

CITY OF SALEM, MASSACHUSETTS

CHASE STREET WATER MAIN REPLACEMENT

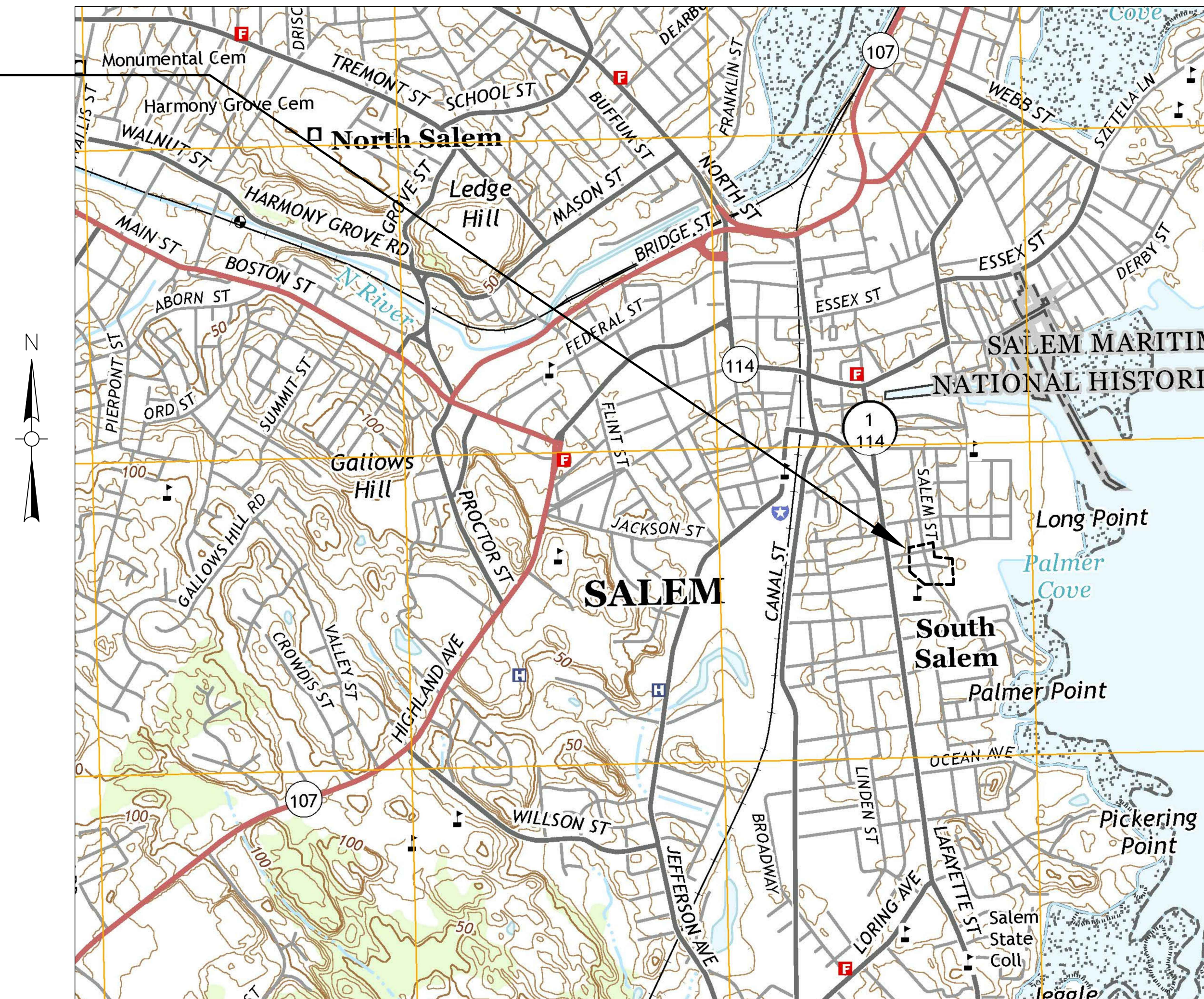
JANUARY 2021

IFB NO. 2117-200

PROJECT LOCATION

CITY OF SALEM
KIMBERLEY DRISCOLL
 Mayor

DAVID KNOWLTON, P.E.
 City Engineer



LOCUS MAP (NO SCALE)

DRAWING INDEX:

- | | |
|-------------------|----------------------|
| G-1 | COVER SHEET |
| C-1 | UTILITY PLANS |
| D-1 to D-3 | DETAILS |

NEW ENGLAND CIVIL ENGINEERING CORP.



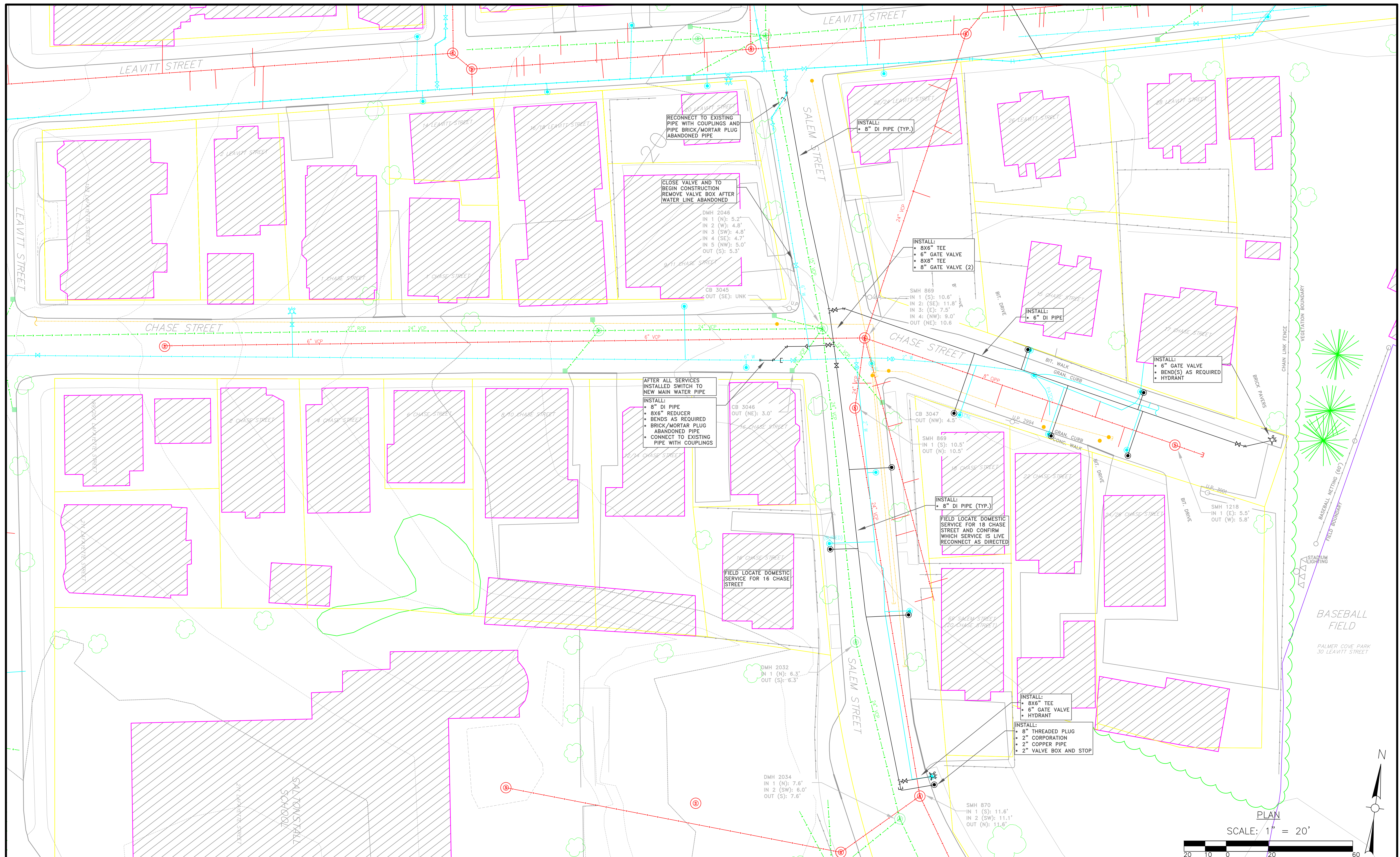
NEW ENGLAND
 CIVIL ENGINEERING
 SALEM, MA

265 Essex Street
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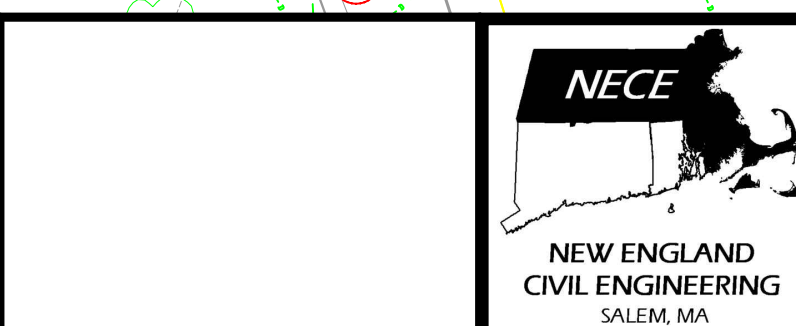
G-1



PLAN
SCALE: 1" = 20'

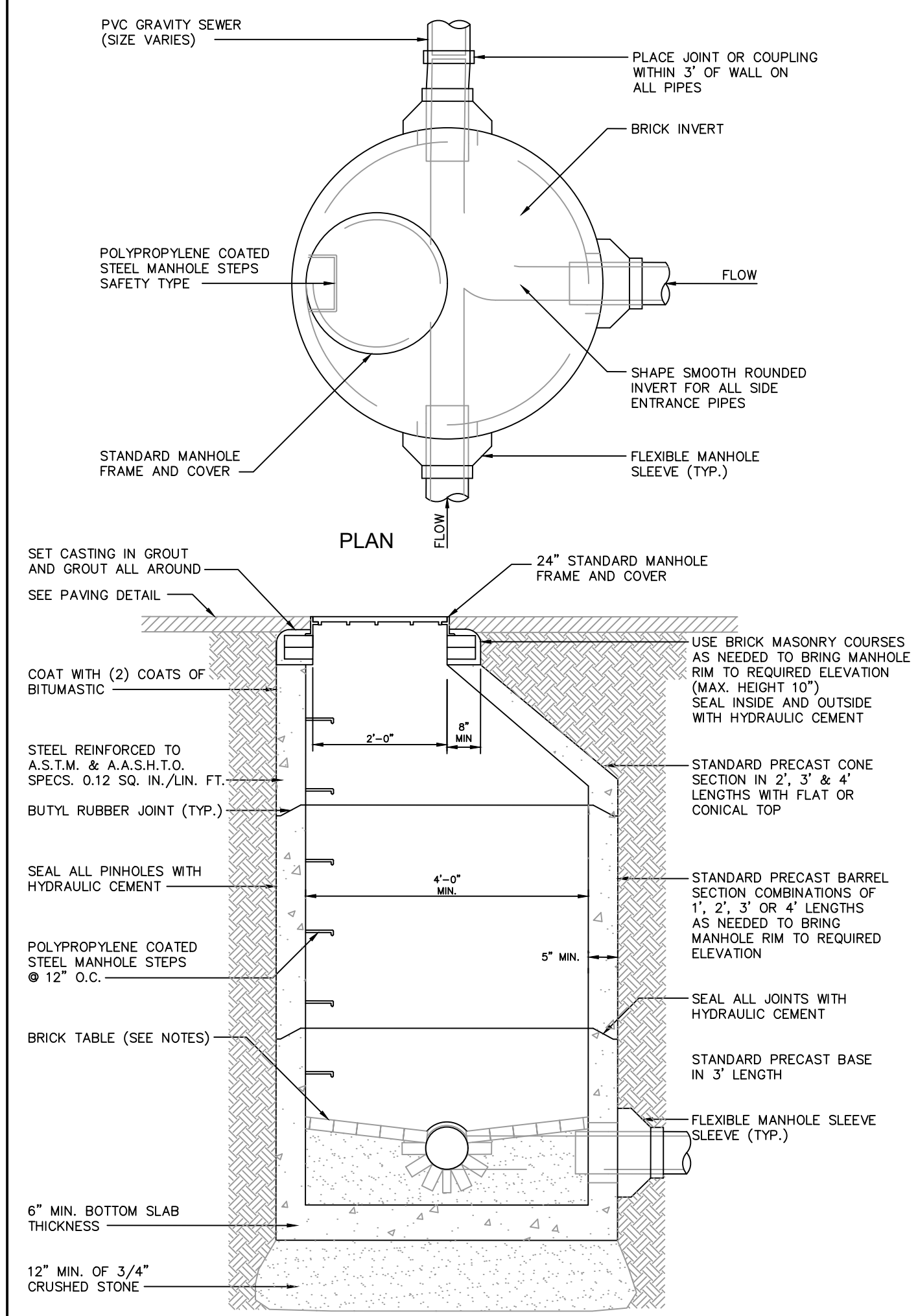
Client	CITY OF SALEM, MASSACHUSETTS
Project	CHASE STREET WATER MAIN REPLACEMENT
	PLAN VIEW

Scale	N.T.S.
Date	1/12/2021
Job	COS-Chase
Designed by	WMR
Drawn by	JJD
Checked by	No.
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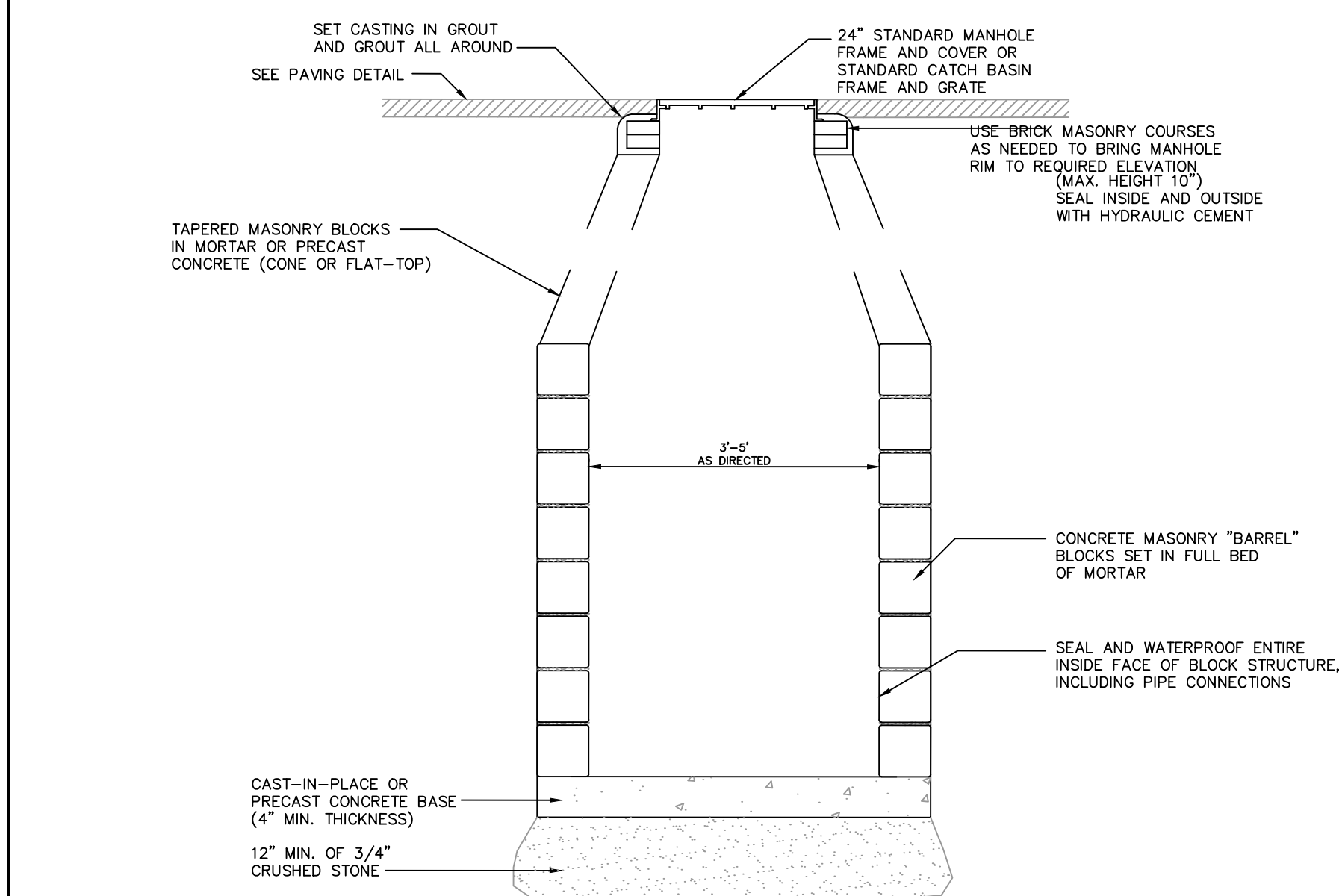
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C-1



NOTES:
 1. INNER EDGE OF BRICK TABLE TO BE AT ELEVATION OF CROWN OF TOP PIPE. TABLE TO SLOPE AT 1" PER 1' TO INSIDE OF MANHOLE BASE.
 2. TYPICAL MANHOLE TO BE 4-FOOT DIAMETER MINIMUM.
 3. CONTRACTOR TO SELECT MANHOLE DIAMETER TO ACCOMMODATE NUMBER OF PIPE OPENINGS PER MANUFACTURER'S REQUIREMENTS AND INTERNAL DROP PIPING.

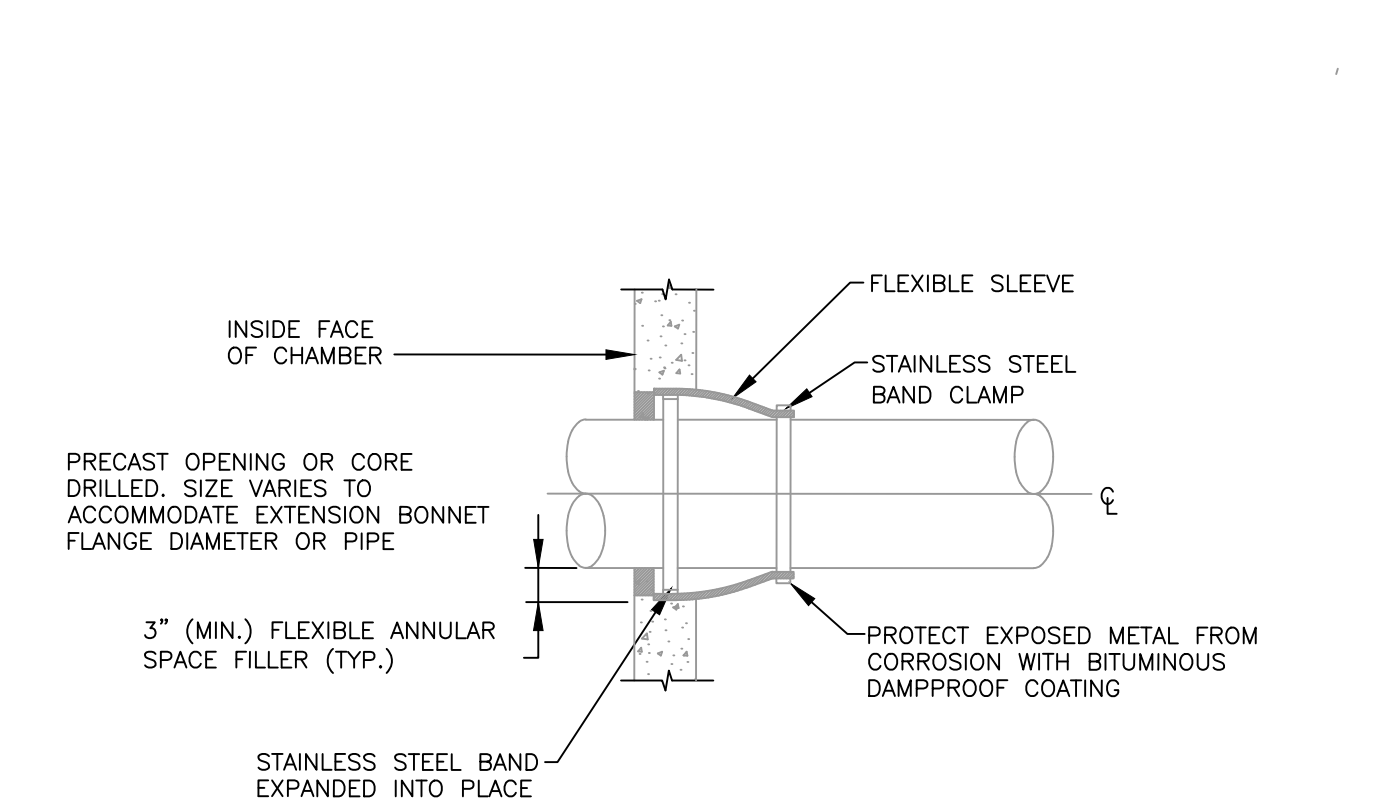
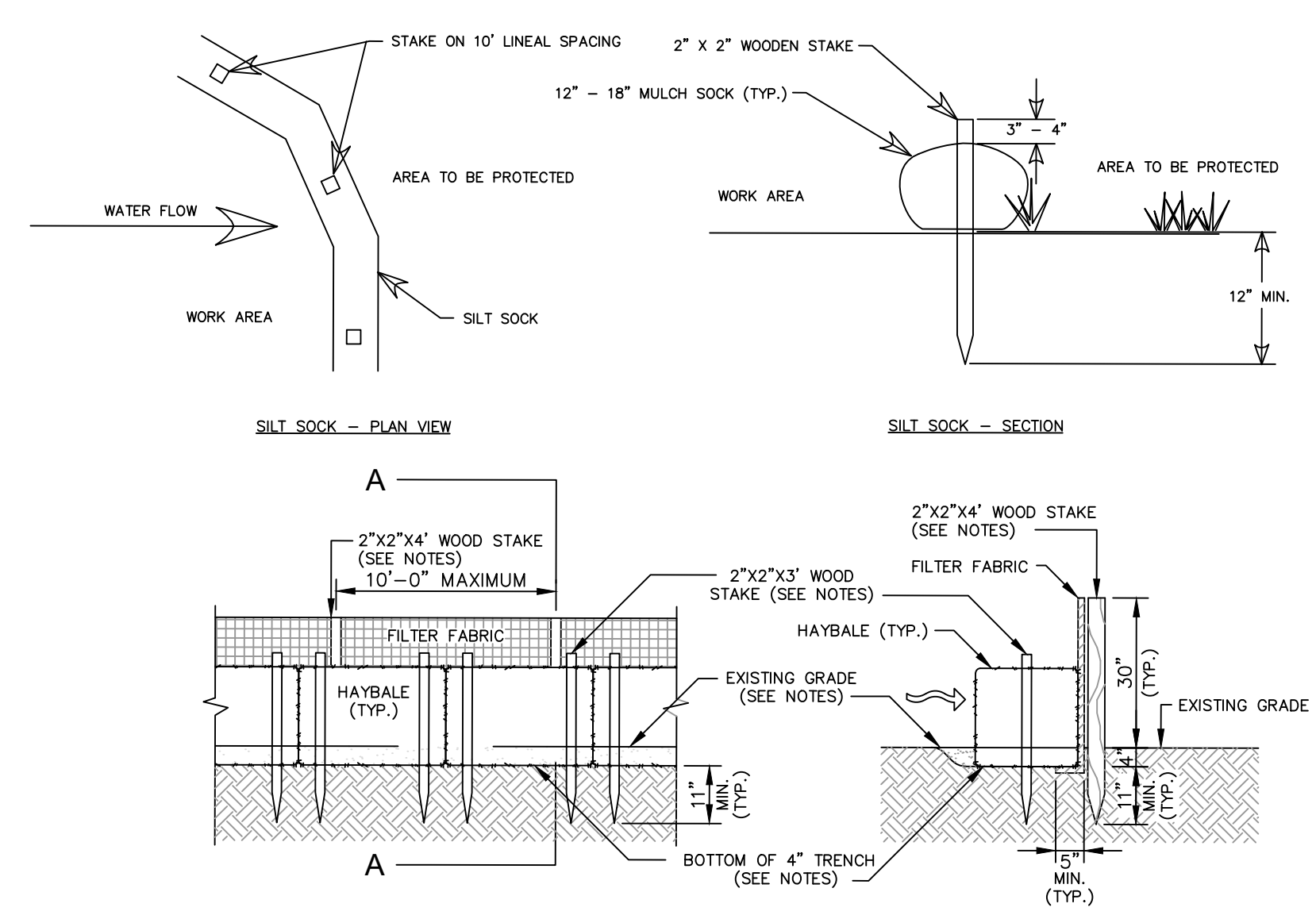
TYPICAL MANHOLE DETAIL

NOT TO SCALE



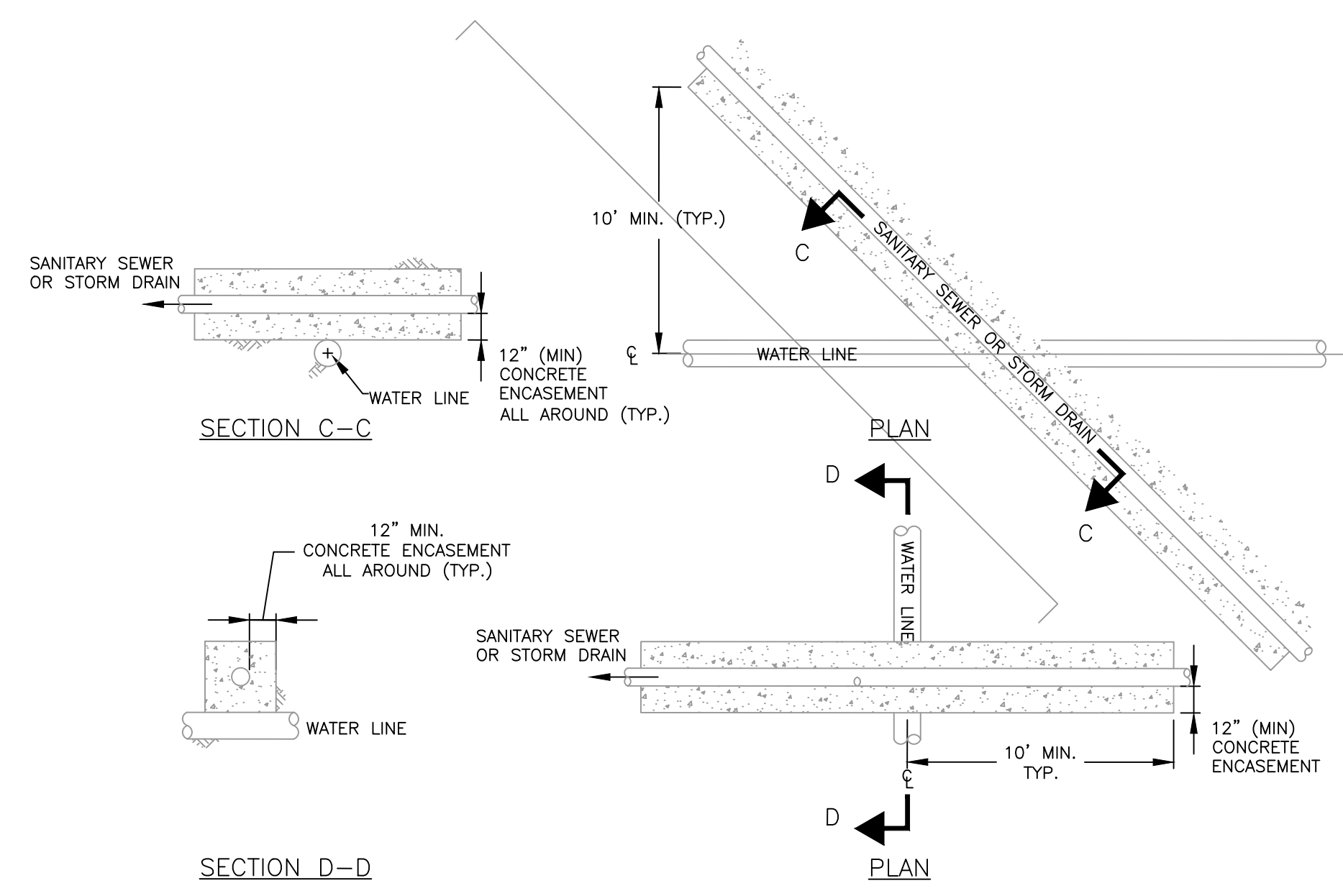
TYPICAL BLOCK STRUCTURE

NOT TO SCALE



FLEXIBLE SLEEVE CONNECTION DETAIL

NOT TO SCALE



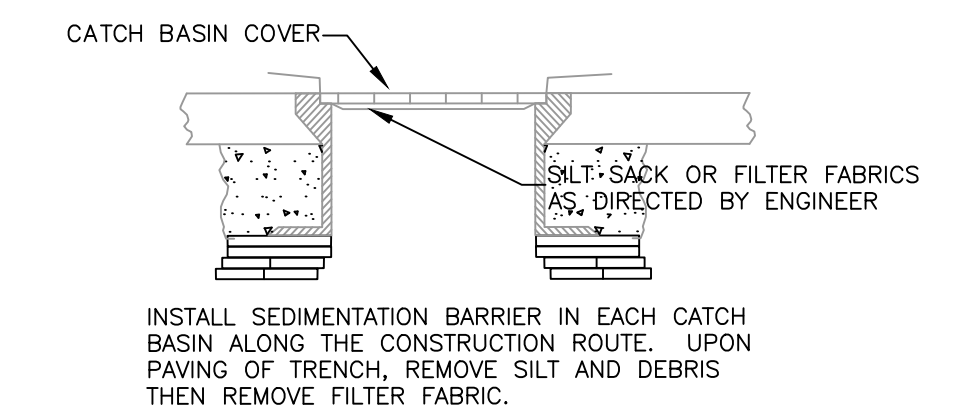
CONCRETE ENCASEMENT DETAIL

NOT TO SCALE

- NOTES:**
- CONTRACTOR TO INSTALL HAYBALES AND SILT FENCE OR MULCH SOCK (SILTSOXX OR EQUAL) AS APPROVED BY THE CITY'S CONSERVATION COMMISSION
 - FABRIC TO BE UV RESISTANT POLYPROPYLENE WITH A MINIMUM WEIGHT OF 2.5 OZ./S.Y.
 - FABRIC TO BE ATTACHED TO STAKES WITH STAPLES.
 - HAY BALES SHALL BE SALT MARSH HAY AS APPROVED BY THE CITY'S CONSERVATION COMMISSION
 - WHERE HAYBALES ARE USED, TRENCH A MINIMUM OF 4" INTO EXISTING GRADE.
 - A MINIMUM OF (2) WOODEN OR METAL STAKES PER HAYBALE. DRIVE STAKES A MINIMUM OF 12" INTO GROUND.
 - MULCH SOCK DEPICTED IS FOR MINIMUM SLOPES. GREATER SLOPES MAY REQUIRE MORE SOCKS PER ENGINEER
 - COMPOST MATERIAL TO BE DISPERSED ON SITE AS DETERMINED BY ENGINEER
 - CONTRACTOR TO INSTALL GEOTEXTILE (SILT SACK) IN ALL CATCH BASINS PRIOR TO EXCAVATION.
 - ALL CONSTRUCTION DEWATERING MUST BE TREATED WITH A SEDIMENTATION TANK PRIOR TO DISCHARGE UPGRADIENT OF OTHER EROSION AND SEDIMENTATION DEVICES AND CONTROLS.

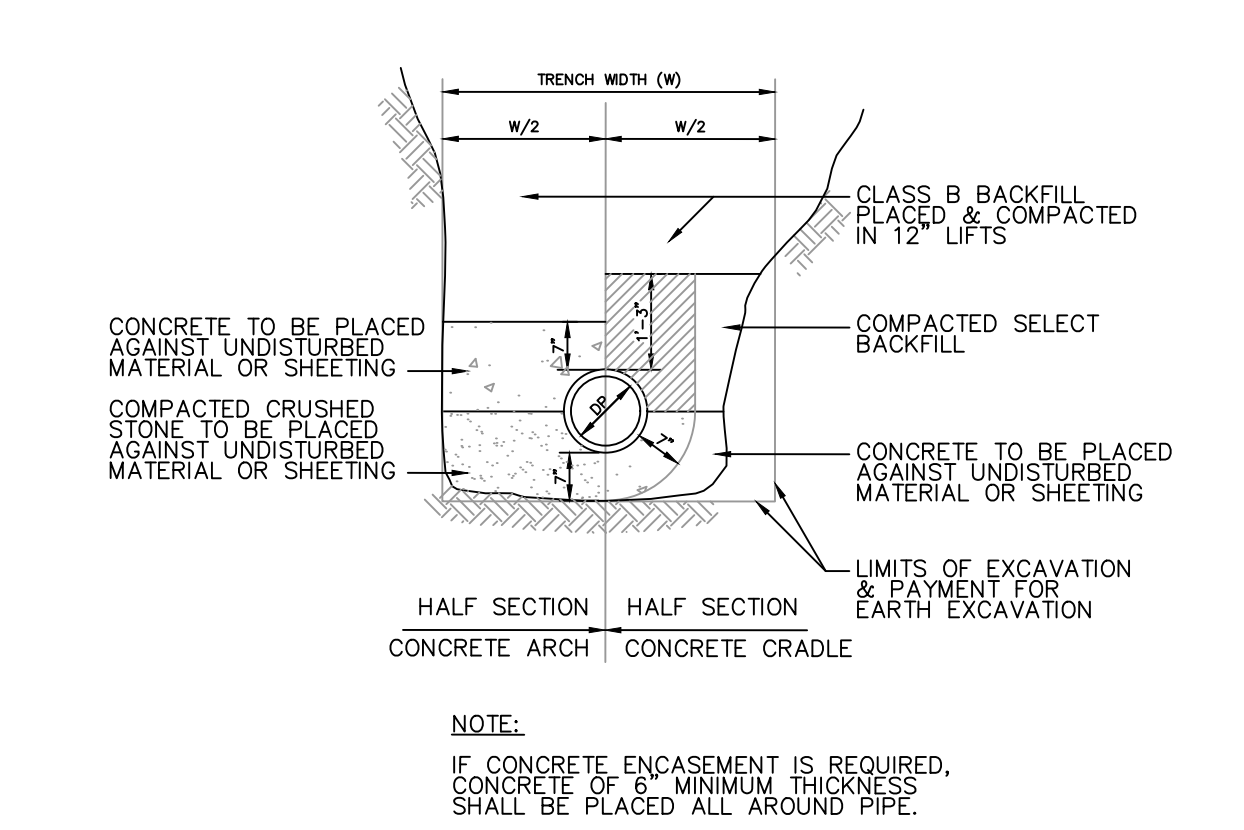
EROSION & SEDIMENTATION BARRIER

NOT TO SCALE



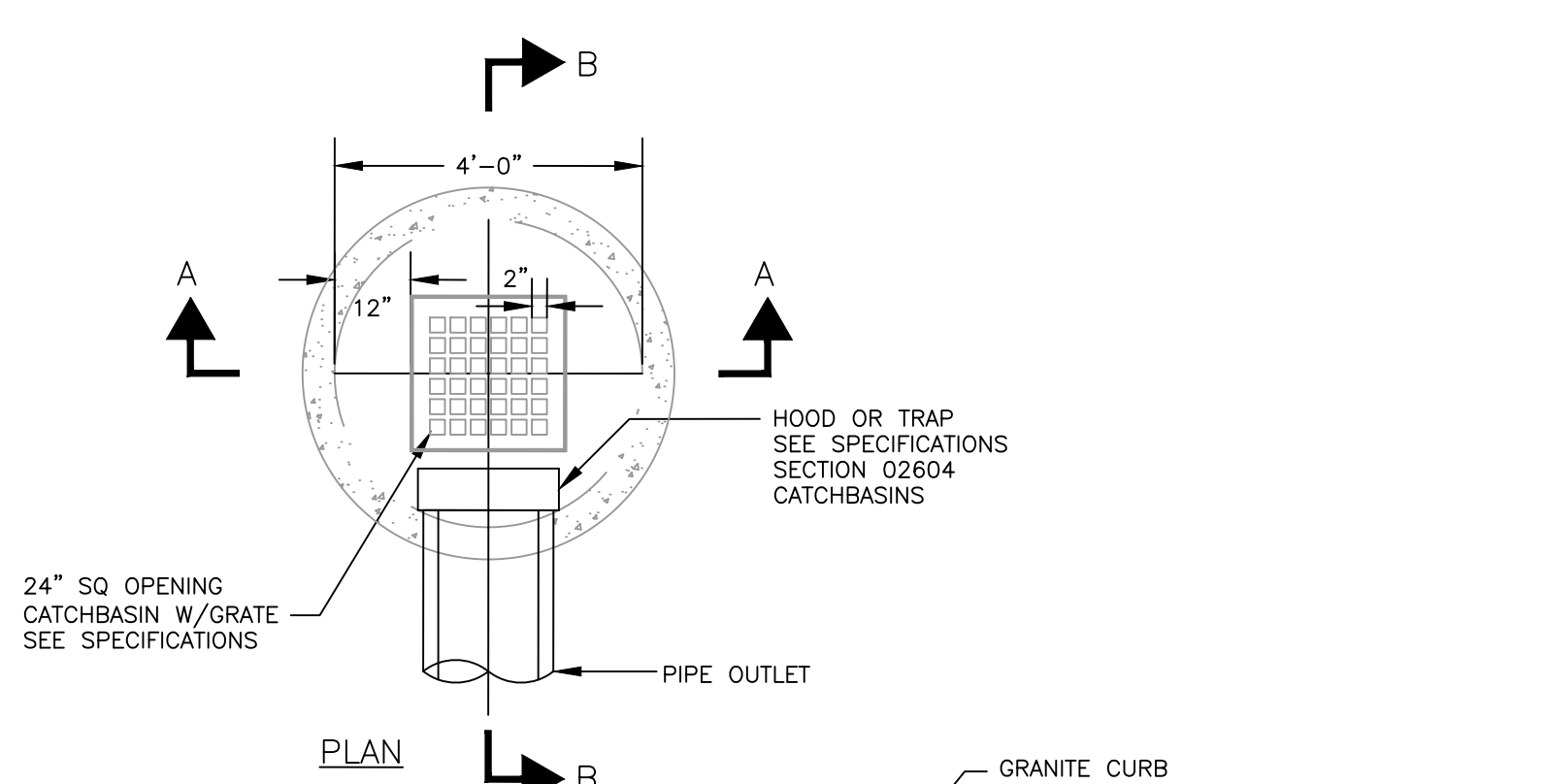
CATCH BASIN SEDIMENTATION BARRIER

NOT TO SCALE



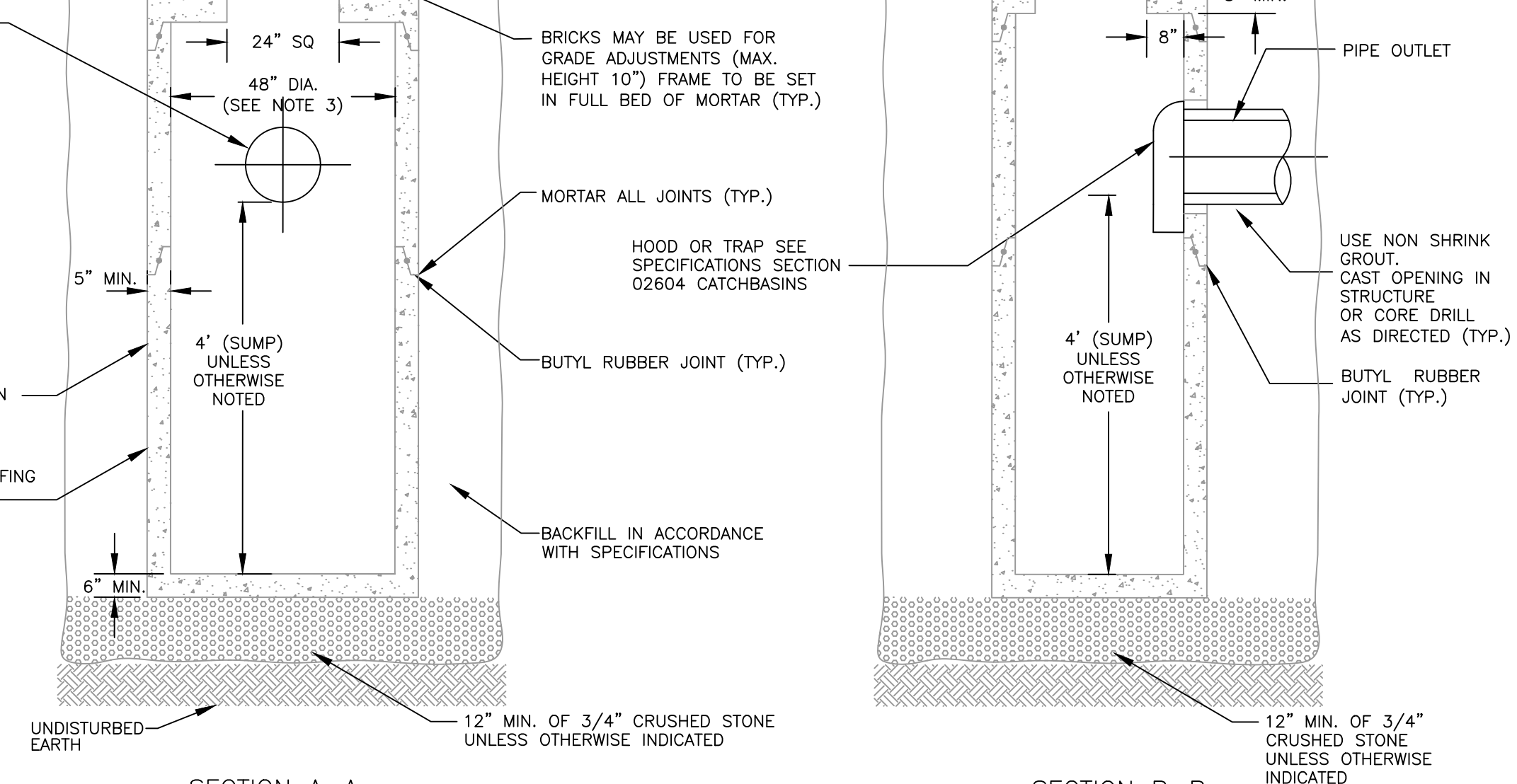
CONCRETE ARCH AND CRADLE DETAIL

NOT TO SCALE



CATCH BASIN WITH GRATE (OR CB CONVERTED TO DMH WITH SUMP)

NOT TO SCALE



NOTES:

- FACE OF PIPE NOT TO PROJECT MORE THAN 4" FROM FACE OF WALL ALONG CENTERLINE OF PIPE.
- FOR DESCRIPTION OF MATERIALS AND CONSTRUCTION METHOD, SEE SPECIFICATIONS.
- 5" DIAMETER MANHOLES FOR DOUBLE CATCH BASINS, 8" BASE SLAB THICKNESS.
- DESIGN PRECAST SECTIONS WITH FRAME AND GRATE FOR AASHTO H20 LOADING.
- CATCH BASIN FRAME AND GRATE REPLACED WITH "DRAIN" FRAME AND COVER FOR NEW CBS INSTALLED WITH GUTTER INLETS (OR CBS CONVERTED TO DMHS).
- PIPE OPENINGS IN EACH MANHOLE OR STRUCTURE TO BE FACTORY CAST OR FIELD CORED AS DIRECTED BY ENGINEER.

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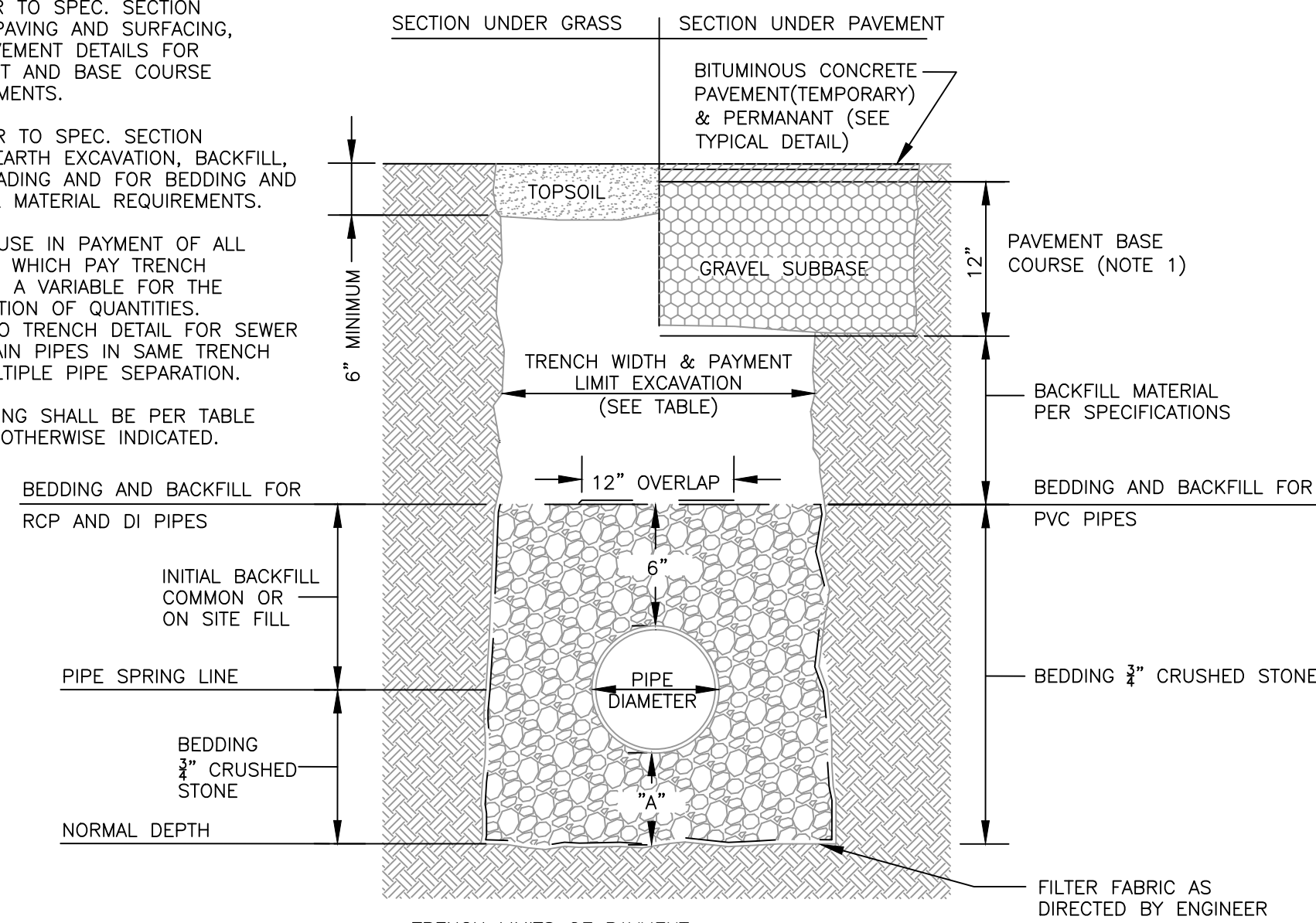
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- NOTES:
- REFER TO SPEC. SECTION 02500-PAVING AND SURFACING, AND PAVEMENT DETAILS FOR PAVEMENT AND BASE COURSE REQUIREMENTS.
 - REFER TO SPEC. SECTION 02210-EARTH EXCAVATION, BACKFILL, FILL, GRADING AND FOR BEDDING AND BACKFILL MATERIAL REQUIREMENTS.
 - FOR USE IN PAYMENT OF ALL ITEMS IN WHICH PAY TRENCH WIDTH IS A VARIABLE FOR THE CALCULATION OF QUANTITIES. REFER TO TRENCH DETAIL FOR SEWER AND DRAIN PIPES IN SAME TRENCH FOR MULTIPLE PIPE SEPARATION.
 - BEDDING SHALL BE PER TABLE UNLESS OTHERWISE INDICATED.

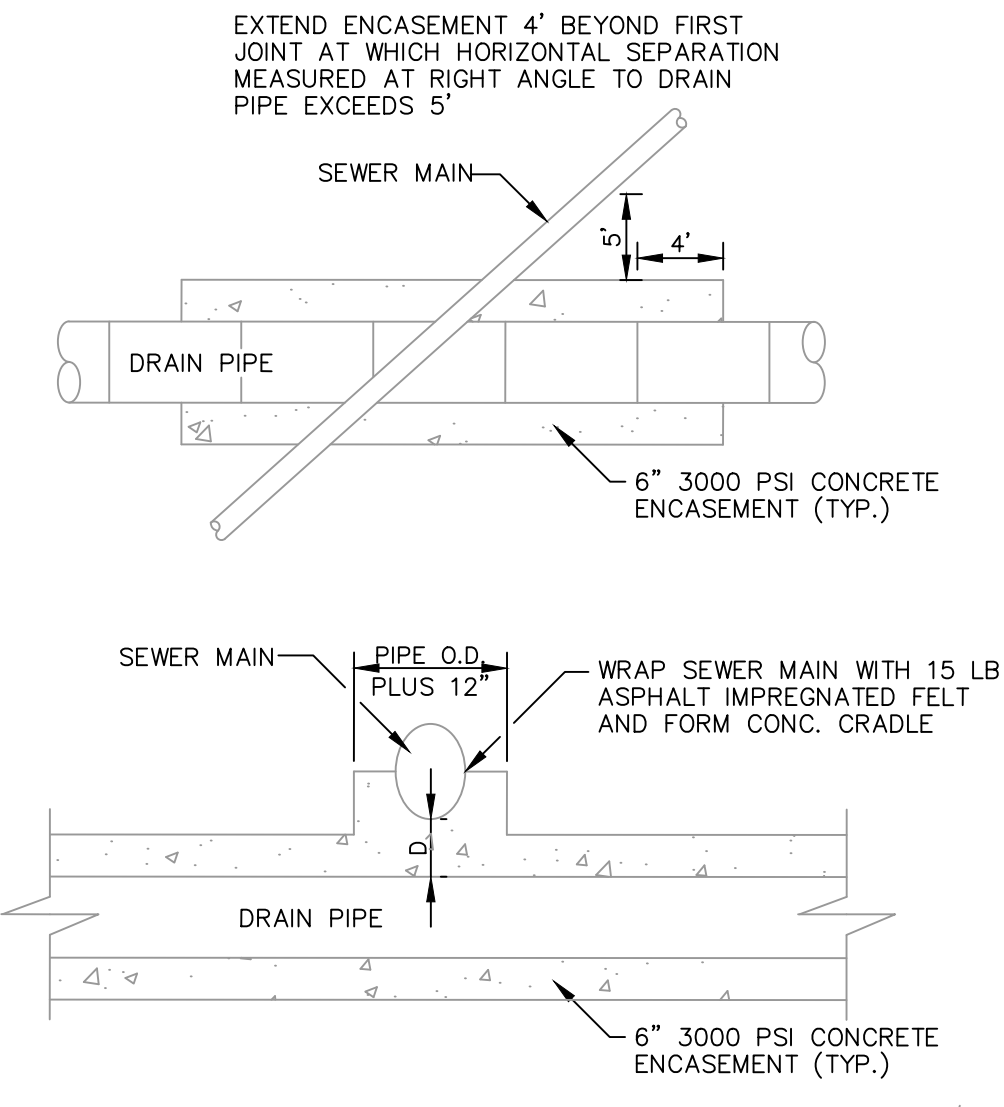


TRENCH LIMITS OF PAYMENT

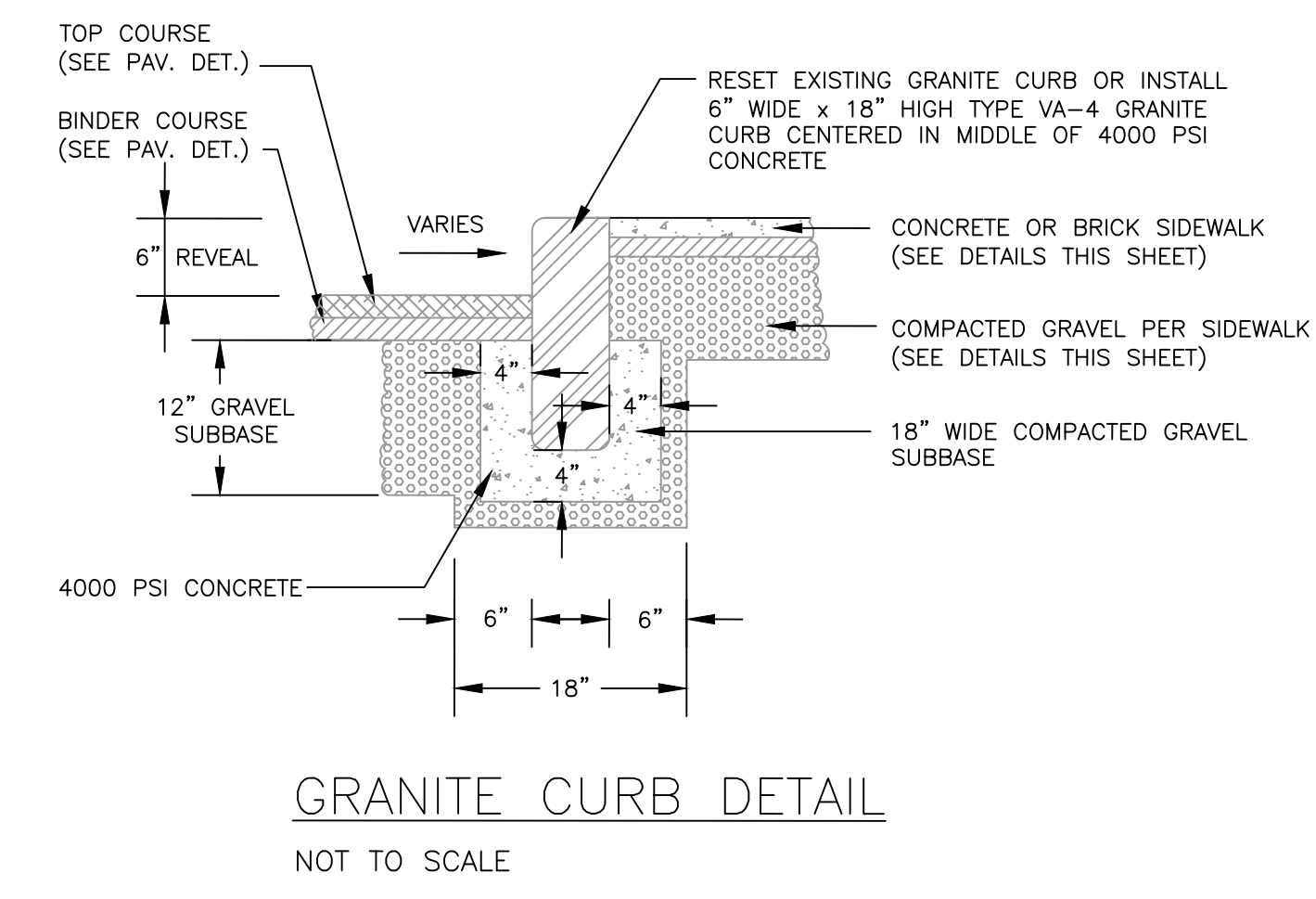
NOMINAL PIPE SIZE	TRENCH WIDTH	"A"
≤12" Ø	4'	6"
>12" Ø	O.D. DIA. +3'	9"
MANHOLES AND ALL STRUCTURES	O.D. DIA. +3'	12"
DRAIN AND SEWER PIPES IN SAME TRENCH	COMBINED PIPE O.D.s +4'	VARIES; SEE INDIVIDUAL PIPE SIZES

O.D. = OUTSIDE DIMENSION

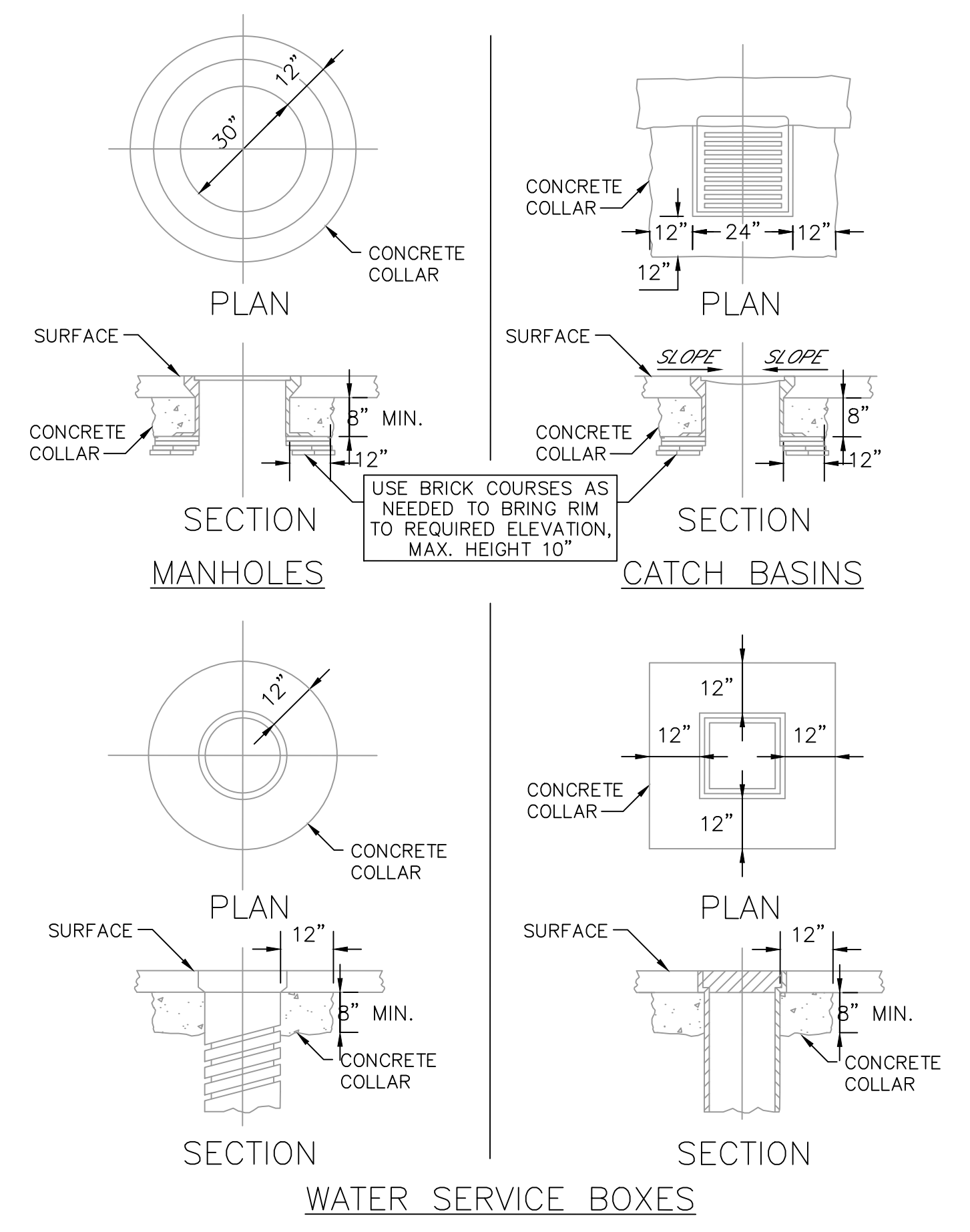
TRENCH DETAIL FOR UTILITY PIPES
NOT TO SCALE



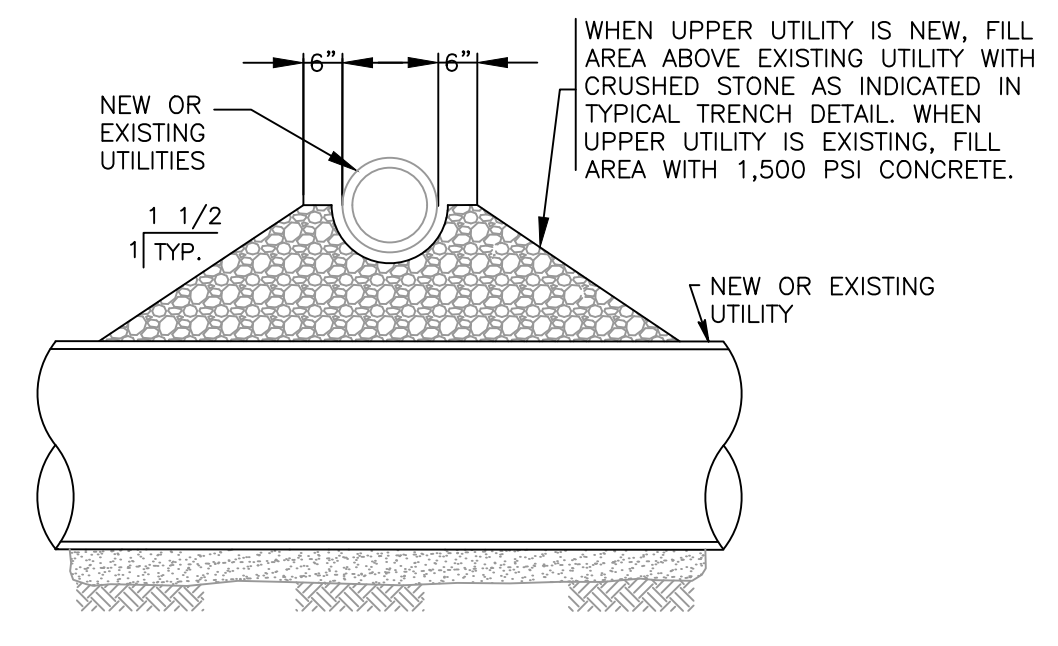
CONCRETE ENCASEMENT FOR SEWER AND DRAIN CROSSING
NOT TO SCALE



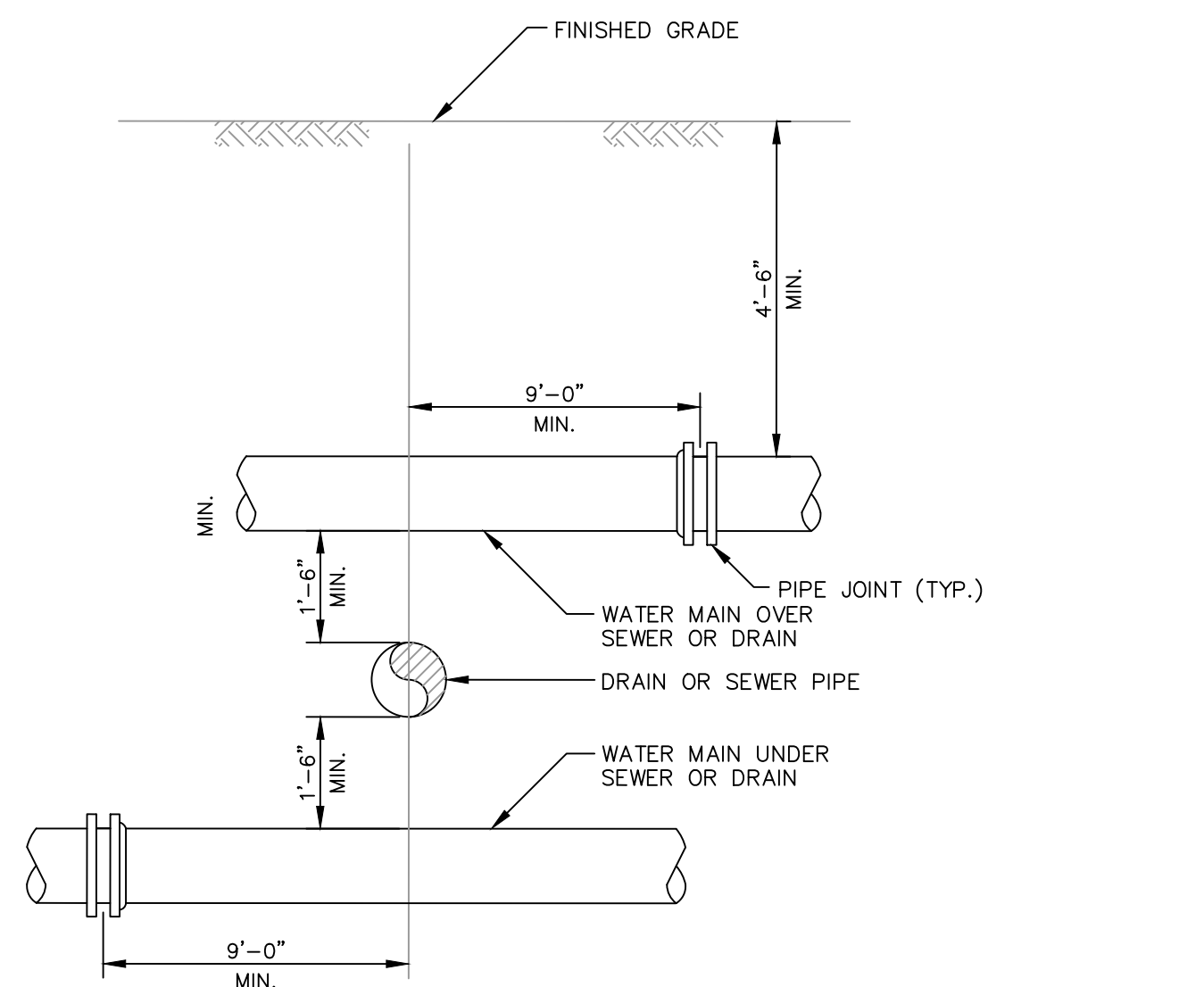
GRANITE CURB DETAIL
NOT TO SCALE



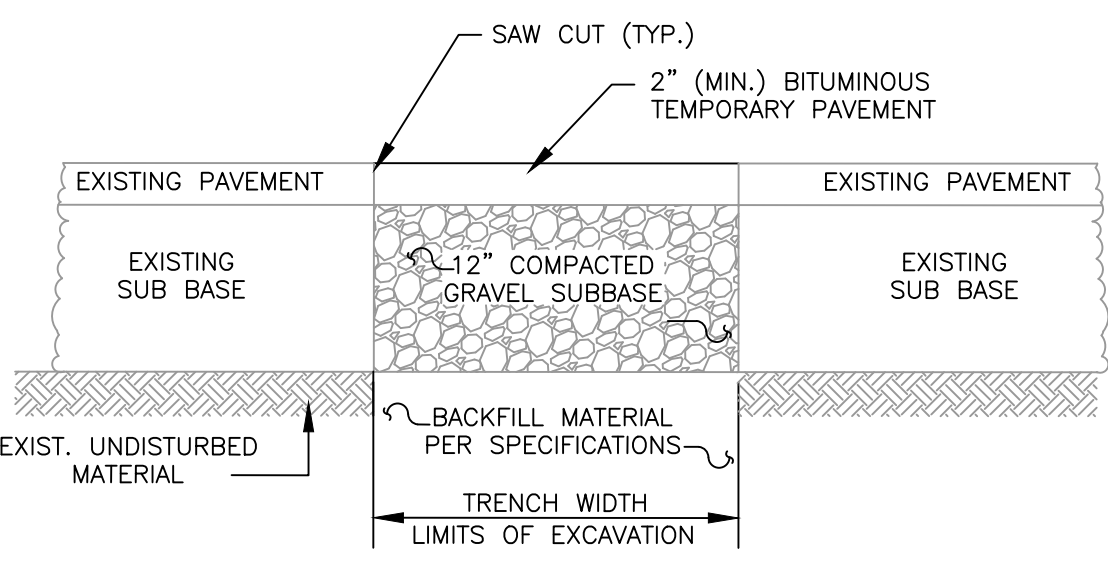
DETAILS FOR RAISING CASTINGS
NOT TO SCALE



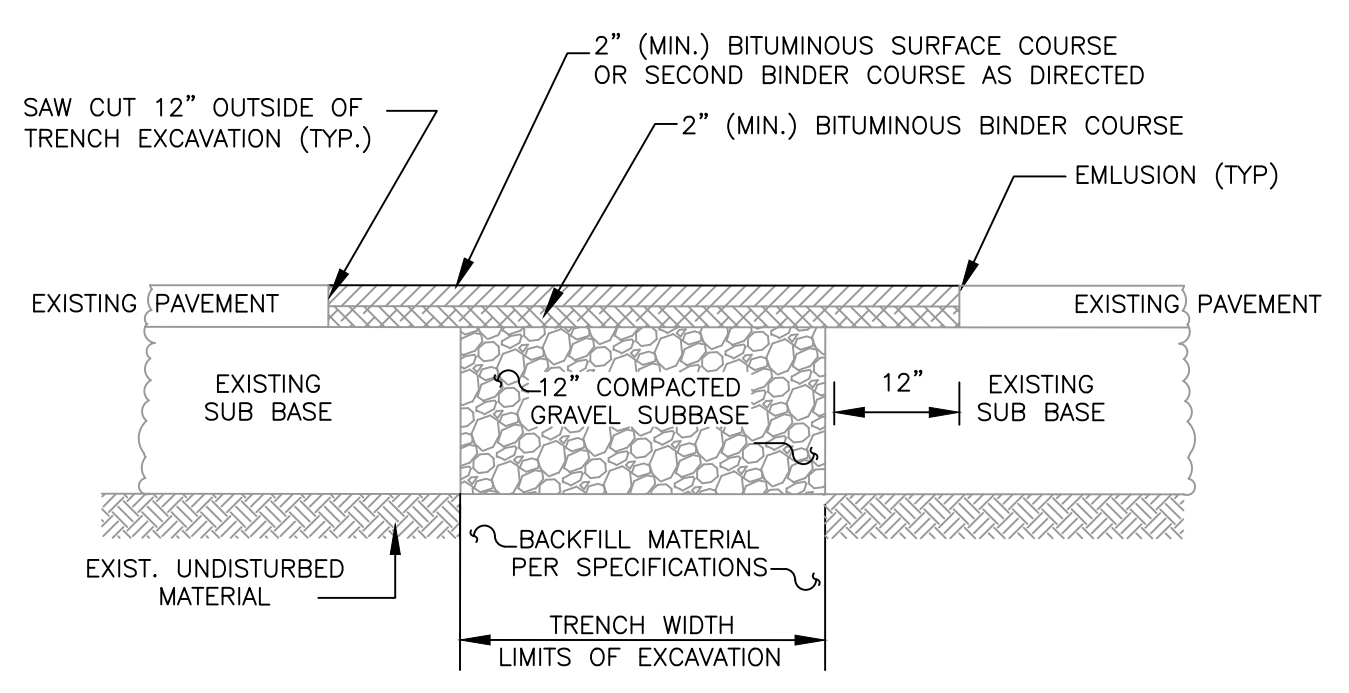
UTILITY CROSSING DETAIL
NOT TO SCALE



WATER MAIN CROSSING WITH SEWER OR DRAIN
NOT TO SCALE

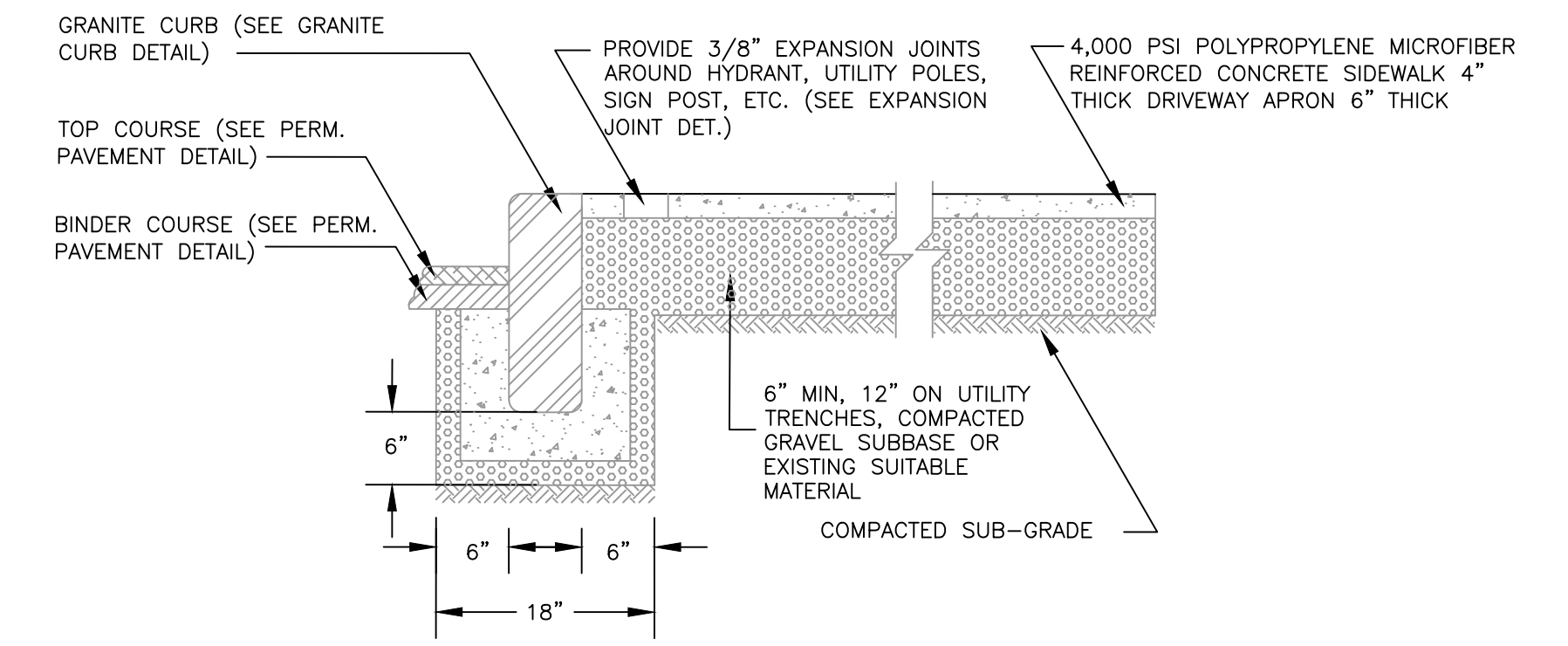


TEMPORARY PAVEMENT DETAIL
NOT TO SCALE



- GENERAL PAVING NOTES:
- THE CONTRACTOR SHALL MAINTAIN TEMPORARY PAVEMENT FOR A MINIMUM OF 90 DAYS UNLESS DIRECTED OTHERWISE BY THE ENGINEER EXCEPT IF TEMPORARY PAVEMENT IS PLACED AFTER OCTOBER 15, THEN IT SHALL BE MAINTAINED UNTIL APRIL 15 OF THE FOLLOWING YEAR.
 - PERMANENT PAVEMENT SHALL BE PLACED BETWEEN APRIL 15 AND OCTOBER 15 OF EACH CALENDAR YEAR UNLESS DIRECTED BY ENGINEER.
 - THE CONTRACTOR SHALL SAW CUT 12" OUTSIDE OF TRENCH EXCAVATION. TEMPORARY PAVEMENT SHALL BE REMOVED AND DISPOSED OF. THE GRAVEL SHALL BE FINE GRADED, EMULSION PLACED ON ALL JOINTS, AND PERMANENT PAVEMENT PLACED IN TWO COURSES.
 - REFER TO SPECIFICATION SECTION 02500 PAVING AND SURFACING FOR ADDITIONAL REQUIREMENTS.
 - PERMANENT PAVEMENT DETAIL TO APPLY TO TRENCH PAVEMENT AND FULL WIDTH ROADWAY RECONSTRUCTION AND/OR PAVEMENT.
 - GRAVEL SUBBASE TO BE 12-INCH THICKNESS ON UTILITY TRENCH, 6-INCH MINIMUM THICKNESS IN STRIPPED AREAS OUTSIDE TRENCH.

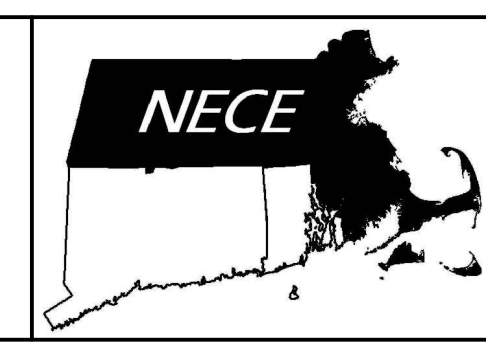
PERMANENT PAVEMENT DETAIL
NOT TO SCALE



CONCRETE SIDEWALK DETAIL
NOT TO SCALE

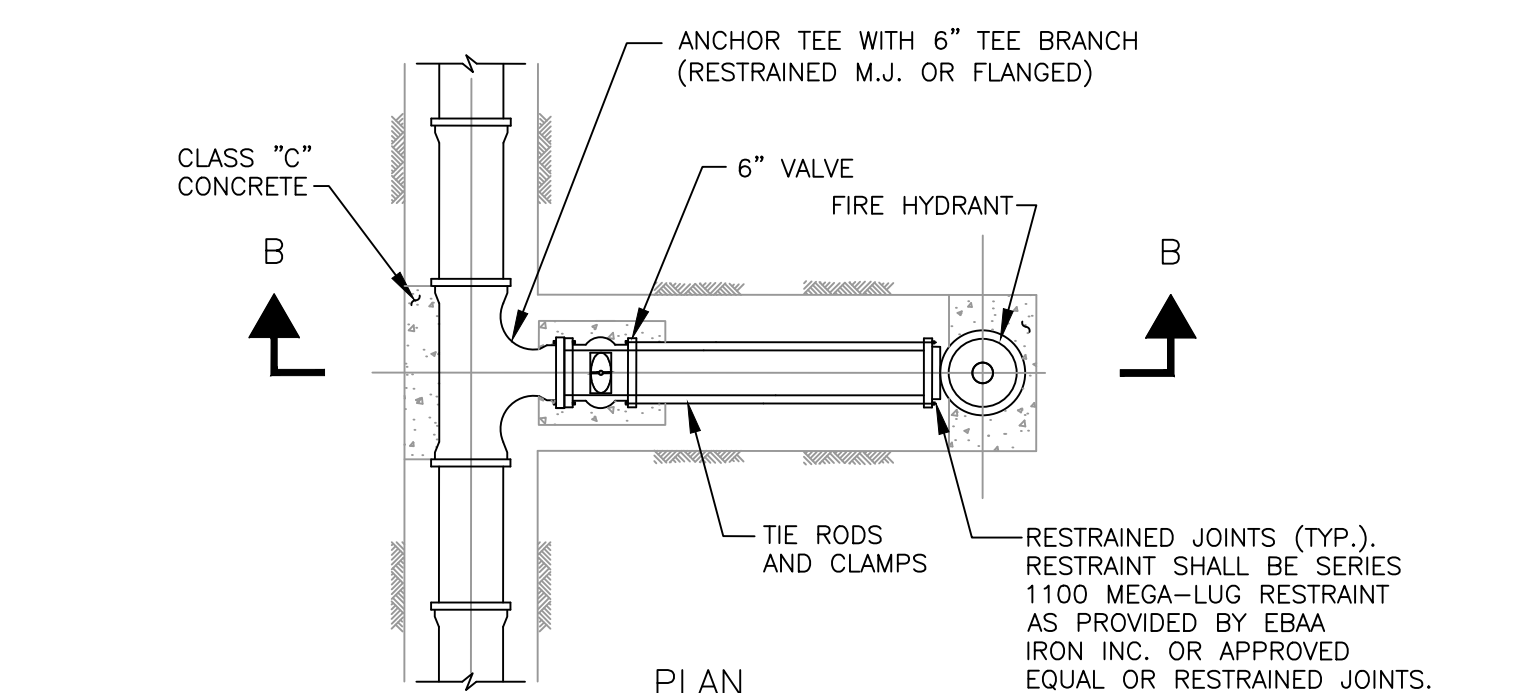
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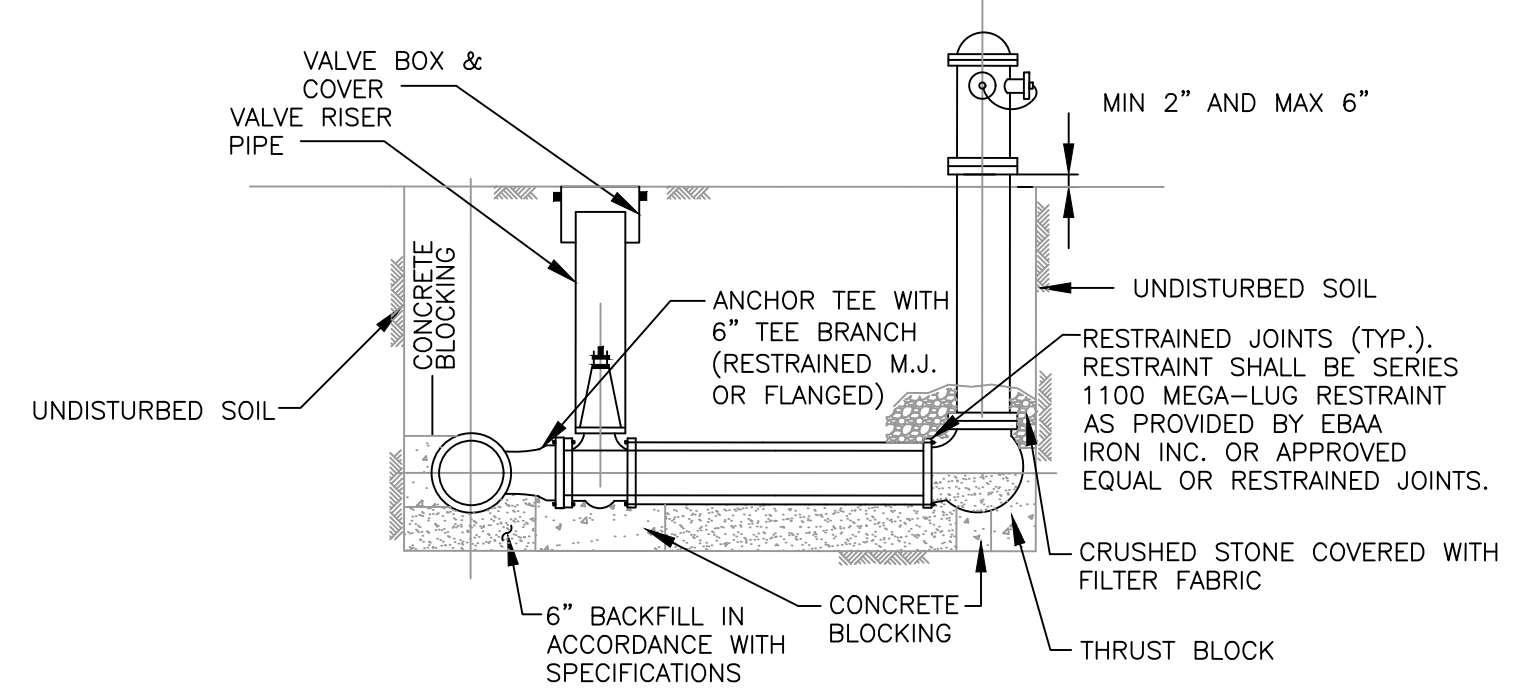


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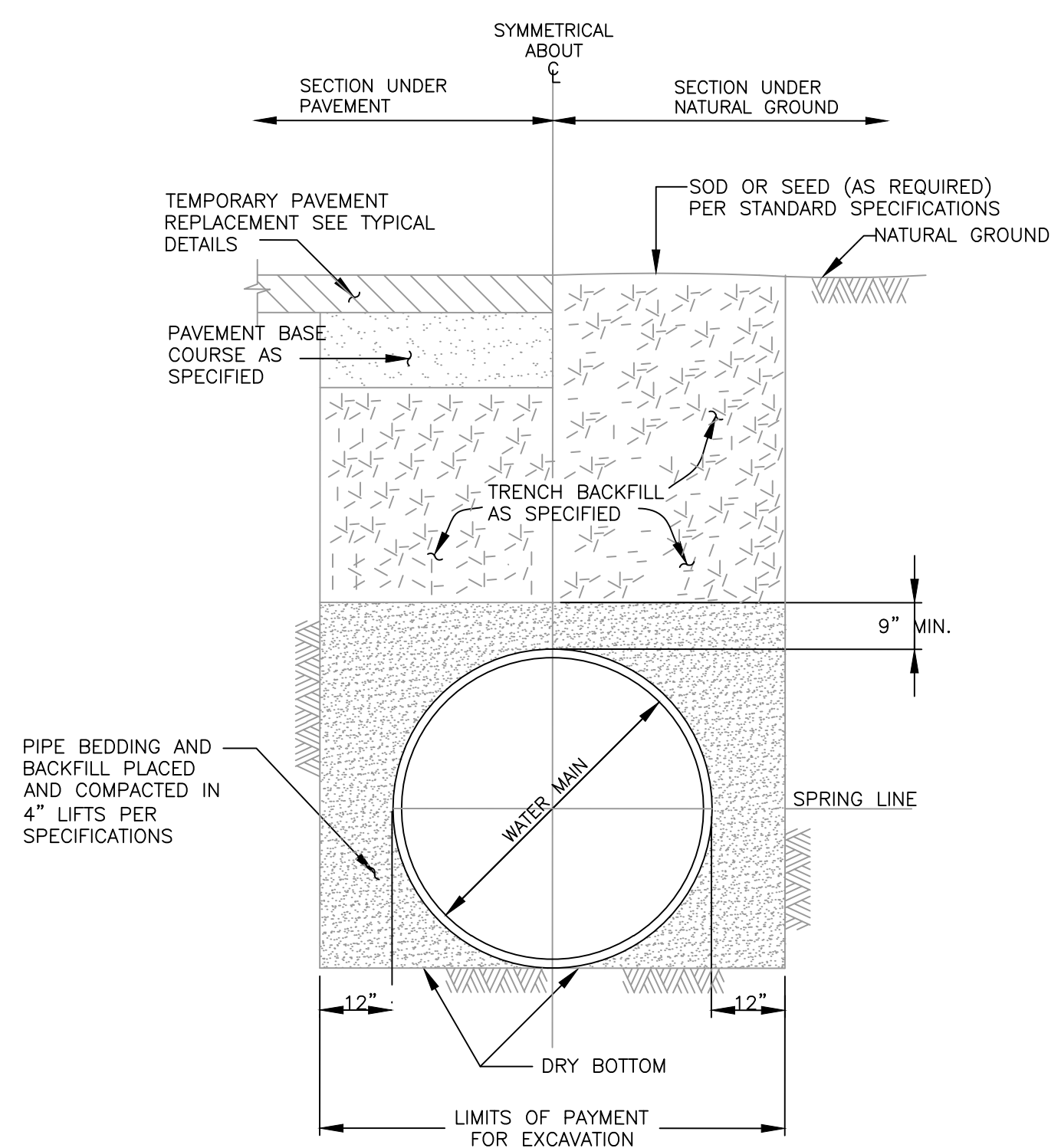


RESTRAINED JOINTS (TYP.) RESTRAINT SHALL BE SERIES 1100 MEGA-LUG RESTRAINT AS PROVIDED BY EBAA IRON INC. OR APPROVED EQUAL OR RESTRAINED JOINTS.

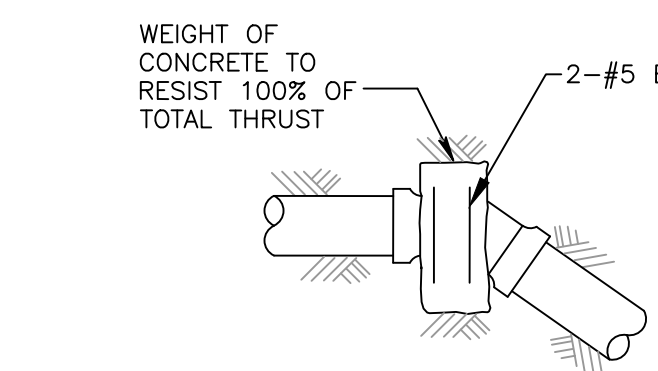


NOTES:
 1. LOCATE FIRE HYDRANTS AS SHOWN ON DRAWINGS, APPROXIMATELY 3 FEET BEHIND CURB OR PROJECTED FUTURE CURB.
 2. THE FIRE HYDRANT STEAMER NOZZLE SHALL FACE THE STREET.
 3. REFER TO SPECIFICATION SECTION 03300 FOR CONCRETE (3,000 PSI) THRUST BLOCKS.
 4. PROVIDE HYDRANT, VALVE AND TEE JOINTS WITH RESTRAINED MECHANICAL JOINTS.

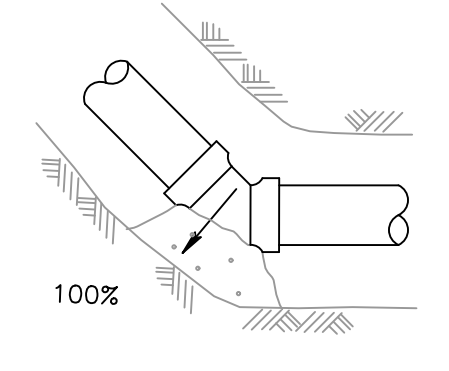
FIRE HYDRANT DETAIL
NOT TO SCALE



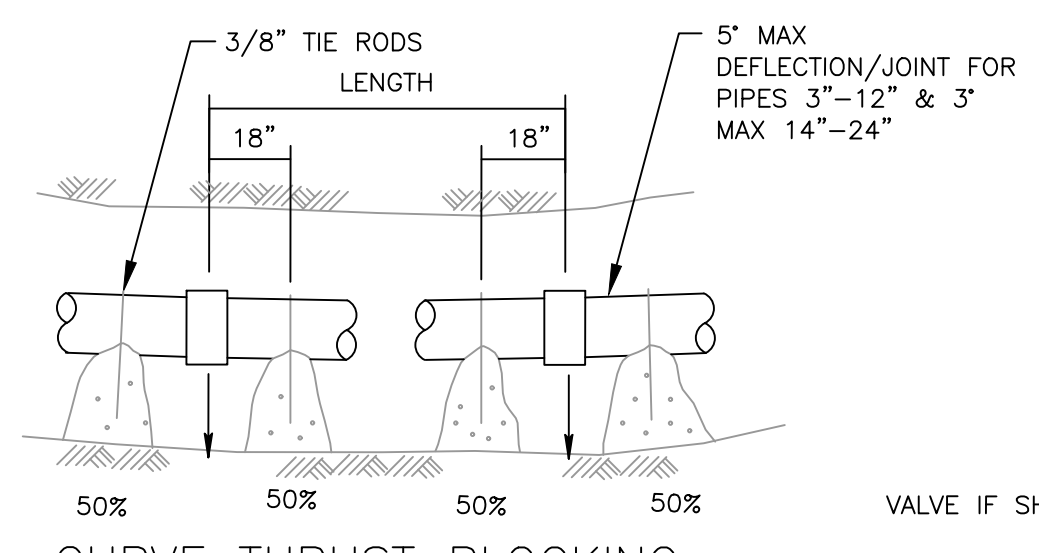
WATER MAIN TRENCH DETAIL
NOT TO SCALE



VERTICAL BEND
NOTE: CONC. FOR THRUST BLOCKS TO BE 3000 P.S.I.



HORIZONTAL BEND
NOTE: FIGURE (100%) AT THRUST BLOCK INDICATES PERCENT OF TOTAL THRUST TO BE APPLIED FOR BEARING AREA.



CURVE THRUST BLOCKING

PIPE SIZE	THRUST PER PSI OF WATER PRESSURE AT VARIOUS FITTINGS			
	DEAD END	90° ELBOW	45° ELBOW	22 1/2° ELBOW
6	39	55	30	15
8	67	94	51	26
10	109	154	84	43
12	155	218	119	61
16	275	383	209	106
18	351	494	269	137

EXAMPLE:
 8-INCH 90° ELBOW, PRESSURE=200lb./SQ.IN.
 FROM TABLE: THRUST=94 x 200=18,800 lb.
 ASSUME BEARING STRENGTH OF SOIL=2000 lb./SQ.FT.

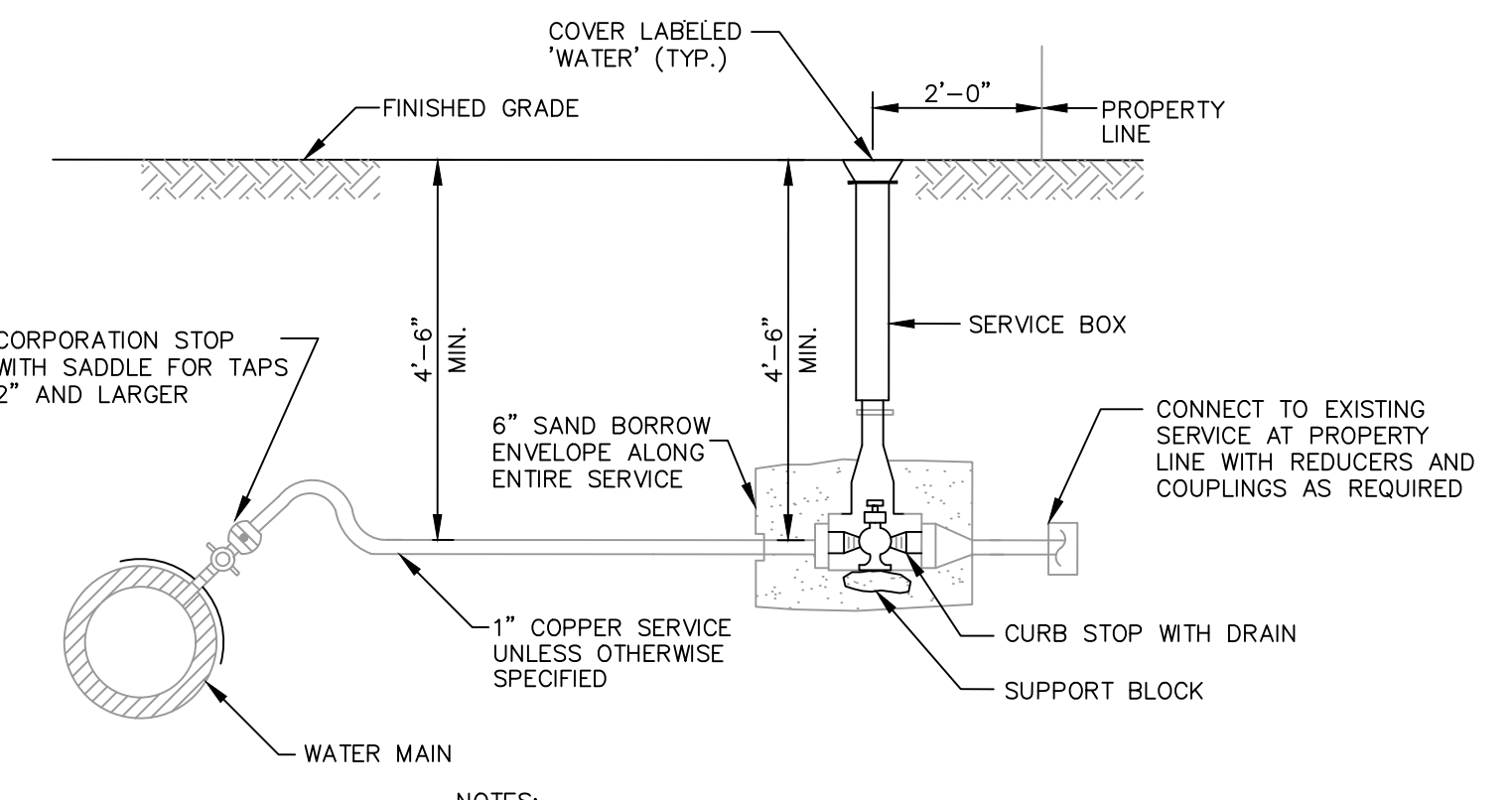
$\frac{18,800}{2000} = 9.4 \text{ SQ.FT.} = \text{AREA OF BEARING REQUIRED FOR THRUST BLOCK}$

NOTES:
 1. IN USING THE ABOVE TABLES, USE THE MAXIMUM INTERNAL PRESSURE ANTICIPATED (i.e. HYDROSTATIC TEST PRESSURE, POSSIBLE SURGE PRESSURE DUE TO PUMP SHUT-OFF, ETC.).
 2. ASSUME A SOIL BEARING STRENGTH OF 2000 LB. PER SQ. FOOT.
 3. JOINTS SHALL BE PROTECTED BY FELT ROOFING PAPER PRIOR TO PLACING CONCRETE.

MULTIPLY THRUST BY DEGREE OF DEFLECTION TO OBTAIN TOTAL THRUST
 4. REFER TO SPECIFICATION SECTION 03300 - CONCRETE FOR CONCRETE REQUIREMENTS

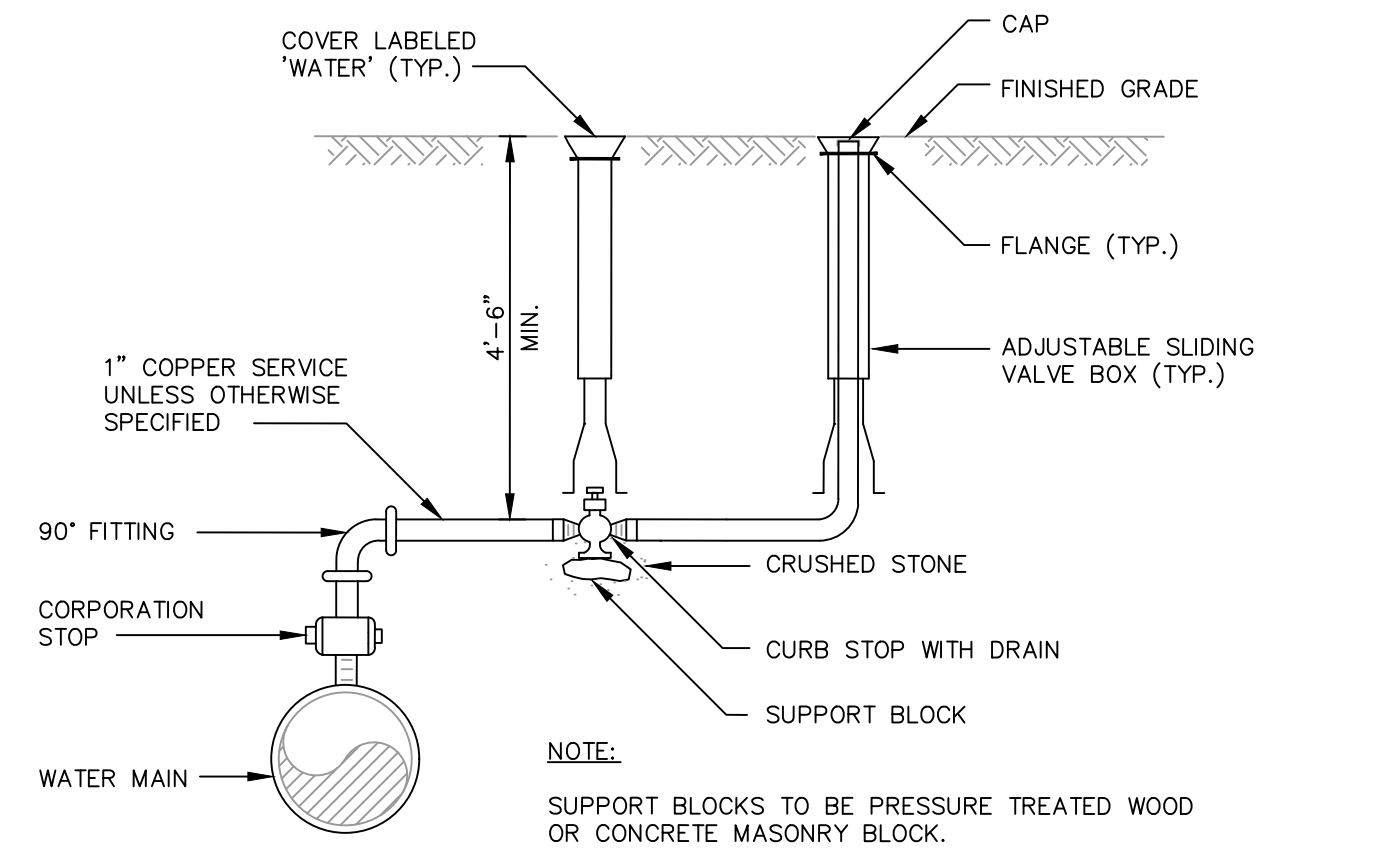
PIPE SIZE-in.	SIDE THRUST PER 100 lb./sq.in. PRESSURE PER DEGREE OF DEFLECTION	
	SIDE THRUST-lb.	PIPE SIZE-in.
6	72	12
8	122	16
10	197	18

CONCRETE THRUST BLOCKS FOR DUCTILE IRON PIPE
NOT TO SCALE

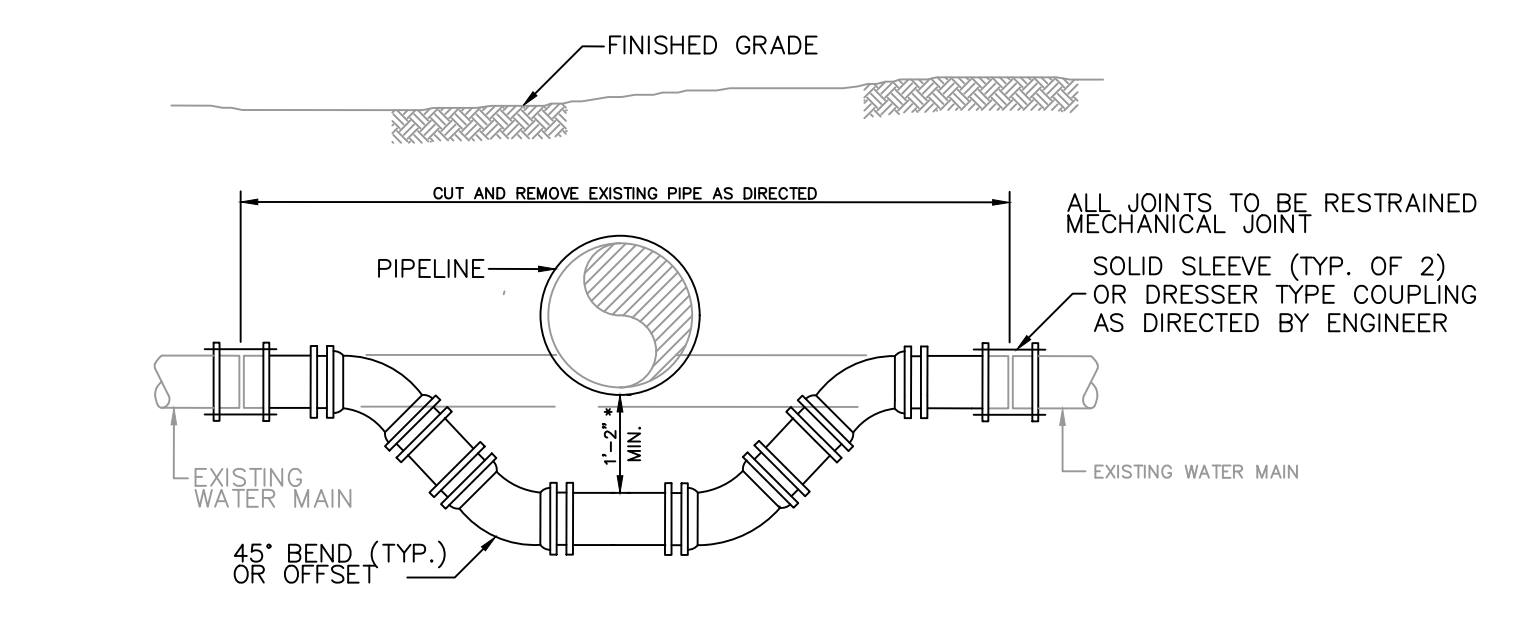


NOTES:
 1. FLUSH ALL NEW SERVICE LINES PRIOR TO CONNECTING TO EXISTING.
 2. AFTER CONNECTION, CONTRACTOR SHALL ASSIST WATER DEPT. PERSONNEL IN FLUSHING SERVICE LINES UP TO THE METER.
 3. COPPER SERVICE TO BE INSTALLED IN 6-INCH SAND ENVELOPE.
 4. CONNECT TO EXISTING SERVICE. WHERE EXISTING SERVICES DO NOT EXIST, PLUG END OF CURB STOP.
 5. ALL NEW COPPER SERVICES TO BE CONTINUOUS WITHOUT UNIONS OR COUPLINGS BETWEEN CORPORATION AND CURB STOP.

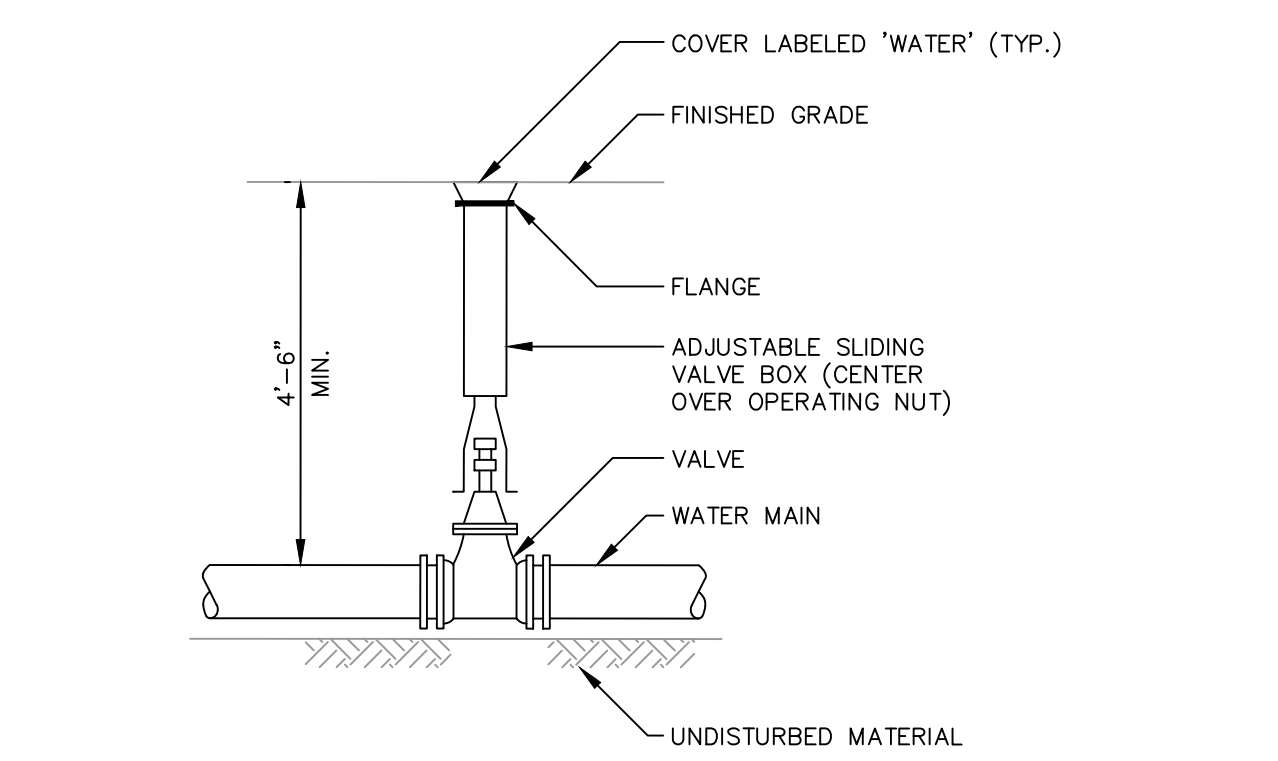
COPPER SERVICE CONNECTION DETAIL
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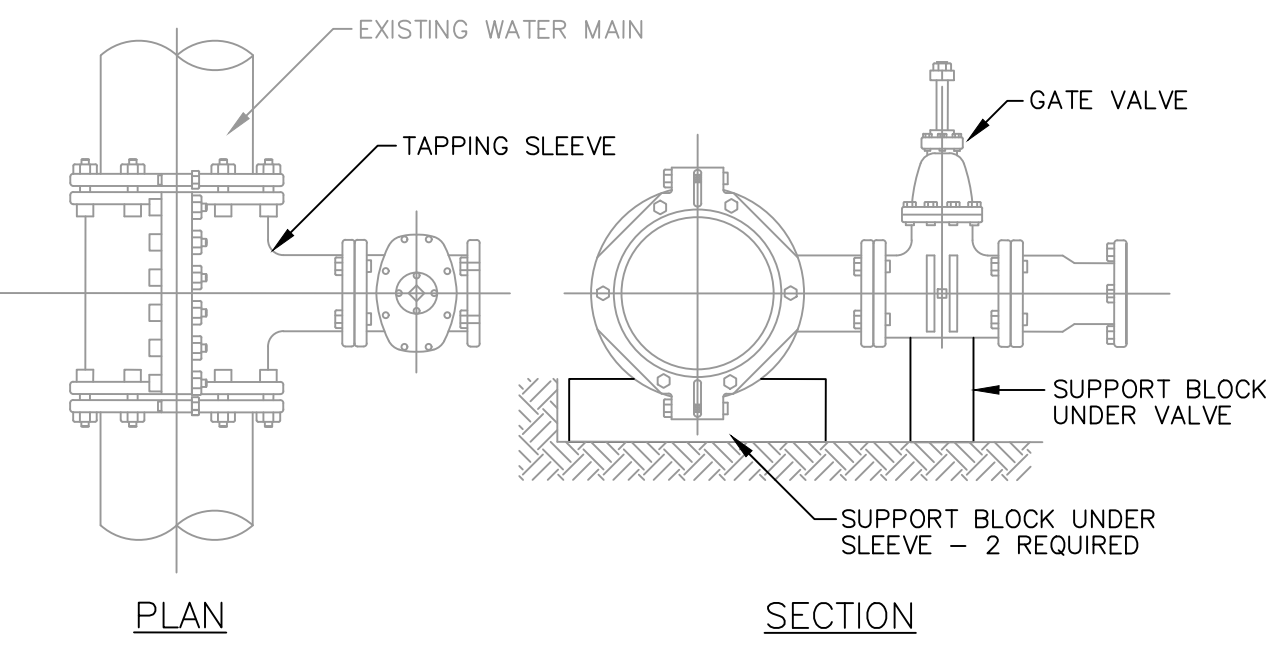
CURB STOP BLOWOFF DETAIL
NOT TO SCALE



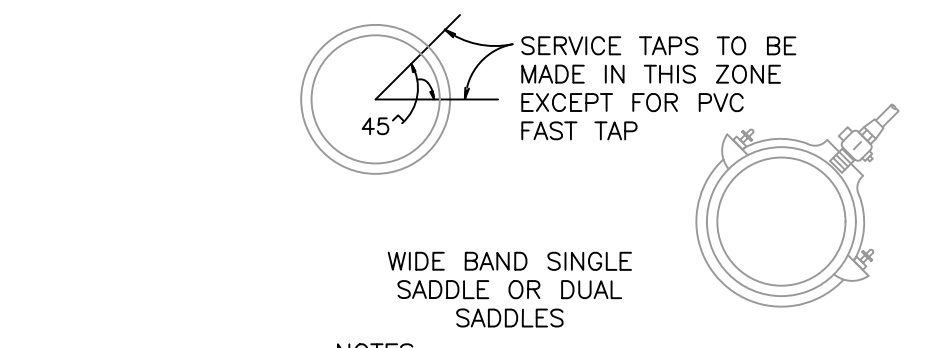
RELOCATION OF EXISTING WATER MAIN DETAIL
NOT TO SCALE



TYPICAL VALVE BOX DETAIL
NOT TO SCALE



TAPPING SLEEVE WITH GATE VALVE
NOT TO SCALE



NOTES:
 1. BLOW-OFF & CHLORINATION TAPS ARE MADE IN VERTICAL POSITION

PIPE TAPPING SCHEDULE	
WATER MAIN TYPE AND DIAMETER	SERVICE TAP TYPE
12" OR LESS CAST IRON OR DUCTILE IRON	DSS, WBSS
16" AND UP CAST IRON OR DUCTILE IRON	DWBSS

DSS - DUAL STRAP SADDLES
 WBSS - WIDE BAND STRAP SADDLES
 DWBSS - DUAL WIDE BAND STRAP SADDLES

SERVICE CONNECTION
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