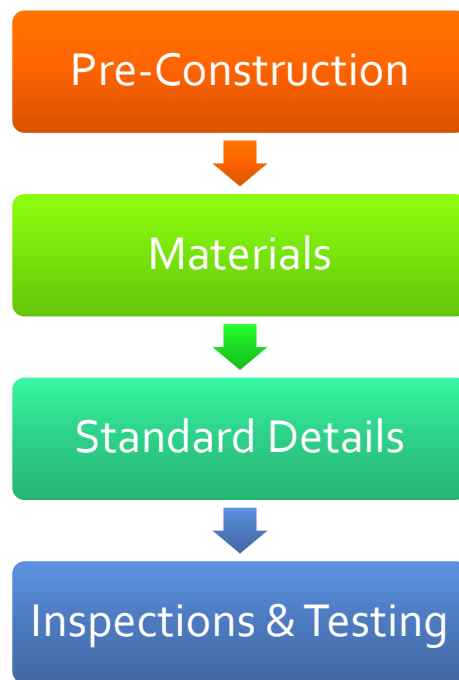




GRANGER-HUNTER
IMPROVEMENT DISTRICT

Improving quality of life today – creating a better tomorrow

2020 Material and Construction Specifications For Water and Wastewater Systems



Granger-Hunter Improvement District Engineering Department

2888 South 3600 West, West Valley City, UT 84119

T: 801-968-3551 E: plans@ghid.org

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- ❖ AASHTO – American Association of State Highway and Transportation Officials
- ❖ ADS – Polyethylene Material
- ❖ APWA – American Public Works Association
- ❖ ASTM – American Society of Testing and Materials
- ❖ CC – Center to Center
- ❖ CI – Cast Iron
- ❖ CORP- Corporation
- ❖ CTS – Copper Tube Size
- ❖ DI – Ductile Iron
- ❖ DIAM – Diameter
- ❖ FIP – Female Iron Pipe
- ❖ FM (Grease) – Food Grade (Grease)
- ❖ GHID – Granger-Hunter Improvement District
- ❖ H-20 – Traffic Loading (AASHTO Load Rating)
- ❖ ID – Inside Diameter
- ❖ MAX – Maximum
- ❖ MH – Manhole
- ❖ MIL – Thickness (1 MIL =1/1000 of an inch)
- ❖ MIN – Minimum
- ❖ MIP – Male Iron Pipe
- ❖ MJ – Mechanical Joint
- ❖ NO- Number
- ❖ OC – On Center
- ❖ OD- Outside Diameter
- ❖ OSHA – Occupational Safety and Health Administration
- ❖ PVC – Polyvinyl Chloride
- ❖ SDR – Standard Dimension Ratio
- ❖ SS – Stainless Steel
- ❖ TYP –Typical
- ❖ WVC – West Valley City

Pre-Construction



New Construction

Prior to construction of water and wastewater lines, all plans must undergo a review process to determine if the proposed improvements meet GHID standards. The following is a general outline of the process:

- The Owner shall complete the Availability and Plan Submittal Application, pay the fee.
- The Owner shall finalize any easements and/or rights-of-way documents necessary.
- After plan approval, GHID shall issue a Letter of Availability (and sign the plat if applicable).
- The Owner shall schedule a pre-construction meeting, where they will pay the impact and inspection fees and sign the development agreement (for construction of public infrastructure).

Copies of GHID's Development Agreement, Availability & Plans Submittal Application, requirements and connection fees are available on our website at <https://www.ghid.org/engineering.html>. E-mail final plans to plans@ghid.org. Each plan set must be accompanied by a completed plan submittal checklist. West Valley City's standard plans are available here: <https://www.wvc-ut.gov/1592/West-Valley-City-Engineering-Standards>.



Modifications/Improvements to Existing Infrastructure

A plan review of improvements of existing infrastructure is required whenever the water, sewer, irrigation, or fire protection systems are being modified. Owners are responsible to contact GHID and fill out an Availability & Plans Submittal Application. Fees will be assessed on the type of improvements made. Forms are available on GHID's website at <https://www.ghid.org/engineering.html>



Contractors

The following items will be required before work may commence:

- Submittal of Contractor's License and Permit Bond.
- General Liability Insurance Certificate.
- Workers Compensation and Employer's Liability Certificate, or State of Utah approved waiver.
- Approved set of drawings.
- Arrange for a Pre-Construction meeting with District inspectors by calling 801-968-3551.
- 24-hour notification is required for all inspections. Inspections are available Monday-Thursday. 8:00 AM to 4:00 PM, excluding holidays.

Design Specifications

Water System









- The design of the improvements shall be consistent with West Valley City's Fire Department fire flow requirements.
- All materials that come into contact with drinking water shall be ANSI/NSF 61 Certified.
- All pipe, joints, fittings, valves, and fire hydrants shall conform to AWWA Standards C104-C550 and C900-C950.
- Service laterals shall conform to the Utah Plumbing Code.
- Water mains not connected to hydrants shall be 6-inch minimum diameter. Water mains connected to hydrants shall be 8-inch minimum diameter.
- Water main valves shall be spaced not more than 500 feet in commercial districts and not more than 800 feet or one block in other areas. Water main valves shall be placed at all street and/or water main intersections.
- All dead-end water mains shall be provided with a fire hydrant or blow-off.
- At high points in water mains, air relief valves shall be installed per GHID Specifications.
- Pipe shall be buried at least 4 feet below ground surface.
- The open ends of all pipelines under construction shall be sealed at the end of each day.
- No used materials (valves, fittings, pipe, fire hydrants, etc.....) shall be used.
- Hydrant drains shall not be connected to, or located within, 10 feet of sanitary sewers or storm drains.
- No vaults with valves or blow-offs shall discharge directly to the storm drain or sewer system.
- In PRV Vaults, isolation valves shall be installed on both sides of the PRV.
- Service laterals shall not be connected to fire lines.
- Water meters shall be placed at adjoining property lines centered in the park strip or within one foot back from curb in accordance with District specifications.
- Only two meters (plus either a landscape/back-out meter) are allowed. Landscaping back-out meters must be smaller than the main meter.
- Owner is responsible to submit backflow reports to GHID Water Quality Department within 10 days of initial use and annually thereafter.









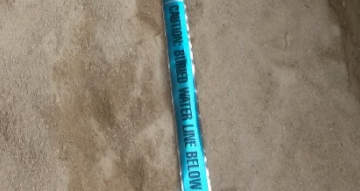

Wastewater System





- The maximum spacing for all sewer lines shall not exceed 400 feet.
- End all sewer mains with a manhole or cleanout.
- All building connections must have an exterior lateral cleanout within five feet of the building.
- Maximum spacing for all 4-inch cleanouts shall not exceed 60 feet.
- Maximum spacing for all 6-inch cleanouts shall not exceed 100 feet.
- All establishments that discharge fat, oil, grease or sand shall install a 1,000-gallon minimum interceptor and sampling manhole per District specifications.
- Sampling manholes and grease interceptors shall be placed where they are permanently accessible.
- All wastewater pipelines and laterals must conform to GHID's Typical Conflict Detail.
- All swimming pool drain lines must be limited to 50 GPM.
- Any business requiring a grease interceptor must have its own meter.
- Parking lots and car washes are required to install a sand/water separator.

Materials

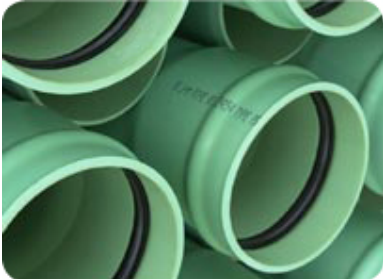





Water Materials



	<p>Water Mainline Pipe</p> <p>C-900 SDR 18 PVC</p> <p>Fittings shall be class 150 or 235 psi Minimum.</p>		<p>Fire Hydrants</p> <p>6" Waterous or Mueller.</p>
	<p>Water Valves</p> <p>Gate valve <= 12-inch. AVK, Clow or Mueller.</p> <p>Brass valve nuts required.</p>		<p>Tracer Wire</p> <p>#14 Insulated Solid Copper Electrical Tracer Wire. Tracer Wire must be continuity tested prior to paving.</p>
	<p>Mechanical Joint Restraints</p> <p>Megalug or Romac grip rings or equivalent</p> <p>All accessory packs to be PTFE or SS</p>		<p>Valve Boxes</p> <p>Cast Iron adjustable with cover labeled "WATER"</p> <p>D&L M-8045-02 Heavy Weight Valve Box Lid or equivalent</p>
	<p>Wrap</p> <p>10 Mil Polyethylene with corrosion tape</p>		<p>Grease</p> <p>FM Food Quality Grease</p> <p>Applied to all nuts and bolts</p>

	<p>Water Meters</p>		<p>Meter Rings and Lids</p>
	<p>Meter Box</p>		<p>Ford Coppersetter</p>
	<p>Stainless Tapping Sleeve</p>		<p>Service Line</p>
	<p>Corporation Stops</p>		<p>Check Valve</p>
	<p>Warning Tape</p>		<p>Snake Pit</p>
	<p>2" Wide 4mil thick Min.</p>		<p>CD14BLUTP</p>

	<p>Sampling Station</p>		<p>Brass Saddle</p>
	<p>Curb Stamps</p>		<p>Bonding Clamp</p>
<p>Kupferle #88-SS Eclipse</p>	<p>W for water lateral, S for sewer lateral</p>	<p>Ford 202BS with brass accessory packs</p>	<p>For Copper to Poly connection for tracer wire</p>

Wastewater Materials

	<p>Sewer Pipe</p>		<p>Nose-on</p>
	<p>PVC SDR 35</p>		<p>Inserta Tee or Equal</p>
	<p>Ring and Cover</p>		<p>Manhole</p>
	<p>D&L A1180 or Equal Labeled as shown</p>		<p>Concrete</p>
	<p>Grease Interceptor</p>		<p>Seal</p>
	<p>Concrete 1,000 gallon minimum</p>		<p>Kent seal (for joints in concrete manholes and grease interceptors)</p>
	<p>WhirlyGIG Manhole Riser Collar System</p>		<p>Cretex Pro-Ring</p>

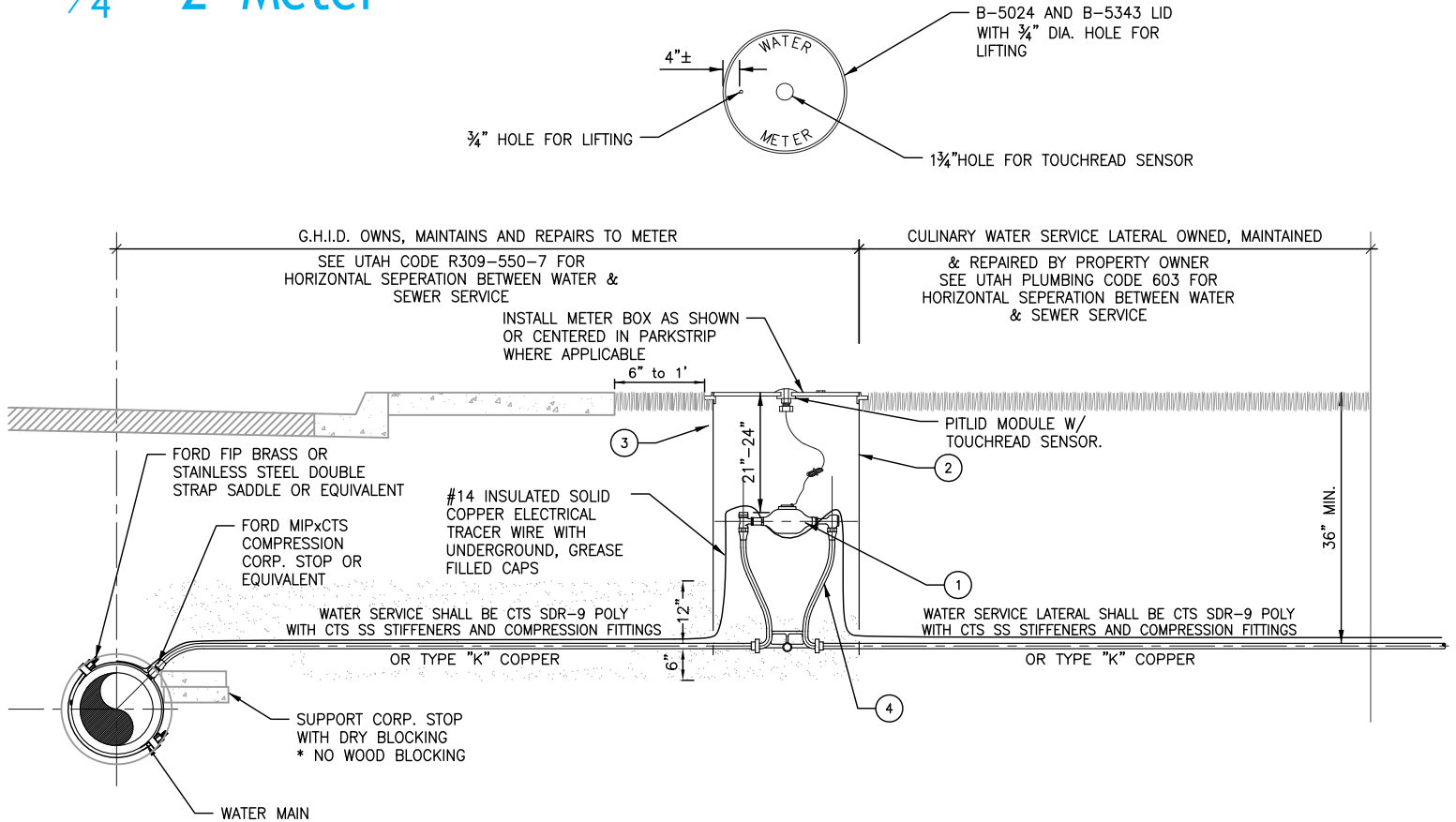
	<p>Shielded Ferrocement Connectors</p>		<p>No Hub Cleanout w/ brass plug</p>

Standard Details

General Notes

1	All construction in the pipe zone shall follow GHID specifications and requirements.
2	The existing water distribution system shall remain in service during construction.
3	It is the contractor's sole responsibility to locate and avoid any/all utilities.
4	All construction above the pipe zone shall follow West Valley City specifications and requirements.
5	All waterline and sewerline construction including, but not limited to, replacement of curb, sidewalk, etc. to be in accordance with APWA Standard Plans and Specifications (2017 edition). Refer to APWA plan 255 for pavement replacement.
6	Refer to GHID, WVC, APWA and OSHA requirements for trench details.
7	Contractor shall sawcut all trenches and provide a smooth clean edge for paving.
8	Select bedding and backfill is required 6" under, 12" on sides, and 12" over waterline, fireline, hydrant, fittings, services, and sewerline.
9	Minimum trench width shall be equal to outside pipe diameter plus 1 foot each side of pipe. (i.e. 12" pipe = 3 foot width)
10	Thrust blocks shall be installed in accordance with GHID specifications.

Typical Water Service with 3/4" - 2" Meter



WATER SERVICE PROFILE

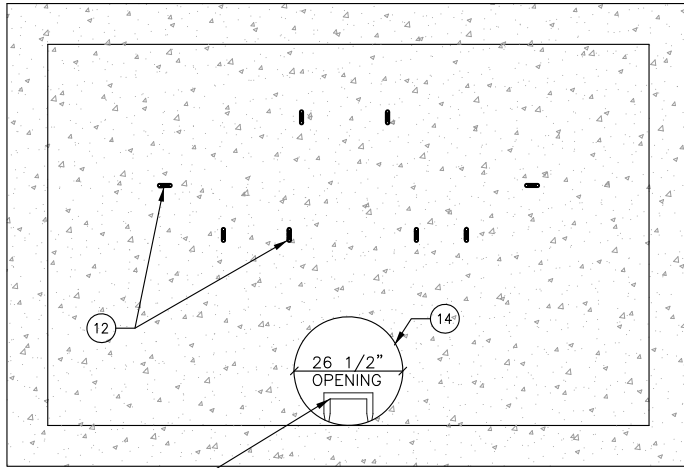
①		②		③		④	
METER SIZE	SENSUS METER TYPE	METER BOX SIZE		LID W/1-3/4" HOLE D&L FOUNDRY *		FORD COPPERSETTERS PART NO. *	
3/4"	iPERL 7-1/2"	24" DIA. x 36" DEEP **		B-5024		VBHC7218W4433QNL	
1"	iPERL	24" DIA. x 36" DEEP		B-5024		VBHC7418W4444QNL	
1 1/2"	OMNI	30" DIA. x 36" DEEP		B-5343		VBHH76184466NL	
2"	OMNI	30" DIA. x 36" DEEP		B-5343		VBHH77184477NL	

* - OR EQUIVALENT

NOTE:

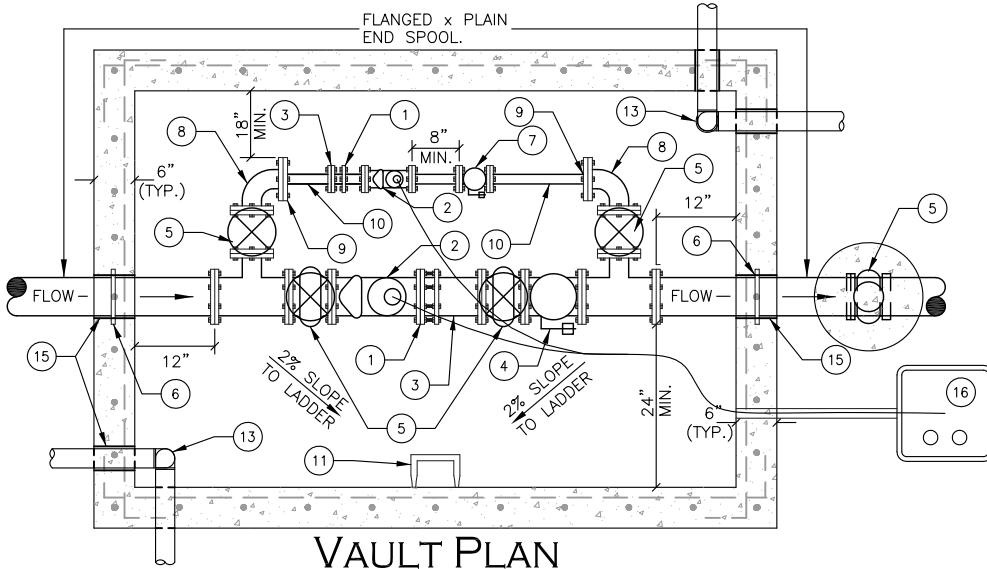
- SEE PAGE 12 FOR GENERAL NOTES.
- SEE TYPICAL SECTIONS FOR BEDDING AND BACKFILL
- MINIMUM TRENCH WIDTH SHALL BE EQUAL TO OUTSIDE PIPE DIAMETER PLUS 1' EACH SIDE OF PIPE.
- IF DAMAGE IS CAUSED TO WATER MAIN, DUE TO METER INSTALLATION AND/OR OTHER MEANS, CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
- WATER METER SHALL BE PLACED INLINE WITH WATER SERVICE, SERVICE DEFLECTION NOT TO EXCEED 1'. WATER METER TO BE PLACED PERPENDICULAR TO WATER SERVICE IF WATER SERVICE IS RELOCATED.
- METER BOX SHALL BE INSTALLED IN PARK STRIP, IF APPLICABLE, OR 6" TO 1' BEHIND SIDEWALK AND SET SUCH THAT THE TOP OF LID IS EQUAL TO THE SIDEWALK ELEVATION (TYPICAL).
- GREASE AND WRAP ALL EXTERNAL FITTINGS AND BOLTS WITH FM GREASE AND 8-MIL PLASTIC WRAPPED TIGHTLY WITH CORROSION TAPE.
- ALL BLOCKING MUST BE REINFORCED BY SECURE GROUND.
- 3/4"-2" METER SUPPLIED AND INSTALLED BY GHID.MATCH EXISTING MATERIALS WHEN DOING REPAIRS.
- METERS SHALL NOT BE PLACED IN DRIVEWAY. IF METER NEEDS TO BE MOVED MORE THAN 2' IN EITHER DIRECTION IT SHALL BE MOVED AT THE MAIN AND OLD LATERAL ABANDONED AT THE MAIN.
- WATER SERVICE TO BE MARKED WITH W AT CURB
- GRANGER-HUNTER IMPROVEMENT DISTRICT DOES NOT ALLOW COPPER SETTERS WITH A BYPASS.
- JUMPERS ARE NOT ALLOWED AND WILL BE ASSESSED A TAMPER FEE.

Typical Large Meter Vault



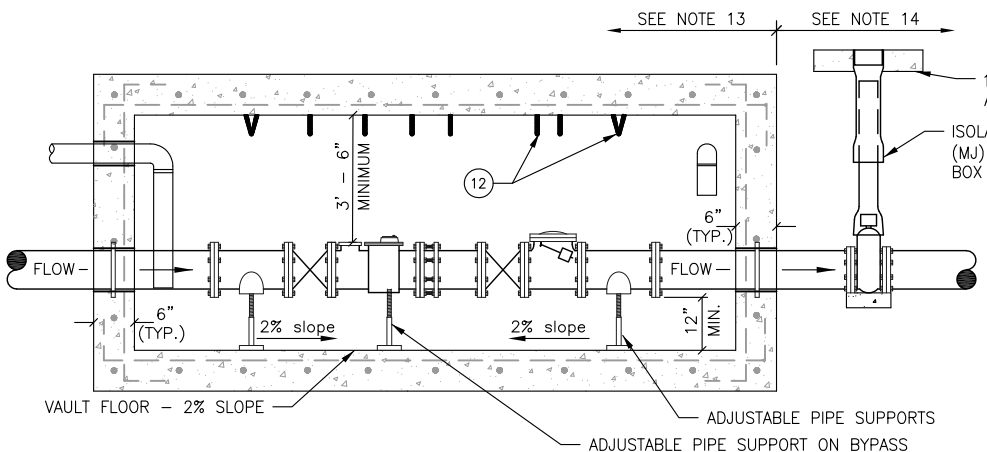
11 **ROOF PLAN**

- NOTE:
1. SEE PAGE 12 FOR GENERAL NOTES.
 2. ALL MANHOLES SHALL HAVE A CONCRETE COLLAR PER A.P.W.A. PLAN 574.
 3. VAULT AND PIPE BEDDING SHALL BE COMPACTED TO 95% MINIMUM ASTM D-1557.
 4. IF DAMAGE IS CAUSED TO WATER MAIN, DUE TO VAULT INSTALLATION AND/OR OTHER MEANS, CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
 5. NO MORE THAN ONE GRADE RING (1' MAX.) ALLOWED PER LID AND COLLAR.
 6. ALL FLANGED x PLAIN END SPOOLS TO BE PRE-CAST INTO VAULT WALLS BY VAULT MANUFACTURER.
 7. FOR TRAFFIC USE, VAULT WALLS SHALL BE 8" THICK (MIN.) WITH #5 EPOXY COATED REBAR 6" ON CENTER EACH WAY AND 4" ON CENTER AT "BEAMS."
 8. FOR NON TRAFFIC USE, VAULT WALLS SHALL BE 6" THICK (MIN.) WITH #5 EPOXY COATED REBAR 9" ON CENTER EACH WAY AND 6" ON CENTER AT "BEAMS."
 9. GREASE AND WRAP ALL EXTERNAL FITTINGS AND BOLTS WITH F.M. GREASE AND 8-MIL POLYTHYLENE WRAP TIGHTLY WITH CORROSION TAPE.
 10. WRAP ALL DUCTILE IRON PIPE WITH 8-MIL POLYTHYLENE TUBE WRAP.
 11. VAULT SHALL BE SUITABLE FOR H-20 LOADINGS.
 12. BYPASS SHALL BE 2".
 13. GHID OWNS, MAINTAINS, AND REPAIRS CULINARY WATER SERVICE TO THE BACK OF THE METER VAULT.
 14. CULINARY WATER SERVICE OWNED, MAINTAINED AND REPAIRED BY PROPERTY OWNER.
 15. VAULT TO BE ENGINEERED BY LICENSED STRUCTURAL ENGINEER, DRAWINGS TO BE PROVIDED TO GHID.
 16. BEDDING FOR VAULT TO BE 1" MINUS GRAVEL 12" THICK.

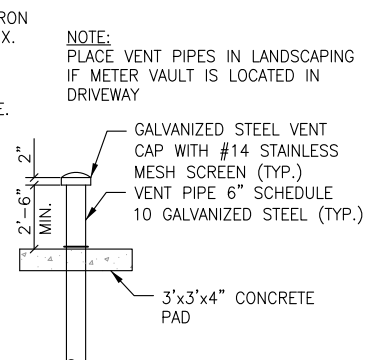


VAULT PLAN

- 1 FLANGED COUPLING ADAPTER
LENGTH = 3 x PIPE DIA.
- 2 SENSUS OMNI METER
- 3 FLANGED x PLAIN END PIECE. CUT TO FIT.
- 4 SWING CHECK VALVE
- 5 GATE VALVE 4" MINIMUM
- 6 PIPE RESTRAINT CAST INTO WALL. ALTERNATIVES AT DISCRETION OF ENGINEER.
- 7 SWING CHECK VALVE
- 8 4" 90° BEND
- 9 4" BLIND FLANGE W/TAPPED HOLE
- 10 2" COPPER OR BRASS, NO GALVANIZED.
- 11 ALUMINUM LADDER WITH EXTENSION, HALLIDAY MODEL L1B WITH L1E OR EQUAL
- 12 (8) 3/4" DIA. S.S. LIFTING EYES (TYPE 304) OVER ALL METERS AND VALVES
- 13 AIR PIPING
- 14 VAULT OPENING EJ 2600 SERIES 4-14" TALL COMPOSITE MANHOLE ASSEMBLY MARKED GHID WATER METER
- 15 LINK SEAL AROUND ALL INTRUSIONS
- 16 12"x12" IRRIGATION BOX W/1 3/4" HOLE FOR TOUCHREAD SENSOR. PLACE BOX IN LANDSCAPING DRILL (2) 2" HOLES IN VAULT TO RUN WIRE THROUGH. RUN 1 1/2" CONDUIT FROM VAULT TO SENSOR BOX.

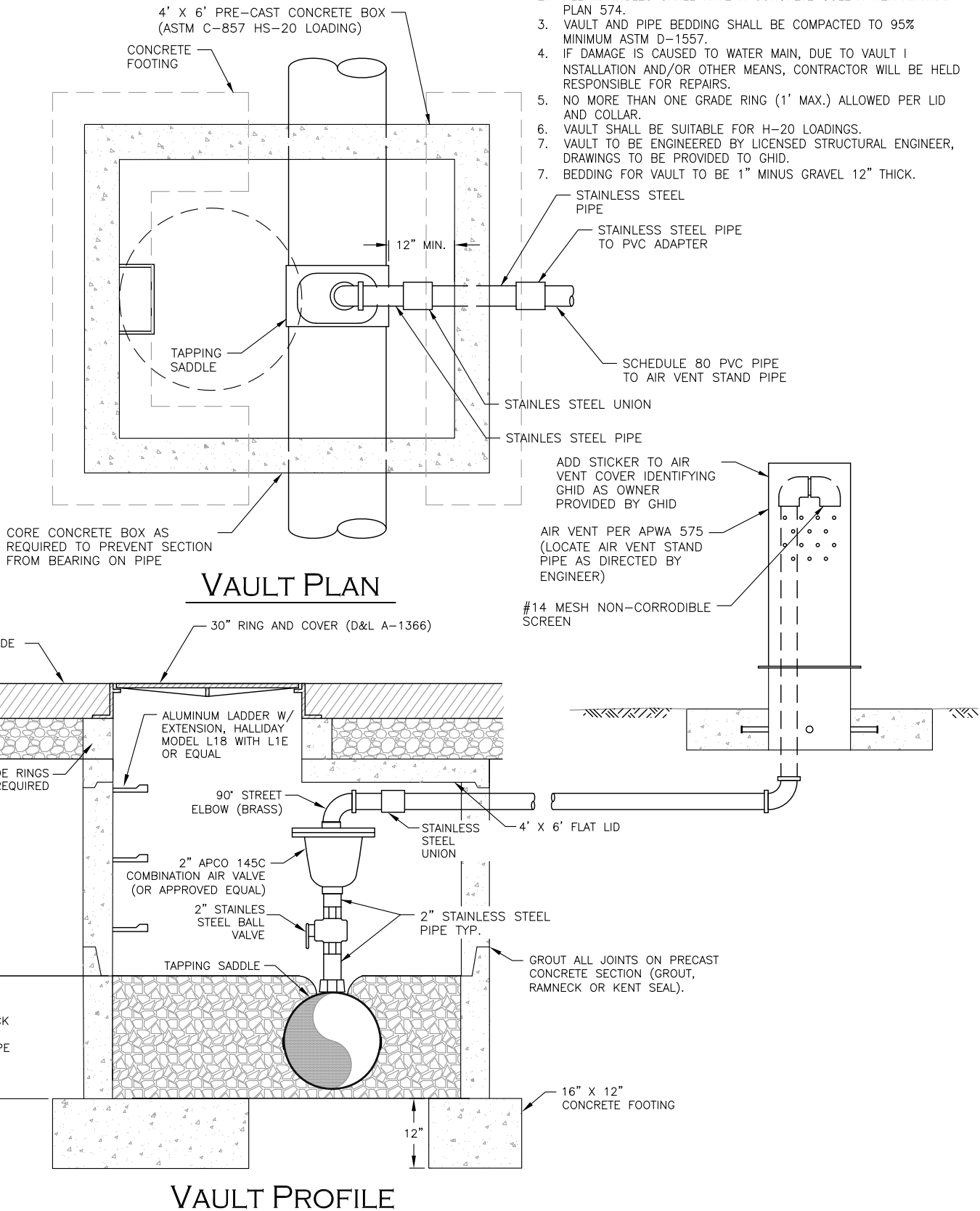


VAULT PROFILE

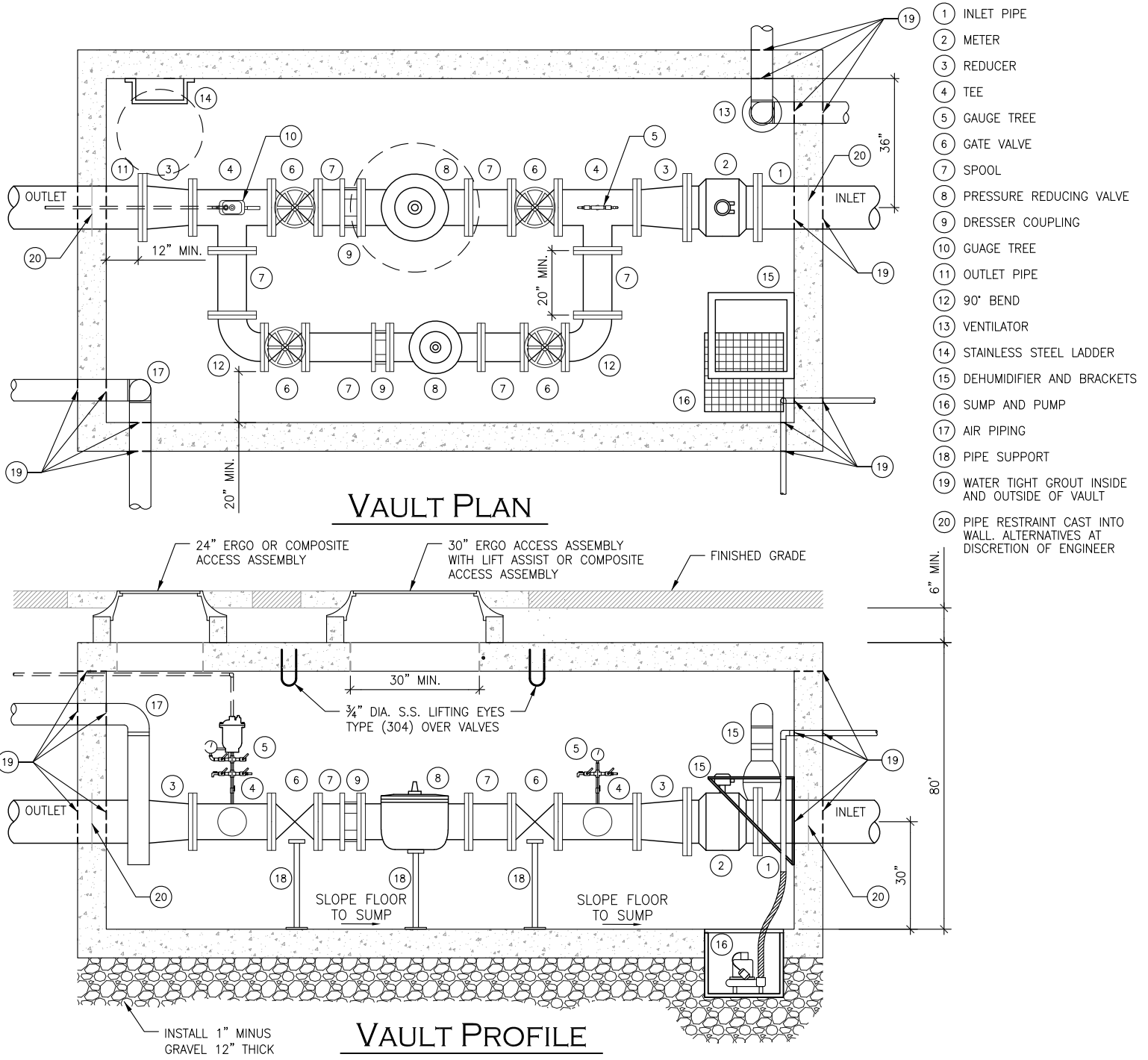


VENT DETAIL

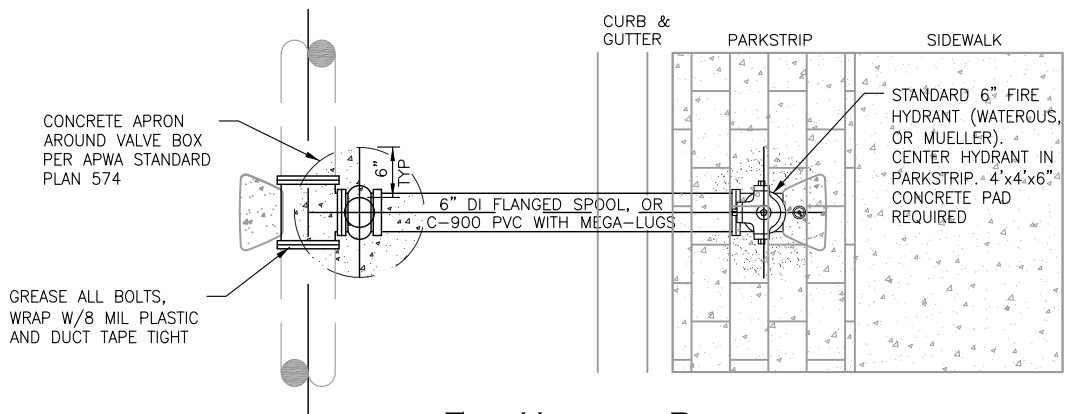
Air/Vacuum Release Assembly



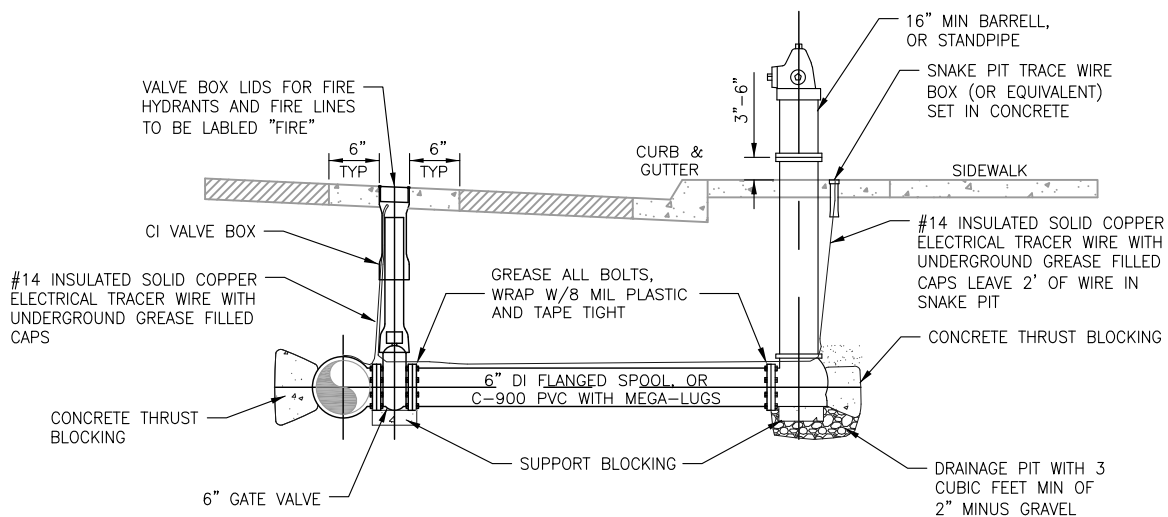
Pressure Reducing Valve



Typical Fire Hydrant



FIRE HYDRANT PLAN

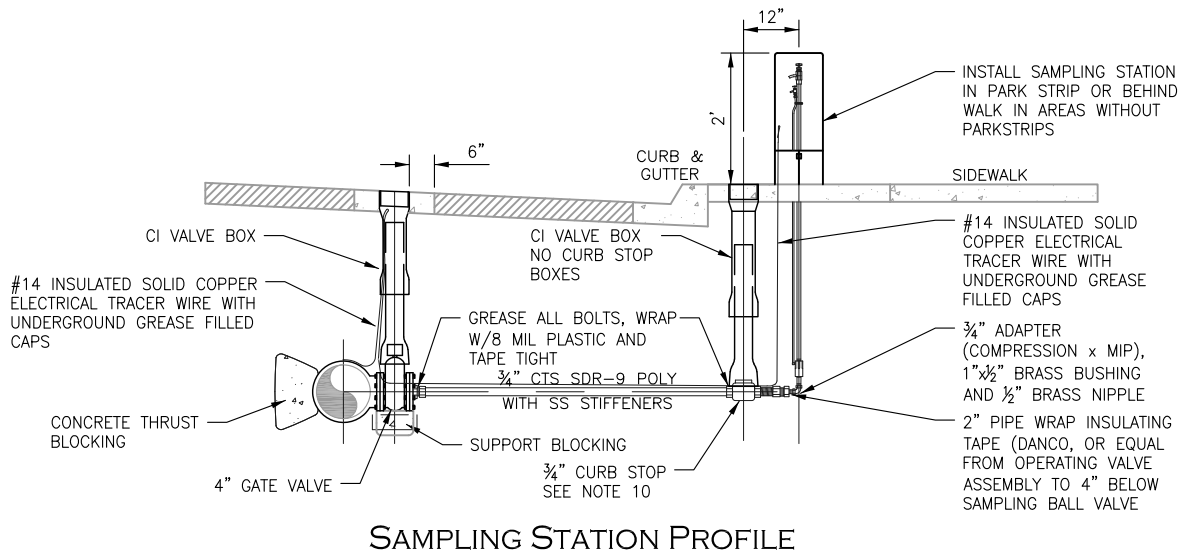
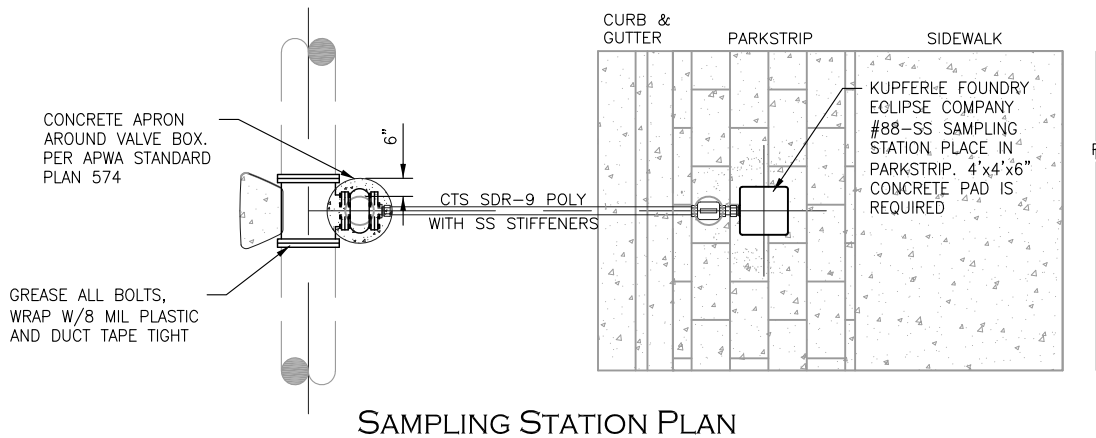


FIRE HYDRANT PROFILE

NOTE:

1. SEE PAGE 12 FOR GENERAL NOTES
2. SEE TYPICAL SECTIONS FOR BEDDING AND BACKFILL
3. BEDDING AND BACKFILL: DRY GROUND – SELECT SAND SHALL BE USED. WET GROUND – 3/4" MINUS SHALL BE USED. BEDDING SHALL BE COMPACTED TO 95% MIN. ASTM D-155
4. MINIMUM TRENCH WIDTH SHALL BE EQUAL TO OUTSIDE PIPE DIAMETER PLUS 1' EACH SIDE OF PIPE.
5. IF DAMAGE IS CAUSED TO WATER MAIN, DUE TO FIRE HYDRANT INSTALLATION AND/OR OTHER MEANS, CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
6. FIRE HYDRANT SHALL BE SET SUCH THAT THE BARREL, OR STANDPIPE, FLANGE IS 3" TO 6" ABOVE FINISH GRADE.
7. GREASE AND WRAP ALL EXTERNAL FITTINGS AND BOLTS WITH FM GREASE AND 8-MIL POLYETHYLENE AND WRAP TIGHTLY WITH CORROSION TAPE.
8. WRAP DI PIPE WITH 8-MIL POLYETHYLENE TUBE WRAP AND WRAP TIGHTLY WITH CORROSION TAPE.
9. DRAINAGE PIT MUST HAVE 3 CUBIC FEET (MINIMUM) OF 3/4" MINUS GRAVEL.
10. ALL THRUST BLOCKING MUST BE REINFORCED BY A UNDISTURBED GROUND.

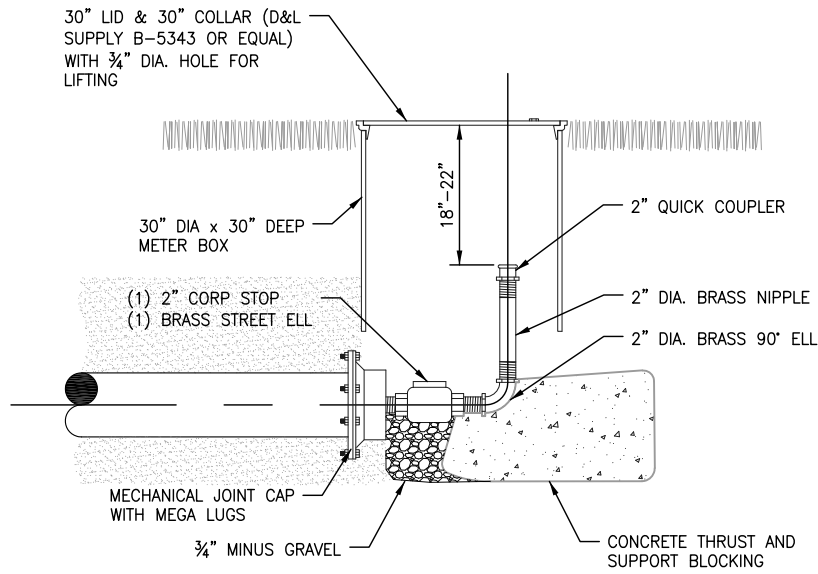
Typical Sampling Station



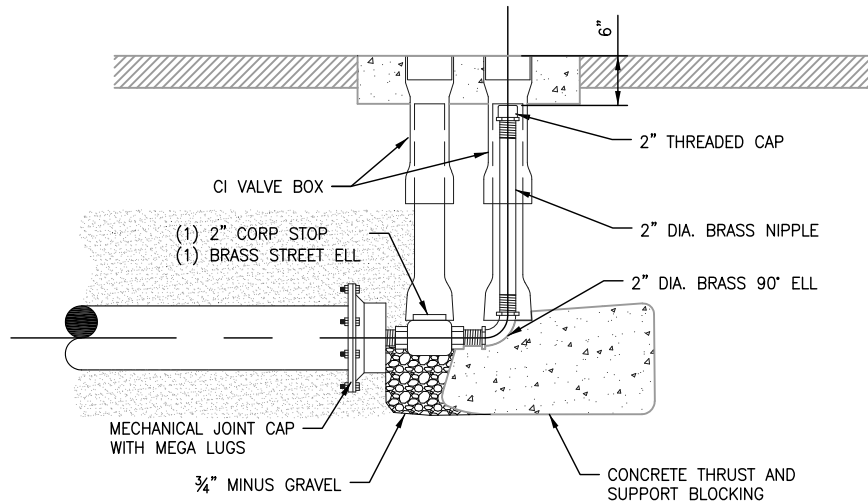
NOTE:

1. SEE PAGE 12 FOR GENERAL NOTES
2. SEE TYPICAL SECTIONS FOR BEDDING AND BACKFILL.
3. IF DAMAGE IS CAUSED TO MAIN LINE, DUE TO SAMPLING STATION INSTALLATION AND/OR OTHER MEANS, CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
4. TYPE OF PIPE SHALL BE CTS POLYETHYLENE WITH COMPRESSION FITTINGS, SS STIFFENERS, AND #14 INSULATED SOLID COPPER ELECTRICAL TRACER WIRE WITH UNDERGROUND GREASE FILLED CAPS.
5. SAMPLING STATION FINISH GRADE SHALL BE SET ACCORDING TO MANUFACTURER SPECIFICATIONS.
6. GREASE AND WRAP ALL EXTERNAL FITTINGS AND BOLTS WITH FM GREASE AND 8-MIL POLYETHYLENE WRAPPED TIGHTLY WITH CORROSION TAPE.
7. 2" PIPE WRAP INSULATING TAPE (DANCO, OR EQUAL) FROM OPERATING VALVE ASSEMBLY TO 4" BELOW SAMPLING BALL VALVE.
8. ALL THRUST BLOCKING SHALL BE REINFORCED BY A UNDISTURBED GROUND.
9. SAMPLING STATION SHALL BE INSTALLED IN PARK STRIP, IF APPLICABLE, OR 6" TO 1' BEHIND SIDEWALK.
10. CURB STOP REQUIRED ON ALL STREETS THAT WOULD TYPICALLY BE STRIPED.

Typical 2" Blow-Off



BLOW OFF IN LANDSCAPING

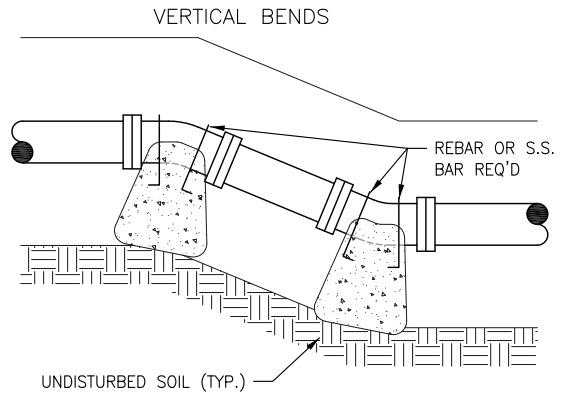
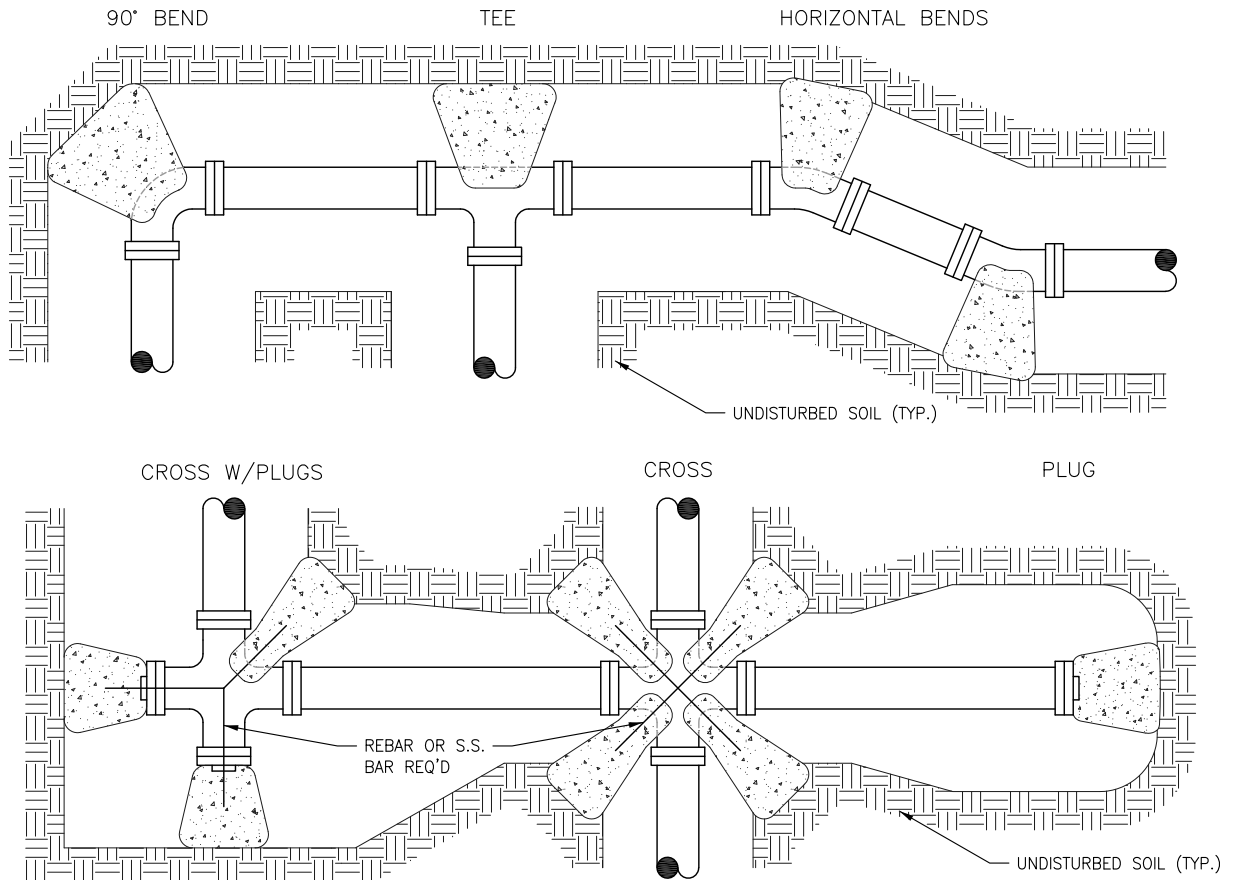


BLOW OFF IN ROADWAY

NOTE:

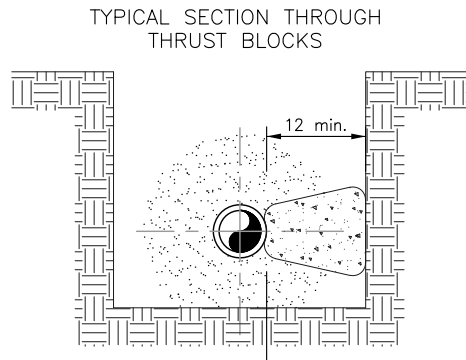
1. SEE PAGE 12 FOR GENERAL NOTES
2. TYPE OFF PIPE SHALL BE 2" SDR 9 POLY OR COPPER WITH ALL BRASS FITTINGS.
3. BLOW-OFF ASSEMBLY SHALL BE INSTALLED AS SHOWN OR OTHERWISE APPROVED BY GHID. GREASE AND WRAP ALL EXTERNAL FITTINGS WITH FM GREASE AND 8-MIL PLASTIC AND WRAPPED TIGHTLY WITH CORROSION TAPE.
4. ALL BLOCKING MUST BE REINFORCED BY UNDISTURBED GROUND.

Thrust Blocking Detail



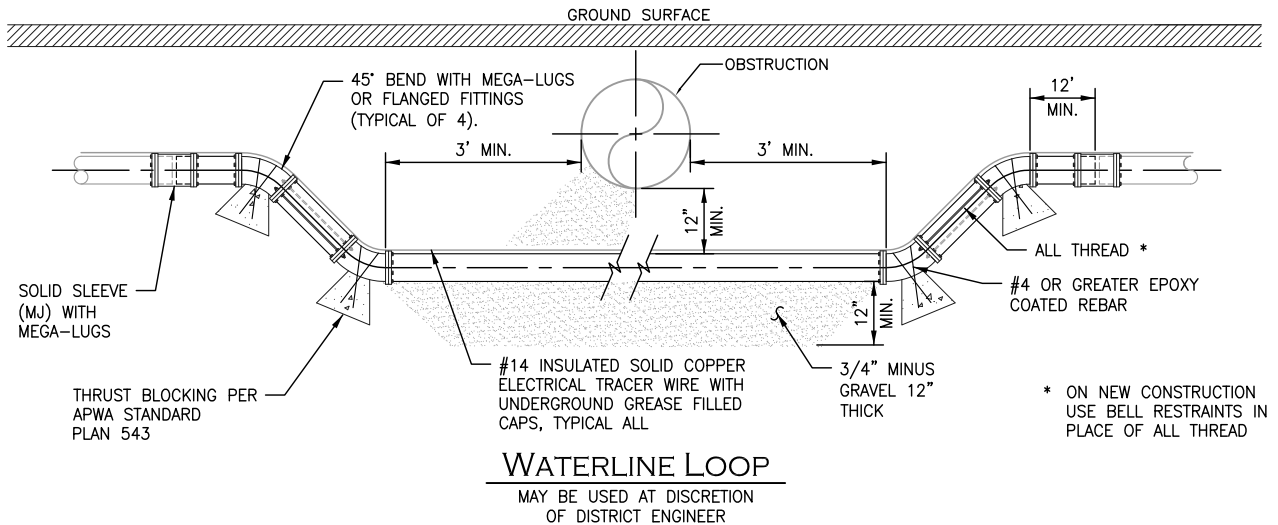
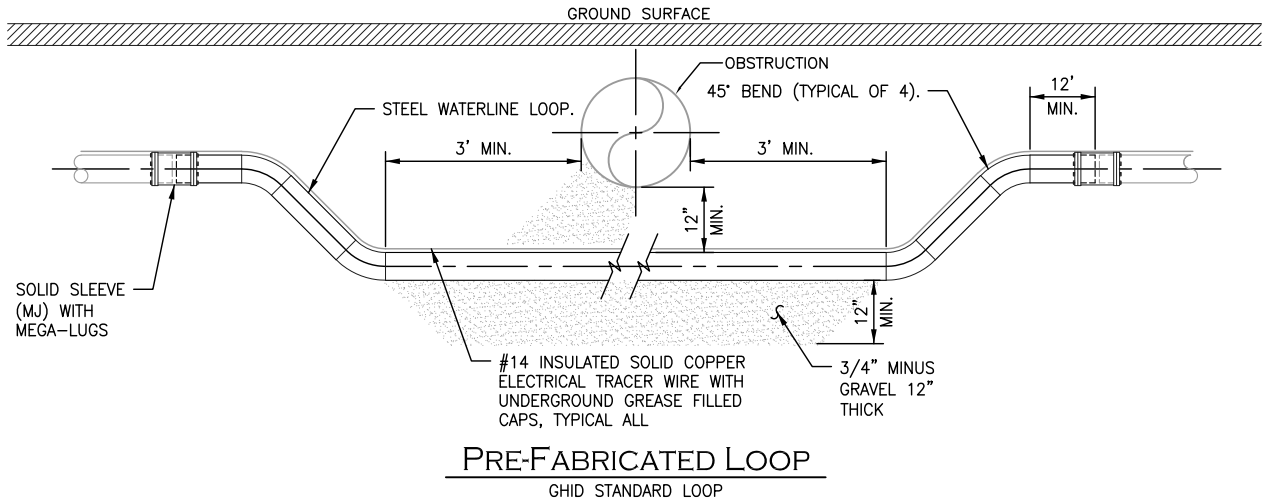
SIZE OF PIPE	MINIMUM BEARING AREA IN SQ. FT.					
	TEES, VALVES DEAD ENDS	90° BENDS	45° BENDS	22 1/2° BENDS	11 1/4° BENDS	
4"	2	3	2	2	2	
6"	4	5.5	3	2.5	2	
8"	6.5	9.5	5	2.75	2.5	
12"	14	20	11	5.5	3	
14"	19	26.5	14.5	7.5	4	
16"	24	34	18.5	9.5	6	
20"	27	52	28.5	14.5	9	
24"	53	74	41	21	12	
30"	81	114	62	32	16	

PER APWA PLAN 561



- NOTE:
1. ALL REBAR MUST BE #4 (MINIMUM) AND EPOXY COATED
 2. 3/8" (MINIMUM) STAINLESS STEEL BAR IS ACCEPTED IN PLACE OF REBAR.
 3. ALL THRUST BLOCK BEARING FACES SHALL BE POURED AGAINST UNDISTURBED SOIL, OR AN APPROVED COMPACTED BACKFILL
 4. CONCRETE USED FOR THRUST BLOCKING SHALL BE CLASS 6.0-B-3000.
 5. ALL THRUST BLOCK SIDES SHALL BE FORMED

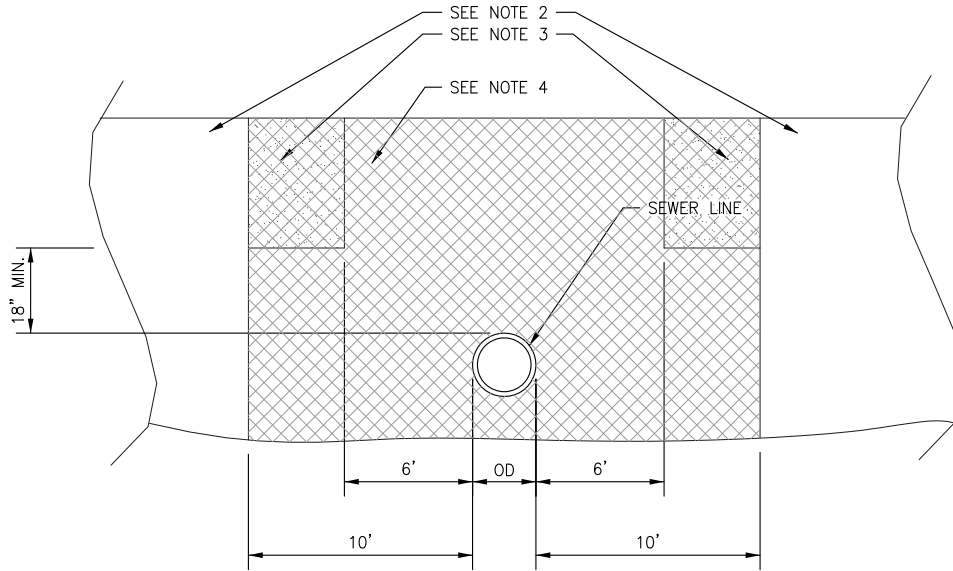
Typical Waterline Loops



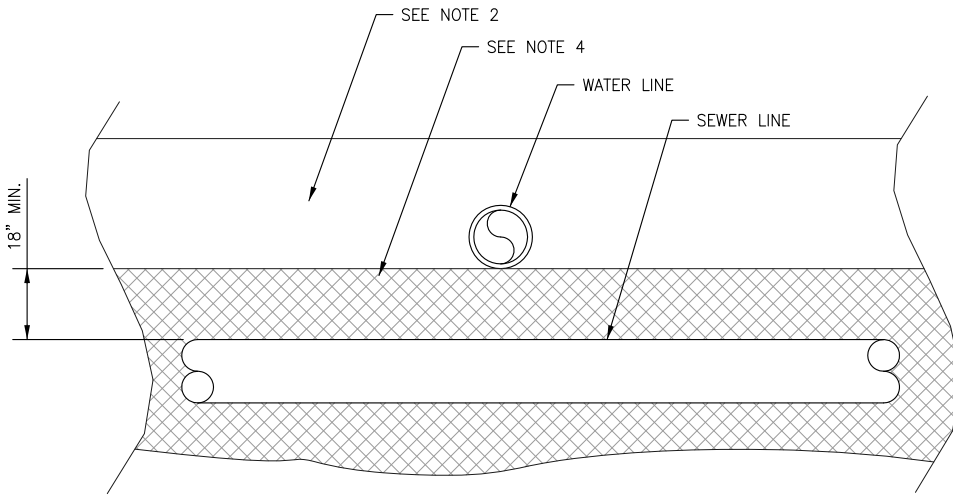
NOTE:

1. SEE PAGE 12 FOR GENERAL NOTES.
2. SELECT BEDDING AND BACKFILL IS REQUIRED 12" UNDER, ON SIDES, AND OVER WATERLINE LOOP.
3. WATERLINE LOOP BEDDING AND BACKFILL: 3/4" MINUS GRAVEL. BEDDING SHALL BE COMPACTED TO 95% MIN. ASTM D-1557.
4. WATERLINE BEDDING AND BACKFILL: DRY GROUND - SELECT SAND SHALL BE USED. WET GROUND - 3/4" MINUS GRAVEL SHALL BE USED. BEDDING SHALL BE COMPACTED TO 95% MIN. ASTM D-1557.
5. MINIMUM TRENCH WIDTH SHALL BE EQUAL TO OUTSIDE PIPE DIAMETER PLUS 1' EACH SIDE OF PIPE.
6. IF DAMAGE IS CAUSED TO WATER MAIN CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
7. PRE-FAB WATERLINE PIPE AND FITTINGS SHALL BE BUTT WELDED A53 GRADE B SCH. 80 STEEL FOR PIPES LESS THAN 12" DIAMETER AND SCH. 40 FOR PIPE GREATER THAN 12" DIAMETER, UNLESS OTHERWISE SPECIFIED BY GHID. ALL PIPE SHALL HAVE #14 INSULATED SOLID COPPER ELECTRICAL TRACER WIRE WITH UNDERGROUND GREASE FILLED CAPS.
8. REFER TO AWWA C210 FOR EPOXY COATING OR AWWA C214 FOR TAPE COATING DETAILS.
9. GREASE AND WRAP ALL EXTERNAL FITTINGS AND BOLTS WITH F.M. GREASE AND 8-MIL POLYETHYLENE AND WRAP TIGHTLY WITH CORROSION TAPE.
10. ALL THRUST BLOCKING MUST BE REINFORCED BY UNDISTURBED GROUND.
11. FOR CANAL OR RIVER CROSSINGS, A MINIMUM OF 2 FEET OF VERTICAL SEPERATION IS REQUIRED. FOR CROSSINGS GREATER THAN 15', RESTRAINED JOINTS SHALL BE USED UNDER THE WATERWAY AND FLEXIBLE RESTRAINED JOINTS USED AT BOTH EDGES, ISOLATING VALVES SHALL BE PROVIDED AT BOTH ENDS OF CROSSING, A SAMPLE TAP SHALL BE INSTALLED OUTSIDE THE FLOOD AREA TO ENABLE TESTING OF THE SECTION, AND PRESSURE TESTING MUST BE COMPLETED ON THE SECTION PRIOR TO PLACING IT INTO SERVICE.

Typical Conflict Resolution



PARALLEL PIPES

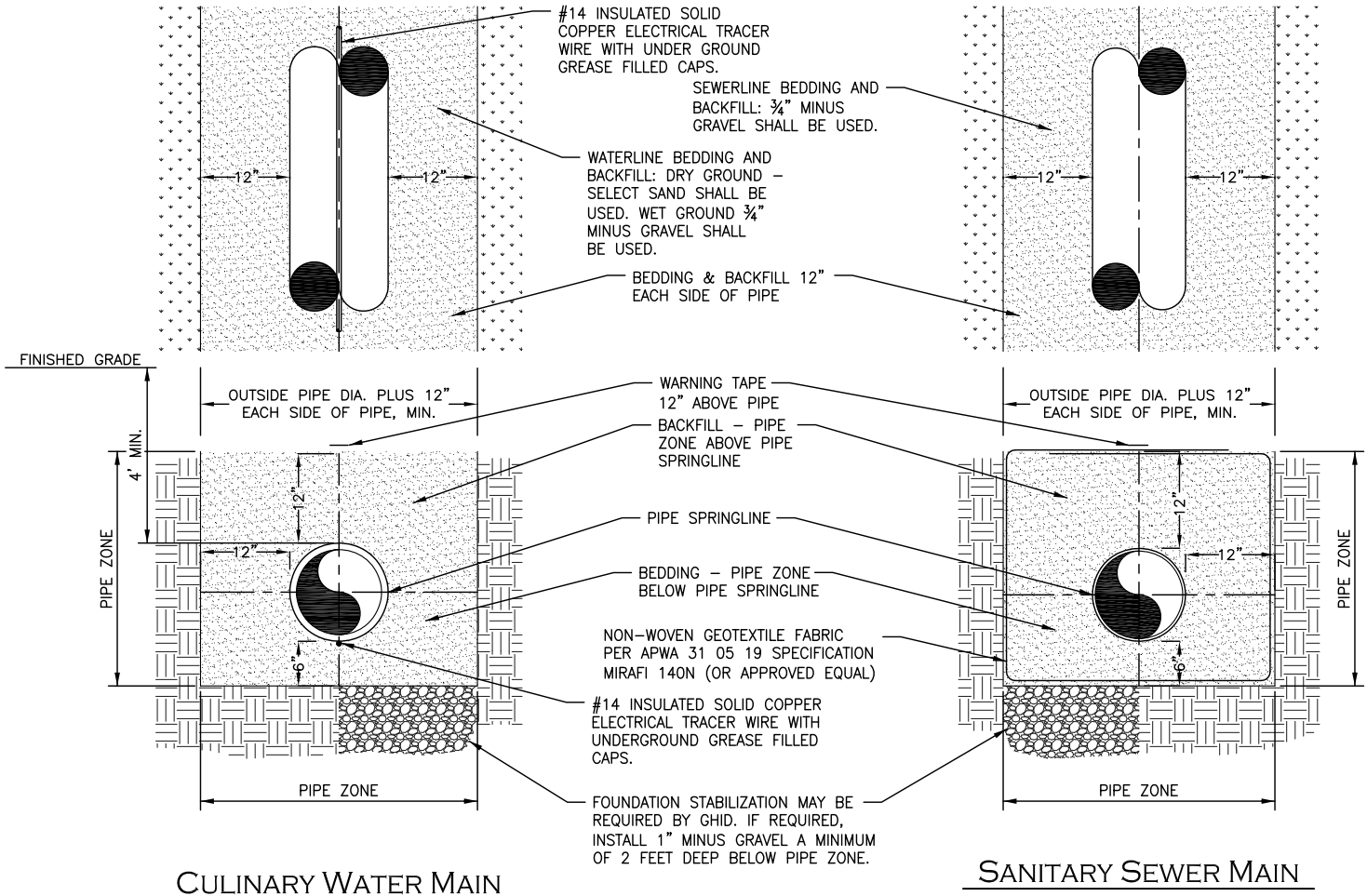


CROSSING PIPES

NOTE:

1. SEE PAGE 12 FOR GENERAL NOTES.
2. MEETS BASIC SEPARATION STANDARDS.
3. MUST APPLY FOR A VARIANCE PER R309-550-7
4. MUST APPLY FOR EXCEPTION PER R309-105-6(2)(b)
5. WATER MAINS AND SEWER LINES SHALL NOT BE INSTALLED IN THE SAME TRENCH.
6. IF SEWER IS FORCE MAIN, SEWER SHALL BE ENCASED IN A CONTINUOUS SLEEVE WITHIN 10' OF WATERLINE
7. IF WATER MAIN IS OVER FORCE MAIN, WATER MAIN WILL BE RATED FOR 200 PSI MINIMUM.

Typical Trench Specifications

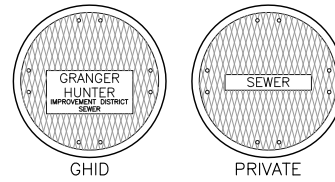


NOTE:

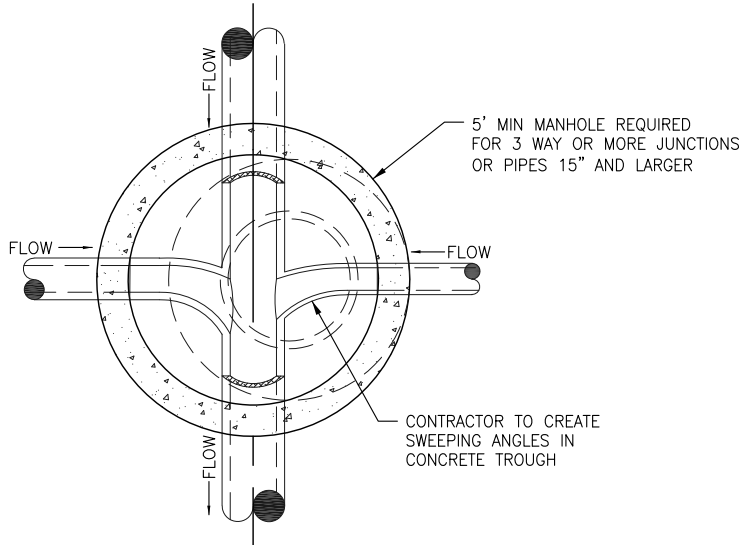
1. SEE PAGE 12 FOR GENERAL NOTES.
2. CONTRACTOR TO SAWCUT ALL TRENCHES AND PROVIDE A SMOOTH CLEAN EDGE FOR PAVING.
3. SELECT SAND BEDDING AND BACKFILL IS REQUIRED 6" UNDER, 12" ON SIDES AND 12" OVER WATERLINE, SEWERLINE, FITTINGS, SERVICES, AND METERS.
4. BEDDING AND BACKFILL: WATERLINE CONSTRUCTED IN DRY GROUND - SELECT SAND SHALL BE USED. WATERLINE CONSTRUCTED IN WET GROUND AND SEWERLINE - 3/4" MINUS GRAVEL SHALL BE USED. BEDDING SHALL BE COMPACTED TO 95% MINIMUM ASTM D-1557.
5. MINIMUM TRENCH WIDTH SHALL BE EQUAL TO OUTSIDE PIPE DIAMETER PLUS 1' EACH SIDE OF PIPE.
6. IF DAMAGE IS CAUSED TO WATER AND/OR SEWER MAIN CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
7. GREASE AND WRAP ALL EXTERNAL FITTINGS AND BOLTS WITH F.M. GREASE AND 8-MIL PLASTIC WRAPPED TIGHTLY WITH CORROSION TAP
8. ALL BLOCKING MUST BE REINFORCED BY UNDISTURBED GROUND.
9. SUBMISSION OF QUALITY CONTROL COMPACTION TEST RESULT DATA FOR BEDDING MAY BE REQUESTED, BY GHID, AT ANY TIME. CONTRACTOR IS TO PROVIDE RESULTS OF TESTS IMMEDIATELY UPON REQUEST.
10. FOR ALL NON-METALLIC CULINARY WATERLINES AND PRESSURE SEWERLINES INSTALL #14 INSULATED SOLID COPPER ELECTRICAL TRACER WIRE. TRACER WIRE TO BE CONTINUITY CHECKED PRIOR TO PAVING.
11. ALL PIPE BEDDING & BACKFILL SHALL BE INSTALLED & COMPACTED IN 8-INCH MAXIMUM LIFTS.

Select Sand Gradation	
US Sieve Size	% Passing by Weight
3/8"	100
#4	90-100
#50	10-40
#100	3-15
#200	0-7

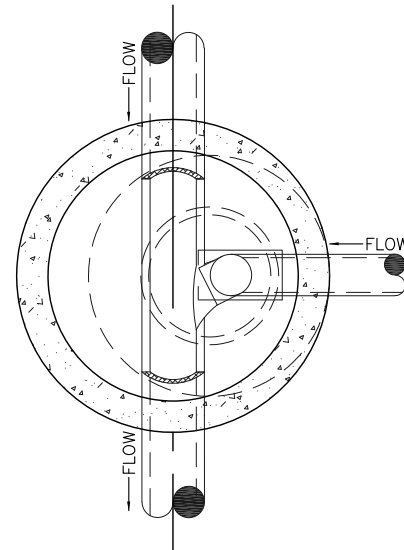
Typical Sanitary Sewer Manhole



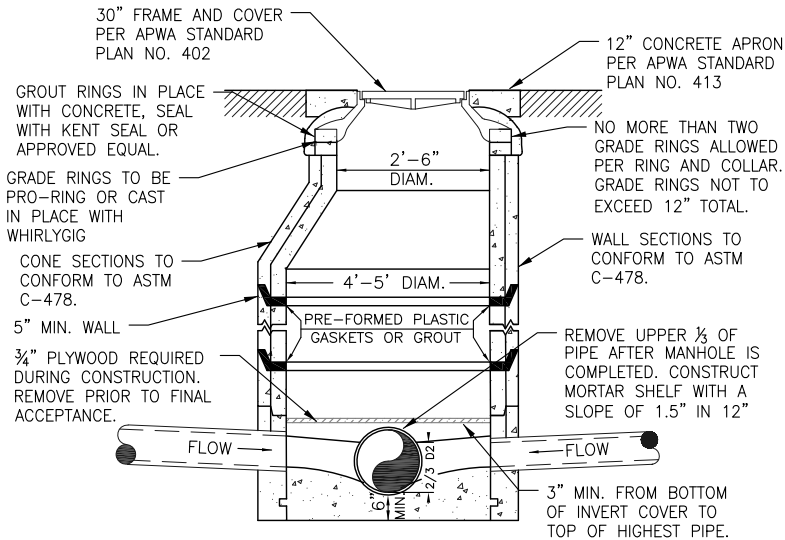
MANHOLE COVERS



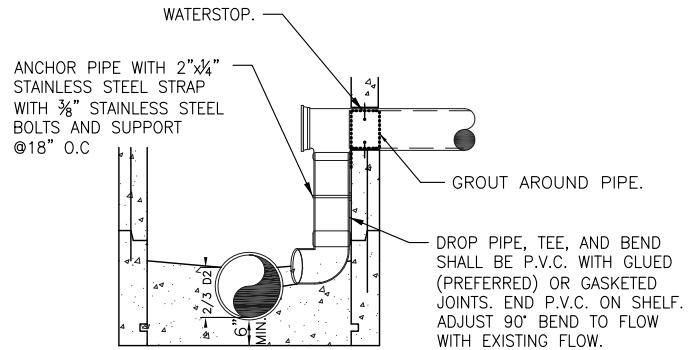
STANDARD MANHOLE PLAN



DROP MANHOLE PLAN



STANDARD MANHOLE SECTION

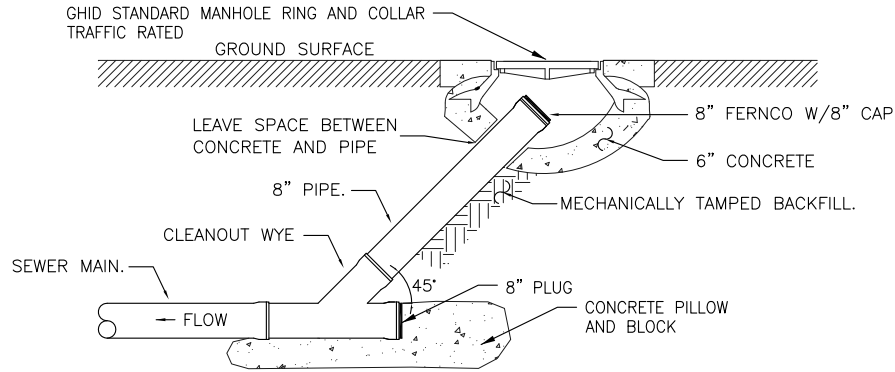


DROP MANHOLE SECTION

NOTE:

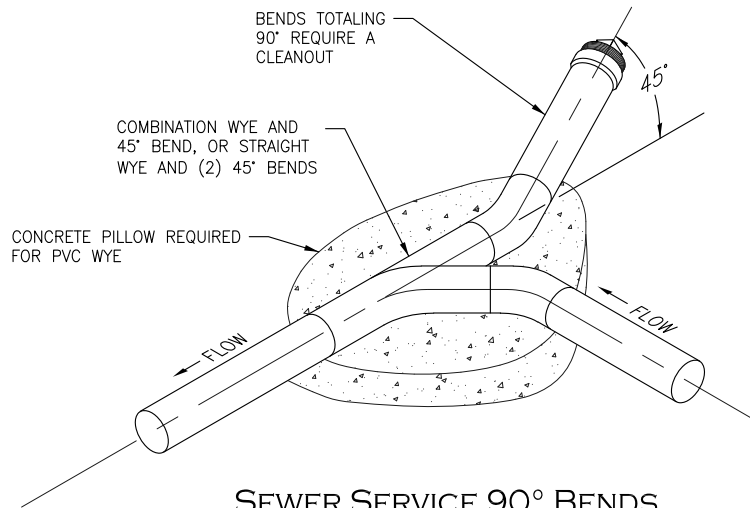
1. SEE PAGE 12 FOR GENERAL NOTES.
2. MANHOLES MUST BE ACCESSIBLE AND MUST NOT BE PLACED IN PARKING SPACES.
3. POUR MANHOLE BASE AFTER PIPES ARE IN PLACE. IF PRE-FORMED BASE IS USED AS ALTERNATIVE TO POURED BASE, FOUNDATION OF 1" MINUS GRAVEL 1.5' DEEP UNDER BASE IS REQUIRED AND SHALL BE COMPACTED TO 95% MINIMUM ASTM D-1557.
4. 3/4" MINUS GRAVEL BACKFILL IS REQUIRED 12" ON SIDES OF MANHOLE TO TOP OF PIPE ZONE.
5. CONTRACTOR IS TO SAW CUT ALL TRENCHES AND PROVIDE A SMOOTH CLEAN EDGE FOR PAVING.
6. ALL MANHOLES SHALL HAVE A CONCRETE COLLAR PER A.P.W.A. STANDARD PLAN 413.
7. IF DAMAGE IS CAUSED TO SEWER MAIN DUE TO MANHOLE INSTALLATION AND/OR OTHER MEANS, CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
8. GRANGER HUNTER MANHOLE COVERS AVAILABLE AT D&L SUPPLY AND NEENAH FOUNDRY.

Typical Mainline Sanitary Sewer Cleanouts



STANDARD 8" AND LARGER CLEANOUT PROFILE

Typical Sanitary Sewer Service 90° Bends

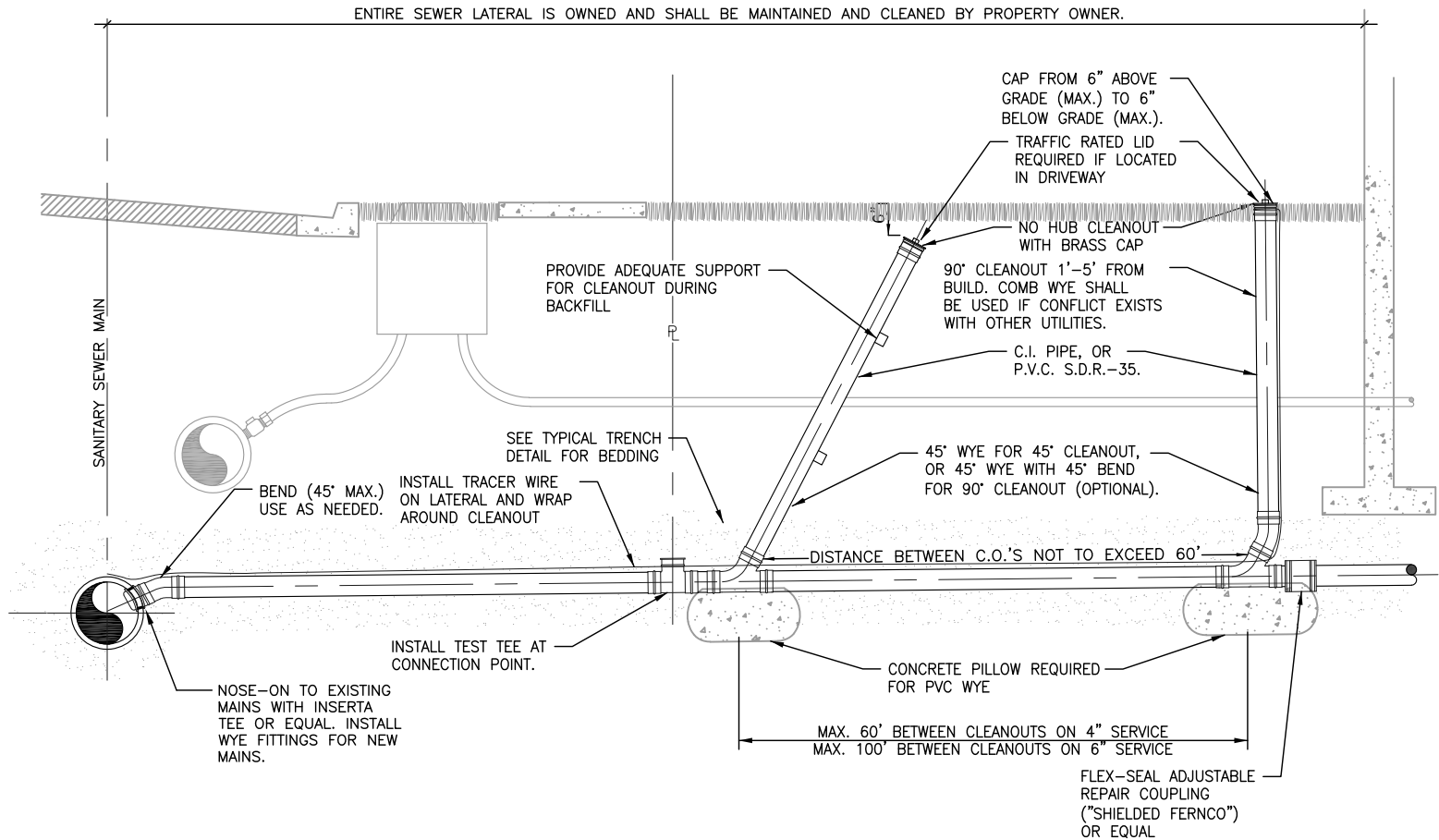


SEWER SERVICE 90° BENDS

NOTE:

1. SEE PAGE 12 FOR GENERAL NOTES.
2. SEE TYPICAL SECTIONS FOR BEDDING AND BACKFILL.
3. CONTRACTOR IS TO SAW CUT ALL TRENCHES AND PROVIDE A SMOOTH CLEAN EDGE FOR PAVING.
4. SELECT BEDDING AND BACKFILL IS REQUIRED 6" UNDER, 12" ON SIDES AND 12" OVER SANITARY SEWER PIPES.
5. IF DAMAGE IS CAUSED TO SEWER MAIN, DUE TO MANHOLE INSTALLATION AND/OR OTHER MEANS, CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.

Typical Sewer Service

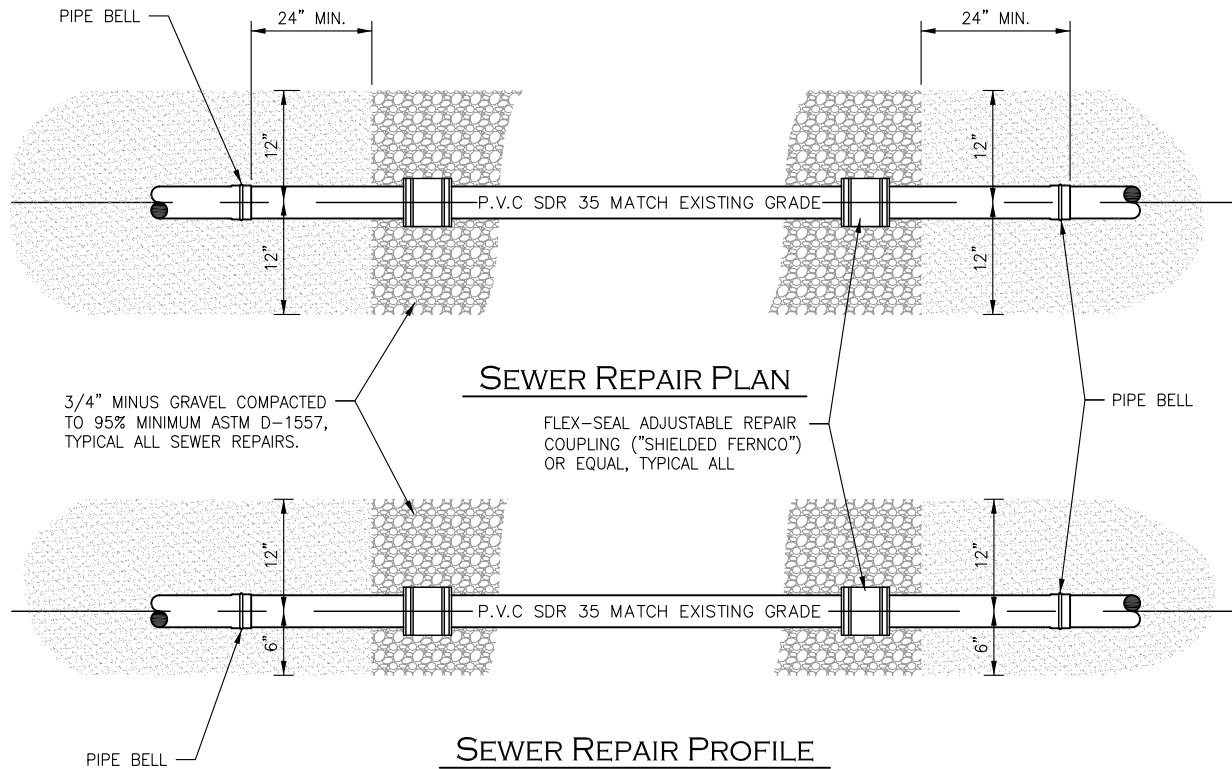


SEWER SERVICE PROFILE

NOTE:

1. SEE PAGE 12 FOR GENERAL NOTES
2. SEE TYPICAL SECTIONS FOR BEDDING AND BACKFILL.
3. MINIMUM TRENCH WIDTH SHALL BE EQUAL TO OUTSIDE PIPE DIAMETER PLUS 1' EACH SIDE OF PIPE.
4. IF DAMAGE IS CAUSED TO WATER AND/OR SEWER MAIN, DUE TO WATERLINE/SEWERLINE INSTALLATION AND/OR OTHER MEANS, CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
5. SEWER LATERAL PIPE SHALL BE PVC SDR-35.
6. MINIMUM GRADE FOR 4" SEWER LATERAL IS 2%, OR 1/4" PER LINEAL FOOT.
7. MINIMUM GRADE FOR 6" SEWER LATERAL IS 1%, OR 1/8" PER LINEAL FOOT.
8. BETWEEN TWO DIFFERENT MATERIALS, SUCH AS CLAY TO P.V.C., USE FLEX SEAL ADJUSTABLE REPAIR COUPLING (SHIELDED FERNCO), OR EQUAL (NO-HUB BANDS ARE NOT ALLOWED).
9. BENDS TOTALING 90° SHALL BE BACKED BY A CLEANOUT, SEE TYPICAL SANITARY SEWER SERVICE 90° BEND DETAIL.
10. ALL SEWER LATERAL PLUGS SHALL BE SLIP IN SOLID PLASTIC PLUGS (BRANDT PLUGS ARE NOT ALLOWED).
11. A SEWER TEST TEE SHALL BE INSTALLED AT EACH CONNECTION POINT.
12. SEWER MAIN SHALL BE CORE DRILLED (OTHER CUTTING, CHIPPING AND/OR PUNCHING METHODS ARE NOT ALLOWED).
13. SEWER NOSE-ON SHALL BE ABOVE THE SEWER MAIN SPRING LINE.
14. SEE TYPICAL WATER SERVICE DETAIL FOR WATER AND SEWER SEPARATION.
15. SEWER SERVICE TO BE MARKED WITH S AT CURB

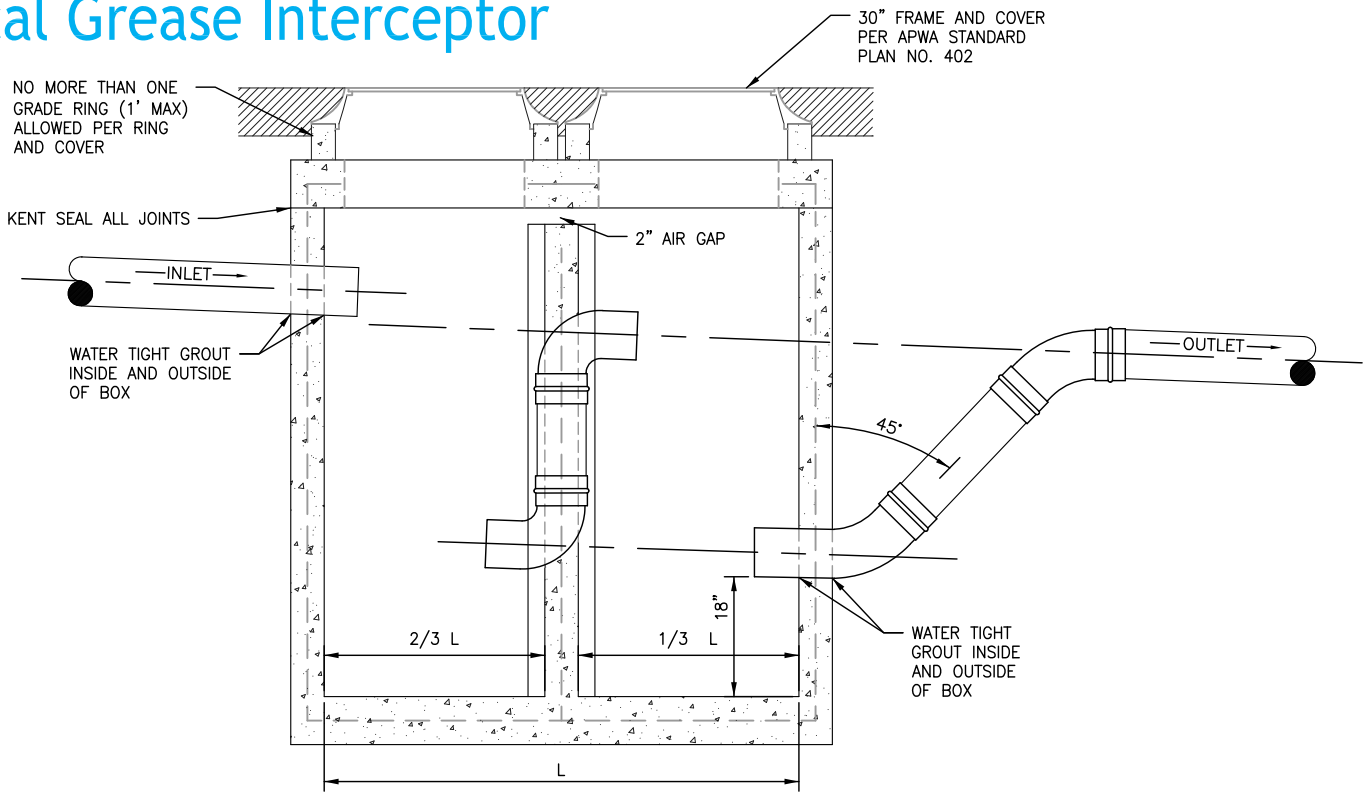
Typical Sewer Repair



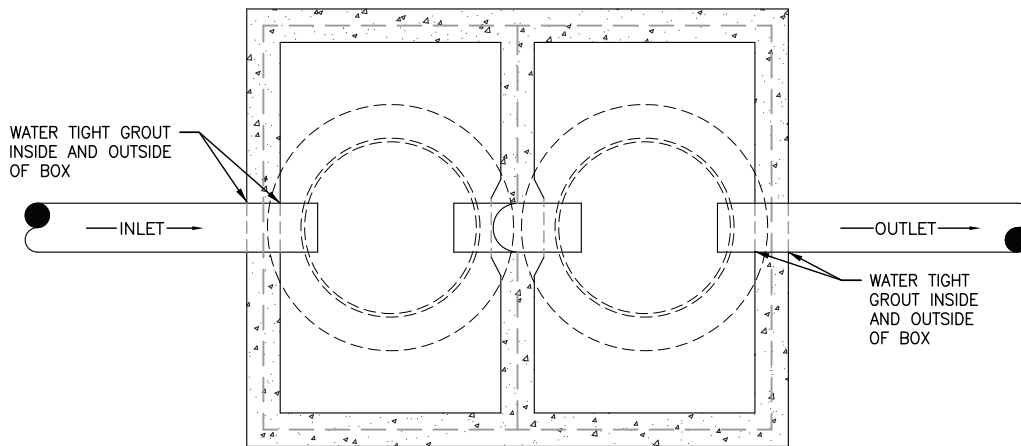
NOTE:

1. SEE PAGE 12 FOR GENERAL NOTES.
2. SEE TYPICAL SECTIONS FOR BEDDING AND BACKFILL.
3. IF DAMAGE IS CAUSED TO SEWER MAIN, DUE TO NOSE-ON AND/OR OTHER MEANS, CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
4. SEWER SHALL BE VIDEO INSPECTED AND VIDEO PROVIDED TO GHID IN DIGITAL FORMAT.
5. IF EXCAVATION IS WITHIN 2 FEET OF A BELL CONTRACTOR TO REMOVE BELL AND EXTEND REPAIR TO CUT.

Typical Grease Interceptor



SECTION

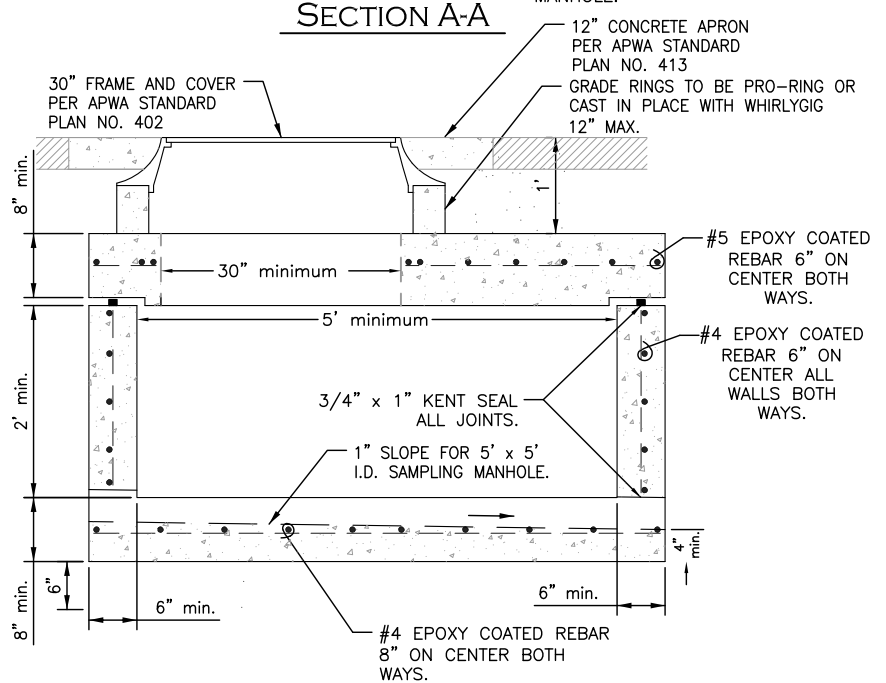
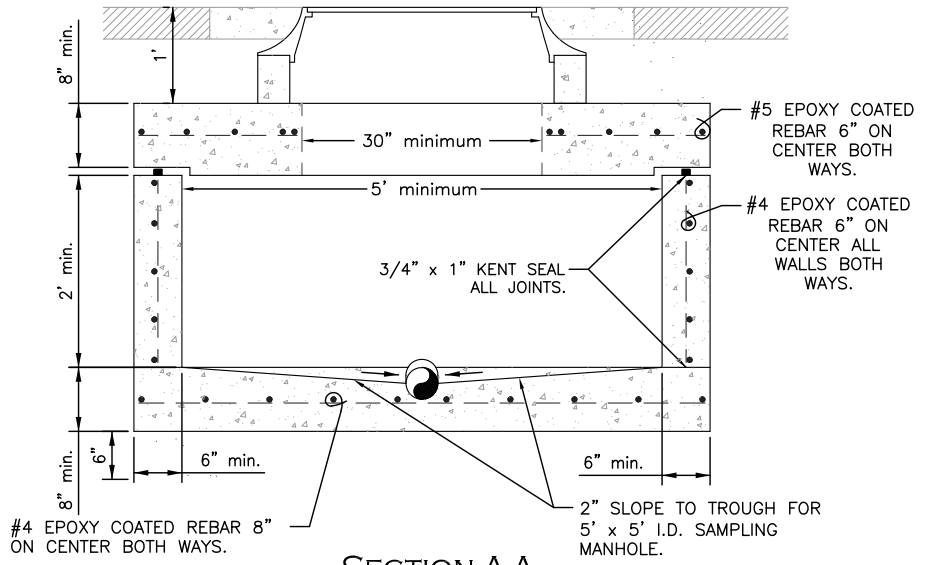
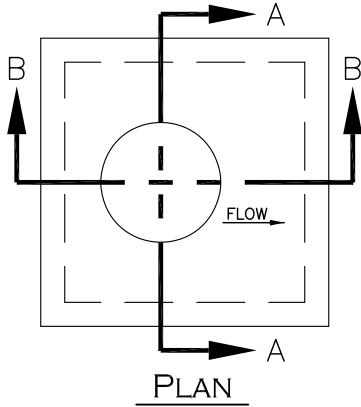


PLAN

NOTES:

1. SEE PAGE 12 FOR GENERAL NOTES.
2. 1,000 GALLON MINIMUM OUTDOOR GREASE INTERCEPTOR. THIS INTERCEPTOR IS NOT A REPLACEMENT FOR AN APPROPRIATELY SIZED AND LOCATED INDOOR GREASE INTERCEPTOR. INDOOR GREASE INTERCEPTORS SHALL COMPLY WITH ALL W.V.C. AND I.P.C. REQUIREMENTS AND SPECIFICATIONS AND BE PLUMBING AND DRAINAGE INSTITUTE CERTIFIED.
3. COVER SHALL BE FLUSH WITH FINISH GRADE.
4. NO MORE THAN ONE GRADE RING (1' MAX.) ALLOWED PER RING AND COVER. IF MORE RISE IS REQUIRED, A SHELL SECTION WITH CENTER WALL SHALL BE INSTALLED.
5. SANITARY SEWER (S.S.) SHALL NOT RUN THROUGH THE SAMPLING MANHOLE AND/OR GREASE INTERCEPTOR. S.S. SHALL BE CONNECTED TO THE SEWER LATERAL DOWNSTREAM FROM THE SAMPLING MANHOLE.
6. FOUNDATION OF 1" MINUS GRAVEL 1.5' DEEP UNDER VAULT IS REQUIRED AND SHALL BE COMPACTED TO 95% MINIMUM ASTM D-1557.
7. 3/4" MINUS GRAVEL BACKFILL IS REQUIRED 12" ON SIDES OF VAULT.
8. BETWEEN TWO DIFFERENT MATERIALS, SUCH AS CLAY TO P.V.C., USE FLEX SEAL ADJUSTABLE REPAIR COUPLINGS ("SHIELDED FERNCO") OR EQUAL (NO-HUB BANDS ARE NOT ALLOWED).
9. FOR INSPECTION, FILL GREASE INTERCEPTOR WITH WATER ABOVE INLET AND OUTLET WATER TIGHT GROUT JOINTS.
10. PIPE SHALL BE P.V.C. SDR 35.
11. GREASE INTERCEPTOR SHALL BE SUITABLE FOR H-20 LOADINGS.
12. GREASE INTERCEPTOR SHALL BE VENTED THROUGH BUILDING PLUMBING.
13. GREASE TRAP AND SAMPLING MANHOLE MUST BE ACCESSIBLE AND MUST NOT BE PLACED IN PARKING STALLS.

Typical Sampling Manhole



- NOTE:
- SEE PAGE 12 FOR GENERAL NOTES.
 - THE EXISTING SEWER COLLECTION SYSTEM SHALL REMAIN IN SERVICE DURING CONSTRUCTION.
 - ALL MANHOLES SHALL HAVE A CONCRETE COLLAR PER A.P.W.A. PLAN 574.
 - FOUNDATION OF 1" MINUS GRAVEL 1.5' DEEP UNDER BASE IS REQUIRED AND SHALL BE COMPACTED TO 95% MINIMUM ASTM D-1557.
 - 3/4" MINUS GRAVEL BACKFILL IS REQUIRED 12" ON SIDES OF MANHOLE TO THE TOP OF THE PIPE ZONE.
 - MINIMUM TRENCH WIDTH SHALL BE EQUAL TO OUTSIDE PIPE DIAMETER PLUS 1 FOOT ON EACH SIDE OF PIPE.
 - TYPE OF PIPE SHALL BE P.V.C. SDR-35.
 - MINIMUM GRADE FOR 4" P.V.C. SDR-35 IS 2% OR 1/4" PER LINEAL FOOT.
 - BETWEEN TWO DIFFERENT MATERIALS, SUCH AS CLAY TO P.V.C., USE FERNCO COUPLERS OR EQUAL (NO-HUB BANDS ARE NOT ALLOWED).
 - DISTANCE BETWEEN CLEANOUTS NOT TO EXCEED 60'.
 - BENDS TOTALING 90° MUST BE BACKED BY A CLEANOUT.
 - SEWER LATERALS MAY RUN UNDER DRIVE APPROACH, PERMITTING TOP OF CLEANOUT IS NOT UNDER CONCRETE.
 - ALL LATERAL PLUGS SHALL BE SLIP IN SOLID PLASTIC PLUGS (BRANDT PLUGS ARE NOT ALLOWED).
 - IF DAMAGE IS CAUSED TO SEWER MAIN, DUE TO M.H. INSTALLATION AND/OR OTHER MEANS, CONTRACTOR WILL BE HELD RESPONSIBLE FOR REPAIRS.
 - SANITARY SEWER SHALL NOT RUN THROUGH THE SAMPLING MANHOLE AND/OR GREASE TRAP. SANITARY SEWER SHALL BE CONNECTED TO THE SEWER LATERAL DOWNSTREAM FROM THE SAMPLING MANHOLE.
 - SAMPLING MANHOLE SHALL BE SUITABLE FOR H-20 LOADINGS.
 - GREASE TRAP AND SAMPLING MANHOLE MUST BE ACCESSIBLE AND MUST NOT BE PLACED IN PARKING STALLS.

Inspections & Testing

Pre-Inspection Requirements

Work may commence when the following items are completed:

- GHID has been provided with the contractor's License and Permit Bond, General Liability Insurance Certificate, Workers Compensation and Employer's Liability Certificate or State Of Utah approved waiver.
 - **Original \$5,000.00 License and Permit Bond** required.
 - General Liability Insurance Certificate. Original, PDF, and faxed copies are acceptable.
 - \$500,000.00 Minimum coverage for work being performed within private property
 - \$1,000,000.00 Minimum coverage for work being performed within a public right of way.
 - Granger Hunter Improvement District (GHID) shall be named as the Certificate Holder and Additional Insured.
 - Workers Compensation or a State of Utah approved waiver. Original, PDF, and faxed copies are acceptable. Alternatively, this coverage may be shown on the General Liability Insurance Certificate. Original, PDF, and faxed copies are acceptable.
- The project has a "GHID Final Review" stamped on the drawing with a date and signature from an approved GHID representative.
- All applicable connection and/or inspection fees are paid in full.
- A preconstruction meeting has taken place with the Developer, the Contractor who will be installing the utilities, and one or more GHID Representatives. **(Note: It is the Developer/Contractors responsibility to schedule a preconstruction meeting.)**

Inspection Requirements

- Developer/Contractor must give GHID a minimum of 24 hours' notice prior to all inspections. When scheduling inspections please note that:
 - GHID's inspection hours are from 8:00 AM to 4:00 PM Monday – Thursday, excluding all holidays.
 - Inspections shall be scheduled by calling GHID's office at 801-968-3551.
 - No inspections will be scheduled from voice mail messages. If necessary please leave a message to call you back.
 - Additional inspection fees may be assessed if a GHID representative is dispatched, and the job is not inspection ready. Please give as much notice as possible for cancellations.
- All work completed that has not been inspected will be required to be uncovered and inspected prior to any final acceptance given for the project. Please note that:
 - Projects that have not been given a final acceptance letter will not be allowed to connect to GHID's water and sewer Utilities, and/or,
 - Projects that are connected to GHID's Utilities will be considered to be in default, and the connection will be terminated until final acceptance is given.
- In the event a stop work order is issued, the Developer/Contractor shall stop work and comply with all requirements set forth by GHID inspectors.

- Owner is responsible to submit backflow reports to GHID Water Quality Department within 10 days of initial use and annually thereafter.
- Prior to final inspection, the Developer/Contractor shall sign up for service for each property being inspected. The Developer/Contractor shall coordinate meter installation (for meters less than 4-inch) or install the meter (4-inch and greater) and coordinate installation of the MXU.
- Prior to final acceptance, Developer/Contractor shall provide as-constructed drawings to GHID in both .PDF and .DWG formats.

Water Shutdown Requirements

Water shutdowns may commence when all of the following items are completed:

- Developer/Contractor has satisfied all pre-inspection requirements (see pre-inspection requirements for details).
- Developer/Contractor has given Granger Hunter Improvement District (GHID) a minimum of 10 business days' notice prior to any scheduled water shutdown.
 - If any problems arise with the scheduled water shutdown, GHID shall notify the contractor within the 10 business day time frame.
 - Proper notice and approval must be given for all water shutdowns (private and public).
 - All water shutdowns shall be scheduled on a Tuesday, Wednesday, or Thursday between the hours of 8:00 Am to 4:00 Pm. Any deviance from these dates and times will constitute an after-hours shutdown and may require additional notification time for approvals.
- GHID has approved the proposed water shutdown:
 - Developer/Contractor shall give all affected parties (i.e. residences, businesses, etc.) a minimum of 48 hours written notice prior to the scheduled shutdown.
 - It is the Developer/Contractor's responsibility to meet all reasonable needs required by all affected parties (i.e. residences, businesses, etc.) prior to the scheduled water shutdown.
 - Only approved GHID personnel shall open or close all public water valves

Disinfection & Testing

Disinfection and testing of water mainlines shall conform to AWWA C600, C651 and APWA 33 13 00 Specifications (current version) in addition to the following requirements and exceptions:

- Contractors are not to operate public mainline valves. Private valves may be opened and closed by the Contractor, but shall be coordinated with GHID staff. GHID staff will be responsible for opening and closing all public mainline valves.
- Once the line has been filled and chlorinated, the line must remain static for a minimum of 24 hours to allow the disinfection process to occur.
- Care must be taken when disposing of chlorinated water. Contractor shall be required to neutralize the chlorinated water before discharging.
- After flushing is completed, GHID staff will take a chlorine residual test. If amounts do not meet GHID standards, additional flushing will be required.
- Bacteriological samples shall be obtained by GHID staff. Frequency of samples shall be a minimum of 1 sample per 1,000 feet of pipeline. If sample(s) are positive, the Contractor shall repeat chlorination and flushing steps and shall be responsible for all retesting costs.

- Pressure testing is required by the Contractor on all water lines. A hydrostatic pressure of 200 psi must be maintained for two hours. All components for the pressure test must be supplied by the Contractor.

Sewer Testing

Sewer mainline testing shall conform to the APWA 33 31 00 Specification (current version) in addition to the following requirements and exceptions:

- Contractors are required to provide a means of protecting GHID's Sewer System prior to and during construction. This can include: Test balls, and false bottoms in addition to any other reasonable means as requested by the inspector.

Prior to performing any testing it is recommended that the sewer line is cleaned and vacuumed.

- Deflection testing
Mandrel testing. Mandrel shall be 95% of the diameter of the pipe that is being tested. If there are any sections of the pipe being tested that fail for any reason it is the responsibility of the contractor to make those repairs. After completion of any such repairs the section of pipe must be retested.
- Video Inspection
CCTV Inspection of all sewer mains is required. This is a way of visually inspecting the quality of workmanship, in addition to any irregularities. This also allows GHID to record the position in which the sewer laterals connect into the Sewer main.
- Air Test
All contractors shall provide air test on 8" mains for 12 minutes at 5 psi and 10-12" mains for 25 minutes at 5 psi. The maximum permissible drop is 0.5 psi in that duration. A visual water test on 6" or smaller for 2 hours is permissible. Any pipe larger than 12", the inspector will determine the best testing method per ASTM F1417.

Abandonments

Permanent Water Abandonment

- Mainline – To be abandoned per District Engineer's instructions.
- Lateral – To be abandoned at main. Corp stop to be shut off and 1' minimum physical disconnection.

Permanent Sewer Abandonment

- Mainline - To be abandoned per District Engineer's instructions.
- Lateral – To be abandoned at main. CIPP with pre and post inspection video or physical disconnect and cap at the main with concrete. Brandt plugs not accepted.

Temporary Water and Sewer Disconnect

- To be capped at a point that is clear of future construction and marked with a 2x4.

All abandoned lines to be inspected prior to being buried.

NOTE: It is the contractor's sole responsibility to comply with all State of Utah, Salt Lake County, West Valley City, and GHID requirements and specifications. For GHID requirements and specifications please visit us at our office (2888 South 3600 West), go to our website (www.ghid.org), or contact our Engineering Department (801-968-3551).