



Winston-Dillard Water District

121 NW Douglas Blvd., Winston, OR 97496

Office 541-679-8467 ~ Fax 541-679-4875 ~ www.wdwd.us

Standards and Specs

MATERIALS

MAINS: Minimum size of main shall be 6-inch for fire flow purposes, cul-de-sacs will be fed by a 6-inch main with the termination ending at a fire hydrant. All lines shall be connected in a grid unless otherwise specified by the Water District.

PVC: All PVC main line material shall be C-900 (DR-18), rubber ring, bell and spigot type pipe.

DUCTILE IRON: Ductile iron shall be a minimum of Class 50 and will be required under travel ways, exposed piping, bridges, or fire suppression systems. Bell restraints may be required depending on application of installation.

POLYETHYLENE: - All polyethylene pipe shall be Rehau Municipex, Crosslinked Polyethelene (PEXa) piping, produced in accordance with AWWA 904, with pressure rating of 200 psi at 73.4F, copper tube size and be **BLUE** in color.

SERVICE LINES: Service lines, single and dual, shall be a minimum of 1-inch. All service lines shall be copper tube size and shall be installed in 2-inch Sch40 PVC conduit at all road crossings.

FIRE HYDRANTS: Fire hydrants, fire lines and valves from the main line tee are the responsibility of the Winston-Dillard Fire District, as well as the location of the hydrants. However all connections to water mains must be approved by the Water District. A hydrant valve shall be installed on the fire service tee. Exact fire flows are determined by Winston-Dillard Fire District. All hydrants shall be Waterous WB67-250, or Mueller Centurion.

FIRE LINES: All dedicated fire lines for suppression purposes shall be Class 50 Ductile Iron minimum. Fire sprinklers etc, will be subject to connection / standby fees. Fire lines will be subject to Winston-Dillard Water Districts current backflow ordinance. All Fire suppression systems must have Winston-Dillard Fire District approval.

**All hydrants that are required and are not placed in the right of way will be subject to District approval and "private / dedicated hydrant fee's".*

FITTINGS

VALVES: All valves shall be resilient seat unless otherwise approved by the District. All valves shall meet AWWA specifications. Ten inch (10") and larger inline valves are required to have pre cast concrete support.

VALVE BOXES: All buried valves shall have boxes that consist of a #910 cast iron top section, 6-inch 3034 PVC riser, with VC212 auto centering bottom. All extensions due to depth require District approval. All valve covers and lids shall read **WATER**. A 3-foot square concrete apron shall be placed around all valve boxes when not in roadway.

TEES: Shall be ductile iron.

ANGLES: Shall be ductile iron.

SPOOLS: Shall be ductile iron.

COUPLINGS: Transition couplings when connecting two different pipe sizes shall be two bolt style, such as Romac Macro or Hymax 2 Wide Range Coupling. Straight couplings shall be ductile iron long barrel, with mechanical joint restraint fittings, such as Romac RomaGrip.

SADDLES: Shall be Romac 101s or District approved equal for 1-inch services. Romac 202s for 1 ½-inch & 2-inch services with iron pipe threads.

CORP STOPS: Shall be brass Ford ball valves with pac joint for copper tube size (NO KEY VALVES). 1 ½-inch shall be iron pipe x pac joint. A 2-inch service will have resilient seat gate valve with male IP x CTS pac joint coupling.

CURB STOPS: Shall be brass Ford ball valves (NO KEY VALVES) CTS pac joint only.

SERVICE LINES: Service lines and curb stops shall be installed to allow placement of meter and box in right of way against property line or behind sidewalk depending on application. Contractor shall be required to set meter connections and meter boxes at proper locations and depths. (*See Detail Sheet Page 9 and 10*)

METERS: Will be installed at each service location by WDWD once all associated system development charges are paid.

TAPPING SLEEVES: Shall be full circumferential and 100% stainless steel including flange.

METER BOXES: Will be supplied by the contractor. DFW boxes, with composite lid, unless otherwise specified.

BACKFLOW DEVICES: All required backflow devices will conform to Winston-Dillard Water District Cross Connection Regulations 51995.

FITTINGS CONT

LOCATOR WIRE: Locator wire shall be 14 gauge solid copper with blue insulation designed for burial. All locator wire will be continuous. All splices will be done with a 3M DBR direct burial kit. Locating wire shall be installed directly over center of all mains and services to the meters not to exceed 6" above pipe. Locator wire must be extended up the outside of the riser and inside of the top section on each valve box so a direct hook-up can be made.

POLY PIPE INSERTS: Shall not be used in the Water District.

RECEIVING MATERIALS: Winston-Dillard Water District must be notified at least 24 hours in advance of material delivery on job site. Contractor shall have a representative from Winston-Dillard Water District on the job site to witness unloading of pipe and materials and check for defects.

No pipe or material shall be delivered on Saturday, Sunday or a Holiday.

Materials not meeting WDWD standards and specs will be rejected.

All pipe shall be unloaded with forks, straps or pipe clamp.

Use of chains is not an accepted procedure at any time.

All pipe that is unloaded by means of dropping or rolling off of trucks shall be rejected.

All rejected materials will be labeled for non usage or immediately removed by contractor from job site.

TRENCHING

SANITARY REQUIREMENT: Pipe shall be plugged or capped to maintain a water-tight seal on the end of lines during construction. This will take place at the end of each day and whenever the trench is to be left open for an extended period of time unattended. This is to minimize the possibility of contamination from surface runoff, from rainfall, construction watering, foreign objects. Ditchline must be kept free of surface water at all times.

EXCAVATION: Contractor shall secure and comply with applicable Federal, State, County and City permits. Contractor is responsible for all locates prior to and during construction.

TRENCH WIDTH & DEPTH: Trench width shall be wide enough to ensure a minimum of 6-inches of bedding on both sides of pipe. Trench depth shall be deep enough to ensure 6-inches of granular bedding with a minimum of 36-inches cover over pipe and a maximum of 42-inches of cover. Any variances must be approved by Winston-Dillard Water District. Any part of the trench excavated below grade shall be corrected with thoroughly compacted material. (*See sheet 16*)

TRENCH SAFETY: All shoring and safety is the responsibility of the contractor and shall be done with current guidelines and practices.

PIPE LAYING: Pipe shall be installed one section at a time in the trench. Pipe shall be laid with the bell facing in the direction of laying unless otherwise directed. Pipe deflection shall be per manufacture specifications. The pipe shall be laid on firm bedding material to afford bearing

over the full length of the pipe. Refer to sanitary requirements. **Pipe must be placed by hand, pipe clamp or by strap into the ditch.** Use of chains is not allowed at anytime.

TRENCHING CONT

BEDDING: Bedding shall be a minimum of 6-inches of granular material. Place bedding material simultaneously on both sides of the pipe to a depth of at least 6” above the pipe barrel. A minimum of 12-inches of cover is to be laid prior to compaction for water mains. Service lines shall be bedded and compacted in the same manner. All bedding shall be ¾-0 crushed rock, having reasonably uniform gradation from course to fine. Pea gravel, sand or other bedding material shall be used only with pre approval from the Water District. *(refer to pg. 12)*

THRUST BLOCKING: All tees, angles, reducers, valves and tapping sleeves shall be installed with adequate thrust blocking. Standard Thrust Block Details are shown on *page 15* and should be used as a minimum required with strict attention applied to verifying soil bearing strength. All thrust blocking shall be of concrete unless otherwise approved by the District and shall have a compressive strength of not less than 2000 PSI in 36 hours. Blocking shall be placed between solid ground & the fitting to be anchored. The area of bearing on fitting & ground shall be maximized without preventing access to the fitting for maintenance. No fill should be installed between the fitting & the blocking soil. All fittings are to be wrapped in plastic.

BACKFILL: In traveled ways Class A trenches shall be utilized. Class B trenches are to be used elsewhere. *(See detail sheet pg. 14)* Class B trenches: the native material used in the trench must have no rocks, foreign material or debris larger than 2-inch.

JOINT RESTRAINTS: All MJ pipe fittings shall have mechanical restraints, such as Romac RomaGrip.

AIR VALVE ASSEMBLIES: When required shall be ARI Brand model D-040 combination air and vacuum release valve, installed to Water Districts specs. *(refer to pg. 11)*

SAMPLING STATIONS: When required shall will be Koreleen – Station Guard XLT and will be installed to Water Districts specs.

AUTO FLUSHERS: When required shall will be #9400 Eclips Automatic flushing device, non-freezing model, installed to Water Districts specs. *(refer to pg. 12)*

CLEAN UP / SITE RESTORATION: Cleaning up shall be a continuing process from the start of work to final acceptance of the project. The Contractor shall, at all times, at his own expense and without further order keep property on which work is in progress free from accumulations of waste material or rubbish caused by employees or by the work, and at all times during the construction period shall maintain structure sites, rights-of-way, adjacent property, and the surfaces of streets and roads on which work is being done in a safe condition for the Contractor’s workers, and the public. Accumulation of waste materials that might constitute a fire hazard will not be permitted. Spillage from the Contractor’s hauling vehicles on travelled public or private roads and parking areas shall be promptly cleaned up. Upon completion of the construction, the Contractor shall, at his own expense, remove all temporary structures, rubbish, and waste materials resulting from his operations. All properties disturbed by project construction shall be restored to the original or better condition.

TESTING & CHLORINATION

SCOPE: Flushing shall remove all air and foreign material, if any, in pipe. Pressure Testing shall be done to check proper assembly and materials to ensure the lines will withstand the demands of the system. Disinfection of the new water main and service lines is required to ensure consumer safety and to meet Oregon State Health Division requirements. Bacteriological tests shall be taken.

FLUSHING: Operations shall be at an adequate velocity and duration to ensure all debris and air is removed from the line. A Water District Representative must operate all valves and oversee the flushing procedure.

PRESSURE TESTING: Before testing a pipeline for leakage, the pipeline shall be bulkheaded. The pipeline shall be tested for water-tightness by filling it with water and bring the hydrostatic pressure up to 175 PSI. The Contractor shall furnish necessary bulkheads, pumps, pressure gauges, means of measuring water loss, and all other equipment, materials and labor required for making the tests. All of the pipelines must be pressure tested. Pipeline may be divided up into sections depending on the length of project, The lengths, sections and provisions for testing shall be subject to approval by Winston-Dillard Water District. All air vents shall be open during the filling of the pipeline with water. After a test section is completely filled, it shall be allowed to stand under slight pressure to allow the lining to absorb what water it will and to allow the escape of air from any small airpockets. Time will be regulated by length of line and predetermined by the Water District. The pressure shall then be raised slowly to the hydrostatic pressure of 175 pounds per square inch and shall be maintained for a period to be determined by Winston-Dillard Water District. No pipe installation will be accepted until the leakage is less than the number of gallons hour as determined by table shown on *page 7*. Should any test of pipe laid disclose leakage greater than that allowed, the Contractor shall, at his own expense, locate and repair the defective joints or pipe until the leakage is within the specified allowance. No piping or joints having visual leakage will be accepted. All such repairs shall be made subject to the approval of Winston-Dillard Water District. If any considerable leakage has been discovered, or if the measured leakage exceeds the limit stated, the District shall require one or more retests after repairs have been made. All leakage tests shall be made in the presence of Winston-Dillard Water District.

DISINFECTION OF WATERLINES: Before being placed in service the entire line shall be chlorinated. Chlorine shall be applied by the method of hypochlorite solution. Chlorination by means of tablets or powders placed in each length of pipe during installation is specifically prohibited. The chlorination agent shall be applied at the beginning of the section adjacent to the connection and shall be injected through a corporation cock insuring treatment of the entire line. Water shall be fed slowly, by Water District, into new line with chlorine applied in amounts to produce a dosage of 50 ppm throughout the entire section being tested for a period of 24 hours. A residual of not less than 10 ppm shall be produced in all parts of the line. During the chlorination process, all valves and accessories shall be operated by Water District personnel only.

TESTING & CHLORINATION CONT

PSI DURING ALL CHLORINATION PHASES THE LINE PRESSURE MUST NEVER EXCEED 40 psi.

After chlorination, the water shall be flushed from the line at its extremities until the replacement water tests are equal chemically and bacteriologically to those of the permanent source of supply. Contractor shall be responsible for the discharge of chlorinated water and must comply to all rules and regulations including dechlorination. Water samples shall be taken for bacteriological tests by the contractor and witnessed by Winston Dillard Water District. Sample sites and frequency shall be determined by the Water District. Test corporation stops must be turned off and injection lines shall be removed after approved bacteriological testing is received at the Water Office.*

****Testing will not be considered complete until a copy of approved bacteriological tests are received in the Water District Office***



Winston-Dillard Water District

Pressure Test Form

Date: _____ Location: _____

Starting Pressure: _____

Starting Time: _____

Ending Pressure: _____

Ending Time: _____

Total Time: _____

Total Pressure Loss: _____

Amount of Water to Re-pressurized: _____

Allowable Leakage (use formula below): _____

Pass: _____ Fail: _____ Signature: _____

Allowable Leakage Formula

$$L = ND\sqrt{P}$$

$$7400$$

L=Allowable leakage (gal/hr)

N= Number of joints in the tested line pipe

D= Nominal diameter of pipe

P= Average test pressure (psi)

NOTES/CALCULATIONS:

AUTHORITY OF THE DISTRICT ENGINEER / INSPECTOR

The District Engineer or appointed employee of the District shall be the representative during the construction and shall observe the work in progress on behalf on the District.

This general inspection of the construction will not, however, relieve the construction contractor (s) from his (their) obligation to conduct comprehensive inspections and to maintain full responsibility for the techniques and sequences of construction, the safety precautions incidental thereto, and for performing the construction work. He shall also have the authority to reject all work and materials which do not conform to the agreement or District specifications.

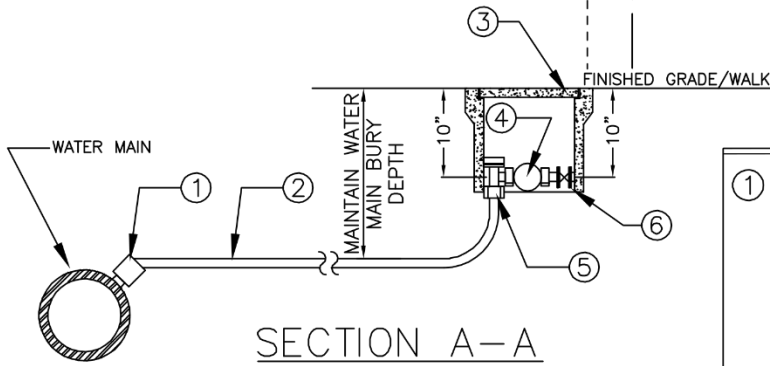
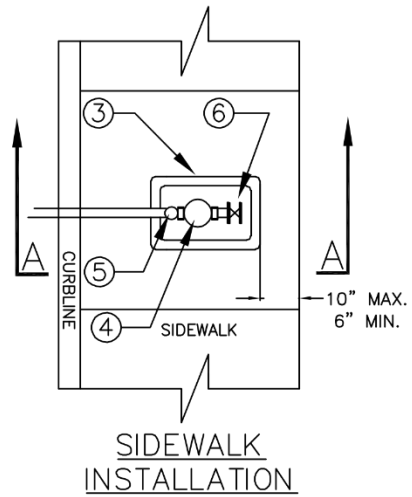
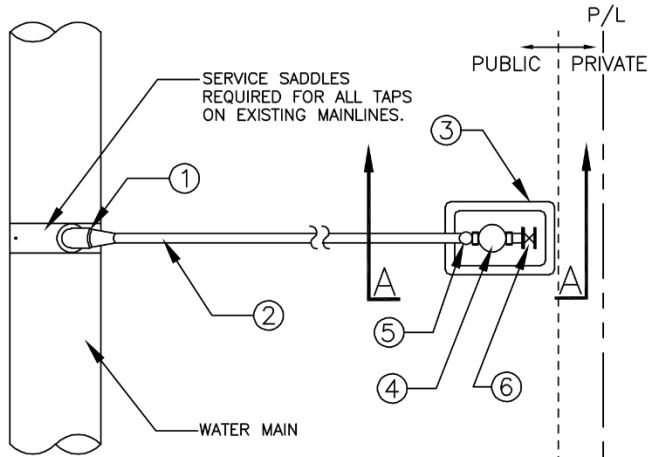
The engineer or appointed representative shall have the authority to order changes in the work.

The Winston-Dillard Water District engineer will not be responsible and has not been retained or compensated to provide design and construction review services relating to the contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the contractor to perform his work.

WARRANTY

CORRECTION OF DEFECTIVE WORK BEFORE FINAL ACCEPTANCE

The warranty will begin after all compliance work has been completed and two (2) sets of accurate as-builts plans are provided and received at the Water District office. No meters will be sold or installed until the as-builts are received. All work shall be guaranteed for a minimum of one (1) year against defects in materials and workmanship. The Contractor hereby agrees to make, at his own expense, all repairs or replacements necessitated by defects in materials or workmanship supplied by him or his subcontractors that become evident within one (1) year after the date of written notice from Winston-Dillard Water District recommending final acceptance of the entire project. The Contractor also agrees to hold Winston-Dillard Water District harmless from claims of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from Winston-Dillard Water District. If the Contractor fails to make the repairs and replacements promptly, Winston-Dillard Water District may do the work, and the Contractor and his surety shall be liable for the cost thereof.



EQUIPMENT SCHEDULE

- ① SADDLES (ROMAC 101S) OR DISTRICT APPROVED EQUAL FOR 1" SERVICES. ROMAC 202S FOR 1 1/2" & 2" SERVICES WITH IRON PIPE THREADS. CORP STOPS BRASS FORD BALL VALVES WITH PAC JOINT COMPRESSION COUPLINGS TO COPPER TUBE SIZE (NO KEY VALVES). 1 1/2" SHALL BE IRON PIPE X PAC JOINT. A 2" SERVICE WILL HAVE RESILIENT SEAT GATE VALVE WITH MALE IP X CTS PAC JOINT COUPLING.
- ② POLYETHYLENE PIPE SHALL BE REHAUE MUNICIPEX, CROSSLINKED POLYETHYLENE PIPING, PRODUCED IN ACCORDANCE WITH AWWA 904. COPPER TUBE SIZE AND BLUE IN COLOR. SERVICE LINES MINIMUM OF 1" (SINGLE AND DUAL).
- ③ DFW BOX, COMPOSITE WITH DUCTILE IRON FLIP UP READER LID.
- ④ HERSEY WATER METER. SHALL READ IN GALLONS.
- ⑤ CURB STOP BRASS FORD BALL TYPE VALVES OR DISTRICT APPROVED EQUAL (NO KEY VALVES) CTS ONLY. ALL COMPRESSION JOINTS SHALL BE PAC JOINT (NO EXTERNAL LOCK).
- ⑥ FORD SERVICE VALVE (SG-13-332 FOR 3/4" & 1" SERVICES OR EQUIVALENT MODEL FOR 1 1/2" & 2")

NOTES:

- 1. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE WATER DISTRICT.
- 2. ALL PIPE AND BACKFILL ZONES SHALL BE BACKFILLED USING 3/4" MINUS GRANULAR MATERIAL AND COMPACTED TO 95% MAX. DENSITY DETERMINED BY AASHTO T-99.
- 3. SET FRONT OF METER BOX 3-INCHES BEHIND BACK OF SIDEWALK LOCATION FOR CURBLINE WALKS.
- 4. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY.
- 5. PROVIDE A MINIMUM OF 18" OF SEPARATION BETWEEN ADJACENT WATERLINE SERVICE TAPS.
- 6. A CONTINUOUS INSULATED SOLID COPPER 14 GAUGE TONING WIRE SHALL BE INSTALLED DIRECTLY OVER ALL POLYETHYLENE SERVICE LINES. SPLICE SERVICE LINE TONING WIRE TO MAINLINE TONING WIRE USING A 3MDBR SPLICE KIT. EXTEND TONING WIRE 12" BEYOND CURB STOP AND LEAVE IN METER BOX.

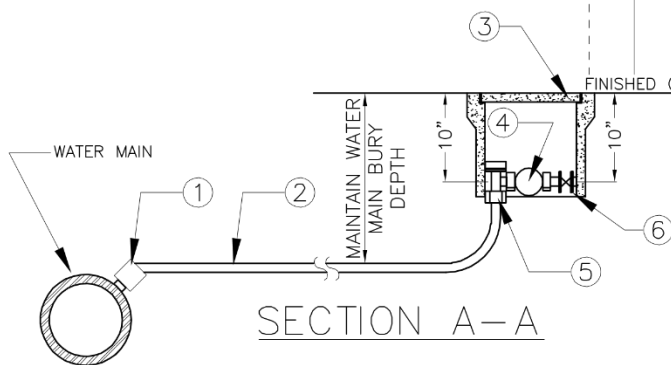
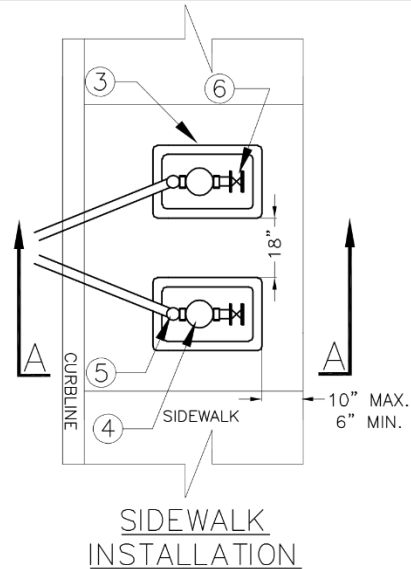
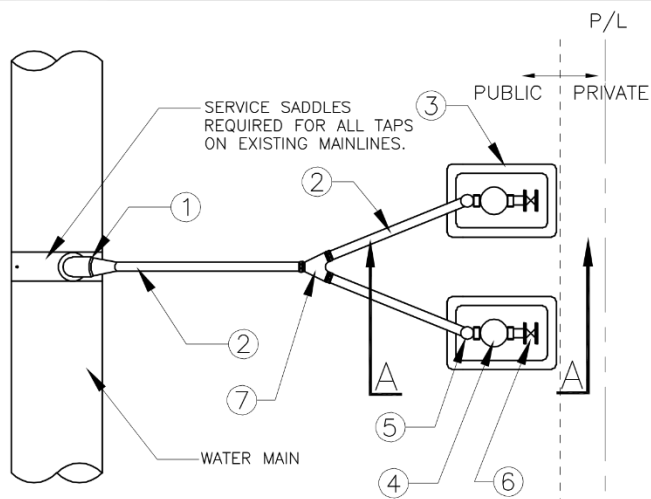
Date: AUGUST-18

Dwn By:

Scale: NTS

**WINSTON-DILLARD
WATER DISTRICT**

STANDARD WATER SERVICE DETAIL



EQUIPMENT SCHEDULE

- ① SADDLES (ROMAC 101S) OR DISTRICT APPROVED EQUAL FOR 1" SERVICES. ROMAC 202S FOR 1 1/2" & 2" SERVICES WITH IRON PIPE THREADS. CORPORATION STOPS SHALL BE BRASS FORD BALL VALVES WITH PAC JOINT COMPRESSION COUPLINGS TO COPPER TUBE SIZE (NO KEY VALVES). 1 1/2" SHALL BE IRON PIPE X PAC JOINT. A 2" SERVICE WILL HAVE RESILIENT SEAT GATE VALVE WITH MALE IP X CTS PAC JOINT COUPLING.
- ② POLYETHYLENE PIPE SHALL BE REHAUE MUNICIPEX, CROSSLINKED POLYETHYLENE PIPING, PRODUCED IN ACCORDANCE WITH AWWA 904. COPPER TUBE SIZE AND BLUE IN COLOR. SERVICE LINES MINIMUM OF 1" (SINGLE AND DUAL).
- ③ DFW BOX, COMPOSITE WITH DUCTILE IRON FLIP UP READER LID.
- ④ HERSEY WATER METER. SHALL READ IN GALLONS.
- ⑤ CURB STOP BRASS FORD BALL TYPE VALVE BA43-343W-NL OR DISTRICT APPROVED EQUAL (NO KEY VALVES) CTS ONLY. ALL COMPRESSION JOINTS SHALL BE PAC JOINT.
- ⑥ FORD SERVICE VALVE (SG-13-332 FOR 3/4" & 1" SERVICES OR EQUIVALENT MODEL FOR 1 1/2" & 2").
- ⑦ FORD BRASS Y44-244NL FITTING, ONE 1" CTS PACK JOINT BY TWO 1" CTS PACK JOINT.

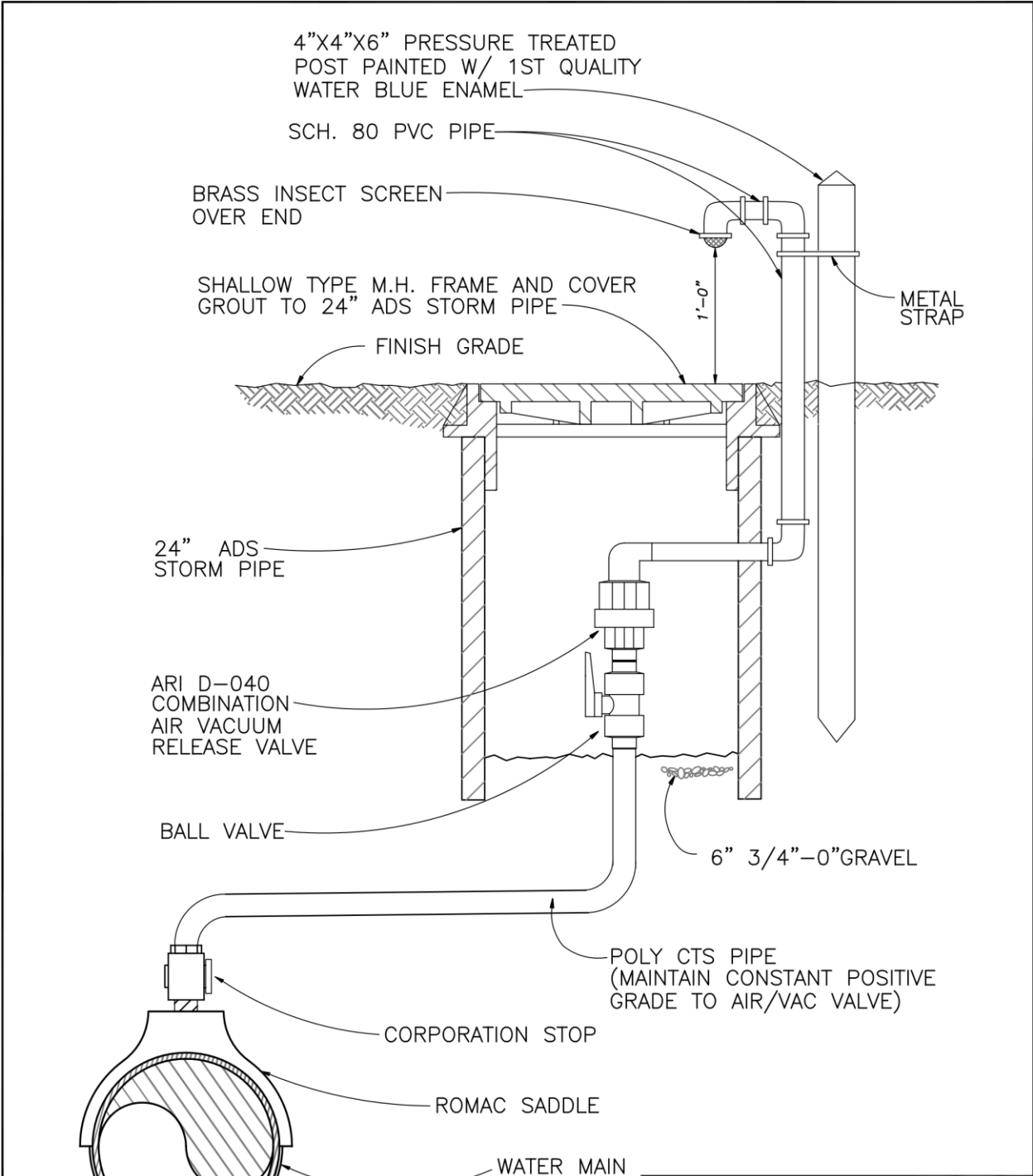
NOTES:

- 1. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE WATER DISTRICT.
- 2. ALL PIPE AND BACKFILL ZONES SHALL BE BACKFILLED USING 3/4" MINUS GRANULAR MATERIAL AND COMPACTED TO 95% MAX. DENSITY DETERMINED BY AASHTO T-99.
- 3. SET FRONT OF METER BOX 6-INCHES BEHIND BACK OF SIDEWALK LOCATION FOR CURBLINE WALKS.
- 4. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY.
- 5. PROVIDE A MINIMUM OF 18" OF SEPARATION BETWEEN ADJACENT WATERLINE SERVICE TAPS.
- 6. A CONTINUOUS INSULATED SOLID COPPER 14 GAUGE TONING WIRE SHALL BE INSTALLED DIRECTLY OVER ALL POLYETHYLENE SERVICE LINES. SPLICE SERVICE LINE TONING WIRE TO MAINLINE TONING WIRE USING A 3MDBR SPLICE KIT. EXTEND TONING WIRE 12" BEYOND CURB STOP AND LEAVE IN METER BOX.

Date: JUNE-20
 Dwn By: CH
 Scale: NTS

**WINSTON-DILLARD
 WATER DISTRICT**

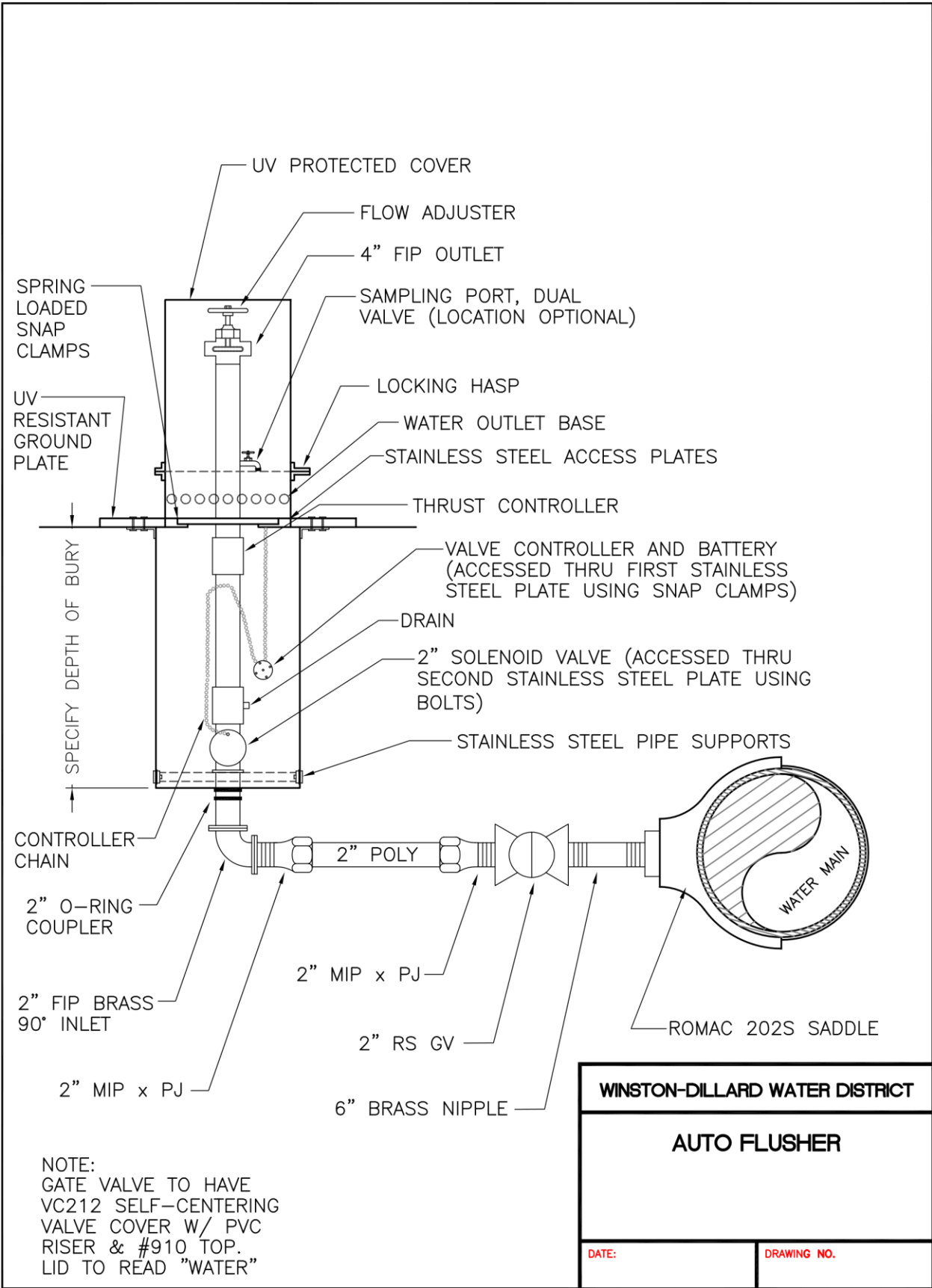
DOUBLE WATER SERVICE DETAIL

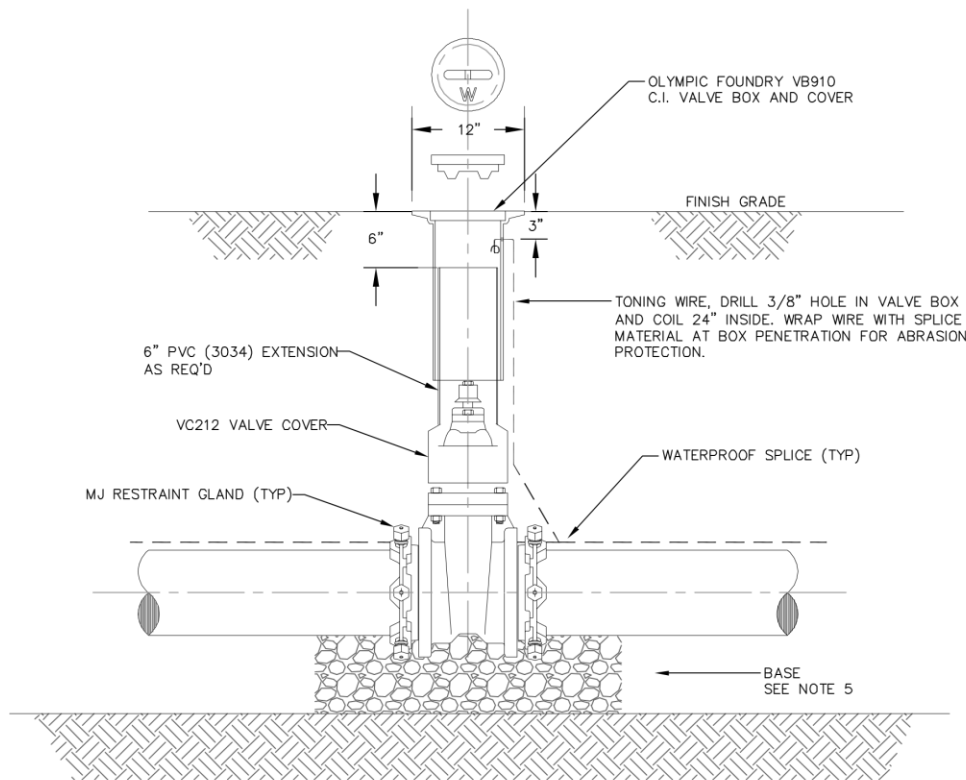


NOTES:

1. AIR-RELEASE AND VALVE ASSEMBLIES SHALL BE INSTALLED AT HIGH POINTS. THE BREATHER TUBE SHALL EXTEND ABOVE GROUND AND PROVIDED WITH DOWNWARD FACING, SCREENED ELBOW.
2. PIPE AND VALVE SIZES SHALL BE SPECIFIED FOR EACH PROJECT BY THE ENGINEER.

WINSTON-DILLARD WATER DISTRICT	
COMBINATION AIR-RELEASE AND VACUUM VALVE ASSEMBLY (ARI MODEL D-040)	
DATE:	DRAWING NO.





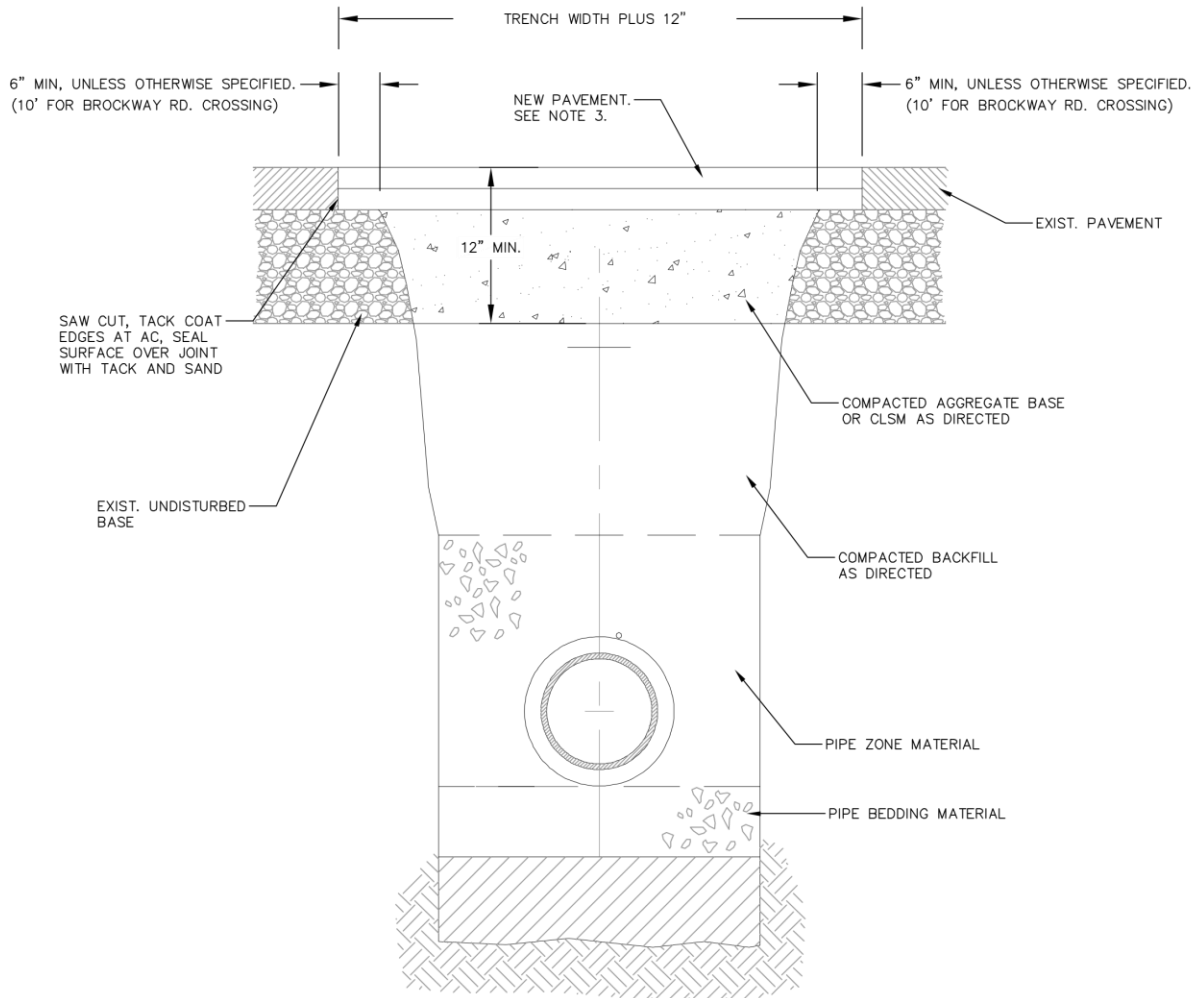
NOTES:

1. VALVE BOX SHALL BE CENTERED OVER VALVE OPERATING NUT.
2. PVC EXTENSION SHALL BEGIN AS CLOSE TO VALVE AS POSSIBLE AND SHALL EXTEND TO WITHIN 6" OF GROUND SURFACE.
3. TOP OF VALVE BOX SHALL BE FLUSH WITH FINISH GRADE.
4. VALVE EQUIPPED WITH 2" SQUARE OPERATING NUT LOCATED WITHIN 24" FROM GROUND SURFACE. SEE VALVE OPERATOR EXTENSION DETAIL WHERE REQUIRED.
5. VALVES 12" AND SMALLER SHALL BE PROVIDED WITH CLASS B BASE. VALVES LARGER THAN 12" SHALL BE INSTALLED ON PRECAST CONCRETE PIER BLOCK.
6. NO PIPE JOINTS ALLOWED WITHIN 10' OF IN-LINE VALVES UNLESS JOINT RESTRAINT DEVICE PROVIDED.

Date: JULY-21
 Dwn By: CAT
 Scale: NTS

WINSTON-DILLARD
 WATER DISTRICT

STANDARD WATER VALVE DETAIL



NOTES:

1. ALL EXISTING AC OR PCC PAVEMENT SHALL BE SAWCUT IMMEDIATELY PRIOR TO REPAVING.
2. CONCRETE PAVEMENT SHALL BE REPLACED WITH CONCRETE TO A MINIMUM THICKNESS OF 6 INCHES OR TO THE THICKNESS OF REMOVED CONCRETE PAVEMENT, WHICHEVER IS GREATER.
3. PLACE AC MIX TO A MINIMUM THICKNESS OF 4 INCHES OR THE THICKNESS OF REMOVED PAVEMENT, WHICHEVER IS GREATER. COMPACT AS DIRECTED. AC PAVEMENT SHALL BE PLACED IN AT LEAST TWO 2" LIFTS.
4. COMPLY WITH THE REQUIREMENTS OF THE AGENCY HAVING JURISDICTION OVER THE ROAD IN WHICH THE STREET CUT OCCURS.

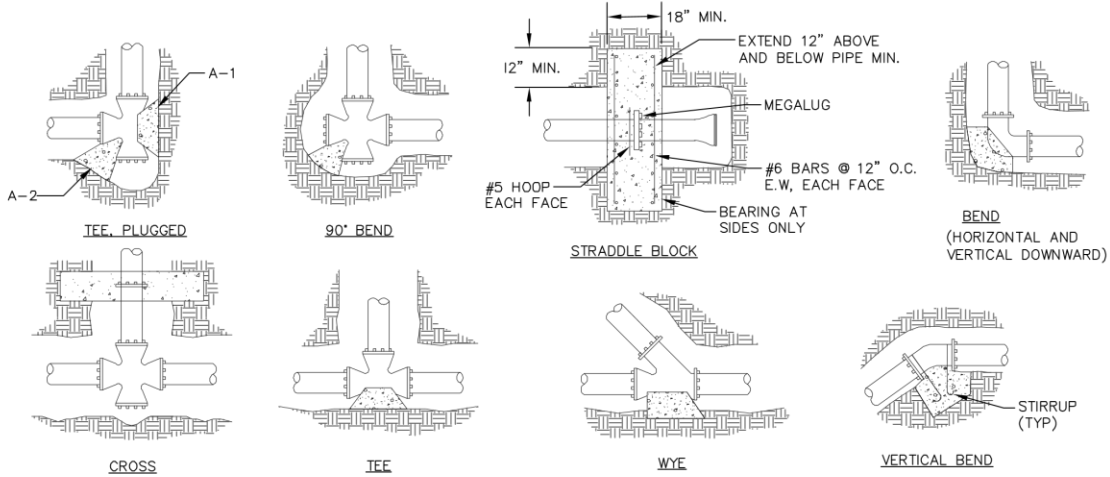
Date: JULY-21
 Dwn By: CAT
 Scale: NTS

WINSTON-DILLARD
WATER DISTRICT

TYPICAL STREET CUT DETAIL

(HORIZONTAL) BEARING AREA OF THRUST BLOCKS IN SQUARE FEET									(VERTICAL UP) VOLUME OF THRUST BLOCK IN CUBIC YARDS			
FITTING SIZE	TEE, WYE, DEAD END, AND HYDRANT	STRADDLE BLOCK	90° BEND	TEE PLUGGED ON RUN		45° BEND	22°-1/2° BEND	11°-1/4° BEND	90° BEND	45° BEND	22°-1/2° BEND	11°-1/4° BEND
				A-1	A-2							
4	1.0	1.0	1.4	1.0	1.4	0.8	0.4	0.2	0.82	0.45	0.23	0.11
6	2.1	2.1	3.0	2.1	3.0	1.6	0.9	0.5	1.85	1.00	0.51	0.26
8	3.8	3.8	5.4	3.8	5.4	2.9	1.5	0.8	3.29	1.78	0.91	0.46
10	5.9	5.9	8.4	5.9	8.4	4.5	2.3	1.2	5.14	2.78	1.42	0.71
12	8.5	8.5	12.0	8.5	12.0	6.5	3.3	1.7	7.40	4.01	2.04	1.03
14	11.6	11.6	16.4	11.6	16.3	8.9	4.5	2.3	10.08	5.45	2.78	1.40
16	15.1	15.1	21.4	15.1	21.3	11.6	5.9	3.0	13.16	7.12	3.63	1.82
18	19.1	19.1	27.0	19.1	27.0	14.6	7.5	3.8	16.66	9.02	4.60	2.31
20	23.6	23.6	33.3	23.6	33.3	18.1	9.2	4.7	20.57	11.13	5.67	2.85
24	34.0	34.0	48.0	34.0	48.0	26.0	13.3	6.7	29.62	16.03	8.17	4.11

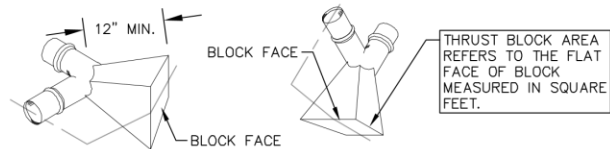
ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 POUNDS PER SQUARE FOOT. DESIGNER IS CAUTIONED TO ENSURE THAT 2,000 PSF BEARING IS AVAILABLE.



NOTES:

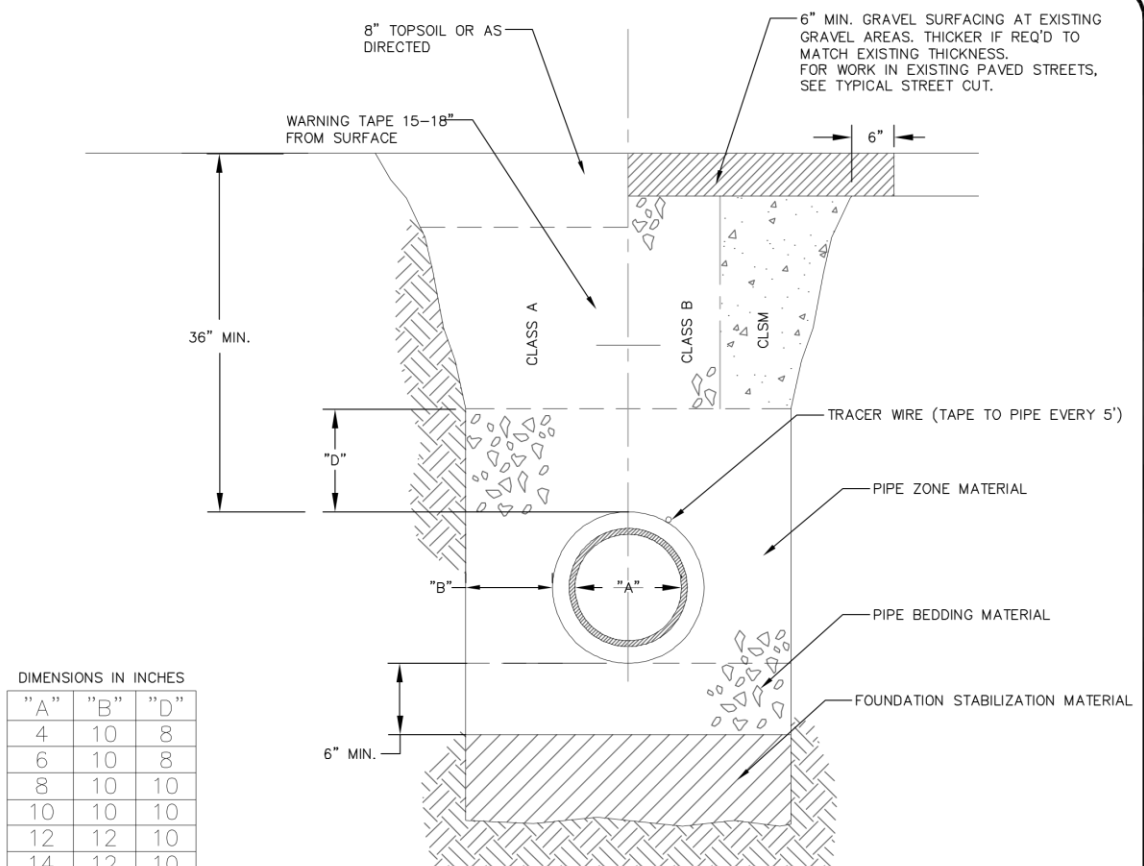
1. CONCRETE BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. ALL CONCRETE TO BE CLASS 3,000 MINIMUM.
3. INSTALL 6 MIL PLASTIC BETWEEN PIPE AND/OR FITTINGS BEFORE POURING CONCRETE BLOCKING.
4. CONCRETE SHALL BE KEPT CLEAR OF ALL JOINTS AND ACCESSORIES.
5. TIE RODS SHALL BE DEFORMED GALVANIZED COLD ROLLED STEEL, 40,000 PSI TENSILE STRENGTH (ASTM A615) COAT WITH COAL TAR EPOXY AFTER INSTALLATION.
6. BEARING AREA REQ'D AT REDUCERS IS THE DIFFERENCE BETWEEN VALUES FOR DEAD END FOR EACH END SIZE (IE 6x8 = 3.8-2.1 = 1.7 S.F.)

RODS FOR VERTICAL BENDS		
FITTING SIZE	ROD SIZE	EMBEDMENT
10" AND LESS	#5	17"
12"-16" (11.25')	#5	17"
12"-16" (22.5')	#7	24"
12" (45')	#7	24"
14"-16" (45')	#9	30"



Date: JULY-21
Dwn By: CAT
Scale: NTS

WINSTON-DILLARD
WATER DISTRICT
CONCRETE THRUST BLOCKING DETAIL



DIMENSIONS IN INCHES

"A"	"B"	"D"
4	10	8
6	10	8
8	10	10
10	10	10
12	12	10
14	12	10
16	16	12
18	16	12
24	18	12
30	18	12
36	24	14

NOTES:

- TRENCH EXCAVATION SHALL BE CONDUCTED IN A SAFE MANNER WITH ALL NECESSARY BRACING AND SHORING PROVIDED FOR COMPLIANCE WITH OSHA.
- FOUNDATION STABILIZATION SHALL BE PROVIDED WHEN MATERIAL AT BOTTOM OF TRENCH IS UNSUITABLE IN THE OPINION OF THE ENGINEER TO PROVIDE A STABLE TRENCH BASE.
- CONSTRUCTION IN COUNTY RIGHT-OF-WAY SHALL COMPLY WITH COUNTY AND DISTRICT STANDARDS.
- CLASS B BACKFILL REQUIRED IN ALL ROADWAYS AND TRAFFIC PATHS EXCEPT WHERE CLSM BACKFILL IS REQUIRED BY COUNTY OR DISTRICT.
- LOCATER WIRE REQUIRED AT ALL NON-METALLIC PIPELINES. WIRE SHALL BE 14 GA. MINIMUM SOLID COPPER WIRE WITH BLUE 30 MIL THICK HDPE INSULATION RATED FOR DIRECT BURY. SPLICES SHALL BE WATERPROOF AND BE DONE WITH 3M DBR DIRECT BURIAL KITS AT ALL CONNECTIONS.
- WARNING TAPE SHALL BE 6" WIDE, 4 MIL THICK, APWA BLUE, READING "CAUTION WATER LINE BURIED BELOW".
- MATERIALS SHALL BE AS SPECIFIED.
- COMPACT FILL AS SPECIFIED.

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WINSTON-DILLARD
 WATER DISTRICT
 TYPICAL WATER LINE TRENCH DETAIL