WATER GENERAL NOTES

1. All construction shall be in accordance with the standard specifications and details of the Town of Northlake and the Fifth Edition of the "Standard Specifications for Public Works Construction - North Central Texas" herein referred to as "COG". Copies may be obtained from the North Central Texas Council of Governments, 616 Six Flags Drive, Suite 200, Arlington, Texas 76005-5888.

2. For 6-inch to 24-inch sizes, water lines shall be AWWA C900-07 Polyvinyl Chloride Pressure Class 235 (DR18) or greater.

3. Fittings shall be cast iron or ductile iron, with 89-mil polywrap per COG Item 501.7.4. All fittings shall be Mega Lug or equivalent unless specified otherwise. Beveled ends of the pipe shall be removed when used with Mega Lug fittings. Fittings shall be blocked as per the Concrete Blocking details.

4. Water pipe shall be blue in color.

5. All pipe joints shall be gasketed, bell and spigot, push-on type or mechanical joint.

6. For creek crossings with less than 5 feet of cover to the creek flowline, the pipe shall be PVC with concrete encasement.

7. Embedment and backfill shall be as per the Water Details for pipes up to 24-inch diameter, per the Town's Standard Details. For pipes larger than 24-inch size, the Engineer shall specify embedment.

8. Minimum cover over water lines shall be as follows:

   a. 48 inches for water lines 12-inches in diameter or less

   b. 60 inches for water lines larger than 12-inches in diameter.

   Cover over 72 inches must be approved by the Town.

9. Trace wire shall be installed on all water mains and shall be considered incidental to all construction of water main. Materials, installation and testing shall be as follows:

   a. Trace wire shall be fourteen (14) gauge minimum solid copper with thermoplastic insulation recommended for direct burial, as manufactured by Copperhead, or approved equal. Wire connectors to be 3M DBR, or approved equal, and shall be watertight to provide electrical continuity.

   b. Trace wire access points shall be composed of one Copperhead SnakePit Magnetized Tracer Box, Test and Monitoring Station, or approved equal, and shall be installed in each proposed 24"x24" concrete valve pad.

   c. Trace wire shall be installed in the same trench and inside bored holes and casing with pipe during pipe installation. It shall be secured to the pipe as required to insure that the wire remains adjacent to the pipe. The trace wire shall be securely bonded together at all wire joints with an approved watertight connector to provide electrical continuity, and it shall be accessible at all trace wire access points.

   d. Trace wire access points shall in general be no more than five hundred (500) feet and at every proposed 24"x24" concrete valve pad. Concentrations of multiple proposed valves near pipe intersections, i.e. tees or crosses, may require more than one access point assembly in each concrete valve pad.

   e. Trace wire shall be laid flat and securely affixed to the pipe at 10 foot intervals. The wire shall be protected from damage during the execution of the work. No breaks or cuts in the trace wire or insulation shall be permitted. At water service saddles, the trace wire shall not be allowed to be placed between the saddle and the water main.

   f. Except for approved spliced-in connections, trace wire shall be continuous and without splices from each trace wire access point. Where any approved spliced-in connections occur, 3M DBR watertight connectors, or approved equal, shall be used to provide electrical continuity.

   g. At all water main end caps, a minimum of 6 feet of trace wire shall be extended beyond the end of the pipe, coiled and secured for future connections. The end of the trace wire shall be spliced to the wire of a six pound zinc anode and is to be buried at the same elevation as the water main.

   h. For directional drilling, auguring or boring installations, four #14 trace wires shall be installed with the pipe and connected to the trace wire at both ends.

   i. Spliced connections between the main line trace wire and branch connection trace wire shall only be allowed at water main tees, crosses or at iron or copper water services where a portion of the branch connection water main or water service is replaced with a non-iron or non-copper material. The branch connection trace wire shall be a single trace wire properly spliced to the main line trace wire. Where the existing branch connection is neither iron nor copper, then the new branch connection trace wire shall be properly spliced to the existing trace wire on the branch connection.

   j. At all repair locations where there is existing trace wire, the trace wire shall be properly reconnected and spliced as outlined above.

   k. Contractor shall perform a continuity test on all trace wire in the presence of the Inspector or the Town's representative. If the trace wire is found to be not continuous after testing, Contractor shall repair or replace the failed segment of the wire.

10. Clay cut-off walls shall be constructed as per the Water Details.

11. PVC Water pipe is allowed to be stored a maximum of six (6) months without cover. Thereafter all pipes should be covered or protected from sunlight and to be protected from other elements.

12. When PVC water pipe is installed in casing, skids must be used to prevent damage to the pipe and bell during installation. PVC pipe should not rest on the Bells. Plastic spacers such as RACI or approved equal shall be used.

13. All valves installed on waterlines shall be vertical gate valves with non-rising stems and resilient wedge seal.

14. Valves and fire hydrants shall be installed in line with lot and ROW lines, where possible.

15. Valve locations shall be marked with "V" stamped or cut on the curb and painted blue for water mains and silver for fire hydrants.

16. All property corners shall be staked with iron pins prior to the installation of any water services. The locations of the water service shall be staked according to the plans.

17. Unless otherwise stated in the Contract Documents the Contractor is responsible for all testing. All final reports shall be turned in to the Town Inspector within five (5) working days. Failed samples must be reported to the Town Inspector immediately.

18. Water mains shall be standard sizes that are readily available such as 8-inch, 12-inch, 18-inch, 20-inch, 30-inch, and 36-inch.

   a. The CONTRACTOR shall be responsible for notifying the Town Inspector at least 24 hours prior to any required testing.

   b. Soil and material testing technicians shall provide written proof of having minimum of two (2) years of related field experience.

   c. The CONTRACTOR shall coordinate all testing activities with the Town Inspector and shall facilitate required testing throughout the construction period. The Inspector shall be present during all testing.

   d. The Town shall make final decision as to the validity of all testing results.

   e. The CONTRACTOR shall be responsible for ensuring that materials to be tested are in compliance with all plans and specifications prior to testing. All materials found not to be in compliance with the plans and specifications before and after testing shall be removed and replaced at the CONTRACTOR'S expense.

   f. All costs associated with the retesting of work that fails to meet the specifications required in the contract documents shall be borne by the CONTRACTOR. For Town projects, retesting cost shall be withheld from pay requests submitted by the CONTRACTOR, this cost will be based on the Town's cost with no additional mark-up. A letter of acceptance will not be issued until all testing deficiencies are addressed and all related cost paid.

   g. The Town Inspector shall be notified of concrete placement 24 hours in advance for steel and form inspection.

   h. One set of four cylinders (2-7 day, 2-28 day) for cast-in-place concrete shall be made for every day that concrete is placed (ASTM C-31). Air, slump, and temperature tests shall be taken for every set of cylinders made. Concrete with a temperature above 95 degrees will be rejected. Additional cylinders and or tests may be requested at the Inspector or ENGINEER's discretion. Exterior forms shall not be removed for a minimum of 24 hours unless approved by Inspector or ENGINEER. Sulfate resistant concrete shall be used for all manholes.

   i. Backfill and Density Testing

      1) All trenches shall be backfilled in accordance with standard details and mechanically compacted with approved vibratory methods in accordance with COG Item 504.5.3.2.1 and paragraph 3) below unless otherwise stated on the plans or in the specifications.

      2) Densities shall conform to standard trench details, COG Item 504.5.3.2.1, and Paragraph 3) below unless otherwise stated on the plans or in the specifications. Proctor samples shall be taken for all classifications of soil on site. Atterberg Limits shall be determined on all Proctor samples. No "potholing" will be allowed. Densities shall be taken on all water services both sides of the street within the Right-of-Way and shall conform to Paragraph 3) below and COG Item 504.5.3.2.1, unless otherwise stated on the plans or in the specifications. Backfill adjacent to all structures shall be compacted manually and density tested on every lift.

W-1

CERTIFICATION:

THIS TOWN OF NORTHLAKE STANDARD DETAIL SHEET IS AUTHORIZED FOR USE IN THIS PROJECT BY THE ENGINEER WHOSE SEAL APPEARS ON THIS SHEET. THIS ENGINEER IS ALSO CERTIFYING THAT THE CONTENT OF THE DETAILS AND NOTES ON THIS SHEET HAVE NOT BEEN ALTERED FROM THAT RECEIVED FROM THE TOWN OF NORTHLAKE.

WATER STANDARD DETAILS

WATER GENERAL NOTES (SHEET 1 OF 2)

THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N.T.S.	W-1	—

1) Mechanical Tamping of Backfill

a) All ditch lines and bore pits shall be mechanically tamped.

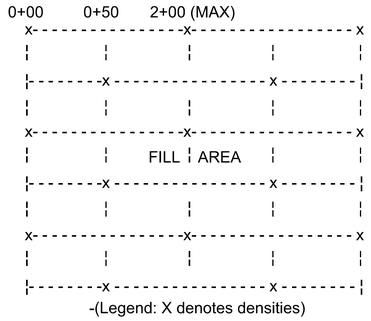
b) Backfill, other than select fill, may consist of onsite or offsite inorganic soils and should be placed in loose lifts 6I - 8I in thickness (not to exceed 12I) and should be mechanically compacted to 95 percent of the maximum dry density as defined by ASTM D-698 (Standard Proctor) procedures under existing and proposed pavement, and to 90 percent standard proctor procedures elsewhere. The moisture content of the fill at the time of compaction shall be between minus 2% of optimum to four percentage points above the proctor optimum value.

c) All backfill material to be select native material, 6I diameter clods and smaller, unless directed otherwise on the plans or in the specifications and to be mechanically tamped and density controlled as described in Paragraph b) above.

d) Water jetting is not permitted.

e) Densities must be taken while backfilling, and shall be taken every one (1) lift at staggered locations not to exceed 200 feet increments. Offset fifty (50') feet every other lift.

f) Densities may be taken at typical locations as shown below; also, densities will be taken at random locations and at the geo-technician's discretion.



-(Legend: X denotes densities)

j. Purging - All water lines greater than 200 feet in length and 12-inches in diameter or less shall be purged using the "Polly-Pig" method with the "Poly-Pig" to enter and exit at an approved location. Purging shall be in accordance with COG Item 506.7.3.1. Lines larger than 12-inches in diameter shall be purged using the flushing method in accordance with COG Item 506.7.3.2. The Town Inspector must be present.

k. Hydrostatic Testing - All water lines shall be tested in accordance with COG Item 506.5. The Town Inspector must be present.

l. Disinfection - All water lines shall be disinfected in accordance with COG Item 506.7.5 and as approved by the Town. All bleeders shall have corporation stops at the main. One water sample shall be obtained for each street name (no greater than 1,000 feet) or as approved by the Town.

W-2

CERTIFICATION:

THIS TOWN OF NORTHLAKE STANDARD DETAIL SHEET IS AUTHORIZED FOR USE IN THIS PROJECT BY THE ENGINEER WHOSE SEAL APPEARS ON THIS SHEET. THIS ENGINEER IS ALSO CERTIFYING THAT THE CONTENT OF THE DETAILS AND NOTES ON THIS SHEET HAVE NOT BEEN ALTERED FROM THAT RECEIVED FROM THE TOWN OF NORTHLAKE.

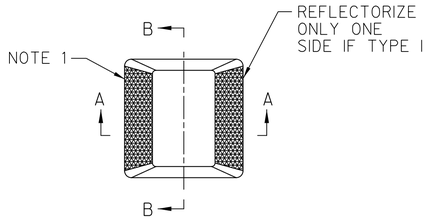
WATER STANDARD DETAILS

WATER GENERAL NOTES (SHEET 2 OF 2)

NORTHLAKE TEXAS

THE TOWN OF NORTHLAKE
TEXAS

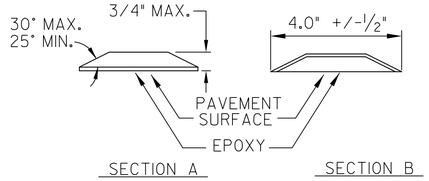
DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N.T.S.	W-2	—



TYPE II
TOP VIEW

HYDRANT MARKER NOTES

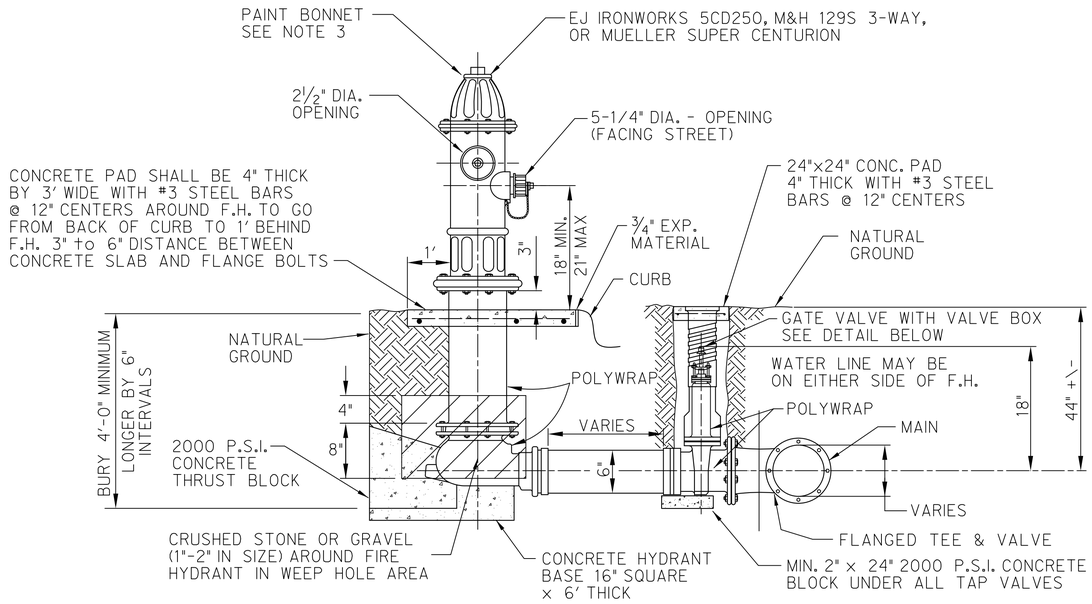
1. USE RAY-O-LITE PAT. 3 409 344 OR APPROVED EQUAL.
2. HYDRANT MARKERS SHOULD BE PLACED 4" OFF THE CENTER STRIPE OR OTHER TRAFFIC BUTTONS AS PER. DRAWINGS.
3. PAVEMENT MARKER NOTES FIRE HYDRANT LOCATION WILL BE MARKED BY PLACING A TYPE II PAVEMENT MARKER REFLECTORIZED BLUE 4" OFF OF THE TRAFFIC LANE BUTTONS. THE MARKER WILL BE IN THE LANE NEAREST TO THE FIRE HYDRANT. ALL MARKERS AT INTERSECTIONS SHOULD BE 10 FEET BACK FROM THE INTERSECTION.



TYPE I

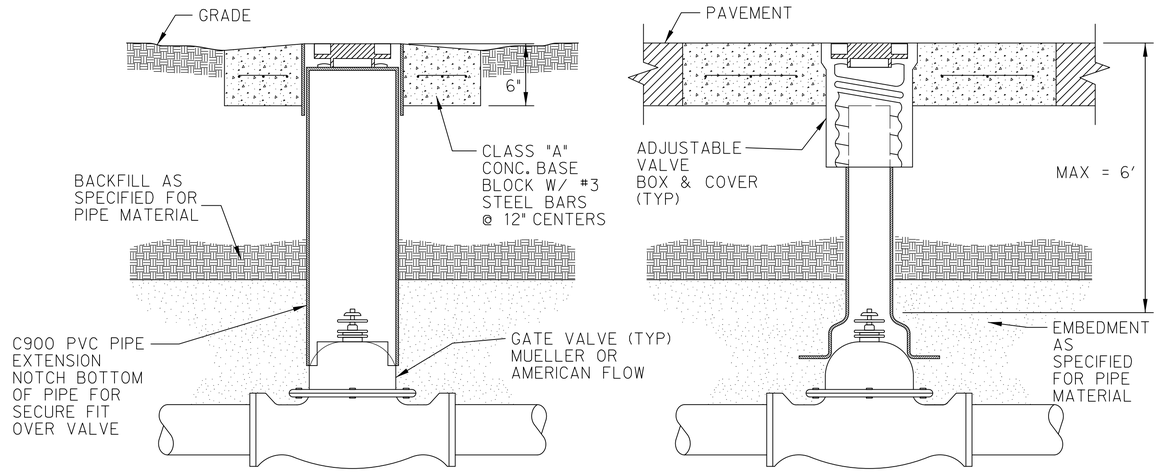
PAVEMENT MARKERS (REFLECTORIZED)

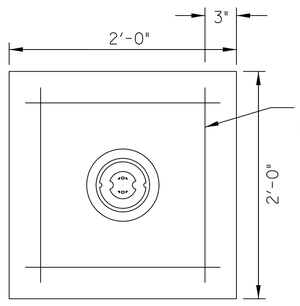
N.T.S.



STANDARD FIRE HYDRANT DETAIL

N. T. S.

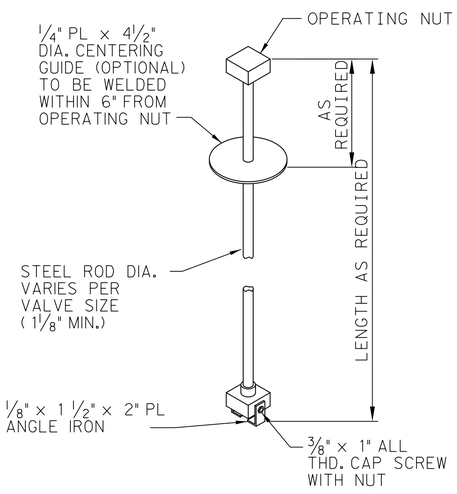




TYPICAL GATE VALVE SETTING AND BOX

N.T.S.

NOTES:
1. THE VALVE AND JOINT ASSEMBLIES SHALL BE WRAPPED IN POLYETHYLENE ACCORDING TO AWWA C105.
2. THE JOINT TYPE SHALL BE MECHANICAL JOINTS UNLESS OTHERWISE SPECIFIED IN THE PLANS.
3. VALVE BOX SHALL BE TYLER PIPE 6850 SERIES OR APPROVED EQUAL.
4. GATE VALVE SHALL BE RESILIENT SEAT TYPE WITH FULLY ENCAPSULATED WEDGE WITH A NON RISING STEM AND A 2-INCH SQUARE OPERATOR AS MANUFACTURED BY MUELLER, AMERICAN FLOW CONTROL, M&H, OR EJ IRONWORKS.



GATE VALVE EXTENSION STEM

N.T.S.

FIRE HYDRANT NOTES:

1. FIRE HYDRANTS SHALL BE LOCATED 3-FEET OFF THE FACE OF CURB IN RESIDENTIAL AREAS. REFER TO PLANS FOR LOCATIONS IN OTHER LOCATIONS.
2. ALL FIRE HYDRANT UPPER BARRELS SHALL BE PAINTED WITH A HIGH GLOSS ALKYD ALUMINUM (SILVER) #17173 COATING.
3. FIRE HYDRANT BONNETS SHALL BE PAINTED PER THE NATIONAL FIRE PROTECTION AGENCY (NFPA) 291 STANDARD FOR RATE OF FLOW COLOR CODING.
4. FIRE HYDRANT SHALL NOT BE PLACED IN SIDEWALK.
5. ALL NUTS AND BOLTS FOR THE BONNET & FOOT OF FIRE HYDRANTS SHALL BE STAINLESS STEEL.

W-3

CERTIFICATION:

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WATER STANDARD DETAILS

VALVE, HYDRANTS

NORTHLAKE TEXAS

THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N. T. S.	W-3	—

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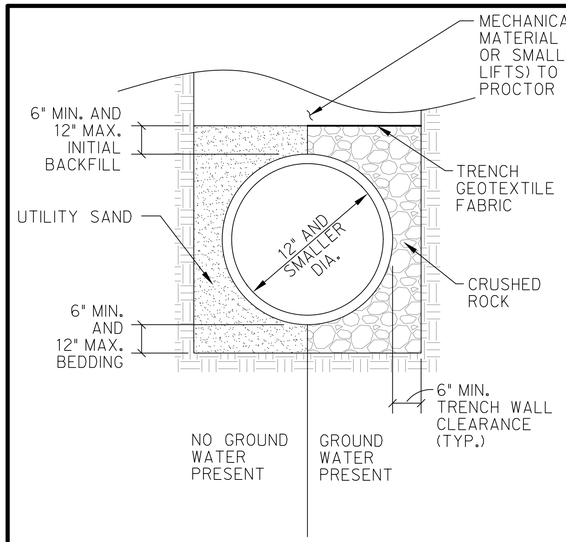
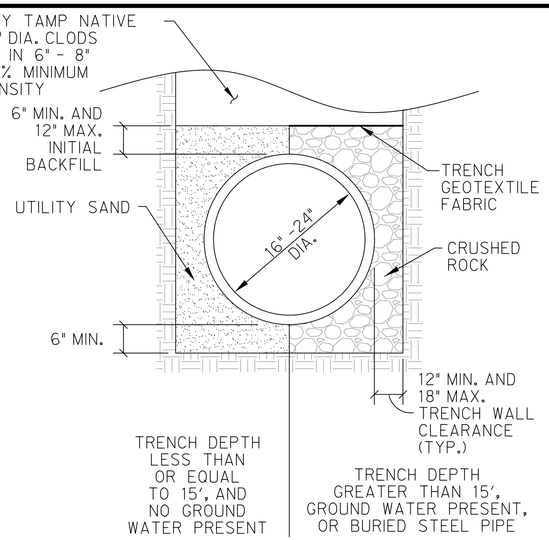


PIPE EMBEDMENT DETAIL
(12-INCH DIA. AND SMALLER)
N.T.S.



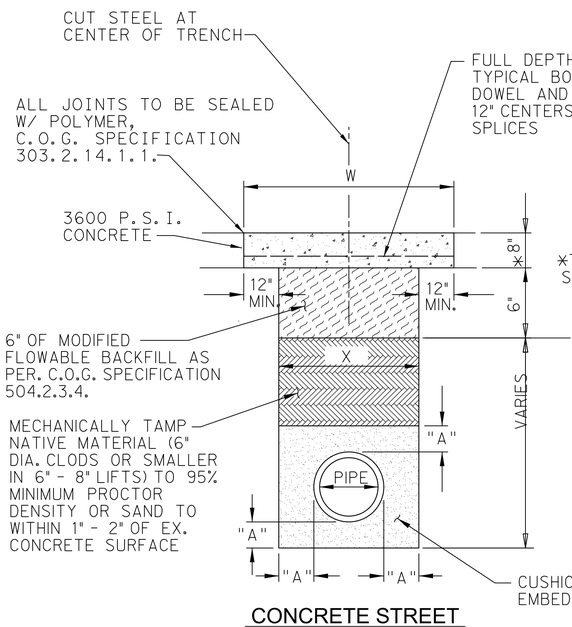
PIPE EMBEDMENT DETAIL
(16-INCH TO 24-INCH)
N.T.S.

NOTES:

1. A COMMERCIALLY AVAILABLE MAGNETIC TAPE SHALL BE INSTALLED 12-INCHES ABOVE THE TOP OF ALL PVC WATER PIPE. THE TAPE SHALL BE BLUE IN COLOR AND HAVE THE WORDING "CAUTION WATER LINE BURIED BELOW".
2. TRACE WIRE SHALL BE INSTALLED ON ALL WATER MAINS. SEE GENERAL NOTES FOR REQUIREMENTS.

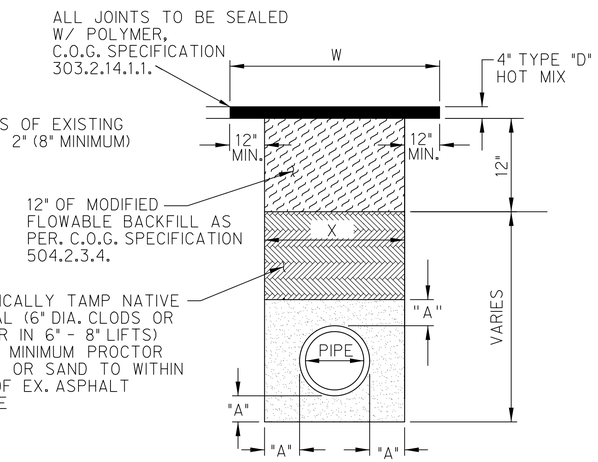
MECHANICALLY TAMPED NATIVE MATERIAL MAY BE USED TO THE BOTTOM OF CONCRETE PAVEMENT WHEN BOTH OF THE FOLLOWING CONDITIONS ARE MET:

1. THE OUTSIDE OF THE WATER LINE MUST BE A MINIMUM OF 2 FEET BELOW THE BOTTOM OF THE PAVEMENT.
2. THE STREET IS BEING COMPLETELY REPLACED OR IT IS A NEW STREET.



CONCRETE STREET REPAIR

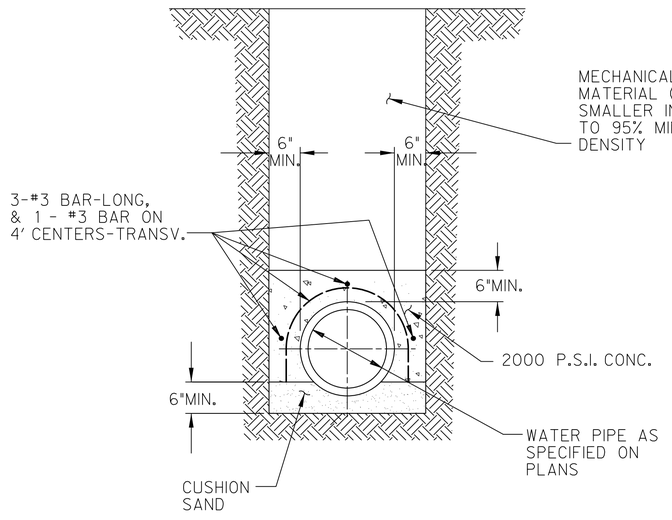
NOTE:
SAWCUT TO REPAIR ASPHALT OR CONCRETE PAVEMENT PRIOR TO OPENING THE DITCH IN ORDER TO ENSURE A NEAT STRAIGHT EDGE.



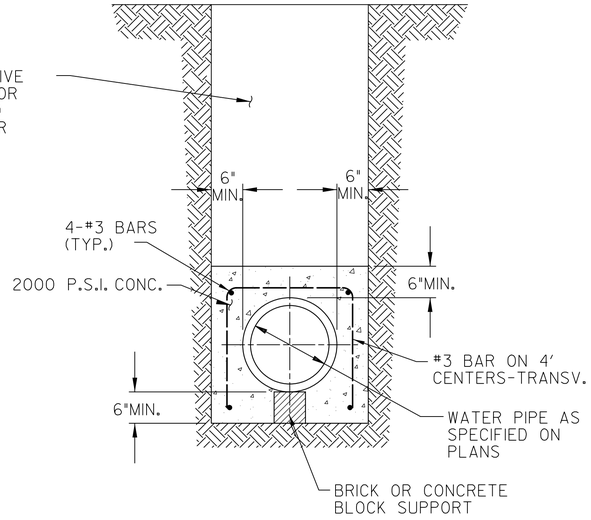
ASPHALT STREET REPAIR

STREET BACKFILL & REPAIR

N.T.S.



CAP DETAIL
N.T.S.



ENCASEMENT DETAIL
N.T.S.

TABLE OF DIMENSIONS FOR WIDTH OF TRENCH AND PAVEMENT REPLACEMENT

NORMAL SIZE OF PIPE IN INCHES	O.D. OF PIPE BELL IN INCHES (PVC-DR18)	MINIMUM TRENCH WALL CLEARANCE "A" IN INCHES	WIDTH OF TRENCH ('X')		WIDTH OF PVMT. REPLACEMENT *
			MAXIMUM ** IN INCHES	MINIMUM ** IN INCHES	('W') CONC. & ASPHALT **
6	6.9	6	24	19	48
6	6.9	6	24	19	48
10	11.10	6	28	24	48
12	13.20	6	30	26	50
16+	VARIES	8	*	*	*

NOTE: * REFER TO THE PLANS FOR SPECIFIED WIDTH OF REPLACEMENT.
** RECOMMENDED WIDTHS - VARIES BASED ON DEPTH. AND SOIL MATERIAL.

W-4

CERTIFICATION:

THIS TOWN OF NORTHLAKE STANDARD DETAIL SHEET IS AUTHORIZED FOR USE IN THIS PROJECT BY THE ENGINEER WHOSE SEAL APPEARS ON THIS SHEET. THIS ENGINEER IS ALSO CERTIFYING THAT THE CONTENT OF THE DETAILS AND NOTES ON THIS SHEET HAVE NOT BEEN ALTERED FROM THAT RECEIVED FROM THE TOWN OF NORTHLAKE.

WATER STANDARD DETAILS

BACKFILL / EMBEDMENT

NORTHLAKE TEXAS

THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N. T. S.	W-4	

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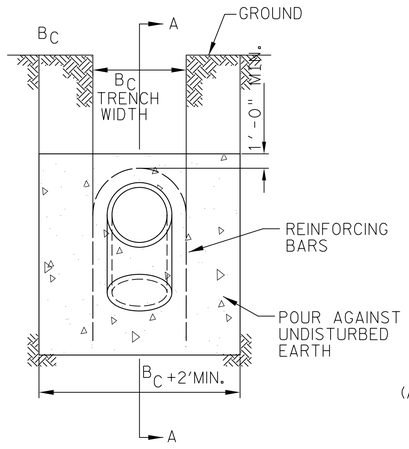
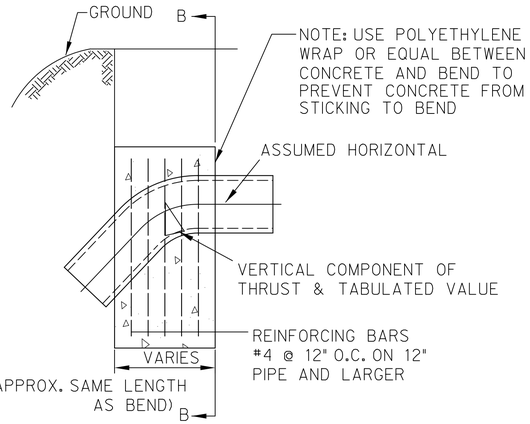


ELEVATION B-B



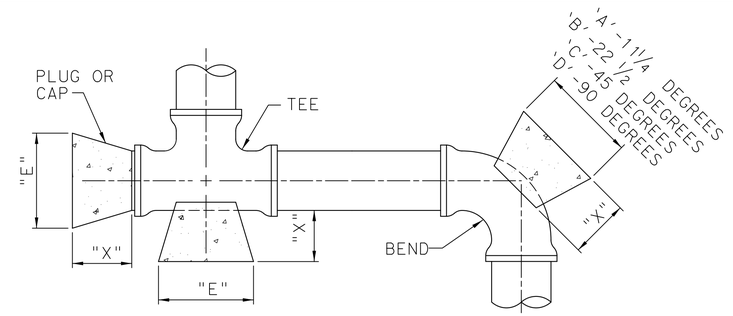
ELEVATION A-A

VERTICAL THRUST BLOCK NOTES:

1. ALL CALCULATIONS ARE BASED ON INTERNAL PRESSURE OF 200 P.S.I FOR 24" I.D. PIPE AND SMALLER AND 150 P.S.I. ON 30" I.D. AND LARGER.
2. VOLUMES OF VERTICAL BEND THRUST BLOCKS ARE NET VOLUMES OF CONCRETE TO BE FURNISHED. THE CORRESPONDING WEIGHT OF THE CONCRETE IS EQUAL TO OR GREATER THAN THE VERTICAL COMPONENT OF THRUST ON THE VERTICAL BEND.
3. WALL THICKNESS (T) ASSUMED HERE FOR ESTIMATED PURPOSES ONLY.
4. CONCRETE FOR BLOCKING SHALL BE 2000 P.S.I. CONCRETE DIMENSIONS MAY BE VARIED AS REQUIRED BY FIELD CONDITIONS WHERE AND AS DIRECTED BY THE ENGINEER. THE VOLUME OF CONCRETE BLOCKING SHALL NOT BE LESS THAN SHOWN HERE.

△	11.25°		22.50°		30°		45°		67.50°		90°		△
I.D. (IN.)	THRUST TONS	VOL. C.Y.	THRUST TONS	VOL. C.Y.	THRUST TONS	VOL. C.Y.	THRUST TONS	VOL. C.Y.	THRUST TONS	VOL. C.Y.	THRUST TONS	VOL. C.Y.	I.D. (IN.)
4,6,8	1.0	0.5	2.0	1.0	2.5	1.3	3.6	1.8	4.6	2.3	5.0	2.5	4,6,8
10,12	2.2	1.1	4.3	2.2	5.7	2.8	8.0	4.0	10.5	5.2	11.3	5.7	10,12
16,18	5.0	2.5	9.7	4.9	12.7	6.4	18.0	9.0	23.5	11.8	25.5	12.7	16,18
20	6.1	3.1	12.0	6.0	15.7	7.9	22.2	11.1	29.2	14.5	31.4	15.7	20
24	8.2	4.4	17.3	8.7	22.6	11.3	32.0	16.0	41.8	20.9	45.2	22.6	24
30	10.5	5.2	20.3	10.1	26.5	13.3	37.5	18.8	49.0	24.5	53.1	26.5	30
36	14.9	7.5	29.2	14.6	38.2	19.1	54.0	27.0	70.5	35.3	76.4	38.2	36
42	20.3	10.1	39.8	19.9	52.0	26.0	73.5	36.7	96.0	48.0	104.0	52.0	42
48	26.5	13.2	51.9	26.0	67.9	33.9	96.0	48.0	126.0	62.7	136.0	67.9	48
54	33.5	16.8	65.7	32.9	85.9	42.9	122.0	60.7	159.0	79.4	172.0	85.9	54
60	41.4	20.7	81.2	40.6	106.0	53.0	150.0	75.0	196.0	98.0	212.0	106.0	60
66	50.1	25.0	98.2	49.1	128.0	64.2	182.0	90.7	237.0	119.0	257.0	128.0	66
72	59.6	29.8	117.0	58.4	153.0	76.3	216.0	108.0	282.0	141.0	305.0	153.0	72
78	69.9	35.0	137.0	68.6	179.0	90.0	254.0	127.0	331.0	166.0	358.0	179.0	78
84	81.1	40.5	159.0	79.5	208.0	104.0	294.0	147.0	384.0	192.0	416.0	208.0	84
90	93.1	46.5	183.0	91.3	239.0	119.0	337.0	169.0	441.0	221.0	477.0	239.0	90
96	106.0	53.0	208.0	104.0	272.0	136.0	384.0	192.0	502.0	251.0	543.0	272.0	96

DIMENSIONS OF CONCRETE FOR VERTICAL THRUST BLOCKS AT FITTINGS



PIPE SIZE	X-* DIA. FT.	11 1/4 DEGREES "A"	11 1/4 DEGREES MIN. AREA	22 1/2 DEGREES "B"	22 1/2 DEGREES MIN. AREA	45 DEGREES "C"	45 DEGREES MIN. AREA	90 DEGREES "D"	90 DEGREES MIN. AREA	TEE & PLUG "E"	TEE & PLUG MIN. AREA
4"	1.5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.06	1.00	1.00
6"	1.5	1.00	1.00	1.00	1.00	1.14	1.30	1.55	2.40	1.30	1.70
8"	1.5	1.00	1.00	1.08	1.18	1.52	2.31	2.07	4.27	1.74	3.02
10"	1.5	1.00	1.00	1.35	1.84	1.90	3.61	2.58	6.66	2.17	4.71
12"	1.5	1.00	1.33	1.63	2.65	1.86	5.19	3.10	9.60	2.61	6.79
14"	1.5	1.03	1.81	1.90	3.60	2.66	7.07	3.61	13.06	3.04	9.246
16"	2.0	1.18	2.36	2.17	4.71	3.04	9.23	4.13	17.06	3.47	12.06
18"	2.0	1.33	2.99	2.44	5.96	3.42	11.69	4.65	21.59	3.91	15.27
20"	2.0	1.48	3.70	2.71	7.35	3.80	14.43	5.16	26.86	4.34	18.85
21"	2.0	1.55	4.07	2.85	8.11	3.99	15.91	5.42	29.39	4.56	20.78
24"	2.0	1.77	5.32	3.25	10.59	4.56	20.77	6.20	38.39	5.21	27.14
27"	2.5	1.99	6.73	3.66	13.40	5.13	26.29	6.97	48.58	5.86	34.35
30"	2.5	2.22	8.31	4.07	16.55	5.70	32.46	7.74	59.98	6.51	42.41
33"	2.5	2.44	10.06	4.47	20.02	6.27	39.28	8.52	72.57	7.16	51.31
36"	2.5	2.66	11.97	4.88	23.83	6.84	46.74	9.29	86.37	7.81	61.07
39"	3.0	2.88	14.05	5.29	27.97	7.41	54.86	10.07	101.36	8.47	71.68
42"	3.0	3.10	16.30	5.69	32.43	7.98	63.62	10.85	117.56	9.12	83.13

HORIZONAL THRUST BLOCK NOTES:

1. USE MEGA LUGS OR EQUIVALENT FOR ALL BENDS.
2. ALL CALCULATIONS ARE BASED ON A WATER LINE PRESSURE OF 150 P.S.I. AND AN ALLOWABLE SOIL BEARING VALUE OF 2,500 POUNDS PER SQUARE FEET.
3. 2000 PSI. CONCRETE SHALL BE USED FOR ALL BLOCKING.
4. THE MINIMUM VERTICAL DIMENSIONS OF ALL BLOCKING SHALL BE 1.5 TIMES THE PIPE DIAMETER WITH AT LEAST 0.75 TIMES THE PIPE DIAMETER EXTENDING BOTH ABOVE AND BELOW THE PIPE CENTERLINE. THIS DIMENSION DETERMINES THE "X" DIMENSION FOR 11 1/4° BENDS.
5. FOR 22-1/2°, 45°, 90°, AND TEE AND PLUGS, THE VERTICAL DIMENSION SHALL BE EQUAL TO THE HORIZONTAL DIMENSION SHOWN TO PRODUCE THE REQUIRED MINIMUM AREA.
6. ALL MINIMUM AREAS ARE IN SQUARE FEET.

DIMENSIONS OF CONCRETE FOR HORIZONTAL THRUST BLOCKING AT FITTINGS

W-5

CERTIFICATION:

THIS TOWN OF NORTHLAKE STANDARD DETAIL SHEET IS AUTHORIZED FOR USE IN THIS PROJECT BY THE ENGINEER WHOSE SEAL APPEARS ON THIS SHEET. THIS ENGINEER IS ALSO CERTIFYING THAT THE CONTENT OF THE DETAILS AND NOTES ON THIS SHEET HAVE NOT BEEN ALTERED FROM THAT RECEIVED FROM THE TOWN OF NORTHLAKE.

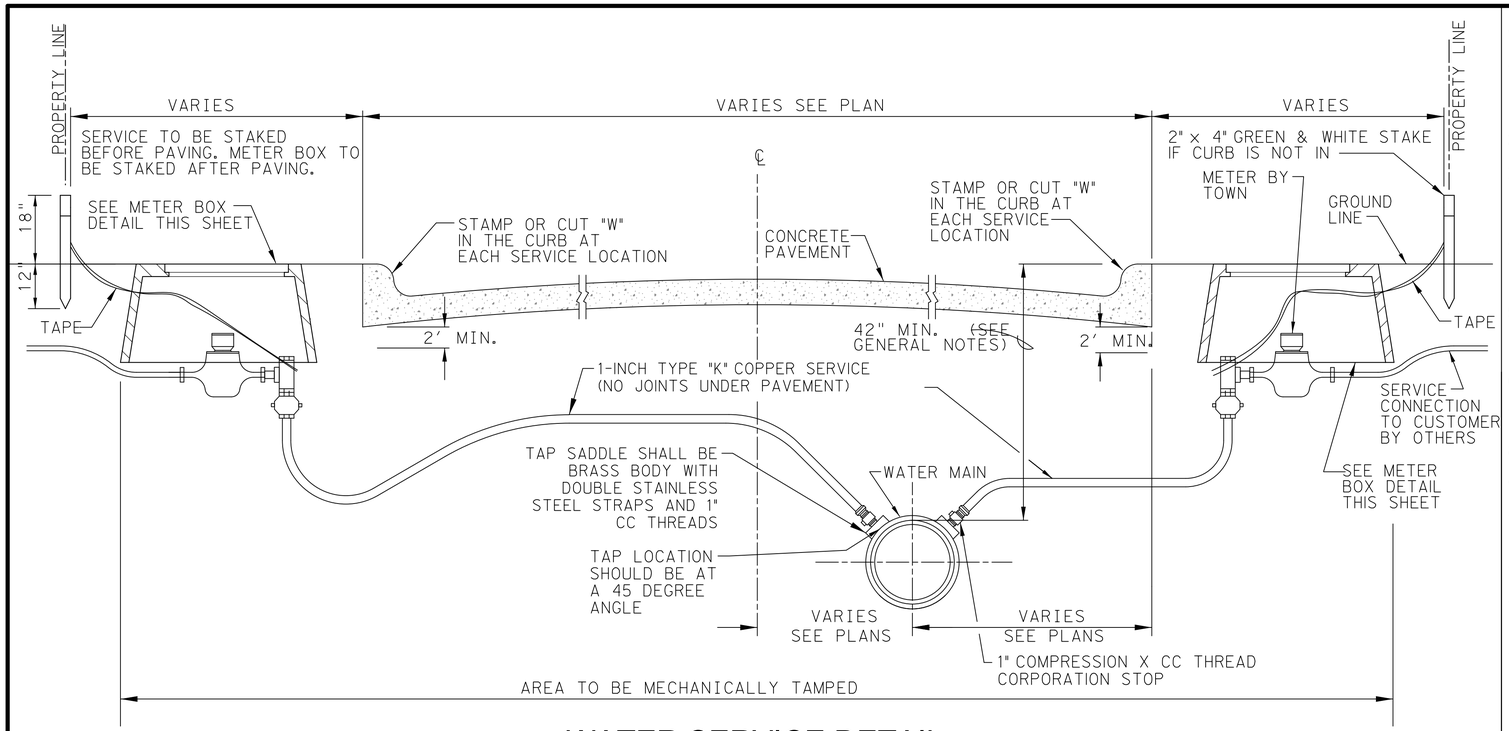
WATER STANDARD DETAILS

CONCRETE BLOCKING

NORTHLAKE TEXAS

THE TOWN OF NORTHLAKE
TEXAS

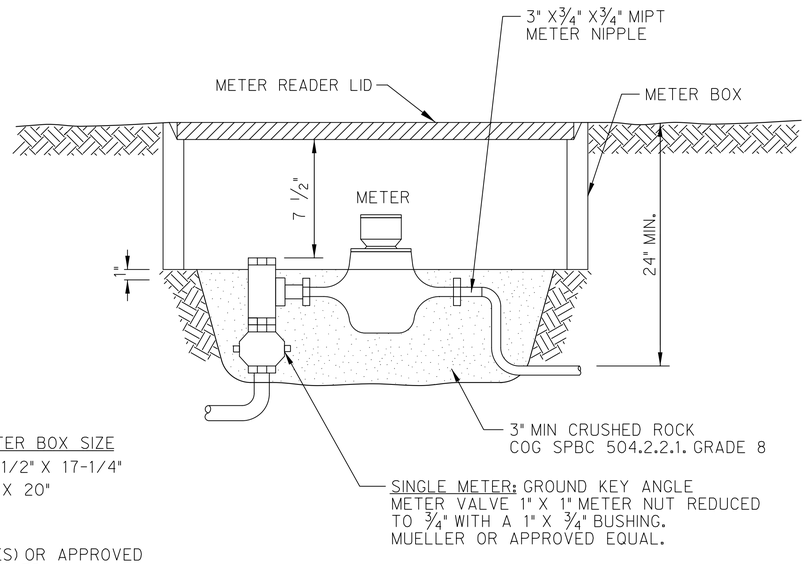
DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N.T.S.	W-5	—



WATER SERVICE DETAIL

N.T.S.

NOTE:
SINGLE SERVICES SHALL BE PLACED ON A PROPERTY LINE WITH A 1" LINE AND REDUCED AT THE ANGLE STOP.



METER SIZE	METER BOX SIZE
SINGLE ¾"	10-1/2" X 17-1/4"
SINGLE 1"	12" X 20"

NOTE:
METER BOX SHALL BE DFW PLASTICS "C" SERIES BOX(ES) OR APPROVED EQUAL IN THE APPROPRIATE SIZE FOR ALL 1" AND SMALLER.

METER BOX DETAIL

N.T.S.

WATER SERVICE NOTES:

1. All property corners shall be staked with iron rods prior to the installation of any water services. Water service locations shall be staked in the field in accordance with Note 4 below.
2. Water services shall not be connected to fire hydrant lead lines.
3. All material shall conform to the standard specifications. See the "Town of Northlake Addendum to the North Central Texas Council of Governments Standard Specifications for Public Works Construction" for a list of approved materials.
4. The Contractor shall set the meter boxes in all cases. The meter box shall be set within the right-of-way or a dedicated utility easement. The meter box shall be protected from vehicular traffic.
5. It is the responsibility of the Contractor to furnish and install the corporation, water service pipe, cut-off angle valve, the connector pipe, and meter box, as per the details on this sheet.
6. Direct taps are not allowed, saddles shall be used.
7. Cutter for taps shall be of the double slotted type.
8. Tap saddle shall be brass body with double stainless steel straps and 1" CC threads.
9. All taps larger than 2-inch shall be made using tapping tees.
10. Taps shall be a minimum of 18 inches apart with taps no closer than 1 foot from the end of the pipe.
11. All house services shall be 1 inch Type "K" soft drawn copper.
12. No splices of water services shall be permitted under pavement unless approved by the Town.
13. Where splices are approved by the Town, use a 3 part union copper to copper, Mueller restrained union, or equal.
14. Corporations shall be minimum 1-inch. Mueller compression corporation or approved equal.
15. Meters shall be centered in boxes.
16. Meter boxes shall be located outside of all flatwork, sidewalks and approaches, except when approved by the building official. A water meter service located in an area subject to vehicular traffic must employ a traffic rated meter box and lid with automatic meter reading capabilities.
17. No 90 degree bends may be installed in services, except as shown.
18. All water services to be marked by "W" stamped or cut on the curb.
19. Any brass part of the fitting or valve in contact with potable water shall be made of a "No-Lead Brass".

W-6

CERTIFICATION:
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WATER STANDARD DETAILS

WATER SERVICES

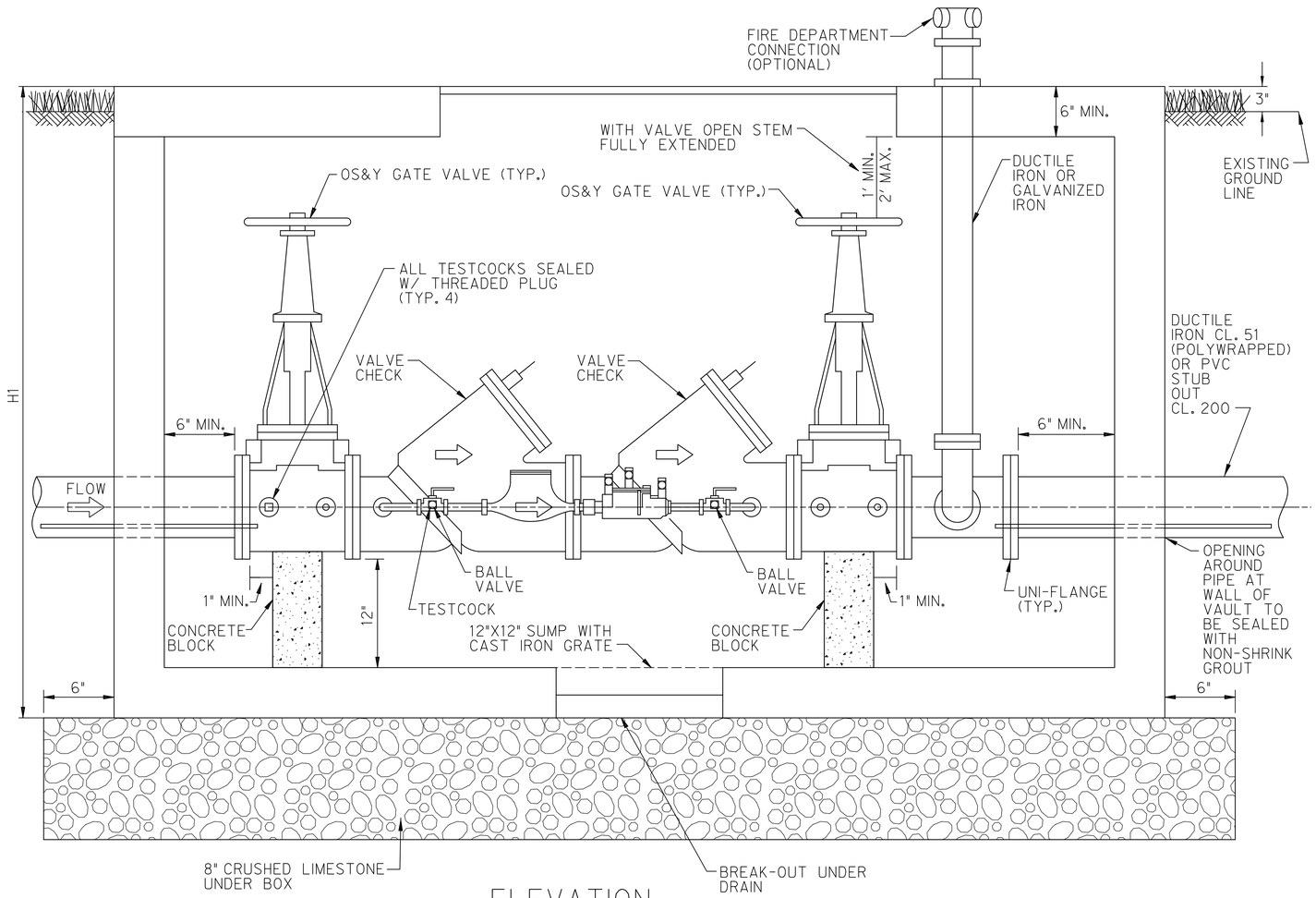
THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N.T.S.	W-6	—

LOCATION:
(A)The vault shall be located on the owner's property and not within town right-of-way.

(B) The owner at his option and the approval of the Town of Northlake may be permitted to install the double check detector backflow preventer assembly inside the building. The installation would be required to be permitted by the Town of Northlake. The Fire Department connection is to be located at the street. The Fire Department connection shall be within 6 feet of curb, unobstructed and in clear view. And Water Utility personnel shall have access during normal business hours.

(C) The Fire Department connection may be installed outside the vault with the approval of the engineering division.



ELEVATION

N.T.S.

VAULT:
(A) The valve vault may be precast as per details of Dalworth Quickset or Brooks Products or an approved equal.

(B) The vault shall be placed on 8-inches crushed limestone and the vault shall have a sump with a minimum of a 12" X 12" grate in the bottom of the vault for drain purposes.

(C) Concrete shall be minimum 6.5 sacks, with 4200 P.S.I. at 28 days.

(D) Unit is to be of monolithic construction at floor and first stage of wall with sectional riser to required depth.

(E) Reinforcement shall be Grade 60 steel Rebar conforming to ASTM A-615 on required centers or equal.

(F) Hatchway shall be 1/4-inch Aluminum Diamond Plate Cover with extruded aluminum frame. Hatch to be furnished with 316 stainless steel snap lock and brass hinges.

PERMIT AND INSPECTION:
(A) The installation of the check valves and vault shall be permitted and inspected by the Public Works Department of the Town of Northlake.

(B) The Pipe Line from the check valve vault to the building shall be permitted and inspected by the Plumbing Inspection Division of the Town of Northlake.

INSTALLATION:
(A) The double check detector backflow preventer assembly shall consist of a single complete assembly containing two independent acting check valves and four properly placed resilient test cocks for test of the assembly. Assembly shall also include two (2) U.L. Listed resilient seated OS & Y shutoff valves and test cocks.

(B) Unit shall be U1/FM approved with UL/FM approved OS & Y shutoff valves.

(C) OS & Y valves shall be Mueller, American Flow Control or an approved equal.

(D) The auxiliary line shall consist of an approved backflow preventer (double check assembly completed with test cocks) and a 5/8" X 3/4" water meter.

(E) The bypass auxiliary line shall have a double check assembly, Watts series 007, Ames 2000 SS BV or FEBCO 805 Y or an approved equal.

(F) The bypass auxiliary line 5/8" X 3/4" meter shall be Hersey, Neptune or Badger.

(G) The backflow preventer shall have a Epoxy coated cast iron body, Epoxy coated ductile iron body or stainless steel body with replacement bronze seats and/or a unitized stainless and plastic check assembly.

(H) The double check detector backflow preventer assembly shall be a Watts series 709 DCDA OSYRW, AMES Model 3000 SS or FEBCO Model 856 or an approved equal.

(I) 4-inch Water check valves shall be reliable Model DW, Mueller A 2102 or NBCO W-900W or an approved equal.

TESTING:
(A) The Uniform Plumbing Code requires that this assembly must be tested immediately upon installation. Copies of the test report must be forwarded to the Environmental Services Department.

(B) Upon installation and approval of fire sprinkler line/Fire Department connection, the owner shall be required to submit a yearly test report from a reputable testing company stating that the check valves are in good working condition. These test reports shall be submitted to the Town of Northlake Environmental Services Department and the Fire Department once a year as required by the TCEQ rules and regulations and Town of Northlake Code of Ordinances. The testing of backflow preventer assemblies which are installed to provide protection against Health hazards are to be completed by certified Fireline Testers that are qualified to test and repair backflow preventer assemblies on fire lines only.

MAINTENANCE:
(A) The maintenance of the double check detector backflow assembly shall be by the property owner.

W-7

GENERAL NOTES:

GENERAL:
(A) All construction shall be in accordance with the standard specifications of the Town of Northlake, which has also adopted the Fifth Edition of the "Standard Specifications For Public Works Construction - North Central Texas" herein referred to as "COG" specifications. Copies may be obtained from the North Central Texas Council of Governments, 616 Six Flags Drive, Suite 200, Arlington, Texas 76005-5888. (817) 640-3300.

(B) Refer to COG Items 502.12.2 and 502.6 specifications.

(C) The assembly shall meet the basic requirements of ASSE 1048 for double check valves and meet requirements of AWWA, CSA, UI Classified, FM Approved. Assembly shall also be approved by the University of Southern California.

(D) All details and specifications shown on this sheet will govern for the installation of the assembly.

PARK EQUIPMENT CO. (OR EQUAL) VAULT DETAIL

DIMENSIONS					
MODEL	SIZE	L1	W1	H1	WEIGHT LBS.
DDBP3	3"	6'-0"	3'-6"	4'-0"	2,700
DDBP4	4"	6'-0"	3'-6"	4'-0"	2,900
DDBP6	6"	7'-10"	4'-4"	5'-5"	9,000
DDPB8	8"	8'-8"	5'-0"	5'-6"	15,000
DDBP10	10"	9'-2"	5'-8"	8'-6"	18,000

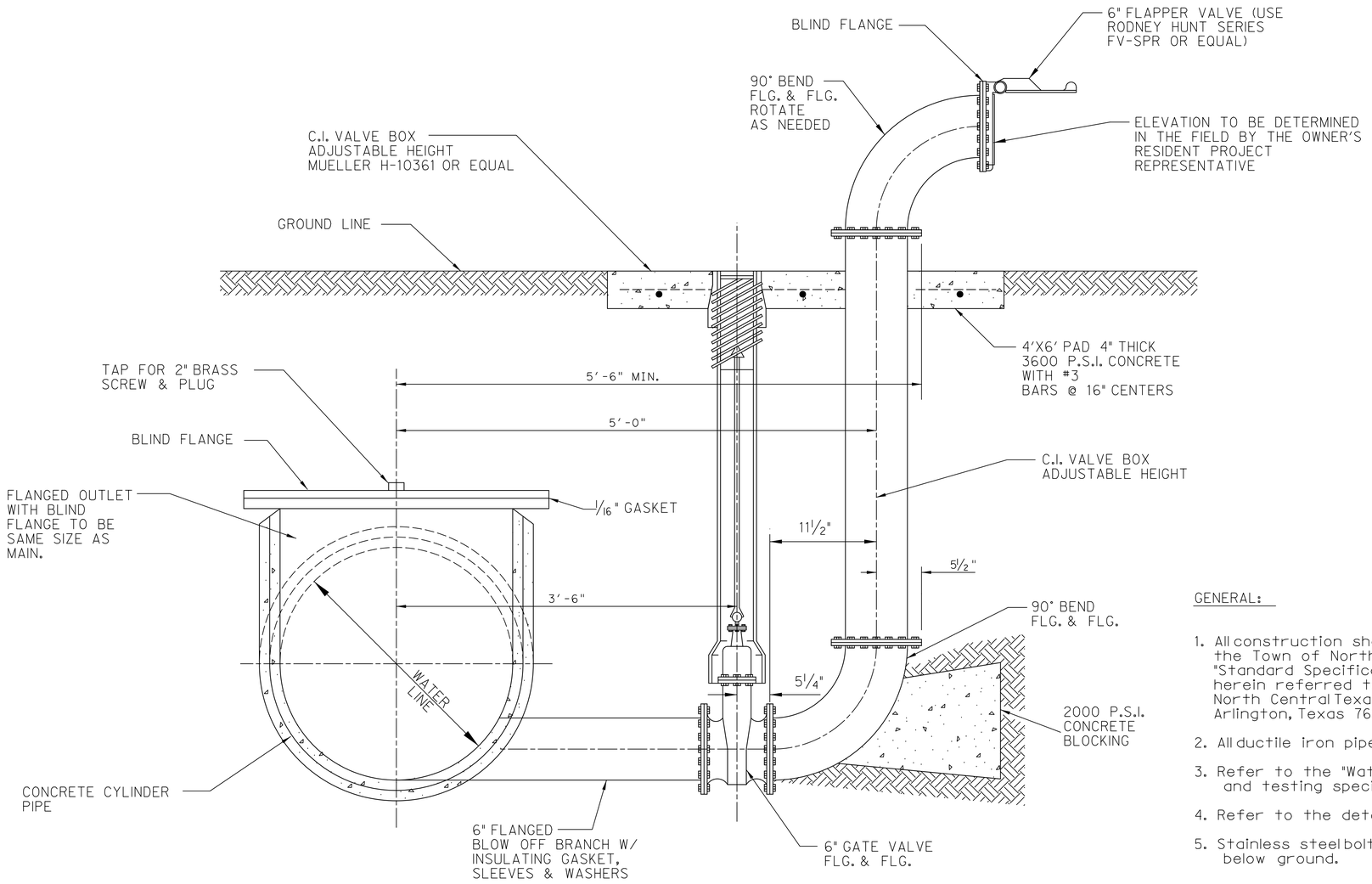
CERTIFICATION:
THIS TOWN OF NORTHLAKE STANDARD DETAIL SHEET IS AUTHORIZED FOR USE IN THIS PROJECT BY THE ENGINEER WHOSE SEAL APPEARS ON THIS SHEET. THIS ENGINEER IS ALSO CERTIFYING THAT THE CONTENT OF THE DETAILS AND NOTES ON THIS SHEET HAVE NOT BEEN ALTERED FROM THAT RECEIVED FROM THE TOWN OF NORTHLAKE.

WATER STANDARD DETAILS

WATER DETECTOR CHECK AND VAULT

THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N. T. S.	W-7	



WATER BLOW-OFF DETAIL

NOT TO SCALE

GENERAL:

1. All construction shall be in accordance with the standard specifications of the Town of Northlake, which has also adopted the Fifth Edition of the "Standard Specifications For Public Works Construction - North Central Texas" herein referred to as "COG" specifications. Copies may be obtained from the North Central Texas Council of Governments, 616 Six Flags Drive, Suite 200, Arlington, Texas 76005-5888. (817) 640-3300.
2. All ductile iron pipe shall be class 50, and polywrapped.
3. Refer to the "Water Standard Detail" sheet for valve, blocking and testing specifications.
4. Refer to the details on this sheet and COG Item 502.11.2 specifications.
5. Stainless steel bolts shall be used on flanged fittings installed below ground.

W-8

CERTIFICATION:

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WATER STANDARD DETAILS

WATER BLOW OFF VALVE

NORTHLAKE TEXAS

THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N. T. S.	W-8	—

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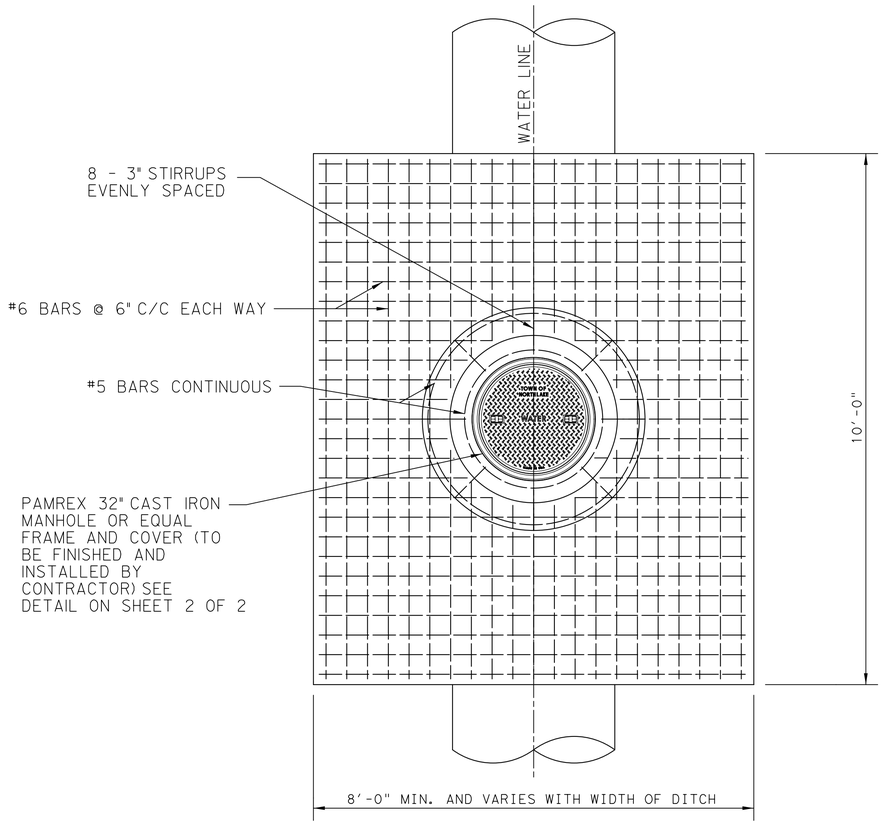
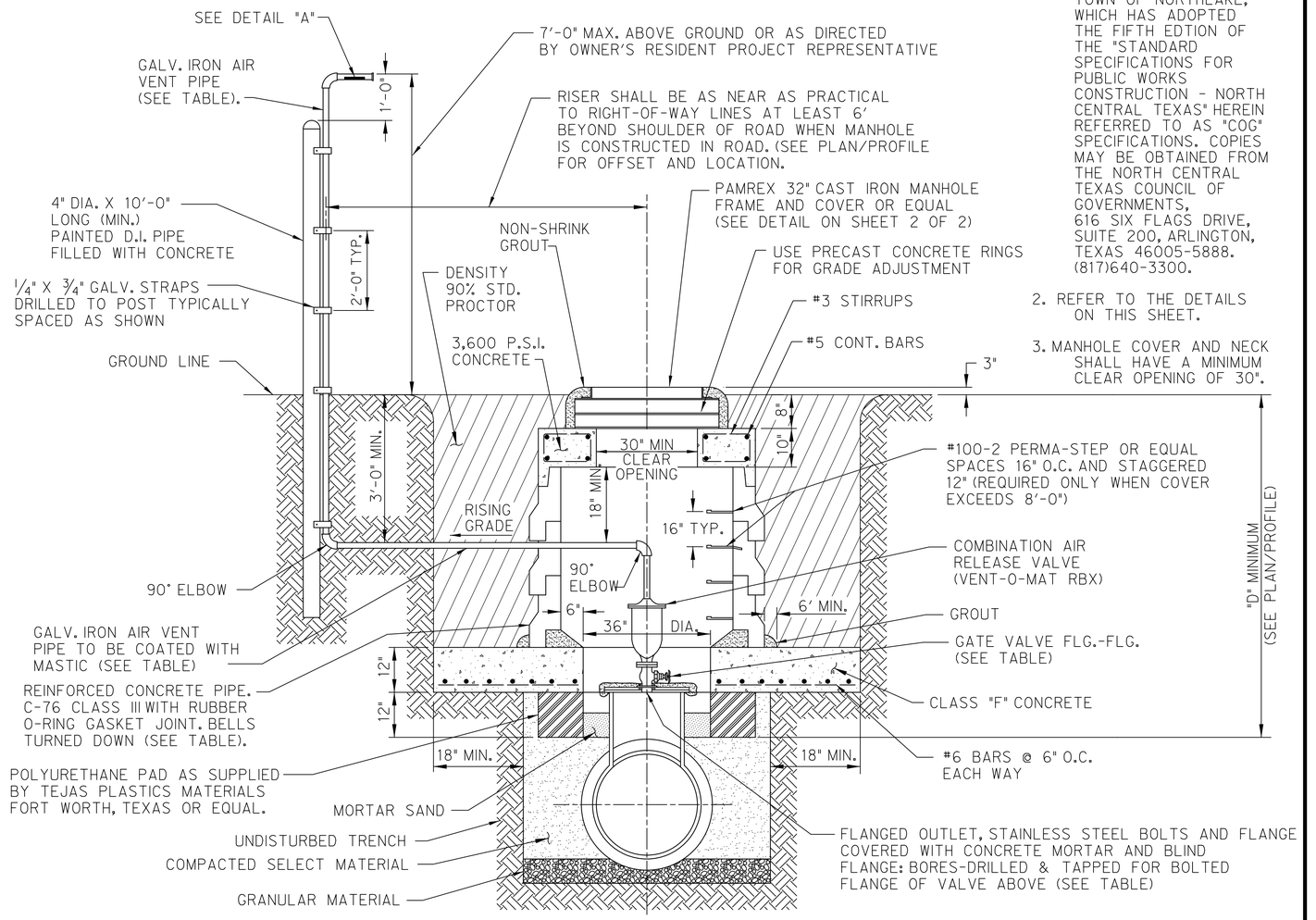


PLAN

NOT TO SCALE



COMBINATION AIR RELEASE VALVE AND VAULT DETAIL

NOT TO SCALE

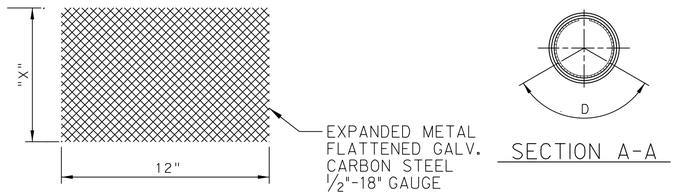
W-9

GENERAL NOTES FOR AIR RELEASE VALVES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE TOWN OF NORTHLAKE, WHICH HAS ADOPTED THE FIFTH EDTION OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION - NORTH CENTRAL TEXAS" HEREIN REFERRED TO AS "COG" SPECIFICATIONS. COPIES MAY BE OBTAINED FROM THE NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS, 616 SIX FLAGS DRIVE, SUITE 200, ARLINGTON, TEXAS 46005-5888. (817)640-3300.
2. REFER TO THE DETAILS ON THIS SHEET.
3. MANHOLE COVER AND NECK SHALL HAVE A MINIMUM CLEAR OPENING OF 30".

COMBINATION AIR RELEASE VALVE - TABLE OF SIZES

AIR VALVE	VALVE	FLG. OUTLET (W)	VENT PIPE	EXPANDED METAL (X)	MANHOLE DIA.	MINIMUM COVER OVER PIPE (D)
1"	1"	8"	1"	3"	N/A	N/A
2"	2"	8"	2"	5"	4'	6.5'
3"	3"	12"	3"	8"	5'	7.0'
4"	4"	16"	4"	10"	5'	7.5'
6"	6"	18"	6"	16"	5'	8.5'
8"	8"	18"	8"	21"	5'	9.0'



DETAIL "A"

NOT TO SCALE

CERTIFICATION:

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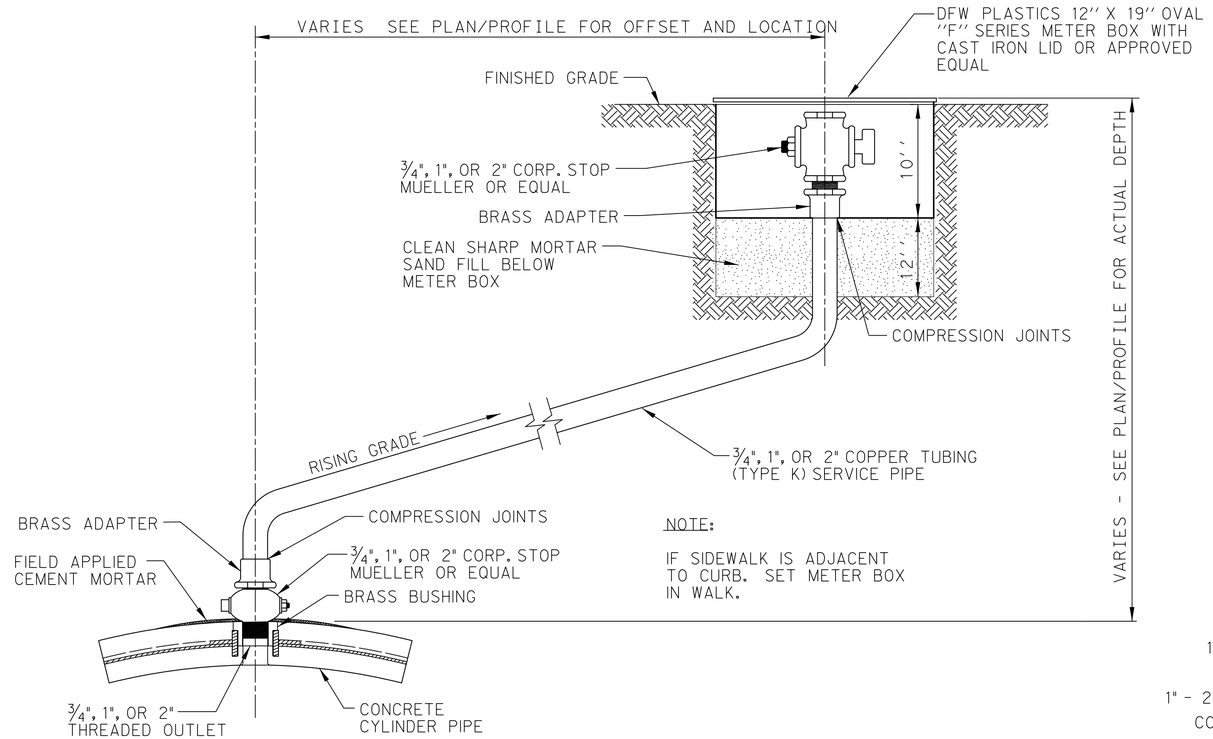
WATER STANDARD DETAILS

WATER AIR VALVE (SHEET 1 OF 2)

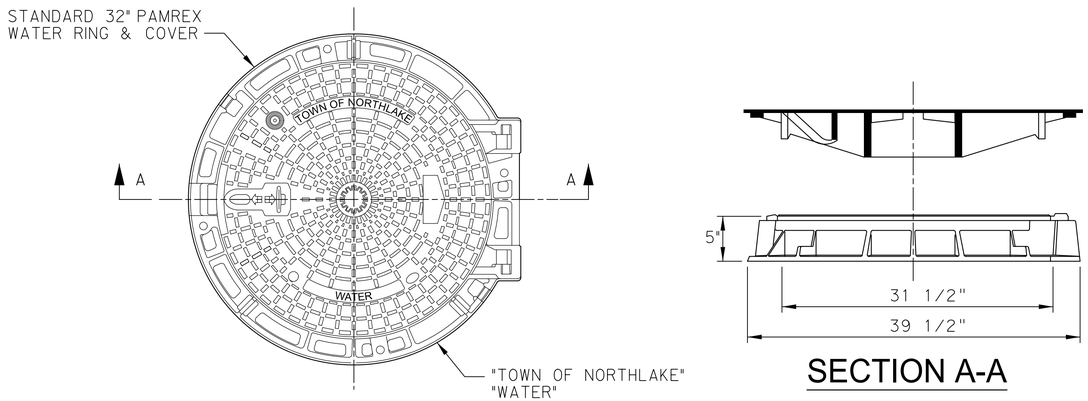
THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N. T. S.	W-9	—



MANUALLY OPERATED AIR VALVE AND FLUSH POINT

(SIZES DESIGNATED ON PLANS)
NOT TO SCALE



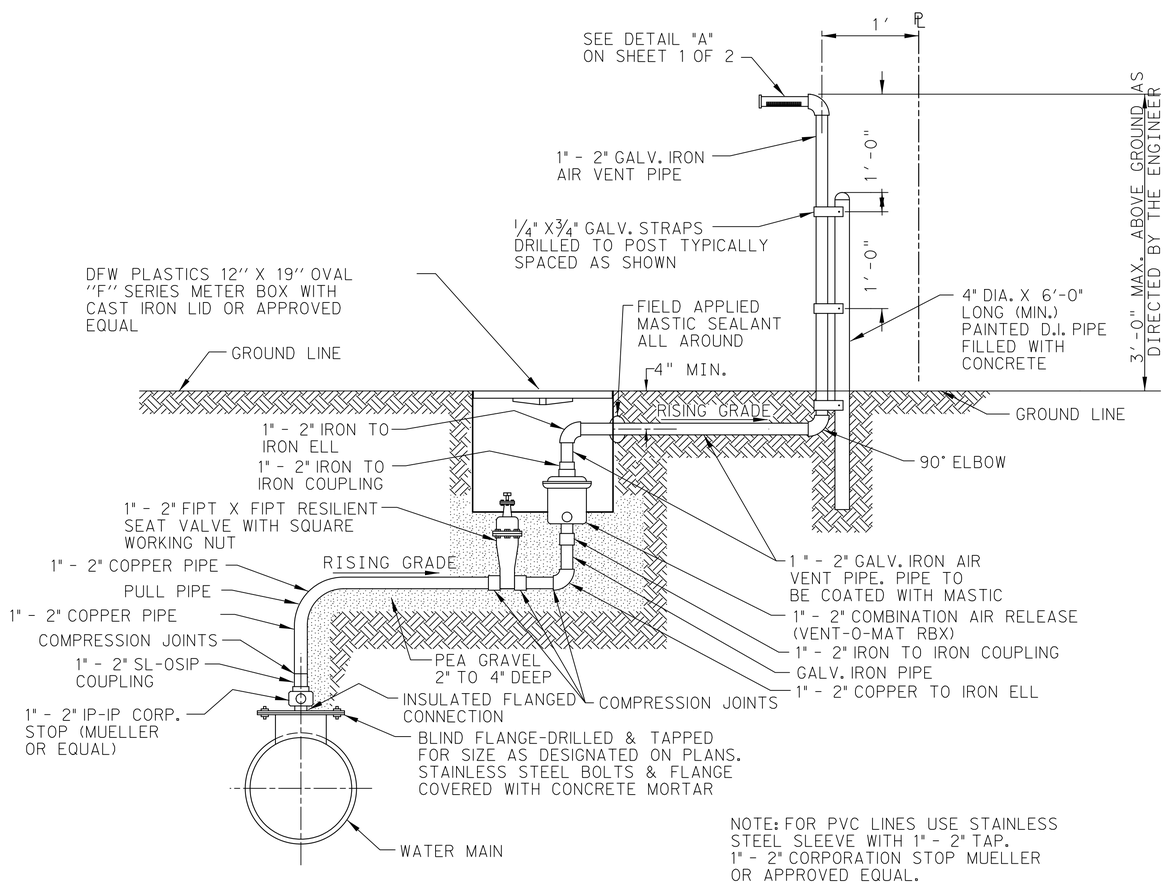
SECTION A-A

STANDARD 32" PAMREX RING & COVER

NOT TO SCALE

RING & COVER NOTES:

1. THE STD. MANHOLE COVER SHALL BE PAMREX 32" RING AND COVER NO. CDPA80EH OR EQUAL
2. APPROXIMATE WEIGHT OF RING=107 LBS. AND COVER=162 LBS.
3. MANHOLE COVER AND NECK SHALL HAVE A MINIMUM CLEAR OPENING OF 30".



COMBINATION AIR RELEASE VALVE AND METER BOX DETAIL

NOT TO SCALE

W-10

CERTIFICATION:

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WATER STANDARD DETAILS

WATER AIR VALVE (SHEET 2 OF 2)

NORTHLAKE TEXAS

THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N. T. S.	W-10	

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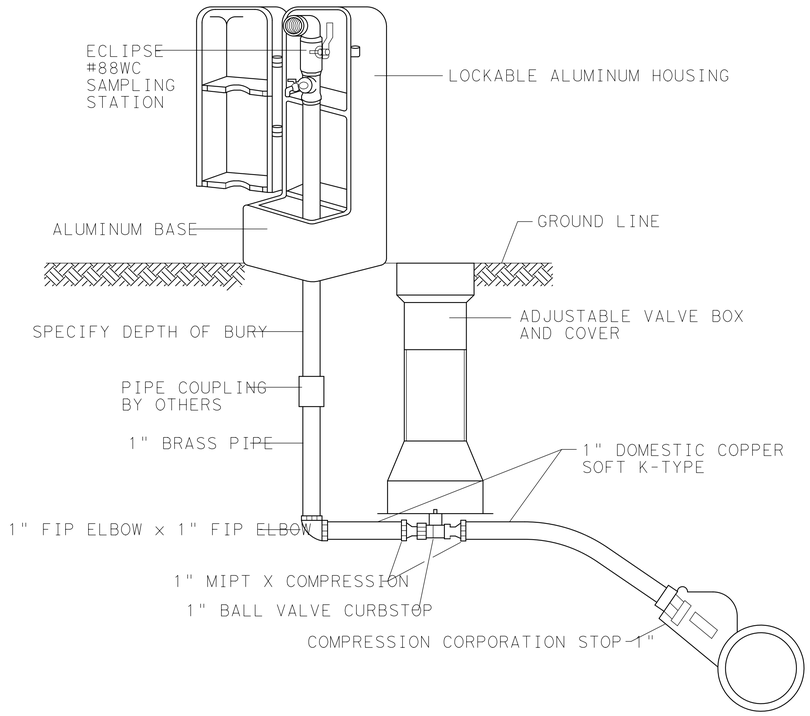
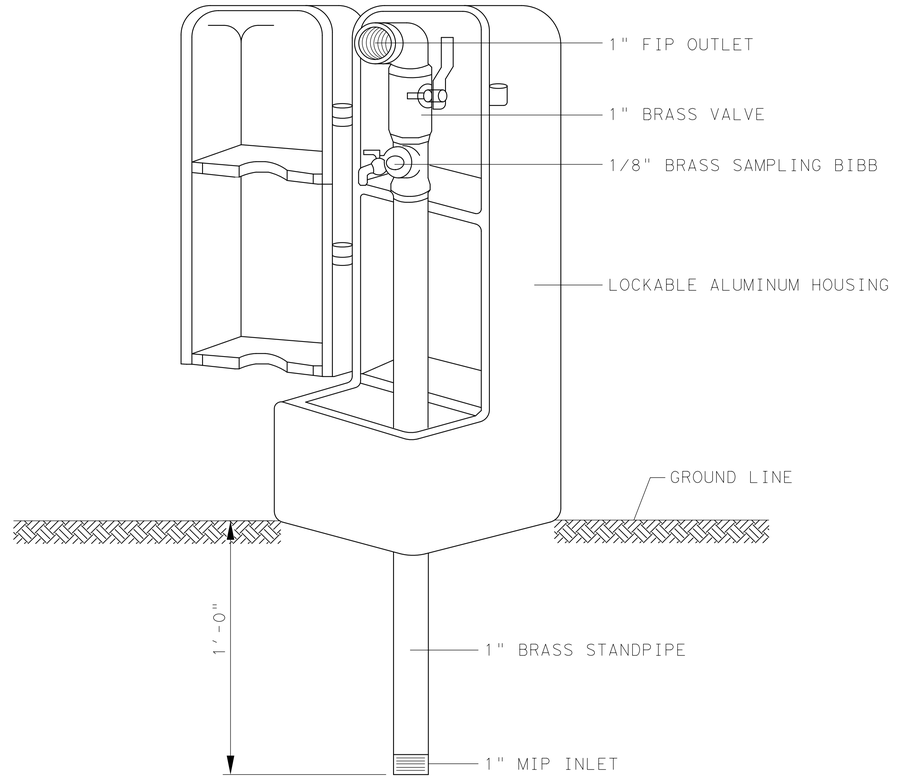


ECLIPSE #88WC SAMPLING STATION

NOT TO SCALE



ECLIPSE #88WC SAMPLING STATION DETAIL

NOT TO SCALE

NOTES:

1. SAMPLING STATIONS SHALL BE 2' BURY, WITH A 1" MIP INLET, AND A 1" FIP THE DISCHARGE. A 1/8" SAMPLING BIBB SHALL BE LOCATED BEFORE THE DISCHARGE PIPE.
2. ALL STATIONS SHALL BE ENCLOSED IN A LOCKABLE, NONREMOVABLE, ALUMINUM-CAST HOUSING.
3. WHEN OPENED, THE STATION SHALL REQUIRE NO KEY FOR OPERATION, AND THE WATER WILL FLOW IN AN ALL BRASS WATERWAY.
4. ALL WORKIING PARTS WILL BE OF BRASS AND SERVICEABLE FROM ABOVE GROUND WITH NO DIGGING. (OPTIONAL: IF DESIRED, A 1/2" BRASS DRAIN TUBE SHALL BE WITHIN THE LOCKING COVER.)
5. A 1" BALL VALVE WILL CONTROL THE WATER FLOW, AND BE LOCATED BEFORE (OR AFTER) THE SAMPLING BIBB, AS MANUFACTURED BY KUPFERIE FOUNDARY ST. LOUIS, MO 63102.
6. WITH 1-300 NEW SERVICES 1 SAMPLING STATION SHALL BE INSTALLED AT THE PUBLIC WORKIS RECOMMENDED LOCATION.
   WITH 301-600 NEW SERVICES 2 SAMPLING STATIONS SHALL BE INSTALLED AT THE PUBLIC WORKS RECOMMENDED LOCATION.
7. WITH 601-900 NEW SERVICES 3 SAMPLING STATIONS SHALL BE INSTALLED AT THE PUBLIC WORKS RECOMMENDED LOCATION.

W-11

CERTIFICATION:

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WATER STANDARD DETAILS

WATER SAMPLING STATION

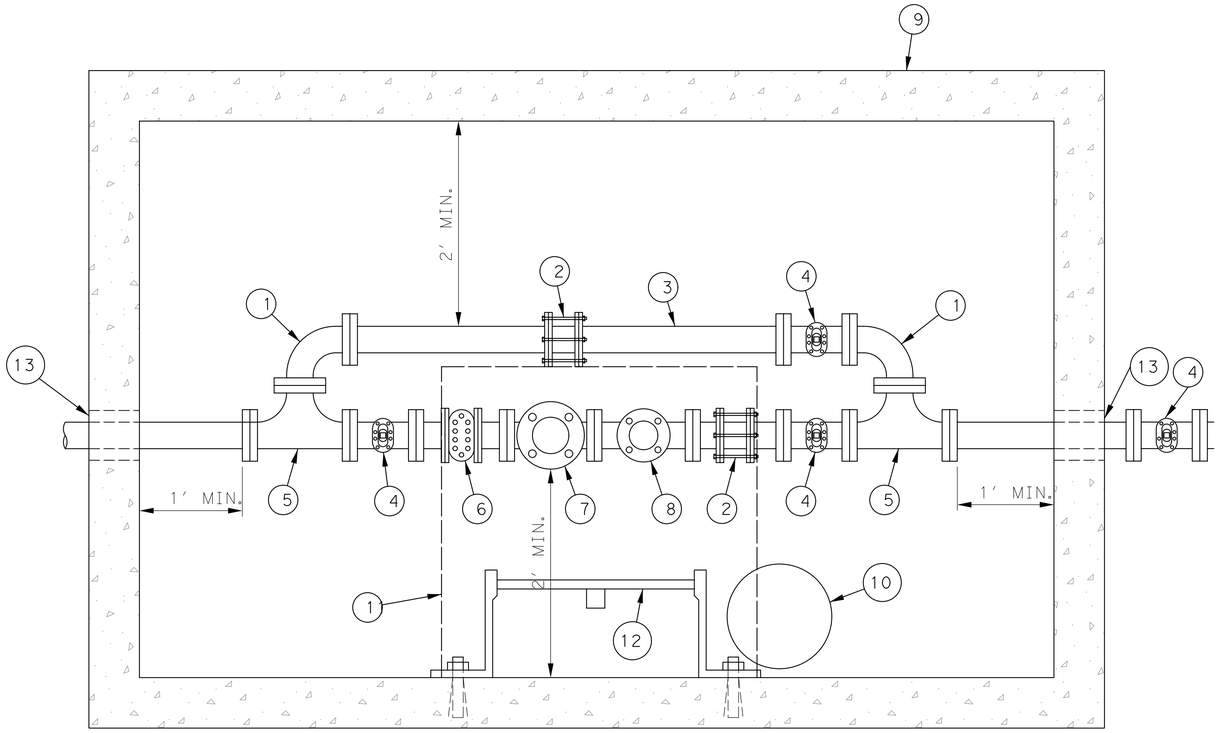
NORTHLAKE TEXAS

THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N.T.S.	W-11	

MATERIALS LIST:	
1	D.I. 90° BEND FLG X FLG
2	RESTRAINED COUPLING OR EXPANSION JOINT
3	BY-PASS LINE
4	GATE VALVE - RESILIENT WEDGE FLG X FLG
5	D.I. TEE FLG X FLG
6	STRAINER
7	METER
8	TESTING TEE FLG X FLG WITH 2" GATE VALVE
9	PRECAST METER VAULT
10	SUMP
11	ACCESS DOOR
12	GALVANIZED STEEL LADDER WITH BILCO LADDER UP SAFETY POST
13	WALL SLEEVE

MINIMUM VAULT SIZE	
METER SIZE	VAULT SIZE
2" COMP	6' X 6'
3" COMP	6' X 8'
3" TURBINE	6' X 8'
4" COMP	6' X 8'
4" TURBINE	6' X 8'
6" COMP	8' X 10'
6" TURBINE	8' X 10'
8" COMP	8' X 12'
8" TURBINE	8' X 12'



2 INCH COMPOUND AND LARGER METER VAULTS

NOT TO SCALE

NOTES:

1. The Town of Northlake requires all vaults to be pre-fabricated and all walls shall be a monolithic pour with no seams or extensions. All side walls shall be 4 inches thick with 4,500 psi concrete reinforced with #4 re-bar on 8 inch centers both ways. All vaults shall be Brooks, American or approved equal. These are minimum specifications.

2. The bottom of the vault shall be 6 inches thick with 4,500 psi concrete with #4 re-bar on 12 inch centers both ways. A 4 inch deep x 12 inch diameter sump shall be installed in one corner on either side of the bottom slab. A 4 inch cushion of sand shall be installed under the slab.

3. The vault shall not be installed in any drive or parking area and must be located in a utility easement dedicated to the Town of Northlake. All piping inside the vault and the vault itself must be inspected by Public Works before installation.

4. The lid shall be a J-4AL Bilco door (3'x3') for 2 inch - 4 inch meter vaults and JD-2AL Bilco (4'x4') door for 6 inch - 8 inch meter vaults. The design loads for the lid shall consist of dead, live, impact loads, and in addition loads due to water table and any other loads which may be imposed upon the structure. Live loads shall be for H-20 per AASHTO standards specifications for highway bridges. Design wheel load shall be 16 kips. The live load shall be that which produces the maximum shear and bending moments in the structure. The lids shall be equipped with a hold-open mechanism and flush locking devices. The access door must have (2) 2 inch holes drilled 6 inches apart in the center of the lid for AMR reading devices. The aluminum must be protected from the concrete during casting.

5. All piping inside the vault must be ductile iron pipe with flanged fittings. Town standards - American National Standard for ductile iron AWWA standard C151 (ANSI A21.51).

6. The contractor shall make the by-pass and meter test tap inside of the vault. The by-pass line must be the same size pipe as the main line. If the service is strictly to be used as irrigation a by-pass will not be necessary. The test tap must be installed at least 2 pipe diameters down-stream from the meter and all test taps shall be 2 inches and the contractor shall install an approved service saddle with brass nipple with a Mueller or approved equal brass gate valve. The test tap gate valve must have a threaded end discharge pipe.

7. The main line and by-pass gate valves shall be resilient wedge. All main line and by-pass valves shall be flanged on both ends and have hand wheels. All gate valves must be Mueller or approved equal.

8. The contractor shall have a choice of having link seal or wall sleeves (model WS-6-25-5-6 for 3 inch pipe; model WS-8-32-5-6 for 4 inch pipe; model WS-10-38-5-6 for 6 inch pipe; model WS-12-37-5-6 for 8 inch pipe). The above mentioned wall sleeves shall use the following Link Seal: For 3 inch pipe - 5 #LS325-C; for 4 inch pipe - 5 #LS400-C; for 6 inch pipe - 7 #LS400-C; for 8 inch pipe - 9 #LS400-C. Breaking the wall with a jackhammer or using a pre-cast knockout panels is not permitted.

9. Pipe and fittings shall be constructed a minimum of 1 foot above the vault floor and there shall be a minimum of 2 feet from the side walls. The by-pass tees shall be a minimum of 1 foot from the sidewall. There will be a concrete support under each valve.

10. Minimum depth of any vault shall be 4 foot 6 inches.

11. The Town will provide the meter at the contractor expense. All other parts will be supplied by the contractor at the contractor's expense.

W-12

CERTIFICATION:

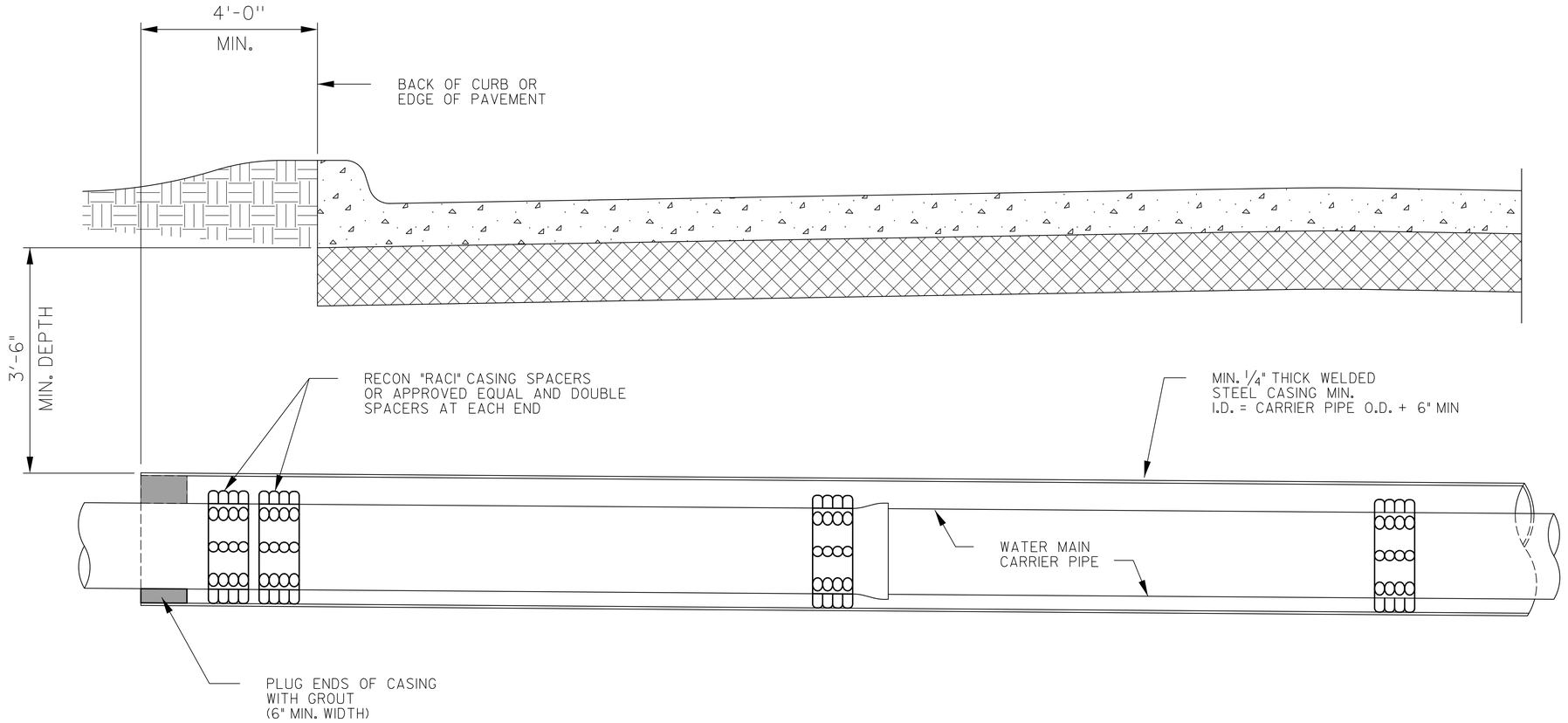
THIS TOWN OF NORTHLAKE STANDARD DETAIL SHEET IS AUTHORIZED FOR USE IN THIS PROJECT BY THE ENGINEER WHOSE SEAL APPEARS ON THIS SHEET. THIS ENGINEER IS ALSO CERTIFYING THAT THE CONTENT OF THE DETAILS AND NOTES ON THIS SHEET HAVE NOT BEEN ALTERED FROM THAT RECEIVED FROM THE TOWN OF NORTHLAKE.

WATER STANDARD DETAILS

2" COMPOUND AND LARGER METERS

THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N. T. S.	W-12	



BORE DETAIL

NOT TO SCALE

W-13

NOTES:

1. WHERE A BORE PIT EXCEEDS 5 FEET IN DEPTH THE CONTRACTOR SHALL INSTALL SHORING OF THE PIT WALLS AS REQUIRED BY OSHA.
2. WHERE A BORE IS TO BE PARTIALLY OR COMPLETELY ABANDONED, SAID BORE SHALL BE COMPLETELY FILLED WITH HYDRAULICALLY PLACED CEMENT GROUT.
3. CASING SHALL BE EXTENDED TO THE RIGHT-OF-WAY LINE FOR STATE HIGHWAY AND RAILROAD CROSSINGS.
4. THE EDGE OF BORE PIT SHALL BE A MINIMUM OF 4' BEHIND THE BACK OF CURB OR EDGE OF PAVEMENT.
5. MINIMUM SCHEDULE CLASS 200 PSI SHALL BE ALLOWED UP TO 6" MAXIMUM.
6. ALL OTHER BORES SHALL BE 1/4" COATED STEEL CASING.
7. 2' SEPARATION BETWEEN ALL OTHER UTILITIES IS REQUIRED.
8. DRY BORES SHALL BE REQUIRED IN ALL ROW AND EASEMENTS.
9. CLAY CUT-OFF WALL AS SHOWN IN DETAIL WW-2 SHALL BE INSTALLED AT EACH END OF THE BORE.

CERTIFICATION:

THIS TOWN OF NORTHLAKE STANDARD DETAIL SHEET IS AUTHORIZED FOR USE IN THIS PROJECT BY THE ENGINEER WHOSE SEAL APPEARS ON THIS SHEET. THIS ENGINEER IS ALSO CERTIFYING THAT THE CONTENT OF THE DETAILS AND NOTES ON THIS SHEET HAVE NOT BEEN ALTERED FROM THAT RECEIVED FROM THE TOWN OF NORTHLAKE.

WATER STANDARD DETAILS

BORE DETAIL

NORTHLAKE TEXAS

THE TOWN OF NORTHLAKE
TEXAS

DESIGN	DRAWN	CHECK	DATE	SCALE	FILE	NO.
HALFF	HALFF	HALFF	AUG 2023	N. T. S.	W-13	