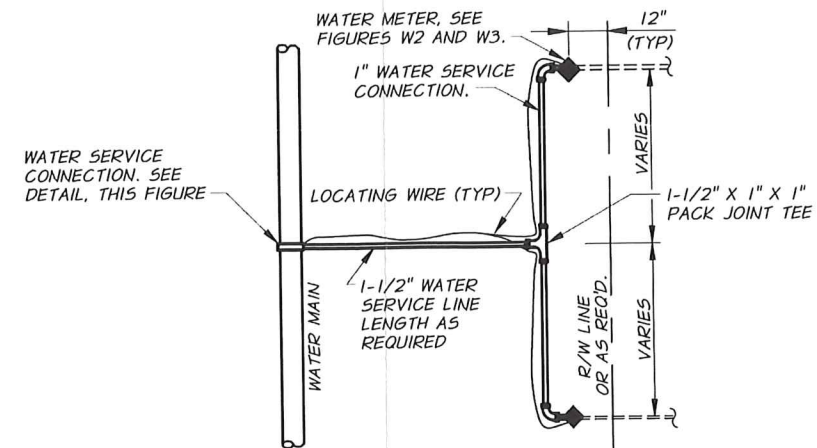


SECTION

TYPICAL SERVICE CONNECTION DETAIL

N.T.S.

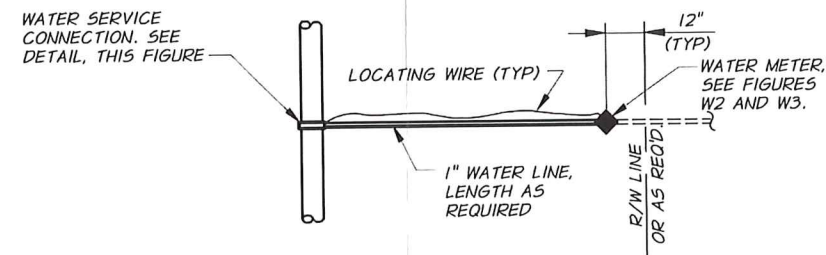


PLAN

MULTIPLE WATER SERVICES

N.T.S.

NOTE
THIS LAYOUT IS SCHEMATIC ONLY. EACH LOCATION WILL REQUIRE SOME VARIATION OF DETAIL SHOWN.



PLAN

SINGLE WATER SERVICE LINE

N.T.S.

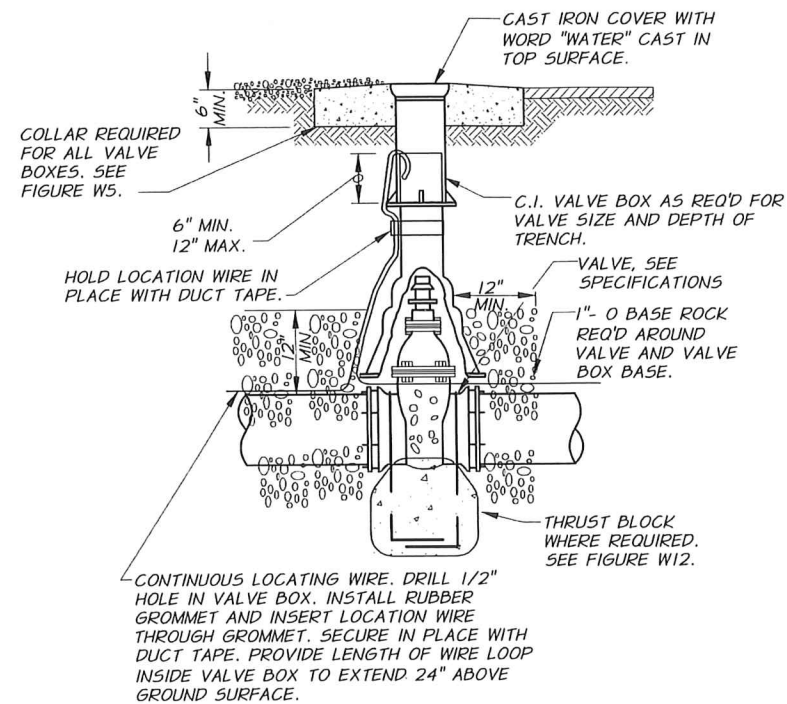
NOTE
THIS LAYOUT IS SCHEMATIC ONLY. EACH LOCATION WILL REQUIRE SOME VARIATION OF DETAIL SHOWN.

REVISION	DATE
ORIGINAL DEVELOPMENT	MARCH 2021

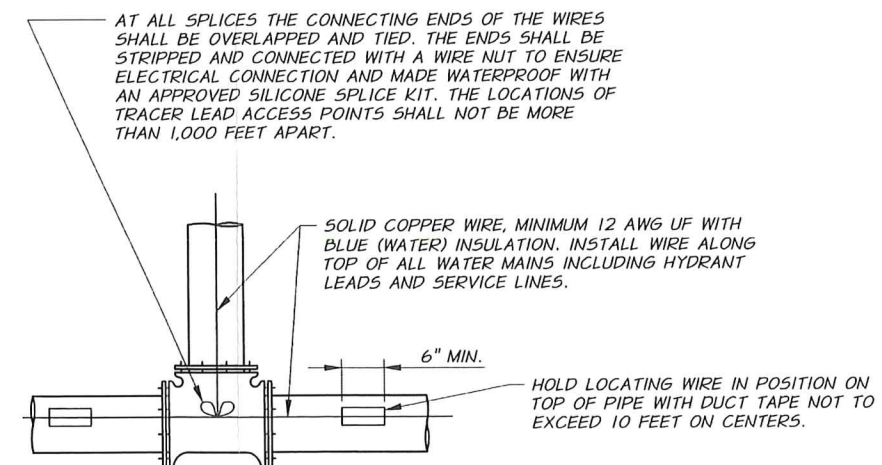


CITY OF
BOARDMAN, OREGON
STANDARD DRAWING
WATER
WATER SERVICE LINE
SECTION AND PLAN DETAILS

FIGURE
W1



VALVE BOX DETAIL
N.T.S.



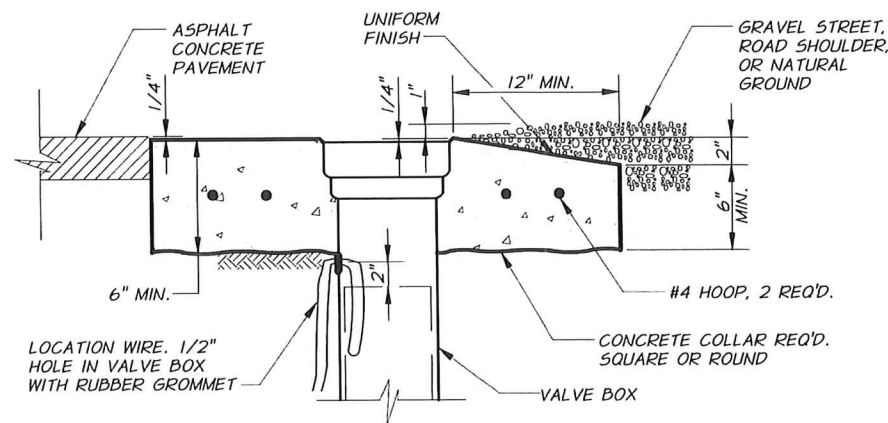
CONTINUOUS LOCATING WIRE DETAIL
N.T.S.

REVISION	DATE
ORIGINAL DEVELOPMENT	MARCH 2021

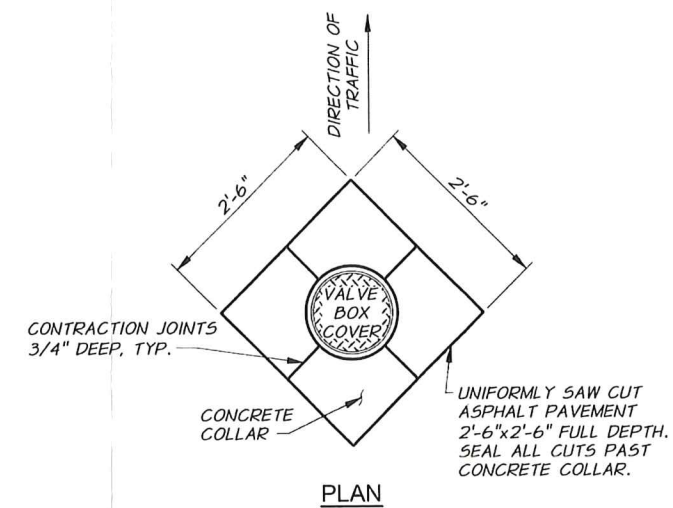


**CITY OF
BOARDMAN, OREGON
STANDARD DRAWING
WATER
VALVE BOX AND CONTINUOUS
LOCATING WIRE DETAIL**

**FIGURE
W4**



TYPICAL SECTION



- REQUIREMENTS FOR CONCRETE COLLARS**
1. CONCRETE : 3/4\"
 2. COLLAR TO BE FORMED AND UNIFORMLY SHAPED.
 3. SMOOTH BROOMED FINISH REQUIRED.
 4. CONTRACTOR TO STAMP OR TOOL AN ARROW, 6 INCHES IN LENGTH INTO THE CONCRETE COLLAR INDICATING FLOW DIRECTION.
 5. APPLY CONCRETE CURING COMPOUND.
 6. PROTECT FROM TRAFFIC FOR 4 DAYS MINIMUM.

VALVE CONCRETE COLLAR DETAIL
IN ASPHALT STREETS, GRAVEL STREETS, OR NATURAL GROUND
N.T.S.

REVISION	DATE
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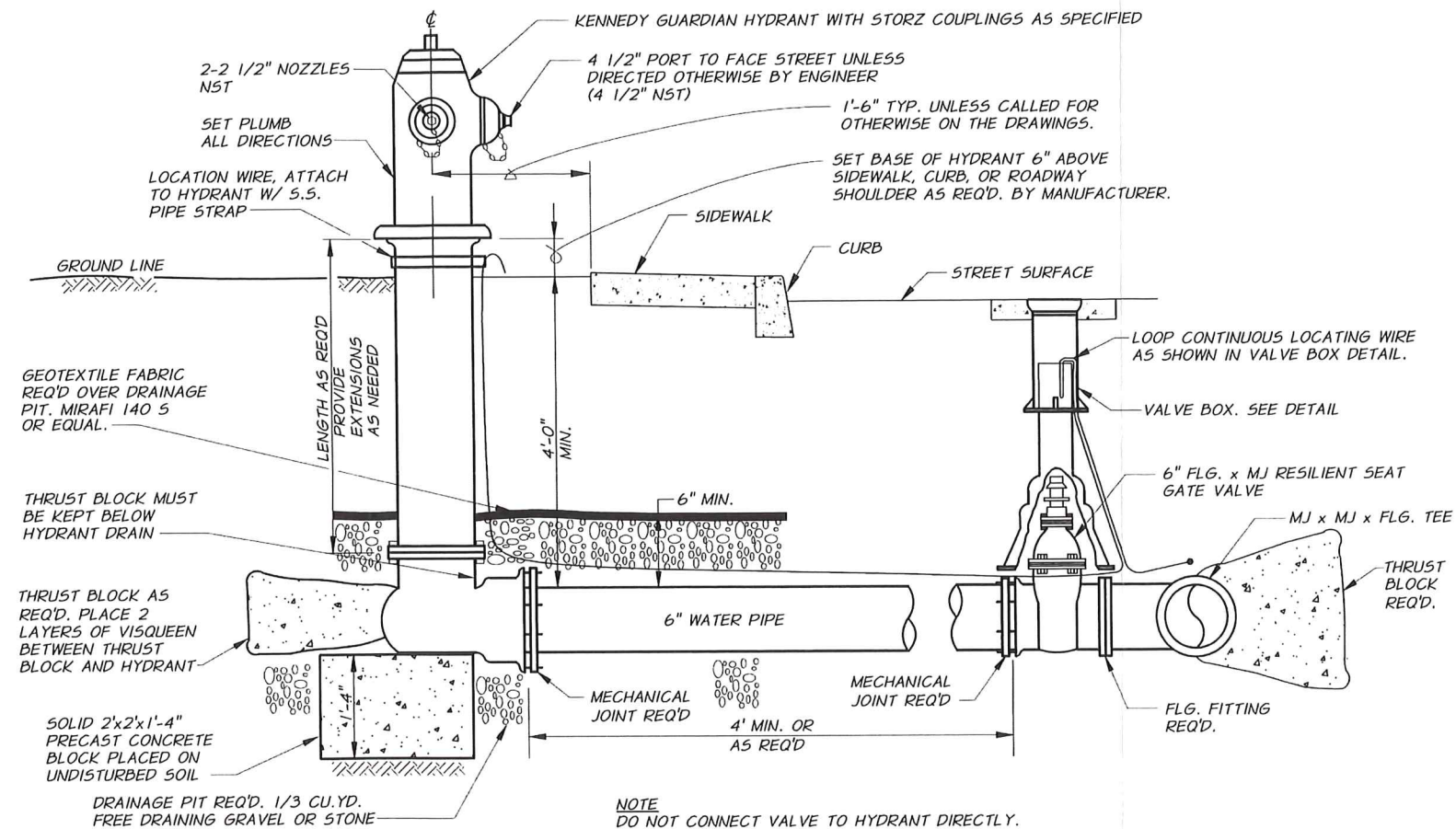


**CITY OF
BOARDMAN, OREGON
STANDARD DRAWING
WATER**

VALVE CONCRETE COLLAR DETAILS

**FIGURE
W5**

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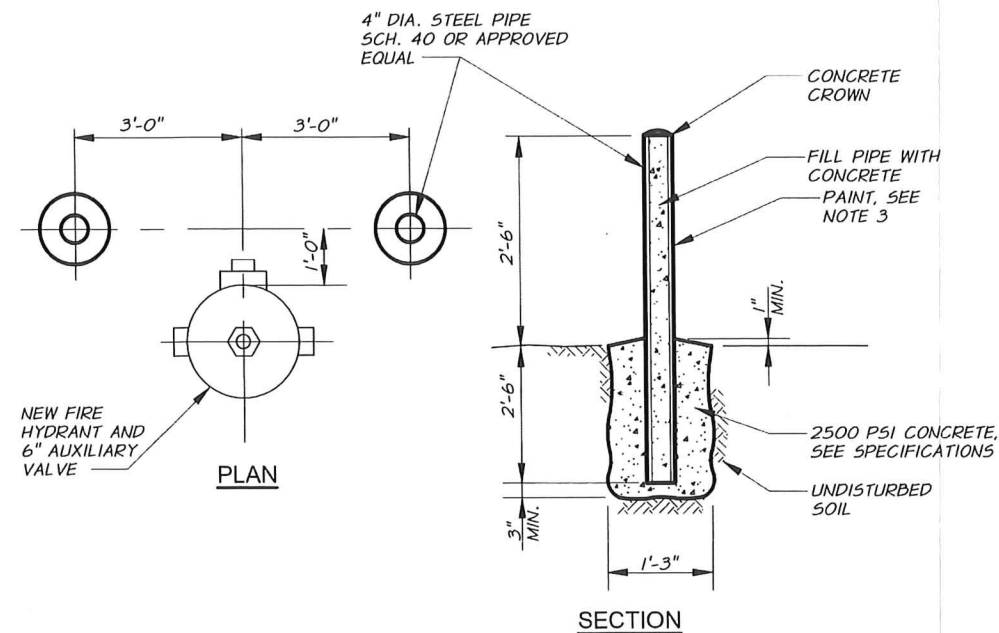
FIRE HYDRANT AND AUXILIARY VALVE DETAIL
N.T.S.

REVISION	DATE
ORIGINAL DEVELOPMENT	MARCH 2021



CITY OF
BOARDMAN, OREGON
STANDARD DRAWING
WATER
FIRE HYDRANT AND AUXILIARY
VALVE DETAIL

FIGURE
W6



NOTES

1. 4" DIAMETER STEEL PIPE SHALL BE PLUMB.
2. LOCATE PIPES EQUIDISTANT FROM FIRE HYDRANT.
3. PAINTING SHALL BE DONE ONLY AFTER SURFACE IS FREE OF RUST, OIL, AND GREASE. THE METAL SHALL BE PRIMED AND TWO FINISH COATS, YELLOW IN COLOR APPLIED.

FIRE HYDRANT BARRICADE

N.T.S.

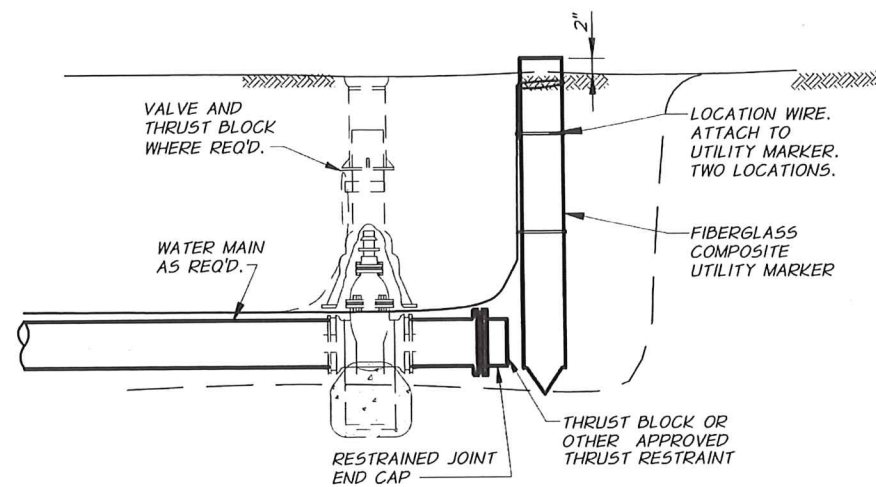
REVISION	DATE
ORIGINAL DEVELOPMENT	MARCH 2021



CITY OF
BOARDMAN, OREGON
STANDARD DRAWING
WATER

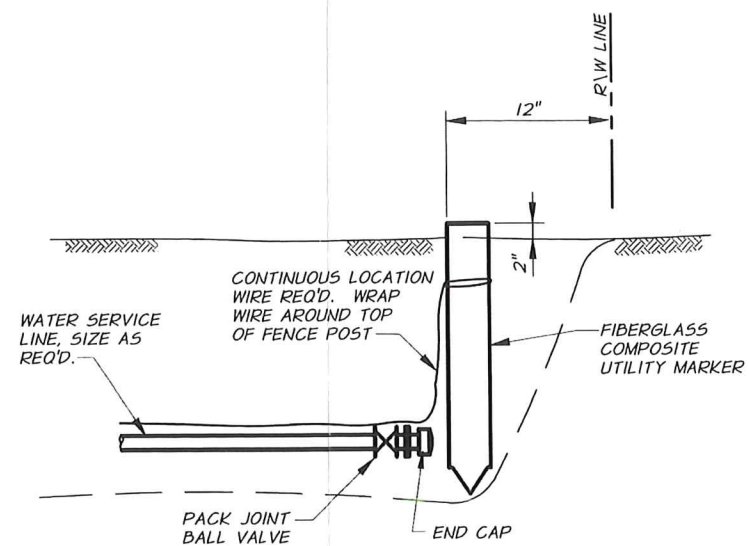
FIRE HYDRANT BARRICADE

FIGURE
W7



NOTE
THE CONTRACTOR SHALL PROVIDE TWO REFERENCES FROM PERMANENT OBJECTS TO THE END OF WATER SERVICE LINE. THESE TIES SHALL BE SHOWN AND DIMENSIONED ON THE "RECORD DRAWINGS" PREPARED BY THE CONTRACTOR.

TYPICAL WATER MAIN STUB
SECTION
N.T.S.



NOTE
THE CONTRACTOR SHALL PROVIDE TWO REFERENCES FROM PERMANENT OBJECTS TO THE END OF WATER SERVICE LINE. THESE TIES SHALL BE SHOWN AND DIMENSIONED ON THE "RECORD DRAWINGS" PREPARED BY THE CONTRACTOR.

TYPICAL WATER SERVICE LINE STUB
SECTION
N.T.S.

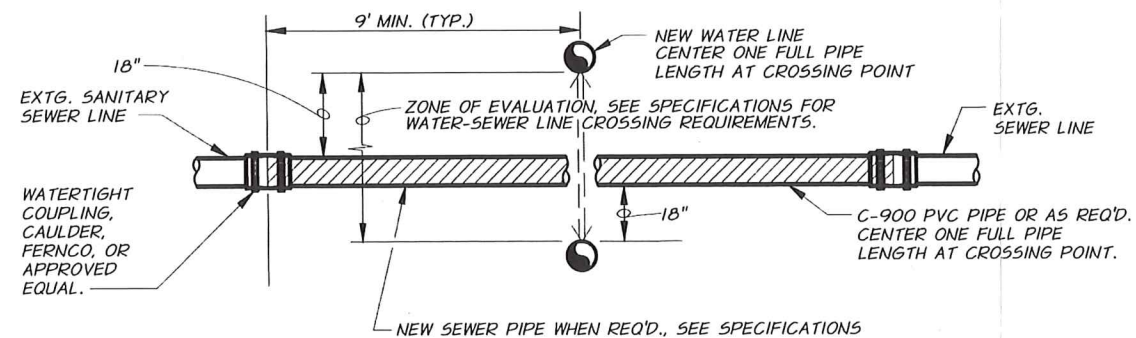
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CITY OF
BOARDMAN, OREGON
STANDARD DRAWING
WATER
**WATER MAIN AND SERVICE LINE STUB
DETAIL**

FIGURE
W8



NOTES

1. PROVIDE SUPPORT BEAM WHEN REQUIRED. SEE SPECIFICATIONS.
2. ALL BACK FILL IN AREA OF WATER-SEWER CROSSING TO A DEPTH 12" ABOVE THE TOP OF THE HIGHEST PIPE SHALL BE 3/4"-0 BASE ROCK COMPACTED TO 95% OF ASTM D-698 LABORATORY DENSITY.

WATER-SEWER CROSSING
NEW WATER LINE CONSTRUCTION
 N.T.S.

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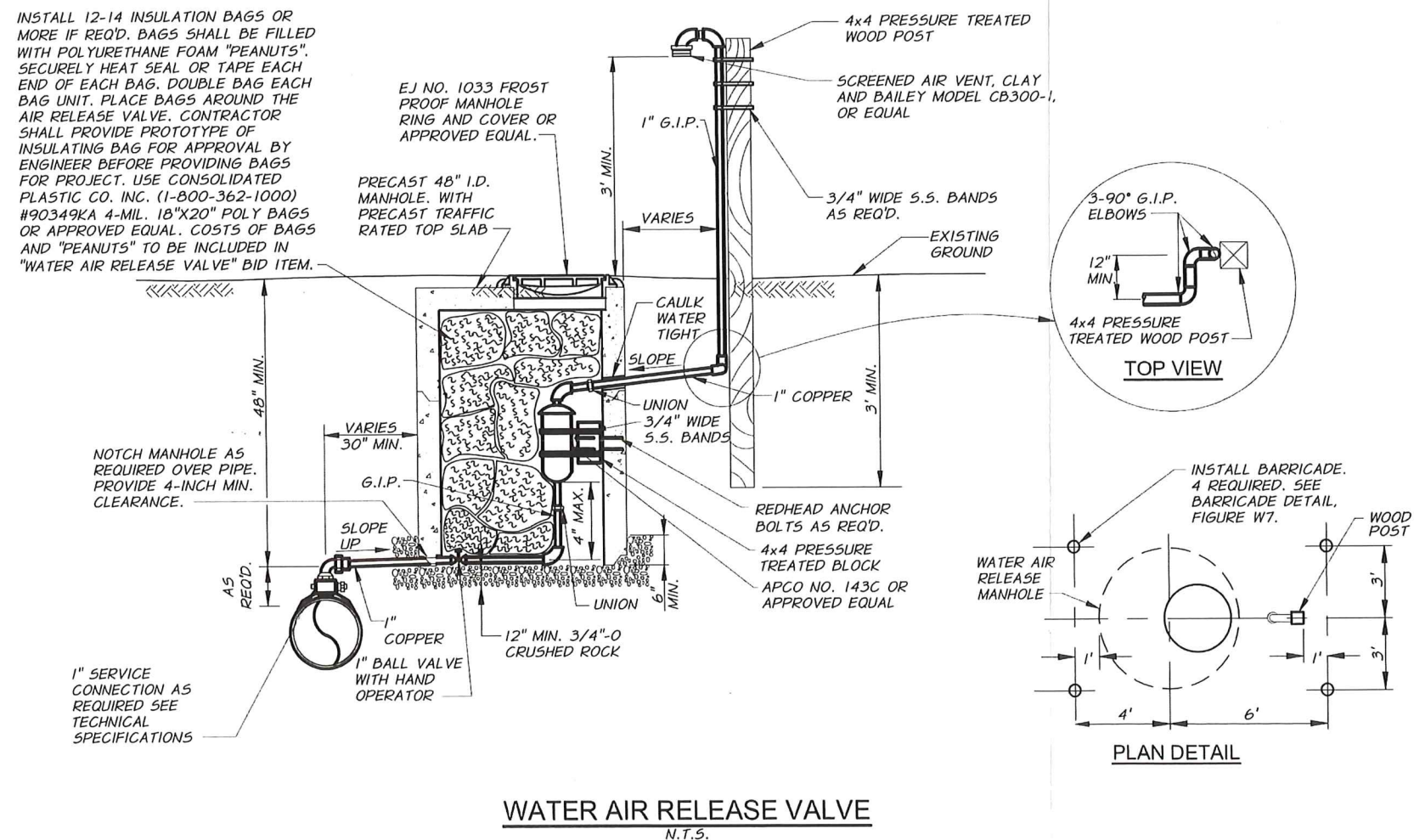
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CITY OF
BOARDMAN, OREGON
 STANDARD DRAWING
 WATER
WATER-SEWER CROSSING

FIGURE
W9

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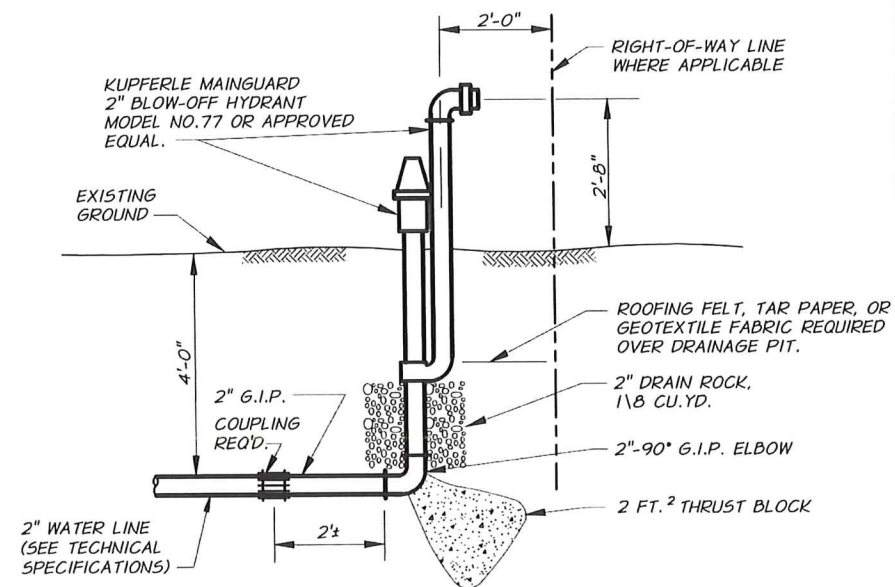


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CITY OF
BOARDMAN, OREGON
STANDARD DRAWING
WATER
WATER AIR RELEASE VALVE

FIGURE
W10



2" WATER LINE BLOW-OFF DETAIL
N.T.S.

REVISION	DATE
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CITY OF
BOARDMAN, OREGON
STANDARD DRAWING
WATER

WATER LINE BLOW-OFF DETAILS

FIGURE
W11

THRUST BLOCK NOTES

- THRUST BLOCKS SHALL BE REQUIRED AT THE FOLLOWING LOCATIONS:
 - ALL CHANGES IN DIRECTION.
 - ALL DEAD-ENDS.
 - ALL VALVES 10-INCH AND LARGER (SIZE FOR CLOSED CONDITION).
 - AT OTHER LOCATIONS REQUIRED BY THE ENGINEER.
 - AT TEMPORARY DEAD ENDS DURING PIPE INSTALLATION AS REQUIRED FOR TEMPORARY PRESSURE TESTING.
 - AT OTHER LOCATIONS REQUIRED BY THE CITY.
- THRUST BLOCKS SHALL BE SIZED AS REQUIRED BY SOIL CONDITIONS AND DESIGN PRESSURE.
- PLACE CONCRETE AGAINST UNDISTURBED TRENCH WALL.
- CONCRETE SHALL BE 2,500 PSI MINIMUM.
- ALL CONCRETE SHALL BE PLACED SO THAT PIPE, FITTING JOINTS, BOLTS AND NUTS, ETC., WILL BE ACCESSIBLE FOR REPAIRS.
- PLACE TWO LAYERS OF VISQUEEN BETWEEN FITTING AND CONCRETE TO FACILITATE FUTURE REMOVAL OF THRUST BLOCK IF REQUIRED.
- ANCHOR RODS SHALL BE 3/4" DIAMETER GALVANIZED STEEL RODS OR #6 EPOXY COATED REINFORCEMENT BAR, AASHTO M284, HAVING AN 18" MINIMUM EMBEDMENT IN CONCRETE.
- THRUST BLOCKING SHALL BE SIZED FOR 150 PSI WATER PRESSURE
- IF THE REQUIRED BEARING AREA IS LESS THAN 1 SQUARE FOOT, A THRUST BLOCK SHALL NOT BE REQUIRED.

DETERMINATION OF THRUST BLOCK BEARING AREA

NOTE
WHEN THRUST BLOCK BEARING AREA IS NOT SPECIFIED ON THE PLANS OR DETERMINED BY THE PROJECT ENGINEER, THE FOLLOWING PROCEDURE SHALL BE USED TO DETERMINE REQUIRED BEARING AREA.

- DETERMINE THRUST (T) FOR TYPE OF FITTING OR JOINT AND SIZE OF PIPE, FROM TABLE NO. 1 OR TABLE NO. 3.
- DETERMINE BEARING CAPACITY (B) OF SOIL FROM TABLE NO. 2.
- DETERMINE REQUIRED BEARING AREA (A) AS FOLLOWS:
 $A = T \div B$

EXAMPLE: DESIGN PRESSURE = 175 PSI
PIPE = 12"
FITTING = TEE
SOIL = SANDY GRAVEL
FROM TABLE NO. 1: $T = 15,310$ LB.
FROM TABLE NO. 2: $B = 3,000$ LB/FT²
 $A = 15,310 \div 3,000 = 5.10$ FT²
3,000

TABLE NO. 1
THRUST AT FITTINGS IN POUNDS AT 100 PSI OF WATER PRESSURE

PIPE SIZE	TEES AND DEAD ENDS	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4"	1,050	2,610	1,420	720	394
6"	3,800	5,370	2,910	1,470	810
8"	6,580	9,300	5,040	2,550	1,372
10"	10,750	15,200	8,240	4,170	2,216
12"	15,310	21,640	11,720	5,940	3,128
14"	20,770	29,360	15,910	8,060	4,241
16"	26,880	38,010	20,590	10,430	5,468
18"	29,865	42,235	22,858	11,653	5,855

NOTE
FOR WATER PRESSURES DIFFERENT THAN 100 PSI, MULTIPLY THRUST FOUND IN TABLE NO. 1 BY REQUIRED PROPORTION.

EXAMPLE: DESIGN PRESSURE = 175 PSI. MULTIPLY VALUE IN TABLE BY 1.75

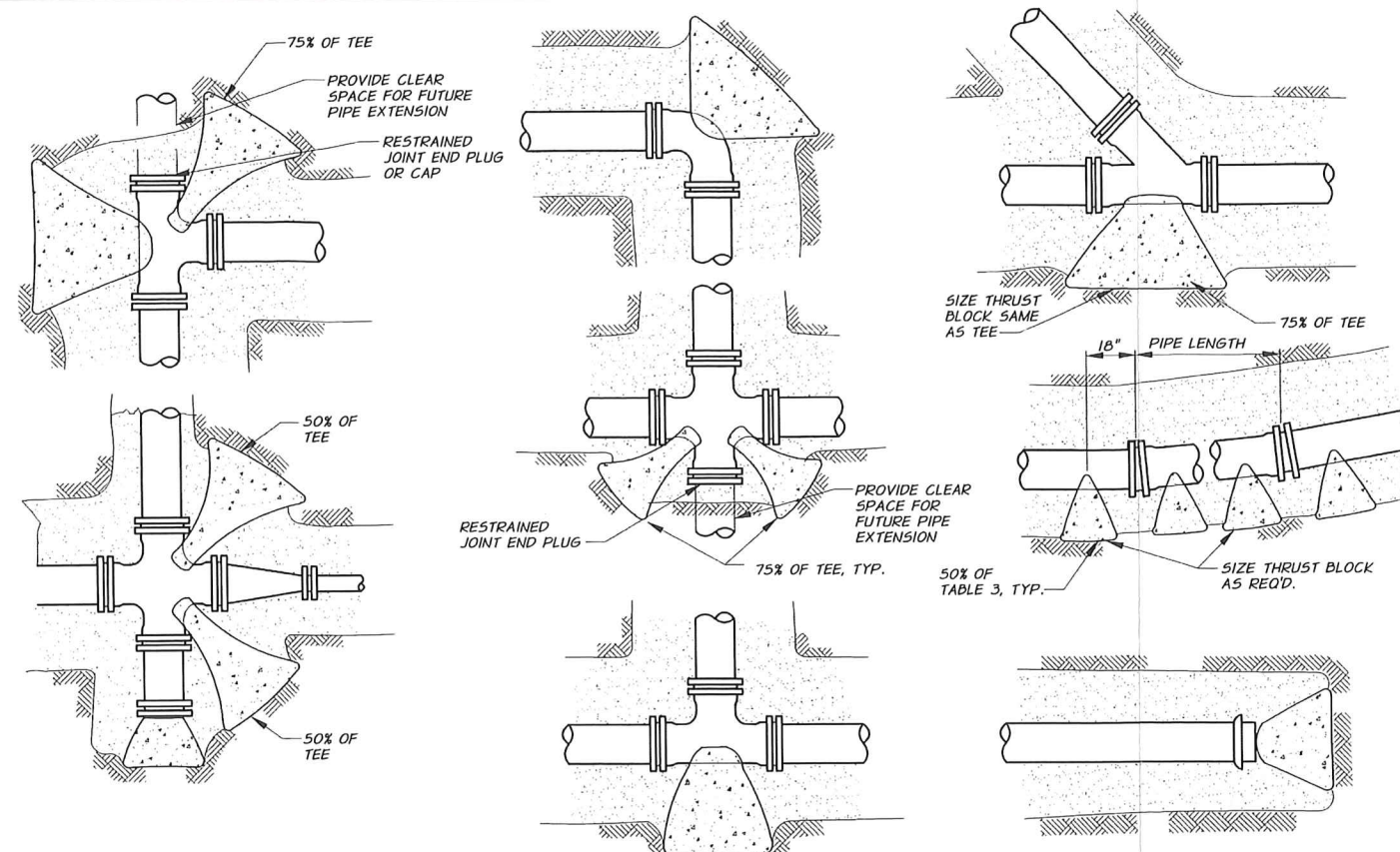
TABLE NO. 2

SOIL	SAFE BEARING LOAD LB/FT ²
SOFT CLAY	500
SILT	1,000
SAND	2,000
SAND AND GRAVEL	3,000
SAND AND GRAVEL CEMENTED WITH CLAY	4,000
HARD CLAY	4,000

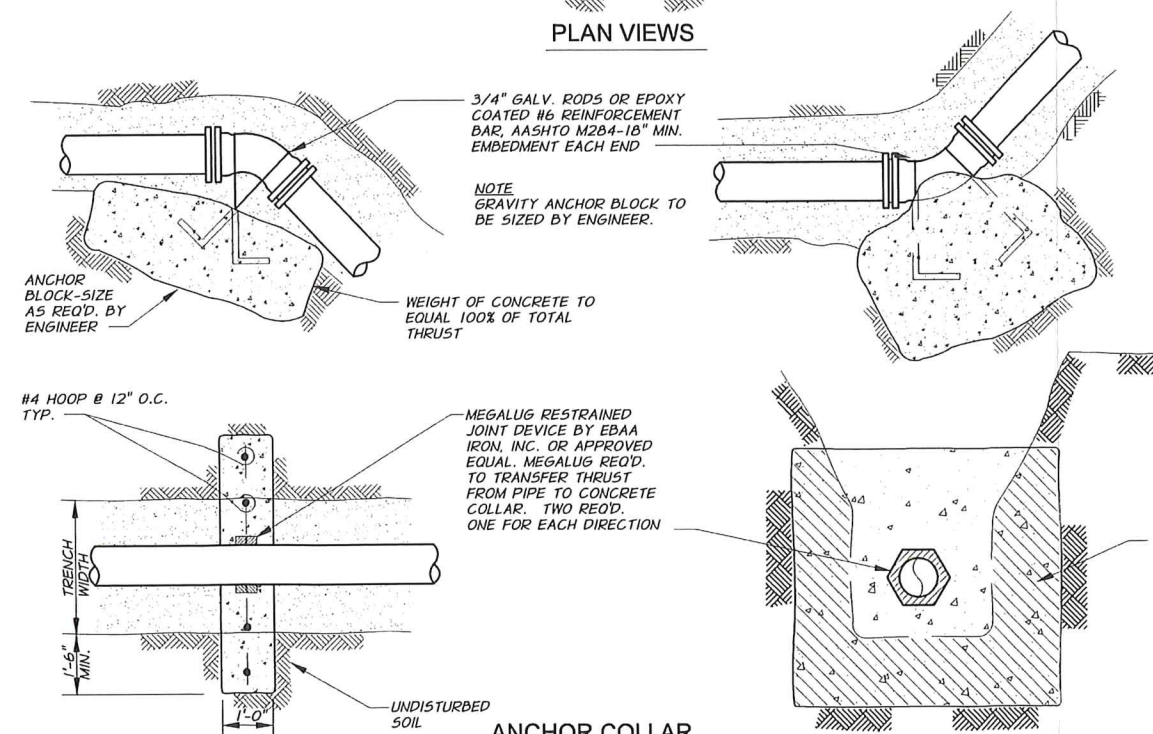
TABLE NO. 3

SIDE THRUST PER 100 LB./SQ. IN. PRESSURE PER DEGREE OF DEFLECTION			
PIPE SIZE	SIDE THRUST-LB	PIPE SIZE	SIDE THRUST-LB
4"	N/A	14	377
6"	N/A	16	486
8"	N/A	18	665
10"	197	20	790
12"	278	24	1,150

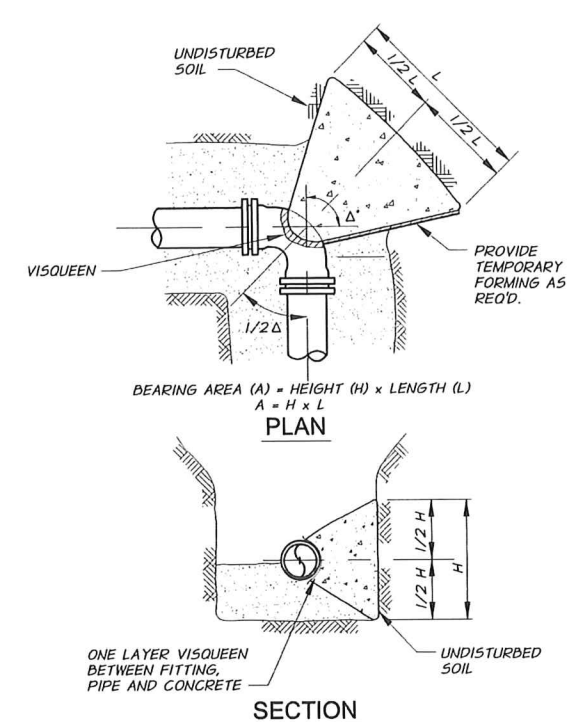
MULTIPLY THRUST BY DEGREE OF DEFLECTION TO OBTAIN TOTAL THRUST



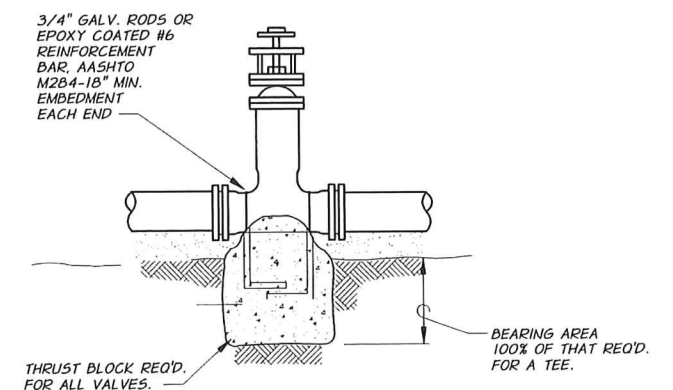
PLAN VIEWS



ANCHOR COLLAR



TYPICAL THRUST BLOCK DETAILS



- NOTES**
- THRUST BLOCK IS NOT REQUIRED WHEN VALVE IS CONNECTED BY A FLANGED OR RESTRAINED JOINT CONNECTION TO ADJACENT FITTING OR PIPE WHICH HAS THE REQUIRED THRUST RESTRAINT.
 - THRUST BLOCK IS NOT REQUIRED ON 8" AND SMALLER VALVES UNLESS CALLED OUT OTHERWISE ON DRAWINGS.

CALCULATE REQ'D. BEARING AREA AGAINST UNDISTURBED SOIL. CALCULATE THRUST AS DEAD END LINE PER TABLE NO. 1

TYPICAL THRUST BLOCK LOCATIONS

SECTION VIEWS

REVISION	DATE
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CITY OF
BOARDMAN, OREGON
STANDARD DRAWING
WATER

THRUST BLOCK DETAILS

FIGURE
W12