

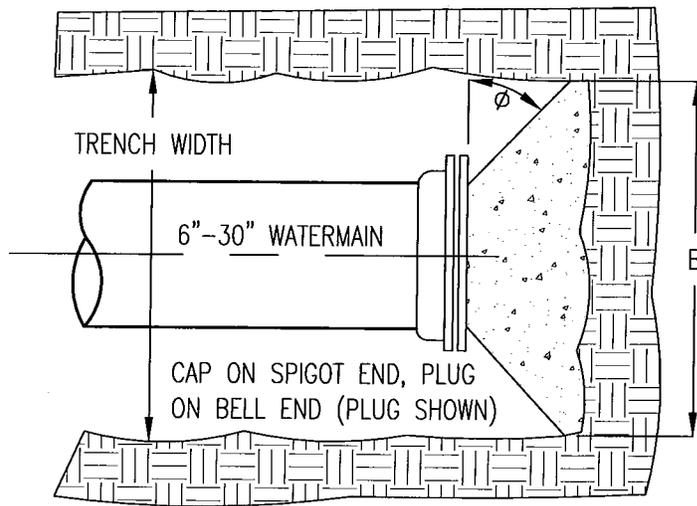


DEPARTMENT OF PUBLIC WORKS & UTILITIES
ENGINEERING DIVISION

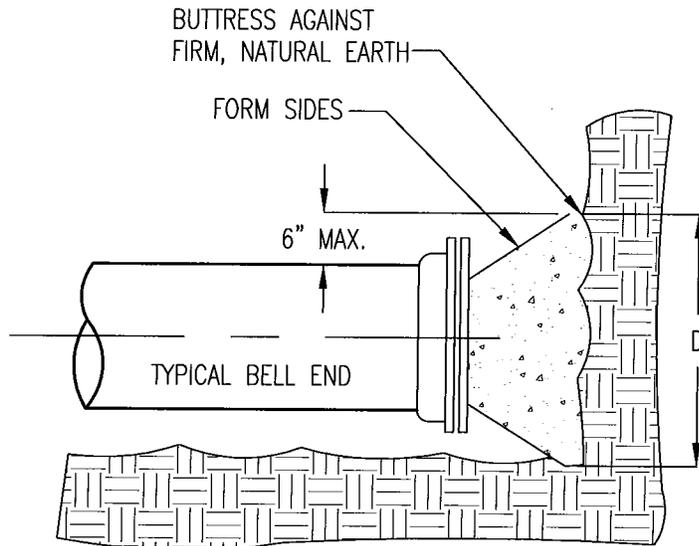
STANDARD DETAIL DRAWINGS

WATER SYSTEM DETAILS

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W-3	THRUST BLOCKING FOR WATERMAIN
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PLAN



ELEVATION

BLOCKING DIMENSIONS		
PLUG SIZE	B	D
6"	12"	15"
8"	24"	15"
10"	24"	20"
12"	30"	22"
16"	40"	28"
20"	50"	34"
24"	62"	40"
30"	80"	48"

NOTES:

1. BLOCKING DIMENSIONS BASED ON EARTH RESISTANCE OF 2 TONS PER SQ. FT. WHERE, IN THE OPINION OF THE ENGINEER, EARTH IS POOR, BLOCKING SHALL BE INCREASED IN SIZE AS DIRECTED OR STRAPPING MAY BE NECESSARY.
2. ANGLE ϕ SHALL BE EQUAL TO OR LARGER THAN 45°.
3. BLOCKING SHALL BE CENTERED ON MAIN.
4. CONCRETE SHALL BE TYPE 3, GRADE B - MNDOT 2461.
5. POLYETHYLENE SHALL BE USED TO SEPARATE CONCRETE FROM FITTING.
6. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

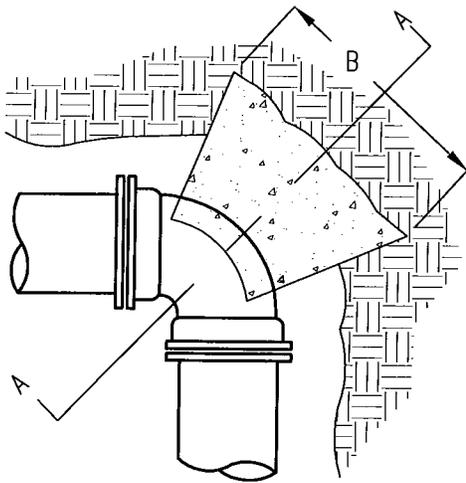
PLUG BLOCKING FOR WATERMAIN

W-2

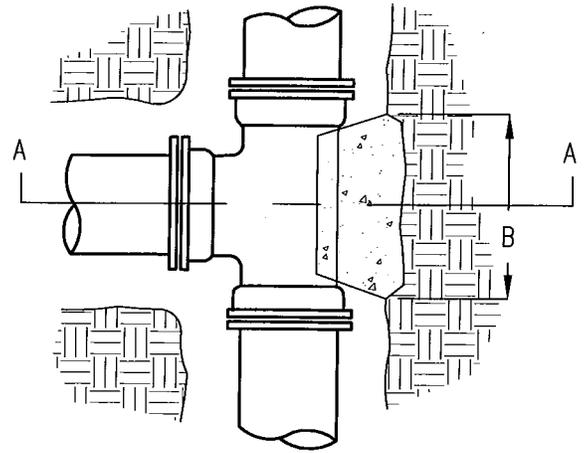
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CITY OF DULUTH STANDARD DETAIL
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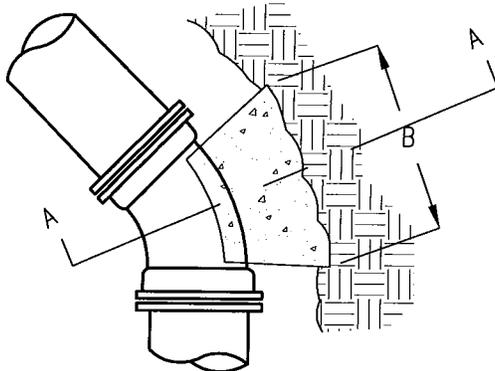
NO SCALE



PLAN - 90° BEND

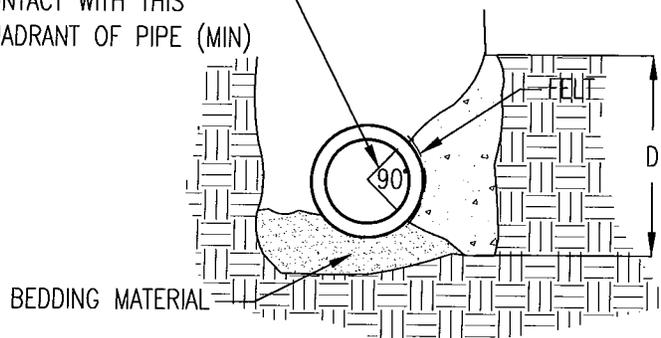


PLAN - TEE



PLAN - 45° BEND

CONCRETE SHALL BE IN CONTACT WITH THIS QUADRANT OF PIPE (MIN)



SECTION A-A

NOTES

1. DIMENSIONS IN TABLE ARE BASED ON A WATER PRESSURE OF 150 P.S.I. & AN EARTH RESISTANCE OF 2 TONS/S.F.
2. BLOCKING TO BE SET AGAINST UNDISTURBED SOIL
3. CONCRETE SHALL BE TYPE 3 GRADE B. (MNDOT SPEC. 2461) CONCRETE SHALL NOT INTERFERE WITH MECHANICAL JOINTS
4. POLYETHYLENE SHALL BE USED TO SEPARATE CONCRETE FROM FITTING.
5. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

BLOCKING DIMENSIONS

BEND OR BRANCH SIZE	22-1/2" BENDS		45° BENDS		90° BENDS		TEES	
	B	D	B	D	B	D	B	D
0'-6"	1'-0"	1'-0"	1'-0"	1'-0"	1'-4"	1'-2"	1'-3"	1'-0"
0'-8"	1'-0"	1'-0"	1'-4"	1'-2"	1'-10"	1'-6"	1'-6"	1'-4"
1'-0"	1'-4"	1'-4"	1'-10"	1'-10"	2'-8"	2'-3"	2'-3"	2'-0"
1'-4"	1'-10"	1'-8"	2'-6"	2'-4"	3'-10"	2'-10"	3'-2"	2'-4"
1'-8"	2'-4"	2'-0"	3'-3"	2'-10"	5'-0"	3'-4"	4'-0"	3'-0"
2'-0"	2'-10"	2'-4"	4'-0"	3'-3"	6'-4"	3'-10"	5'-3"	3'-4"
2'-6"	3'-6"	3'-0"	5'-4"	3'-10"	8'-0"	4'-8"	6'-3"	4'-3"

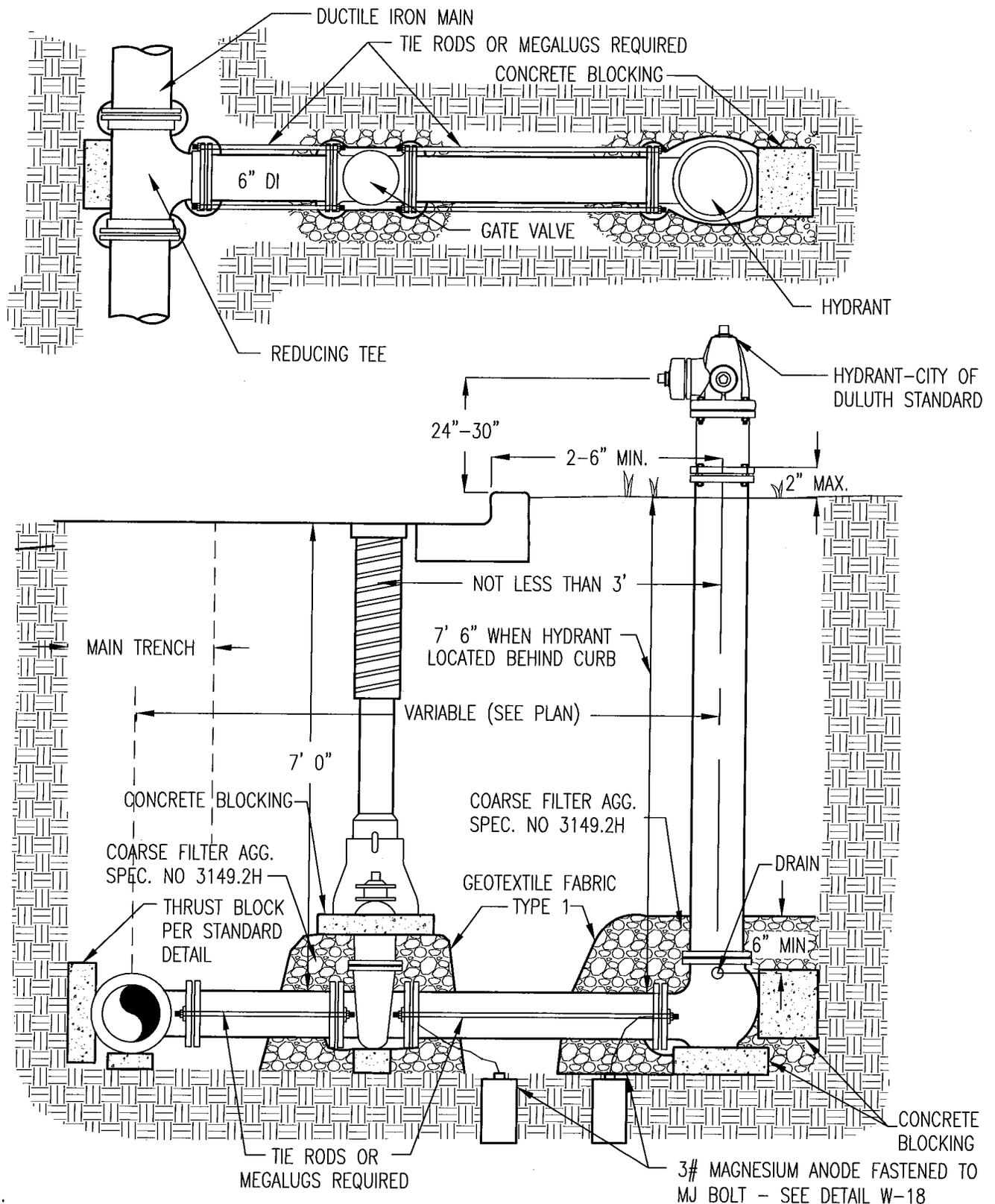
THRUST BLOCKING FOR WATERMAIN

W-3

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



NOTES:

1. VALVES SHALL BE CONNECTED DIRECTLY TO AN ANCHORING TEE. WHENEVER DIRECT CONNECTION IS NOT POSSIBLE, TIE RODS OR MEGALUGS SHALL BE USED. TIE RODS SHALL BE GALVANIZED.
2. USE EPOXY COATING ON VALVE AND HYDRANT BASE.
3. ALL BOLTS SHALL BE COR-TEN WITH 6 OUNCE ZINC ANODE CAPS CONFORMING TO ASTM B-418 FOR ALL MECHANICAL JOINT FITTINGS.

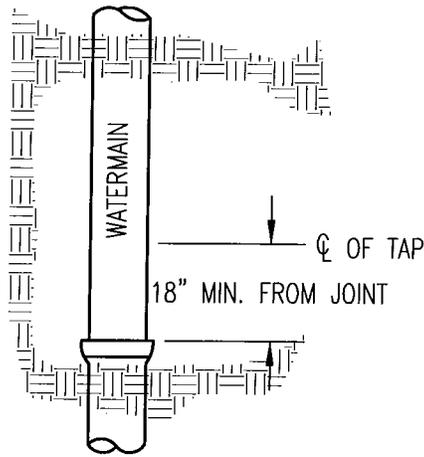
FIRE HYDRANT SETTING DETAIL - DUCTILE IRON

W-4

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



TAPPING LOCATION

NOTE: EXCAVATE 6" UNDER IN-PLACE MAIN AND BACKFILL WITH COARSE FILTER AGGREGATE MNDOT SPEC. # 3149.2H. CONTRACTOR SHALL PROVIDE & PLACE A TRENCH BOX WHEN REQUIRED.

CURB BOX WILL BE SUPPLIED BY CITY AT GARFIELD SHOP AND INSTALLED BY CONTRACTOR. (INCIDENTAL)

2" I.D. BLK. IRON CAP ON 6" LONG PIECE OF 2" I.D. BLK IRON SLIPPED OVER 1 1/2" I.D. BLK IRON PIPE.

1 1/2" I.D. BLK. IRON PIPE TOP SECTION SLIPPED IN 2" I.D. BLK. IRON PIPE

2" I.D. BLK IRON PIPE BOTTOM SECTION SCREWED ONTO 2" X 1 1/2" I.D. REDUCING BUSHING

7' MIN. COVER

CORPORATION STOP DIRECT CONNECTION

VARIABLE PAY MEASURE - ONE PIECE

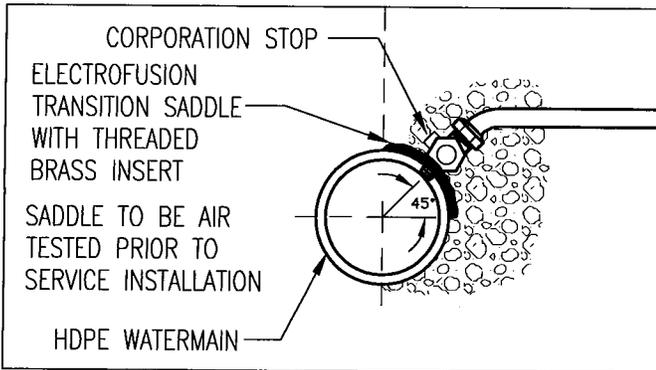
TYPE "K" COPPER (FLARED FITTING)

DI WATERMAIN

SPEC. NO. 3149.2H COARSE FILTER AGGREGATE REQUIRED AROUND CORPORATION STOP AND CURB STOP

CONCRETE SUPPORT

INSERT LEAD OR PLASTIC SLUG & TIGHTEN COUPLING TO SEAL END



TYPICAL COPPER WATER SERVICE - 3/4", 1", 1-1/4", AND 2"

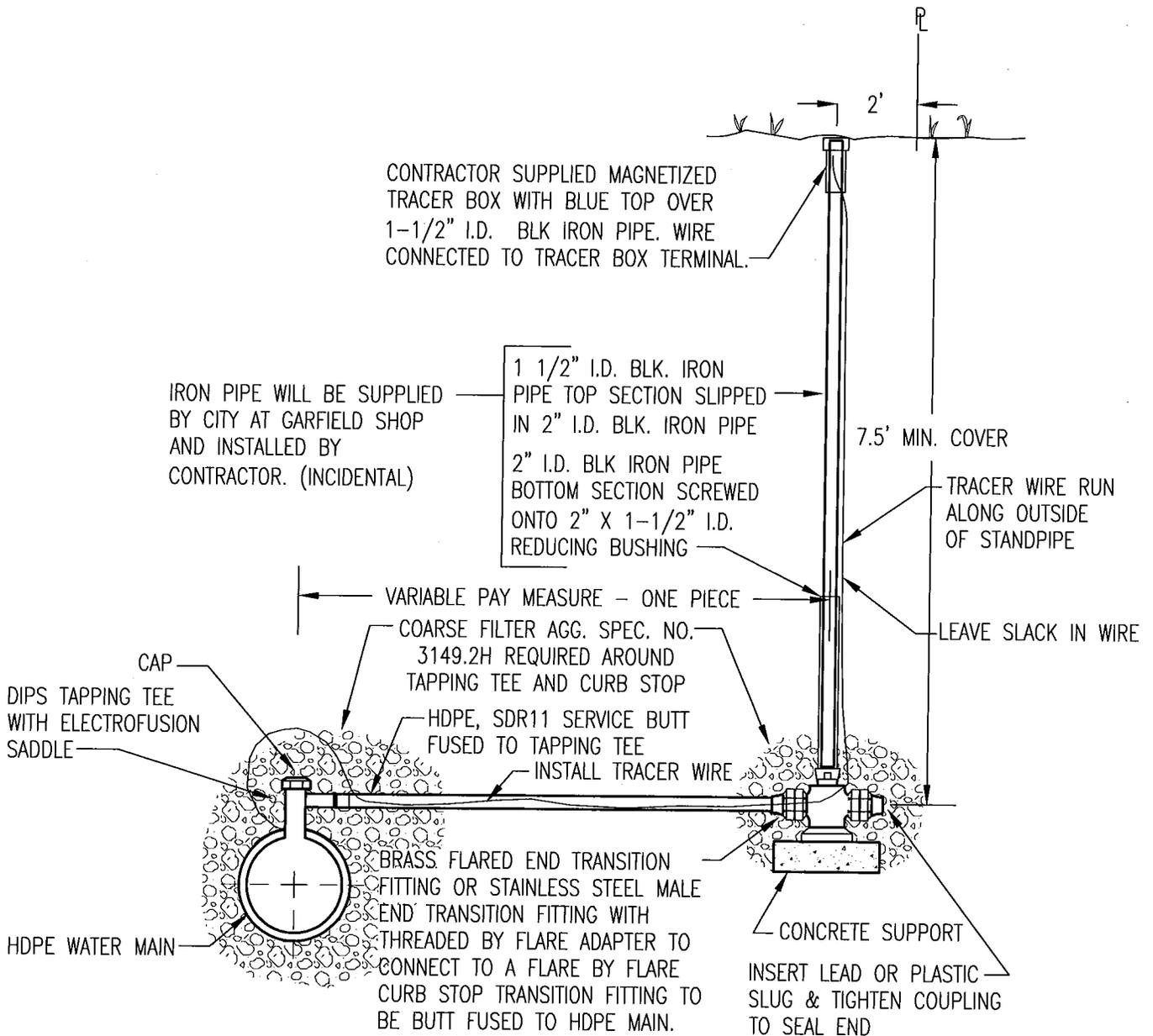
W-5

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

NOTE: EXCAVATE 6" UNDER IN-PLACE MAIN AND BACKFILL WITH COURSE FILTER AGGREGATE MNDOT SPEC. # 3149.2H. CONTRACTOR SHALL PROVIDE & PLACE A TRENCH BOX WHEN REQUIRED.



NOTE: SERVICE TO BE AIR TESTED PRIOR TO TAPPING MAIN

THE TRACER WIRE SHALL REMAIN CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. SPLICES IN THE TRACER WIRE SHOULD BE MADE WITH SPLIT BOLT CONNECTORS. WIRE NUTS OR CLIP TYPE CONNECTOR SHALL NOT BE USED. A WATER-PROOF CONNECTION IS NECESSARY TO PREVENT CORROSION.

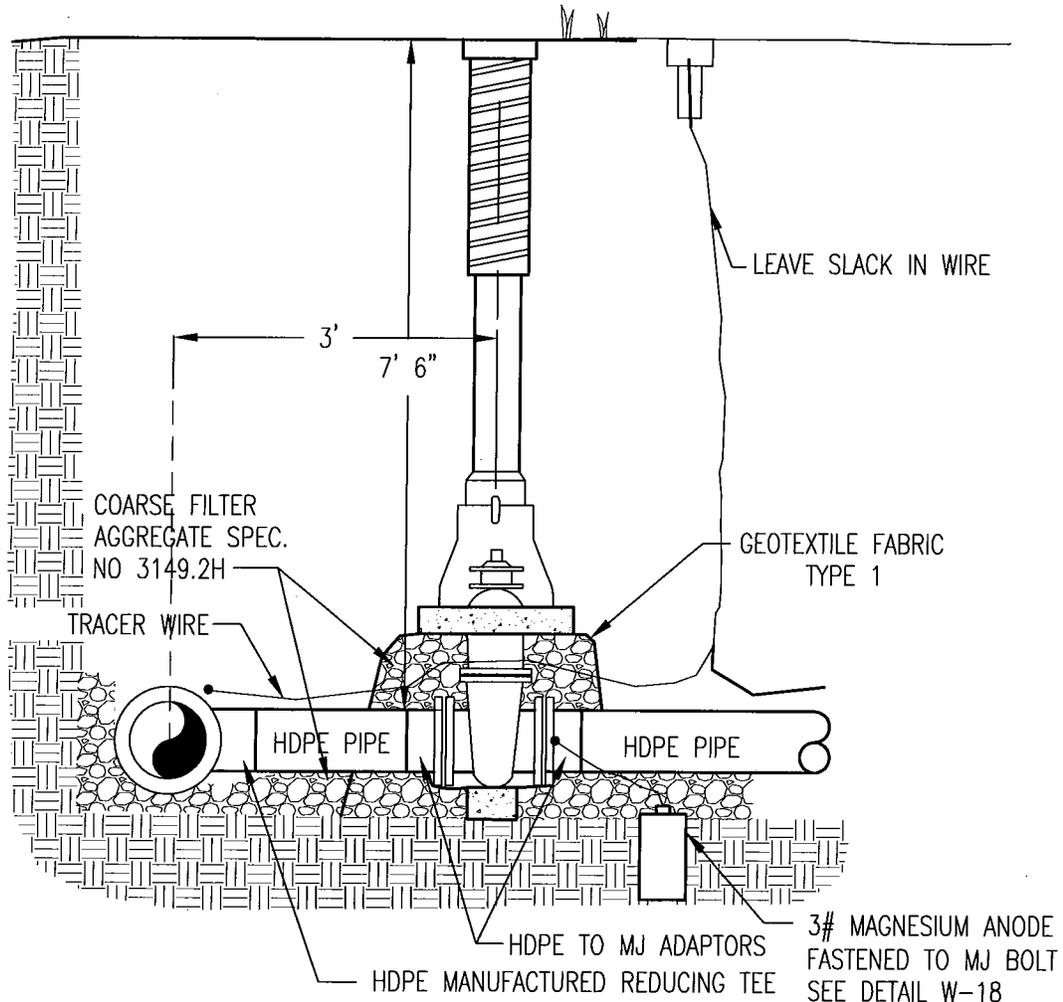
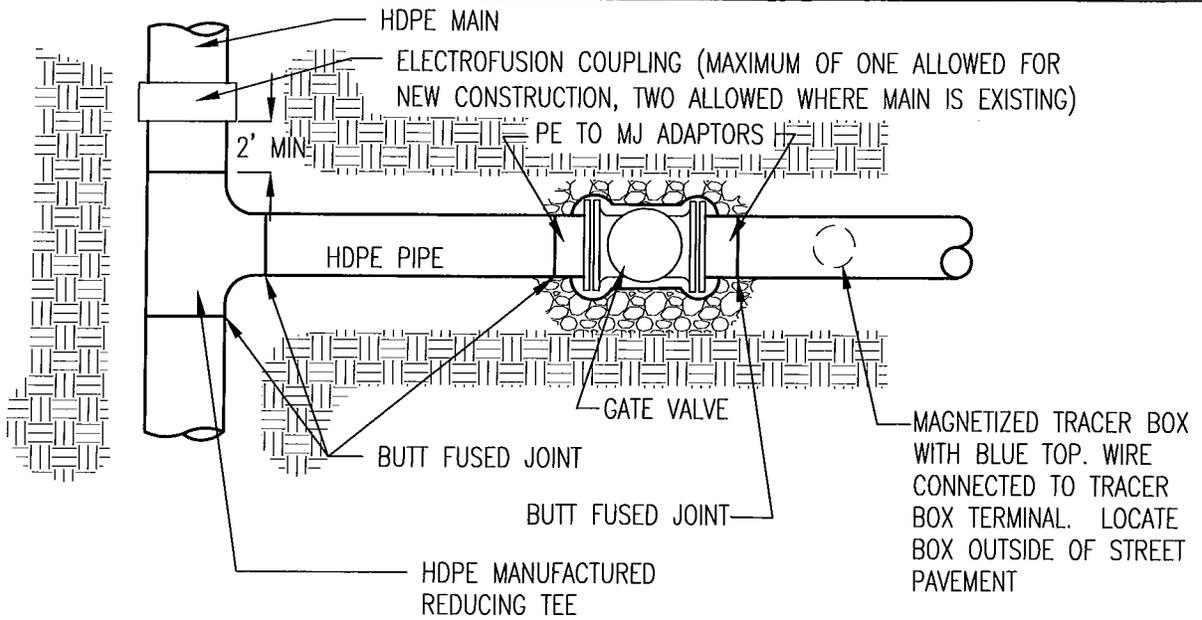
TYPICAL HDPE WATER SERVICE - 3/4" AND 1"

W-5A

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



NOTES

1. VALVES SHALL BE CONNECTED DIRECTLY TO MECHANICAL JOINT ADAPTORS.
2. ALL BOLTS SHALL BE COR-TEN WITH 6 OUNCE ZINC ANODE CAPS CONFORMING TO ASTM B-418 FOR ALL MECHANICAL JOINT FITTINGS.

4" & LARGER WATER SERVICE - HDPE

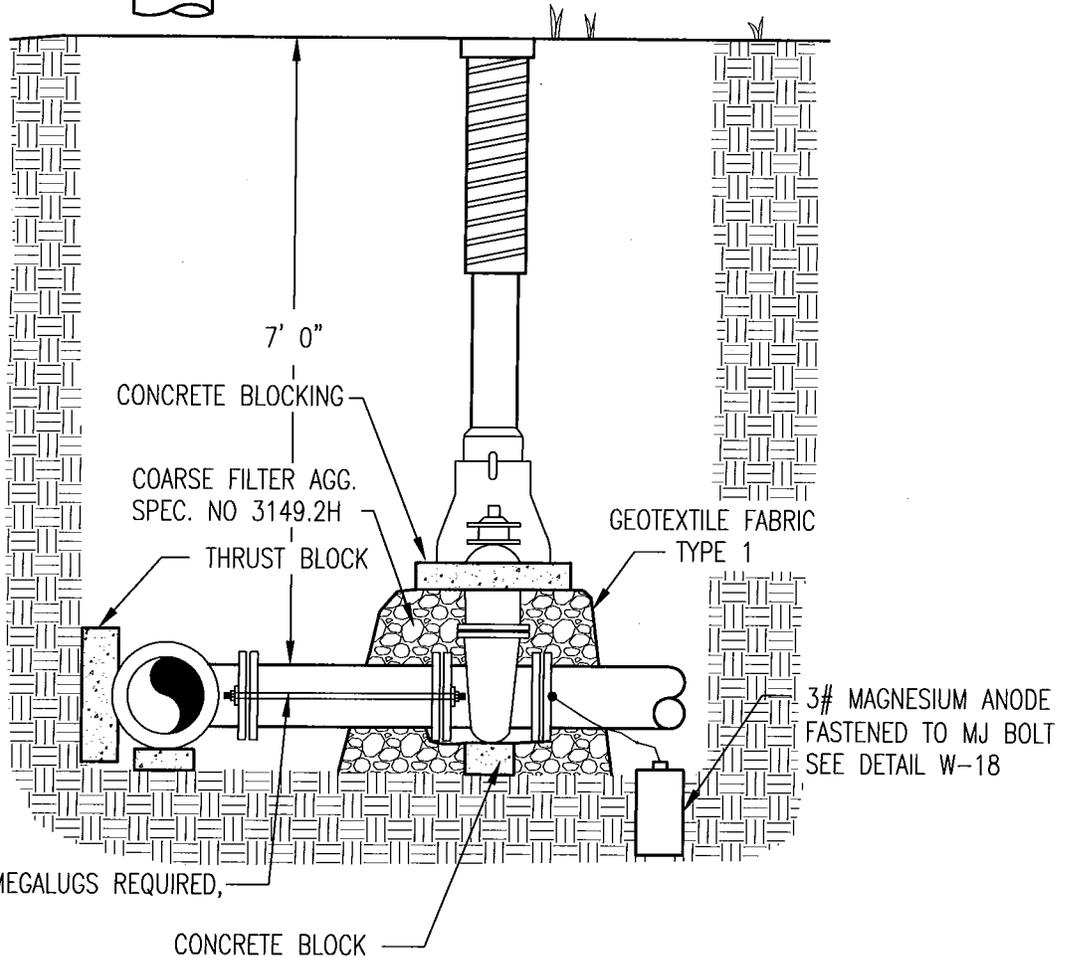
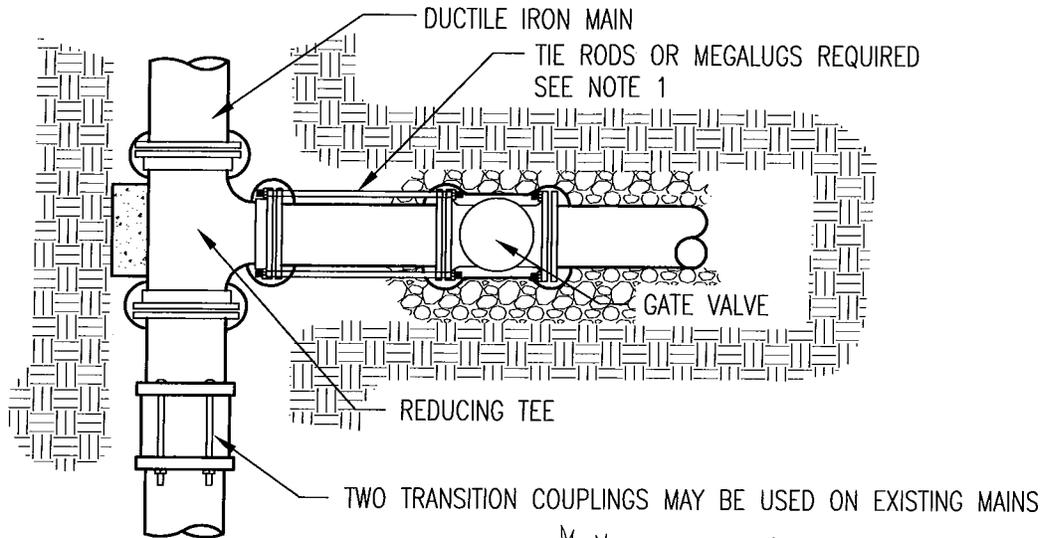
W-5B

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

NOTE: ON EXISTING WATERMAINS, HOT TAPS SHALL BE PERFORMED FOR NEW SERVICES WHEN POSSIBLE.



NOTES:

1. VALVES SHALL BE CONNECTED DIRECTLY TO AN ANCHORING TEE. WHENEVER DIRECT CONNECTION IS NOT POSSIBLE, TIE RODS OR MEGALUGS SHALL BE USED. TIE RODS SHALL BE GALVANIZED.
2. USE EPOXY COATING ON VALVE.
3. ALL BOLTS SHALL BE COR-TEN WITH 6 OUNCE ZINC ANODE CAPS CONFORMING TO ASTM B-418 FOR ALL MECHANICAL JOINT FITTINGS.

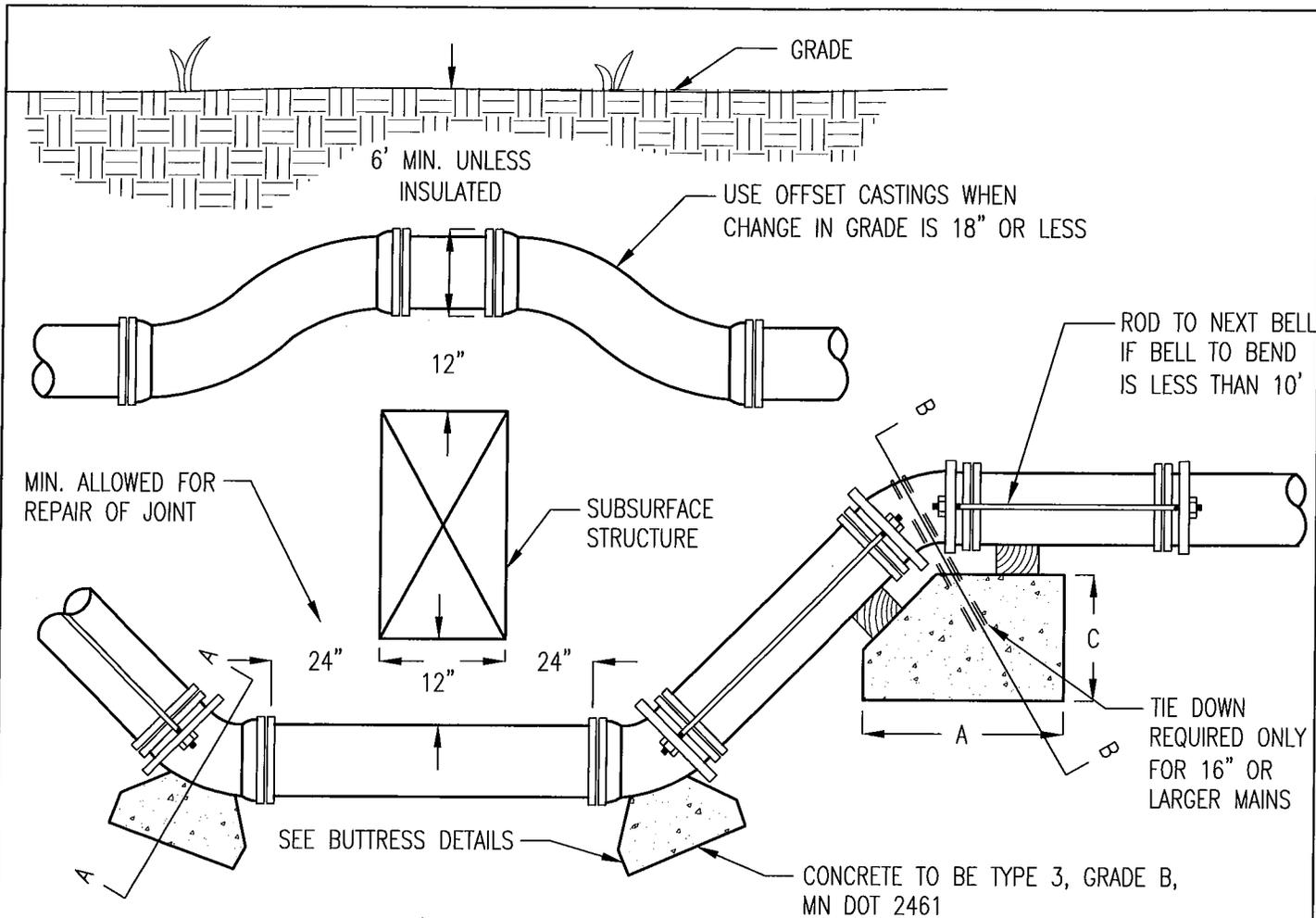
4" & LARGER WATER SERVICE - DUCTILE IRON

W-5C

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



MIN. ALLOWED FOR REPAIR OF JOINT

6' MIN. UNLESS INSULATED

USE OFFSET CASTINGS WHEN CHANGE IN GRADE IS 18" OR LESS

12"

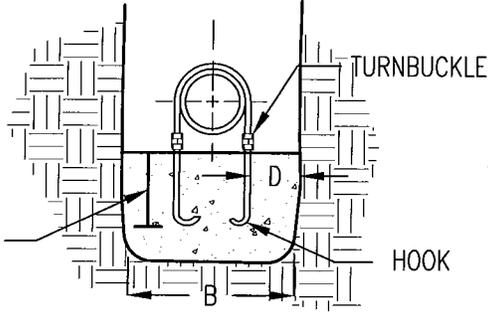
ROD TO NEXT BELL IF BELL TO BEND IS LESS THAN 10'

SUBSURFACE STRUCTURE

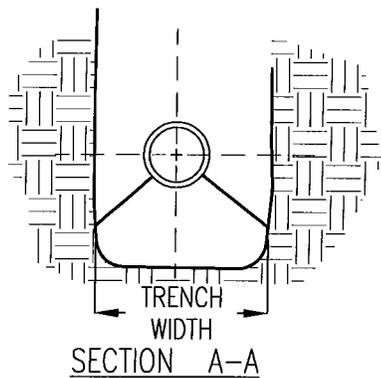
SEE BUTTRESS DETAILS

TIE DOWN REQUIRED ONLY FOR 16" OR LARGER MAINS

CONCRETE TO BE TYPE 3, GRADE B, MN DOT 2461



SECTION B-B



SECTION A-A

NOTES:

1. TIE RODS, BOLTS, NUTS, BANDS, AND WASHERS TO BE FURNISHED BY THE CONTRACTOR AND INSTALLED BY CONTRACTOR. ALL RODS AND CONNECTING HARDWARE SHALL BE GALVANIZED. ALL BOLTS SHALL BE COR-TEN WITH ZINC ANODE CAPS
2. STRAPPING MATERIAL:
 - 2.1. NO. RODS 2 PER TIE
 - 2.2. DIA. RODS 1 INCH
 - 2.3. STRAP SIZE 1/2" X 2"
 - 2.4. BOLT DIA. 3/4"
 - 2.5. WASHER SIZE 1/2" X 3" X 5"
3. OFFSETS FOR 16" WATER MAIN AND LARGER, TIE DOWNS SHALL BE INSTALLED AS SHOWN. TURNBUCKLE AND BLOCK SIZES:

PIPE SIZE	A	B	C	D
16"	6'-0"	2'-6"	3'-0"	0'-1"
20"	8'-0"	3'-0"	3'-0"	0'-1 1/4"
24"	8'-0"	3'-0"	5'-0"	0'-1 1/2"
30"	8'-0"	5'-0"	5'-0"	0'-2"

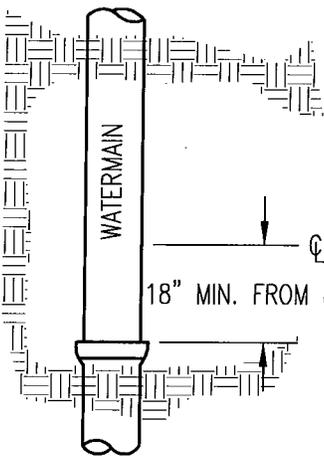
STRAPPING WATERMAIN VERTICAL OFFSETS

W-6

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



NOTE: EXCAVATE 6" UNDER IN-PLACE MAIN AND BACKFILL WITH COARSE FILTER AGGREGATE MNDOT SPEC. # 3149.2H. CONTRACTOR SHALL PROVIDE & PLACE A TRENCH BOX WHEN REQUIRED.

TAPPING LOCATION

CONTRACTOR SUPPLIED MAGNETIZED TRACER BOX WITH BLUE TOP OVER 1-1/2" I.D. BLK IRON PIPE. WIRE CONNECTED TO TRACER BOX TERMINAL.

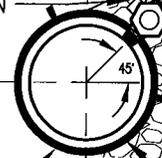
IRON PIPE WILL BE SUPPLIED BY CITY AT GARFIELD SHOP AND INSTALLED BY CONTRACTOR. (INCIDENTAL)

2" X 2" I.P.S. STAINLESS STEEL MALE END TRANSITION FITTING WITH IRON PIPE THREADS TO HDPE

2" CU TUBE NUT. 2" FEMALE CU THREAD TO 2" FEMALE IRON PIPE THREAD.

2" 45° BEND

2" CORPORATION STOP



SADDLE

ELECTROFUSION COUPLING INSTALL TRACER WIRE

2" HDPE, SDR11

DI OR CI WATERMAIN

CONCRETE SUPPORT

1 1/2" I.D. BLK. IRON PIPE TOP SECTION SLIPPED IN 2" I.D. BLK. IRON PIPE
2" I.D. BLK IRON PIPE BOTTOM SECTION SCREWED ONTO 2" X 1 1/2" I.D. REDUCING BUSHING



TRACE WIRE RUN ALONG OUTSIDE OF STANDPIPE

7.5' MIN. COVER

LEAVE SLACK IN WIRE

SPEC. NO. 3149H COARSE FILTER AGGREGATE REQUIRED AROUND CORPORATION STOP AND CURB STOP

2" HDPE, SDR11 WATERMAIN

BRASS FLARED END TRANSITION FITTING OR STAINLESS STEEL MALE END TRANSITION FITTING WITH THREADED BY FLARE ADAPTER TO CONNECT TO A FLARE BY FLARE CURB STOP, TRANSITION FITTING TO BE BUTT FUSED TO HDPE MAIN.

CONNECT TRACER WIRE TO WATERMAIN TO ENSURE ELECTRICAL CONDUCTIVITY.

THE TRACER WIRE SHALL REMAIN CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. THE NUMBER OF CONNECTIONS MUST BE KEPT TO A MINIMUM. ANY SPLICES IN THE TRACER WIRE SHOULD BE MADE WITH SPLIT BOLT CONNECTORS. WIRE NUTS OR CLIP TYPE CONNECTORS SHALL NOT BE USED. A WATER-PROOF CONNECTION IS NECESSARY TO PREVENT CORROSION.

2" HDPE WATER MAIN CONNECTION TO DI OR CI

W-7

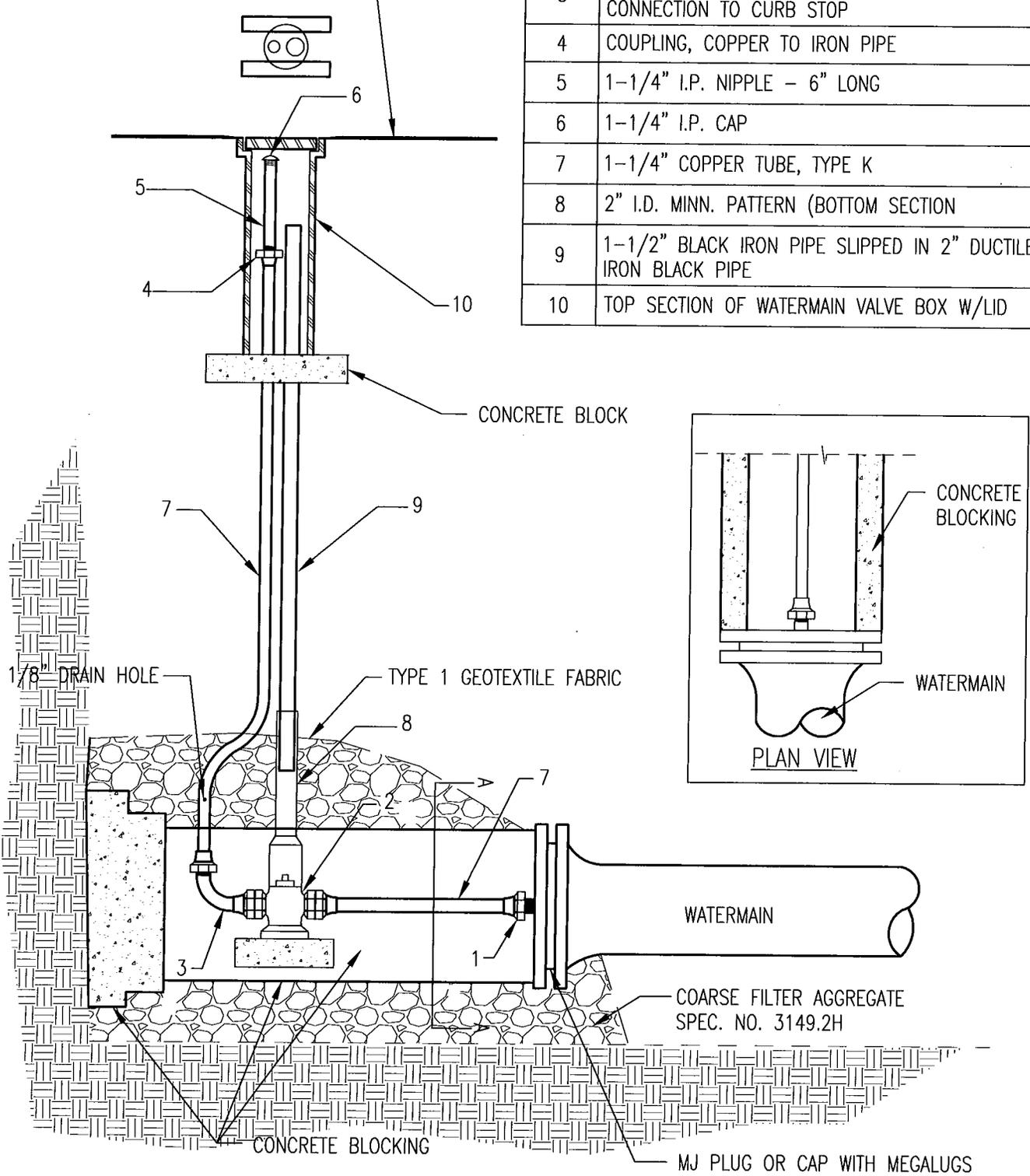
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CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

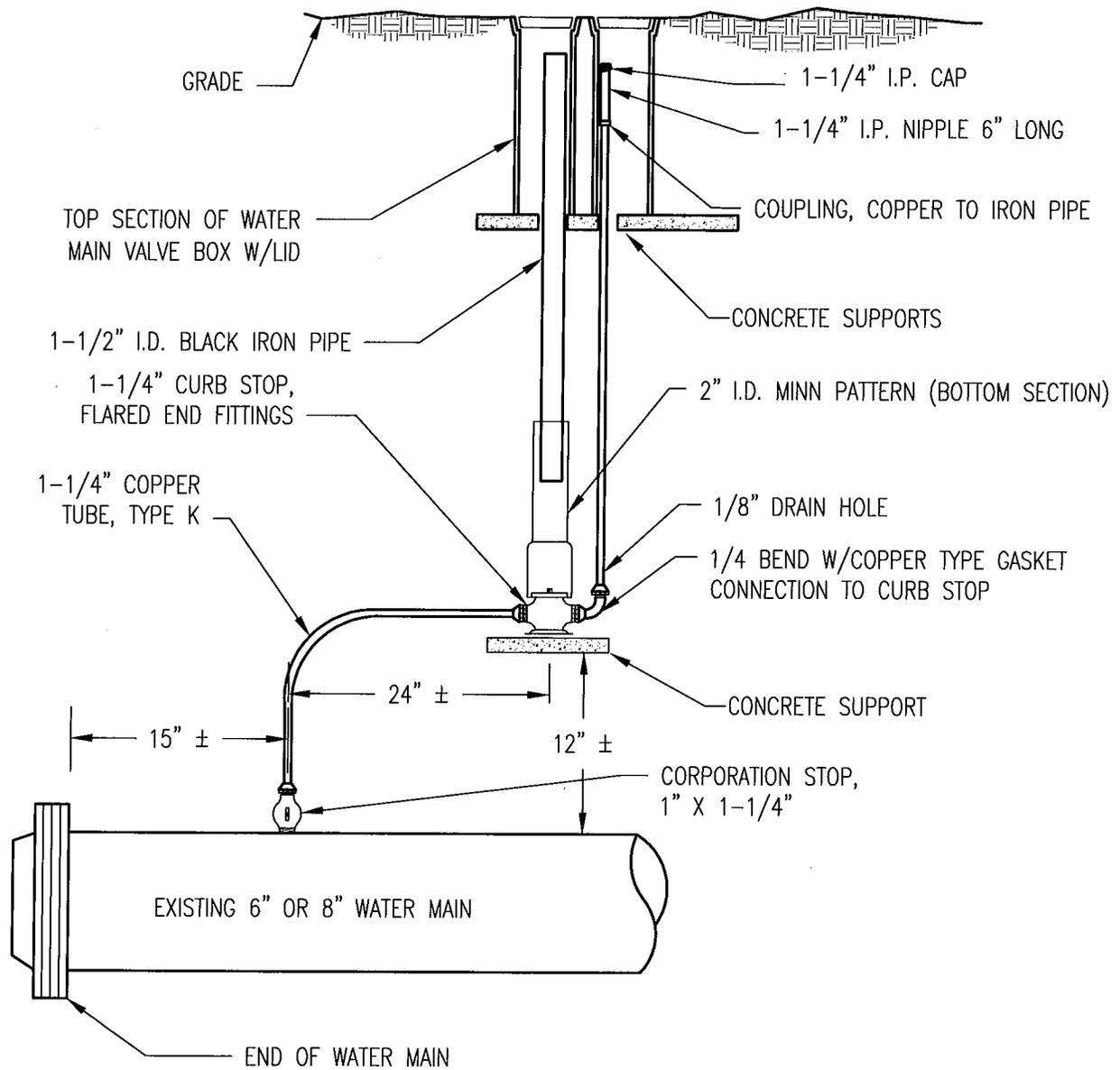
NO SCALE

NOTE: TOP OF CASTING SHALL BE
3/8 INCH BELOW FINISHED SURFACE.

ITEM	DESCRIPTION
1	1-1/4" I.P. THREAD TO FLARE COPPER COUPLING
2	1-1/4" CURB STOP, FLARED END FITTINGS
3	1-1/4" 90° BEND W/ COPPER TYPE GASKET CONNECTION TO CURB STOP
4	COUPLING, COPPER TO IRON PIPE
5	1-1/4" I.P. NIPPLE - 6" LONG
6	1-1/4" I.P. CAP
7	1-1/4" COPPER TUBE, TYPE K
8	2" I.D. MINN. PATTERN (BOTTOM SECTION)
9	1-1/2" BLACK IRON PIPE SLIPPED IN 2" DUCTILE IRON BLACK PIPE
10	TOP SECTION OF WATERMAIN VALVE BOX W/LID



1-1/4" BLOWOFF FOR 6" & 8" DUCTILE IRON WATERMAINS		W-8
REVISED/APPROVED 2/01/2013	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



1-1/4" BLOW OFF (VALVE BOX TYPE) ON EXISTING WATERMAIN

W-8A

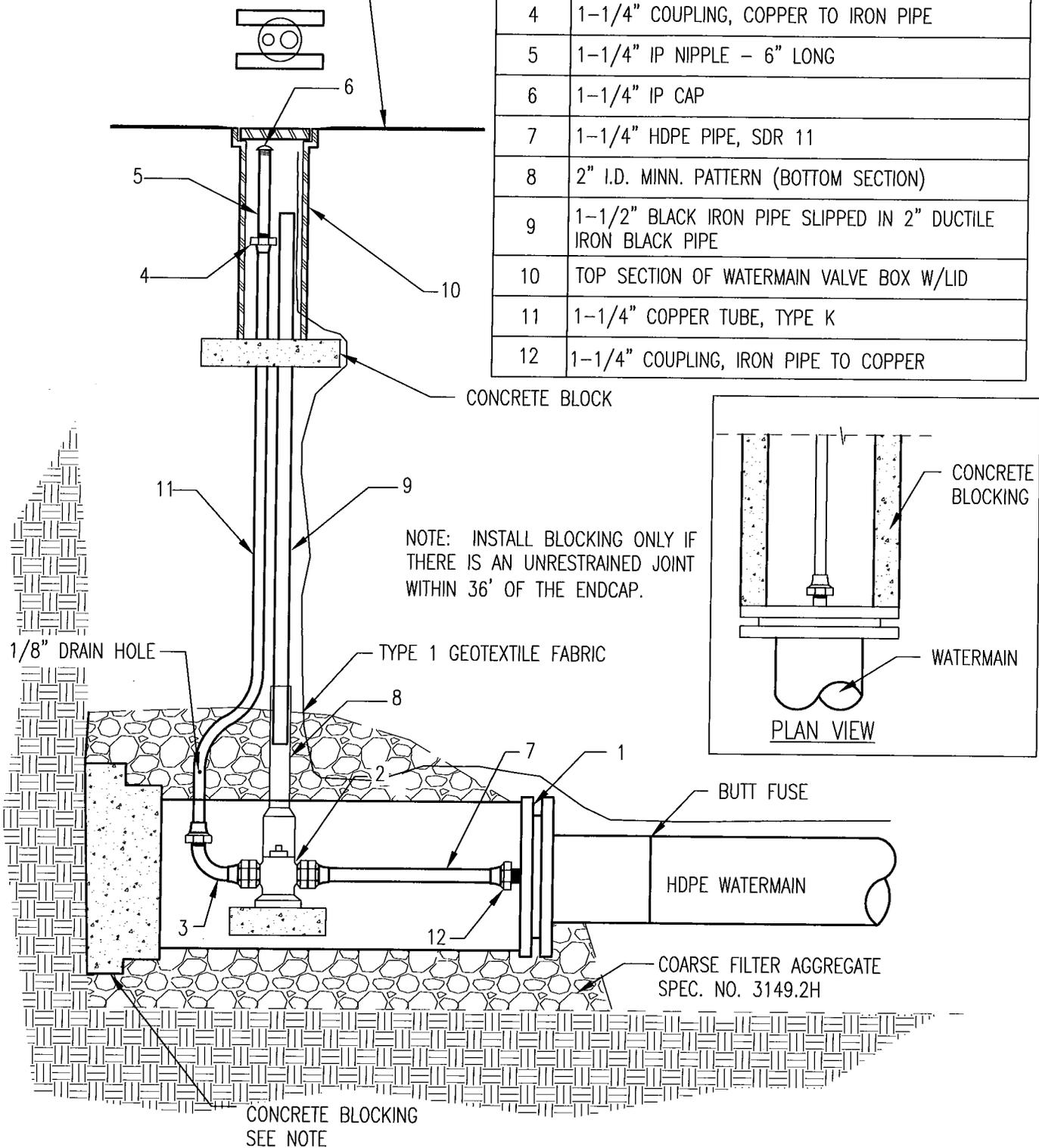
REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

NOTE: TOP OF CASTING SHALL BE 3/8 INCH BELOW FINISHED SURFACE.

ITEM	DESCRIPTION
1	MJ ADAPTOR AND TAPPED DI ENDCAP
2	1-1/4" CURB STOP, FLARED END FITTINGS
3	1-1/4" 90° BEND W/COPPER TYPE GASKET CONNECTION TO CURB STOP
4	1-1/4" COUPLING, COPPER TO IRON PIPE
5	1-1/4" IP NIPPLE - 6" LONG
6	1-1/4" IP CAP
7	1-1/4" HDPE PIPE, SDR 11
8	2" I.D. MINN. PATTERN (BOTTOM SECTION)
9	1-1/2" BLACK IRON PIPE SLIPPED IN 2" DUCTILE IRON BLACK PIPE
10	TOP SECTION OF WATERMAIN VALVE BOX W/LID
11	1-1/4" COPPER TUBE, TYPE K
12	1-1/4" COUPLING, IRON PIPE TO COPPER



1-1/4" BLOWOFF FOR HDPE WATERMAINS

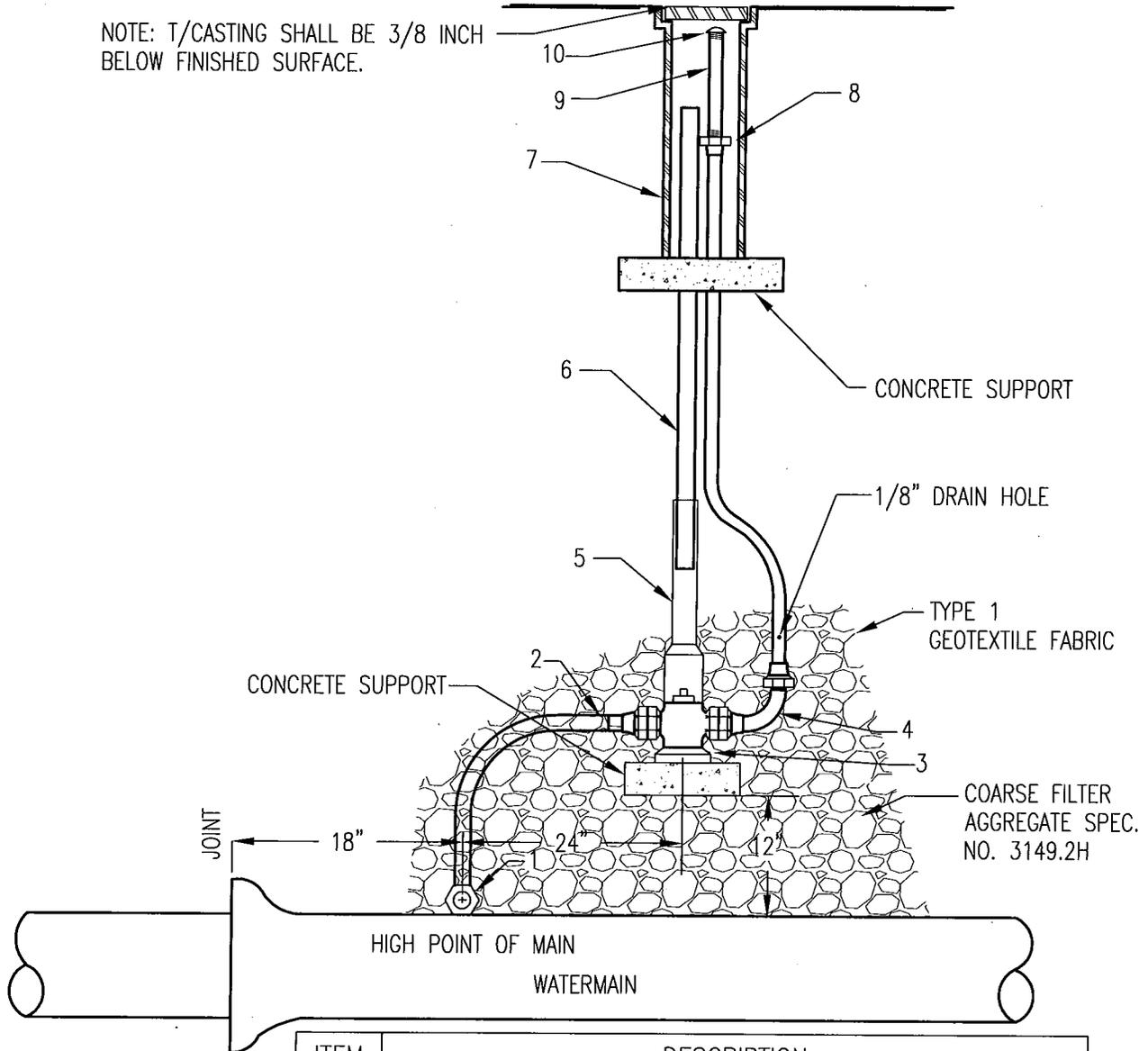
W-8B

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

NOTE: T/CASTING SHALL BE 3/8 INCH BELOW FINISHED SURFACE.



ITEM	DESCRIPTION
1	1" CORPORATION STOP
2	1" COPPER TUBE, TYPE K
3	1" CURB STOP, FLARED END FITTINGS
4	1 90° BEND W/ COPPER TYPE GASKET CONNECTION TO CURB STOP
5	2" I.D. MINN. PATTERN (BOTTOM SECTION)
6	1-1/2" I.D. BLACK IRON PIPE
7	TOP SECTION OF WATERMAIN VALVE BOX W/ LID
8	COUPLING, COPPER TO IRON PIPE
9	1" I.P. NIPPLE - 6" LONG
10	1" I.P. CAP

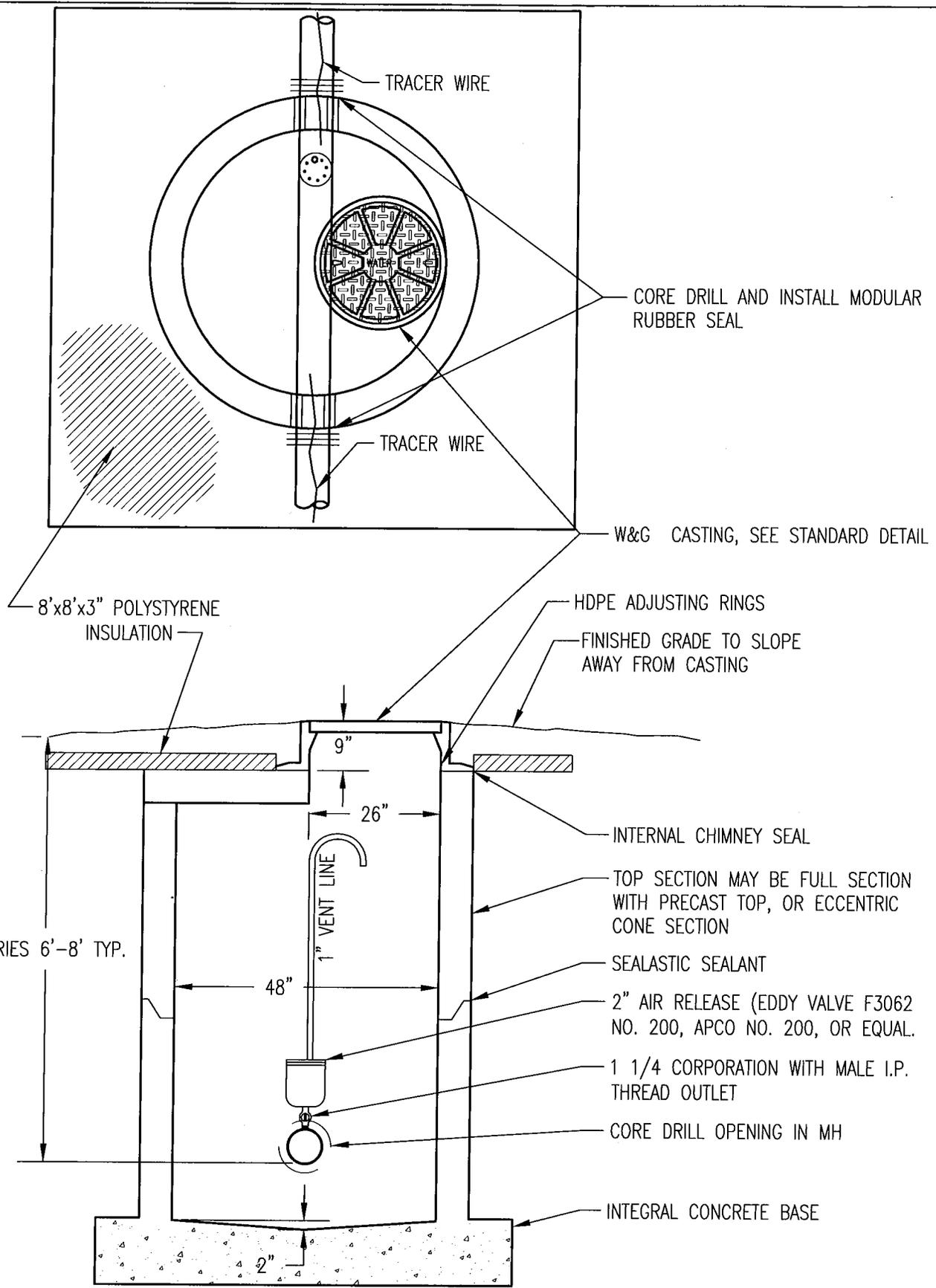
MANUAL AIR RELEASE VALVE BOX TYPE

W-9

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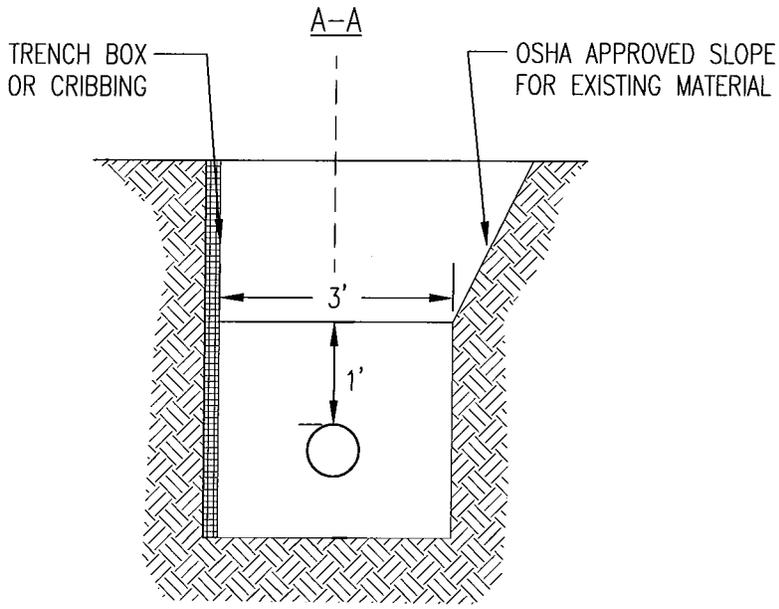
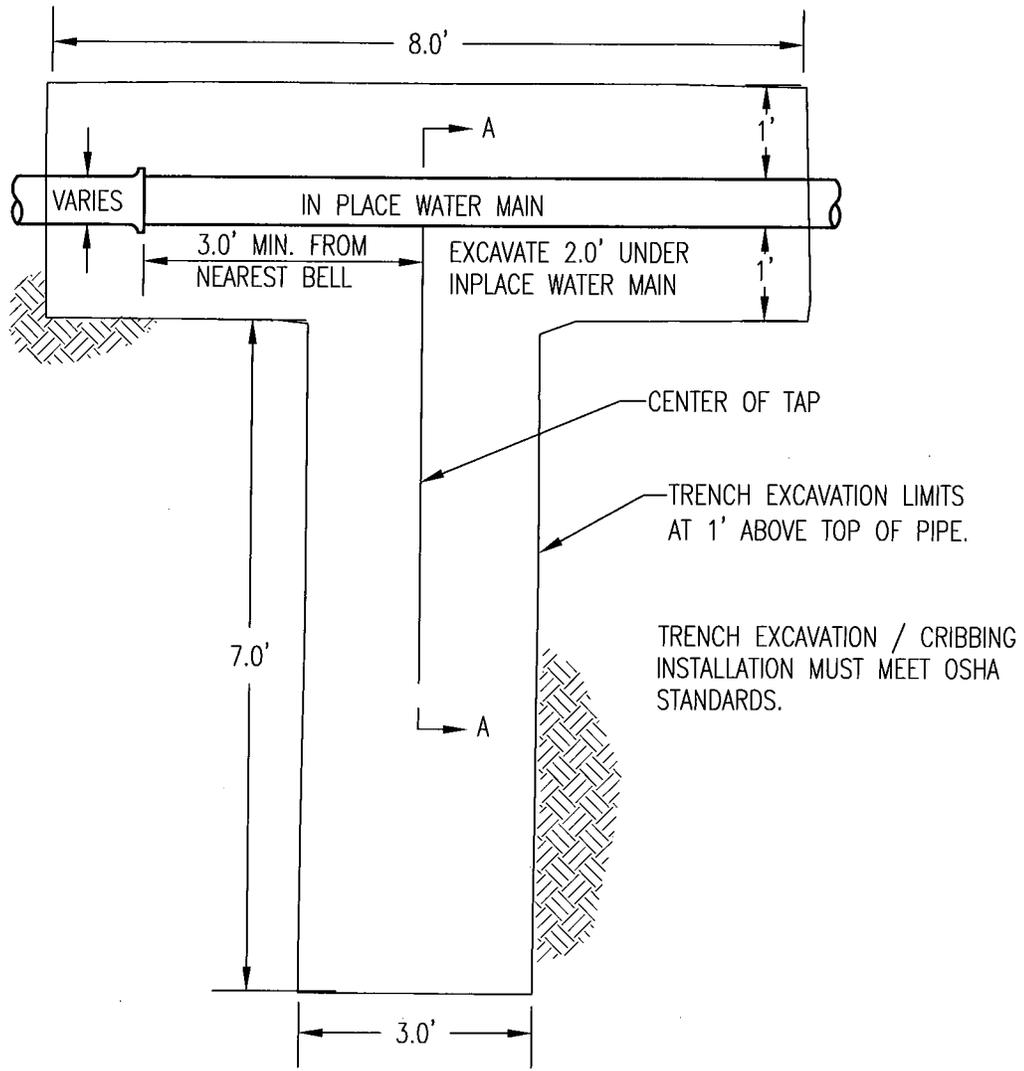
CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



NOTE: MANHOLE TO MEET ALL REQUIREMENTS OF DETAIL SAN-11

AUTO AIR RELEASE VALVE AND MANHOLE		W-10
REVISED/APPROVED 2/01/2013	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



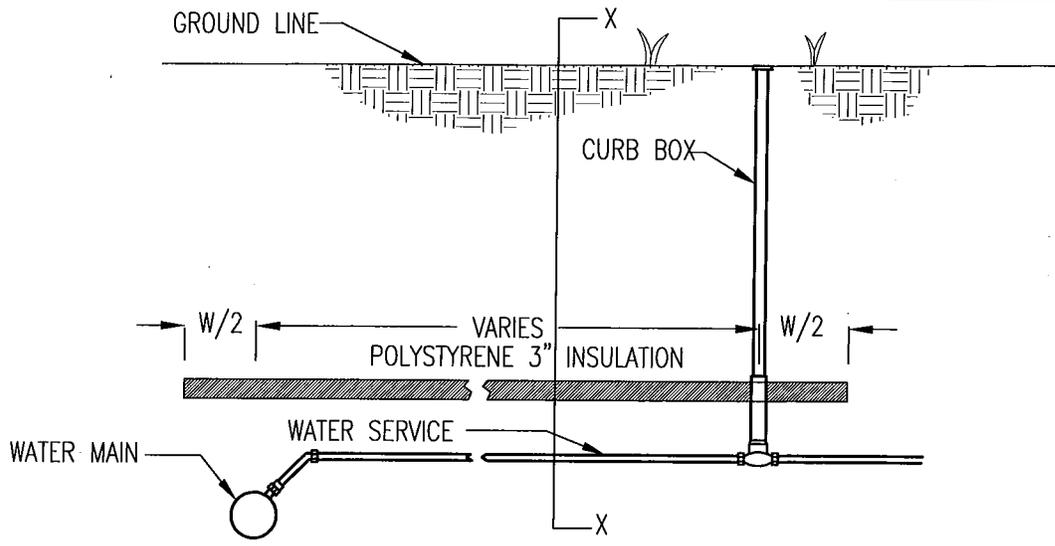
EXCAVATION FOR TAPPING SLEEVE AND VALVE

W-11

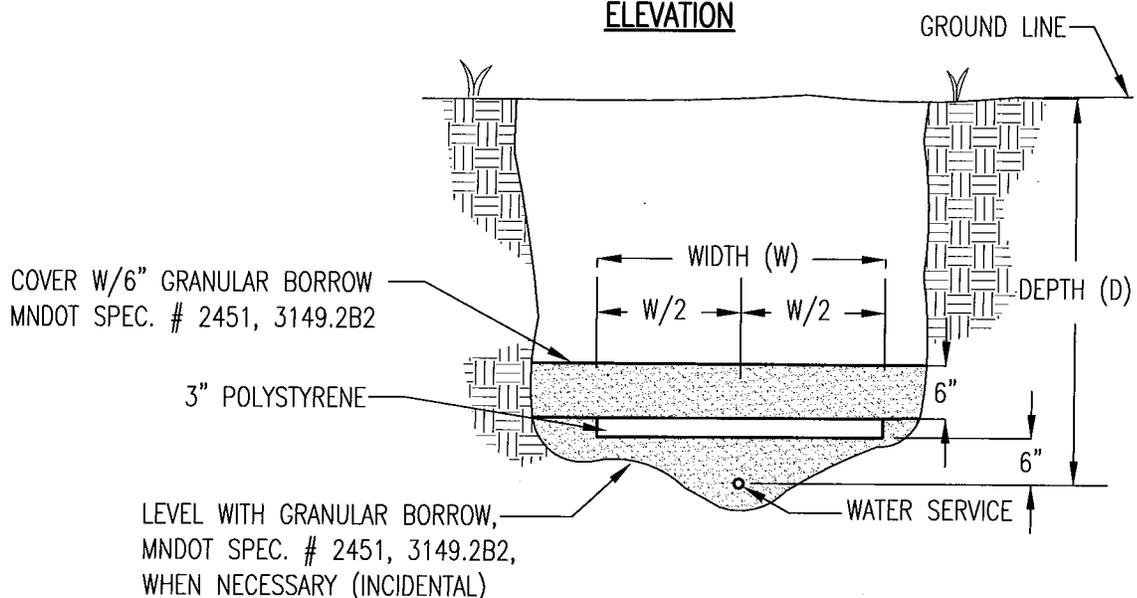
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CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



ELEVATION



SECTION X-X

NOTES:

1. LAYERING OF 2 OR 3 SHEETS TO ARRIVE AT 3" IS PERMITTED WITH JOINTS OFFSET A MINIMUM OF 6".
2. POLYSTYRENE SHALL BE AS SPECIFIED IN THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES STANDARD CONSTRUCTION SPECIFICATIONS.
3. INSULATION SHALL ONLY BE USED WHERE APPROVED BY THE ENGINEER.

DEPTH (D)	WIDTH (W)
7' OR MORE	NONE
5.2' TO 6.9'	4'-0"
4.3' TO 5.1'	6'-0"
3.0' TO 4.2'	8'-0"

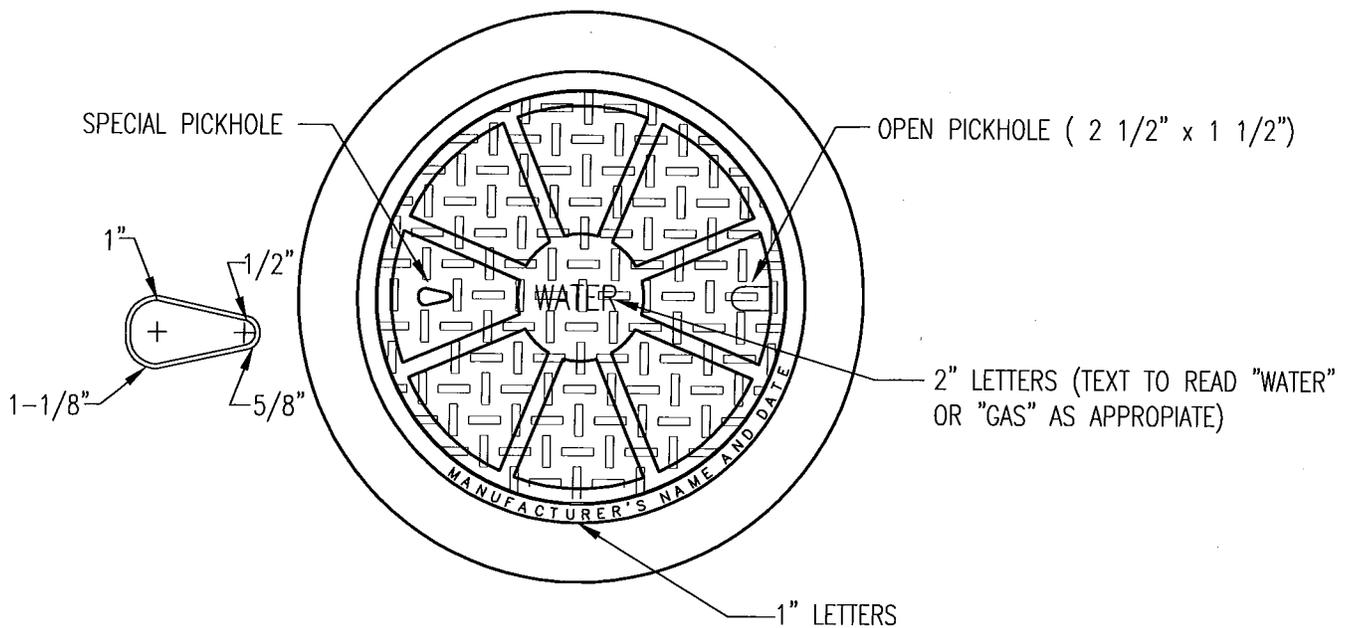
WATER SERVICE INSULATION

W-13

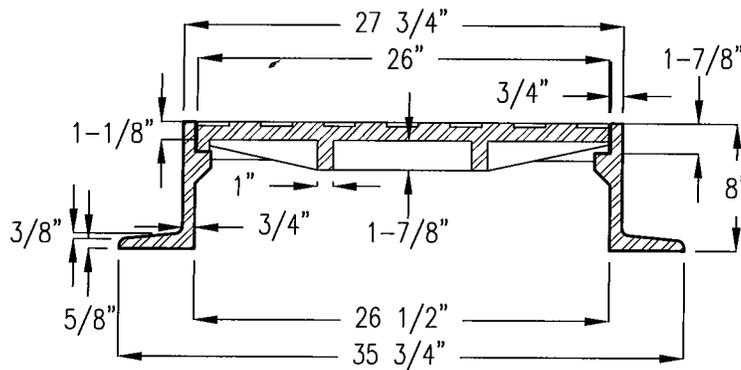
REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



PLAN OF COVER



SECTION OF FRAME AND COVER

NOTE: ROUND OFF ALL EXPOSED EDGES FURNISHED WITH MACHINED HORIZONTAL BEARING SURFACES.
 WEIGHT: RING-295 LBS. COVER - 162 LBS. SIMILAR OR EQUAL TO NEENAH FOUNDRY NQR-1723 (EXCEPT WITH LETTERING AS NOTED)

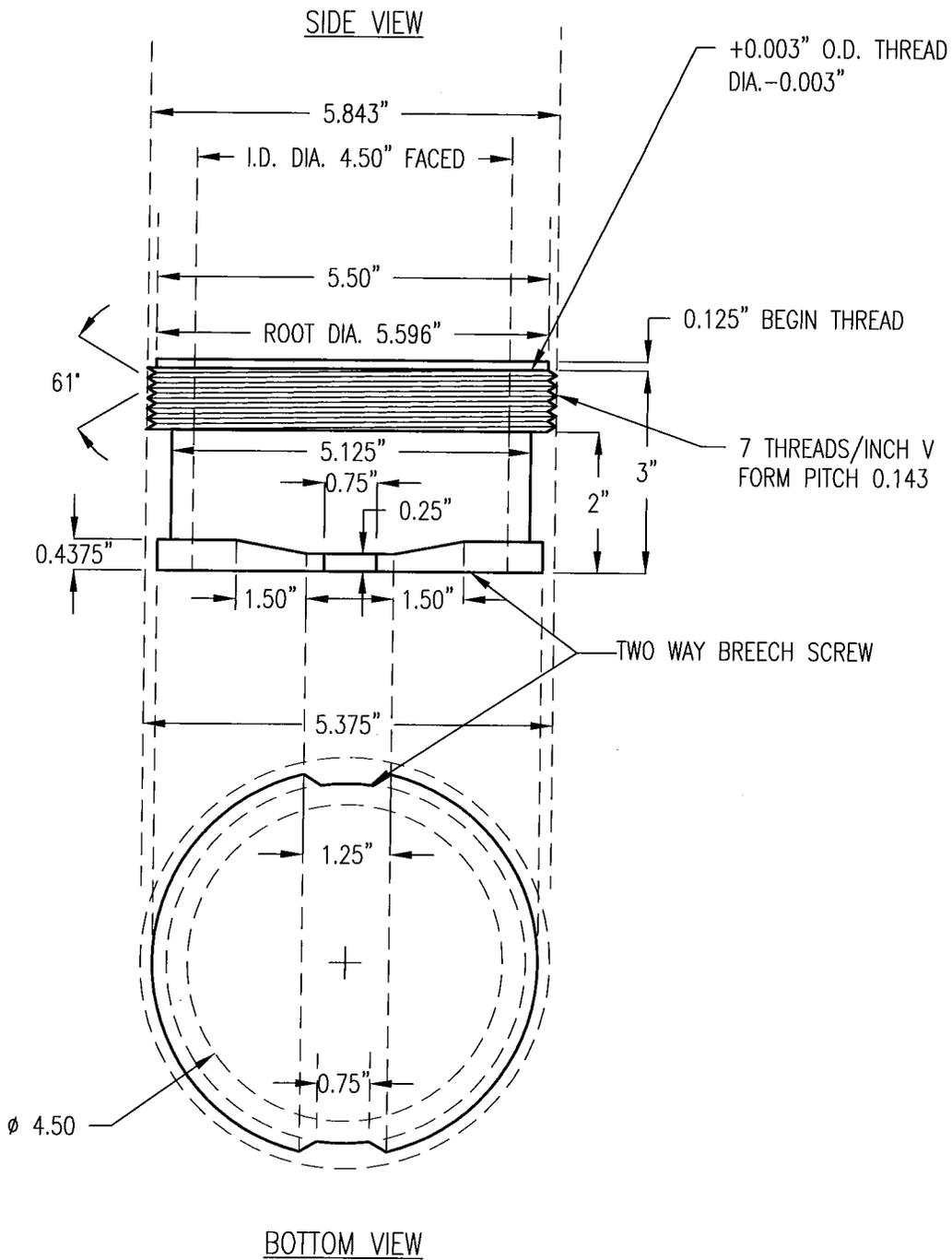
CAST IRON WATER MANHOLE FRAME AND COVER

W-15

REVIEWED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
 DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



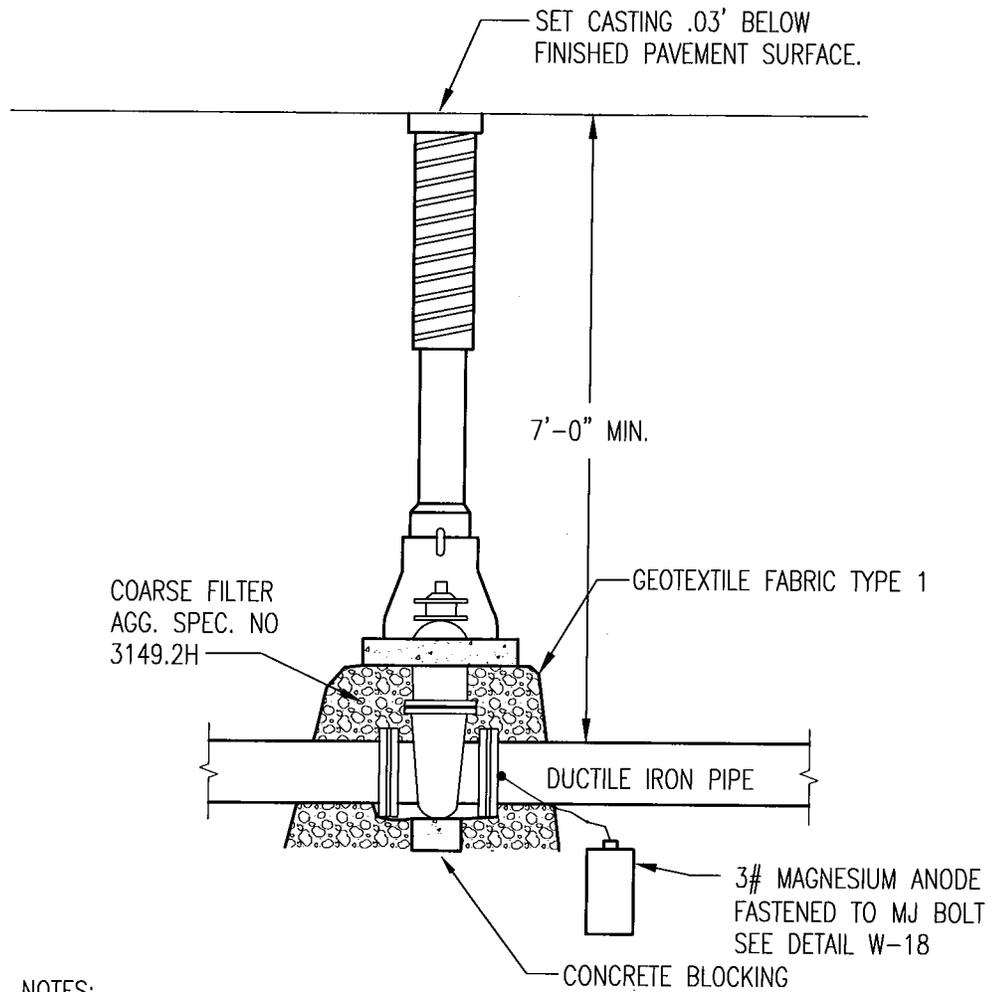
DULUTH THREAD FOR STEAMER NOZZLE

W-16

REVIEWED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
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NO SCALE



NOTES:

1. USE EPOXY COATING ON EXTERIOR OF VALVES
2. ALL BOLTS SHALL BE COR-TEN WITH 6 OUNCE ZINC ANODE CAPS CONFORMING TO ASTM B-418 FOR ALL MECHANICAL JOINT FITTINGS.

WATER VALVE BOX - DUCTILE IRON MAIN

W-17

REVISED/APPROVED 2/01/2013

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NO SCALE

MAGNETIZED TRACER BOXES NOT
REQUIRED WHERE VALVES ARE
INSTALLED IN THE ROADWAY

SET CASTING .03' BELOW
FINISHED PAVEMENT SURFACE.

MAGNETIZED TRACER BOX WITH
BLUE TOP. WIRE CONNECTED
TO TRACER BOX TERMINAL..
TRACER LOCATED DIRECTLY
ABOVE PIPE WITHIN 2' OF VALVE
BOX.

LEAVE SLACK IN WIRE

7'-6"

NOTE: THE CONNECTION FOR THE WIRE
IS SO THAT THE MINIMUM NO. OF CONNECTIONS
IN THE WIRE SYSTEM ARE USED.

COARSE FILTER AGGREGATE
SPEC. NO 3149.2H

GEOTEXTILE FABRIC TYPE 1

TRACER WIRE

HDPE PIPE

HDPE PIPE

HDPE TO MJ ADAPTORS

3# MAGNESIUM ANODE
FASTENED TO MJ BOLT
SEE DETAIL W-18

CONCRETE BLOCKING TO SUPPORT THE
VALVE BOX AS SHOWN IN DETAIL W-17

NOTES:

1. VALVES SHALL BE CONNECTED DIRECTLY TO HDPE WITH HDPE TO MECHANICAL JOINT ADAPTORS.
2. USE EPOXY COATING ON EXTERIOR OF VALVES.
3. ALL BOLTS SHALL BE COR-TEN WITH 6 OUNCE ZINC ANODE CAPS CONFORMING TO ASTM B-418 FOR ALL MECHANICAL JOINT FITTINGS.
4. FOR OPEN CUT PIPE INSTALLATIONS, ELECTROFUSION COUPLINGS ARE NOT ALLOWED FOR CONNECTION OF HDPE TO MJ ADAPTORS. FOR DIRECTIONAL DRILLED INSTALLATIONS, ONE ELECTROFUSION COUPLING MAY BE USED PER VALVE.

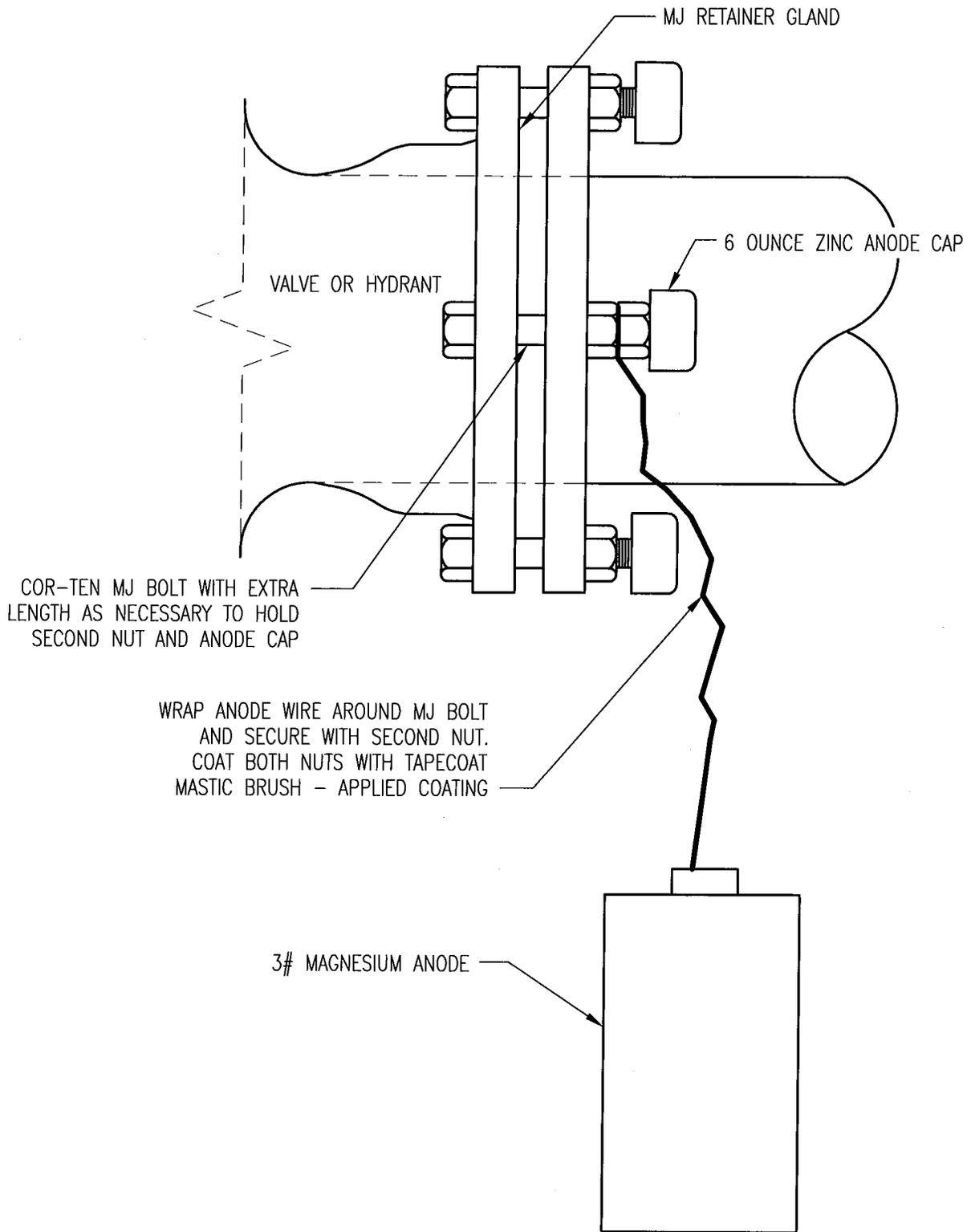
WATER VALVE BOX - HDPE MAIN

W-17A

REVISED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

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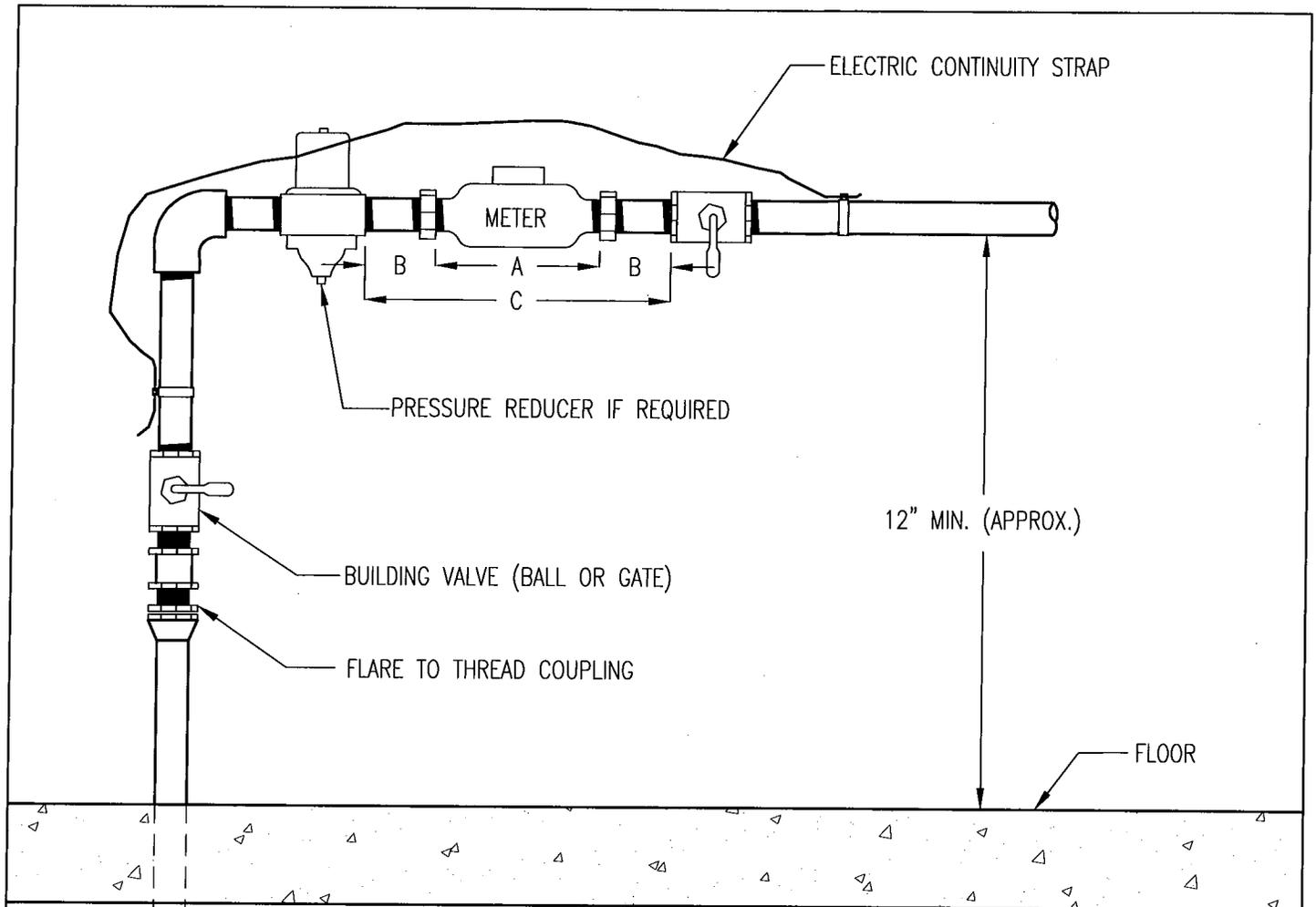
ANODE CONNECTION

W-18

REVISED/APPROVED 2/01/2013

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DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

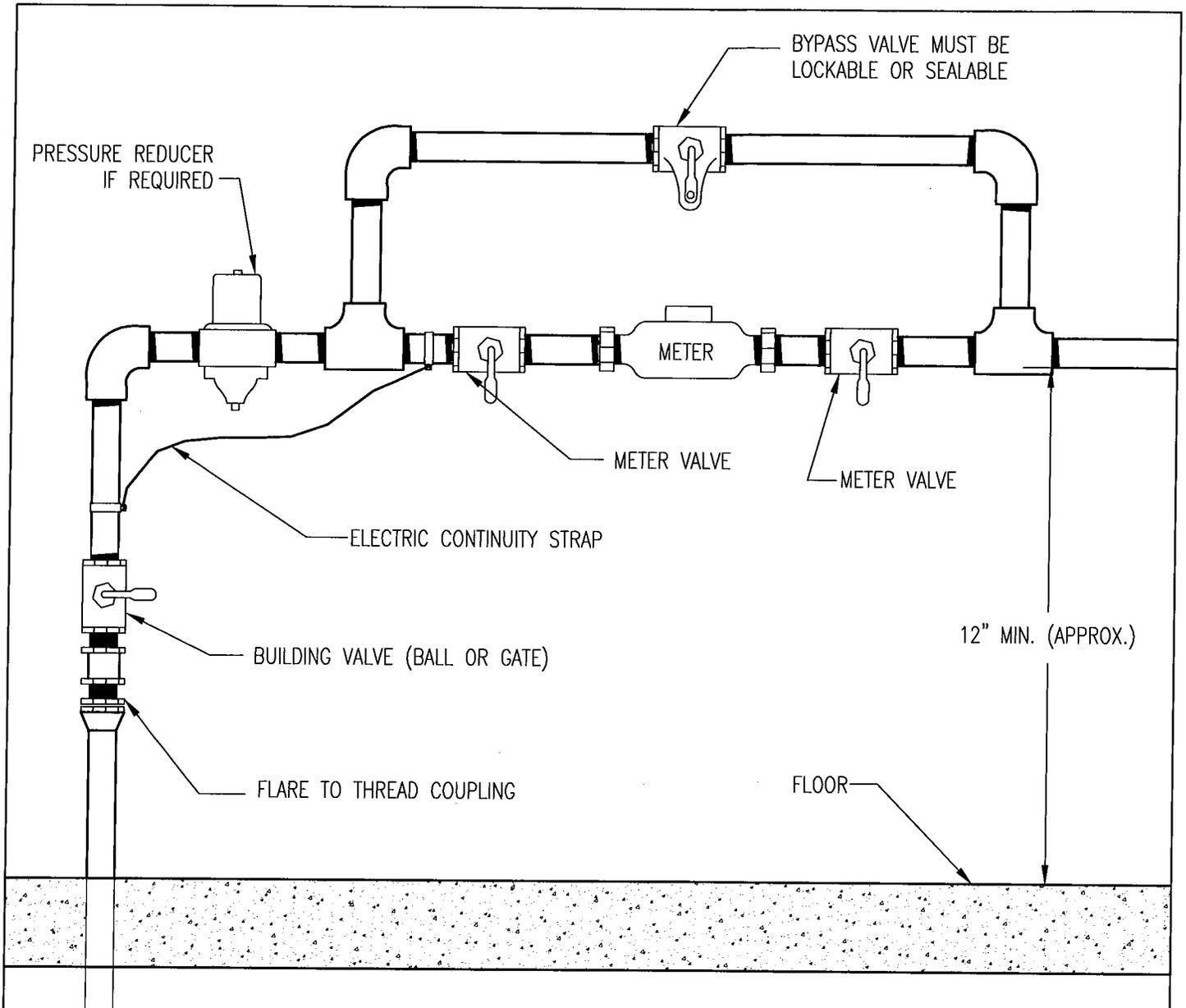


WATER METER SIZE					
	5/8"	3/4"	1"	1 1/2"	2"
A - METER LENGTH	7-1/2"	9"	10 3/4"	12-5/8"	15-1/4"
B - METER TAIL PIECE	2-3/8"	2-1/2"	2 5/8"	2-1/2"	2-5/8"
C - METER W/ TAIL PIECE	12-1/2"	14"	16"	17-5/8"	20-1/2"
TAIL PIECE THREAD SIZE	1/2"	3/4"	1"	2-1/4" X 1-3/4"	2-1/4" X 1-3/4"
MAX. METER OUTPUT (GPM)	25	35	70	120	170

NOTES:

1. SUPPLY PIPE AND FITTINGS BETWEEN BUILDING VALVE AND METER SHALL BE THREADED BRASS AND/OR COPPER AND NOT BE LESS THAN 3/4" SIZE.
2. METERS SHALL ALWAYS BE INSTALLED IN A HORIZONTAL POSITION.
3. VALVES SHALL BE GATE OR FULL-WAY BALL VALVES.
4. PRESSURE REDUCING VALVE IS REQUIRED WHERE PRESSURE EXCEEDS 80 PSI.
5. ELECTRICAL CONTINUITY STRAP IS REQUIRED EXCEPT WHERE BYPASS IS INSTALLED. SIZE OF STRAP BY ELECTRICAL CODE.

TYPICAL WATER METER INSTALLATION - SINGLE		W-30
REVISED/APPROVED 2/01/2013	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



NOTES:

1. SUPPLY PIPE AND FITTINGS BETWEEN BUILDING VALVE AND METER SHALL BE THREADED BRASS AND/OR COPPER AND NOT BE LESS THAN 3/4" SIZE
2. METERS SHALL ALWAYS BE INSTALLED IN A HORIZONTAL POSITION
3. VALVES SHALL BE GATE OR FULL-WAY BALL VALVES
4. PRESSURE REDUCING VALVE IS REQUIRED WHERE PRESSURE EXCEEDS 80 PSI
5. ELECTRICAL CONTINUITY STRAP IS REQUIRED EXCEPT WHERE BYPASS IS INSTALLED. SIZE OF STRAP BY ELECTRICAL CODE
6. BYPASS VALVE MUST BE LOCKABLE OR SEALABLE
7. METER INSTALLATIONS 2" OR LARGER MAY REQUIRE A BYPASS IF POTENTIAL HEALTH OR SAFETY RISKS INCREASE IF WATER SUPPLY IS INTERRUPTED

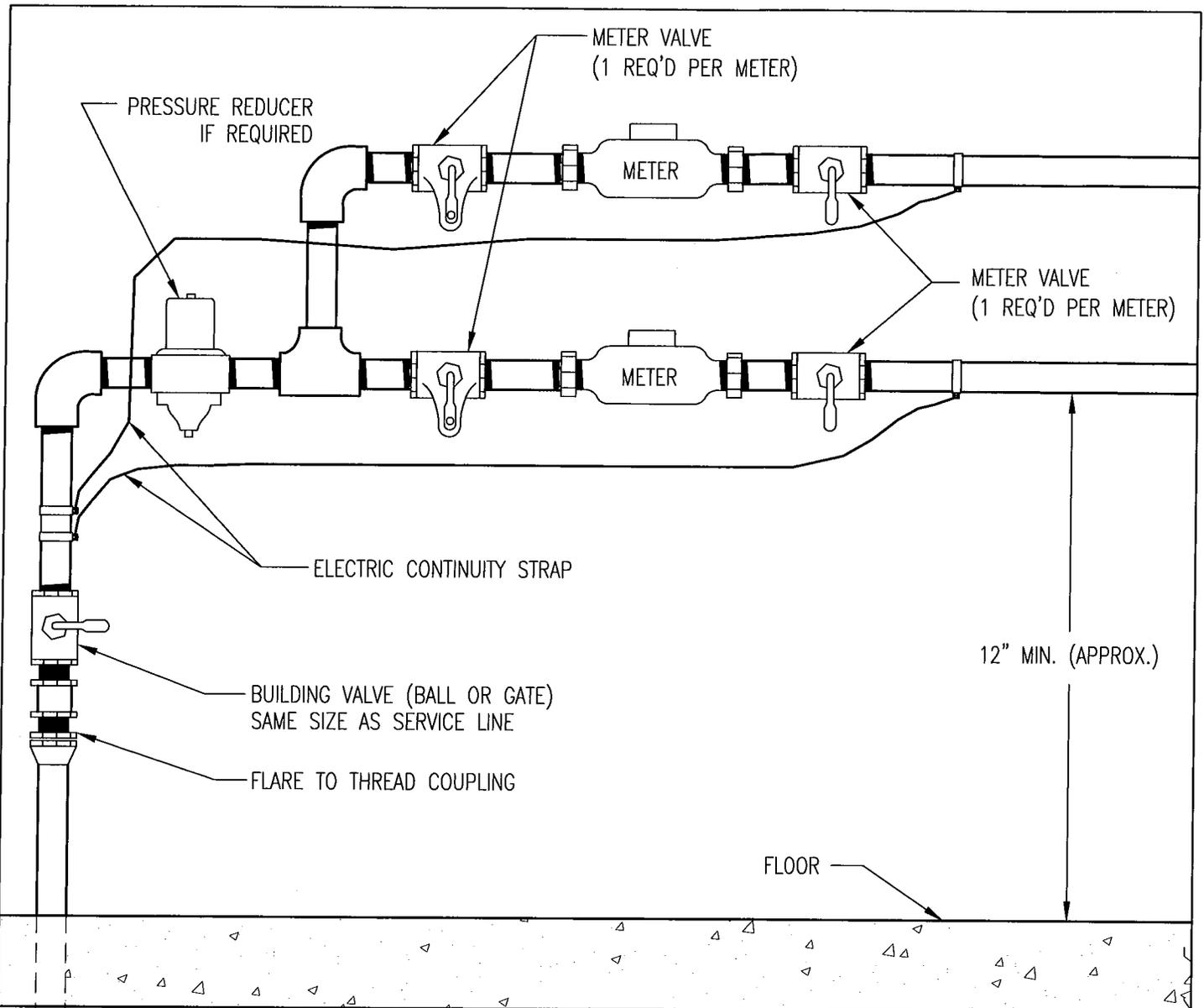
TYPICAL WATER METER INSTALLATION WITH BYPASS

W-31

REVISED/APPROVED 2/01/2013

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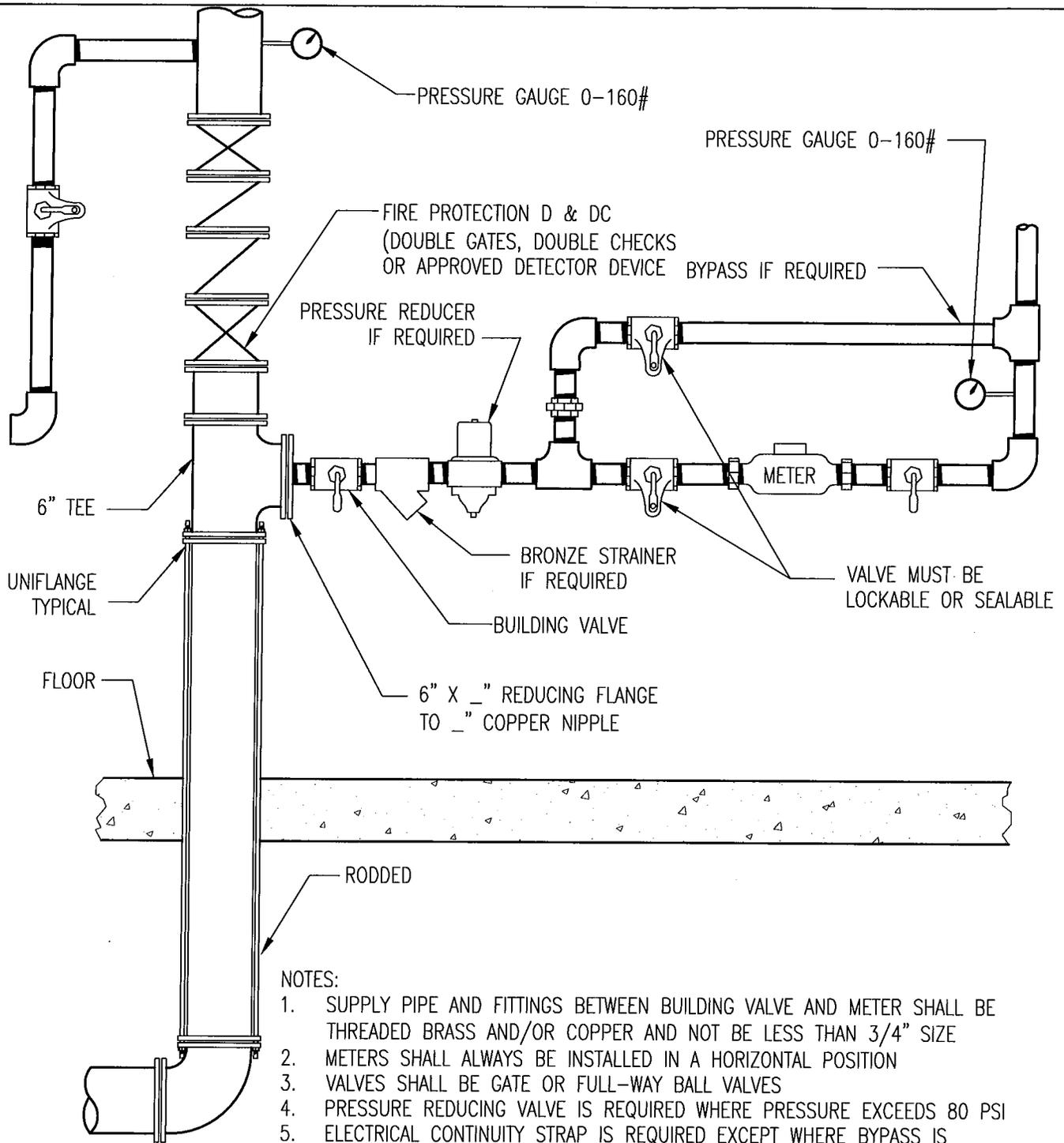
NO SCALE



NOTES:

1. SUPPLY PIPE AND FITTINGS BETWEEN BUILDING VALVE AND METER SHALL BE THREADED BRASS AND/OR COPPER AND NOT BE LESS THAN 3/4" SIZE
2. METERS SHALL ALWAYS BE INSTALLED IN A HORIZONTAL POSITION
3. VALVES SHALL BE GATE OR FULL-WAY BALL VALVES
4. PRESSURE REDUCING VALVE IS REQUIRED WHERE PRESSURE EXCEEDS 80 PSI
5. ELECTRICAL CONTINUITY STRAP IS REQUIRED EXCEPT WHERE BYPASS IS INSTALLED. SIZE OF STRAP BY ELECTRICAL CODE
6. FOR METERS 3" AND LARGER, A STRAINER IS REQUIRED AHEAD OF METER
7. UPSTREAM METER VALVE ON MULTIMETER INSTALLATIONS MUST BE LOCKABLE

MULTIPLE WATER METER INSTALLATION		W-32
REVIEWED/APPROVED 2/01/2013	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE



NOTES:

1. SUPPLY PIPE AND FITTINGS BETWEEN BUILDING VALVE AND METER SHALL BE THREADED BRASS AND/OR COPPER AND NOT BE LESS THAN 3/4" SIZE
2. METERS SHALL ALWAYS BE INSTALLED IN A HORIZONTAL POSITION
3. VALVES SHALL BE GATE OR FULL-WAY BALL VALVES
4. PRESSURE REDUCING VALVE IS REQUIRED WHERE PRESSURE EXCEEDS 80 PSI
5. ELECTRICAL CONTINUITY STRAP IS REQUIRED EXCEPT WHERE BYPASS IS INSTALLED. SIZE OF STRAP BY ELECTRICAL CODE
6. FOR METERS 3" AND LARGER, A STRAINER IS REQUIRED AHEAD OF METER
7. UPSTREAM METER VALVE ON MULTIMETER INSTALLATIONS MUST BE LOCKABLE
8. BYPASS VALVE MUST BE LOCKABLE OR SEALABLE
9. UPSTREAM METER VALVE ON DOMESTIC BRANCH OFF OF A FIRE SERVICE MUST BE LOCKABLE

TYPICAL 6" FIRE SERVICE WITH DOMESTIC WATER

W-34

REVIEWED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE