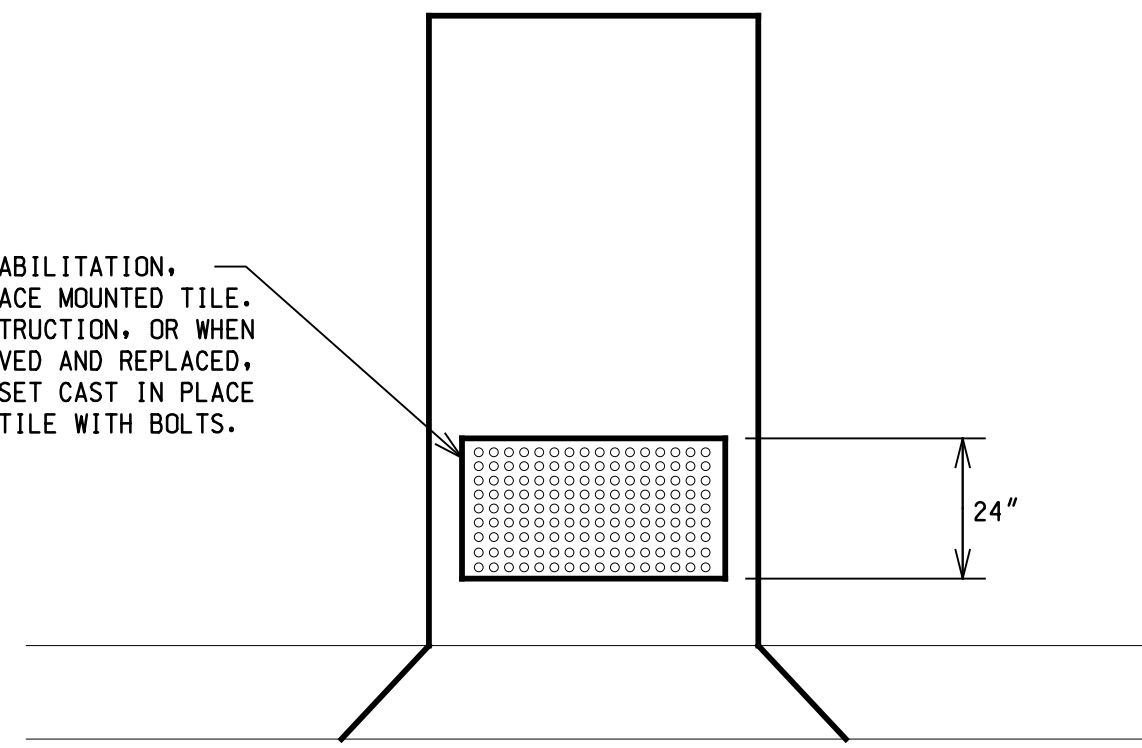


FOR RAMP REHABILITATION, USE RED SURFACE MOUNTED TILE. FOR NEW CONSTRUCTION, OR WHEN RAMP IS REMOVED AND REPLACED, USE RED WET SET CAST IN PLACE REPLACEABLE TILE WITH BOLTS.

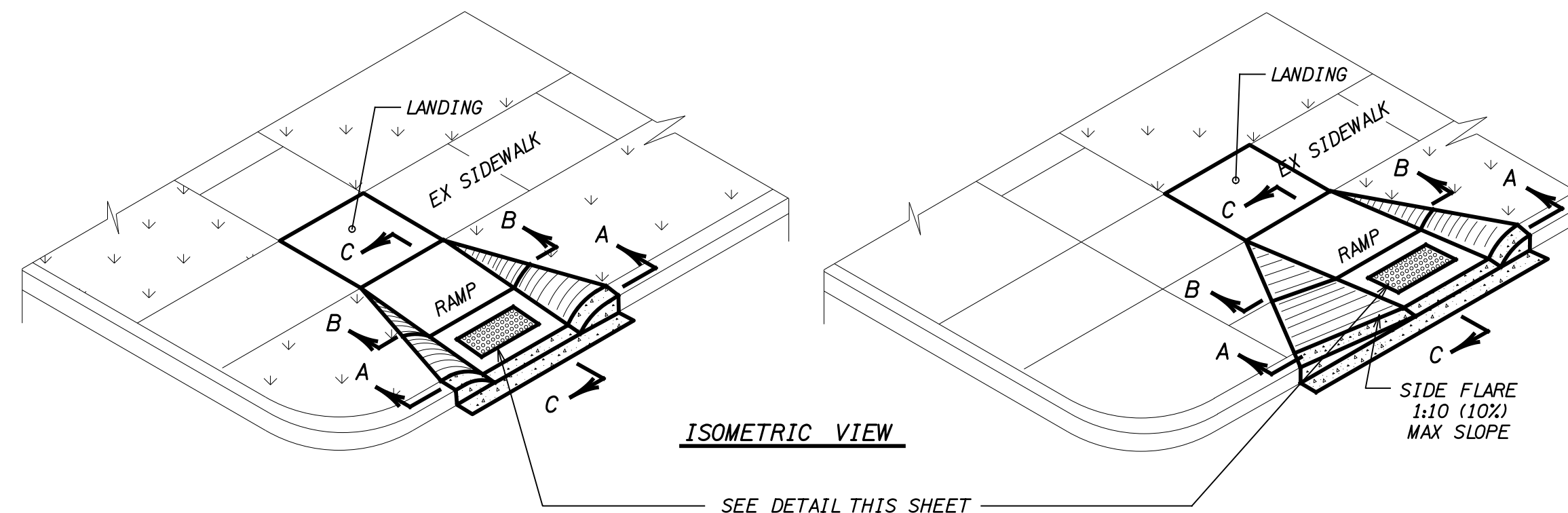


**RED PREFABRICATED TRUNCATED DOME ADA TILE DETAIL**

MANUFACTURED BY ADA SOLUTIONS, INC.

**NOTES:**

1. SURFACE APPLIED TACTILE PANELS SHALL BE MECHANICALLY FASTENED AND ADHERED TO THE UNDERLYING SUBSTRATE.
2. LOCATION OF ADA TILE TO MEET CURRENT MDT STANDARDS FOR DETECTABLE WARNINGS AND SHALL BE APPROVED BY CITY DPW.
3. THE ALIGNMENT OF THE NEW TILE SHALL BE PERPENDICULAR TO THE DIRECTION OF TRAVEL TO THE OPPOSITE RAMP.

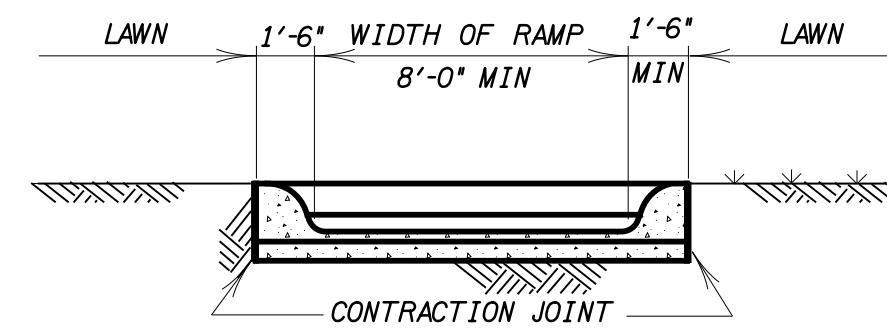


ISOMETRIC VIEW

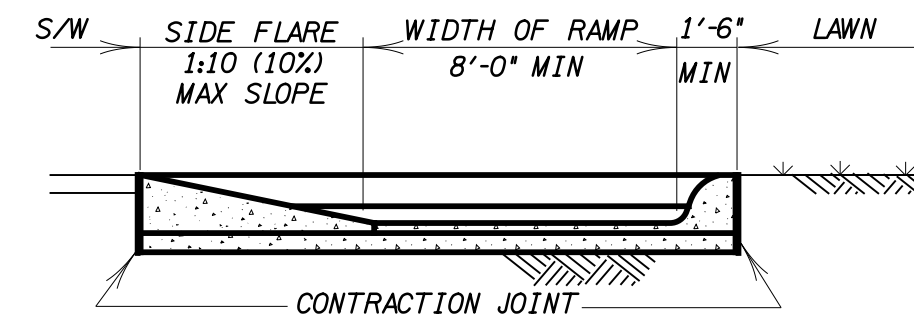
SEE DETAIL THIS SHEET

TYPE 1

TYPE 2



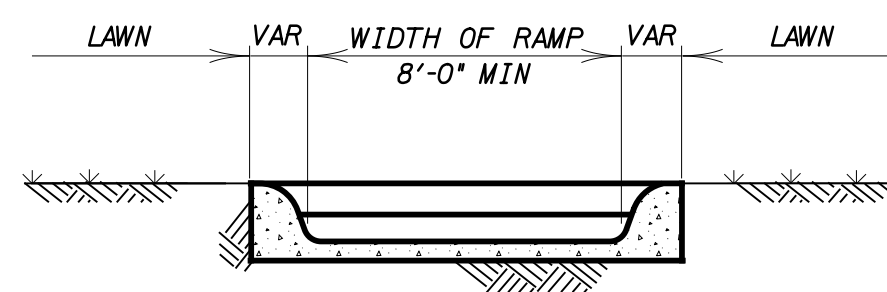
SECTION A-A



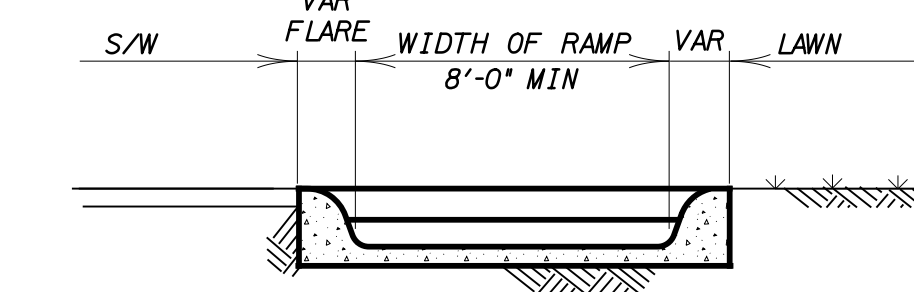
SECTION A-A

NOTE: ALL SIDEWALK RAMP TO BE A MINIMUM 6" THICK CONCRETE.

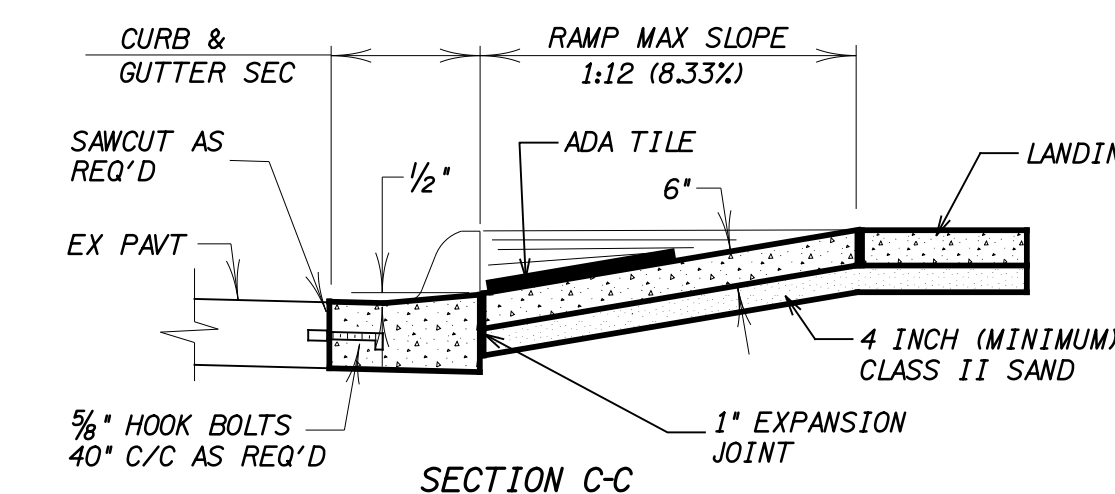
NOTE: ALL SIDEWALK RAMP TO BE A MINIMUM 6" THICK CONCRETE.



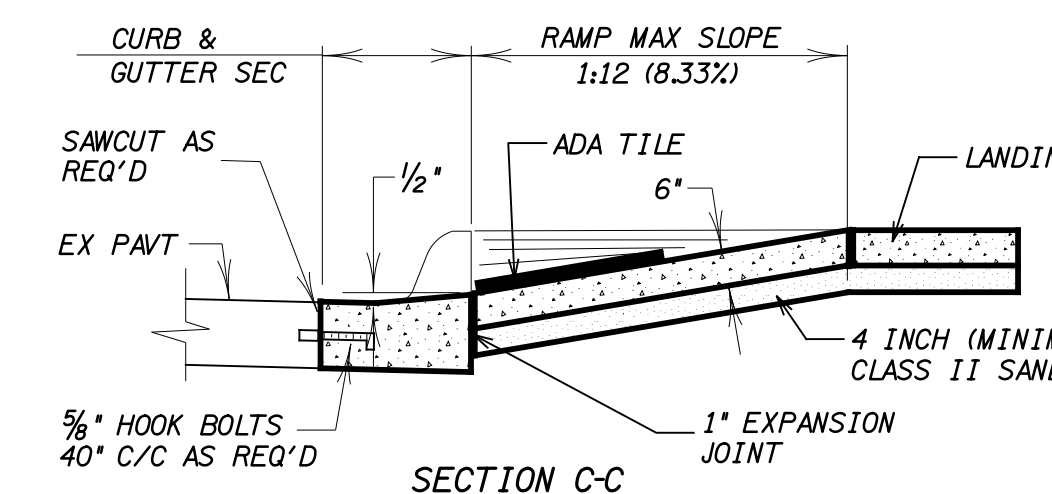
SECTION B-B



SECTION B-B



SECTION C-C



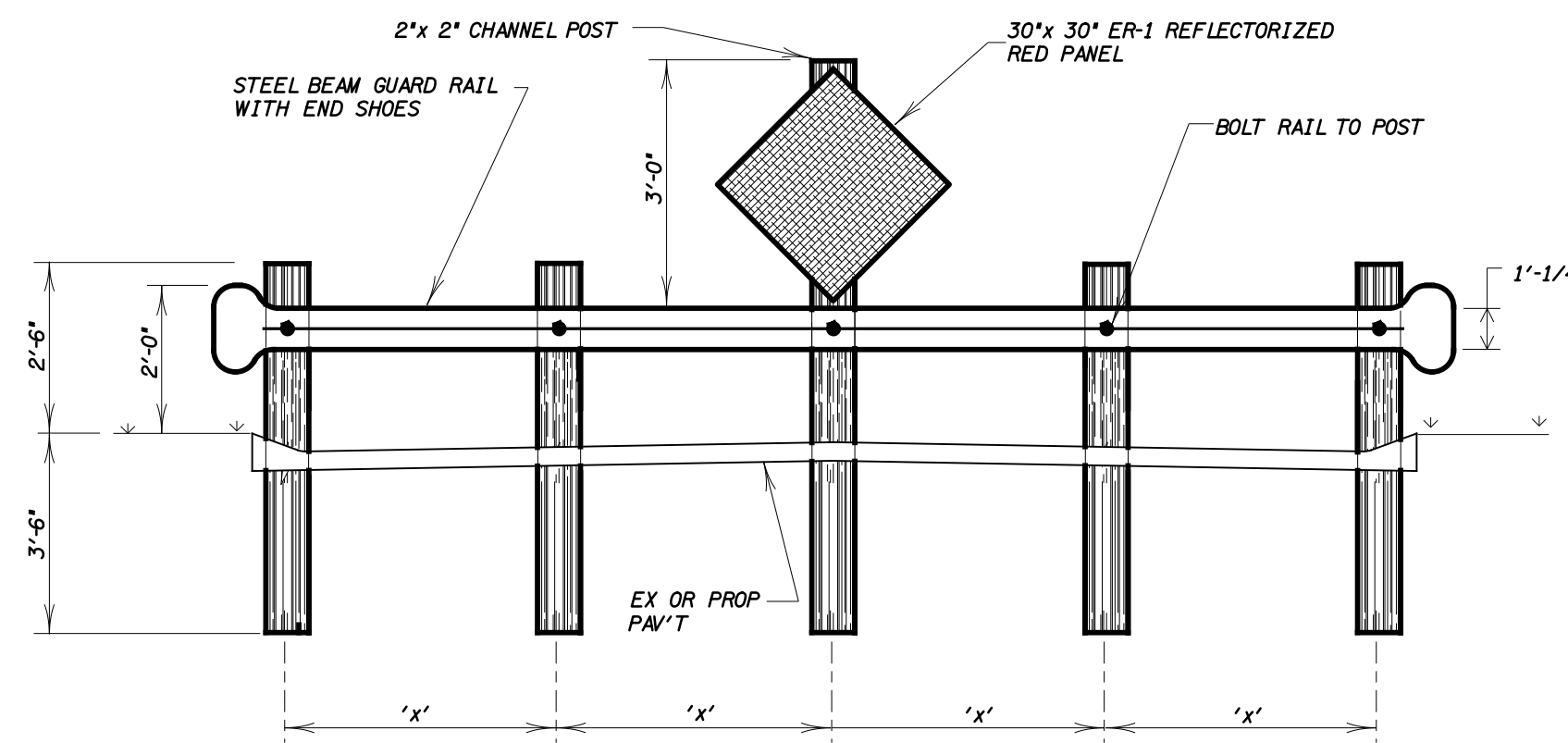
SECTION C-C

NOTE: PLACE EXPANSION JOINT AT B/C LINE OR SIDEWALK JOINT

NOTE: PLACE EXPANSION JOINT AT B/C LINE OR SIDEWALK JOINT

**ADA CONCRETE SIDEWALK RAMP**

NOTE: MAX SIDEWALK AND RAMP CROSS-SLOPE IS 2.0%. MAX LANDING SLOPE IS 2.0% IN ALL DIRECTIONS.

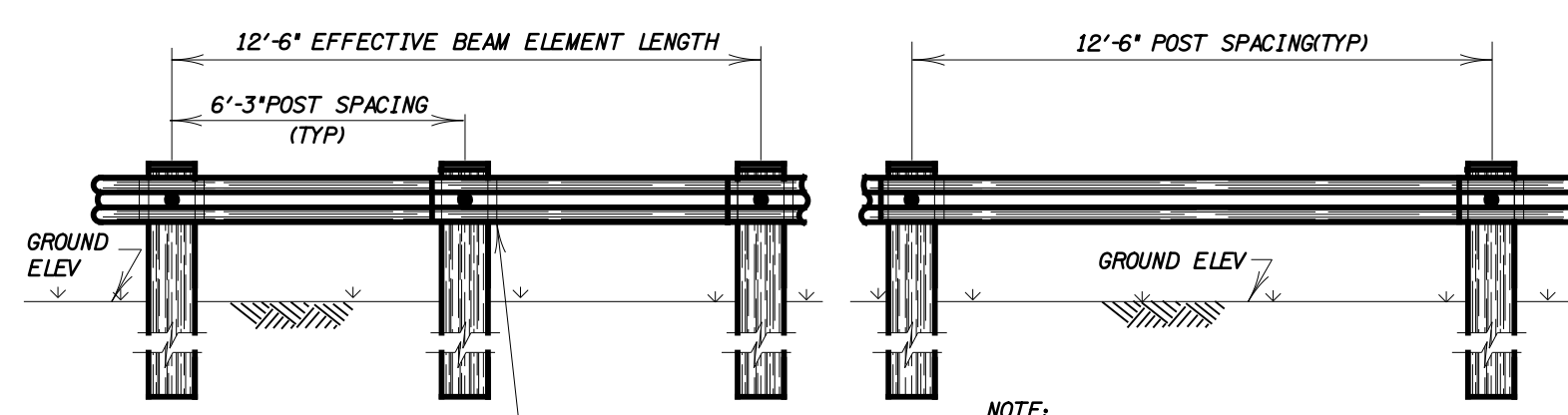


**NOTES:**

1. STEEL W6x9 x 6'-0" MAY REPLACE OAK POST
2. CHANNEL TO BE BOLTED TO OAK POSTS, OR BOLTED TO OAK POSTS
3. GUARD RAIL & FITTINGS TO CONFORM TO M.D.T. STANDARDS

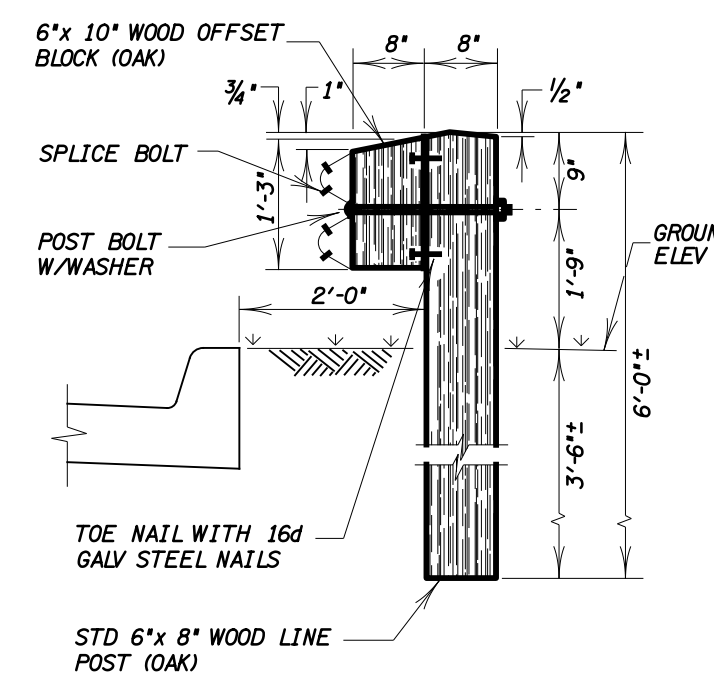
WIDTH OF PAWT	X	NO OF POSTS
27FT B/B	6'-0"	5
36FT B/B	5'-6"	7

**ROAD END STEEL BEAM GUARD RAIL**



BEAM GUARDRAIL - TYPE 'B'

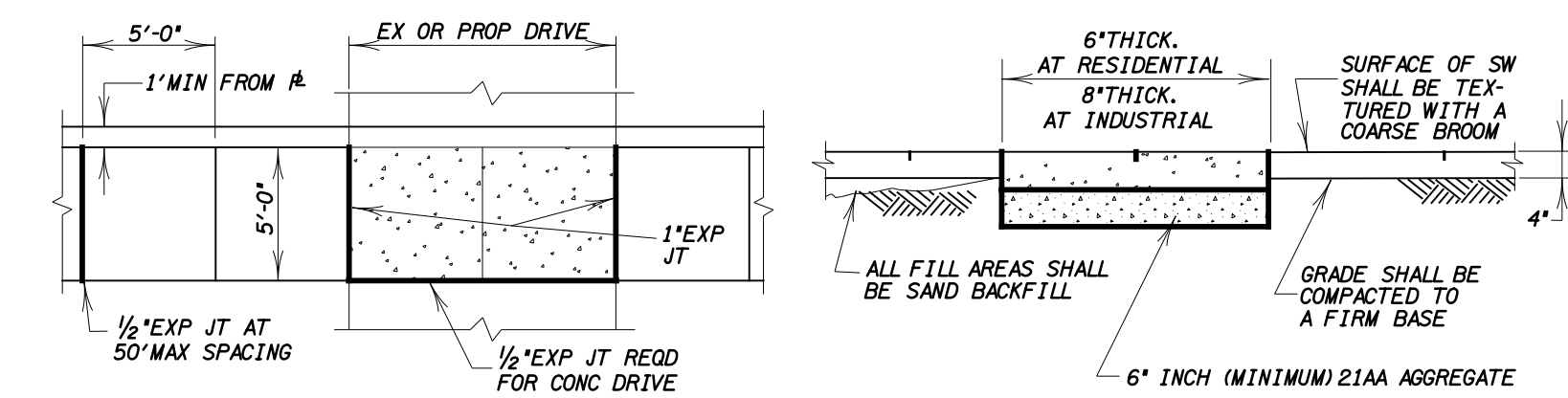
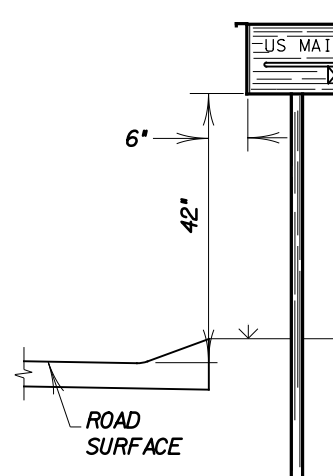
NOTE: GUARD RAIL END SECTIONS & REFLECTORIZED WASHER MATERIALS SHALL CONFORM WITH THE MDT STANDARDS (111-SOCKTYPE 'B')



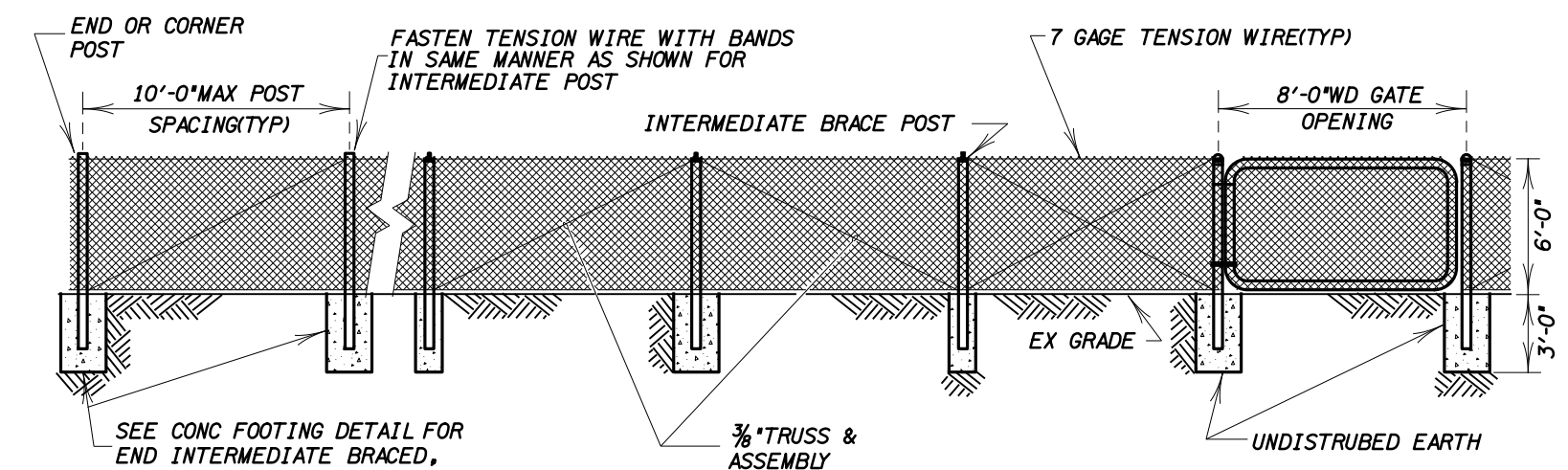
MAIL-BOX LOCATION

**NOTES:**

1. HEIGHT OF MAILBOX IS 42" FROM SURFACE OF ROAD
2. ON ROADS WITH GRAVEL SHOULDERS, LOCATE FACE OF MAILBOX 6" FROM EDGE OF SHOULDER.
3. ON ROADS WITH S/D SHOULDERS, LOCATE FACE OF MAILBOX 6" FROM EDGE OF PAVEMENT.
4. ROADS WITH CURBS, LOCATE FACE OF MAILBOX 6" FROM BACK OF CURB.



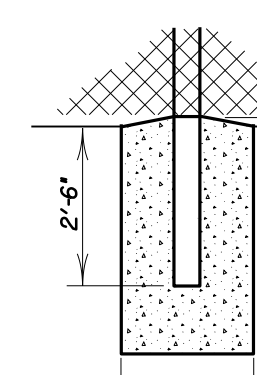
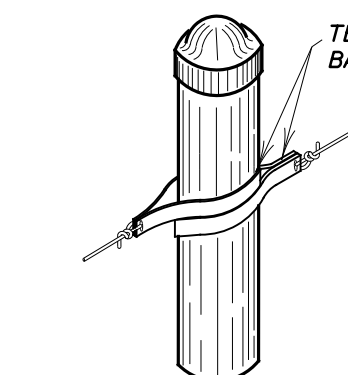
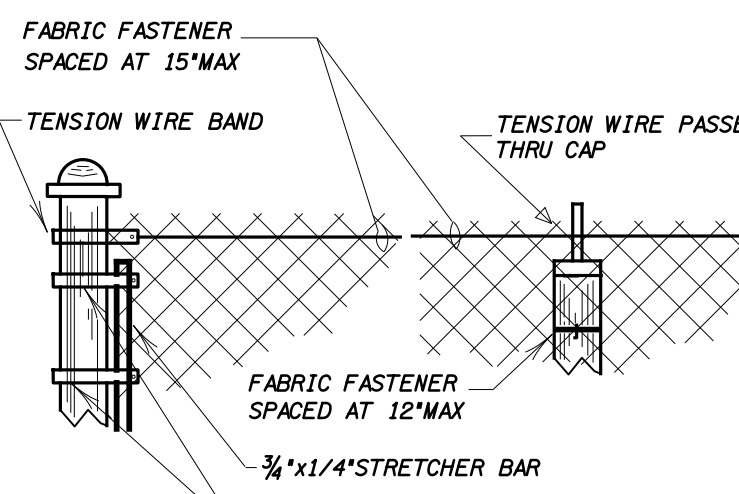
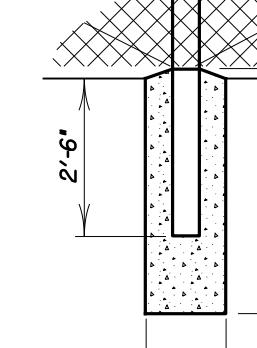
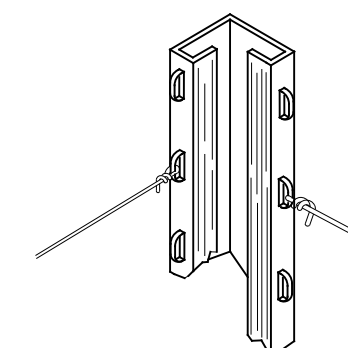
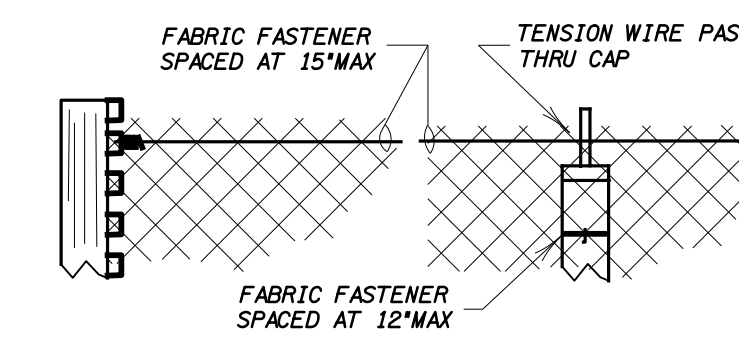
SIDEWALK PLACEMENT DETAIL AT DRIVE CROSSING



CORNER OR END CHANNEL POST TYPE 'H' LINE POST

INTERMEDIATE OR CORNER CHANNEL POST

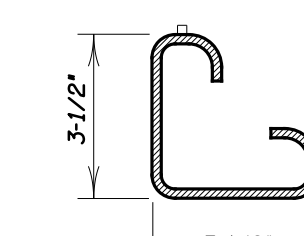
LINE POST



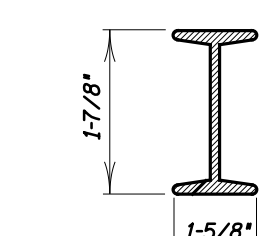
CORNER OR END ROUND POST ROUND LINE POST

INTERMEDIATE OR CORNER ROUND POST

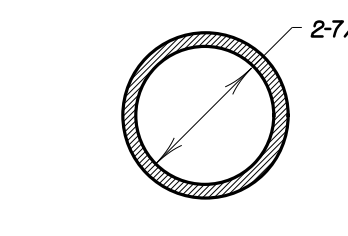
END POST



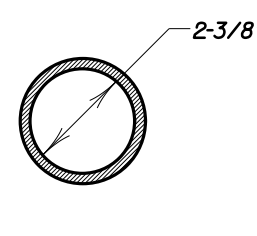
CHANNEL POST



TYPE 'H' LINE POST



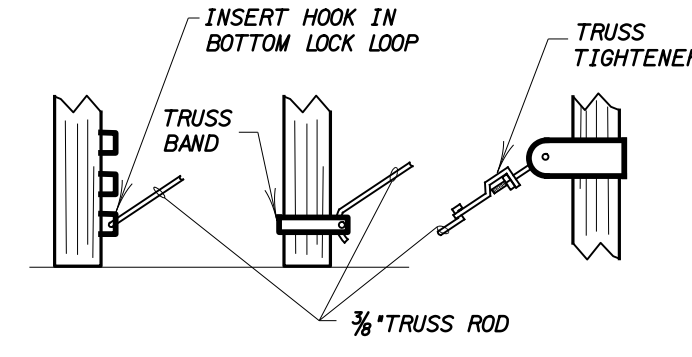
BRACE POST



LINE POST

**NOTES:**

1. INTERMEDIATE BRACED POSTS SHALL BE PLACED AT 660 FT INTERVALS OR MIDWAY BETWEEN END AND CORNER POSTS WHEN THIS DISTANCE IS LESS THAN 1320 FT AND MORE THAN 660 FT
2. TENSION WIRE WILL BE STRETCHED TIGHT
3. TOP & BOTTOM SELVAGES OF FENCE FABRIC SHALL HAVE A KNUCKLED FINISH.
4. ALTERNATE MATERIALS MAY BE USED WITH THE APPROVAL OF THE CITY ENGINEER.
5. FENCE FABRIC SHALL BE FASTENED TO TOP TENSION WIRE AND TO EACH POST.
6. IF HOG RINGS ARE USED THEY SHALL BE 12 GAGE IF TIGHTLY CRIMPED ABOUT BOTH THE TENSION WIRE AND THE FABRIC WIRE, OR 11 GAGE IF UNCRIMPED
7. TENSION WIRE WILL BE 7 GAGE.
8. RODS SHALL BE GROUNDED EVERY 500 FEET.



BRACE POST

**GENERAL STANDARDS**

SHEET 1 OF 1

CITY OF WIXOM  
OAKLAND COUNTY, MICHIGAN  
STANDARD CONSTRUCTION DETAIL SHEET



HRC  
HUBBELL, ROTH & CLARK, INC  
Consulting Engineers

DATE	REVISION
XX-XX-2012	ADOPTED BY CITY COUNCIL

TIME - 07-MAR-2013 13:20

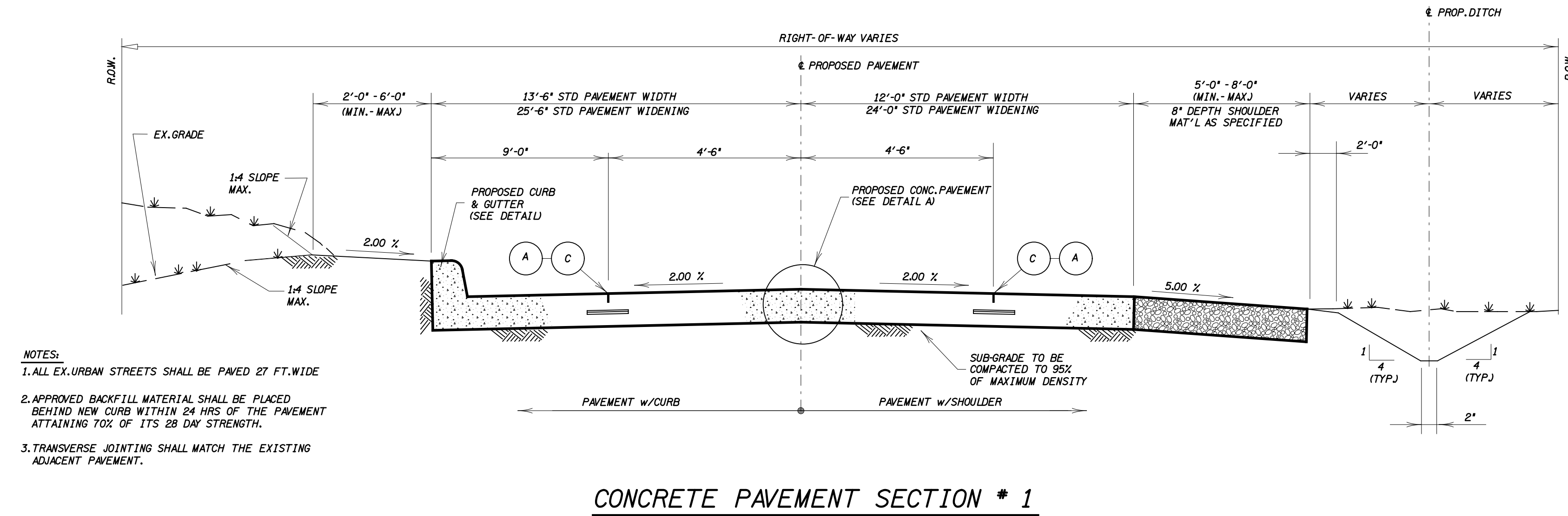
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QUELE - \Vigoria\BIBand

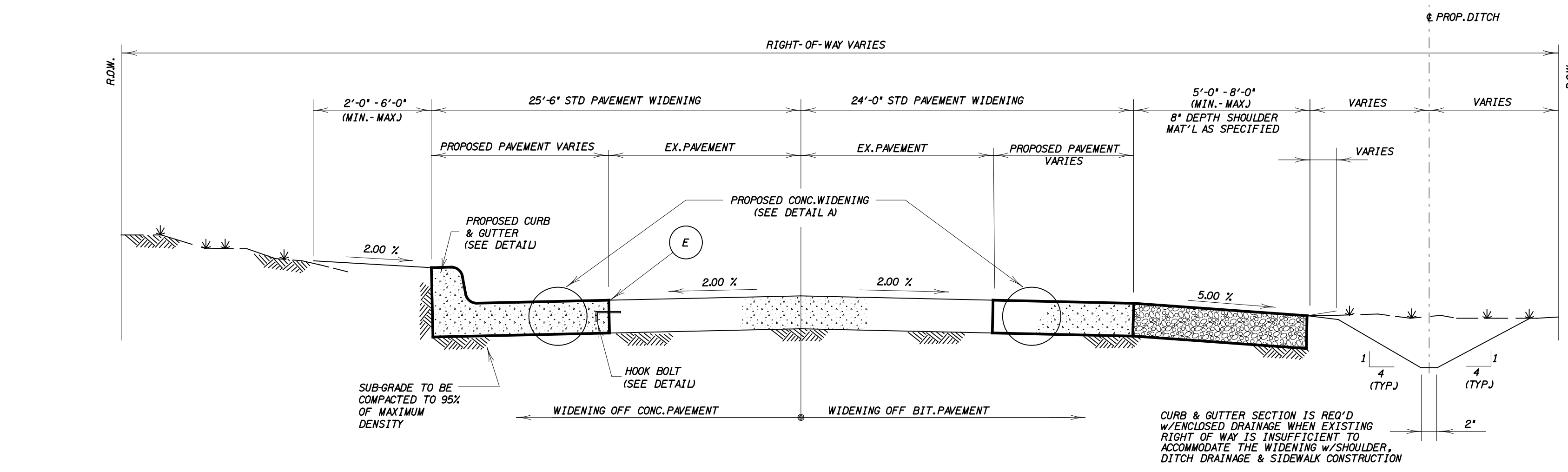
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USER NAME - d.james



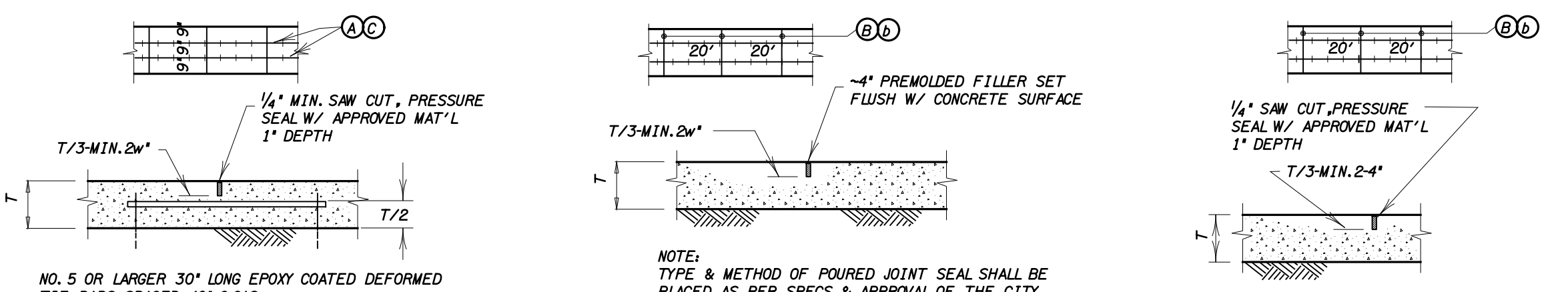
- NOTES:
1. ALL EX. URBAN STREETS SHALL BE PAVED 27 FT. WIDE
  2. APPROVED BACKFILL MATERIAL SHALL BE PLACED BEHIND NEW CURB WITHIN 24 HRS OF THE PAVEMENT ATTAINING 70% OF ITS 28 DAY STRENGTH.
  3. TRANSVERSE JOINTING SHALL MATCH THE EXISTING ADJACENT PAVEMENT.

CONCRETE PAVEMENT SECTION # 1



- NOTE:
1. WHEN WIDENING A CONCRETE PAVEMENT, THE EXISTING PAVEMENT SHALL BE REMOVED TO THE NEXT JOINT, WHEN THE DIMENSION FOR THE PAVEMENT TO REMAIN IS 6'-0\"/>

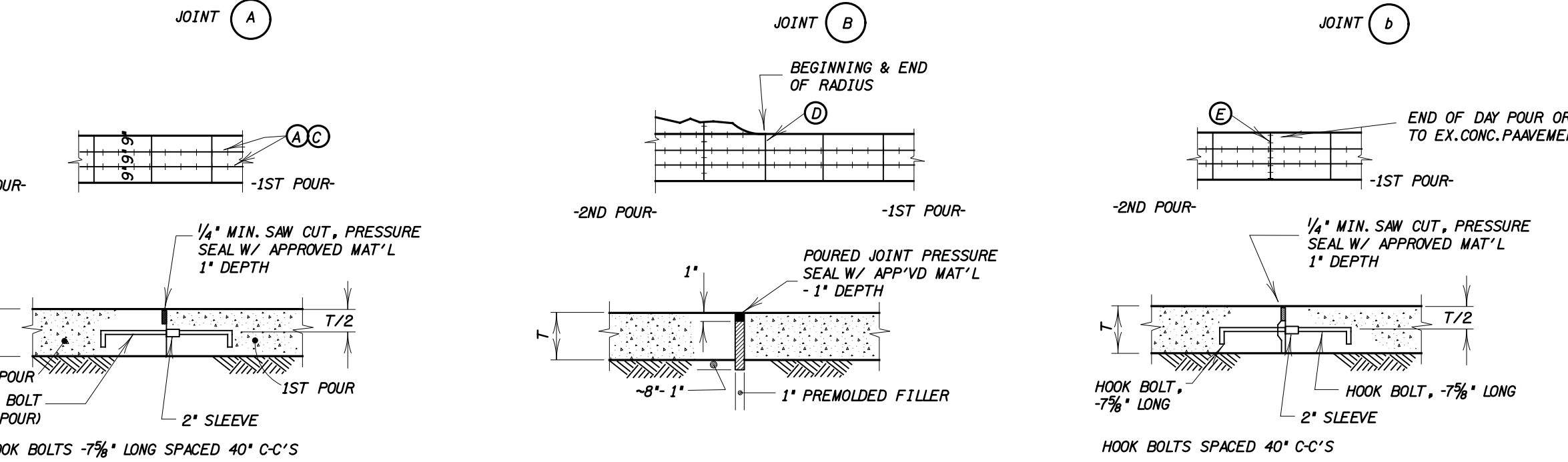
CONCRETE PAVEMENT SECTION # 2



LONGITUDINAL LANE TIE JOINT

PREMOLDED CONSTRUCTION JOINT

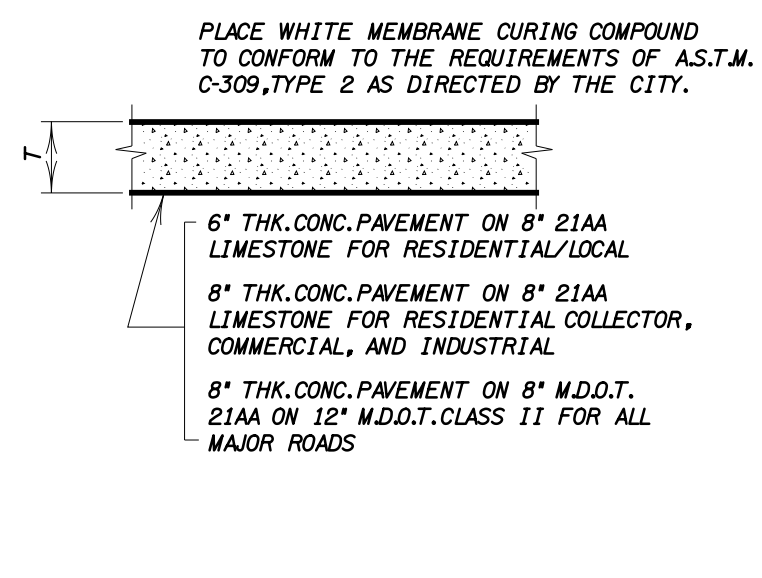
SAWED CONSTRUCTION JOINT



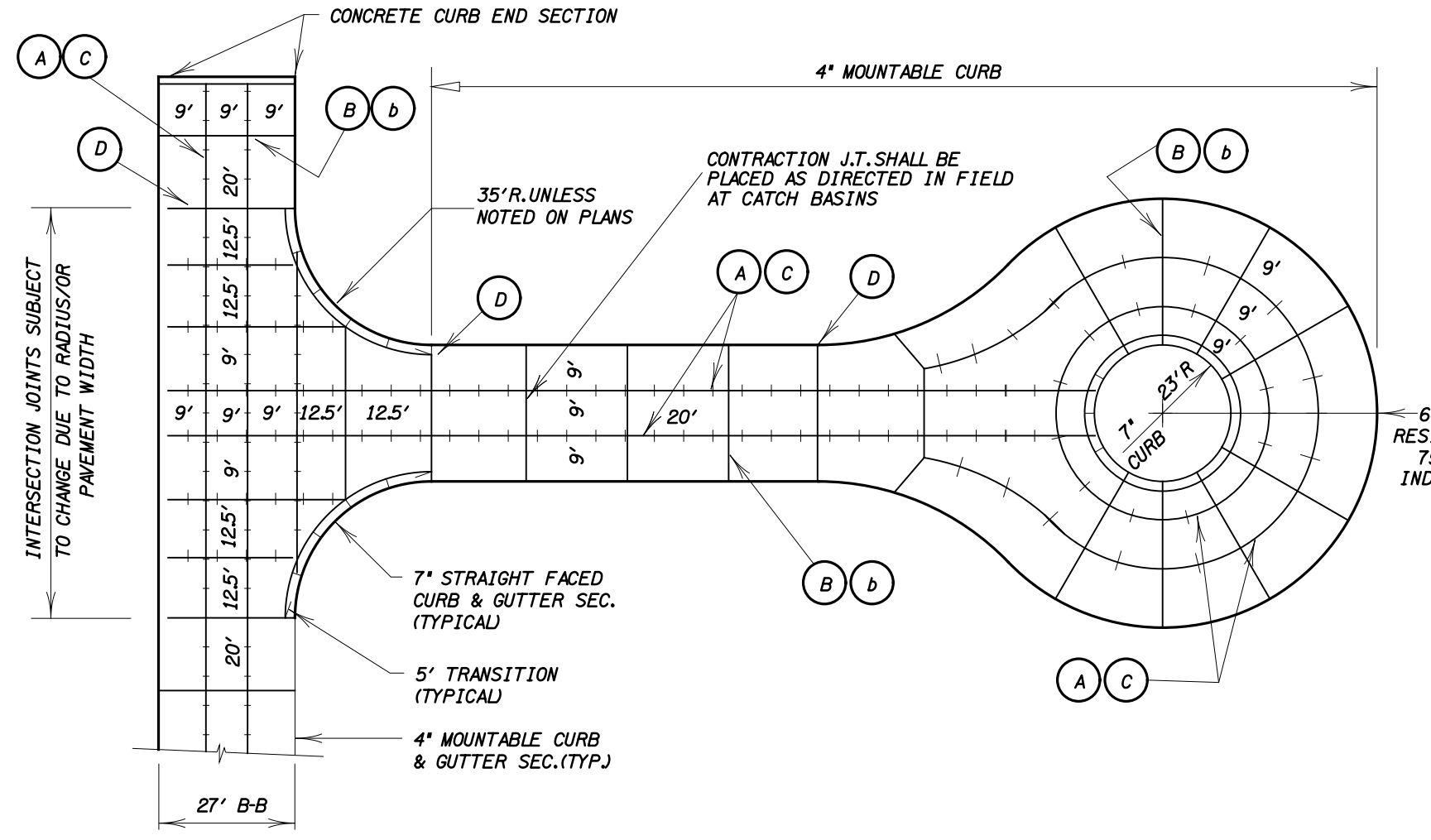
LONGITUDINAL BULKHEAD JOINT

EXPANSION JOINT

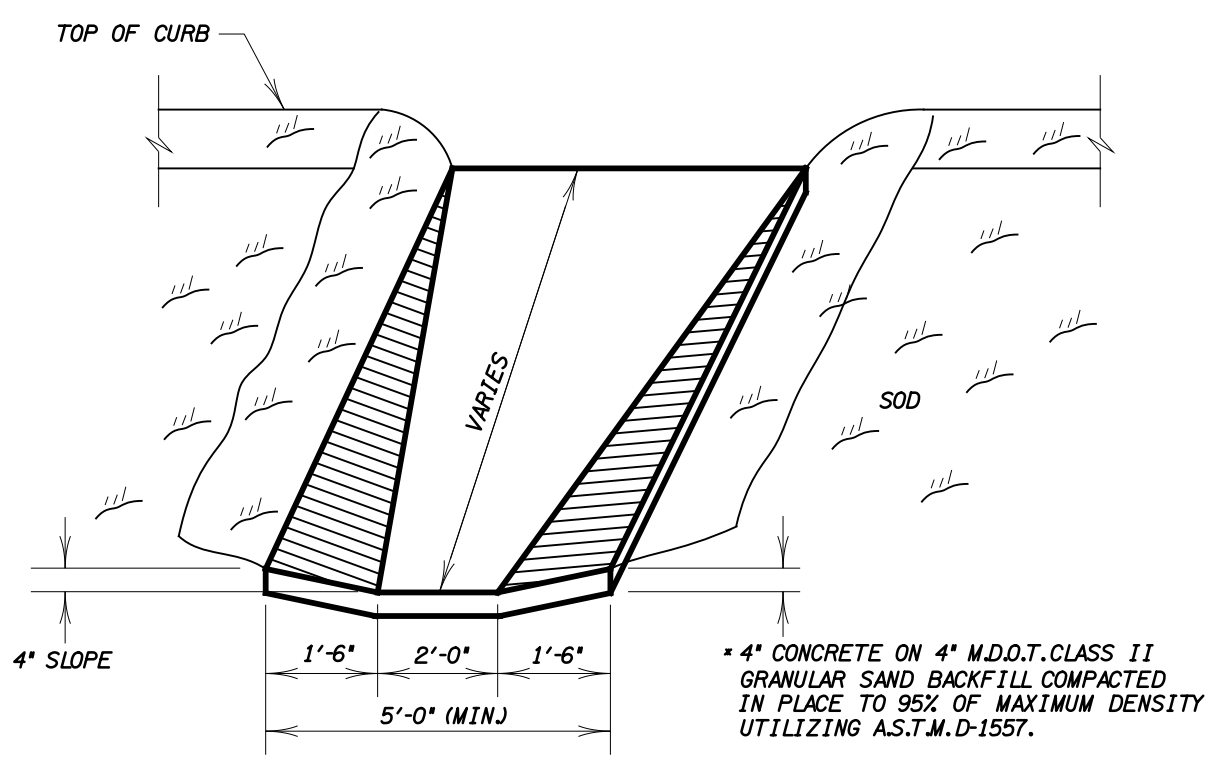
TRANSVERSE CONSTRUCTION JOINT



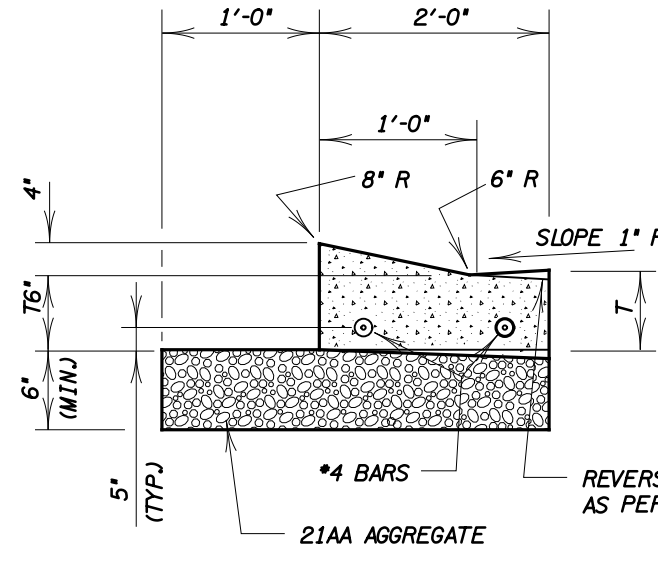
DETAIL A



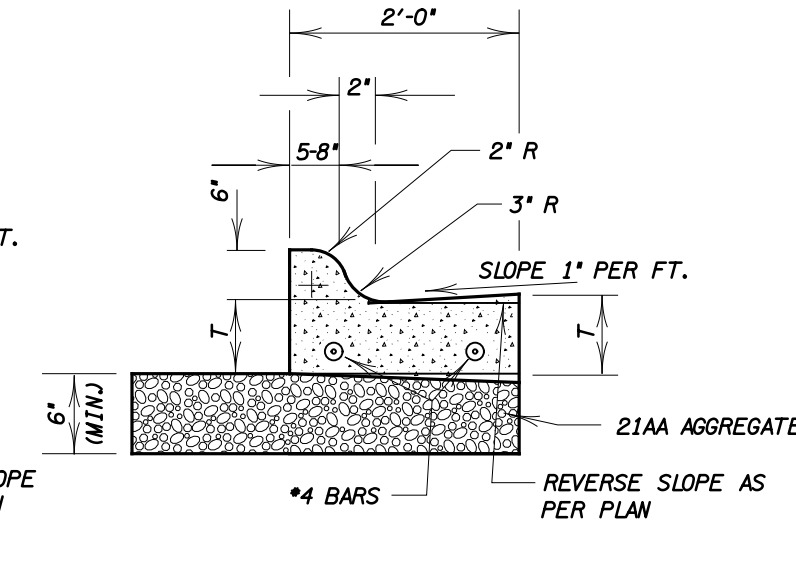
CONCRETE PAVEMENT JOINTS - RESIDENTIAL



CONCRETE SPILLWAY

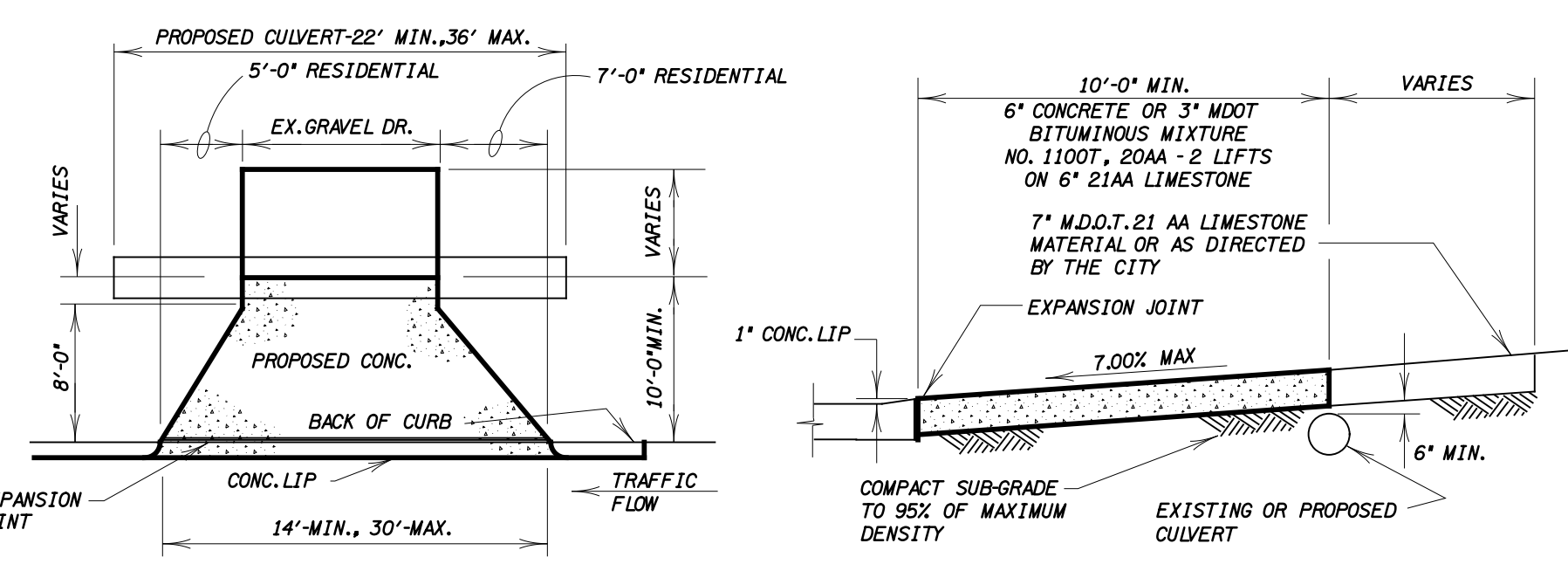


4\"/>



6\"/>

- NOTES:
1. WHITE MEMBRANE CURING COMPOUND SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. C-309, TYPE 2 AND PLACED AS DIRECTED BY THE CITY.
  2. T = THICKNESS OF CONCRETE PAVEMENT OR 9\"/>



RESIDENTIAL DRIVEWAY

**PAVEMENT STANDARDS**  
SHEET 1 OF 2

CITY OF WIXOM  
OAKLAND COUNTY, MICHIGAN  
STANDARD CONSTRUCTION DETAIL SHEET

*City of Wixom*

HRC  
HUBBELL, ROTH & CLARK, INC.  
Consulting Engineers

DATE	REVISION
XX-XX-2012	ADOPTED BY CITY COUNCIL

TIME - 12 NOV 2012 11:50

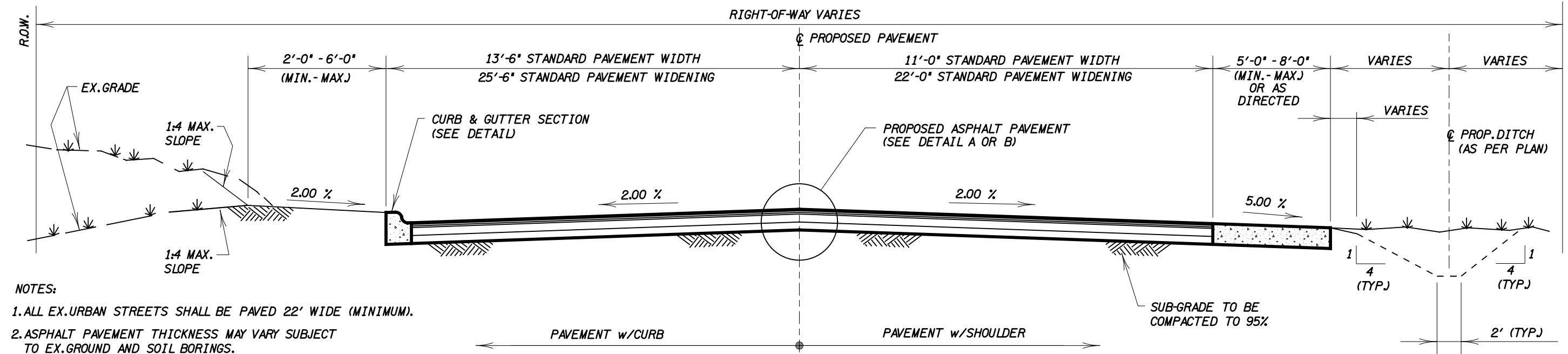
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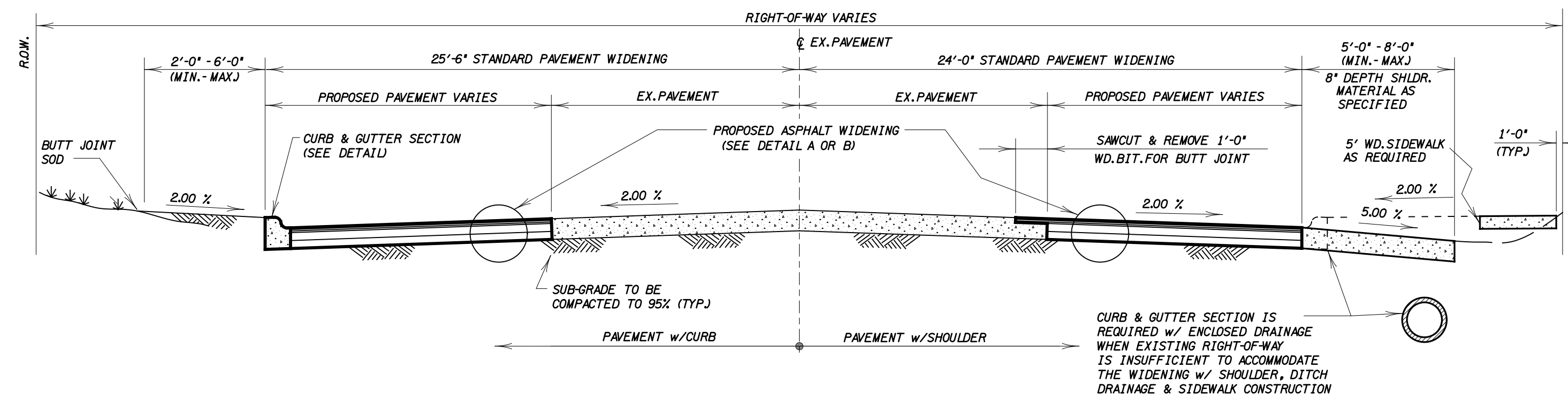
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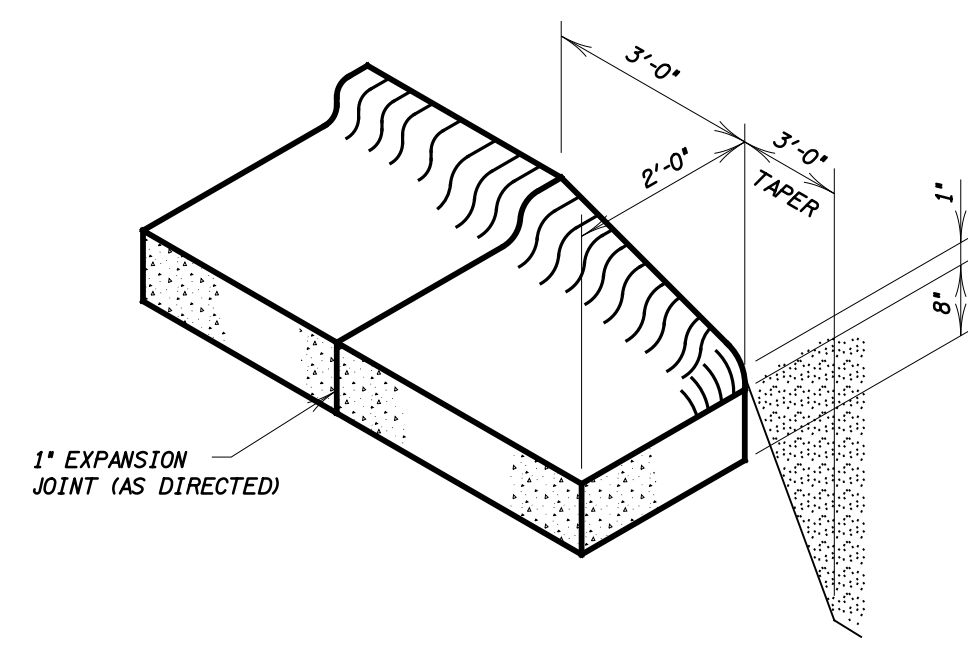


- NOTES:
1. ALL EX. URBAN STREETS SHALL BE PAVED 22' WIDE (MINIMUM).
  2. ASPHALT PAVEMENT THICKNESS MAY VARY SUBJECT TO EX. GROUND AND SOIL BORINGS.
  3. BITUMINOUS WEARING OVERLAY SHALL BE PLACED 12 MONTHS AFTER PLACEMENT OF BASE COURSE OR AS DIRECTED.
  4. APPROVED BACKFILL MATERIAL SHALL BE PLACED BEHIND NEW CURB WITHIN 24 HOURS OF THE CONCRETE CURB ATTAINING 70% OF ITS 28 DAY STRENGTH.

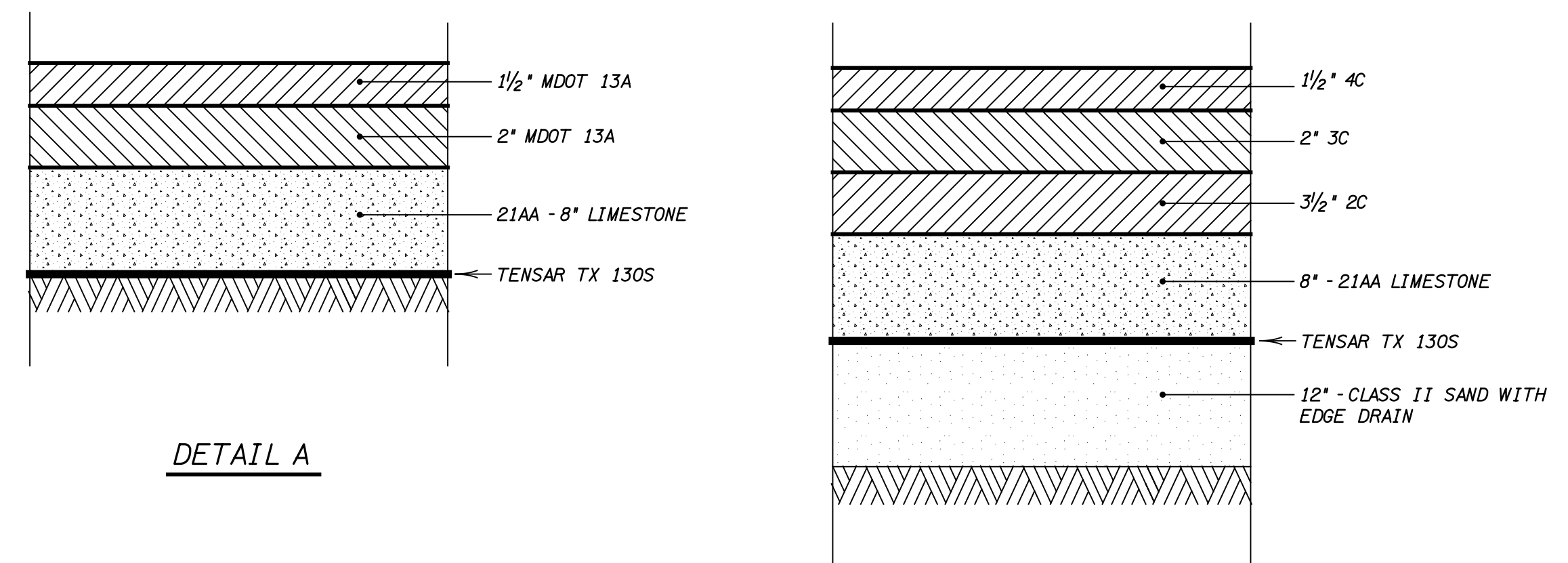
**BITUMINOUS PAVEMENT SECTION No. 1**



**BITUMINOUS WIDENING SECTION No. 2**

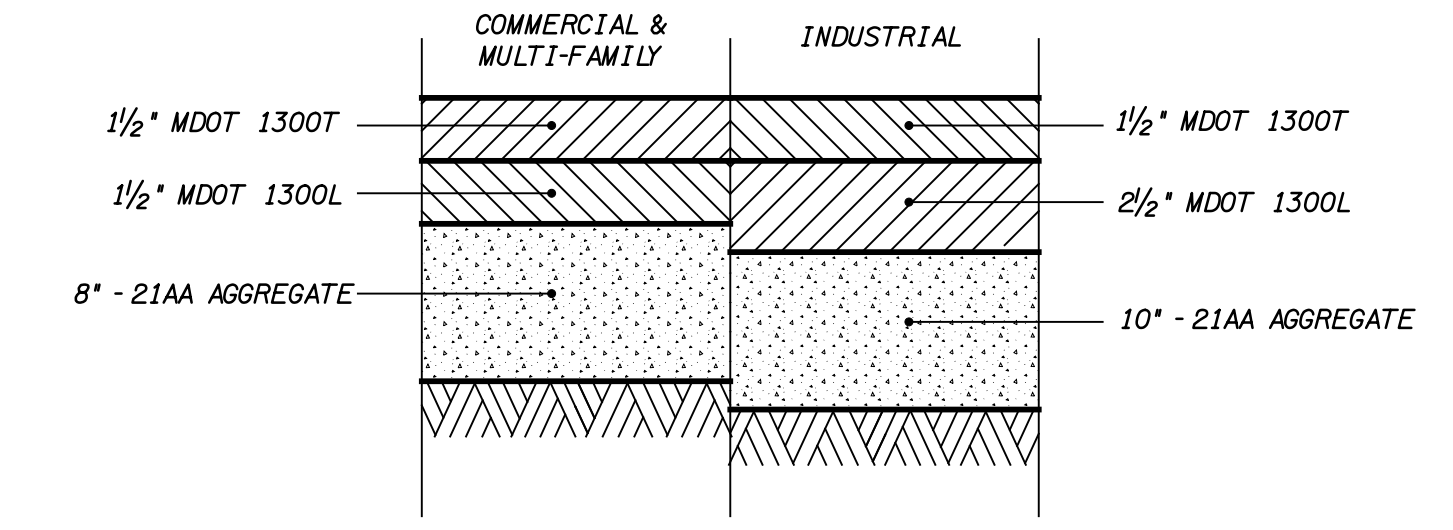


**CONCRETE CURB END SECTION**



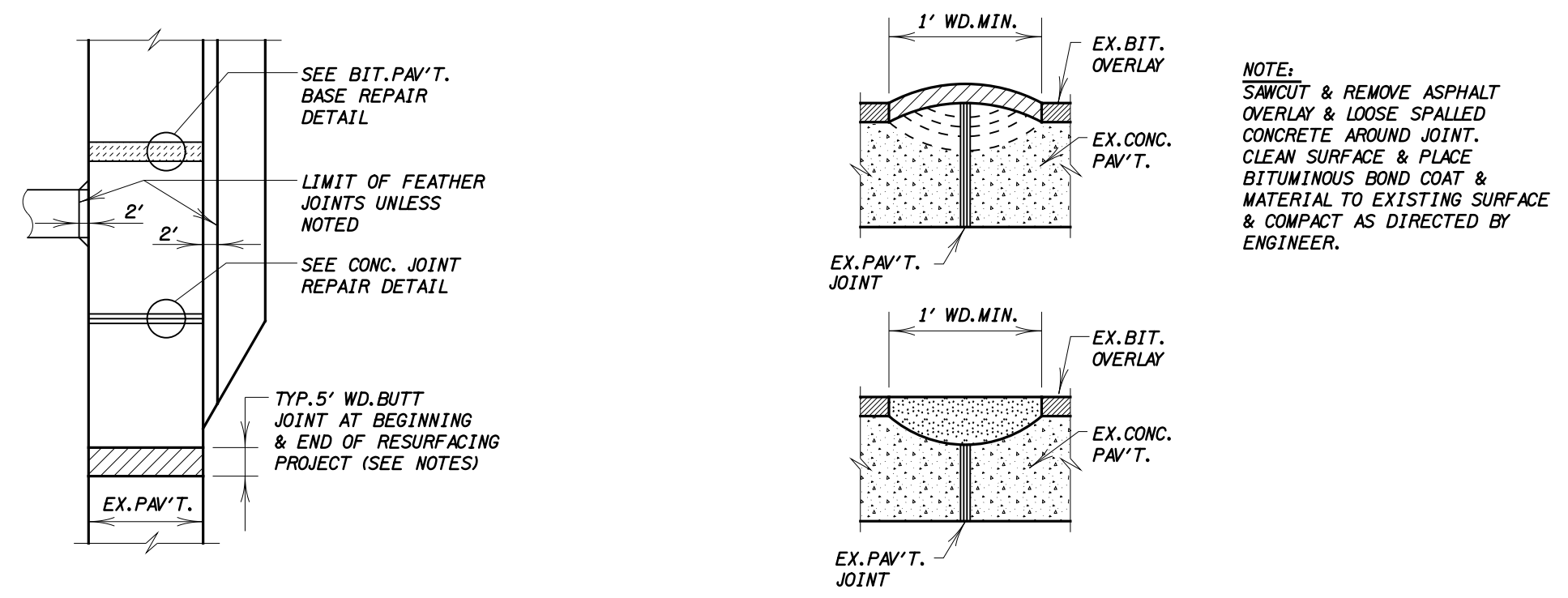
**DETAIL A**

**DETAIL B - MAJOR ROADS**



**DETAIL C - PARKING LOT PAVEMENT**



**TYPICAL BITUMINOUS SECTIONS**



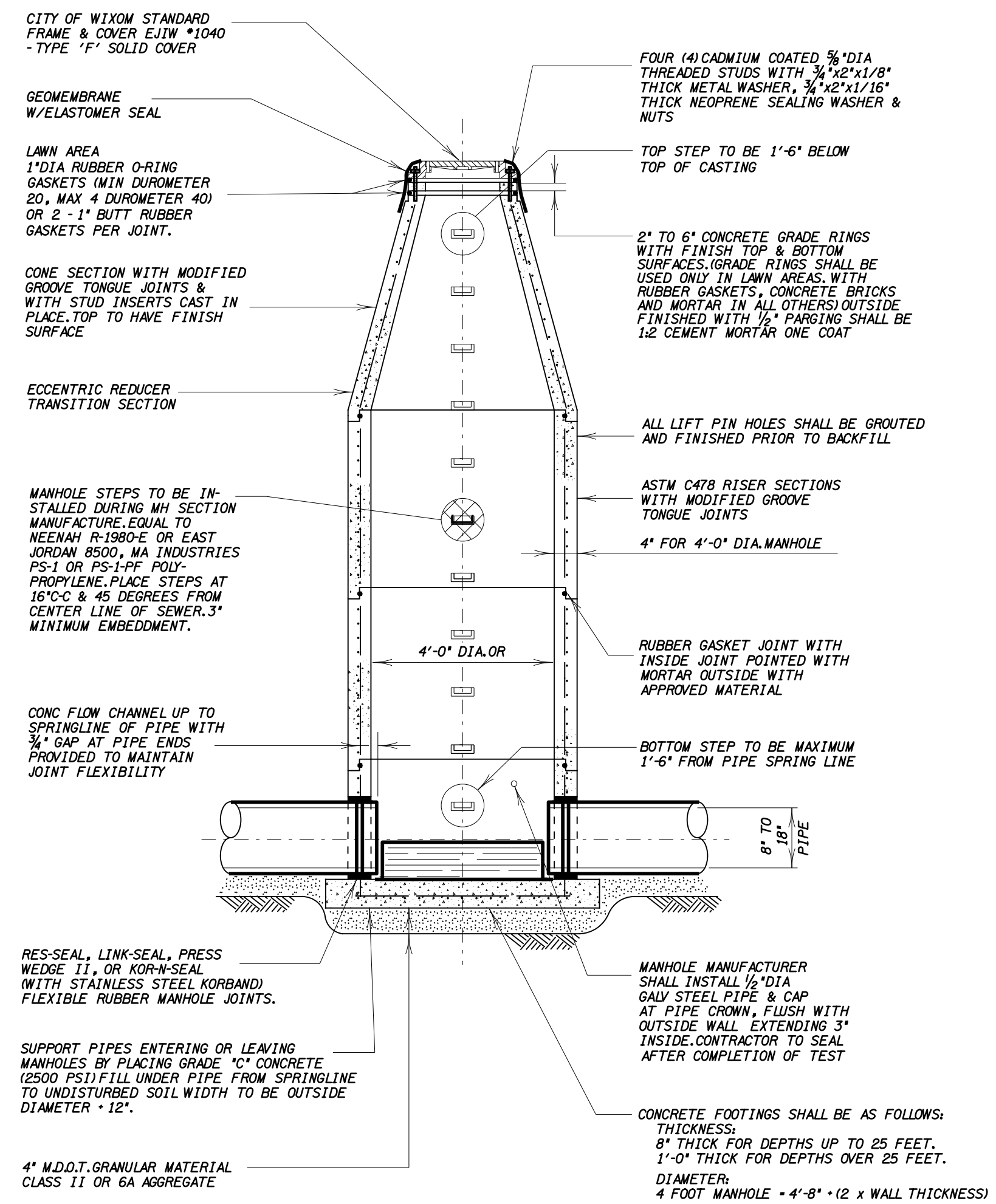
**TYPICAL JOINT DETAIL**

**CONCRETE JOINT REPAIR**

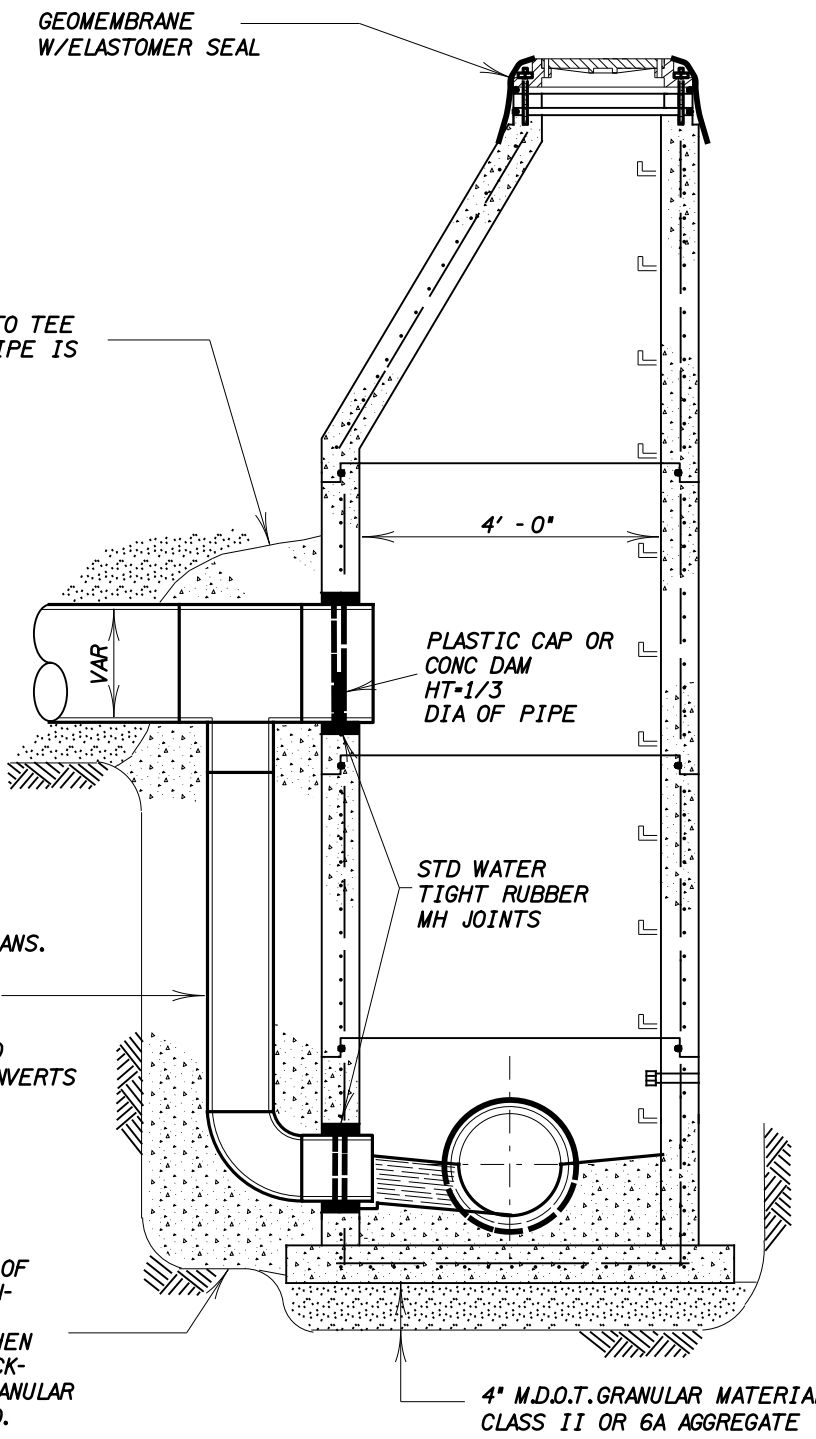
NOTE:  
UNDERCUTTING AND BACKFILLING OF UNSTABLE AREAS SHALL BE COMPLETED BY THE DEVELOPER/ BIDDERS AT THE CITY'S SOLE DISCRETION.

<b>PAVEMENT STANDARDS</b>		CITY OF WIXOM OAKLAND COUNTY, MICHIGAN STANDARD CONSTRUCTION DETAIL SHEET	
SHEET <u>2</u> OF <u>2</u>		  HUBBELL, ROTH & CLARK, INC Consulting Engineers	
DATE	REVISION		
XX-XX-2012	ADOPTED BY CITY COUNCIL		

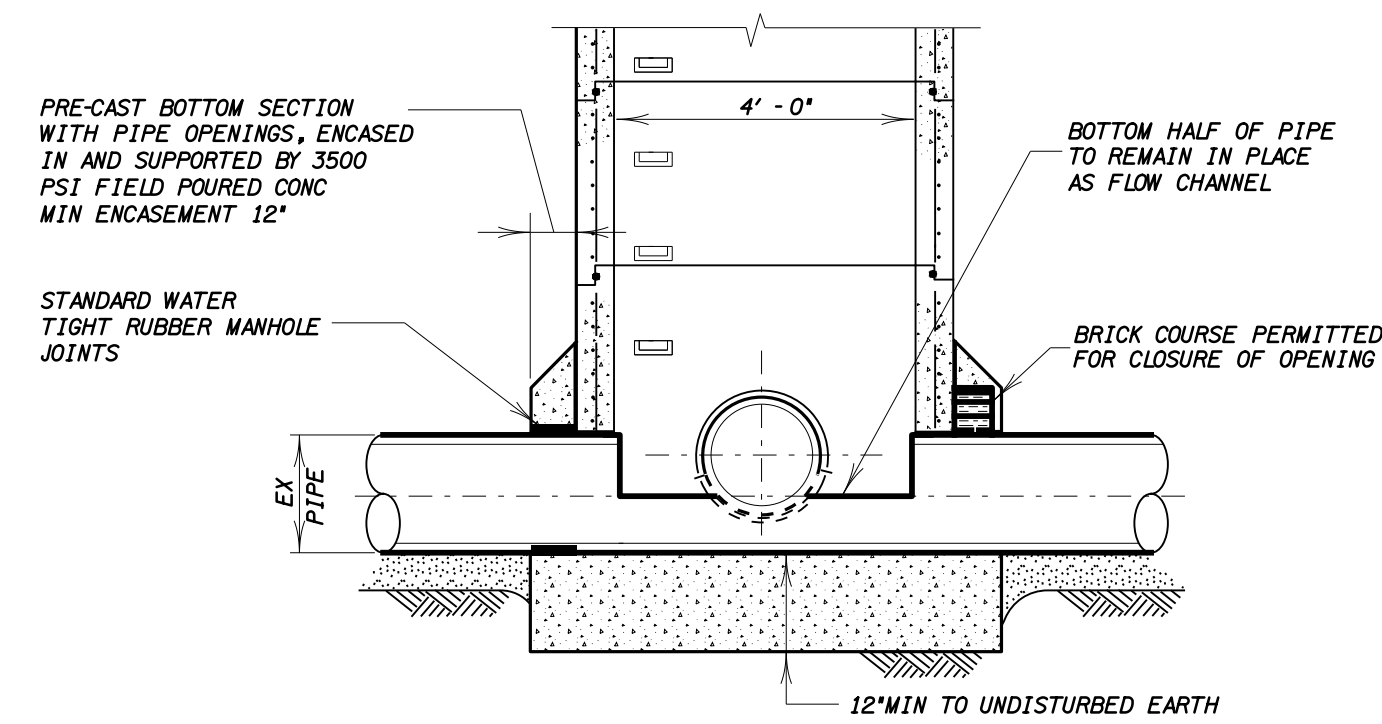
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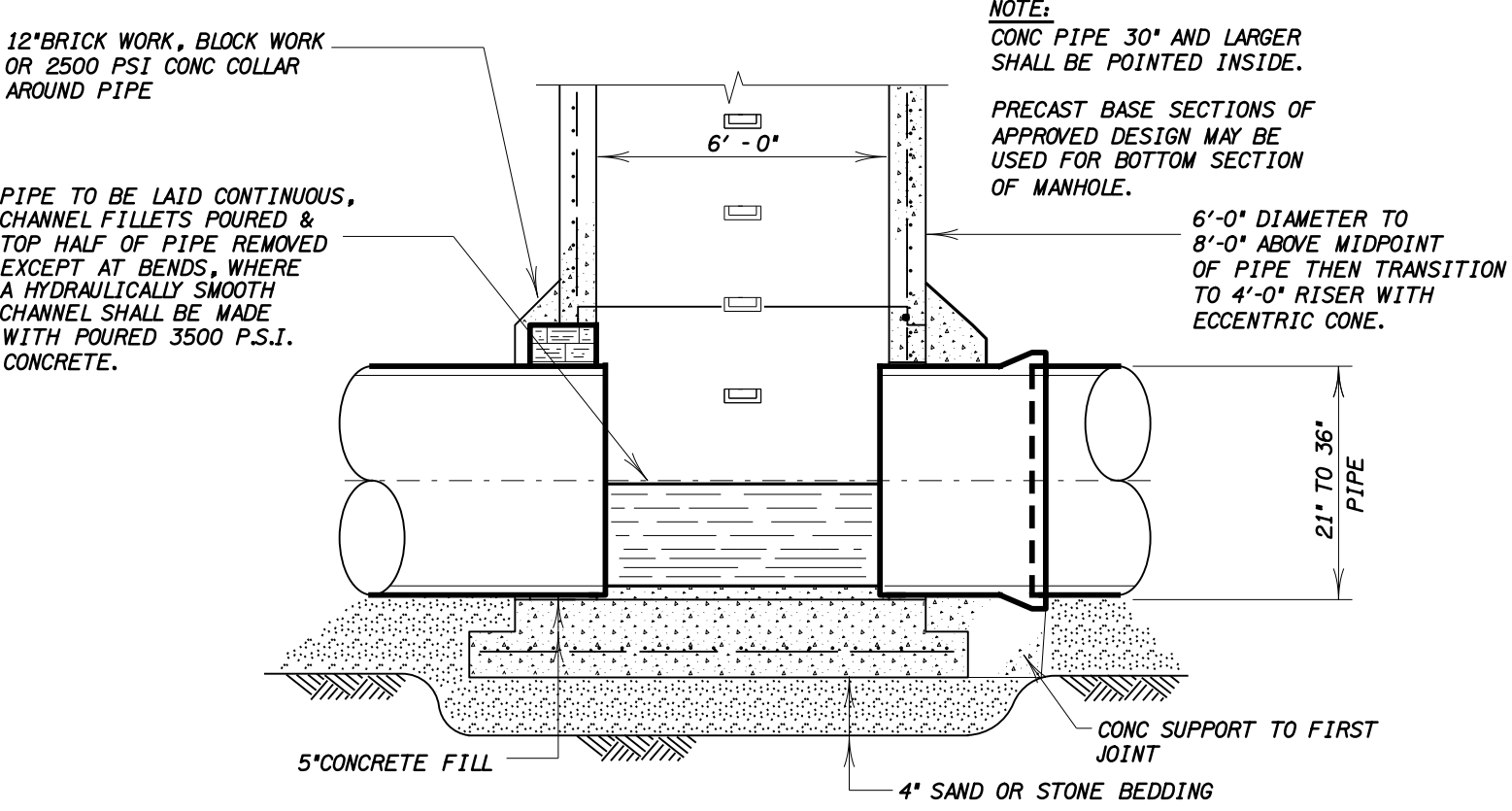
**SANITARY MANHOLE**



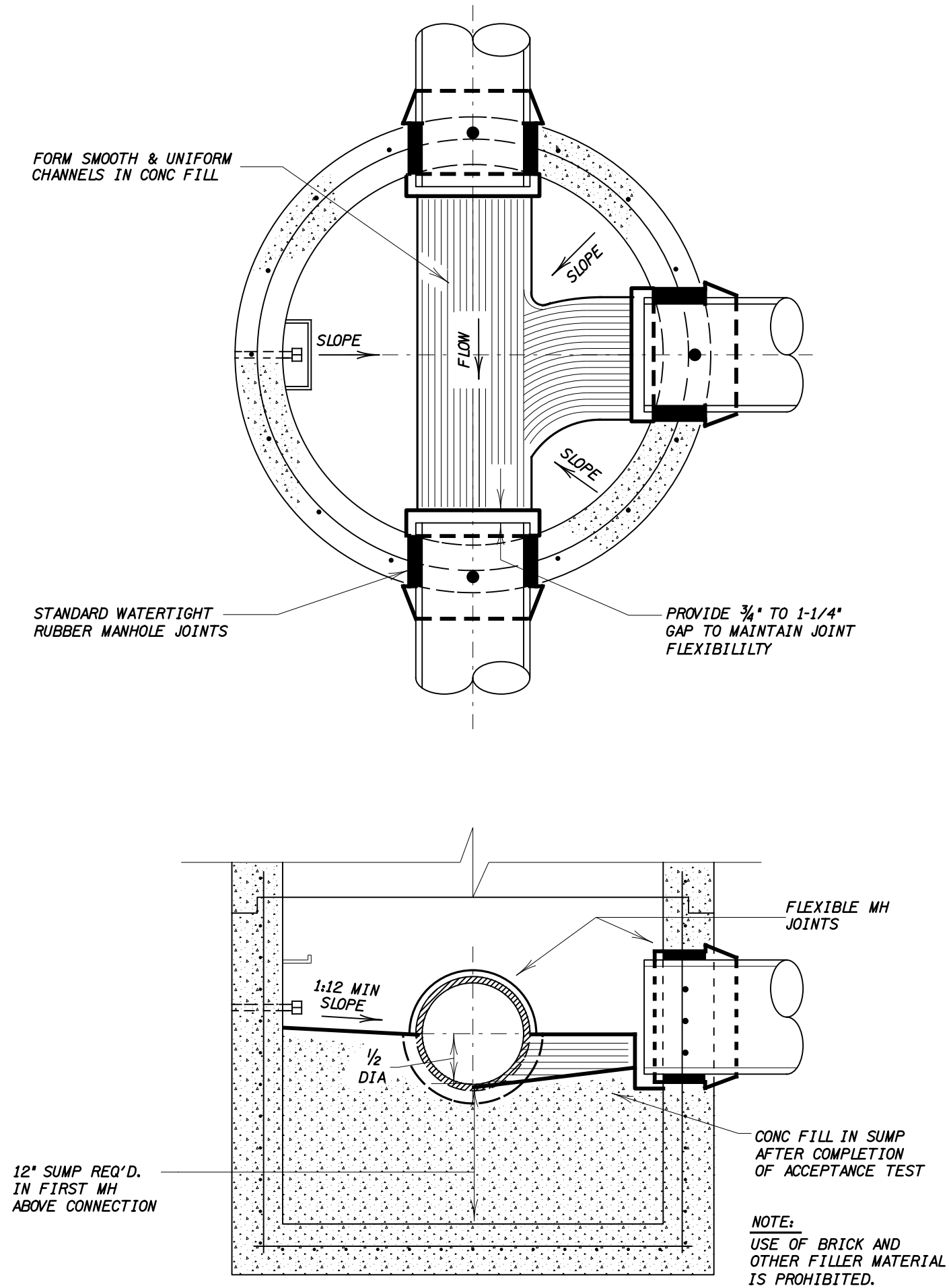
**DROP MANHOLE CONNECTION**



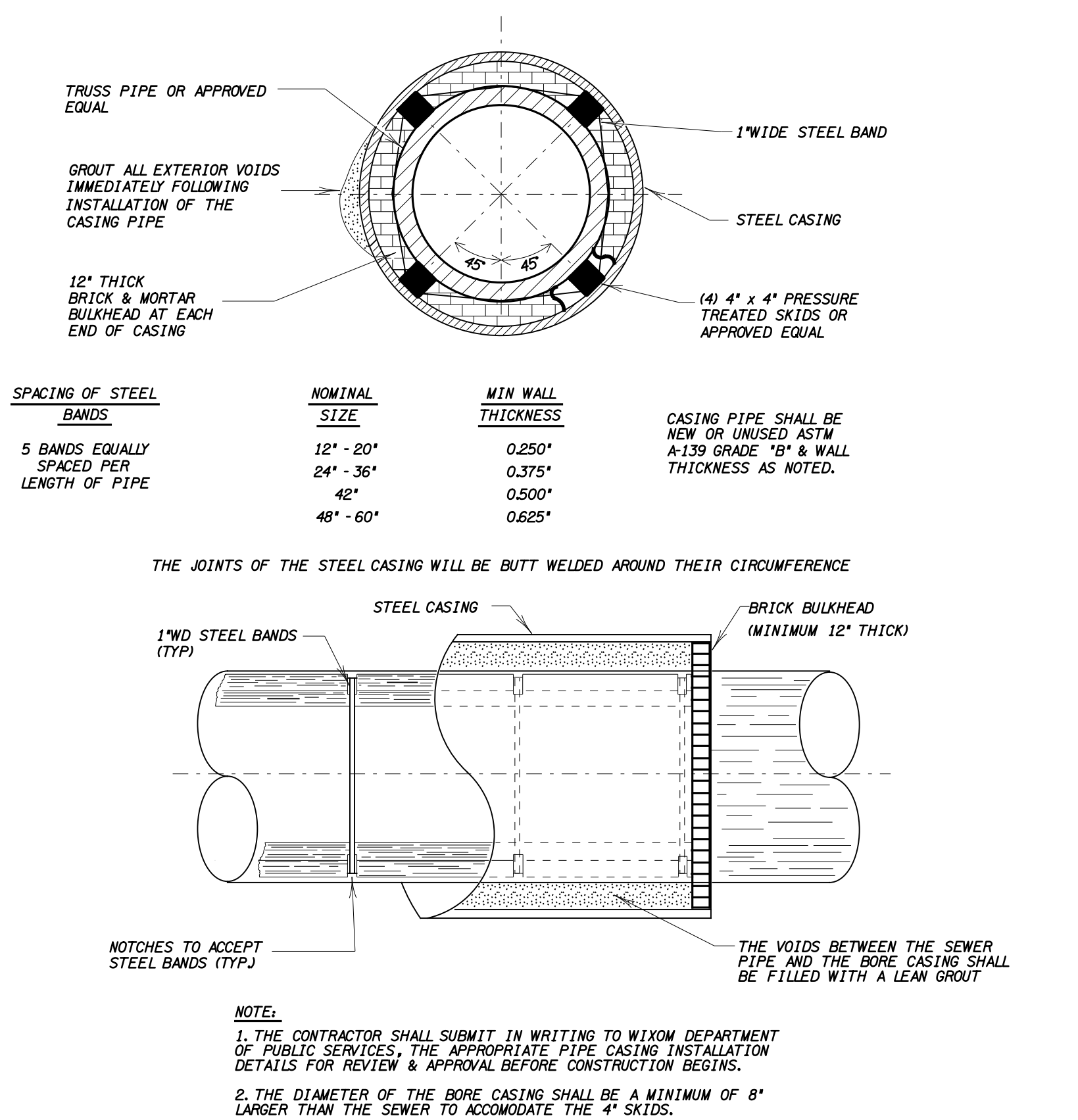
**MANHOLE CONSTRUCTION OVER EXISTING SANITARY SEWER**



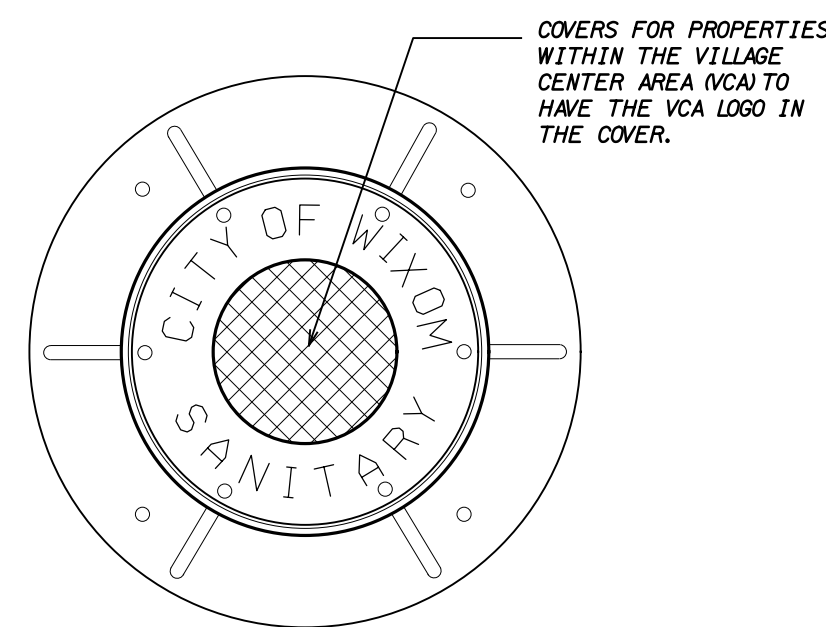
**MANHOLE CONSTRUCTION FOR 21" TO 36" DIAMETER SANITARY SEWER**



**SANITARY SUMP MANHOLE**

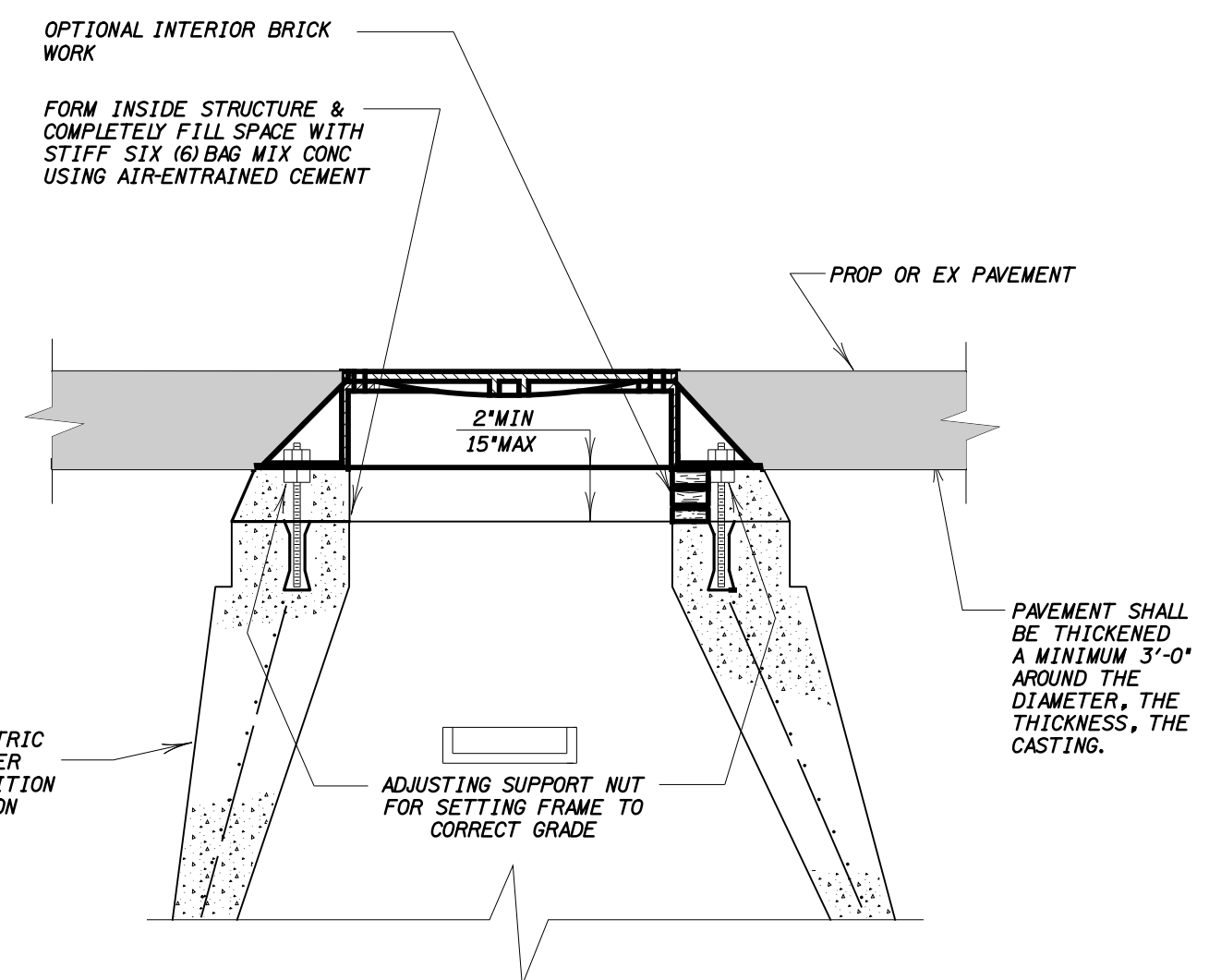


**SEWER MAIN BORE**



**SANITARY MANHOLE COVER**

PIPE I.D.	TRENCH WIDTH
4" - 12"	32"
15"	36"
18"	39"
21"	43"
24"	46"
27"	50"
30"	53"
36"	68"
42"	75"



**RIM ADJUSTMENT WITHIN PAVEMENT**

**SANITARY SEWER STANDARDS**  
SHEET 1 OF 2

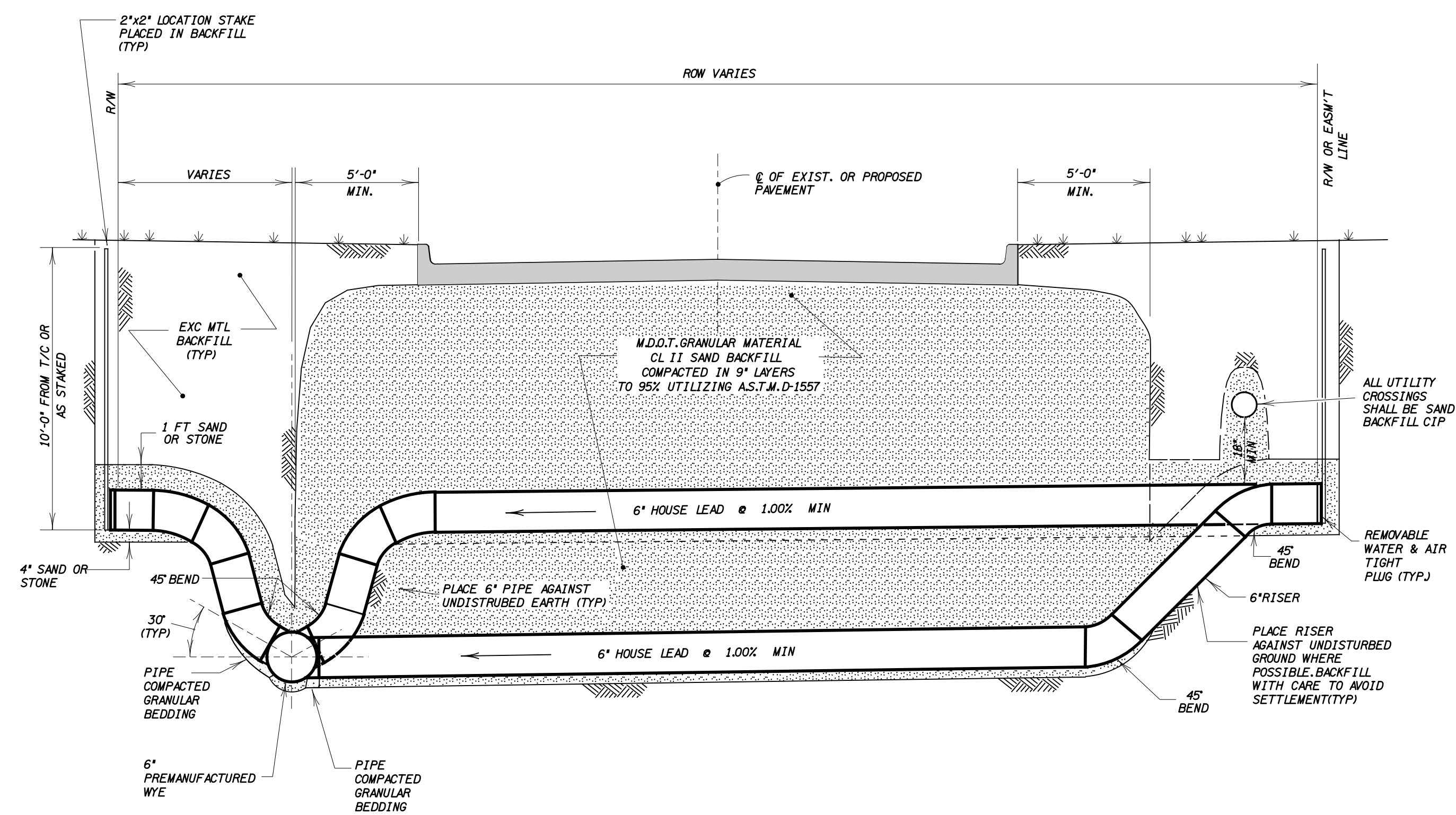
CITY OF WIXOM  
OAKLAND COUNTY, MICHIGAN  
STANDARD CONSTRUCTION DETAIL SHEET

**City of WIXOM**  
HUBCELL, ROTH & CLARK, INC.  
Consulting Engineers

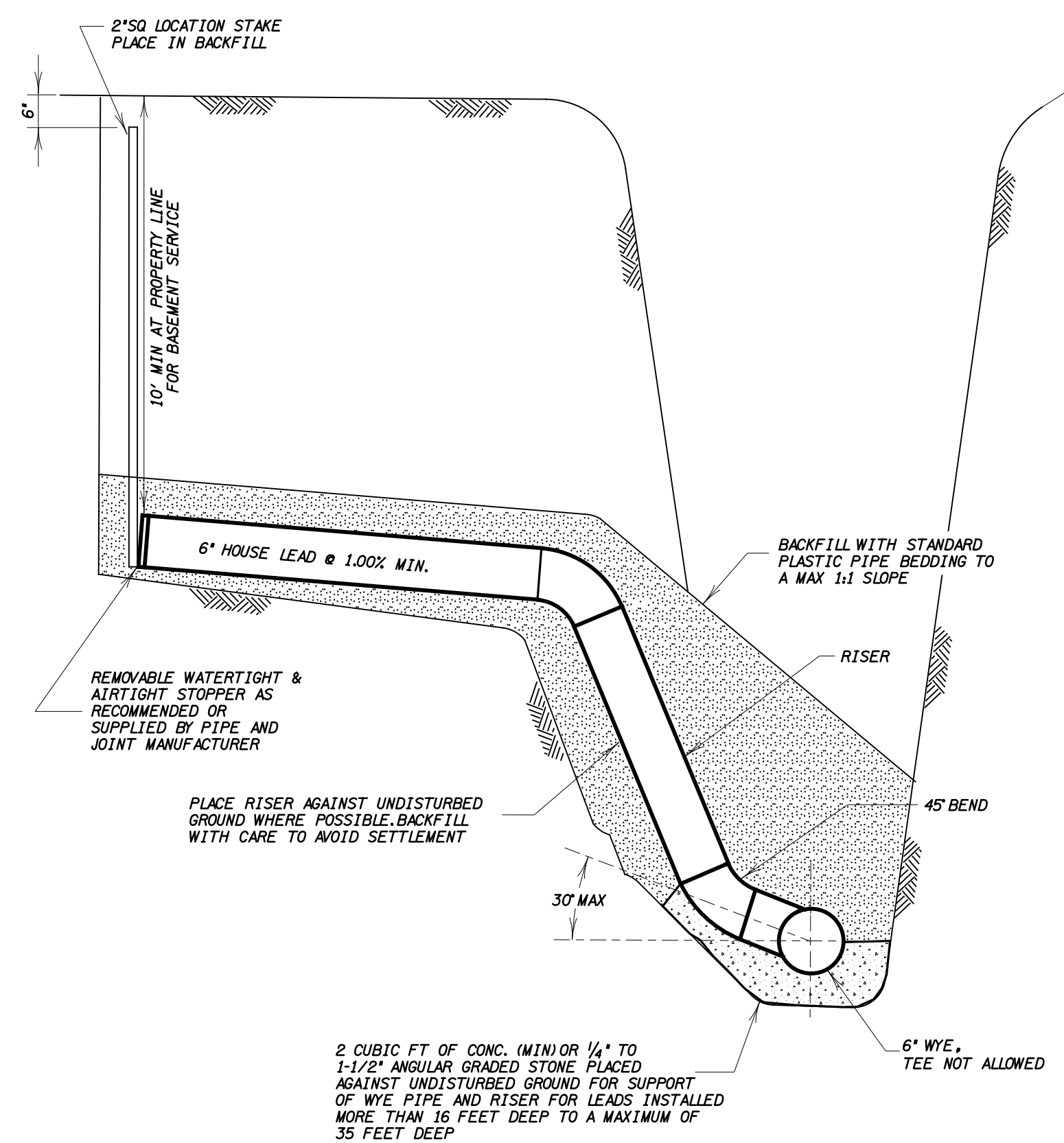
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XX-XX-2012	ADOPTED BY CITY COUNCIL

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 TIME = 12-NOV-2012 11:19

NOTE:  
 ALL UTILITIES - PUBLIC OR PRIVATE THAT FALL WITHIN A ONE ON ONE ZONE OF INFLUENCE FROM A POINT 5'-0" BEHIND BACK OF CURB AT TOP OF CURB SHALL BE BACKFILLED WITH M.D.T.GRANULAR MATERIAL, CLASS II COMPACTED TO 95% OF MAXIMUM DENSITY UTILIZING A.S.T.M.D-1557.



**6" HOUSE LEAD CONSTRUCTION**



**HOUSE LEAD DETAIL**

**GENERAL NOTES**

- ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS & SPECIFICATIONS OF THE CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES. SANITARY SEWER CONSTRUCTION SHALL HAVE FULL TIME INSPECTION SUPERVISED BY A LICENSED PROFESSIONAL ENGINEER PROVIDED BY OR CAUSED TO BE PROVIDED BY THE CITY OF WIXOM.
- BEFORE THE START OF CONSTRUCTION, THE CONTRACTOR MUST REQUEST AND HAVE IN HIS POSSESSION AN APPROVED CONNECTION PERMIT ISSUED BY CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES. REQUEST FOR APPLICATION FOR PERMIT MUST BE ACCOMPANIED BY AN INSPECTION FEE. THE CONTRACTOR SHALL NOTIFY THE CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES 24 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION.
- NO SEWER INSTALLATION SHALL HAVE AN INFILTRATION EXCEEDING 100 GALLONS PER INCH DIA PER MILE OF PIPE PER 24 HOUR PERIOD AND NO SINGLE RUN OF SEWER BETWEEN MANHOLES SHALL EXCEED 100 GALLONS PER INCH DIA PER MILE. IF EXCEED INFILTRATION LIMITS ARE MORE CONSERVATIVE, THEN THEY SHALL APPLY. AIR TEST IN LIEU OF INFILTRATION TESTS SHALL BE ALLOWED SUBJECT TO APPROVAL OF THE CITY OF WIXOM.
- MODIFIED GROOVE TONGUE, ASTM C-425, ASTM C-443, O-RING, UNLOC, STRE-TITE, RING-TITE, OR EQUAL, AS APPROVED BY THE CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES MAY BE USED FOR SEWER JOINTS.
- A WATER TIGHT BULKHEAD WITH A CAPPED 1-INCH DIA PIPE TO PERMIT MEASURING INFILTRATION SHALL BE PROVIDED. A TEMPORARY 12-INCH DEEP SUMP SHALL ALSO BE PROVIDED IN THE FIRST MANHOLE ABOVE THE CONNECTION WHICH WILL BE FILLED IN AFTER SUCCESSFUL COMPLETION OF ANY INFILTRATION TEST UP TO THE STANDARD FILET PROVIDED FOR THE FLOW CHANNEL.
- BUILDING LEADS AND RISERS SHALL BE 6-INCH DIA, SDR 23.5 OR SCHEDULE 40 BUILDING LEADS TO BE FURNISHED WITH MANUFACTURER APPROVED REMOVABLE AIR-TIGHT AND WATER-TIGHT STOPPERS.
- SEWER PIPE SHALL BE INSTALLED IN STANDARD BEDDING OR BETTER.
- NEW MANHOLES SHALL HAVE WIXOM APPROVED FLEXIBLE, WATER-TIGHT SEALS WHERE PIPES PASS THROUGH WALLS. MANHOLES SHALL BE OF PRECAST SECTIONS WITH MODIFIED GROOVE TONGUE AND RUBBER GASKET TYPE JOINTS. PRECAST MANHOLE CONE SECTIONS SHALL BE CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES APPROVED ECCENTRIC CONE TYPE. ALL MANHOLES SHALL BE PROVIDED WITH BOLTED, WATER-TIGHT COVERS.
- DROP CONNECTIONS WILL BE REQUIRED WHEN THE DIFFERENCE IN INVERT ELEVATIONS EXCEEDS 18 INCHES. ONLY OUTSIDE DROP CONNECTIONS ARE ALLOWED.
- WHEREVER EXISTING MANHOLES OR SEWER PIPE ARE TO BE TAPPED, HOLES SHALL BE DRILLED AT 4-INCH CENTER TO CENTER AROUND PERIPHERY OF OPENING TO CREATE A PLANE OF WEAKNESS BEFORE BREAKING OUT SECTION. NON-SHARP GROUT SHALL BE USED TO SEAL THE OPENING AND A CONC COLLAR SHALL BE POURED 12 INCHES THICK AROUND THE PIPE AND EXTENDED 12 INCHES BEYOND THE OPENING.
- NEW MANHOLES CONSTRUCTED DIRECTLY ON CITY OF WIXOM SEWERS SHALL BE PROVIDED WITH COVERS READING "CITY OF WIXOM -SANITARY" IN RAISED LETTERS ONLY. NEW MANHOLES BUILT OVER AN EXISTING SANITARY SEWER SHALL HAVE MONOLITHIC POURED BOTTOMS.
- NO GROUND WATER, STORM WATER OR CONSTRUCTION WATER, DOWNSPOUT DRAINAGE SHALL BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.
- PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL TELEPHONE MISS DIG FOR THE LOCATION OF UNDERGROUND GAS, ELECTRIC, TELEPHONE AND CABLE FACILITIES, AND SHALL ALSO NOTIFY REPRESENTATIVES OF OTHER UTILITIES LOCATED IN THE VICINITY OF THE WORK.
- A MINIMUM VERTICAL CLEARANCE OF 18-INCHES SHALL BE MAINTAINED BETWEEN SANITARY SEWER AND ALL OTHER UTILITIES.
- IT SHALL BE THE OWNER'S ENGINEERS AND CONTRACTOR'S RESPONSIBILITY TO VERIFY AND/OR OBTAIN ANY INFORMATION NECESSARY REGARDING THE PRESENCE OF UNDERGROUND UTILITIES WHICH MIGHT AFFECT THE INSTALLATION OF THE UTILITY.
- THE MINIMUM ALLOWABLE SIZE OF A PUBLIC SANITARY SEWER IS 8" DIA. THE LAST UPSTREAM RUN OF SEWER MUST BE AT A GRADE OF 1.00% OR GREATER.
- ONE SEWER LEAD PER UNIT MUST BE PROVIDED. MULTI UNITS SERVICED FROM A SINGLE LEAD WILL NOT BE PERMITTED.
- SEWER LEADS OF LONGER THAN 200 FT. IN LENGTH WILL REQUIRE THE CONSTRUCTION OF A SEWER LATERAL.
- IF THE DEWATERING ACTIVITIES IMPACT EXISTING WELLS, THE CONTRACTOR SHALL TAKE IMMEDIATE ACTION (2 DAYS MAXIMUM) TO GET POTABLE WATER TO THE AFFECTED PARTIES. THE OWNER/CONTRACTOR SHALL RESTORE PERMANENT WATER SUPPLY TO THE AFFECTED PARTIES AS SOON AS PRACTICALLY POSSIBLE.

**SPECIFICATIONS FOR TRUSS PIPE SANITARY SEWER**

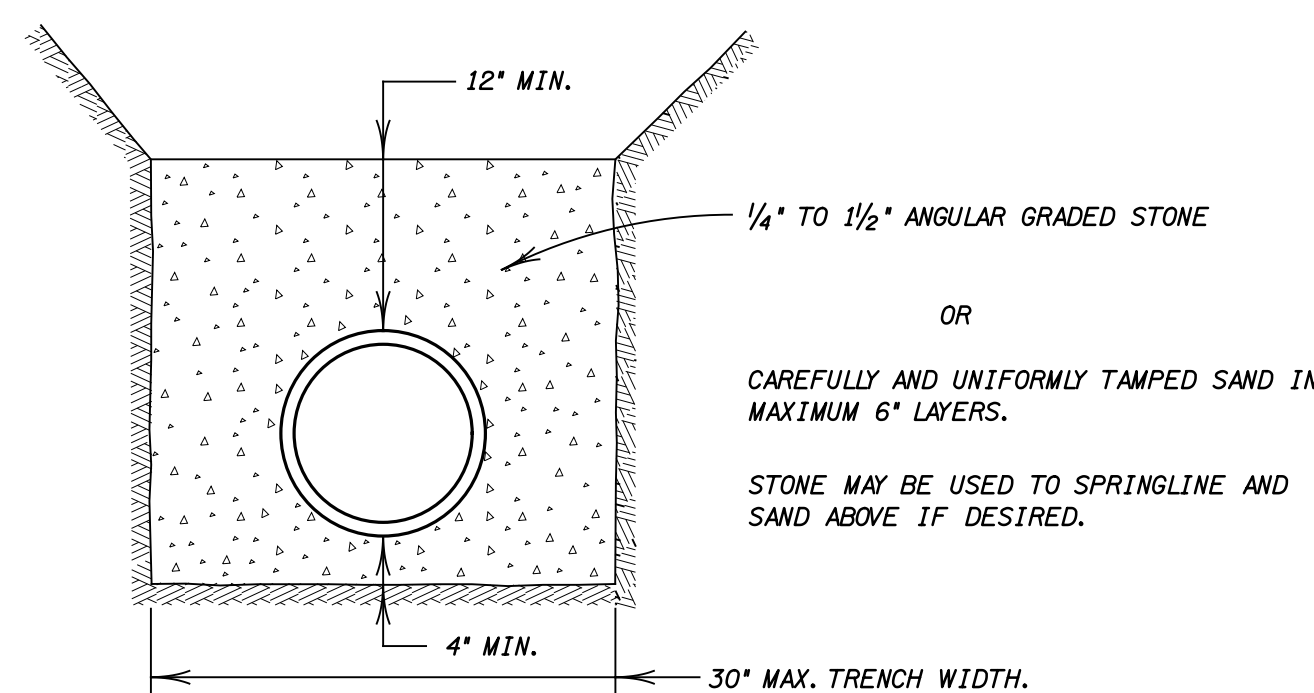
**MATERIALS AND CERTIFICATIONS**

ARMO TRUSS PIPE AND FITTINGS SHALL BE AS DESCRIBED UNDER ASTM DESIGNATION D2680-85a, STANDARD SPECIFICATION FOR ACRYLONITRILE-BUTADIENE-STYRENE (ABS) AND POLYVINYL CHLORIDE (PVC) COMPILING APPENDIX II OF SAID SPECIFICATION SHALL BE MODIFIED BY THE BEDDING REQUIREMENTS OUTLINED BELOW.

SOLID WALL PVC PIPE FOR 6" HOUSE CONNECTION SEWERS SHALL BE SCH. 40 OR SDR 23.5 CONFORMING TO ASTM DESIGNATION D2751-83a SOLID WALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH BEDDING REQUIREMENTS OUTLINED BELOW.

ALL PIPE SHALL BE CERTIFIED BY THE MANUFACTURER TO MEET THE APPLICABLE ASTM SPECIFICATION REQUIREMENTS. CERTIFICATION FORMS, TOGETHER WITH A REPORT OF THE TEST RESULTS, SHALL BE PROVIDED TO THE INSPECTOR WITH PIPE DELIVERIES AND COPIES SHALL BE FORWARDED TO THE ENGINEER OR THE OWNER. CERTIFICATION FORMS SHALL INCLUDE PROJECT NAME, LOCATION, CONTRACTOR, AND TEST LOT NUMBER. LOT SIZES SHALL BE ACCEPTABLE TO THE ENGINEER.

ALL PIPE AND FITTINGS SHALL BE SUITABLY MARKED TO PROVIDE MANUFACTURER'S NAME, LOT OR PRODUCTION NUMBER, ASTM DESIGNATION, PVC, NOMINAL DIAMETER, AND SDR NUMBER, WHERE APPLICABLE. FITTINGS, HOWEVER, NEED NOT CONTAIN LOT OR PRODUCTION NUMBER. PIPE SHALL HAVE A "HOME" MARK. TRUSS PIPE WITH AN ABSENCE OF FILLER MATERIAL AT THE ENDS GREATER THAN 1/4" DEEP SHALL BE SUBJECT TO REJECTION OR ACCEPTABLE REPAIR.



**TRUSS & SOLID WALL DETAIL**

**BEDDING**

BEDDING FOR TRUSS PIPE AND ABS SOLID WALL PIPE SHALL BE IN ACCORDANCE WITH ASTM D 2321-83a, EXCEPT, (1) ONLY CLASS I AND CLASS II MATERIALS MAY BE USED, (2) BEDDING SHALL EXTEND TO MINIMUM 12" ABOVE TOP OF PIPE, AND (3) FLOOD OR PUDDLING SHALL NOT BE USED TO ACHIEVE COMPACTION. IT IS ESSENTIAL THAT IT BE RECOGNIZED THAT THE SUCCESSFUL USE OF FLEXIBLE AND SEMI-FLEXIBLE PIPE REQUIRES BEDDING THAT PROVIDES UNYIELDING SIDE SUPPORT AND COMPLETE BEDDING CONTACT UNDER PIPE HAUNCHES.

WHERE UNSTABLE BOTTOMS ARE ENCOUNTERED, THE CONTRACTOR SHALL PROVIDE A RECOMMENDATION FOR FOUNDATION SUPPORT PREPARED BY A LICENSED PROFESSIONAL ENGINEER WITH GEO-TECHNICAL EXPERIENCE FOR THIS FOUNDATION WHICH MAY CONSIST OF AN APPROVED GRADED AND PROCESSED ANGULAR STONE OR GRAVEL TO ACT AS AN IMPERVIOUS MAT TO PREVENT MIGRATION OR VERTICAL MOVEMENT OF UNSTABLE SOILS OR BEDDING MATERIALS WHERE TRENCH SHEETING, PLATES, OR A TRENCH BOX ARE USED DUE TO SEVERE GROUND CONDITIONS. ALL VOIDS TO THE SIDE AND BELOW THE TOP OF THE PIPE CAUSED BY THE SHEETING, PLATES, OR BOX WITHDRAWAL SHALL BE COMPLETELY FILLED OR THE SUPPORTS LEFT IN PLACES BELOW THE TOP OF THE PIPE.

CONCRETE CRADLE BEDDING SHALL NOT BE USED WHERE ALLOWABLE TRENCH WIDTHS ARE EXCEEDED. IN LIEU OF CONCRETE CRADLE BEDDING, STANDARD PIPE BEDDING SHOWN SHALL BE PROVIDED TO THE FULL WIDTH BETWEEN UNDISTURBED TRENCH WALLS OR AT LEAST 2.5 PIPE DIAMETERS ON BOTH SIDES OF THE PIPE.

DUE TO POTENTIAL DAMAGE TO EXTERIOR WALLS OF TRUSS PIPE, PARTICULARLY UNDER COLD WEATHER CONDITIONS, THE CONTRACTOR SHALL CAREFULLY AVOID DUMPING ANY MATERIALS OTHER THAN APPROVED BEDDING SAND OR STONE ON THE PIPE UNTIL 12" COVER IS PLACED OVER THE PIPE. PIPE WALLS AND ENDS SHALL ALSO BE PROTECTED FROM ABRASION AND DAMAGE DURING HANDLING, AND SHALL BE FULLY INSPECTED JUST PRIOR TO PLACING IN THE TRENCH.

CARE SHALL BE TAKEN DURING BEDDING COMPACTION TO AVOID DISTORTING THE SHAPE OF THE PIPE OR DAMAGING ITS EXTERIOR WALL. MOBILE EQUIPMENT SHALL NOT BE USED OVER THE PIPE TRENCHES UNTIL 48" OF COVER HAS BEEN PLACED.

HOUSE CONNECTIONS SHALL BE MADE TO WYE FITTINGS. BEDDING FOR HOUSE CONNECTION SEWERS SHALL BE EQUAL TO THAT OF THE MAIN BEDDING. RISERS IN DEEP AND UNSTABLE TRENCHES SHOULD BE BEDDED IN ANGULAR STONE TO AVOID SETTLEMENT. CONCRETE SHALL NOT BE USED FOR BEDDING, END CAPS OR PLUGS SHALL BE BRACED OR ANCHORED TO WITHSTAND AIR TEST PRESSURES. CAPS OR PLUGS SHALL NOT BE CHEMICALLY WELDED IN PLACE.

**JOINTS**

JOINTS FOR PIPE AND FITTINGS SHALL BE OF THE ELASTOMERIC GASKET PUSH-ON TYPE. SUCH JOINTS SHALL CONFORM TO ASTM DESIGNATION D 3212-81 AND THE PIPE MANUFACTURER SHALL FILE WITH THE CITY OF WIXOM A COPY OF CERTIFIED TEST RESULTS OF ITS JOINTING SYSTEM PRIOR TO USE. GASKET JOINTS SHALL BE INSTALLED IN ACCORDANCE WITH PROCEDURES SPECIFIED BY THE PIPE MANUFACTURER. CARE SHALL BE TAKEN TO INSURE ALL JOINTS BEING PUSHED TO THE FULL "HOME" POSITION AND HELD TIGHTLY IN THE "HOME" POSITION DURING ANY GRADE OR LINE ADJUSTMENTS. JOINTS FOR SEWER LEAD PIPES SHALL BE CHEMICALLY WELDED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. ADDITIONALLY, CARE SHALL BE TAKEN TO INSURE ALL JOINTS BEING PUSHED TO THE FULL "HOME" POSITION DURING ANY GRADE OR LINE ADJUSTMENTS. PIPE SHALL BE ROTATED DURING JOINT INSERTION TO INSURE A COMPLETE SPREAD OF JOINTING CEMENT. PLASTIC CEMENT PRIMER AND PLASTIC PIPE CEMENT SHALL ARRIVE AT THE JOB SITE IN SEALED AND LABELED CONTAINERS. "JOHNNY MOP" OR SIMILAR SWAB TYPE APPLICATIONS SHALL BE USED TO APPLY PRIMER AND CEMENT. OPENED CONTAINERS IN THE TRENCH SHALL BE PROTECTED FROM DIRT, WATER, AND OTHER CONTAMINANTS.

**CUTTING AND HANDLING**

CUTTING OF PIPE LENGTHS, WHERE REQUIRED, SHALL BE PERFORMED BY THE USE OF TOOLS OR EQUIPMENT THAT WILL PROVIDE A NEAT, PERPENDICULAR CUT WITHOUT DAMAGE TO THE PLASTIC OR THE FILLER MATERIAL. BOWING OR WARPING OF PIPE CAN OCCUR WITH TEMPERATURE FLUCTUATIONS. THE CONTRACTOR SHALL STORE AND PROTECT THE PIPE TO MINIMIZE BOWING. NOMINAL 12.5 FT LENGTHS HAVING DEVIATIONS FROM STRAIGHT GREATER THAN 1" SHALL NOT BE USED.


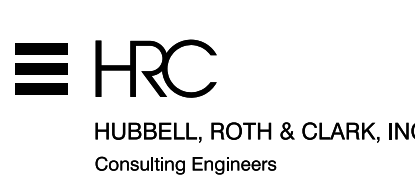
**SPECIAL CONDITIONS**

THE COMPLETED INSTALLATION SHALL AT NO POINT HAVE OUT-OF-ROUND PIPE DEFLECTIONS GREATER THAN 5%. THE ENGINEER SHALL HAVE THE OPTION OF REQUIRING DEFLECTOMETER OR GO NO-GO GAUGING TEST RUN PRIOR TO ACCEPTANCE ON PIPELINES WHERE HIGH DEFLECTIONS ARE SUSPECTED.

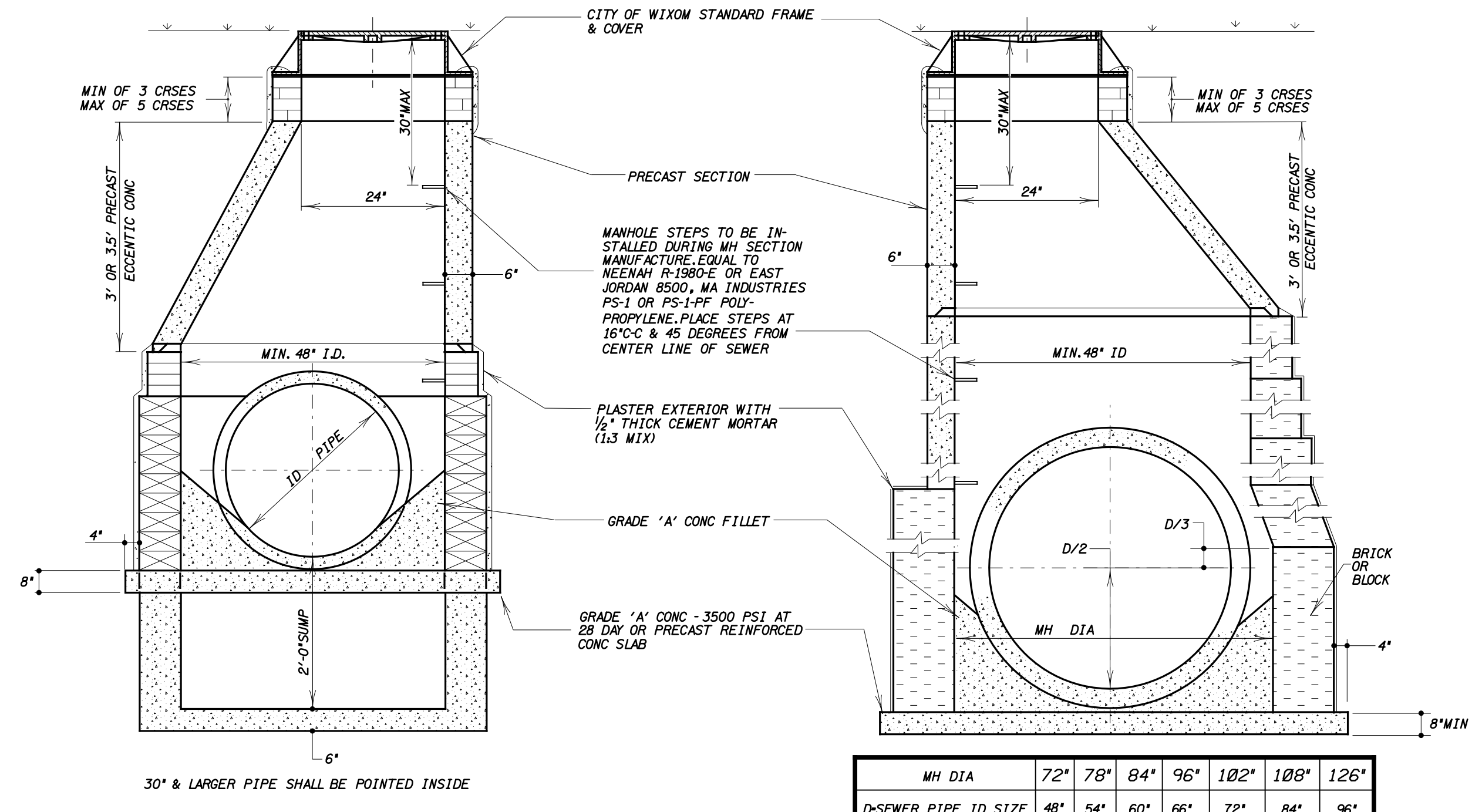
AS-BUILT PLANS SHALL BE PROVIDED TO THE CITY OF WIXOM DEPT. OF PUBLIC SERVICES BY THE ENGINEER AND AS-BUILT PLANS SHALL SPECIFICALLY DESIGNATE THE TYPE OF SEWER PIPE INSTALLED AT ALL LOCATIONS.

**TELEVISION OF NEW SANITARY SEWER**

NO SOONER THAN 30 DAYS AFTER THE INSTALLATION OF NEW SANITARY SEWER MAINS, THE PIPE SHALL BE INTERNALLY INSPECTED VIA VIDEO CAMERA. THE VIDEO EQUIPMENT SHALL BE SPECIFICALLY DESIGNED FOR THE INTERNAL INSPECTION OF THE PIPE. THE DEVELOPER SHALL PROVIDE THE CITY WITH 2 COPIES OF BOTH A COLOR DVD AND A WRITTEN LOG DESCRIBING THE CONTENT OF THE DISC FOR THE ENTIRE LENGTH OF THE NEW SEWER. THE VIDEO WILL BE REVIEWED BY THE CITY OR ITS AGENTS PRIOR TO ISSUANCE OF FINAL ACCEPTANCE. IF DEFECTS ARE DISCOVERED, THE DEVELOPER SHALL MAKE THE NECESSARY REPAIRS AT THEIR COST PRIOR TO FINAL ACCEPTANCE OF THE SEWER BY THE CITY. A FOLLOW UP VIDEO INSPECTION WILL BE REQUIRED TO BE SUPPLIED BY THE CONTRACTOR TO ENSURE THE REPAIRS HAVE BEEN COMPLETED.

<b>SANITARY SEWER STANDARDS</b>		CITY OF WIXOM OAKLAND COUNTY, MICHIGAN STANDARD CONSTRUCTION DETAIL SHEET	
SHEET 2 OF 2		 	
DATE	REVISION		
XX-XX-2012	ADOPTED BY CITY COUNCIL		

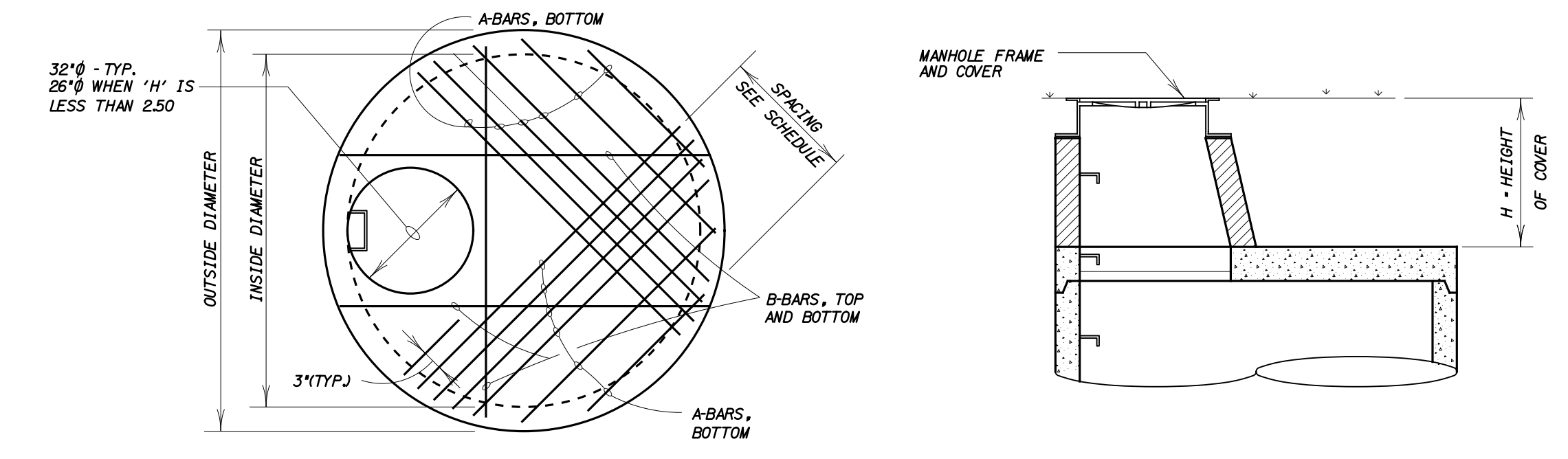
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**STORM MANHOLE FOR 42" PIPE AND UNDER**

**STORM MANHOLE FOR 48" PIPE AND OVER**

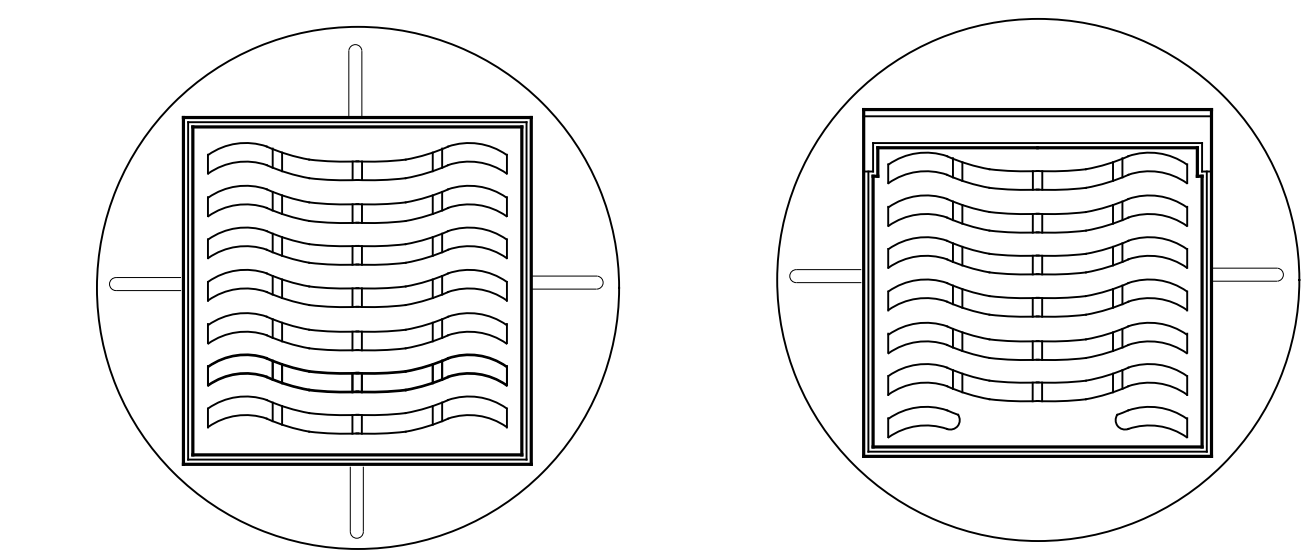
MH DIA	72"	78"	84"	96"	102"	108"	126"
D-SEWER PIPE ID SIZE	48"	54"	60"	66"	72"	84"	96"



**PLAN**

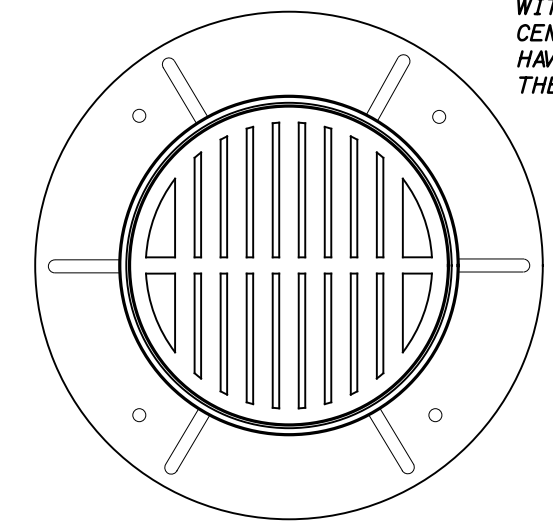
**SECTION**

INSIDE DIA.	SLAB THICKNESS	MAX. HEIGHT OF COVER	REINFORCEMENT		B-BARS TOP & BOTTOM
			A-BARS EA. SIDE NO. SIZE	SPACING	
4'-0"	8"	8'-0"	(4)*5	3 @ 3"	(3)*5
5'-0"	8"	8'-0"	(6)*5	3 @ 3"	(3)*5
6'-0"	8"	8'-0"	(5)*6	4 @ 8"	(3)*5
7'-0"	8"	8'-0"	(7)*6	6 @ 6"	(3)*5
8'-0"	8"	8'-0"	(9)*6	8 @ 6"	(3)*5
9'-0"	10"	8'-0"	(11)*6	10 @ 6"	(3)*5
10'-0"	10"	8'-0"	(13)*7	12 @ 6"	(3)*5

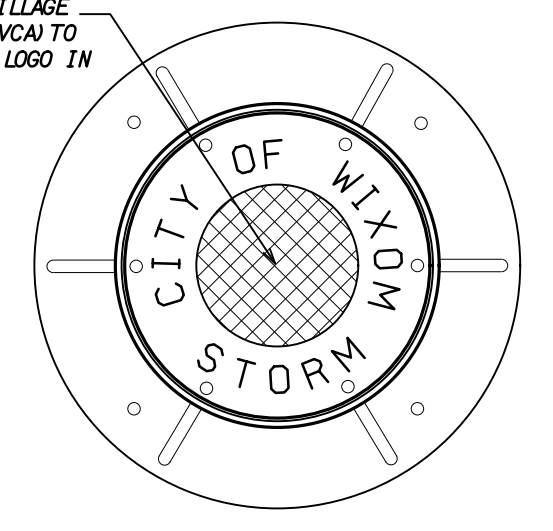


**- TYPE 'A' COVER -**  
CATCH BASINS AND INLETS WITHIN PAVED DRIVING AREAS  
FRAME & COVER EIJW #5105 WITH TYPE 'M-1' GRATE

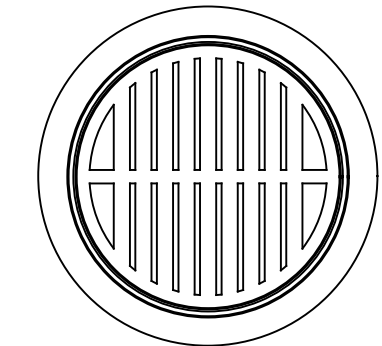
**- TYPE 'B' COVER -**  
CURBED PAVEMENT SECTIONS  
FRAME & COVER EIJW #7045 WITH TYPE 'M-1'



**- TYPE 'C' COVER -**  
REAR YARD FRAME & COVER EIJW #1040  
WITH TYPE 'N' GRATE

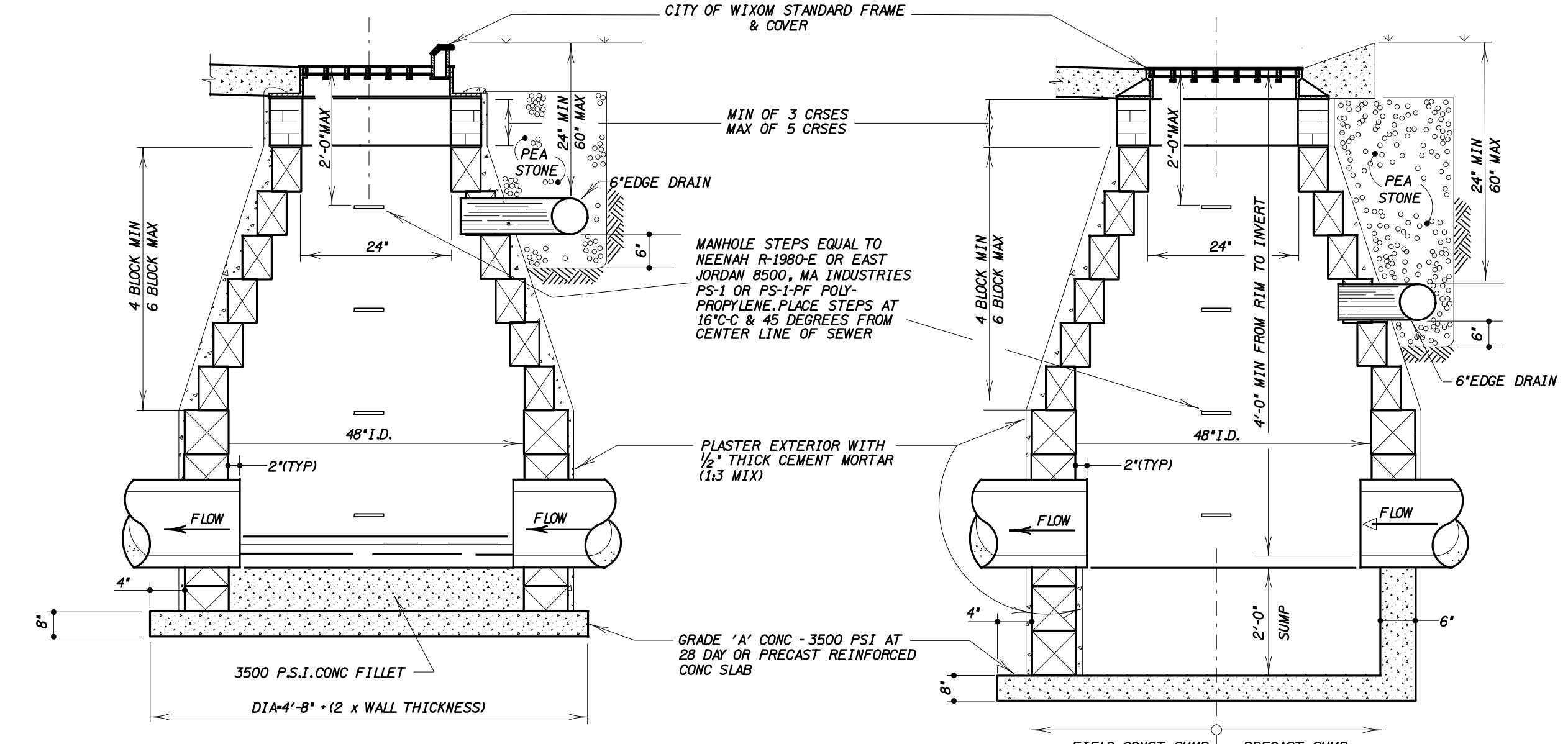


**- TYPE 'D' COVER -**  
STORM SEWER FRAME & COVER EIJW #1040  
WITH TYPE 'C' COVER



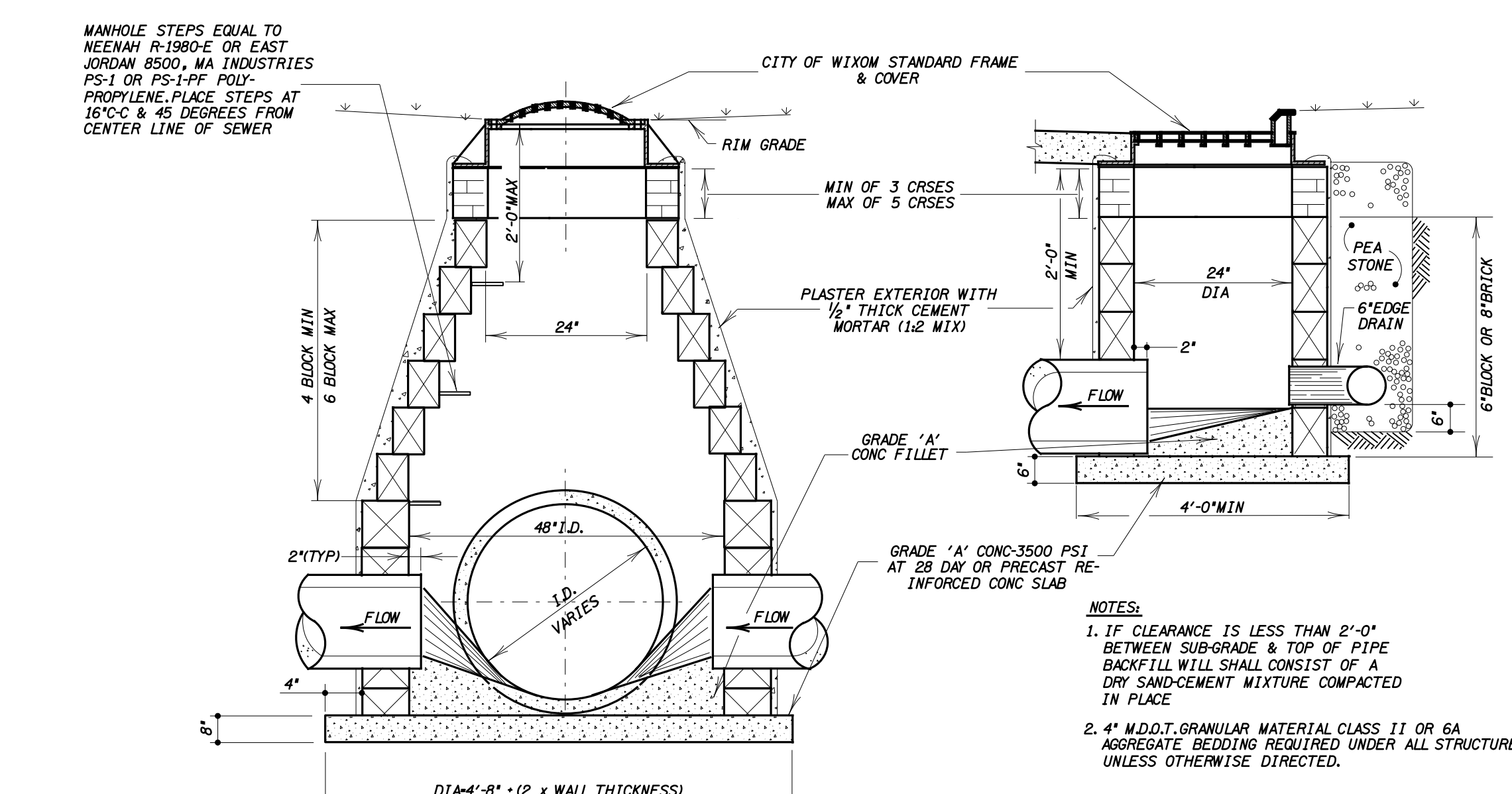
**- TYPE 'E' COVER -**  
REAR YARD FRAME & COVER FOR 2'-0" DIA. INLET  
STREIJW #1170 WITH TYPE 'N' GRATE

**FRAME AND COVER**  
- ALL COVERS TO INDICATE THAT THEY DRAIN TO WATERWAYS.



**TYPE "A" INLET**

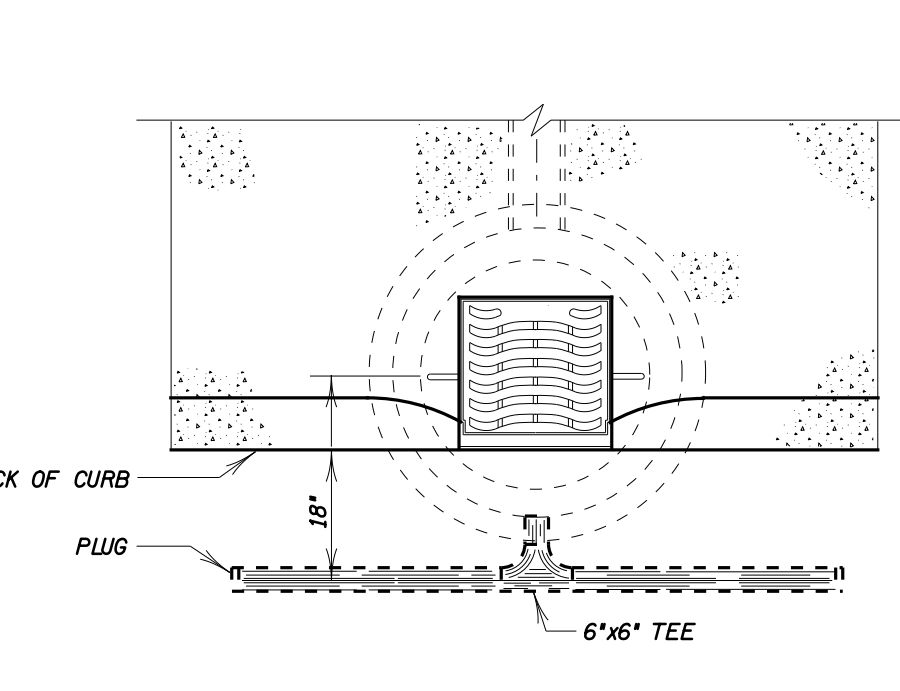
**TYPE "B" CATCH BASIN**



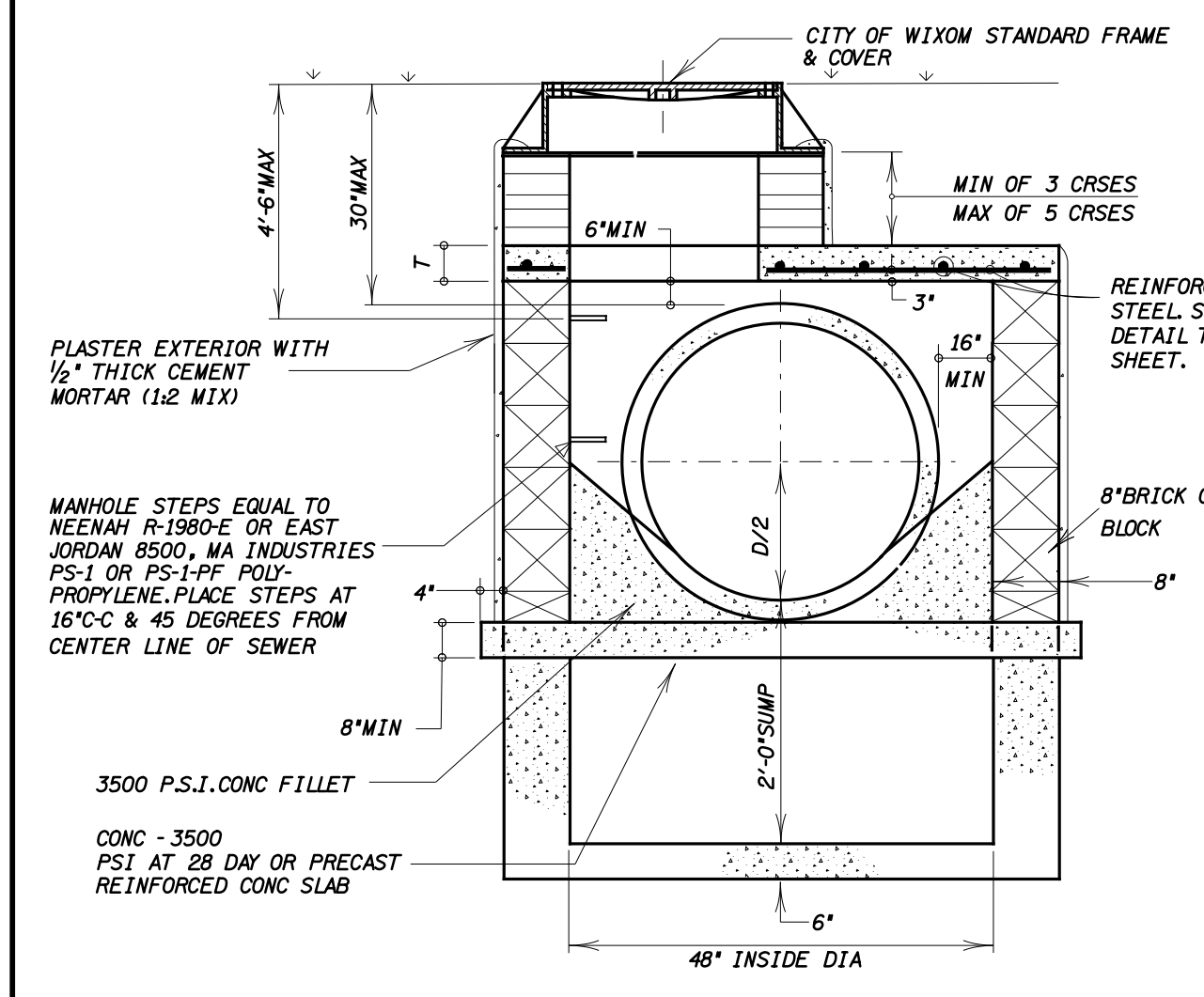
**TYPE A-N INLET**

**LOW HEAD MANHOLE TYPE C INLET**

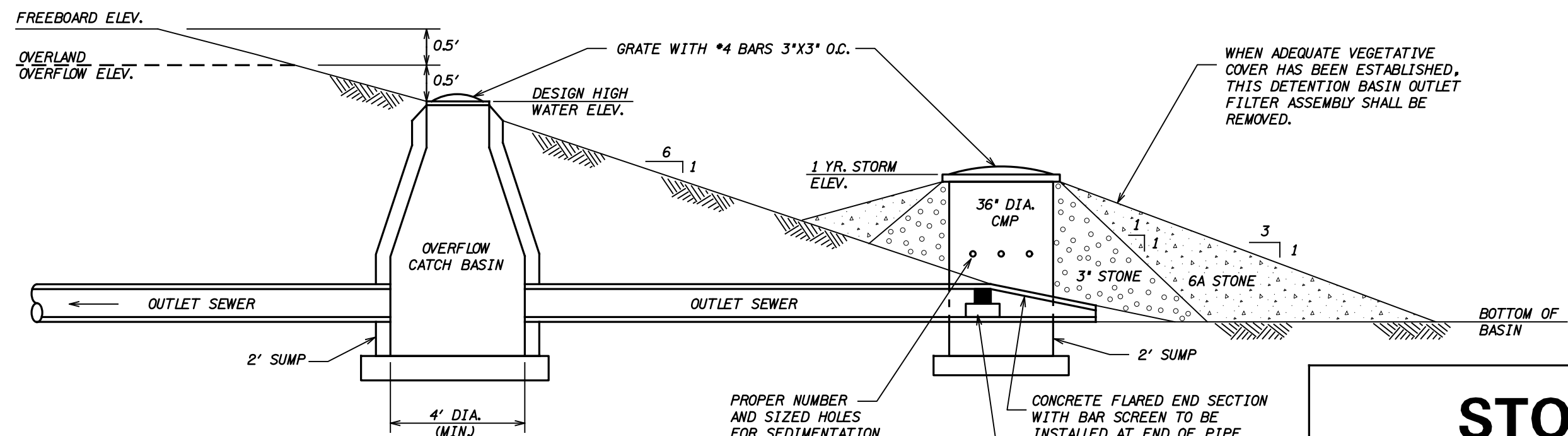
- STORM SEWER NOTES:**
1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF WIXOM.
  2. IT SHALL BE THE OWNER'S ENGINEER AND CONTRACTOR'S RESPONSIBILITY TO VERIFY THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES.
  3. ALL SEWER TRENCHES UNDER THE 45 DEGREE ZONE OF INFLUENCE LINE OF EXISTING OR PROPOSED PAVEMENTS, BIKEPATHS, SIDEWALKS OR DRIVE APPROACHES SHALL BE BACKFILLED WITH MDOT CLASS II SAND COMPACTED TO AT LEAST 95% OF MAXIMUM UNIT WEIGHT.
  4. ALL STORM SEWER SHALL BE INSTALLED ON CLASS 'B' BEDDING OR BETTER.
  5. JOINTS FOR STORM SEWER SHALL BE PREMIUM JOINTS (TONGUE AND GROOVE WITH RUBBER GASKETS).
  6. LEAD MATERIAL SHALL BE SCHED 40 PVC OR SDR 23.5.



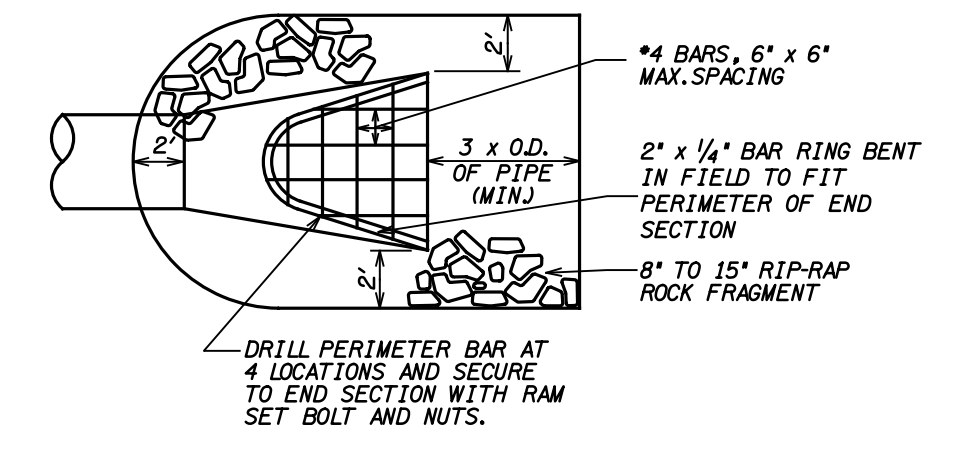
**6" EDGE DRAIN**



**LOW-HEAD STORM SEWER STRUCTURE**



**OUTLET STRUCTURE DETAIL**



**END SECTION AND BAR SCREEN DETAIL**

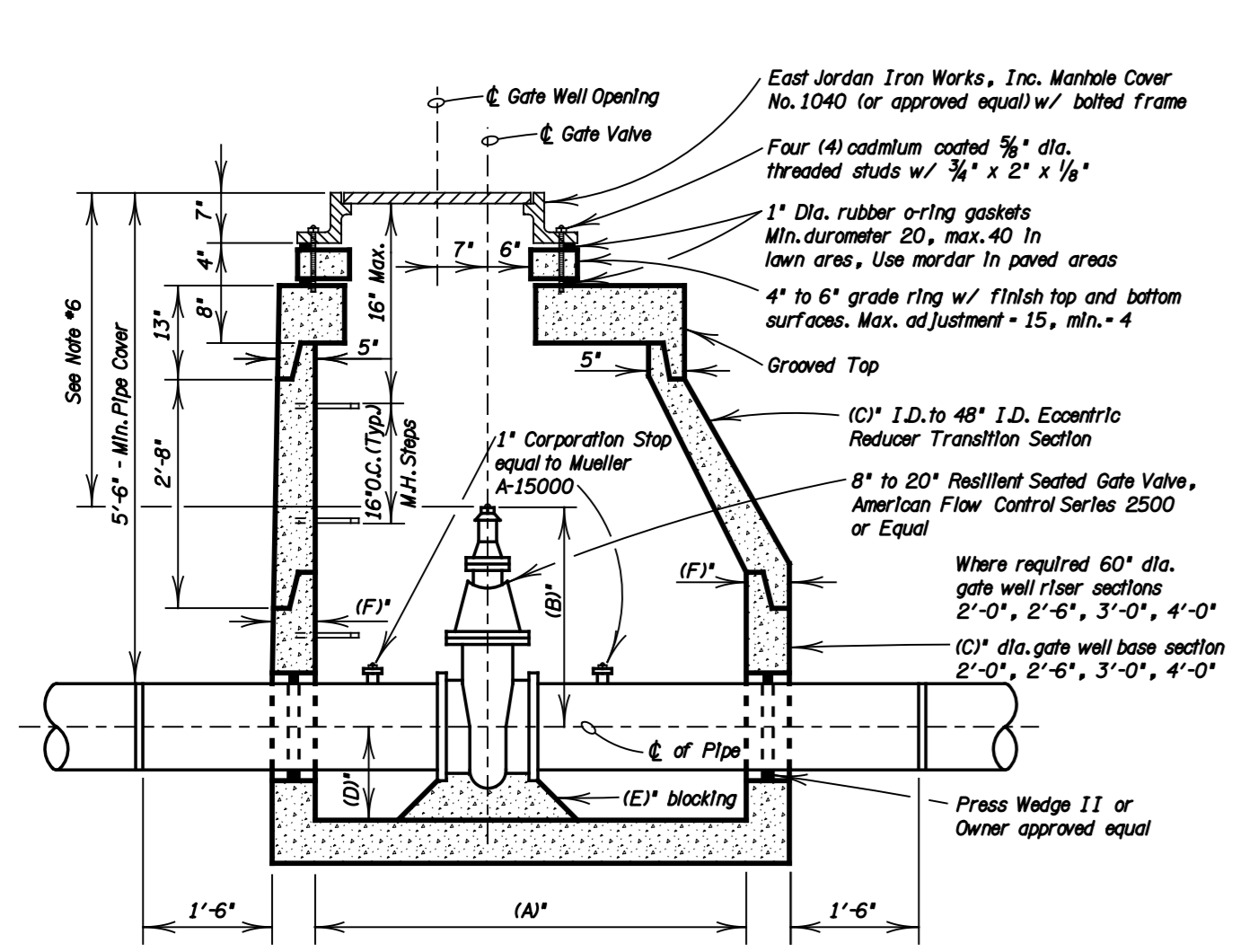
**STORM SEWER STANDARDS**  
SHEET 1 OF 1

CITY OF WIXOM  
OAKLAND COUNTY, MICHIGAN  
STANDARD CONSTRUCTION DETAIL SHEET

**City of WIXOM**  
HUBBELL, ROTH & CLARK, INC.  
Consulting Engineers

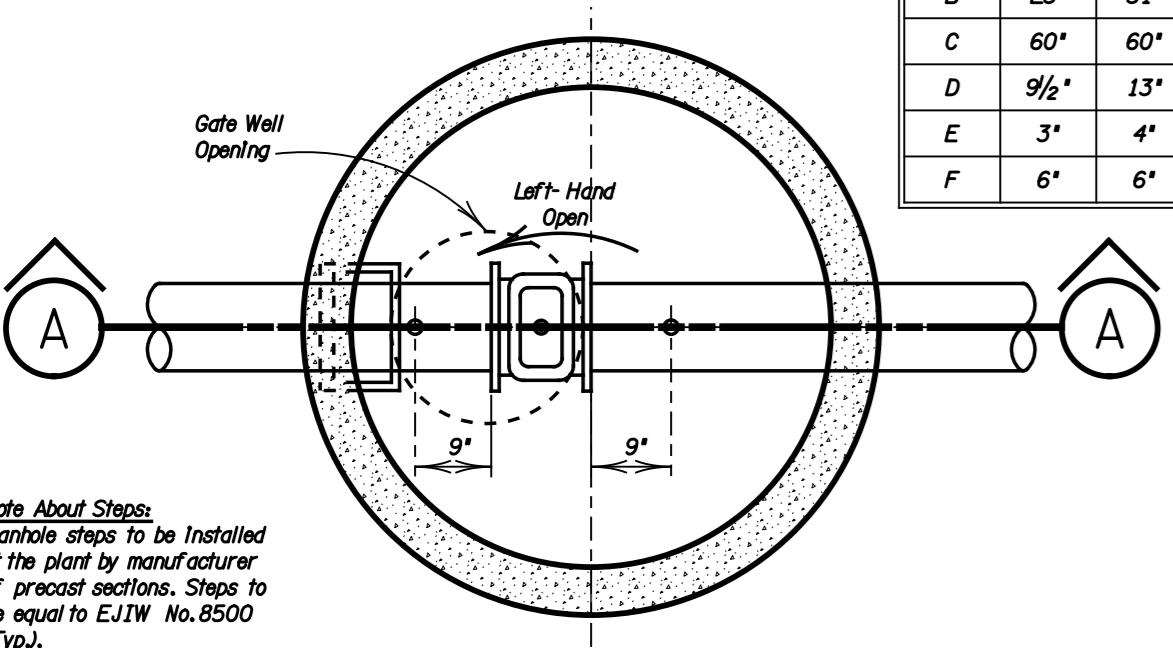
DATE	REVISION
XX-XX-2012	ADOPTED BY CITY COUNCIL

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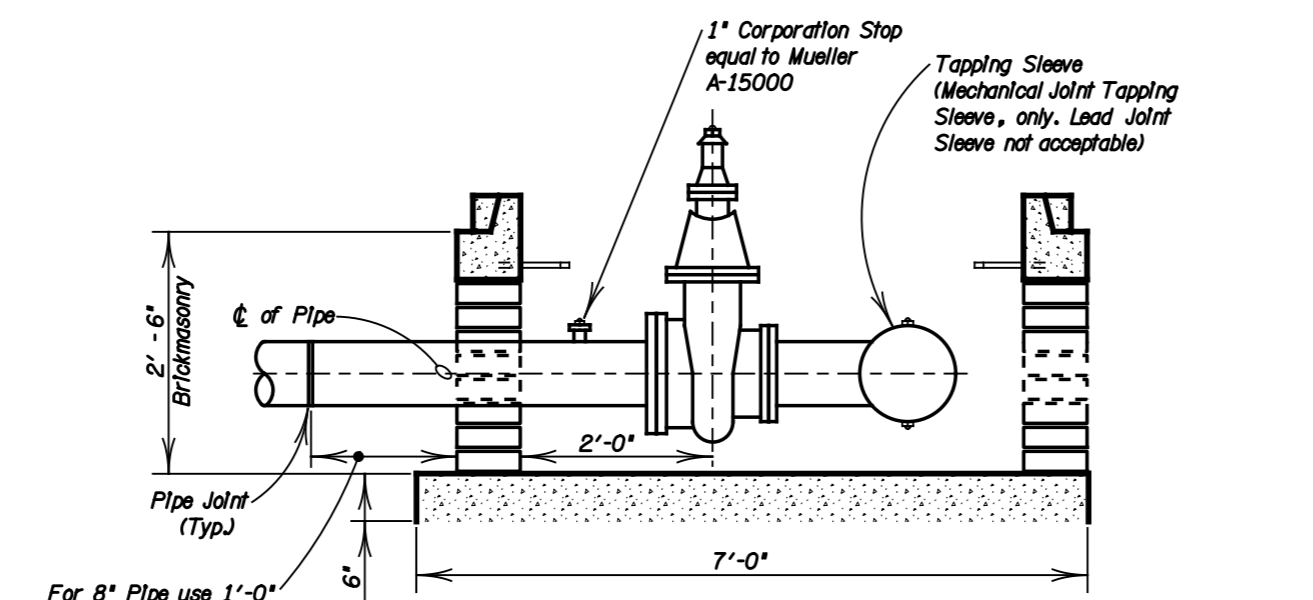


**Gate Well Dimensions - Inches**

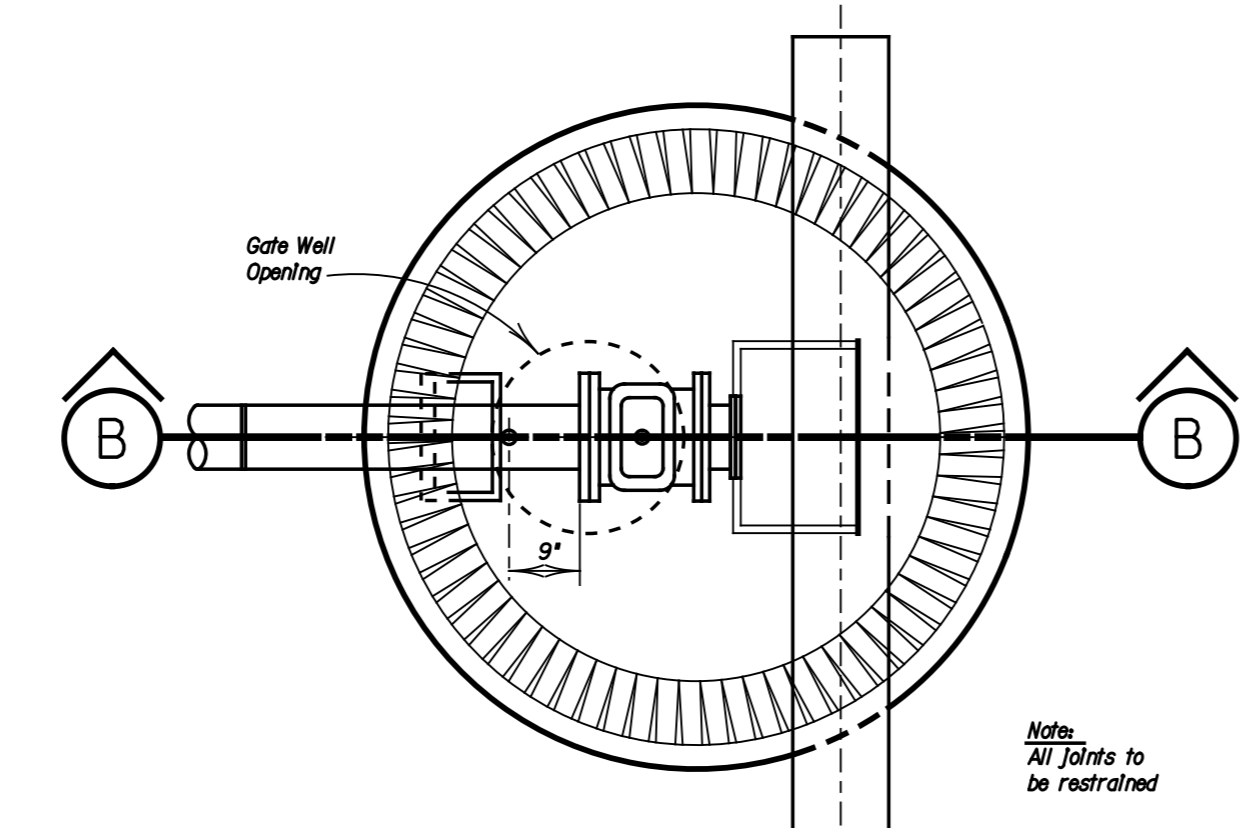
Dim.	6' & 8'	12'	16'	20'
A	5'-0"	5'-0"	6'-0"	6'-0"
B	23"	31"	40"	43"
C	60"	60"	72"	72"
D	9 1/2"	13"	15"	17"
E	3"	4"	4"	4"
F	6"	6"	7"	7"



PLAN OF GATE WELL



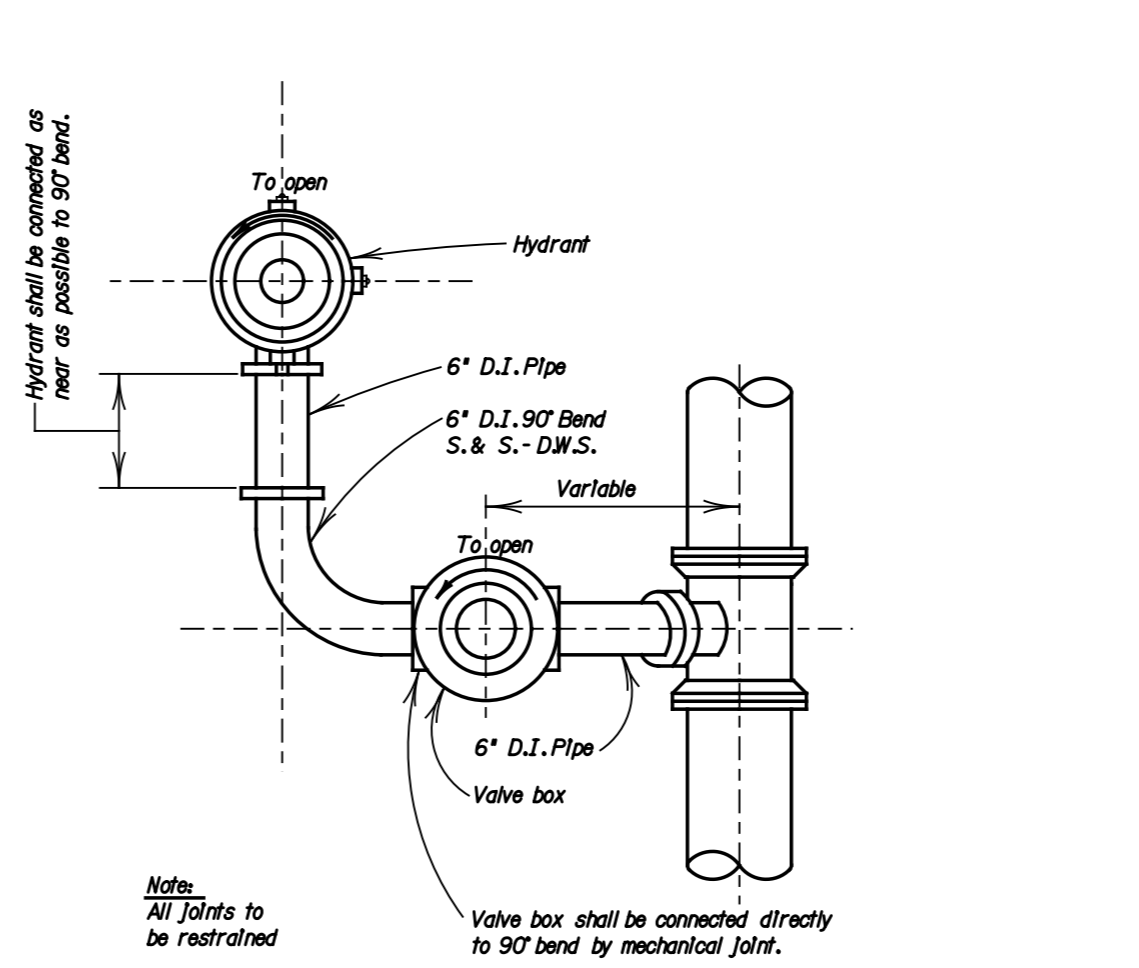
TAPPING SLEEVE, VALVE & WELL (B-B)



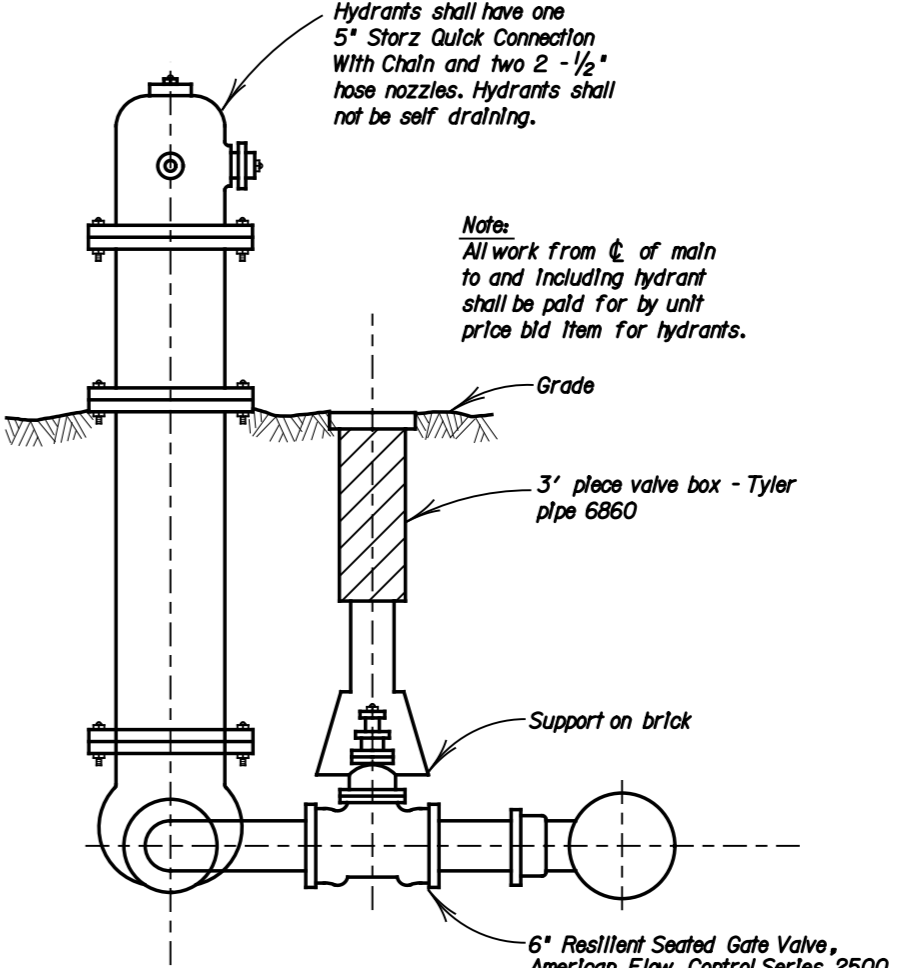
PLAN OF TAPPING SLEEVE, VALVE & WELL

- GENERAL NOTES:**
- ALL CONSTRUCTION PROCEDURES AND MATERIALS USED SHALL CONFORM TO THE CITY OF WIXOM CURRENT STANDARDS AND SPECIFICATIONS.
  - ALL HYDRANTS SHALL BE, MUELLER CENTURION OR WATEROUS PACER (APPROVED ANMA TYPE) WITH A STORZ CONNECTION AND CHAIN. SELF DRAINING HYDRANTS SHALL NOT BE USED, ONE TYPE OF HYDRANT SHALL BE USED THROUGHOUT A GIVEN DEVELOPMENT. HYDRANT TYPES SHALL NOT BE MIXED.
  - ALL HYDRANTS SHALL BE PAINTED RED ABOVE GROUND AND BLACK BELOW, WITH A FINISH COAT OF GLAMORTEX 501 ENAMEL, COLOR 314 VERMILLION, OR APPROVED EQUAL.
  - ALL GATE VALVES WITH OPERATING NUTS AT A DISTANCE GREATER THAN 5' BELOW GROUND SURFACE SHALL BE PROVIDED WITH AN EXTENSION STEM. THE LENGTH OF THE STEM SHALL BE SUCH THAT IT WILL BE WITHIN 5' OF THE GROUND SURFACE WHEN AN EXTENSION STEM IS USED. IT SHALL BE HELD IN PLACE BY AN EXTENSION STEM GUIDE SUITABLY FASTENED TO THE WALL OF THE GATE WELL. THE EXTENSION STEM SHALL BE MECHANICALLY ATTACHED TO THE OPERATING NUT DETAILS OF THE EXTENSION STEM AND METHOD OF INSTALLATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
  - FOR PIPE DIAMETERS LESS THAN 20" DUCTILE IRON PIPE SHALL BE CLASS 54 DOUBLE CEMENT LINED WITH TWO BRASS WEDGES PER JOINT, MINIMUM DEPTH OF COVER IS 6'-0" BELOW FINISHED GRADE.
  - ALL PRECAST CONCRETE GATEWELL SECTIONS SHALL BE MANUFACTURED TO CONFORM WITH A.S.T.M. C478, STANDARD SPECIFICATION FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, EXCEPT, WALL THICKNESS SHALL BE SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATEWELL SECTIONS SHALL BE "MODIFIED GROoved TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C443, STANDARD SPECIFICATIONS FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
  - THE CONTRACTOR SHALL OBTAIN A WATER MAIN CONSTRUCTION PERMIT AND WATER USE PERMIT PRIOR TO THE START OF CONSTRUCTION FROM THE CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES.
  - THE CONTRACTOR SHALL NOTIFY THE CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES (248) 624-0882 OR ITS WATER SYSTEM OPERATOR FOR TAP INSPECTION TO THE EXISTING WATER MAIN, PRESSURE TEST WITNESS, BACTERIOLOGICAL SAMPLING, AND FOR FINAL INSPECTION. (MINIMUM 24 HOURS PRIOR NOTICE IS REQUIRED)
  - FOR NON CITY ADMINISTERED PROJECTS ALL 2 INCH AND SMALLER WATER SERVICE CONNECTIONS ARE MADE BY THE CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES PERSONNEL AFTER WATER MAIN ACCEPTANCE AND APPLICABLE PERMITS ARE OBTAINED.
  - ALL NECESSARY EASEMENTS SHALL BE PROVIDED IN THE NAME OF THE CITY OF WIXOM AND/OR ITS AGENT FOR THE INSTALLATION, OPERATION, AND MAINTENANCE OF THE PROVIDED WATER MAINS BEFORE ACCEPTANCE OF THE WATER DISTRIBUTION SYSTEM.

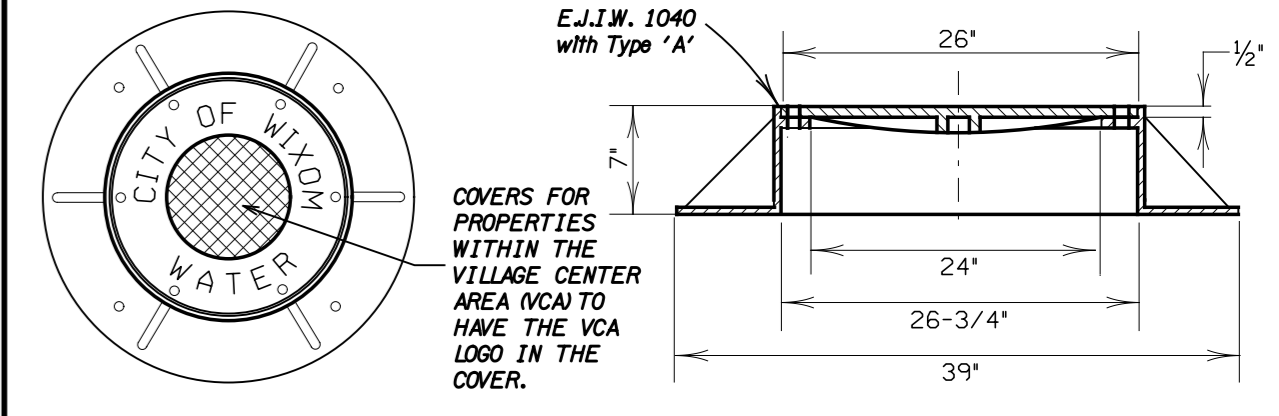
- THE DESIGN ENGINEER SHALL FURNISH THE CITY OF WIXOM WITH "AS BUILT" WATER MAIN PLANS PER THE CITY STANDARDS, UPON JOB COMPLETION, PLANS SHALL LOCATE ALL WATER MAINS, HYDRANTS, AND GATE VALVES AND WELLS PER CITY OF WIXOM "AS BUILT" STANDARDS.
- ALL REQUIRED CROSS CONNECTION AND CONTROL DEVICES SHALL BE INSTALLED AS REQUIRED BY THE CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES AND IN ACCORDANCE WITH THE STANDARDS OF THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY.
- TAPPING SLEEVE SHALL BE MECHANICAL JOINT.
- THE CONTRACTOR SHALL NOTIFY THE CITY OF WIXOM DEPARTMENT OF PUBLIC SERVICES 48 HOURS PRIOR TO THE START OF CONSTRUCTION AND REQUEST INSPECTION.
- ALL TRENCHES UNDER THE 45 DEGREE LINE OF INFLUENCE OF EXISTING OR PROPOSED PAVEMENTS, SIDEWALKS, BIKEPATHS & DRIVE APPROACHES SHALL BE BACKED FILLED WITH MDT CLASS II SAND COMPACTED TO 95% OF MAXIMUM UNIT WEIGHT.
- ALL WATER MAIN JOINTS REQUIRING RESTRAINT SHALL USE MEGA-LOG FITTINGS OR FIELD-LOG GASKETS, FOLLOWING MANUFACTURERS GUIDELINES. THE USE FOR CONCRETE THRUST BLOCS WILL NOT BE ALLOWED.
- TRACER WIRE IS REQUIRED ON ALL HDPE LEADS (SDR9, ANMA C-901, ASTM D2737.) IT SHALL BE A MINIMUM OF 12 GAUGE COPPER, COLORED BLACK OR WHITE, AND RUN THE ENTIRE LENGTH OF THE PIPE WITH THE ENDS ACCESSIBLE FOR LINE LOCATION PURPOSES.



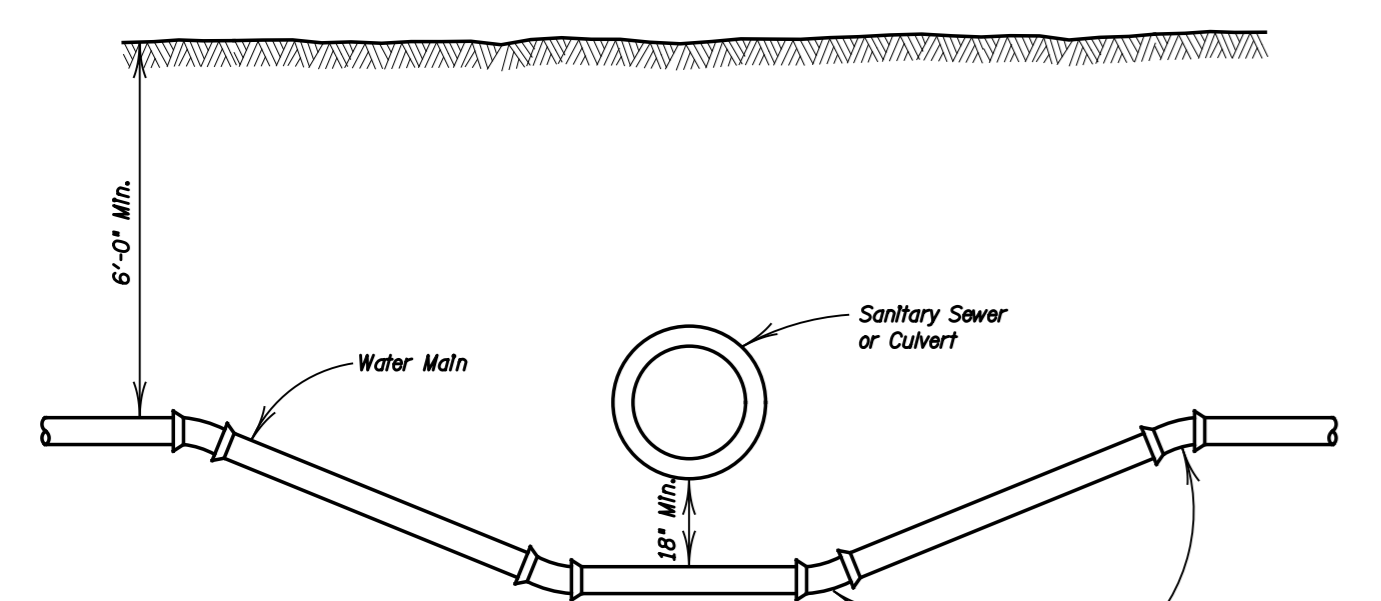
PREFERRED HYDRANT SETTING



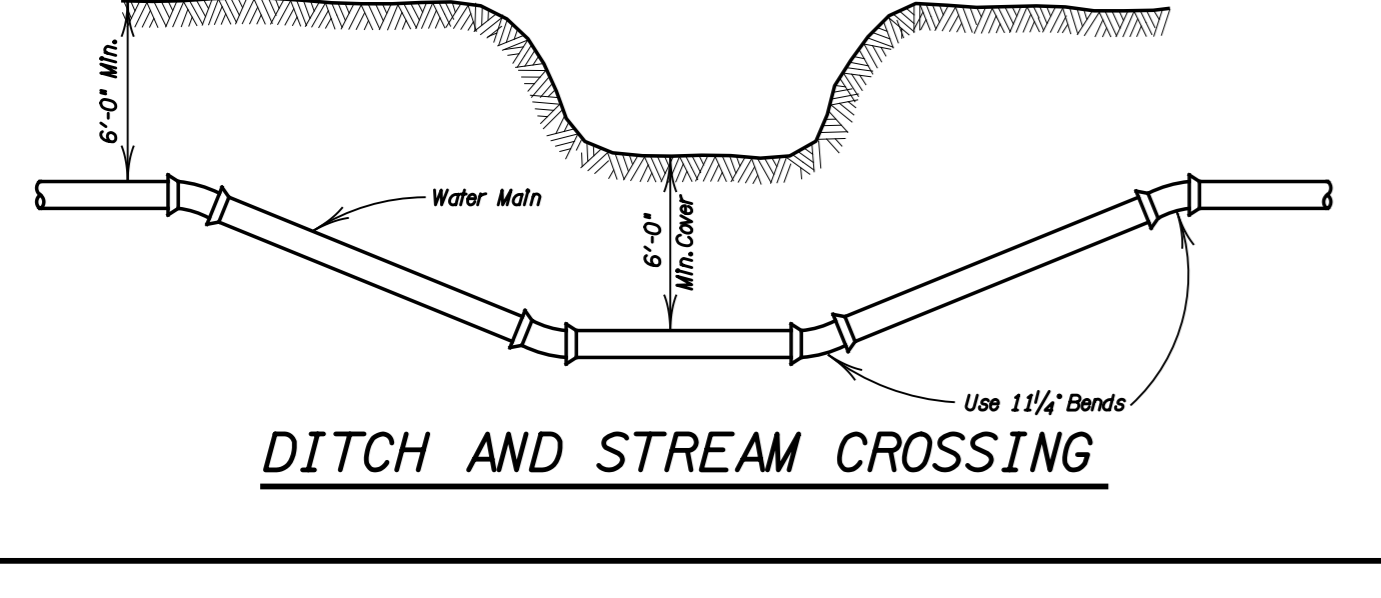
Elevation



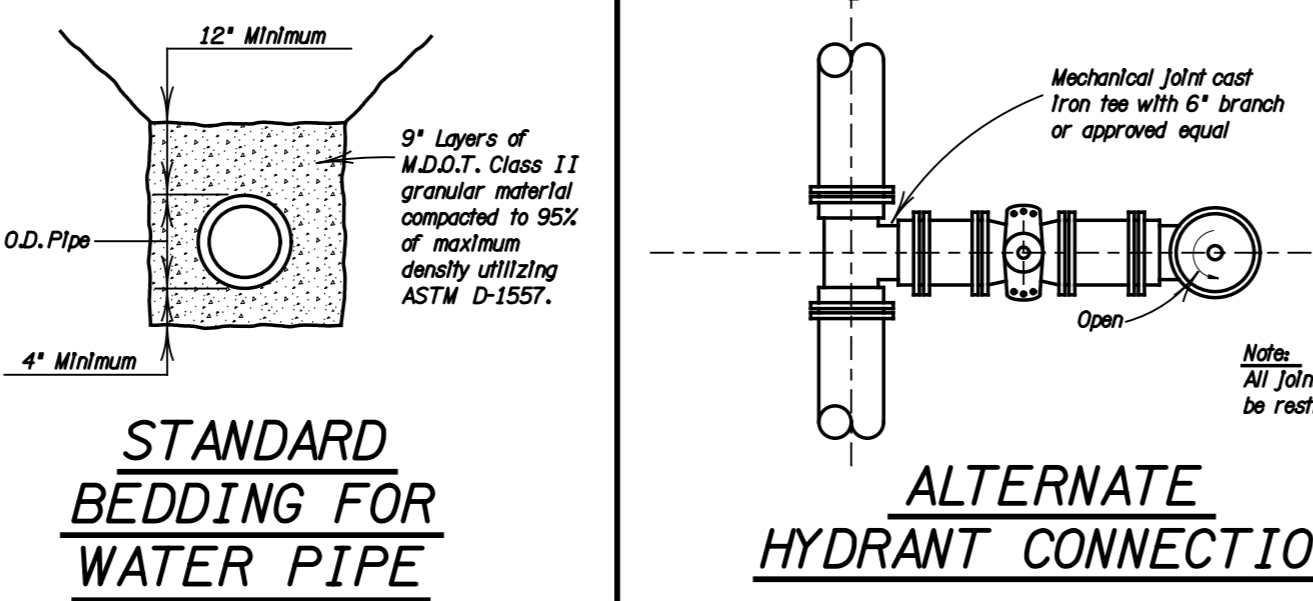
TYPE "H" GATE WELL COVER



SEWER OR CULVERT CROSSING

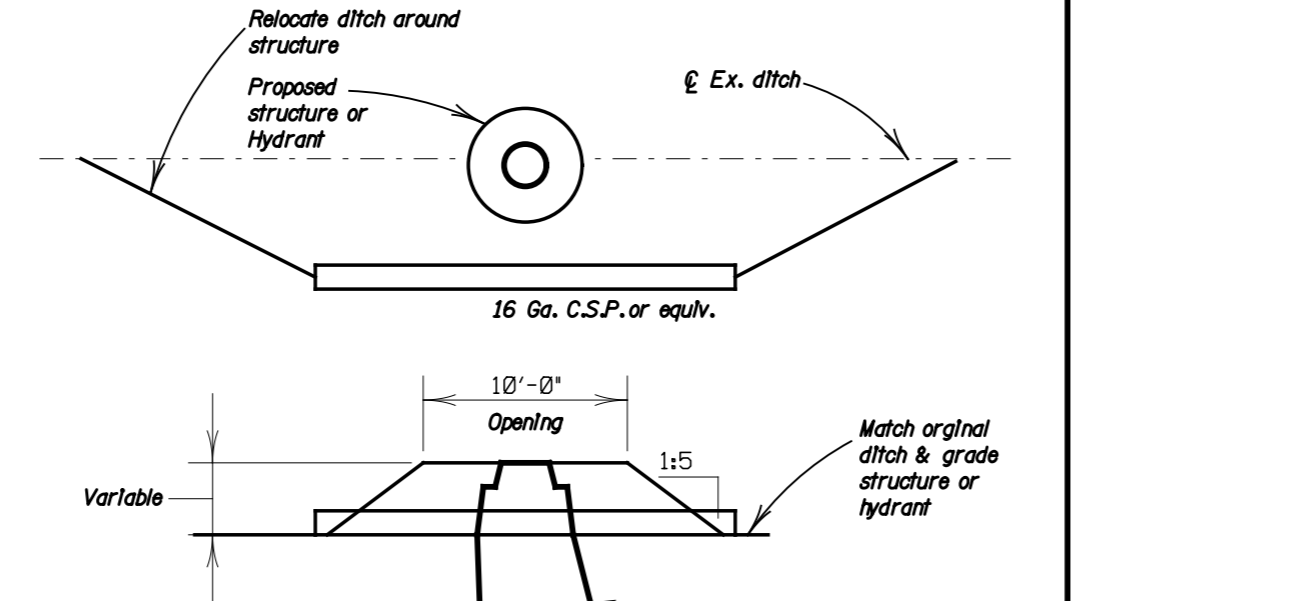


DITCH AND STREAM CROSSING



STANDARD BEDDING FOR WATER PIPE

ALTERNATE HYDRANT CONNECTION



DITCH ENCLOSURE AT STRUCTURE OR HYDRANT

**TYPICAL WATER MAIN TUNNEL CASING DETAIL**

3" MINIMUM CLEARANCE BETWEEN MAX. O.D. AT A JOINT OF THE PROPOSED PIPE AND THE I.D. OF THE CASING PIPE FOR THE TOP 90° OF THE BORE.

STEEL PIPE CASING SHALL MEET THE REQUIREMENTS OF THE A.S.T.M. DESIGNATION A-39 GRADE 18 MATERIAL PROVIDE BULKHEAD AT BOTH ENDS.

1/4" x 12 GAUGE DOUBLE GALVANIZED STRAP, 4-EACH PIPE.

4 - 4" x 4" PRESSURE PRESERVATIVE TIMBERS SKIDS (TYP) OR APPROVED PRE-MANUFACTURED SKID.

ALL VOIDS BETWEEN THE WATER MAIN AND THE CASING PIPE SHALL BE FILLED WITH A LEAN GROUT. 12" MIN. BULKHEADS MUST BE PLACED AT EACH END.

**ALLOWABLE HEIGHT OF COVER (H) IN FT., FOR STEEL CASING**

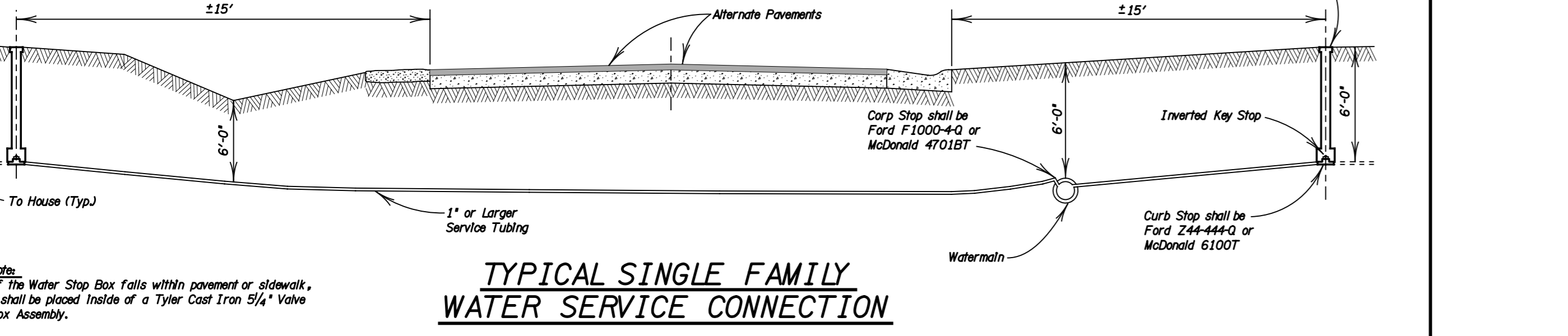
WALL THICKNESS (IN.)	STEEL CASING OUTSIDE DIAMETER (IN.)										
	12	14	16	18	20	24	28	30	36	42	
3/16	1875	39	30	24	21	19	17	16			
1/4	250	50	50	39	31	27	21	19	18	16	
5/16	3125			50	48	39	28	23	21	18	
3/8	375				50	50	39	29	27	22	
7/16	4375					50	39	34	26	21	
1/2	500						50	44	31	25	
5/8	5625								50	39	
3/4	625									48	

**TYPICAL TUNNEL CASING DETAIL**

**NOTE:**

- FOR 36" W.M. PROVIDE A MIN. OF 60" DIA. CASING WITH 1" WALL THICKNESS.
- CASING PIPE JOINTS TO BE FULLY WELDED AROUND THE CIRCUMFERENCE BY A CERTIFIED WELDER.
- THE DIAMETER OF THE BORE CASING SHALL BE A MINIMUM OF 8" LARGER THAN THE WATERMAIN TO ACCOMMODATE THE 4" SKIDS.

TYPICAL WATER MAIN TUNNEL CASING DETAIL



TYPICAL SINGLE FAMILY WATER SERVICE CONNECTION

**NOTE:**  
If the Water Stop Box falls within pavement or sidewalk, it shall be placed inside of a Tyler Cast Iron 5 1/4" Valve Box Assembly.

# WATER MAIN STANDARDS

SHEET 1 OF 1

CITY OF WIXOM  
OAKLAND COUNTY, MICHIGAN

STANDARD CONSTRUCTION DETAIL SHEET

HUBBELL, ROTH & CLARK, INC.  
Consulting Engineers

DATE	REVISION
XX-XX-2012	ADOPTED BY CITY COUNCIL