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CITY OF WATAUGA

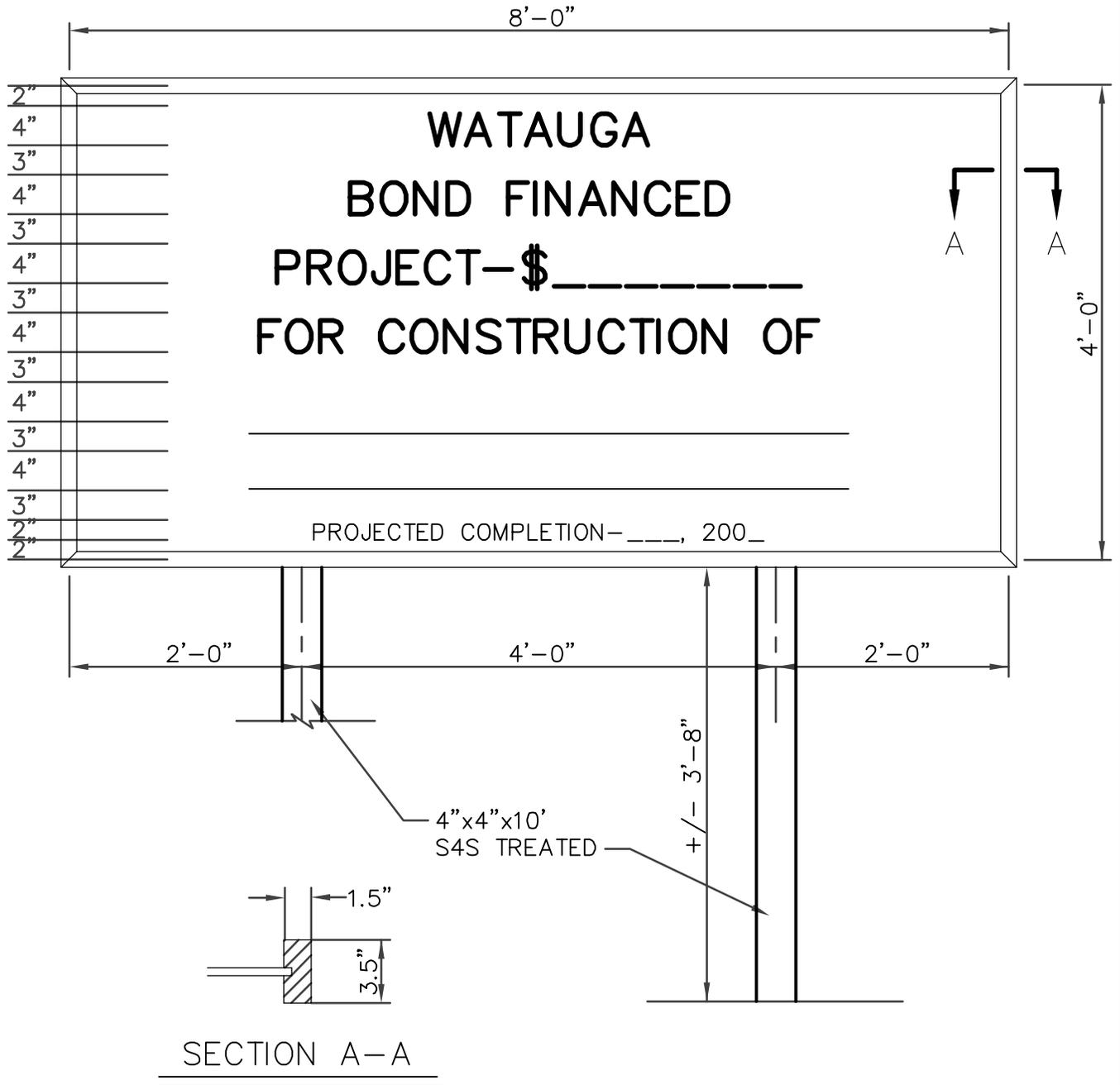
* GENERAL NOTES *

1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE CITY OF WATAUGA STANDARDS AND SPECIFICATIONS.
2. UTILITY CONTRACTOR AND STREET CONTRACTOR ARE TO NOTIFY A CITY TECHNICAL CONSTRUCTION INSPECTOR, AT (817) 514-5838, AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
3. ALL SANITARY SEWER PIPE SHALL BE SDR 35 PVC (ASTM D-3034).
4. ALL STORM DRAINAGE PIPE SHALL BE ASTM C-76, CLASS III REINFORCED CONCRETE, UNLESS NOTED OTHERWISE.
5. ALL WATER MAINS SHALL BE PVC AWWA-C900, DR18, CLASS 150 (FACTORY INSTALLATION GASKETS).
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF A MAXIMUM NUMBER OF PASSING FIELD DENSITY TESTS ON LIME STABILIZED SUBGRADE EQUAL TO THE RATIO OF 1 PER 100 LINEAR FEET OF STREET AND ALL FAILING DENSITY TESTS AND REQUIRED MOISTURE-DENSITY CURVES.
7. ALL FILL SHALL BE COMPACTED TO 95% (+ or - 2% O.M.) OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR METHOD (ASTM D-698).
8. ROUTE WATER LINES AROUND STORM DRAIN INLETS WITH A MINIMUM OF 12" CLEARANCE OUT-TO-OUT.
9. "CURB RAMPS" ARE TO BE CONSTRUCTED ON ALL PERMANENT CURB RETURNS AT INTERSECTIONS OF ALL STREETS OR AS DIRECTED BY THE PUBLIC WORKS DEPARTMENT.
10. ALL CONSTRUCTION BARRICADING TO BE IN ACCORDANCE WITH CURRENT "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" GUIDELINES.
11. GATE VALVES SHALL CONFORM TO ANSI/AWWA C509-87 R.S. VALVE.
12. MATERIAL DISPOSAL FOR CITY PROJECTS- THE CONTRACTOR SHALL NOTIFY THE PUBLIC WORKS DIRECTOR IN WRITING OF PROPOSED MATERIAL DISPOSAL SITES TO BE UTILIZED WITHIN THE CITY OF WATAUGA. THE NOTIFICATION SHALL INCLUDE THE LEGAL LOT/BLOCK, ADDITION DESCRIPTION AND ADDRESS OF THE PROPOSED SITE. THE PUBLIC WORKS DIRECTOR SHALL BE NOTIFIED TWO (2) WEEKS IN ADVANCE OF ANY MATERIAL BEING DEPOSITED.
13. MATERIAL DISPOSAL FOR DEVELOPER PROJECTS- THE CONTRACTOR SHALL NOTIFY THE PUBLIC WORKS DIRECTOR IN WRITING OF PROPOSED MATERIAL DISPOSAL SITES TO BE UTILIZED OUTSIDE OF THE PROJECT LIMITS AND INSIDE OF THE CITY OF WATAUGA. PROJECT LIMITS SHALL BE DEFINED AS PROPERTY OWNED BY THE DEVELOPER AND PART OF THE ADDITION BEING CONSTRUCTED. THE NOTIFICATION SHALL INCLUDE LEGAL LOT/BLOCK, ADDITION DESCRIPTION AND ADDRESS OF THE PROPOSED SITE. THE PUBLIC WORKS DIRECTOR SHALL BE NOTIFIED TWO (2) WEEKS IN ADVANCE OF ANY MATERIAL BEING DEPOSITED.
14. EBAA IRON "MEGALUG" SERIES RESTRAINTS SHALL BE USED AT ALL MECHANICAL JOINT FITTINGS AND ON PIPE JOINTS WHERE INSUFFICIENT LENGTH OF STRAIGHT PIPE IS SUPPORTED IN TRENCH.

* GENERAL NOTES *



3.2.26 PROJECT SIGN: SUBSIDIARY TO BID ITEMS.
 THE CONTRACTOR SHALL FURNISH AND MAINTAIN ALL-WEATHER PROJECT SIGN AS ILLUSTRATED BELOW. THE SIGN SHALL HAVE A BLUE BACKGROUND WITH WHITE FRAME AND LETTERING. IT SHALL BE LOCATED AT THE PROJECT SITE AS DIRECTED BY THE OWNER'S PROJECT REPRESENTATIVE.

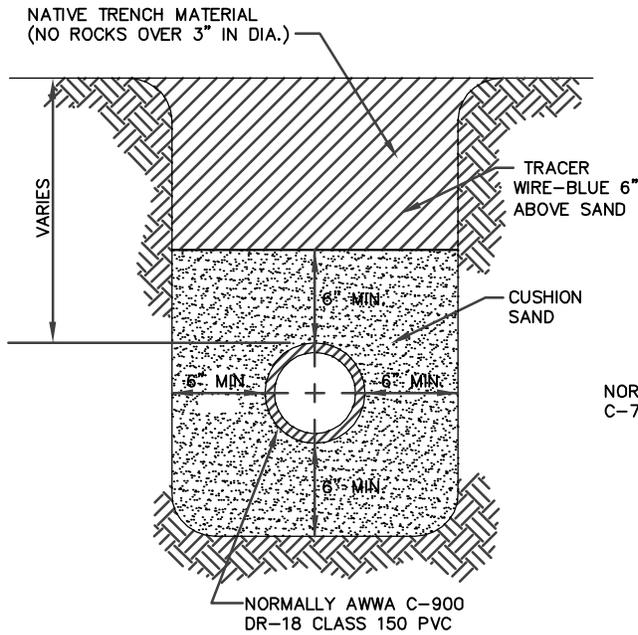


* GENERAL NOTES *

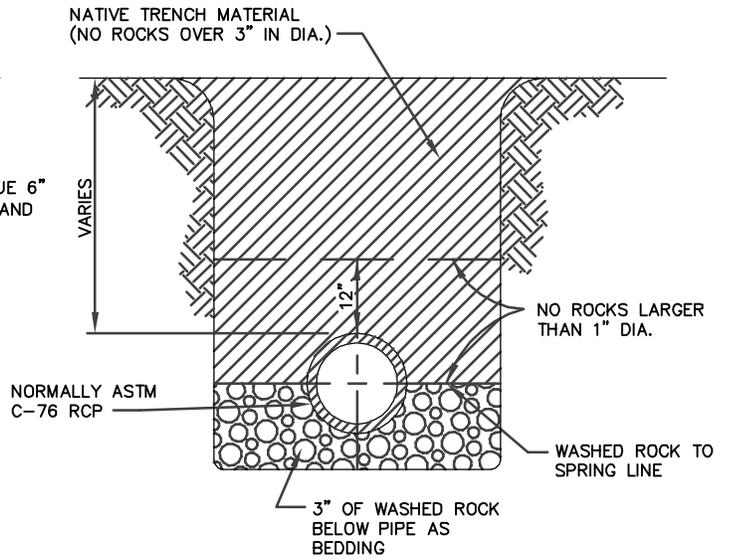


MISCELLANEOUS TRENCH EMBEDMENT AND BACKFILL DETAILS

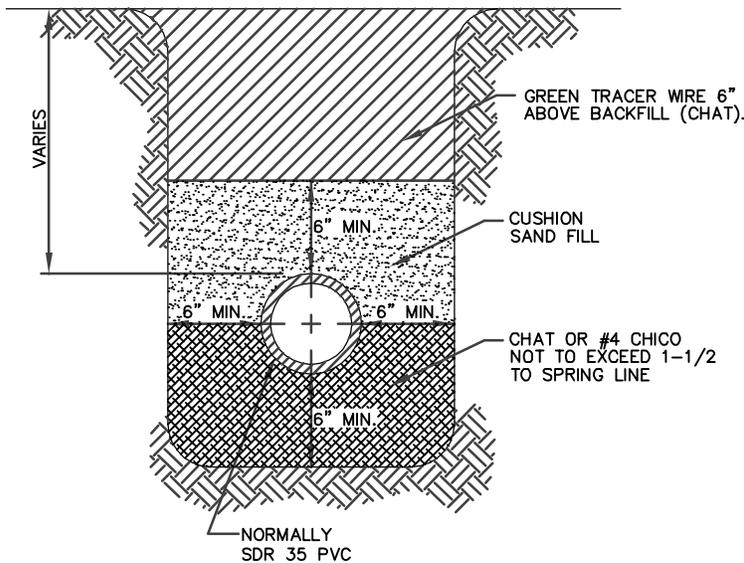
NOT TO SCALE



WATER



STORM DRAIN



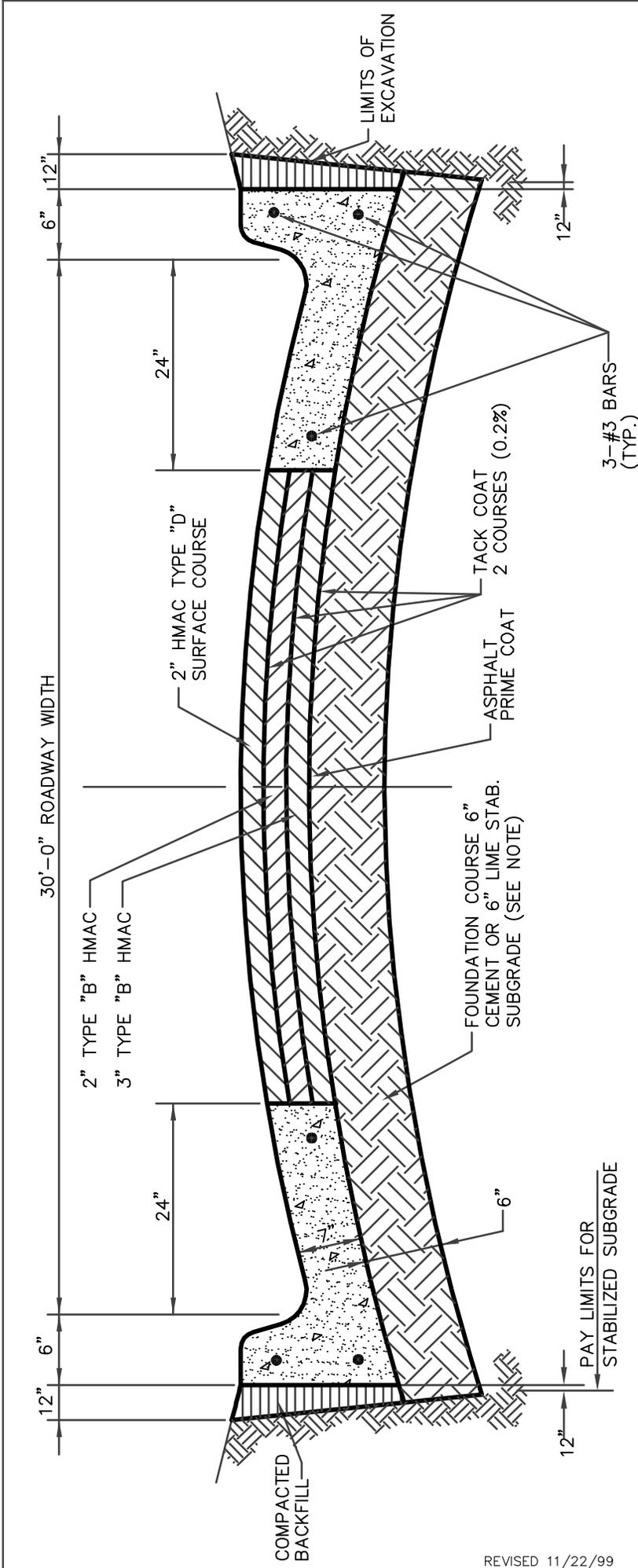
SANITARY SEWER

GENERAL NOTES:

1. ALL TRENCH BACKFILL SHALL BE COMPACTED TO 95% STANDARD PROCTOR DRY DENSITY (ASTM D-698).
2. MECHANICALLY COMPACTED TRENCH BACKFILL SHALL BE PLACED IN NO GREATER THAN 6" LIFTS. TESTING SHALL BE AT THE RATE OF ONE TEST PER LIFT PER 300 FEET OF TRENCH.

TRENCH EMBEDMENT & BACKFILL DETAILS





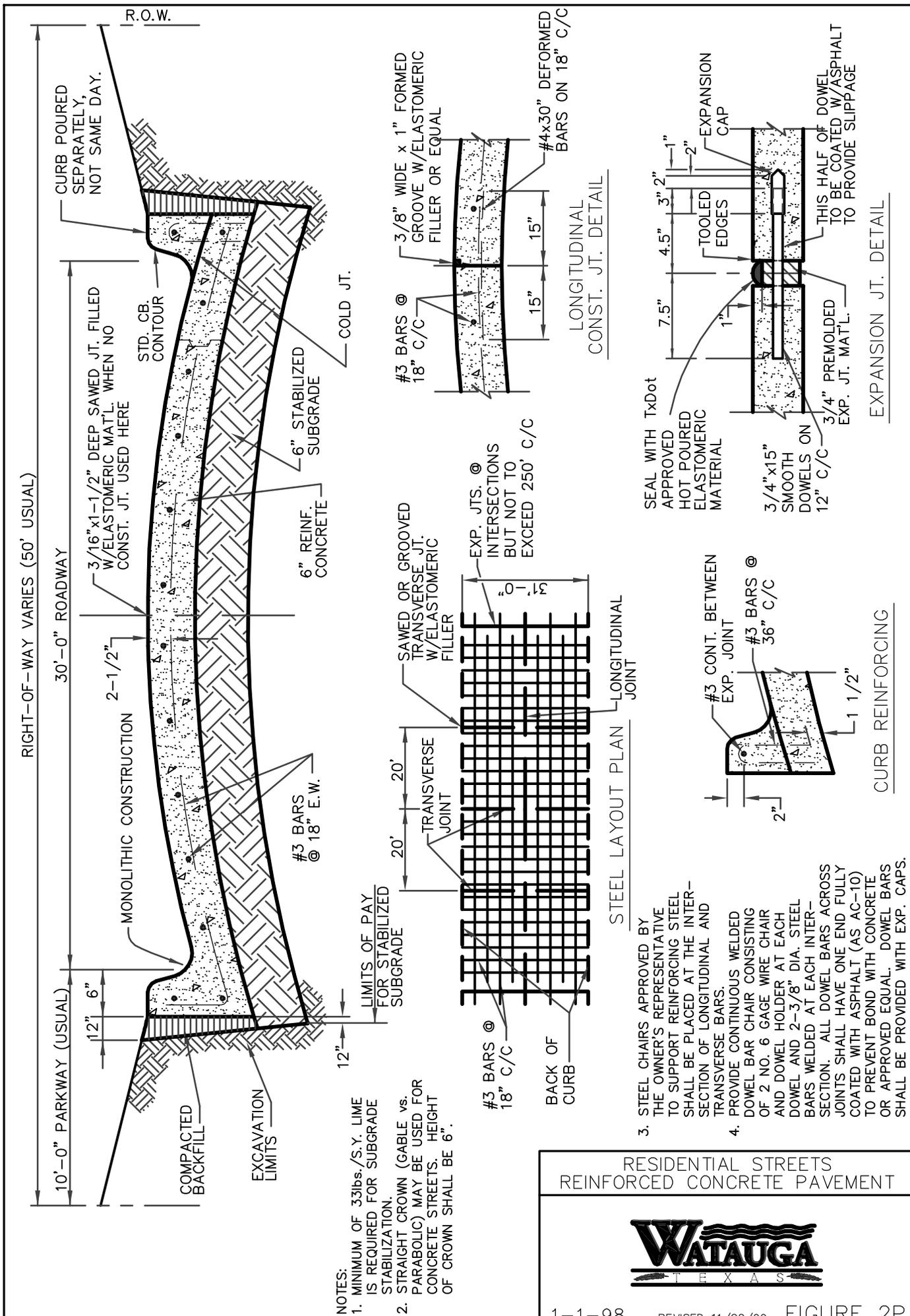
FOUNDATION COURSE --
 CEMENT OR LIME TREATED SUBGRADE (6") - IF THE NATURAL SUBGRADE HAS A P.I. LESS THAN 20, THE ENGINEER MAY SPECIFY CEMENT OR LIME TREATED SUBGRADE AFTER CONSIDERING LINEAR SHRINKAGE, SOIL CLASSIFICATION, SEEPAGE, AND OTHER FACTORS. IF THE NATURAL SUBGRADE HAS A P.I. GREATER THAN 20, LIME TREATED SUBGRADE SHALL BE USED. IF SUFFICIENT DEPTH OF SUITABLE SUBGRADE MATERIAL IS NOT AVAILABLE, IT SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL.

NOTE: MINIMUM OF 33 LBS/S.Y. LIME WILL BE REQUIRED FOR SUBGRADE STABILIZATION.

NOTE: PRIME COAT SHALL BE APPLIED AT THE RATE OF 0.15-0.20 GALLONS PER SQUARE YARD. TACK COAT SHALL BE APPLIED AT THE RATE OF 0.05-0.10 GALLONS PER SQUARE YARD.

RESIDENTIAL STREETS HOT MIX ASPHALT CONCRETE PAVEMENT





RIGHT-OF-WAY VARIES (50' USUAL)

R.O.W.

10'-0" PARKWAY (USUAL)

30'-0" ROADWAY

12"

6"

12"

6"

12"

6"

12"

6"

12"

6"

MONOLITHIC CONSTRUCTION

3/16" x 1-1/2" DEEP SAWED JT. FILLED W/ELASTOMERIC MAT'L. WHEN NO CONST. JT. USED HERE

2-1/2"

6" REINF. CONCRETE

6" STABILIZED SUBGRADE

COLD JT.

STD. CB. CONTOUR

CURB POURED SEPARATELY, NOT SAME DAY.

EXCAVATION LIMITS

COMPACTED BACKFILL

LIMITS OF PAY FOR STABILIZED SUBGRADE

#3 BARS @ 18" E.W.

6" REINF. CONCRETE

20'

20'

TRANSVERSE JOINT

TRANSVERSE JOINT

SAWED OR GROOVED TRANSVERSE JT. W/ELASTOMERIC FILLER

EXP. JTS. @ INTERSECTIONS BUT NOT TO EXCEED 250' C/C

LONGITUDINAL JOINT

BACK OF CURB

#3 BARS @ 18" C/C

LONGITUDINAL CONST. JT. DETAIL

15"

15"

3/8" GROOVE W/ELASTOMERIC FILLER OR EQUAL

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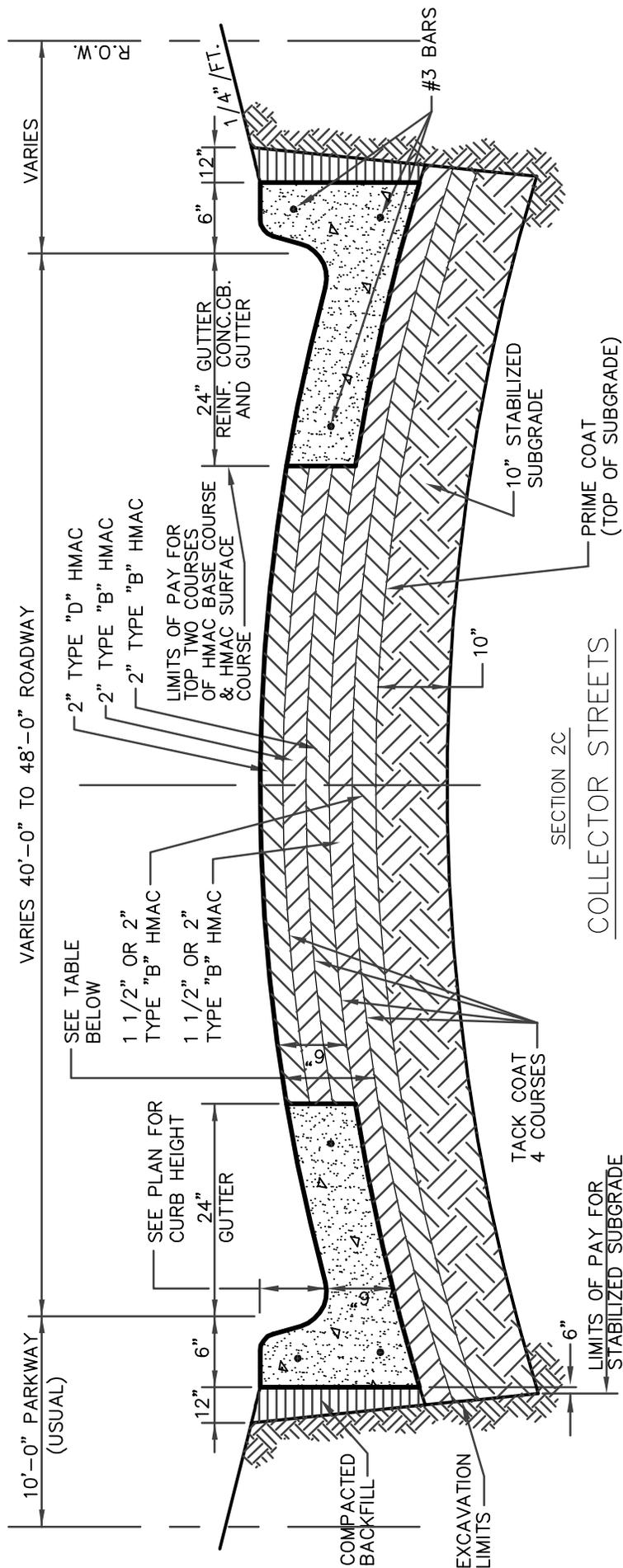
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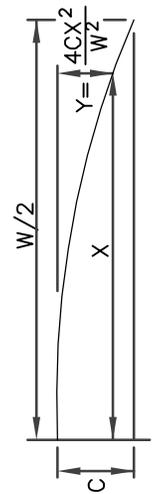
EXP. JTS. @ INTERSECTIONS BUT NOT TO EXCEED 2



ROADWAY WIDTH	40'	48'
MIN. HMAc THICKNESS	9"	10"

RDWY.	30'	40'	48'	60'
CROWN	6"	7"	8"	8"
SEC.	R	R/C	C	A
DIST. OUT				
Q	0.000	0.000	0.000	0.000
5'	0.054	0.036	0.028	0.019
10'	0.217	0.143	0.113	0.074
15'	0.500	0.322	0.255	0.167
18'		0.464	0.367	0.240
20'		0.583	0.453	0.296
22'			0.548	0.359
24'			0.667	0.427
26'				0.501
28'				0.581

MINIMUM PAVING THICKNESS	40'	48'
ROADWAY WIDTH	9"	10"
MIN. HMAc THICKNESS	9"	10"

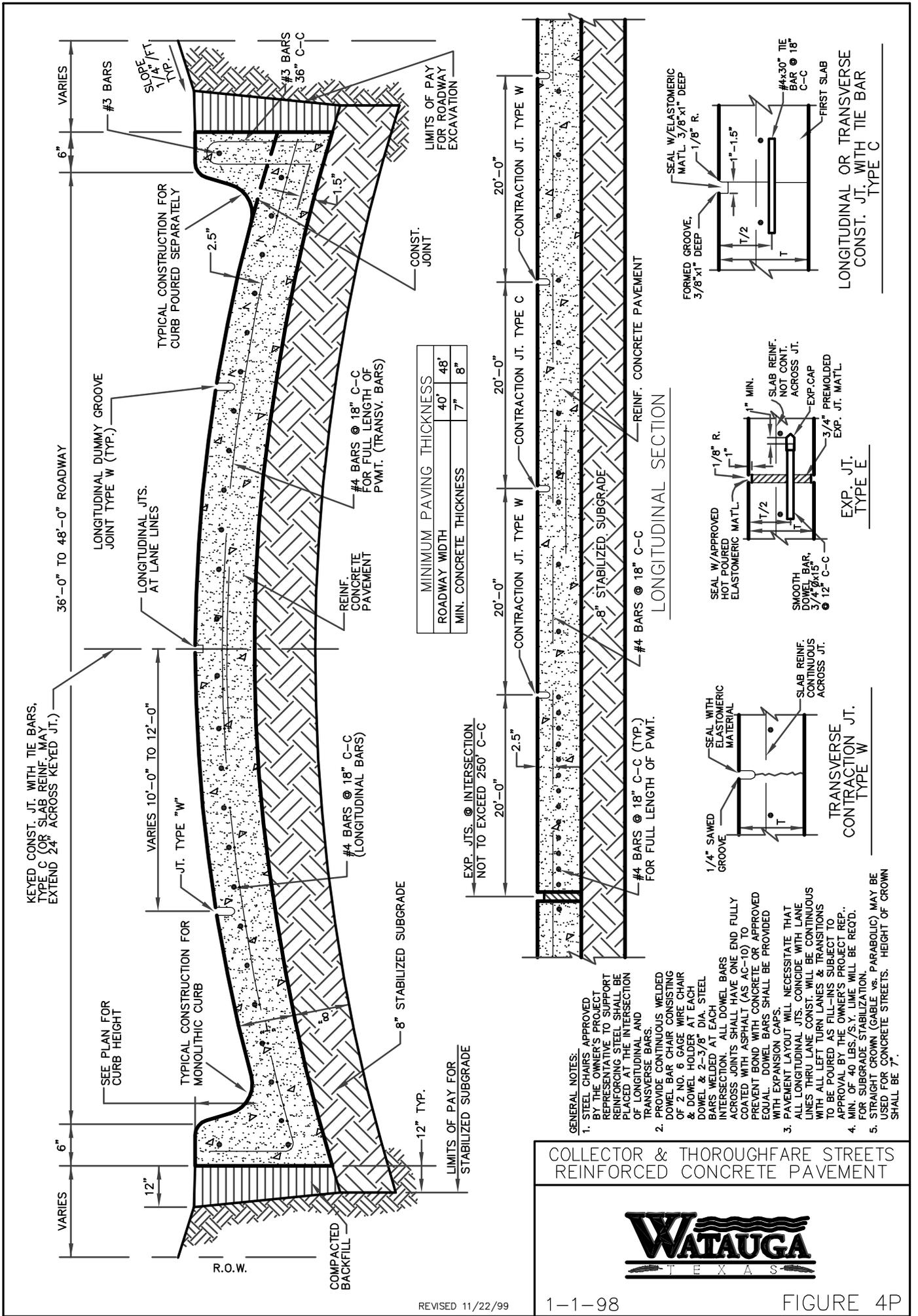


GENERAL NOTES:

1. COAT WITH ASPHALT THE SIDES OF GUTTERS WHICH ARE IN CONTACT WITH HMAc PAVEMENT.
2. FOUNDATION COURSE - CEMENT OR LIME TREATED SUBGRADE (10") - IF THE NATURAL SUBGRADE HAS A P.I. LESS THAN 20. THE ENGINEER MAY SPECIFY CEMENT OR LIME TREATED SUBGRADE AFTER CONSIDERING LINEAR SHRINKAGE, SOIL CLASSIFICATION, SEEPAGE, AND OTHER FACTORS. IF THE NATURAL SUBGRADE HAS A P.I. GREATER THAN 20, LIME TREATED SUBGRADE SHALL BE USED. IF SUFFICIENT DEPTH OF SUITABLE SUBGRADE MATERIAL IS NOT AVAILABLE, IT SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL, AND ALTERNATE STABILIZING AGENT MAY BE USED IF APPROVED BY THE ENGINEER.
3. MINIMUM OF 50 LBS/S.Y. LIME WILL BE REQUIRED FOR SUBGRADE STABILIZATION.
4. PRIME COAT SHALL BE APPLIED AT THE RATE OF 0.15-0.20 GALLONS PER S.Y.. TACK COAT SHALL BE APPLIED AT THE RATE OF 0.05-0.10 GALLONS PER S.Y..

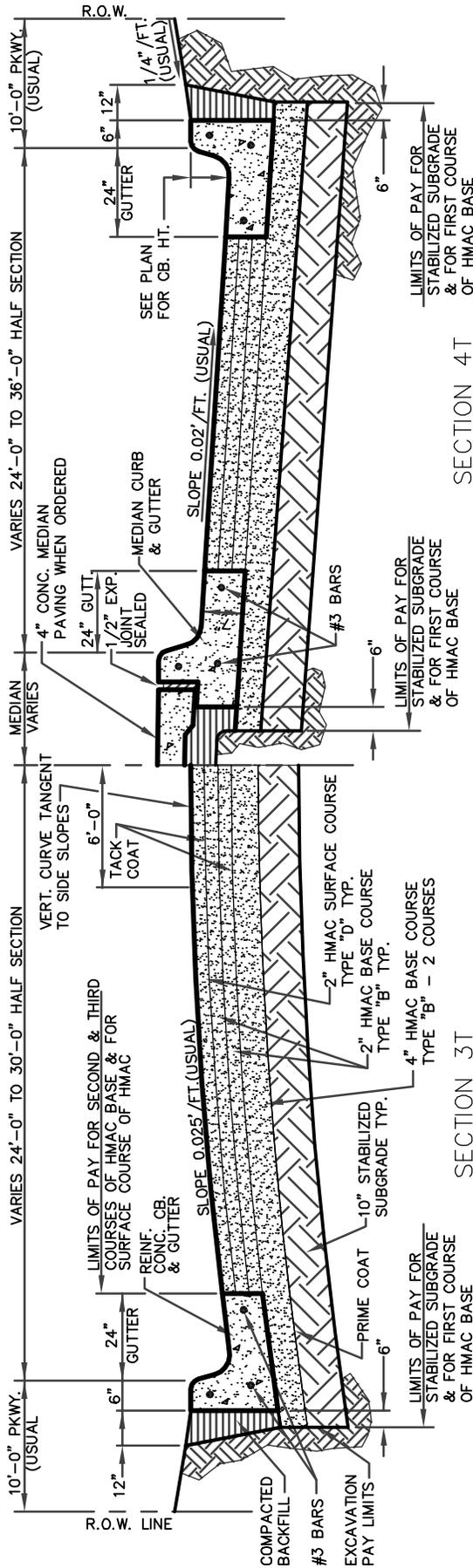
COLLECTOR STREETS
HOT MIX ASPHALT CONCRETE PAVEMENT





COLLECTOR & THOROUGHFARE STREETS
REINFORCED CONCRETE PAVEMENT





SECTION 4T

SECTION 3T

ARTERIAL & INDUSTRIAL STREETS

ARTERIAL & INDUSTRIAL STREETS
HOT MIX ASPHALT CONCRETE PAVEMENT

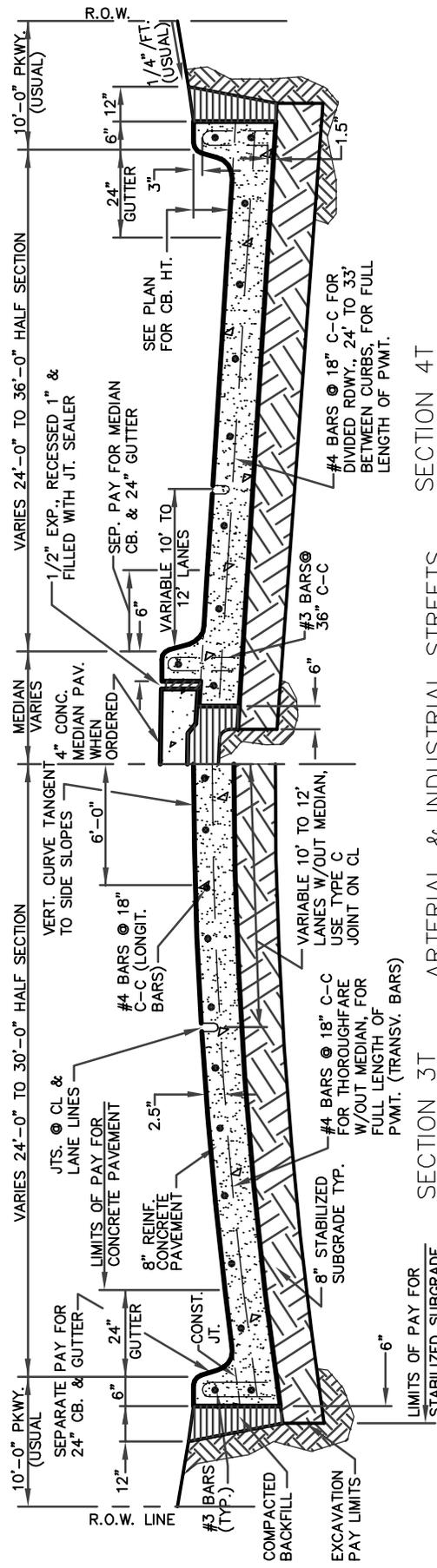


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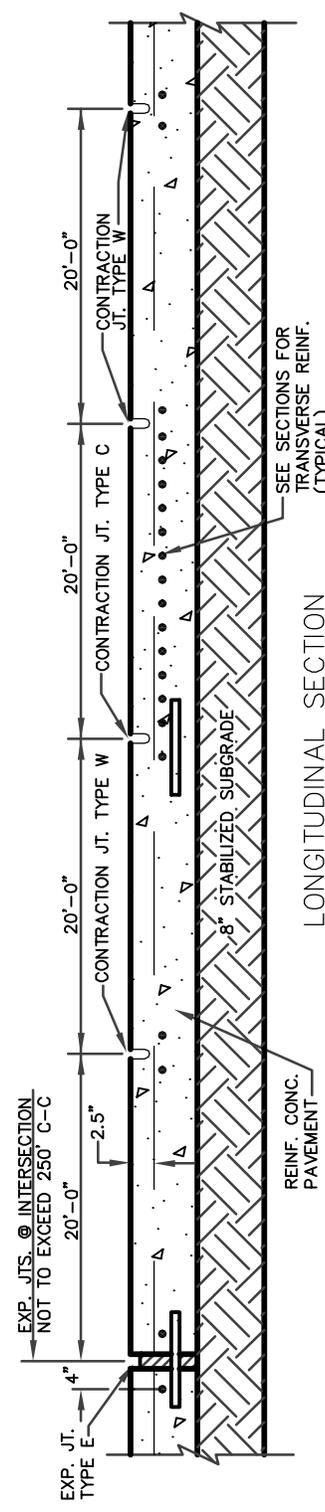
1. COAT WITH ASPHALT THE SIDES OF GUTTERS WHICH ARE IN CONTACT WITH HMA PAVEMENT.
2. FOUNDATION COURSE-CEMENT OR LIME TREATED SUBGRADE (8")-IF THE NATURAL SUBGRADE HAS A P.I. LESS THAN 20, THE ENGINEER MAY SPECIFY CEMENT OR LIME TREATED SUBGRADE AFTER CONSIDERING LINEAR SHRINKAGE, SOIL CLASSIFICATION, SEEPAGE, AND OTHER FACTORS. IF THE NATURAL SUBGRADE HAS A P.I. GREATER THAN 20, LIME TREATED SUBGRADE SHALL BE USED. IF SUFFICIENT DEPTH OF SUITABLE SUBGRADE MATERIAL IS NOT AVAILABLE, IT SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL. AN ALTERNATE STABILIZING AGENT MAY BE USED IF APPROVED BY THE ENGINEER.
3. MINIMUM OF 50 LBS./S.Y. LIME WILL BE REQUIRED FOR SUBGRADE STABILIZATION.
4. PRIME COAT SHALL BE APPLIED AT THE RATE OF 0.15-0.20 GALLONS PER S.Y.. TACK COAT SHALL BE APPLIED AT THE RATE OF 0.05-0.10 GALLONS PER S.Y..

ORDINATES FOR
PARABOLIC STREET
CROWNS IN FEET

RDWY.	30'	40'	48'	60'
CROWN	6"	7"	8"	8"
SEC.	R	R/C	C	A
DIST. OUT				
Q	0.000	0.000	0.000	0.000
5'	0.054	0.036	0.028	0.019
10'	0.217	0.143	0.113	0.074
15'	0.500	0.322	0.255	0.167
18'		0.464	0.367	0.240
20'		0.583	0.453	0.296
22'			0.548	0.359
24'			0.667	0.427
26'				0.501
28'				0.581

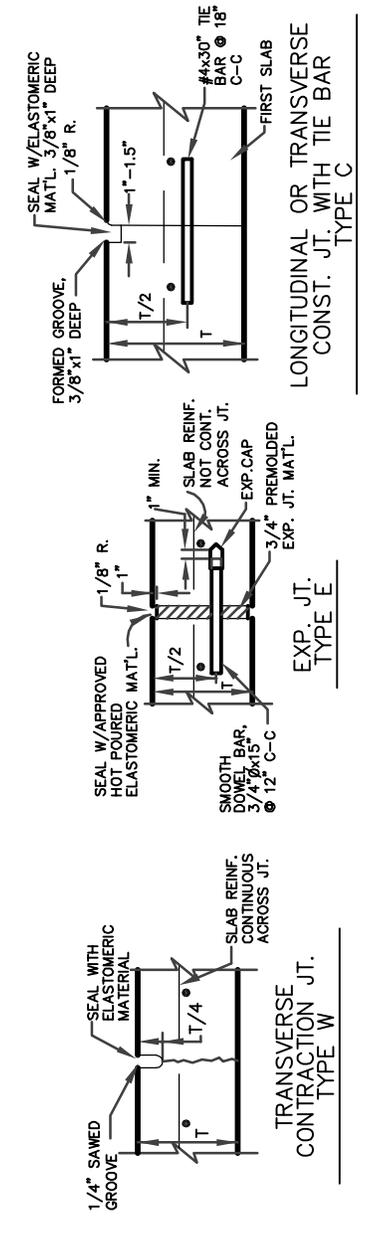


SECTION 3T ARTERIAL & INDUSTRIAL STREETS SECTION 4T



LONGITUDINAL SECTION

- GENERAL NOTES:
1. STEEL CHAIRS APPROVED BY THE OWNER'S PROJECT REPRESENTATIVE TO SUPPORT REINF. STEEL SHALL BE PLACED AT THE INTERSECTION OF LONGITUDINAL AND TRANSVERSE BARS AT SPACINGS OF 3'-0" LONGITUDINALLY AND 3'-4" TRANSVERSELY.
 2. PROVIDE CONTINUOUS WELDED DWEL BAR CHAIR CONSISTING OF 2 NO. 6 GAGE WIRE CHAIR AND DWEL HOLDER AT EACH DWEL & 2-3/8" Ø STEEL BARS WELDED AT EACH INTERSECTION. ALL DWEL BARS SHALL HAVE ONE END FULLY COATED WITH ASPHALT (AS AC-10) TO PREVENT BOND WITH CONCRETE. DWEL BARS SHALL BE PROVIDED WITH EXPANSION CAPS.
 3. PAVEMENT LAYOUT WILL NECESSITATE THAT ALL LONGITUDINAL JOINTS COINCIDE WITH LANE LINES- THRU LANE CONST. WILL BE CONTINUOUS WITH ALL LEFT TURN LANES & TRANSITIONS TO BE POURED AS FILL-INS SUBJECT TO THE OWNER'S PROJECT REPRESENTATIVE.
 4. MINIMUM OF 40 LBS./SQ. Y. LINE WILL BE REQUIRED FOR SURGRADE STABILIZATION.
 5. HEIGHT OF CROWN SHALL BE 8".



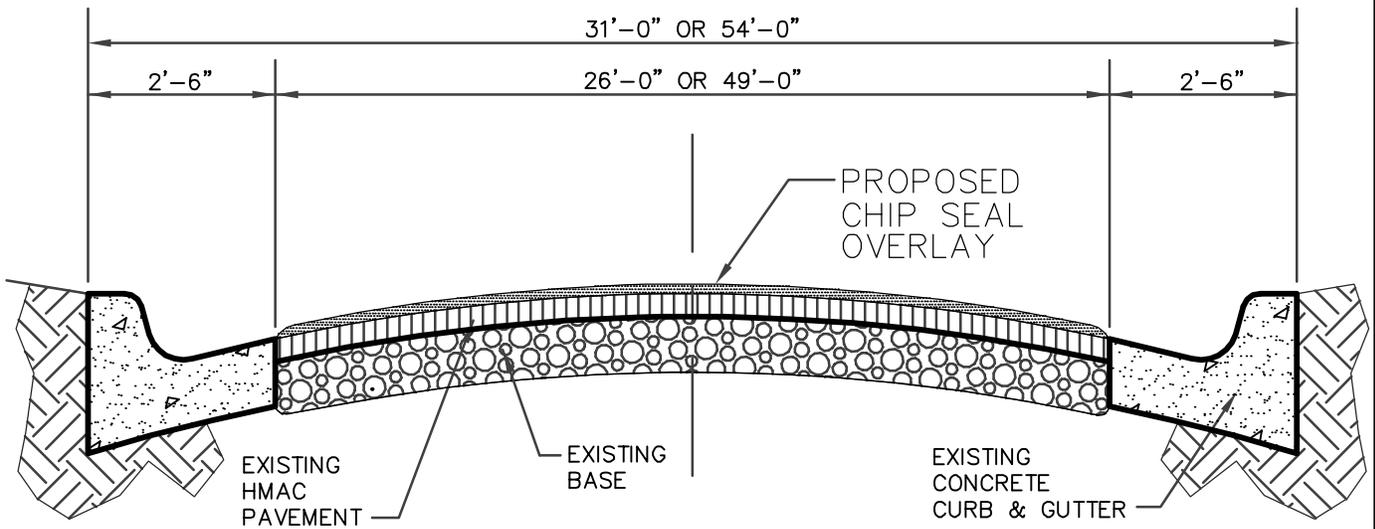
TRANSVERSE SECTION TYPE W

EXP. JT. TYPE E

LONGITUDINAL OR TRANSVERSE CONST. JT. WITH TIE BAR TYPE C

ARTERIAL & INDUSTRIAL STREETS REINFORCED CONCRETE PAVEMENT





TYPICAL STREET SECTION
NOT TO SCALE

NOTE:

SINGLE COURSE CHIP SEAL (ITEM 321, *TxDot SPECS.)

- ASPHALT (AC-5 PER ITEM 300, TxDot SPECS.);
RESIDUAL ASPHALT RATE=0.25 GAL./S.Y.
- AGGREGATE (PB-GRADE 5 PER ITEM 304, TxDot SPECS.);
APPLICATION RATE=1 C.Y. PER 135 S.Y.

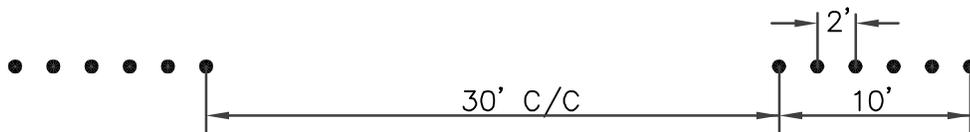
*TxDot=TEXAS DEPARTMENT OF HIGHWAYS & PUBLIC TRANSPORTATION

CHIP SEAL PAVEMENT
SECTION DETAIL



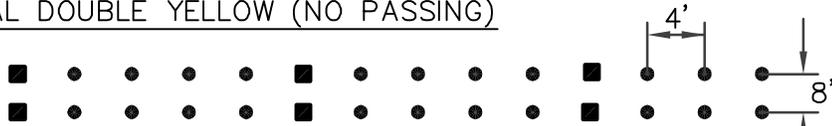
TYPICAL DASH LINE

10 FT. DASH WITH 6 BUTTONS ON 2 FT. CENTERS
30 FT. SPACES



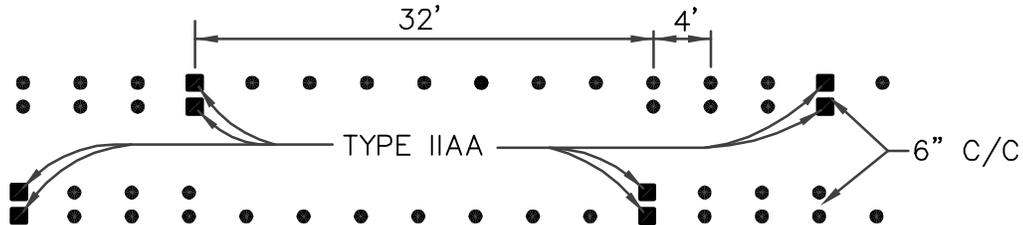
NOTE: LEAD BUTTONS TO BE REFLECTIVE TYPE IC OR TYPE IA.
ALL OTHER BUTTONS TYPE "W" OR "Y", AS SPECIFIED ON PLANS.

TYPICAL DOUBLE YELLOW (NO PASSING)



NOTE: BUTTONS TO BE INSTALLED ON 4 FT. CENTERS, 8 INCHES APART.
LINE TO TERMINATE FOR INTERSECTIONS. BUTTONS TO BE TYPE "Y" WITH TYPE IIAA
BUTTONS ON 20 FT. CENTERS. TYPE IIAA BUTTONS TO BE USED AT THE START AND
END OF STRIPES AT INTERSECTIONS.

TYPICAL CONTINUOUS LEFT TURN LANE



NOTE: ALL BUTTONS TO BE TYPE "Y" AND TYPE IIAA. OUTSIDE LINE TO BE ON
4 FT. CENTERS AS ABOVE. INSIDE DASH TO BE ON 4 FT. CENTERS AS ABOVE.
TYPE IIAA BUTTONS AT START OF EACH DASH TO MATCH TYPE IIAA BUTTONS
IN THE LINE. LINES AND DASHES TO TERMINATE AT INTERSECTIONS WITH TYPE
IIAA BUTTONS.

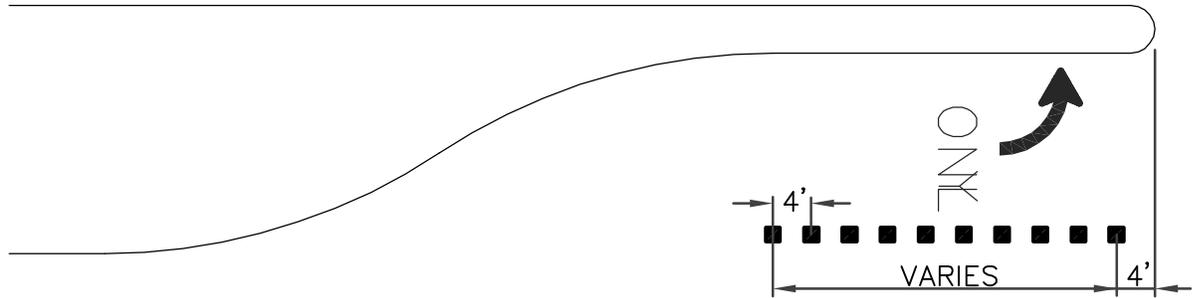
SPECIAL PROVISIONS:

1. BUTTONS AS PER ITEM 676 TDHPT STD. SPECS. 1982.
2. ADHESIVE – TYPE II M AS PER ITEM 575 TDHPT STD. SPECS. 1982.
3. CONSTRUCTION – AS PER ITEM 676.4 TDHPT STD. SPECS. 1982.
4. ALL CONCRETE STREETS TO BE SAND BLASTED BEFORE BUTTON APPLICATION.
5. DESIGN TO BE APPROVED BY CITY OF WATAUGA.
6. COLOR OF BUTTONS TO BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
7. SIZE OF ALL BUTTONS TO BE FOUR (4") INCHES IN DIAMETER UNLESS OTHERWISE SPECIFIED.

PAVEMENT MARKING DETAILS

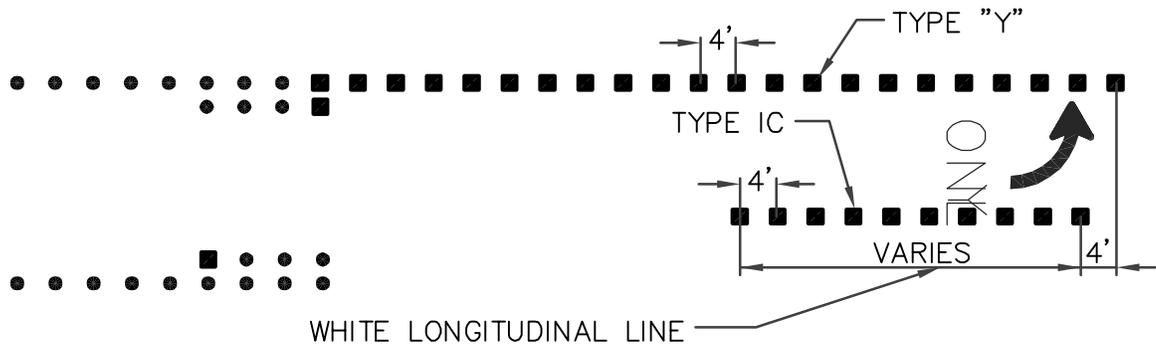


STREET WITH CURBED MEDIAN



NOTE: ALL BUTTONS TO BE TYPE IC.

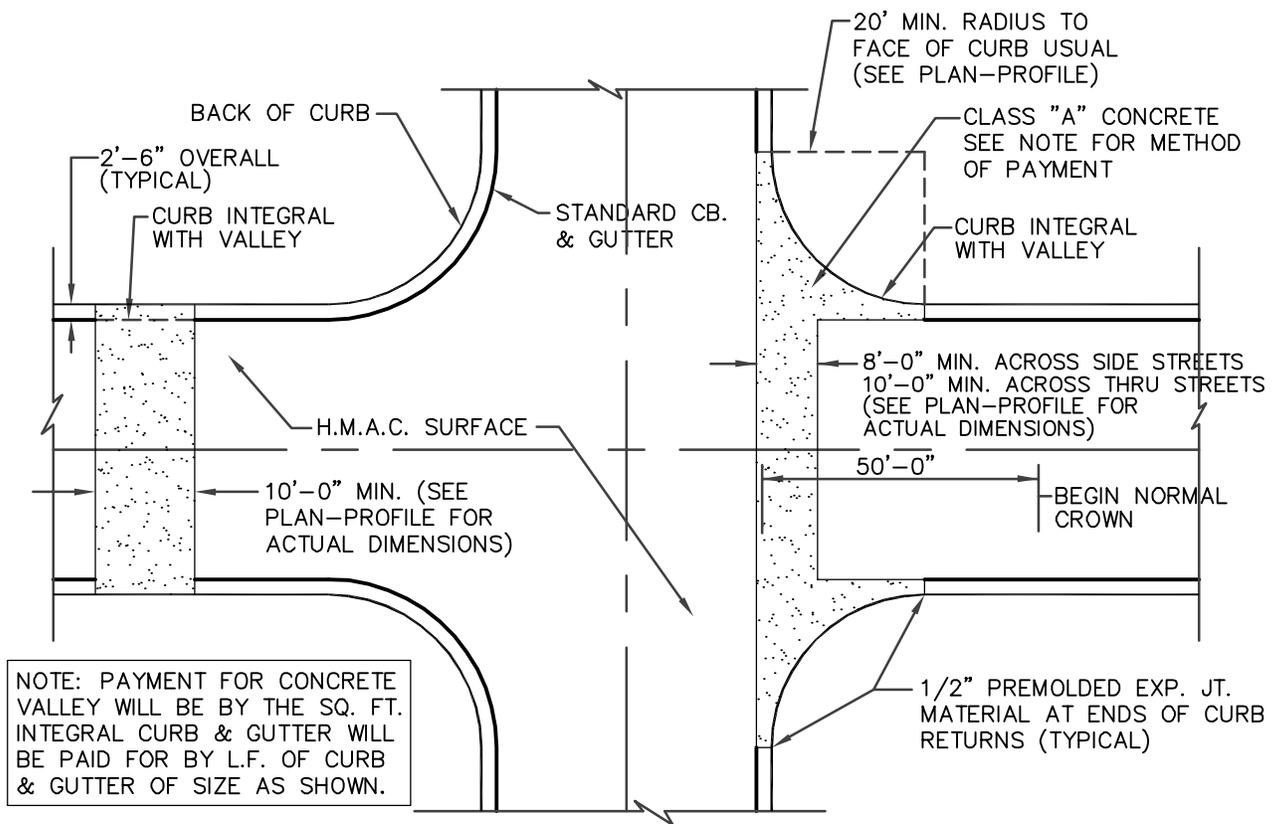
STREET WITH TERMINATING CONTINUOUS
LEFT TURN LANE AT SIGNALIZED INTERSECTION:



1. A STORAGE LANE SHALL BE DESIGNED TO ACCOMMODATE THE APPROPRIATE AMOUNT OF TRAFFIC.
2. THE WHITE LONGITUDINAL LINE SHALL BE OF TYPE IC.
(SEE LAYOUT DETAIL ABOVE.)
3. TYPE 'Y' JIGGLE BARS SHALL BE 6" SQUARE.

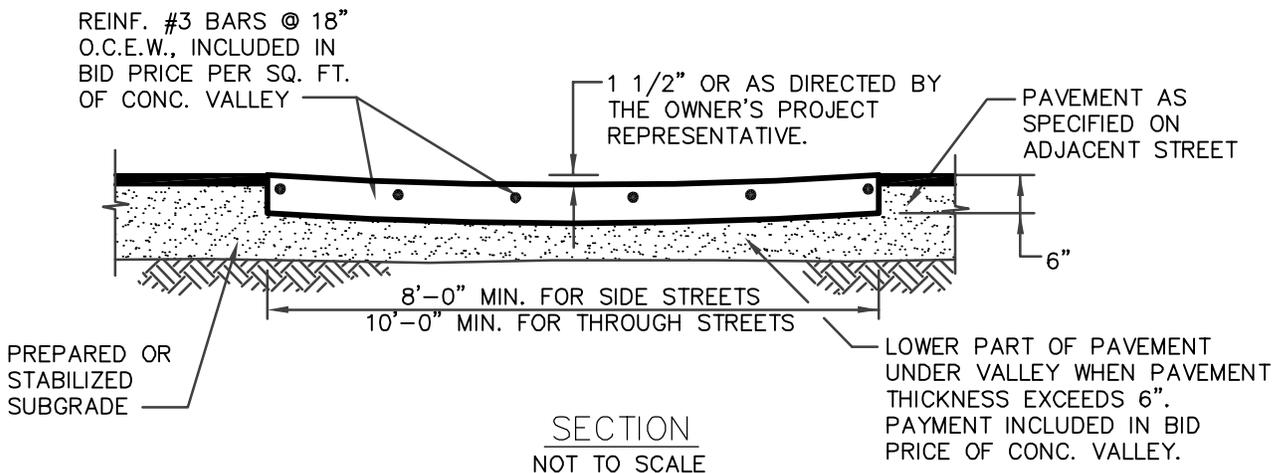
TYPICAL LEFT TURN LANES





NOTE: PAYMENT FOR CONCRETE VALLEY WILL BE BY THE SQ. FT. INTEGRAL CURB & GUTTER WILL BE PAID FOR BY L.F. OF CURB & GUTTER OF SIZE AS SHOWN.

PLAN
NOT TO SCALE



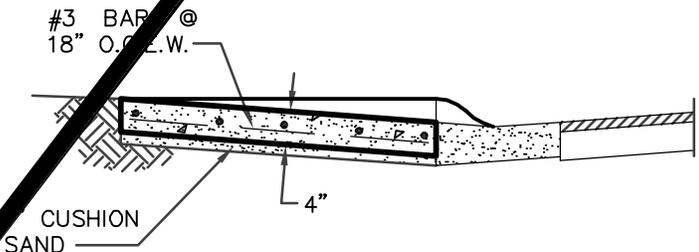
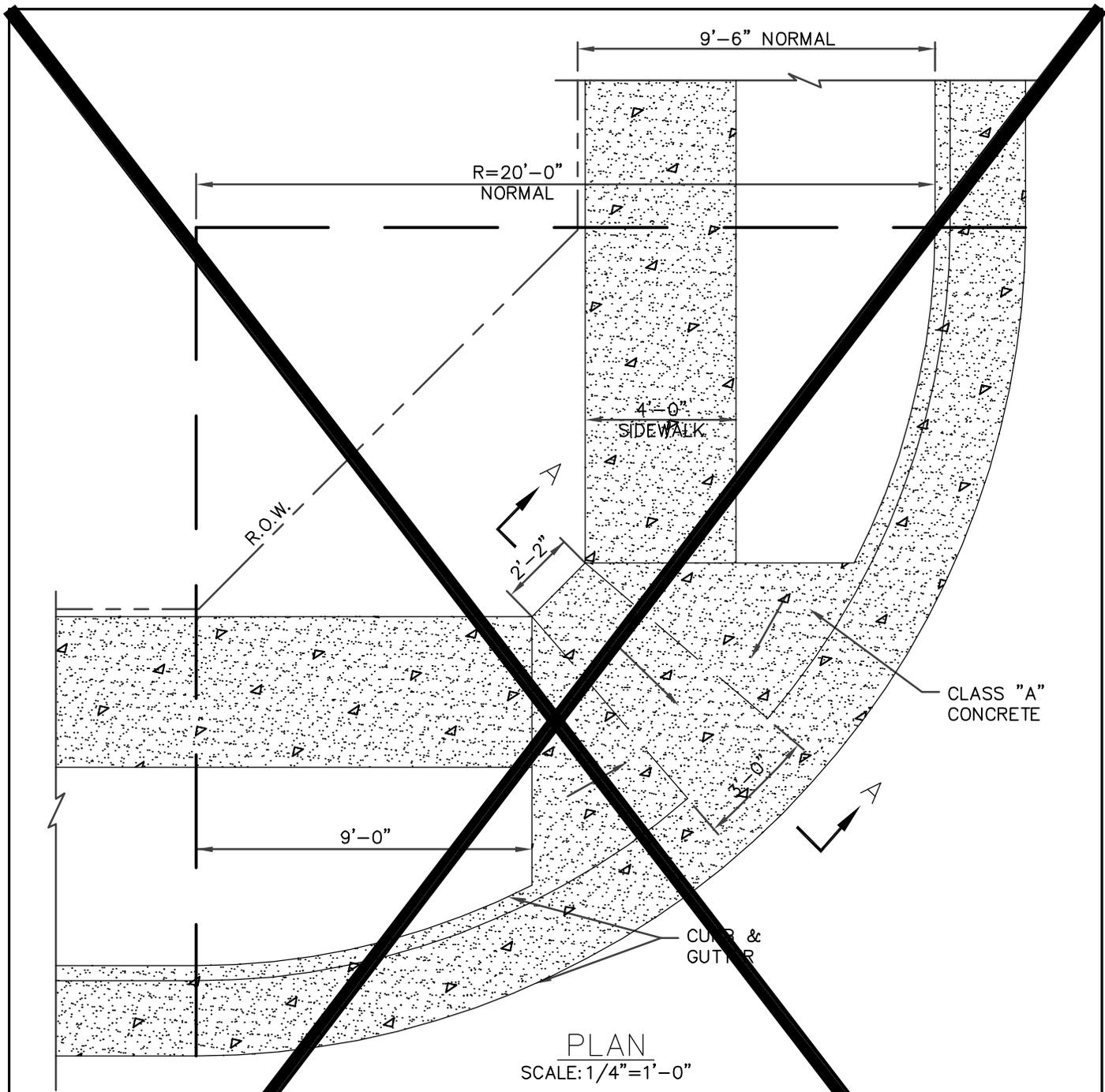
SECTION
NOT TO SCALE

NOTE: CLASS "A" CONCRETE SHALL HAVE 5 SACKS OF CEMENT/C.Y., MAXIMUM SLUMP OF 5 INCHES, AND A 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.

CROWN TRANSITION FOR CONCRETE VALLEY			
DISTANCE FROM C OF VALLEY	CROWN		
	6"	7"	8"
0'	0.000'	0.000'	0.000'
5'	0.167'	0.167'	0.167'
10'	0.290'	0.290'	0.290'
20'	0.445'	0.445'	0.465'
30'	0.500'	0.540'	0.580'
40'	0.500'	0.583'	0.635'
50'	0.500'	0.583'	0.667'

CONCRETE VALLEY DETAILS



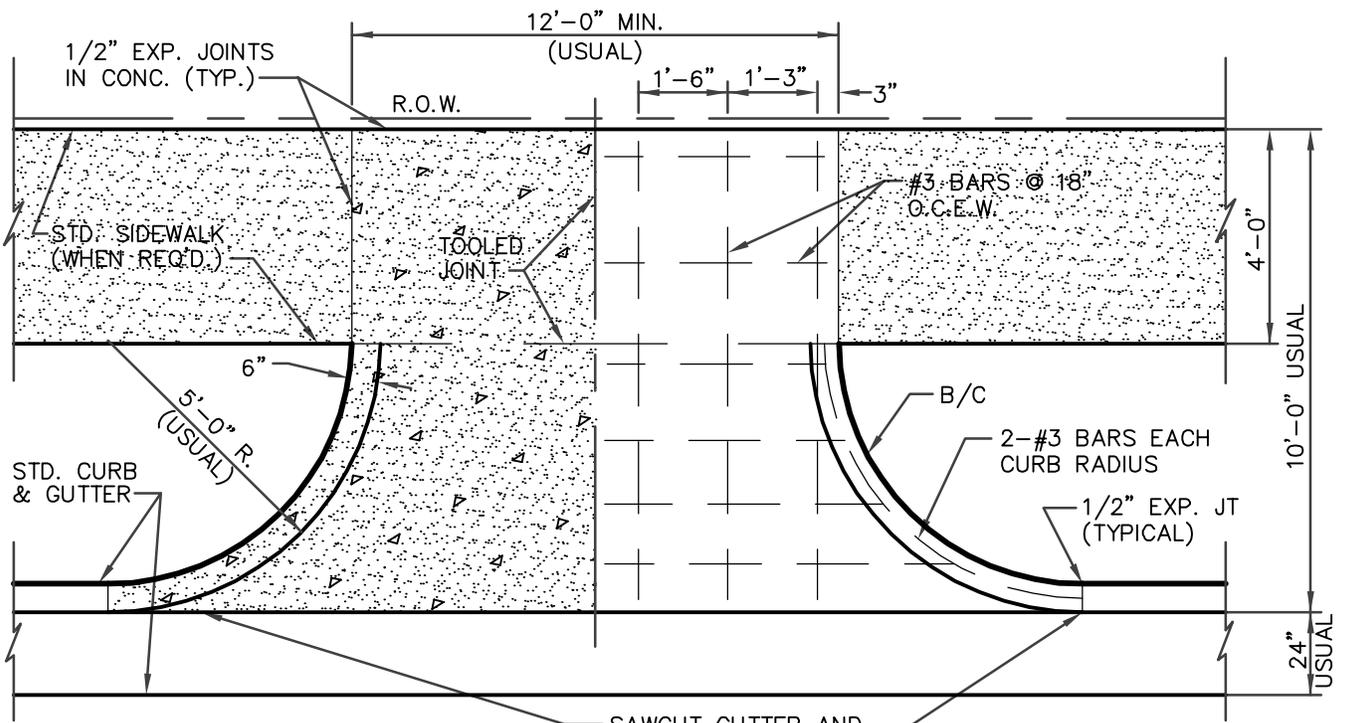


NOTE: CLASS "A" CONCRETE SHALL HAVE 5 SACKS OF CEMENT/C.Y., MAXIMUM SLUMP OF 5 INCHES, AND A 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.

CURB RAMP DETAILS

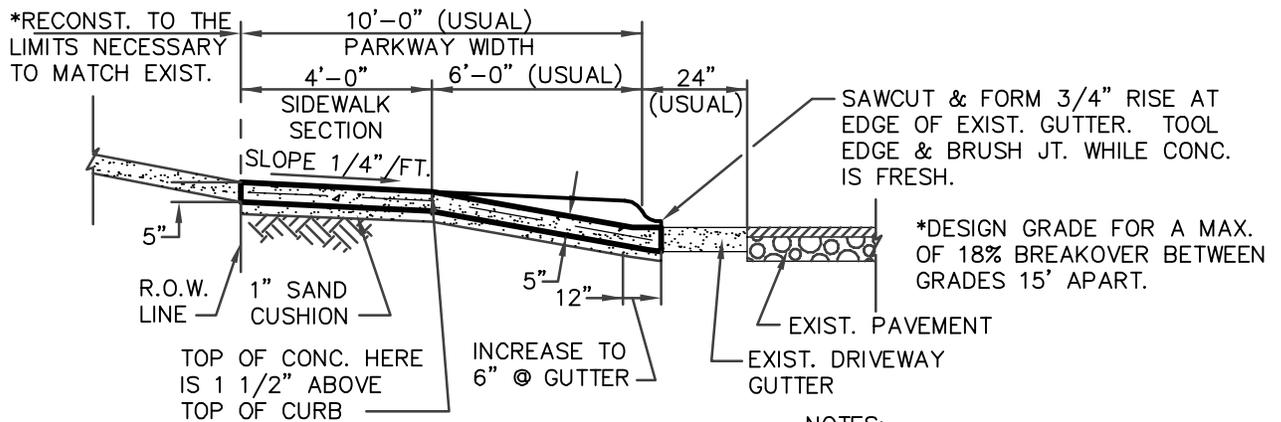


CURB RAMPS ARE TO BE CONSTRUCTED ACCORDING TO CURRENT TXDOT "PEDESTRIAN FACILITIES CURB RAMPS" DETAIL (PED-12A AS OF 4/29/2013)

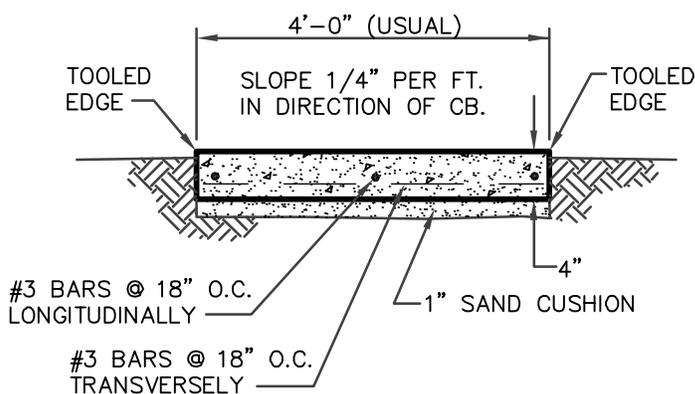


NOTE: IF GUTTER IS CRACKED, DRIVEWAY & GUTTER MUST BE POURED MONOLITHICALLY.

PLAN



SECTION



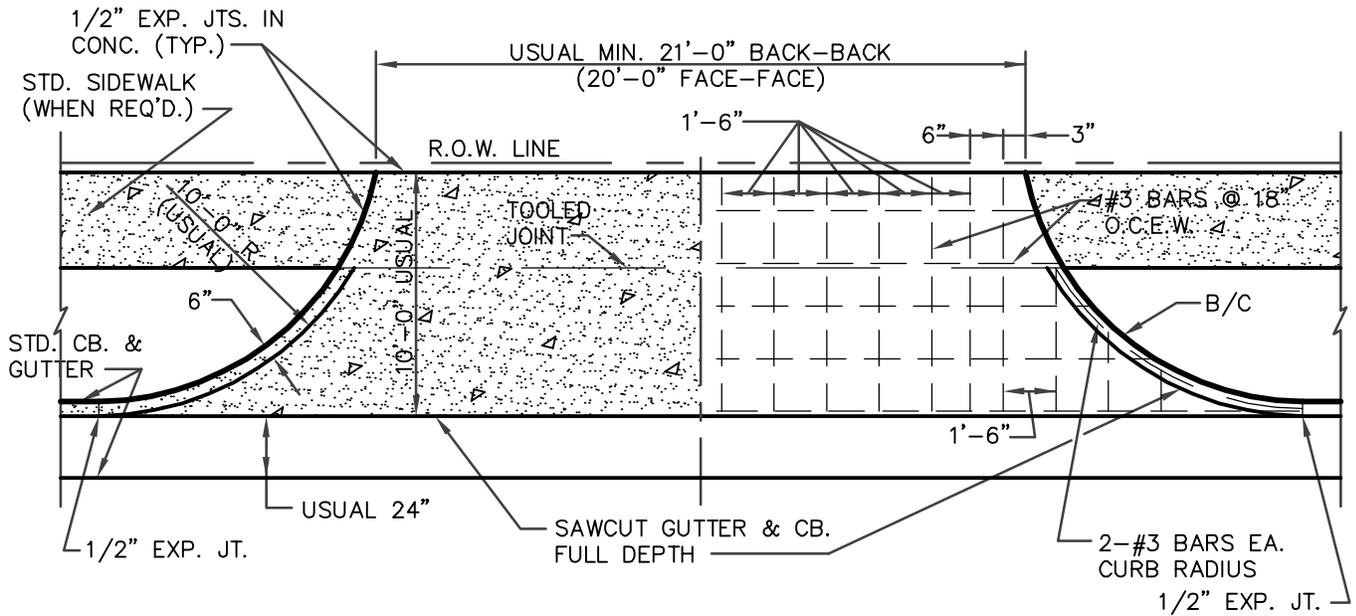
DETAIL
STANDARD SIDEWALK

NOTES:

1. MINIMUM THICKNESS OF DRIVEWAY IS 5", USE 3000 PSI COMPRESSIVE STRENGTH CONCRETE WITH 5" MAXIMUM SLUMP.
2. CONCRETE TO BE POURED WITHIN 72 HOURS FROM THE TIME THE CURB & GUTTER IS SAWCUT.
3. PARKWAY, SIDEWALK, AND DRIVEWAY SIDEWALK SECTION WILL ALL HAVE A 1/4" PER FOOT SLOPE DOWN IN THE DIRECTION OF THE TOP OF CURB.
4. SEE FIGURE 4P FOR EXPANSION JOINT DETAIL.

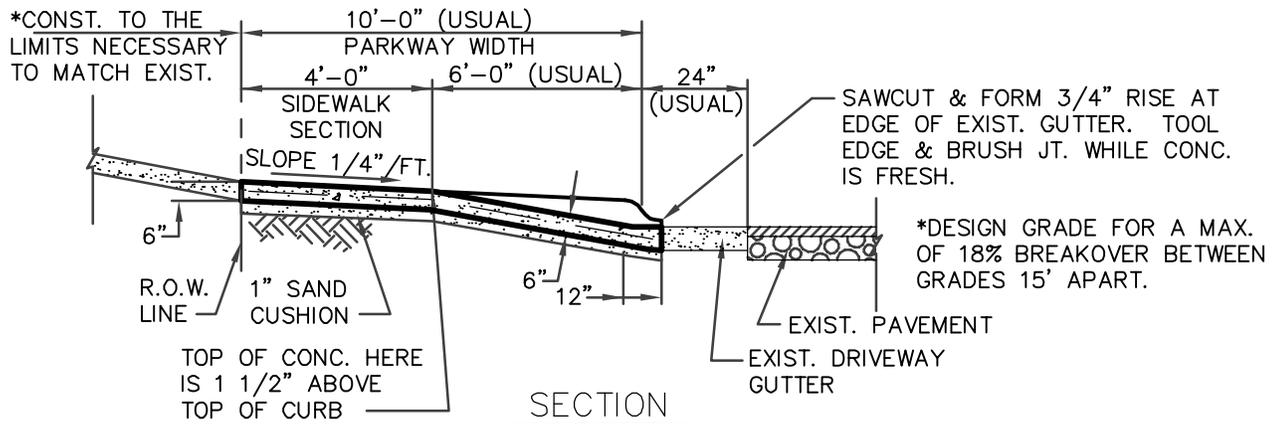
RESIDENTIAL DRIVE DETAILS



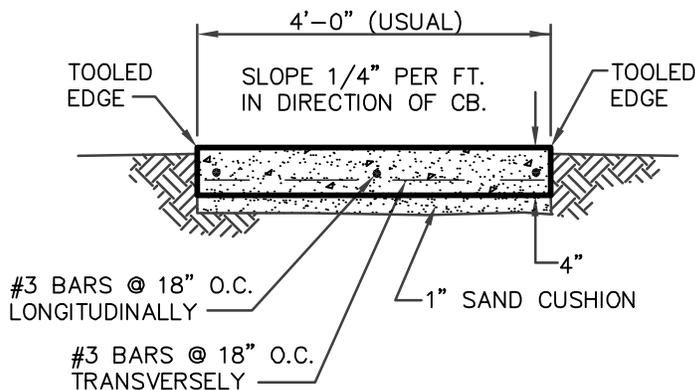


PLAN

NOTE: IF GUTTER IS CRACKED, DRIVEWAY AND GUTTER MUST BE POURED MONOLITHICALLY.



SECTION



DETAIL

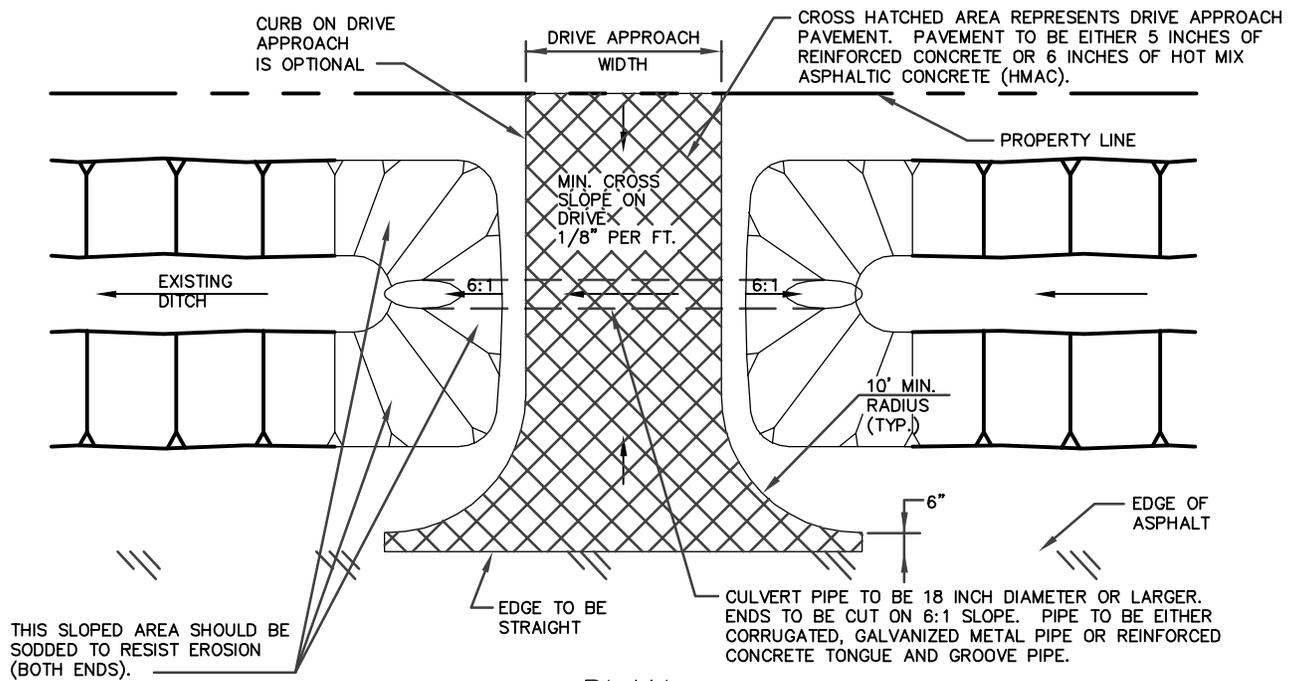
STANDARD SIDEWALK

NOTES:

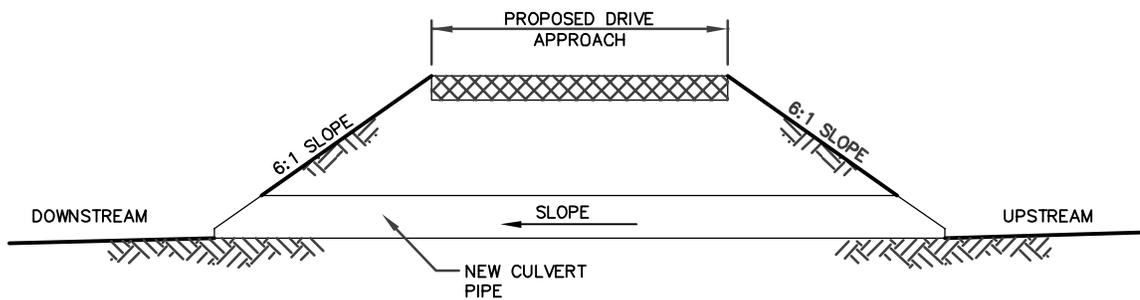
1. MINIMUM THICKNESS OF DRIVEWAY IS 6", USE 3000 PSI COMPRESSIVE STRENGTH CONCRETE WITH 5" MAXIMUM SLUMP.
2. CONCRETE TO BE POURED WITHIN 72 HOURS FROM THE TIME THE CURB & GUTTER IS SAWCUT.
3. PARKWAY, SIDEWALK, AND DRIVEWAY SIDEWALK SECTION WILL ALL HAVE A 1/4" PER FOOT SLOPE DOWN IN THE DIRECTION OF THE TOP OF CURB.
4. SEE FIGURE 4P FOR EXPANSION JOINT DETAIL.

COMMERCIAL DRIVE DETAILS



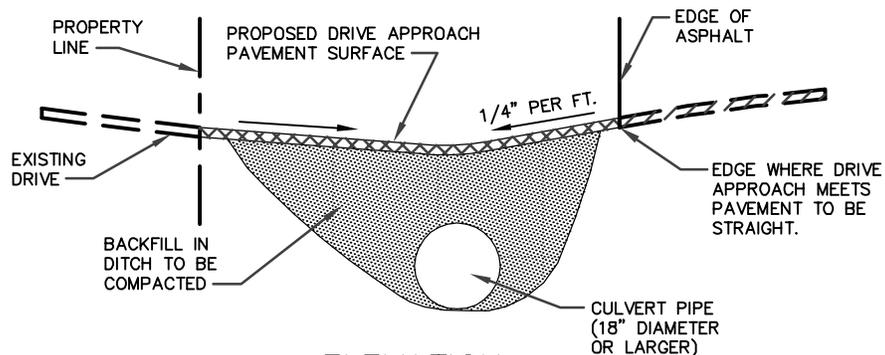


PLAN



NOTE: UPSTREAM AND DOWNSTREAM GRADING IN ROADWAY DITCH IS PROPERTY OWNER'S RESPONSIBILITY DURING DRIVE APPROACH INSTALLATION.

PROFILE



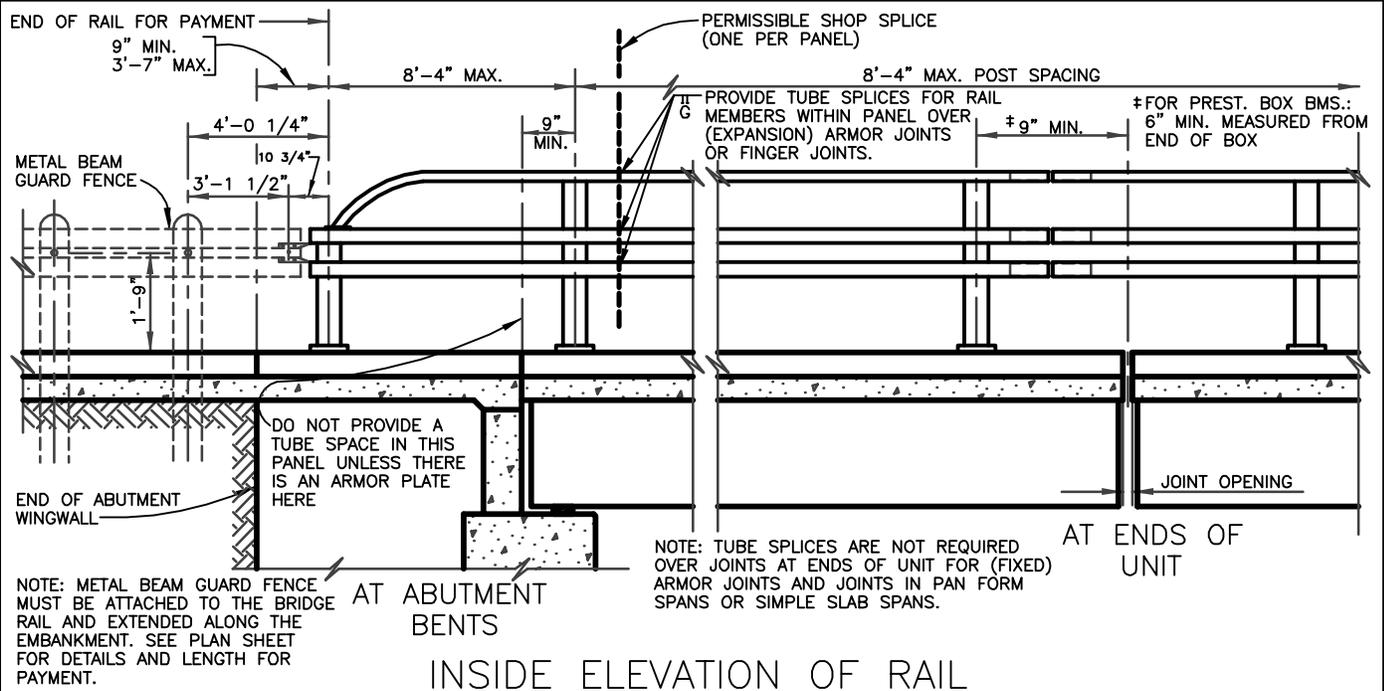
ELEVATION

NOTES:

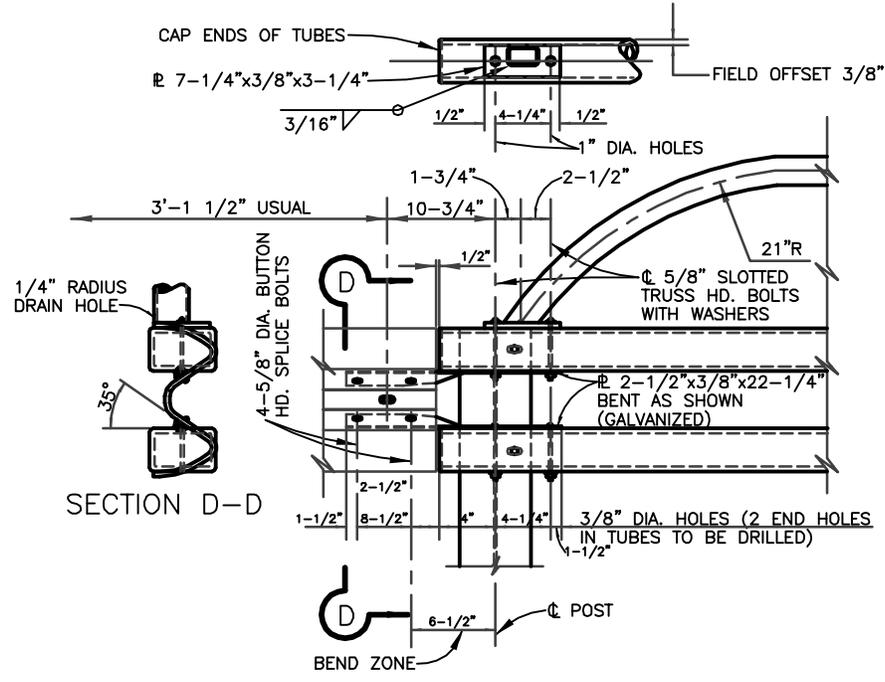
1. ALL CULVERT PIPE TO BE NEW (NOT PREVIOUSLY USED).
2. DIAMETER OF CULVERT PIPE TO BE DETERMINED BY THE PUBLIC WORKS DEPARTMENT.
3. FUTURE MAINTENANCE OF THE DRIVE APPROACH AND CULVERT PIPE IS THE PROPERTY OWNER'S RESPONSIBILITY.
4. ALL DITCH GRADING UPSTREAM AND DOWNSTREAM OF THE PROPOSED DRIVEWAY CULVERT IS THE PROPERTY OWNER'S RESPONSIBILITY.

DRIVE WITH CULVERT DETAILS

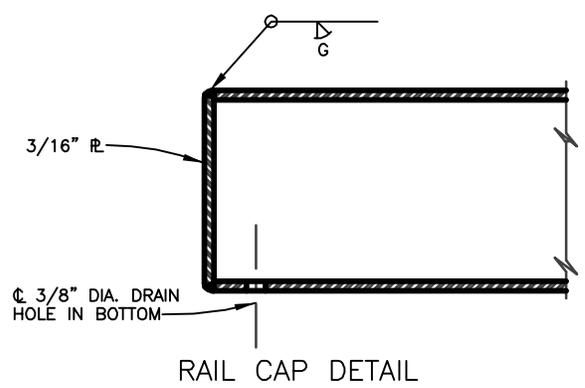




INSIDE ELEVATION OF RAIL



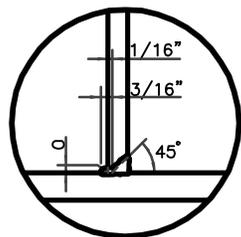
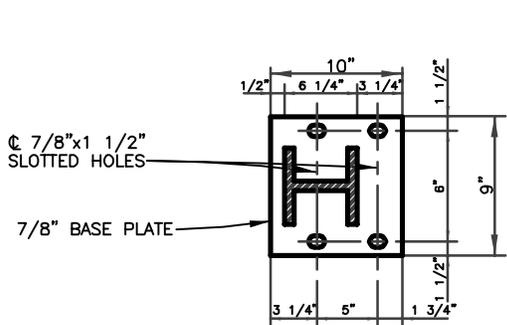
METAL BEAM GUARD FENCE TO RAIL CONN.



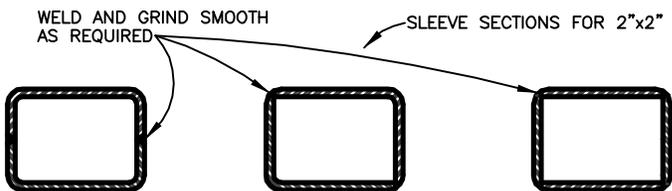
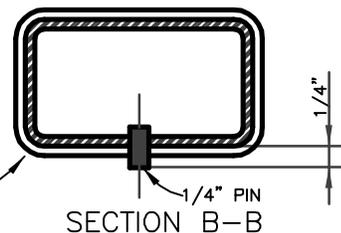
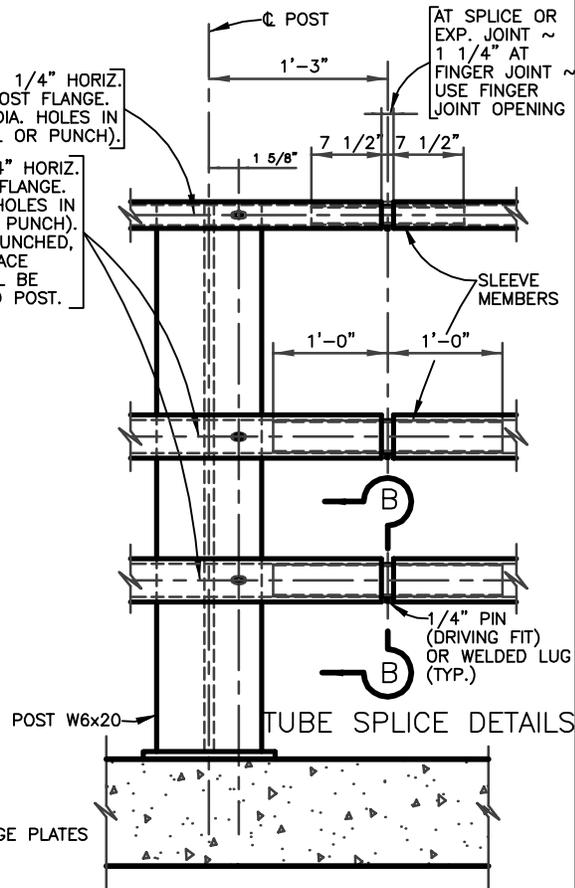
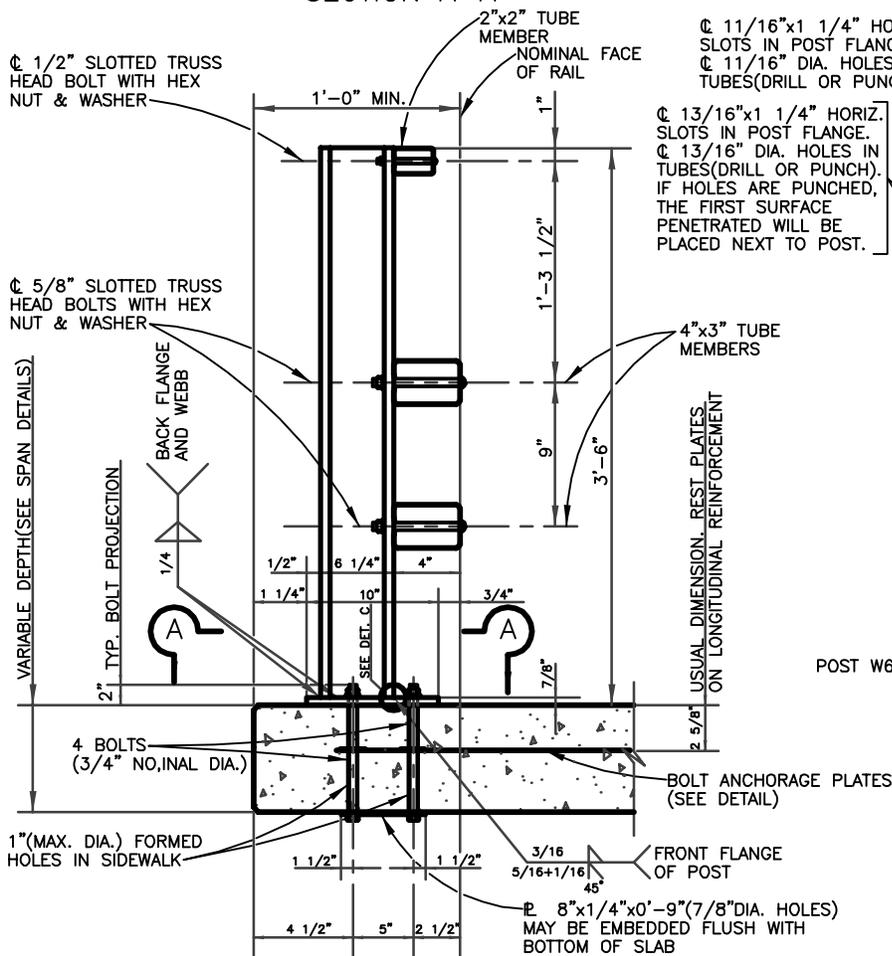
COMBINATION RAIL
TYPE C301

1-1-98

FIGURE 15P1



NOTE: IN LIEU OF FLANGE WELD SHOWN, A 3/8" FILLET WELD ALL AROUND INCLUDING EDGES OF FLANGE MAY BE USED.



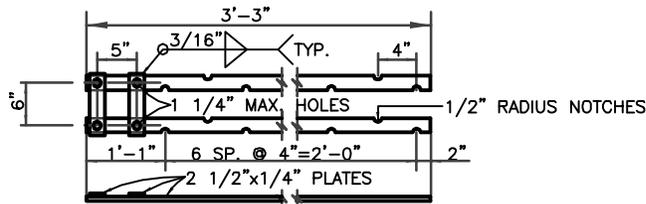
SLEEVE FABRICATION OPTIONS

NOTE: THE DIFFERENCE BETWEEN THE OUTSIDE DIMENSIONS OF THE SLEEVE AND THE INSIDE DIMENSIONS OF THE RAIL SHALL NOT EXCEED .125" ALONG EITHER AXIS.

TUBE AND SLEEVE MEMBERS		
4"x3" RAIL MEMBER	SLEEVE THICKNESS	
MATERIAL	THICKNESS	MATERIAL A36
A500 Gr C	.188"	.188"
A500 Gr B	.250"	.250"
A500 Gr A OR A501	.313"	.250"
2"x2" TUBE MEMBER		
ANY OF ABOVE OR EQUAL	.110"	.110"

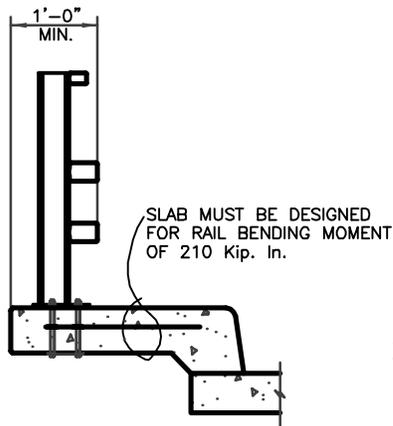
COMBINATION RAIL
TYPE C301



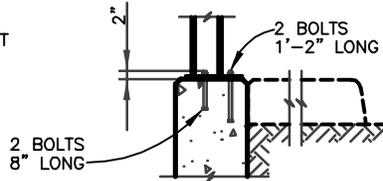


INSTALL ONE ASSEMBLY IN SIDEWALK AT EACH RAIL POST.
FIELD CUT OR BEND AS REQUIRED TO FIT SPECIAL CONDITIONS.
DO NOT GALVANIZE NOR OIL THIS ASSEMBLY.

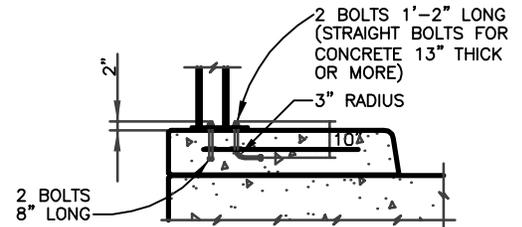
BOLT ANCHORAGE PLATES



USUAL MOUNTING



AT ABUTMENT WINGWALL



SPECIAL MOUNTING

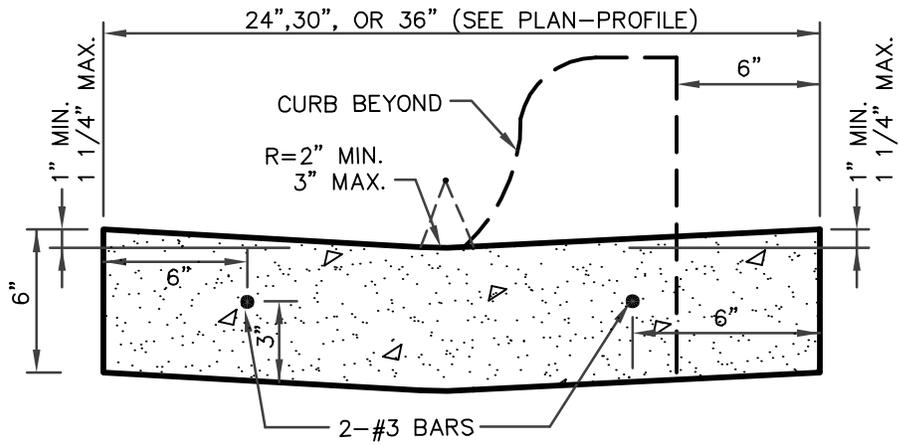
POST MOUNTING DETAILS

GENERAL NOTES

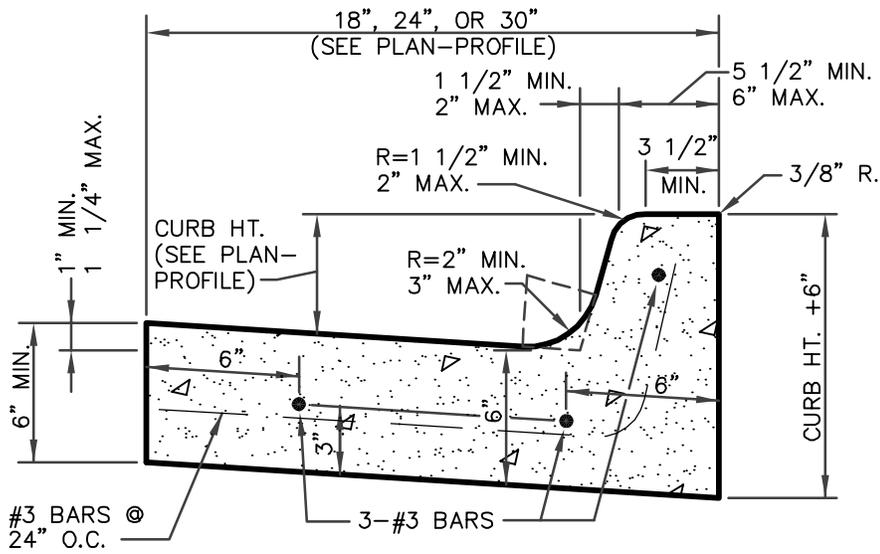
- *DESIGNED ACCORDING TO AASHTO 1977 STANDARD AND CURRENT INTERIM SPECIFICATIONS.
- *PANEL LENGTHS OF TUBE MEMBERS SHALL BE ATTACHED CONTINUOUSLY TO A MINIMUM OF THREE POSTS (EXCEPT AT ABUTMENTS WITH EXPANSION JOINTS).
- *THE FACE OF RAILING SHALL BE VERTICAL IF ADJACENT TO A WALKWAY UNLESS OTHERWISE SHOWN IN PLANS. RAIL POSTS SHALL BE PERPENDICULAR TO ADJACENT ROADWAY GRADE. GROUT MAY BE USED UNDER BASE PLATES IF NECESSARY.
- *EXPOSED EDGES OF HANDRAIL AND HANDRAIL POSTS SHALL BE ROUNDED OR CHAMFERED TO APPROXIMATELY 1/16" BY GRINDING.
- *ALL BOLTS, NITS, WASHERS, ANCHORAGE PLATES, BOTTOM PLATES AND M.B.G.F. CONNECTORS ARE CONSIDERED PARTS OF THE RAIL FOR PAYMENT.
- *ALL STEEL COMPONENTS EXCEPT REINFORCING SHALL BE GALVANIZED UNLESS OTHERWISE SHOWN ON PLANS.
- *ANCHOR BOLTS SHALL BE 3/4" DIA. ASTM-A325(OR A321 THREADED RODS WITH TACK WELDED NUTS). THREADED RODS MAY BE 0.670" MIN. DIA. WITH ROLLED THREADS. EACH BOLT SHALL HAVE A HARDENED STEEL WASHER AND A 2" PLAIN STEEL WASHER. NUTS SHALL CONFORM TO A563 REQUIREMENTS AND SHALL BE TAPPED AFTER GALVANIZING. BOLTS AND NUTS SHALL HAVE CLASS A 2B FIT TOLERANCES.
- *SHOP DRAWINGS TO BE SUBMITTED TO THE BRIDGE ENGINEER FOR APPROVAL WILL BE REQUIRED ONLY FOR RAILS ON HORIZONTAL CURVES IN WHICH CASE THE RAIL MEMBERS SHALL BE FABRICATED TO THE REQUIRED RADIUS FOR RADII OF 600' OR LESS.
- *FOR RAILS NOT REQUIRING SHOP DRAWINGS, ERECTION DRAWINGS SHOWING PANEL LENGTHS, SPLICE LOCATIONS, RAIL POST SPACING AND ANCHOR BOLT SETTING SHALL BE SUBMITTED TO THE RESIDENT ENGINEER FOR APPROVAL.
- *SHOP DRAWINGS MAY BE SUBMITTED AS 11"x17" PRINTS PROVIDED THEY ARE CLEARLY LEGIBLE.
- *ALL OPEN ENDS OF RAIL SHALL BE CAPPED.

COMBINATION RAIL
TYPE C301

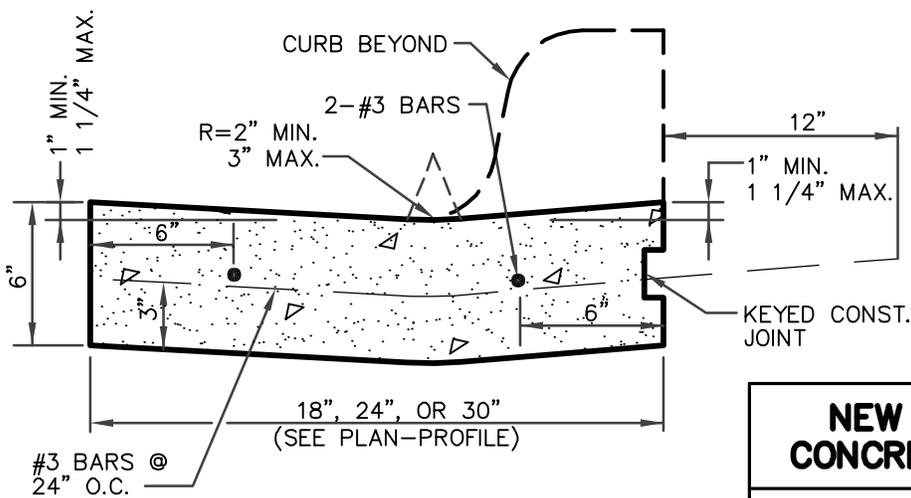




GUTTER WITH LAID DOWN CURB



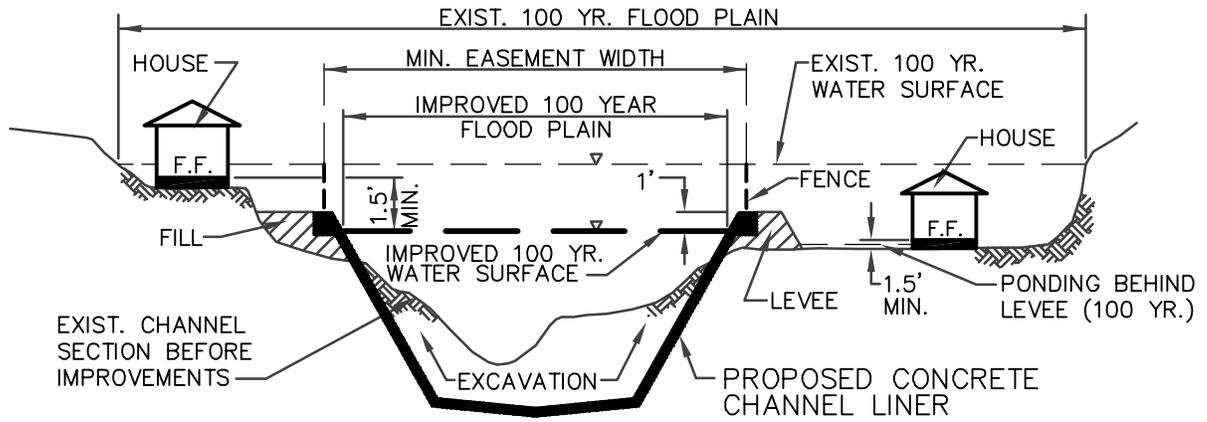
STANDARD CURB & GUTTER



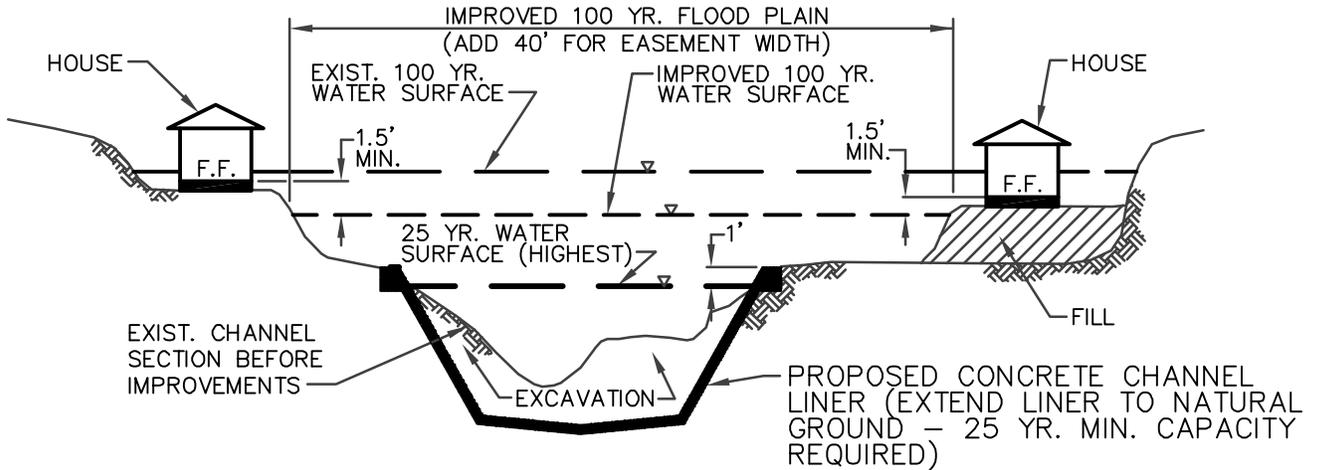
DRIVEWAY GUTTER

**NEW STANDARD DETAIL
CONCRETE CURB & GUTTER**

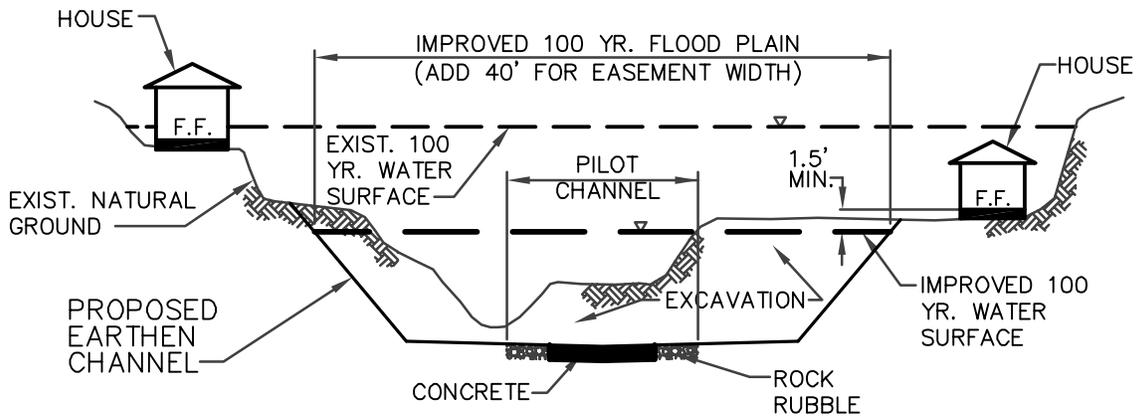




FULL 100 YR. CONCRETE CHANNEL LINER



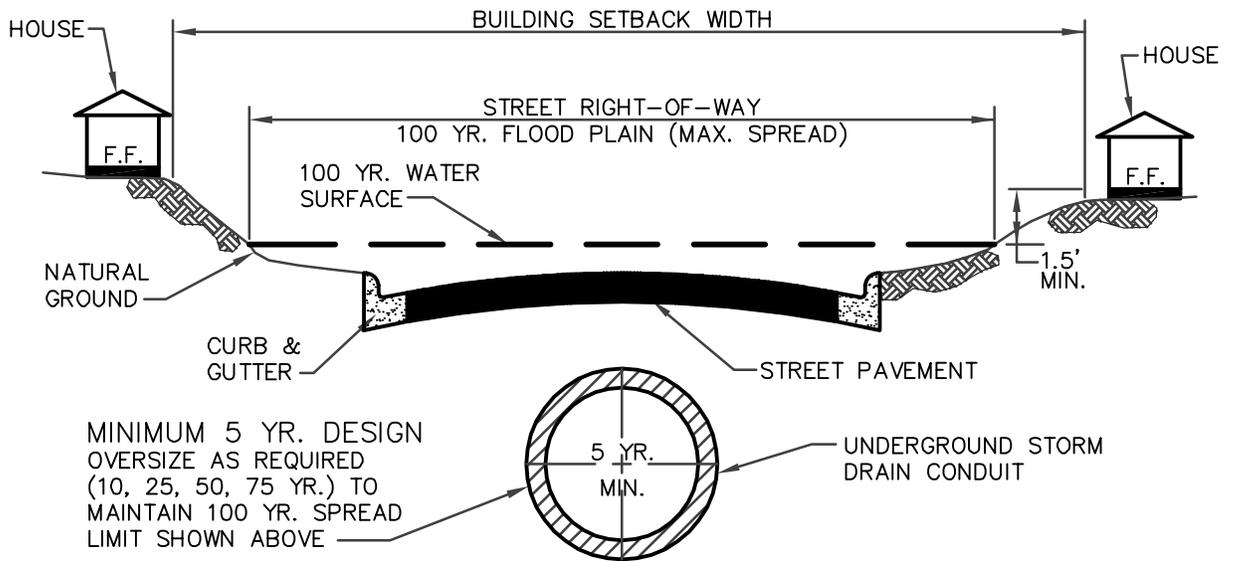
PARTIAL 100 YR. CONCRETE CHANNEL LINER



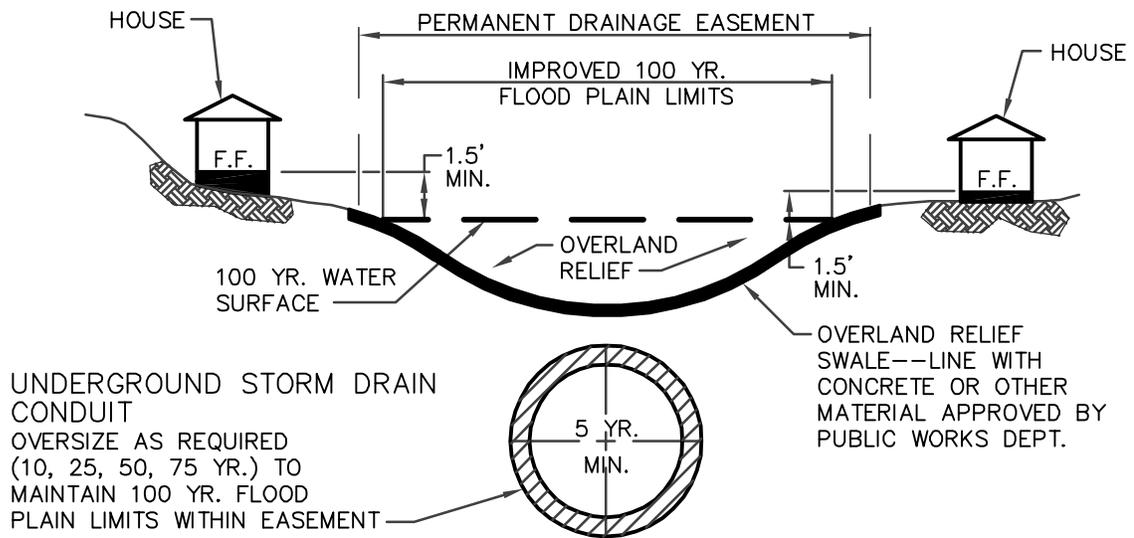
EARTHEN CHANNEL WITH CONCRETE PILOT

TYPICAL CHANNEL LINERS





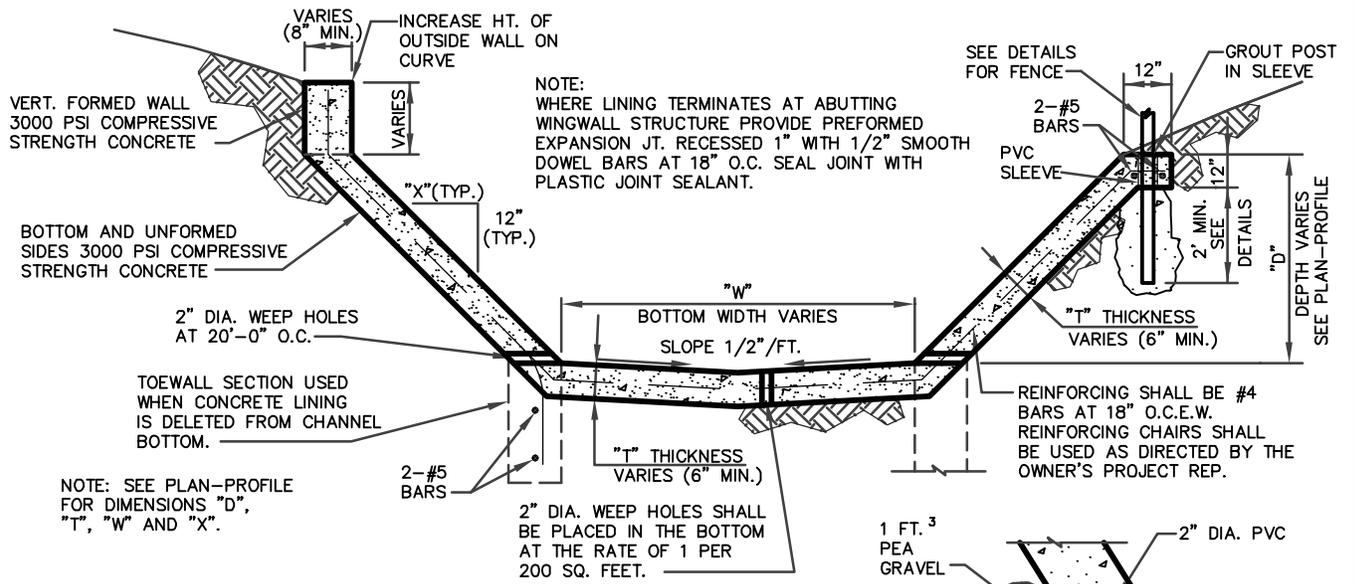
STORM DRAIN IN STREET



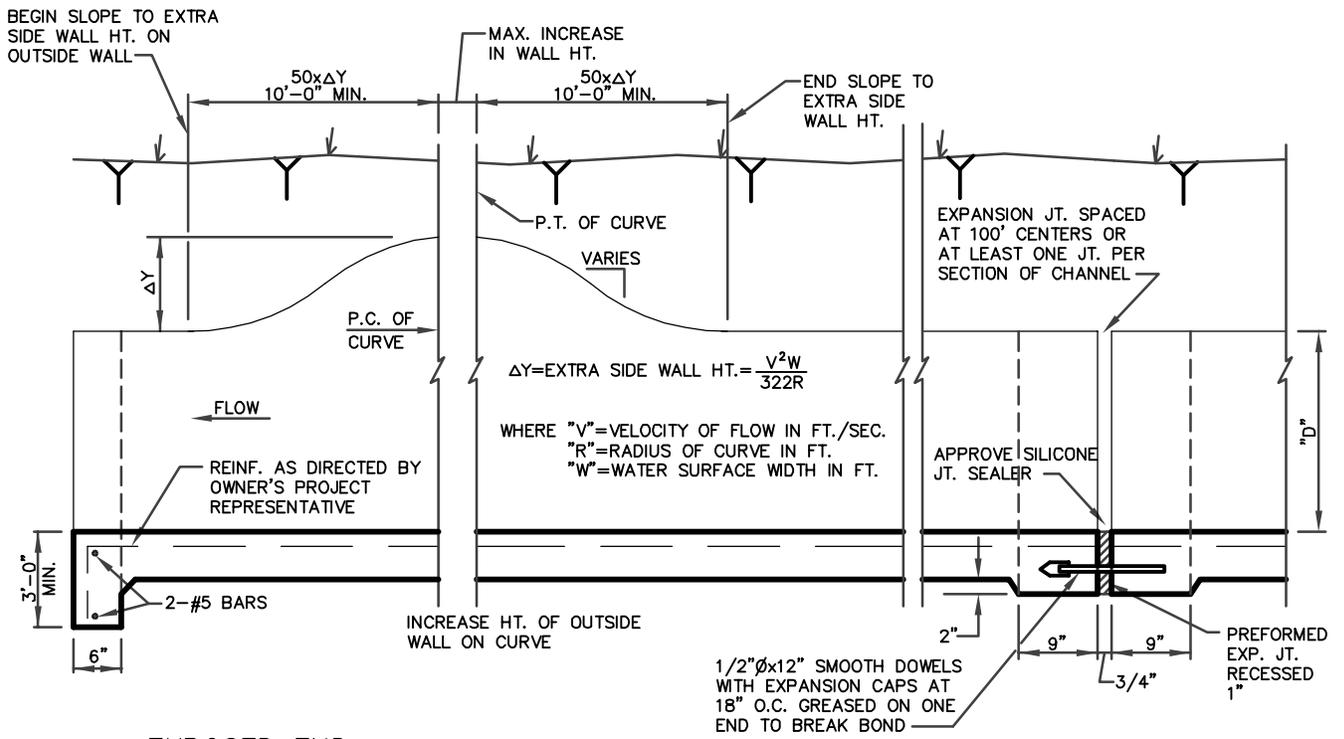
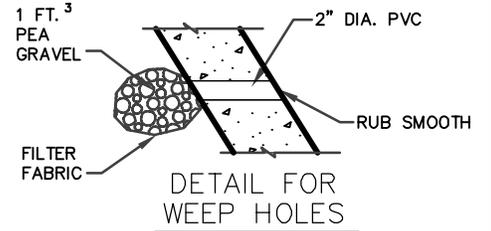
STORM DRAIN IN EASEMENT

STORM DRAIN FLOOD LIMITS





TYPICAL TRAPEZOIDAL SECTION



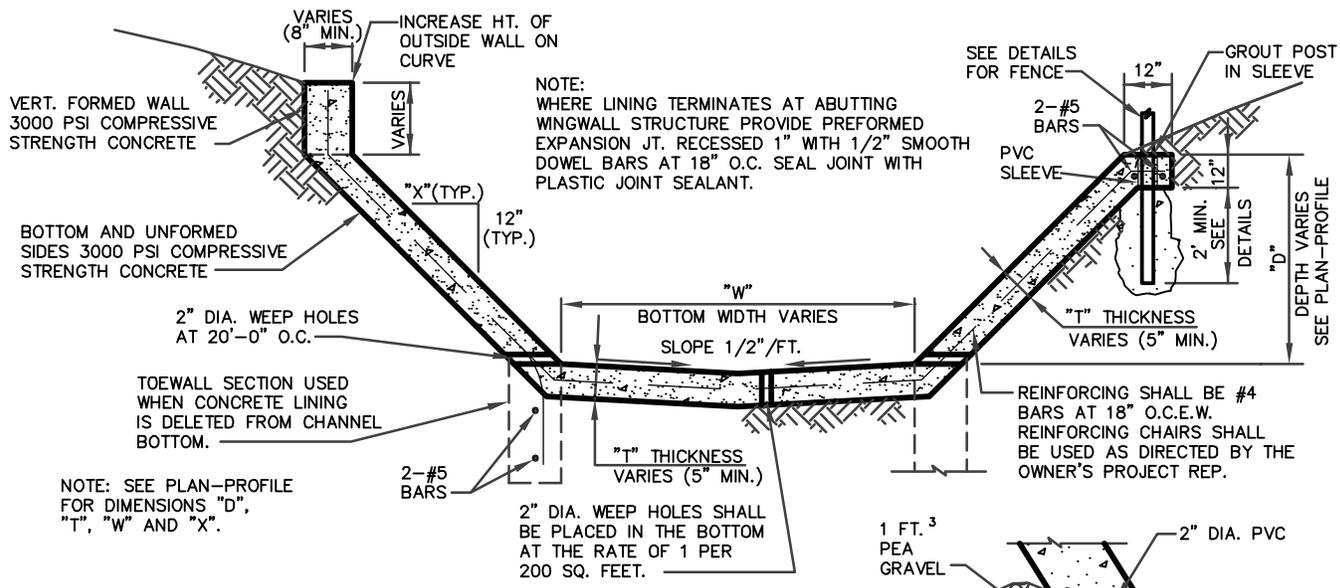
EXPOSED END

EXPANSION JOINT

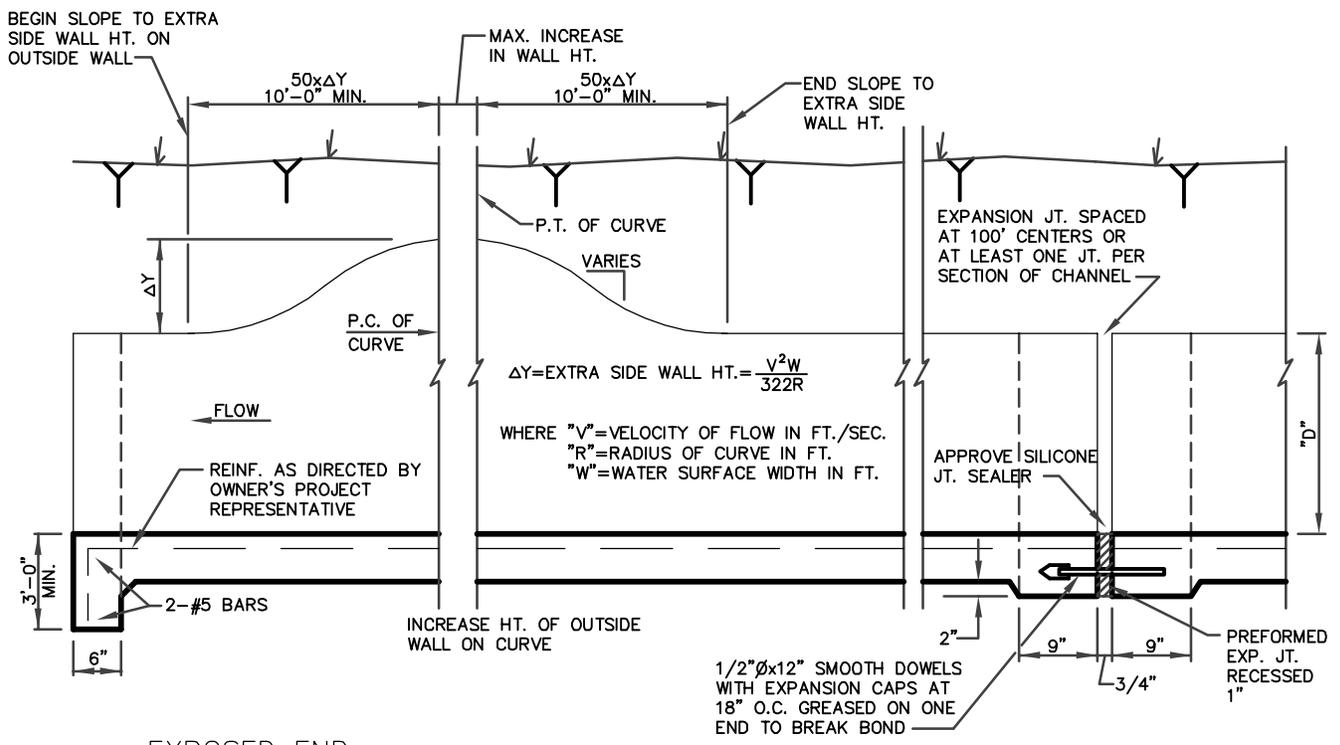
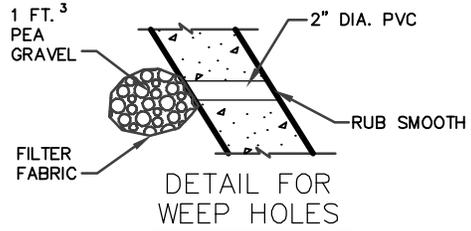
DETAILS OF REINFORCED CONCRETE CHANNEL LINER

REINFORCED CONCRETE CHANNEL LINER DETAILS





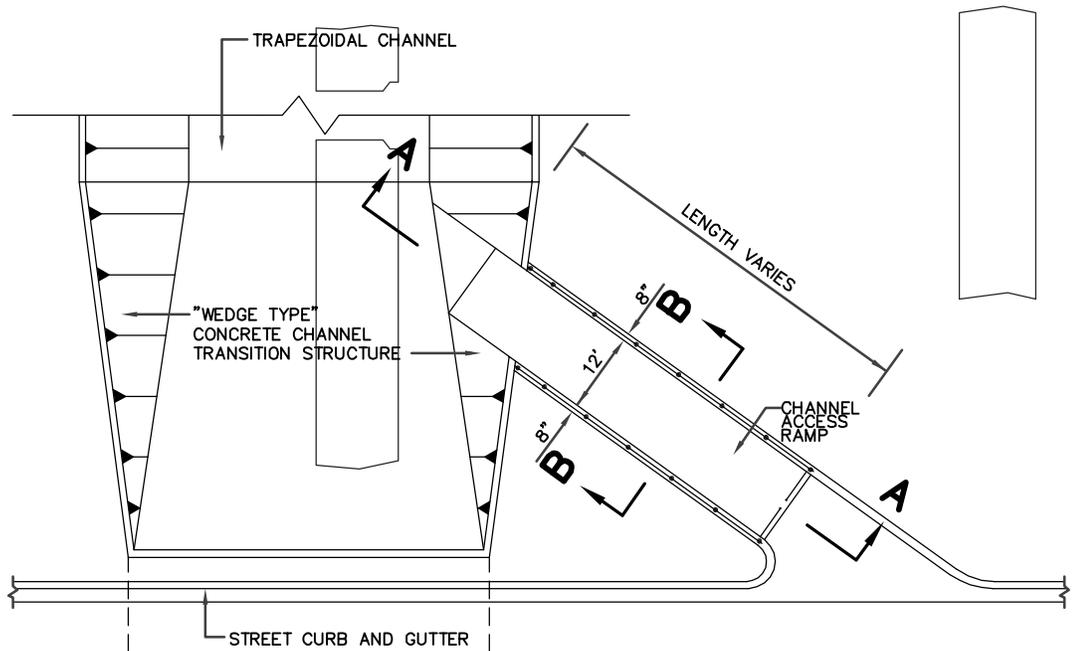
TYPICAL TRAPEZOIDAL SECTION



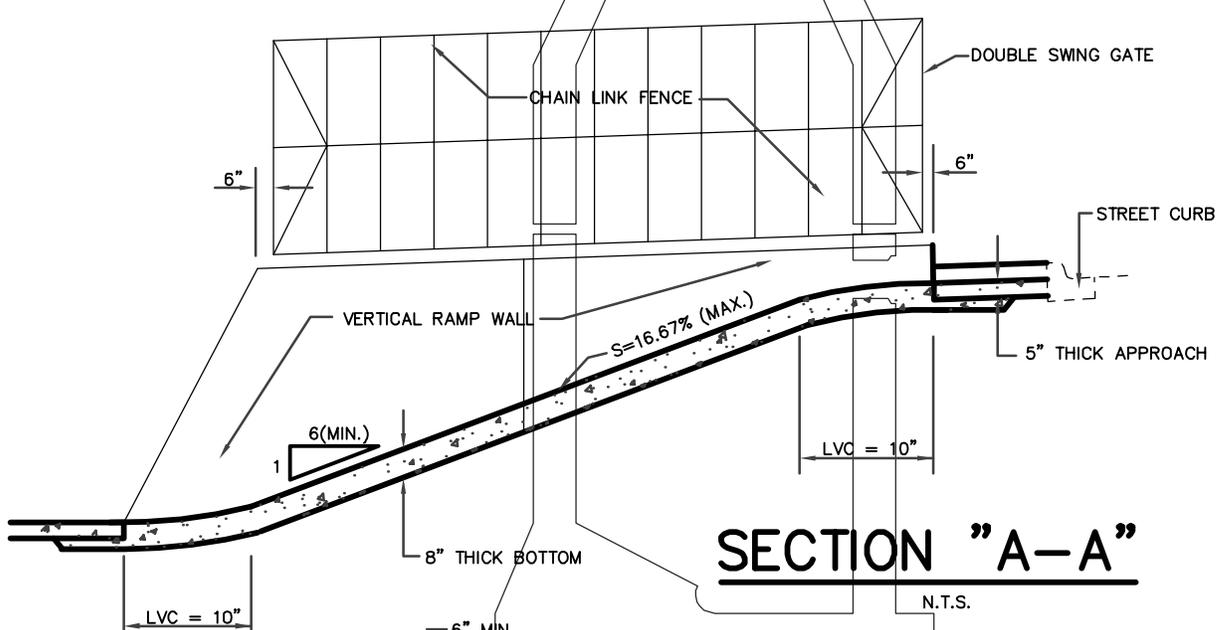
DETAILS OF REINFORCED CONCRETE CHANNEL LINER

REINFORCED CONCRETE CHANNEL LINER DETAILS

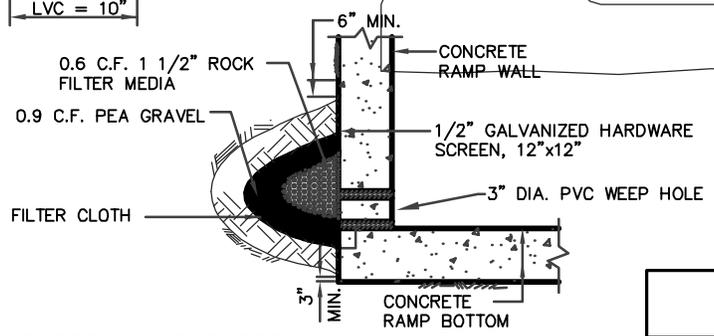
1-1-98 FIGURE 3D2



PLAN VIEW
N.T.S.



SECTION "A-A"
N.T.S.

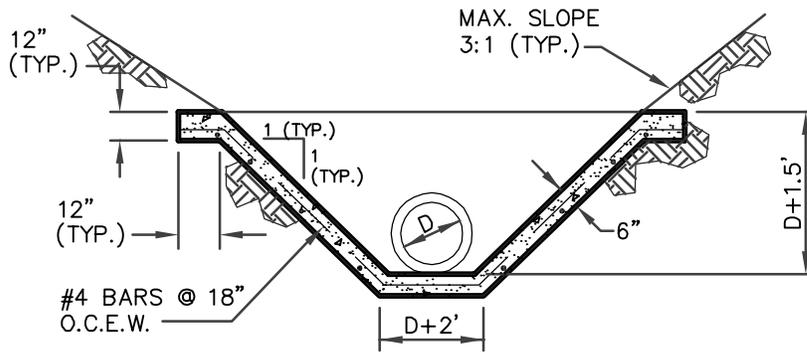


**WEEP HOLE DETAIL AT BOTTOM
OF CONCRETE RAMP WALL**
N.T.S.

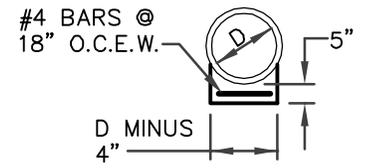
NOTE: 3" DIA. WEEP HOLES WITH TWO C.F. EACH OF SAND, PEA GRAVEL AND 1 1/2" ROCK FILTER MEDIA SHALL BE SPACED AT 10' C.C EACH SIDE ALONG BOTTOM OF RAMP WALL OR AS DIRECTED BY OWNERS RESIDENT PROJECT REPRESENTATIVE.

CHANNEL ACCESS RAMP

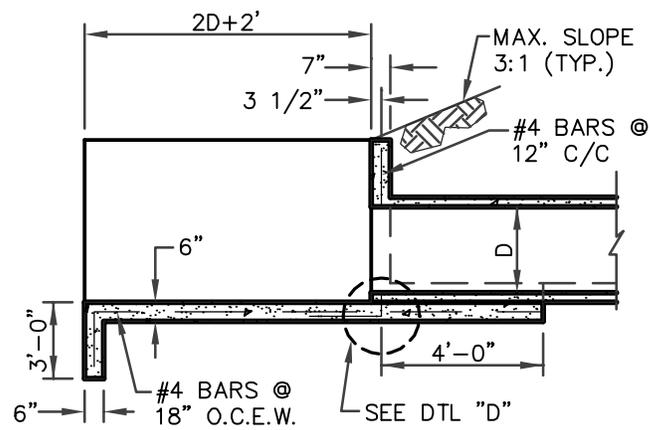
1-1-98 FIGURE 5D1



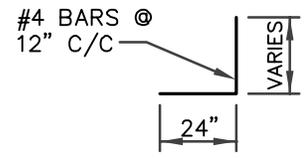
SECTION B-B
N.T.S.



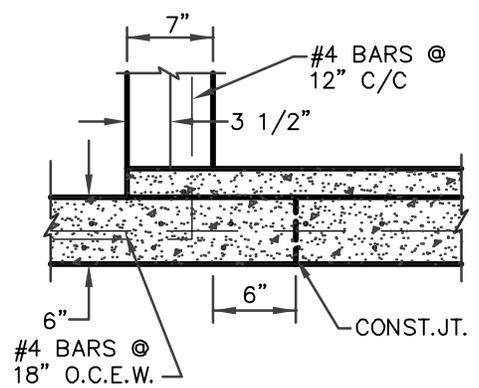
SECTION C-C
N.T.S.



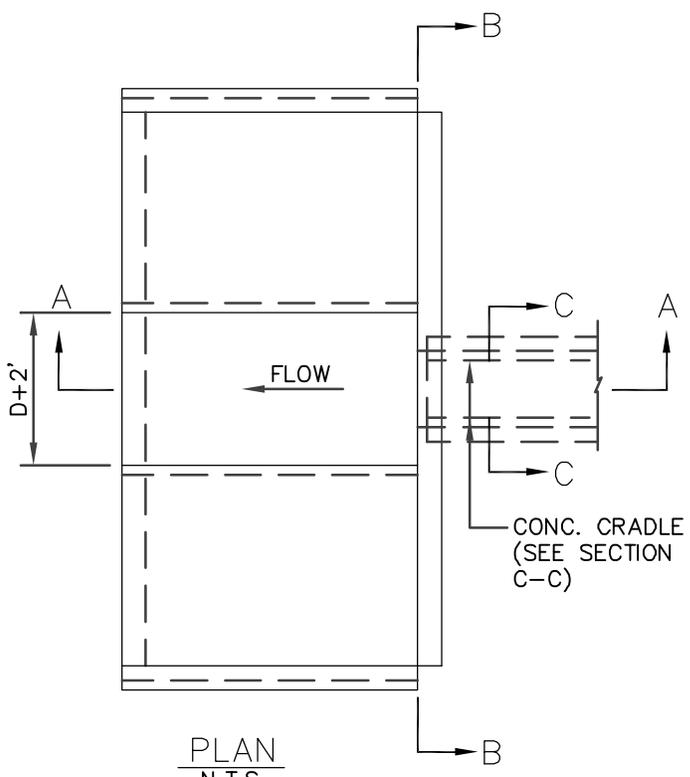
SECTION A-A
N.T.S.



BAR DETAIL
N.T.S.



DETAIL "D"
N.T.S.

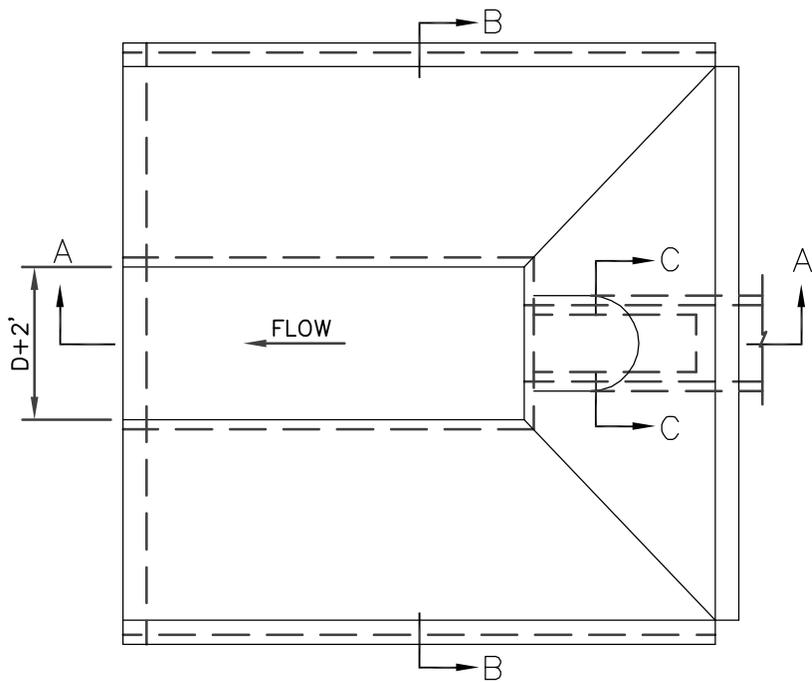


PLAN
N.T.S.

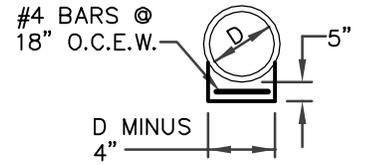
NOTE:
FOR PIPE DIAMETER (SEE
PLAN AND PROFILE SHEET.)

CONCRETE CHANNEL APRON FOR STORM
DRAIN WITH VERTICAL HEADWALL

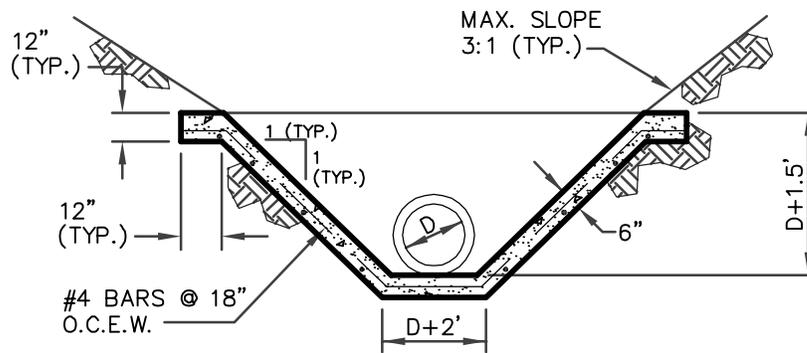




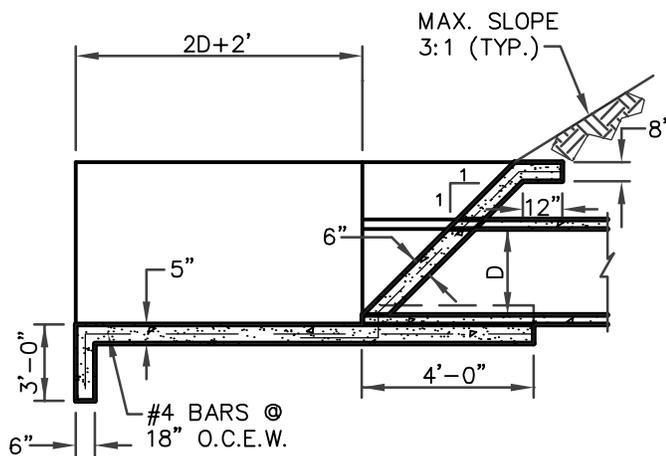
PLAN
N.T.S.



SECTION C-C
N.T.S.



SECTION B-B
N.T.S.

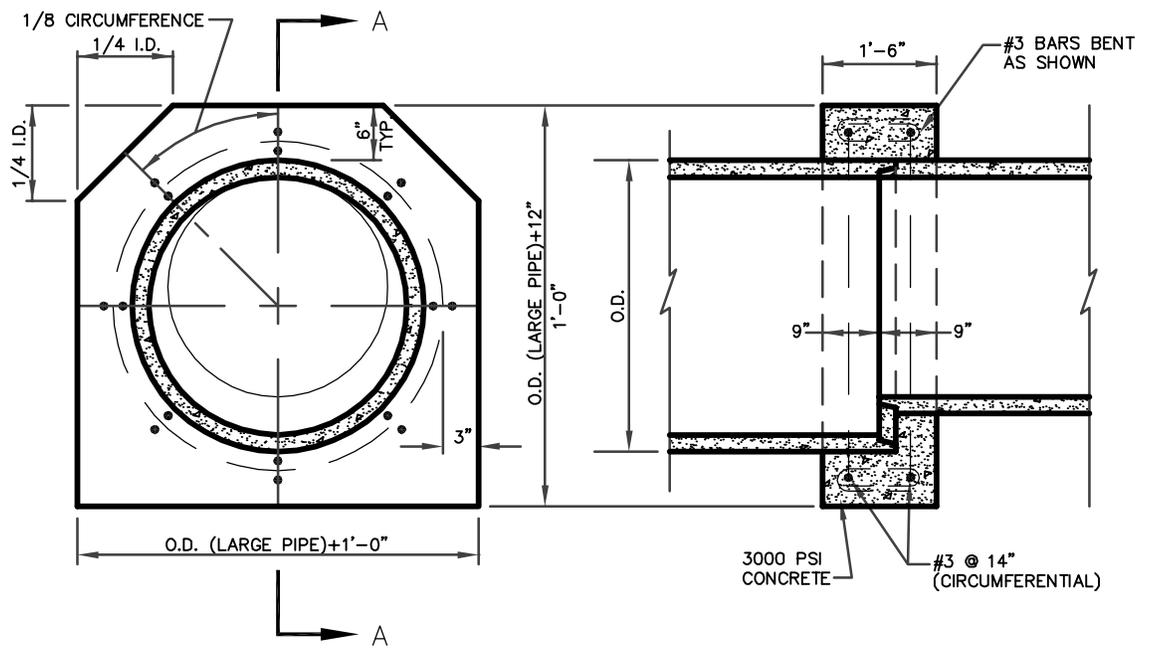


SECTION A-A
N.T.S.

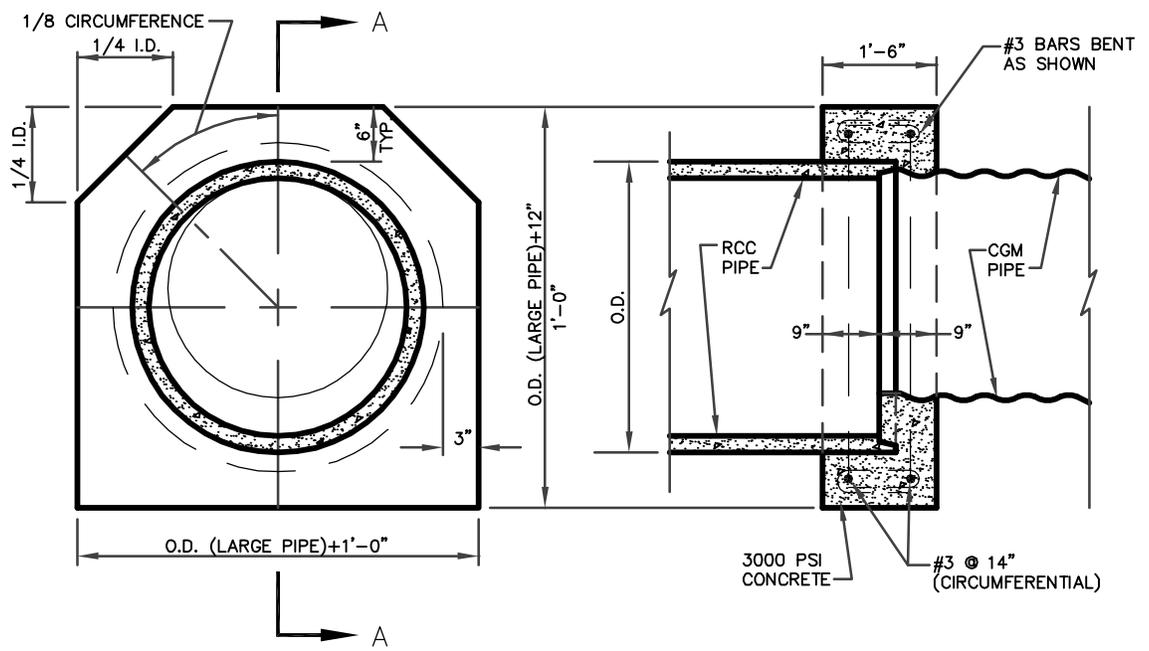
NOTE:
FOR PIPE DIAMETER, SEE
PLAN AND PROFILE SHEET.

CONCRETE CHANNEL APRON FOR STORM
DRAIN WITH SLOPING HEADWALL





COUPLING OF R.C.C. PIPES OF DIFFERENT DIAMETERS



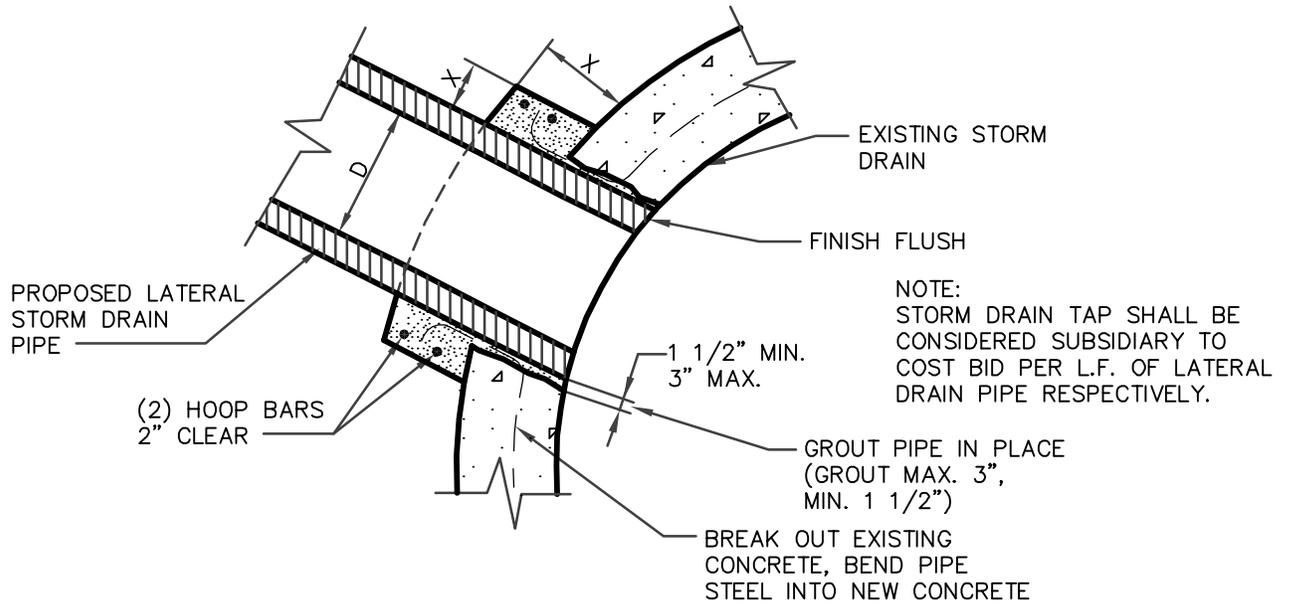
COUPLING OF RCCP TO CGMP

CONCRETE COLLAR DETAILS

CONCRETE COLLAR DETAILS



D	X	HOOP BARS
18" OR SMALLER	6"	#3
LARGER THAN 18"	9"	#4



STORM DRAIN TAP DETAIL

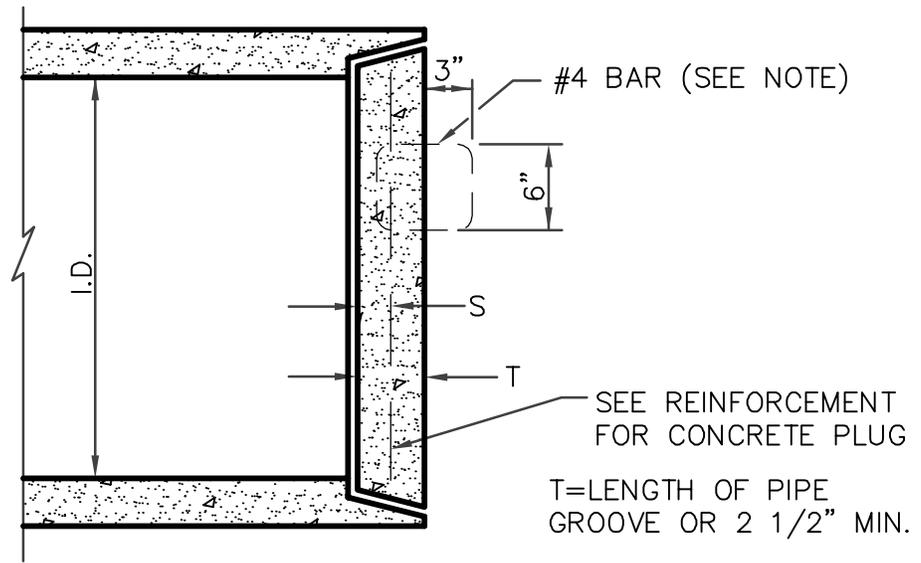
NOTE: PREFABRICATED FITTINGS SHALL
BE USED ON ALL PROPOSED STORM DRAINS.

STORM DRAIN TAP DETAIL



1-1-98

FIGURE 9D



REINFORCEMENT FOR CONCRETE PLUG

PIPE SIZE	REINF. BAR	DISTANCE C-C	S
18"-39"	#3	12" E.W.	1/2T
42"-54"	#3	12" E.W.	1/3T
60"-72"	#4	12" E.W.	1/4T

NOTE: STEEL HANDLE FOR REINFORCED CONCRETE PIPE PLUG SHALL BE LOCATED 1/4 I.D. ABOVE CENTER POINT OF PLUG. TWO STEEL HANDLES WILL BE REQUIRED ON PLUGS OF 36" PIPES OR LARGER AND SHALL BE PLACED 1/4 I.D. APART AND 1/4 I.D. ABOVE CENTER OF PLUG.

CONCRETE PLUG DETAILS

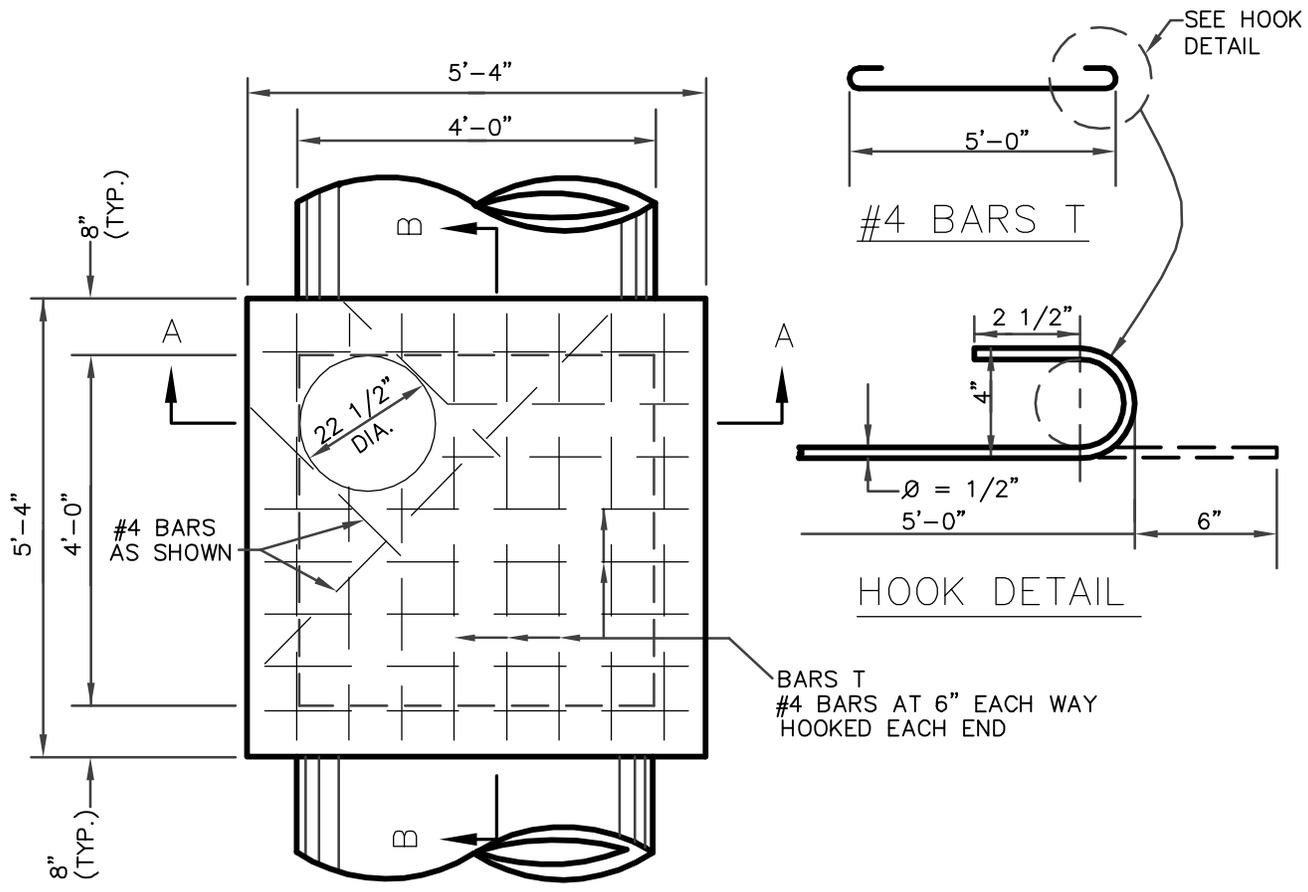
NO SCALE

CONCRETE PLUG DETAILS



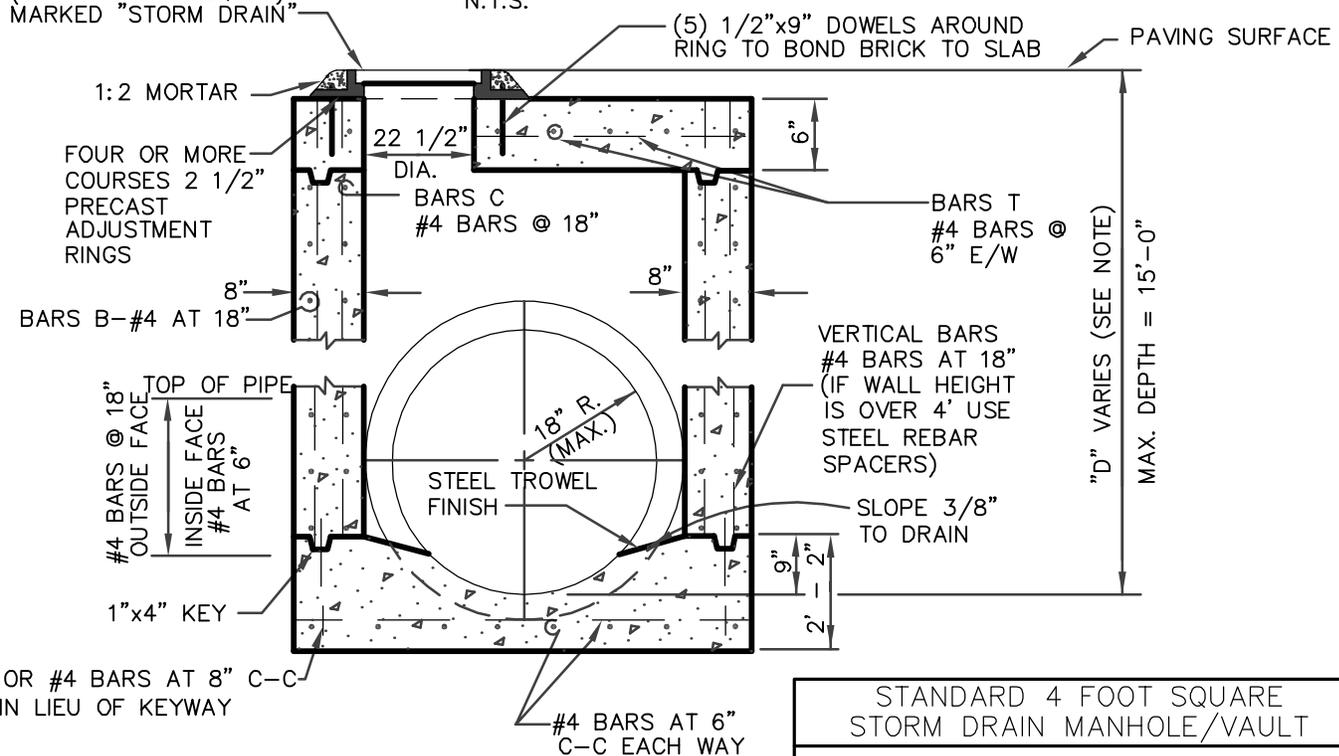
1-1-98

FIGURE 10D



PLAN
N.T.S.

BASS & HAYES NO.300-24
(OR APPROVED EQUAL)
MARKED "STORM DRAIN"

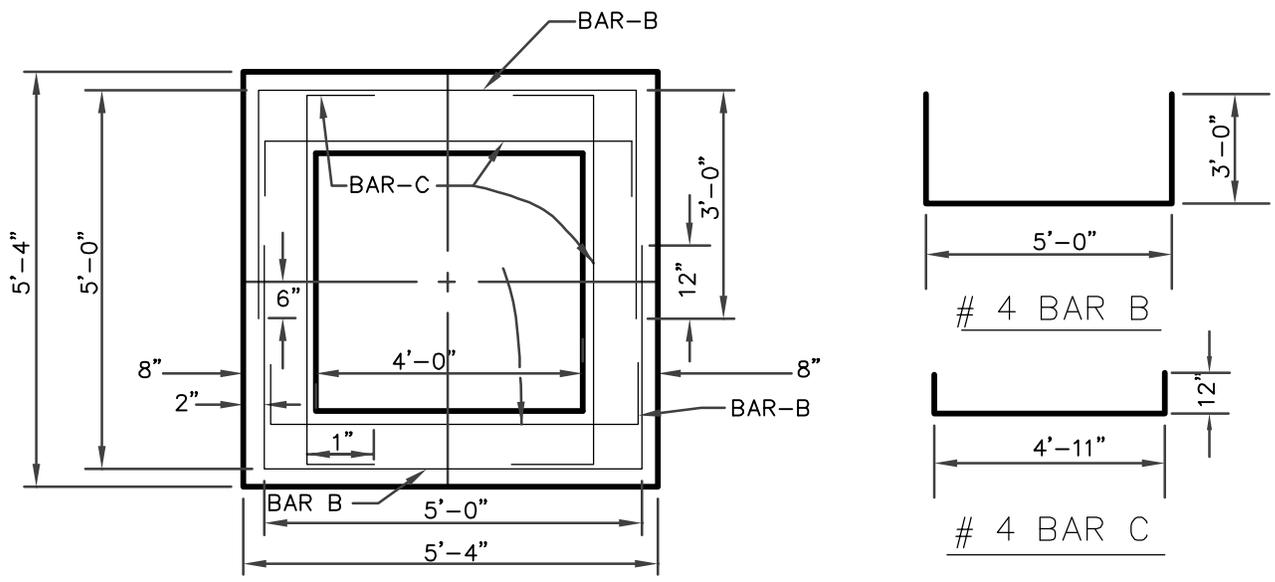
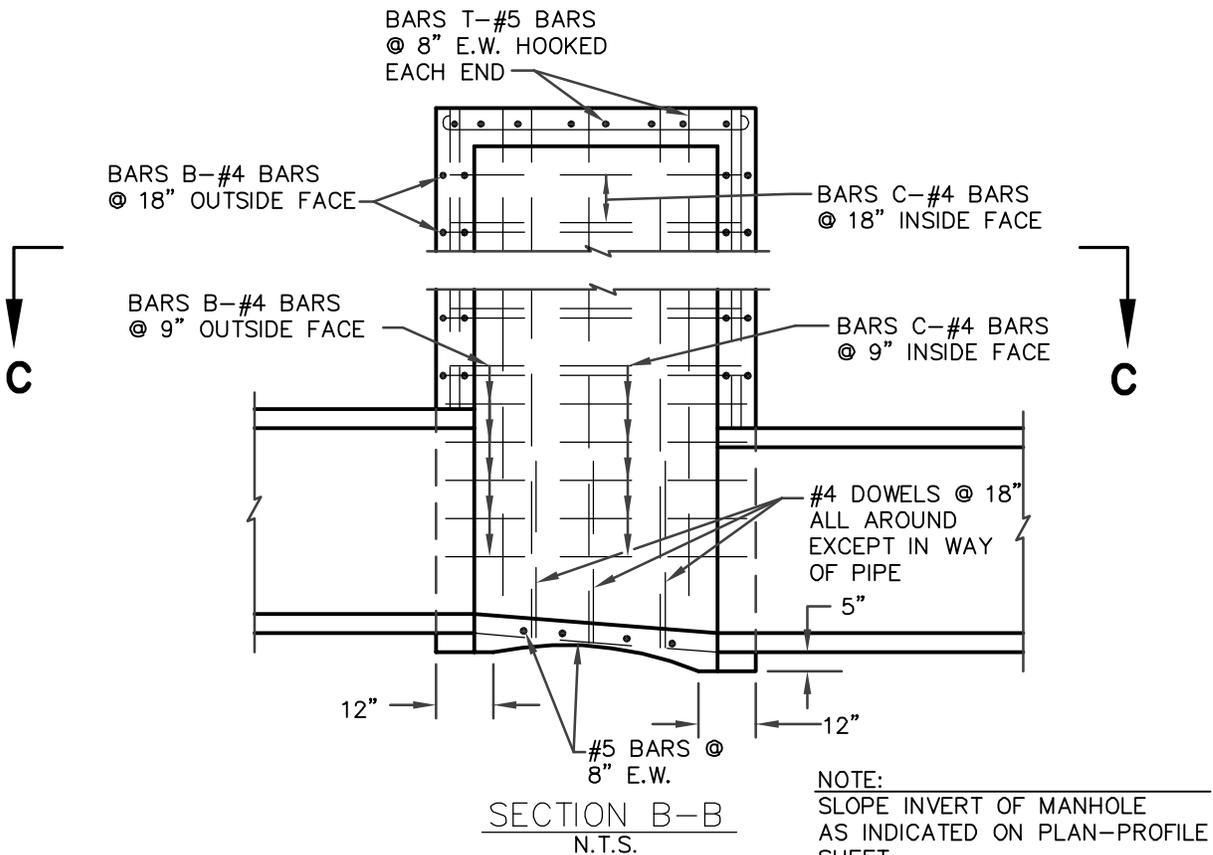


SECTION A-A
N.T.S.

NOTE:
DEPTH "D" SHALL BE
SHOWN ON STORM DRAIN
PLAN AND PROFILE SHEETS

STANDARD 4 FOOT SQUARE
STORM DRAIN MANHOLE/VAULT



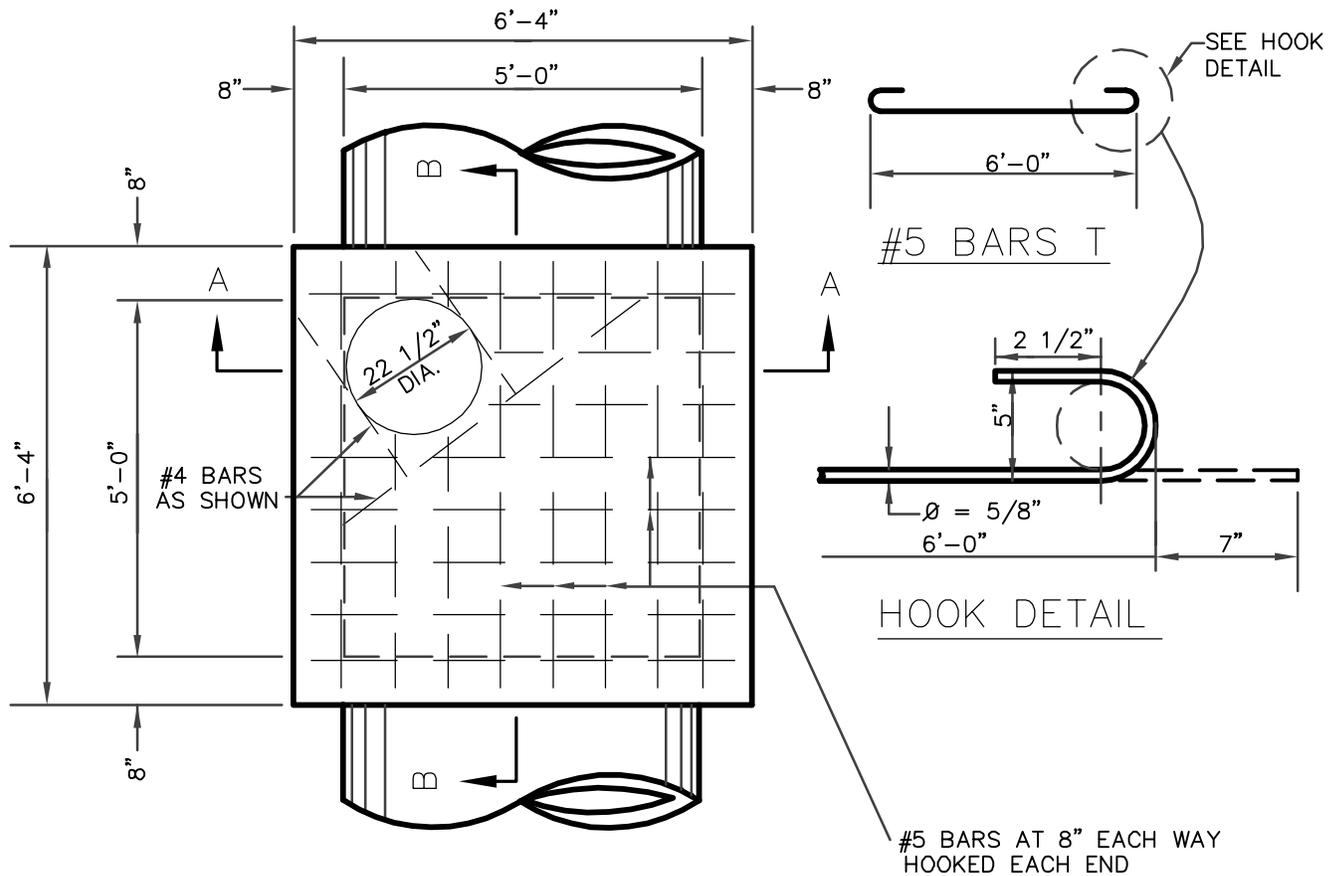


NOTES:

1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF STANDARD SPECIFICATION FOR STANDARD MANHOLES.
2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACE SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
3. EXCAVATION FOR MANHOLE TO BE INCLUDED IN UNIT PRICE BID FOR MANHOLE.
4. STANDARD 4 FOOT SQUARE MANHOLE SHALL NOT BE USED IF STORM DRAIN PIPE I.D. IS GREATER THAN 36".

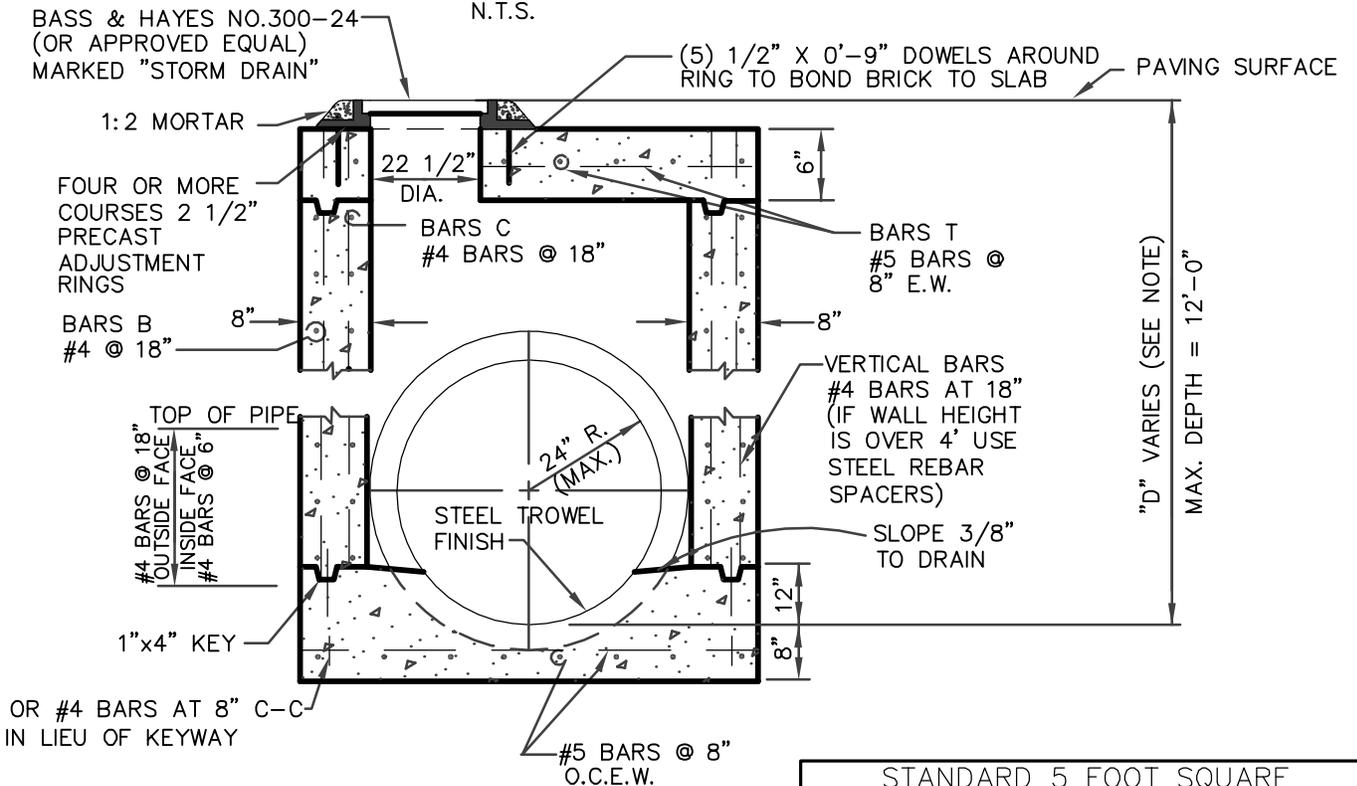
STANDARD 4 FOOT SQUARE
STORM DRAIN MANHOLE/VAULT





PLAN

N.T.S.



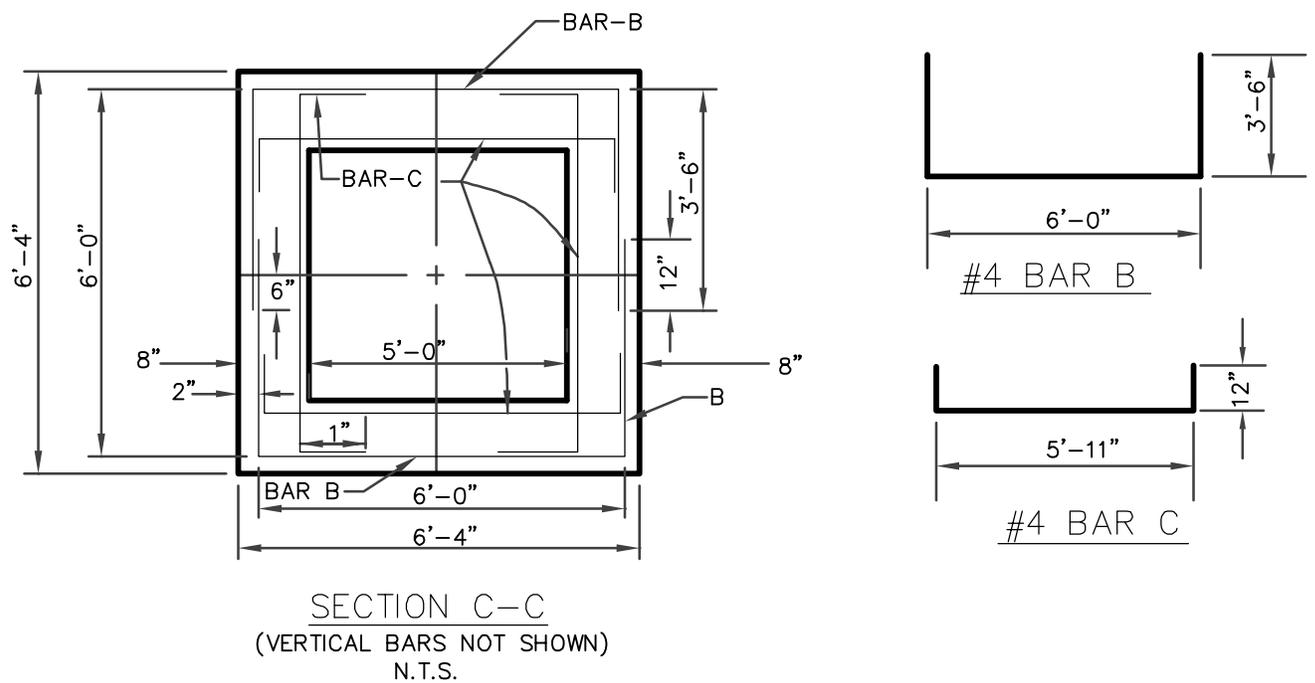
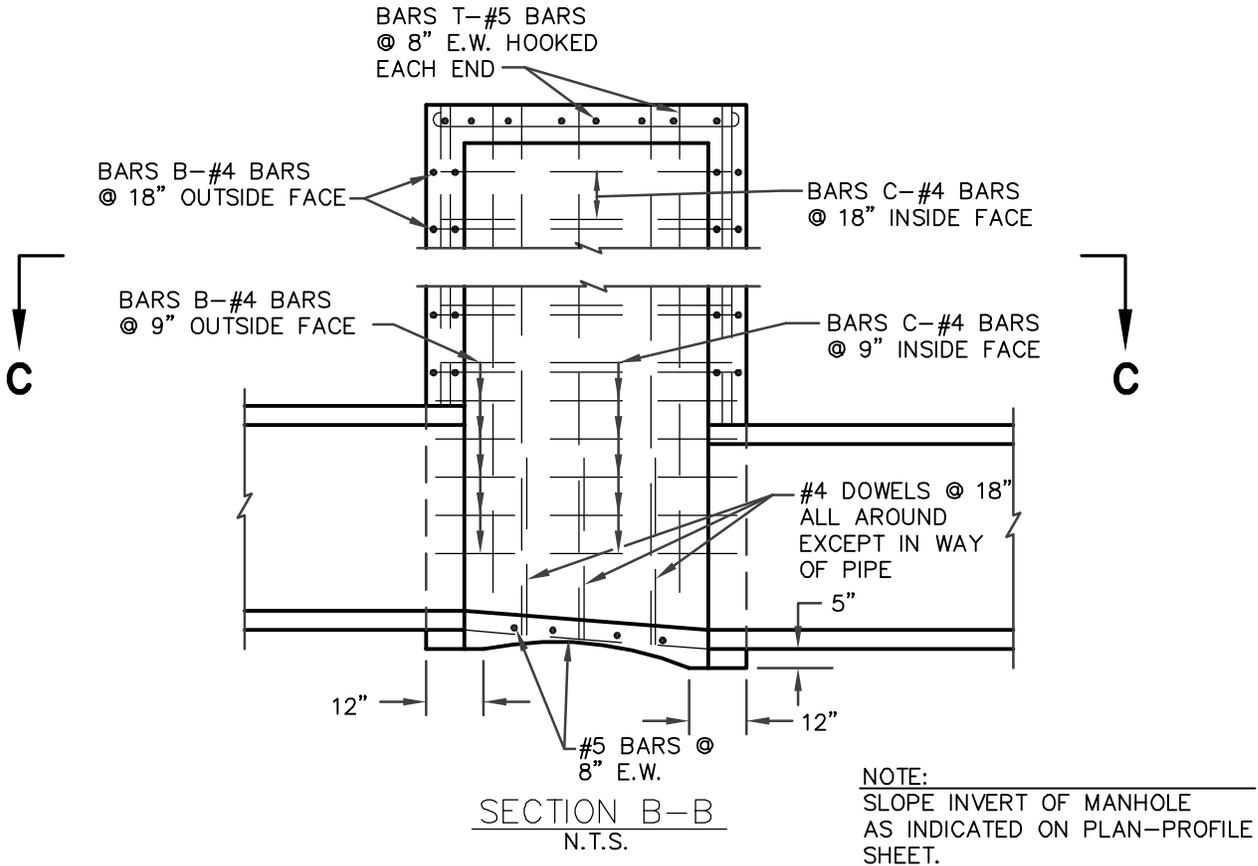
SECTION A-A

N.T.S.

NOTE:
DEPTH "D" SHALL BE SHOWN ON STORM DRAIN PLAN AND PROFILE SHEETS

STANDARD 5 FOOT SQUARE STORM DRAIN MANHOLE/VAULT

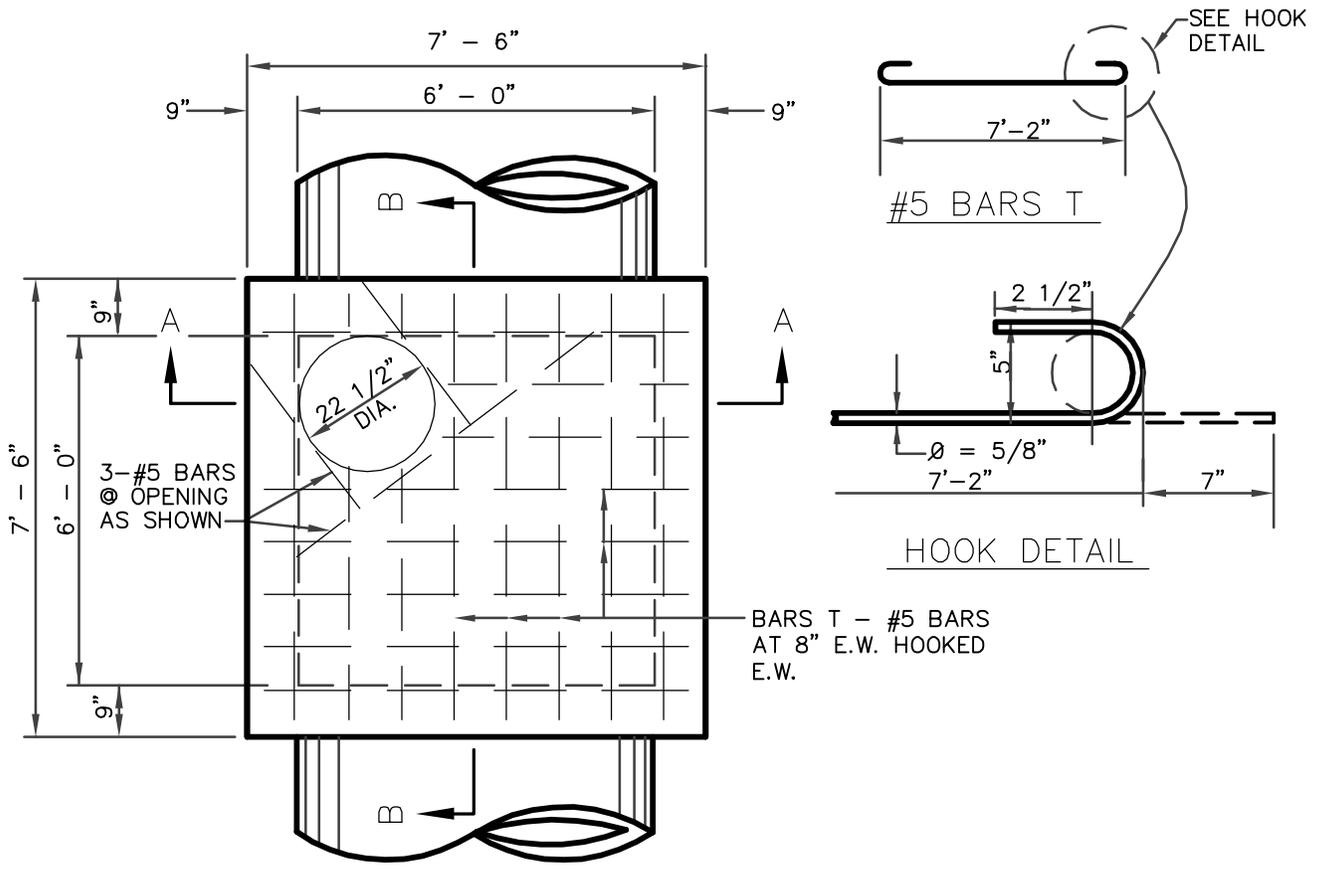




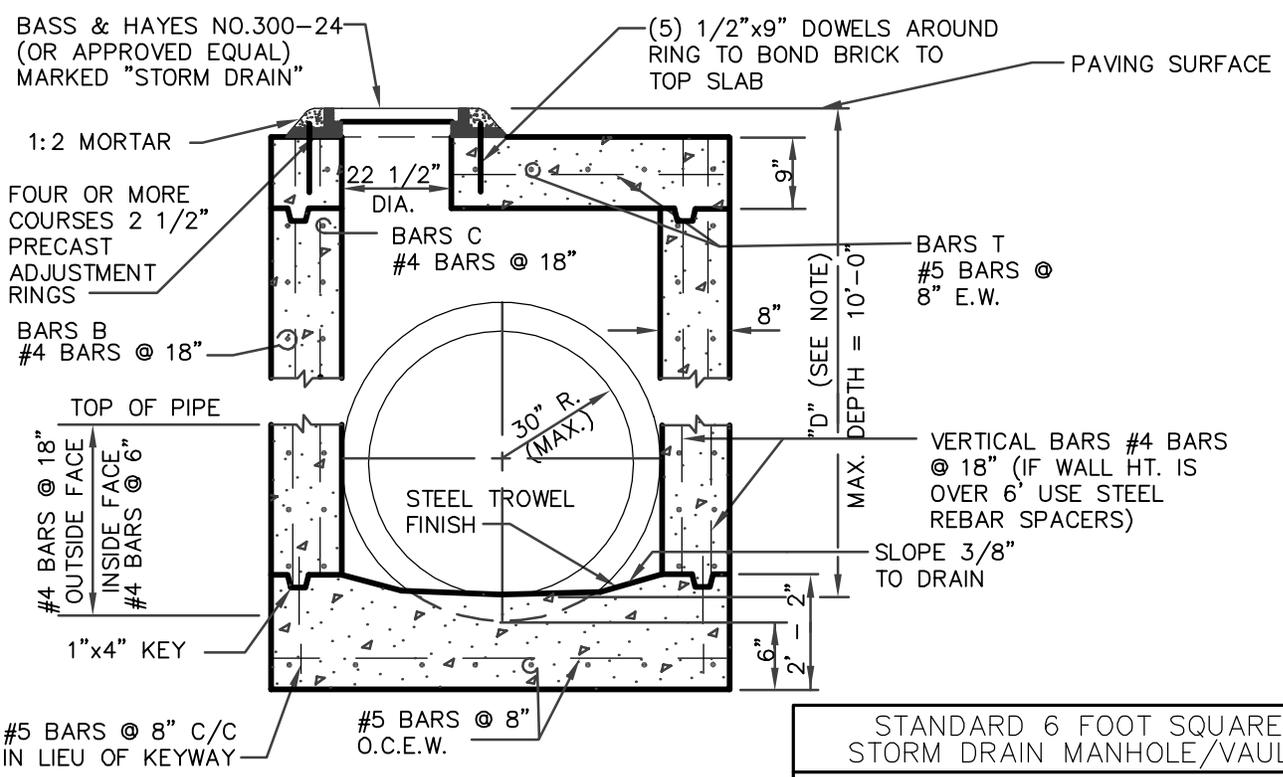
- NOTES:
1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF STANDARD SPECIFICATION FOR STANDARD MANHOLES.
 2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACE SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
 3. EXCAVATION FOR MANHOLE TO BE INCLUDED IN UNIT PRICE BID FOR MANHOLE.

STANDARD 5 FOOT SQUARE
STORM DRAIN MANHOLE/VAULT

1-1-98 FIGURE 13D2



PLAN
N.T.S.

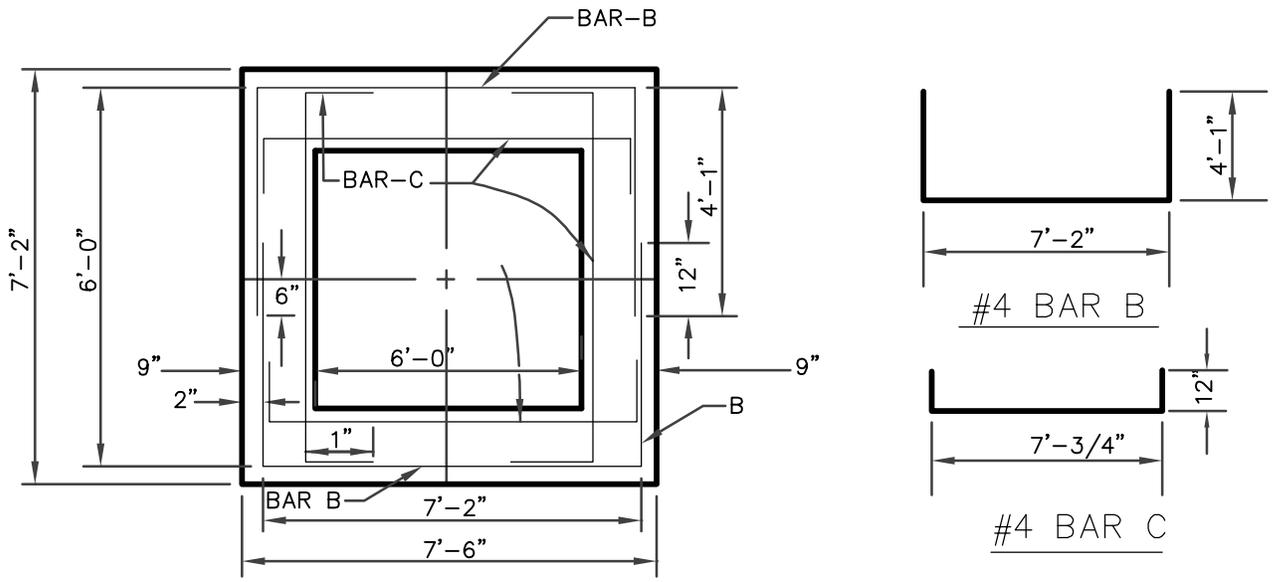
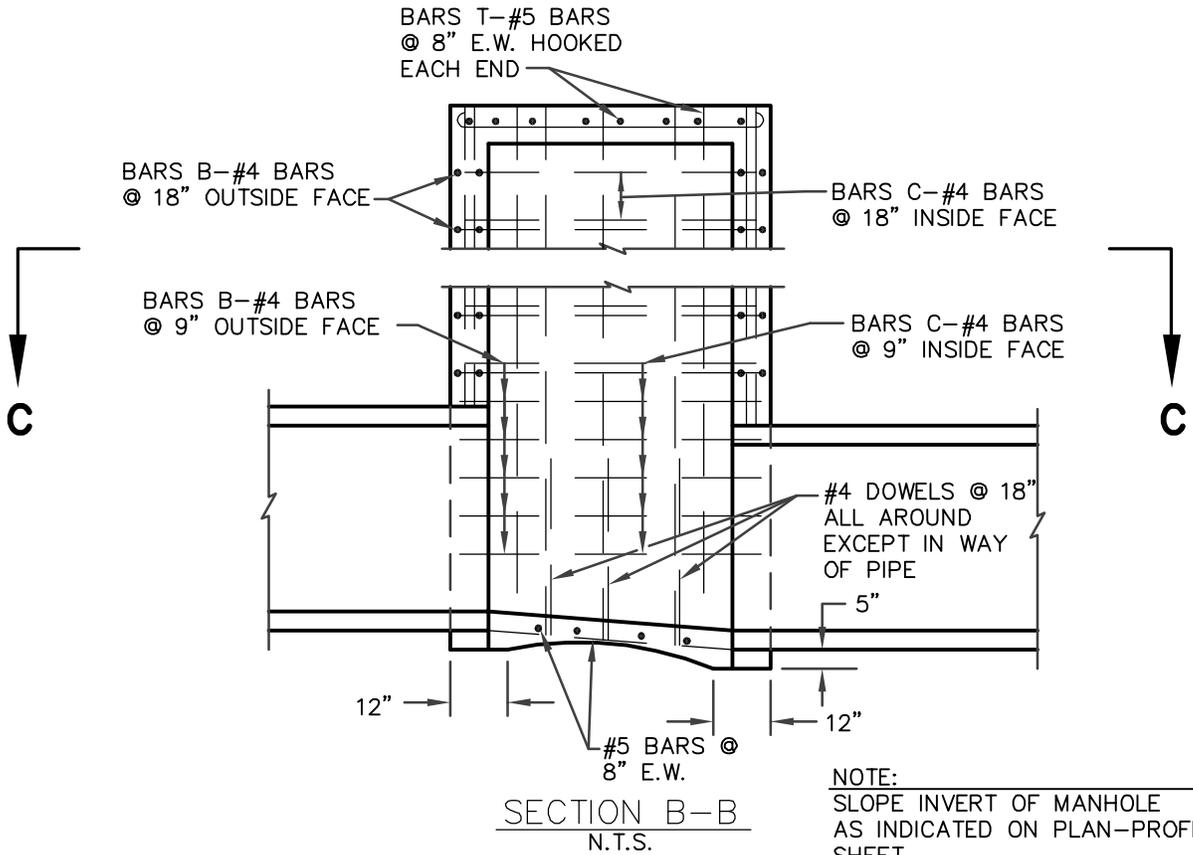


SECTION A-A
N.T.S.

NOTE:
DEPTH "D" SHALL BE
SHOWN ON STORM DRAIN
PLAN AND PROFILE SHEET

STANDARD 6 FOOT SQUARE
STORM DRAIN MANHOLE/VAULT

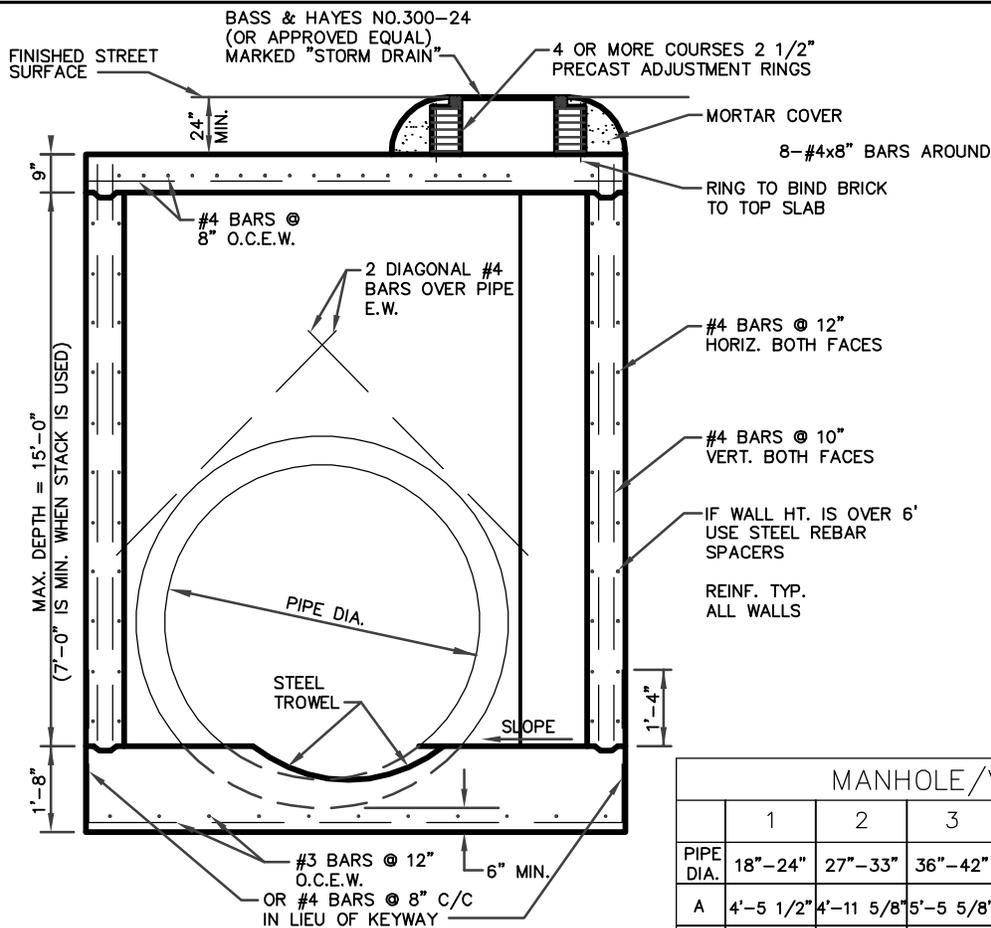




- NOTES:
1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF STANDARD SPECIFICATION FOR STANDARD MANHOLES.
 2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACE SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
 3. EXCAVATION FOR MANHOLE TO BE INCLUDED IN UNIT PRICE BID FOR MANHOLE.

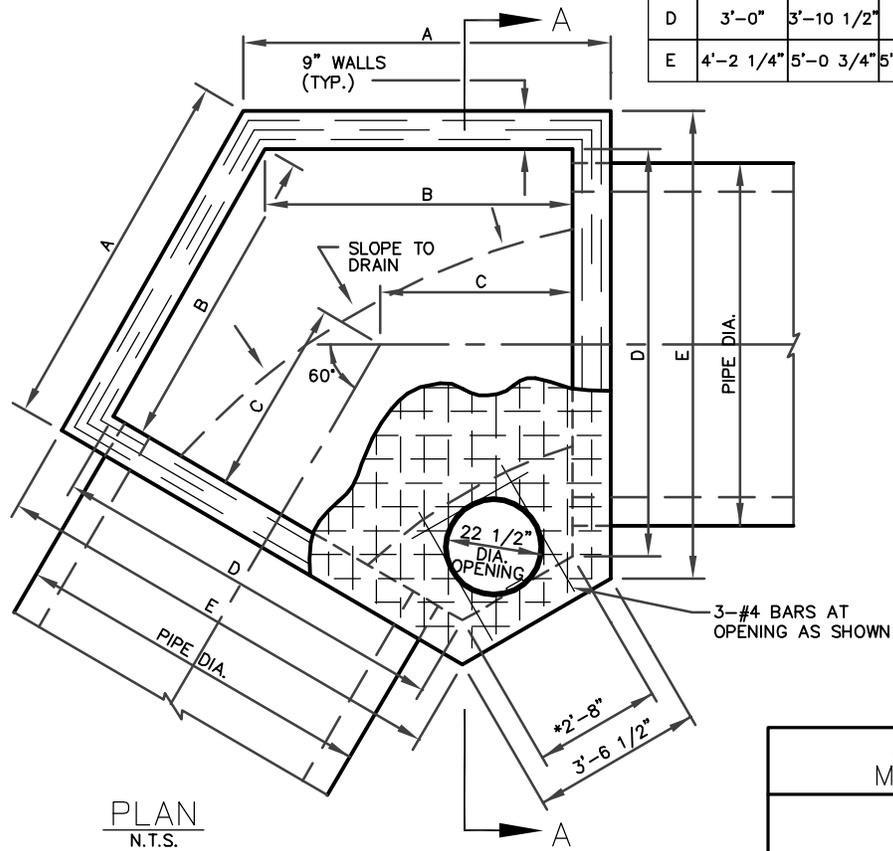
STANDARD 6 FOOT SQUARE
STORM DRAIN MANHOLE/VAULT





SECTION A-A
N.T.S.

MANHOLE/VAULT TYPE						
	1	2	3	4	5	6
PIPE DIA.	18"-24"	27"-33"	36"-42"	48"-54"	60"-66"	72"
A	4'-5 1/2"	4'-11 5/8"	5'-5 5/8"	6'-1 3/4"	6'-9 7/8"	7'-6"
B	3'-3 5/16"	3'-9 3/8"	4'-3 7/16"	4'-11 1/2"	5'-7 5/8"	6'-3 3/4"
C	2'-5"	2'-8"	2'-11"	3'-3"	3'-7"	3'-11"
D	3'-0"	3'-10 1/2"	4'-9"	5'-11"	7'-1"	8'-3"
E	4'-2 1/4"	5'-0 3/4"	5'-11 1/4"	7'-1 1/4"	8'-3 1/4"	9'-5 1/4"

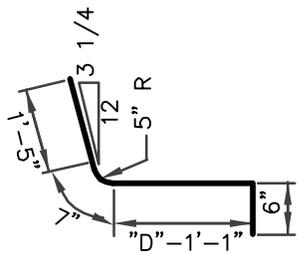


PLAN
N.T.S.

- NOTES:
- *1. THE 2'-8" DIMENSION SHALL IN ALL CASES BE THE CONTROL DIMENSION AND ANY DEVIATION IN OTHER DIMENSIONS ENCOUNTERED IN THE FIELD SHALL BE ADJUSTED BY THE ENGINEER.
 2. MIN. 3000 PSI STRENGTH CONCRETE AT 28 DAYS, MIN. 40 GRADE STEEL.

ANGLED STORM DRAIN
MANHOLE/VAULT DETAIL

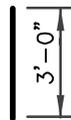




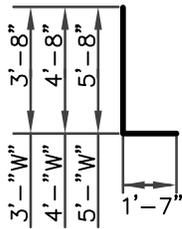
#4 BARS A
N.T.S.



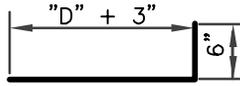
#4 BARS E
N.T.S.



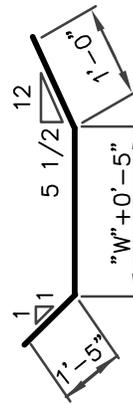
#4 BARS J
N.T.S.



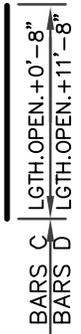
#4 BARS B
N.T.S.



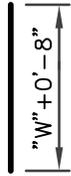
#4 BARS F
N.T.S.



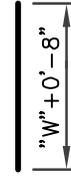
#3 BARS M
N.T.S.



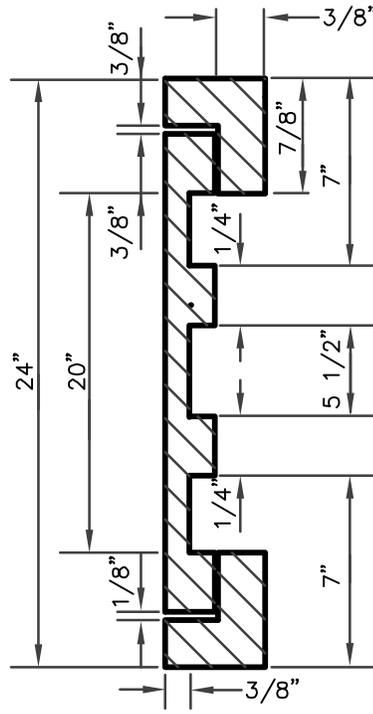
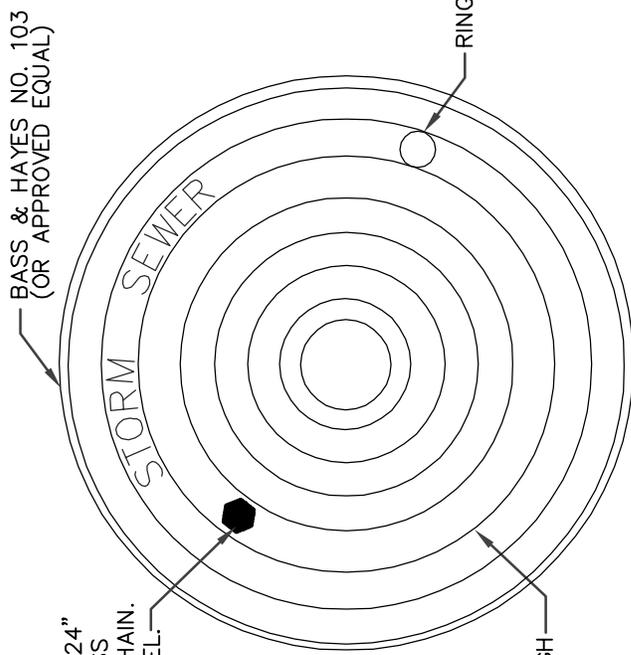
#4 BARS C & D
N.T.S.



#4 BARS G
N.T.S.



#5 BARS N
N.T.S.

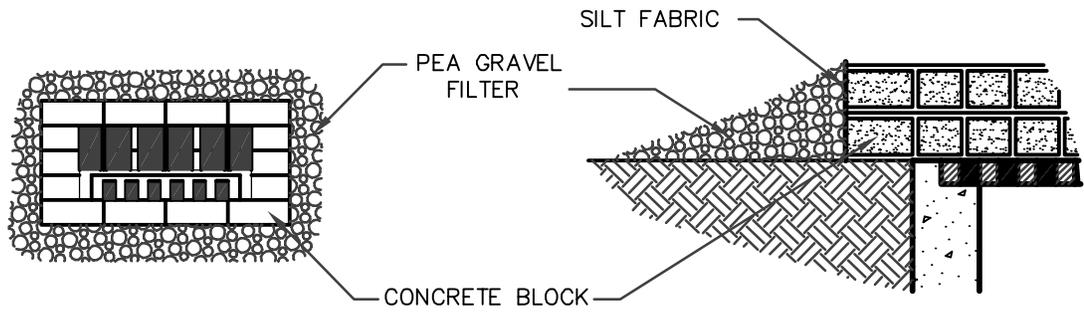


DETAIL OF CAST IRON
RING AND COVER

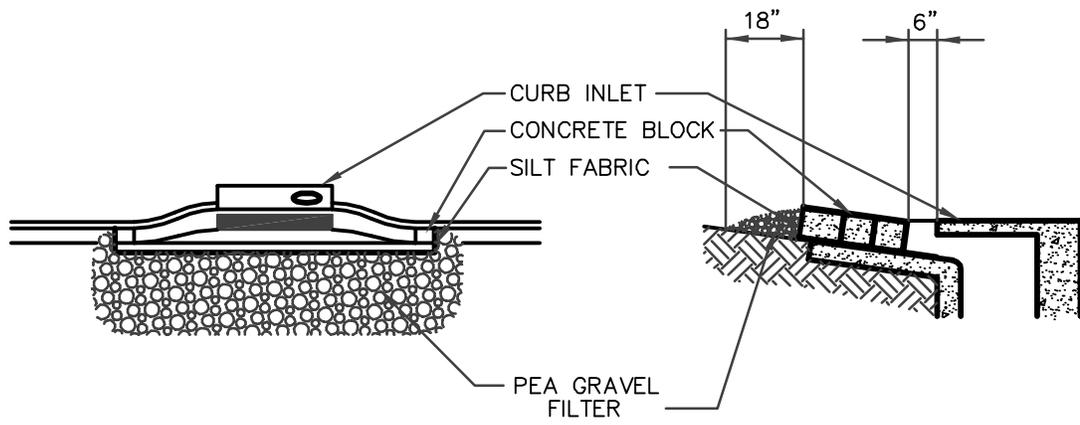
N.T.S.

STANDARD CURB INLET





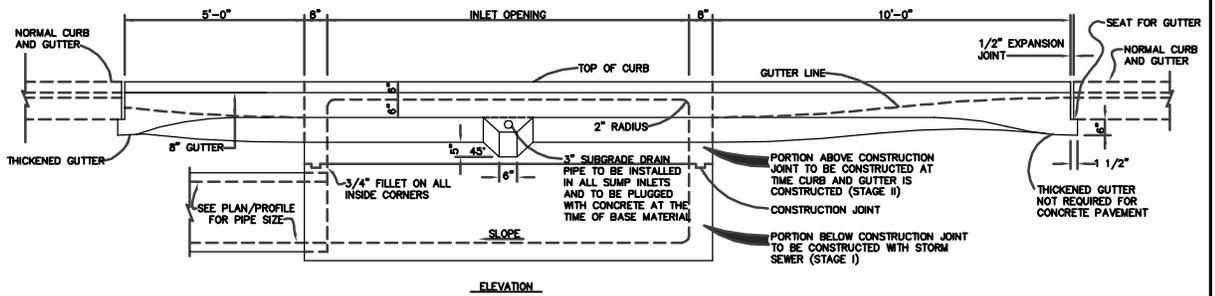
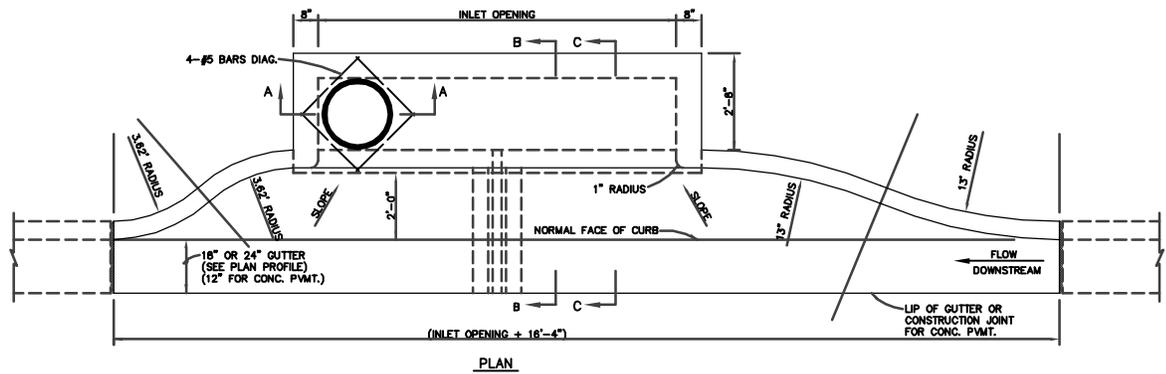
DROP INLET PROTECTION
N.T.S.



CURB INLET PROTECTION
N.T.S.

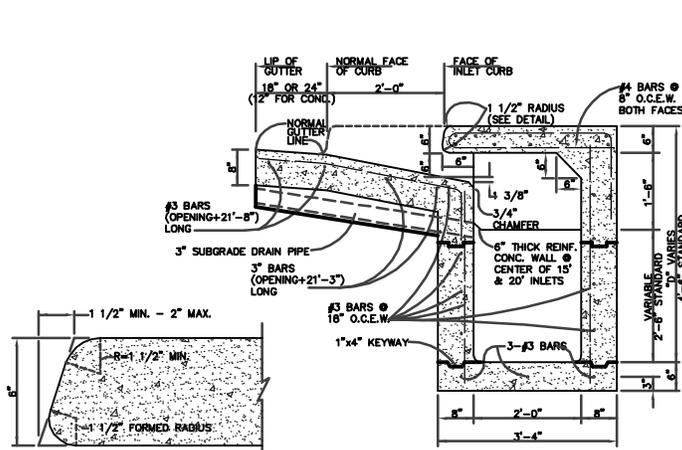
INLET PROTECTION
BLOCK AND GRAVEL





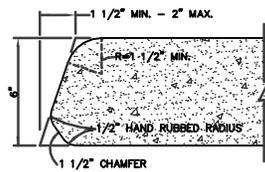
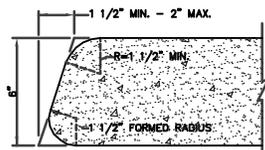
STANDARD 10' CURB INLET DETAIL

N.T.S.



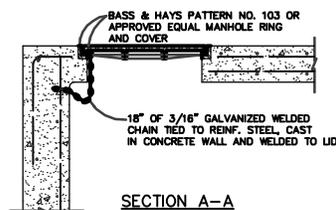
SECTION C-C
(ALTERNATE TYPE INLET)

N.T.S.



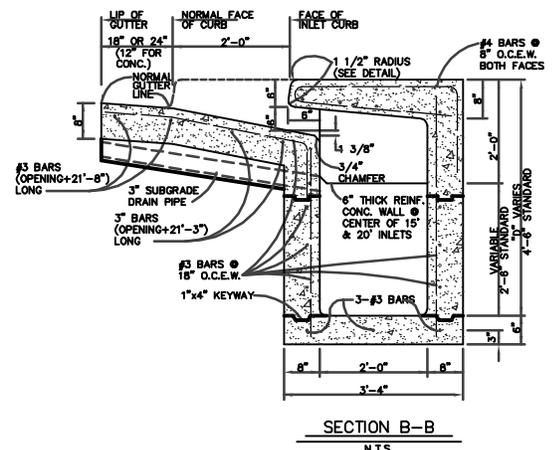
ALTERNATE CURB SECTIONS AT INLET

N.T.S.



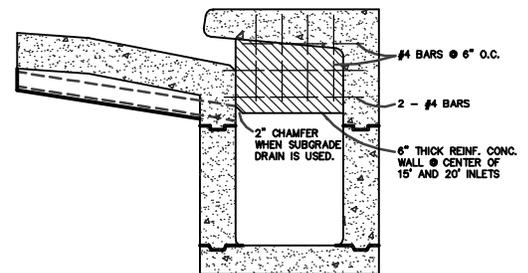
SECTION A-A

N.T.S.



SECTION B-B

N.T.S.

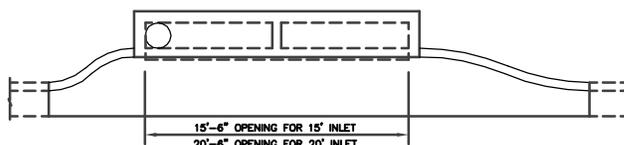


CENTER WALL DETAILS
FOR 15' & 20' INLETS

N.T.S.



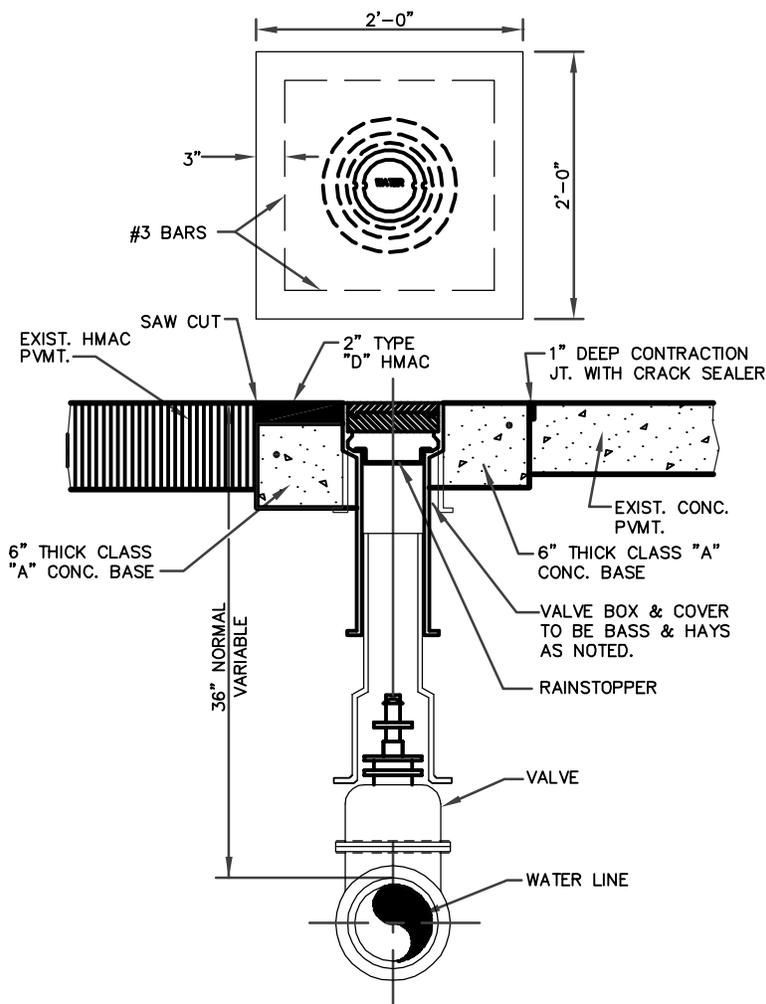
STANDARD 5' & 10' RECESSED INLETS



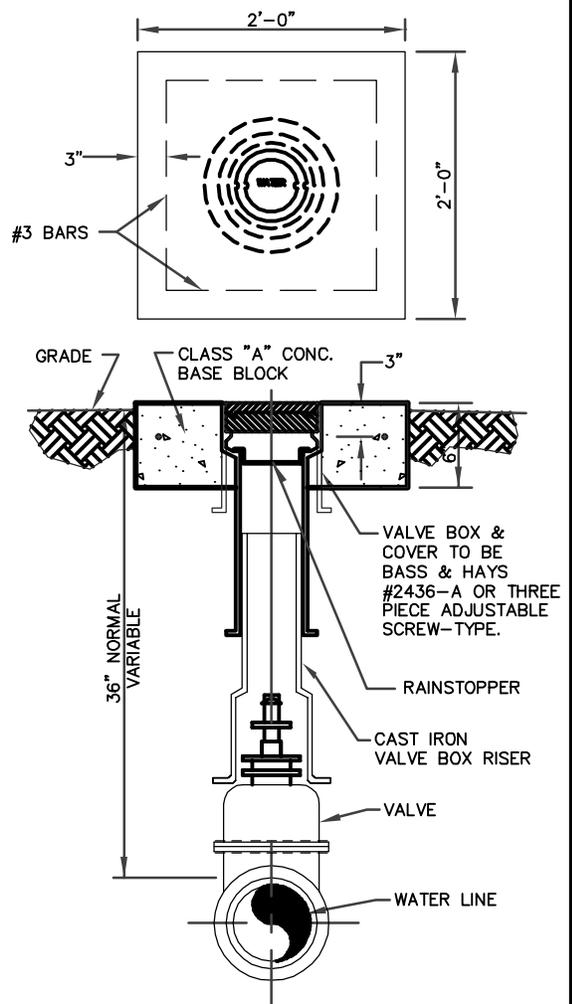
STANDARD 15' & 20' RECESSED INLETS WITH CENTER WALL

NEW STANDARD DETAIL
RECESSED CURB INLET

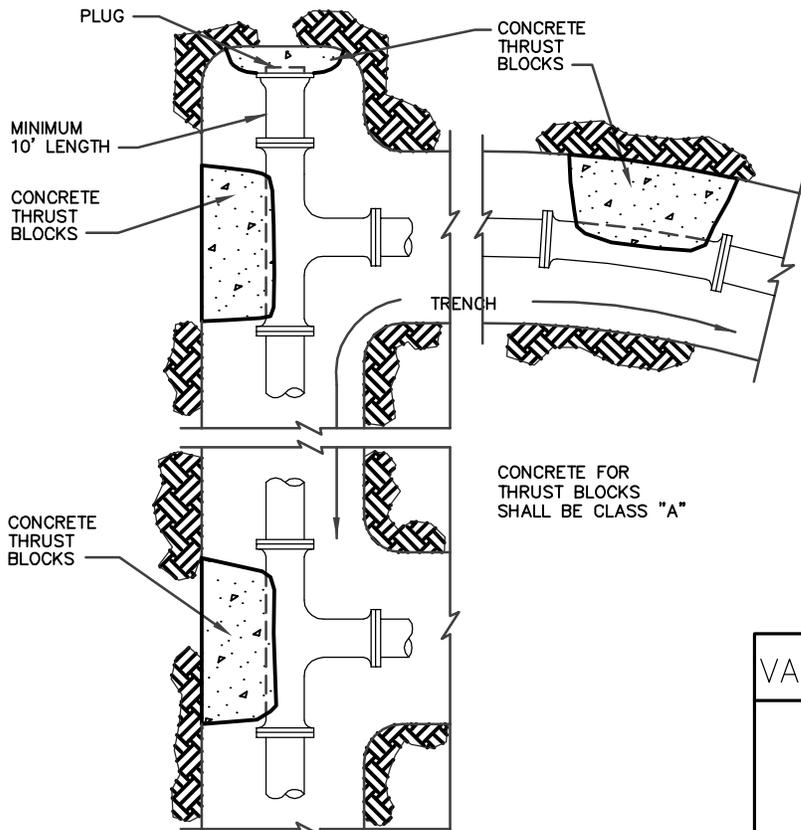




VALVES WITHIN ROADWAYS
OR OTHER PAVED OR SURFACED AREAS



VALVES IN YARDS OR OTHER AREAS
NOT SUBJECT TO TRAFFIC



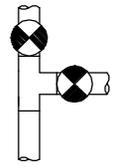
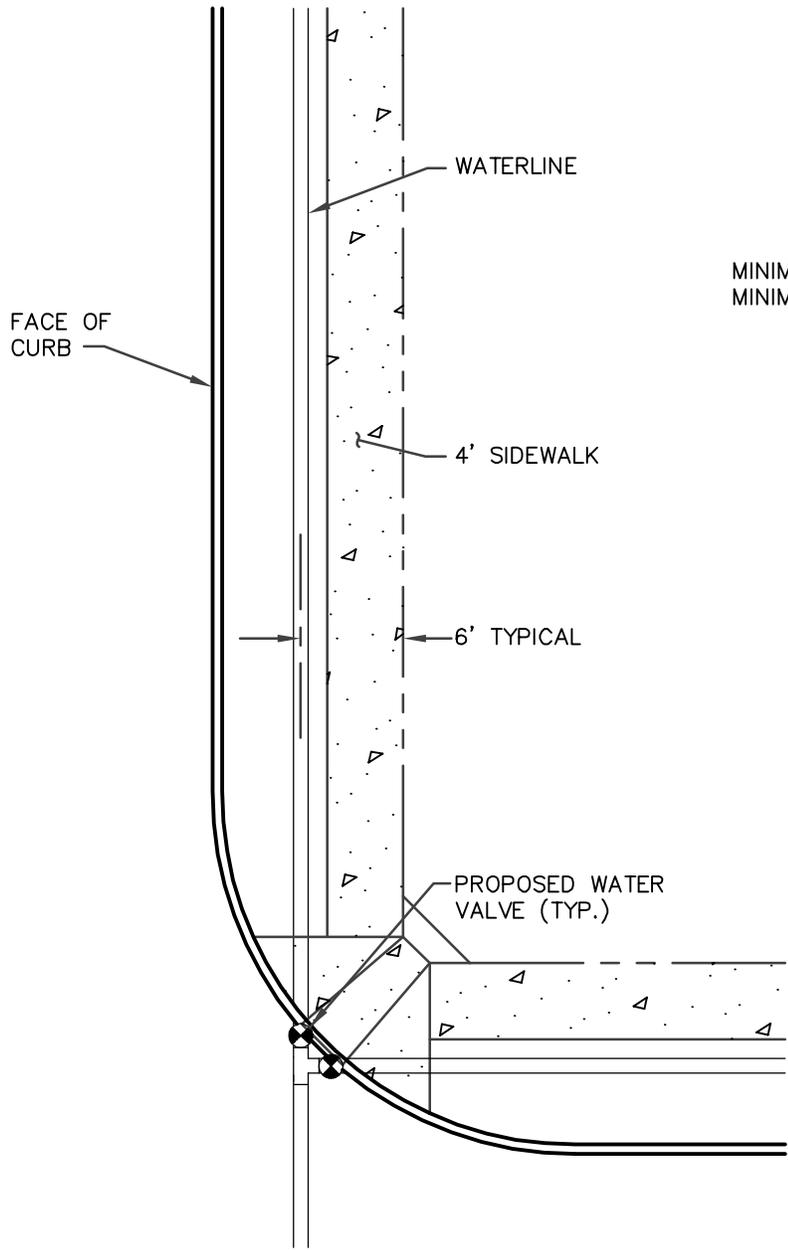
TYPICAL THRUST BLOCK DETAILS

NOTES:

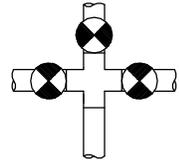
1. CLASS "A" CONCRETE SHALL HAVE 5 SACKS OF CEMENT/C.Y., MAXIMUM SLUMP OF 5 INCHES, AND A 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
2. ALL ITEMS SHOWN INCLUDED IN VALVE & BOX UNIT PRICE, COMPLETE IN PLACE.
3. ALL WATER VALVES SHALL MEET THE MINIMUM REQUIREMENTS OF AWWA C509 AND SHALL BE MUELLER A-2380, WATEROUS SERIES 500, CLOW MODEL F-6100, AMERICAN DARLING MODEL CRS-80-NRS OR APPROVED EQUAL.
4. RAINSTOPPER REQUIRED IN VALVE BOX.
5. SEE DETAIL 09W FOR PIPE RESTRAINT DETAILS.

VALVE & THRUST BLOCK DETAILS





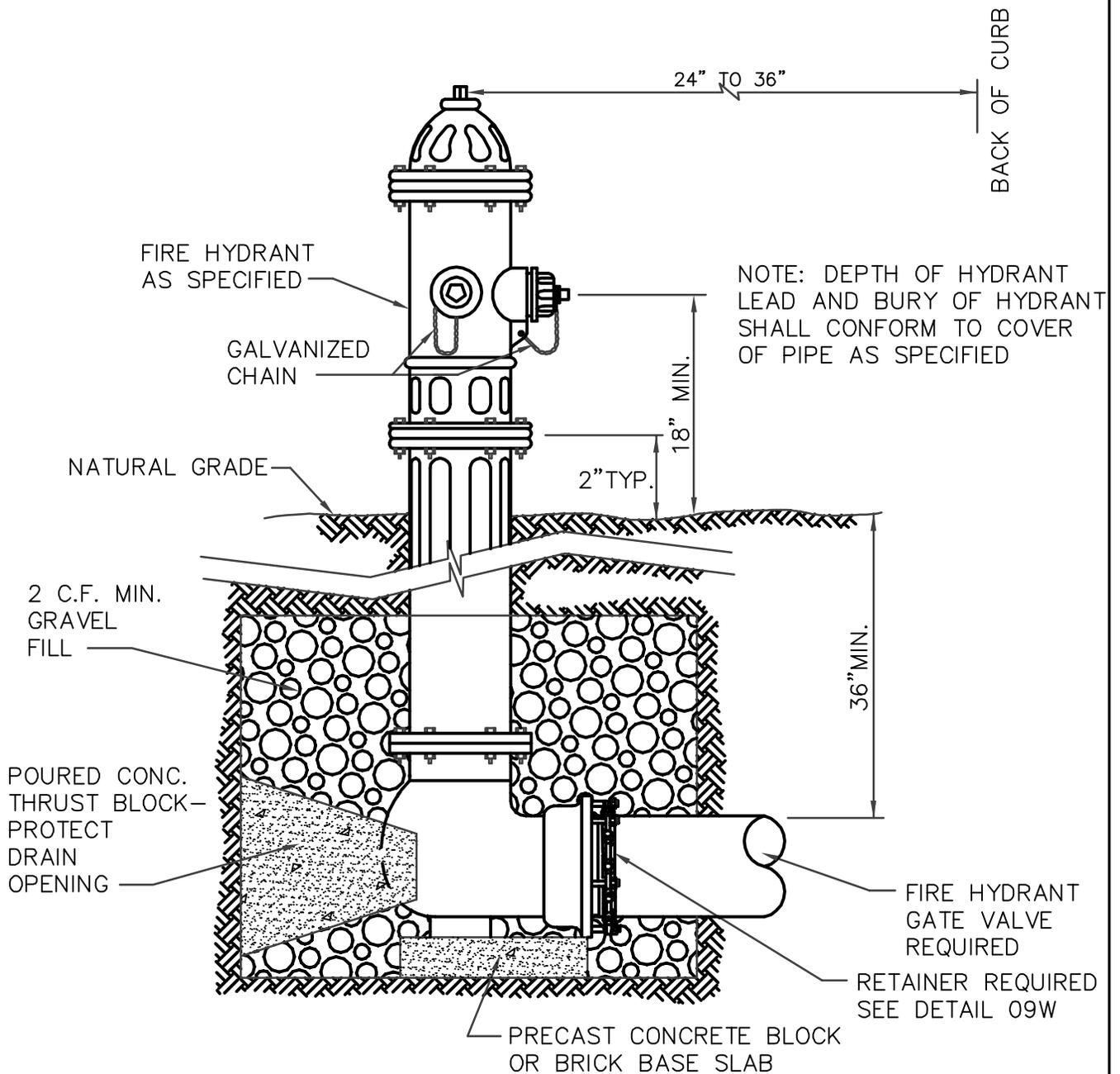
MINIMUM OF 2 VALVES ON TEE
 MINIMUM OF 3 VALVES ON CROSS



TYPICAL VALVE LOCATIONS
 N.T.S.

DETAIL OF VALVE LOCATIONS
 AT STREET INTERSECTIONS





NOTE: DEPTH OF HYDRANT LEAD AND BURY OF HYDRANT SHALL CONFORM TO COVER OF PIPE AS SPECIFIED

FIRE HYDRANT DETAIL

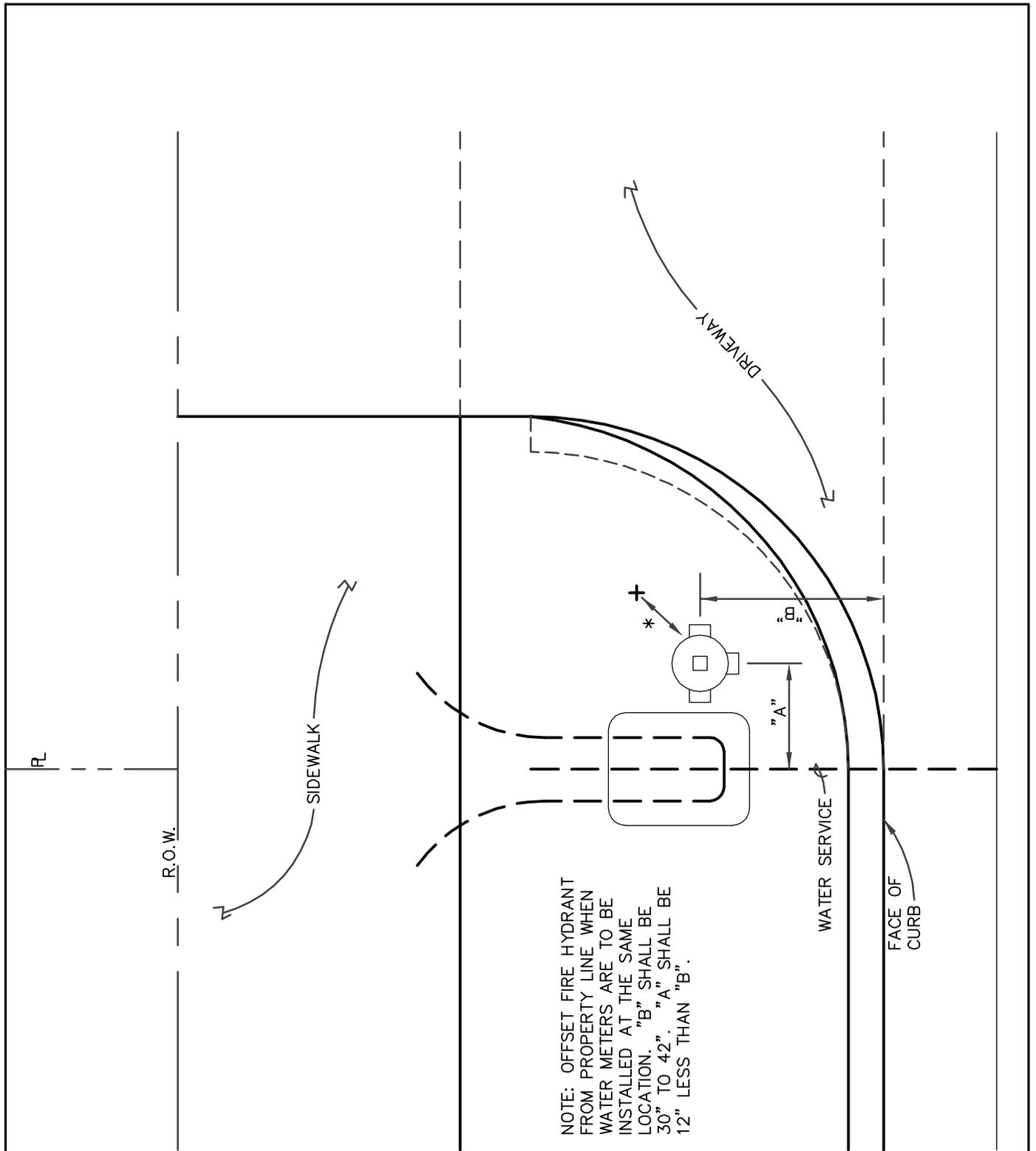
NOTES:

N.T.S.

1. CONCRETE SHALL BE PLACED OR Poured AGAINST UNDISTURBED SOIL.
2. ALL FIRE HYDRANTS SHALL CONFORM TO WATAUGA SPECIFICATIONS AND SHALL BE MUELLER SUPER MODEL A-423 (CENTURION 200), WATEROUS MODEL WB-67DD9-635, AMERICAN DARLING MODEL B-84-B, CLOW MODEL 2546-5-B (MEDALLION).
3. NO SEPARATE PAY FOR EXTENSIONS TO FINISHED GRADE.
4. ALL PORTIONS (EXCLUDING CHAINS) OF FIRE HYDRANT ABOVE GRADE SHALL BE PAINTED WITH TNEMEC SERIES 02H HI-BUILD TNEMEC-GLOSS. COLOR (PRIMED): CHILEAN RED.
5. ALL FIRE HYDRANT GATE VALVES SHALL BE ANCHORED TO THE MAIN AS DIRECTED BY THE CITY REPRESENTATIVE.

FIRE HYDRANT DETAILS





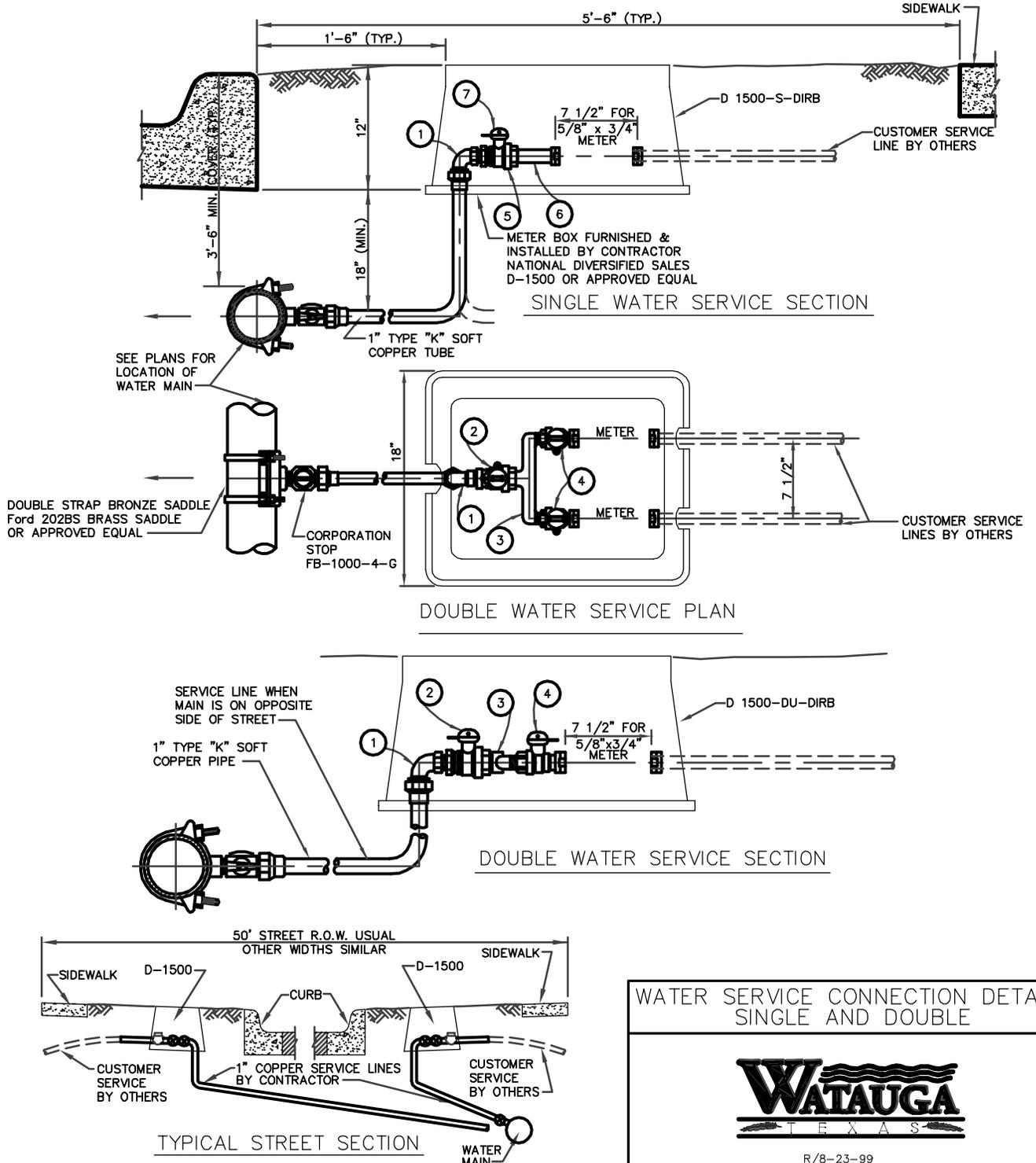
FIRE HYDRANT AND WATER METERS



ITEM NO.	QUANTITY		SIZE	DESCRIPTION	PART NUMBER	
	SINGLE	DOUBLE			FORD	MUELLER
1.	1	1	1"	90° BRASS ELBOW, COPPER X M.I.P., (QTR. BEND)	L-84-44	330 H 15530
2.	1	1	1"	BALLVALVE CB. STOP, F.I.P. X F.I.P.	B11-444WR	330 B 20200
3.	1	1	1"x3/4"x7 1/2"	U-BRANCH	U88-43	H 15362
4.	1	2	3/4"	BALLVALVE CB. STOP, F.I.P. X METER YOKE	B13-332WR	250 B 24351-3
5.	1		1"x3/4"	BRASS REDUCER BUSHING (REDUCING SPUD MIP X MIP)	-	502464
6.	1		3/4"	BRASS NIPPLE THREAD x METER YOKE	-	-
6.	1		1"x3/4"	BALL VALVE CURB STOP	B41-343-G	-

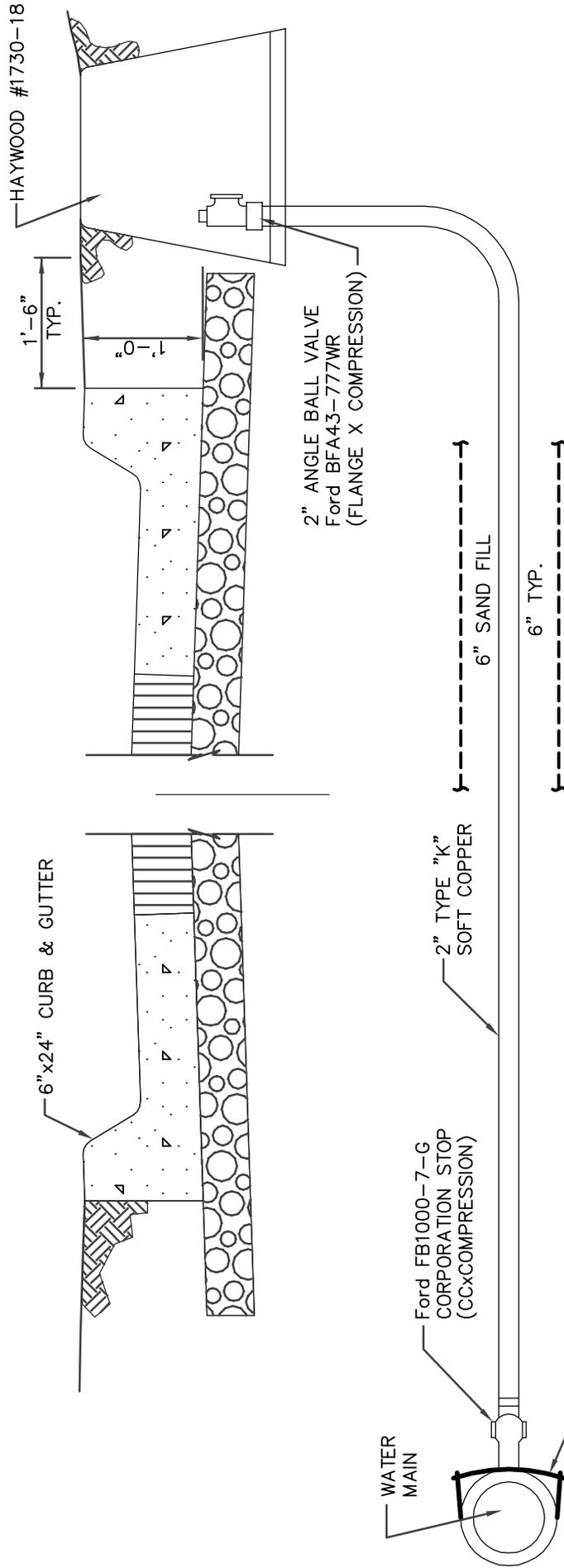
NOTES:

- IF SERVICE IS INSTALLED AHEAD OF CURB AND GUTTER, CUT AND SHAPE PIPE TO FIT POSITION SHOWN BUT BEND DOWN ABOUT 5 INCHES TO MINIMIZE CHANCES OF DAMAGE DURING CONSTRUCTION OF CURB AND GUTTER. SERVICE LINE COVER MINIMUM 24 INCHES, UNDER STREET SUBGRADE AND MINIMUM 12 INCHES UNDER BOTTOM OF CURB AND GUTTER.
- CONTRACTOR FURNISHES ALL PARTS LISTED AT HIS EXPENSE. ALL ITEMS SHALL BE INSTALLED BY CONTRACTOR.
- CITY MAY REQUIRE INSTALLATION OF Ford V72-W-11-13 COPPERSETTERS.



WATER SERVICE CONNECTION DETAILS
SINGLE AND DOUBLE





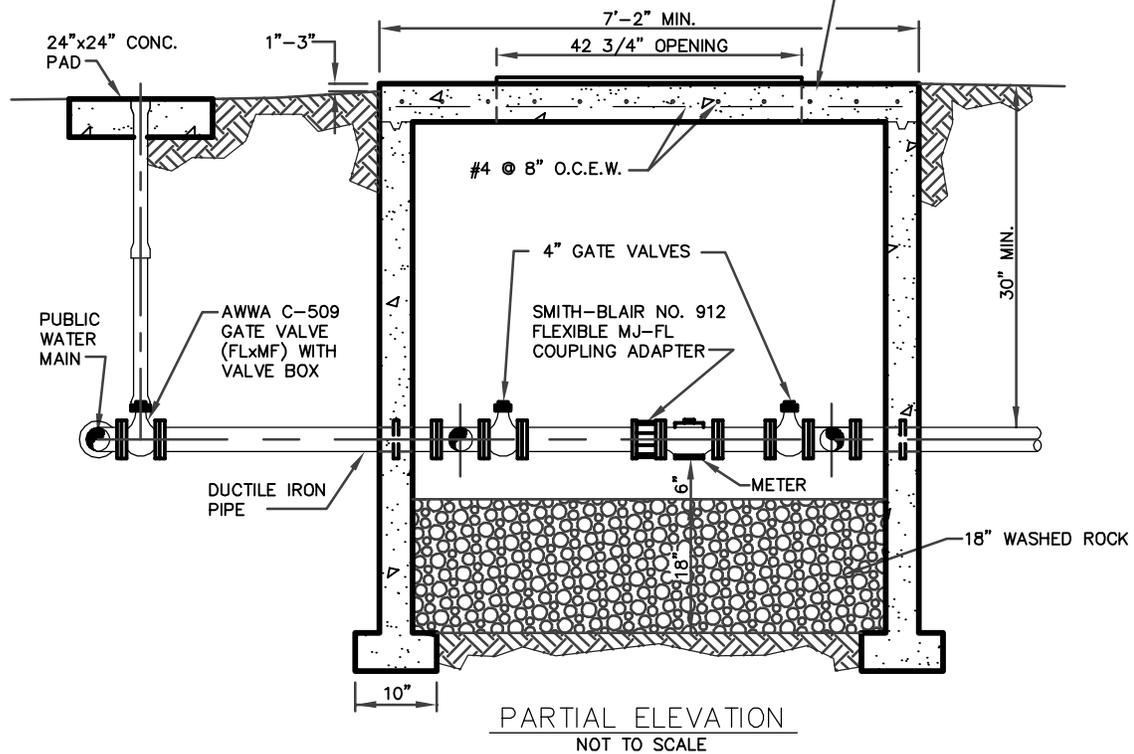
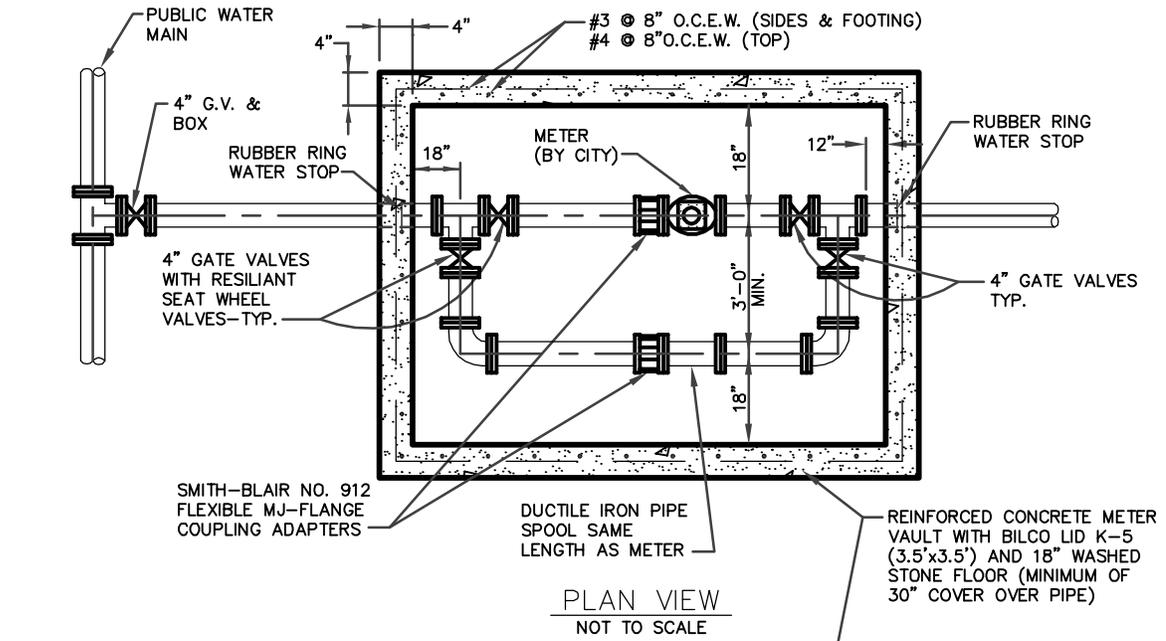
NOTE:
 IF SERVICE IS INSTALLED AHEAD OF CURB & GUTTER,
 CUT AND SHAPE PIPE TO FIT POSITION SHOWN BUT
 BEND DOWN ABOUT 5 INCHES TO MINIMIZE CHANCES
 OF DAMAGE DURING CONSTRUCTION OF CURB AND
 GUTTER. SERVICE LINE COVER MINIMUM 24 INCHES,
 UNDER STREET SUBGRADE.

DETAIL FOR 2" WATER SERVICE

2" WATER SERVICE



1-1-98 R/8-23-99 R/9-18-00 FIGURE 5W

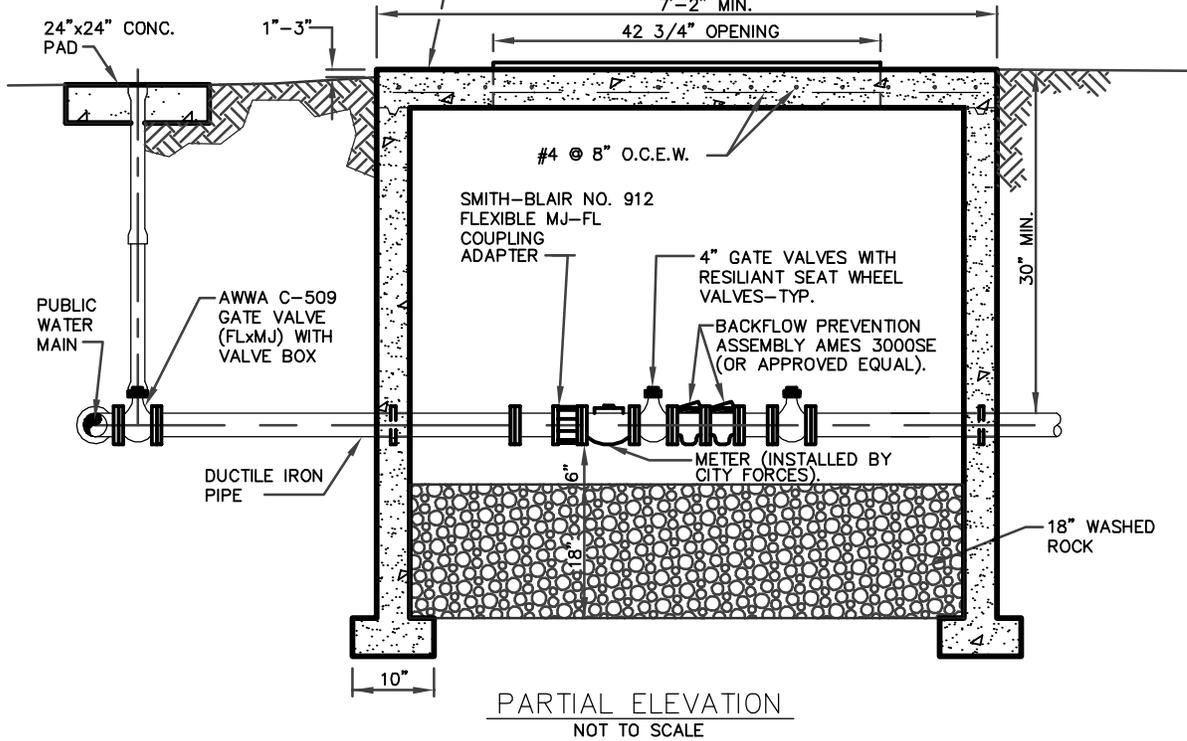
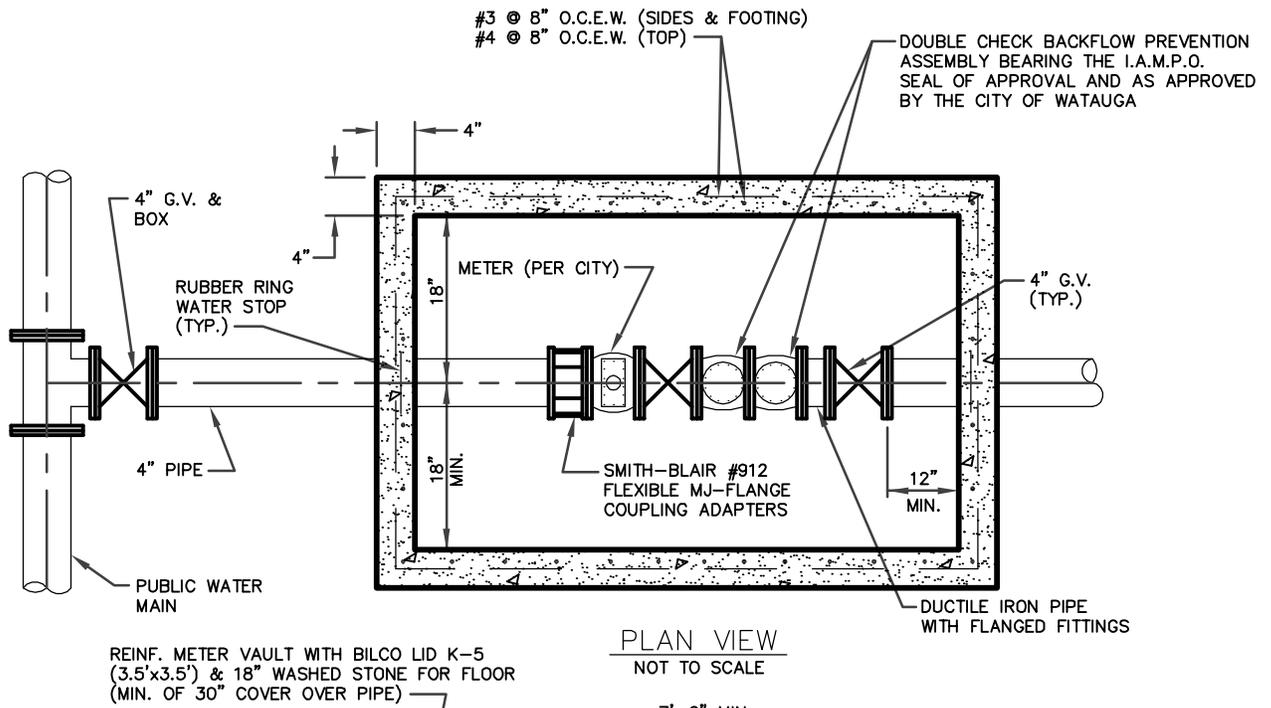


NOTES:

1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE CITY OF WATAUGA STANDARDS AND SPECIFICATIONS.
2. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS WITH A MAXIMUM SLUMP OF 4 INCHES.
3. ALL REINFORCING STEEL WILL BE CONTINUOUS AROUND CORNERS WITH MIN. LAP OF 24 INCHES.
4. BILCO LID K-5 (3.5'x3.5') OR APPROVED EQUAL SHALL BE INSTALLED IN TOP. CONTRACTOR SHALL FURNISH TWO (2) BILCO KEY WRENCHES WITH EACH INSTALLATION.
5. ALL DUCTILE IRON WATER PIPE SHALL MEET SPECIFICATION ANSI/AWWA-C150/A21.50 CLASS 50 WITH 8 MIL POLYETHYLENE TUBE WRAP AND CEMENT LINING ACCORDING TO ANSI/AWWA-C104/A21.4.
6. FAILURE TO OBTAIN PROPER INSPECTION WILL RESULT IN UNCOVERING ALL PIPE AND FITTINGS FOR REINSPECTION.

DOMESTIC 4" METER INSTALLATION



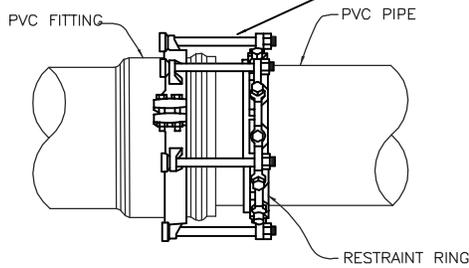


- NOTES:
1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE CITY OF WATUGA STANDARDS AND SPECIFICATIONS.
 2. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS WITH A MAXIMUM SLUMP OF 4 INCHES.
 3. ALL REINFORCING STEEL WILL BE CONTINUOUS AROUND CORNERS WITH MINIMUM LAP OF 24 INCHES.
 4. BILCO LID K-5 (3.5'x3.5') OR APPROVED EQUAL SHALL BE INSTALLED IN TOP. CONTRACTOR SHALL FURNISH TWO (2) BILCO KEY WRENCHES WITH EACH INSTALLATION.
 5. ALL DUCTILE IRON WATER PIPE SHALL MEET SPECIFICATION ANSI/AWWA-C150/A21.50, CLASS 50 WITH 8 MIL POLYETHYLENE TUBE WRAP AND CEMENT LINING ACCORDING TO ANSI/AWWA-C104/A21.4.
 6. FAILURE TO OBTAIN PROPER INSPECTION WILL RESULT IN UNCOVERING ALL PIPE AND FITTINGS FOR REINSPECTION.

IRRIGATION 4" METER INSTALLATION



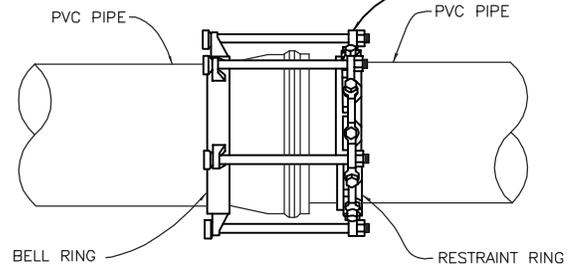
USE EBAA IRON "MEGALUG" SERIES 2500 RESTRAINT HARNESS FOR C-900 OR C-905 PVC PIPE FITTINGS



PVC PIPE FITTINGS TO PVC PIPE

Not To Scale

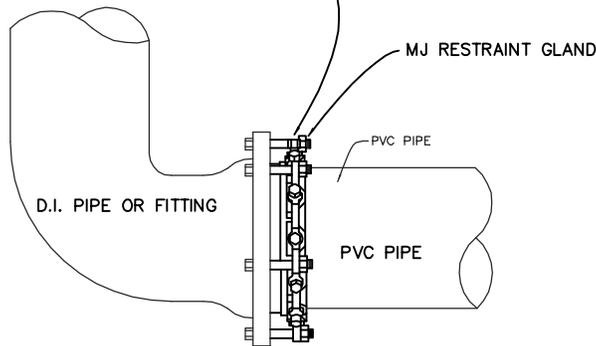
USE EBAA IRON "MEGALUG" SERIES 1600 RESTRAINT HARNESS FOR C-900 OR SERIES 2800 RESTRAINT FOR C-905 PVC PIPE TO PIPE



PVC PIPE TO PVC PIPE

Not To Scale

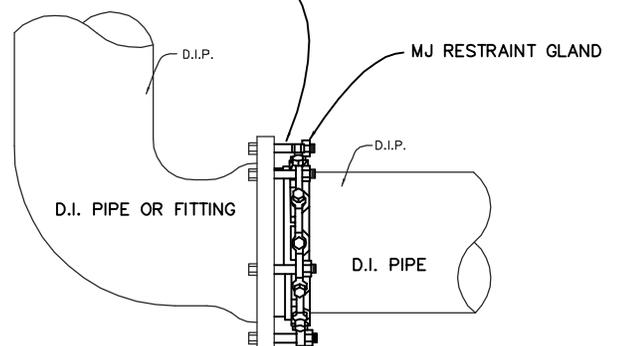
USE EBAA IRON "MEGALUG" SERIES 2000PV RESTRAINT GLAND FOR MECHANICAL JOINT TO C-900 OR C-905 PVC PIPE



MJ PIPE FITTINGS TO PVC PIPE

Not To Scale

USE EBAA IRON "MEGALUG" SERIES 1100 RESTRAINT GLAND FOR MECHANICAL JOINT TO DUCTILE IRON PIPE



MJ PIPE FITTINGS TO DI PIPE

Not To Scale

NOTE: USE EBAA IRON "MEGALUG" SERIES 2100 RESTRAINED FLANGE ADAPTER FOR FLANGE TO DUCTILE IRON OR PVC PIPE CONNECTION.

EBAA IRON "MEGALUG" SERIES RESTRAINTS SHALL BE USED AT ALL MECHANICAL JOINT FITTINGS AND ON PIPE JOINTS WHERE INSUFFICIENT LENGTH OF STRAIGHT PIPE IS SUPPORTED IN TRENCH.

INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

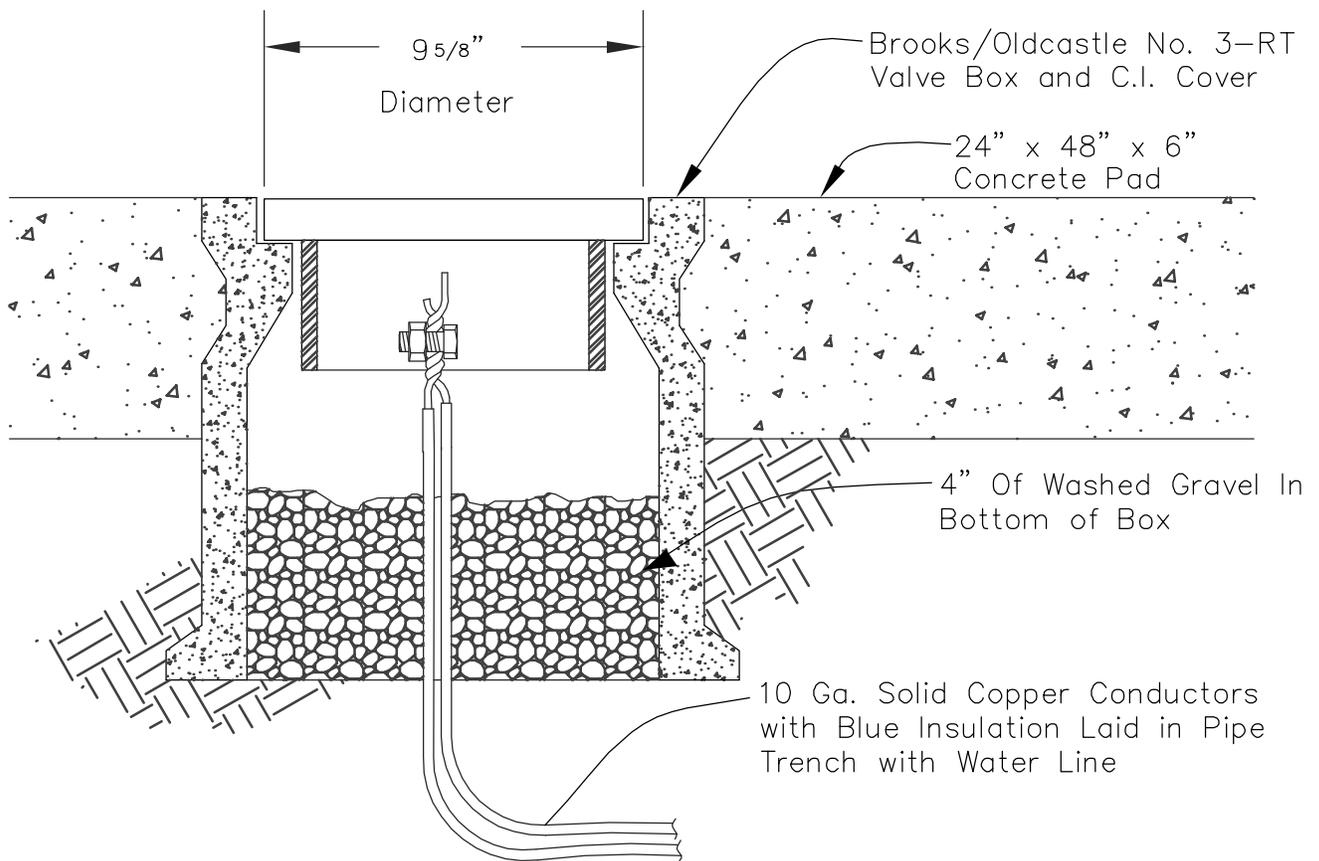
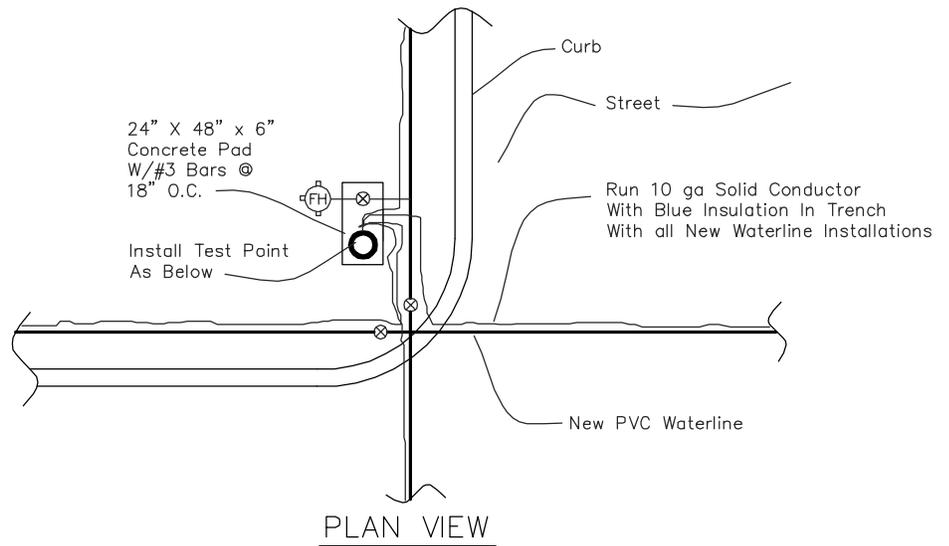
PIPE RESTRAINT DETAILS



MAY 1999

File: J:\WAT\400\09W.dwg

FIGURE 09W



TYPICAL TEST POINT DETAIL

NOTES:

1. TEST POINT BOXES SHALL BE INSTALLED 18" FROM AND ADJACENT TO EACH FIRE HYDRANT GATE VALVE IN PARKWAY AS REQUIRED.
2. THE 10 GA. COPPER WIRE SHALL BE INSTALLED CONTINUOUS WITH NO SPLICES IN THE WIRE OTHER THAN IN THE TEST POINT BOXES AS SHOWN.
3. TWIST THE BARE COPPER WIRES AND CLAMP WITH APPROPRIATE BRONZE ALLOY SPLIT-BOLT CONNECTOR

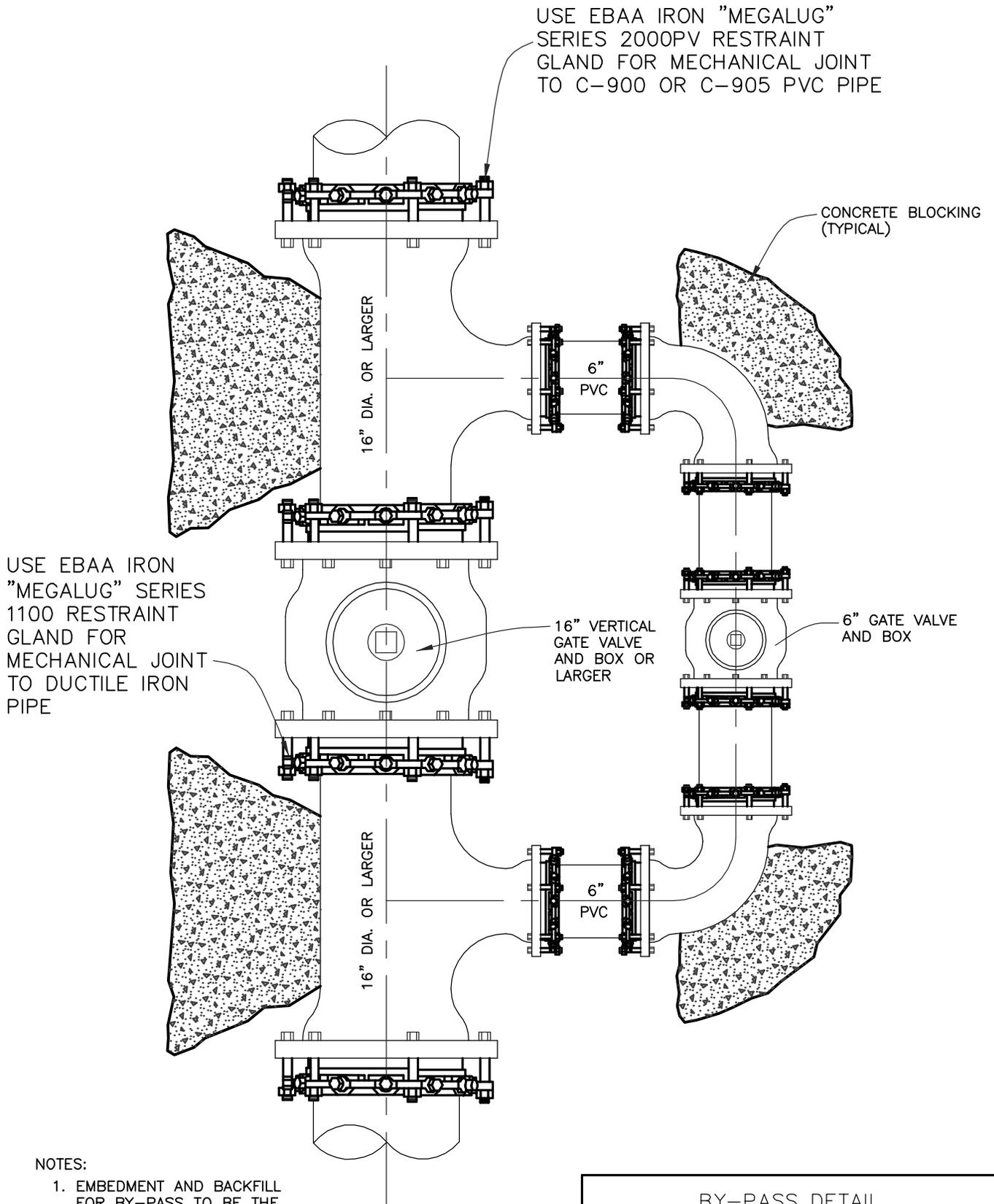
TRACE LINE TEST POINT DETAILS



R/01-20-04

02-14-02

FIGURE 10W



USE EBAA IRON "MEGALUG" SERIES 1100 RESTRAINT GLAND FOR MECHANICAL JOINT TO DUCTILE IRON PIPE

USE EBAA IRON "MEGALUG" SERIES 2000PV RESTRAINT GLAND FOR MECHANICAL JOINT TO C-900 OR C-905 PVC PIPE

NOTES:

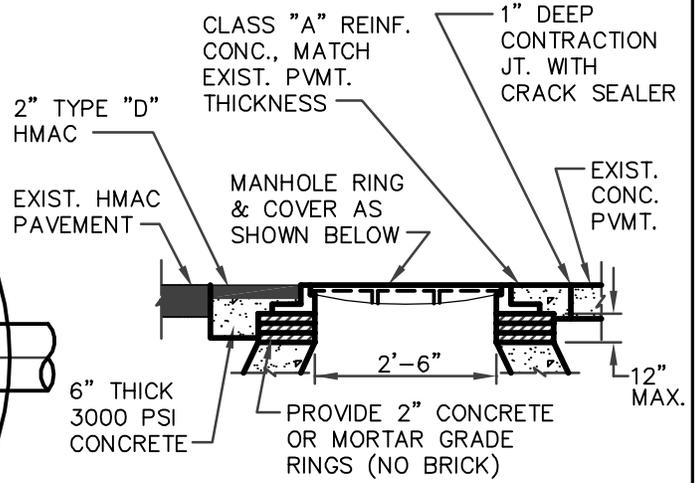
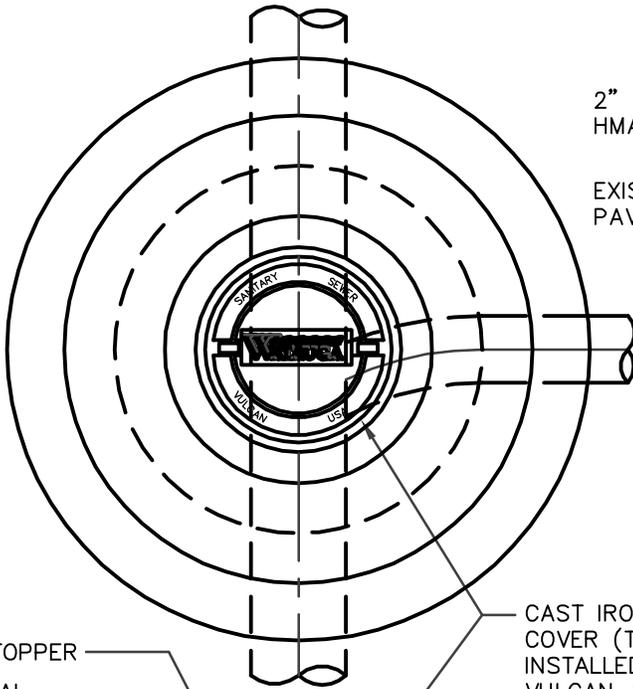
1. EMBEDMENT AND BACKFILL FOR BY-PASS TO BE THE SAME AS THE MAIN LINE.
2. BY-PASS TO BE PAID FOR AT UNIT PRICE FOR EACH COMPLETE IN PLACE INCLUDING 6" GATE VALVE, MAIN LINE TEES, 90d BENDS, AND 6" PVC PIPE.

BY-PASS DETAIL



11-5-2002

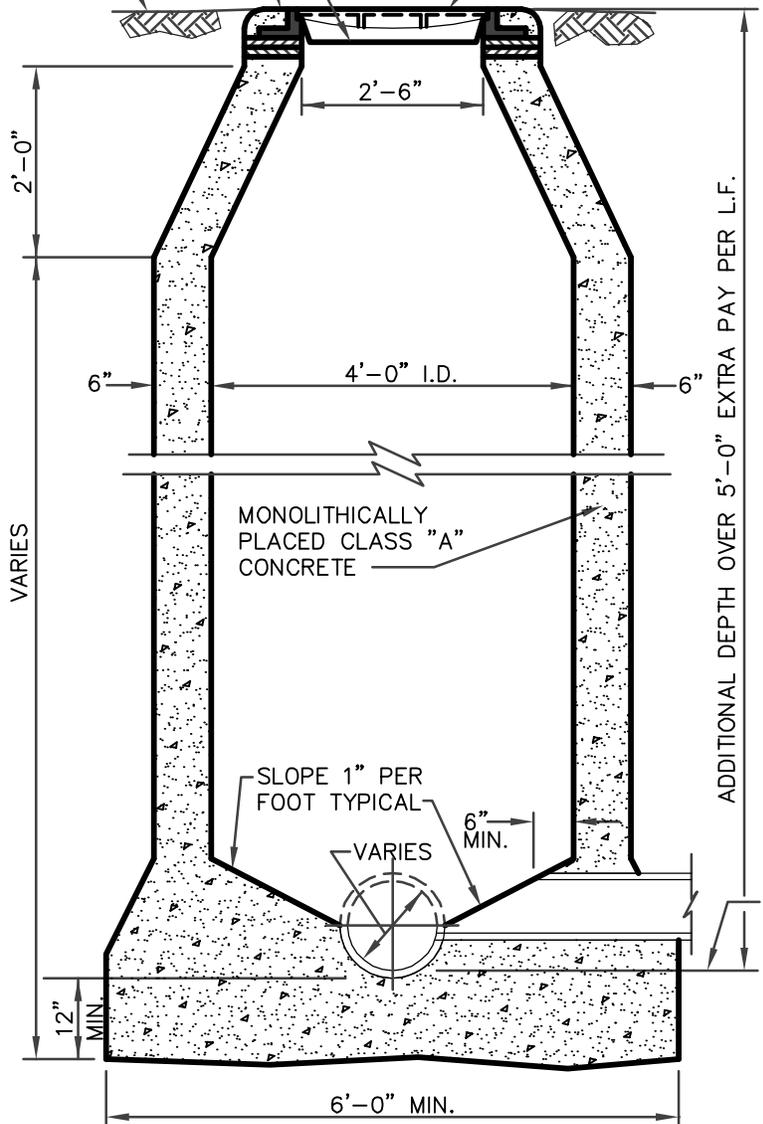
FIGURE 11W



MANHOLE TOP FOR STREET INSTALLATION

CAST IRON MANHOLE FRAME AND COVER (TO BE FURNISHED AND INSTALLED BY CONTRACTOR). VULCAN #V-1342 WITH PICK BARS OR EQUAL MARKED WITH WATAUGA LOGO AND "SANITARY SEWER".

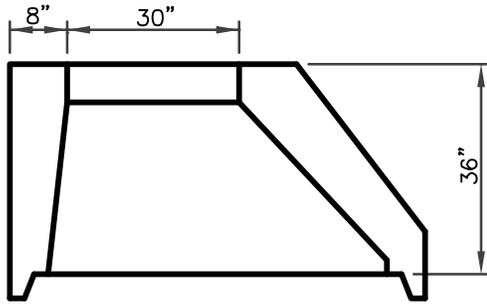
RAINSTOPPER
NATURAL GRADE
SET IN MORTAR



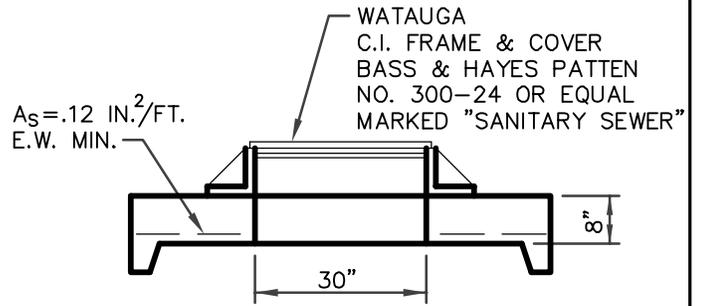
- NOTES:
1. STANDARD CAST-IN-PLACE CONCRETE MANHOLE TO BE USED WITH SEWERS 6" THROUGH 36" IN DIAMETER WHERE SPECIFIED.
 2. THE CONNECTION OF THE SEWER PIPE TO THE MANHOLE SHALL BE ACCOMPLISHED BY USING MANHOLE COUPLING OR RUBBER RING WATER STOPS AS RECOMMENDED BY THE PIPE MANUFACTURER.
 3. CLASS "A" CONCRETE SHALL HAVE 5 SACKS CEMENT/C.Y., MAXIMUM SLUMP OF 5", AND A 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
 4. SERVICES WHICH ARE CONNECTED TO MANHOLES SHALL BE INSTALLED A MINIMUM OF 8 INCHES ABOVE THE MAIN FLOWLINE.
 5. RAINSTOPPER REQUIRED IN MANHOLE.

SANITARY SEWER MANHOLE DETAILS

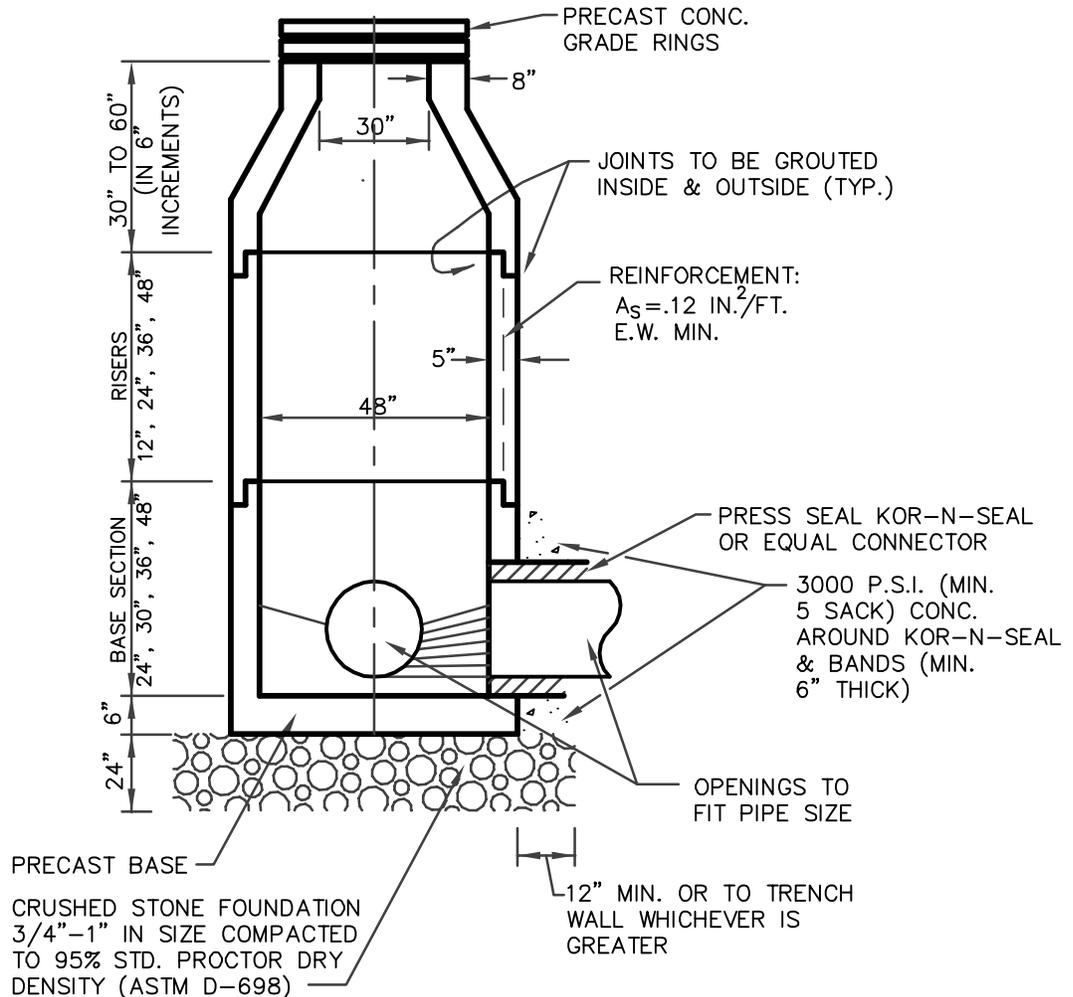




ECCENTRIC CONE



FLAT TOP
(USED IN PLACE OF CONE)
(OFF-SET HOLE ALSO AVAILABLE)



TYPICAL 48" DIA. MANHOLE
(WITH PRECAST BASE & FACTORY INVERT)

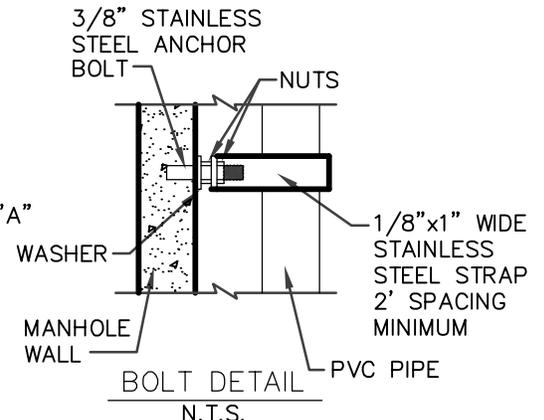
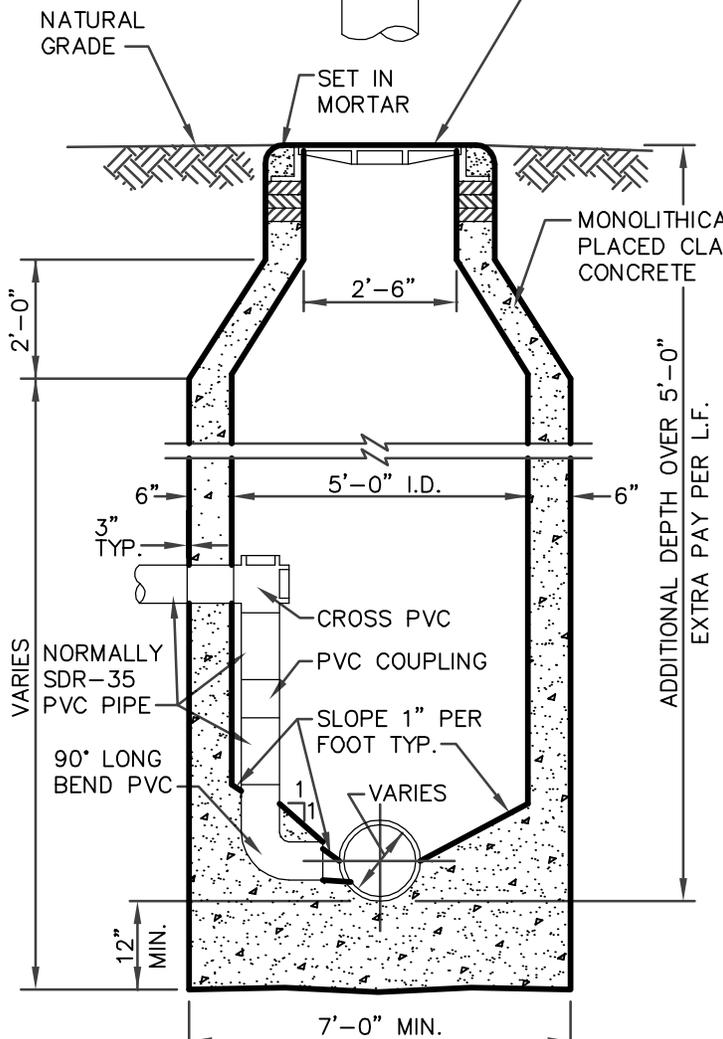
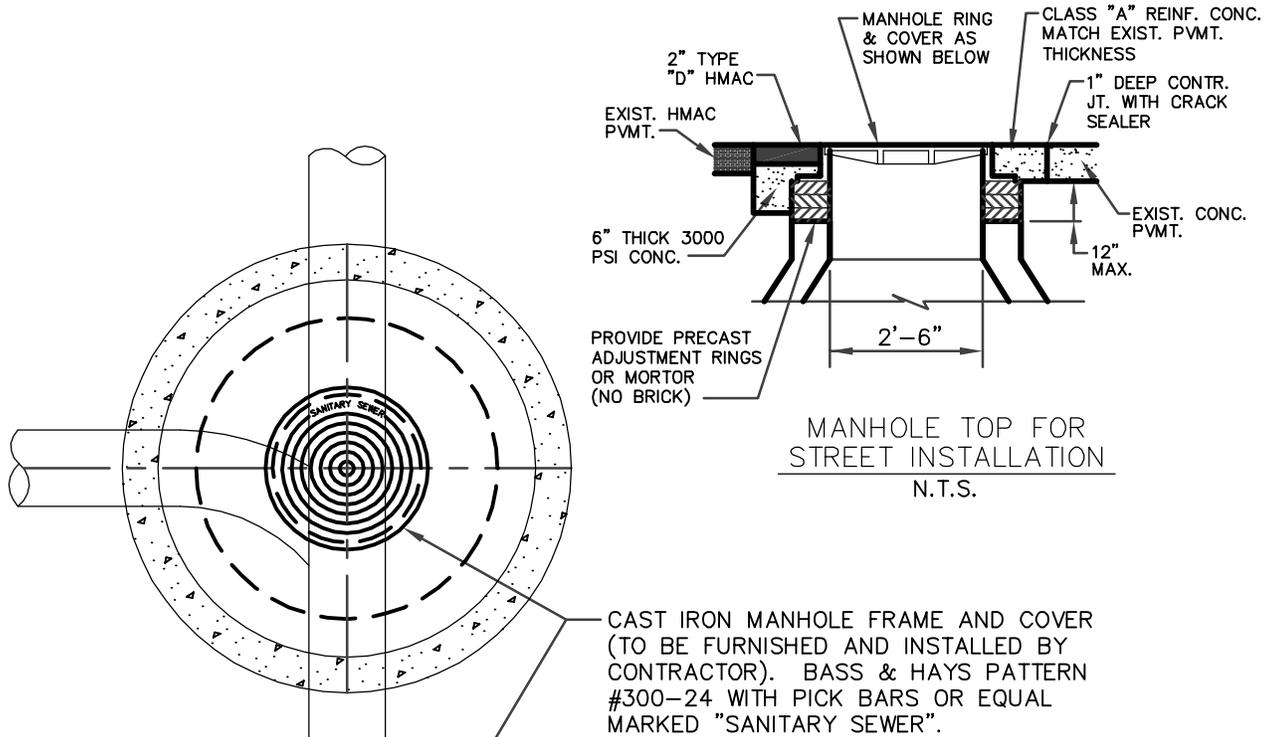
N.T.S.

NOTES:

1. PRECAST MANHOLE TO MEET ALL REQUIREMENTS OF ASTM C-478.
2. O'RING GASKET JOINT REQUIRED IN ACCORDANCE WITH ASTM C-443.
3. SERVICES WHICH ARE CONNECTED TO MANHOLES SHALL BE INSTALLED A MINIMUM OF 8 INCHES ABOVE THE MAIN FLOWLINE.
4. EACH INDIVIDUAL SECTION OF THE PRECAST MANHOLE WILL NEED TO BE STAMPED WITH THE ASTM SPECIFICATION NUMBER, THE MANUFACTURER'S NAME, AND DATE MANUFACTURED
5. RAINSTOPPER REQUIRED IN MANHOLE.

PRECAST CONCRETE MANHOLE DETAILS



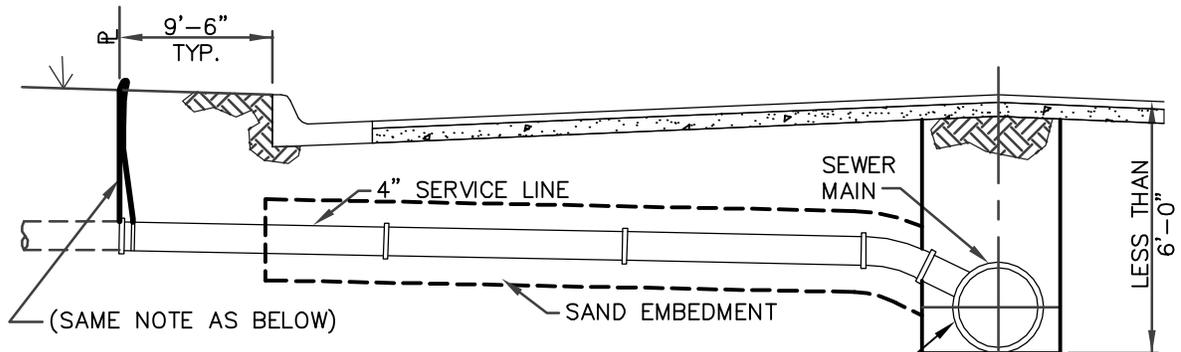


- NOTES:
1. STANDARD CAST-IN-PLACE MANHOLE TO BE USED WITH SEWERS 6" THROUGH 8" DIA. WHERE SPECIFIED.
 2. THE CONNECTION OF THE SEWER PIPE TO THE MANHOLE SHALL BE ACCOMPLISHED BY USING MANHOLE COUPLING OR RUBBER RING WATER STOPS AS RECOMMENDED BY THE PIPE MANUFACTURER.
 3. CLASS "A" CONCRETE SHALL HAVE 5 SACKS CEMENT/C.Y., MAXIMUM SLUMP OF 5", AND A 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
 4. RAINSTOPPER REQUIRED IN MANHOLE.

STANDARD CAST-IN-PLACE CONCRETE DROP MANHOLE
N.T.S.

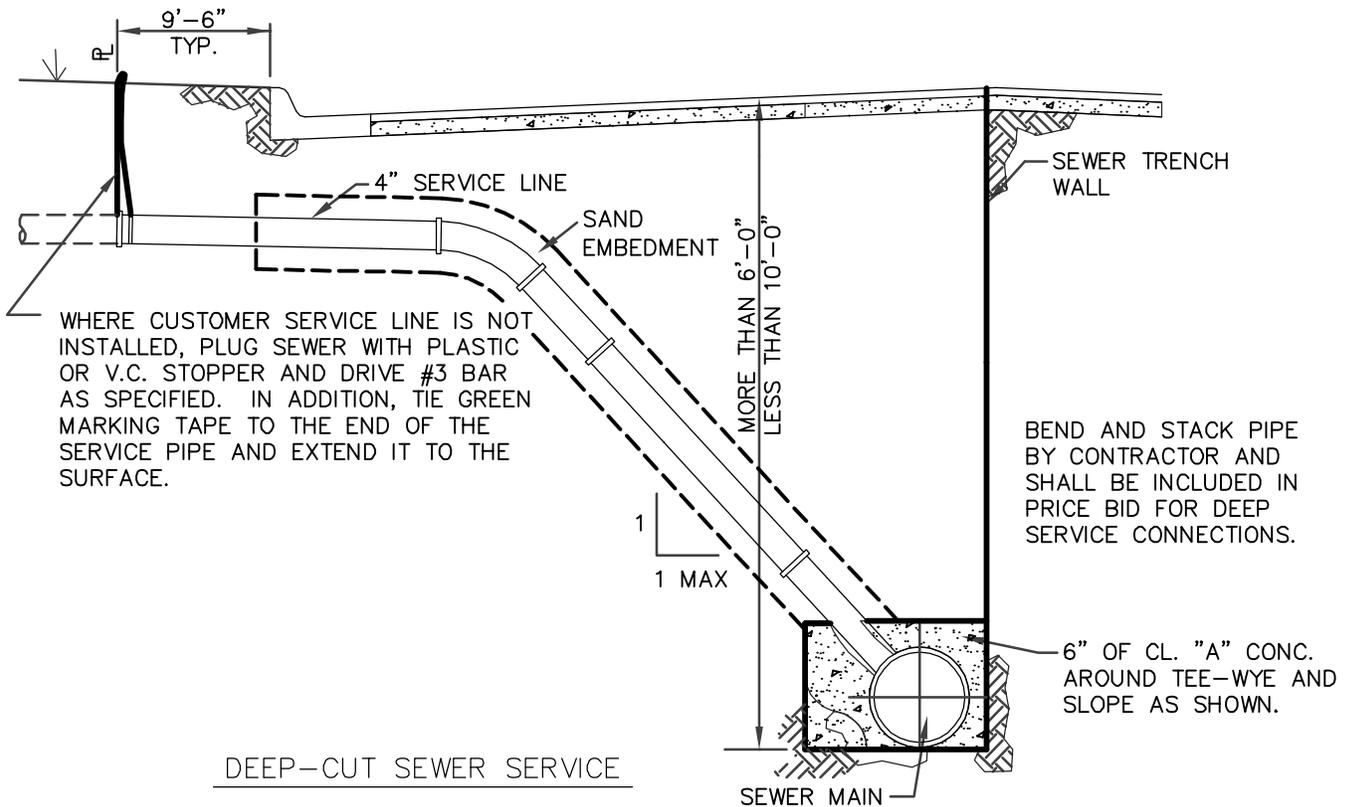
SANITARY SEWER DROP MANHOLE DETAILS

1-1-98 R/6-25-99 R/4-29-13 FIGURE 3S



STANDARD SEWER SERVICE

TEE-WYE
(MULTI FITTINGS
CORP. PART NO.
480251 FOR 6"
MAIN OR APPROVED
EQUAL.)



DEEP-CUT SEWER SERVICE

BEND AND STACK PIPE
BY CONTRACTOR AND
SHALL BE INCLUDED IN
PRICE BID FOR DEEP
SERVICE CONNECTIONS.

6" OF CL. "A" CONC.
AROUND TEE-WYE AND
SLOPE AS SHOWN.

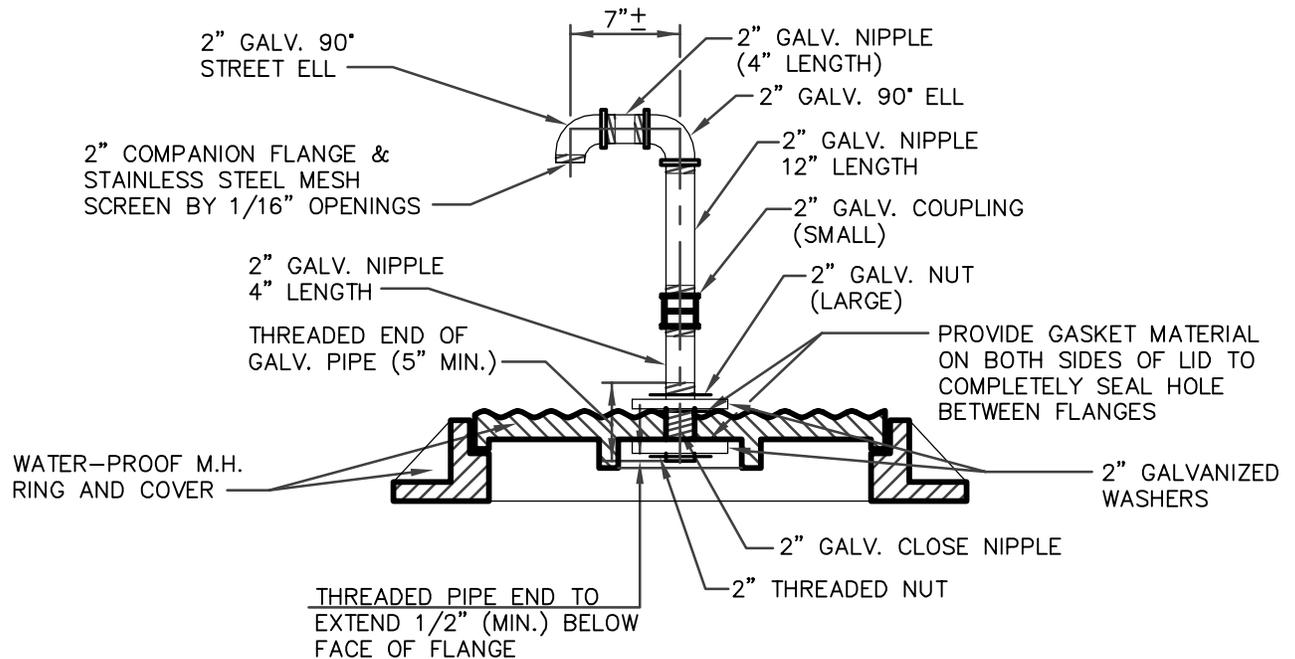
SEWER SERVICE CONNECTIONS

NOTES:

1. TOP OF SERVICE SHALL BE SUFFICIENT DEPTH TO PROVIDE ADEQUATE FALL FROM THE FACILITY TO BE SERVED.
2. CLASS "A" CONCRETE SHALL HAVE 5 SACKS OF CEMENT, MAXIMUM SLUMP OF 5 INCHES, AND 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.

SEWER SERVICE CONNECTION DETAILS





MANHOLE VENT DETAIL

NOT TO SCALE

NOTES:

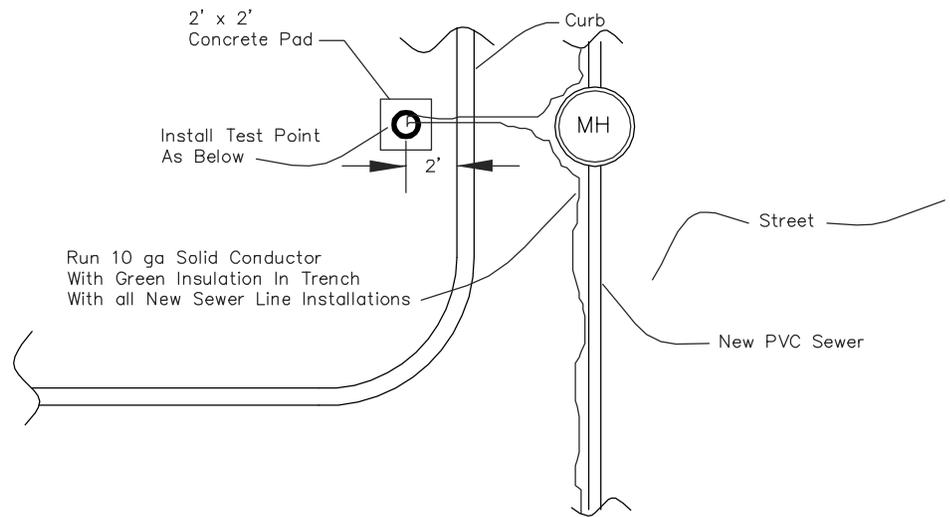
1. MANHOLE VENTS SHALL BE PROVIDED ON EVERY FOURTH MANHOLE COVER. ACTUAL LOCATIONS SHALL BE AS DIRECTED BY OWNER'S PROJECT REPRESENTATIVE. INCLUDE IN PRICE BID PER EACH FOR TYPE "A" AND "B" MANHOLES.
2. ALL COMPONENT PARTS OF MANHOLE VENT SHALL BE GALVANIZED. IF SPECIFIC PARTS CANNOT BE GALVANIZED, THEN CONTRACTOR SHALL PAINT THE PARTS WITH A GALVANIZED BASE PAINT. A FINAL COAT OF ORANGE PAINT WILL BE APPLIED TO THE VENT PIPE TO INCREASE ITS VISIBILITY.
3. EQUIVALENT REMOVABLE TYPE CONNECTION TO MANHOLE LID SHALL BE SUBMITTED TO ENGINEER FOR POSSIBLE APPROVAL.
4. ACTUAL LOCATION OF VENT PIPE DOES NOT HAVE TO BE IN CENTER AS SHOWN AND CAN BE OFFSET TO BETTER SUIT STRUCTURAL CONFIGURATION OF MANHOLE LID.
5. ALL THREADED PIPES AND FITTINGS SHALL BE CAULKED TO FORM WATERTIGHT INTEGRITY.

MANHOLE VENT DETAIL

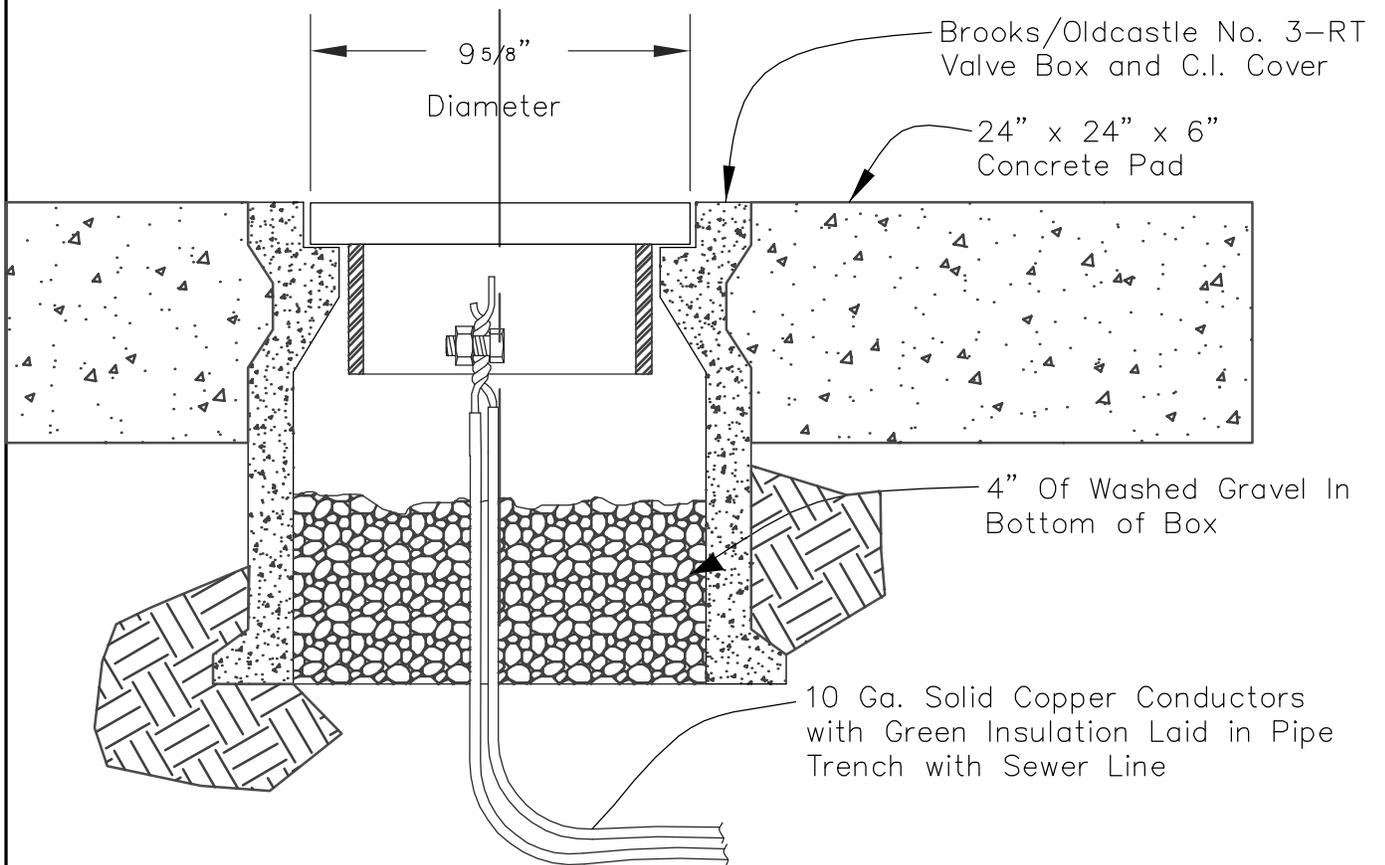


1-1-98

FIGURE 5S



PLAN VIEW



TYPICAL TEST POINT DETAIL

NOTES:

1. TEST POINT BOXES SHALL BE INSTALLED ADJACENT TO EACH MANHOLE
2. THE 10 GA. COPPER WIRE SHALL BE INSTALLED CONTINUOUS WITH NO SPLICES IN THE WIRE OTHER THAN IN THE TEST POINT BOXES AS SHOWN.
3. TWIST THE BARE COPPER WIRES AND CLAMP WITH APPROPRIATE BRONZE ALLOY SPLIT-BOLT CONNECTOR

TRACE LINE TEST POINT DETAILS

