

TYPICAL SECTION



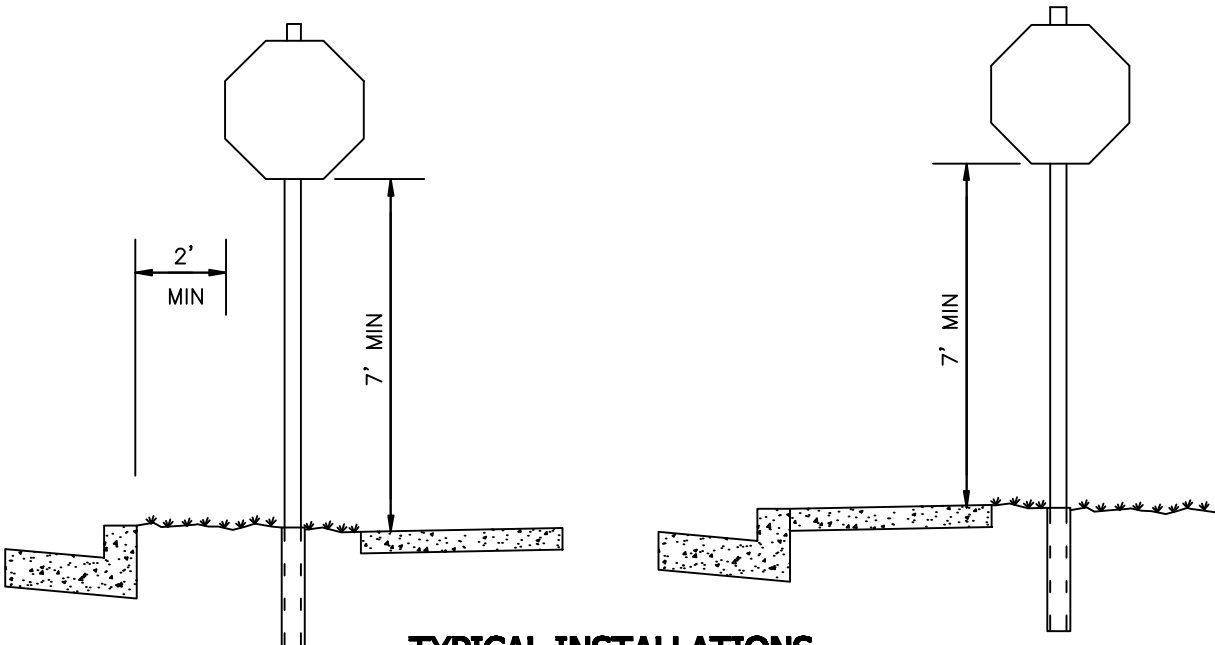
APPROVED BY	L. OLIVE
DATE	07/31/2008
REF STD SPEC	

DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS

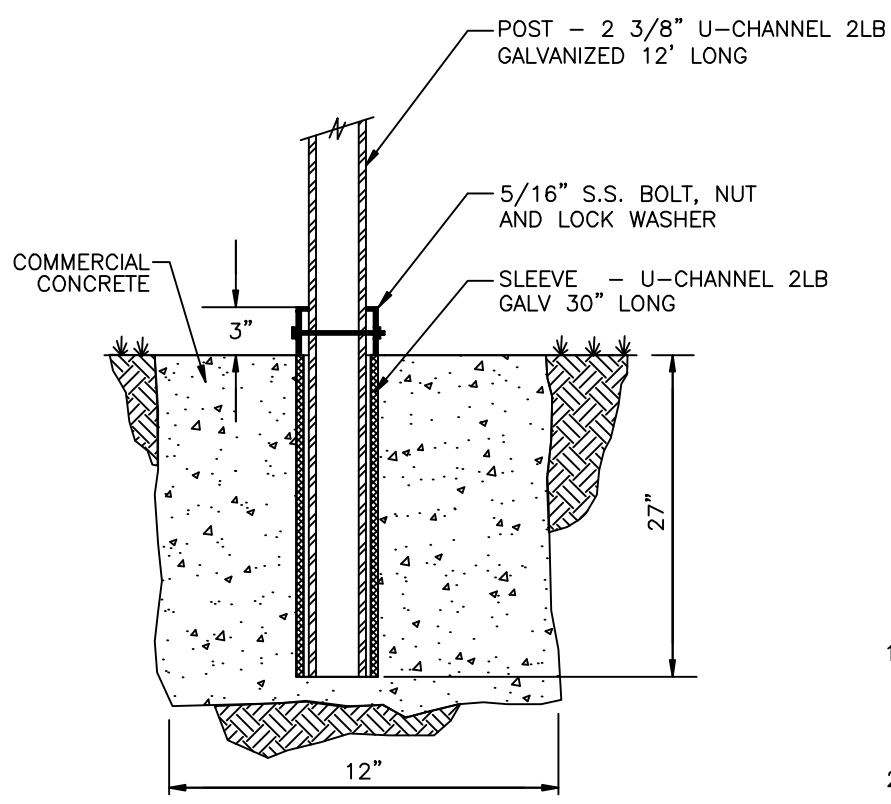
POST MOUNTED STREET NAME SIGNS

STANDARD DETAIL NUMBER

R-110



TYPICAL INSTALLATIONS

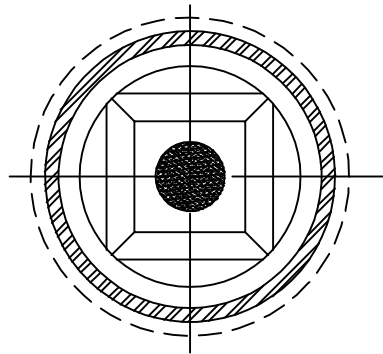


TYPICAL SECTION

NOTES:

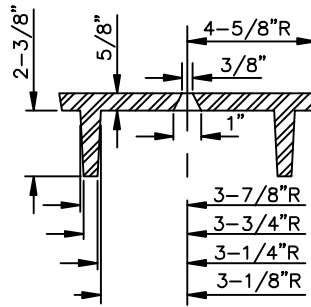
1. STANDARD STOP SIGNS SHALL BE 30"x30" PRISMATIC SPECIFICATION UNLESS OTHERWISE APPROVED OR DIRECTED BY THE CITY ENGINEER.
2. STREET NAME SIGNS MAY BE INSTALLED AT TOP OF POST.

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	DATE	07/31/2008		
	REF STD SPEC		TRAFFIC REGULATORY SIGN INSTALLATION	

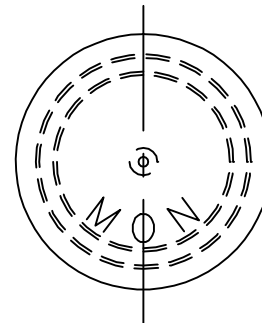


PLAN

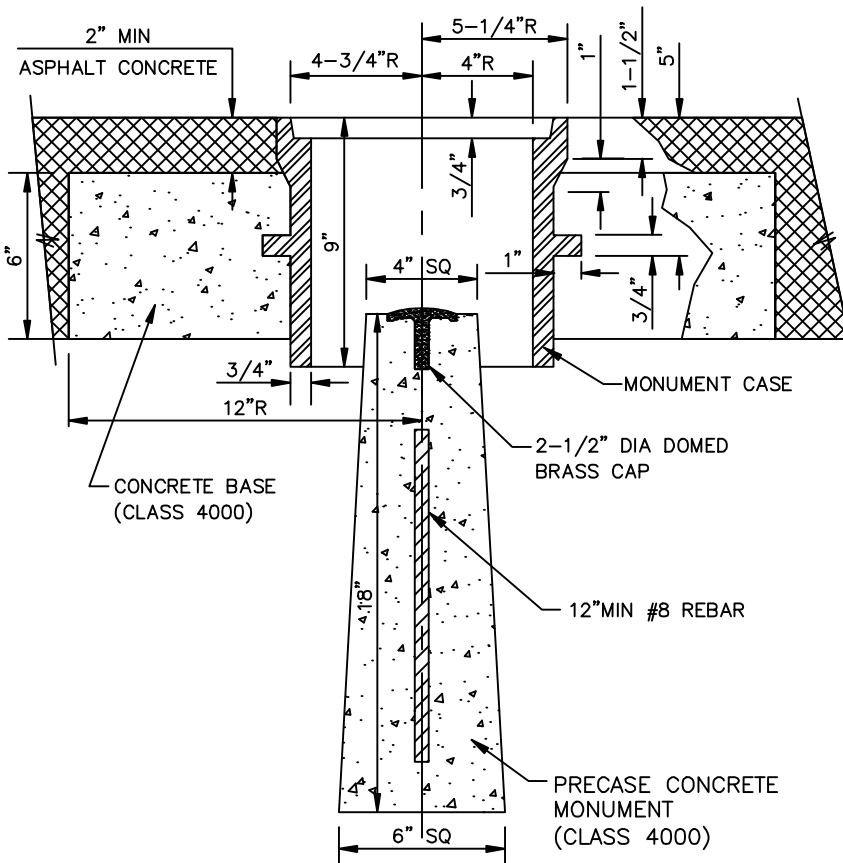
COVER REMOVED



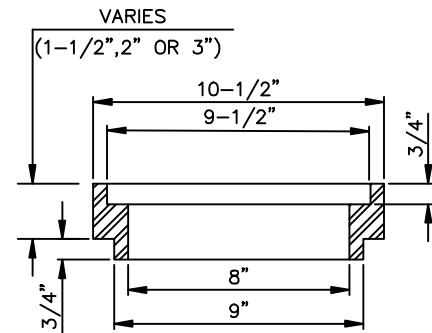
COVER SECTION



COVER PLAN



SECTION



EXTENSION SECTION

NOTES

1. MONUMENTS IN NON-PAVED AREAS SHALL BE 3" ABOVE GRADE.
2. ALL MONUMENTS SHALL BE PRECAST CONC. WITH REBAR AND 2-1/2" DIA BRASS CAP.
3. MONUMENT CASE AND RISER SECTION SHALL BE CAST IRON PER ASTM-A48, CLASS 30, WITH BITUMINOUS COATING.
4. COVER SHALL BE DUCTILE IRON PER ASTM-A536, GRADE 80-55-06, WITH BITUMINOUS COATING.
5. LEGEND ON COVER SHALL BE 1/8" RAISED INTERGRALLY CAST LETTERS 1" HIGH WITH A MIN FACE WIDTH OF 3/16".



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DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS

SURVEY MONUMENT

STANDARD DETAIL NUMBER

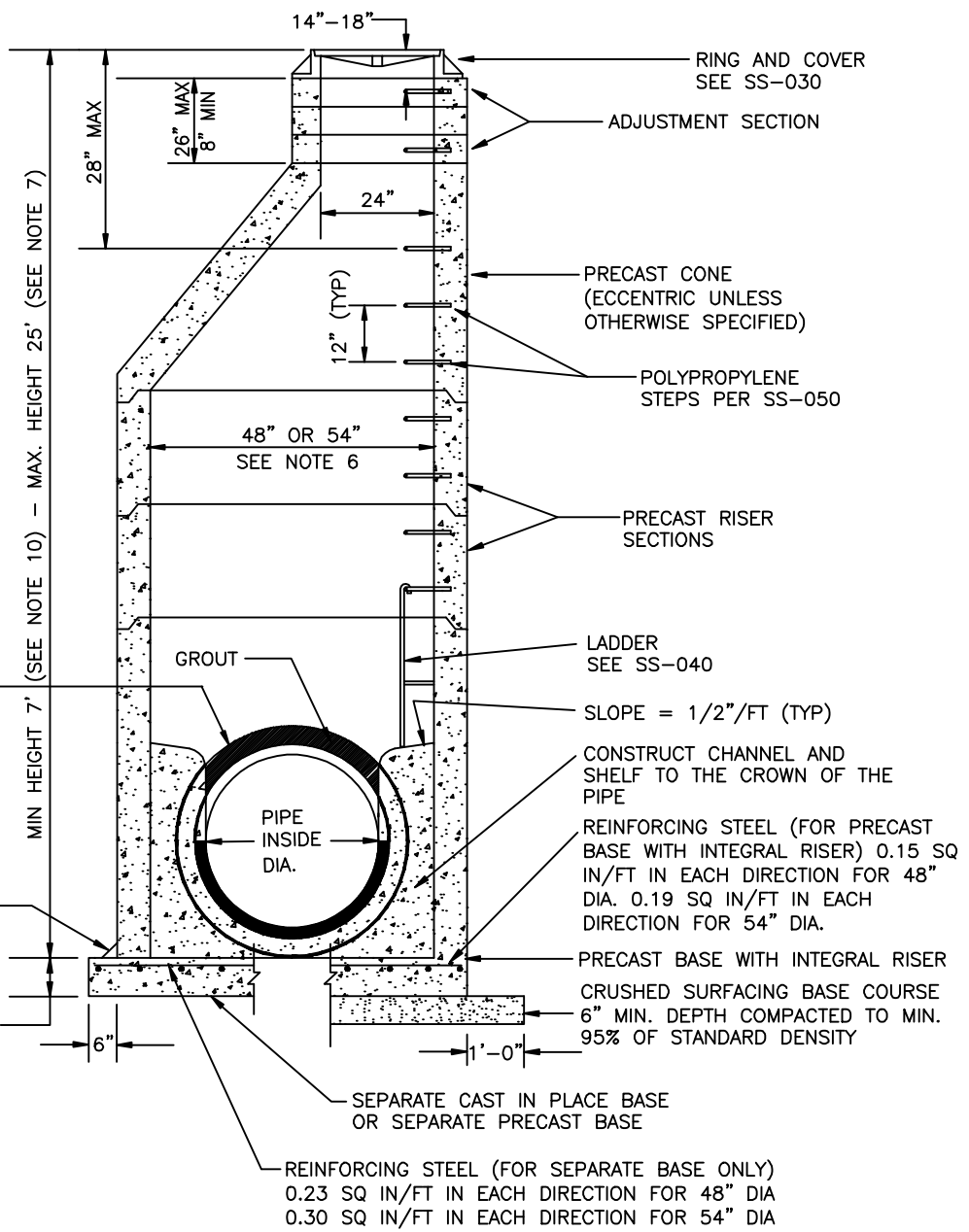
R-130

NOTES:

1. MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M-199 (ASTM C 478) UNLESS OTHERWISE SHOWN ON PLANS OR NOTED IN STANDARD SPECIFICATIONS.
2. ALL REINFORCED CAST IN PLACE CONCRETE SHALL BE CLASS 4000. NON-REINFORCED CONCRETE IN CHANNEL AND SHELF SHALL BE CLASS 3000. ALL PRECAST CONCRETE SHALL BE CLASS 4000.
3. PRECAST BASES SHALL BE FURNISHED WITH CUTOUTS.
4. ALL BASE REINFORCING STEEL SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI AND BE PLACED IN THE UPPER HALF OF THE BASE WITH 1" MINIMUM CLEARANCE.
5. CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAMETER PLUS MANHOLE WALL THICKNESS. MAXIMUM PIPE SIZE IS 12" FOR 48" MANHOLE, 24" FOR 54" MANHOLE. MINIMUM DISTANCE BETWEEN HOLES IS 8"(MEASURED ON THE INSIDE OF THE MANHOLE).
6. MANHOLE SIZE DEPENDS ON SIZES, LOCATION AND NUMBERS OF HOLES FOR PIPES. MANHOLE DESIGN AND SIZE SHALL BE APPROVED AND WARRANTED BY THE MANHOLE SUPPLIER.
7. FOR DEPTHS OVER 25' MANHOLE BASE SLAB DESIGN SHALL BE DESIGNED BY A STRUCTURAL ENGINEER.
8. ALL INTERIOR AND EXTERIOR JOINTS TO BE GROUTED (SEE GROUT SPECIFICATIONS). GROUT TO BE 1/2" THICK MINIMUM AND 3" EACH SIDE OF JOINT MINIMUM. THEY MUST BE INSPECTED PRIOR TO BACKFILL.
9. CORE DRILLING ONLY, HAMMERING KNOCKOUTS WILL NOT BE ALLOWED. KOR-N-SEAL FACTORY INSTALLED BOOTS ARE ALLOWED.
10. MANHOLES 5'-7' DEEP MUST BE FLAT TOPS.

MAX. HOLE SIZE IS 12" FOR 48" MANHOLE, 24" FOR 54" MANHOLE. (SEE NOTES 5 & 6 ABOVE)

MIN HEIGHT 7' (SEE NOTE 10) - MAX. HEIGHT 25' (SEE NOTE 7)

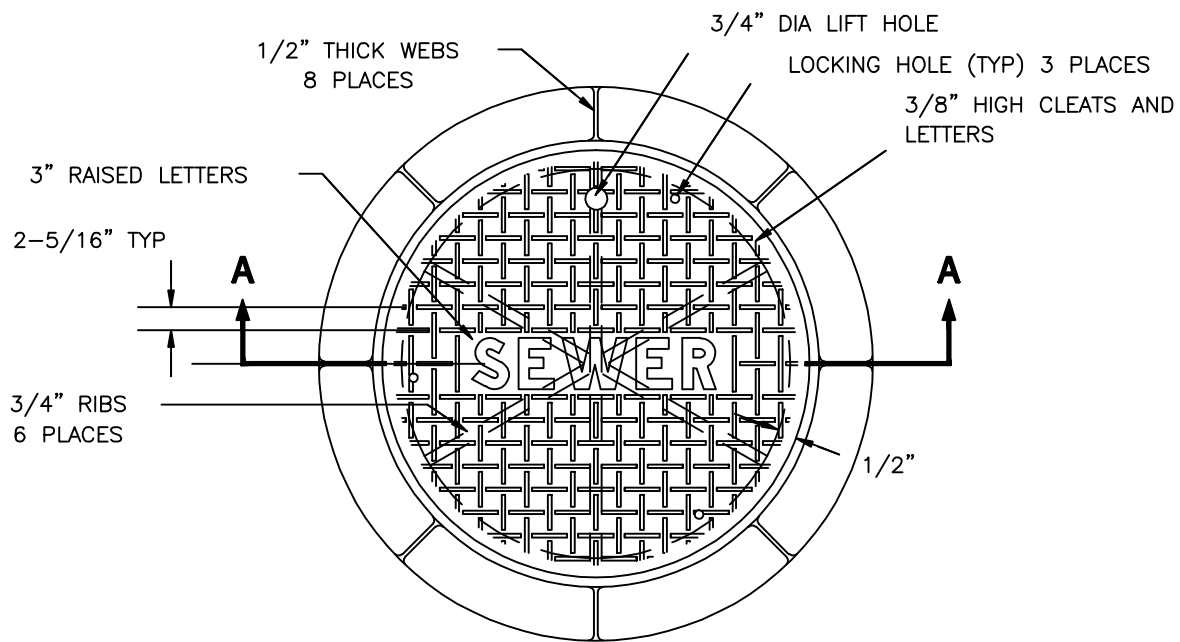


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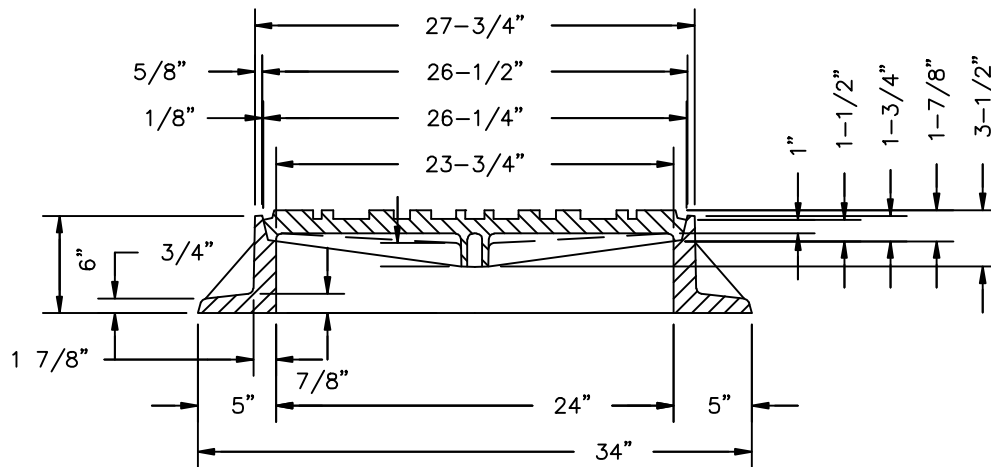
DEPARTMENT OF PUBLIC WORKS
STANDARD DETAIL

MANHOLE TYPE I

STANDARD DETAIL NUMBER
SS-010



PLAN



SECTION A-A

NOTES:

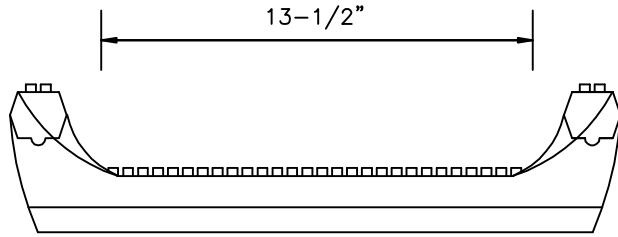
1. MANHOLE RINGS SHALL BE GRAY IRON CONFORMING TO THE REQUIREMENTS OF AASHTO M 105, GRADE 30B.
2. MANHOLE COVER TO BE DUCTILE IRON CONFORMING TO ASTM A536, GR 80-55-06 OLYMPIC FOUNDRY PART NO. MH30 OR APPROVED EQUAL.
3. LOCKING COVER TO BE USED IN ALL LOCATIONS. THE LID SHALL BE LOCKED DOWN WITH 3-5/8" S.S SOCKET HEAD CAP SCREWS.
4. RING AND COVER SHALL BE TESTED FOR ACCURACY OF FIT AND SHALL BE MARKED IN SETS FOR DELIVERY.
5. ALL CASTINGS TO HAVE A BITUMINOUS COATING.



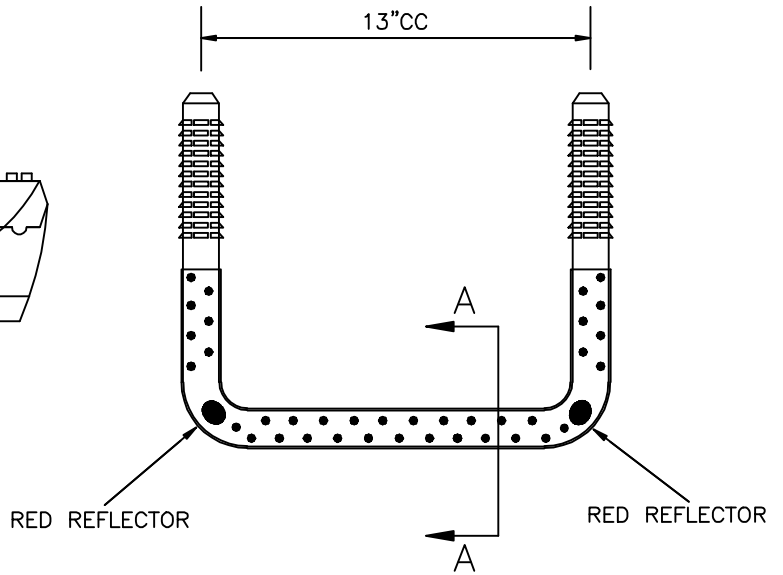
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DATE	07/31/2008
REF STAD SPEC	

DEPARTMENT OF PUBLIC WORKS STANDARD DETAIL
MANHOLE COVER

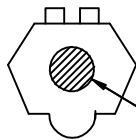
STANDARD DETAIL NUMBER
SS-030



ELEVATION



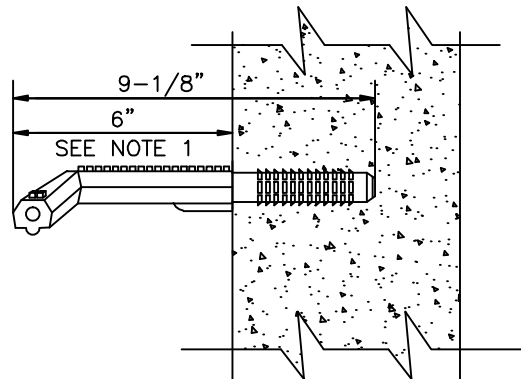
PLAN



1/2" GRADE 60 STEEL
REINFORCING BAR (ASTM A-615)

POLYPROYLENE ASTM D4101
STEP MEETS ASTM C-478

SECTION A-A



SIDE ELEVATION

NOTE:

1. STEPS LOCATED IN RISER SECTIONS SHALL BE 6".



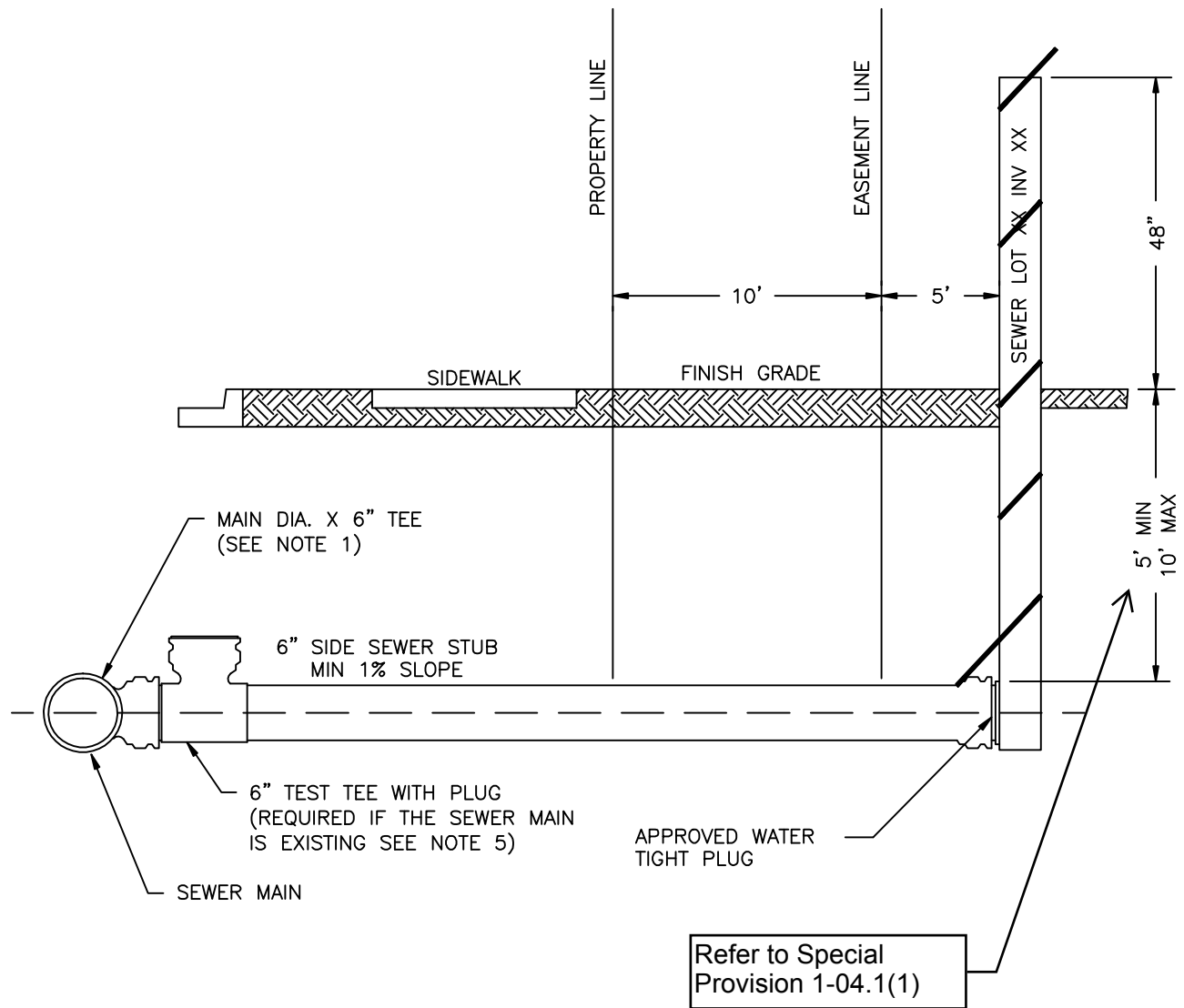
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DATE	07/31/2008
REF STAD SPEC	

DEPARTMENT OF PUBLIC WORKS
STANDARD DETAIL

MANHOLE LADDER STEP

STANDARD DETAIL
NUMBER

SS-050



NOTES:

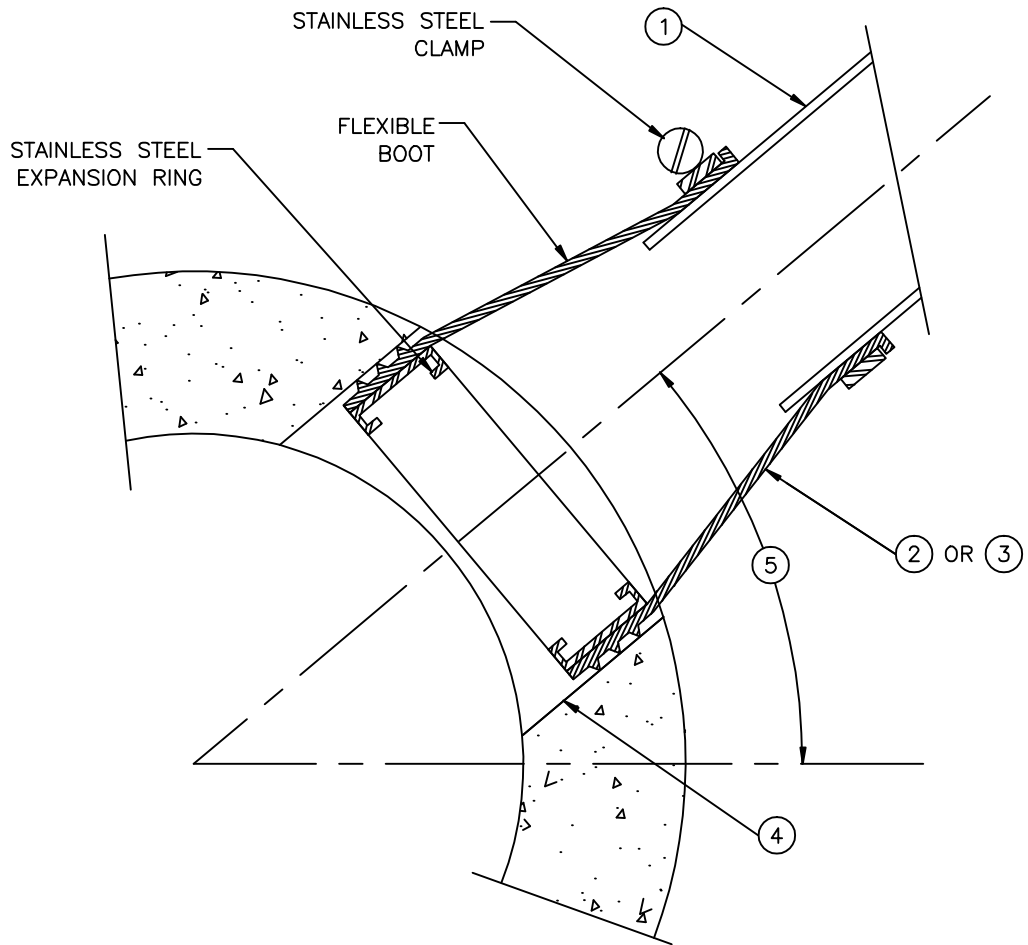
1. AT THE CONNECTION TO THE SEWER MAIN A MAIN DIA. X 6" TEE IS REQUIRED FOR NEW SEWER MAINS AND A ROMAC TAPPING TEE OR CORE DRILLED INSERT-A-TEE REQUIRED FOR AN EXISTING SEWER MAIN.
2. 2x4 PRESSURE TREATED MARKER POST SHALL BE PAINTED WHITE WITH BLACK LETTERS "SEWER LOT # INVERT DEPTH".
3. 12 GAUGE WIRE SHALL BE CONNECTED TO PIPE AT INVERT AND WRAPPED AROUND MARKER POST.
4. DETECTOR TAPE REQUIRED FROM SEWER MAIN TO MARKER POST.
5. TEST TEE SHALL BE INSTALLED AT THE SEWER MAIN WHEN A SIDE SEWER IS CONNECTED TO AN EXISTING SEWER MAIN.



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REF STAD SPEC	

DEPARTMENT OF PUBLIC WORKS
STANDARD DETAIL
 SIDE SEWER STUB

STANDARD DETAIL NUMBER
SS-090



NOTES:

- ① PVC SIDE SEWER. FOR REMAINDER OF PVC SERVICE SEE SS-090.
- ② ROMAC STYLE CB TAPPING SADDLE OR APPROVED EQUAL ON ALL PIPE.
- ③ CORE-DRILLING WITH INSERT-A-TEE MAY ALSO BE USED ON ALL PIPE.
- ④ CORE DRILL EXISTING MAINLINE PIPE PER MFG'S SPECIFICATIONS.
- ⑤ 35' MIN, 45' MAX.

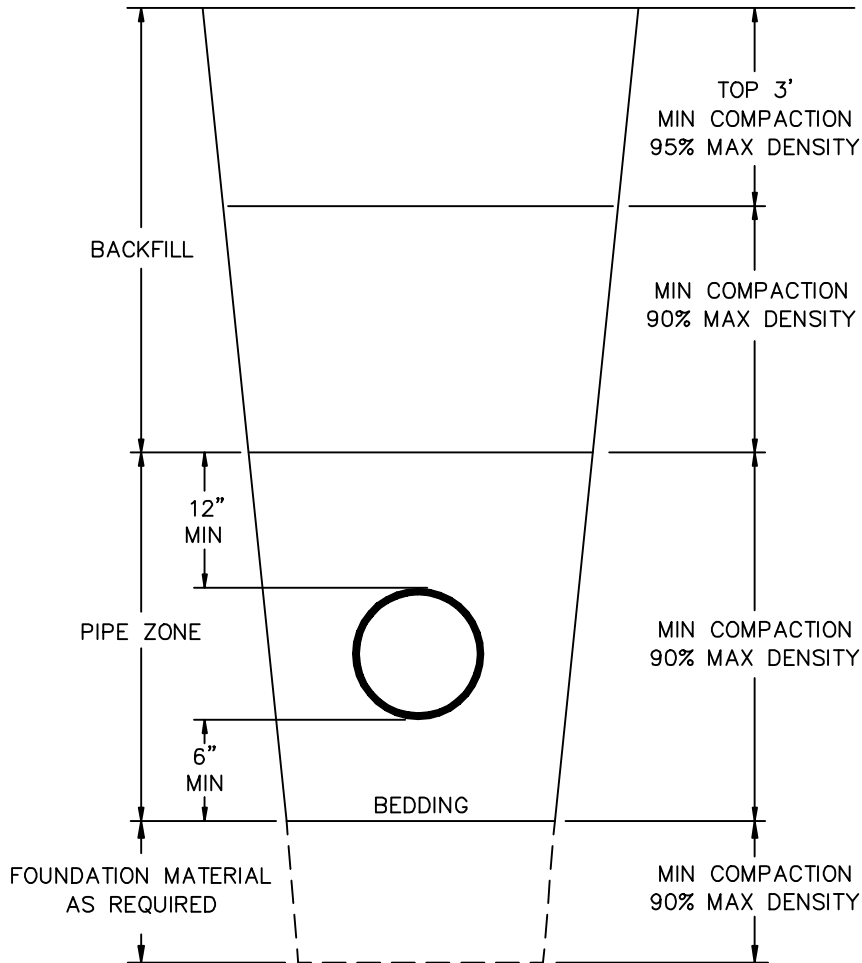


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DATE	07/31/2008
REF STAD SPEC	

DEPARTMENT OF PUBLIC WORKS
STANDARD DETAIL

NEW SERVICE ON EXISTING MAIN

STANDARD DETAIL NUMBER
SS-100



SECTION

NOTES:

1. ALL BACKFILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 12 INCHES BEFORE COMPACTION UNLESS AUTHORIZED BY THE CITY ENGINEER DUE TO THE CHARACTER OF THE MATERIAL AND THE COMPACTING EQUIPMENT.
2. MECHANICAL COMPACTION OF BACK FILL MATERIAL SHALL NOT BEGIN UNTIL THE DEPTH OF COMPACTED BACKFILL MATERIAL IS 2 FEET ABOVE THE TOP OF PIPE.
3. EACH LIFT SHALL BE MECHANICALLY COMPACTED TO THE REQUIRED DENSITY PRIOR TO PLACING SUCCEEDING LIFTS OF BACKFILL MATERIAL.
4. COMPACTION TESTS SHALL BE AS REQUIRED BY THE CITY ENGINEER, BUT IN NO CASE LESS THAN 2 TESTS EVERY 200 FEET OF TRENCH (ONE AT SUBGRADE AND ONE AT 50% OF TRENCH DEPTH).
5. IN-PLACE DENSITY AND MOISTURE CONTENT WILL BE DETERMINED USING NUCLEAR METHOD, ASTM 2922-71.
6. LABORATORY MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT WILL BE DETERMINED USING THE MODIFIED PROCTOR METHOD IN ACCORDANCE WITH ASTM D-1557.
7. BEDDING MATERIAL SHALL BE 3/8" MINUS.

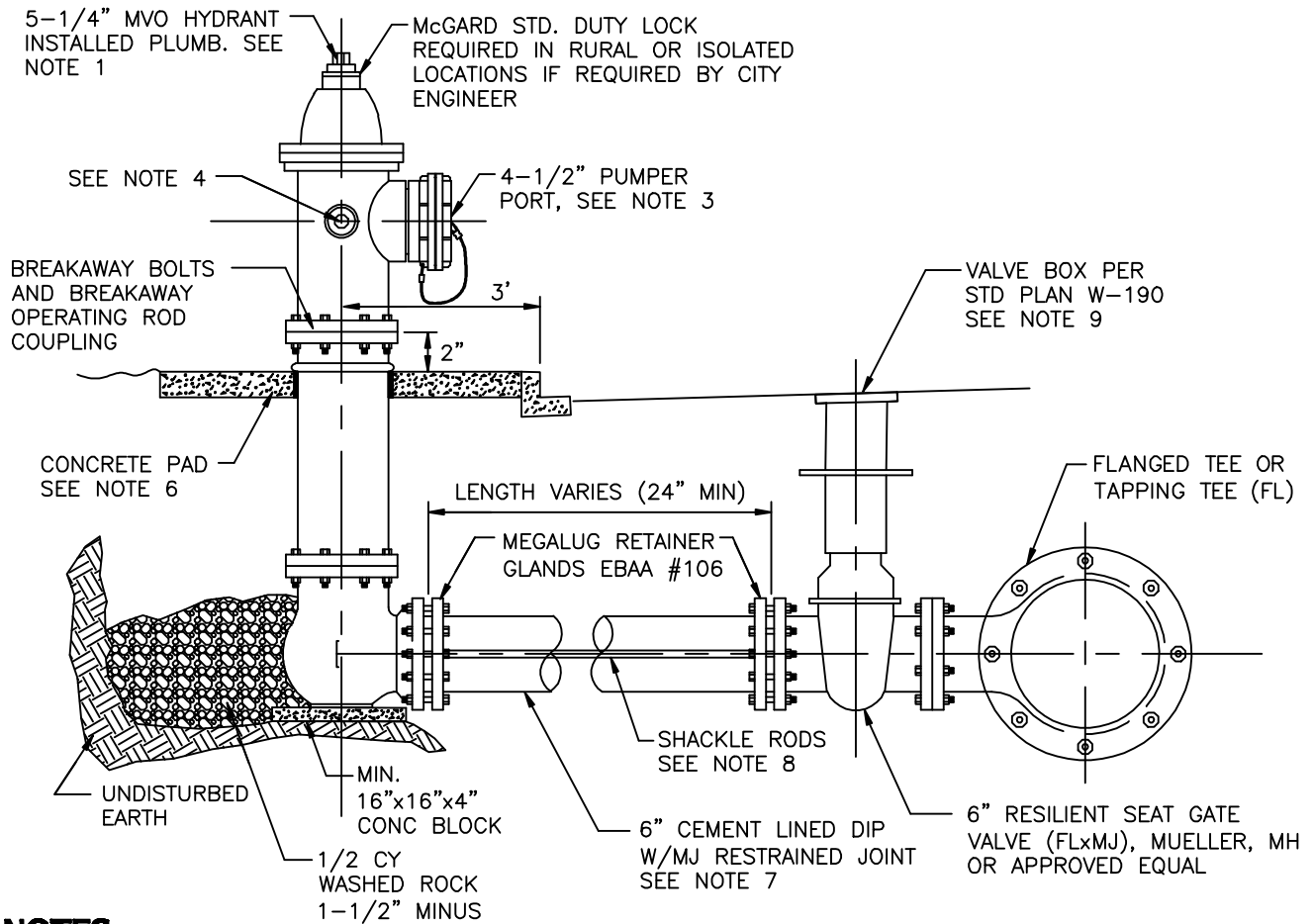


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REF STAD SPEC	

DEPARTMENT OF PUBLIC WORKS
STANDARD DETAIL

TRENCH SECTION

STANDARD DETAIL NUMBER
SS-120



NOTES:

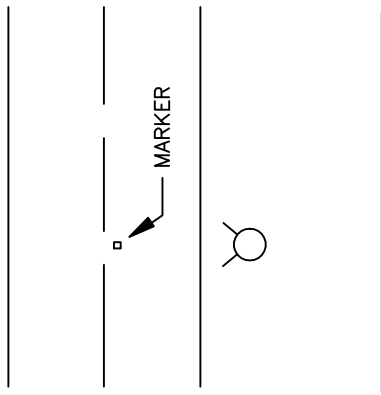
1. HYDRANTS AND ALL MATERIALS SHALL CONFORM TO AWWA STANDARDS AND SHALL BE OF STANDARD MANUFACTURE (M&H 929 RELIANT OR MUELLER SUPER CENTURION 250 ONLY).
2. THE CENTER OF THE HYDRANT SHALL BE 3' FROM FACE OF CURB. IF THERE IS NO CURB, THE CENTER OF HYDRANT SHALL BE 3' FROM RIGHT-OF-WAY AND A MINIMUM OF 5' FROM TRAVELED LANE.
3. ONE 5" TO 4-1/2" PUMPER PORT W/N.S.T. AND STORZ ADAPTER ASSEMBLY. PUMPER PORT TO BE FACING STREET OR ROADWAY FOR THE FIRE ENGINE ACCESS.
4. TWO 2-1/2" HOSE PORTS W/N.S.T. AND 1-1/4" OPERATING NUTS.
5. PROVIDE GUARD POSTS FOR VEHICULAR TRAFFIC PROTECTION IF REQUIRED BY CITY ENGINEER PER STD. DETAIL W-030.
6. INSTALL 3'x3'x4" CONCRETE PAD (3000 PSI) AROUND HYDRANT IN UNPAVED AREAS INCLUDING PLANTER STRIPS. COMPLETELY SURROUND HYDRANT W/FULL DEPTH OF CONCRETE PAD WITH 1/4" JOINT MATERIAL BEFORE PLACING CONCRETE.
7. HYDRANT RUN TO BE 6" CEMENT LINED DUCTILE IRON PIPE CLASS 52 WITH RESTRAINED JOINTS (MEGALUG OR APPROVED EQUAL). HYDRANT RUN LONGER THAN 50 FEET SHALL BE 8" DIA. OR LARGER.
8. 3/4" GALV. SHACKLE RODS WITH THE EYE BOLTS AT BOTH ENDS REQUIRED FROM VALVE TO HYDRANT.
9. FIRE HYDRANTS SHALL BE PAINTED WITH TWO COATS OF HIGH GLOSS EQUIPMENT YELLOW "RUST-OLEUM" TYPE PAINT.
10. INSTALL 24"x24"x4" CONCRETE PAD (3000 PSI) AROUND VALVE BOX AND 48"x48"x4" FOR MULTIPLE VALVE BOXES IN UNPAVED AREA.



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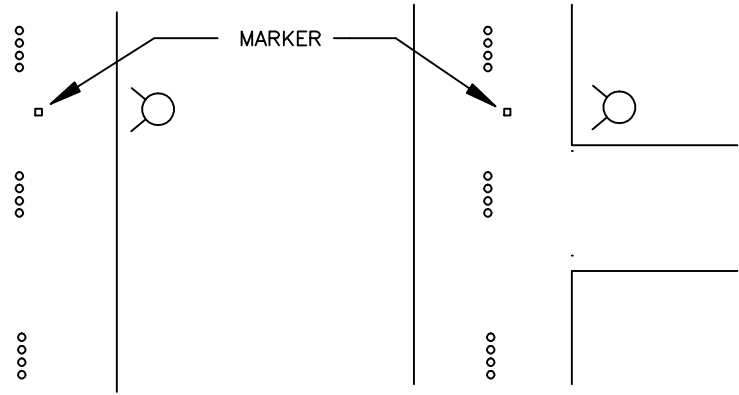
DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS
FIRE HYDRANT ASSEMBLY

STANDARD DETAIL
NUMBER
W-010



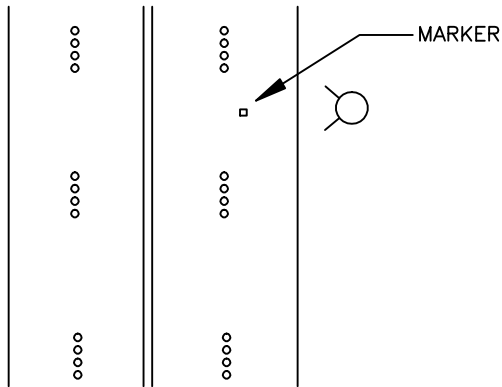
TWO LANE ROAD

OFFSET MARKER TO INDICATE WHICH SIDE OF STREET HYDRANT IS ON. MARKER TO BE PLACED 4" TO 6" OFF OF CENTERLINE



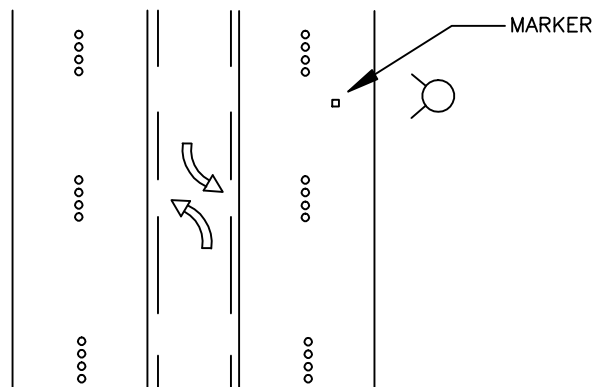
ON SIDE STREETS

WHERE THE HYDRANT IS WITHIN 20' OF THE MAIN TRAVELED STREET, THE MARKER IS TO BE INSTALLED ON THAT MAIN STREET AND 4" TO 6" OFF THE CENTERLINE.



FOUR LANE ROAD

OFFSET MARKER TO INDICATE WHICH SIDE OF STREET HYDRANT IS ON. MARKER TO BE PLACED 4" TO 6" OFF OF DOTS OR PAINTED LANE DIVIDER.



FIVE LANE ROAD

OFFSET MARKER TO INDICATE WHICH SIDE OF STREET HYDRANT IS ON. MARKER TO BE PLACED 4" TO 6" OFF OF DOTS OR PAINTED LANE DIVIDER.

NOTE:

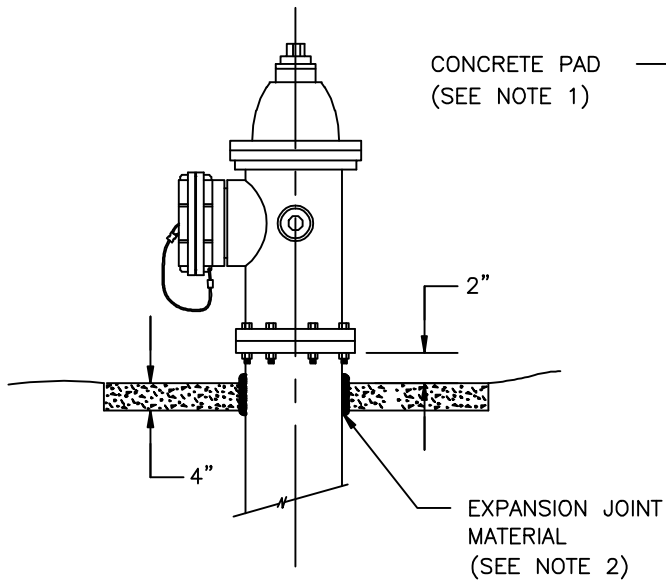
MARKER: TYPE 88 AB STIMSONITE TWO WAY (BLUE)



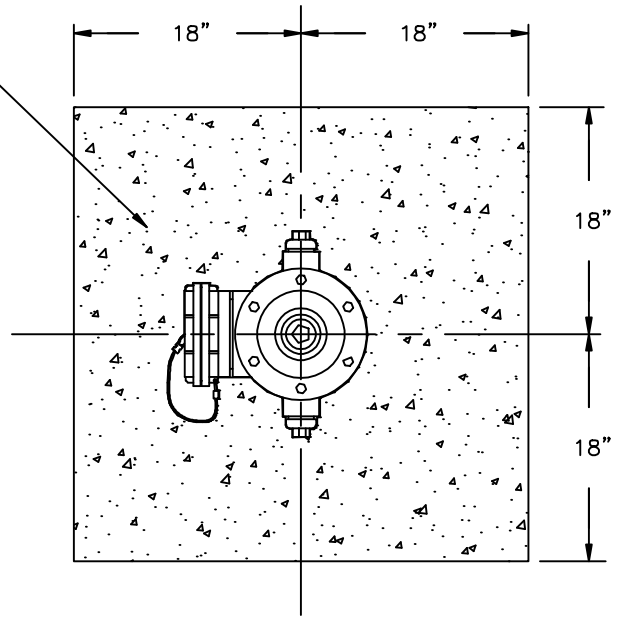
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REF STAD SPEC	

DEPARTMENT OF PUBLIC WORKS STANDARD DETAILS
FIRE HYDRANT MARKER

STANDARD DETAIL NUMBER
W-015



ELEVATION



PLAN

NOTES:

1. CONCRETE SHALL BE CLASS 3000 PSI MIN.
2. INSTALL 1/4" EXPANSION JOINT MATERIAL WITH FULL DEPTH OF CONCRETE PAD AROUND HYDRANT.

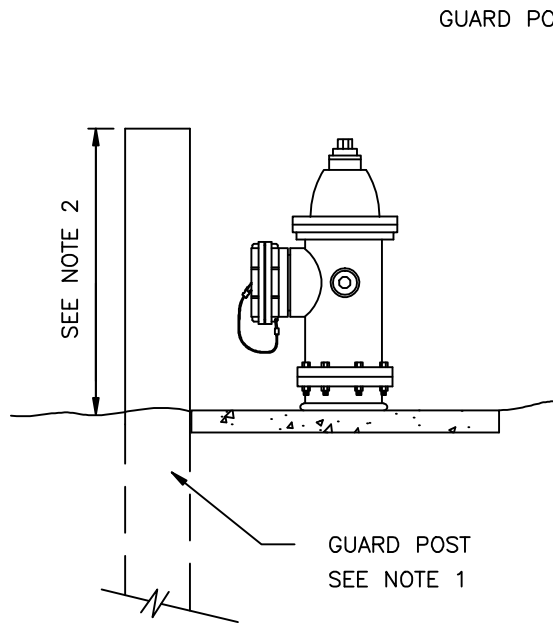


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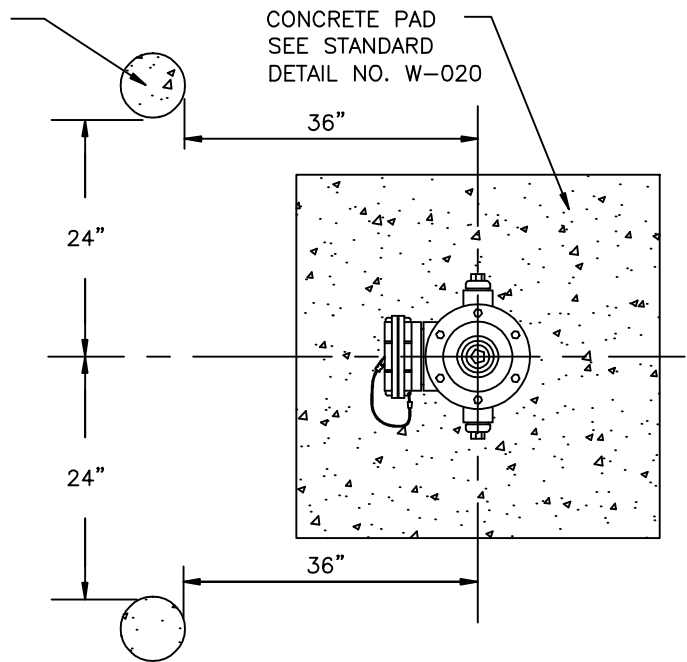
DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS

FIRE HYDRANT CONCRETE PAD

STANDARD DETAIL
NUMBER
W-020



ELEVATION



PLAN

NOTES:

1. GUARD POSTS SHALL BE 8' LONG, 6" DIAMETER, CONCRETE FILLED CLASS 52 D.I. PIPE OR 8' LONG 8" DIAMETER REINFORCED CONCRETE. PAINTED WITH TWO COATS OF HIGH GLOSS CATERPILLAR YELLOW (RUST-OLEUM) TYPE PAINT.
2. TOP OF GUARD POST SHALL BE LEVEL WITH TOP OF OPERATING NUT.



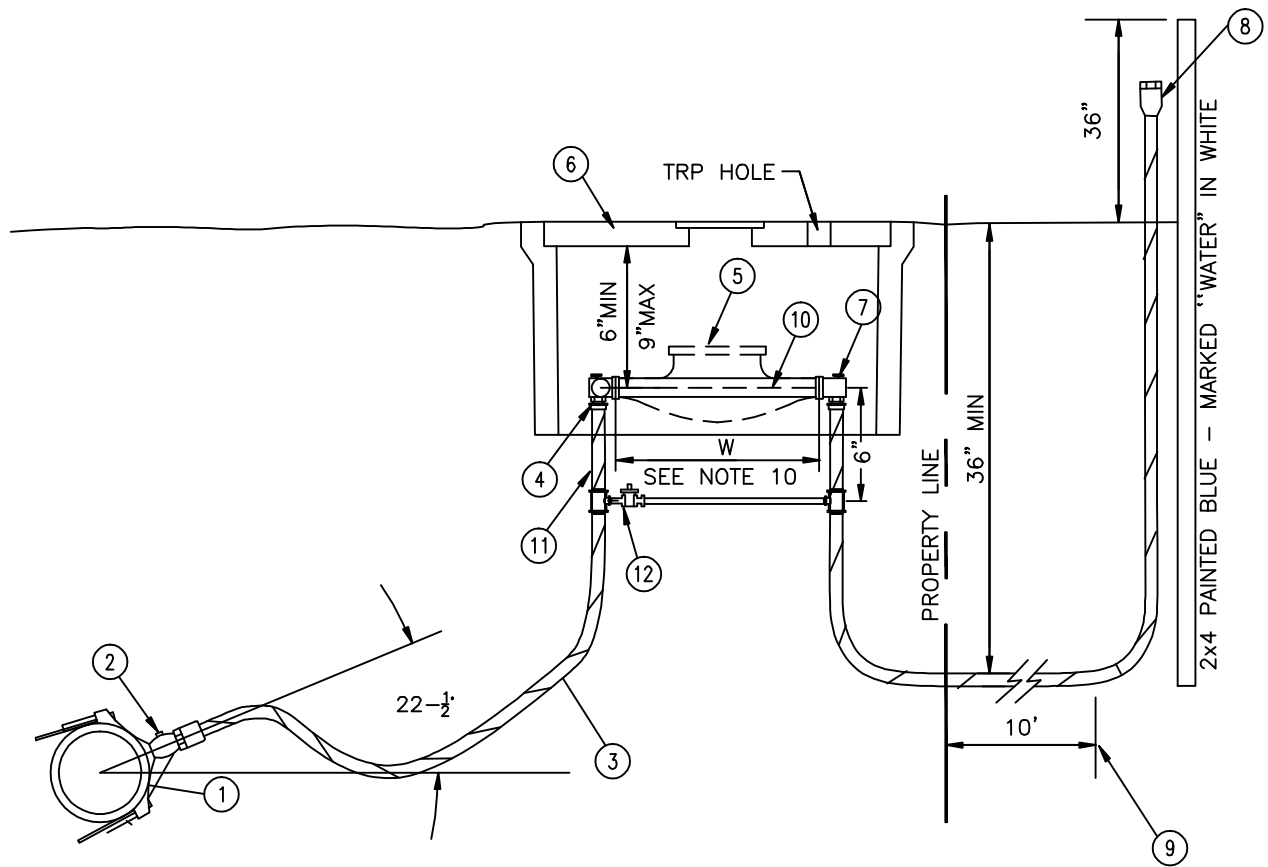
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REF STAD SPEC	

DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS

FIRE HYDRANT GUARD POST

STANDARD DETAIL
NUMBER

W-030



NOTES AND MATERIALS:

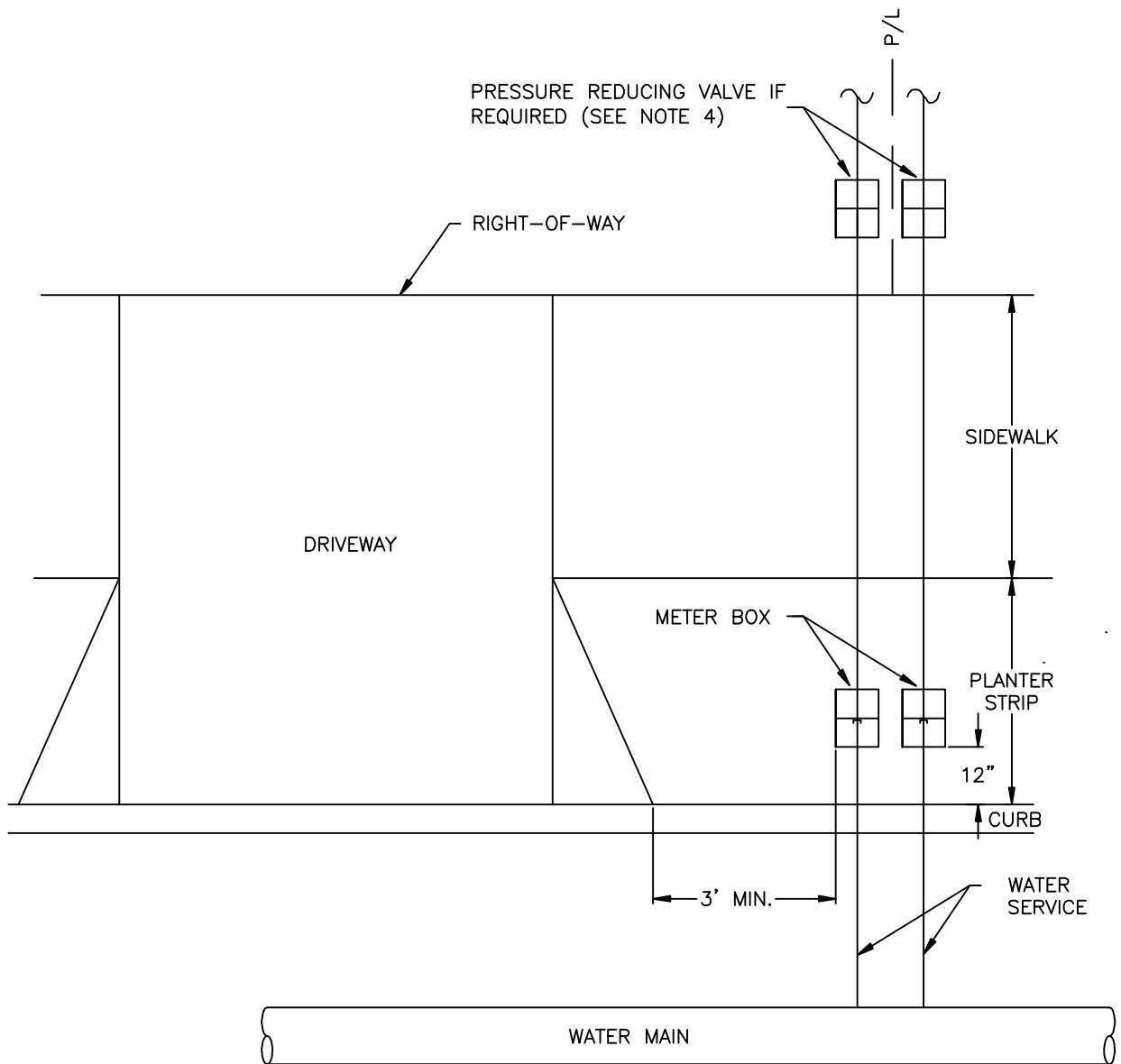
- ① 2" CC SERVICE SADDLE W/DOUBLE STAINLESS STEEL STRAP.
- ② 2" BALL VALVE CORPORATE STOP COMPRESSION WITH KEY FACING UP, MUELLER OR FORD ONLY.
- ③ 2" HDPE CTS CLASS 200 HIGH SERVICE PIPE (200 PSI RATING) WITH STAINLESS STEEL STIFFENER AND 10 GAUGE COATED COPPER TRACER WIRE WRAPPED AROUND THE PIPE AND ATTACHED ON BOTH ENDS.
- ④ 2" COMPRESSION ANGLE METER BALL VALVE (LOCKABLE).
- ⑤ METER (SIZE AS SHOWN IN PLAN) SHALL BE INSTALLED BY CITY UTILITIES DIVISION AT OWNER'S EXPENSE. CITY WILL INSTALL ADAPTERS AT BOTH ENDS OF METER IF THE METER IS NOT 2".
- ⑥ METER BOX SHALL BE MIDSTATES PLASTICS (1730-18) W/SOLID DI LID WITH 1 3/4" HOLE FOR TOUCH READ PAD (TRP).
- ⑦ 2" ANGLE METER CHECK COUPLING (LOCKABLE).
- ⑧ COMPRESSION x FIPT ADAPTER WITH PLASTIC PLUG.
- ⑨ EXTEND SERVICE PIPE 10' BEYOND PROPERTY LINE AND AN ADDITIONAL 5' BEYOND EASEMENT LINE.
- ⑩ METER LENGTH BLANK STUB FOR A 2" METER, W=17-1/4".
- ⑪ 2" METER SETTER, FORD OR MUELLER.
- ⑫ BYPASSES MUST BE HIGH BYPASS OR SIDE-BY SIDE WITH THE METER.



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DATE	07/31/2008
REF STAD SPEC	

DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS
 2" AND SMALLER
 NON-RESIDENTIAL WATER SERVICE

STANDARD DETAIL
 NUMBER
W-050



NOTES:

1. INDIVIDUAL METERS ARE REQUIRED FOR EACH RESIDENTIAL UNIT UP TO AND INCLUDING TRIPLEXES.
2. SEE STANDARD DETAIL NO. W-040 FOR CONFIGURATION OF METER AND SERVICE CONNECTION.
3. METER AND PRESSURE REDUCING VALVE (PRV) LOCATIONS SHOWN IN THE PLAN ARE APPROXIMATE. FINAL LOCATIONS SHALL BE DETERMINED BY CITY INSPECTOR DURING CONSTRUCTION.
4. A PRV IS REQUIRED IF THE STATIC PRESSURE AT THE METER IS GREATER THAN 80 POUNDS PER SQUARE INCH (PSI).
5. METER BOXES SHALL NOT BE INSTALLED IN DRIVEWAY OR OTHER TRAFFIC AREA UNLESS APPROVED BY CITY ENGINEER.
6. WHEN POSSIBLE CLUSTER METER BOXES AT PROPERTY LINES.

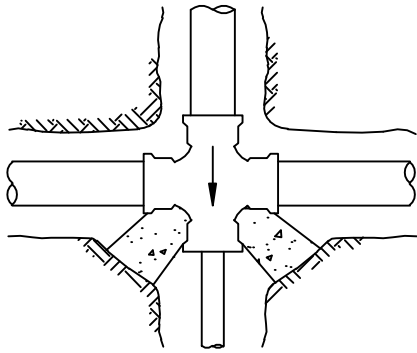


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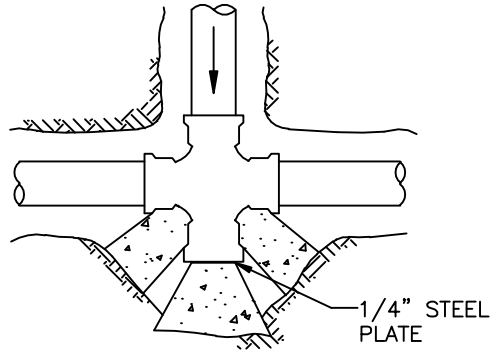
DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS

WATER METER INSTALLATION LOCATIONS

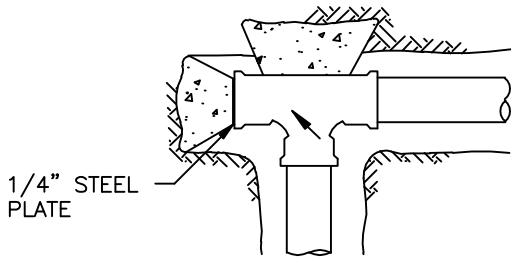
STANDARD DETAIL
NUMBER
W-070



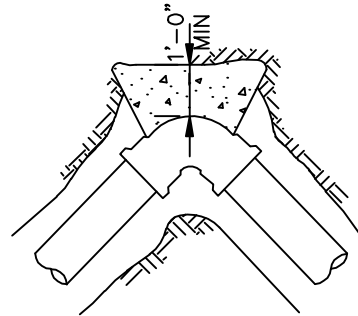
UNBALANCED CROSS



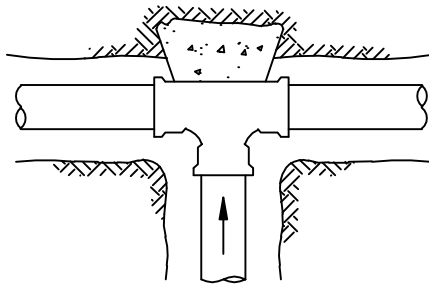
CROSS WITH PLUG



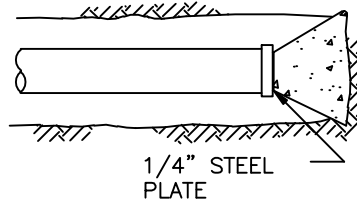
PLUGGED TEE



HORIZONTAL BEND



TEE



PIPE & CAP

THRUST BLOCK AREA IN SQUARE FEET (SEE STD DETAIL NO W-165)												
PIPE SIZE	FIRM SILT OR FIRM SILTY SAND				COMPACT SAND				COMPACT SAND & GRAVEL			
	90° BEND	TEE	45° BEND CAP OR PLUG	11 1/4' & 22 1/2' BEND	90° BEND	TEE	45° BEND CAP OR PLUG	11 1/4' & 22 1/2' BEND	90° BEND	TEE	45° BEND CAP OR PLUG	11 1/4' & 22 1/2' BEND
4"	7.0	4.2	4.2	1.7	2.9	2.1	2.1	1.0	2.2	1.6	1.6	1.0
6"	13.3	9.4	9.4	3.8	6.7	4.7	4.7	1.9	5.0	3.5	3.5	1.4
8"	23.3	16.7	16.7	6.7	11.7	8.4	8.4	3.4	8.8	6.3	6.3	2.5
12"	53.0	37.5	37.5	15.0	26.5	18.8	18.8	7.5	20.0	14.0	14.0	5.6

AREAS CALCULATED ON 300 PSI TEST PRESSURE AND 3'-0" MIN COVER OVER WATERMAIN

IF ECOLOGY BLOCKS MAY BE USED IN LIEU OF POURED-IN-PLACE BLOCKING FOR FITTINGS IN SHADED PORTION OF TABLE RESTRAINED JOINTS MUST BE USED.

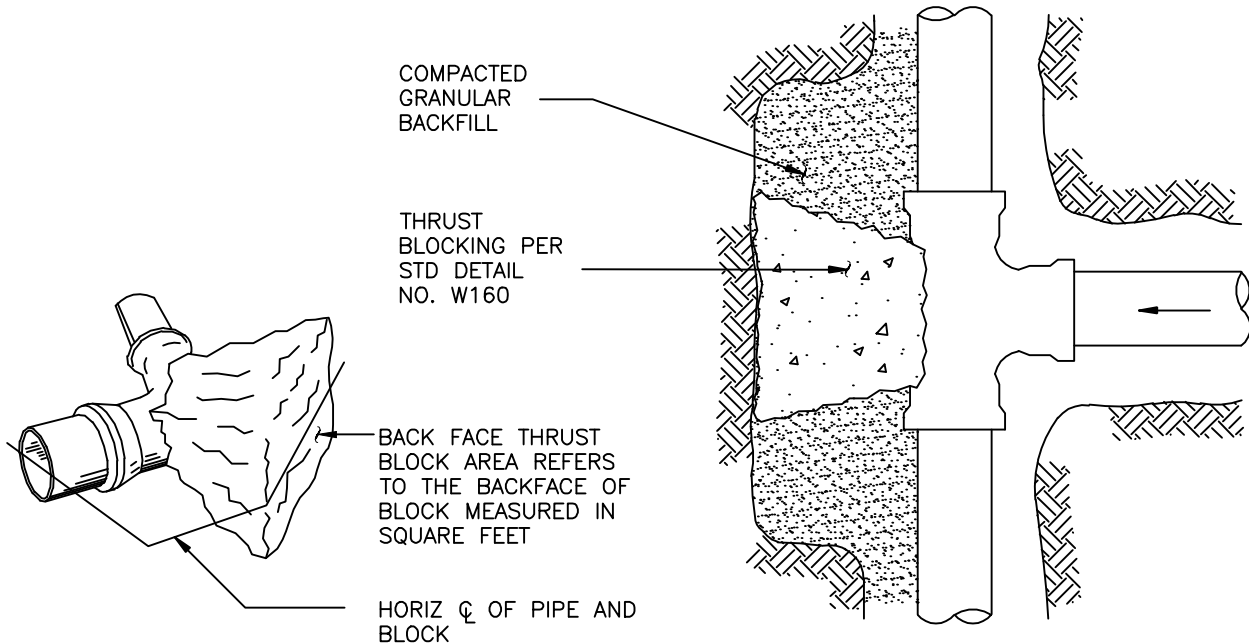
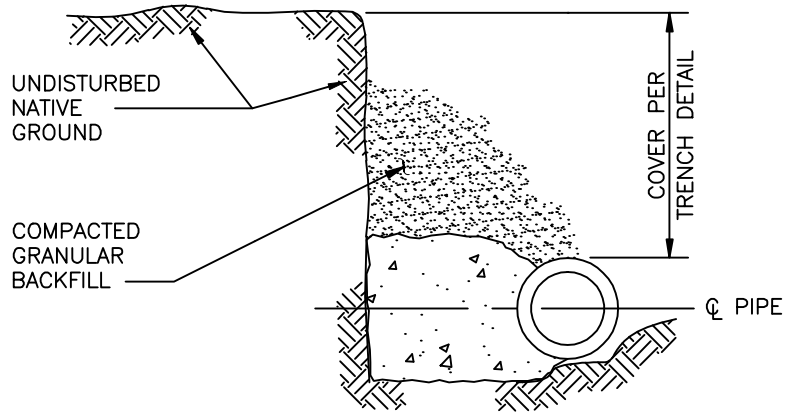
FOR NOTES SEE STD DETAIL NO W-165



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DEPARTMENT OF PUBLIC WORKS
STANDARD PLANS
 THRUST BLOCK

STANDARD DETAIL NUMBER
W-160



THRUST BLOCK DETAIL

NOTES:

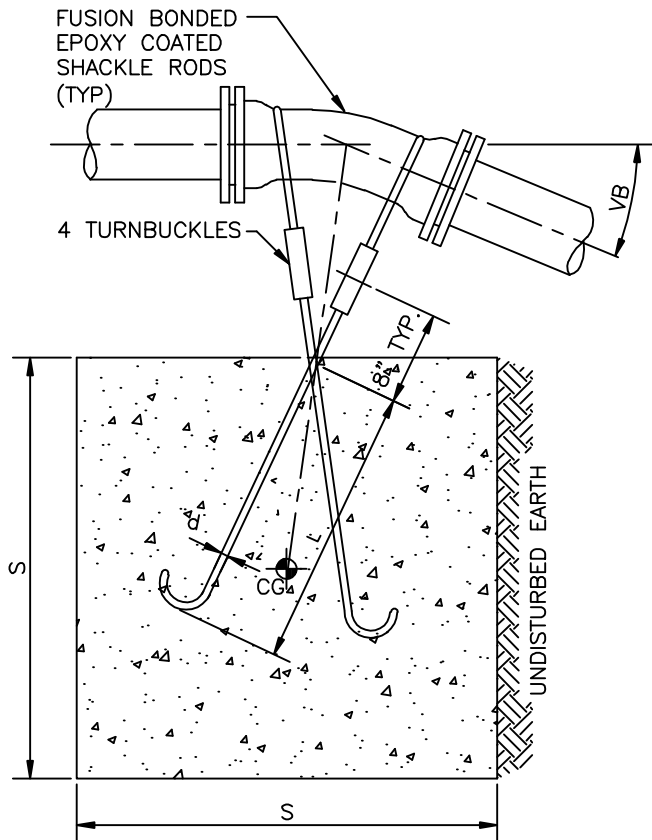
1. LOCATION AND SIZE OF BLOCKING FOR PIPE LARGER THAN 12" DIAMETER AND FOR SOIL TYPES DIFFERENT THAN SHOWN SHALL BE DETERMINED BY THE CITY ENGINEER.
2. ALL BLOCKING FOR HORIZONTAL FITTINGS (POURED IN PLACE) SHALL BEAR AGAINST UNDISTURBED NATIVE GROUND OR FILL MATERIAL COMPACTED TO 95% MAXIMUM DENSITY.
3. ALL POURED THRUST BLOCKS SHALL BE BACKFILLED AFTER MINIMUM 1 DAY. PRESSURE TESTING SHALL OCCUR AFTER CONCRETE HAS REACHED COMPRESSIVE STRENGTH (f'c).
4. ALL BLOCKING TO BE CONCRETE CL 3000-1 (3000 PSI).
5. BLOCKING AGAINST FITTINGS SHALL BEAR AGAINST THE GREATEST FITTING SURFACE AREA POSSIBLE, BUT SHALL NOT COVER OR ENCLOSE BELL ENDS, JOINT BOLTS OR GLANDS. ACCESS TO BOLTS AND GLANDS SHALL BE PROVIDED.
6. ALL HORIZONTAL BLOCKING THRUST AREAS SHALL BE CENTERED ON PIPE.
7. WHERE POURED-IN-PLACE BLOCKING IS REQUIRED AT A POINT OF CONNECTION TO AN EXISTING WATERMAIN, THE BLOCKING SHALL BE INSTALLED PRIOR TO CONNECTION WHENEVER POSSIBLE OR AS DIRECTED BY THE CITY ENGINEER.
8. TEMPORARY BLOCKING, IF USED, SHALL BE APPROVED BY THE CITY ENGINEER.



APPROVED BY	L. OLIVE
DATE	07/31/2008
REF STAD SPEC	

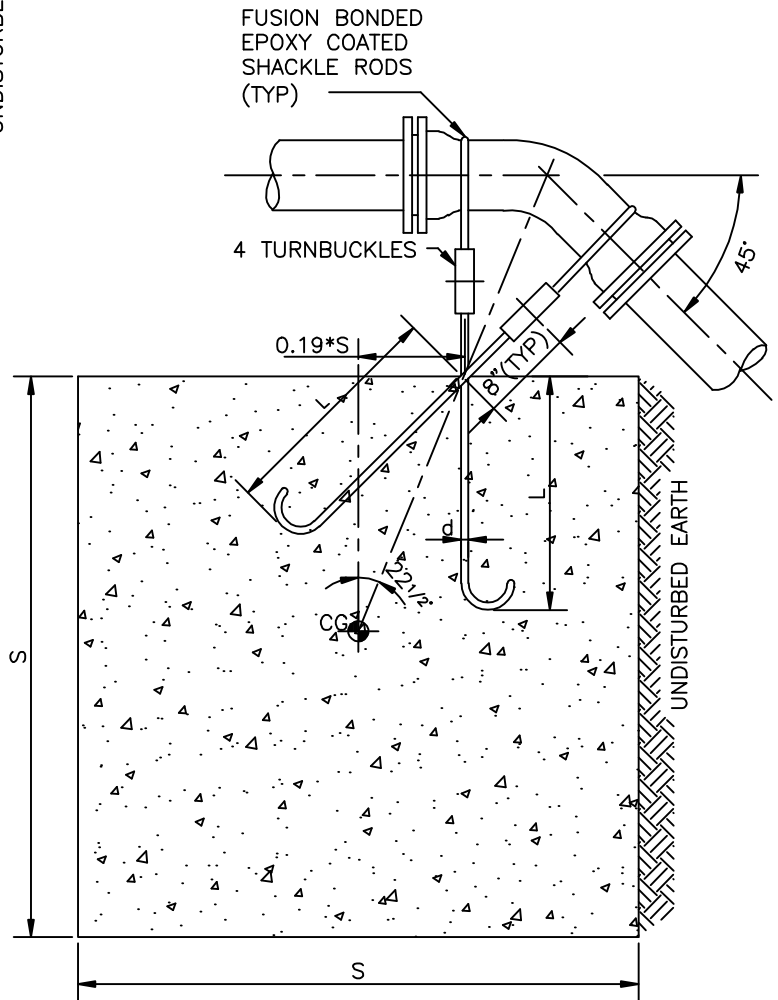
DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS
 THRUST BLOCK

STANDARD DETAIL
 NUMBER
W-165



TYPE A

TYPE A BLOCKING FOR 11 1/4' & 22 1/2' VERTICAL BENDS						
PIPE SIZE NOM DIA INCHES	TEST PRESSURE PSI	VB VERTICAL BEND DEGREES	NO OF CU FT OF CONC BLOCKING	S SIDE OF CUBE FEET	d DIA OF SHACKLE RODS (2) INCHES	L DEPTH OF RODS IN CONCRETE INCHES
4"	300	11 1/4	8	2	3/4	18
		22 1/2	12	2 1/4		24
6"	300	11 1/4	12	2 1/4	3/4	24
		22 1/2	27	3		
8"	300	11 1/4	16	2 1/2	3/4	24
		22 1/2	43	3 1/2		
12"	300	11 1/4	64	4	1	36
		22 1/2	125	5	1	36



TYPE B

TYPE B BLOCKING FOR 45° VERTICAL BENDS						
PIPE SIZE NOM DIA (INCHES)	TEST PRESSURE (PSI)	VB VERTICAL BEND (DEGREES)	NO OF CU FT OF CONC BLOCKING	S SIDE OF CUBE (FEET)	d DIA OF SHACKLE RODS (4) (INCHES)	L DEPTH OF RODS IN CONCRETE (INCHES)
4"	300	45	27	3	3/4	20
6"			64	4		
8"			125	5		
12"			216	6		

FOR NOTES SEE STD DETAIL NO. W-175

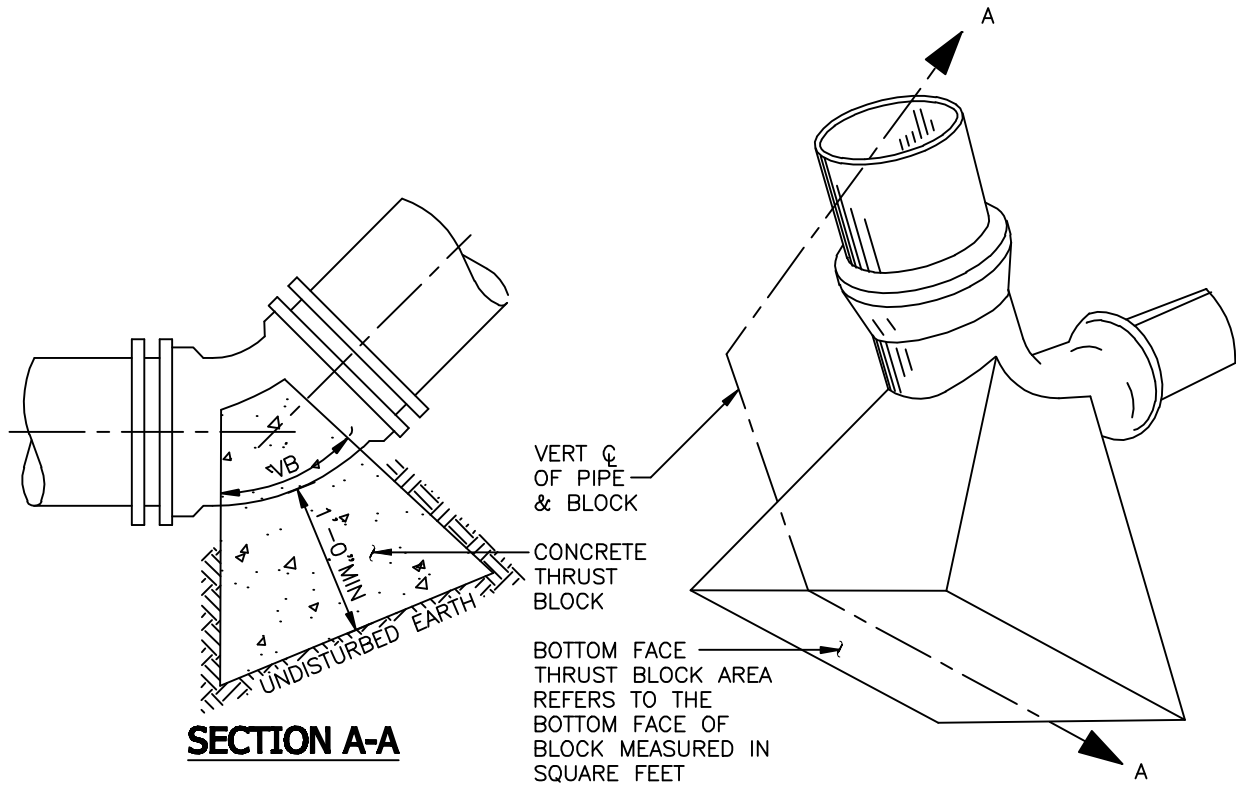


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DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS
VERTICAL THRUST BLOCK
TYPE A & TYPE B

STANDARD DETAIL
NUMBER

W-170



TYPE "C" BLOCKING FOR 11 1/4', 22 1/2', 45° AND 90° VERTICAL BENDS
THRUST BLOCK AREA IN SQUARE FEET

PIPE SIZE	FITTING	FIRM SILT OR FIRM SILTY SAND			COMPACT SAND			COMPACT SAND & GRAVEL		
		90° BEND	TEE, 45° BEND & DEAD END	11 1/4' & 22 1/2' BEND	90° BEND	TEE, 45° BEND & DEAD END	11 1/4' & 22 1/2' BEND	90° BEND	TEE, 45° BEND & DEAD END	11 1/4' & 22 1/2' BEND
4"		5.8	4.2	1.7	2.9	2.1	1.0	2.2	1.6	1.0
6"		13.3	9.4	3.8	6.7	4.7	1.9	5.0	3.5	1.4
8"		23.3	16.7	6.7	11.7	8.4	3.4	8.8	6.3	2.5
12"		53.0	37.5	15.0	26.5	18.8	7.5	20.0	14.0	5.6

AREAS CALCULATED ON 300 PSI TEST PRESSURE AND 3'-0" MIN COVER OVER WATERMAIN

NOTES:

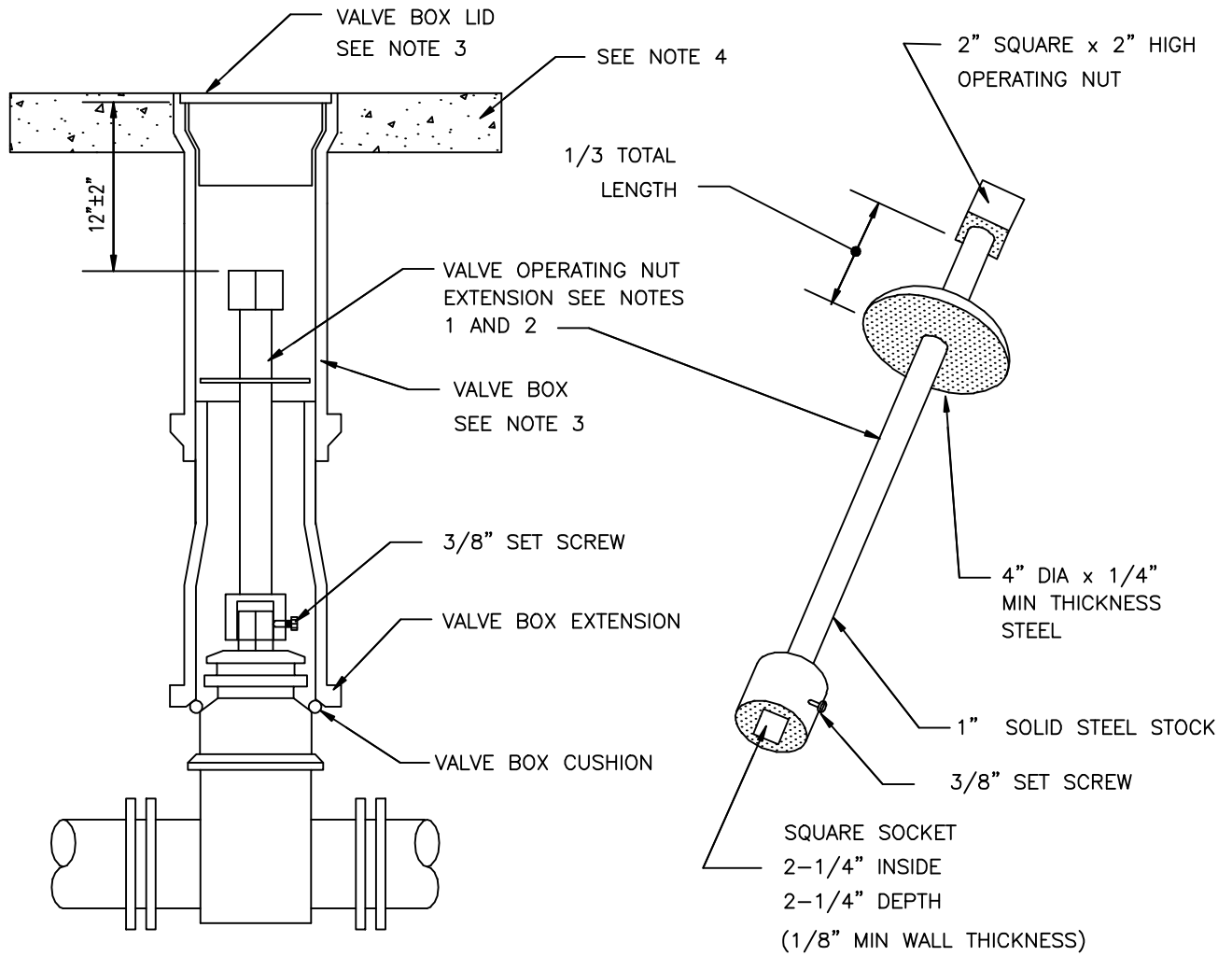
1. LOCATION AND SIZE OF BLOCKING FOR PIPE LARGER THAN 12" DIAMETER AND FOR SOIL TYPES DIFFERENT THAN SHOWN SHALL BE DETERMINED BY THE CITY ENGINEER.
2. ALL BLOCKING FOR VERTICAL FITTINGS (POURED IN PLACE) SHALL BEAR AGAINST UNDISTURBED NATIVE GROUND.
3. ALL POURED THRUST BLOCKS SHALL BE BACKFILLED AFTER MINIMUM 1 DAY. PRESSURE TESTING SHALL OCCUR AFTER CONCRETE HAS REACHED COMPRESSIVE STRENGTH (f'c).
4. ALL BLOCKING SHALL BE CONCRETE CL 3000-1 (3000 psi).
5. AFTER INSTALLATION, SHACKLE RODS & TURNBUCKLES SHALL BE CLEANED AND COATED WITH 2 COATS OF ASPHALTIC VARNISH, ROYSTON ROYKOTE #612M OR APPROVED EQUAL.
6. SHACKLE RODS SHALL BE FUSION BONDED EPOXY COATED ROUND MILD STEEL, ASTM A 36.
7. BLOCKING AGAINST FITTINGS SHALL BEAR AGAINST THE GREATEST FITTING SURFACE AREA POSSIBLE, BUT SHALL NOT COVER OR ENCLOSE BELL ENDS, JOINT BOLTS OR GLANDS REASONABLE ACCESS TO BOLTS AND GLANDS SHALL BE PROVIDED.



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DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS
VERTICAL THRUST BLOCK TYPE C

STANDARD DETAIL
NUMBER
W-175



VALVE BOX AND EXTENSION

VALVE OPERATING NUT EXTENSION

NOTES:

1. VALVE OPERATING NUT EXTENSIONS ARE REQUIRED WHEN THE VALVE NUT IS MORE THAN THREE (3) FEET BELOW FINISHED GRADE. EXTENSIONS ARE TO BE A MINIMUM OF ONE (1) FOOT LONG. ONLY ONE EXTENSION WILL BE ALLOWED PER VALVE.
2. ALL VALVE OPERATING NUT EXTENSIONS ARE TO BE MADE OF STEEL, SIZED AS NOTED, AND PAINTED WITH TWO (2) COATS OF METAL PAINT.
3. VALVE BOXES SHALL BE CAST IRON, TWO PIECE UNITS, DESIGNED WITH DEEP SKIRT (2") LIDS W/LUGS, EQUAL TO "RICH NO. 940" AS MANUFACTURED BY RICH OR SATHER.
4. 4" THICK CONCRETE PAD AROUND VALVE BOXES OUTSIDE OF PAVED AREAS. 2'x2' SQUARE AROUND SINGLE VALVE BOXES AND 4'x4' AROUND MULTIPLE VALVE BOXES.



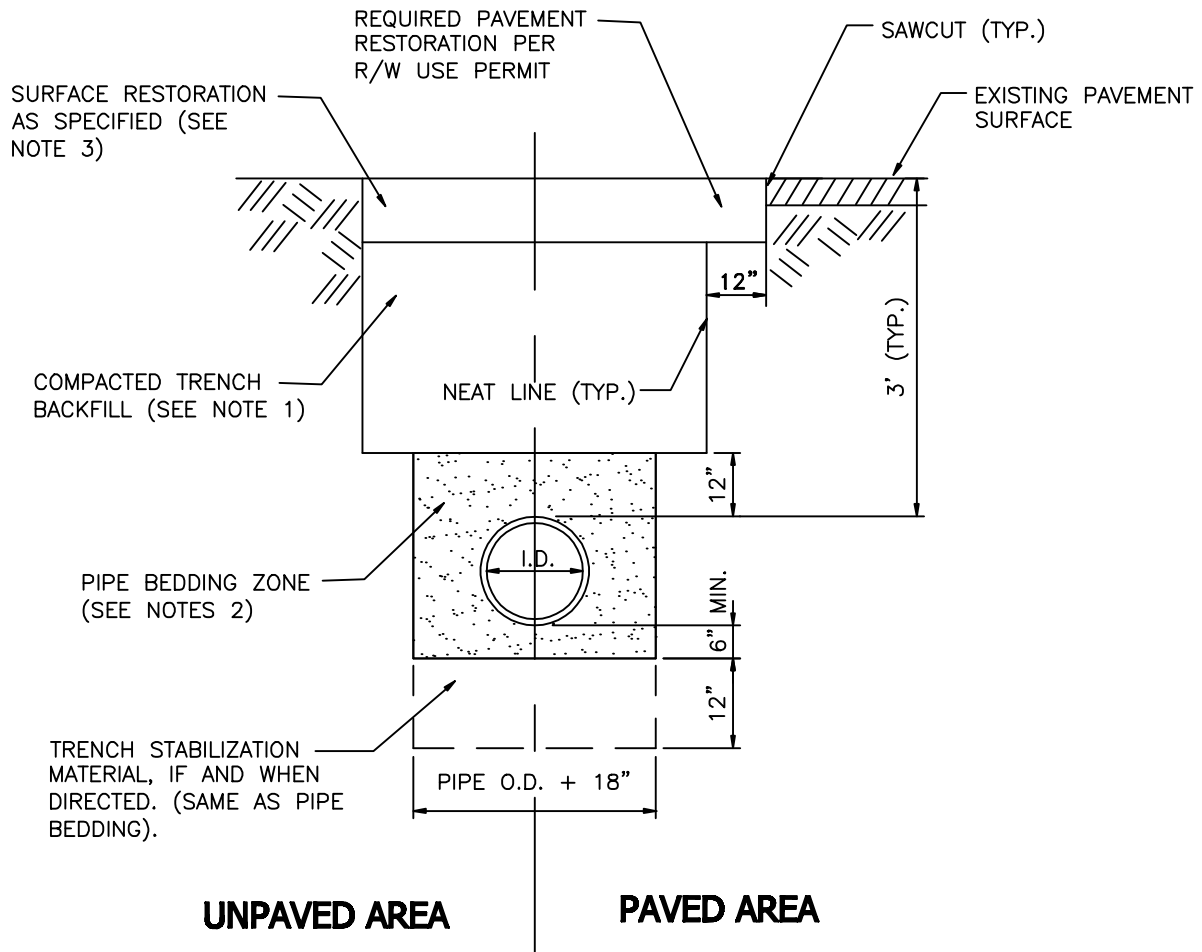
APPROVED BY	L. OLIVE
DATE	07/31/2008
REF STAD SPEC	

DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS

VALVE BOX AND
OPERATING NUT EXTENSION

STANDARD DETAIL
NUMBER

W-190



NOTES:

1. TRENCH BACKFILL SHALL BE:
 - * PAVED AREA: GRANULAR BACKFILL AS APPROVED BY LOCAL AGENCY, OR PER WSDOT 9-03.9(3), OR CDF, OR 5/8" MINUS CRUSHED SURFACING, OR APPROVED NATIVE MATERIAL COMPACTED TO 95% OF MAXIMUM DENSITY.
 - * UNPAVED AREA: SELECTED GRANULAR MATERIAL WITH MAXIMUM DIMENSION OF 6" PER WSDOT 9-03.15, COMPACTED TO 90% OF MAXIMUM DENSITY.
2. GRAVEL BACKFILL FOR PIPE ZONE BEDDING SHALL BE SELECTED GRANULAR MATERIAL PER WSDOT 9-03.12(3), WASHED SAND, OR APPROVED SUITABLE EXCAVATED MATERIAL WITH MAXIMUM DIMENSION OF 1-1/2" COMPACTED TO 95% OF MAXIMUM DENSITY BY APPROVED HAND-HELD TOOLS.
3. EXCAVATE FOR THE PIPE BELL TO ENSURE UNIFORM SUPPORT FOR THE PIPE BARREL.
4. UNPAVED AREA SHALL BE RESTORED WITH 4" TOP SOIL, FERTILIZER AND SEED, OR AS SPECIFIED. PAVEMENT RESTORATION SHALL BE DONE PER RIGHT-OF-WAY USE PERMIT, OR AS SPECIFIED.



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DEPARTMENT OF PUBLIC WORKS
STANDARD DETAILS

TYPICAL TRENCH DETAIL

STANDARD DETAIL NUMBER
W-270