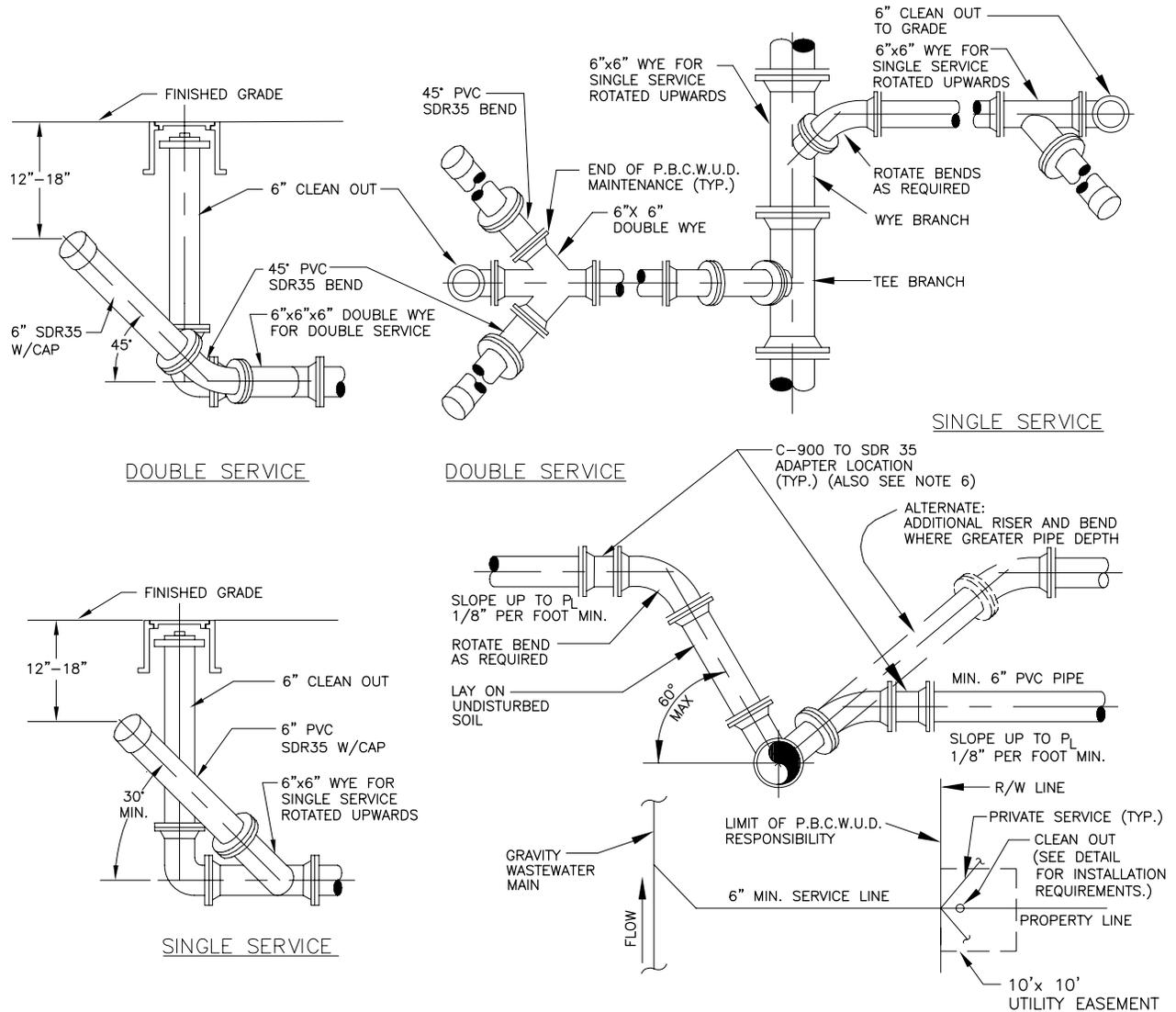
1. SERVICE PIPING LARGER THAN 2" WILL NOT BE ACCEPTED. FOR SERVICE LINE UNDER PAVEMENT USE 4" SCH.40 PVC.
2. METER LOCATION MUST CORRESPOND TO UNIT/BAY CONFIGURATION TO AVOID SERVICE LINE CROSSINGS.
3. METER/SERVICE WILL NOT BE INSTALLED/ACTIVATED UNTIL:
 - A. - FORM BOARDS FOR DRIVEWAY AND/OR SIDEWALK ARE IN PLACE OR
- DRIVEWAY OR SIDEWALK IS IN PLACE
 - B. "MINIMUM UNOBSTRUCTED SPACE" (AS SHOWN) IS PROVIDED.
 - C. REQUIRED BACKFLOW PREVENTION ASSEMBLY/DEVICE IS INSTALLED AND HAS PASSED THE INITIAL TEST.
4. TYPICAL SERVICE INSTALLATION DETAILS APPLY.
5. THE DEVELOPER/PROPERTY OWNER OR ASSIGNEE SHALL BE RESPONSIBLE FOR SERVICE INSTALLATION BEYOND PRESSURE TEST LIMITS AS SPECIFIED BY THE CITY.
6. THREADED AREAS OF CORPORATION STOP AND OTHER FITTINGS SHALL BE SPIRAL WRAPPED WITH TWO (2) WRAPS OF TEFLON TAPE.
7. MAX. (8) 5/8" METERS OR MAX. (4) 1" METERS MAY BE CONNECTED TO A SINGLE 2" SERVICE LINE.

**POTABLE WATER TYPICAL CONNECTION
FOR MULTIPLE SERVICES (2 OR MORE)**

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Figure 1-10
City Of Callaway
Potable Water Typical Connection
For Multiple Services (2 Or More)



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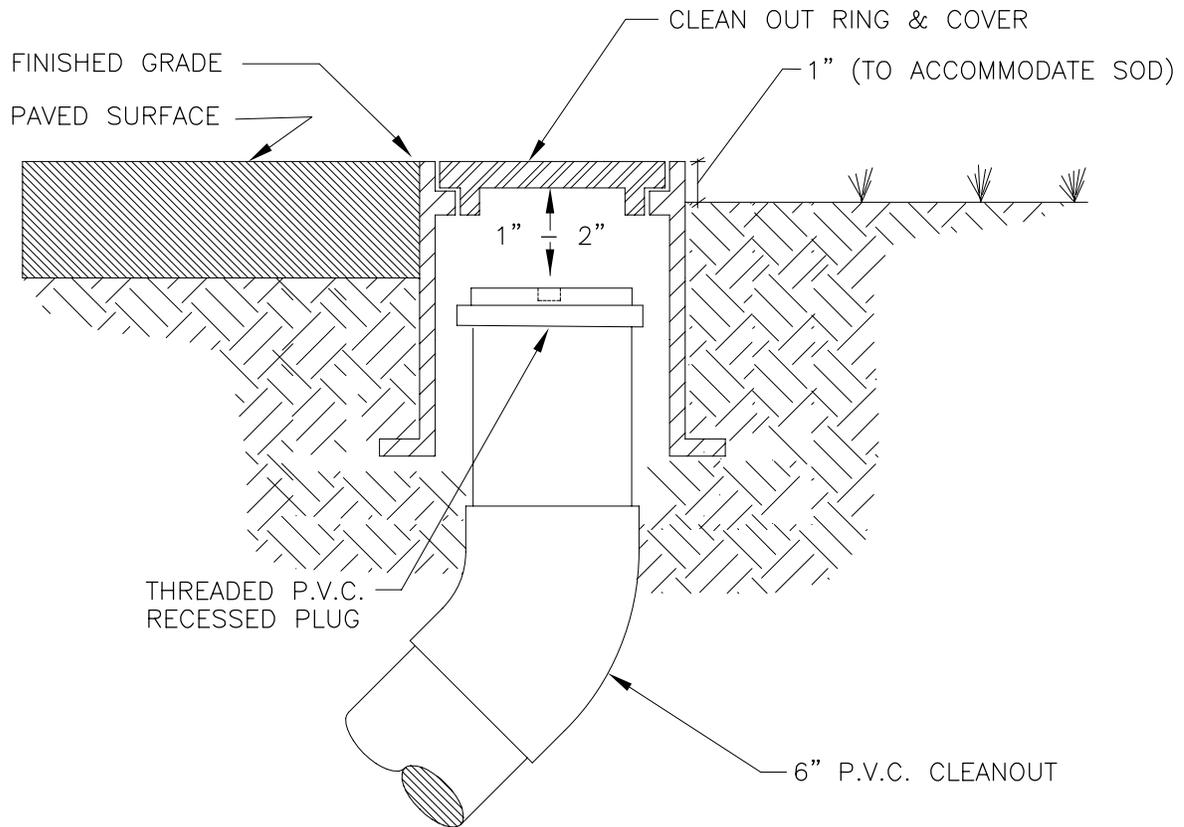
1. MIN. 3' AND 5' MAX. DEPTH IS REQUIRED, UNLESS PLANS SHOW OTHERWISE, FOR SERVICE LATERAL WYE AT THE CLEAN OUT ENDING CITY OF CALLAWAY OWNERSHIP AND MAINTENANCE RESPONSIBILITY.
2. CLEAN OUT IS TO BE INSTALLED PER DEPARTMENT STANDARDS PRIOR TO WATER METER INSTALLATION. AN INSPECTION OF CONNECTION INTO THE CITY LATERAL IS REQUIRED PRIOR TO WATER METER RELEASE.
3. WASTEWATER MAIN WYE BRANCH TO MATCH MAIN PIPE MATERIAL.
4. CLEAN OUTS DESIGNATING THE END OF THE DEPARTMENT'S MAINTENANCE RESPONSIBILITY SHALL BE LOCATED WITHIN AN UTILITY EASEMENT OR RIGHT-OF WAY DEDICATED FOR UTILITIES.
5. THE DEVELOPER/PROPERTY OWNER OR ASSIGNEE SHALL BE RESPONSIBLE FOR CLEAN OUT INSTALLATION PRIOR TO WATER METER INSTALLATION AS SPECIFIED BY THE CITY.
6. SEE MINIMUM SEPARATION STATEMENT FOR P.V.C. C-900 SDR 18 PIPE MATERIAL REQUIREMENTS AT WASTEWATER LATERAL/POTABLE WATER MAIN CROSSINGS.

TYPICAL WASTEWATER SERVICE CONNECTION

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Figure 2-1
City Of Callaway
Typical Wastewater Service Connection



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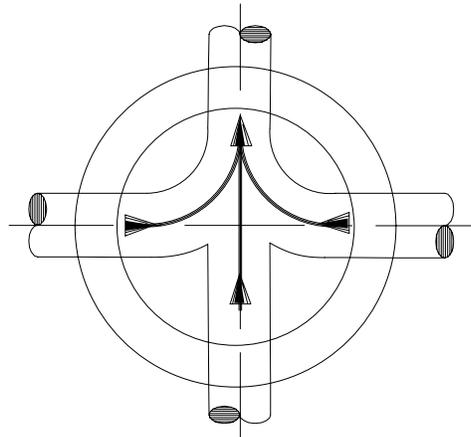
1. CLEANOUTS TO BE LOCATED IN GRASS AREA WHENEVER POSSIBLE.
2. CLEANOUTS SHALL NOT BE INSTALLED IN TRAFFIC LANES OR AREAS UNDER HEAVY TRAFFIC LOADS.
3. THE COVER TO BE MARKED "S".
4. CLEANOUTS TO BE INSTALLED PRIOR TO WATER METER RELEASE.
5. THE DEVELOPER/PROPERTY OWNER OR ASSIGNEE SHALL BE RESPONSIBLE FOR CLEANOUT INSTALLATION PRIOR TO WATER METER INSTALLATION AS SPECIFIED BY THE CITY.
6. A CONCRETE COLLAR MAY BE REQUIRED IF CLEANOUT IS LOCATED BETWEEN DRIVEWAYS. SPECIAL CONSTRUCTION DETAIL WILL BE REQUIRED.

TYPICAL CLEANOUT INSTALLATION

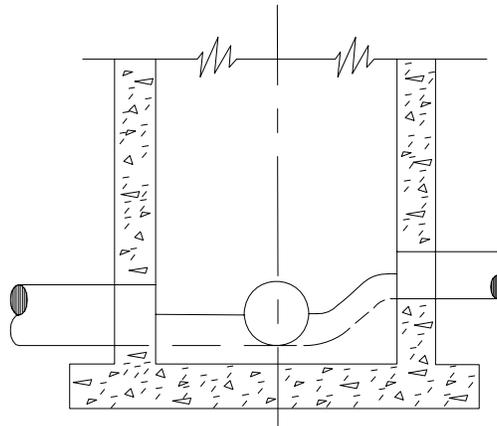
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Figure 2-2
City Of Callaway
Typical Cleanout Installation



PLAN



SECTION

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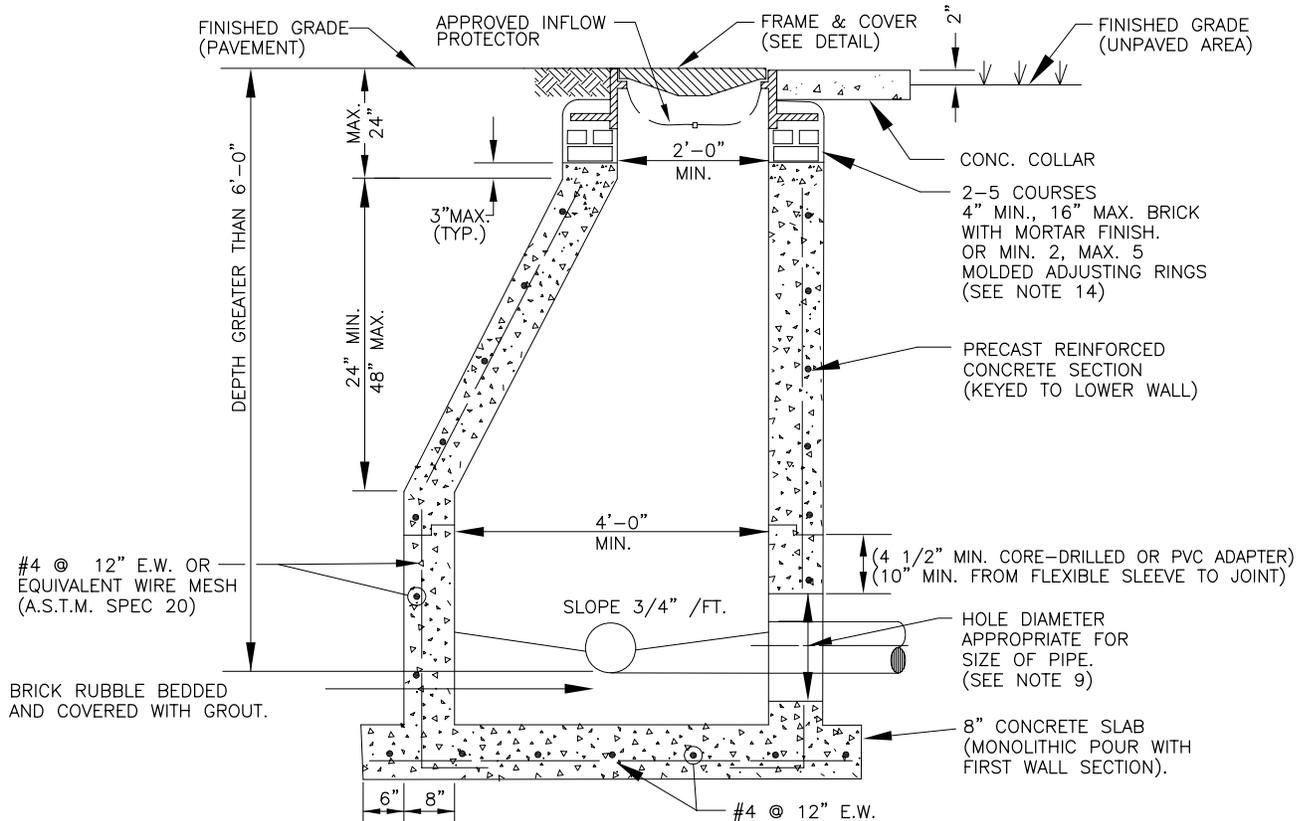
1. ALL INVERT CHANNELS ARE TO BE CONSTRUCTED FOR SMOOTH FLOW WITHOUT OBSTRUCTION.
2. PROPERLY SHAPED SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS TO PROVIDE FOR SMOOTH FLOWS.
3. SERVICE LATERALS SHALL NOT ENTER MANHOLES UNLESS SPECIFIED ON PLANS AND THEN MUST BE TREATED AS MAINS (ELEVATIONS SHOWN, PRECAST HOLE, FLOW CHANNEL)
4. BRICK AND CONCRETE RUBBLE PERMITTED AS FLOW CHANNEL BUILDUP.
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 WITH 3 OR 4 INVERTS AND MANHOLES WITH A CHANGE OF DIRECTION OF FLOW OF MORE THAN 45 DEGREES.

INVERT FLOW CHANNELS

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Figure 2-3
City Of Callaway
Invert Flow Channels



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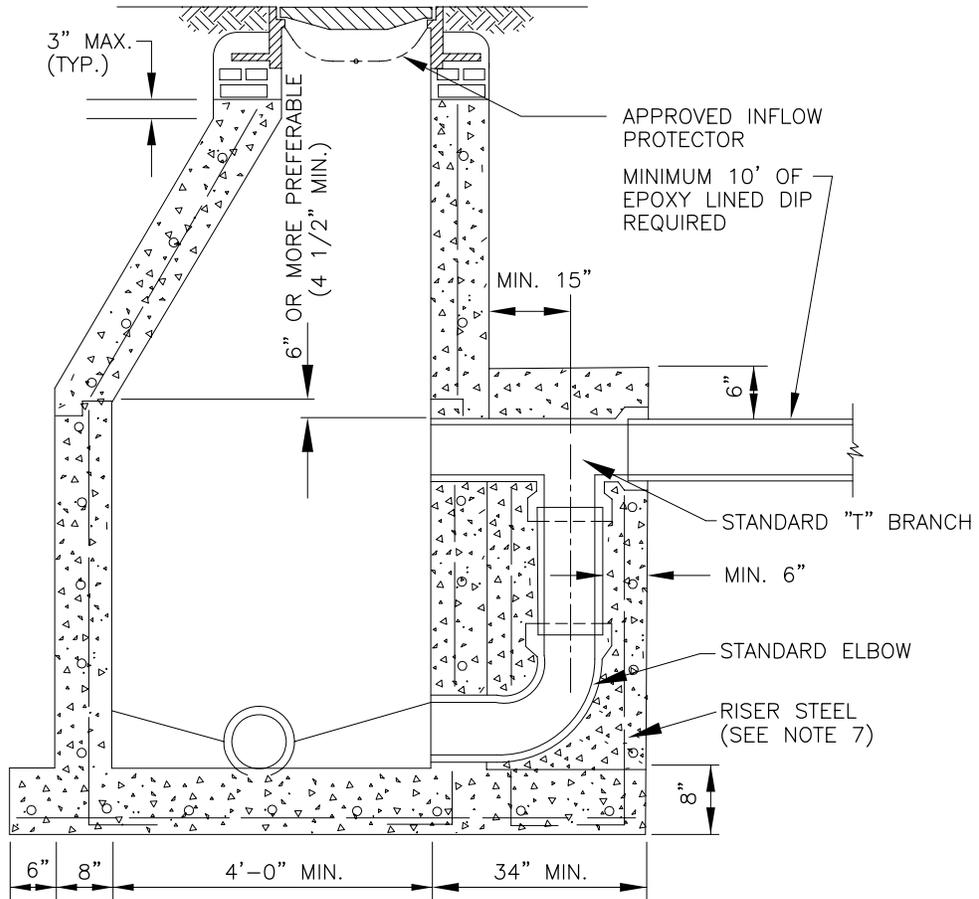
1. PRECAST CONCRETE TYPE II 4000 P.S.I. CALCAREOUS AGGREGATE REQUIRED (MIN. CaCO3 CONTENT: 65% IN LARGE AGGREGATE, 50% IN CONCRETE SCREENING).
2. "RAMNEK" OR EQUAL AT ALL RISER JOINTS (1/2" THICK WITH THE WIDTH AT LEAST 1/2 THE WALL THICKNESS) WITH GROUT ON INSIDE AND OUTSIDE.
3. ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
4. FLOW CHANNELS SHALL BE CONSTRUCTED TO DIRECT INFLUENT INTO FLOW STREAM. (SEE DETAIL)
5. LIFT HOLES ARE PERMITTED.
6. ALL PIPE HOLES SHALL BE PRECAST OR CORE - DRILLED.
7. A. FOR PVC PIPE ENTERING MANHOLE WITH PRECAST HOLES USE THE APPROVED NON-ASBESTOS PVC-MANHOLE ADAPTER OR PRECASTED FLEXIBLE MANHOLE SLEEVE FOR THE APPROPRIATE PIPE DIAMETER AND DIMENSION RATIO. THE ADAPTER SHALL NOT EXTEND MORE THAN 1" INTO THE MANHOLE. DOUBLE BANDING IS REQUIRED FOR FLEXIBLE MANHOLE SLEEVE.
 B. CONNECTION TO A MANHOLE WITH A CORE DRILLED HOLE SHALL BE MADE USING A 5' MIN. DUCTILE IRON PIPE SECTION (EPOXY LINED) OR THE APPROVED PVC-MANHOLE ADAPTER.
8. INSIDE DROPS SHALL NOT BE DESIGNED TO EXCEED 1.80 FEET AND NOT CONSTRUCTED TO EXCEED 2.0 FEET. MAX. 6" INSIDE DROP IS PERMITTED FOR MANHOLES WITH 3 OR MORE INVERTS AND MANHOLES WITH A CHANGE IN FLOW DIRECTION OF MORE THAN 45 DEGREES.
9. 8" DIAMETER PIPE: 12" HOLE FOR DIP, 15" HOLE FOR PVC - 10" DIAMETER PIPE: 14" HOLE FOR DIP, 17" HOLE FOR PVC.
10. MANHOLE FABRICATION SHALL BE IN ACCORDANCE WITH ASTM C-478, LATEST STANDARD.
11. MINIMUM 5 FEET IS REQUIRED BETWEEN OUTSIDE OF MANHOLE AND SERVICE WYE.
12. MANHOLES TO BE COATED INSIDE WITH AN APPROVED CORROSION BARRIER SYSTEM.
13. APPROVED INFLOW PROTECTORS ARE REQUIRED.
14. IN LIEU OF BRICK WORK, APPROVED HDPE ADJUSTING RINGS MAY BE USED. RINGS AND MANHOLE FRAME TO BE ALIGNED BY THREADING (2) 3/4" DIAMETER 304L STAINLESS STEEL ALL THREAD RODS INTO CAST-IN PLASTIC INSERTS AND SECURED WITH STAINLESS STEEL WASHER AND DOUBLE NUT. IF NO INSERTS ARE PRECAST, DRILL AND INSTALL (2) 3/4" EXPANSION SHIELDS INTO PRECAST CONE. INSTALLATION SHALL FOLLOW MANUFACTURERS RECOMMENDATIONS. ONLY APPROVED BUTYL SEALANT (GASKETS) MAY BE USED. DOUBLE GASKETS ARE REQUIRED BETWEEN THE MANHOLE TOP SECTION AND BOTTOM RING AND BETWEEN THE TOP RING AND THE MANHOLE RING AND COVER ASSEMBLY. MAXIMUM HEIGHT OF RISER RINGS SHALL NOT EXCEED 16".

STANDARD MANHOLE

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Figure 2-4
 City Of Callaway
 Standard Manhole



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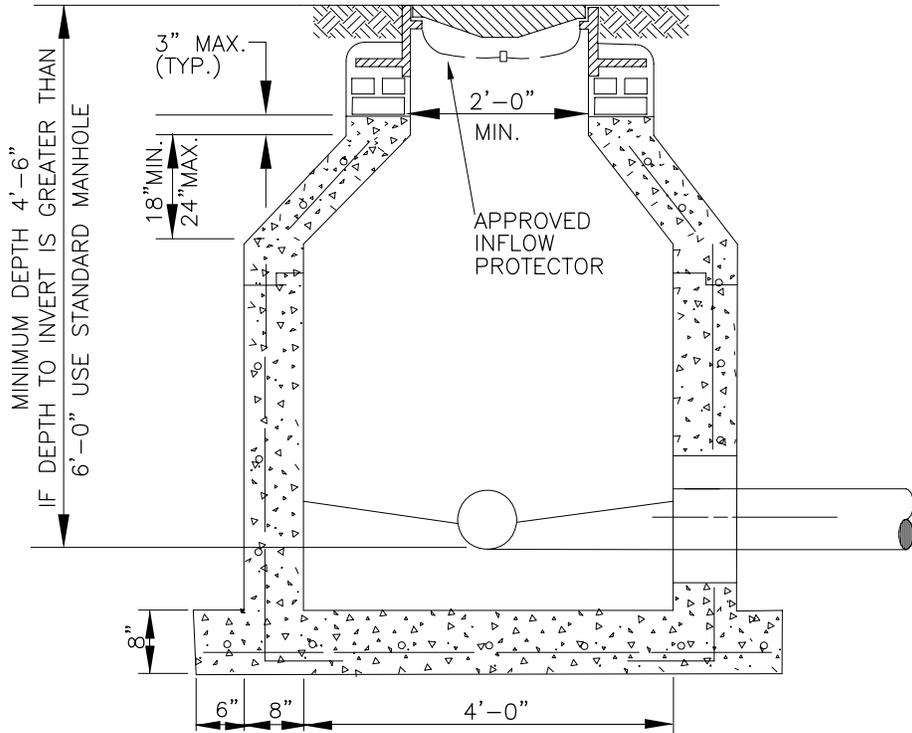
1. ALL DETAILS AND SPECIFICATIONS FOR STANDARD MANHOLES ARE APPLICABLE EXCEPT FOR REFERENCES TO DROP ASSEMBLY.
2. THE PRECAST BASE SHALL EXTEND FULLY UNDER THE DROP ASSEMBLY.
3. MASONRY CONSTRUCTION ABOVE THE EXTENDED PRECAST BASE, IF FILLED WITH CONCRETE, IS PERMISSIBLE.
4. BRICK AND CONCRETE RUBBLE ARE PERMITTED AS FILLER IN DROP ENCASEMENT.
5. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT INVERT IS LOCATED 2.0 FEET OR MORE ABOVE THE MAIN INVERT CHANNEL. DROP CONNECTIONS SHOULD NOT BE DESIGNED FOR LESS THAN A 2.4 FOOT DROP.
6. SOLVENT TYPE JOINT PVC FITTINGS MAY BE UTILIZED IN THE DROP ASSEMBLY ONLY.
7. RISER STEEL TO BE CAST IN PLACE WITH BASE (4 RODS) OR USE 4 - 1/2" DIA. COIL LOOP INSERTS CAST IN PLACE WITH BASE (TO BE USED WITH 1/2" COIL RODS). COIL LOOP INSERTS TO BE "DAYTON SUPERIOR" B16, 1/2"X 4" OR APPROVED EQUAL.

DROP CONNECTION PRECAST MANHOLE

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Figure 2-5
City Of Callaway
Drop Connection Precast Manhole



NOTE:

ALL STANDARD MANHOLE NOTES AND DETAILS ARE APPLICABLE

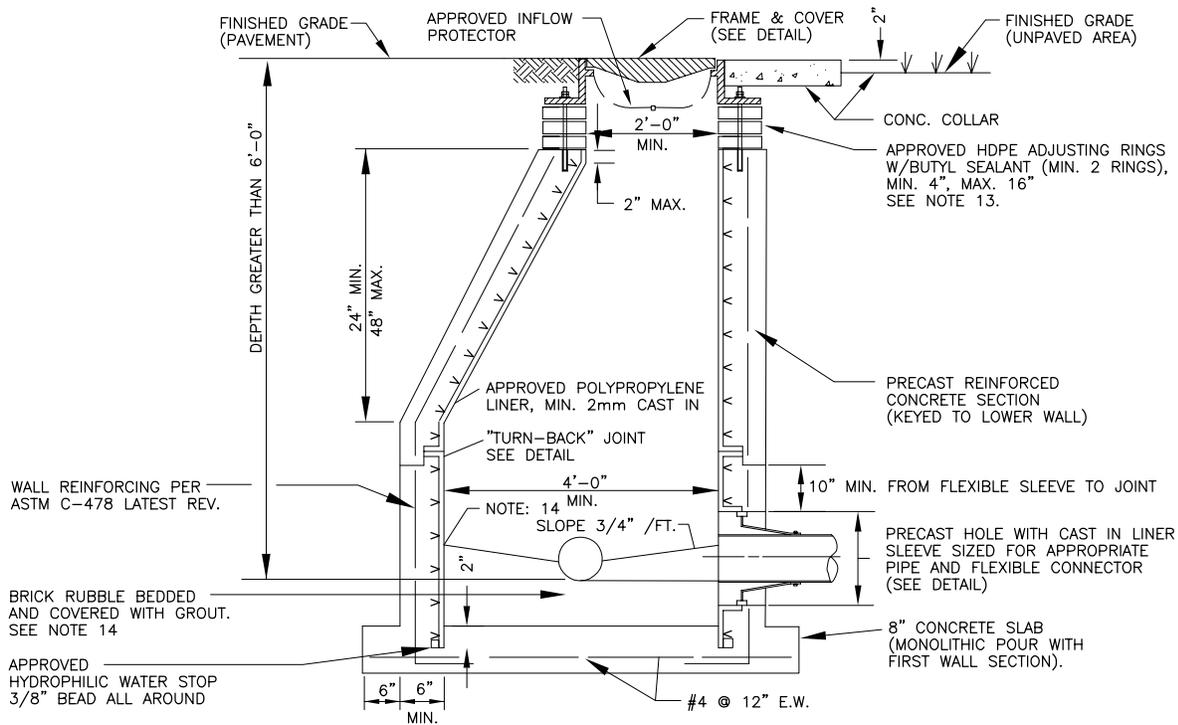
SHALLOW MANHOLE

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Figure 2-6
City Of Callaway
Shallow Manhole

P:\10341\54843\30p\Report\FIGURE2-7 04/09/07 11:35 bartlewskilr



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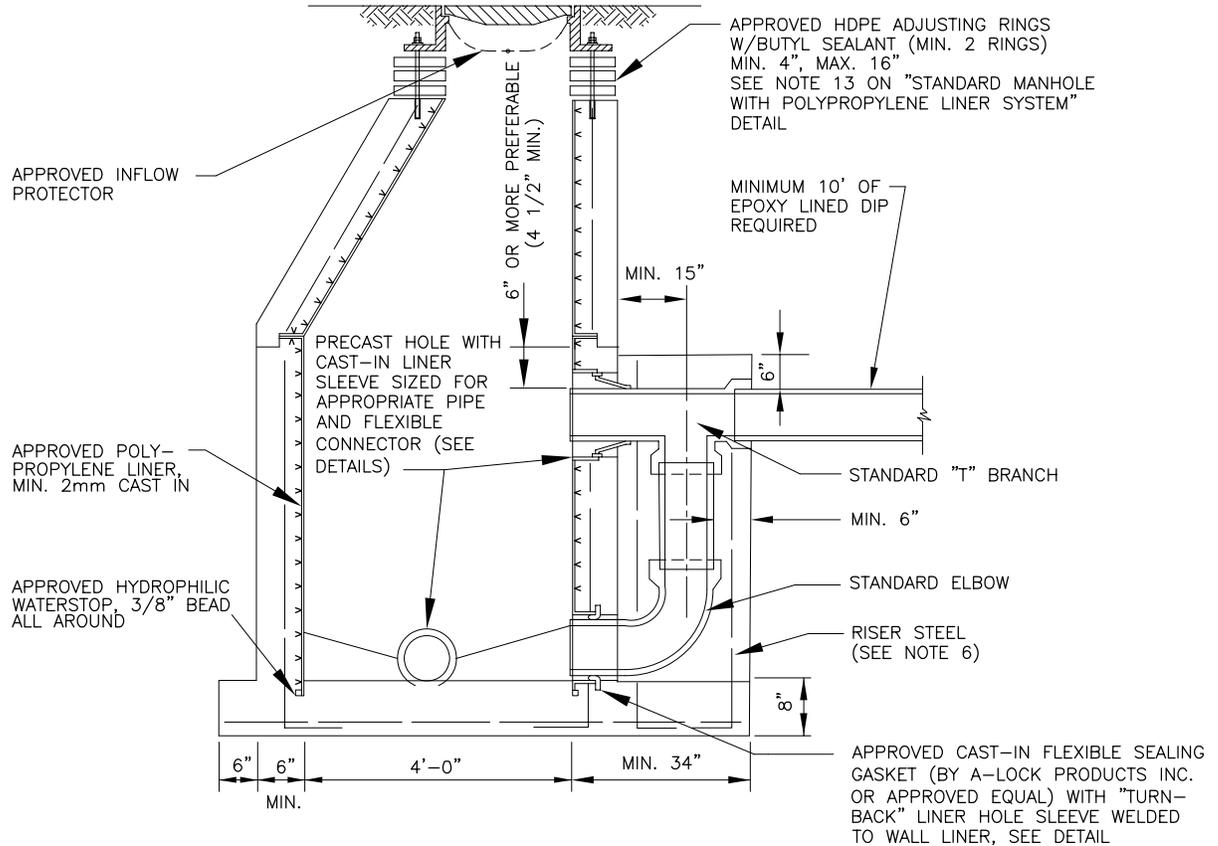
1. PRECAST CONCRETE TYPE II 4000 P.S.I. CALCAREOUS AGGREGATE REQUIRED (MIN. CaCO3 CONTENT: 65% IN LARGE AGGREGATE, 50% IN CONCRETE SCREENING).
2. "RAMNEK" OR APPROVED EQUAL AT ALL RISER JOINTS (1/2" THICK WITH THE WIDTH AT LEAST 1/2 THE WALL THICKNESS)
3. ALL PIPE OPENINGS SHALL BE GAS TIGHT AND WATER TIGHT WITH NO EXPOSED CONCRETE SURFACES. ALL PIPE CONNECTIONS TO MANHOLE SHALL BE PRECAST.
4. CAST OPENINGS SHALL BE MANUFACTURED WITH A POLYPROPYLENE SLEEVE CAST IN. APPROVED FLEXIBLE MANHOLE CONNECTORS SHALL BE USED AT PIPE CONNECTIONS. HOLE SIZE PER BOOT MANUFACTURER'S SPECIFICATIONS. DOUBLE PIPE CLAMPS MUST BE INSTALLED ON FLEXIBLE SLEEVES WHERE REQUIRED BY BOOT MANUFACTURERS INSTALLATION INSTRUCTIONS.
5. CORED PIPE OPENINGS SHALL BE INSTALLED PER DETAIL. APPROVED FLEXIBLE CONNECTOR WILL BE INSTALLED ONTO POLY-PROPYLENE WALL SLEEVE. WALL SLEEVE SHALL BE EPOXIED INTO CORED OPENING AND THERMAL WELDED TO WALL LINER.
6. FLOW CHANNELS SHALL BE CONSTRUCTED TO DIRECT INFLUENT INTO FLOW STREAM. (SEE DETAIL)
7. LIFT HOLES ARE PERMITTED.
8. INSIDE DROPS SHALL NOT BE DESIGNED TO EXCEED 1.80 FEET AND NOT CONSTRUCTED TO EXCEED 2.0 FEET. MAX. 6" INSIDE DROP IS PERMITTED FOR MANHOLES WITH 3 OR MORE INVERTS AND MANHOLES WITH A CHANGE IN FLOW DIRECTION OF MORE THAN 45 DEGREES.
9. MANHOLE FABRICATION SHALL BE IN ACCORDANCE WITH ASTM C-478, LATEST STANDARD.
10. MINIMUM 5 FEET IS REQUIRED BETWEEN OUTSIDE OF MANHOLE AND SERVICE WYE.
11. MANHOLES WILL BE LINED INSIDE WITH AN APPROVED POLYPROPYLENE LINER SYSTEM. LINER MUST HAVE A MINIMUM OF 39 EXTRUDED ANCHORS PER SQ. FT. LINERS MUST BE WELDED BY LINER MFG CERTIFIED WELDERS AND BE CAST INTO THE MANHOLE BY A LINER MANUFACTURER CERTIFIED PRECASTER.
12. APPROVED INFLOW PROTECTORS ARE REQUIRED.
13. APPROVED HDPE ADJUSTING RINGS SHALL BE USED. INSTALLATION SHALL FOLLOW MANUFACTURERS RECOMMENDATIONS. ONLY APPROVED BUTYL SEALANT MAY BE USED. MAXIMUM HEIGHT OF CHIMNEY SHALL NOT EXCEED 24" (INCLUDING FRAME CASTING). THE JOINT BETWEEN THE CASTING FRAME AND THE UPPERMOST HDPE RING AND THE JOINT BETWEEN THE PRECAST CONE SECTION AND THE LOWEST HDPE RING MUST BE SEALED WITH 2 BEADS OF BUTYL CAULKING (3/8") OR 2 STRIPS OF 3/8" PRE FORMED BUTYL GASKETS. ALL INTERMEDIATE HDPE RING JOINTS WILL BE SEALED WITH 1 BEAD (3/8") OF BUTYL CAULKING OR ONE PRE FORMED GASKET (3/8"). ALIGN BOLT HOLES IN CAST IRON RING AND HDPE ADJUSTING RINGS. THREAD 2 EACH 3/4" DIAMETER 304L STAINLESS STEEL ALL THREAD RODS INTO PENNSYLVANIA INSERT CORPORATION PLASTIC INSERTS CAST INTO PRECAST CONE SECTION, OR DRILL AND INSTALL 3/4" DIAMETER EXPANSION SHIELD INTO PRECAST CONE. SECURE WITH 304L STAINLESS STEEL WASHER AND DOUBLE NUT. TRIM ROD 2" ABOVE DOUBLE NUT.
14. SEAL INVERT BENCH AND CHANNEL TO WALL LINER WITH 3M WEATHERBAN 5354 SEALANT TAPE OR APPROVED EQUAL.

STANDARD MANHOLE WITH POLYPROPYLENE LINER SYSTEM CAST-IN

NTS



Figure 2-7
City Of Callaway
Standard Manhole With Polypropylene
Liner System Cast-In



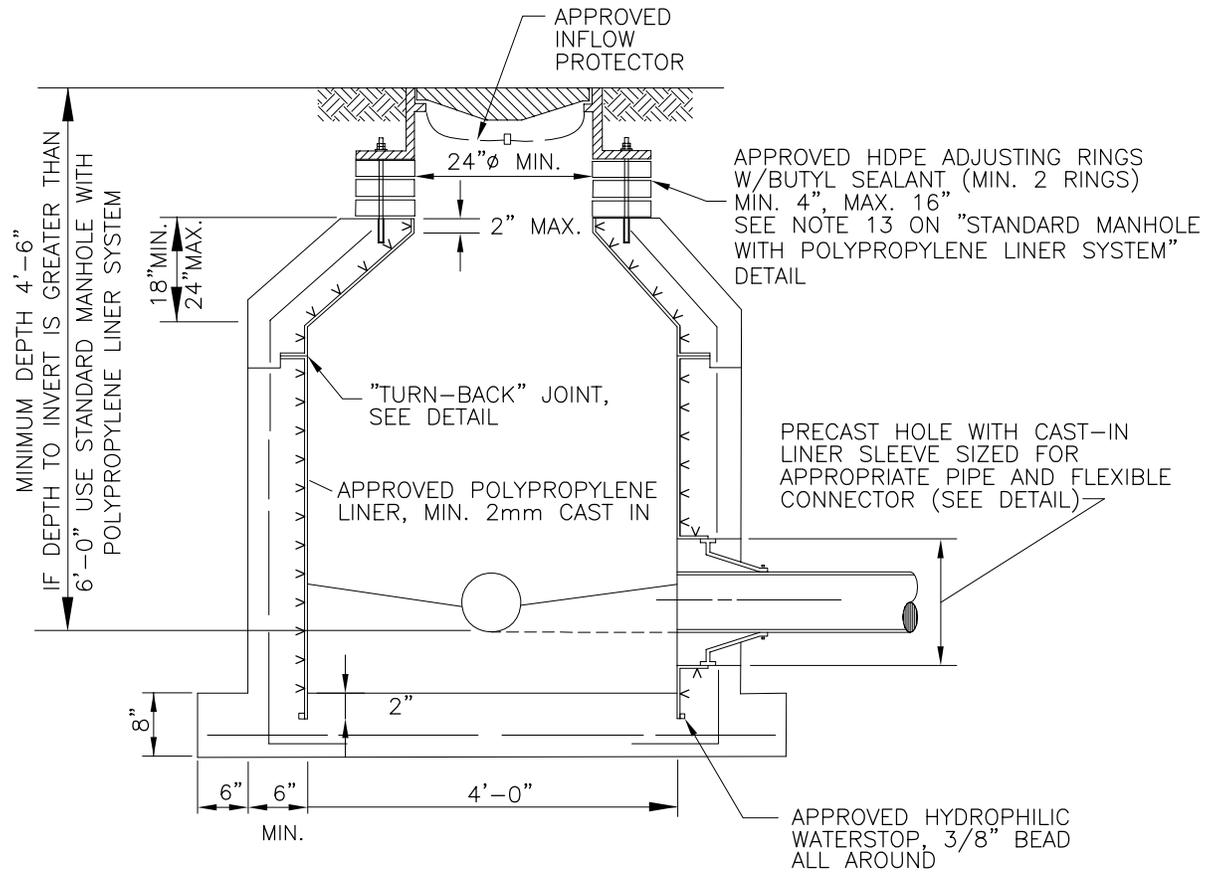
NOTES:

1. ALL DETAILS AND SPECIFICATIONS FOR "STANDARD MANHOLE WITH SOLID POLYPROPYLENE LINER SYSTEM" ARE APPLICABLE EXCEPT FOR REFERENCES TO DROP ASSEMBLY.
2. THE PRECAST BASE SHALL EXTEND FULLY UNDER THE DROP ASSEMBLY.
3. PRECAST DROP ENCASMENT REQUIRED UP TO TOP EDGE OF 90 DEGREE ELBOW, BRICK AND CONCRETE RUBBLE ARE PERMITTED AS FILLER IN REMAINDER OF DROP ENCASMENT.
4. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT INVERT IS LOCATED 2.0 FEET OR MORE ABOVE THE MAIN INVERT CHANNEL. DROP CONNECTIONS SHOULD NOT BE DESIGNED FOR LESS THAN A 2.4 FOOT DROP.
5. SOLVENT TYPE JOINT PVC FITTINGS MAY BE UTILIZED IN THE DROP ASSEMBLY ONLY.
6. DROP ENCASMENT REINFORCING STEEL TO BE CAST IN PLACE WITH BASE (4 RODS) OR USE 4-1/2" DIA. COIL LOOP INSERTS CAST IN PLACE WITH BASE (TO BE USED WITH 1/2" COIL RODS). COIL LOOP INSERTS TO BE "DAYTON SUPERIOR" B16, 1/2"X 4" OR APPROVED EQUAL.

**DROP CONNECTION PRECAST MANHOLE WITH
POLYPROPYLENE LINER SYSTEM CAST-IN**
NTS



Figure 2-8
City Of Callaway
Drop Connection Precast Manhole With
Polypropylene Liner System Cast-In



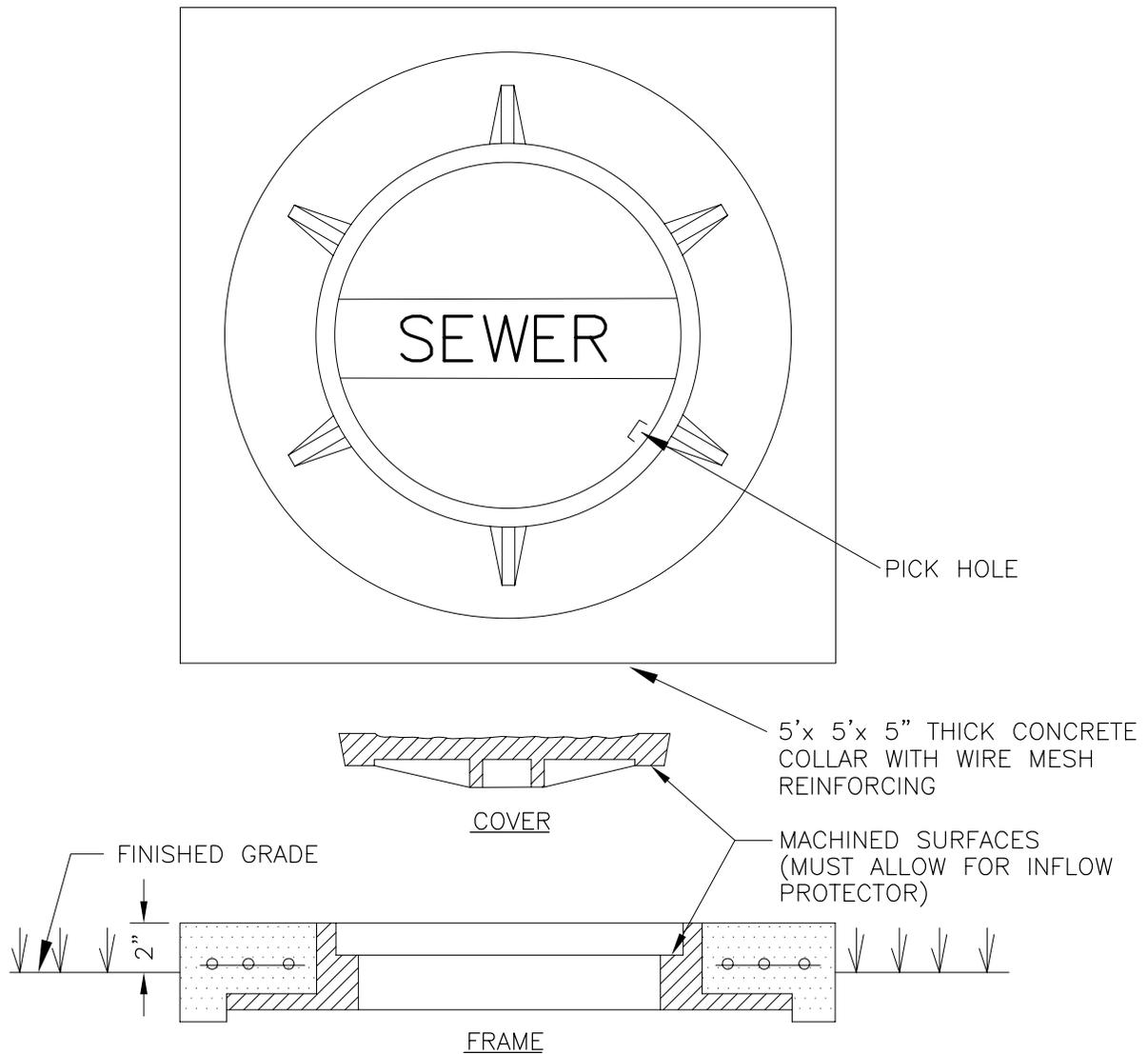
NOTE:

1. ALL "STANDARD MANHOLE WITH POLYPROPYLENE LINER SYSTEM" NOTES AND DETAILS ARE APPLICABLE

SHALLOW MANHOLE WITH POLYPROPYLENE LINER SYSTEM CAST-IN
NTS



Figure 2-9
City Of Callaway
Shallow Manhole With Polypropylene
Liner System Cast-In



NOTES:

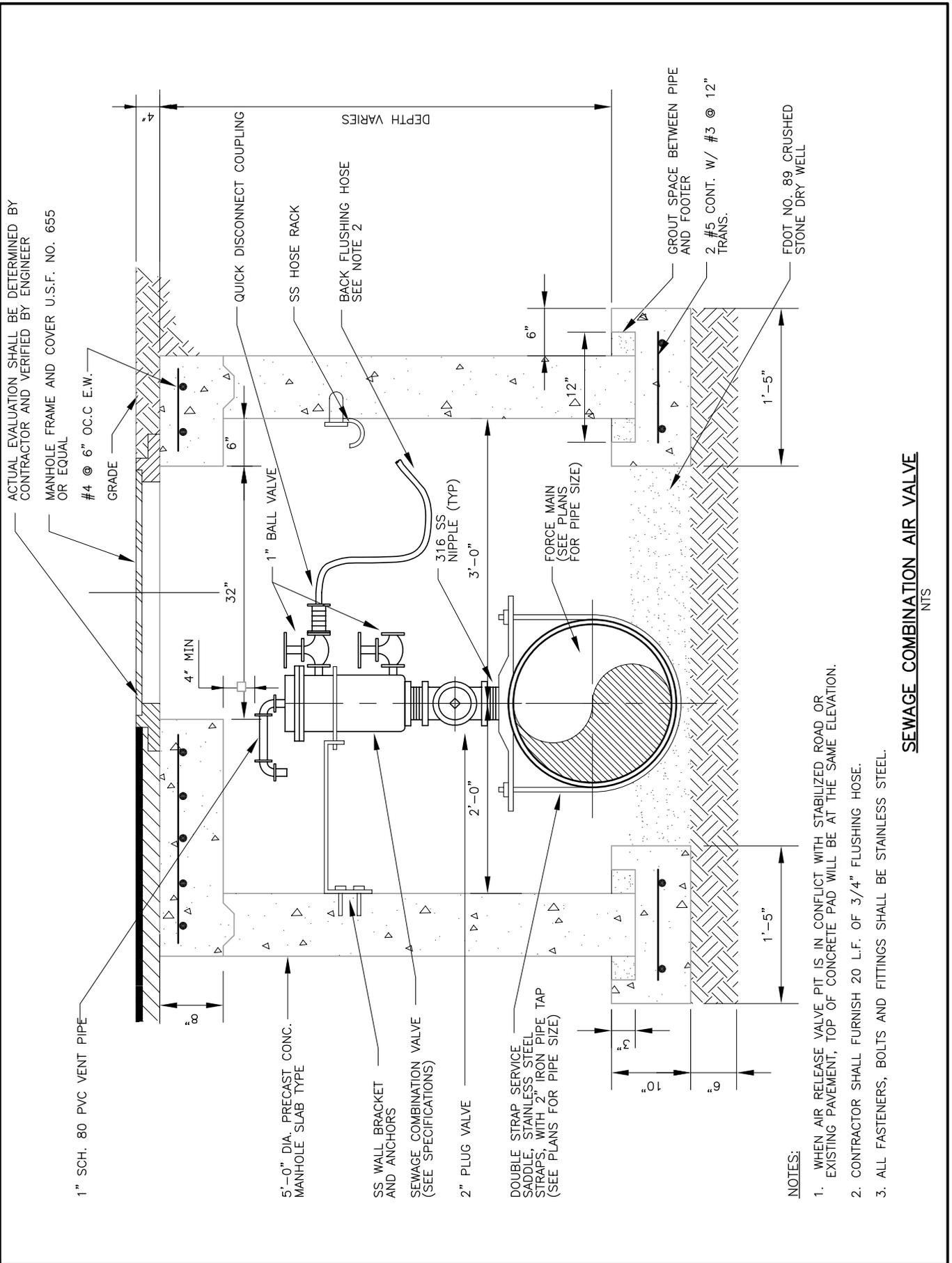
1. COLLAR IS REQUIRED ONLY WHEN MANHOLE IS OUT OF PAVEMENT.
2. STANDARD FRAME AND COVER SIZE SHALL BE SEVEN INCHES (7"). A 4" FRAME MAY ONLY BE USED WITH PRIOR APPROVAL.
3. A STEEL MANHOLE RISER, APPROVED HDPE ADJUSTING RINGS OR ADDITIONAL BRICKS MAY BE USED TO ELEVATE EXISTING MANHOLE COVERS TO RESURFACED GRADE (MAX. 4" HEIGHT).
4. COVER SHALL FIT FLUSH WITH THE FRAME WITH THE INFLOW PROTECTOR INSTALLED.

SANITARY SEWER MANHOLE FRAME & COVER

NTS



Figure 2-10
 City Of Callaway
 Shallow Manhole With Polypropylene
 Liner System Cast-In



NOTES:

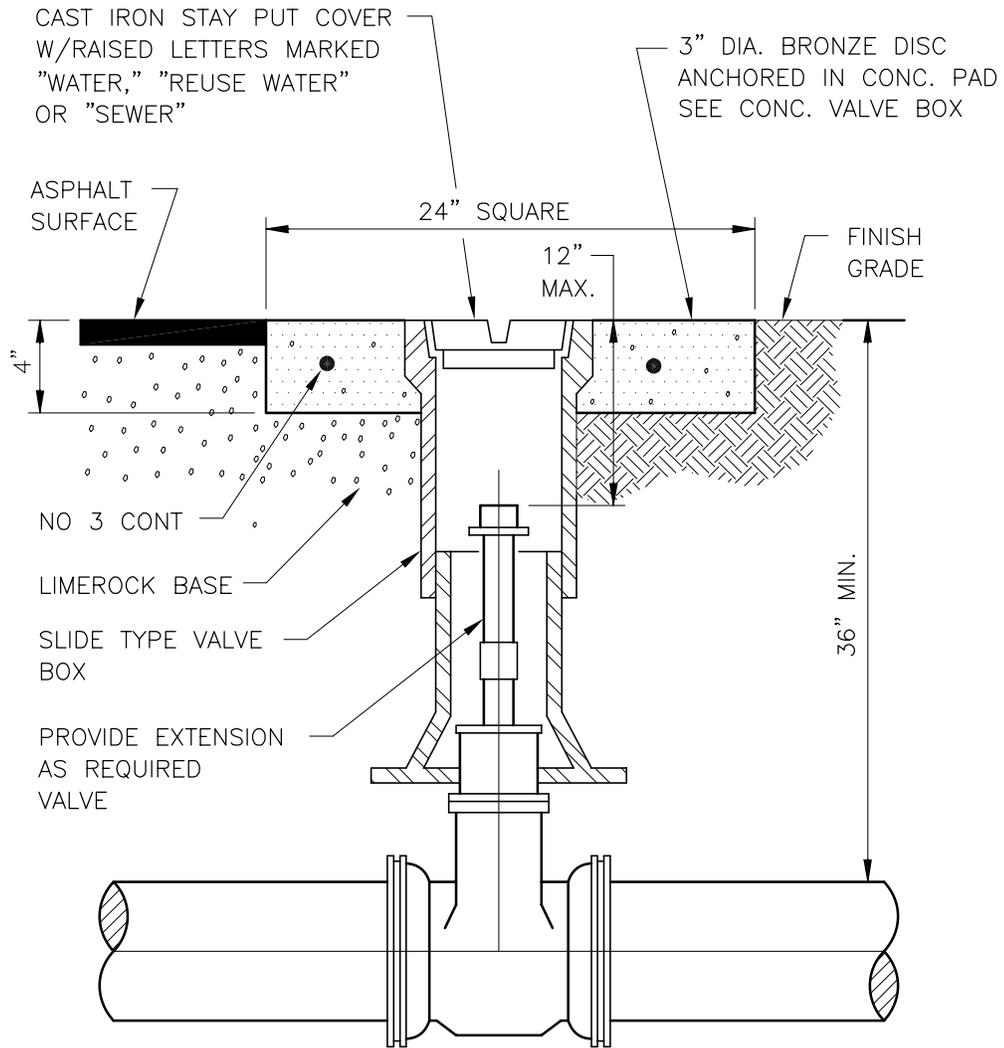
1. WHEN AIR RELEASE VALVE PIT IS IN CONFLICT WITH STABILIZED ROAD OR EXISTING PAVEMENT, TOP OF CONCRETE PAD WILL BE AT THE SAME ELEVATION.
2. CONTRACTOR SHALL FURNISH 20 L.F. OF 3/4" FLUSHING HOSE.
3. ALL FASTENERS, BOLTS AND FITTINGS SHALL BE STAINLESS STEEL.

SEWAGE COMBINATION AIR VALVE
NTS



Figure 3-1
City of Callaway
Sewage Combination Air Valve

P:\10341\54843\30p\Report\ FIGURE3-2 04/10/07 15:47 bartlewskilr

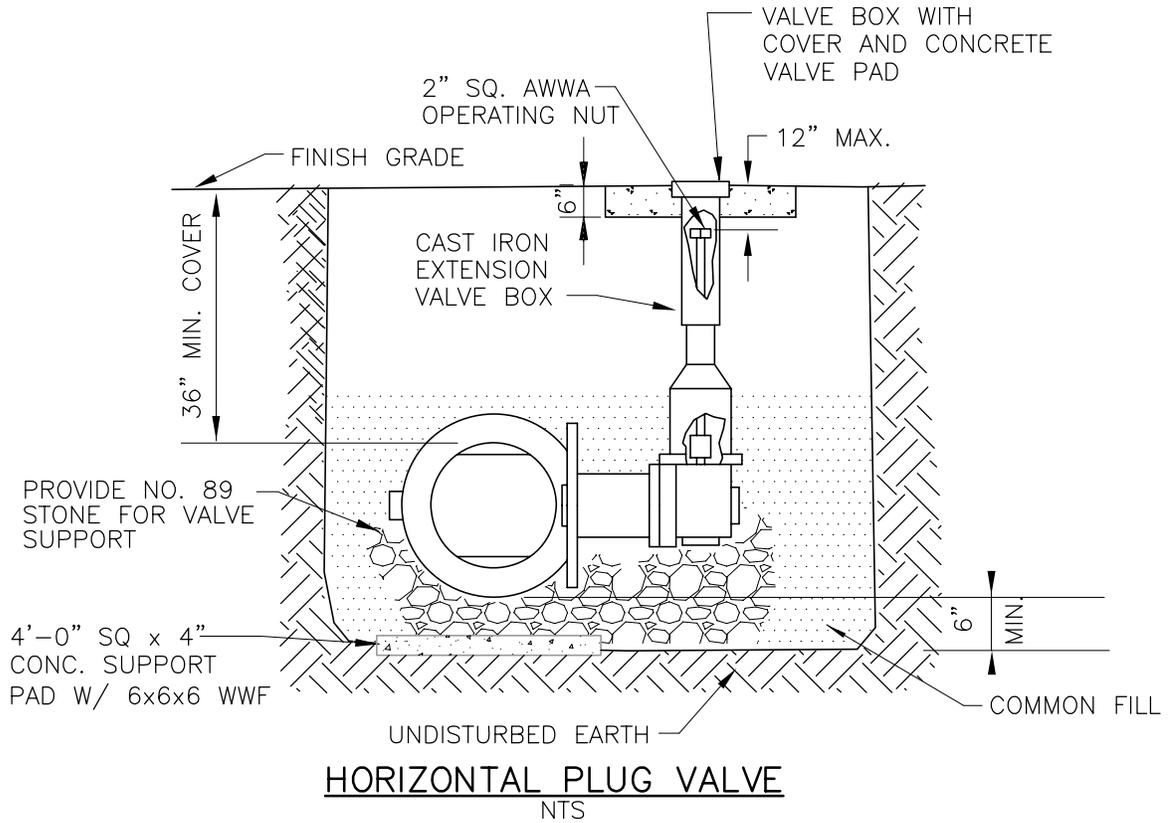


VERTICAL PLUG VALVE AND BOX

NTS



Figure 3-2
City Of Callaway
Vertical Plug Valve and Box



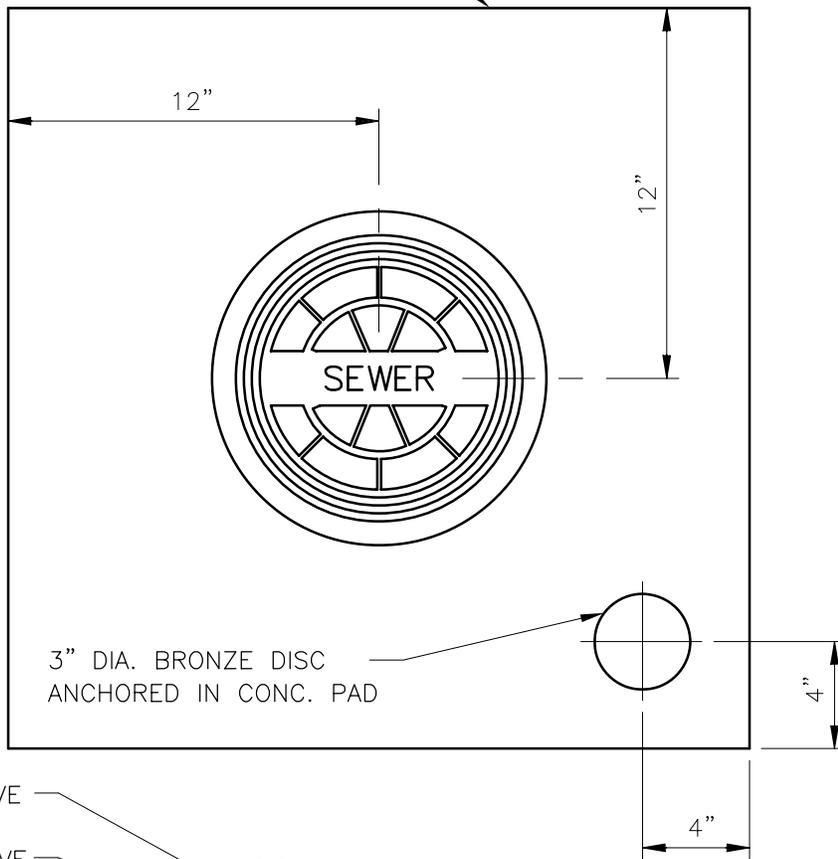
NOTES:

1. ALL VALVE INSTALLATION OF 16" AND LARGER SHALL BE INSTALLED HORIZONTAL
2. VALVE INSTALLATION SMALLER THAN 16" SHALL BE INSTALLED VERTICAL UNLESS APPROVED BY THE CITY.



Figure 3-3
City of Callaway
Horizontal Plug Valve

24" x 24" x 4" THICK CONCRETE PAD
AT EACH VALVE BOX WITH 1-NO.3
CONT.

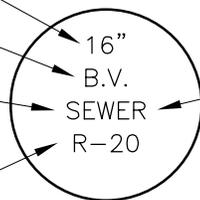


SIZE OF VALVE

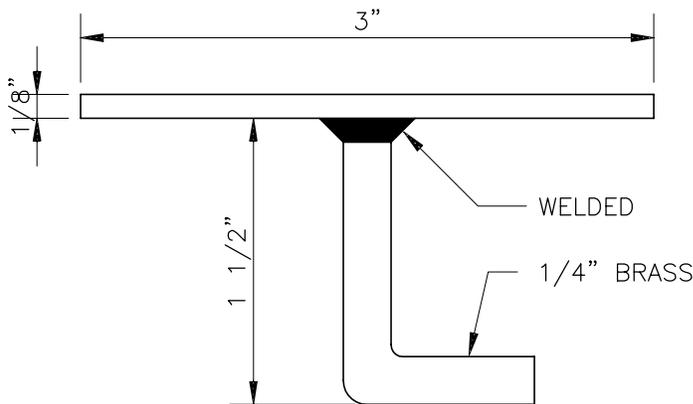
TYPE OF VALVE

SERVICE

DIRECTION & NUMBER
OF TURNS TO OPEN



1/8" RAISED LETTERS
TO BE CAST WITH 3" DIA.
BRONZE DISC AS MFG.
BY SHEIDOW BRONZE CO.



CONCRETE VALVE PAD / IDENT. DISC.

NTS

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Figure 3-4
City Of Callaway
Concrete Valve Pad / Ident. Disc.

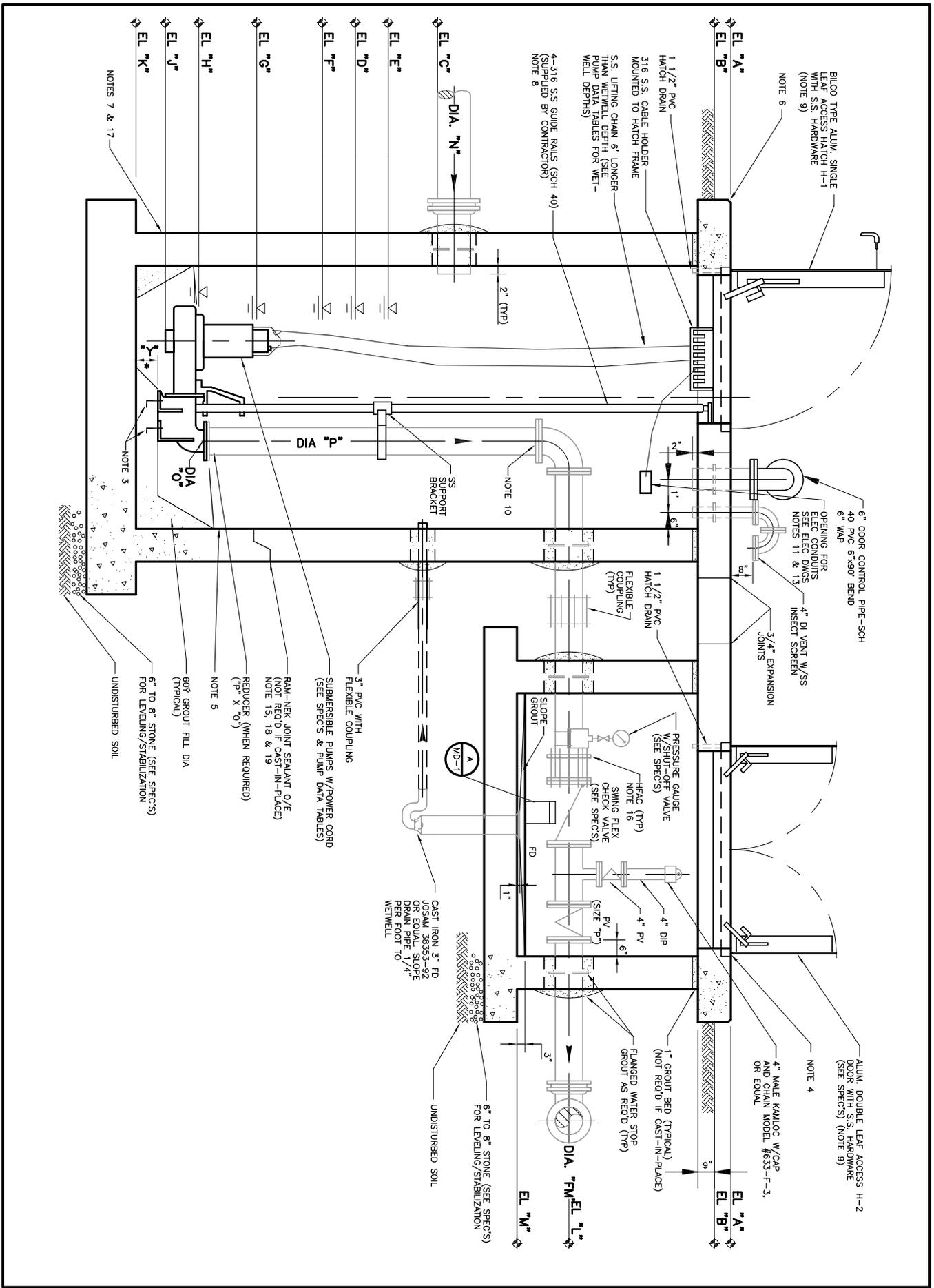


Figure 4-2
 City of Callaway
 Lift Station Section

LIFT STATION GENERAL NOTES

1. SYMBOL (*) DENOTES DIMENSION TO BE CONFIRMED WITH MANUFACTURERS SHOP DRAWINGS.
2. ALL PUMPING STATION WORK SHALL CONFORM TO THE REQUIREMENTS OF THE APPROPRIATE SECTIONS OF THE SPECIFICATIONS.
3. ALL EQUIPMENT, ANCHOR BOLT SIZES, LOCATIONS, CLEARANCES, ETC. SHALL BE IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE APPROVED SHOP DRAWINGS.
4. ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE SHALL HAVE A BITUMASTIC COATING (2 COATS, 9 MILS EACH COAT DFT).
5. CONTRACTOR SHALL COAT MANHOLE INTERIOR SURFACES DIRECTED IN THE STANDARDS.
6. CHAMFER ALL EXPOSED CONCRETE EDGES 3/4" MINIMUM.
7. ALL BACKFILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATIONS.
8. TYPE 316 STAINLESS STEEL SHALL BE USED IN THE WETWELL FOR FLANGE BOLTS, BRACKETS, GUIDE RAILS AND ALL OTHER HARDWARE EXCEPT AS OTHERWISE SPECIFIED.
9. PUMP ACCESS HATCH CONFIGURATION AND DIMENSIONS SHALL BE CONFIRMED WITH EQUIPMENT SUPPLIER. DIMENSIONS SHOWN ARE MINIMUM VALUES ONLY.
10. ALL PIPING WITHIN THE PUMP STATION SITE SHALL BE D.I.P. FACTORY TYPE RESTRAINED JOINTS UNLESS OTHERWISE NOTED.
11. SEE STRUCTURAL, ELECTRICAL, INSTRUMENTATION, STANDARD AND MISCELLANEOUS DRAWING DETAILS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
12. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL TRADES AND SUBCONTRACTORS.
13. SEE ELECTRICAL PLAN DRAWINGS FOR LOCATION OF ELECTRICAL/ CONTROL PANEL AND CONNECTING CONDUITS.
14. DETAIL CONSTRUCTION PLANS, INCLUDING BUT NOT LIMITED TO EXCAVATION, SHEETING, SHORING, BRACING AND DEWATERING SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO CONSTRUCTION.
15. WETWELL AND VALVE VAULT MAY BE POURED IN PLACE OR PRECAST REINFORCED CONCRETE AT THE CONTRACTORS OPTION.
16. SMITH-BLAIR (TYP 913) OR DRESSER (STYLE 127) O/E, C.I. FLANGE ADAPTER COUPLINGS AND HARNESSED WITH A MINIMUM OF 4 LOCKING PINS. TEST PRESSURE RATING 150 PSI MINIMUM.
17. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS AGAINST FLOTATION OF WETWELL UNTIL ALL BACK FILL IS IN PLACE.
18. ALL CONCRETE SHALL BE CLASS A-A (4,000 PSI FOR PRECAST AND 3,000 PSI FOR CAST-IN-PLACE) UNLESS OTHERWISE SPECIFIED.
19. WETWELL WALL SHALL CONTAIN A MINIMUM OF 0.22 SQ. IN/LINEAR FOOT REINFORCEMENT, IN THE VERTICAL AND HORIZONTAL DIRECTIONS.
20. SEE SPECIFICATIONS AND ELECTRIC DRAWINGS FOR CONTROL PANEL DETAILS.

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Figure 4-3
City of Callaway
Lift Station General Notes

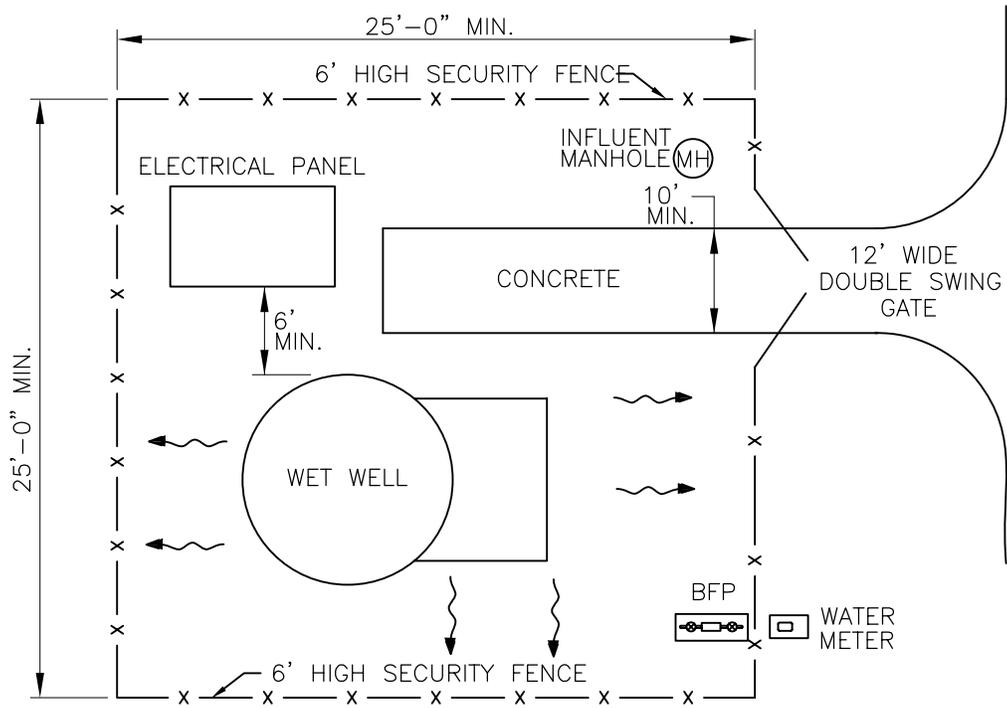
LIFT STATION DATA

LIFT STATION		
INITIAL NUMBER OF PUMPS	EA	
ULTIMATE NUMBER OF PUMPS	EA	
INITIAL DESIGN CONDITIONS	GPM/TDH	
TOP OF SLAB (WET WELL)	EL "A"	
TOP OF SLAB (VALVE VAULT)	EL "A"	
FINISH GRADE	EL "B"	
INVERT OF INFLUENT PIPE	EL "C"	
HIGH LEVEL ALARM	EL "D"	
LAG PUMP – ON	EL "E"	
LEAD PUMP – ON	EL "F"	
ALL PUMPS – OFF	EL "G"	
LOW LEVEL ALARM	EL "H"	
PUMP SUCTION	EL "J"	
WET WELL BASE SLAB	EL "K"	
EFFLUENT FORCE MAIN PIPE	EL "L"	
VALVE VAULT BASE SLAB	EL "M"	
INFLUENT PIPE	DIA "N"	
PUMP DISCHARGE	DIA "O"	
DISCHARGE	DIA "P"	
FORCE MAIN PIPE	DIA "FM"	
WET WELL DIAMETER	DIA "Q"	
PUMP HATCH	DIM "R"	
PUMP HATCH	DIM "S"	
VALVE VAULT HATCH	DIM "T"	
VALVE VAULT HATCH	DIM "U"	
☉ OF W.W TO BACK OF HATCH	DIM "V"	
☉ OF W.W TO ☉ OF DISCHARGE	DIM "W"	
☉ OF W.W TO ☉ OF PUMPS	DIM "X"	
PUMP BASE TO W.W. BOTTOM	DIM "Y"	
VALVE VAULT WIDTH	DIM "AA"	
VALVE VAULT LENGTH	DIM "BB"	

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Figure 4-4
City of Callaway
Lift Station Data



NOTES:

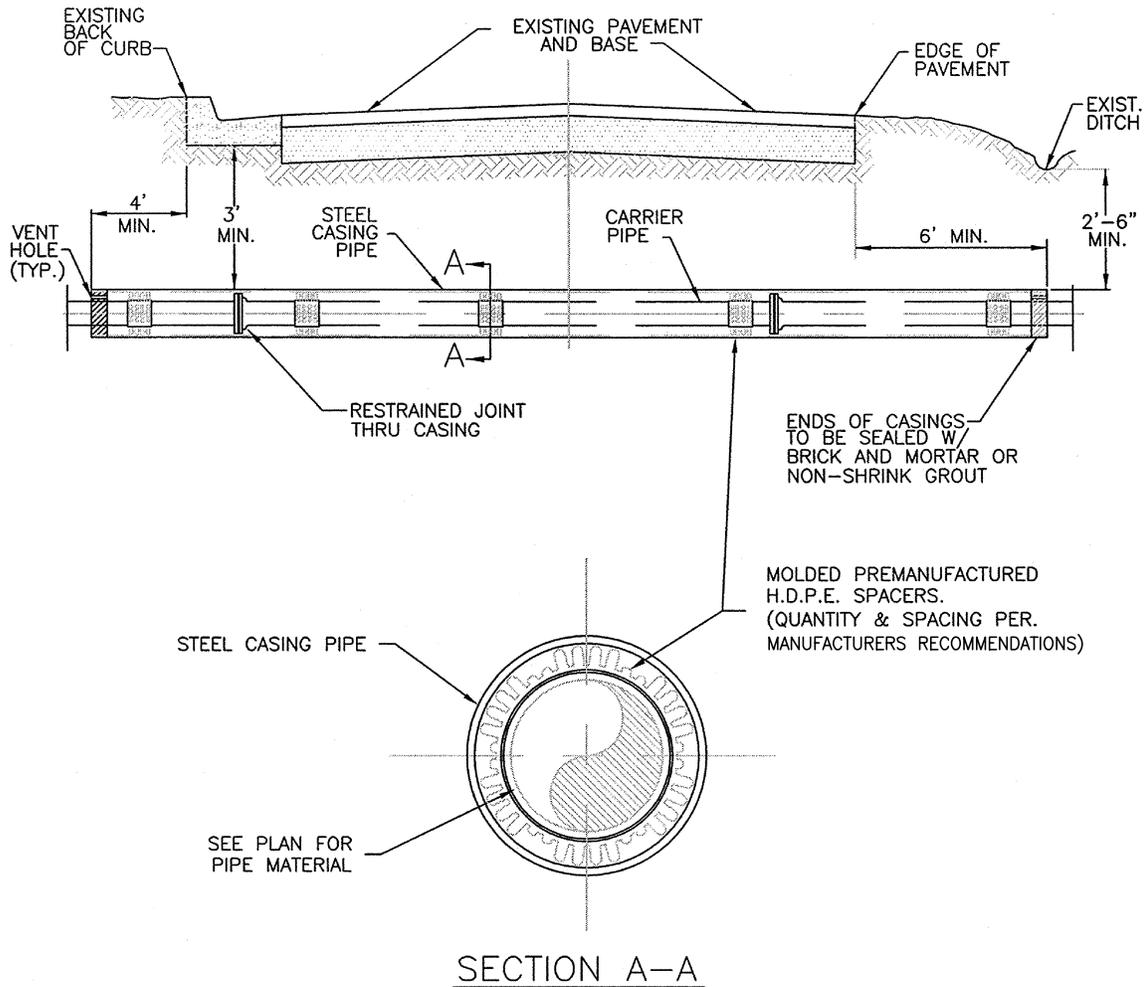
1. 6' HIGH FENCE (TO CONFORM WITH SURROUNDINGS) DIMENSIONS, CONFIGURATION & GATE, MAY VARY WITH EACH LOCATION. CITY L/S PERSONNEL TO VERIFY LOCATION OF GATE PRIOR TO INSTALLATION.
2. STORMWATER FLOW SHALL BE DIRECTED AWAY FROM LIFT STATION SITE.
3. ALL INFLUENT LINES TO LIFT STATION MUST BE ROUTED TO THE INFLUENT MANHOLE TO THE WET WELL, A SINGLE GRAVITY LINE SHALL CONNECT THE INFLUENT MANHOLE TO THE WET WELL, AT A DISTANCE OF NO GREATER THAN 30 FEET.

TYPICAL LIFT STATION SITE PLAN
NTS



Figure 4-5
City Of Callaway
Lift Station Site Plan

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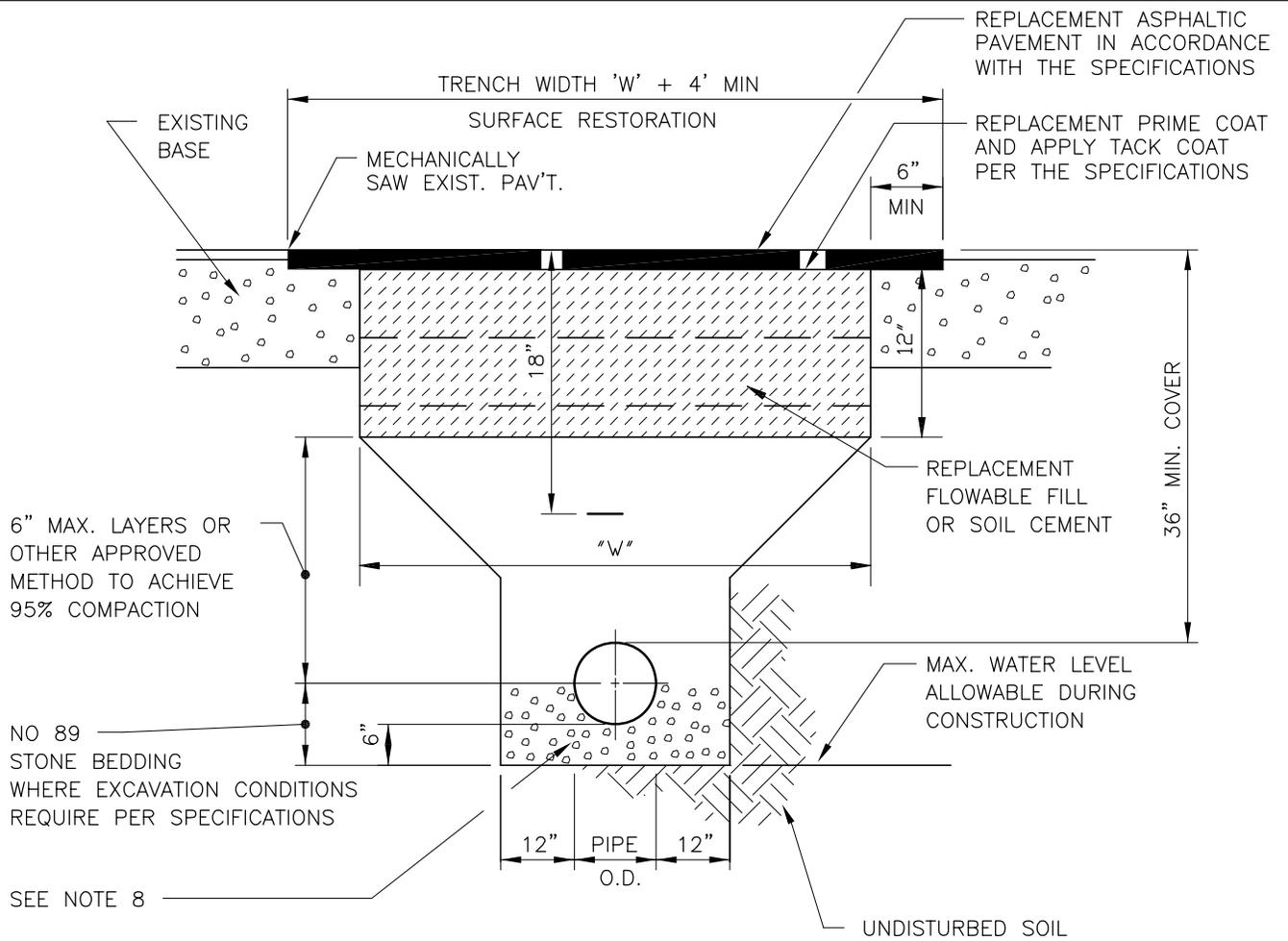
NOTES:

1. WHEN CONSTRUCTION IS WITHIN FDOT JURISDICTION, ADDITIONAL REQUIREMENTS OF THE UTILITY ACCOMMODATION GUIDE SHALL BE MET.
2. WHERE PRACTICAL, CASING SHALL EXTEND 10' BEYOND EDGE OF PAVEMENT AND SHALL NOT BE LESS THAN 6' BEYOND EDGE OF PAVEMENT IN ANY CASE. THE CITY MAY REQUIRE LONGER CASING FOR DEEPER BORES.
3. CASING PIPE JOINTS SHALL BE MADE BY USING A FULL CIRCUMFERENCE COMPLETE PENETRATION GROOVE WELD.

CARRIER & CASING SIZE										
CARRIER	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
CASING	12"	14"	16"	18"	20"	24"	30"	30"	30"	36"
CASING / WALL THICKNESS	0.250"	0.250"	0.250"	0.250"	0.250"	0.250"	0.312"	0.312"	0.312"	0.375"



Figure 6-1
City of Callaway
Jack and Jill Bore Detail



6" MAX. LAYERS OR OTHER APPROVED METHOD TO ACHIEVE 95% COMPACTION

NO 89 STONE BEDDING WHERE EXCAVATION CONDITIONS REQUIRE PER SPECIFICATIONS

SEE NOTE 8

NOTES:

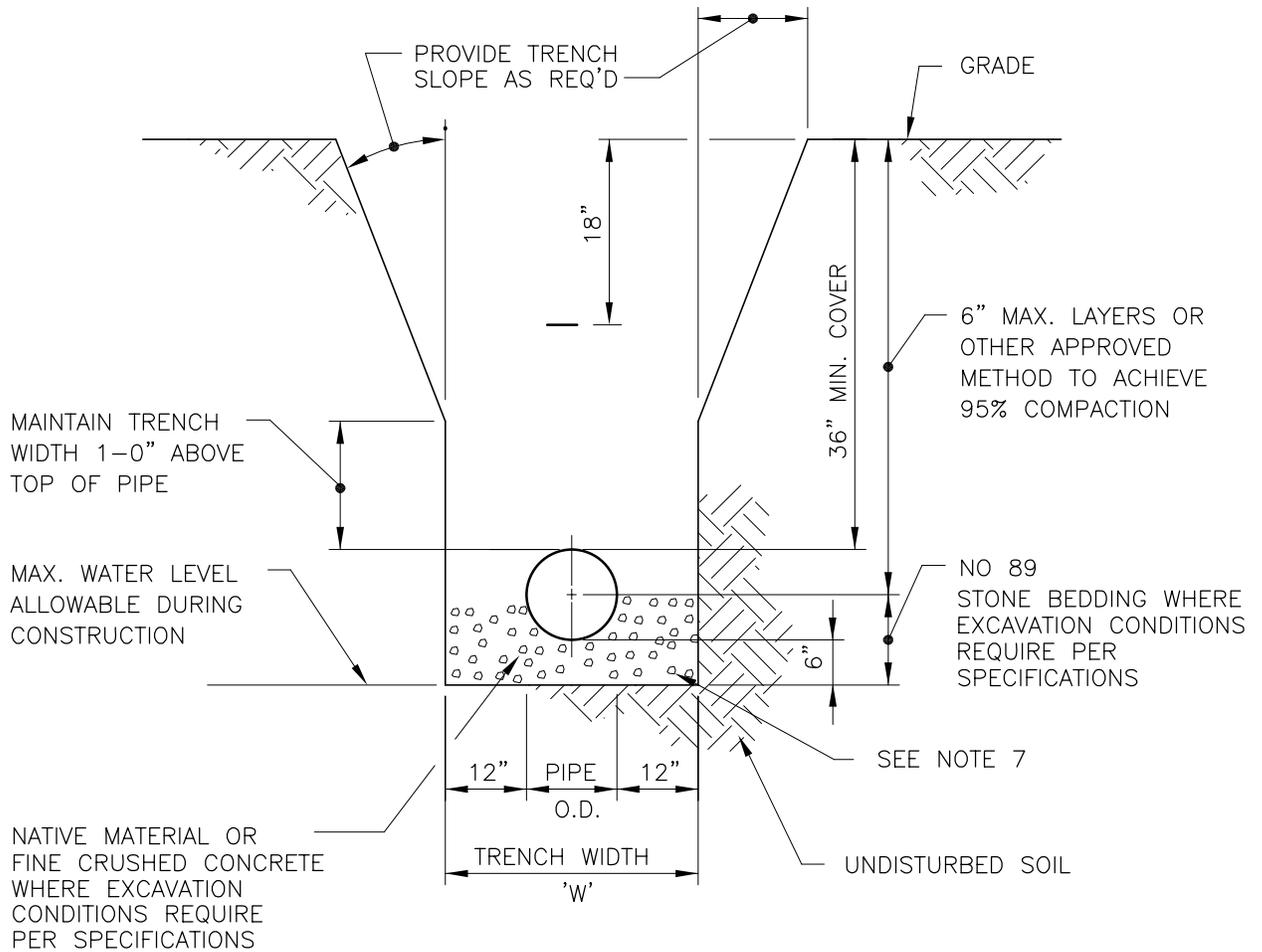
1. WHERE SOIL CONDITIONS CAN NOT BE MAINTAINED AS SHOWN ABOVE, PROVIDE ALTERNATE METHOD OF CONSTRUCTION TO COMPLY WITH THE FLORIDA TRENCH SAFETY ACT.
2. SHEETING WILL BE REQUIRED AS DETERMINED IN THE FIELD.
3. NEW SURFACING MATERIALS SHALL BE CONSISTENT WITH EXISTING AND SHALL HAVE LAPPED AND KEYED JOINTS (1 1/2" MIN. THK.)
4. COMPACTION PERCENTAGES SHOWN REFER TO A.A.S.H.T.O. T-180.
5. FOR PVC AND HDPE PIPE - INSTALL MINIMUM 12-GAUGE COPPER TRACE WIRE OVER FULL LENGTH OF PIPE. SEE SPECIFICATIONS.
6. THE BACK FILL MATERIAL SHALL HAVE NO MORE THAN 15 PERCENT PASSING THE NUMBER 200 SIEVE. WHEREVER POSSIBLE, USE IN-SITU MATERIAL FOR BACK FILL AND BEDDING.
7. ALL PIPE SHALL BE BURIED WITH IDENTIFICATION TAPE ABOVE THE TOP OF THE PIPE.
8. NO. 89 STONE BEDDING 6 INCHES BELOW INVERT TO SPRINGLINE WHERE EXCAVATION CONDITIONS REQUIRE PER SPECIFICATIONS.

(PAVED AREAS)
TRENCH DETAIL
 NTS

P:\10341\54843\30p\Report\ FIGURE8-1 01/17/08 12:36 SmithDR



Figure 8-1
 City Of Callaway
 Trench Detail



NOTES:

1. WHERE SOIL CONDITIONS CAN NOT BE MAINTAINED AS SHOWN ABOVE, PROVIDE ALTERNATE METHOD OF CONSTRUCTION TO COMPLY WITH THE FLORIDA TRENCH SAFETY ACT.
2. SHEETING WILL BE REQUIRED AS DETERMINED IN THE FIELD.
3. COMPACTION PERCENTAGES SHOWN REFER TO A.A.S.H.T.O. T-180.
4. FOR PVC AND HDPE PIPE – INSTALL MINIMUM 12-GAUGE TRACE WIRE OVER FULL LENGTH OF PIPE. SEE SPECIFICATIONS.
5. WHEREVER POSSIBLE, USE IN – SITU MATERIAL FOR BACK FILL AND BEDDING. THE BACK FILL MATERIAL SHALL HAVE NO MORE THAN 15 PERCENT PASSING THE NUMBER 200 SIEVE.
6. ALL PIPE SHALL BE BURIED WITH IDENTIFICATION TAPE ABOVE THE TOP OF THE PIPE.
7. NO. 89 STONE BEDDING 6 INCHES BELOW INVERT TO SPRINGLINE WHERE EXCAVATION CONDITIONS REQUIRE PER SPECIFICATIONS.

(UNPAVED AREAS)
TRENCH DETAIL
NTS



Figure 8-2
City Of Callaway
Trench Detail