

SD-1 PAVING-STRAIGHT CROWN STREETS
SD-2 PAVING-PARABOLIC CROWN STREETS
SD-3 PAVING-PAVEMENT JOINTS & PAVING STONES
SD-4 PAVING-ALLEY & DRIVEWAY RETURNS
SD-5 PAVING-ALLY GEOMETRICS - 1
SD-6 PAVING-MAJOR/MAJOR INTERSECT. & WIDENING DETAIL
SD-7 PAVING-SCREENING WALL - SIDEWALK
SD-7A-E . . . PAVING-THIN WALL BRICK SCREENING WALL
SD-8 STORM DRAINAGE - MANHOLES & STROM SEWER
SD-9 STORM DRAIN - CURB INLETS
SD-10 STORM DRAIN - COMBINATION INLET
SD-11 STORM DRAIN - GRATE INLET-DROP INLET
SD-12 STORM DRAIN - CHANNEL SECTIONS
SD-13 STORM DRAIN - CULVERT RAIL
..... BARRIER FREE RAMPS
SD-14 HEADWALLS, BARRIER FREE RAMPS, BRIDGE RAILS,
FLOOD MANAGEMENT MONUMENTS
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SD-17 WATER-R.C.C.P. WATER PIPE DETAILS
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SD-27 CROSS DRAINAGE SAFETY PIPE RUNNERS
SD-28 PARALLEL DRAINAGE SAFETY PIPE RUNNERS
SD-29 METAL BEAM GUARD FENCE
SD-30 IRRIGATION DETAILS (A - D)
SD-31 IRRIGATION DETAILS (A - C)
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..... TRAIL DETAILS (1 - 21)
SD-34 PLANTING DETAILS (22 - 23)
SD-35 MEDIAN DETAILS
MISC.

CITY OF PLANO

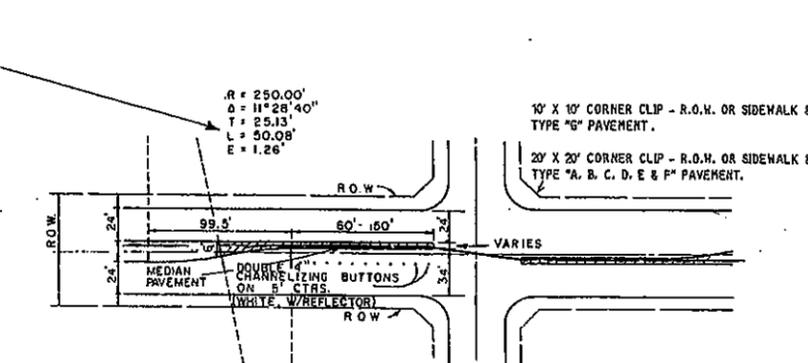
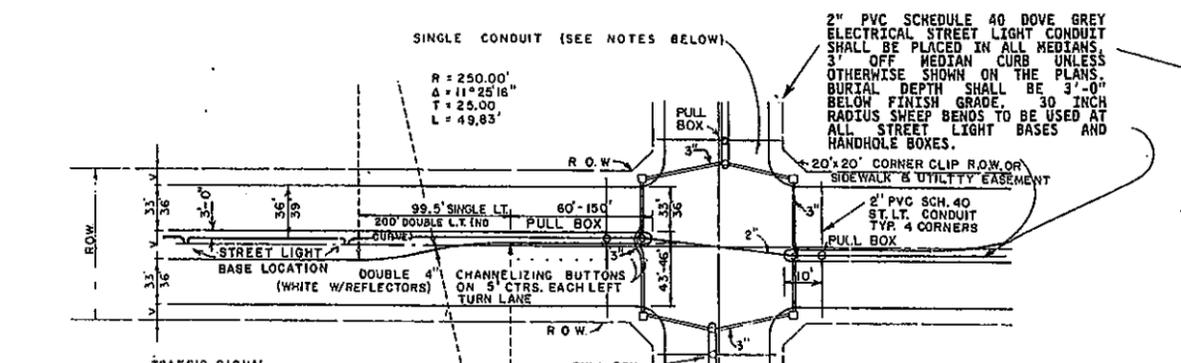
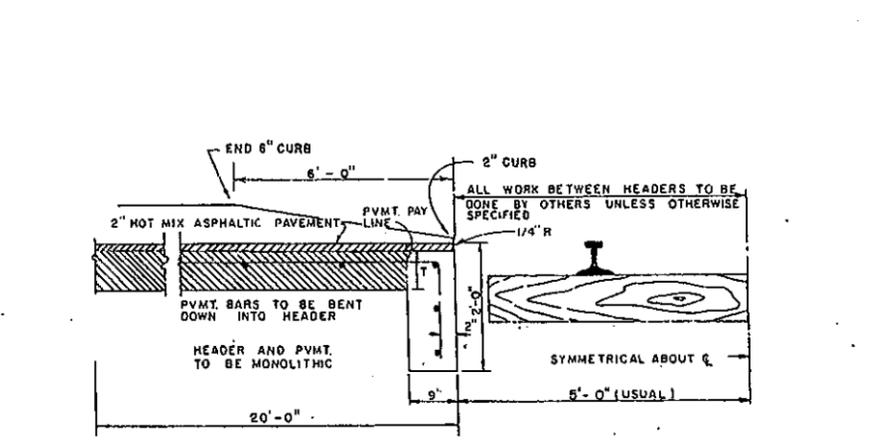
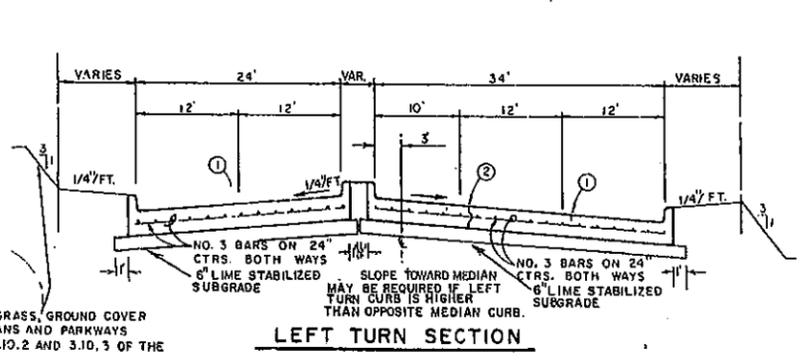
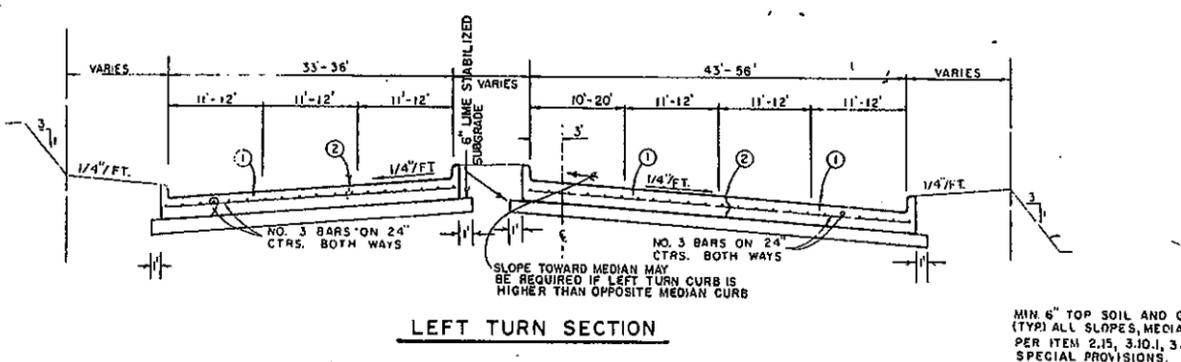
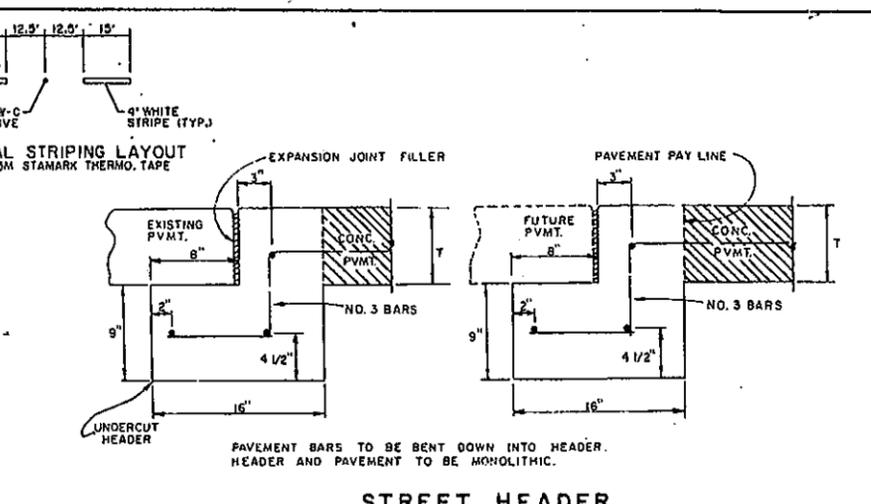
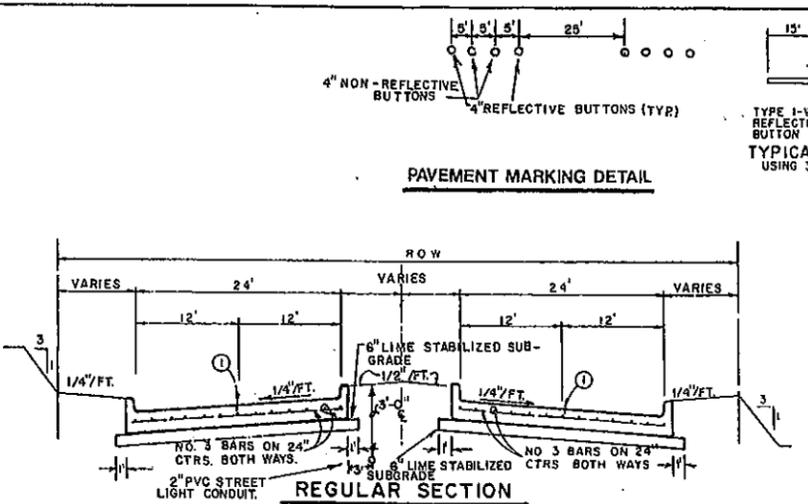
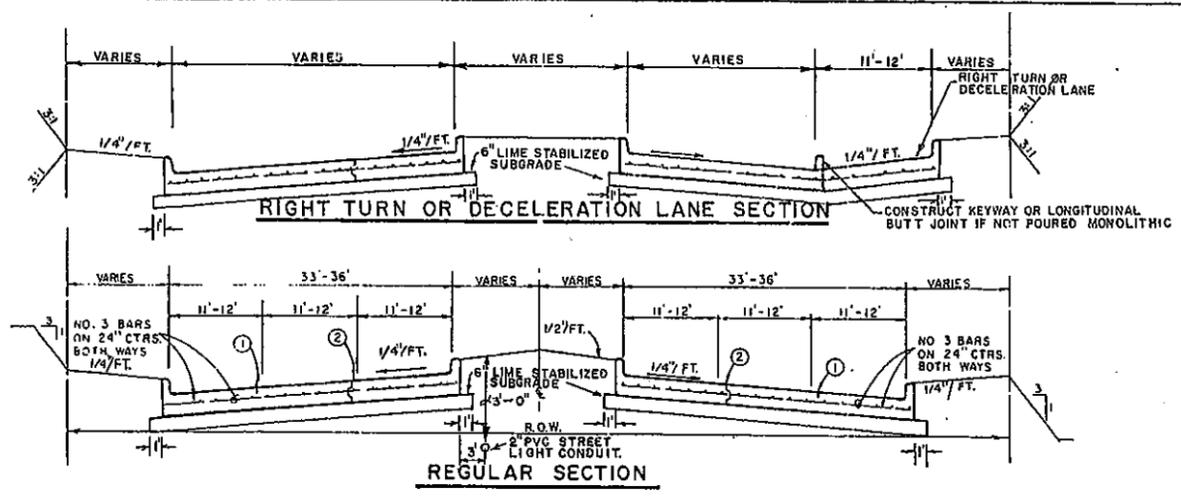
STANDARD CONSTRUCTION DETAILS



**DEVELOPMENT SERVICES DEPARTMENT
ENGINEERING DIVISION
JANUARY 1, 1997**

**IN ACCORDANCE WITH STANDARD SPECIFICATIONS
FOR PUBLIC WORKS CONSTRUCTION**

**NORTH CENTRAL TEXAS
AND
CITY OF PLANO SPECIAL PROVISIONS**



TRAFFIC SIGNAL PULL BOXES SHALL BE #36 FROM TRAFFIC SIGNAL EQUIPMENT COMPANY, FT. NORTH, TEXAS OR APPROVED EQUAL. BOXES ARE APPROXIMATELY 10" x 12" x 12" AND SHALL BE PROVIDED WITH A CONCRETE COVER. BURIAL DEPTH OF 3" CONDUIT SHALL BE 36" INCHES BELOW CURB GRADES. BOXES TO BE INSTALLED 1/4" PER FOOT ABOVE TOP OF CURB.

NOTES:

- 3" PVC SCHEDULE 40 DOVE GREY ELECTRICAL TRAFFIC SIGNAL CONDUIT TO BE INSTALLED CONTINUOUS ACROSS INTERSECTION, EXTENDING TO 2' BEHIND CURBS. SWEEP BENDS TO BE USED AT ALL PULL BOXES.
- RED MARKER TAPE IS TO BE INSTALLED ON THE ENDS OF THE CONDUIT WITH 3" CAP.
- A NO. 9 GALVANIZED WIRE SHALL BE PLACED IN ALL CONDUIT. THIS WIRE SHALL EXTEND A MINIMUM OF 1' FROM THE END OF THE CONDUIT. ITEM 8.10.3
- CONTACT T.U. ELECTRIC CO. PRIOR TO INSTALLING STREET LIGHT ELECTRIC CONDUIT. PLACEMENT OF ELECTRIC HANDHOLE BOXES SHALL BE AS DIRECTED BY T.U. ELECTRIC CO. BOXES MAY BE OBTAINED FROM T.U. ELECTRIC.

LEGEND:

- ① - SAWED LONGITUDINAL DUMMY JOINT
- ② - CONSTRUCTION JOINT (FULL WIDTH PVMT. IS ALLOWED WHERE APPROVED BY CITY OF PLANO) DELETE IF PAVING IS 25 FT. WIDTH TO BE WIDENED LATER. INSTALL CURB IF PAVING IS LESS THAN FULL WIDTH OF 33'-36'.

5 RED DOT CURB MARKERS, DAS 2.5 NSL FOR STREET LIGHTING & 2.5 NTS FOR TRAFFIC SIGNALS TO BE INSTALLED ON FACE OF CURBS.

PAVEMENT THICKNESS AND STRENGTHS SHALL BE AS FOLLOWS UNLESS OTHERWISE SHOWN ON THE PLANS.

TYPE A OR B : 8" MIN. - 4000 P.S.I. COMP.

TYPE C : 8" MIN. - 4000 P.S.I. COMP.

TYPE D : 7" - 4200 P.S.I. COMP.

ALL MEDIANS & PARKWAYS SHALL BE PROVIDED WITH GRASSSED GROUND COVER. MATERIALS SHALL BE AS SPECIFIED IN ITEM 2.15. TOP SOIL & SEEDING SHALL BE IN ACCORDANCE WITH ITEMS 3.8, 3.9, 3.10 AND 3.11 OF THE SPECIAL PROVISIONS AND SPECIFICATIONS.

STRIPES OR BUTTONS FOR RIGHT TURN LANES WILL BE REQUIRED TO BE THE SAME AS FOR LEFT TURN LANES.

GENERAL NOTES

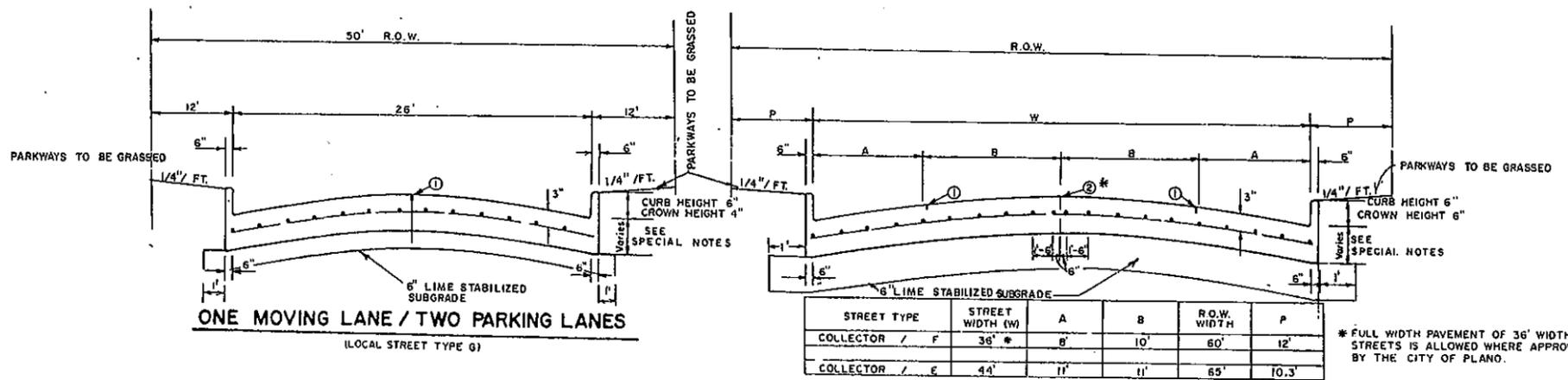
- GENERAL PAVEMENT THICKNESS FOR STRAIGHT CROWN STREETS SHALL BE AS SPECIFIED BELOW IN SPECIAL NOTES.
- STANDARD SPECIFICATIONS. REINFORCED CONCRETE PAVEMENTS.
 - ALL CURBS SHALL BE PLACED INTEGRAL WITH PAVEMENT.
 - CURBS SHALL MEET THE SAME STRENGTH AS SPECIFIED FOR THE CONCRETE PAVEMENT.
 - DETAIL AND ARRANGEMENT OF JOINTS. ALL TYPES, SHALL BE AS SHOWN ON SHEET SD-3 OF THE STANDARD CONSTRUCTION DETAILS.
 - BAR LAPS SHALL BE 30 DIAMETERS.
 - SUBGRADE - SEE GENERAL NOTE C, SHEET SD-2.
- BAR CHAIRS SHALL BE FURNISHED.
- CROSS SLOPE SHALL BE 1/4" PER FOOT UNLESS APPROVED BY ENGINEERING DEPARTMENT.
- SUBGRADE UNDER ALL PAVEMENT SHALL BE 6" INCHES THICK AND SHALL BE STABILIZED WITH AT LEAST 27 LBS. PER SQ. YD. HYDRATED LIME, COMPACTED TO A DENSITY NOT LESS THAN 95 PERCENT. LABORATORY TESTS MUST BE SUBMITTED TO THE ENGINEERING DEPARTMENT FOR APPROVAL TO DETERMINE AMOUNT OF LIME REQUIRED. LABORATORY TEST MAY BE WAIVED PROVIDED AT LEAST 36 LBS. OF LIME PER SQ. YD. IS USED. SEE ITEM 4.6.4. SPECIAL PROVISIONS, OR AS REQUIRED TO REDUCE THE P1 TO IS.
- FIRE LANES CAN BE CONSTRUCTED OF 5"-3600 PSI CONCRETE, (6 SACK MIX) 6"-3000 PSI CONCRETE, 7" ASPHALTIC CONCRETE (5" TYPE A BASE, 2" TYPE C SURFACE) OR GRASSCRETE, TO BE LOCATED AS PER FIRE CODE.

SPECIAL NOTES

NCT STANDARD SPECIFICATIONS		S.A.S. 9-21-87	
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS PAVING			
STRAIGHT CROWN STREETS			
APPROVED		ALAN L. UPCHURCH, P.E.	
DATE: JULY, 1998			SHEET SD-1



7-22-96

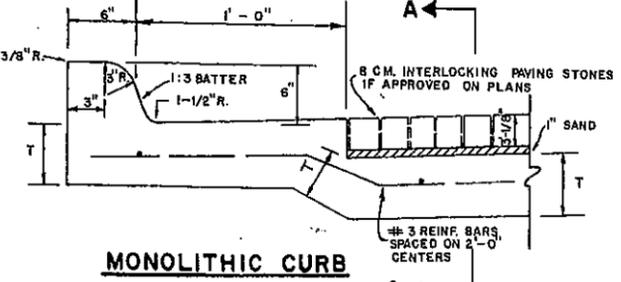


STREET TYPE	STREET WIDTH (W)	A	B	R.O.W. WIDTH	P
COLLECTOR / F	36'	8'	10'	60'	12'
COLLECTOR / E	44'	11'	11'	65'	10.3'

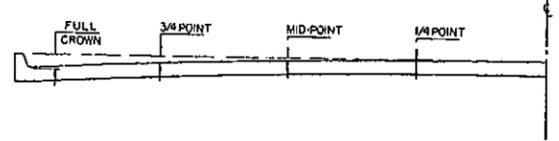
* FULL WIDTH PAVEMENT OF 36' WIDTH STREETS IS ALLOWED WHERE APPROVED BY THE CITY OF PLANO.

REINFORCED CONCRETE PAVEMENT

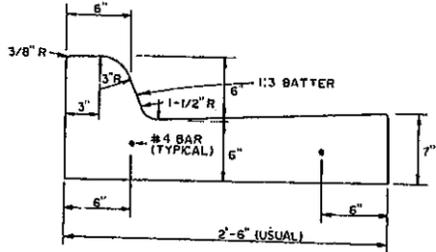
ALL REINFORCING BARS SHALL BE NO.3 TRANSVERSE BARS TO BE SPACED ON 2'-0" CENTERS, LONGITUDINAL BARS TO BE SPACED ON 2'-0" EXCEPT WHERE NOTED
 ① SAWED LONGITUDINAL DUMMY JOINT
 ② CONSTRUCTION JOINT (FULL WIDTH PVMT IS ALLOWED WHERE APPROVED BY ENGINEERING DEPARTMENT)



MONOLITHIC CURB



ROADWAY WIDTH (W)	TOTAL CROWN HEIGHT	3/4 POINT	MID-POINT	1/4 POINT
26'	4"	2-1/4"	1"	1/4"
36'	6"	3-3/8"	1-1/2"	3/8"
44'	6"	3-3/8"	1-1/2"	3/8"



SEPARATE CURB-AND-GUTTER

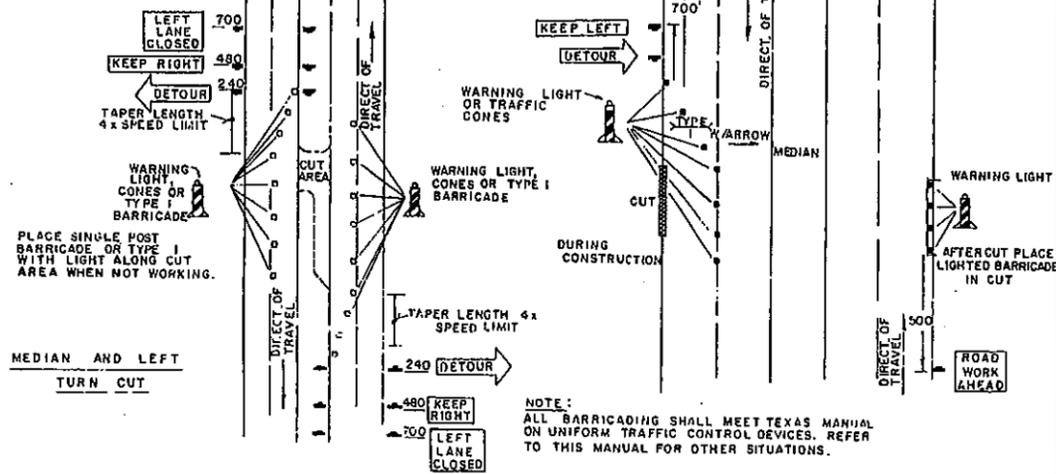
CURB AND CURB-AND-GUTTER

GENERAL NOTES

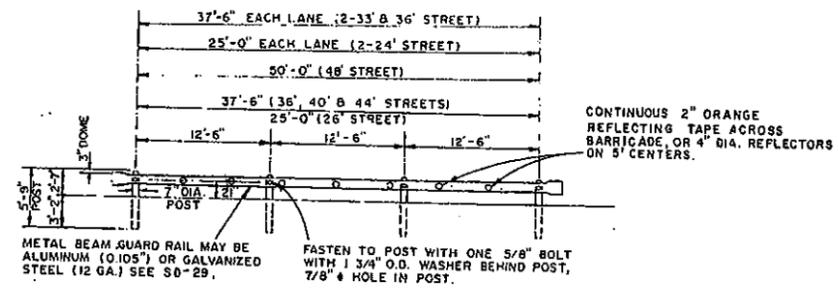
- A. GENERAL
USUAL PAVEMENT THICKNESS IS AS SHOWN IN SPECIAL NOTES. SUBGRADE DESIGN SHALL CONFORM TO CITY OF PLANO DEPARTMENT OF ENGINEERING REQUIREMENTS, AND SHALL EXTEND 12" (MIN) BEHIND CURB.
- B. REINFORCED CONCRETE PAVEMENT
1. CONCRETE STRENGTH SHALL BE AS SHOWN IN SPECIAL NOTES.
2. ALL CURBS SHALL BE INTEGRAL WITH PAVEMENT.
3. DETAIL AND ARRANGEMENT OF PAVEMENT JOINTS, ALL TYPES, SHALL BE AS SHOWN ON SHEET SD-3
4. BAR LAPS SHALL BE THIRTY DIAMETERS.
- C. SUBGRADE
SUBGRADE UNDER ALL PAVEMENT SHALL BE 6 INCHES THICK AND SHALL BE STABILIZED WITH AT LEAST 27 LBS. PER SQ. YD. HYDRATED LIME, COMPACTED TO A DENSITY NOT LESS THAN 95 PERCENT. LABORATORY TESTS MUST BE SUBMITTED TO THE ENGINEERING DEPARTMENT FOR APPROVAL TO DETERMINE AMOUNT OF LIME REQUIRED. LABORATORY TEST MAY BE WAIVED PROVIDED AT LEAST 36 LBS. OF LIME PER SQ. YD. IS USED. SEE ITEM 4-6-4 SPECIAL PROVISIONS, OR AS REQUIRED TO REDUCE THE R1 TO 15.
- D. BAR CHAIRS SHALL BE FURNISHED.
- E. MIN. 6" TOP SOIL AND GRASS GROUND COVER REQUIRED ON ALL SLOPES, PARKWAYS AND OTHER DISTURBED, ERODABLE AREAS PER ITEMS 2.15, 3.10.1, 3.10.2 AND 3.10.3 OF THE SPECIAL PROVISIONS.

SPECIAL NOTES

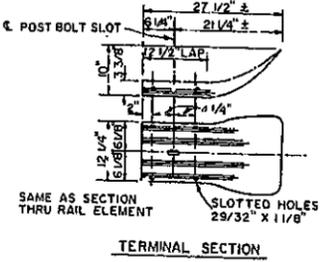
PAVEMENT THICKNESS AND STRENGTHS SHALL BE AS FOLLOWS:
 TYPE E, RETAIL THRU INDUSTRIAL
 7"-4200 P.S.I. COMP
 TYPE F, G
 6"-3000 P.S.I. COMP. OR 5"-3600 P.S.I. COMP. (6 SACK MIX)



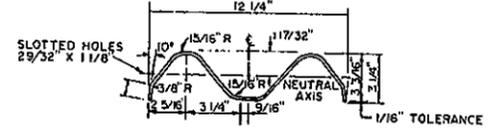
TYPICAL CONSTRUCTION BARRICADING DETAILS



FRONT ELEVATION



TERMINAL SECTION



SECTION THRU RAIL ELEMENT

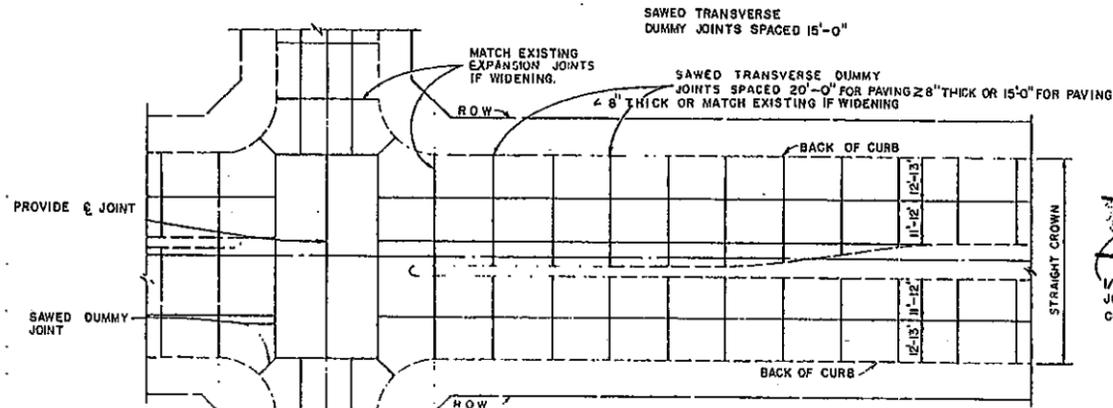
TYPICAL PERMANENT BARRICADE DETAIL

TABLE OF CROWN HEIGHTS AND ORDINATES FOR VARIOUS PARABOLIC SECTIONS

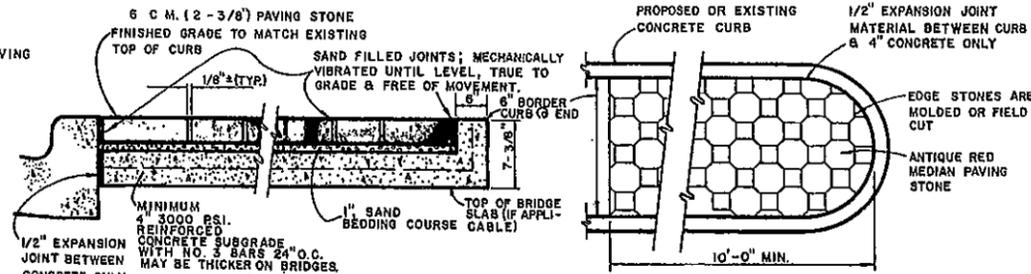
SLIP-FORM PAVEMENT MUST MEET CROWN GRADES AT GUTTERS, AT MID-POINTS & E

NCT STANDARD SPECIFICATIONS		S.A.S. 9-22-87	
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS PAVING			
PARABOLIC CROWN STREETS			
APPROVED	<i>Alan L. Upchurch</i> ALAN L. UPCHURCH, P.E.		
DATE: JULY, 1996			SHEET SD-2

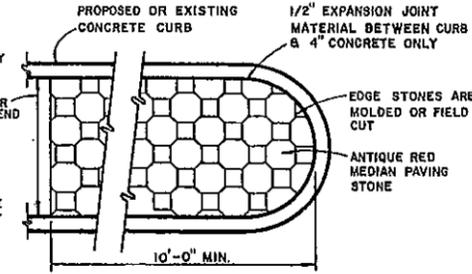




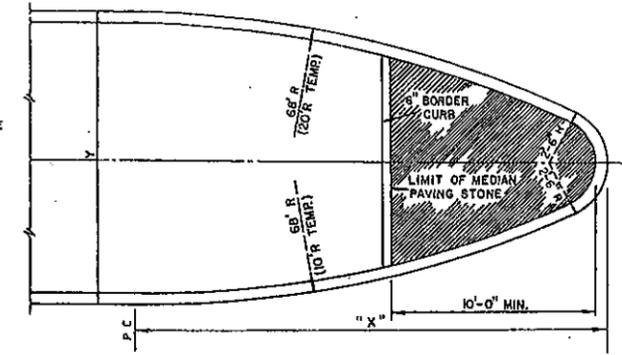
SPACING DIAGRAM FOR TRANSVERSE JOINTS



TYPICAL CROSS SECTION



PLAN



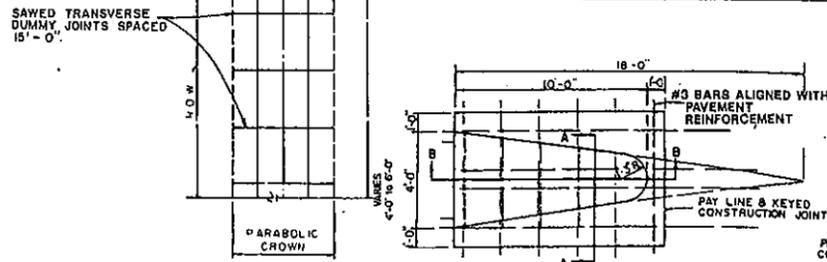
DETAIL OF NOSE FOR MEDIAN ISLAND

MEDIAN PAVING STONE DETAIL

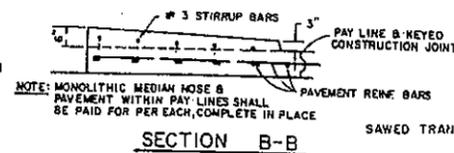
PAVING STONE SHALL BE INTERLOCKING CONCRETE PER ITEMS 2.3.7 AND 5.8.9 OF THE SPECIAL PROVISIONS AND SHALL BE ANTIQUE RED COLOR.

NOTE: SEE SD-2 FOR STREET PAVING STONE DETAILS.

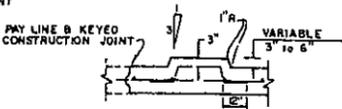
MEDIAN PAVING SHALL EXTEND TO A POINT WHERE MEDIAN IS 6' WIDE. IF MEDIAN IS 6' WIDE, PAVING SHALL EXTEND 15' FROM NOSE. FOR MEDIANS WIDER THAN 6', PAVING SHALL EXTEND 10' FROM NOSE. ALL DISTANCES ARE MINIMUM.



MONOLITHIC MEDIAN NOSE

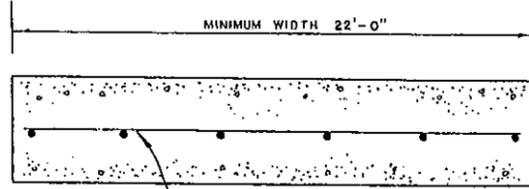


SECTION B-B



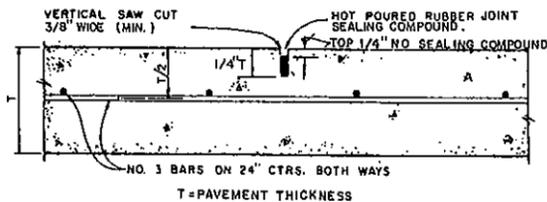
SECTION A-A

SAWED TRANSVERSE DUMMY JOINT SHALL BE SPACED 20'-0"

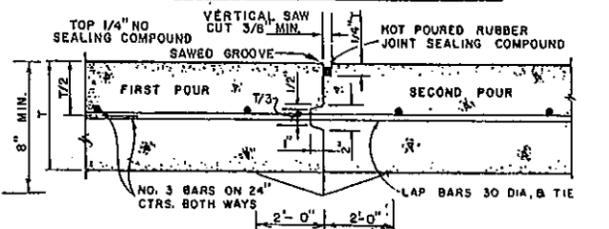


6" - 3000 PSI OR 5" - 3600 PSI REINF. - 3 BARS 24" O.C. BOTH WAYS
 1. DOWELS & REBARS SHALL BE SUPPORTED BY AN APPROVED DEVICE.
 2. EXPANSION JOINTS TO BE THE SAME AS USED FOR CONCRETE STREET PAVING.

FIRE LANE PAVING & JOINT DETAIL



SAWED DUMMY JOINT

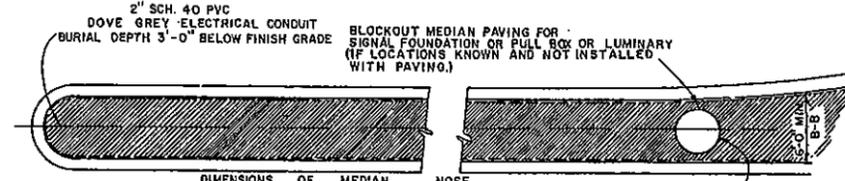


CONSTRUCTION JOINT FOR PAVEMENTS

TRANSVERSE AND LONGITUDINAL JOINTS

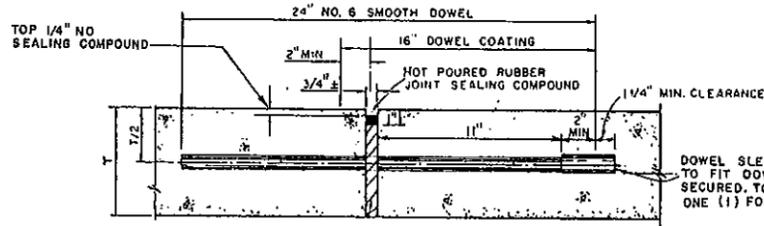
NOTE: CONTRACTOR SHALL PROTECT KEYWAY PRIOR TO SECOND POUR. IF LONGITUDINAL KEYWAY IS DAMAGED, CONTRACTOR SHALL REPAIR WITH THE USE OF LONGITUDINAL BUTT JOINT. DRILL DOWELS INTO FIRST POUR.

T = PAVEMENT THICKNESS
 THICKENED EDGES ARE REQUIRED FOR FUTURE WIDENING ONLY.



DETAIL OF MEDIAN PAVEMENT

DIMENSIONS OF MEDIAN NOSE			
X = 13.90'	Y = 7.0'	X = 26.36'	Y = 14.0'
X = 16.44'	Y = 8.0'	X = 29.89'	Y = 17.0'
X = 18.06'	Y = 9.0'	X = 32.93'	Y = 20.0'
X = 20.42'	Y = 10.0'	X = 36.47'	Y = 24.0'

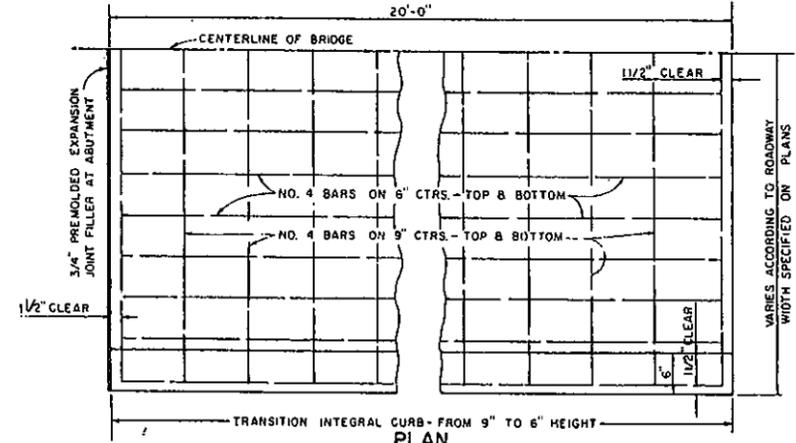


TRANSVERSE EXPANSION JOINT

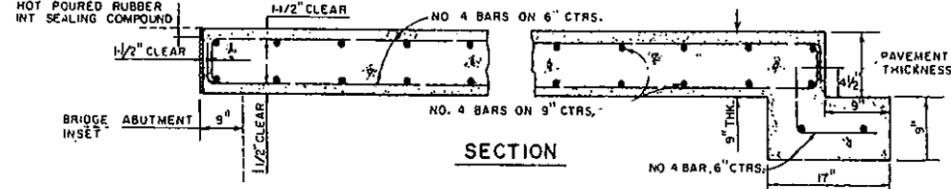
(SPACED 600 FT. MAXIMUM, LOCATE AT INTERSECTIONS)
 T = PAVEMENT THICKNESS

- NOTES:
- NO. 5 SMOOTH DOWEL BAR MAY BE USED IN 5 INCH AND 6 INCH PAVEMENT THICKNESS.
 - LONGITUDINAL BUTT CONSTRUCTION MAY BE UTILIZED IN PLACE OF LONGITUDINAL HINGED (KEYWAY) JOINT AT CONTRACTORS OPTION.
 - DOWEL BARS SHALL BE DRILLED INTO PAVEMENT HORIZONTALLY BY USE OF A MECHANICAL RIG.
- DRILLING BY HAND IS NOT ACCEPTABLE, PUSHING DOWEL BARS INTO GREEN CONCRETE NOT ACCEPTABLE.

LONGITUDINAL BUTT JOINT



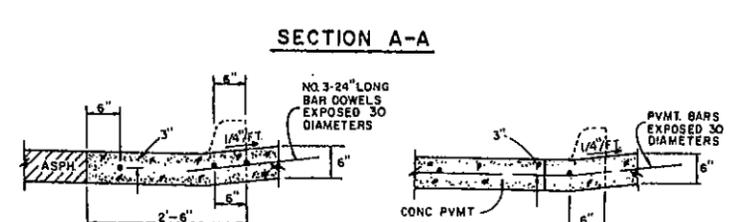
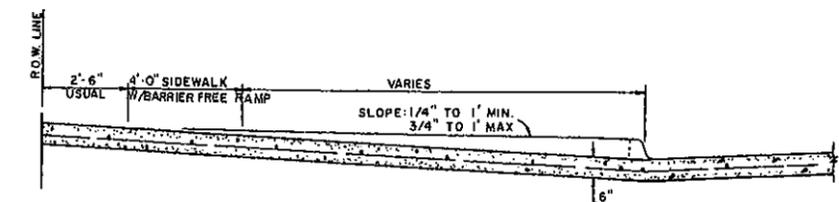
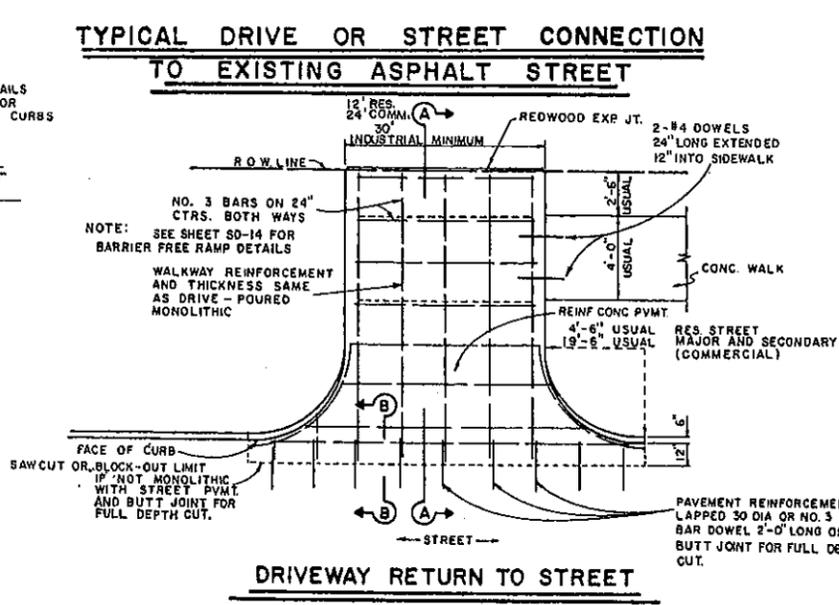
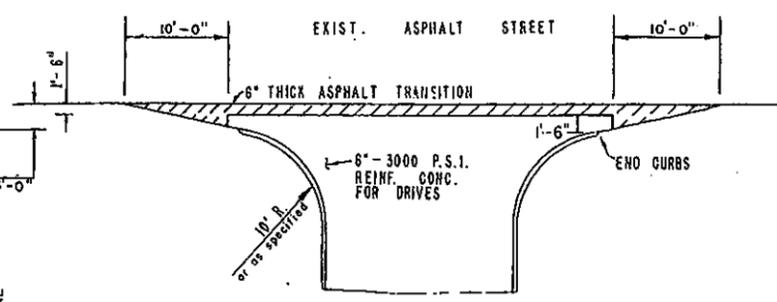
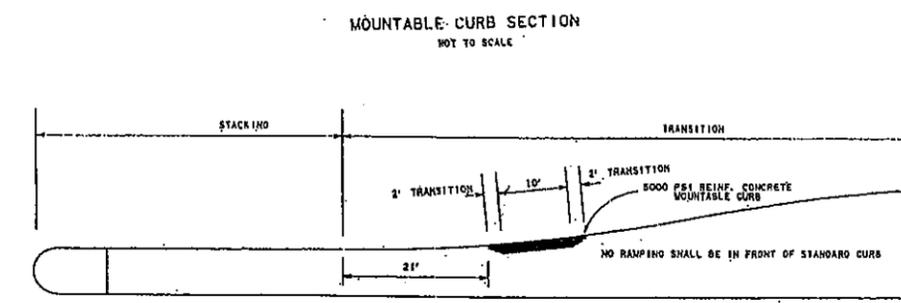
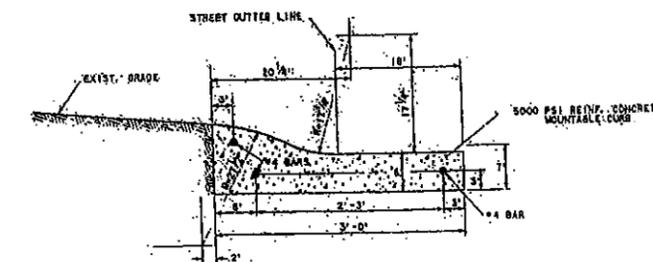
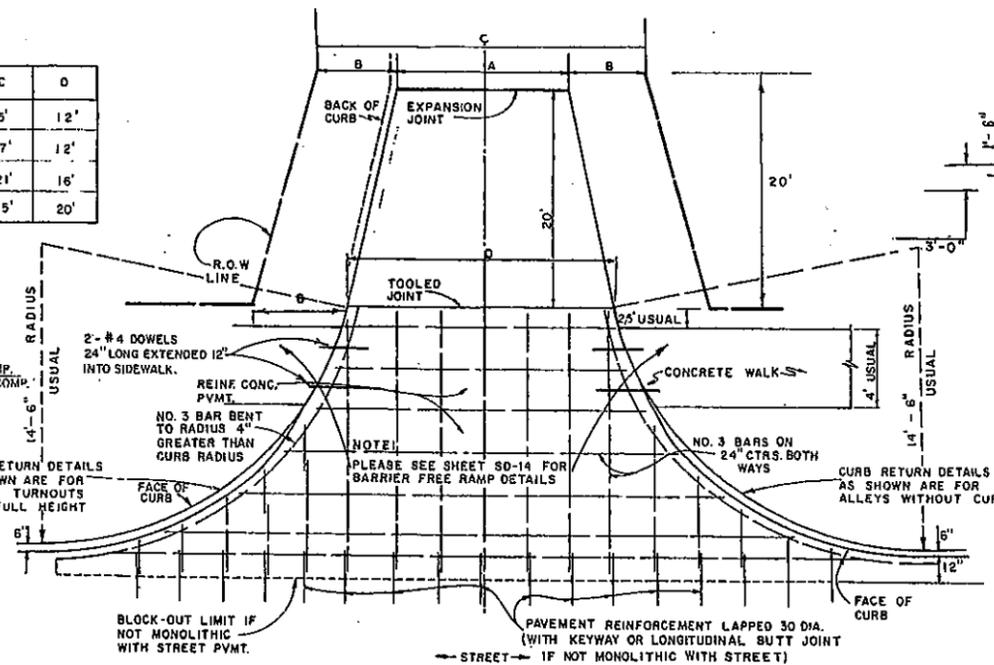
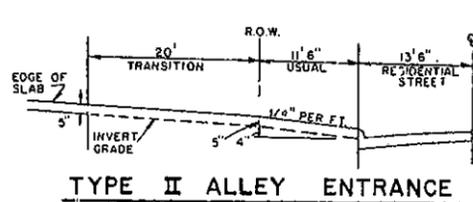
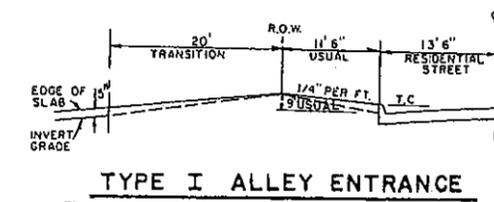
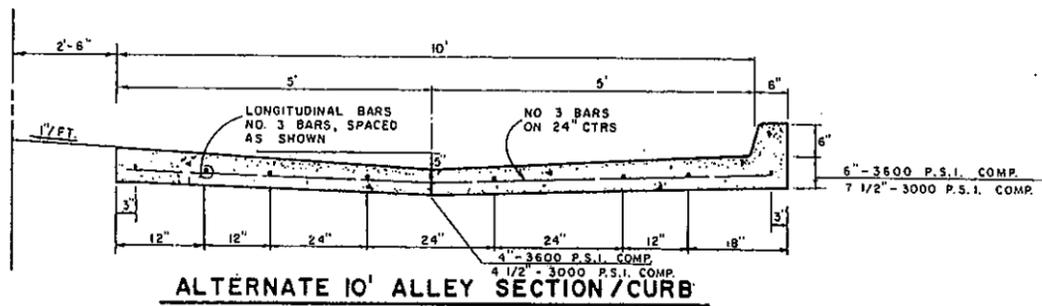
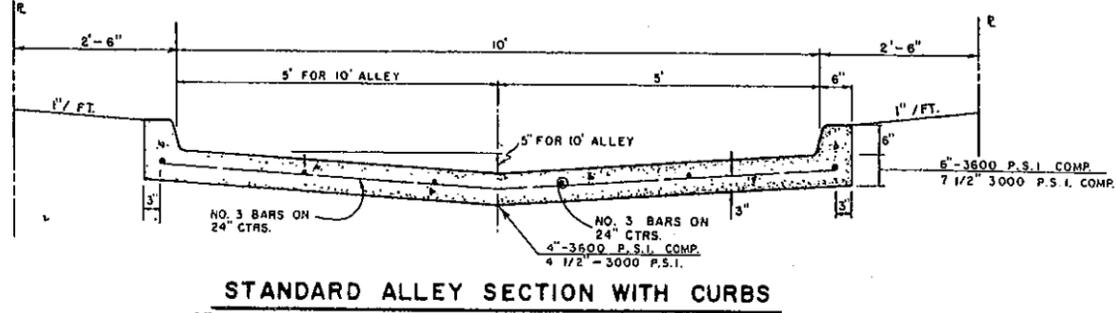
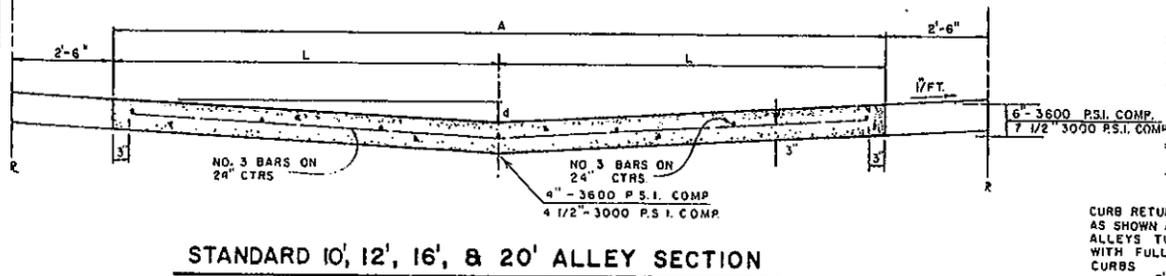
BRIDGE APPROACH SLAB



NCT STANDARD SPECIFICATIONS REVISION	S.A.S. 9-23-87 BY DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING	
STANDARD CONSTRUCTION DETAILS PAVING	
PAVEMENT JOINTS & PAVING STONES	
APPROVED: <i>Alan L. Upchurch</i> ALAN L. UPCHURCH, P.E.	SHEET SD-3
DATE: JULY, 1996	

ALLEY WIDTH (A)	HALF SECTION WIDTH (L)	INVERT DEPTH (d)
10'	5'	5"
12'	6'	6"
16'	8'	6"
20'	10'	6"

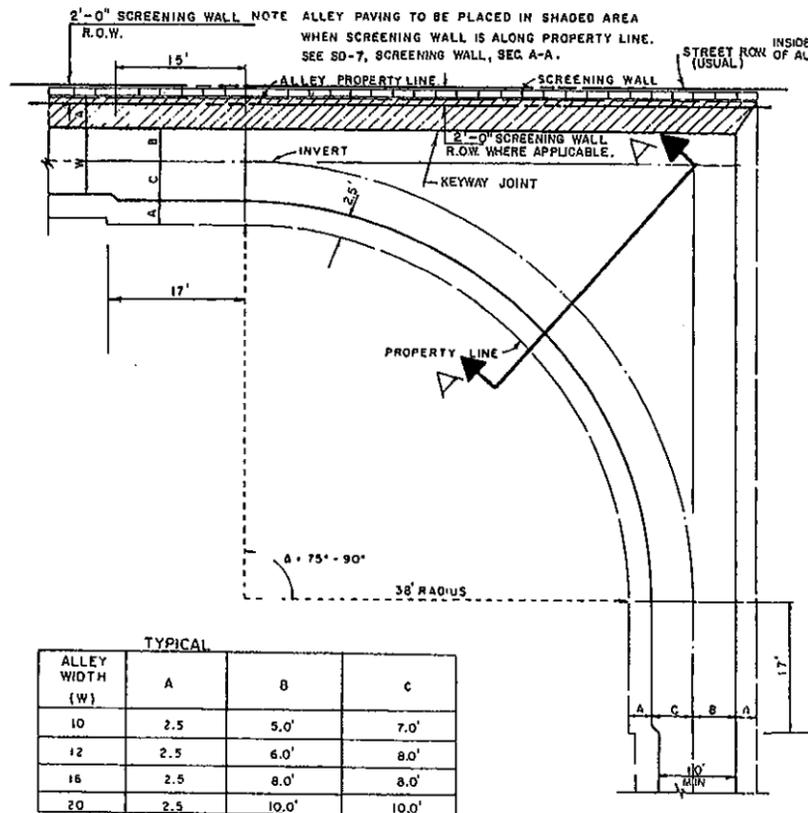
ALLEY WIDTH	A	B	C	D
10'	10'	2'-6"	15'	12'
12'	12'	2'-6"	17'	12'
16'	16'	2'-6"	21'	16'
20'	20'	2'-6"	25'	20'



- GENERAL NOTES FOR ALLEYS AND DRIVEWAYS**
- CONCRETE FOR ALLEY RETURNS AND DRIVEWAYS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS (IDENTICAL TO THAT SPECIFIED FOR THE STREET PAVEMENT OR BASE WHEN BUILT AS COMPONENTS OF A CONCRETE PAVING PROJECT, WHEN BUILT SEPARATELY, THE STRENGTH SHALL BE AS SPECIFIED ON THE CONSTRUCTION PLANS.
 - CONCRETE FOR ALLEY PAVEMENT SHALL BE OF THE STRENGTH SPECIFIED ON THE CONSTRUCTION PLANS. (3000 P.S.I. OR 3600 P.S.I. MINIMUM COMPRESSIVE)
 - SPACING AND CONSTRUCTION OF JOINTS SHALL CONFORM TO STREET PAVEMENT DETAILS.
 - SUBGRADE SHALL BE COMPACTED TO NOT LESS THAN 95% DENSITY, AND STABILIZED WITH HYDRATED LIME TO REDUCE RL TO 15, ONE FOOT EACH SIDE OF ALLEY PAVEMENT.



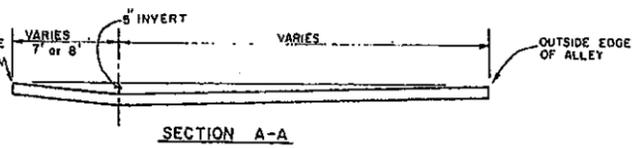
NCT STANDARD SPECIFICATIONS	S.A.S. 9-25-87
REVISION	BY DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING	
STANDARD CONSTRUCTION DETAILS PAVING	
ALLEY AND DRIVEWAY RETURNS	
APPROVED <i>Alan L. Upchurch</i>	
ALAN L. UPCHURCH, P.E.	
DATE JULY, 1996	SHEET SD-4



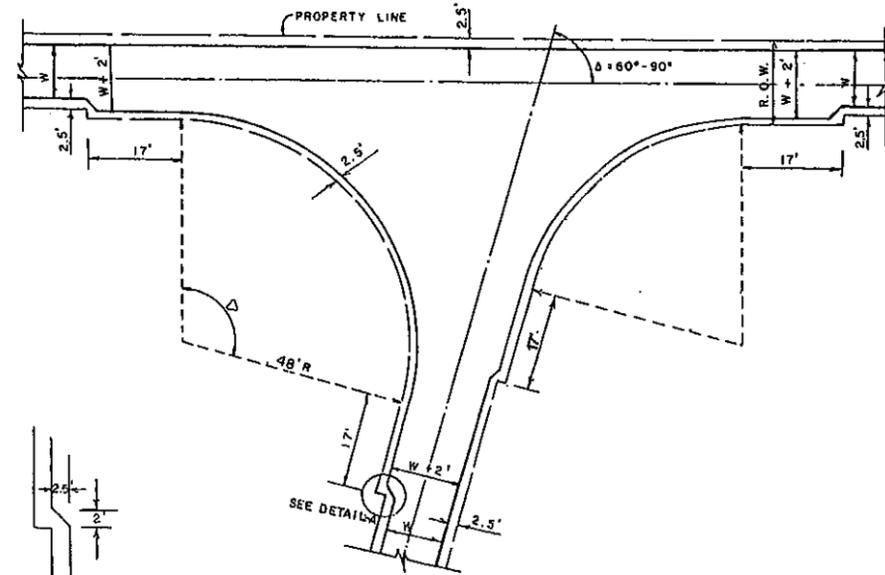
TYPICAL

ALLEY WIDTH (W)	A	B	C
10	2.5'	5.0'	7.0'
12	2.5'	6.0'	8.0'
16	2.5'	8.0'	8.0'
20	2.5'	10.0'	10.0'

ALLEY TURN FOR $\Delta = 75^\circ - 90^\circ$

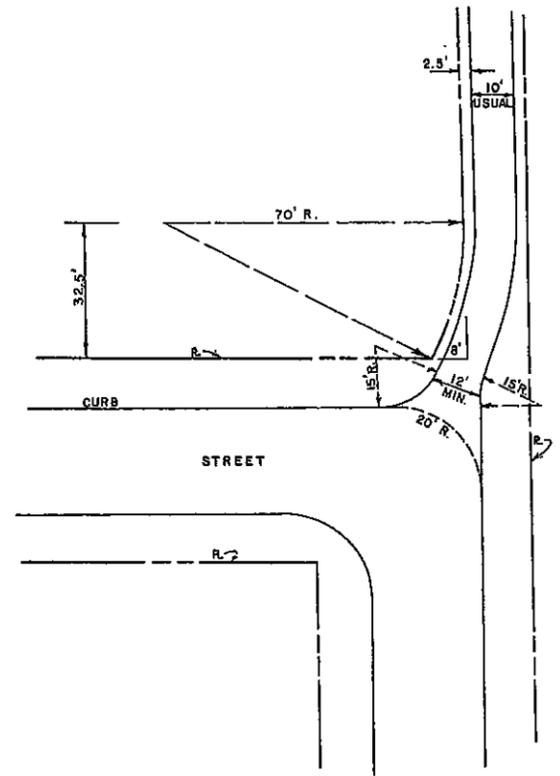


SECTION A-A

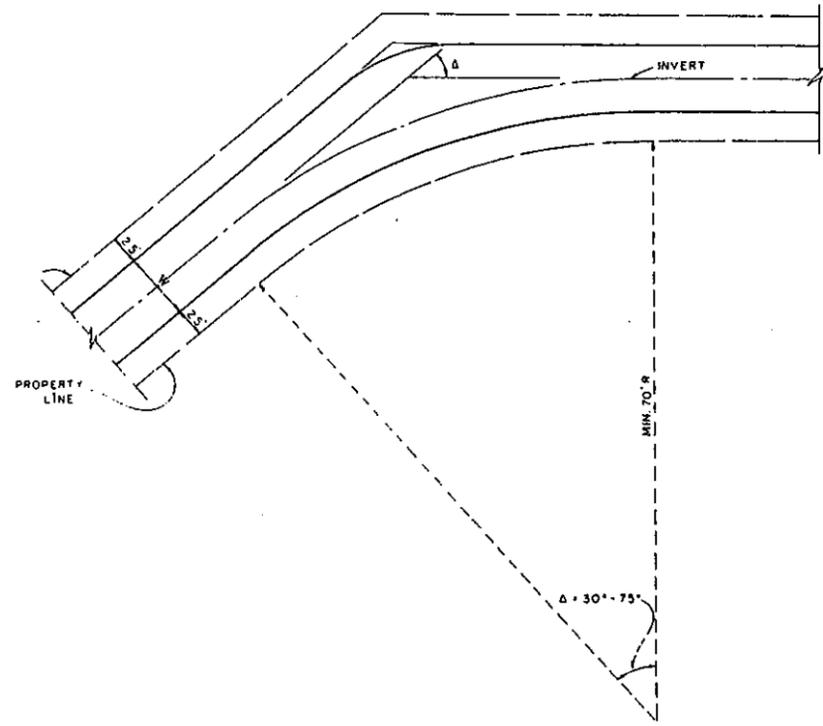


ALLEY TURN FOR $\Delta > 90^\circ$

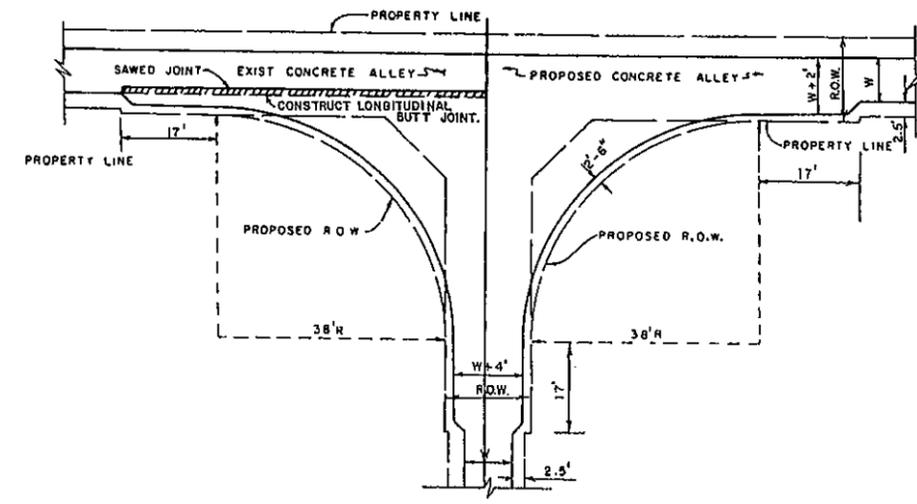
DETAIL A



ALLEY/STREET INTERSECTION
SCALE: 1" = 20'



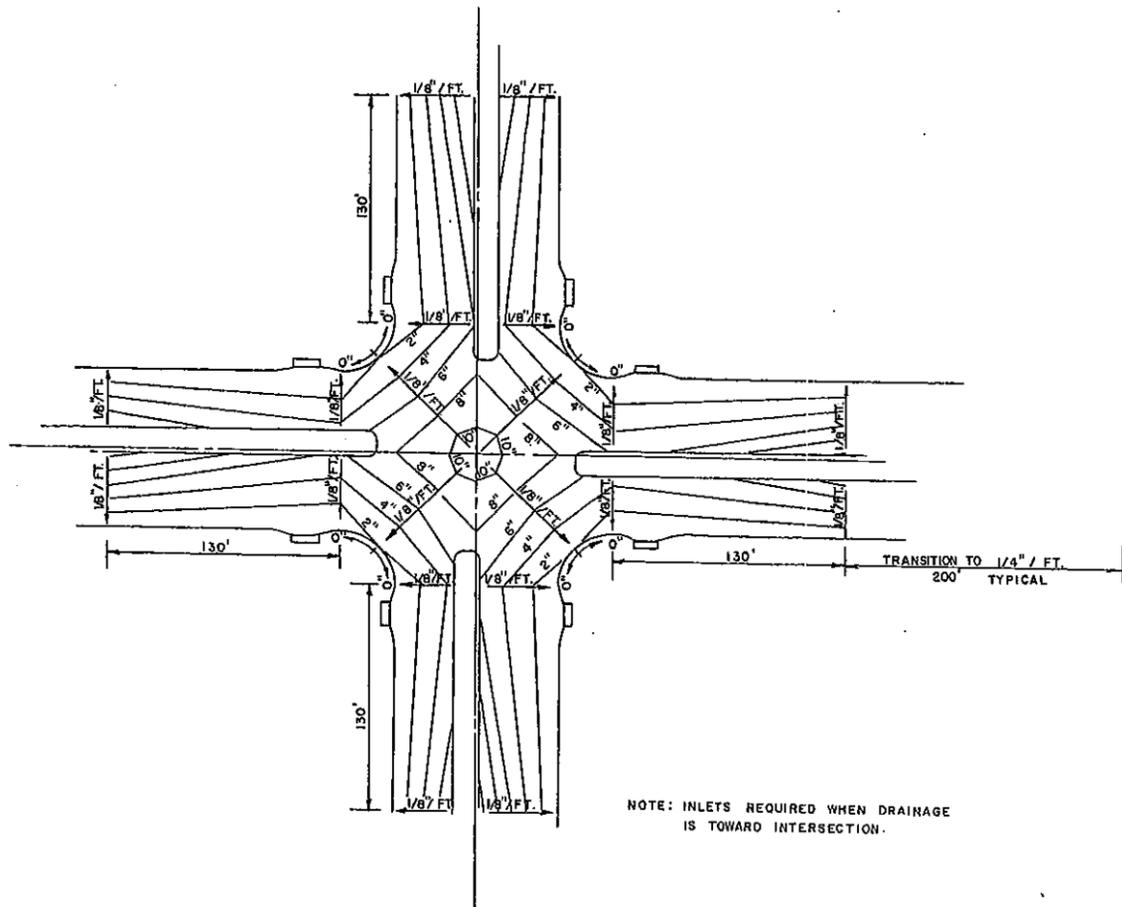
ALLEY TURN 30° - 75°



ALLEY INTERSECTING ALLEY



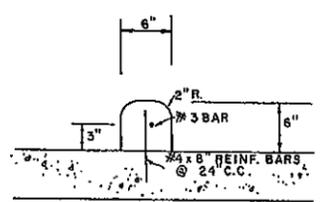
NCT STANDARD SPECIFICATIONS		S.A.S. 9-26-87	
NO	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS PAVING			
ALLEY GEOMETRICS-1			
APPROVED		ALAN L. UPCHURCH, P.E.	
DATE: JULY, 1996		SHEET SD-5	



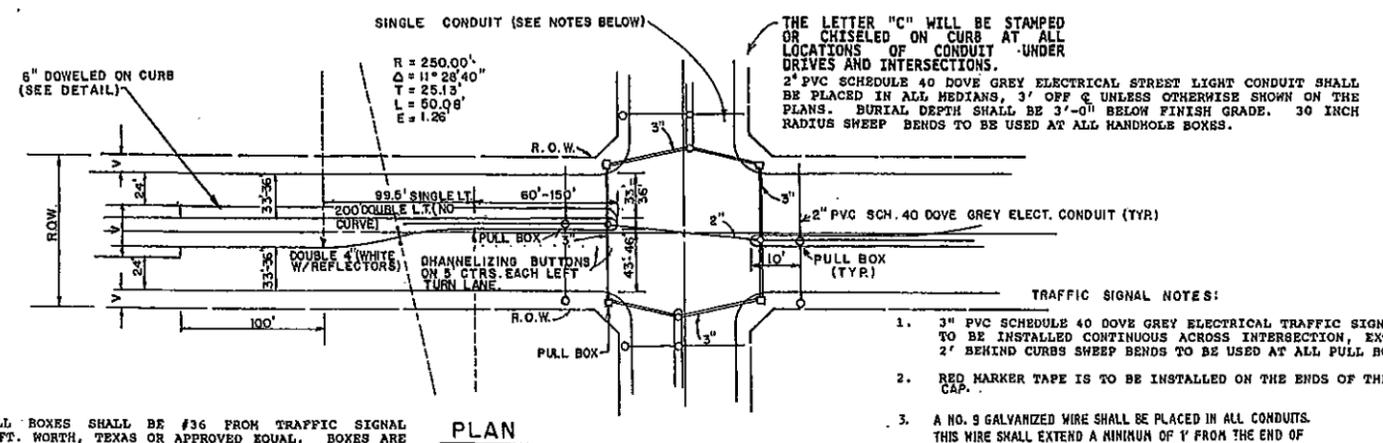
**TYPICAL CONTOURS FOR
A, B, C AND D THOROUGHFARE INTERSECTIONS**

NOTE: INLETS REQUIRED WHEN DRAINAGE IS TOWARD INTERSECTION.

TRAFFIC SIGNAL PULL BOXES SHALL BE #36 FROM TRAFFIC SIGNAL EQUIPMENT COMPANY, FT. WORTH, TEXAS OR APPROVED EQUAL. BOXES ARE APPROXIMATELY 10 1/2" X 17" X 12" AND SHALL BE PROVIDED WITH A CONCRETE COVER. BURIAL DEPTH OF 3" CONDUIT SHALL BE 36 INCHES BELOW CURB GRADES. BOXES TO BE INSTALLED 1/4" PER FOOT ABOVE TOP OF CURB



**6" DOWELED ON CURB
(TEMPORARY CURB ONLY)**

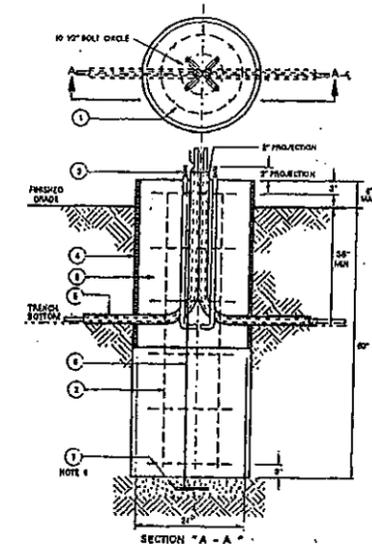


**PLAN
TYPE A,B,B+C PAVEMENT
INTERSECTION WIDENING DETAIL**

THE LETTER "C" WILL BE STAMPED OR CHISELED ON CURB AT ALL LOCATIONS OF CONDUIT UNDER DRIVES AND INTERSECTIONS. 2" PVC SCHEDULE 40 DOVE GREY ELECTRICAL STREET LIGHT CONDUIT SHALL BE PLACED IN ALL MEDIANS, 3' OFF Q UNLESS OTHERWISE SHOWN ON THE PLANS. BURIAL DEPTH SHALL BE 3'-0" BELOW FINISH GRADE. 30 INCH RADIUS SWEEP BENDS TO BE USED AT ALL HANDHOLE BOXES.

- TRAFFIC SIGNAL NOTES:**
- 3" PVC SCHEDULE 40 DOVE GREY ELECTRICAL TRAFFIC SIGNAL CONDUIT TO BE INSTALLED CONTINUOUS ACROSS INTERSECTION, EXTENDING TO 2' BEHIND CURBS SWEEP BENDS TO BE USED AT ALL PULL BOXES.
 - RED MARKER TAPE IS TO BE INSTALLED ON THE ENDS OF THE CONDUIT WITH 3" CAP.
 - A NO. 9 GALVANIZED WIRE SHALL BE PLACED IN ALL CONDUITS. THIS WIRE SHALL EXTEND A MINIMUM OF 1' FROM THE END OF THE CONDUIT ITEM 8.10.3
 - CONTRACTOR SHALL CONTACT TUELECTRIC COMPANY PRIOR TO INSTALLING STREET LIGHT ELECTRIC CONDUIT. PLACEMENT OF ELECTRIC HANDHOLE BOXES SHALL BE AS DIRECTED BY TUELECTRIC COMPANY. BOXES MAY BE OBTAINED FROM TUELECTRIC.
 - RED DOT CURB MARKERS, DAS 2.5NSL FOR STREET LIGHTING AND DAS 2.5 NTS FOR TRAFFIC SIGNALS TO BE INSTALLED ON FACE OF CURBS.

**213 - 320 STREET LIGHT FOUNDATION
25' M.H. & 30' M.H. ROUND STEEL POLE**



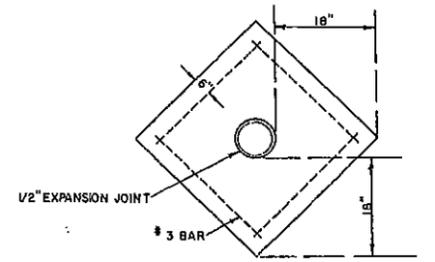
- NOTE:**
- CONCRETE TO BE MINIMUM 3000 PSI AT 28 DAYS. 8 SACS MAXIMUM APPROXIMATE 2" TOP OF FOUNDATION TO BE THROTTLED TO A FLAT AND LEVEL SURFACE. AVOID EXCESSIVE TROWELING. CONCRETE TO SET A MINIMUM OF 72 HOURS BEFORE POLE INSTALLATION.
 - REBAR HOOPS ARE TIED TO EACH OTHER AND ARE SPACED AT APPROXIMATE 1 FT. INTERVALS TO BOTTOM OF FOUNDATION.
 - ANCHOR BOLTS TO BE SUPPLIED WITH POLE. USE TEMPLATE FURNISHED BY POLE MANUFACTURER FOR ALIGNING ANCHOR BOLTS.
 - CONCRETE FORM OF FOUNDATION TO EXTEND TO BOTTOM OF TRENCH OR AS NEEDED.
 - PROVIDE 2" METAL FOR CONNECTION OF GROUND WIRE TO POLE.
 - A MINIMUM OF 12" OF BARE #8 SD CU WIRE TO BE PLACED IN BOTTOM OF HOLE AND COVERED WITH 2" OF DIRT.
 - IF SOIL HAS BEEN DISTURBED, EXTEND FOUNDATION BY DEPTH OF DISTURBED SOIL.

ITEM	QTY	DESCRIPTION	TS/REF	CU	MU
1	1	25' M.H. & 30' M.H. ROUND STEEL POLE	2500		
2	4	#4 REBAR STRAIGHT AS PER LOGS	3000		
3	4	ANCHOR BOLT GALVANIZED 1/2" (MULTIPLES W/ POLE)	3000		
4	1	CONCRETE FOUNDATION TUBE 24" DIAMETER	3000	1.25	
5	1	#4 REBAR CONCRETE PIPE ON THE 120" DIAMETER FOUNDATION	3000		
6	1	WIRE #8 COPPER BOND	3000		
7	1	GROUND POLE BOLT WIRE COL	3000		
8	1	CONCRETE			

APPROVED BY **TUELECTRIC**
STREET LIGHT DETAIL



7-22-96



CONCRETE MOW STRIP AROUND STREET LIGHT BASE
TOP OF CONCRETE TO BE AT GRADE LEVEL
CONCRETE TO BE 4" THICK 3000 PSI WITH #3 BARS

NO.	REVISED	STANDARD SPECIFICATIONS	BY	DATE

CITY OF PLANO, TEXAS
PUBLIC WORKS
DEPARTMENT OF ENGINEERING

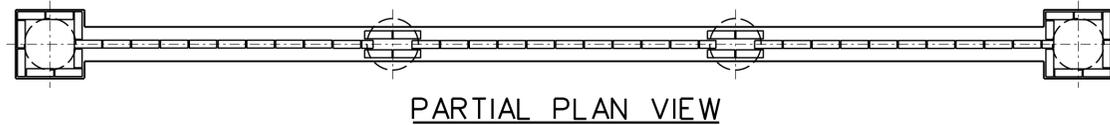
STANDARD CONSTRUCTION DETAILS
PAVING

INTERSECTION & WIDENING
DETAIL

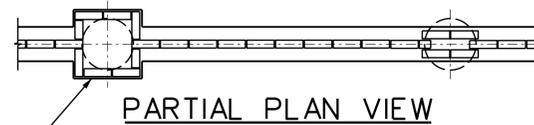
APPROVED *Alan L. Upchurch*
ALAN L. UPCHURCH, P.E.

DATE: JULY, 1996

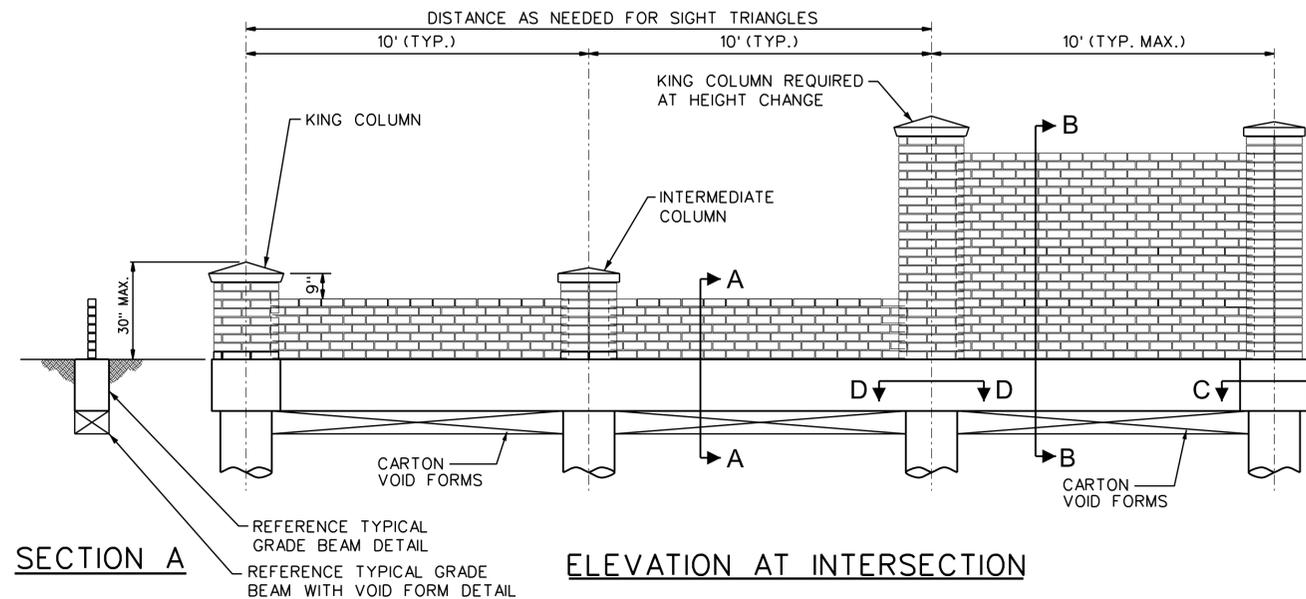
SHEET SD - 6



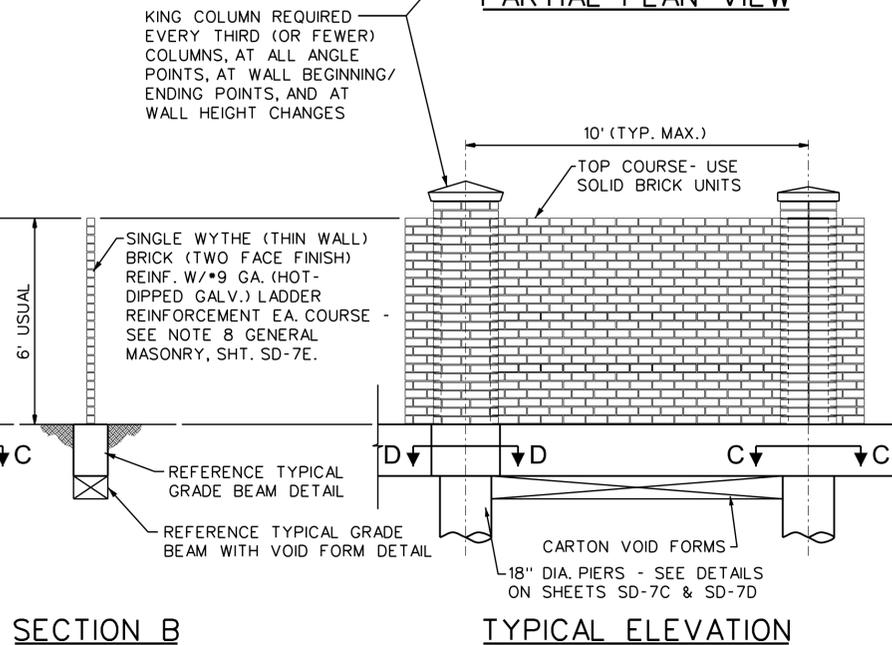
PARTIAL PLAN VIEW



PARTIAL PLAN VIEW

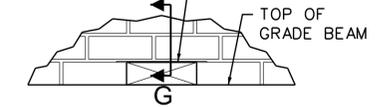


ELEVATION AT INTERSECTION

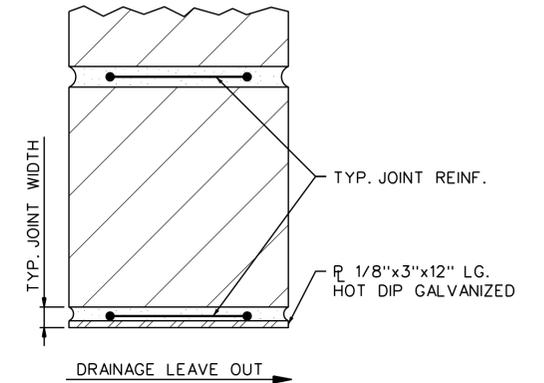


TYPICAL ELEVATION

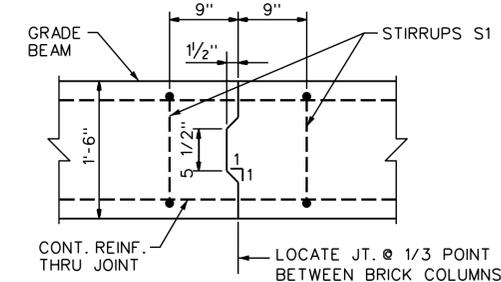
NOTE: DRAINAGE LEAVE-OUT LOCATION AS DETERMINED PER SPECIFIC SITE LOCATION BY THE DESIGN ENGINEER FOR THAT PROJECT.



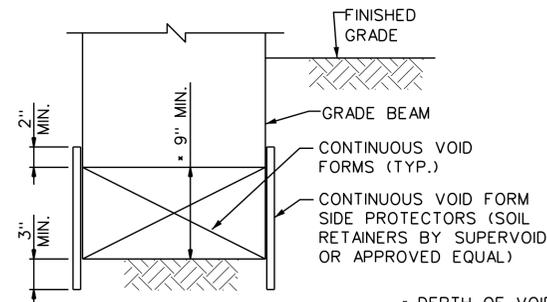
ELEVATION @ DRAINAGE LEAVE-OUT
N.T.S.



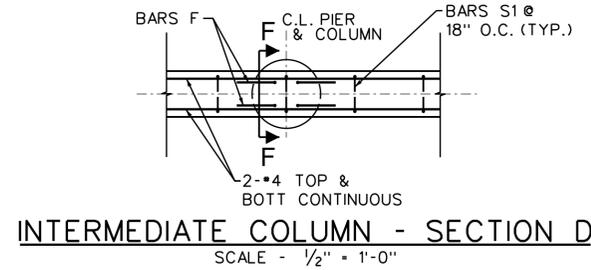
SECTION G-G @ DRAINAGE LEAVE-OUT
N.T.S.



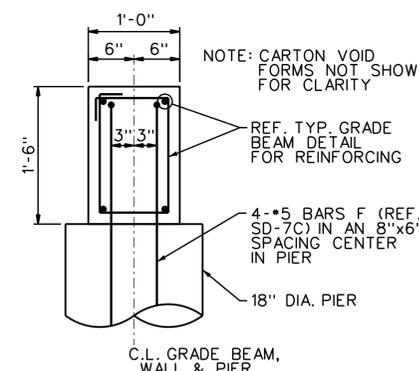
PERMISSIBLE CONSTRUCTION JOINT DETAIL - GRADE BEAM



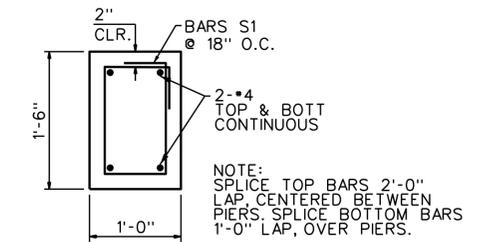
TYPICAL GRADE BEAM WITH VOID FORM DETAIL
N.T.S.



INTERMEDIATE COLUMN - SECTION D
SCALE - 1/2" = 1'-0"

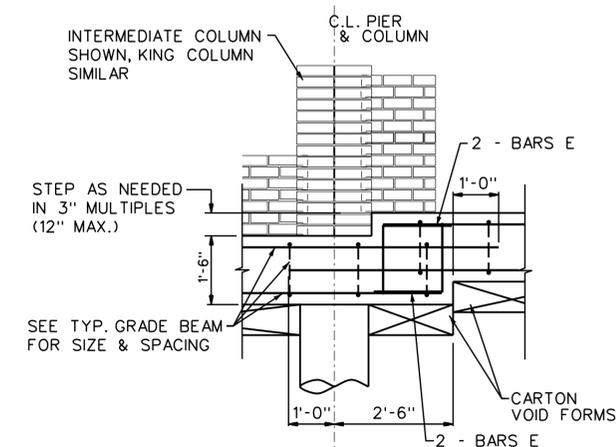


SECTION F

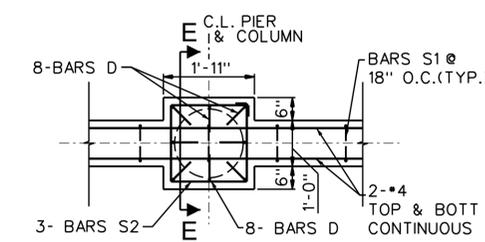


TYPICAL GRADE BEAM DETAIL
SCALE - 1" = 1'-0"

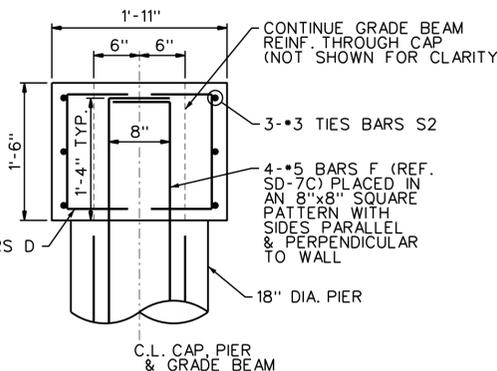
* DEPTH OF VOID FORMS MAY ONLY BE REDUCED IF A LICENSED (TEXAS) STRUCTURAL ENGINEER PROVIDES AN ALTERNATE DESIGN UTILIZING SITE SPECIFIC GEOTECHNICAL DATA.



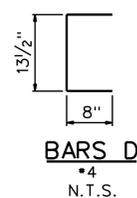
WALL STEP DETAIL
SCALE - 1/2" = 1'-0"



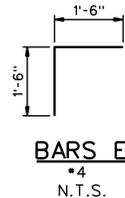
KING COLUMN - SECTION C
SCALE - 1/2" = 1'-0"



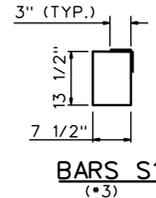
SECTION E



BARS D
#4
N.T.S.



BARS E
#4
N.T.S.



BARS S1
#3



BARS S2
#3



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CITY OF PLANO, TEXAS
DEPARTMENT OF ENGINEERING

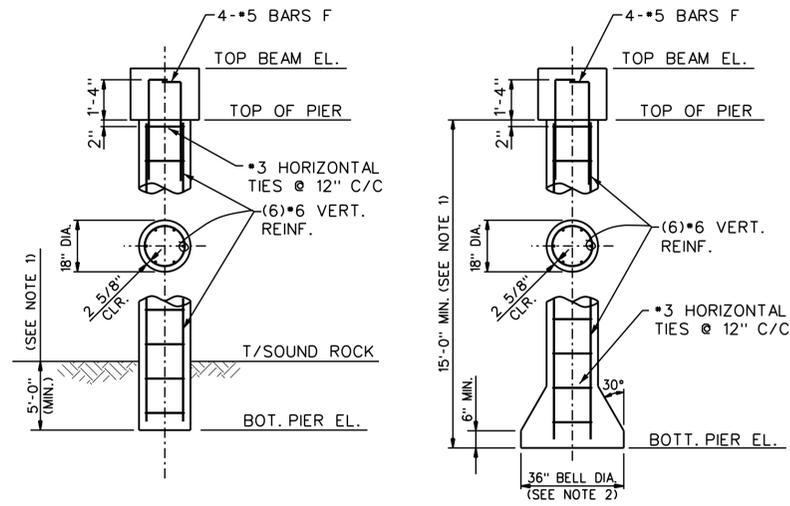
STANDARD CONSTRUCTION DETAILS
THIN WALL BRICK SCREENING WALL -
GRADE BEAM OPTION

(1 of 5)

rdelta ENGINEERS
618 Main Street
Garland, TX 75040
Ph: (972) 484-5031
Fax: (972) 487-2270
www.rdelta.com TBPE No. F-1515

plano PROJECT No. 6250

DESIGN: RCK	CHECK: RDE	SCALE: AS SHOWN	SD-7A
DRAWN: RDE	DATE: MAY 2013	RDE PROJECT: 2081-12	



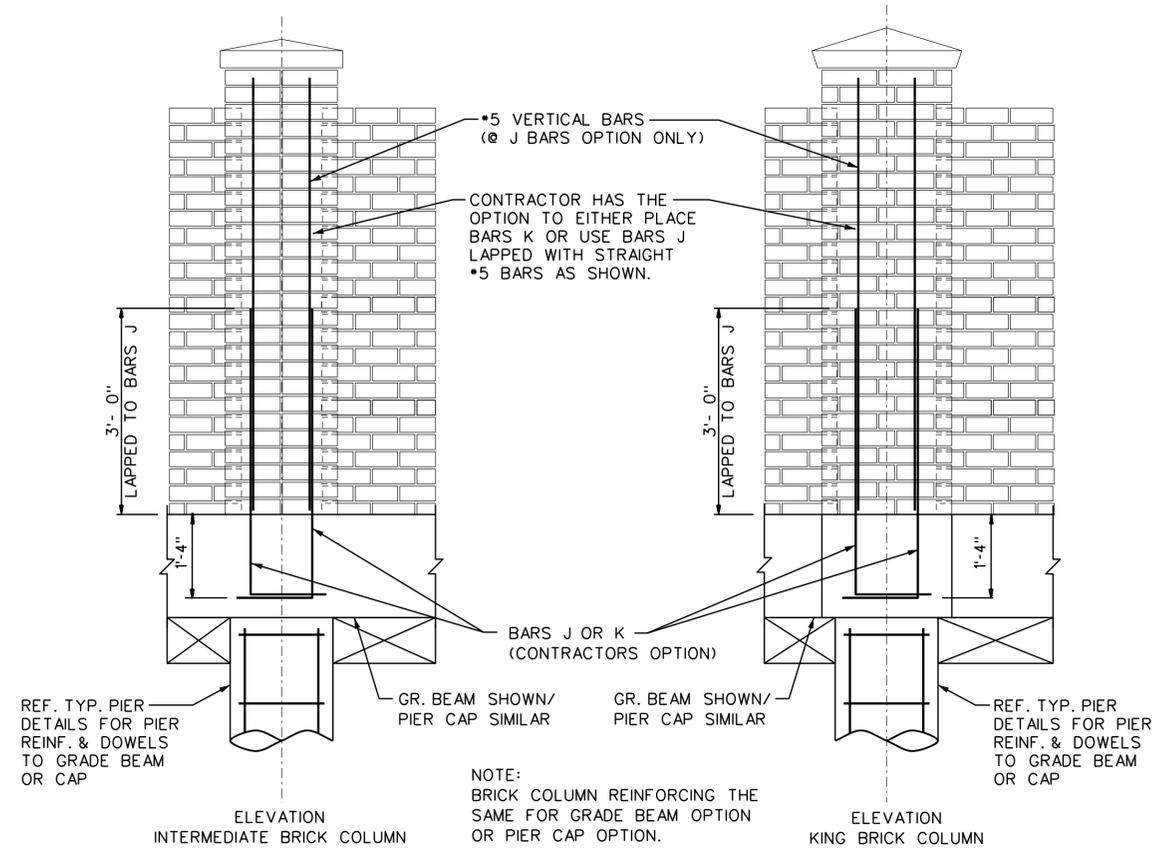
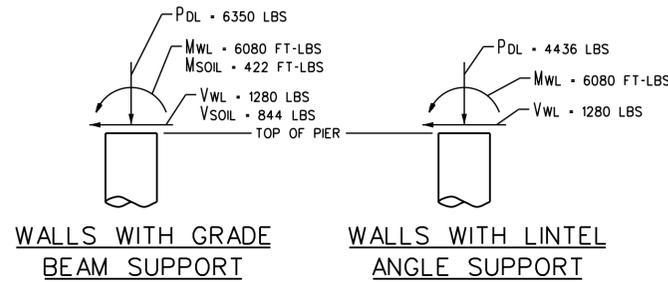
TYPICAL PIER DETAILS

SCALE - 3/8" = 1'-0"

NOTES (PIERS):

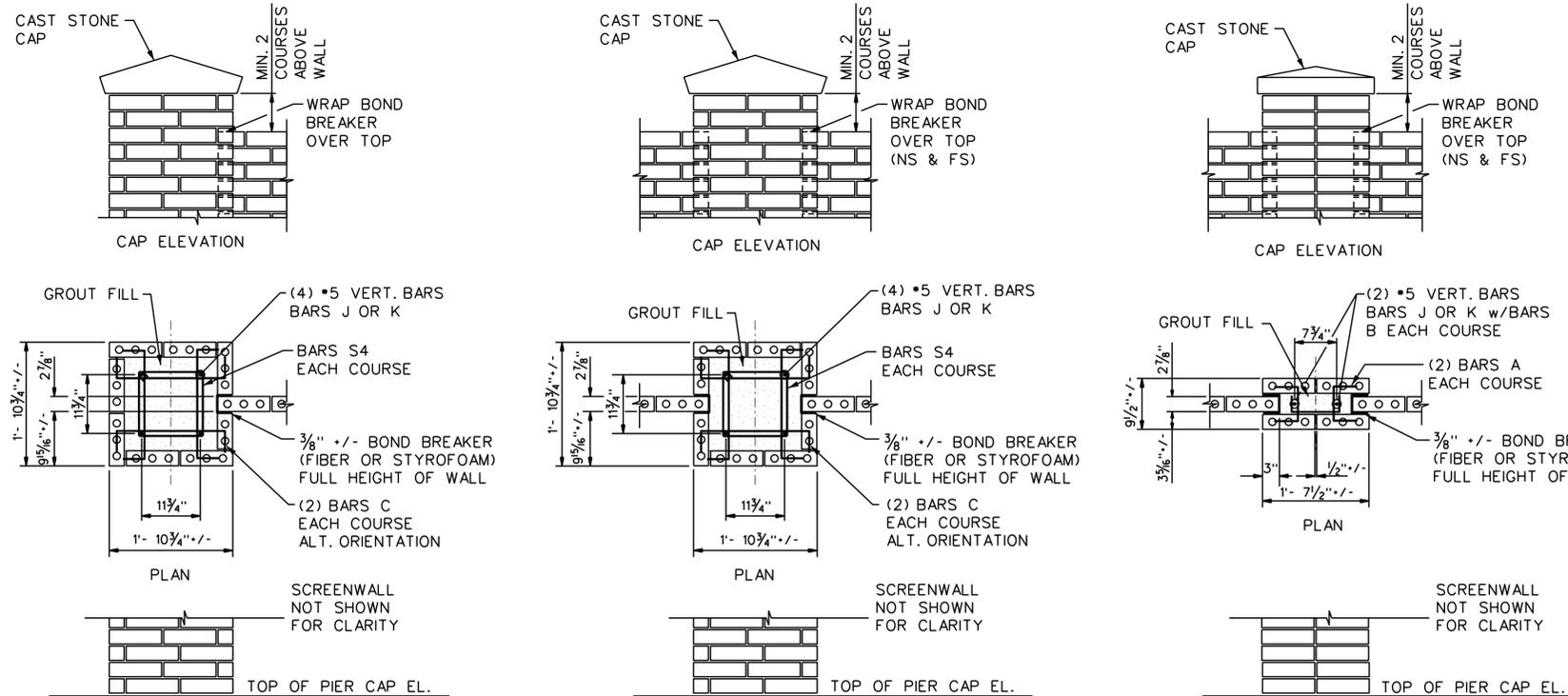
1. MINIMUM PENETRATION INTO SOUND ROCK FOR STRAIGHT PIERS IS BASED ON ASSUMPTIONS OF POOR QUALITY ROCK MATERIAL AND CONSERVATIVE PIER UPLIFT FORCES. THE PENETRATION INTO SOUND ROCK MAY BE REDUCED ONLY IF A LICENSED (TEXAS) STRUCTURAL ENGINEER PROVIDES AN ALTERNATE DESIGN UTILIZING SITE SPECIFIC GEOTECHNICAL DATA. THE ENGINEER PROVIDING ALTERNATE PIER DESIGNS IS SOLELY RESPONSIBLE FOR THE ADEQUACY OF THE ALTERNATE DESIGN.
2. MINIMUM SHAFT LENGTH AND BELL DIAMETER FOR UNDERREADED (BELLED) PIERS ARE BASED ON ASSUMPTIONS OF POOR QUALITY SOILS AND CONSERVATIVE PIER UPLIFT FORCES. THE MINIMUM SHAFT LENGTH AND BELL DIAMETER MAY BE REDUCED ONLY IF A LICENSED (TEXAS) STRUCTURAL ENGINEER PROVIDES AN ALTERNATE DESIGN UTILIZING SITE SPECIFIC GEOTECHNICAL DATA. THE ENGINEER PROVIDING ALTERNATE PIER DESIGNS IS SOLELY RESPONSIBLE FOR THE ADEQUACY OF THE ALTERNATE DESIGN.
3. TOP OF PIER LOADING REACTIONS (UNFACTORED) FOR DESIGN:

P_{DL} - DEAD LOAD (AXIAL)
 M_{WL} - MOMENT - WIND LOAD
 M_{SOIL} - MOMENT - SOIL (FOR 18" DEPTH RETAINED BY BEAM)
 V_{WL} - SHEAR - WIND LOAD
 V_{SOIL} - SHEAR - SOIL (FOR 18" DEPTH RETAINED BY BEAM)



BRICK COLUMN REINFORCEMENT DETAILS

SCALE - 3/4" = 1'-0"



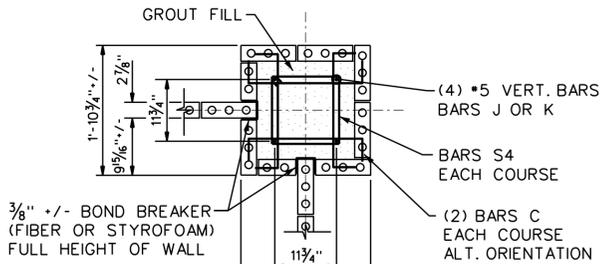
**KING BRICK COLUMN
END WALL CONDITION**

**KING BRICK COLUMN
INTERMEDIATE CONDITION**

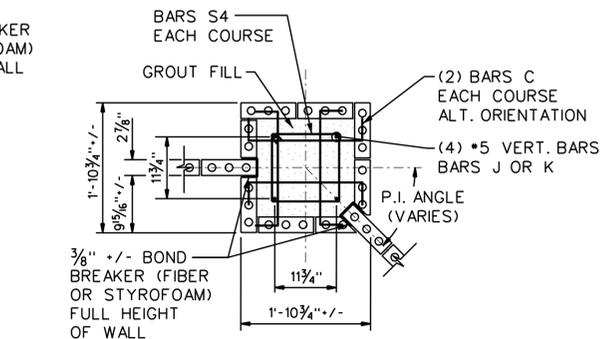
INTERMEDIATE BRICK COLUMN

TYPICAL COLUMN DETAILS

SCALE - 3/4" = 1'-0"

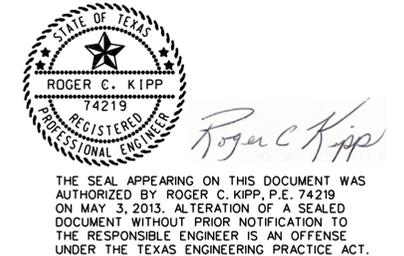


**KING BRICK COLUMN
90° ANGLE**



**KING BRICK COLUMN
VARIABLE ANGLE
(45° SHOWN)**

NOTE: SEE DWG. SD-7D FOR ADDITIONAL DETAILS.

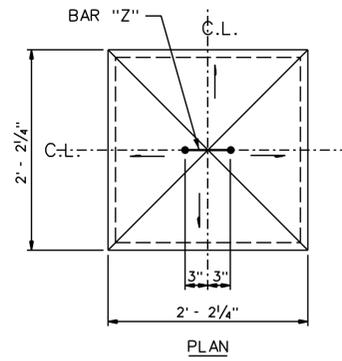


**CITY OF PLANO, TEXAS
DEPARTMENT OF ENGINEERING**

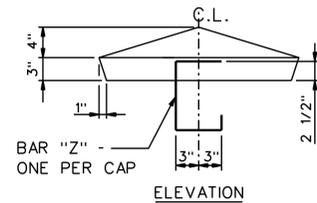
STANDARD CONSTRUCTION DETAILS

**THIN WALL BRICK SCREENING WALL -
MISCELLANEOUS DETAILS - 1**

DESIGN: RCK		CHECK: RDE		SCALE: AS SHOWN		PROJECT No. 6250	
DRAWN: RDE		DATE: MAY 2013		RDE PROJECT: 2081-12		SD-7C	

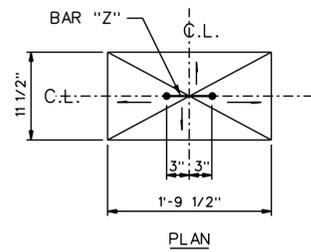


PLAN

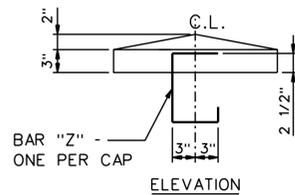


ELEVATION

KING COLUMNS

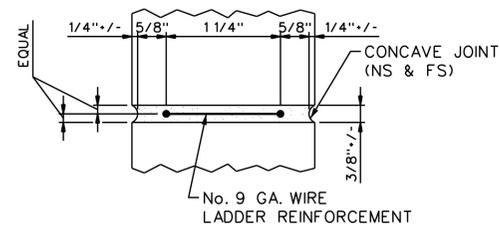


PLAN

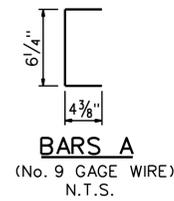


ELEVATION

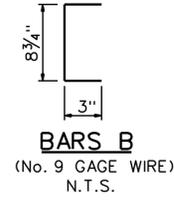
INTERMEDIATE COLUMNS



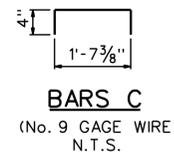
**SECTION - TYPICAL
BRICK MORTAR JOINT**
N.T.S.



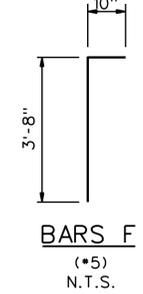
BARS A
(No. 9 GAGE WIRE)
N.T.S.



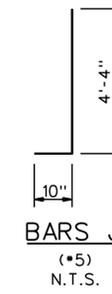
BARS B
(No. 9 GAGE WIRE)
N.T.S.



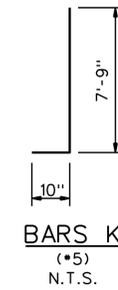
BARS C
(No. 9 GAGE WIRE)
N.T.S.



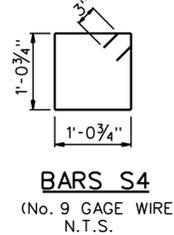
BARS F
(*5)
N.T.S.



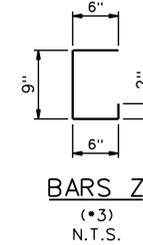
BARS J
(*5)
N.T.S.



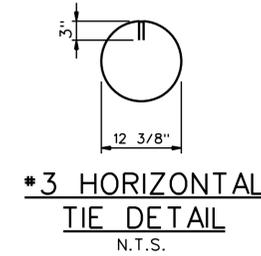
BARS K
(*5)
N.T.S.



BARS S4
(No. 9 GAGE WIRE)
N.T.S.



BARS Z
(*3)
N.T.S.



**#3 HORIZONTAL
TIE DETAIL**
N.T.S.

NOTES (CAPS):

1. REFERENCE GENERAL NOTES (SHEET SD-7E) - ARCHITECTURAL CAST STONE CONCRETE.
2. CONTRACTOR SHALL VERIFY CAST STONE CAP PLAN DIMENSIONS WITH FINAL BRICK COLUMN PLAN DIMENSIONS PRIOR TO PROCUREMENT AND CASTING.
3. CAP SHALL BE SECURELY ANCHORED TO COLUMN BY GROUTING BAR "Z" IN PLACE.

CAST STONE CAP DETAILS

SCALE - 1" = 1'-0"

NOTE: SEE DWG. SD-7C FOR ADDITIONAL DETAILS.



Roger C. Kipp

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CITY OF PLANO, TEXAS
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DETAILS

THIN WALL BRICK SCREENING WALL -
MISCELLANEOUS DETAILS - 2

(4 of 5)

rdelta
ENGINEERS
618 Main Street
Garland, TX 75040
Ph: (972) 494-5031
Fax: (972) 487-2270
www.rdelta.com TBPE No. F-1515

plano PROJECT
No. 6250

DESIGN: RCK	CHECK:	SCALE: AS SHOWN	SD-7D
DRAWN: RDE	DATE: MAY 2013	RDE PROJECT: 2081-12	

GENERAL CONDITION NOTES

1. REFER TO SITE SPECIFIC PROJECT PLANS FOR THIN WALL TYPE, ALIGNMENT, LAYOUT, ELEVATION, PIER TYPE/LOCATION INFORMATION AND MASONRY/CAST STONE COLOR INFORMATION.
2. CERTIFIED MILL TEST REPORTS, SHOP DRAWING SUBMITTALS, AND PERIODIC MATERIAL TESTING SHALL BE INCLUDED IN THE PROJECT PER CITY OF PLANO REQUIREMENTS AND THE CITY SHALL BE PROVIDED WITH ONE COPY OF ALL SUBMITTALS AND REPORTS; CERTIFIED MILL TESTS, SHOP DRAWING SUBMITTALS, AND PERIODIC TESTING SHALL INCLUDE BUT MAY NOT NECESSARILY BE LIMITED TO THE FOLLOWING:
 - a. CERTIFIED MILL TEST REPORTS OF STRUCTURAL STEEL AND REINFORCING BARS.
 - b. PRIOR TO FABRICATION OF ANY MATERIAL OR PLACEMENT OF CONCRETE, THE CONTRACTOR SHALL SUBMIT THE FOLLOWING FOR REVIEW AND APPROVAL:
 - i. REINFORCEMENT SHOP DRAWINGS - REINFORCEMENT SHOP DRAWINGS SHALL SHOW COMPLETE INFORMATION FOR PLACING REINFORCEMENTS AND ACCESSORIES INCLUDING CRITICAL DIMENSIONS TO ENDS OF BARS, AMOUNT OF CONCRETE COVER, AND MINIMUM SPACING BETWEEN BARS. PREPARE REINFORCEMENT SHOP DRAWINGS COMPARABLE TO THOSE IN ACI 315.
 - ii. CONCRETE MIX DESIGNS AND RESULTS OF CONCRETE TESTS MADE USING PROPOSED CONCRETE MIXES.
 - c. THE OWNER SHALL PROVIDE A TESTING LABORATORY TO OBSERVE THAT THE MATERIAL FURNISHED OR WORK PERFORMED BY THE CONTRACTOR IS ACCEPTABLE. TESTING LABORATORY RESPONSIBILITIES WILL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
 - i. MAINTAIN AN ACCURATE BORING LOG OF THE OVERALL DEPTH, BEARING STRATA, AND DEPTH OF PENETRATION OF EACH DRILLED PIER INTO THE BEARING STRATA. BORING LOGS SHALL BE SUBMITTED TO THE CITY FOR RECORD.
 - ii. CONDUCT CONCRETE FIELD STRENGTH TESTS, ASTM C172, ASTM C31, ASTM C39, AND ASTM C78.
 - iii. CONDUCT SLUMP TEST, ASTM C143
 - iv. CONDUCT AIR CONTENT TEST, ASTM C173 OR ASTM C231
 - v. CONDUCT MORTAR COMPRESSIVE STRENGTH TEST, ASTM C270
 - vi. BACKFILL COMPACTION TESTS
3. CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANIES TO FIELD LOCATE ALL EXISTING UNDERGROUND UTILITIES INCLUDING DEPTH PRIOR TO INSTALLATION OF SCREEN WALL DRILLED PIERS AND GRADE BEAMS IN LINE WITH SCREEN WALL.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL SURPLUS EXCAVATION AND OTHER MATERIALS GENERATED BY THE SCREEN WALL CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ASSOCIATED FEES NECESSARY FOR PROPER DISPOSAL.

DEMOLITION AND EXCAVATION NOTES

1. PRIOR TO THE BEGINNING OF DEMOLITION WORK, VERIFY ALL UTILITIES WITHIN THE AREA OF DEMOLITION HAVE BEEN LOCATED, REMOVED, RELOCATED, OR ABANDONED AS NECESSARY FOR THE DEMOLITION WORK TO PROCEED.
2. ALL DEMOLITION PROCEDURES SHALL BE DOCUMENTED AND SUBMITTED FOR REVIEW AND APPROVAL BY THE CITY PRIOR TO THE START OF DEMOLITION. ALL METHODS UTILIZED MUST INCLUDE PROPER SAFE GUARDS MINIMIZING DUST, SMOKE, FUME PRODUCTION AND THE MIGRATION OF SUCH.
3. WHEN SAW-CUTTING ALLEY PAVEMENT OR AN EXISTING CONCRETE SCREEN WALL FOR DEMOLITION, WATER SPRAY SHALL BE USED TO MINIMIZE THE AMOUNT OF DUST GENERATED.
4. ALL PIERS SUPPORTING AN EXISTING CONCRETE OR MASONRY SCREEN WALL SHALL BE DEMOLISHED A MINIMUM OF 2'-0" BELOW BOTTOM OF PROPOSED SCREENING WALL GRADE BEAM OR MOW STRIP.
5. DEBRIS RESULTING FROM DEMOLITION AND EXCAVATION SHALL BE REMOVED FROM THE SITE AND BE PROPERLY DISPOSED OF ON A DAILY BASIS.
6. CONTRACTOR SHALL REPAIR OR REPLACE ALL DEMOLITION OR EXCAVATION PERFORMED IN EXCESS OF THE MINIMUM REQUIRED FOR WALL CONSTRUCTION. CONTRACTOR SHALL PATCH AND REPAIR TO LIKE-NEW CONDITIONS, OR REPLACE ALL EXISTING BUILDING SURFACES, PRIVATE REAR YARD WOOD PRIVACY FENCES, STREET OR ALLEY PAVEMENT, CURB OR OTHER FACILITIES DAMAGED BY PROJECT DEMOLITION OR EXCAVATION AT NO COST TO THE CITY OR PRIVATE PROPERTY OWNERS.

CONSTRUCTION NOTES

1. UNLESS OTHERWISE NOTED WITHIN THESE DETAILS, ALL CONSTRUCTION TO BE IN ACCORDANCE WITH CITY OF PLANO SPECIFICATIONS AND REQUIREMENTS.
2. USE CORRECT CONSTRUCTION SAFETY PROTOCOL FOR PROTECTION OF LIFE AND PROPERTY, INCLUDING ELECTRIC, GAS, CABLE TV AND TELEPHONE UTILITIES NEAR THE WALL.
3. CONTRACTOR SHALL VISIT THE SITE TO DOCUMENT ALL UTILITIES AND REQUEST UTILITY COMPANIES TO FLAG AND IDENTIFY ALL UNDERGROUND LINES.
4. GRADE AND CLEAN SITE AFTER WALL CONSTRUCTION ALONG PARKWAYS. PLACE SOD TO MATCH EXISTING GROUND COVER IN ALL DISTRIBUTED AREAS.

DESIGN CRITERIA

1. WIND LOADS:
 - "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES", (ASCE 7-05)
 - WIND VELOCITY (3sec. GUST)90 MPH
 - EXPOSURE CATEGORYC
 - IMPORTANCE FACTOR CATEGORY (II)1.0
 - WIND DIRECTIONALITY FACTOR, Kd0.85
 - VELOCITY PRESSURE EXPOSURE COEFF., Kh0.85
 - GUST EFFECT FACTOR, G0.85
 - NET FORCE COEFFICIENT, Cf1.35
 - VELOCITY PRESSURE, qh15 PSF
 - DESIGN WIND PRESSURE (PER CODE)17.3 PSF
 - DESIGN WIND PRESSURE (PER CITY OF PLANO STDS.)20 PSF
2. ALL WORK SHALL BE DONE IN CONFORMANCE WITH THE LOCAL GOVERNING BUILDING CODE AND OSHA REGULATIONS.

GENERAL NOTES - MASONRY

1. KING SIZED BRICK UNITS SHALL BE USED AND BRICK MASONRY FOR SCREEN WALL SHALL CONFORM TO ASTM C216 OR C62, GRADE SW AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,500 P.S.I. AND BE CORED. BRICK SHALL BE FROM A SUPPLIER FROM WHICH REPLACEMENT BRICKS ARE READILY AVAILABLE TO THE PLANO AREA. USED BRICK WILL NOT BE ALLOWED. ACCEPTABLE MANUFACTURERS/PLANTS ARE:
 - ACME BRICK - DENTON, TEXAS
 - BILCO BRICK, LANCASTER, TEXAS
 - BORAL BRICKS - HENDERSON, TEXAS
 - HANSON BRICK - ATHENS, TEXAS

BRICKS FROM OTHER MANUFACTURERS OR PLANT LOCATIONS REQUIRE WRITTEN APPROVAL FROM THE CITY OF PLANO ENGINEERING DEPARTMENT.

BRICK COLOR SHALL BE LIMITED TO EARTH-TONE COLORS EXCLUDING GREY, GREEN, AND WHITE. THE COLOR OF THE WALL SHALL BE UNIFORM ON EACH SIDE OF A THOROUGHFARE FOR THE ENTIRE LENGTH BETWEEN INTERSECTING TYPE A, B, OR C THOROUGHFARES UNLESS OTHERWISE APPROVED BY THE CITY OF PLANO ENGINEERING DEPARTMENT. THE FINISH OF THE WALL SHALL BE CONSISTENT ON ALL SURFACES.

2. PRIOR TO PROCUREMENT, THE CONTRACTOR SHALL SUBMIT BRICK SAMPLES SHOWING COLOR, TEXTURE, AND SIZE OF THE BRICK TO THE OWNER AND/OR THE CITY OF PLANO FOR REVIEW AND APPROVAL.
3. MORTAR FOR BRICK SHALL CONFORM TO ASTM C270, TYPE S, HAVING A MINIMUM COMPRESSIVE STRENGTH OF 1,800 P.S.I AT 28 DAYS.
4. GROUT FOR REINFORCED BRICK SCREEN WALL COLUMNS SHALL CONFORM WITH THE REQUIREMENTS OF ASTM C476 (FINE GROUT) AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI AT 28 DAYS AND A MAXIMUM SLUMP OF 10 INCHES.
5. VERTICAL REINFORCING STEEL FOR COLUMNS SHALL CONFORM TO ASTM A615, GRADE 60.
6. BRICK COLUMNS VERTICAL REINFORCEMENT SHALL EXTEND TO WITHIN THREE (3) INCHES OF THE TOP OF COLUMN. SPLICES IN VERTICAL REINFORCEMENT STEEL SHALL BE A MINIMUM OF 36 INCHES IN LENGTH.
7. BRICK COLUMNS SHALL HAVE No. 9 HOT-DIPPED GALVANIZED STEEL WIRE TIES PLACED IN ALTERNATING COURSES, ALL AS DETAILED WITHIN THESE DRAWINGS. WIRE SHALL A MINIMUM YIELD STRENGTH OF 60,000 P.S.I.
8. HORIZONTAL JOINT REINFORCEMENT IN WALL SHALL BE FACTORY- FABRICATED, 1 1/4" WIDE HOT-DIPPED GALVANIZED LADDER TYPE, No. 9 GA. STEEL WIRE BY HOBMANN & BARNARD, OR AN APPROVED EQUAL, CONFORMING TO THE "STANDARD SPECIFICATION FOR COLD DRAWN STEEL WIRE FOR CONCRETE", ASTM A82. HORIZONTAL JOINT REINFORCEMENT SHALL BE PLACED IN EACH MASONRY COURSE AS SHOWN WITHIN THESE DRAWINGS.
9. ALL HOT-DIPPED GALVANIZED REINFORCEMENT COATINGS SHALL BE IN ACCORDANCE WITH ASTM A153, CLASS B-2. THE CONTRACTOR SHALL HANDLE AND PLACE ALL GALVANIZED REINFORCEMENT WITH CARE, DAMAGE TO GALVANIZED COATING OR VISIBLE CORROSION IS CAUSE FOR REJECTION OF REINFORCEMENT.
10. BRICK FOR SINGLE WYTHE SCREEN WALL SHALL BE SMOOTH TWO-SIDED BRICK.
11. ALL BRICK MASONRY UNITS SHALL BE LAID PLUMB AND TRUE IN FULL HEAD AND BED MORTAR JOINTS. THE ENDS OF BRICK UNITS SHALL BE BUTTERED WITH SUFFICIENT MORTAR TO FILL HEAD JOINTS.
12. ALL MASONRY WORK PERFORMED IN TEMPERATURES BELOW 40 F. DEGREES SHALL BE DONE IN ACCORDANCE WITH THE RECOMMENDATION OF THE NATIONAL CONCRETE MASONRY ASSOCIATION.
13. CLEAN MASONRY OF EXCESS MORTAR BY FREQUENTLY BRUSHING SURFACE WITH MASON'S BRUSH. SCRUB DOWN PILASTERS AND WALLS WITH SOLUTION BASED ON A MIX OF ONE-HALF CUP TRISODIUM PHOSPHATE AND A HALF CUP HOUSEHOLD DETERGENT DISSOLVED IN ONE GALLON OF CLEAN WATER. SCRUB WITH STIFF BRUSH ONLY. THOROUGHLY WASH OFF ALL CLEANING SOLUTION, DIRT, AND MORTAR USING CLEAN PRESSURIZED WATER.
14. ABANDON ANY METHOD OF CLEANING MASONRY SHOWING DETRIMENTAL EFFECTS SUCH AS DISCOLORATION OF MORTAR OR BRICK, EFFLORESCENCE, ETCHING OF MORTAR, ETC.
15. CHEMICAL CLEANERS MAY BE USED TO CLEAN MASONRY AS RECOMMENDED BY THE BRICK AND CLEANER MANUFACTURERS AND APPROVED BY THE CITY OF PLANO. NO MURIATIC ACID SOLUTIONS WILL BE PERMITTED FOR CLEANING ANY BRICK WORK UNLESS APPROVED IN WRITING BY THE CITY OF PLANO.

GENERAL NOTES - DRILLED PIERS

1. FOUNDATION PIER INFORMATION PRESENTED IN THESE STANDARD DETAILS IS CONSERVATIVE AND BASED ON ASSUMPTIONS OF POOR GEOTECHNICAL CONDITIONS. IT IS RECOMMENDED THAT A SITE SPECIFIC ("ALTERNATE DESIGN") BE PERFORMED FOR ALL SCREENING WALL PROJECTS TO DETERMINE THE APPROPRIATE PIER TYPE (STRAIGHT OR BELLED), MINIMUM PIER ROCK PENETRATION OR FOUNDING DEPTH, PIER BELL DIAMETER, AND VOID CARTON DEPTH. THE ALTERNATE DESIGN SHALL BE PERFORMED BY A LICENSED (TEXAS) STRUCTURAL ENGINEER EXPERIENCED WITH PIER FOUNDATION DESIGN AND SUBMITTED TO THE CITY OF PLANO FOR THEIR RECORDS.
2. CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS HAVING A MAXIMUM SLUMP OF FOUR TO SIX INCHES (FIVE TO SEVEN INCHES IN CASED PIERS) PRIOR TO INJECTION OF ANY TYPE OF WATER REDUCING ADMIXTURE. CONCRETE MATERIAL SHALL CONFORM TO THE FOLLOWING:
 - a. PORTLAND CEMENT, ASTM C150 TYPE I
 - b. AGGREGATE, ASTM C33
 - c. WATER REDUCING ADMIXTURE, ASTM C494, TYPE Ad. WATER, CLEAN, AND POTABLE
3. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN AN ACCURATE LOG OF THE DEPTHS OF ALL PIERS AND PIER TYPES INSTALLED AND THOSE REQUIRING CASING.
5. THE PRESENCE OF EXCESSIVE GROUNDWATER MAY NECESSITATE THE USE OF STRAIGHT DRILLED SHAFTS INSTALLED WITH TEMPORARY CASING, CONVENTIONAL DEWATERING EQUIPMENT, OR SLURRY AS NECESSARY TO PREVENT CAVING OF THE EXCAVATION.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL DRILLED PIER SPOILS OFF-SITE.
7. UNLESS OTHERWISE NOTED, ALL DRILLED PIERS SHALL BE 18" DIA. REINFORCED W/ (6) #6 VERTICAL BARS W/ #3 TIES AT 12" O.C. LENGTH AND/OR MINIMUM ROCK PENETRATION WILL BE AS SHOWN IN THESE DETAILS UNLESS AN ALTERNATE DESIGN IS PROVIDED (SEE DRILLED PIERS - GENERAL NOTE 1).
8. CONCRETE FOR DRILLED PIERS SHALL BE PLACED WITHIN 8 HOURS OF DRILLING PIERS HOLES. UNDER NO CIRCUMSTANCES SHALL ANY PIER HOLE REMAIN OVER NIGHT UNFILLED.

GENERAL NOTES - ARCHITECTURAL CAST STONE CONCRETE

1. ARCHITECTURAL CAST STONE CONCRETE MATERIALS SHALL CONFORM TO THE FOLLOWING:
 - a. PORTLAND CEMENT, ASTM C150 TYPE I OR TYPE III, WHITE OR GRAY.
 - b. COARSE AGGREGATE, MANUFACTURED OR NATURAL SAND, ASTM C33 EXCEPT FOR GRADATION.
 - c. FINE AGGREGATE, MANUFACTURED OR NATURAL SAND, ASTM C33, EXCEPT GRADATION.
 - d. AIR-ENTRAINED ADMIXTURES, ASTM C260
 - e. WATER REDUCING ADMIXTURE, ASTM C494, TYPE A
 - f. RETARDING ADMIXTURE, ASTM AC94, TYPE D
 - g. WATER, CLEAN, AND POTABLE
 - h. CAST STONE CONCRETE SHALL BE PROPORTIONED IN ACCORDANCE WITH ACI 318 TO DEVELOP A MINIMUM 28-DAY STRENGTH OF 6,500 PSI IN ACCORDANCE WITH ASTM C1194.
 - i. AIR CONTENT 4-8%, ASTM C173 OR C231
2. CAST STONE MANUFACTURER SHALL SUBMIT PIECES OF CAST STONE REPRESENTATIVE OF THE GENERAL RANGE OF FINISH AND COLOR PROPOSED TO BE FURNISHED FOR THE PROJECT FOR REVIEW AND APPROVAL PRIOR TO FABRICATION. SUBMITTAL SHALL ALSO INCLUDE TEST RESULTS OF CAST STONE PREVIOUSLY MADE BY THE MANUFACTURER AND SHOP DRAWINGS INCLUDING PROFILES, CROSS-SECTIONS, AND REINFORCEMENT ARRANGEMENT.
3. UNLESS OTHERWISE NOTED, ALL REINFORCING STEEL SHALL FOR ARCHITECTURAL CAST STONE MEMBERS BE IN ACCORDANCE WITH THE FOLLOWING:
 - a. ASTM A615/A GRADE 60, INCLUDING SUPPLEMENTARY REQUIREMENTS. REINFORCEMENT BARS SHALL BE GALVANIZED OR EPOXY COATED WHEN COVER IS LESS THAN 1 1/2".
 - b. WELDED FIRE FABRIC, ASTM A82, FOR WET CAST UNITS ONLY.
 - c. MINIMUM AMOUNT OF REINFORCEMENT IN CAST STONE UNITS SHALL BE 0.25 PERCENT OF THE CROSS SECTIONAL AREA.
 - d. THE DESIGN AND DETAIL OF CAST STONE UNIT REINFORCEMENT SHALL BE THE RESPONSIBILITY OF THE MANUFACTURER.
4. SURFACES EXPOSED TO VIEW SHALL HAVE A FINE-GRAINED TEXTURE SIMILAR TO NATURAL STONE, WITH NO AIR VOIDS IN EXCESS OF 1/32 INCH AND THE DENSITY OF SUCH VOIDS SHALL BE LESS THAN 3 OCCURRENCES PER ANY 1 SQ. IN. AND NOT OBVIOUS IN DIRECT SUNLIGHT AT 5 FT. DISTANCE.
5. CROSS SECTION AND LENGTH OF UNITS SHALL NOT DEVIATE MORE THAN 1/8 INCH FROM DIMENSIONS AS SHOWN ON PLANS.
6. CAST STONE UNITS SHALL BE SET IN TYPE S MORTAR, ASTM C270, USING A FULL BED OF MORTAR, 3/8" THICK, RAKE MORTAR JOINTS 1/4" FOR POINTING AND TUCK POINT JOINT TO A CONCAVE PROFILE MATCHING BRICK WALL JOINTS.

GENERAL NOTES - BACKFILL ALONG SCREEN WALL GRADE BEAM

1. BACKFILL MATERIAL PLACED BEHIND GRADE BEAM SHALL BE CLEAN ONSITE SOILS.
2. LIGHTWEIGHT HAND CONTROLLED VIBRATING PLATE COMPACTORS SHALL BE USED FOR THE COMPACTION OF THE BACKFILL PLACED ADJACENT TO THE GRADE BEAM. HEAVY COMPACTION EQUIPMENT SHALL NOT BE OPERATED WITHIN 10 FEET OF THE WALL.
3. COMPACTION OF BACKFILL MATERIAL ALONG GRADE BEAM SHALL NOT EXCEED 95 PERCENT STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D698).
4. WALL FOUNDATION DESIGN AND SHAFT REACTIONS PROVIDED IN THESE DETAILS INCLUDE CONSIDERATION OF UP TO EIGHTEEN (18) INCHES OF ELEVATION DIFFERENCE AT ANY WALL SECTION (i.e. 18" OF RETAINED EARTH).

GENERAL NOTES - CONCRETE SCREEN WALL GRADE BEAM

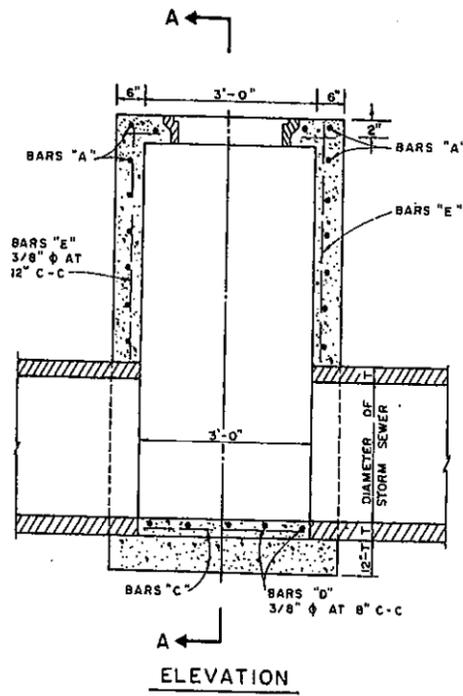
1. UNLESS OTHERWISE NOTED, ALL DETAILING, FABRICATION AND PLACING OF REINFORCING STEEL SHALL CONFORM TO THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (A.C.I. 315).
2. CONCRETE MATERIAL SHALL CONFORM TO THE FOLLOWING:
 - a. PORTLAND CEMENT, ASTM C150 TYPE I
 - b. AGGREGATE, ASTM C33
 - c. AIR-ENTRAINED ADMIXTURES, ASTM C260
 - d. WATER REDUCING ADMIXTURE, ASTM C494, TYPE A
 - e. RETARDING ADMIXTURE, ASTM AC94, TYPE D
 - f. WATER, CLEAN, AND POTABLE
 - g. CONCRETE SHALL BE PROPORTIONED IN ACCORDANCE WITH ACI 318 TO DEVELOP A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF:
 - GRADE BEAMS4,000 PSI
 - MOW STRIP4,000 PSI
 - PIERS4,000 PSI
 - h. CURING COMPOUND, ASTM C309
3. UNLESS OTHERWISE NOTED, MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCEMENT AS FOLLOWS:
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH ...3" CONCRETE EXPOSED TO EARTH OR WEATHER:
 - #5 BAR AND SMALLER1 1/2"
 - CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND: (BEAMS, PRIMARY REINFORCEMENT, TIES, STIRRUPS).....1 1/2"
4. UNLESS OTHERWISE NOTED, ALL REINFORCING STEEL SHALL BE DEFORMED BARS OF NEW BILLET STEEL CONFORMING TO ASTM A615, GRADE 60, INCLUDING SUPPLEMENTARY REQUIREMENTS.
5. UNLESS OTHERWISE NOTED OR APPROVED BY THE ENGINEER, PROVIDE CLASS B TENSION LAP BAR SPLICES PER ACI 318, FOR CONCRETE STRENGTH, BAR LOCATION AND SPACING AS NOTED ON THE DRAWINGS. ALL SPLICES DETAILED BY THE FABRICATOR ARE THE RESPONSIBILITY OF THE FABRICATOR. REVIEW OF SHOP DRAWINGS BY THE ENGINEER IS ONLY FOR GENERAL CONFORMANCE WITH DESIGN CONCEPT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS.
6. ALL REINFORCING BAR HOOKS SHOWN ON DRAWINGS SHALL BE A.C.I. STANDARD 90 DEG. HOOKS, UNLESS OTHERWISE NOTED.
7. PROVIDE MIN. 36 DIA. SPLICE FOR TOP BARS AT CENTER OF A SPAN AND BOTTOM BARS OVER A PIER.
8. UNLESS OTHERWISE NOTED, ALL EXPOSED CONCRETE SHALL HAVE THE FOLLOWING:
 - MOW STRIP - BROOM FINISH
 - ALLEY PAVEMENT - BROOM FINISH
 - ALL OTHER - RUBBED FINISH



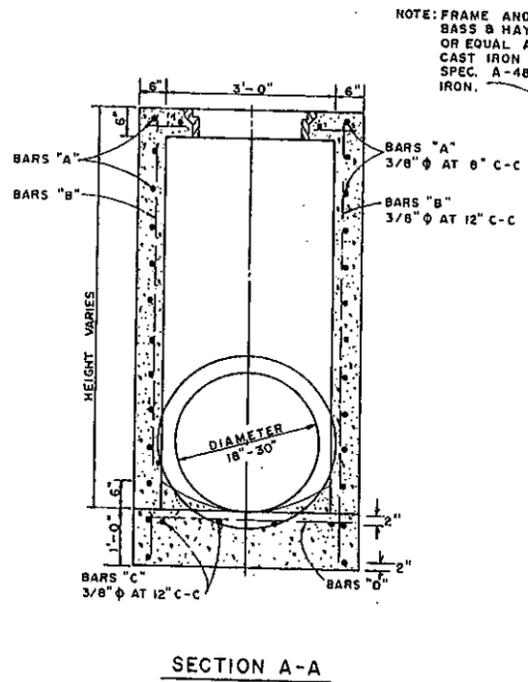
Roger C. Kipp

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ROGER C. KIPP, P.E. 74219 ON MAY 3, 2013. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.

CITY OF PLANO, TEXAS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS			
THIN WALL BRICK SCREENING WALL - GENERAL NOTES			
(5 of 5)			
rdelta ENGINEERS		618 Main Street Garland, TX 75040 Ph: (972) 494-5031 Fax: (972) 487-2270 www.rdelta.com TBPE No. F-1515	
plano		PROJECT No. 6250	
DESIGN: RCK	CHECK: FAP	SCALE: AS SHOWN	SD-7E
DRAWN: RDE	DATE: MAY 2013	RDE PROJECT: 2081-12	



TYPE A STORM SEWER MANHOLE
(FOR PIPE 18" TO 30" IN DIAMETER)



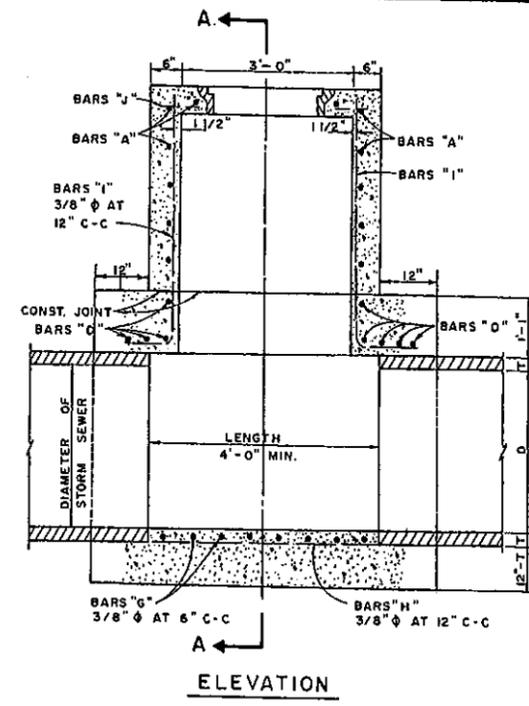
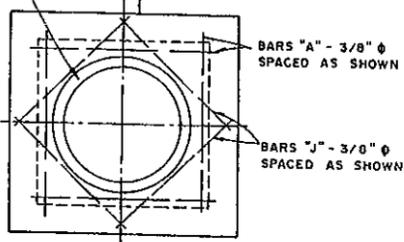
SECTION A-A

TOP PLAN
TYPE A & TYPE B
STORM SEWER MANHOLE

NOTE: MAXIMUM PIPE SIZE TO BE USED 78"

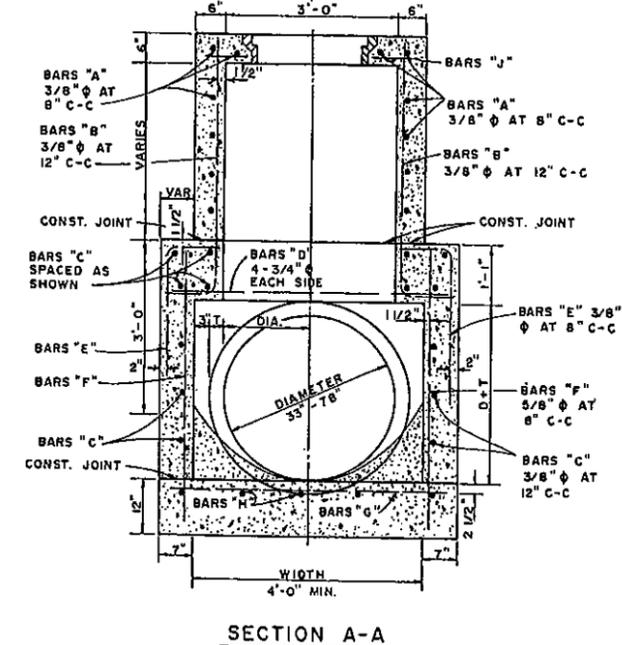
NOTE: FRAME AND COVER SHALL BE BARS 8 HAYS AND COVER SHALL BE BARS 8 HAYS PATTERN NO. 400-24 OR EQUAL AND SHALL BE OF GRAY CAST IRON CONFORMING TO A.S.T.M. SPEC. A-48 FOR CLASS 30 CAST IRON.

PROVIDE 3/4" PREMOLDED EXPANSION JOINT BETWEEN MANHOLE AND CONCRETE PAVEMENT AND SEAL WITH HOT POURED RUBBER



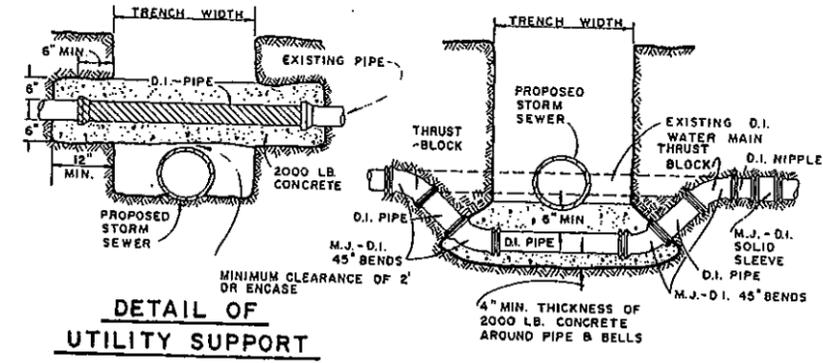
ELEVATION

TYPE B STORM SEWER MANHOLE
(FOR PIPE 33" TO 78" IN DIAMETER)



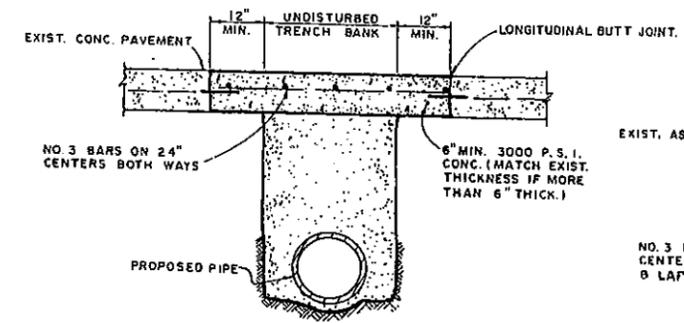
SECTION A-A

NOTE:
1) STRUCTURAL CONCRETE TO BE MIN. 4200 PSI UNLESS NOTED.

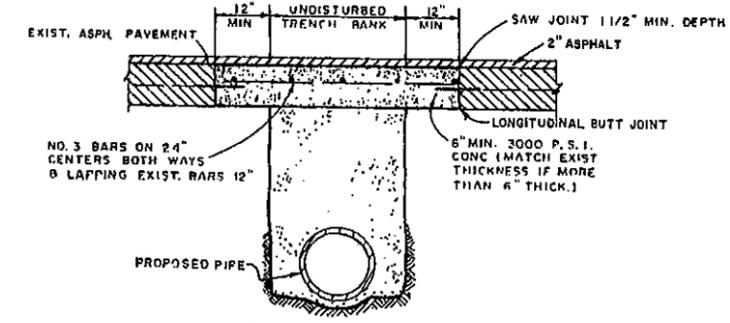


DETAIL OF UTILITY SUPPORT

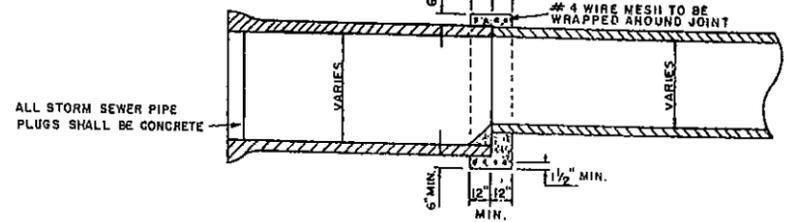
DETAIL FOR WATER MAIN LOWERING



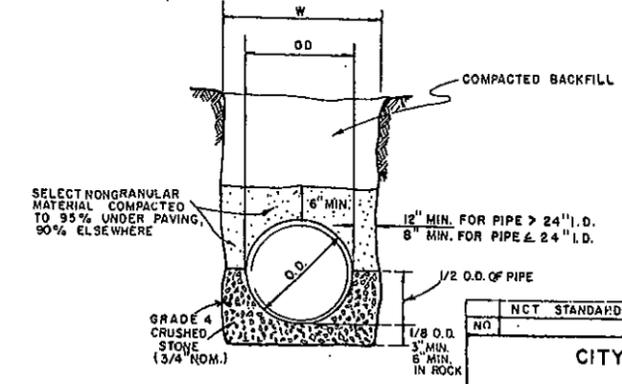
CONCRETE STREET OR DRIVEWAY REPAIR



ASPHALT STREET OR DRIVEWAY REPAIR



DETAIL OF CONCRETE COLLAR FOR PIPE CONNECTIONS



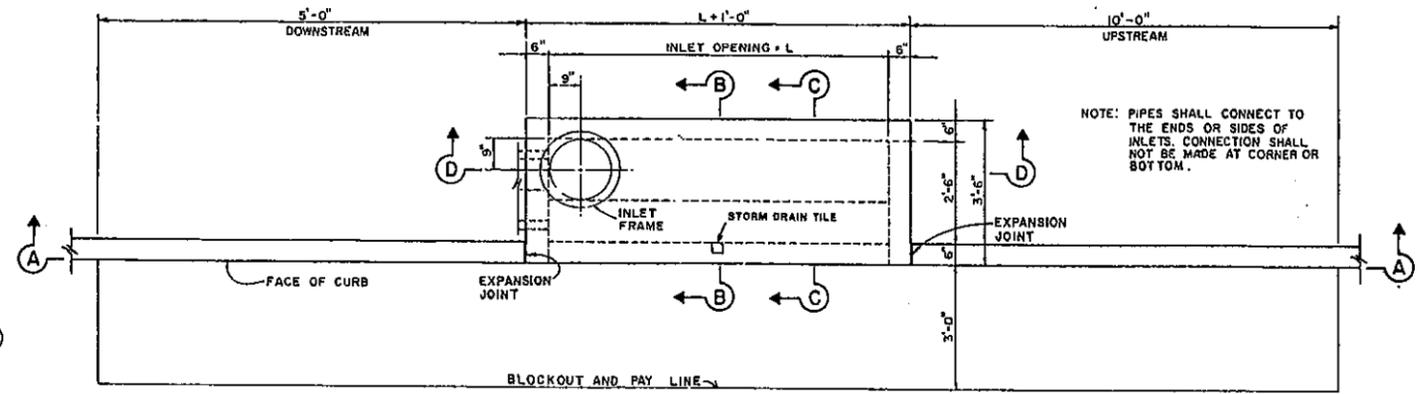
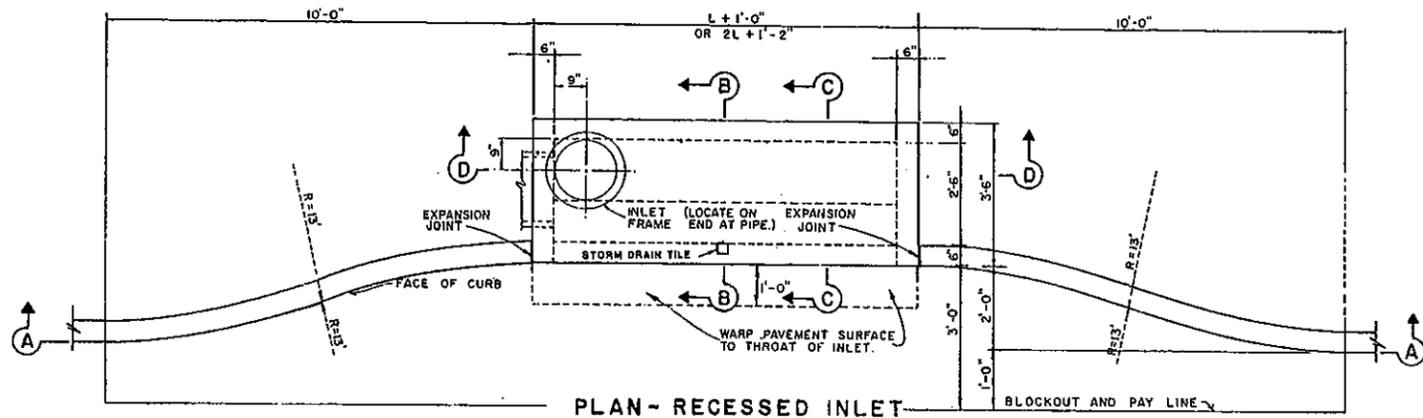
STORM SEWER PIPE BEDDING DETAIL

DEPTH OF TRENCH BELOW PIPE:
3" MIN. FOR 27" PIPE & SMALLER
4" MIN. FOR 30" TO 60" PIPE
6" MIN. FOR 66" PIPE & LARGER

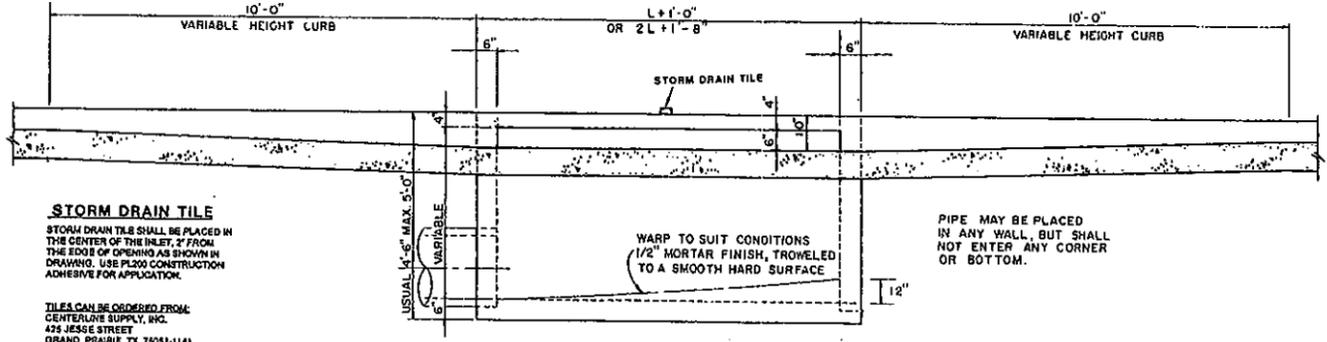


NCT STANDARD SPECIFICATIONS		S.A.S. 10-5-87	
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS STORM DRAINAGE			
MANHOLES & STORM SEWER			
APPROVED	<i>Alan L. Upchurch</i> ALAN L. UPCHURCH, P.E.		
DATE: JULY, 1996			SHEET SD-8

7-22-96

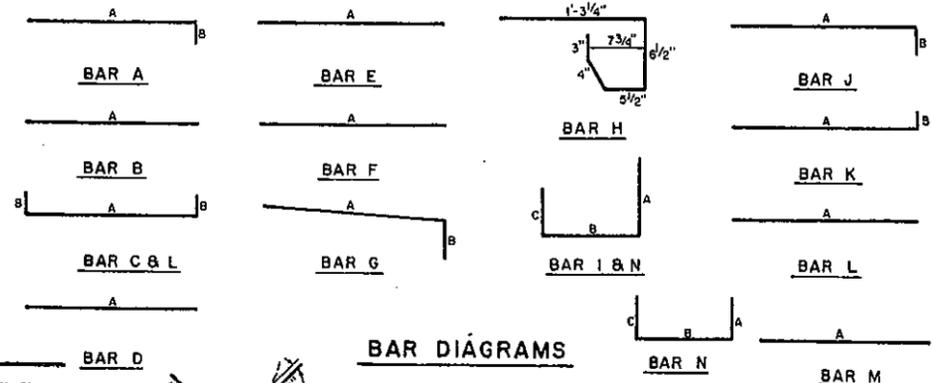


NOTE: PIPES SHALL CONNECT TO THE ENDS OR SIDES OF INLETS. CONNECTION SHALL NOT BE MADE AT CORNER OR BOTTOM.



SECTION A-A-RECESSED AND STANDARD INLETS

4, 6, 8 AND 10 FOOT INLETS



BAR DIAGRAMS

REINFORCING STEEL SCHEDULE

DIMENSIONS SHOWN ARE FOR MAXIMUM SIZE INLETS

INLET LENGTH	BAR TYPE	BAR DIA. (1/8 IN.)	NO. REQ'D	BAR DIMENSIONS		
				A	B	C
4	A	3	6	3'-2"	0'-3"	-
	B	3	1	2'-10"	-	-
	C	4	15	4'-8"	0'-6"	-
	D	4	5	4'-8"	-	-
	F	4	1	3'-2"	-	-
	G	3	5	2'-0"	1'-3"	-
	H	3	3	-	-	-
	N	3	3	3'-2"	3'-2"	3'-2"
6	A	3	9	3'-2"	0'-3"	-
	B	3	1	4'-10"	-	-
	C	4	15	6'-8"	0'-6"	-
	O	4	5	4'-8"	-	-
	F	4	1	3'-2"	-	-
	G	3	5	2'-0"	1'-3"	-
	H	3	3	-	-	-
	N	3	3	3'-2"	3'-2"	3'-2"
8	A	3	12	3'-2"	0'-3"	-
	B	3	1	6'-10"	-	-
	C	4	15	8'-8"	0'-6"	-
	D	4	5	4'-8"	-	-
	F	4	1	3'-2"	-	-
	G	3	5	2'-0"	1'-3"	-
	H	3	3	-	-	-
	N	3	3	3'-2"	3'-2"	3'-2"
10	A	3	10	3'-2"	0'-3"	-
	B	3	2	6'-10"	-	-
	C	4	16	10'-6"	0'-6"	-
	D	4	4	4'-8"	-	-
	E	5	6	10'-8"	-	-
	G	3	5	2'-0"	1'-3"	-
	H	3	15	-	-	-
	I	4	8	4'-8"	3'-2"	3'-2"
	L	4	5	4'-3"	-	-

REINFORCING STEEL SCHEDULE

DOUBLE INLETS

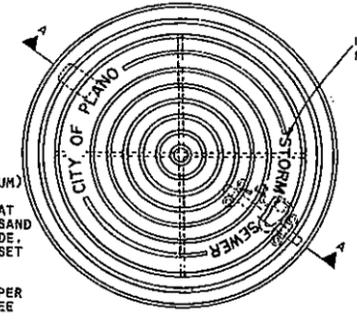
DIMENSIONS SHOWN ARE FOR MAXIMUM SIZE INLETS

INLET LENGTH	BAR TYPE	BAR DIA. (1/8 IN.)	NO. REQ'D	BAR DIMENSIONS		
				A	B	C
5 FT.	A	3	13	3'-2"	0'-6"	-
	B	3	2	11'-2"	-	-
	C	4	18	15'-4"	0'-6"	-
	D	4	9	4'-8"	-	-
	E	5	6	17'-4"	-	-
	F	3	12	2'-0"	1'-3"	-
	G	3	12	2'-0"	1'-3"	-
	H	3	26	-	-	-
	J	4	12	4'-8"	3'-2"	3'-2"
	K	5	6	3'-2"	0'-6"	-
	L	4	11	3'-2"	0'-6"	-
	M	4	2	3'-0 1/2"	-	-
	N	4	2	4'-8"	3'-2"	4'-8"
7 FT.	A	3	17	3'-2"	0'-6"	-
	B	3	2	13'-8"	-	-
	C	4	18	15'-4"	0'-6"	-
	D	4	9	4'-8"	-	-
	E	5	6	17'-4"	-	-
	F	3	12	2'-0"	1'-3"	-
	G	3	12	2'-0"	1'-3"	-
	H	3	32	-	-	-
	J	4	14	4'-8"	3'-2"	3'-2"
	K	5	6	3'-2"	0'-6"	-
	L	4	11	3'-2"	0'-6"	-
	M	4	2	3'-0 1/2"	-	-
	N	4	2	4'-8"	3'-2"	4'-8"
8 FT.	A	3	19	3'-2"	0'-6"	-
	B	3	2	15'-8"	-	-
	C	4	18	17'-4"	0'-6"	-
	D	4	9	4'-8"	-	-
	E	5	6	17'-4"	-	-
	F	3	12	2'-0"	1'-3"	-
	G	3	12	2'-0"	1'-3"	-
	H	3	32	-	-	-
	J	4	16	4'-8"	3'-2"	3'-2"
	K	5	6	3'-2"	0'-6"	-
	L	4	11	3'-2"	0'-6"	-
	M	4	2	3'-0 1/2"	-	-
	N	4	2	4'-8"	3'-2"	4'-8"
10 FT.	A	3	23	3'-2"	0'-6"	-
	B	3	2	19'-8"	-	-
	C	4	18	21'-4"	0'-6"	-
	D	4	9	4'-8"	-	-
	E	5	6	17'-4"	-	-
	F	3	12	2'-0"	1'-3"	-
	G	3	12	2'-0"	1'-3"	-
	H	3	32	-	-	-
	J	4	20	4'-8"	3'-2"	3'-2"
	K	5	6	3'-2"	0'-6"	-
	L	4	11	3'-2"	0'-6"	-
	M	4	2	3'-0 1/2"	-	-
	N	4	2	4'-8"	3'-2"	4'-8"

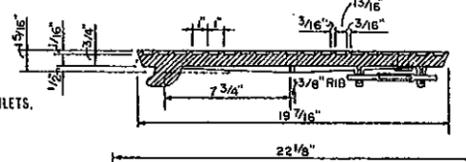
*SEE DIAGRAM FOR DIMENSIONS
**FIELD CUT AS REQ'D TO ACCOMMODATE DRAIN PIPE.

NOTES FOR PRECAST INLET

- THE FLOOR OF THE EXCAVATION MUST PROVIDE A FIRM, LEVEL BED FOR THE BASE SECTION TO REST UPON.
- A MINIMUM OF 6 INCHES OF 1" DIAMETER (MAXIMUM) ROCK OR GRAVEL SHALL BE USED TO PREPARE THE BEDDING TO FINAL GRADE OR IN LIEU OF THIS, AT LEAST 6 INCHES OF 2-SACK CEMENT STABILIZED SAND SHALL BE USED TO PREPARE THE BEDDING TO GRADE. CEMENT STABILIZED SAND SHALL BE ALLOWED TO SET BY KEEPING HOLE PUMPED DRY.
- AFTER CASTING HAS BEEN INSTALLED ON THE PROPER BEDDING, THE BACKFILL MATERIAL, WHICH IS FREE FLOWING AND CLEAR OF ROCKS, IN EXCESS OF 1" DIAMETER AND OTHER LUMPS WHICH WOULD PROHIBIT PROPER COMPACTION, SHALL BE COMMENCED IN LIFTS OF NO MORE THAN 18". THE MATERIAL USED FOR BACKFILL SHOULD BE OF A TYPE SUITABLE TO OBTAIN THE DENSITY REQUIREMENTS FOR THE SPECIFIC JOB.
- PRECAST INLETS MUST BE APPROVED BY CITY ENGINEER.
- CONCRETE TO BE MIN. 4200 PSI.
- LOCKING DEVICE IS REQUIRED ON ALL STORM SEWER LIDS.
- "NO DUMPING" WARNING PLAQUE TO BE INSTALLED ON ALL STANDARD AND RECESSED INLETS.

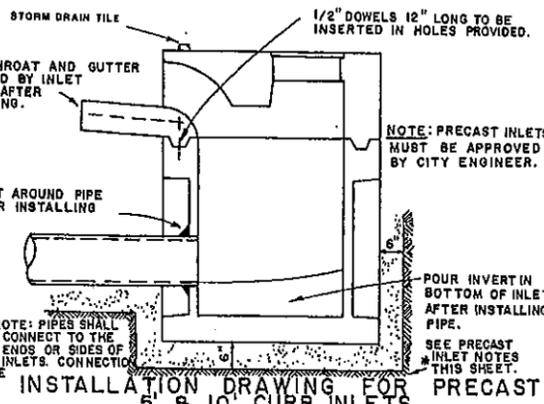


PLAN OF FRAME



SECTION OF FRAME AND COVER

INLET FRAME AND COVER

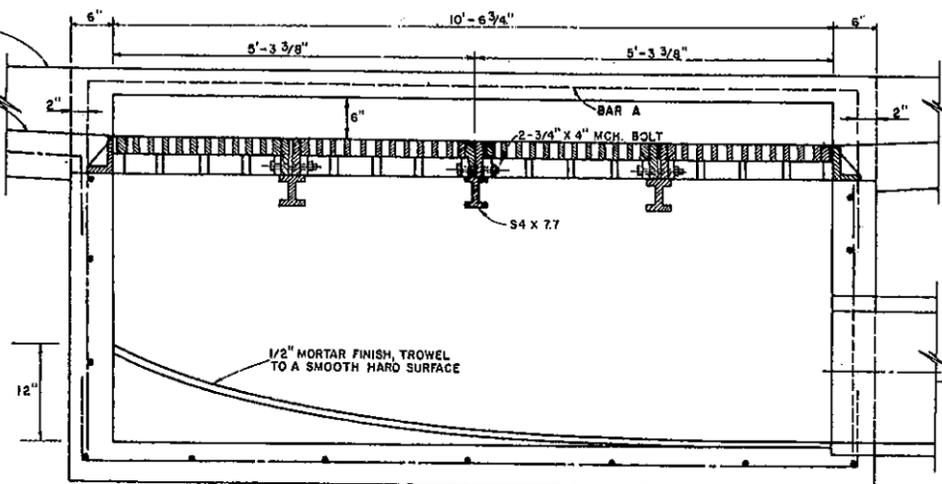
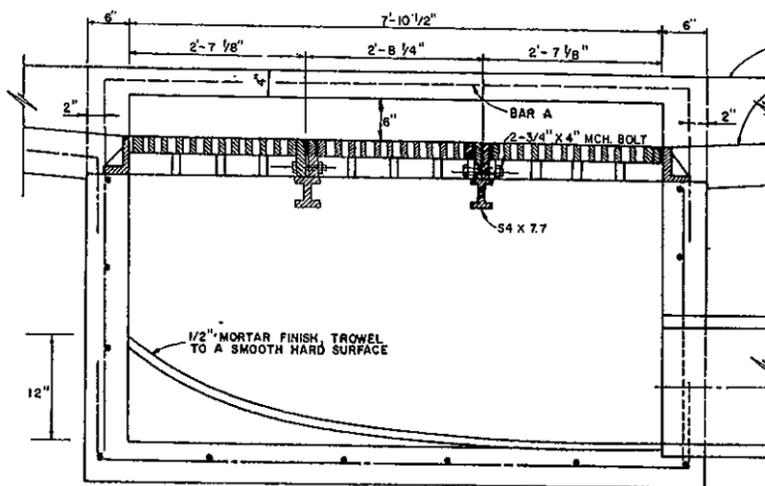
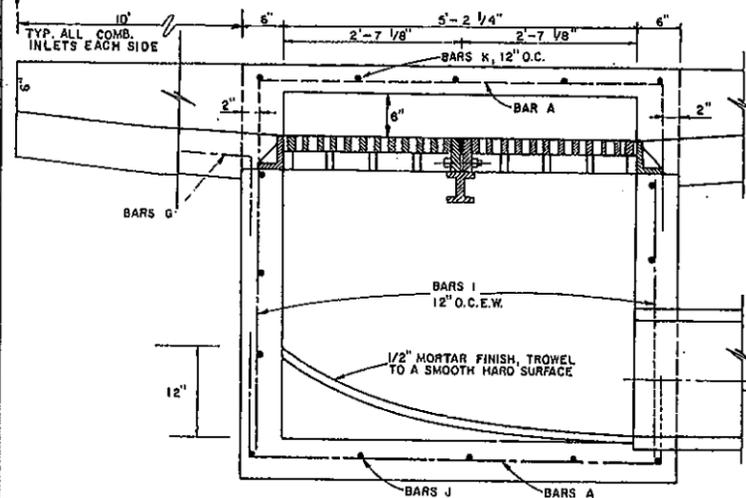
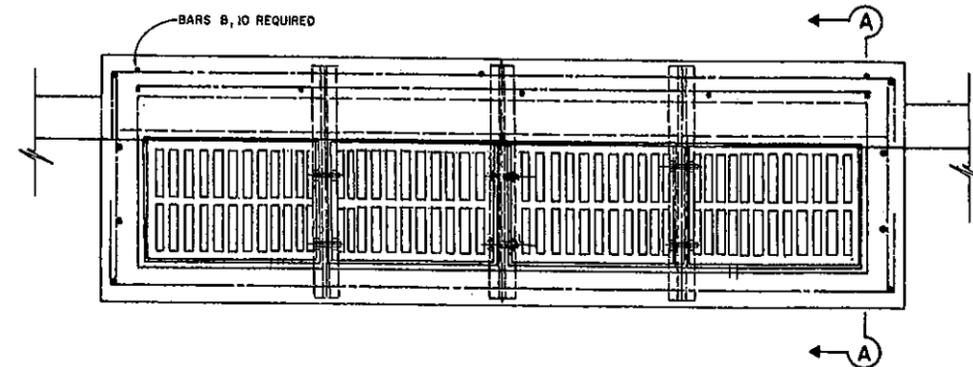
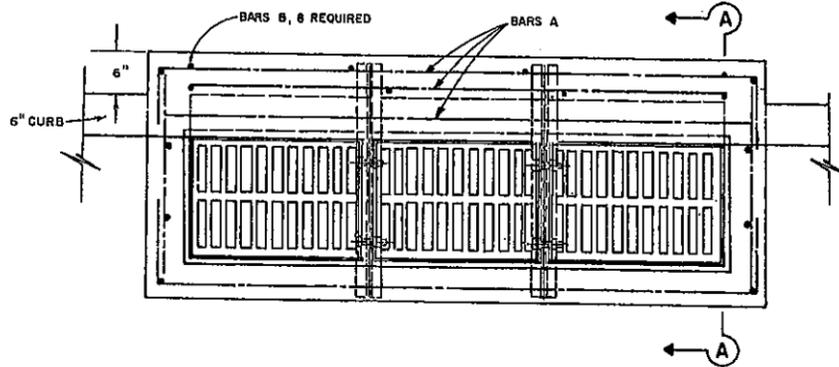
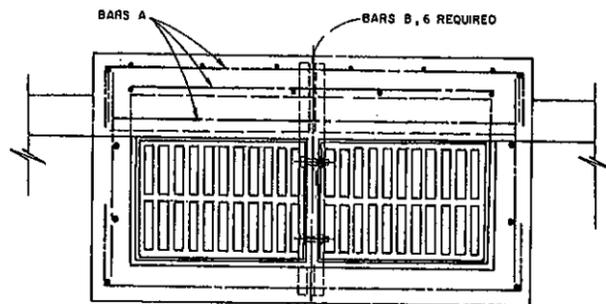


INSTALLATION DRAWING FOR PRECAST 5' & 10' CURB INLETS

NO.	NCT.	STANDARD	SPECIFICATIONS	S.A.S.	10-5-87
			REVISION	BY	DATE
<p>CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING</p> <p>STANDARD CONSTRUCTION DETAILS STORM DRAINAGE</p> <p>CURB INLETS</p>					
APPROVED <i>Alan L. Upchurch, P.E.</i>					
DATE: JULY, 1996					
SHEET SD-9					



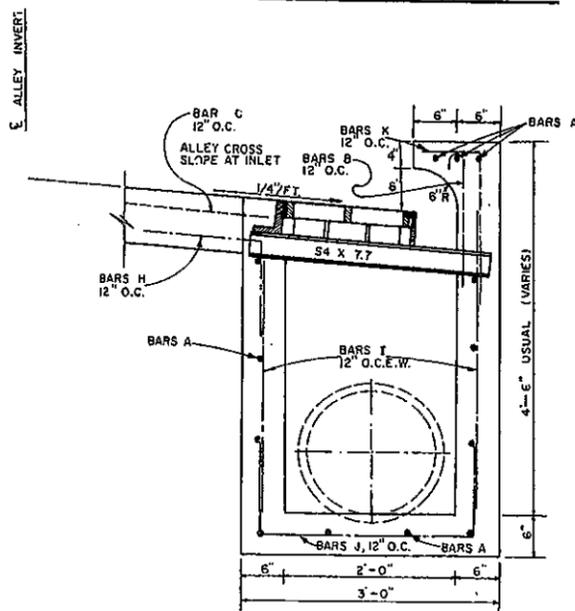
6" CURB TYPICAL ALL COMBINATION INLETS



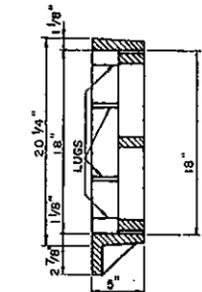
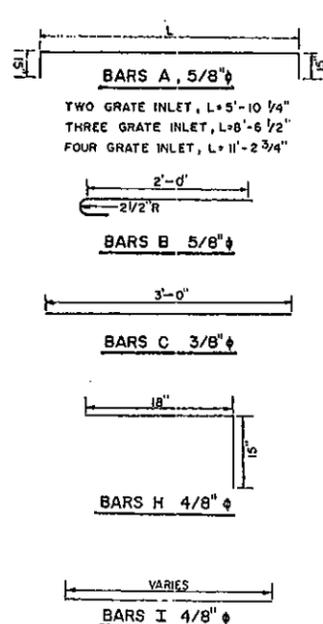
TWO GRATE INLET

THREE GRATE INLET

FOUR GRATE INLET

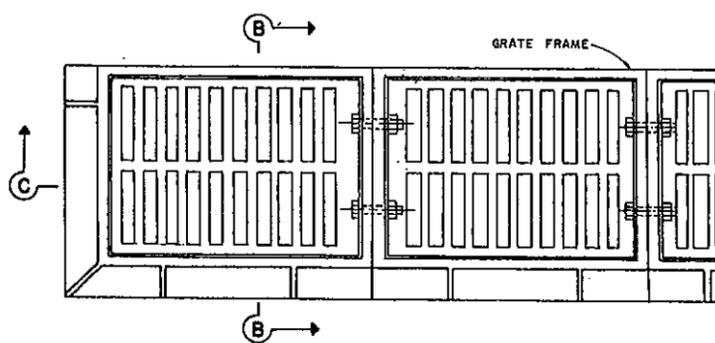


SECTION A-A

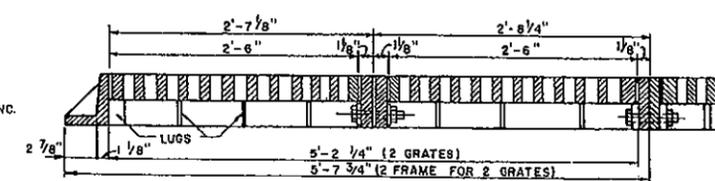


SECTION B-B

NOTE: GRATE AND FRAME SHALL BE PATTERN NO. B14 AS MANUFACTURED BY BASS & HAYES FOUNDRY, INC. OR APPROVED EQUAL.



PLAN



SECTION C-C

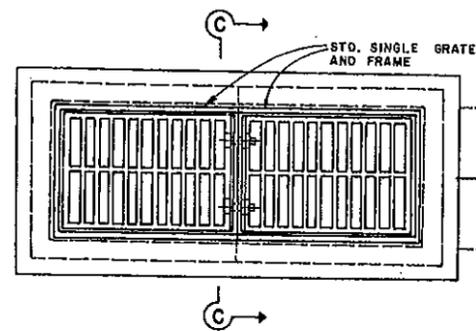
GRATE DETAILS

NOTES

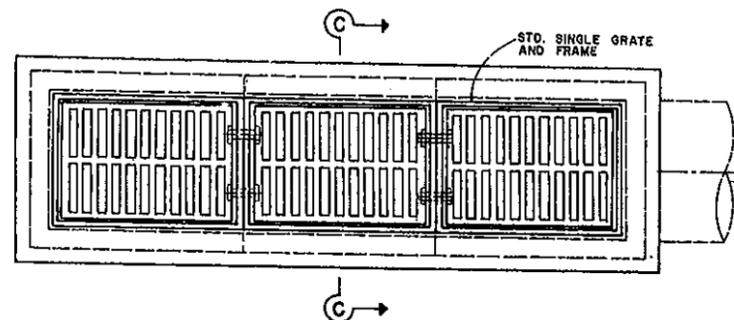
1. COMBINATION INLETS TO BE USED IN ALL ALLEYS WHERE INLETS ARE REQUIRED.
2. ALL LAPS AND EXTENSIONS OF REINFORCING BARS SHALL BE 3S BAR DIAMETERS UNLESS NOTED OTHERWISE.
3. TACK WELD GRATES IN PLACE.
4. PIPE MAY BE PLACED IN ANY WALL, BUT SHALL NOT ENTER ANY CORNER OR BOTTOM.
5. CONC. SHALL BE A MIN. OF 4200 P.S.I.
6. "NO DUMPING" WARNING PLAQUE TO BE INSTALLED ON ALL COMBINATION INLETS.



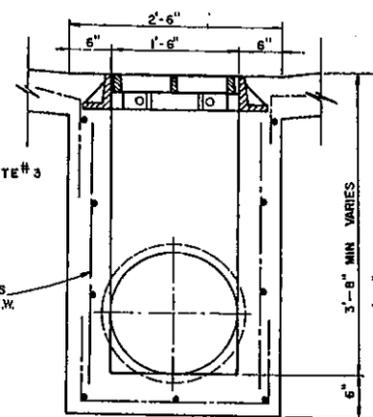
NCT STANDARD SPECIFICATIONS		S.A.S.	10-6-87
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS STORM DRAINAGE			
COMBINATION INLET			
APPROVED		<i>Alan L. Upchurch</i> ALAN L. UPCHURCH, P.E.	
DATE: JULY, 1996		SHEET SD-10	



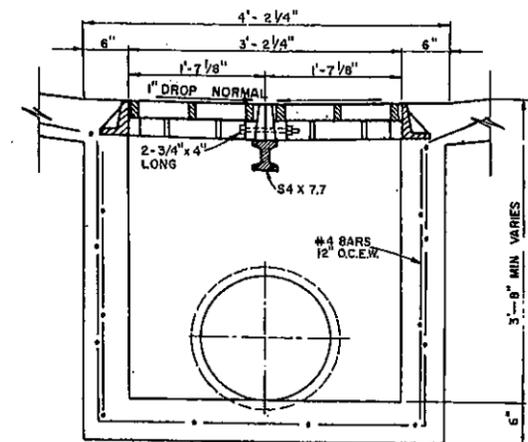
TWO GRATE INLET



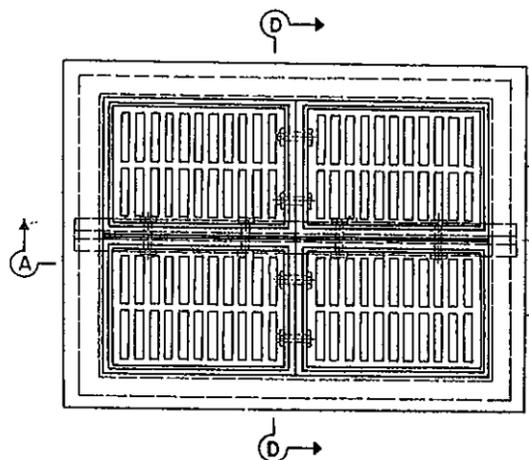
THREE GRATE INLET



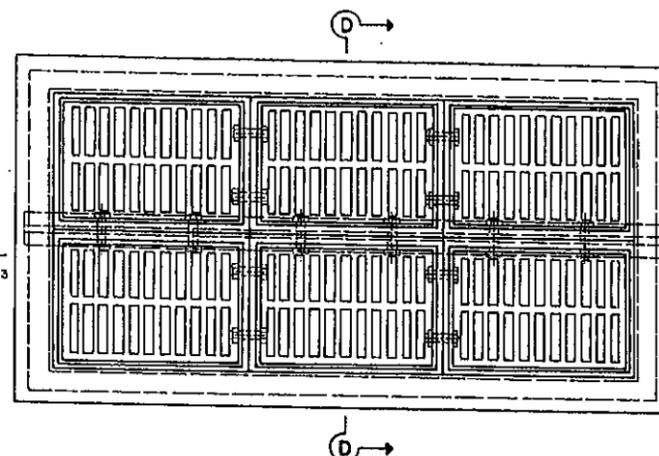
SECTION C-C



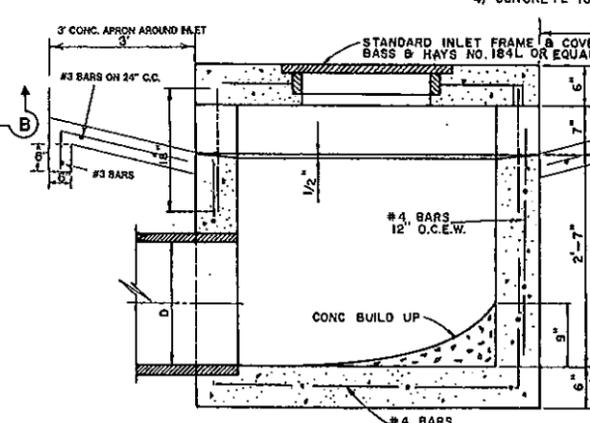
SECTION D-D



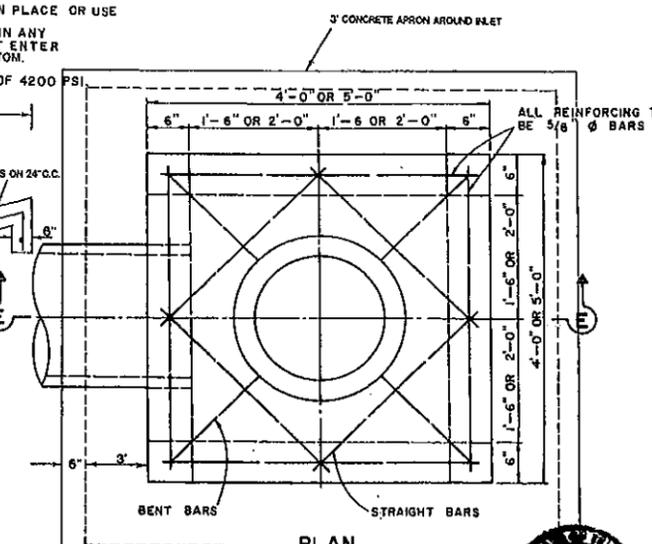
FOUR GRATE INLET



SIX GRATE INLET



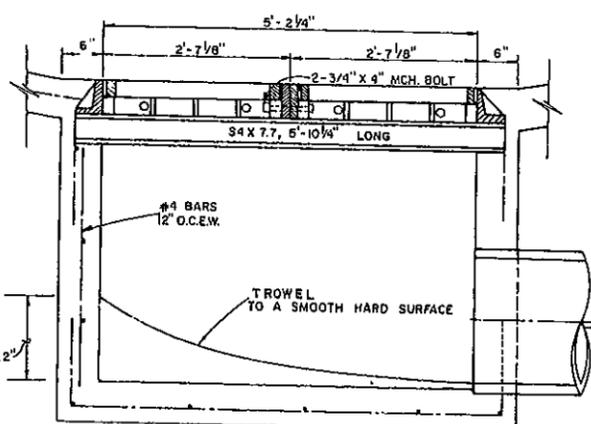
SECTION E-E



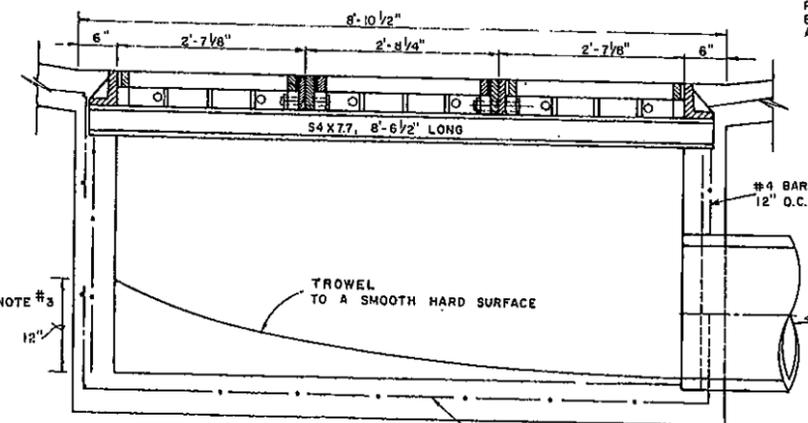
PLAN

- NOTES**
1. ALL LAPS AND EXTENSIONS OF REINFORCING BARS SHALL BE 3Ø BAR DIAMETERS UNLESS NOTED OTHERWISE.
 2. TACK WELD GRATES IN PLACE OR USE GRATE LOCK.
 3. PIPE MAY BE PLACED IN ANY WALL, BUT SHALL NOT ENTER ANY CORNER OR BOTTOM.
 - 4) CONCRETE TO BE MIN. OF 4200 PSI.

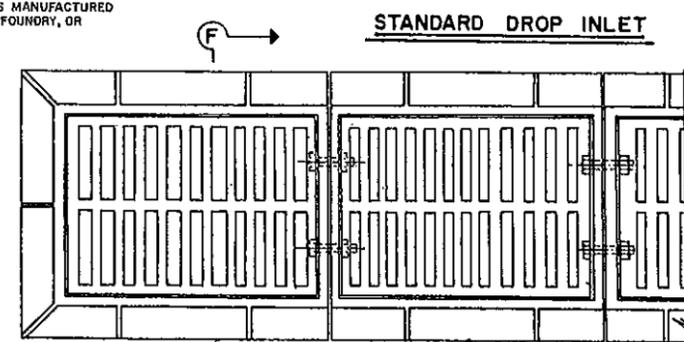
NOTE 1: GRATE AND FRAME SHALL BE PATTERN NO. 814 AS MANUFACTURED BY BASS & HAYES FOUNDRY, OR APPROVED EQUAL.



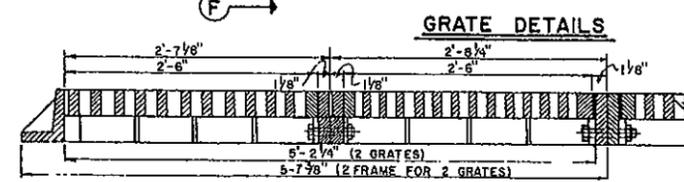
SECTION A-A



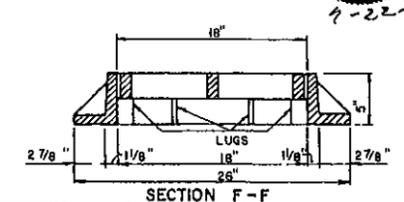
SECTION B-B



STANDARD DROP INLET



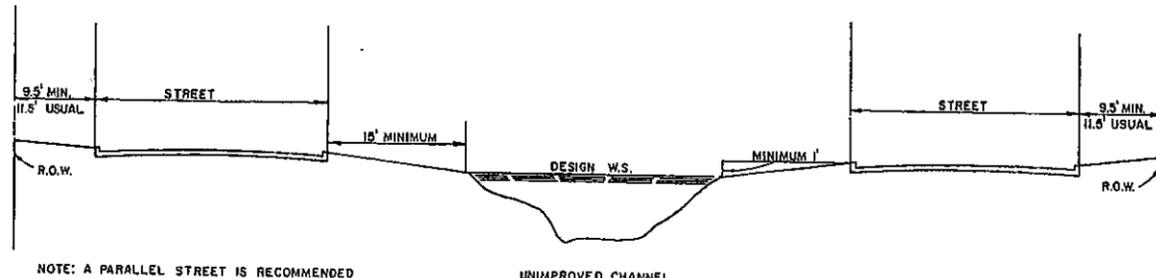
GRATE DETAILS



SECTION F-F

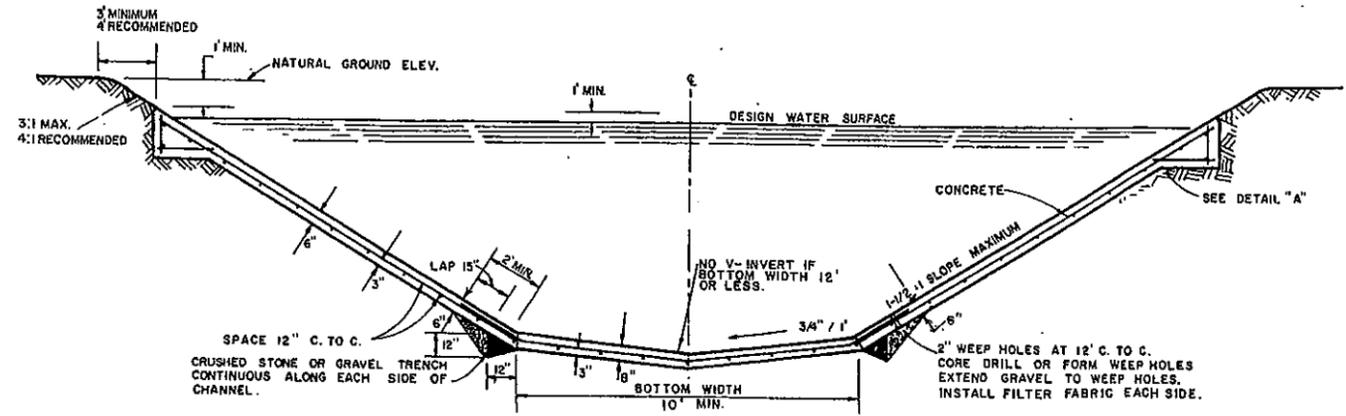
NCT STANDARD SPECIFICATIONS		S.A.S. 10-9-87	
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS STORM DRAINAGE			
GRATE INLET - DROP INLET			
APPROVED <i>Alan L. Upchurch</i> ALAN L. UPCHURCH, P.E.			
DATE: JULY, 1996		SHEET SD-11	



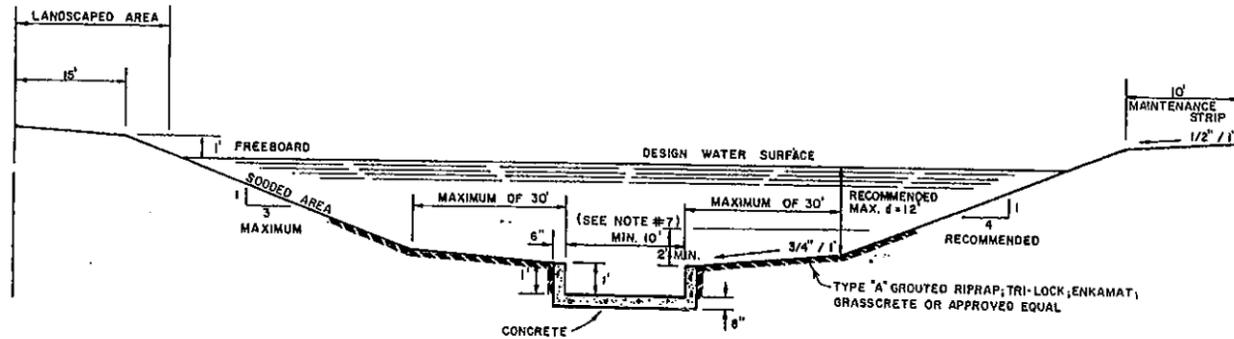


NOTE: A PARALLEL STREET IS RECOMMENDED EACH SIDE OF TYPE I CHANNELS THE AREA BETWEEN THE STREETS SHOULD BE DEDICATED TO PUBLIC USE.

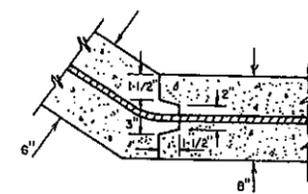
TYPE I-NATURAL



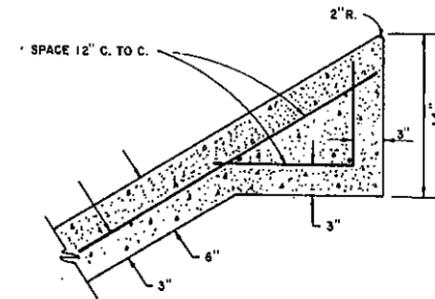
TYPE III NORMAL CHANNEL SECTION



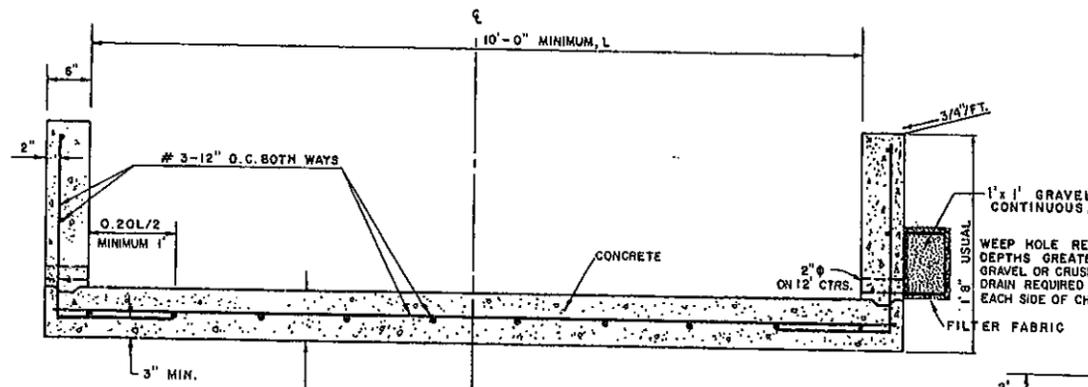
TYPE II - UNLINED WITH LINED PILOT CHANNEL



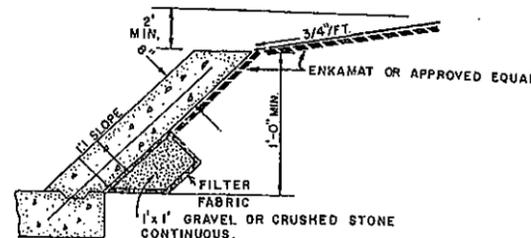
CONSTRUCTION JOINT OPTIONAL



SLAB EDGE-DETAIL "A"



PILOT CHANNEL DETAIL



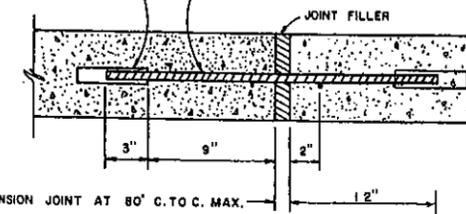
OPTIONAL

GENERAL NOTES FOR OPEN CHANNELS

- CONSTRUCTION JOINT SHOWN FOR CONVENIENCE ONLY-MONOLITHIC CONSTRUCTION MAY BE USED
- ALL VISIBLE SURFACES SHALL BE A TROWEL FINISH
- ALL REINFORCING STEEL SHALL BE 3/8" DIAMETER AND SPACED 12" C. TO C. BOTH WAYS UNLESS OTHERWISE SPECIFIED
- TYPE I CHANNEL, A NATURAL CHANNEL, IS SHOWN FOR LOCATION OF ADJACENT STREETS.
- IF WOOD FORMS ARE USED WITH CONSTRUCTION JOINT THEY SHALL BE TWO, 2"x4", AND SHALL NOT BE REMOVED UNTIL CONCRETE ON SLOPES IS READY TO BE PLACED.
- ALL CONCRETE IN LINED CHANNEL SHALL BE CLASS "A" (MIN. 3000 PSI)
- FLAT BOTTOM TO BE CONSTRUCTED WHEN CHANNEL WIDTH IS LESS THAN 12'
- 3/4" CHAMFER ON ALL CONG. CORNERS.
- GRASS COVER REQUIRED FOR ALL SLOPES 3:1 OR FLATTER. CONCRETE RIP-RAP REQUIRED ON SLOPES STEEPER THAN 3:1.

SLEEVE FOR DOWEL SHALL HAVE AN INSIDE DIAMETER OF 7/8" AND SHALL BE 5" LONG.

NO. 6 BARS SPACED 24" C. TO C. SHALL SERVE AS DOWELS. DOWELS SHALL BE ASPHALT COATED 12" ON THE FREE END.

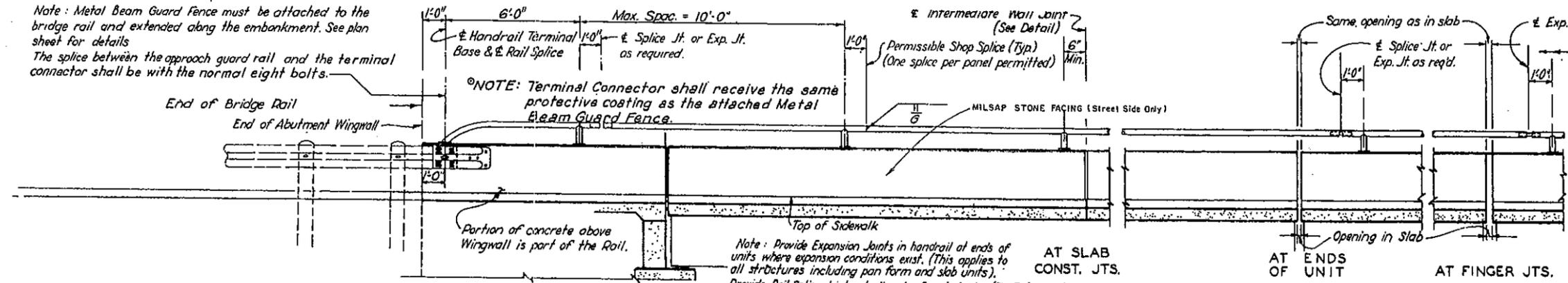


TRANSVERSE EXPANSION JOINT



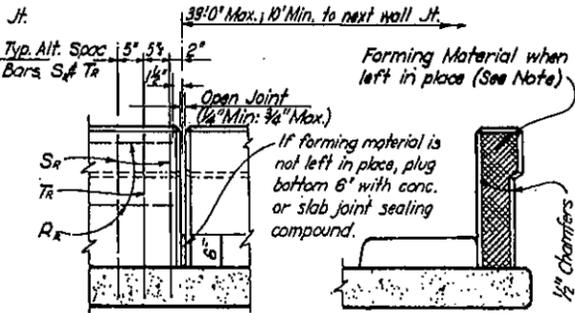
NOT STANDARD SPECIFICATIONS		S.A.S.	10-12-87
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS STORM DRAINAGE			
CHANNEL SECTIONS			
APPROVED		<i>Alan L. Upchurch</i>	
		ALAN L. UPCHURCH, P.E.	
DATE JULY, 1996		SHEET	SD-12

Note: Metal Beam Guard Fence must be attached to the bridge rail and extended along the embankment. See plan sheet for details. The splice between the approach guard rail and the terminal connector shall be with the normal eight bolts.

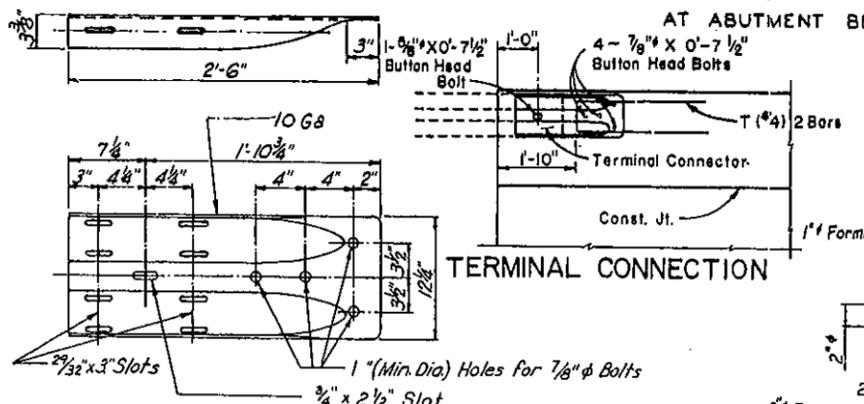


NOTE: Terminal Connector shall receive the same protective coating as the attached Metal Beam Guard Fence.

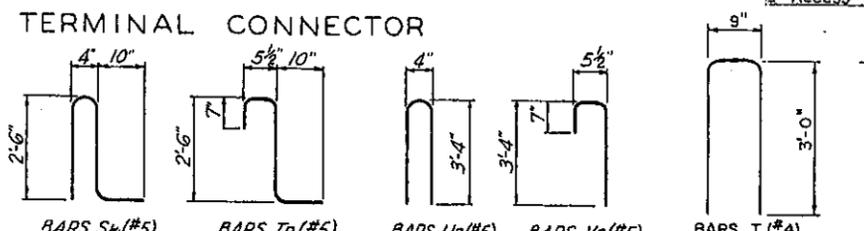
Note: Provide Expansion Joints in handrail at ends of units where expansion conditions exist. (This applies to all structures including pan form and slab units). Provide Rail Splice Joints at all ends of units having (Fix-Fix) condition.



Note: Provide intermediate wall joints over all slab const. joints, over interior supports on continuous units, and at equal intervals in between as necessary to maintain a 33' max. length of unbroken wall. Material used in forming joint may be left in place if it is compressible and light in color such as the following materials: polystyrene, molded cork granules, sponge rubber sheet, etc.

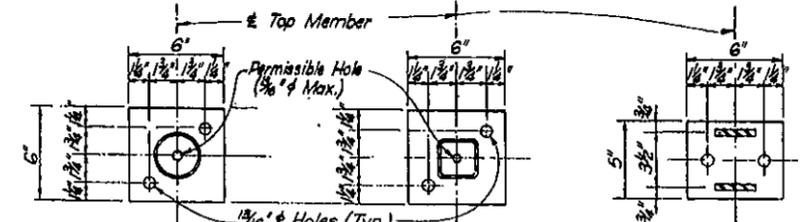


TERMINAL CONNECTION

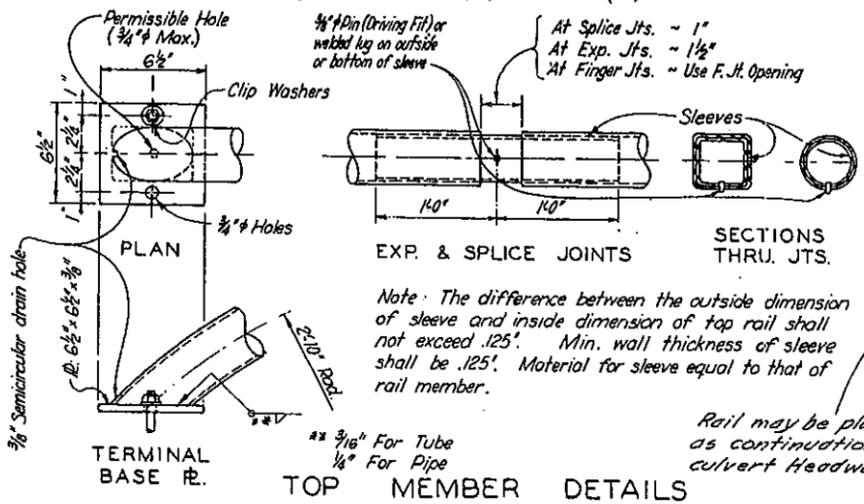


TERMINAL CONNECTOR

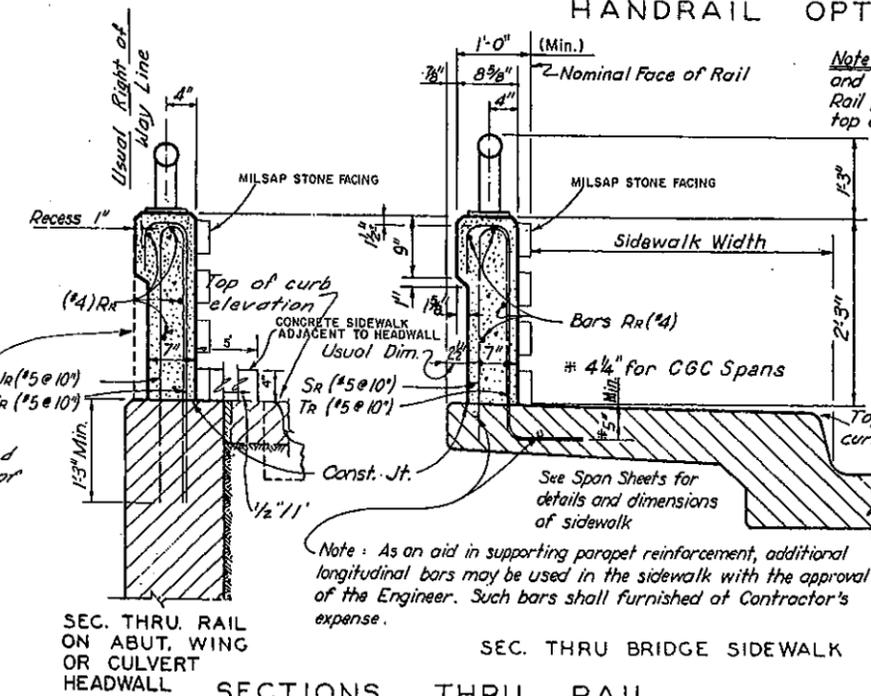
ROADWAY ELEVATION OF RAIL



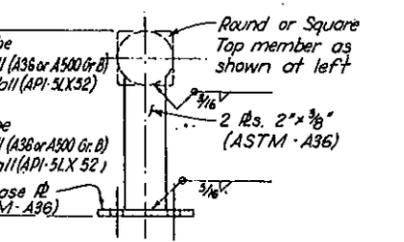
HANDRAIL OPTIONS



TOP MEMBER DETAILS



SECTIONS THRU RAIL



ANCHOR BOLT OPTIONS

(For Handrail) Threaded rods may be .557" minimum diameter with rolled threads.

APPROX. P.L.F. QUANTITIES*		
CONCRETE	C.Y.	0.053
REINF. STEEL	L.B.	13.89

*Note: P.L.F. Quantities shown are for concrete and reinforcing steel in railing wall above main slab, including portions of steel bars anchored in slab. These quantities are for Contractor's information only.

Whichever of the various handrail options is selected for use shall be used throughout the entire project. Handrail sections shall be made continuous over not less than two posts nor more than four (except at Abutments).

† Loss of one half the tolerance provided between bolts and holes, or between splice sleeves and rail members has been allowed in determining these controls.

‡ RAILS ON HORIZONTAL CURVES

Road to Face of Rail	Max. Chord Lgth.	Construction or Fabrication
Over 3200'	33'-0"	Construct wall to the required radius or in chords shown
Over 2000'-3200'	20'-0"	Construct wall to the required radius or in chords shown
Over 300'-2000'	10'-0"	Construct wall to the required radius
Thru. 300'	0	Construct wall to the required radius
Over 2800'	29'-0"	Furnish in straight rail panels
Over 1400'-2800'	14'-6"	Bent chord sections or fabricate to the required radius
Over 700'-1400'	7'-3"	Fabricate to the required radius
Thru. 700'	0	Fabricate to the required radius

NOTE: Parallel or Flared Wingwalls shall be constructed in conformance with standard details of the State Department of Highways and Public Transportation. Details for raising height of wingwalls should be included in the Plans. Also flared wingwalls must be adjusted for 3:1 channel slopes.

NOTE: SEE SD-14 FOR TYPE A, B, C & D BRIDGE RAIL DETAIL.

State Department of Highways and Public Transportation combination Rail Type C201 Standard Detail.

NCT STANDARD SPECIFICATIONS		S.A.S. 10-12-87	
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS STORM DRAINAGE			
CULVERT RAIL			
APPROVED	Alan L. Upchurch, P.E.		
DATE	JULY, 1996		SHEET SD-13



7-22-96



December 2, 1999

Re: Barrier Free Ramps

Ladies and Gentlemen:

The City of Plano is modifying its detail for the barrier-free ramps to meet the requirements of Sections 4.7 and 4.29 of the Texas Accessibility Standards and the Americans with Disabilities Act. These sections deal with differing texture and color contrast between curb ramps and sidewalks. We are attaching copies of our new details for your use.

These details will only apply to curb ramps installed in City rights-of-way. Ramps constructed on private property will be at the discretion of the owner and/or his architect to meet Federal and State requirements.

Projects receiving preliminary plat approval on or after December 6, 1999 will meet these requirements. Please call me at 972-941-7152 should you have any questions.

Sincerely,

Charles Davis, P.E.
Chief Engineer/Development

mm

enclosure

xc: Alan Upchurch, P.E., City Engineer/Director of Engineering
Gerald Cosgrove, P.E., Chief Engineer/CIP
Michael J. Rapplean, Public Works Operations Manager
Steve Spencer, Public Works Construction Coordinator
Engineers
Inspectors

Jeran Akers
Mayor

Rick Neudorff
Mayor Pro tem

Phil Dyer
Deputy Mayor Pro tem

Shep Stahl
Place 1

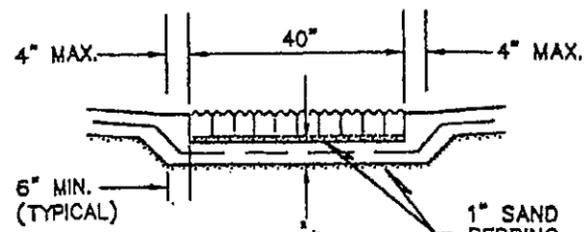
Pat Evans
Place 2

Steve Stovall
Place 5

John R. Roach, Jr.
Place 7

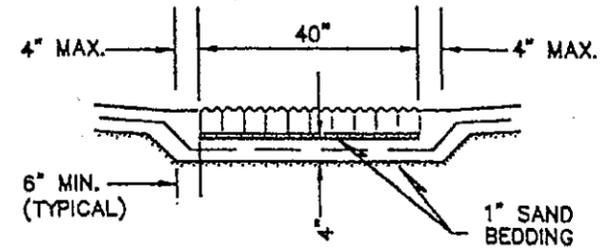
Ken Lambert
Place 8

•
Thomas H. Muehlenbeck
City Manager



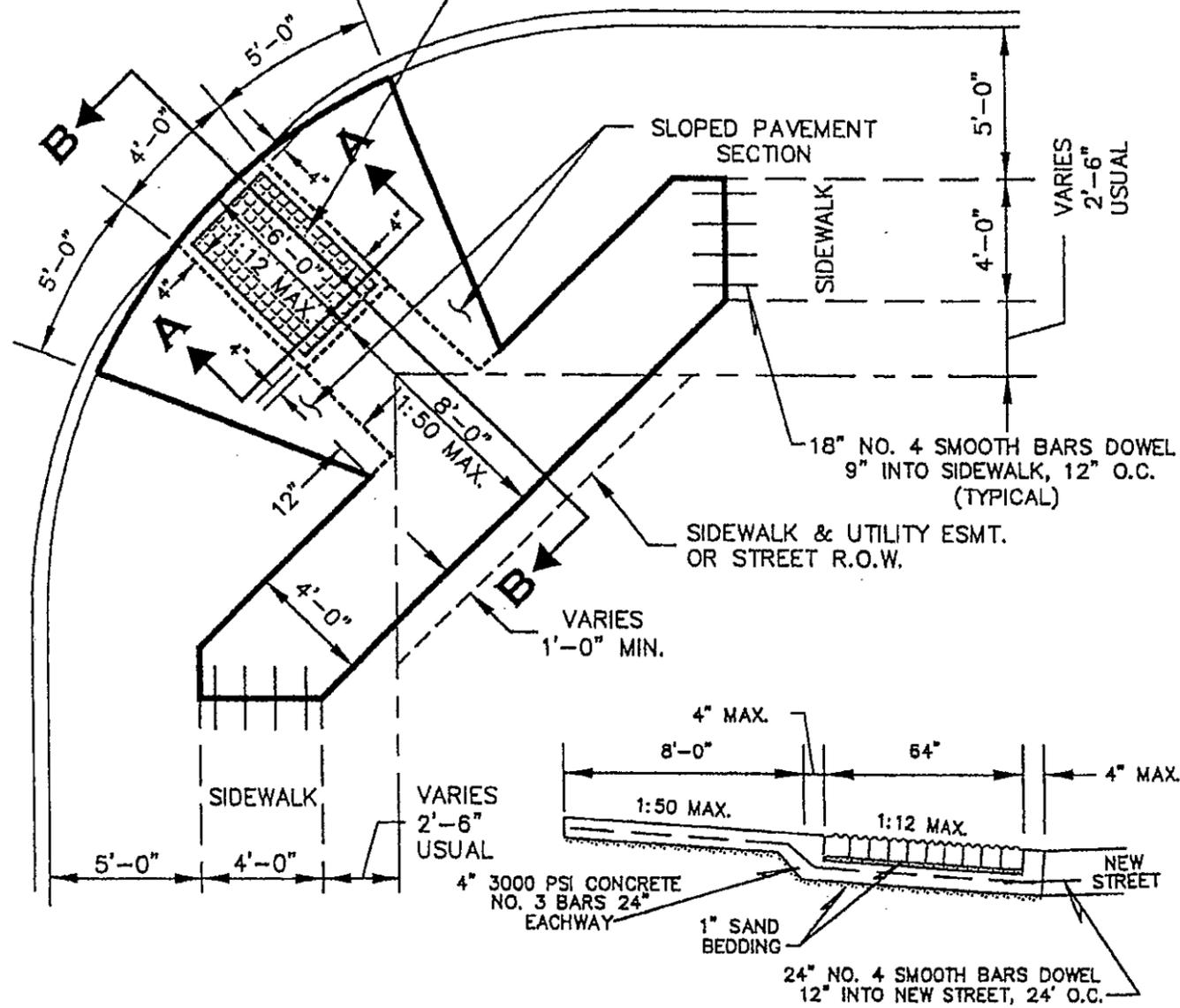
SECTION A-A

BRICK PAVERS SHALL BE 8"x 4"x 2-1/2" ANTIQUE RED PAVERS IN COLOR MEETING ADA SECTION 4.29.2. (WHITACRE GREER ANTIQUE RED SHADE NO. 32 OR APPROVED EQUAL). PAVERS SHALL HAVE DETECTABLE WARNING THAT CONSIST OF RAISED TRUNCATED DOMES WITH A DIA. OF 0.9 IN. (23MM), A HEIGHT OF NOMINAL 0.2 IN. (5MM) AND A CENTER TO CENTER SPACING OF NOMINAL 2.35 IN. (60MM).



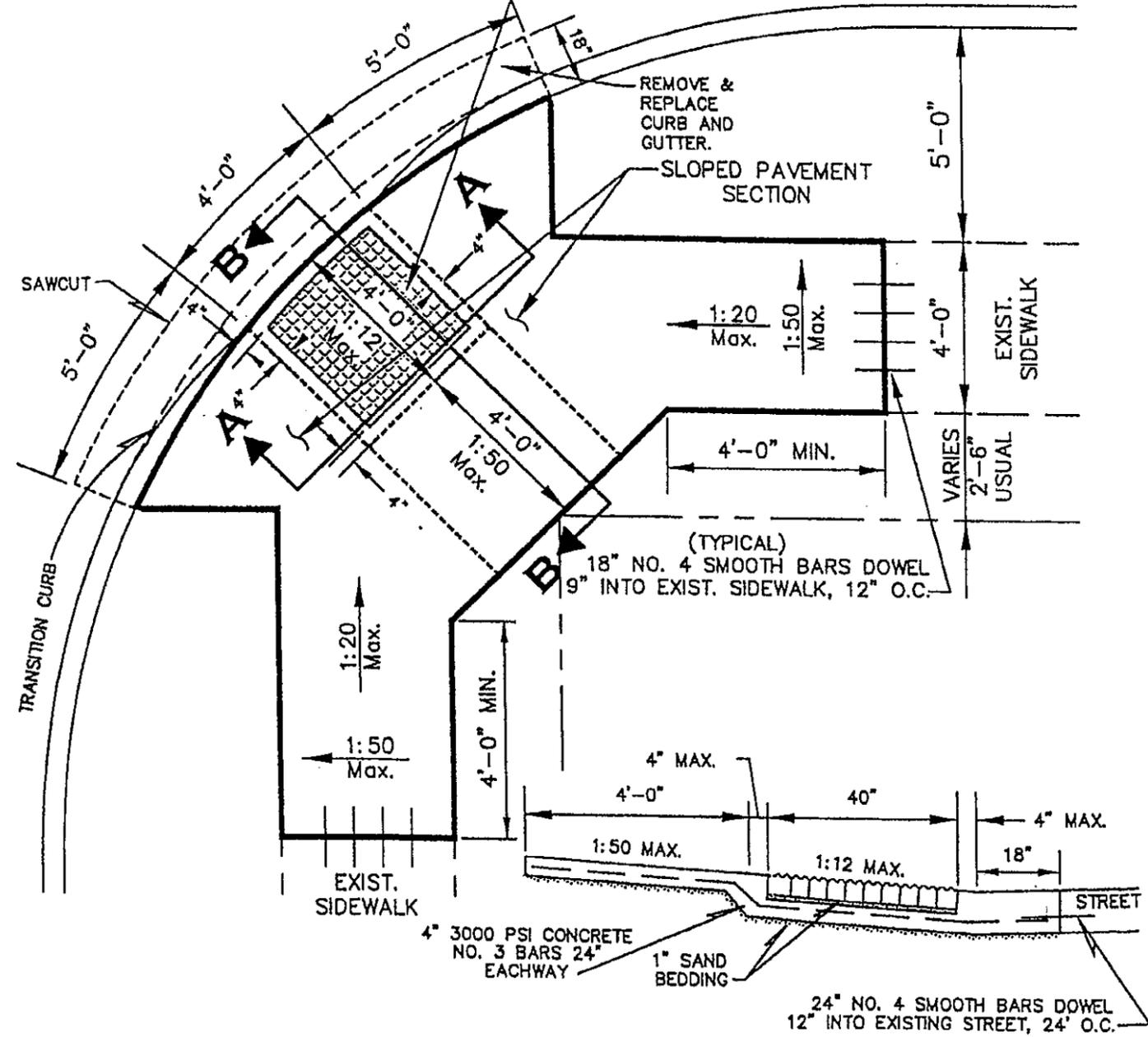
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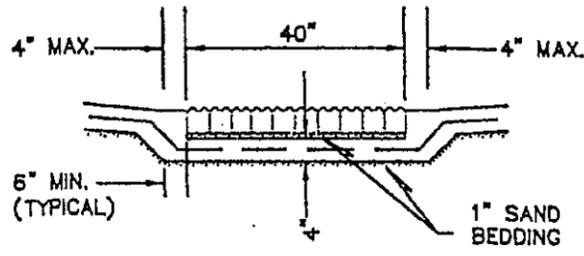
SECTION B-B

BARRIER FREE RAMP AT INTERSECTION



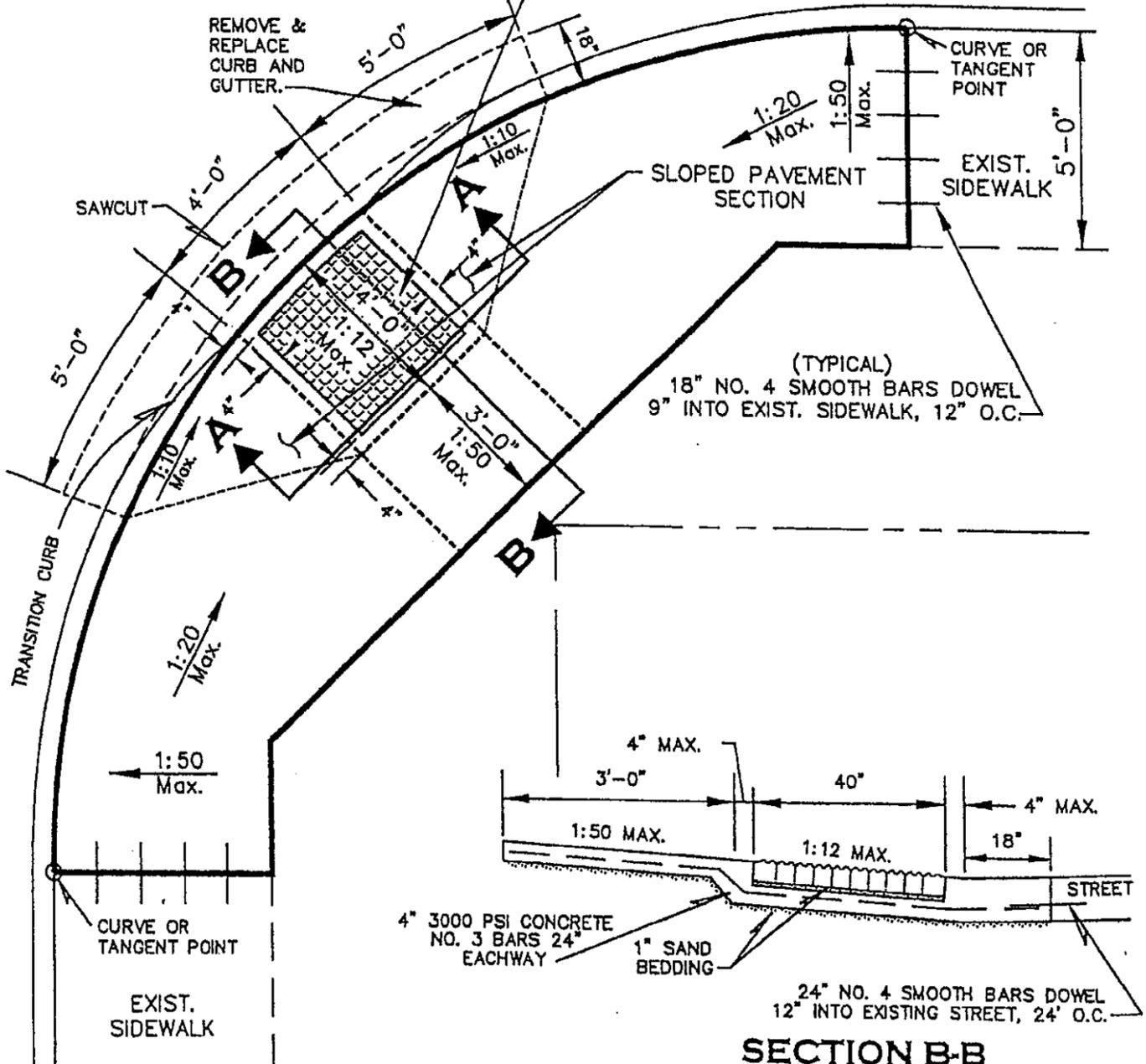
SECTION B-B

BARRIER FREE RAMP INSIDE R.O.W.



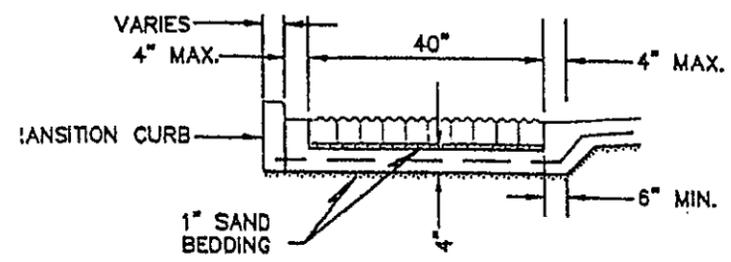
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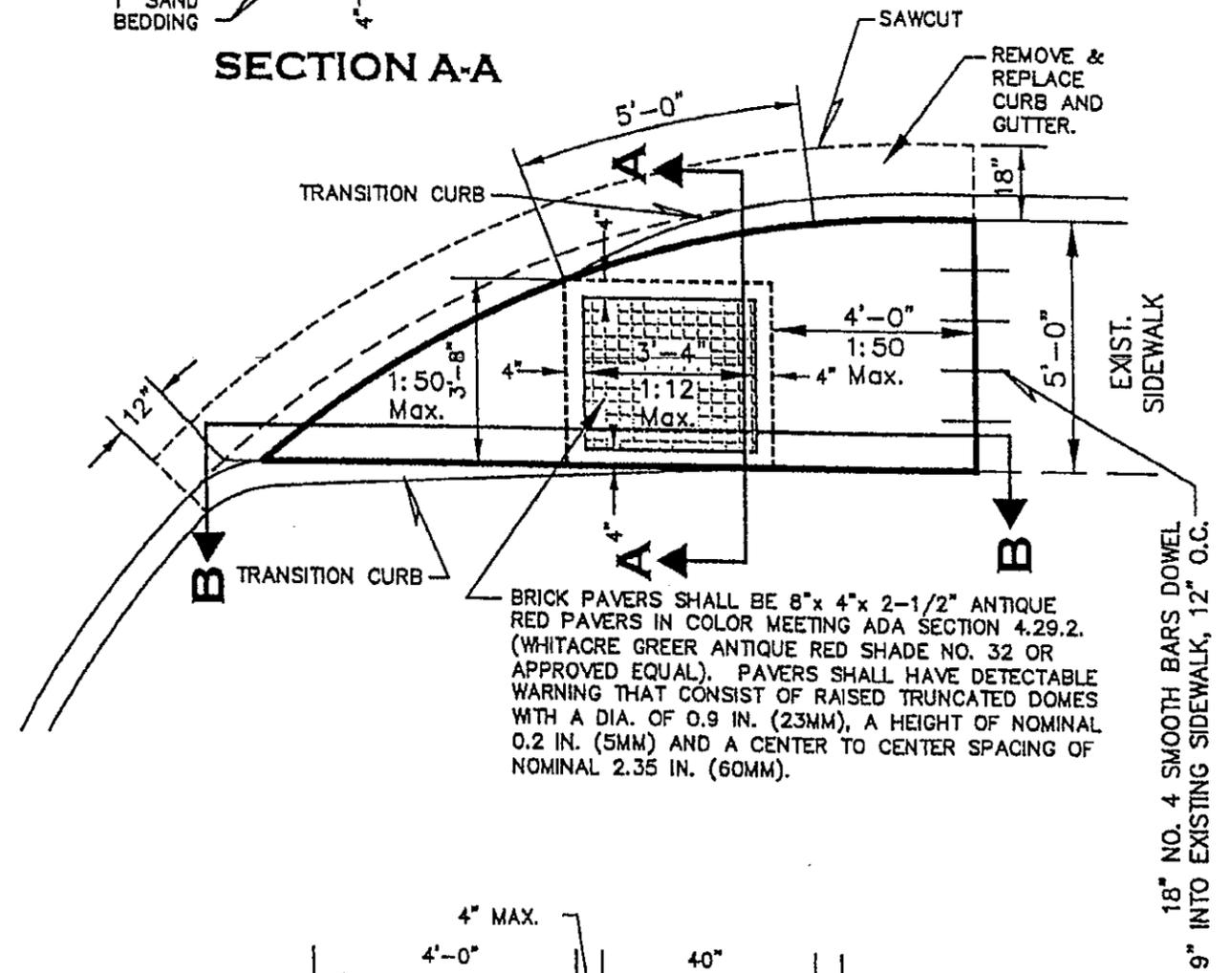
SECTION B-B

**BARRIER FREE RAMP
SIDEWALK AT CURB**



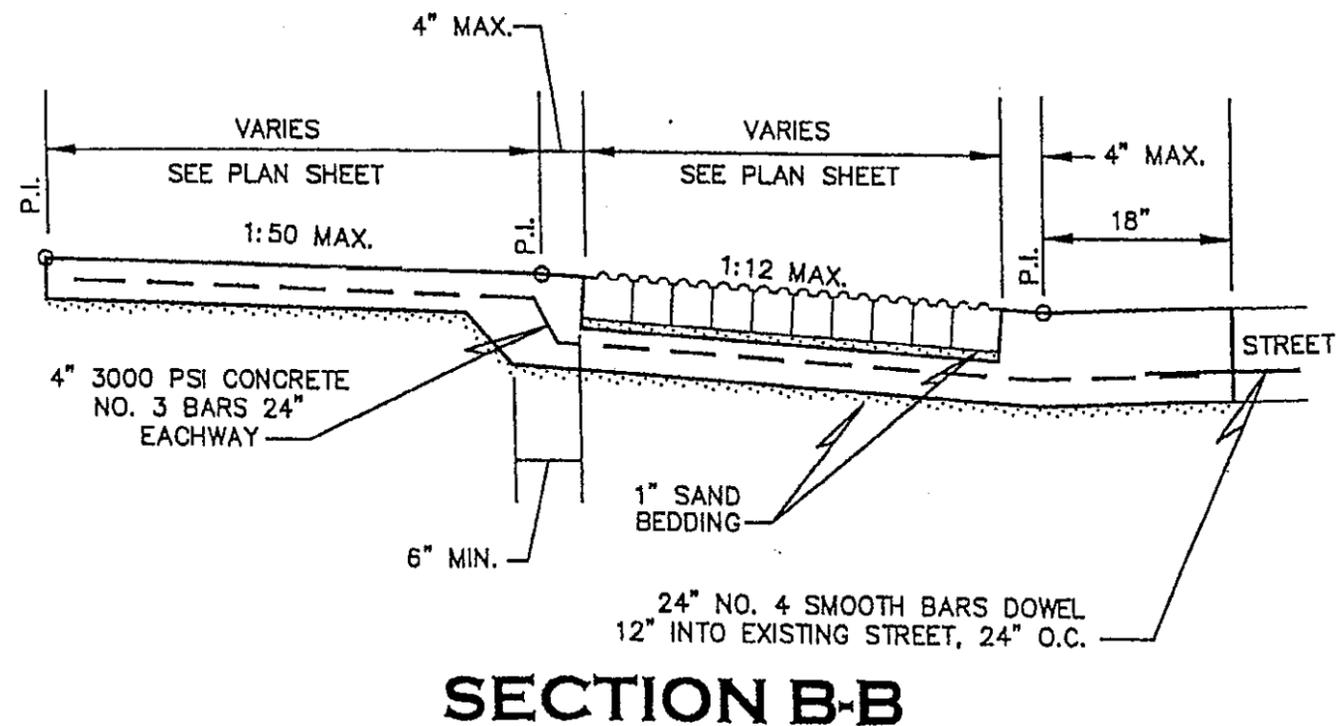
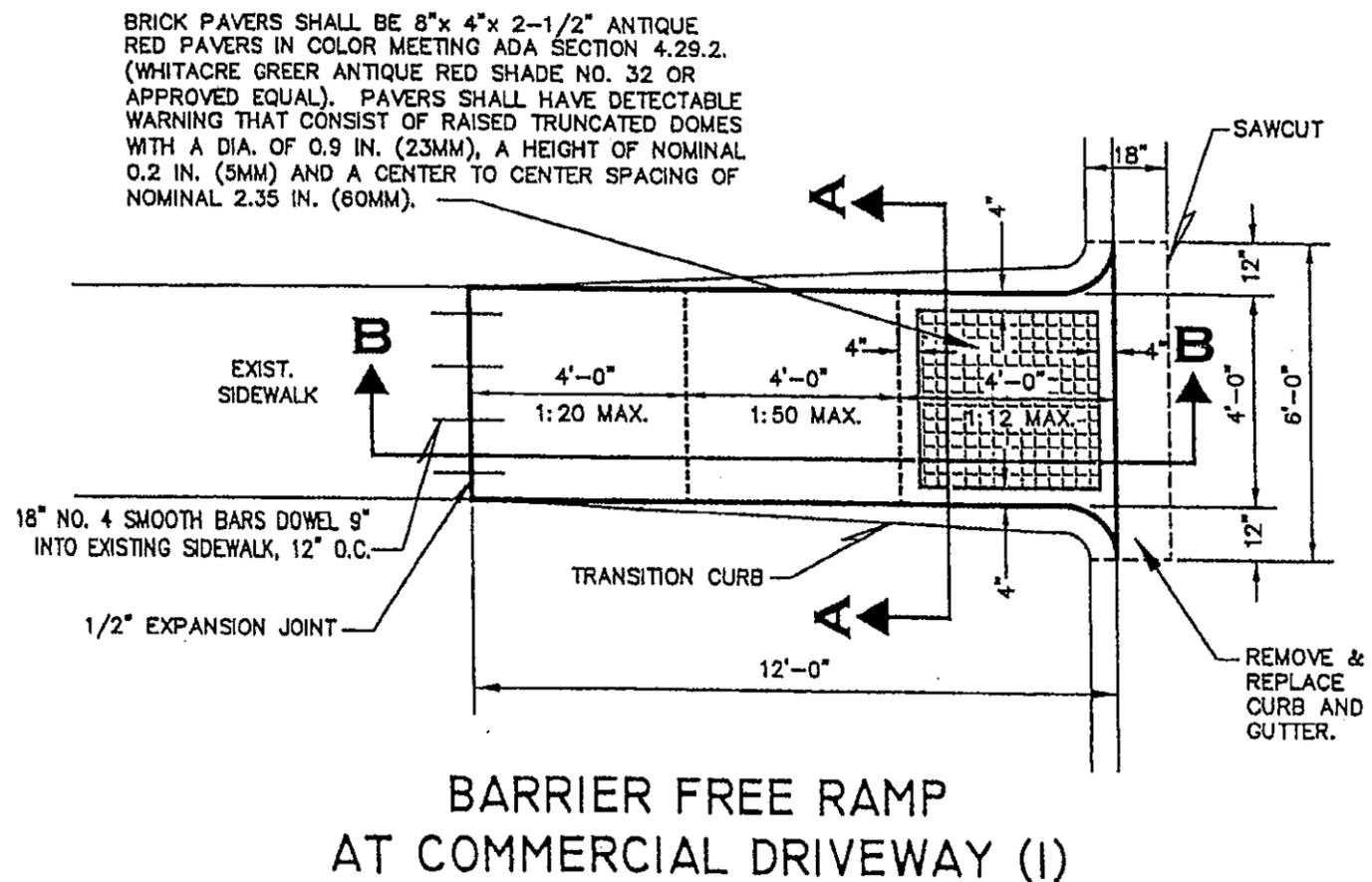
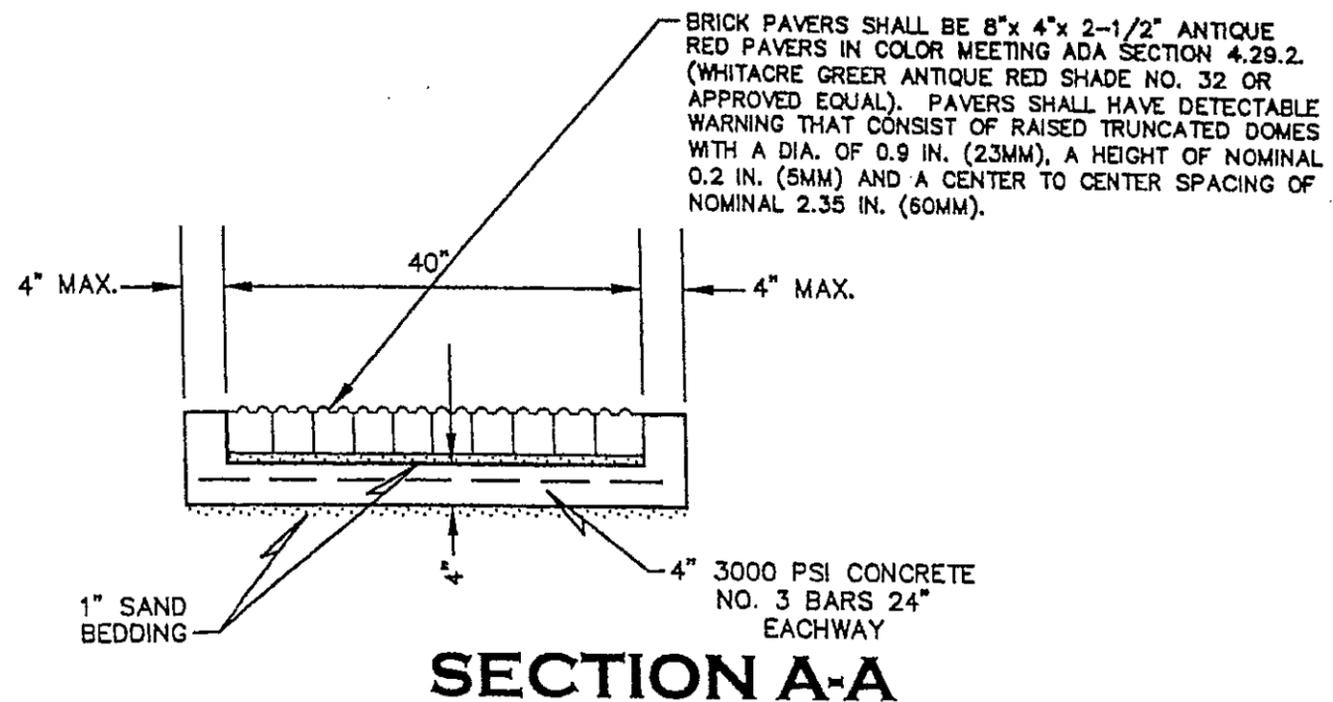
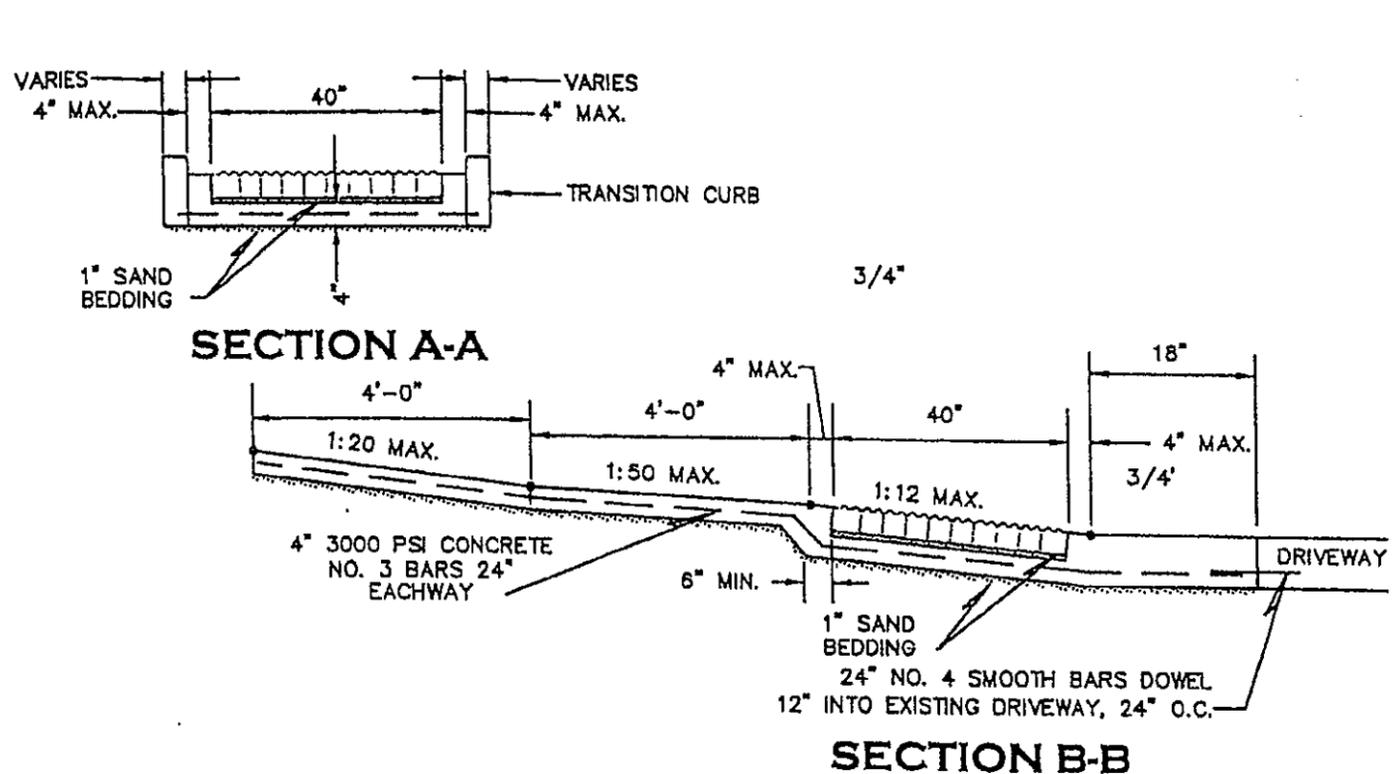
SECTION A-A

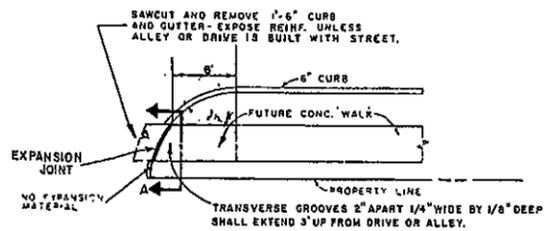
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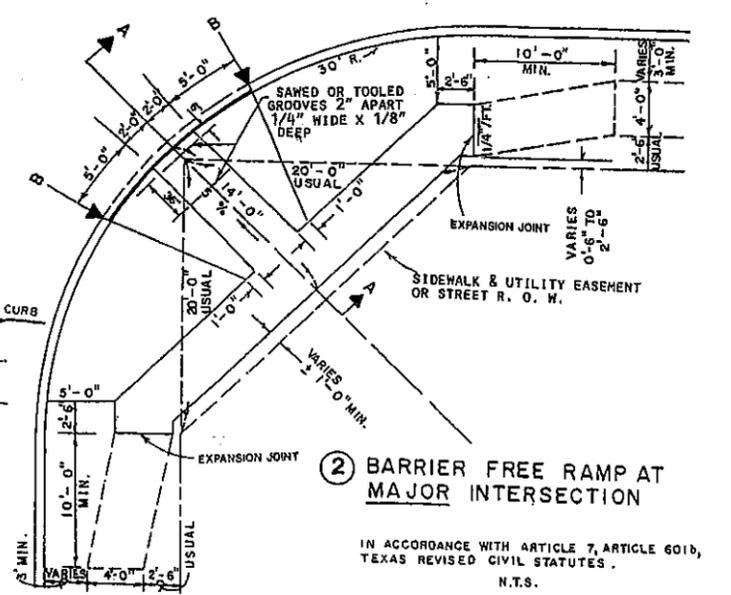
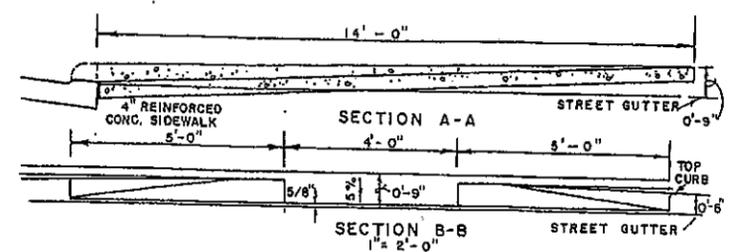
SECTION B-B

**BARRIER FREE RAMP
AT COMMERCIAL DRIVEWAY (2)**



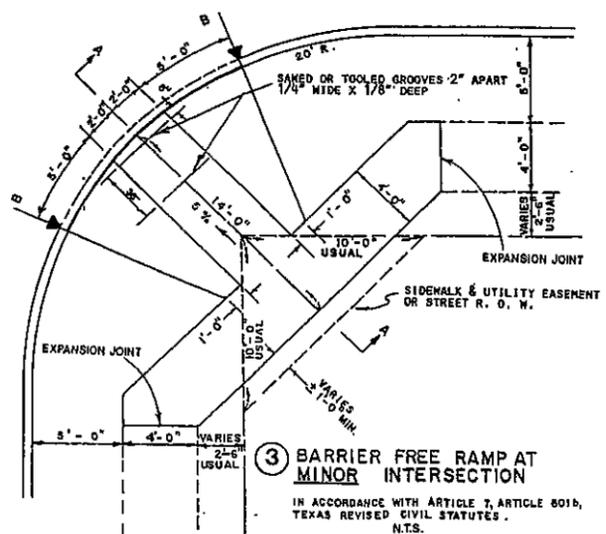
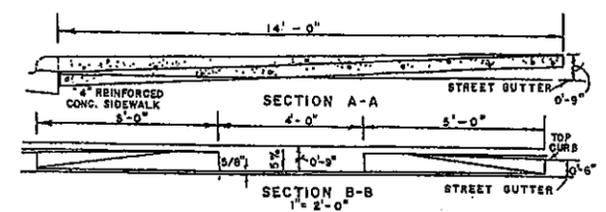


① BARRIER FREE RAMP AT DRIVE OR ALLEY



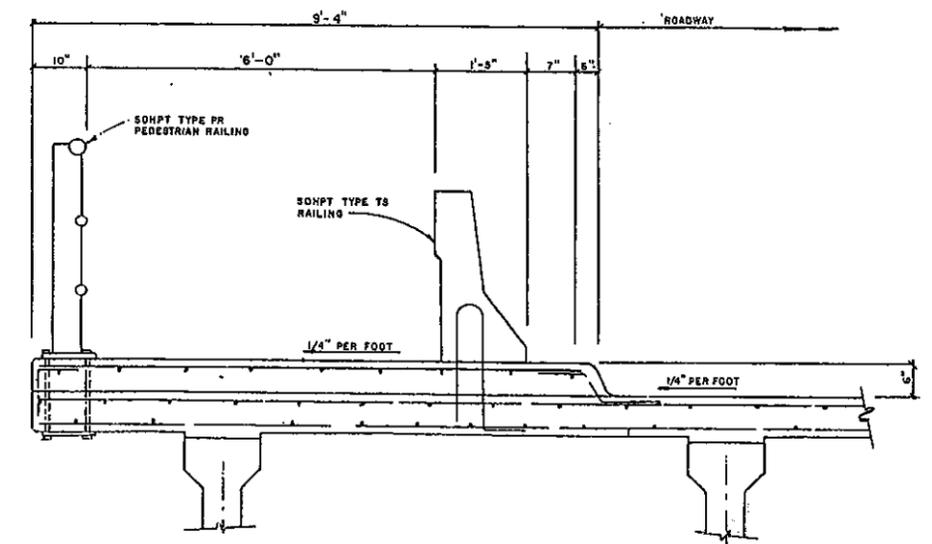
② BARRIER FREE RAMP AT MAJOR INTERSECTION

IN ACCORDANCE WITH ARTICLE 7, ARTICLE 601D, TEXAS REVISED CIVIL STATUTES. N.T.S.

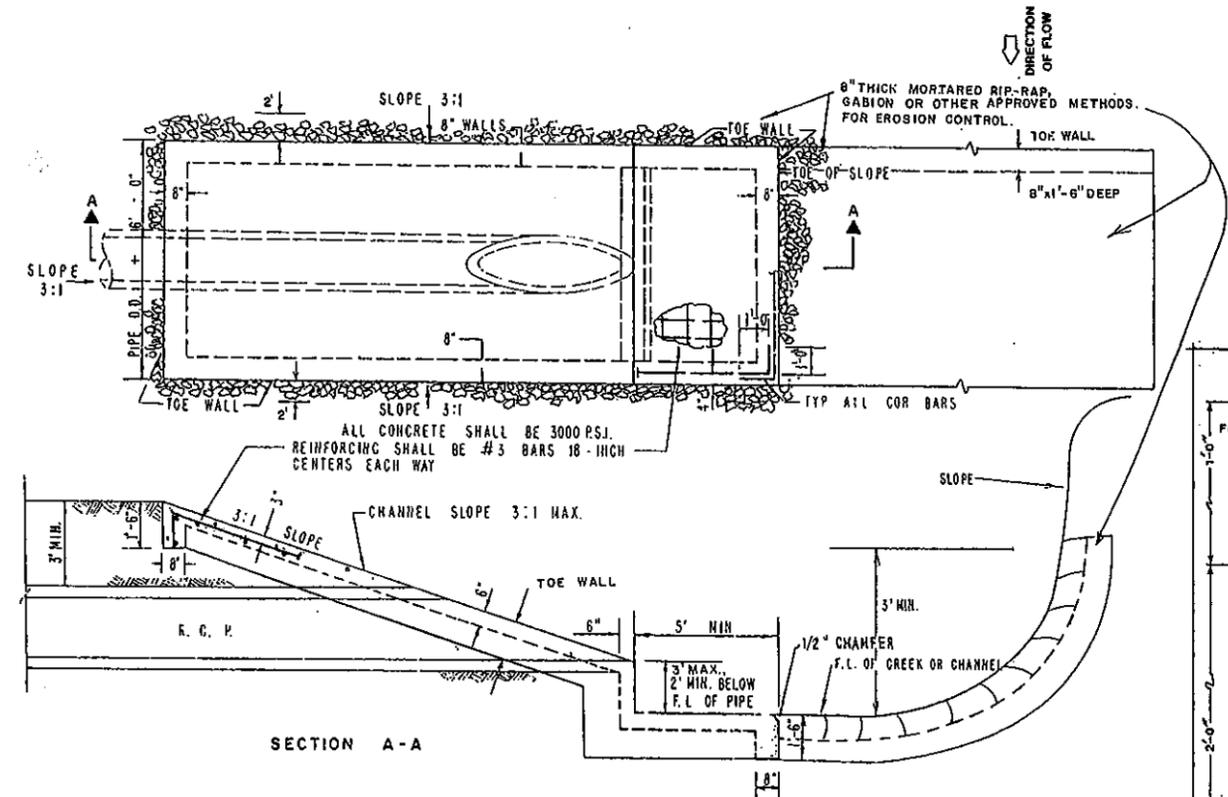


③ BARRIER FREE RAMP AT MINOR INTERSECTION

IN ACCORDANCE WITH ARTICLE 7, ARTICLE 601D, TEXAS REVISED CIVIL STATUTES. N.T.S.

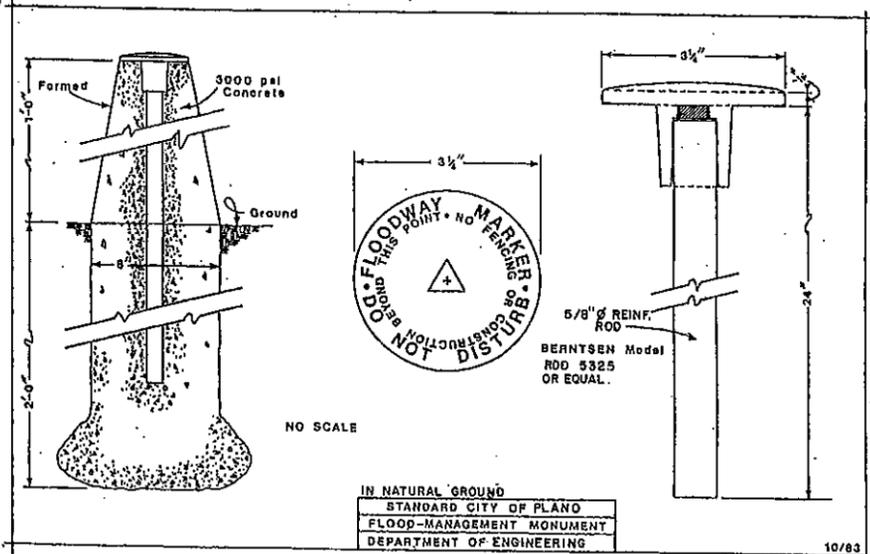


PEDESTRIAN & TRAFFIC RAILS FOR TYPE A, B, C & D BRIDGES

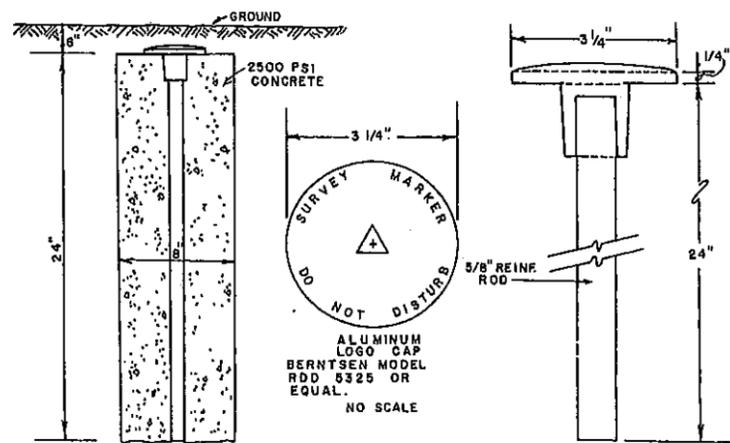


SECTION A-A

TYPE C HEADWALL
CAN BE MODIFIED WITH PERMISSION OF CITY ENGINEER



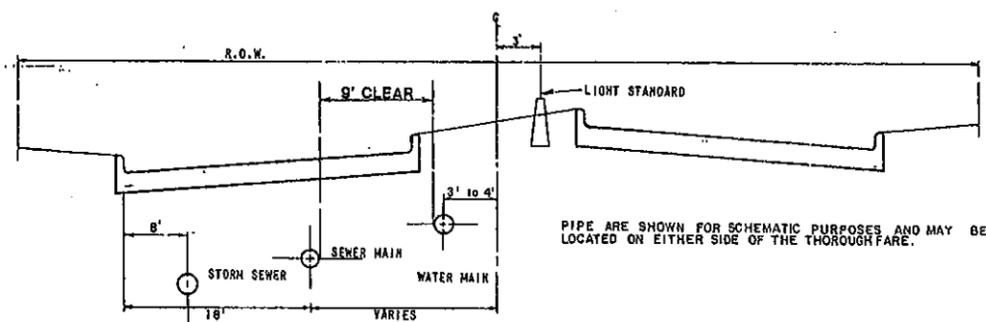
IN NATURAL GROUND
STANDARD CITY OF PLANO
FLOOD-MANAGEMENT MONUMENT
DEPARTMENT OF ENGINEERING



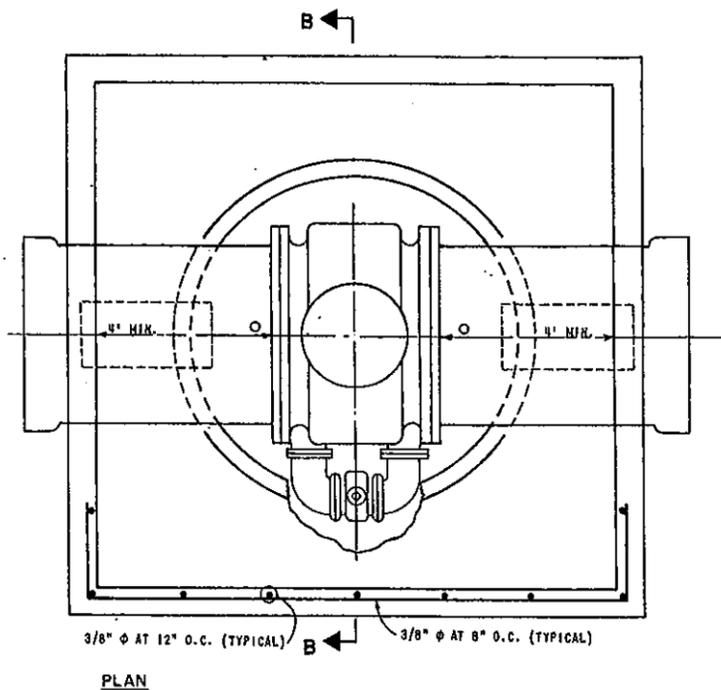
IN NATURAL GROUND
STANDARD CITY OF PLANO
CORNER SURVEY MONUMENT
DEPARTMENT OF ENGINEERING 9-90



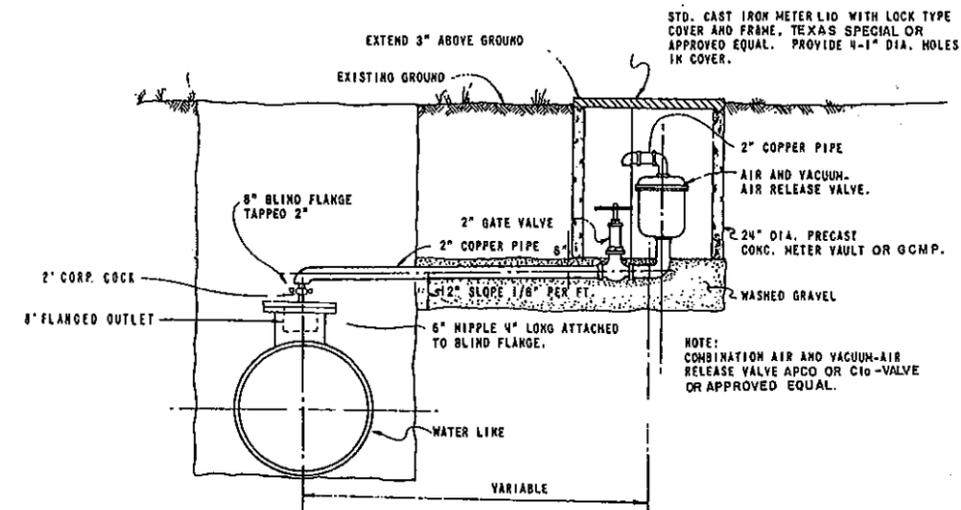
NCT STANDARD SPECIFICATIONS		S.A.S. 10-12-87	
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS STORM SEWER			
HEADWALLS, BRIDGE RAILS AND BARRIER FREE RAMPS			
APPROVED		ALAN L. UPCHURCH, P.E.	
DATE: JULY, 1996		SHEET SD-14	



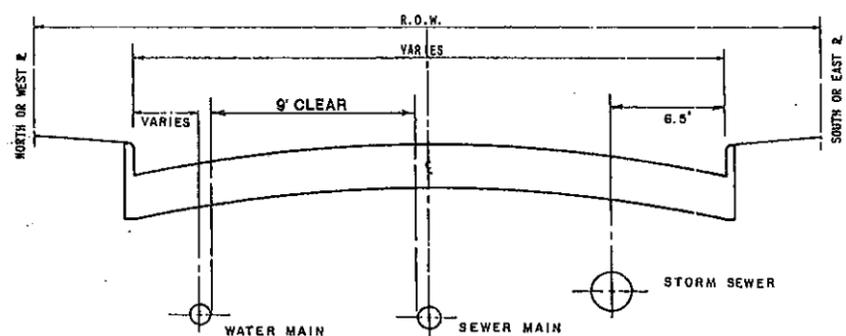
TYPICAL LOCATION UTILITIES
STRAIGHT CROWN STREETS



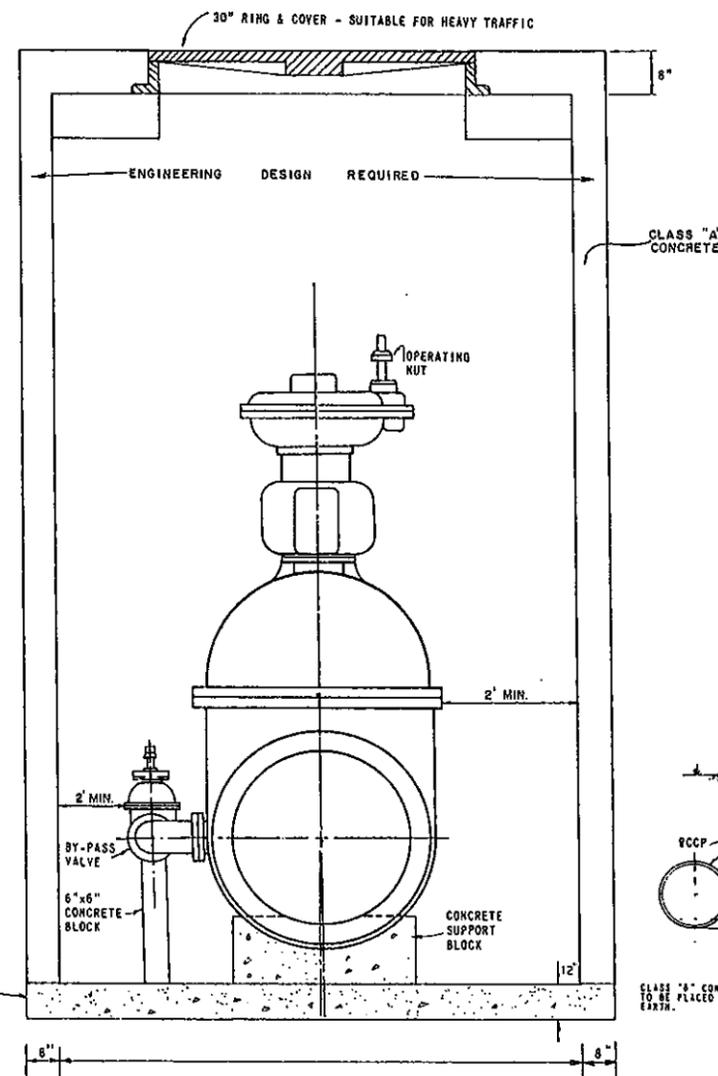
PLAN



TYPICAL AIR AND VACUUM-AIR RELEASE
VALVE INSTALLATION

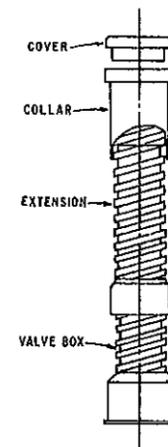


TYPICAL LOCATION UTILITIES
PARABOLIC CROWN STREET

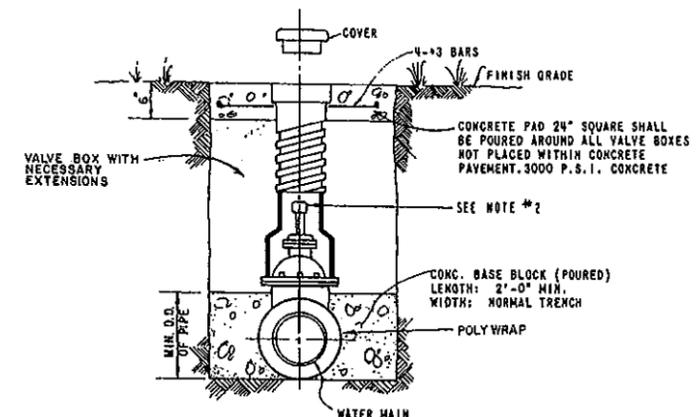


SECTION B-B

VERTICAL VALVE INSTALLATION
FOR 18", 20" & 24"



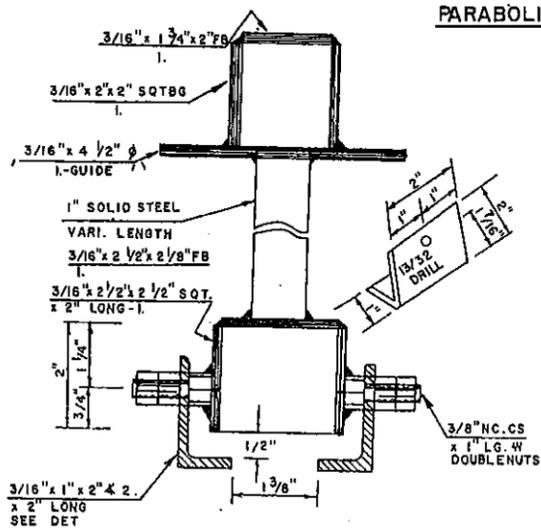
VALVE BOX WITH EXTENSION



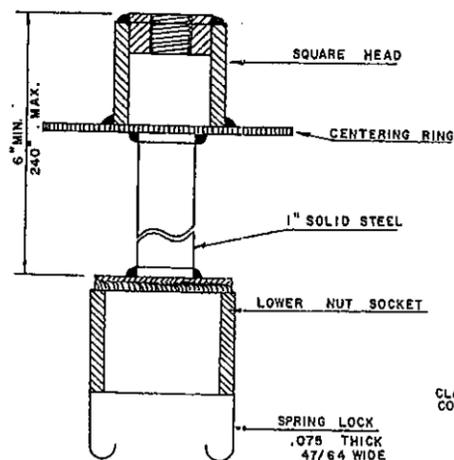
NOTE:

- 4"-12" R/S GATE VALVES SHALL BE IN ACCORDANCE WITH ANWA STANDARD C-309.
- A PERMANENTLY ATTACHED VALVE EXTENSION STEM SHALL BE REQUIRED FOR ANY VALVE THATS OPERATING NUT IS LOCATED IN EXCESS OF 4 FEET BELOW THE TOP OF VALVE BOX. THIS EXTENSION SHALL BE OF SUFFICIENT LENGTH TO INSURE THAT ITS TOP IS WITHIN 4" OF VALVE BOX LID.
- DUCTILE IRON OR C-900 PVC PIPE SHALL BE USED FOR VALVE STACKS WITH VALVE BOX CASTING.
- BLUE DOT (S) ON NEAREST CURB FACE TO VALVE.

TYPICAL VALVE SETTING AND BOX

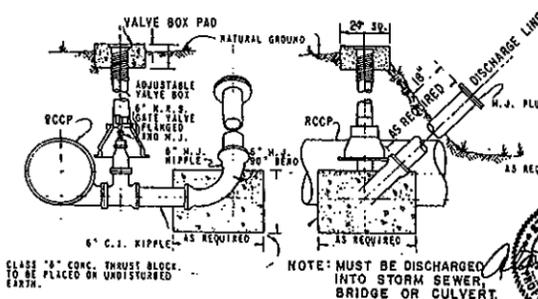


TYPE-B
VALVE EXTENSION



SPRING LOCK
VALVE EXTENSION

NOTE: HORIZONTAL VALVES MUST BE
INSTALLED IN CONCRETE VAULTS.
DESIGN MUST BE SUBMITTED FOR
APPROVAL.



BLOW OFF VALVE DETAIL



NCT STANDARD SPECIFICATIONS		S.A.S. 10-16-87	
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS WATER			
VALVES			
APPROVED	<i>Alan L. Upchurch</i> ALAN L. UPCHURCH, P.E.		
DATE: JULY, 1996	SHEET SD-15		

SPECIFICATIONS FOR WATER PIPE
POLYVINYL CHLORIDE (P.V.C.) WATER PIPE

UNPLASTICIZED POLYVINYL CHLORIDE (PVC) WATER SHALL MEET OR EXCEED REQUIREMENTS OF AWWA C900. PVC PIPE WITH CAST IRON OUTSIDE DIMENSIONS, PIPE SHALL BE LISTED BY UNDERWRITER LABORATORIES AND SHALL BE APPROVED FOR USE IN CITIES AND TOWNS OF THE STATE OF TEXAS BY THE STATE BOARD OF INSURANCE.

PVC WATER PIPE SHALL BE FURNISHED WITH A RUBBER RING AT EACH JOINT AND IN INTEGRAL THICKENED BELL AS A PART OF EACH JOINT THE PIPE CLASS SHALL BE MINIMUM CLASS 200 OR 16 FOR 8-INCH PIPE AND CLASS 150 OR 18 FOR 8-INCH AND LARGER PIPE WHICH REFERS TO THE MAXIMUM HYDROSTATIC PRESSURE IN NORMAL OPERATIONS. LAYING LENGTHS SHALL BE 20 FEET. PIPE AND FITTING MUST BE ASSEMBLED WITH A NONTOXIC LUBRICANT.

FITTINGS FOR PVC WATER PIPE SHALL BE GRAY IRON OR DUCTILE IRON OF THE BELL AND SPIGOT OR MECHANICAL JOINT TYPE AND SHALL BE CLASS 250 IN ACCORDANCE WITH AWWA C110-77 (ANSI A21.10).

UNLESS OTHERWISE SPECIFIED ON PLANS OR SHOWN IN PROFILES, PVC WATER PIPE SHALL BE INSTALLED TO CLEAR ALL UTILITY LINES AND SHALL HAVE THE FOLLOWING MINIMUM COVER:

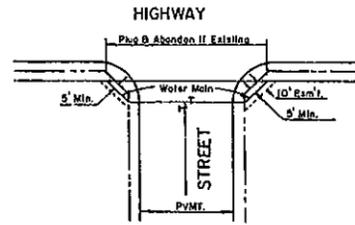
6" INCH AND SMALLER 42" COVER AND 8 INCH PIPE - 48" COVER
10" INCH AND 12 INCH PIPE - 54" TO 60" COVER.

NORMAL SIZE	PIPE DIMENSIONS O.D.	OR 18 MIN. WALL THICKNESS
6	8.90	0.385
8	9.09	0.503
10	11.10	0.617
12	13.20	1.733

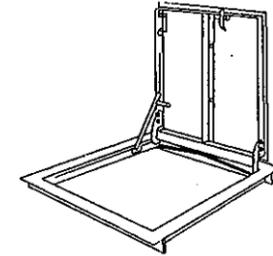
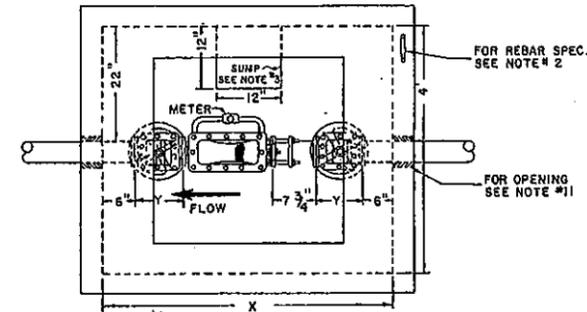
ROCKWELL 317 NYLON COATED DOUBLE STRAP STAINLESS STEEL SADDLES SHALL BE USED FOR MAKING 2" OR SMALLER TAPS.

GENERAL NOTES

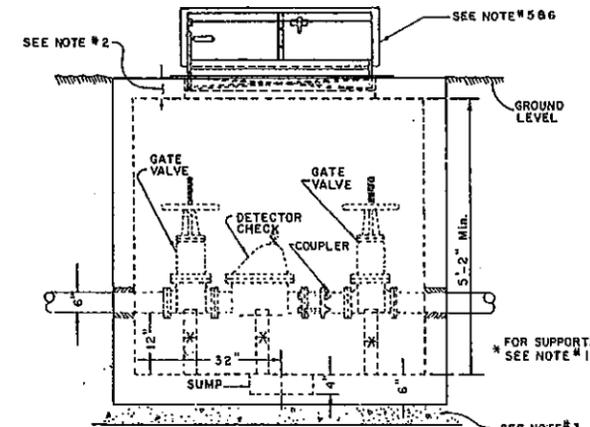
- ALL WATER LINES SHALL BE AS SPECIFIED IN THE STANDARD SPECIFICATIONS AND OR SPECIAL PROVISIONS.
- ALL CAST IRON FITTINGS SHALL BE MECHANICAL JOINT OR SLIP JOINT FOR C.I. PIPE OR MECHANICAL JOINT, SLIP JOINT OR BELL & SPIGOT FOR PVC WATER PIPE.
- ALL WATER MAINS SHALL HAVE THE FOLLOWING MINIMUM COVER OR SUFFICIENT COVER TO CLEAR OTHER UTILITIES:
6" AND SMALLER - 42" COVER
10" AND 12" PIPE - 54" TO 60" COVER
8" - 48" COVER
- REMOVE ALL BLEEDER LINES UPON COMPLETION OF TESTING.
- ALL WATER MAINS SHALL BE SWABBED BY THE "POLY-PIG METHOD"



**TYPICAL LOCATION
OF WATER MAIN AT HIGHWAY**

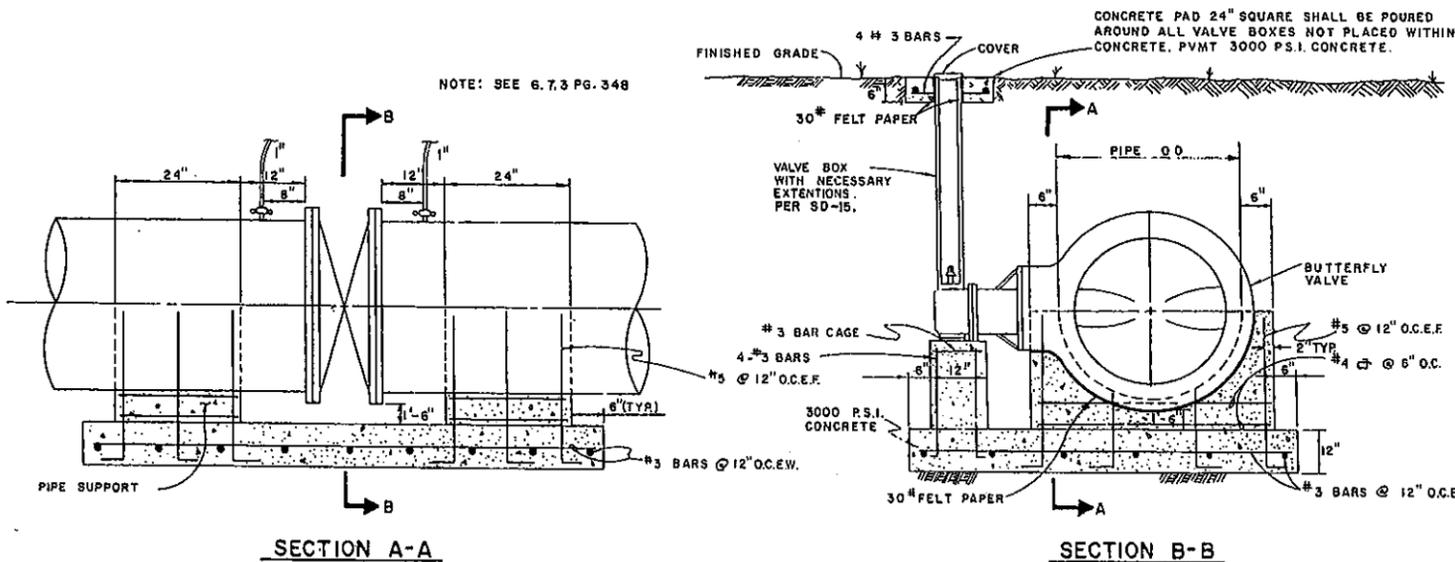


BILCO LID



DETECTOR CHECK VAULT		
DETECTOR SIZE	"X"	"Y"
4"	4'-7"	9"
6"	5'-4"	10 1/2"
8"	5'-6"	11 1/2"

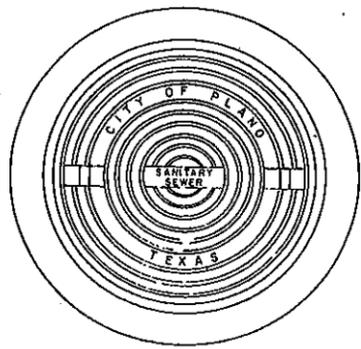
- DETECTOR CHECK VAULT SPECIFICATIONS**
- NOTIFY THE UTILITY OPERATIONS DEPARTMENT (964-4160) PRIOR TO CONSTRUCTION OF METER VAULT OR BY-PASS ASSEMBLY.
 - THE VAULT CAN BE EITHER POURED IN PLACE OR PREFABRICATED. ALL WALLS, EITHER POURED IN PLACE OR PREFABRICATED, SHALL BE A MONOLITHIC POUR. NO BEAMS OR EXTENSIONS WILL BE ALLOWED. CONCRETE SHALL BE 8" THICK - 3,000 P.S.I., REINFORCED WITH #4 STEEL BARS ON 12" CENTERS EACH WAY ON POURED IN-PLACE VAULTS. PREFABRICATED VAULTS SHALL BE 4" THICK - 4,800 P.S.I. CONCRETE, REINFORCED WITH #4 STEEL BARS ON 8" CENTERS EACH WAY. THESE ARE MINIMUM SPECIFICATIONS.
 - THE BOTTOM OF THE VAULT SHALL BE 8" THICK - 3,000 P.S.I. CONCRETE, REINFORCED WITH #4 STEEL BARS ON 12" CENTERS BOTH WAYS. A 4" DEEP X 12" DIAMETER SUMP SHALL BE INSTALLED TO ONE SIDE AND IN EITHER CORNER OF THE BOTTOM SLAB. A 4" CUSHION OF SAND SHALL BE INSTALLED UNDER THE SLAB. IF A PRE-CAST VAULT IS TO BE USED, A LAYER OF RAM-NEK SHALL BE INSTALLED BETWEEN THE WALLS AND BOTTOM SLAB.
 - THE VAULT SHALL NOT BE INSTALLED IN ANY DRIVE OR PARKING AREAS AND MUST BE LOCATED IN A UTILITY EASEMENT DEDICATED TO THE CITY OF PLANO.
 - THE VAULT LID SHALL BE A BILCO TYPE Q-4 LEAF DESIGN LID. ANGLE FRAME IS 1/4" STEEL WITH STRAP ANCHORS BOLTED TO THE EXTERIOR. THE LEAF IS 1/4" STEEL DIAMOND PATTERN PLATE, PIVOTING ON TORSION BARS FOR EASY OPERATIONS. THE MINIMUM LIVE LOAD CAPACITY IS 150 LBS. PER SQUARE FOOT. THE LID SIZE SHALL BE 3' X 3'.
 - LID SHALL BE PAINTED WITH 42-38 TNEIEG DIFFUSED ALUMINUM PAINT OR APPROVED EQUAL.
 - ALL PIPING INSIDE THE VAULT SHALL BE DUCTILE IRON WITH FLANGED FITTINGS. THE OUTSIDE DIMENSION OF THE PIPING SHALL BE WITHIN THE FOLLOWING RANGES: 3" PIPE - 3.74 TO 3.88; 4" PIPE - 4.74 TO 4.80; 6" PIPE - 6.81 TO 6.88; 8" PIPE - 8.93 TO 9.20; 10" PIPE - 11.04 TO 11.61. VARIATION FROM THESE DIMENSIONS WILL RESULT IN THE VAULT BEING REJECTED.
 - THE DETECTOR CHECK VALVE SHALL BE A MUELLER A-2130-8, EQUIPPED WITH AN ALL BRASS AND COPPER, IRON PIPE THREADS TRIM PACKAGE, WITH VALVES ON BOTH ENDS. THE SIZE OF THE TRIM PACKAGE IS AS FOLLOWS FOR EACH SIZE: 3" THROUGH 6" DETECTOR CHECK REQUIRES A 1" TRIM PACKAGE; 10" DETECTOR CHECK REQUIRES A 2" TRIM PACKAGE. THE METER FOR THE TRIM PACKAGE AND THE FLANGED ADAPTER COUPLING WILL BE FURNISHED BY THE CITY AT THE CONTRACTOR'S EXPENSE.
 - THE GATE VALVES SHALL BE MUELLER NO. A-2074-S OUTSIDE STEM AND YOKE AND SHALL HAVE AN UNDERWRITERS LABORATORY LISTING.
 - ALL PIPING INSIDE THE VAULT AND THE VAULT ITSELF HAS TO BE INSPECTED AND APPROVED BY THE UTILITY OPERATIONS DEPARTMENT.
 - CONTRACTOR SHALL HAVE A CHOICE OF EITHER HAVING A LINK SEAL WALL SLEEVE MODEL WS-8-32-S-8 FOR 4" PIPE; MODEL WS-10-36-S-8 FOR 6" PIPE; MODEL WS-12-37-S-8 FOR 8" PIPE; CAST IN THE WALL OF THE VAULT. THE ABOVE MENTIONED WALL SLEEVES SHALL USE THE FOLLOWING LINK SEALS: 6" - #8-400-C FOR A 4" PIPE; 7" - #8-400-C FOR A 6" PIPE; 8" - #8-400-C FOR A 8" PIPE. THE CONTRACTOR MAY HAVE THE WALL CORED BEFORE INSTALLATION OF VAULT AND PIPING. IF THE WALL IS CORED, THE FOLLOWING SPECIFICATION SHALL BE USED: FOR 4" PIPE CORE SIZE SHALL BE 6" AND USE 6" - #8-400-C LINK SEALS; FOR 6" PIPE CORE SIZE SHALL BE 10" AND USE 7" - #8-400-C LINK SEALS; FOR 8" PIPE CORE SIZE SHALL BE 12" AND USE 9" - #8-400-C LINK SEALS. BREAKING OF THE WALL WITH A JACKHAMMER OR USING PRE-CAST KNOCKOUT PANELS IS NOT PERMITTED.
 - THERE WILL BE A CONCRETE SUPPORT UNDER EACH VALVE AND THE DETECTOR CHECK.
 - MINIMUM DEPTH OF ANY VAULT SHALL BE 5'-2".
 - IF ELEVATION ADJUSTMENTS ARE NEEDED ON THE ACCESS LID CONTRACTOR SHALL CONTACT UTILITY OPERATIONS DEPARTMENT FOR APPROVAL PRIOR TO IMPLEMENTATION OF ADJUSTMENT.



BUTTERFLY VALVE DETAIL
NOT TO SCALE
APPROVED BUTTERFLY VALVES
I. MUELLER

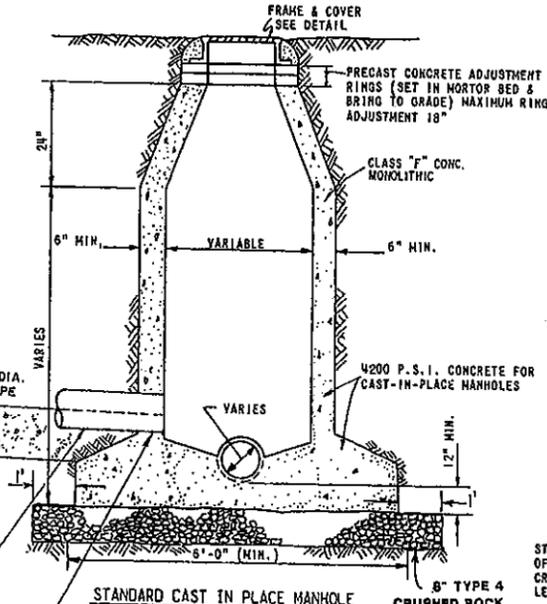
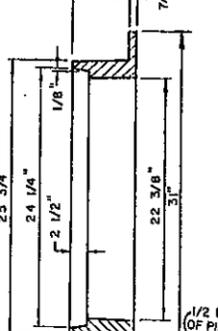
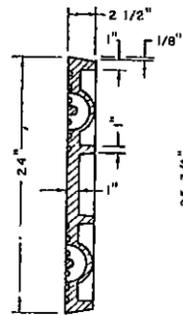


NCT STANDARD SPECIFICATIONS		S.A.S. 10-13-87
NO.	REVISION	BY DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING		
STANDARD CONSTRUCTION DETAILS WATER		
WATER PIPE DETAILS		
APPROVED	<i>Alan L. Upchurch</i> ALAN L. UPCHURCH, P.E.	
DATE: JULY, 1996		SHEET SD-18



MANHOLE RING AND COVER

PROVIDE WITH PICK SLOTS ONLY B AND H 400-24 OR EQUAL



STANDARD CAST IN PLACE MANHOLE

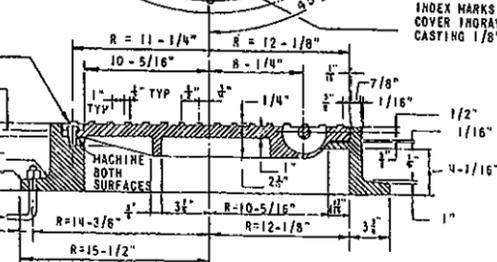
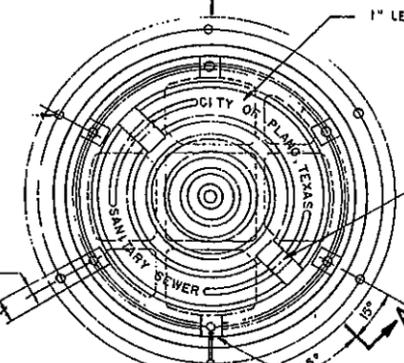
CAST-IN-PLACE NOTES:

- KEYWAYS REQUIRED FOR ALL CONSTRUCTION JOINTS.
- P.V.C. WATER STOP REQUIRED FOR ALL JOINTS IN LOWER 4'-0" OF MANHOLES.
- CONCRETE SHALL BE CLASS F P.S.I. (4200 P.S.I.)

GENERAL NOTES

- All Sanitary Sewer Pipe Shall Be Vitriified Clay Or PVC SDR-35 Pipe. Other Pipes Shall Be Subject To Approval By The City Engineer
- Sanitary Sewer Pipe Joints Shall Conform To Current ASTM Designations For Vitriified Clay Pipe And For PVC Pipe.
- All Sanitary Sewer Laterals Shall Include 4" Tee Wye Bend, Pipe And Stopper Installed 10' Feet Downstream From The Water Main Service On Each Lot, Unless Otherwise Indicated On Plans. 6" Laterals Require M.H. At Main Sewer Pipe
- Unless Otherwise Noted, All Material And Construction Shall Conform To The Standard Specifications And/or Special Provisions.
- In The Event An Item Is Not Covered In The City Of Plano Specifications, The City Engineer Decision Shall Apply.
- Drop Manhole Required For Connection Of 18" Or Greater.
- All Manholes Shall Be Vacuum Tested In Accordance With The Specs.
- All Pipes Entering & Leaving A Manhole Shall Be Cradled For A Distance Of 5' Outside Of M.H.

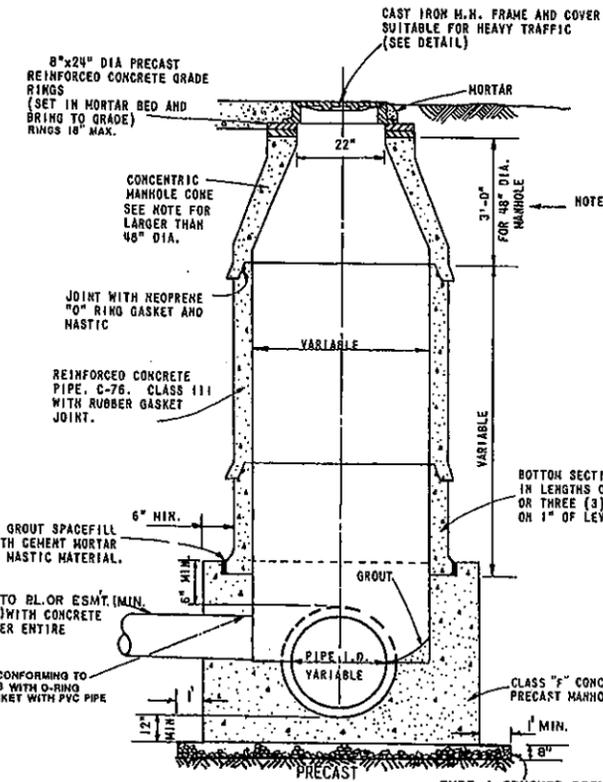
MANHOLE NOTES CONT'D. ON SD-20



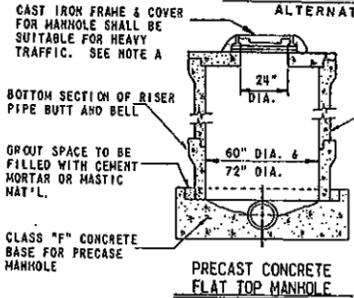
SECTION A-A

1" DIA. STEEL ROD MATERIAL PER ITEM 2.11.5(b)(2) RING & COVER MATERIAL PER ITEM 2.11.5(c)

PRESSURE TYPE MANHOLE RING AND COVER

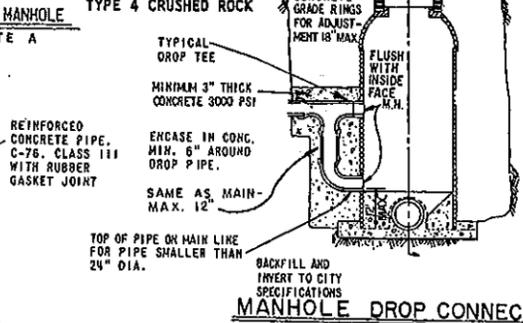


CONCRETE PIPE MANHOLE

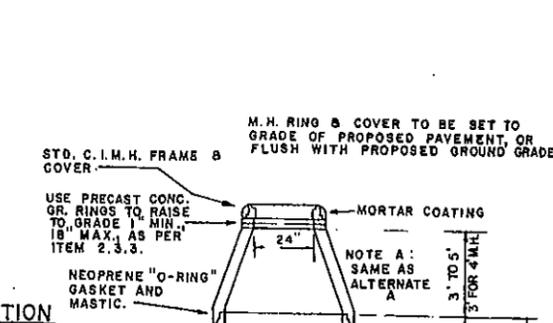


ALTERNATE A

PRECAST CONCRETE FLAT TOP MANHOLE



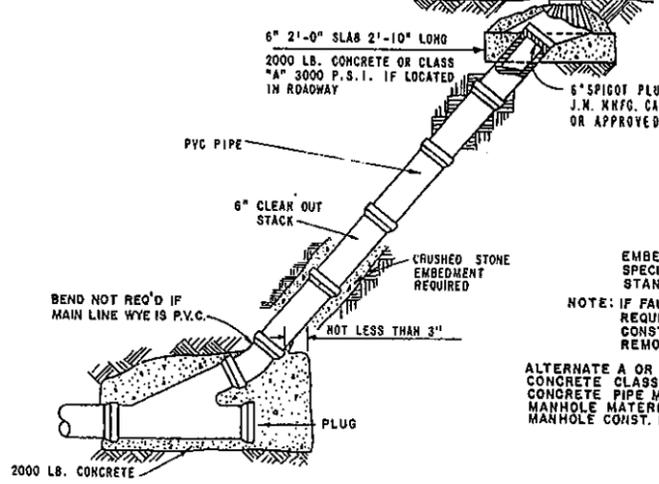
MANHOLE DROP CONNECTION



ALTERNATE B

PRECAST CONCRETE MANHOLE

MANHOLE NOTES CONT'D. ON SD-20

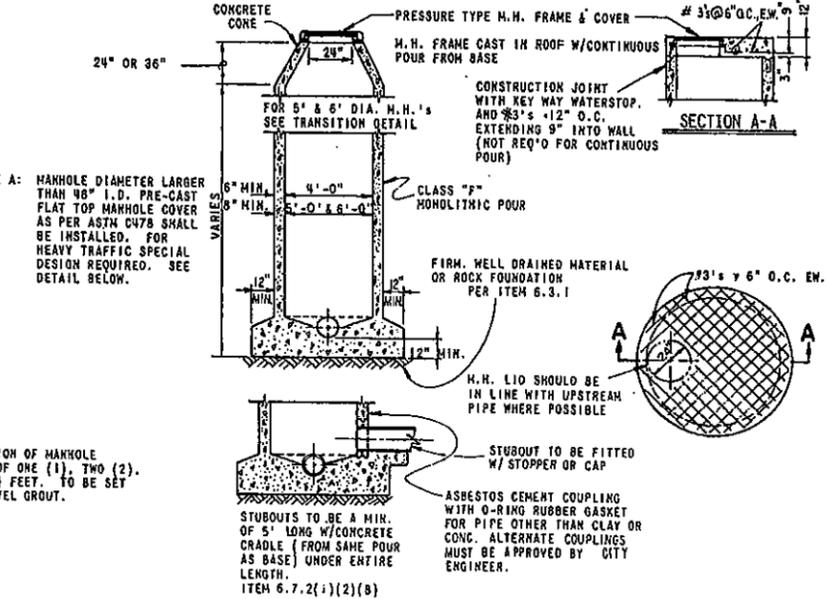


STANDARD CLEANOUT

NOTE: Shallower Parallel Line Required When Flow Line Of Sanitary Sewer Exceeds 12 Ft. Depth. Vertical Drop Connections Not Permitted.

FOR ADDITIONAL NOTES AND INFORMATION ON MANHOLE SEE SD.-20

ROOF OPTIONS



SECTION A-A

NOTE: MANHOLE DIAMETER LARGER THAN 48" I.D. PRE-CAST FLAT TOP MANHOLE COVER AS PER ASTM C478 SHALL BE INSTALLED. FOR HEAVY TRAFFIC SPECIAL DESIGN REQUIRED. SEE DETAIL BELOW.

NOTE: M.H. LID SHOULD BE IN LINE WITH UPSTREAM PIPE WHERE POSSIBLE

NOTE: STUBOUTS TO BE A MIN. OF 5' LONG W/CONCRETE CRADLE (FROM SAME POUR AS BASE) UNDER ENTIRE LENGTH. ITEM 6.7.2(1)(2)(8)

NOTE: ASBESTOS CEMENT COUPLING WITH O-RING RUBBER GASKET FOR PIPE OTHER THAN CLAY OR CONC. ALTERNATE COUPLINGS MUST BE APPROVED BY CITY ENGINEER.

NOTE: STUBOUTS TO BE FITTED W/ STOPPER OR CAP

NOTE: FIRM, WELL DRAINED MATERIAL OR ROCK FOUNDATION PER ITEM 6.3.1

NOTE: CONSTRUCTION JOINT WITH KEY WAY WATERSTOP AND #3'S 12" O.C. EXTENDING 9" INTO WALL (NOT REQ'D FOR CONTINUOUS POUR)

NOTE: M.H. FRAME CAST IN ROOF W/CONTINUOUS POUR FROM BASE

NOTE: #3@6" O.C. E.W. 12"

NOTE: 24" OR 36"

NOTE: 6" MIN. 8" MIN. 12" MIN.

NOTE: 4'-0" 5'-0" 6'-0"

NOTE: CLASS "F" MONOLITHIC POUR

NOTE: MORTAR COATING

NOTE: M.H. RING & COVER TO BE SET TO GRADE OF PROPOSED PAVEMENT, OR FLUSH WITH PROPOSED GROUND GRADE

NOTE: STD. C.I.M.H. FRAME & COVER

NOTE: USE PRECAST CONC. OR RINGS TO RAISE TO GRADE 1 MIN. 18" MAX. AS PER ITEM 2.3.3.

NOTE: NEOPRENE "O-RING" GASKET AND MASTIC.

NOTE: KOR-N-SEAL, OR APPROVED EQUAL, VOIDS TO BE GROUTED.

NOTE: KOR-N-SEAL, OR APPROVED EQUAL CONNECTOR, CONFORMING TO ASTM C-923

NOTE: 6" TO 18" PRESS-SEAL OR APPROVED EQUAL CONN. OVER 18"

NOTE: EMBEDMENT AS SPECIFIED BY STANDARD DETAILS

NOTE: IF FALSE MANHOLE BOTTOMS REQUIRED, THEY SHALL BE CONSTRUCTED, INSTALLED & REMOVED.

NOTE: GEOTEXTILE MATERIAL, ITEM 2.24.2 OF SPECIAL PROVISIONS, AS PER ITEM 6.3.1

NOTE: INTERMEDIATE RISER AVAILABLE IN: 1'-0", 2'-0", 3'-0", 4'-0" LENGTHS (USE MINIMUM NO. OF RISERS)

NOTE: VARIES

NOTE: TO TOP OF PIPE

NOTE: 8" LINE

NOTE: MIN. 12"

NOTE: 4'-0"

NOTE: 24"

NOTE: 6" 2'-0" SLAB 2'-10" LONG

NOTE: 2000 LB. CONCRETE OR CLASS "A" 3000 P.S.I. IF LOCATED IN ROADWAY

NOTE: 5" SPIGOT PLUG, J.N. KHFG. CAT# 0079012 OR APPROVED EQUAL

NOTE: 6" CLEAR OUT STACK

NOTE: BEND NOT REQ'D IF MAIN LINE WYE IS P.V.C.

NOTE: CRUSHED STONE EMBEDMENT REQUIRED

NOTE: NOT LESS THAN 3"

NOTE: 2000 LB. CONCRETE

NOTE: PLUG

NOTE: ALTERNATE A OR B: CONCRETE CLASS ITEM 7.4.5

NOTE: CONCRETE PIPE MATERIAL ITEM 2.12.4

NOTE: MANHOLE MATERIAL ITEM 2.19

NOTE: MANHOLE CONST. ITEM 6.7.2(1)(1)(3)

NOTE: NCT STANDARD SPECIFICATIONS

NOTE: S.A.S. 10-13-87

NOTE: CITY OF PLANO, TEXAS

NOTE: DEPARTMENT OF ENGINEERING

NOTE: STANDARD CONSTRUCTION DETAILS

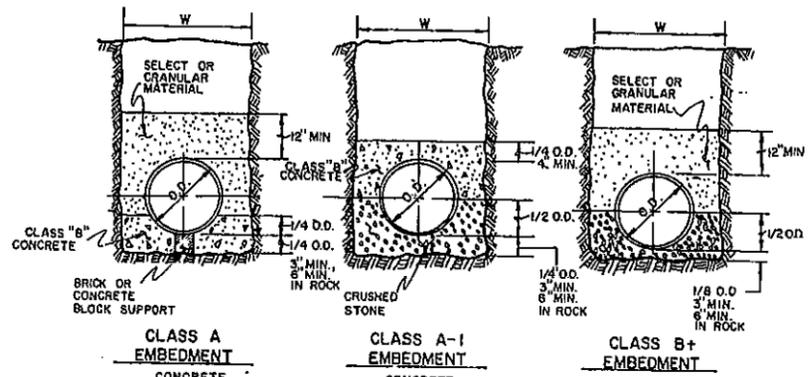
NOTE: SANITARY SEWER

NOTE: MANHOLE - CLEANOUT - CONNECTIONS

NOTE: APPROVED

NOTE: DATE: JULY, 1998

NOTE: SHEET SD-19



CLASS A EMBEDMENT
CONCRETE GRADE

CLASS A-1 EMBEDMENT
CONCRETE CAP

CLASS B+ EMBEDMENT

NOTE: DEPTH OF TRENCH BELOW PIPE SHALL BE:
 3" (MIN.) FOR PIPE 27" AND SMALLER
 4" (MIN.) FOR PIPE 30" TO 60"
 6" (MIN.) FOR PIPE 66" AND LARGER

MANHOLE NOTES CONT'D. FROM SD-19:

- The use of brick manholes is not permitted in the City of Plano.
- Brick, stones, concrete rubble, and construction debris shall not be used to adjust manholes to final grade.
- All backfill shall be free of organic matter and any other unstable material.
- Where sewer lines enter a manhole more than 24 inches above the invert, the invert shall be filleted to prevent solids deposition.
- Provide a U-shaped channel through all manholes:
 - For pipes less than 15 inches diameter, channel depth must be at least one-half the pipe diameter;
 - For pipes more than 15 inches but less than 24 inches diameter, channel depth must be at least 3/4 the pipe diameter;
 - For pipes greater than 24 inches diameter, channel depth must be at least equal to the pipe diameter.
- All manhole bench areas shall have a slope of at least 0.5 inches per foot.
- Exterior STOMA seal or approved equal is required on all sanitary sewer manholes.

The following manhole tests are adopted by the City of Plano to comply with Chapter 317 of 30 Texas Administrative Code. These tests supersede those listed in Item 6.7.2(c) of The Standard Specifications for Public Works Construction - North Central Texas:

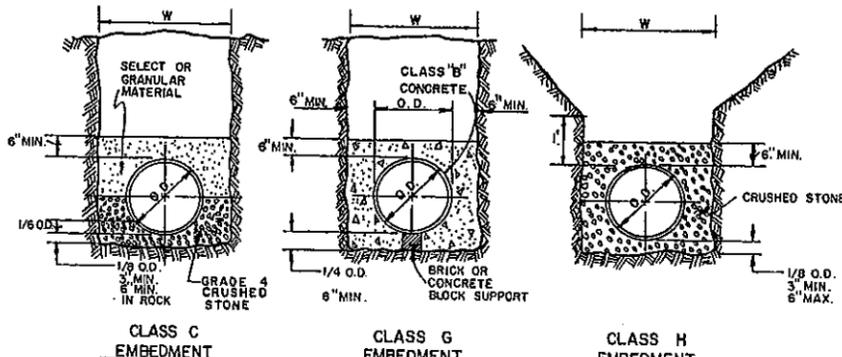
EXFILTRATION TEST

- Plug all lines entering the manhole.
- For concrete manholes, fill manhole with water 24 hours prior to beginning test. This will allow for saturation of the manhole.
- After the wetting period maintain the manhole full for one hour.
- The maximum allowable leakage shall be 0.025 gallons per foot diameter per foot of manhole depth per hour.
- If the manhole exceeds the leakage rate specified above, identify the source of leakage, repair, and retest the manhole. Continue with testing and repair until the manhole passes the test.

LOW PRESSURE AIR TESTING OF SANITARY SEWERS

The following revision to Item 6.7.2(f) of The Standard Specifications for Public Works Construction - North Central Texas is adopted by the City of Plano to comply with Chapter 317 of 30 Texas Administrative Code:

When ground water is encountered during sanitary sewer construction, the pipe shall be pressurized to 3.5 psig greater than the pressure exerted by the ground water above the pipe.



CLASS C EMBEDMENT

CLASS G EMBEDMENT
CONCRETE ENCASEMENT

CLASS H EMBEDMENT
P.V.C. PIPE ONLY
STD. P.V.C. SEWER INSTALLATION
STD. P.V.C., R.C.C.P. & DUCTILE WATER INSTALLATION.

NOTE: TYPE OF EMBEDMENT OR ENCASEMENT SHALL BE SHOWN IN THE PROFILES FOR ALL LINES. LOAD CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEERING DEPARTMENT. WIDTH OF TRENCH SHALL BE 24 INCHES PLUS O.D. FOR PIPE > 24" I.D., O.D. PLUS 16" FOR PIPE < 24" I.D.

VACUUM TESTING

After the completion of the manhole, the manholes shall be visually inspected by the Engineer and the Owner before final acceptance. In addition, the Contractor shall perform low pressure vacuum air testing on each manhole. Each manhole shall be tested separately and independently of the sanitary sewer lines. All sanitary sewer lines coming into the manhole shall be sealed with an internal pipe plug. The method of testing shall be by means of creating an air vacuum within the manhole, whereby, a 10" Hg. (mercury) vacuum will be developed. The air vacuum shall then be monitored once it has reached 10" Hg. for a test period of two minutes. The allowable drop in air vacuum shall be no greater than 1" Hg. during the two-minute test period.

The air vacuum testing procedures for the rehabilitated manholes shall be according to the recommendations of Crane Industries, Inc., (Air-Loc Vacuum Manhole Tester), or such other manufacturer/supplier that would have acceptable equipment designed specifically for air vacuum testing of manholes.

The Contractor shall provide the Owner with certified documentation that the test procedures were conducted as recommended by the equipment manufacturers and the test results were actual numbers recorded in the field. The contractor shall record and certify to the following information:

- Date and time of testing.
- Name of contractor's representative performing the tests.
- Equipment used and calibration procedures.
- Manhole location(s).
- Air-vacuum maximum (Hg.)
- Test period.
- Drop of air vacuum within the test period.
- Other observers at the testing site.

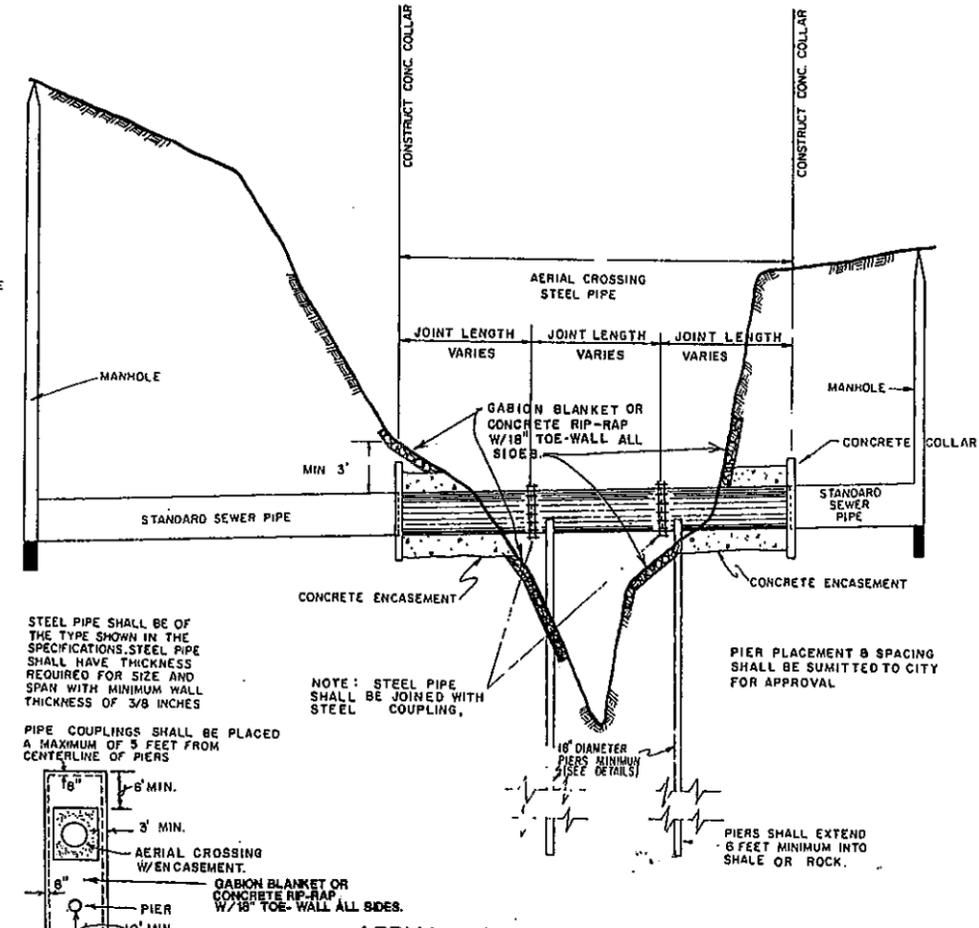
The following Tables presents 5% deflection mandrel sizes adopted by the City of Plano to comply with Chapter 317 of 30 Texas Administrative Code. Dimensions listed below supersede the dimensions given in Item 6.7.2(g) of The Standard Specifications for Public Works Construction - North Central Texas.

5 PERCENT DEFLECTION MANDREL

NOMINAL I. D., inches	Mandrel O. D., inches	Nearest 1/16 inches	Minimum Runner Length, inches	Minimum Number of Mandrel Runners
6	5.70	5-11/16	4-1/2	9
8	7.60	7-10/16	6	9
10	9.50	9-1/2	7-1/2	9
12	11.40	11-3/8	9	9
15	14.25	14-1/4	11-1/4	9
18	17.10	17-1/8	13-1/2	9
21	19.95	19-15/16	15-3/4	9
24	22.80	22-13/16	18	9
27	25.65	25-5/8	20-1/4	9
30	28.50	28-1/2	22-1/2	9
33	31.35	31-3/8	24-3/4	9
36	34.20	34-3/16	27	9
42	39.90	39-7/8	31-1/2	9

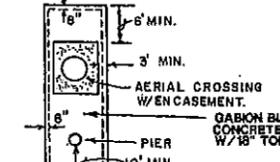
NOTES

- Deflection tests shall be done without mechanical pulling devices.
- Tests shall be done after the backfill has been in place for 30 days.
- The rigid mandrel shall be constructed of a metal or rigid plastic that can withstand 200 psi without deforming.
- Adjustable or flexible mandrels are prohibited.
- Mandrels with removable legs or runners may be accepted on a case by case basis.
- A proving ring shall be provided for each size mandrel used.



STEEL PIPE SHALL BE OF THE TYPE SHOWN IN THE SPECIFICATIONS. STEEL PIPE SHALL HAVE THICKNESS REQUIRED FOR SIZE AND SPAN WITH MINIMUM WALL THICKNESS OF 3/8 INCHES

PIPE COUPLINGS SHALL BE PLACED A MAXIMUM OF 5 FEET FROM CENTERLINE OF PIERS

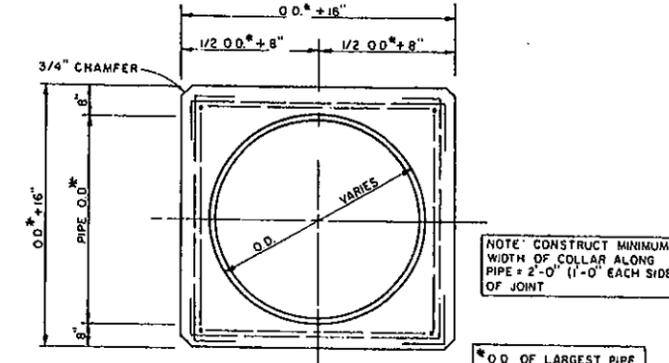


BANK PROTECTION (TYP)

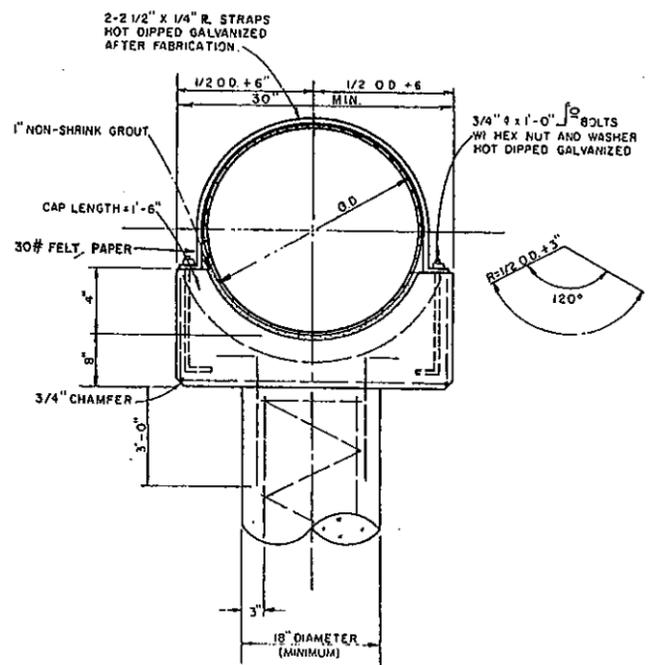
AERIAL CROSSING DETAIL

MATERIALS SHALL CONFORM TO THE SPECIAL PROVISIONS AND/OR THE STANDARD SPECIFICATIONS

NOTE: ENGINEERING DESIGN SHALL BE SUBMITTED FOR EACH CROSSING. PIERS SHALL BE PLACED AT MAXIMUM SPAN DISTANCE AS DICTATED BY DESIGN.



AERIAL CROSSING CONCRETE COLLAR DETAIL
N.T.S.



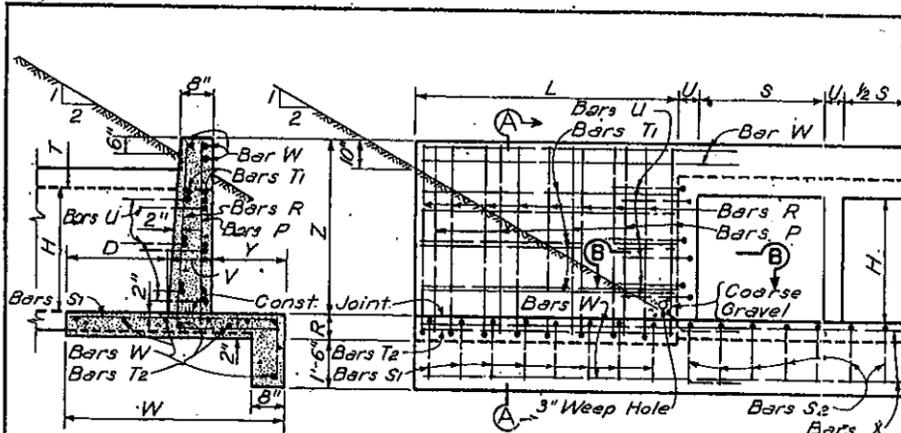
AERIAL CROSSING PIER CAP DETAIL
N.T.S.



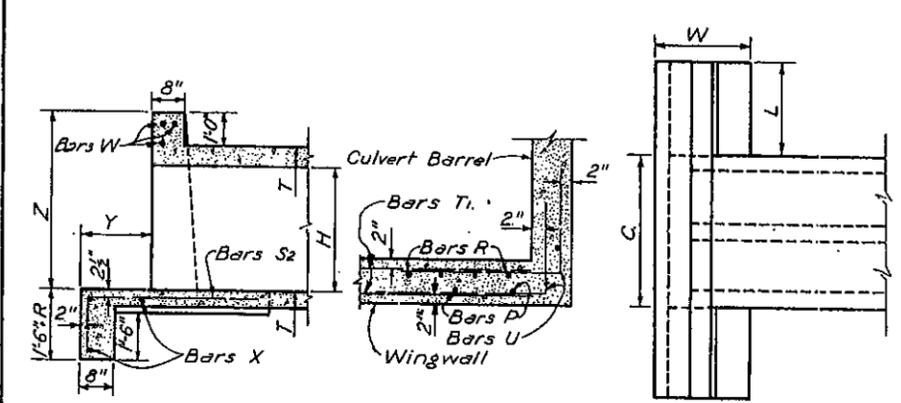
NCT STANDARD SPECIFICATIONS		S.A.S. 10-13-87	
NO.	REVISION	BY	DATE
CITY OF PLANO, TEXAS PUBLIC WORKS DEPARTMENT OF ENGINEERING			
STANDARD CONSTRUCTION DETAILS SANITARY SEWER			
EMBEDMENT - AERIAL CROSSING			
APPROVED		ALAN I. UPCHURCH, P.E.	
DATE: JULY, 1996		SHEET SD-20	

NOTE: CONCRETE RIP-RAP REQUIRED ON ALL SLOPES STEEPER THAN 3:1
SEE SHEET SD-13 FOR CULVERT RAIL DETAILS

NOTE: HEADWALL MAY BE REQUIRED TO BE EXTENDED VERTICALLY TO SERVE AS A PARAPET WALL. REFER TO SD-13



SECTION A-A
HALF ELEVATION
DETAIL OF WINGWALL



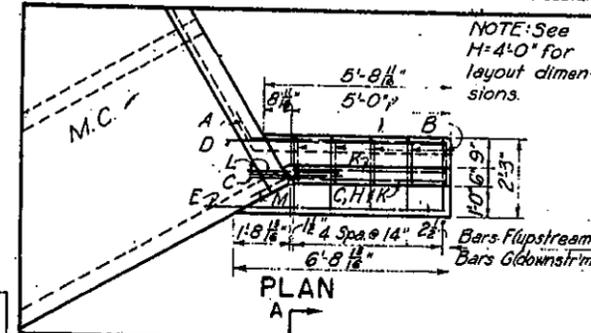
LONGITUDINAL SECTION THRU BOX SHOWING DETAIL OF APRON
SECTION B-B
PLAN VIEW OF WINGWALL

BARS S ₁		BARS T ₁		BARS S ₂ (Culvert Apron)	
WING SIZE	BAR	WING SIZE	BAR	WING SIZE	BAR
2'-0"	2'-2" (H=2'-0")	5'-1" (H=2'-0")	2'-3" (H=2'-0")	2'-0"	2'-3" (H=2'-0")
3'-0"	2'-6" (H=3'-0")	7'-2" (H=3'-0")	2'-5" (H=3'-0")	3'-0"	2'-7" (H=3'-0")
4'-0"	3'-1" (H=4'-0")	9'-3" (H=4'-0")	2'-7" (H=4'-0")	4'-0"	3'-0" (H=4'-0")
5'-0"	3'-8" (H=5'-0")	11'-3" (H=5'-0")	3'-0" (H=5'-0")	5'-0"	3'-1" (H=5'-0")
6'-0"	4'-4" (H=6'-0")	13'-3" (H=6'-0")	3'-5" (H=6'-0")	6'-0"	3'-5" (H=6'-0")
7'-0"	4'-10" (H=7'-0")	15'-3" (H=7'-0")	3'-9" (H=7'-0")	7'-0"	3'-9" (H=7'-0")
8'-0"	5'-7" (H=8'-0")	17'-4" (H=8'-0")	3'-11" (H=8'-0")	8'-0"	3'-11" (H=8'-0")
9'-0"	6'-2" (H=9'-0")	19'-6" (H=9'-0")		9'-0"	
10'-0"	6'-8" (H=10'-0")	21'-8" (H=10'-0")		10'-0"	

REINFORCING FOR 2 CULVERT APRONS

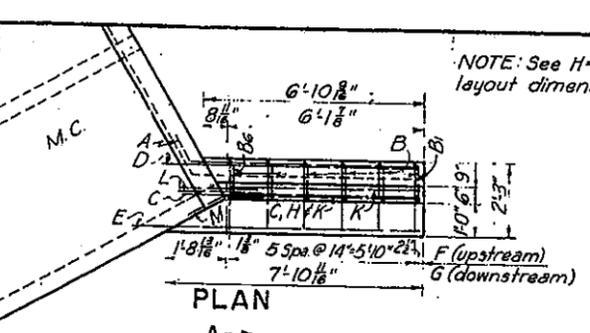
BARS X-#4 @ 12"±		BARS S ₂ - #4 @ 12"±						CULVERT SIZE	TABLE OF DIMENSIONS												TOTAL QUANTITIES (FOR 4 WINGS AND 2 APRONS)																		
NUMBER OF SPANS		NUMBER OF SPANS							SLAB	WING						APRON						NUMBER OF SPANS																	
2	3	4	5	6	7	8	9	S		H	T	Z	L	R	W	V	D	Y	NUMBER OF SPANS						CONC. REINF. C.Y.	CONC. REINF. LBS.													
31	45	60	75	90	3 1/2"	24	63		36										94	46	120	58	152	68									178	5 x 2	6"	3'-6"	5'-4"	7"	2'-6"
31	45	60	75	90	3 1/2"	24	63	36	94	46	120	58	152	68	178	5 x 3	6"	4'-6"	7'-4"	7"	2'-0"	8"	1'-2"	1'-0"	11'-6"	17'-0"	22'-6"	28'-0"	33'-6"	7.47	883	8.10	928	8.73	969	9.37	1016	10.00	1057
31	45	60	75	90	4'-0"	24	65	36	98	46	125	58	158	68	185	5 x 4	6"	5'-6"	9'-4"	7"	3'-5"	8"	1'-7"	1'-2"	11'-6"	17'-0"	22'-6"	28'-0"	33'-6"	10.61	1433	11.27	1480	11.94	1522	12.61	1570	13.28	1612
47	69	92	114	137	4'-3"	24	68	36	102	46	131	58	165	68	193	5 x 5	6"	6'-6"	11'-4"	7"	4'-0"	8"	2'-0"	1'-4"	11'-9"	17'-4"	22'-11"	28'-6"	34'-1"	14.37	2101	15.08	2157	15.80	2209	16.51	2265	17.22	2316
36	53	71	88	105	3 1/2"	28	73	42	110	54	141	68	178	80	209	6 x 3	6"	4'-6"	7'-4"	7"	2'-10"	8"	1'-2"	1'-0"	13'-6"	20'-0"	26'-6"	33'-0"	39'-6"	7.70	898	8.45	952	9.19	1001	9.94	1055	10.69	1103
36	53	71	88	105	4'-1"	28	76	42	114	54	147	68	185	80	218	6 x 4	6"	5'-6"	9'-4"	7"	3'-5"	8"	1'-7"	1'-2"	13'-6"	20'-0"	26'-6"	33'-0"	39'-6"	10.85	1449	11.64	1504	12.43	1555	13.22	1610	14.00	1660
55	81	108	134	161	4'-3"	28	79	42	119	54	153	68	193	80	227	6 x 5	6"	6'-6"	11'-4"	7"	4'-0"	8"	2'-0"	1'-4"	13'-9"	20'-4"	26'-11"	33'-6"	40'-1"	14.63	2120	15.47	2186	16.31	2247	17.15	2313	17.99	2374
55	81	108	134	161	4'-8"	28	87	42	131	54	168	68	212	80	250	6 x 6	6"	7'-6"	13'-4"	7"	4'-8"	8"	2'-3"	1'-9"	13'-9"	20'-4"	26'-11"	33'-6"	40'-4"	19.20	3016	20.14	3086	21.08	3150	22.02	3220	22.96	3285
41	61	81	102	122	3 1/2"	32	84	48	126	62	162	78	204	92	241	7 x 3	6 1/2"	4'-6"	7'-5"	7"	2'-10"	8"	1'-2"	1'-0"	15'-6"	23'-0"	30'-6"	38'-0"	45'-6"	8.04	914	8.92	976	9.79	1032	10.66	1095	11.53	1152
41	61	81	102	122	4'-1"	32	87	48	131	62	169	78	213	92	251	7 x 4	6 1/2"	5'-6"	9'-5"	7"	3'-5"	8"	1'-7"	1'-2"	15'-6"	23'-0"	30'-6"	38'-0"	45'-6"	11.24	1465	12.16	1529	13.08	1587	14.00	1652	14.92	1710
63	94	124	154	185	4'-3"	32	91	48	136	62	176	78	221	92	261	7 x 5	6 1/2"	6'-6"	11'-5"	7"	4'-0"	8"	2'-0"	1'-4"	15'-9"	23'-4"	30'-11"	38'-6"	46'-1"	15.06	2140	16.04	2216	17.02	2286	18.01	2361	18.99	2432
63	94	124	154	185	4'-8"	32	100	48	150	62	193	78	243	92	287	7 x 6	6 1/2"	7'-6"	13'-5"	7"	4'-8"	8"	2'-3"	1'-9"	15'-9"	23'-4"	30'-11"	38'-6"	46'-1"	19.70	3037	20.81	3118	21.92	3191	23.03	3271	24.14	3346
67	94	124	154	185	4'-9"	32	102	48	152	62	197	78	247	92	292	7 x 7	6 1/2"	8'-6"	15'-5"	8"	5'-2"	9 1/2"	2'-6"	1'-10"	15'-9"	23'-4"	30'-11"	38'-6"	46'-4"	26.80	4345	27.97	4426	29.13	4501	30.30	4581	31.47	4657
41	61	81	102	122	3 1/2"	32	84	48	126	62	162	78	204	92	241	8 x 4	6 1/2"	5'-6"	9'-5"	7"	3'-5"	8"	1'-7"	1'-2"	17'-6"	26'-0"	34'-6"	43'-0"	51'-6"	11.48	1482	12.53	1553	13.57	1620	14.62	1692	15.66	1758
41	61	81	102	122	4'-1"	32	87	48	131	62	169	78	213	92	251	8 x 5	6 1/2"	6'-6"	11'-5"	7"	4'-0"	8"	2'-0"	1'-4"	17'-9"	26'-4"	34'-11"	43'-6"	52'-1"	15.32	2159	16.62	2245	17.75	2325	18.88	2410	20.01	2490
71	106	140	174	209	4'-3"	36	112	54	168	70	218	88	275	104	324	8 x 6	6 1/2"	7'-6"	13'-5"	7"	4'-8"	8"	2'-3"	1'-9"	17'-9"	26'-4"	34'-11"	43'-6"	52'-1"	19.99	3057	21.25	3148	22.50	3232	23.76	3323	25.02	3407
71	106	140	174	209	4'-8"	36	114	54	171	70	222	88	279	104	330	8 x 7	6 1/2"	8'-6"	15'-5"	8"	5'-2"	9 1/2"	2'-6"	1'-10"	17'-9"	26'-4"	34'-11"	43'-6"	52'-1"	27.11	4365	28.43	4457	29.75	4542	31.07	4633	32.39	4719
96	143	189	235	281	5'-1"	36	122	54	183	70	238	88	299	104	353	8 x 8	6 1/2"	9'-6"	17'-5"	9"	5'-9"	10 1/2"	2'-8"	1'-10"	18'-0"	26'-8"	35'-4"	44'-0"	52'-8"	35.77	6166	37.25	6274	38.74	6375	40.22	6482	41.71	6582
47	69	92	115	138	4'-1"	36	98	54	147	70	191	88	240	104	283	8 x 4	7"	5'-7"	9'-6"	7"	3'-5"	8"	1'-7"	1'-2"	17'-6"	26'-0"	34'-6"	43'-0"	51'-6"	11.63	1482	12.69	1553	13.75	1620	14.81	1692	15.86	1758
47	69	92	115	138	4'-3"	36	102	54	153	70	199	88	250	104	295	8 x 5	7"	6'-7"	11'-6"	7"	4'-0"	8"	2'-0"	1'-4"	17'-9"	26'-4"	34'-11"	43'-6"	52'-1"	15.49	2159	16.62	2245	17.75	2325	18.88	2410	20.01	2490
71	106	140	174	209	4'-8"	36	112	54	168	70	218	88	275	104	324	8 x 6	7"	7'-7"	13'-5"	7"	4'-8"	8"	2'-3"	1'-9"	17'-9"	26'-4"	34'-11"	43'-6"	52'-1"	20.21	3057	21.50	3148	22.78	3232	24.07	3323	25.35	3407
71	106	140	174	209	4'-9"	36	114	54	171	70	222	88	279	104	330	8 x 7	7"	8'-7"	15'-6"	8"	5'-2"	9 1/2"	2'-6"	1'-10"	17'-9"	26'-4"	34'-11"	43'-6"	52'-1"	27.37	4365	28.72	4457	30.07	4542	31.43	4633	32.78	4719
96	143	189	235	281	5'-1"	36	122	54	183	70	238	88	299	104	353	8 x 8	7"	9'-7"	17'-6"	9"	5'-9"	10 1/2"	2'-8"	1'-10"	18'-0"	26'-8"	35'-4"	44'-0"	52'-8"	36.09	6166	37.62	6274	39.14	6375	40.67	6482	42.19	6582
47	69	92	115	138	4'-1"	36	98	54	147	70	191	88	240	104	283	9 x 5	7"	6'-7"	11'-6"	7"	4'-0"	8"	2'-0"	1'-4"	19'-9"	29'-4"	38'-11"	48'-6"	58'-1"	15.76	2179	17.02	2274	18.28	2363	19.54	2458	20.80	2554
47	69	92	115	138	4'-3"	36	102	54	153	70	199	88	250	104	295	9 x 6	7"	7'-7"	13'-5"	7"	4'-8"	8"	2'-3"	1'-9"	19'-9"	29'-4"	38'-11"	48'-6"	58'-1"	15.67	2159	16.82	2245	17.97	2325	19.12	2410	20.27	2490
71	106	140	174	209	4'-8"	36	112	54	168	70	218	88	275	104	324	9 x 7	7"	8'-7"	15'-6"	8"	5'-2"	9 1/2"	2'-6"	1'-10"	17'-9"	26'-4"	34'-11"	43'-6"	52'-1"	20.44	3057	21.75	3148	23.06	3232	24.38	3323	25.69	3407
71	106	140	174	209	4'-9"	36	114	54	171	70	222	88	279	104	330	9 x 8	7"	9'-7"	15'-6"	8"	5'-2"	9 1/2"	2'-6"	1'-10"	17'-9"	26'-4"	34'-11"	43'-6"	52'-1"	27.64	4365	29.02	4457	30.40	4542	31.79	4633	33.17	4719
96	143	189	235	281	5'-1"	36	122	54	183	70	238	88	299	104	353	9 x 9	7"	10'-7"	19'-6"</																				

NOTE: CONCRETE RIP-RAP REQUIRED ON ALL SLOPES STEEPER THAN 3:1
SEE SHEET SD-13 FOR CULVERT RAIL DETAILS



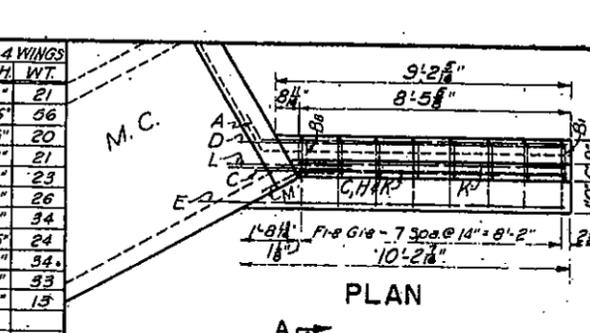
BILL OF REINF STEEL - 4 WINGS

BAR NO.	SIZE	SPA	LGTH	WT.
A	4	#4	6'-9"	18
B	20	#4	14'-2 1/2"	37
C	4	#4	6'-9"	17
D	4	#4	6'-9"	18
E	4	#4	7'-5"	20
F	10	#4	14'-3 1/2"	22
G	10	#4	14'-3 1/2"	28
H	4	#4	9'-1"	8
K	8	#4	5'-2"	28
L	8	#5	4'-0"	33
M	4	#4	2'-6"	7
TOTAL FOR 4 WINGS				236



BILL OF REINF STEEL - 4 WINGS

BAR NO.	SIZE	SPA	LGTH	WT.
A	4	#4	8'-0"	21
B	24	#4	14'-3 1/2"	56
C	4	#4	7'-5"	20
D	4	#4	7'-11"	21
E	4	#4	8'-7"	23
F	12	#4	14'-3 1/2"	26
G	12	#4	14'-3 1/2"	34
H	8	#4	15'-4 1/2"	24
K	8	#4	6'-5"	34
L	8	#5	4'-0"	33
M	8	#4	2'-6"	13
TOTAL FOR 4 WINGS				305



BILL OF REINF STEEL - 4 WINGS

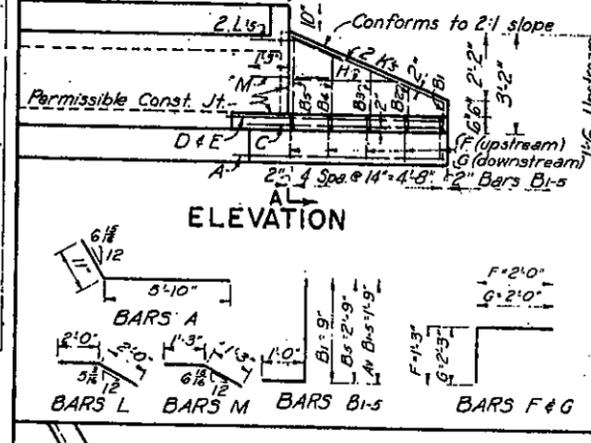
BAR NO.	SIZE	SPA	LGTH	WT.
A	4	#4	10'-3"	27
B	32	#4	14'-4 1/2"	86
C	4	#4	9'-8"	28
D	4	#4	10'-2"	27
E	4	#5	11'-5"	48
F	16	#4	14'-3 1/2"	35
G	16	#4	14'-4 1/2"	45
H	12	#4	15'-4 1/2"	43
K	8	#5	9'-0"	33
L	8	#5	4'-0"	33
M	12	#4	2'-6"	20
TOTAL FOR 4 WINGS				465

LAYOUT DIMENSIONS
H=2'-0" TO H=4'-0" INCL.

ESTIMATED QUANT - 4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	4.34
REINF STEEL	LB	465

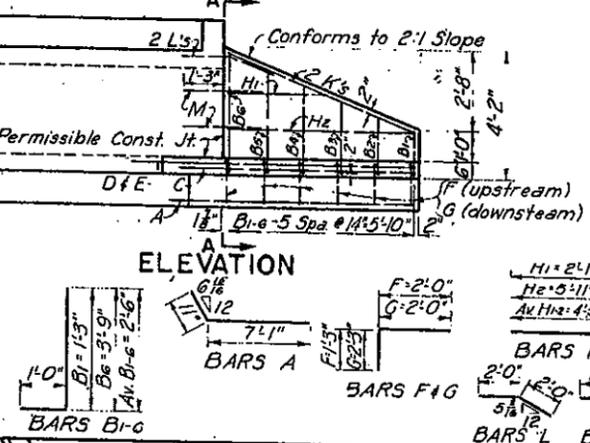
WINGWALLS FOR M.C.'s
H=4'-0"



ESTIMATED QUANT - 4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	2.16
REINF STEEL	LB	236

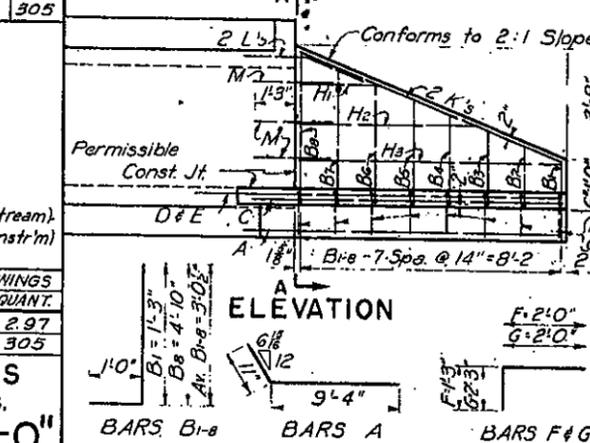
WINGWALLS FOR M.C.'s
H=2'-0"



ESTIMATED QUANT - 4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	2.97
REINF STEEL	LB	305

WINGWALLS FOR M.C.'s
H=3'-0"



ESTIMATED QUANT - 4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	4.34
REINF STEEL	LB	465

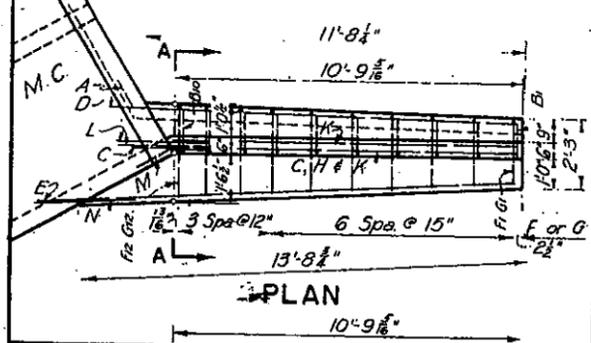
WINGWALLS FOR M.C.'s
H=4'-0"

LAYOUT DIMENSIONS
H=2'-0" TO H=4'-0" INCL.

ESTIMATED QUANT - 4 WINGS

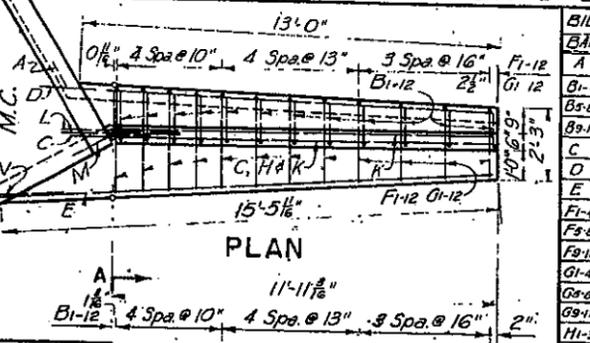
ITEM	UNIT	QUANT.
CONCRETE	C.Y.	4.34
REINF STEEL	LB	465

WINGWALLS FOR M.C.'s
H=4'-0"



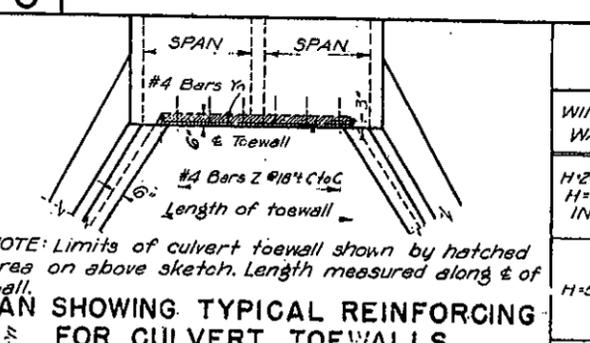
BILL OF REINF STEEL - 4 WINGS

BAR NO.	SIZE	SPA	LGTH	WT.
A	4	#4	12'-9"	34
B	28	#4	15'-4 1/2"	73
C	12	#4	12'-4 1/2"	51
D	4	#4	12'-9"	34
E	4	#5	14'-0"	62
F	14	#4	15'-4 1/2"	33
G	14	#4	15'-4 1/2"	42
H	6	#4	12'-4 1/2"	16
I	12	#4	15'-4 1/2"	51
K	8	#5	11'-6"	36
L	8	#6	4'-6"	51
M	12	#4	2'-6"	20
N	4	#5	3'-2"	13
TOTAL FOR 4 WINGS				633



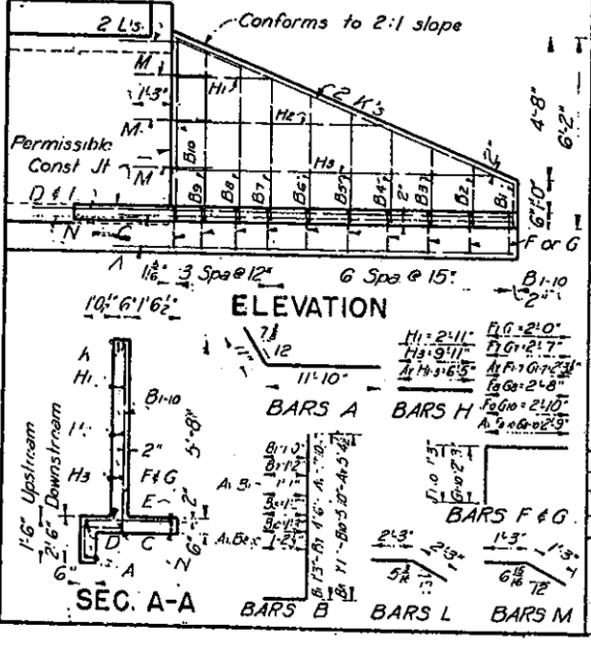
BILL OF REINF STEEL - 4 WINGS

BAR NO.	SIZE	SPA	LGTH	WT.
A	4	#4	14'-1"	38
B	16	#4	16'-4 1/2"	39
C	16	#4	13'-4 1/2"	64
D	16	#4	10'-4 1/2"	83
E	4	#4	13'-2"	35
F	4	#4	14'-0"	37
G	4	#5	16'-9"	70
H	8	#4	16'-4 1/2"	18
I	8	#4	15'-4 1/2"	21
J	8	#4	10'-4 1/2"	24
K	8	#5	11'-8"	31
L	8	#6	4'-6"	54
M	16	#4	2'-6"	27
N	4	#5	3'-2"	13
TOTAL FOR 4 WINGS				791



ESTIMATED QUANTITIES FOR TWO CULVERT TOEWALLS

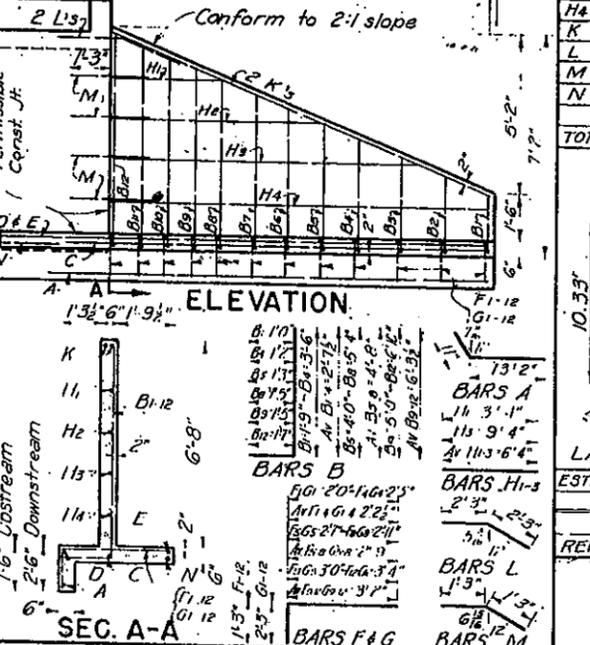
WING WALL	SPAN	2 SPANS	3 SPANS	4 SPANS	5 SPANS	6 SPANS					
	LENGTH	CONC. REINF. C.Y.	CONC. REINF. LB.	CONC. REINF. C.Y.	CONC. REINF. LB.	CONC. REINF. C.Y.					
H=2'-0" TO H=4'-0" INCL.	5'-0"	0.53	41	0.83	64	1.14	83	1.44	105	1.70	134
	6'-0"	0.64	51	1.00	76	1.35	101	1.72	129	2.08	161
	7'-0"	0.70	59	1.17	88	1.58	118	2.00	148	2.42	178
	8'-0"	0.86	65	1.33	100	1.80	135	2.28	168	2.75	207
	9'-0"	1.02	76	1.61	119	2.20	161	2.78	203	3.37	248
H=5'-0"	5'-0"	0.50	40	0.81	63	1.12	83	1.43	108	1.74	130
	6'-0"	0.61	47	0.99	75	1.34	100	1.71	128	2.07	154
	7'-0"	0.72	57	1.14	88	1.56	118	1.99	148	2.41	178
	8'-0"	0.85	64	1.31	100	1.79	131	2.26	164	2.74	204
	9'-0"	0.94	71	1.48	112	2.01	148	2.54	185	3.07	226
H=6'-0"	5'-0"	0.58	46	0.94	71	1.31	99	1.67	124	2.04	149
	6'-0"	0.69	52	1.11	85	1.55	113	1.95	143	2.37	173
	7'-0"	0.80	63	1.28	95	1.75	130	2.23	163	2.71	197
	8'-0"	0.91	70	1.44	107	1.97	147	2.51	184	3.04	228
	9'-0"	1.02	76	1.61	119	2.20	161	2.78	203	3.37	248



ESTIMATED QUANT - 4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	6.34
REINF STEEL	LB	633

WINGWALLS FOR M.C.'s
H=5'-0"



ESTIMATED QUANT - 4 WINGS

ITEM	UNIT	QUANT.
CONCRETE	C.Y.	7.95
REINF STEEL	LB	791

WINGWALLS FOR M.C.'s
H=6'-0"

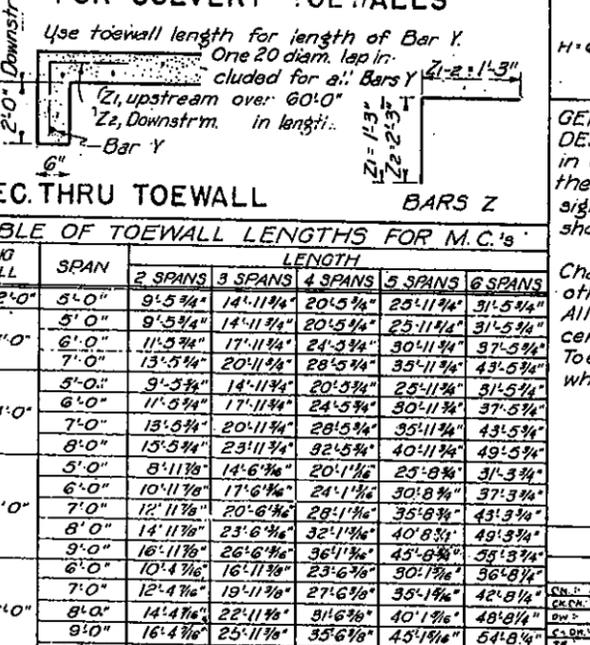


TABLE OF TOEWALL LENGTHS FOR M.C.'s

WING WALL	SPAN	LENGTH					
		2 SPANS	3 SPANS	4 SPANS	5 SPANS	6 SPANS	
H=2'-0"	5'-0"	9'-5 3/4"	14'-11 1/4"	20'-5 1/4"	25'-11 1/4"	31'-5 3/4"	
	6'-0"	9'-5 3/4"	14'-11 1/4"	20'-5 1/4"	25'-11 1/4"	31'-5 3/4"	
	7'-0"	11'-5 3/4"	17'-11 1/4"	24'-3 3/4"	30'-11 1/4"	37'-5 3/4"	
	8'-0"	13'-5 3/4"	20'-11 1/4"	28'-5 3/4"	35'-11 1/4"	43'-5 3/4"	
H=4'-0"	5'-0"	9'-5 3/4"	14'-11 1/4"	20'-5 1/4"	25'-11 1/4"	31'-5 3/4"	
	6'-0"	11'-5 3/4"	17'-11 1/4"	24'-3 3/4"	30'-11 1/4"	37'-5 3/4"	
	7'-0"	13'-5 3/4"	20'-11 1/4"	28'-5 3/4"	35'-11 1/4"	43'-5 3/4"	
	8'-0"	15'-5 3/4"	23'-11 1/4"	32'-5 3/4"	40'-11 1/4"	49'-5 3/4"	
H=5'-0"	5'-0"	9'-5 3/4"	14'-11 1/4"	20'-5 1/4"	25'-11 1/4"	31'-5 3/4"	
	6'-0"	10'-11 1/4"	17'-11 1/4"	24'-1 1/4"	30'-8 3/4"	37'-3 3/4"	
	7'-0"	12'-11 1/4"	20'-6 1/4"	28'-1 1/4"	35'-8 3/4"	43'-3 3/4"	
	8'-0"	14'-11 1/4"	23'-6 1/4"	32'-1 1/4"	40'-8 3/4"	49'-3 3/4"	
	9'-0"	16'-11 1/4"	26'-6 1/4"	36'-1 1/4"	45'-6 3/4"	55'-3 3/4"	
H=6'-0"	5'-0"	10'-4 3/4"	16'-11 1/8"	23'-6 3/8"	30'-1 3/8"	36'-8 3/8"	
	6'-0"	12'-4 3/4"	19'-11 1/8"	27'-6 3/8"	35'-1 3/8"	42'-8 3/8"	
	7'-0"	14'-4 3/4"	22'-11 1/8"	31'-6 3/8"	40'-1 3/8"	48'-8 3/8"	
	8'-0"	16'-4 3/4"	25'-11 1/8"	35'-6 3/8"	45'-1 3/8"	54'-8 3/8"	
	9'-0"	18'-4 3/4"	28'-11 1/8"	39'-6 3/8"	50'-1 3/8"	60'-8 3/8"	

GENERAL NOTES:
DESIGN: Wing Walls designed in accordance with Rankine's theory of retaining wall design. Elements of design are shown on sketch at right.

WINGWALL TOP DETAIL (TYPICAL)

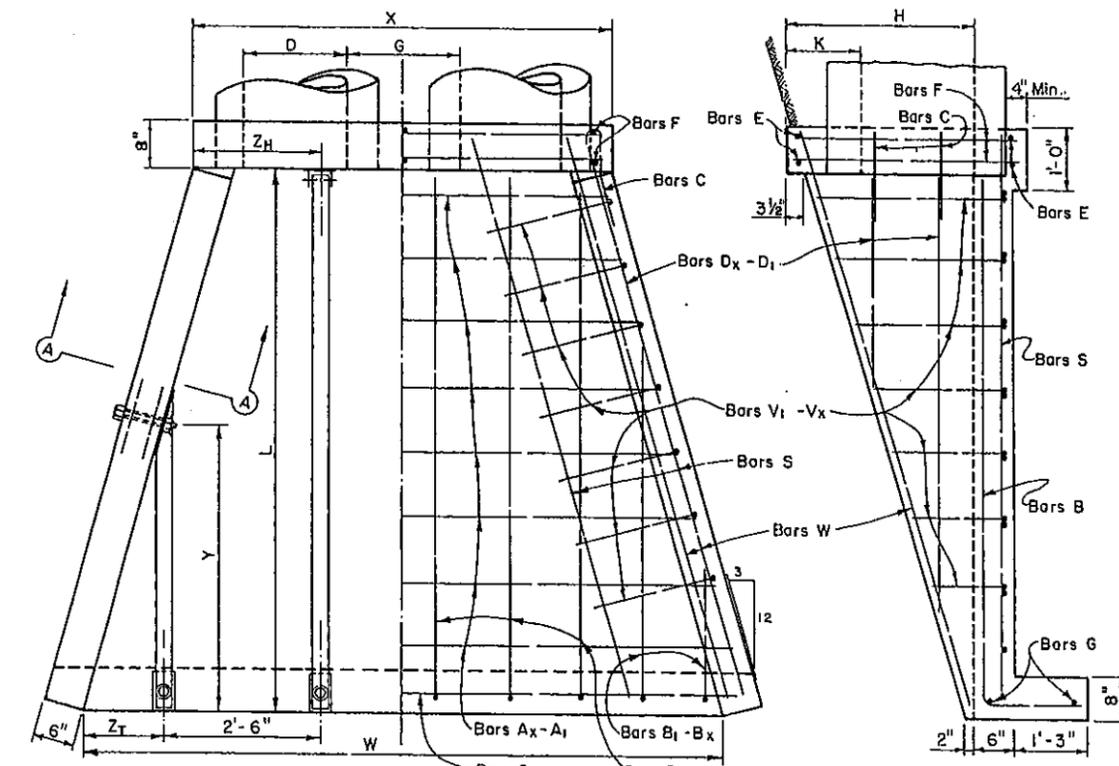
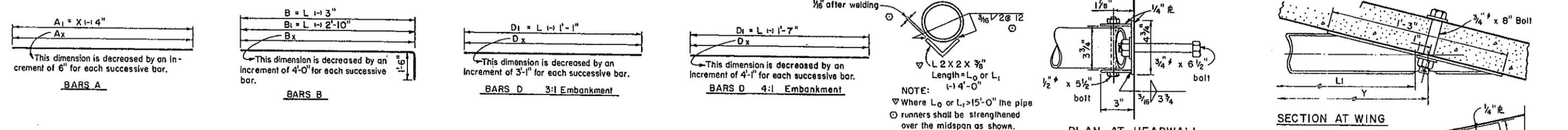
Chamfer all exposed corners 1/4" unless specified otherwise.
All dimensions relating to reinforcing steel are to centers of bars.
Toe walls for culvert and wing walls shall be omitted when structure is founded on solid rock.

TEXAS HIGHWAY DEPARTMENT
FLARED WINGWALLS
FOR MULTIPLE CULVERTS
H=2'-0" TO 6'-0" INCL.

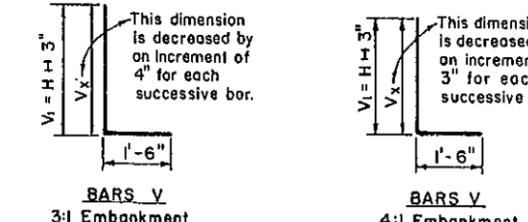
CITY OF PLANO, TEXAS
DATE: OCT., 1987
MCW-F1

TABLE OF QUANTITIES AND DIMENSIONS FOR TWO TYPE B HEADWALLS

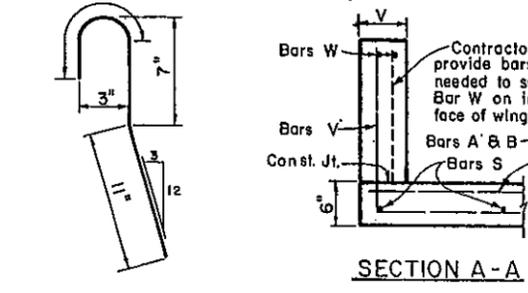
NO. OF PIPES	TABLE OF DIMENSIONS										REINFORCING STEEL AND QUANTITIES FOR TWO HEADWALLS																TOTAL QUANTITIES			PIPE RUNNERS														
	D	G	K	X	H	L	W	Y	Z _H	Z _T	Bars A ₁ -A _x # 4 at 12"±		Bars B ₁ -B _x # 4 at 12"±		Bars C ₁ -C _x # 4 at 12"±		Bars D ₁ -D _x # 4 at 12"±		Bars E ₁ -E _x # 4 at 12"±		Bars F ₁ -F _x # 4 at 12"±		Bars G ₁ -G _x # 4 at 12"±		Bars S ₁ -S _x # 4 at 12"±		Bars V ₁ -V _x # 4 at 12"±		Bars W ₁ -W _x # 4 at 12"±		STEEL	CONC.	PIPE	HEADWALL PIPE		SIDEWALL PIPE								
	No.	Av. Lgth.	Wght.	No.	Av. Lgth.	Wght.	No.	Av. Lgth.	Wght.	No.	Av. Lgth.	Wght.	No.	Av. Lgth.	Wght.	No.	Av. Lgth.	Wght.	No.	Av. Lgth.	Wght.	No.	Av. Lgth.	Wght.	No.	Av. Lgth.	Wght.	No.	Av. Lgth.	Wght.	Lbs.	C.Y.	L.F.	No.	Lo	No.	L1							
3:1 EMBANKMENT	42"	2'-2"	13"	10'-11"	4'-7"	12'-4 1/2"	16'-0 3/4"	7'-1 1/2"	1'-8 1/2"	2'-7 1/2"	2'-8 3/8"	24	7'-8"	123	10	13'-7"	91	8	9'-0"	48	16	21	16	6'-8"	71	10'-7"	88	12	# 4	4'-11"	39	16'-4"	44	4'-2"	122	13'-10"	115	757	7.26	70.85	2	12'-0 3/8"	4	11'-3 1/8"
4:1 EMBANKMENT	42"	2'-2"	13"	16'-7"	4'-7"	12'-4 1/2"	21'-8 3/4"	8'-5 3/4"	2'-0 1/2"	2'-1 3/8"	2'-1 3/8"	24	13'-4"	214	20	13'-7"	181	8	9'-0"	48	16	21	16	6'-8"	71	10'-7"	88	12	# 4	4'-11"	39	16'-4"	44	4'-2"	122	13'-10"	115	1013	11.01	132.83	8	12'-0 3/8"	4	11'-3 1/8"



HALF PLAN SHOWING DIMENSIONS, HALF PLAN SHOWING REINFORCING BARS, ELEVATION PARALLEL TO BARREL



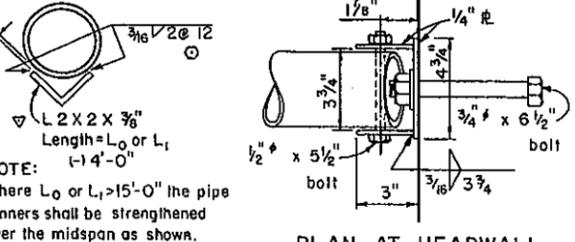
BARS V 3:1 Embankment, BARS V 4:1 Embankment



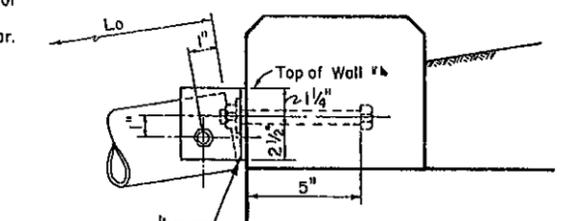
BARS C



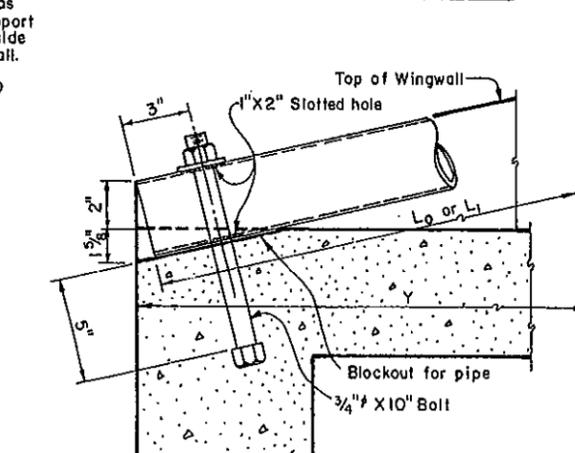
ANCHOR BARS Contractor shall provide 2-#3 anchor bars per sidewall bolt.



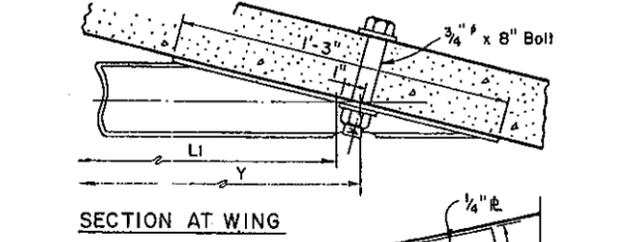
PLAN AT HEADWALL



ELEVATION AT HEADWALL



SECTION THRU TOEWALL



SECTION AT WING



ELEVATION AT WING

GENERAL NOTES:
 All bolts, nuts, washers, brackets, angles and pipe runners are considered parts of the Safety End Treatment for payment.
 Pipe runners shall be 3" Schedule 40 steel pipe.
 Bolts and nuts shall conform to ASTM A307.
 Holes shall be 1/8" oversize unless otherwise noted.
 Steel plate shall conform to ASTM A36.
 Dimensions relating to reinforcing steel are to centers of bars.
 Steel cover to be 2" from center of outside layer of steel to face of concrete.
 Chamfer exposed corners 3/4" except as otherwise noted.
 All exposed steel shall be galvanized unless otherwise shown on plans. Galvanizing damaged during transport and construction shall be repaired in accordance with the specifications.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

FLARED WINGWALLS-NORMAL

FOR PIPE CULVERTS WITH SAFETY END TREATMENT-TYPE I

3:1 EMBANKMENT SIZES 42" to 60"
 4:1 EMBANKMENT SIZES 42" & 48"

WS-P-N

ORIGINAL DRAWING DATE NOV. 1980	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT #	SHEET
CR.-CCT	6			50-25
DW.-EDS				
CR.-CCT				

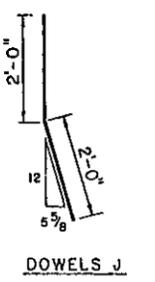
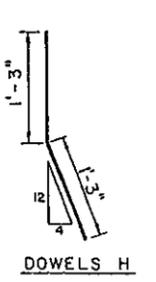
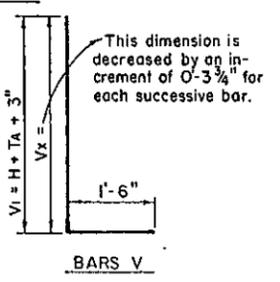
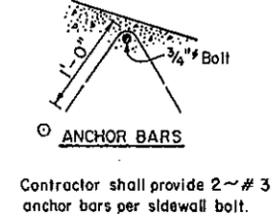
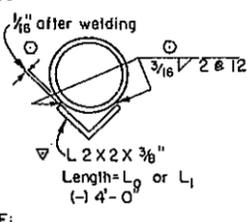
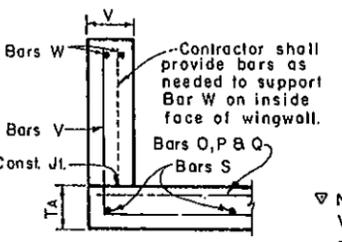
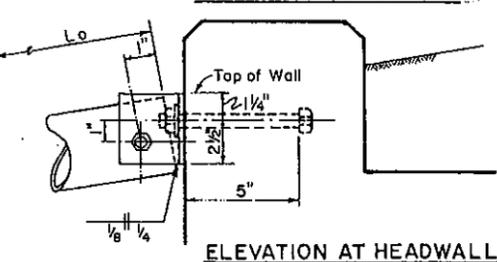
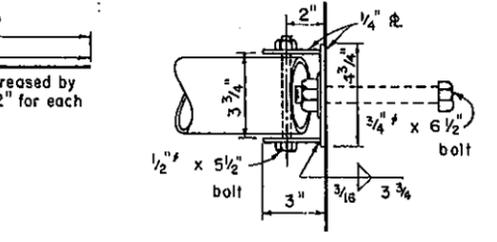
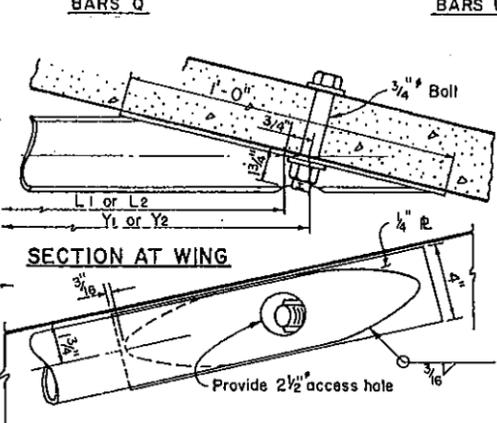
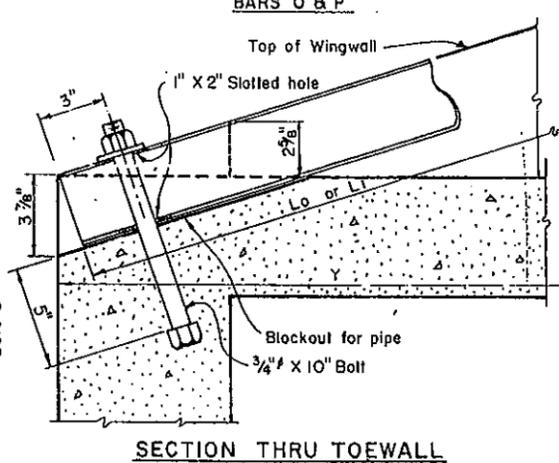
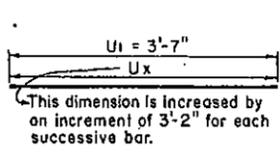
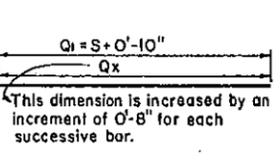
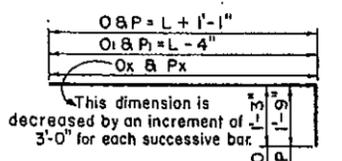
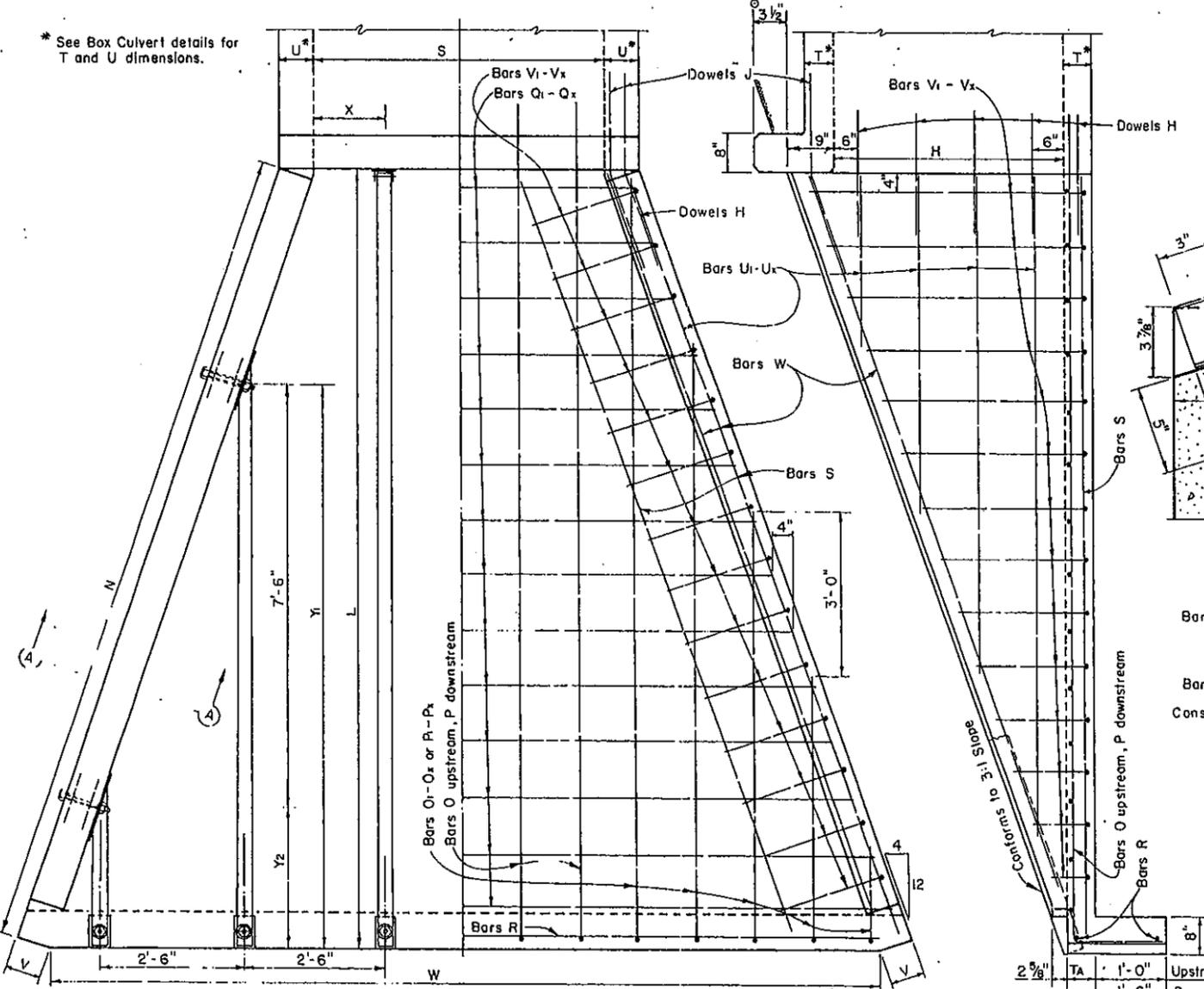
CITY OF PLANO, TEXAS

DATE: OCT., 1987



CULVERT SIZE	TABLE OF DIMENSIONS								TOTAL QUANTITIES			TABLE OF REINFORCING STEEL FOR TWO WINGS																PIPE RUNNERS																				
	S X H	L	N	V	W	T _A	X	Y ₁	Y ₂	2 WINGS			Bars H # 4		Bars J # 6		Bars O		Bars O ₁ -O _x		Bars P		Bars P ₁ -P _x		Bars Q ₁ -Q _x		Bars R		Bars S		Bars U		Bars V ₁ -V _x		8 Bars W		Headwall Pipe		Wingwall Pipe									
										Cu. Yd.	Lbs.	Fl.	No.	Wt.	No.	Wt.	No.	Lgth.	Wt.	No.	Av. Lgth.	Wt.	No.	Lgth.	Wt.	No.	Av. Lgth.	Wt.	No.	Lgth.	Wt.	No.	Av. Lgth.	Wt.	No.	Av. Lgth.	Wt.	No.	Av. Lgth.	Wt.	No.	Lo	No.	L ₁	L ₂			
3 X 2	8'-3"	8'-6 1/2"	6"	8'-5 3/8"	6"	0'-3"			3.57	428	34.24	12	20	8	48	3	10'-7"	21	6	6'-2"	25	3	11'-1"	22	6	6'-2"	27	16	6'-2"	66	8'-6"	23	8'-3"	44	8	5'-0"	27	28	3'-4"	62	#4	8'-0"	43	4	8'-6 3/4"	0		
3 X 3	11'-3"	11'-8 1/4"	6"	10'-5 3/8"	6"	1'-6"	8'-2"		5.63	659	57.45	16	27	8	48	3	13'-7"	27	8	7'-8"	41	3	14'-1"	28	8	8'-2"	44	22	7'-2"	105	10'-6"	28	11'-5"	61	12	6'-7"	52	40	3'-10"	103	#5	11'-4"	95	2	11'-8 3/8"	4	8'-6"	
4 X 2	8'-3"	8'-6 3/8"	6"	9'-5 3/8"	6"	0'-9"			3.94	456	34.24	12	20	8	48	4	10'-7"	28	6	6'-2"	25	4	11'-1"	30	6	6'-8"	27	16	7'-2"	77	9'-6"	25	8'-3"	44	8	5'-0"	27	28	3'-4"	62	#4	8'-0"	43	4	8'-6 3/4"	0		
4 X 3	11'-3"	11'-8 1/4"	6"	11'-5 3/8"	6"	2'-0"	9'-8"		6.11	695	63.77	16	27	8	48	4	13'-7"	36	8	7'-8"	41	4	14'-1"	37	8	8'-2"	44	22	8'-2"	120	11'-6"	31	11'-5"	61	12	6'-7"	52	40	3'-10"	103	#5	11'-4"	95	2	11'-8 3/8"	4	10'-1"	
4 X 4	14'-3"	14'-10 1/4"	6"	13'-5 3/8"	6"	0'-9"	8'-11"		8.73	943	96.70	20	33	8	48	4	16'-7"	44	10	9'-2"	61	4	17'-1"	46	10	9'-8"	65	28	9'-2"	171	13'-6"	36	14'-7"	78	16	8'-2"	87	52	4'-4 1/2"	152	#5	14'-8"	122	4	14'-10 3/8"	4	9'-3 1/2"	
5 X 2	8'-3"	8'-6 3/8"	6"	10'-5 3/8"	6"	1'-3"	4'-5"		4.31	483	52.43	12	20	8	48	5	10'-7"	35	6	6'-2"	25	5	11'-1"	37	6	6'-8"	27	16	8'-2"	87	10'-6"	28	8'-3"	44	8	5'-0"	27	28	3'-4"	62	#4	8'-0"	43	4	8'-6 3/4"	0		
5 X 3	11'-3"	11'-8 1/4"	6"	12'-5 3/8"	6"	1'-3"	7'-5"		6.59	730	77.73	16	27	8	48	5	13'-7"	45	8	7'-8"	41	5	14'-1"	47	8	8'-2"	44	22	9'-2"	134	12'-6"	33	11'-5"	61	12	6'-7"	52	40	3'-10"	103	#5	11'-4"	95	4	11'-8 3/8"	4	7'-8 3/8"	
5 X 4	14'-3"	14'-10 1/4"	6"	14'-5 3/8"	6"	1'-3"	10'-5"		9.32	987	103.02	20	33	8	48	5	16'-7"	55	10	9'-2"	61	5	17'-1"	57	10	9'-8"	65	28	10'-2"	190	14'-6"	39	14'-7"	78	16	8'-2"	87	52	4'-4 1/2"	152	#5	14'-8"	122	4	14'-10 3/8"	4	10'-10 1/2"	
5 X 5	17'-3"	17'-11 3/8"	7"	16'-5 3/8"	6"	1'-3"	13'-4 1/8"	5'-10 3/8"	13.26	1344	152.75	24	40	8	48	5	19'-7"	65	12	10'-8"	86	5	20'-1"	67	12	11'-2"	90	34	11'-2"	254	16'-6"	44	17'-8"	94	20	9'-9"	130	64	4'-11"	210	#6	18'-0"	216	4	18'-0 1/2"	8	14'-0 1/4"	6'-1 3/8"
6 X 3	11'-3"	11'-8 1/4"	6"	13'-5 3/8"	6"	1'-9"	8'-11"		7.06	766	84.05	16	27	8	48	6	13'-7"	54	8	7'-8"	41	6	14'-1"	56	8	8'-2"	44	22	10'-2"	149	13'-6"	36	11'-5"	61	12	6'-7"	52	40	3'-10"	103	#5	11'-4"	95	4	11'-8 3/8"	4	9'-3 1/2"	
6 X 4	14'-3"	14'-10 1/4"	6"	15'-5 3/8"	6"	0'-6"	8'-2"		9.91	1031	123.31	20	33	8	48	6	16'-7"	66	10	9'-2"	61	6	17'-1"	68	10	9'-8"	65	28	11'-2"	209	15'-6"	42	14'-7"	78	16	8'-2"	87	52	4'-4 1/2"	152	#5	14'-8"	122	6	14'-10 3/8"	4	8'-6"	
6 X 5	17'-3"	17'-11 3/8"	7"	17'-5 3/8"	6"	1'-9"	14'-10 3/8"	7'-4 3/8"	13.96	1395	165.40	24	40	8	48	6	19'-7"	78	12	10'-8"	86	6	20'-1"	80	12	11'-2"	90	34	12'-2"	276	17'-6"	47	17'-8"	94	20	9'-9"	130	64	4'-11"	210	#6	18'-0"	216	4	18'-0 1/2"	8	15'-7 1/4"	7'-8 3/8"
7 X 3	11'-3"	11'-8 1/4"	6"	14'-5 3/8"	6 1/2"	2'-3"	10'-5"		7.95	805	90.37	16	27	8	48	7	13'-7"	64	8	7'-8"	41	7	14'-1"	66	8	8'-2"	44	22	11'-2"	164	14'-6"	39	11'-5"	61	12	6'-7"	52	40	3'-10"	103	#5	11'-4"	95	4	11'-8 3/8"	4	10'-10 1/2"	
7 X 4	14'-3"	14'-10 1/4"	6"	16'-5 3/8"	6 1/2"	1'-0"	9'-8"		11.06	1077	129.63	20	33	8	48	7	16'-7"	78	10	9'-2"	61	7	17'-1"	80	10	9'-8"	65	28	12'-2"	228	16'-6"	44	14'-7"	78	16	8'-2"	87	52	4'-5"	153	#5	14'-8"	122	6	14'-10 3/8"	4	10'-1"	
7 X 5	17'-3"	17'-11 3/8"	7"	18'-5 3/8"	6 1/2"	2'-3"	16'-4 3/8"	8'-10 3/8"	15.41	1446	178.05	24	40	8	48	7	19'-7"	92	12	10'-8"	86	7	20'-1"	90	12	11'-2"	90	34	13'-2"	299	18'-6"	49	17'-8"	94	20	9'-9"	130	64	4'-11 1/2"	212	#6	18'-0"	216	4	18'-0 1/2"	8	17'-2 1/4"	9'-3 3/8"
8 X 4	14'-3"	14'-10 1/4"	6"	17'-5 3/8"	7"	0'-3"	7'-5"		12.30	1122	149.92	20	33	8	48	8	16'-7"	89	10	9'-2"	61	8	17'-1"	91	10	9'-8"	65	28	13'-2"	246	17'-6"	47	14'-7"	78	16	8'-2"	87	52	4'-5 1/2"	155	#5	14'-8"	122	8	14'-10 3/8"	4	7'-8 1/2"	
8 X 5	17'-3"	17'-11 3/8"	7"	19'-5 3/8"	7"	0'-3"	10'-4 3/8"		16.95	1504	187.82	24	40	8	48	8	19'-7"	105	12	10'-8"	86	8	20'-1"	107	12	11'-2"	90	34	14'-2"	322	19'-6"	52	17'-8"	94	20	9'-9"	130	64	5'-0"	214	#6	18'-0"	216	8	18'-0 1/2"	4	10'-10 3/8"	
9 X 5	17'-3"	17'-11 3/8"	7"	20'-5 3/8"	7"	2'-0"	15'-7 3/8"	8'-1 3/8"	17.76	1556	207.82	24	40	8	48	9	19'-7"	118	12	10'-8"	86	9	20'-1"	121	12	11'-2"	90	34	15'-2"	344	20'-6"	55	17'-8"	94	20	9'-9"	130	64	5'-0"	214	#6	18'-0"	216	8	18'-0 1/2"	8	16'-4 3/8"	8'-5 3/8"
10 X 5	17'-3"	17'-11 3/8"	7"	21'-5 3/8"	7 1/2"	1'-3"	13'-4 3/8"	5'-10 3/8"	19.47	1607	224.94	24	40	8	48	10	19'-7"	131	12	10'-8"	86	10	20'-1"	134	12	11'-2"	90	34	16'-2"	367	21'-6"	57	17'-8"	94	20	9'-9"	130	64	5'-0 1/2"	214	#6	18'-0"	216	8	18'-0 1/2"	8	14'-0 1/4"	6'-1 3/8"

* See Box Culvert details for T and U dimensions.



GENERAL NOTES:
 All bolts, nuts, washers, brackets, angles and pipe runners are considered parts of the Safety End Treatment for payment.
 Pipe runners shall be 3" Schedule 40 steel pipe.
 Bolts and nuts shall conform to ASTM A307.
 Holes shall be 1/8" oversize unless otherwise noted.
 Steel plate shall conform to ASTM A36.
 Dimensions relating to reinforcing steel are to centers of bars.
 Steel cover to be 2" from center of outside layer of steel to face of concrete.
 Chamfer exposed corners 3/4" except as otherwise noted.
 All exposed steel shall be galvanized unless otherwise shown on plans. Galvanizing damaged during transport and construction shall be repaired in accordance with the specifications.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

FLARED WINGWALLS - NORMAL

FOR SINGLE BOX CULVERTS WITH SAFETY END TREATMENT - TYPE I

3:1 EMBANKMENT SLOPE SIZES 3 X 2 TO 10 X 5

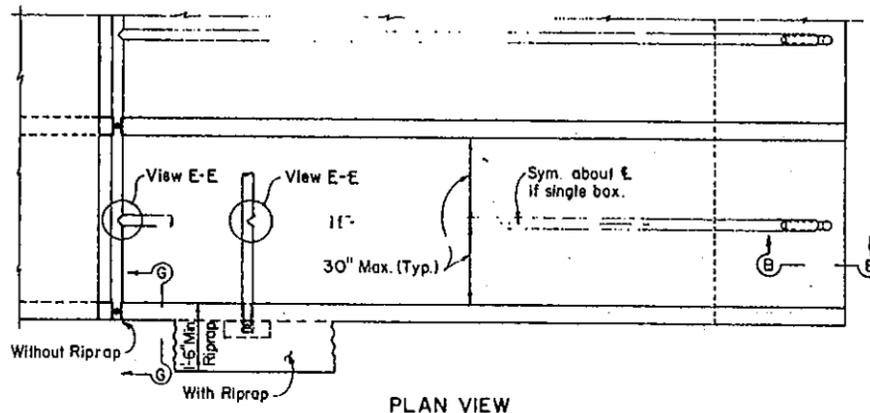
WS-S-N-3

ORIGINAL DRAWING DATE: NOV. 1980	STATE DISTRICT: 6	FEDERAL AID PROJECT: 0	SHEET: 28
REVISIONS:	6		
CR.: GCT	Rev. 1-81		
CR.: LEH	Rev. 1-82		
CR.: EDS	Rev. 8-83		
CR.: LEH	Rev. 8-83		

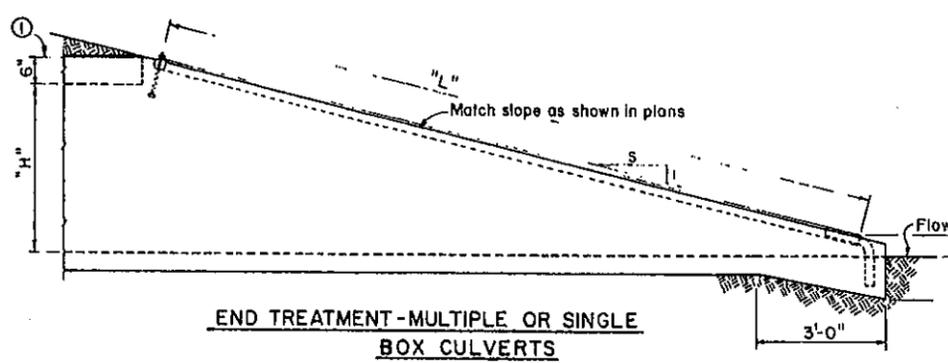
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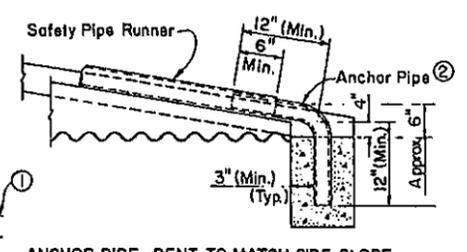




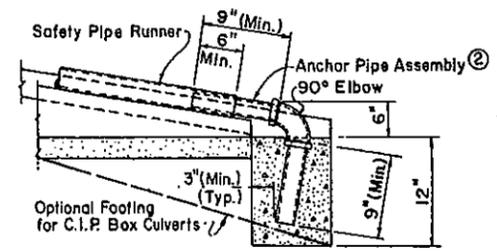
PLAN VIEW



END TREATMENT - MULTIPLE OR SINGLE BOX CULVERTS

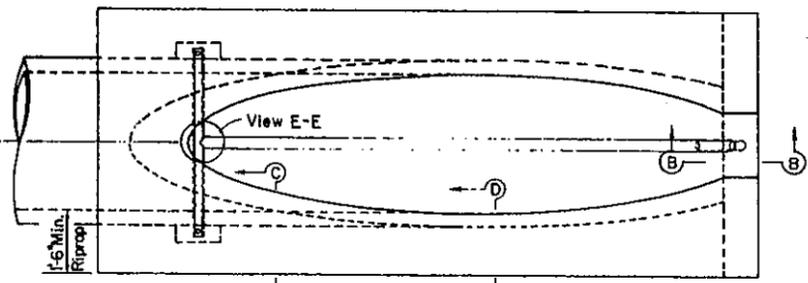


ANCHOR PIPE - BENT TO MATCH SIDE SLOPE
SHOWING C.M. PIPE - OPTIONAL 90° ELBOW
MAY BE USED FOR ANCHOR PIPE

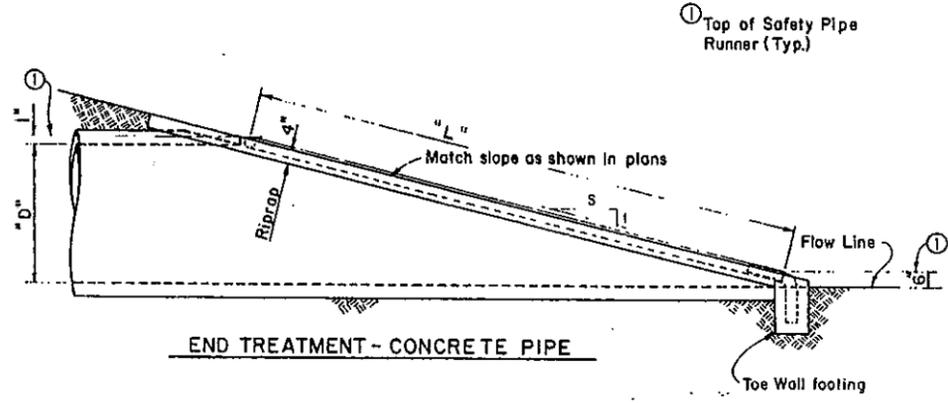


ANCHOR PIPE - USING 90° ELBOW (OPTIONAL)
SHOWING CONCRETE PIPE

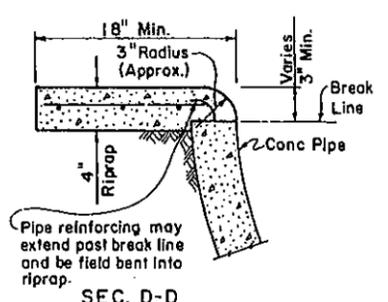
SEC. B-B



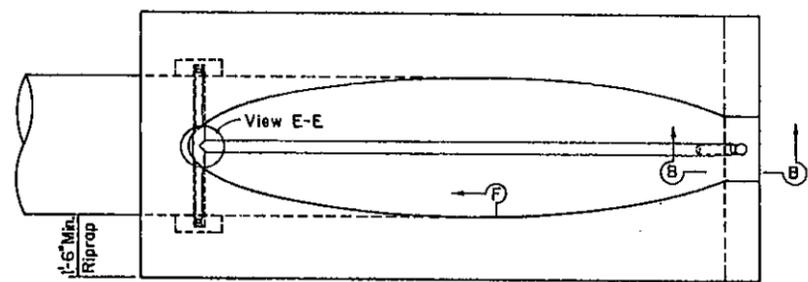
PLAN VIEW
CONCRETE PIPE



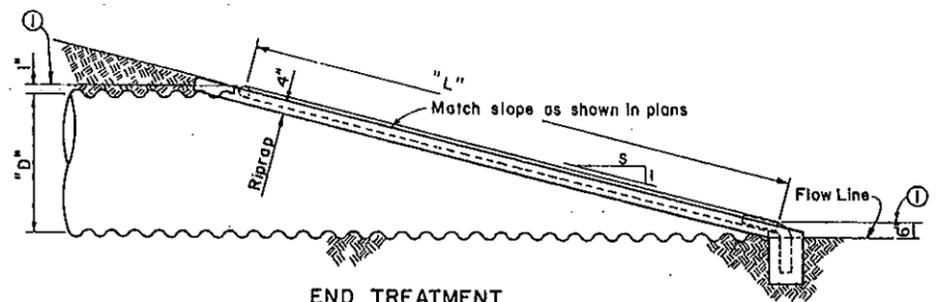
END TREATMENT - CONCRETE PIPE



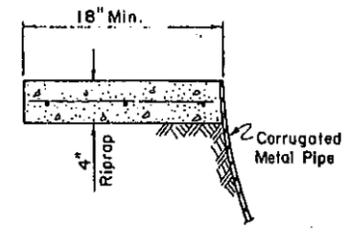
SEC. D-D



PLAN VIEW
CORRUGATED METAL PIPE



END TREATMENT
CORRUGATED METAL PIPE



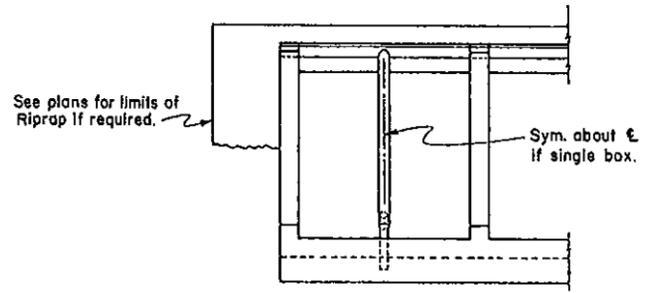
SEC. F-F

"L" FOR VARIOUS CULVERT SIZES AND SIDE SLOPES				
Slope	3:1	4:1	5:1	6:1
D = 36"	8'-2"	10'-8"	13'-2"	15'-9"
H = 36"	9'-6"	12'-4"	15'-4"	18'-3"
D = 42"	9'-9"	12'-9"	15'-9"	18'-9"
H = 42"	11'-1"	14'-5"	17'-10"	21'-3"
D = 48"	11'-4"	14'-9"	18'-3"	21'-10"
H = 48"	12'-8"	16'-6"	20'-5"	24'-4"
D = 54"	12'-11"	16'-10"	20'-10"	24'-10"
H = 54"	14'-3"	18'-7"	22'-11"	27'-4"
D = 60"	14'-6"	18'-11"	23'-4"	27'-11"
H = 60"	15'-10"	20'-7"	25'-6"	30'-5"

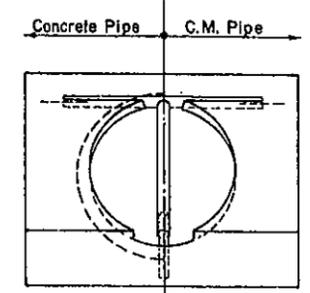
MAXIMUM PIPE "L" FOR A GIVEN PIPE SIZE AND YIELD			
Yield	35 ksi	42 ksi	52 ksi
Nom. Dia.	ASTM A53 Type E BS Gr. B	ASTM A500 Gr. B	API 5LX52
3"	11'-2"	13'-4"	16'-7"
3 1/2"	15'-6"	18'-7"	23'-0"
4"	20'-10"	25'-0"	30'-1"
5"	35'-4"		
OD=3.500"			
OD=4.000"			
OD=4.500"			
OD=5.563"			

Anchor Pipe may be any of the above materials and shall have an O.D. of 1/4" to 5/8" less than the I.D. of the Safety Pipe Runners.

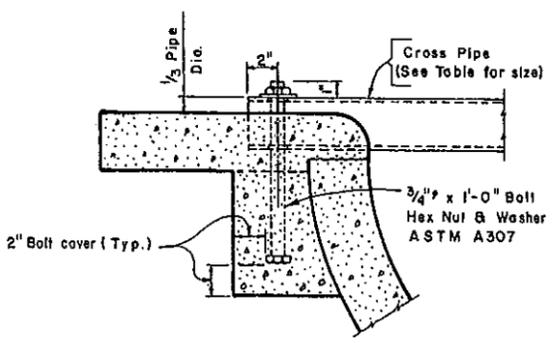
GENERAL NOTES:
 These details are to be used as a guide for installation of safety pipe runners for cross-drainage structures where out of control vehicles may traverse the openings approximately perpendicular to the safety pipe runners. Some installations may require the preparation of special details. In general, safety pipe runners are installed on cross-drainage structures at maximum spacings of approximately 30 inches.
 Single 36 inch or smaller diameter pipes are permissible without Safety Pipe Runners. Multiple 30" diameter or smaller pipes are permissible without Safety Pipe Runners. Single or multiple box culverts with spans of 30' or less are also permissible without Safety Pipe Runners.
 Payment for riprap (if required) toe wall footing is included in the price bid for each Safety Pipe End Treatment.
 Design Safety Pipe Runners are designed for a traversing load of 1,800 pounds of yield as recommended by Research Report 280-1, Safety Treatment of Roadside Cross-Drainage Structures, Texas Transportation Institute, March 1981.



END VIEW
MULTIPLE OR SINGLE BOX CULVERTS

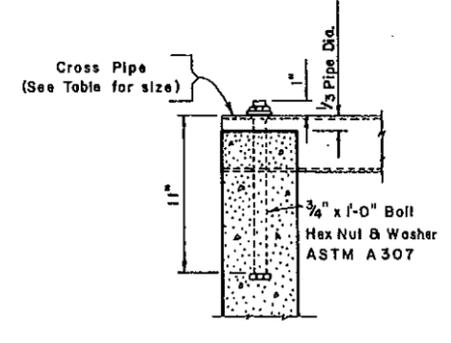


END VIEW
CONCRETE OR CORRUGATED METAL PIPE

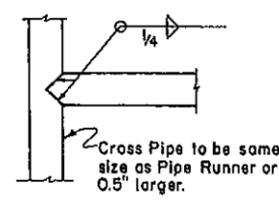


SEC. C-C

Deepen and widen riprap around end of cross pipe and provide bolted connection to allow cleanout access.



SEC. G-G



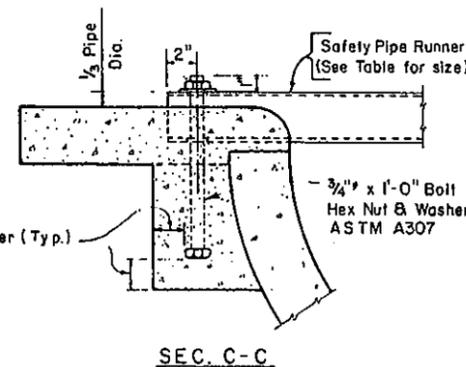
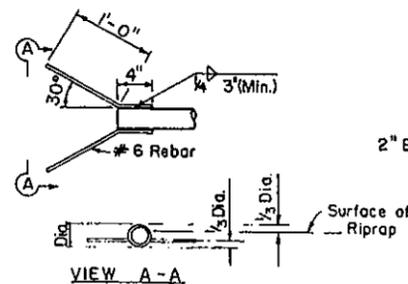
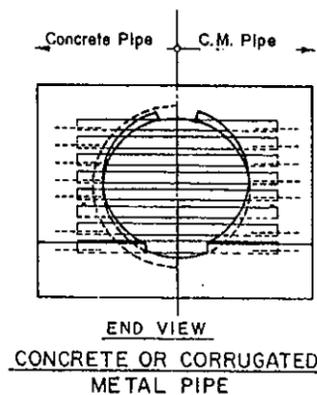
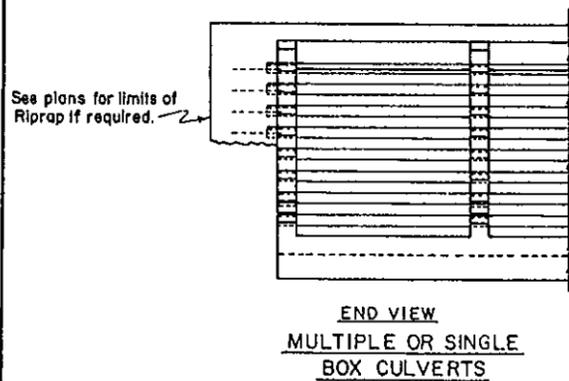
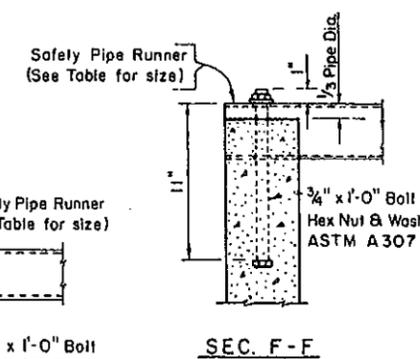
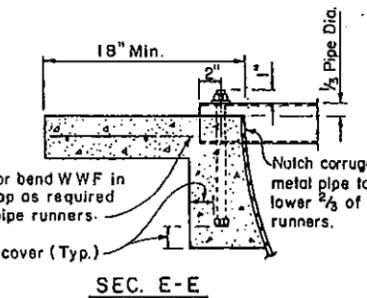
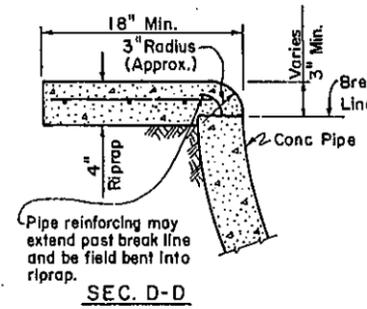
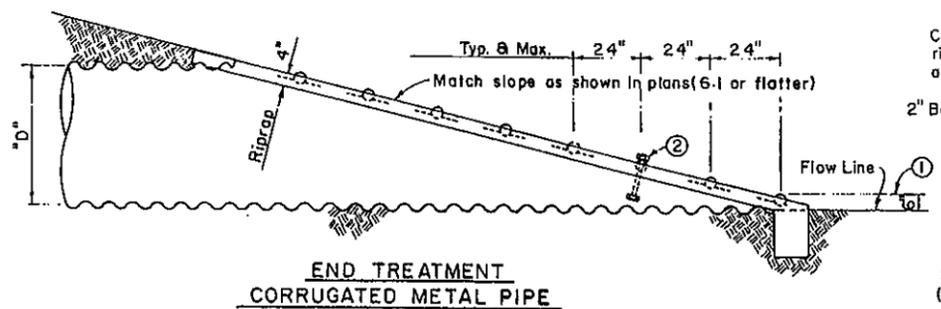
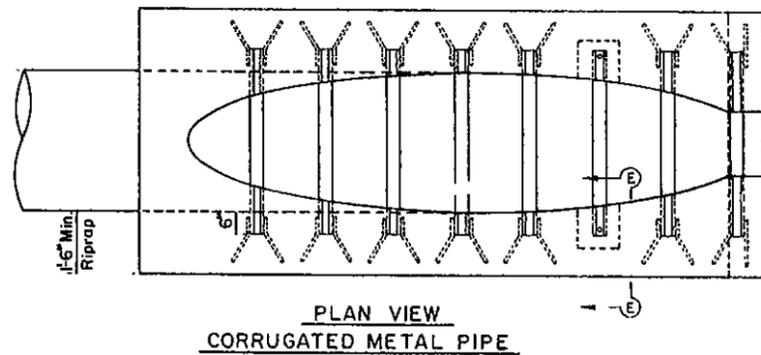
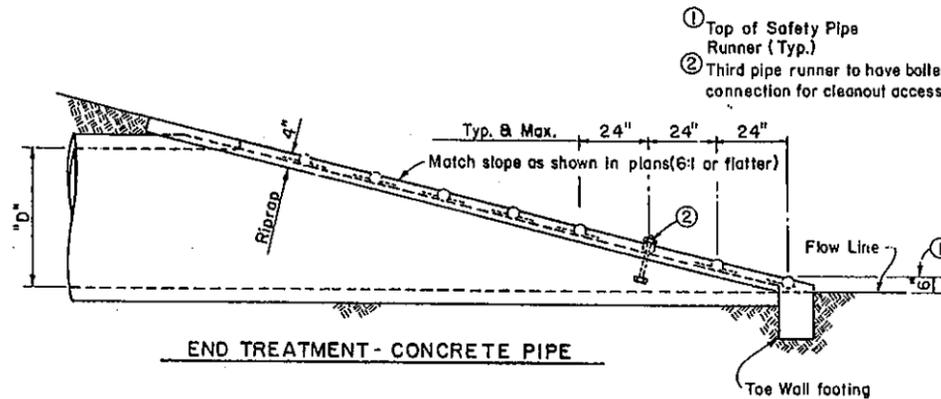
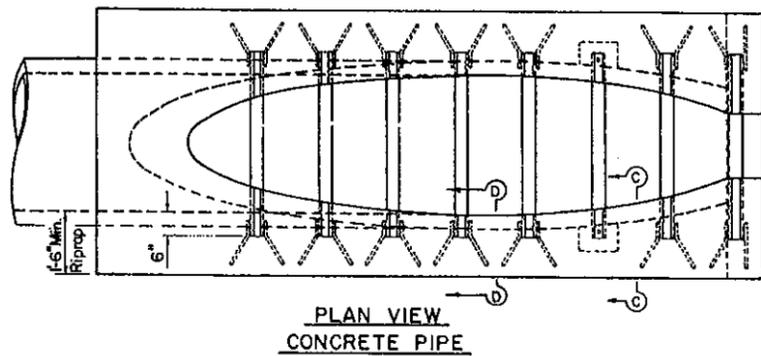
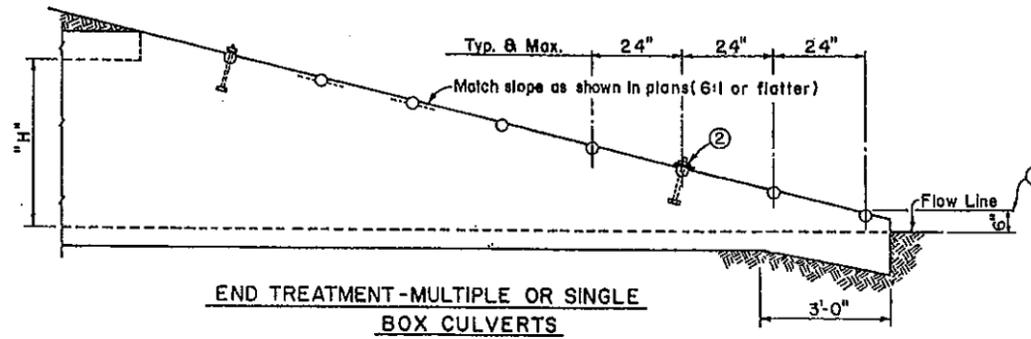
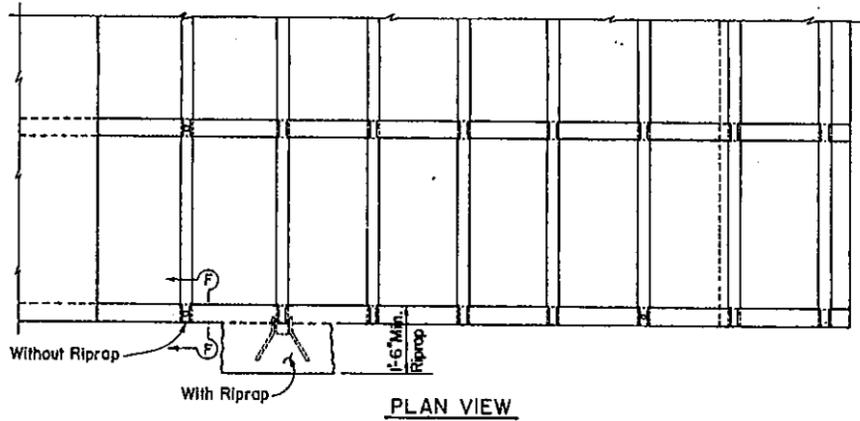
VIEW E-E

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

CROSS DRAINAGE SAFETY PIPE RUNNERS

CD-SPR

ORIGINAL DRAWING DATE	NOV. 1980	STATE FEDERAL PROJECT		SHEET	
DR. - MPM		REVISIONS	6		
CR. - JJP					
DW. - EDS					
CR. - JJP					



Deepen and widen riprap around ends of 3rd. pipe runner and provide a bolted connection to allow cleanout access.

Culvert Size	Pipe Runner Length	REQUIRED PIPE SIZES FOR GIVEN PIPE YIELD								
		35 ks: ASTM A53, Ty. E & S Gr. B			42 ks: ASTM A500, Gr. B			52 ks: API 5LX52		
		Nom.	OD	ID	Nom.	OD	ID	Nom.	OD	ID
36"	48"	3"XXS	3,500	2,300	3"XXS	3,500	2,900	3"Std.	3,500	3,068
		3 1/2"XS	4,000	3,364	3 1/2"Std.	4,000	3,548			
42"	54"	3"XXS	3,500	2,300	3"XXS	3,500	2,300	3"XXS	3,500	2,900
		3 1/2"XS	4,000	3,364	3 1/2"XS	4,000	3,364	3 1/2"Std.	4,000	3,548
48"	60"	3"XXS	3,500	2,300	3"XXS	3,500	2,300	3"XXS	3,500	2,300
		4"XS	4,500	3,826	3 1/2"XS	4,000	3,364	3 1/2"Std.	4,000	3,548
54"	66"	4"XS	4,500	3,826	3"XXS	3,500	2,300	3"XXS	3,500	2,300
		5"Std.	5,563	5,047	4"Std.	4,500	4,026	3 1/2"XS	4,000	3,364
60"	72"	4"XS	4,500	3,826	4"XS	4,500	3,826	3"XXS	3,500	2,300
		5"Std.	5,563	5,047	5"Std.	5,563	5,047	3 1/2"XS	4,000	3,364

GENERAL NOTES:
 These details are to be used as a guide for installation of safety pipe runners for parallel-drainage structures where out of control vehicles may impact the openings approximately perpendicular to the safety pipe runners. Some installations may require the preparation of special details. In general, safety pipe runners are installed on parallel-drainage structures at maximum spacings of approximately 24 inches.
 Single 30 inch or smaller diameter pipes are permissible without Safety Pipe Runners. Multiple 30" diameter or smaller pipes are permissible without Safety Pipe Runners. Single or multiple box culverts with spans of 30" or less are also permissible without Safety Pipe Runners.
 Payment for riprap (if required) toe wall footing is included in the price bid for each Safety Pipe End Treatment.
 Design: Safety Pipe Runners are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, Safety Treatment of Roadside Parallel Drainage Structures, Texas Transportation Institute, June 1981.

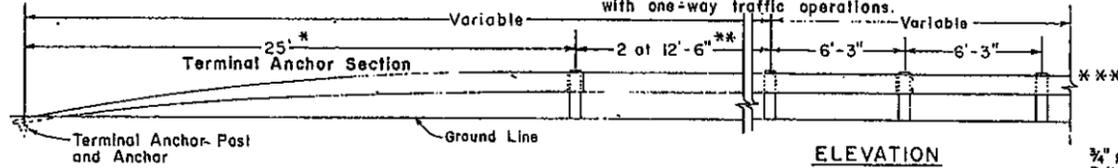
STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

PARALLEL DRAINAGE SAFETY PIPE RUNNERS

PD-SPR

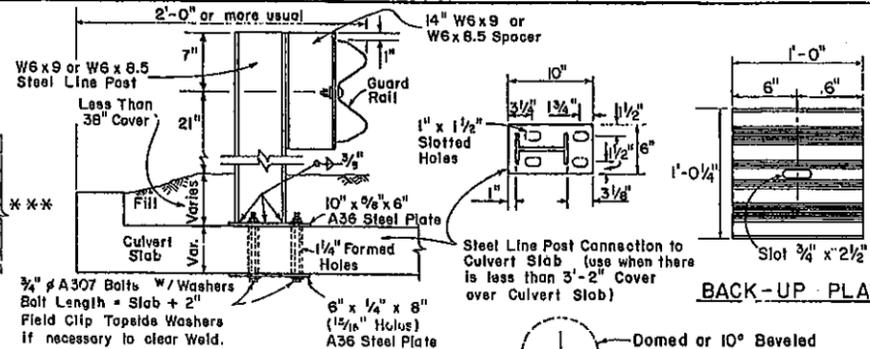
ORIGINAL DRAWING DATE JUNE, 1985	STATE FEDERAL PROJECT #	SHEET
REVISIONS	6	
DATE	COUNTY	SECTION
BY	DESIGNED BY	CHECKED BY
APP'D	DATE	

* * Usual closer post spacing used for short (50' or less) sections of MBGF at bridge ends as shown elsewhere in the plans. 6'-3" spacing may be used on the downstream (from a traffic flow standpoint) end of MBGF placed on roadways with one-way traffic operations.

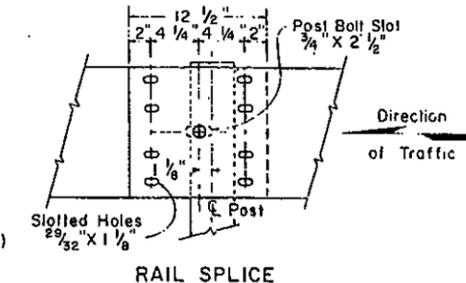


*NOTE: This dimension measured to center of splice when Terminal Connector is used.

* * * Connect to Terminal Anchor, Concrete Traffic Barrier, Wingwall, Bridge Rail, etc. as shown elsewhere in the plans.

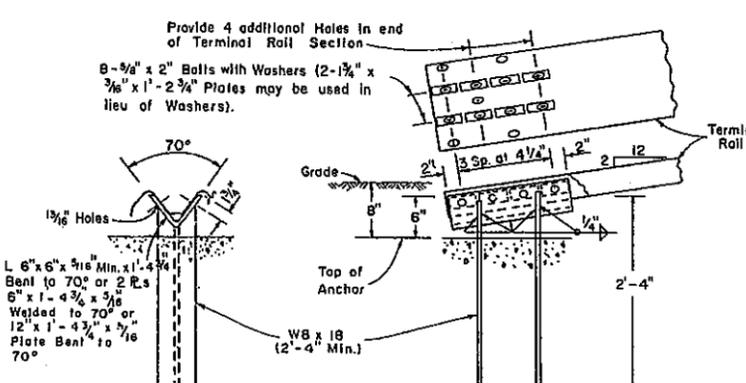


ANCHOR OR SPLICE BOLT 5/8" NUT
POST BOLT: similar except length
(7/8" Hex bolts required for Terminal Connector)



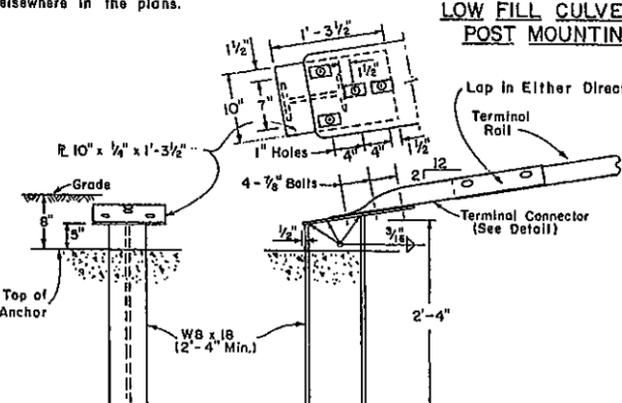
GENERAL NOTES

- THE EXACT POSITION OF GUARD FENCE SHALL BE AS SHOWN ELSEWHERE ON THE PLANS OR AS DIRECTED BY THE ENGINEER. GUARD FENCE SHALL BE TRANSITIONED TO A SMOOTH CONNECTION WITH OTHER GUARD FENCE OR STRUCTURE RAILING AS SHOWN ELSEWHERE ON PLANS.
- AT THE OPTION OF THE CONTRACTOR THE RAIL ELEMENTS FOR THE GUARD FENCE MAY BE FURNISHED IN EITHER 12 1/2 OR 25 FOOT NOMINAL LENGTHS WITH POST BOLT SLOTS FOR CONNECTION TO POSTS.
- BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.
- THE TOP OF THE TERMINAL ANCHOR POST AND ALL STEEL FITTINGS THEREIN SHALL BE GALVANIZED A MINIMUM OF 10" AS SHOWN.
- WHERE WILD ROCK IS ENCOUNTERED OR WHERE SHOWN ON THE PLANS, THE DIAMETER OF THE HOLES SHALL BE APPROXIMATELY 12 INCHES, THE BACKFILLING SHALL BE WITH A CONSIDERABLE MATERIAL, AND EMBEDMENT DEPTH SHALL BE 1'-6" OR MORE AS DIRECTED BY THE ENGINEER. TIMBER POSTS SHALL NOT BE SET IN CONCRETE.
- THE TERMINAL ANCHOR POST SHALL BE SET IN CLASS "A", "B" OR "C" CONCRETE IN ACCORDANCE WITH ITEM, "CONCRETE FOR STRUCTURES", OR SET IN CONCRETE IN ACCORDANCE WITH ITEM "CONCRETE PAVEMENT". CONCRETE SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TERMINAL RAIL SECTION AND ANCHORAGE SYSTEM.
- TIMBER POSTS MAY BE BEVELED AT APPROXIMATELY 10 DEGREES ON THE TOP OR BOTH ENDS WITH HIGH SIDE OF TOP OF POST PLACED TOWARD THE ROADWAY OR THEY MAY BE DOMED. WHEN "BLOCKED OUT", THE UPPER PORTION OF THE POST SHALL BE NOTCHED 3/4" TO PROVIDE FLAT SURFACE FOR TIMBER SPACER. A TOLERANCE OF ± 1/8" WILL BE PERMITTED ON THE NOTCHED PORTION OF THE POST.
- AN ANCHOR OTHER THAN TO A TERMINAL ANCHOR POST SHALL CONSIST OF A CONNECTION SIMILAR TO THE RAIL SPLICE OR SIMILAR TO THE TERMINAL CONNECTION.
- SPECIAL FABRICATION WILL BE REQUIRED IN INSTALLATIONS HAVING A CURVATURE OF LESS THAN 150' RADIUS.
- POST SPACING WILL BE 6' - 3" EXCEPT THAT THE FIRST POST WILL BE 25' FROM THE TERMINAL ANCHOR POST AND THE NEXT TWO POSTS SPACED AT 12' - 6" WITH A MINIMUM OF 8 POSTS ADJACENT TO STRUCTURES SPACED AT 3' - 1 1/2".
- THE 10 GAUGE TERMINAL CONNECTORS MUST BE USED WITH THE OPTIONAL TERMINAL ANCHOR POST. EITHER ANCHOR POST MAY BE USED WITH EITHER CONCRETE ANCHOR.
- CROWN WILL BE WIDENED TO ACCOMMODATE GUARD FENCE.
- STEEL POSTS SHALL BE BLOCKED OUT. A W6x8.5 OR W6x9.0 STEEL SPACER SHALL BE USED WITH STEEL POSTS. BACK-UP PLATES SHALL BE PROVIDED AT INTERMEDIATE (NON-SPLICE) STEEL POSTS.
- WHEN BLOCKOUT GUARD FENCE IS SPECIFIED ELSEWHERE IN THE PLANS, A 6" x 6" x 14" TREATED TIMBER SPACER OF YELLOW PINE SHALL BE USED WITH WOOD POSTS.
- UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE BLOCKED OUT SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 21-INCHES ABOVE THE OUTER FACE OF ROADWAY SURFACE.
- WELDED STEEL POSTS AND SPACERS SHALL MEET THE REQUIREMENTS OF ASTM A-769. THE FLANGE WIDTH AND THICKNESS, WEB THICKNESS, AND DEPTH OF WELDED POSTS AND SPACERS SHALL EQUAL OR EXCEED THE DIMENSIONS OF A STANDARD ROLLED W6x8.5.
- STEEL POSTS AND SPACERS SHALL MEET THE REQUIREMENTS OF ASTM A-36. BUILT HOLES SHALL BE APPROXIMATELY CENTERED BETWEEN WEB AND EDGE OF FLANGE OF SPACERS AND POSTS.
- UNLESS OTHERWISE SHOWN IN THE PLANS, MBGF SHALL BE PLACED WITH THE FACE OF RAIL DIRECTLY ABOVE THE SHOULDER EDGE (OR CURBFACE) EXCEPT THE 25' TERMINAL ANCHOR SECTION AND ADJACENT 25' OF MBGF SHALL BE PLACED AT 25:1 (LONGITUDINAL/LATERAL) TO PROVIDE A 2' OFFSET BETWEEN RURED ANCHOR AND SHOULDER EDGE (OR CURBFACE). PLACING THE 25' TERMINAL ANCHOR AND ADJACENT 25' MBGF IS OPTIONAL FOR ONE-WAY TRAFFIC CONDITIONS ON THE DOWNSTREAM END OF GUARD FENCE.
- WASHERS USED WITH THE 5/8" SPLICE BOLTS AND NUTS THAT ARE PROVIDED FOR TERMINAL CONNECTORS AND/OR TERMINAL ANCHOR POSTS SHALL BE 1 3/4" x 3 1/4" x 3.16", OR 1 1/2" I.D. AND 2" O.D. x 0.134" (ANSI B27.2) NARROW TYPE A PLAIN WASHERS.
- BACK-UP PLATES SHALL CONFORM TO THE MATERIALS AND GALVANIZING REQUIREMENTS SPECIFIED FOR THE RAIL ELEMENT, AND SHALL BE OF THE SAME NOMINAL THICKNESS AS THE RAIL ELEMENT USED.



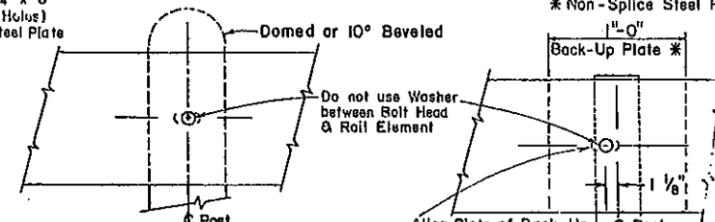
TERMINAL ANCHOR POST

NOTE: This Post requires 4 additional Holes (Shop or Field) in the Terminal Rail member with 8-5/8" Bolts and Washer Plates as shown for attachment.



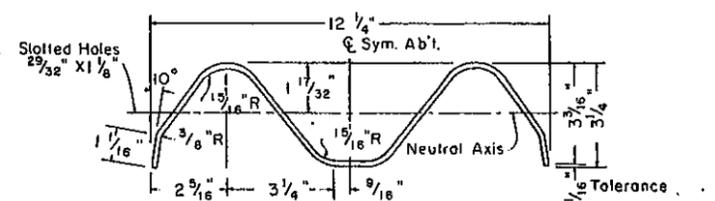
OPTIONAL TERMINAL ANCHOR POST

NOTE: This Optional Post requires the use of the 10 Ga. Terminal Connector with 4-7/8" Bolts for attachment to the Anchor Post.



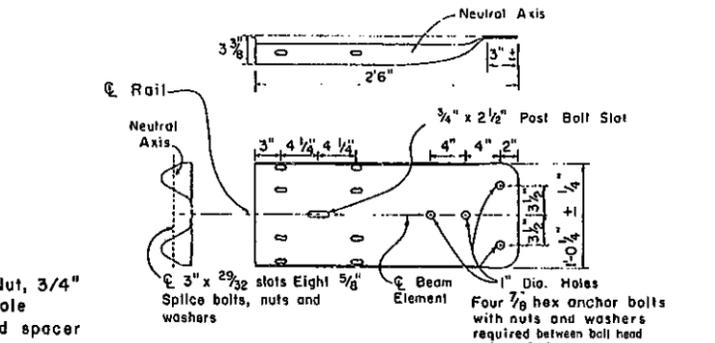
POST CONNECTION WOOD POST

Wood Post May Be Domed or Beveled

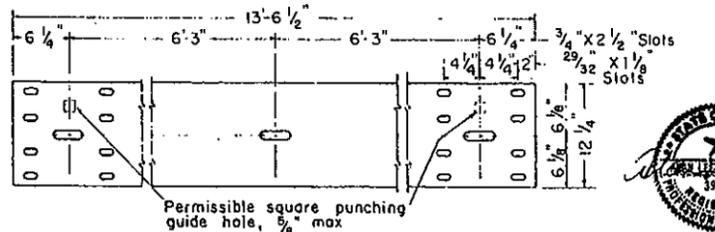


NOTE: Actual section may be slightly different depending upon the manufacturer.

SECTION THRU GUARD RAIL AND BACK-UP PLATE

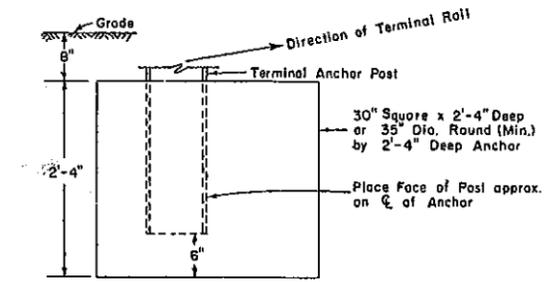


TERMINAL CONNECTOR (10 GAUGE MINIMUM)



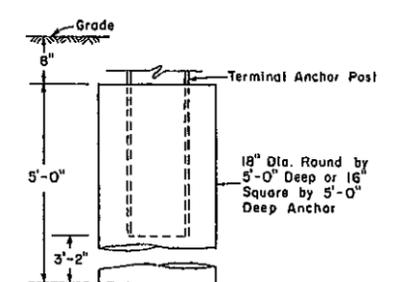
ELEVATION OF NOMINAL 12 1/2 FOOT GUARD RAIL

(25 Foot sections may also be supplied)

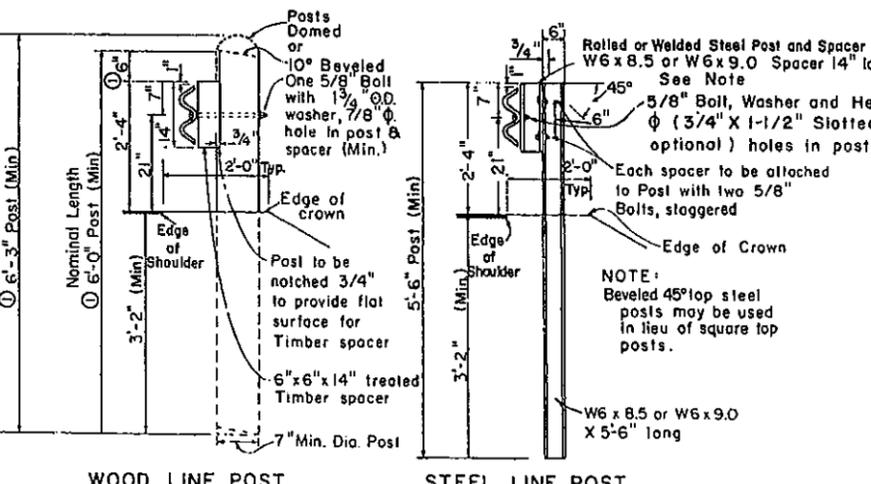
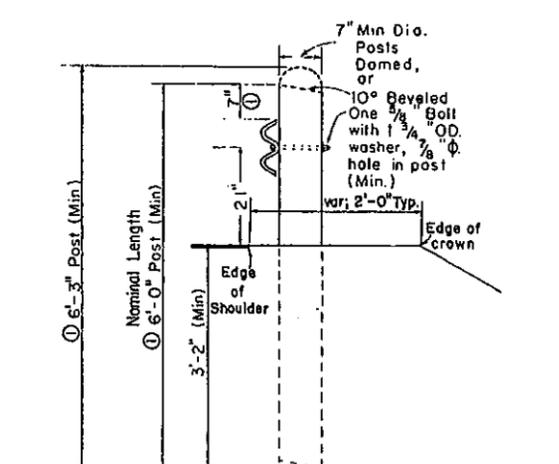


TERMINAL CONCRETE ANCHOR

NOTE: Either Post may be used with either Anchor. No Construction Joint is allowed in the Concrete Anchor. Terminal Rail may be bolted to Post and in twist position prior to placing Concrete Anchor. Upper 10" (Min.) of Anchor Post must be Galvanized.



OPTIONAL TERMINAL CONCRETE ANCHOR



WOOD LINE POST (Blockout)

STEEL LINE POST (Blockout)

NOTE: Where a nominal length of 5'-6" is specified as acceptable elsewhere in the plans, these dimensions shall be reduced by 0'-6".

The designer should specify the reduced length only on highways where future ACP overlays are unlikely.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION

METAL BEAM GUARD FENCE GF(TD) - 87

DN	CK	DR	DATE	FED. NO.	STATE	FEDERAL PROJECT NO.	SHEET NO.
				6	TEXAS		SD-29
DR	REVIS						
CK	REVIS						
DR	REVIS						



STANDARD IRRIGATION DETAILS
PLANO, TEXAS

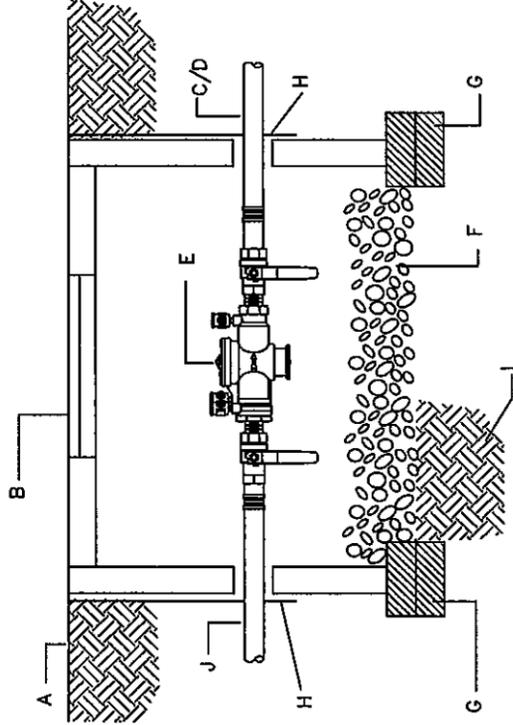
PREFERRED MATERIAL:
Double Check Valve Assembly - FEBCO 850

GENERAL NOTES:

1. INSTALL 4" X 8" X 16" SOLID CMU BLOCKS, LAID FLAT STACKED 2 HIGH ALL AROUND THE VALVE BOX.
2. WASH ROCK SHALL BE INSTALLED TO ALLOW ACCESS AND OPERATION OF BALL VALVES.
3. SEE IRRIGATION PLANS FOR EQUIPMENT SPECIFICATIONS NOT CALLED OUT ON THIS DETAIL.
4. MAINLINE SHALL BE INSTALLED A MINIMUM OF 18" DEEP FROM TOP OF PIPE.

CONSTRUCTION NOTES:

- A. FINISHED GRADE
- B. AMETEK VALVE BOX - X LUB #195035 W/ LID #195117 SET FLUSH WITH FINISHED GRADE FOR 2" DBL CHECKS. ALLOW A MINIMUM OF 6" CLEARANCE ON ALL SIDES OF DOUBLE CHECK VALVE.
- C/D. MAINLINE - TYPE K COPPER TO MASTER VALVE (WITH BALLVALVE ASSEMBLY).
- E. DOUBLE CHECK VALVE ASSM.
- F. 6" DEPTH PEA GRAVEL
- G. 4" X 8" X 16" SOLID CMU BLOCKS.
- H. "DEWITT" FILTER FABRIC. TAPE TO ALL INLET AND OUTLET PORTS OF VALVE BOX. INSTALL FABRIC SO THAT BOX IS ALLOWED TO DRAIN.
- I. COMPACTED SUBGRADE
- J. TYPE K COPPER SERVICE LINE TO METER.



DOUBLE CHECK VALVE DETAIL

RR-15016

NOT TO SCALE



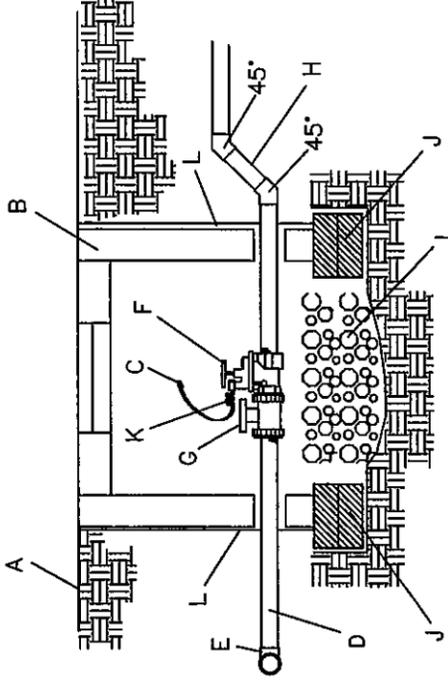
STANDARD IRRIGATION DETAILS
PLANO, TEXAS

PREFERRED MATERIAL

VALVES - NELSON 9500 SERIES WITH
NELSON 9500 SERIES BALLVALVE.
OR
IRRITROL 200 SERIES W/ SPEARS TRUUNION, SCHEDULE 80
UNIONS & SPEARS TRUUNION
(SIZE ACCORDING TO PLAN)

GENERAL NOTES:

1. INSTALL 4" X 8" X 16" SOLID CMU BLOCKS, LAID FLAT, STACKED 2 HIGH ALL AROUND THE VALVE BOX.
2. PEA GRAVEL SHALL BE INSTALLED TO 2" BELOW BOTTOM OF PIPE AND VALVE.
3. MAIN LINE SHALL HAVE A MINIMUM OF 18" COVER LATERAL LINE SHALL HAVE A MINIMUM 12" COVER
4. PROVIDE A 24" WIRE EXPANSION COIL AT EACH TOM KING BLACK SPICE WIRE CONNECTION.
5. CENTER VALVE ASSEMBLY IN VALVE BOX.



CONSTRUCTION NOTES:

- A. FINISH GRADE
- B. AMETEK VALVE BOX INSTALLED FLUSH TO FINISHED GRADE. (STANDARD BOX W/ LID #170133 - VALVES 1" AND SMALLER) (JUMBO BOX W/ LID #190109 OR #190117 - VALVES 1" - 2") (X LUB BOX #195035 W/LID #195117 - VALVES GREATER THAN 2")
- C. "TOM KING BLACK" SPICE CONNECTORS (PART #LV9500)
- D. IRRIGATION MAINLINE
- E. ELECTRIC VALVE - SEE PREFERRED MATERIAL
- F. BALL VALVE WITH FITTING & COUPLING NUT - SEE PREFERRED MATERIALS.
- G. LATERAL LINE
- H. MINIMUM 6" DEPTH PEA GRAVEL
- I. INSTALLED TO 2" BELOW PIPE AND VALVE.
- J. 4" X 8" X 16" SOLID CMU BLOCKS, LAID FLAT, STACKED 2 HIGH ALL AROUND VALVE BOX.
- K. "DEWITT" FILTER FABRIC. TAPE TO ALL INLET AND OUTLET PORTS OF VALVE BOX TO BLOCK SILTING PROBLEMS. INSTALL FABRIC SO THAT BOX IS ALLOWED TO DRAIN.
- L.

IRRIGATION ELECTRIC VALVE

RR-15016

NOT TO SCALE

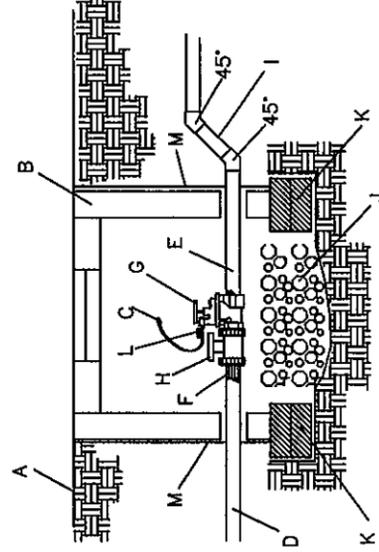


GENERAL NOTES:

- INSTALL 4" X 8" X 16" SOLID CMU BLOCKS STACKED 2 HIGH ALL AROUND THE VALVE BOX.
- PEA GRAVEL SHALL BE INSTALLED TO 2" BELOW BOTTOM OF PIPE AND VALVE.
- MAIN LINE SHALL HAVE A MINIMUM OF 18" COVER LATERAL LINE SHALL HAVE A MINIMUM 12" COVER
- PROVIDE A 24" WIRE EXPANSION COIL AT EACH TOM KING BLACK SPICE WIRE CONNECTION.
- CENTER VALVE ASSEMBLY IN VALVE BOX.
- DESIGN SYSTEM WITH AN EXTRA VALVE AS MASTER VALVE, TO WORK WITH MIR CONTROLLER.

CONSTRUCTION NOTES:

- FINISH GRADE
- AMETEK VALVE BOX INSTALLED FLUSH TO FINISHED GRADE. (STANDARD BOX W/LID 3170133 - VALVES 1" AND SMALLER) (JUMBO BOX W/LID #190109 OR #190117 - VALVES 1" to 2") (X LUB BOX #190335 W/LID 1195117 - VALVES GREATER THAN 2")
- "TOM KING BLACK" SPICE CONNECTORS (PART #LV9500)
- IRRIGATION MAINLINE, TYPE K COPPER (FROM BALLVALVE BACK TO METER)
- IRRIGATION MAINLINE - PVC
- COPPER MALE ADAPTER
- NELSON 9500 SERIES VALVE
- NELSON 9500 SERIES BALLVALVE WITH FITTING AND COUPLING NUT
- LATERAL LINE
- MINIMUM 6" DEPTH PEA GRAVEL. (INSTALLED TO 2" BELOW PIPE AND VALVE)
- 4" X 8" X 16" SOLID CMU BLOCKS - LAID FLAT, STACKED 2 HIGH ALL AROUND VALVE BOX.
- 24" WIRE EXPANSION COIL.
- "DEWITT" FILTER FABRIC, TAPE TO ALL INLET AND OUTLET PORTS OF VALVE BOX. TO BLOCK SILTING PROBLEMS
- INSTALL FABRIC SO THAT BOX IS ALLOWED TO DRAIN.



IRRIGATION MASTER VALVE



NOT TO SCALE

IRRI-15.DWG

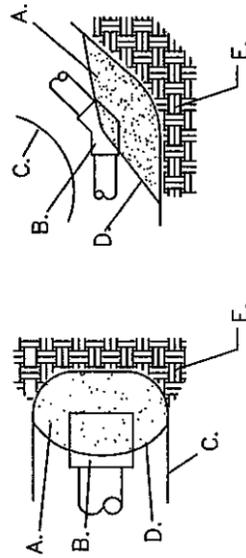
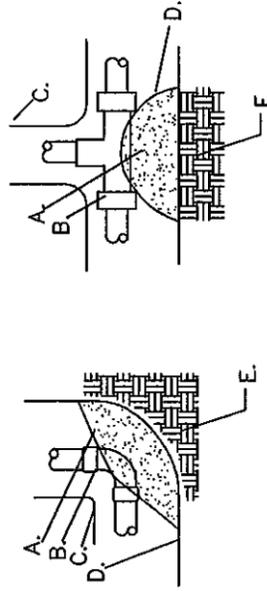
PREFERRED MATERIAL

VALVES LESS THAN 60 GALLONS USE:
NELSON 9500 SERIES WITH
NELSON 9500 SERIES BALLVALVE.
OR
IRRITROL 200 SERIES W/SPEARS
TRU-UNIONS (SCH80) AND
SPEARS TRU-UNION BALL VALVE.
VALVES GREATER THAN 60 GALLONS USE:
ARAD FLOWMETER SIZED ACCORDING TO PLAN.



GENERAL NOTES:

- PVC FITTINGS SHALL BE PROTECTED FROM CONCRETE BY PLACING "DEWITT" FILTER FABRIC ON CONCRETE AND FITTING.
- THRUST BLOCKS SHALL BE USED ON ALL SOLVENT WELD PIPE 3" OR LARGER.
- NO FOUR WAY CONNECTS SHALL BE ALLOWED
- MINIMUM 2000 PSI STRENGTH CONCRETE AFTER 28 DAYS.
- MINIMUM 2.0 CUBIC FOOT OF CONCRETE PER THRUST BLOCK.



CONSTRUCTION NOTES:

- CONCRETE THRUST BLOCK PLACED AGAINST SOLID UNDISTURBED SOIL.
- PVC FITTING.
- PIPE TRENCH.
- "DEWITT" FILTER FABRIC, TAPE TO ALL INLET AND OUTLET PORTS. INSTALL FABRIC SO THAT BOX IS ALLOWED TO DRAIN.

IRRIGATION THRUST BLOCKS

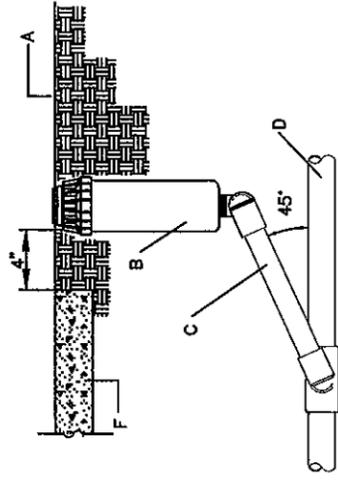


NOT TO SCALE

IRRI-34.DWG



PREFERRED MATERIAL:
HUNTER— GEAR DRIVEN ROTORS (SIZE ACCORDING TO PLAN)
SWING JOINT — MANUFACTURED RING & GASKET / LASCO OR SPEAR BRAND



GENERAL NOTES:

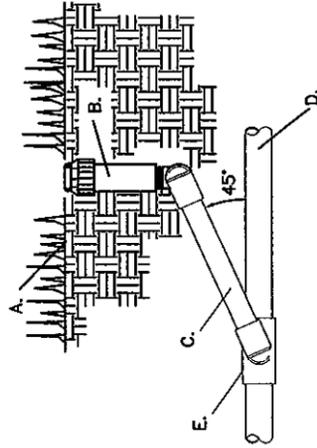
- THIS DETAIL SHALL BE USED FOR ANY IRRIGATION HEAD THAT IS NOT CLASSIFIED AS A POP UP SPRAY HEAD.
 - TOP OF SPRINKLER HEAD SHALL BE SET FLUSH WITH FINISH GRADE
 - FLUSH PIPING BEFORE INSTALLING HEADS
- CONSTRUCTION NOTES:
- FINISH GRADE
 - SPRINKLER HEAD (SEE PLAN)
 - MANUFACTURED RING AND GASKET SWING JOINT.
 - LATERAL PIPE
 - 45 DEGREE ANGLE
 - HARDSCAPE



RR-53JMG
NOT TO SCALE

PREFERRED MATERIAL:

RAINBIRD 1804 NOZZLE PER APPLICATION
SWING JOINT — HUNTER SJ-506 OR 512

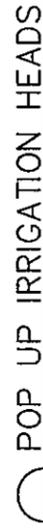


GENERAL NOTES:

- THIS DETAIL SHALL BE USED FOR POP-UP SHRUB SPRAYS, POP-UP TURF SPRAYS, AND POP UP TREE SPRAYS, TWO PER TREE
- TOP OF SPRINKLER HEAD SHALL BE SET FLUSH WITH FINISH GRADE
- NO "FUNNY" PIPE OR "FLEX" PIPE IS TO BE USED IN THE INSTALLATION.
- NO BLUE GLUE IS TO BE USED

CONSTRUCTION NOTES:

- FINISH GRADE
- RAINBIRD 1806 — 6" POP-UP
- SWING JOINT — SIZED ACCORDING TO HEAD SIZE
- LATERAL PIPE
- APPROPRIATE SCHEDULE 40 FITTING.



RR-17JMG
NOT TO SCALE



IRRIGATION DETAIL FOR NEWLY PLANTED TREES

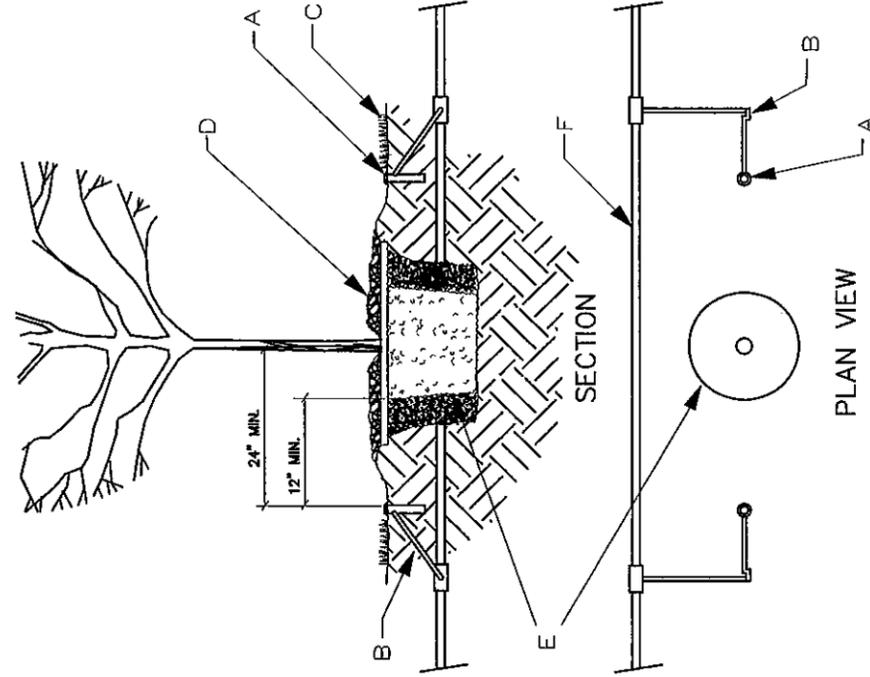
NOT TO SCALE

GENERAL NOTES:

- ALL TREE IRRIGATION HEADS ARE TO BE RAINBIRD 1806 SERIES 6" POP-UP W/ 8' Q NOZZLES.

CONSTRUCTION NOTES:

- IRRIGATION HEAD (2 PER TREE) — SHALL BE INSTALLED OUTSIDE OF AND ON OPPOSITE SIDES OFF THE TREE WELL. HEADS SHALL BE A MINIMUM OF 24" FROM THE BASE OF THE TREE AND A MINIMUM OF 12" FROM THE ROOT BALL — NOT TO BE COVERED WITH MULCH.
- SWING JOINT TO BE A HUNTER SJ-512
- FINISHED GRADE
- MULCH TREE WELL (SEE PLANTING DETAIL)
- TREE ROOT BALL
- LATERAL IRRIGATION LINE TO REMAIN A MINIMUM OF 12" OUTSIDE OF ROOTBALL AND A MINIMUM OF 24" FROM THE TRUNK OF THE TREE.



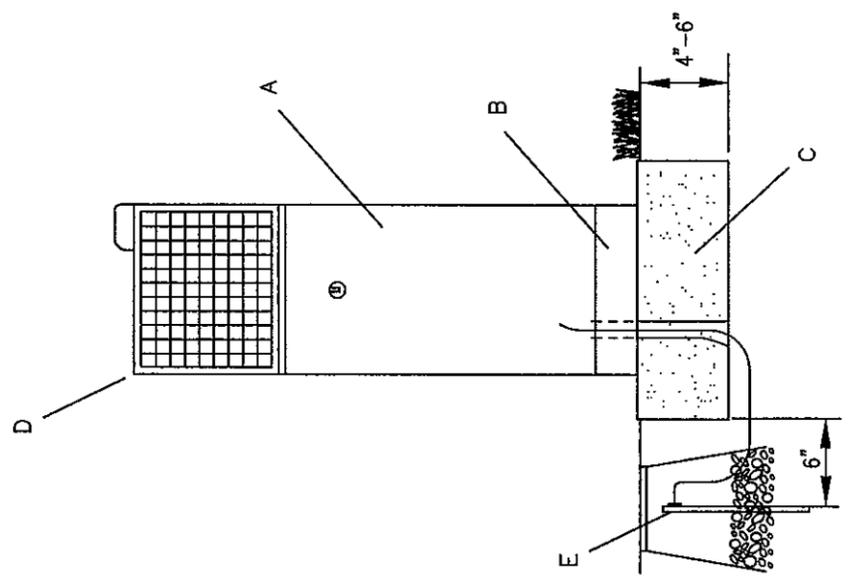


STANDARD
IRRIGATION DETAILS
PLANO, TEXAS

- GENERAL NOTES:**
1. 'MIR' OR 'SCORPIO' CONTROLLER - (Specific to job site.)
NOTE: ALL ELECTRICAL WIRING TO BE INSTALLED AS PER LOCAL CODES.
 2. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ELECTRICAL WORK.
 3. PROVIDE DRAINAGE AWAY FROM THE BASE OF THE CONTROLLER IN ALL DIRECTIONS.
 4. ALL IRRIGATION BOXES TO BE GROUNDED WITH GROUNDING ROD & WIRE PER N.E.C.
 5. INSTALL CONTROLLER IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS
 6. NO MORE THAN 1200' BETWEEN CONTROLLER AND FURTHEST VALVE.

CONSTRUCTION NOTES:

- A. WEATHER PROOF AUTOMATIC CONTROLLER AS SPECIFIED
- B. CONTROLLER PEDESTAL (SECURELY ANCHOR TO CONCRETE BASE)
- C. CONCRETE BASE (TAPER AT EDGE)
- D. SOLAR PANEL (MUST FACE SOUTH)
- E. GROUNDING ROD - #8 COPPER ROD 8FT IN LENGTH LOCATE WITHIN 6" OF CONTROLLER IN A 10" ROUND BOX WITH 6" OF GRAVEL BELOW GROUNDING ROD CLAMP. *DO NOT PUT GROUNDING ROD IN CONC. PAD



PEDESTAL MOUNTED
CONTROLLER

NOT TO SCALE

RR-44/DWG

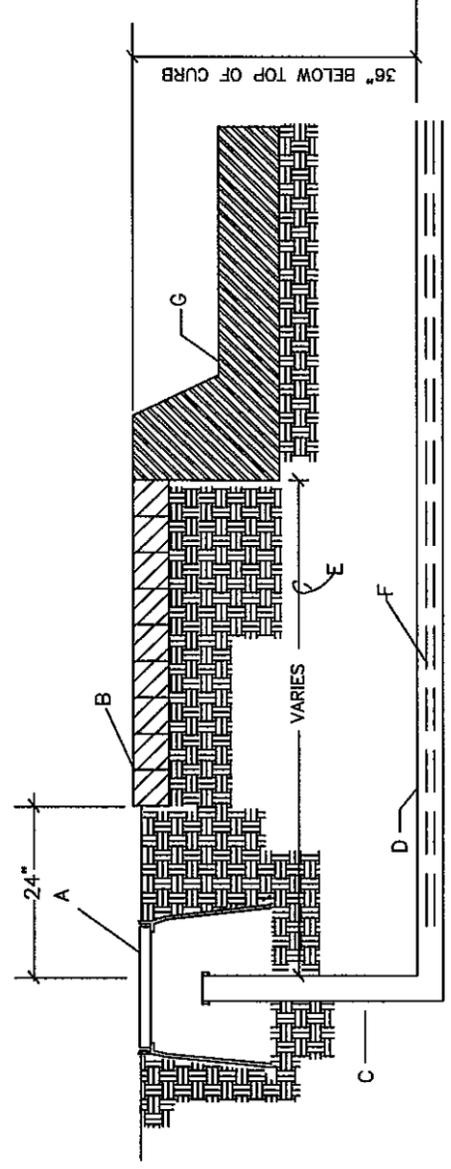


STANDARD
IRRIGATION DETAILS
PLANO, TEXAS

- GENERAL NOTES:**
1. NOTES: NO DIRECT CONNECTION TO SLEEVE SHALL BE ALLOWED. SLEEVE SIZE SHALL BE TWO SIZES LARGER THAN THE PIPE TO BE SLEEVED.
 2. MARK HARDSCAPE WITH SYMBOL "S" TO INDICATE THAT A SLEEVE IS BELOW.

CONSTRUCTION NOTES:

- A. CONCRETE VALVE BOX WITH STEEL SOLID CAST IRON LID (C-65T SERIES). STUB UP MAINLINE AND CAP. PAINT TOP OF VALVE BOX DAY GLOW ORANGE FOR FUTURE REFERENCE.
- B. MEDIAN PAVERS
- C. SCH 40 PVC MAINLINE OR LATERAL LINE
- D. SCH 40 PVC IRRIGATION SLEEVE - SEE PLAN
- E. EXTEND SLEEVE 2'-0" BEYOND EDGE OF MEDIAN PAVERS.
- F. PVC MAINLINE OR LATERAL AS SPEC'D.
- G. PAVING



IRRIGATION SLEEVES UNDER
MEDIAN OPENING PAVEMENT

NOT TO SCALE

RR-44/DWG

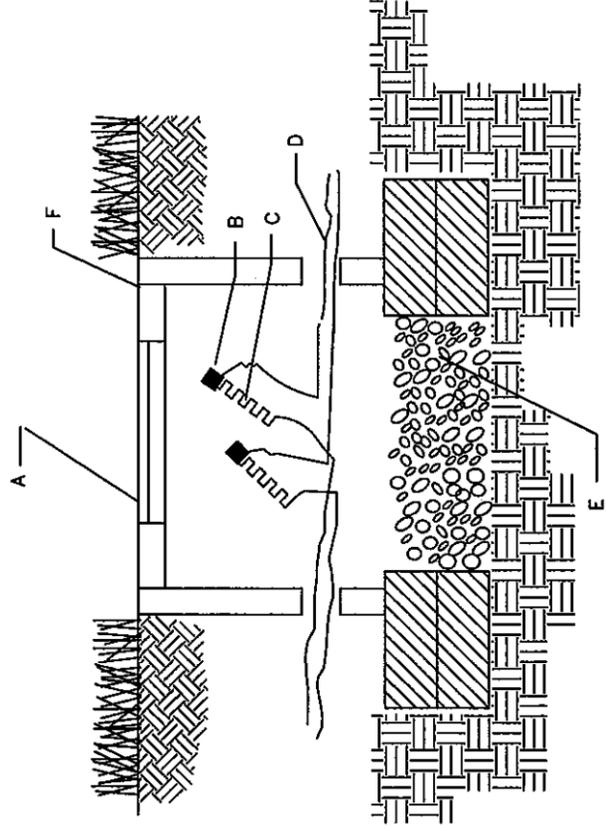


GENERAL NOTE:

1. THIS DETAIL IS FOR AC SYSTEMS ONLY.
NO WIRE SPLICES ARE ALLOWED IN DC SYSTEMS. (See Irrigation Technical Specs #4.144 Rev. 10/6/03)
2. INSTALL 4" X 8" X 16" (LAID FLAT) SOLID CMU BLOCKS, STACKED 2 HIGH ALL AROUND THE VALVE BOX

CONSTRUCTION NOTES:

- A. AMETEK VALVE BOX INSTALLED FLUSH W/ FINISHED GRAD - (STANDARD BOX W/LID #170133 IF LESS THAN 40 SPLICES) (JUMBO BOX W/LID #190109 OR #190117 IF OVER 40 SPLICES)
- B. 'TOM KING BLACK' SPLICE CONNECTOR (PART #LV9500)
- C. 24" WIRE COIL FOR EXPANSION
- D. MINIMUM 12 GAUGE UL APPROVED SINGLE STRAND COPPER, DIRECT BURIAL WIRE.
- E. 6" DEPTH PEA GRAVEL
- F. FINISHED GRADE



○ WIRE SPLICE DETAIL - AC SYSTEMS ONLY

NOT TO SCALE

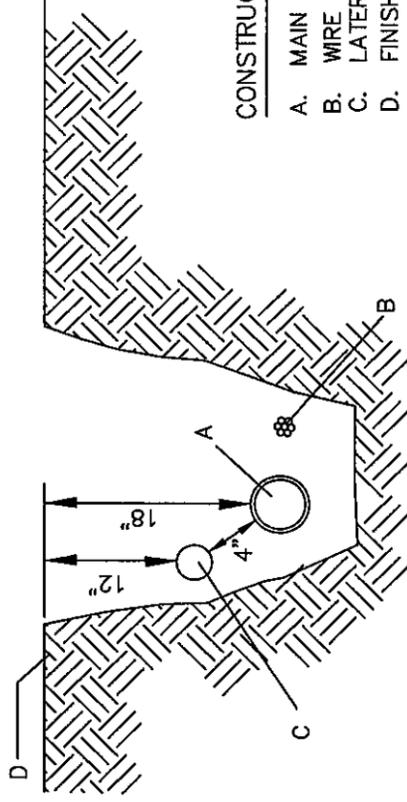


GENERAL NOTES:

1. PIPE SHALL REST FIRMLY ON TRENCH BOTTOM.
BUNDLE WIRE AT 20' INTERVALS. SNAKE PIPE FROM SIDE TO SIDE.
2. MAINTAIN MIN 4" SEPARATION BETWEEN LATERAL LINES AND MAIN LINE.
3. NO BLUE GLUE IS TO BE USED.
4. WIRE IS TO BE 12 GAUGE.
USE WHITE FOR COMMON, RED FOR STATION VALVES,
2 YELLOW FOR MASTER VALVE & 2 BLUE FOR FLOW.

CONSTRUCTION NOTES:

- A. MAIN LINE, 18" COVER
- B. WIRE BUNDLE. TAPE PER SPECS.
- C. LATERAL LINE, 12" COVER
- D. FINISHED GRADE



○ IRRIGATION TRENCH DETAIL

IRR-29.DWG

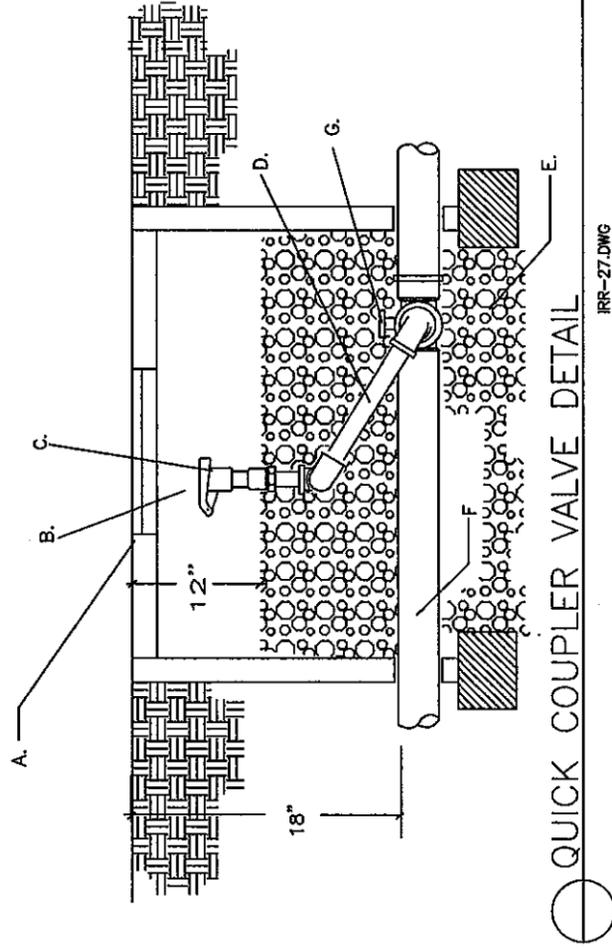
NOT TO SCALE

GENERAL NOTE:

1. INSTALL 4" X 8" X 16" SOLID BLOCKS STACKED 2 HIGH AROUND EACH VALVE BOX
2. PEA GRAVEL SHALL BE INSTALLED FLUSH WITH BOTTOM OF QUICK COUPLER

CONSTRUCTION NOTES:

- A. CONCRETE VALVE BOX - (BROOKS 35C) WITH SOLID CAST IRON LID (C-65T SERIES)
- B. CONTRACTOR SHALL PROVIDE ALL NECESSARY KEYS TO OWNER UPON FINAL ACCEPTANCE.
- C. QUICK COUPLER VALVE-
- D. SEE IRRIGATION PARTS LIST
- E. MANUFACTURED RING AND "LASCO" BRAND GASKET SWING JOINT
- F. MINIMUM 6" DEPTH PEA GRAVEL MAINLINE
- G. BALLVALVE INSTALLED ON LATERAL LINE PRIOR TO SWING JOINT.



○ QUICK COUPLER VALVE DETAIL

IRR-27.DWG

NOT TO SCALE

GENERAL IRRIGATION NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES, PIPES AND STRUCTURES EITHER SHOWN OR NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO UTILITIES AND STRUCTURES DURING CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE LINE LOCATIONS WITH FRANCHISE & CITY UTILITIES. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AND EXISTING SITE CONDITIONS.
2. VERIFY MINIMUM STATIC PRESSURE AS NOTED ON THE PLAN BEFORE BEGINNING INSTALLATION. IF LOWER THAN NOTED, NOTIFY OWNER'S REPRESENTATIVE BEFORE PROCEEDING.
3. ALL PIPING IS DIAGRAMMATIC. LOCATE ALL IRRIGATION LINES IN THE TURF AND PLANTING AREAS. ADJUST ALL HEAD AND LINE LOCATIONS AS NECESSARY, ON SITE, TO ACCOMMODATE EXISTING JOB CONDITIONS AND TO ACHIEVE 100% COVERAGE.
4. THE IRRIGATION SYSTEM IS TO BE INSTALLED PER ALL LOCAL & STATE CODES AND REQUIREMENTS. THE IRRIGATION CONTRACTOR IS RESPONSIBLE FOR ALL REQUIRED PERMITS AND INSPECTION FEES.
5. LOCATE ALL HEADS A MINIMUM 4" & MAXIMUM OF 6" FROM ADJACENT PAVING. ADJUST ARCS AS NEEDED.
6. THE IRRIGATION CONTRACTOR SHALL ENSURE ALL AREAS SHOWN TO BE IRRIGATED RECEIVE 100% COVERAGE WITH NO OVERTHROW ONTO THE STREETS. ADJUST NOZZLES AND ARCS AS NEEDED.
7. ALL VALVES, WIRE SPLICES, QUICK COUPLERS, AND DOUBLE CHECKS ARE TO BE LOCATED IN AMETEK VALVE BOXES (SIZE PER DETAIL SPECS) VALVE BOXES TO BE SET FLUSH WITH FINISH GRADE.
8. ALL WIRES FOR REMOTE CONTROL VALVES ARE TO BE MIN. 12 GAUGE SINGLE STRAND, UL APPROVED DIRECT BURIAL WIRE. ALL WIRE SPLICES ARE TO BE TOM KING BLACK SPLICE CONNECTORS (PART #LV9500) PROVIDE WIRE COIL EVERY 100' FOR EXPANSION AND CONTRACTION.
9. THE IRRIGATION CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH OTHER TRADES.
10. REFER TO THE TECHNICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION.
11. THE CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF AS-BUILT DRAWINGS DURING CONSTRUCTION, AND PROVIDE THE CITY WITH A REPRODUCIBLE COPY UPON COMPLETION OF THE PROJECT.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ELECTRICAL SERVICE (INCLUDING METER BASES) TO THE IRRIGATION CONTROLLERS AS SHOWN ON THE PLANS. HARDWARE CONTROLLERS TO THE ELECTRICAL SERVICES. ELECTRICAL CONNECTIONS SHALL BE IN ACCORDANCE WITH ALL STATE & LOCAL CODES AND REQUIREMENTS. CONTACT T.U. ELECTRIC FOR ADDITIONAL SERVICE REQUIREMENTS.
13. THE ELECTRICAL SERVICE SHALL BE LOCATED IN A SEPERATE TRENCH THAN THE IRRIGATION PIPING, AND THE LOCATION OF THE SERVICE SHALL BE SHOWN AND DIMENSIONED ON THE AS-BUILT PLANS.
14. CONTRACTOR IS TO PROGRAM AND MAINTAIN CONTROLLER UNTIL FINAL ACCEPTANCE OF THE PROJECT.
15. THE REMOTE CONTROL VALVES ARE TO BE INSTALLED IMMEDIATELY ADJACENT TO THE MAIN LINE.



THE CITY OF PLANO
PARK PLANNING & DEVELOPMENT

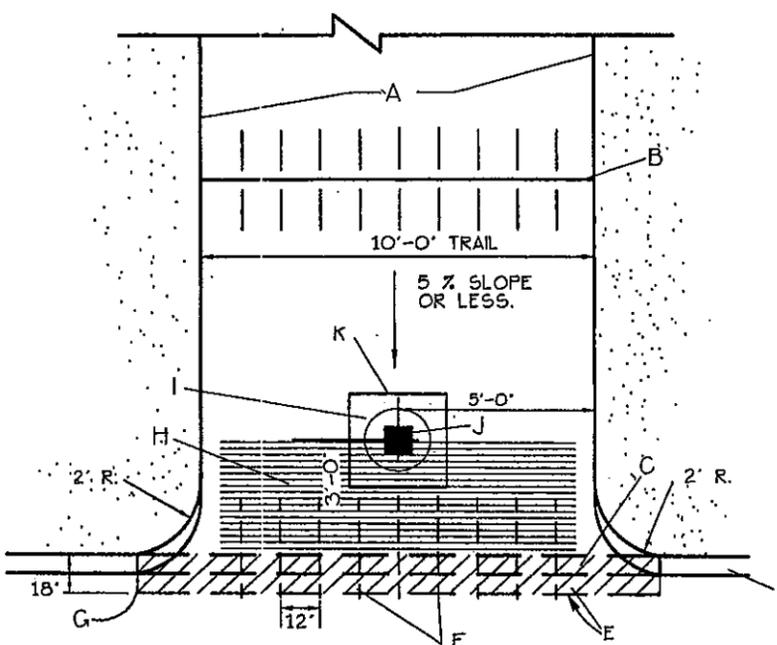
1400 W. I
PLANO, TX 75074
214/574-7250

STANDARD
TRAIL DETAILS
PLANO, TEXAS

Scale: NTS
Date: 11/96
Drawn by: JCP
Revisions:

Job: STD-TR

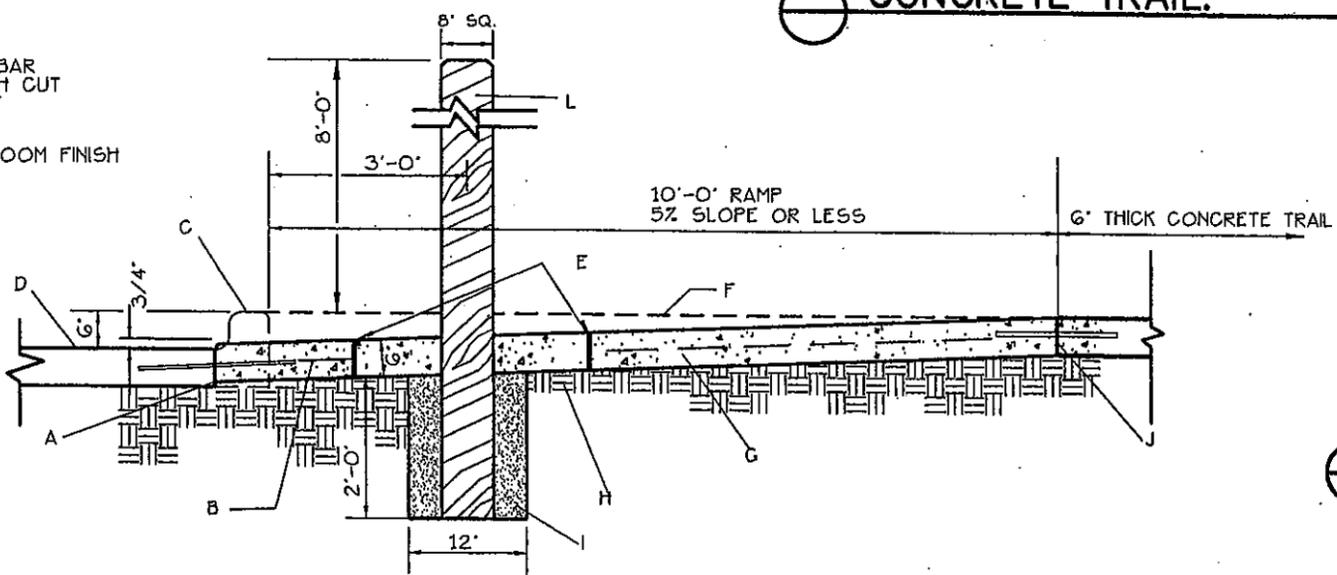
SD-33



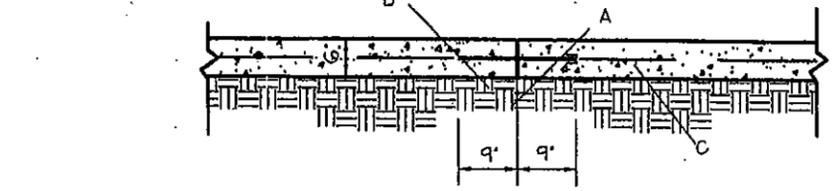
CURB CUT / TRAIL TRANSITION "PLAN"
PAV-86.DWG NOT TO SCALE

CONSTRUCTION NOTES:

- A. STRAIGHTEN AND REVISE EXISTING REBAR AND TIE TO NEW BARS. IF FULL DEPTH CUT CONSTRUCT LONGITUDINAL BUTT JOINT PER SHEET SD-3.
- B. 6" THICK CONCRETE RAMP-HEAVY BROOM FINISH W/ #3 BARS • 24" O.C. EACH WAY
- C. EXISTING CURB, SAW CUT AND REMOVE • RAMP
- D. EXISTING STREET PAVING
- E. EXPANSION JOINT
- F. TOP OF CURB EXTENDED
- G. 6" THICK CONCRETE W/ #3 BARS • 24" O.C. EACH WAY
- H. COMPACT SUBGRADE TO 95% STANDARD PROCTOR DENSITY
- I. COMPACTED SAND
- J. DOWELED EXPANSION JOINT AT END OF RAMP
- K. 6" CONCRETE TRAIL.
- L. BOLLARD (8'x 8' CEDER)



CURB CUT / TRAIL TRANSITION "SECTION"
PAV-86.DWG NOT TO SCALE



DOWELED EXPANSION JOINT.
PAV-88.DWG NOT TO SCALE

GENERAL NOTES:

- 1. LOCATE EXPANSION JOINTS ON MAXIMUM 20' CENTERS REFER TO CITY OF PLANO STANDARD CONSTRUCTION DETAILS (SD-7) FOR ADDITIONAL INFORMATION

CONSTRUCTION NOTES:

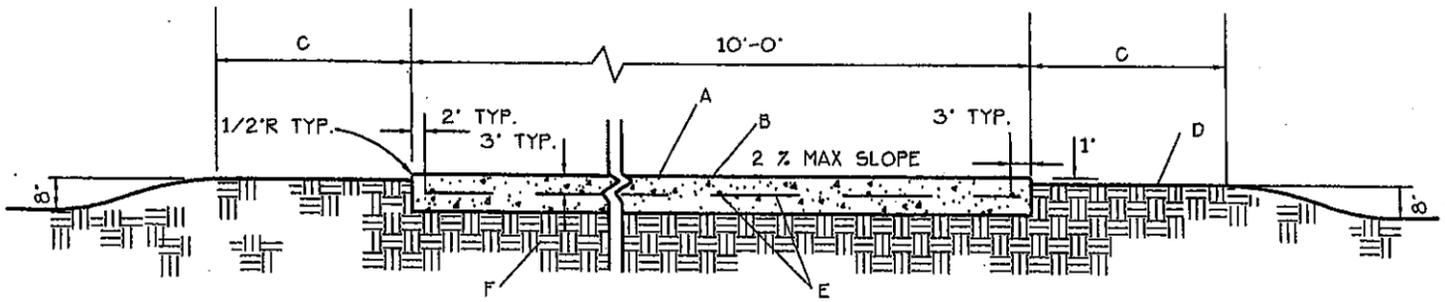
- A. #4 SMOOTH DOWEL 18" LONG EACH LUBRICATED, 10 PER JOINT • 12" O.C. WITH CAP
- B. FILL EXPANSION JOINTS WITH PREMOLDED BITUMINOUS EXPANSION JOINT FILLER INSTALL REDWOOD EXPANSION JOINT 1/2" BELOW FINISHED GRADE OF TRAIL
- C. 6" CONCRETE TRAIL WITH #3 BARS • 24" O.C. BOTH WAYS

GENERAL NOTES:

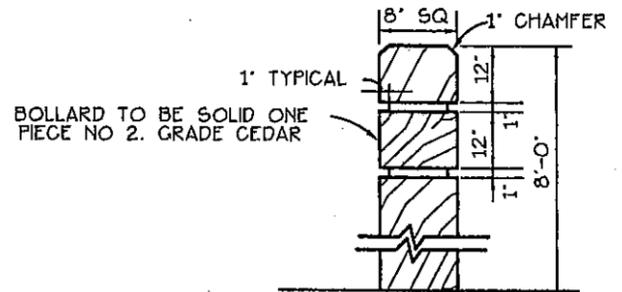
- 1. GRADE TRAIL WITH DRAINAGE SWALES ON BOTH SIDES AND DIVERT FLOWS UNDER TRAIL SECTIONS WITH CMP WHEN NEEDED. DO NOT GRADE TRAIL OR LOCATE TRAIL IN SITUATIONS THAT IT WILL RECEIVE FLOWS OVER THE TRAIL.
- 2. THE MATERIALS AND WORKMANSHIP FOR CONCRETE PAVING SHALL BE IN ACCORDANCE WITH N.C.T.C.O.G. SPECIFICATIONS AS MODIFIED BY THE CITY OF PLANO SPECIAL PROVISIONS.

CONSTRUCTION NOTES:

- A. 3000 PSI CONCRETE TRAIL
- B. HEAVY BROOM FINISH
- C. 3' CLEAR ZONE RESEED ALL DISTURBED PLANT MATERIAL.
- D. FINISH GRADE
- E. #3 BARS 24" O.C. MAX BOTH WAYS
- F. COMPACT SUBGRADE TO 95% STANDARD PROCTOR DENSITY



CONCRETE TRAIL.
PAV-87.DWG NOT TO SCALE



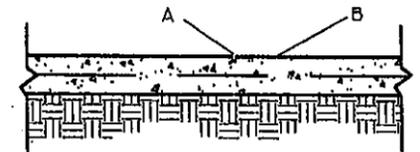
BOLLARD ELEVATION
PAV-88.DWG NOT TO SCALE

GENERAL NOTES:

- 1. CONTROL JOINT SPACING SHALL BE WIDTH OF PAVING OR AS SHOWN ON THE PLANS.

CONSTRUCTION NOTES:

- A. CONTROL JOINTS 3/8" DEEP ON 10'-0" CENTERS MAX.
- B. 6" CONCRETE TRAIL WITH #3 BARS • 24" O.C. BOTH WAYS



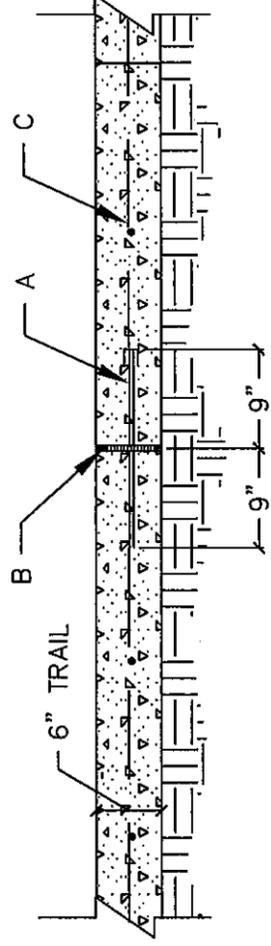
TYPICAL CONTROL JOINT
PAV-89.DWG NOT TO SCALE

GENERAL NOTES:

- 1. LOCATE EXPANSION JOINTS ON MAXIMUM 40' CENTERS

CONSTRUCTION NOTES:

- A. #4 SMOOTH DOWEL 18" LONG EACH LUBRICATED WITH CAP @ 12" O.C. WITH CAP; BARS 6" FROM EDGE OF TRAIL
- B. FILL EXPANSION JOINTS WITH SONNEBORN SONOLASTIC SEALANT SYSTEMS. CONTRACTOR TO SUBMIT COLOR SAMPLES. INSTALL REDWOOD EXPANSION JOINT 1/2" BELOW FINISHED GRADE OF TRAIL.
- C. 6" CONCRETE TRAIL PAVING WITH #3 BARS @ 18" O.C. BOTH WAYS



DOWELED EXPANSION JOINT

SCALE: $\frac{3/4"}{1'-0"} =$



AUGUST 1,
2002

TRAIL PAVING DETAILS

TRAIL STANDARDS

CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

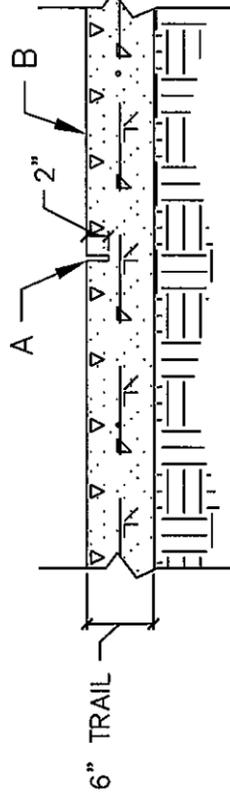
3

GENERAL NOTES:

- 1. CONTROL JOINT SPACING SHALL BE WIDTH OF PAVING OR AS SHOWN ON THE PLANS.

CONSTRUCTION NOTES:

- A. SAWED CONTROL JOINTS 2" DEEP X 3/8" WIDE ON 10'-0" CENTERS MAX. OR AS SHOWN ON PLANS.
- B. 6" CONCRETE TRAIL WITH #3 BARS @ 18" O.C. BOTH WAYS



TYPICAL CONTROL JOINT

SCALE: $\frac{3/4"}{1'-0"} =$



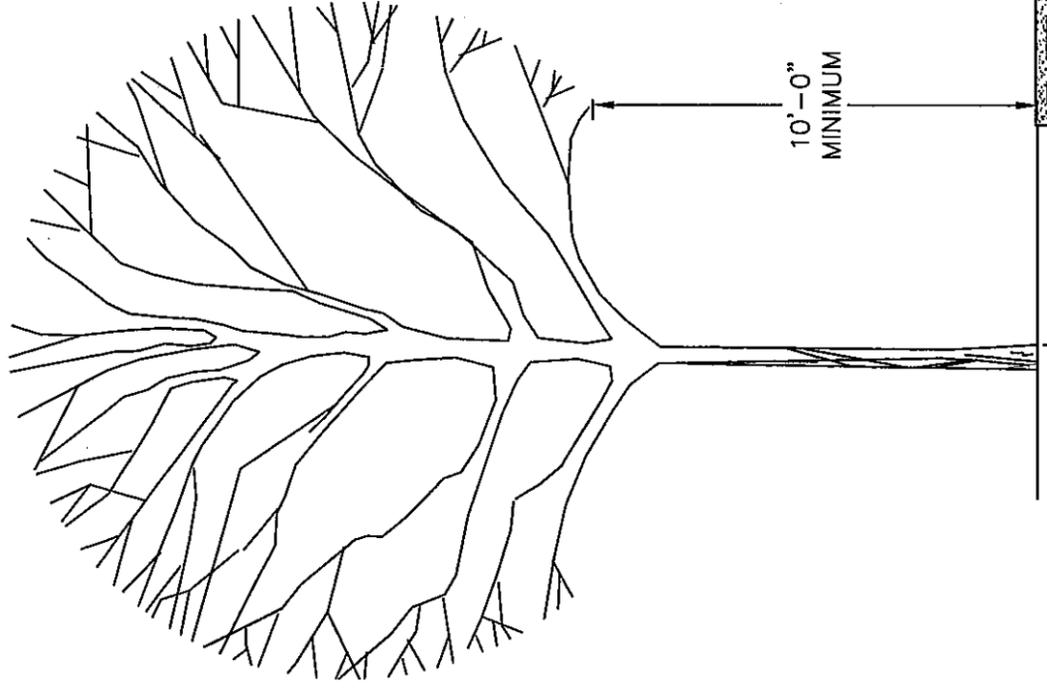
AUGUST 1,
2002

TRAIL PAVING DETAILS

TRAIL STANDARDS

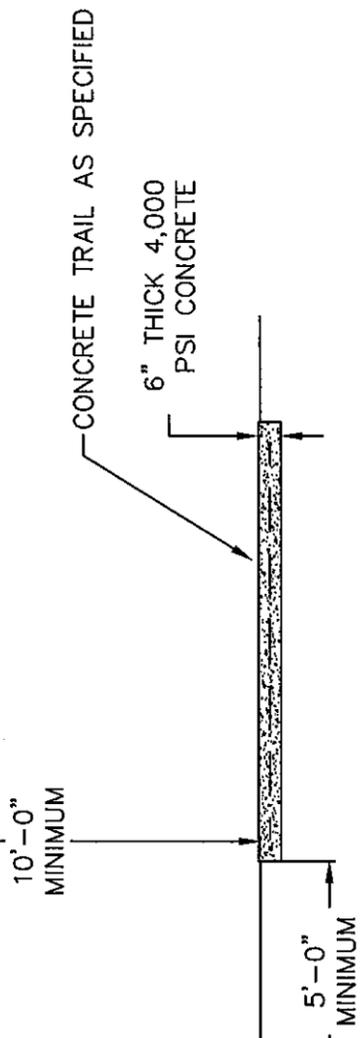
CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

4



GENERAL NOTES:

CONTRACTOR IS TO PRUNE EXISTING TREES TO REMOVE ALL DEAD OR DAMAGED BRANCHES AND TO PROVIDE A MINIMUM 10'-0" BRANCHING HEIGHT. PROPER PRUNING AND HORTICULTURAL PRACTICES SHALL BE OBSERVED DURING THIS WORK.



AUGUST 1,
2002

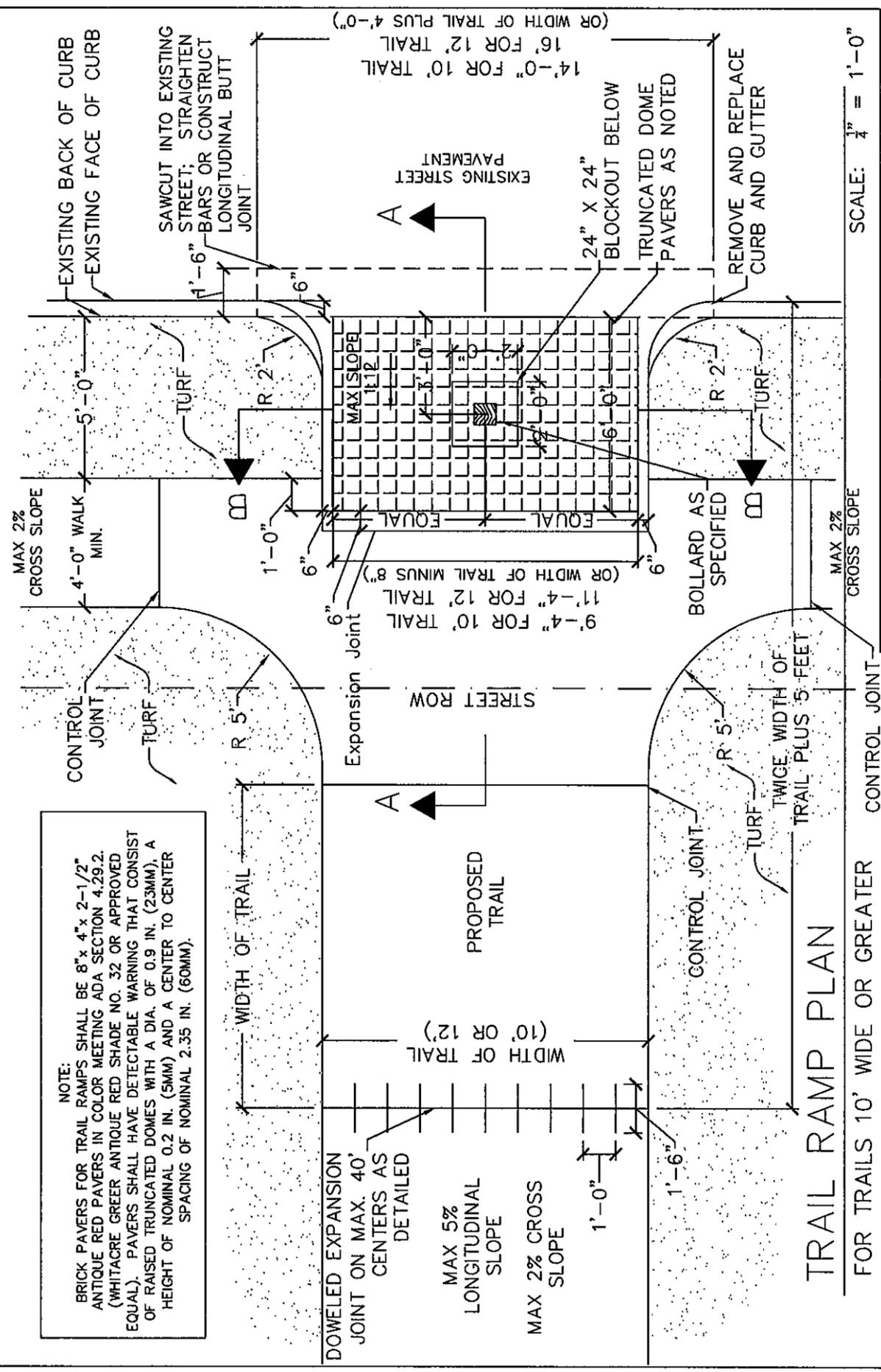
OVERHEAD TRAIL CLEARANCE

TRAIL STANDARDS

CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

7

NOTE:
BRICK PAVERS FOR TRAIL RAMPS SHALL BE 8"x 4"x 2-1/2" ANTIQUE RED PAVERS IN COLOR MEETING ADA SECTION 4.29.2. (WHITACRE GREER ANTIQUE RED SHADE NO. 32 OR APPROVED EQUAL). PAVERS SHALL HAVE DETECTABLE WARNING THAT CONSIST OF RAISED TRUNCATED DOMES WITH A DIA. OF 0.9 IN. (23MM), A HEIGHT OF NOMINAL 0.2 IN. (5MM) AND A CENTER TO CENTER SPACING OF NOMINAL 2.35 IN. (60MM).



TRAIL RAMP PLAN

FOR TRAILS 10' WIDE OR GREATER

SCALE: 1/4" = 1'-0"



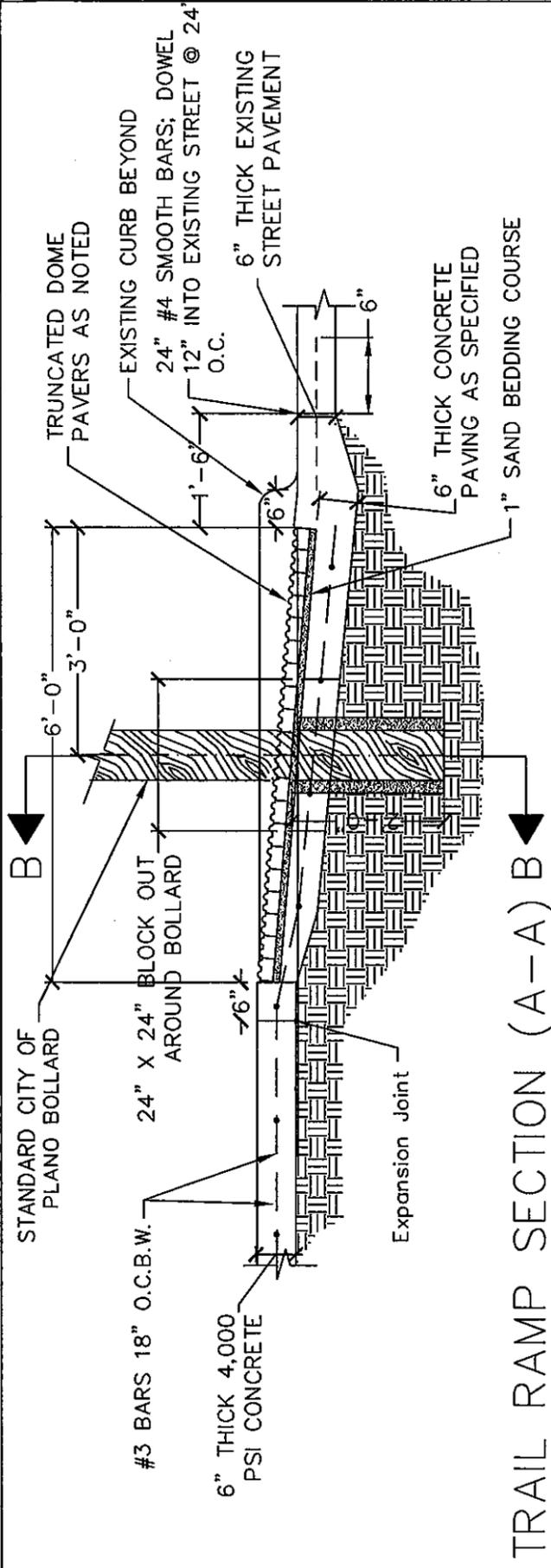
AUGUST 1,
2002

BARRIER FREE RAMP DETAILS FOR
10' (OR GREATER) TRAILS

TRAIL STANDARDS

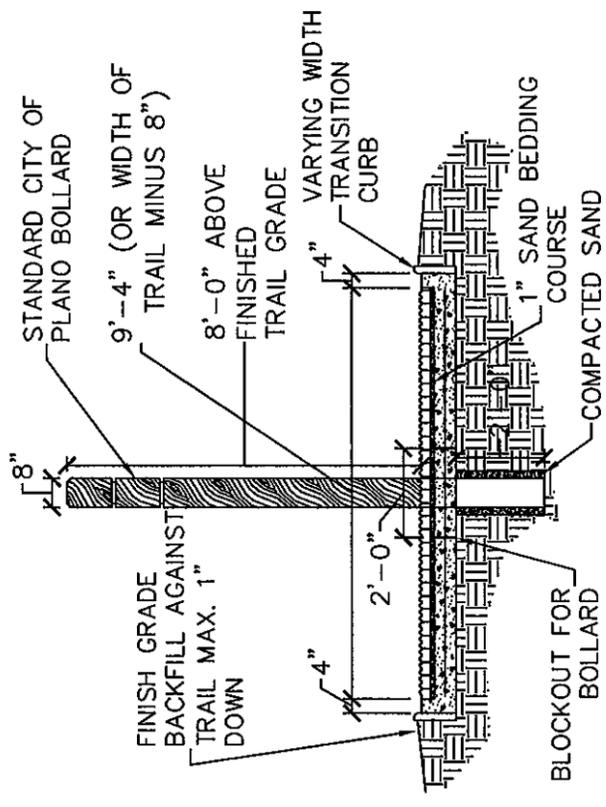
CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

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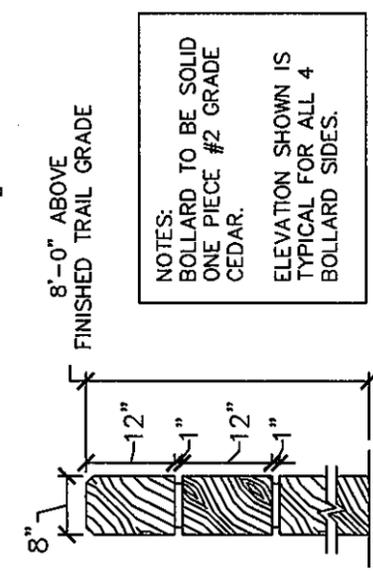
TRAIL RAMP SECTION (A-A) B

SCALE: $\frac{1}{2}" = 1'-0"$



TRAIL RAMP SECTION (B-B)

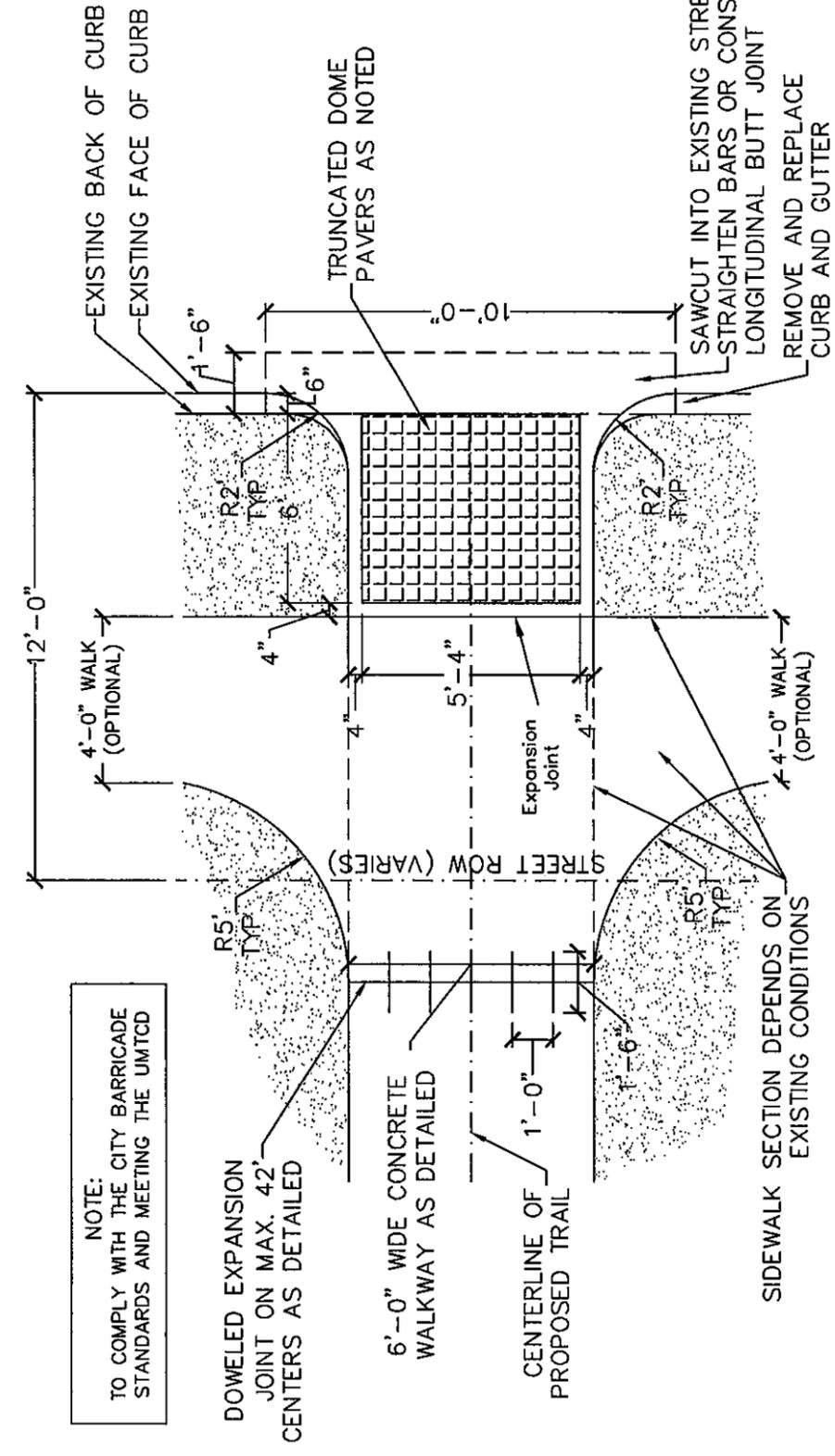
SCALE: $\frac{1}{4}" = 1'-0"$



BOLLARD ELEVATION

SCALE: $\frac{1}{2}" = 1'-0"$

	BARRIER FREE RAMP DETAILS FOR 10' (OR GREATER) TRAILS
AUGUST 1, 2002	TRAIL STANDARDS
	CITY OF PLANO PARKS AND RECREATION DEPARTMENT
	9



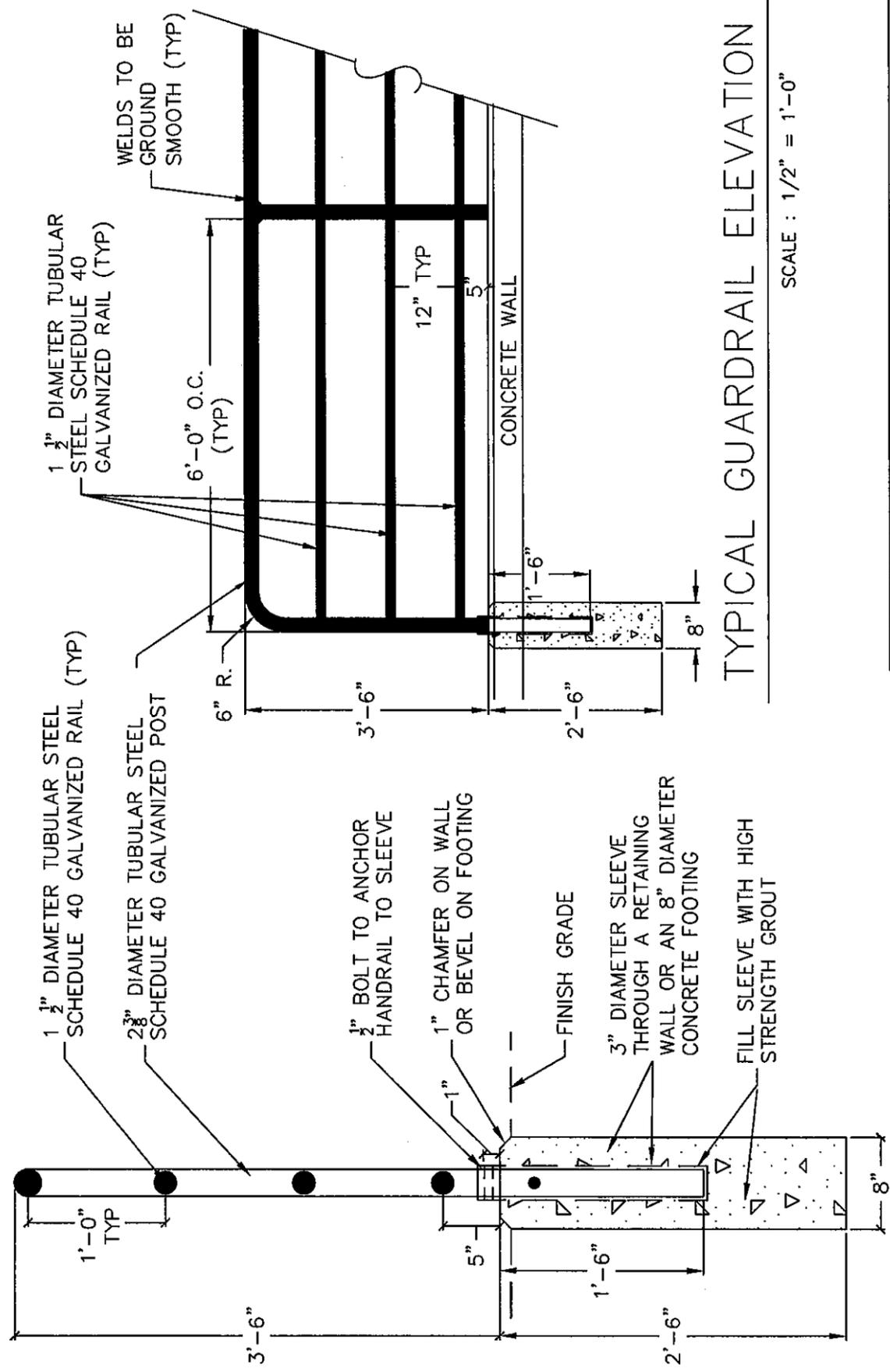
TRAIL RAMP PLAN

FOR 6' WIDE CONCRETE WALKWAY

SCALE: $\frac{1}{4}" = 1'-0"$

NOTE:
BRICK PAVERS FOR TRAIL RAMPS SHALL BE 8" x 4" x 2-1/2" ANTIQUE RED PAVERS IN COLOR MEETING ADA SECTION 4.29.2 (WHITACRE GREER ANTIQUE RED SHADE NO. 32 OR APPROVED EQUAL). PAVERS SHALL HAVE DETECTABLE WARNING THAT CONSIST OF RAISED TRUNCATED DOMES WITH A DIA. OF 0.9 IN. (23MM), A HEIGHT OF NOMINAL 0.2 IN. (5MM) AND A CENTER TO CENTER SPACING OF NOMINAL 2.35 IN. (60MM).

	BARRIER FREE RAMP DETAIL FOR 6' CONCRETE WALKWAY
AUGUST 1, 2002	TRAIL STANDARDS
	CITY OF PLANO PARKS AND RECREATION DEPARTMENT
	10



TYPICAL GUARDRAIL SECTION

SCALE : 1" = 1'-0"



AUGUST 1, 2002

TRAIL GUARDRAIL DETAILS

TRAIL STANDARDS

CITY OF PLANO PARKS AND RECREATION DEPARTMENT

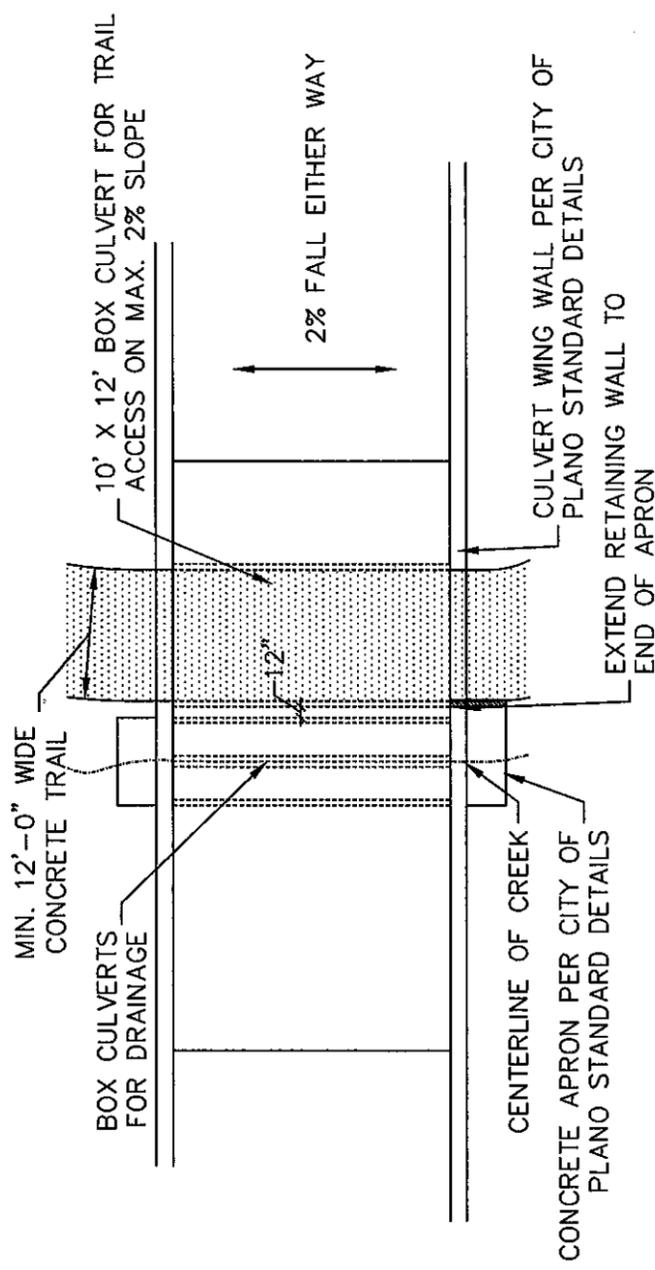
11

TYPICAL GUARDRAIL ELEVATION

SCALE : 1/2" = 1'-0"

TYPICAL GUARDRAIL SECTION

SCALE : 1" = 1'-0"



TYPICAL TRAIL THROUGH BRIDGE-PLAN

SCALE : 1/16" = 1'-0"

NOTE :
CONCRETE WINGWALL AND DRAINAGE CULVERT PER CITY OF PLANO STANDARDS



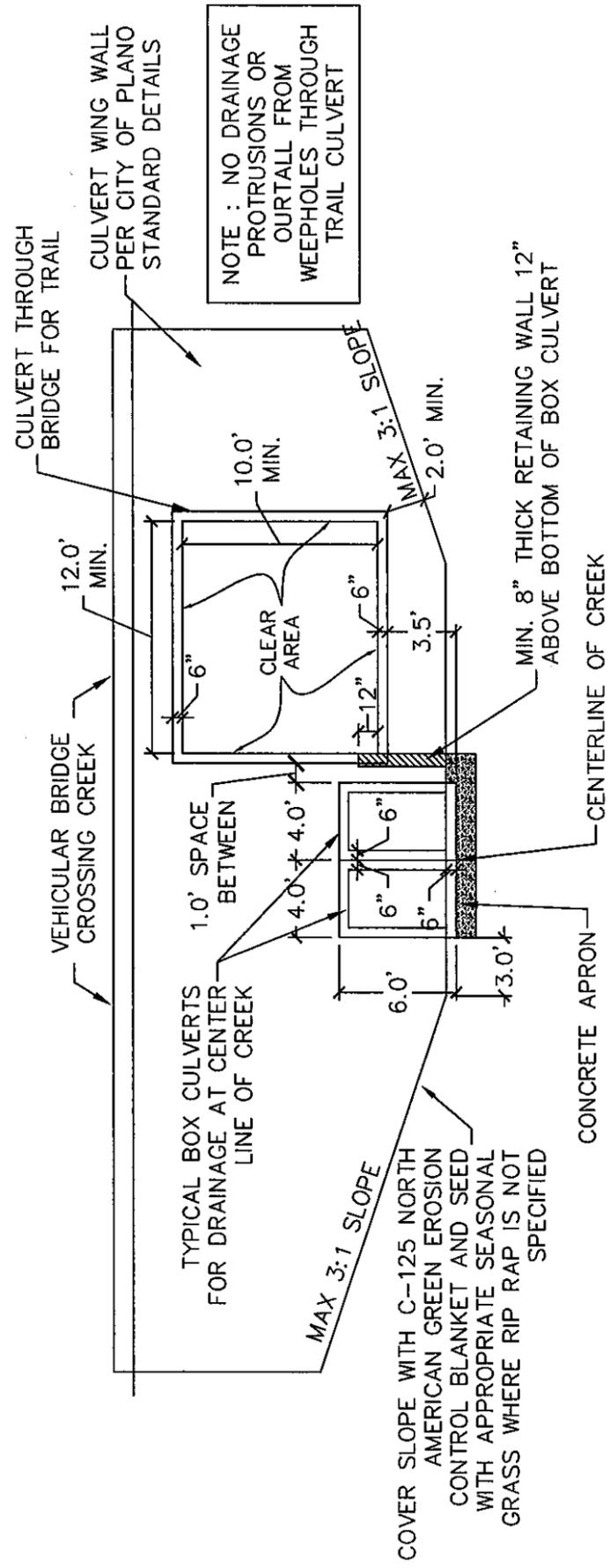
AUGUST 1, 2002

TRAIL CULVERT CROSSING

TRAIL STANDARDS

CITY OF PLANO PARKS AND RECREATION DEPARTMENT

12

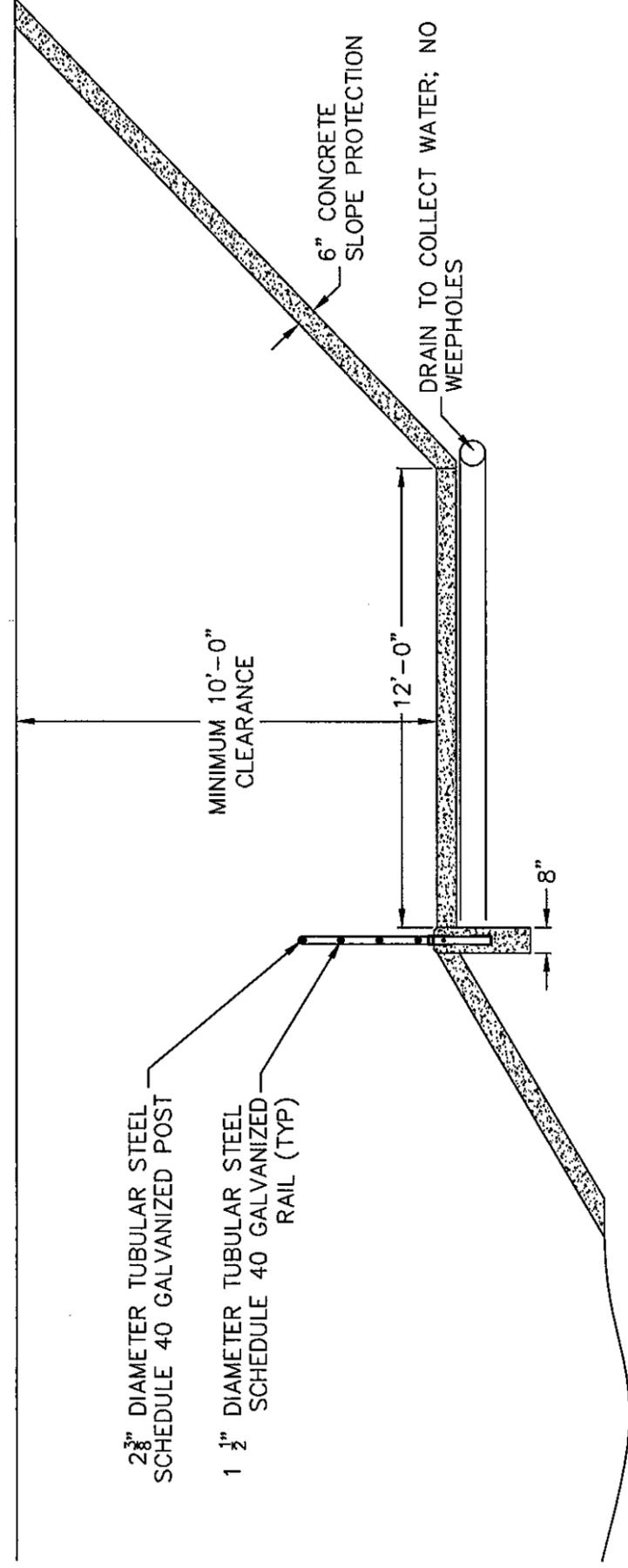


TYPICAL TRAIL THROUGH BRIDGE--ELEVATION

SCALE : 1/8" = 1'-0"

NOTE :
CONCRETE WINGWALL AND DRAINAGE CULVERT PER CITY OF PLANO STANDARDS

	TRAIL CULVERT CROSSING
	TRAIL STANDARDS
AUGUST 1, 2002	CITY OF PLANO PARKS AND RECREATION DEPARTMENT
	13

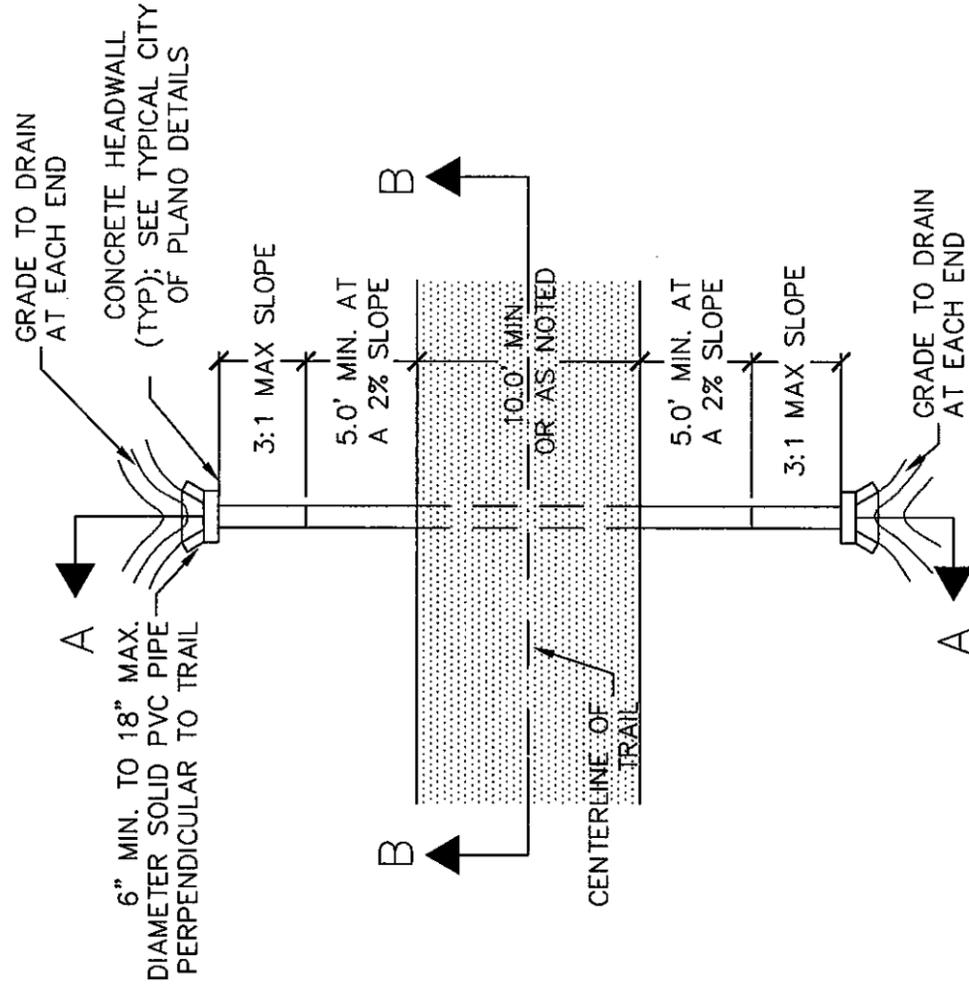


TRAIL SHELF DETAIL

SCALE : 1/4" = 1'-0"

NOTE:
ALL PIPE FOR HANDRAILS TO BE SCHEDULE 40 GALVANIZED STEEL TUBE

	TRAIL SHELF DETAIL
	TRAIL STANDARDS
AUGUST 1, 2002	CITY OF PLANO PARKS AND RECREATION DEPARTMENT
	14



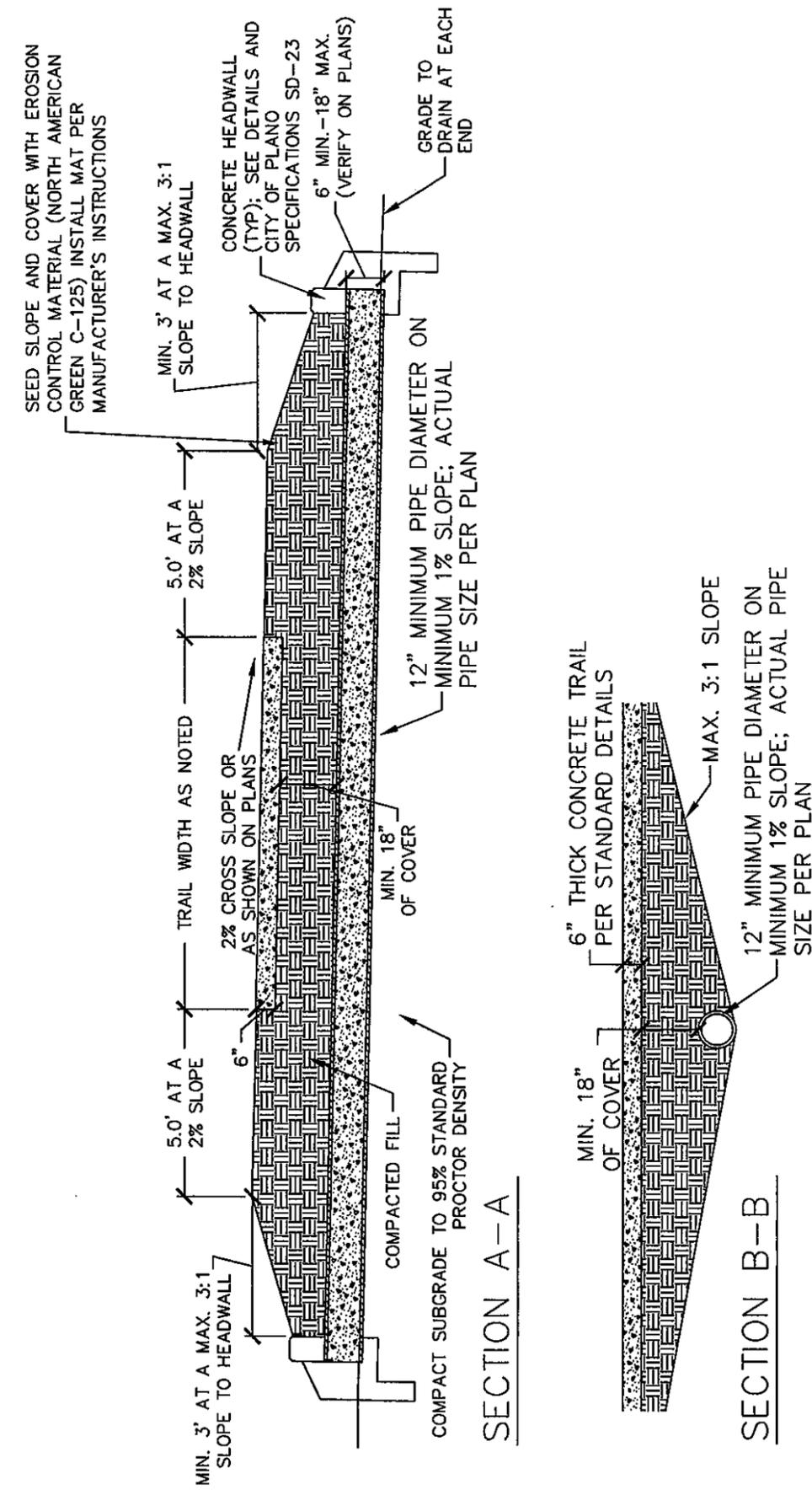
DRAINAGE BENEATH TRAIL - PLAN

SCALE : $\frac{1}{8}'' = 1'-0''$

plano 

AUGUST 1,
2002

TRAIL DRAINAGE DETAILS	
TRAIL STANDARDS	
CITY OF PLANO PARKS AND RECREATION DEPARTMENT	15



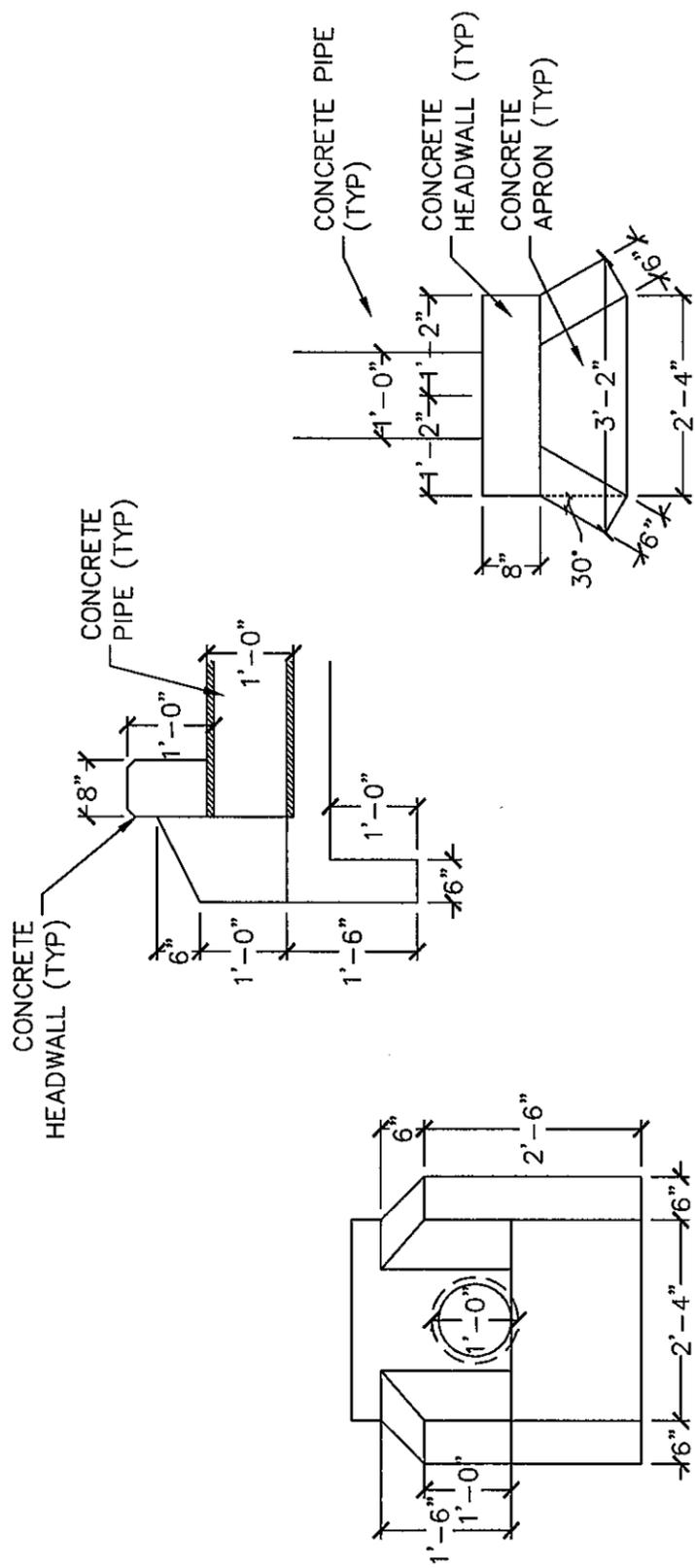
DRAINAGE BENEATH TRAIL - SECTIONS

SCALE : $\frac{1}{4}'' = 1'-0''$

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AUGUST 1,
2002

TRAIL DRAINAGE DETAILS	
TRAIL STANDARDS	
CITY OF PLANO PARKS AND RECREATION DEPARTMENT	16



CONCRETE HEADWALL FOR 12" RCP

PER CITY OF PLANO STANDARDS SD-23

SCALE : 1/2" = 1'-0"

NOTE :
SEE CITY OF PLANO
STANDARD DETAILS FOR
REINFORCING



TRAIL DRAINAGE DETAILS
TRAIL STANDARDS
CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

POSTED SPEED OR 85% SPEED (MPH)	30 OR LESS	35	40	160	240	320	500
X MIN. DISTANCE (FEET)							

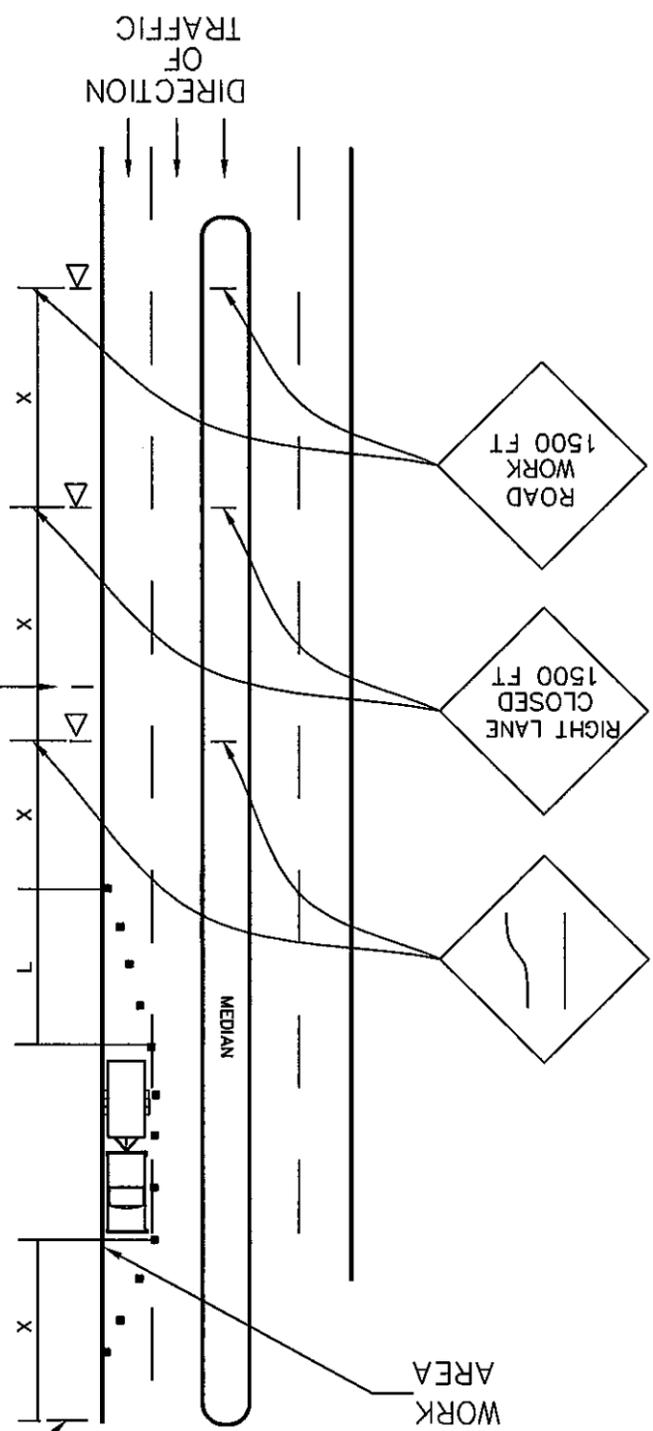
KEY:
■ CHANNELIZING DEVICES
△ OPTIONAL

FORM ONE LINE LEFT

END ROADWORK

NOTE:
FOR MORE INFORMATION ON LANE CLOSURE SEE "POCKET GUIDE TO PUBLIC WORKS TRAINING DIVISION TEXAS ENGINEERING EXTENSION SERVICE TEXAS A & M UNIVERSITY SYSTEM COLLEGE STATION, TEXAS 77843-8000 (979) 845-2911

NOT TO SCALE



TRAFFIC CONTROL DETAIL
TRAIL STANDARDS
CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

TRAFFIC CONTROL NOTES

1. TAPER FORMULA:

$L = S \times W$ FOR SPEEDS OF 45 OR MORE

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40 OR LESS

WHERE:

L=MINIMUM LENGTH OF TAPER

S=NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR

TO WORK OR 85% SPEED.

W=WIDTH OF OFFSET

2. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT.

3. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE ADVANCE WARNING SIGNS AND/OR EQUIPMENT

4. ALL DISTANCES AND SPACINGS SHOWN ARE APPROXIMATE.

5. THE WORD UTILITY MAY BE SUBSTITUTED FOR ROAD IN ALL SIGNS WHERE APPLICABLE.

6. ONE OR MORE FLAGGERS TO BE WHERE TRAFFIC, ROAD CONDITIONS, OR TERRAIN WARRANT THEIR USE.

7. TRAFFIC CONTROL DEVICES AND SIGNAGE TO BE IN ACCORDANCE WITH "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES"

8. ONLY ONE LANE TO BE CLOSED AT A TIME.

9. THE CONTRACTOR IS RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AS STATED IN THE GENERAL CONDITIONS OF THE CONTRACT. ADDITIONAL MEASURES MAY BE IMPLEMENTED BY THE CONTRACTOR AS NECESSARY IN THE INTEREST OF SAFETY.



AUGUST 1,
2002

TRAFFIC CONTROL NOTES

TRAIL STANDARDS

CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

19

TRAFFIC CONTROL NOTES

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AUGUST 1,
2002

TRAFFIC CONTROL NOTES

TRAIL STANDARDS

CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

19



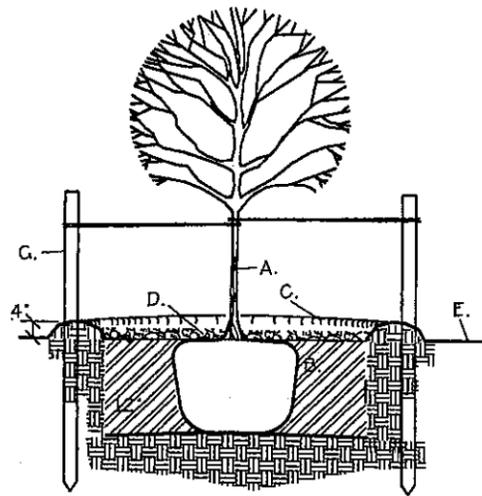
THE CITY OF PLANO
 PARK PLANNING & DEVELOPMENT
 1400 AVE. K
 PLANO, TX 75074
 214/576-7250

STANDARD
 PLANTING DETAILS
 PLANO, TEXAS

Scale: N.T.S.
 Date: 11/96
 Drawn By: KCP
 Revisions:

PLA-STD

SD-34



GENERAL NOTES:

1. STABILIZE SOIL BELOW ROOT BALL PRIOR TO PLANTING TO PREVENT TREE FROM SETTLING.
2. TOP OF ROOTBALL SHALL BE 1' TO 2' ABOVE FINISH GRADE
3. ALL WIRE ROPE AND SYNTHETIC MATERIALS SHALL BE REMOVED COMPLETELY FROM ROOTBALL AND REMOVE TOP 1/3 OF BURLAP.

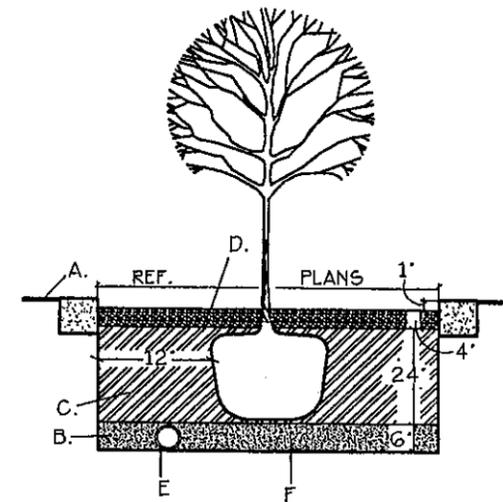
CONSTRUCTION NOTES:

- A. TREE.
- B. LOOSEN NATIVE BACKFILL
- C. WATER RETENTION BASIN.
- D. 2" DEPTH OF BARK MULCH.
- E. FINISH GRADE.
- F. 2 STRAND TWISTED 12 GAUGE GAL. WIRE ENCASE IN 1" DIA. RUBBER HOSE.
- G. 6"-Ø METAL TEE POSTS. INSTALL 24" BELOW GRADE. MULTI TRUNKS 2 STAKES. SINGLE TRUNK 3 STAKES. ALIGN IN MEDIANS PARALLEL TO CURB. INSTALL IN FIRM GROUND. SEE STANDARD MEDIAN DETAILS SD-36.

ISOLATED TREE PLANTING

PLANT-3.DWG

NOT TO SCALE



GENERAL NOTES:

1. SOIL WITHIN THE PLANTER BED SHALL BE REMOVED TO A DEPTH OF 3'Ø AND REPLACED WITH THE SPECIFIED PLANTING SOIL MIXTURE. REF. SPECIFICATIONS
2. COMPACT SOIL BELOW ROOTBALL PRIOR TO PLANTING TO PREVENT TREE FROM SETTLING.
3. ALL WIRE, ROPE, AND SYNTHETIC MATERIAL SHALL BE COMPLETELY REMOVED FROM ROOTBALL AND REMOVE BURLAP FROM TOP 1/3.

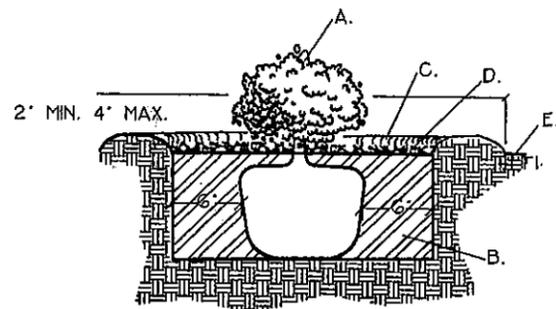
CONSTRUCTION NOTES:

- A. MATERIAL VARIES. REFERENCE THE DRAWING.
- B. LOOSEN SOIL TO DEPTH OF 6'.
- C. PLANTING SOIL MIXTURE. REFERENCE THE SPECIFICATIONS.
- D. MULCH.
- E. 4" PERFORATED DRAIN PIPE. DAY LIGHT TO DRAIN
- F. 6" LAYER OF GRAVEL.

TREE PLANTING IN PLANTER

PLANT-14.DWG

NOT TO SCALE



GENERAL NOTES:

1. THE OUTSIDE DIAMETER OF THE WATER RETENTION BASIN SHALL BE TWICE THE DIAMETER OF THE SHRUB PLANTING PIT.

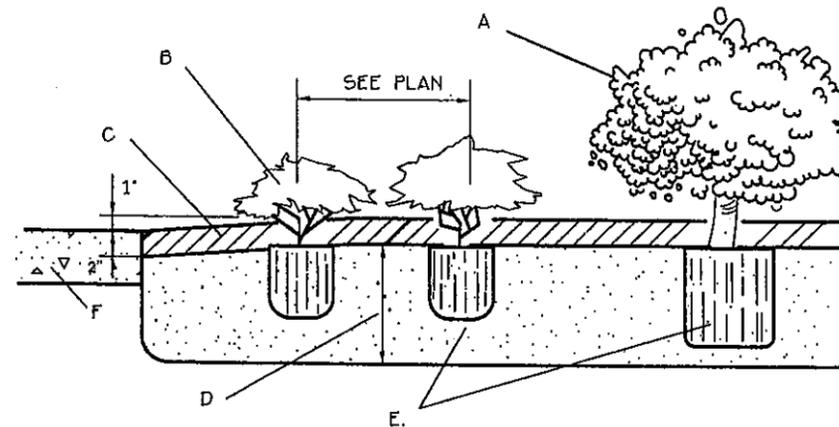
CONSTRUCTION NOTES:

- A. SHRUB.
- B. PLANTING SOIL MIXTURE (REF SPECIFICATIONS)
- C. WATER RETENTION BASIN.
- D. 2" DEPTH OF BARK MULCH.
- E. FINISH GRADE.

ISOLATED SHRUB PLANTING

PLANT-18.DWG

NOT TO SCALE



GENERAL NOTES:

1. ADD OR REMOVE TOPSOIL AS NECESSARY TO ACCOUNT FOR THE INCLUSION OF SOIL AMMENDMENTS. SOIL MIXTURE. REF SPECS.
2. TRIANGULARLY SPACE ALL GROUNDCOVERS AT SPACING SHOWN ON PLANS.
3. SAVE MULCHING OF PLANTING BED UNTIL NEAR FINAL ACCEPTANCE.

CONSTRUCTION NOTES:

- A. SHRUB - PER PLAN REMOVE ALL LABELS
- B. GROUNDCOVER - PER PLAN
- C. 2" MIN. BARK MULCH AS SPEC'D. SLOPE FROM HARDSCAPE TO 1" ABOVE HARDSCAPE
- D. PLANTING MIX AS SPECIFIED
- E. REMOVE CONTAINER PRUNE ANY CIRCLING ROOT

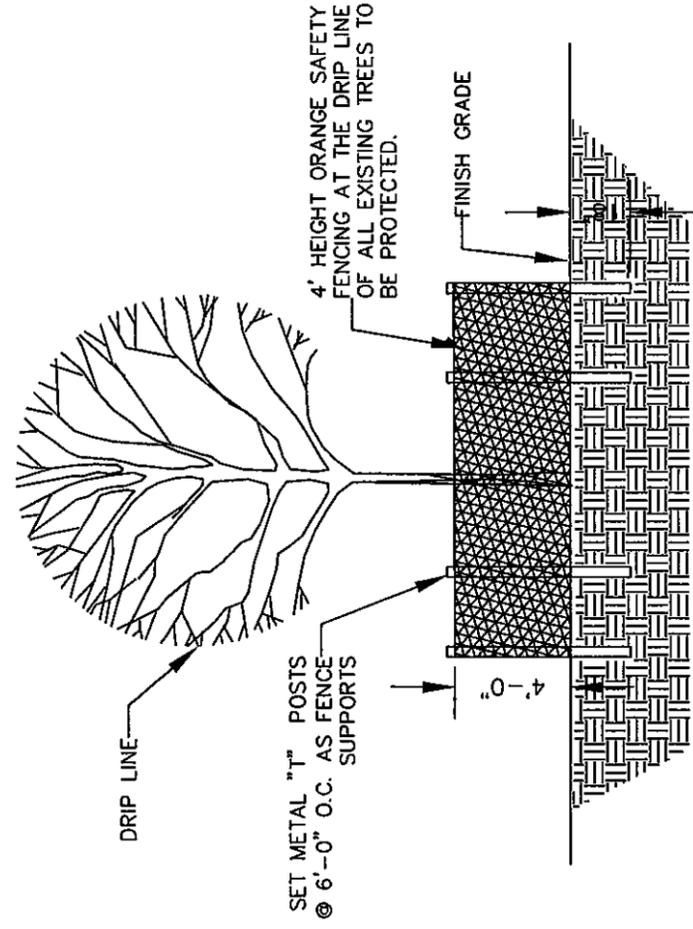
PLANTING BED DETAIL

PLANT-5.DWG

NOT TO SCALE

NOTES:

1. FENCE TO BE MAINTAINED AND REPAIRED AS NEEDED DURING CONSTRUCTION.
2. NO CONSTRUCTION TRAFFIC, GRADING, STORAGE OR WASTE DISPOSAL ALLOWED WITHIN THE FENCED AREA AROUND TREES.



TREE PROTECTION DETAIL

NOT TO SCALE

TREE PROTECTION NOTES

1. EXISTING TREES SHOWN TO REMAIN ARE TO BE PROTECTED DURING CONSTRUCTION. ORANGE SAFETY FENCING (MIN. 4'-0" HEIGHT) SHALL BE INSTALLED AT THE DRIPLINE OF ALL TREES OR TREE GROUPS TO REMAIN. PARKING OF VEHICLES OR PERFORMING WORK WITHIN THESE AREAS OTHER THAN SHOWN ON THE PLAN, WILL NOT BE ALLOWED. THE TREE PROTECTION SHALL REMAIN DURING CONSTRUCTION. OTHER TREE PROTECTION MEASURES SHALL BE IN ACCORDANCE WITH THE CITY OF PLANO STANDARDS AND ORDINANCES.
2. DISPOSAL OF ANY WASTE MATERIAL SUCH AS, BUT NOT LIMITED TO, PAINT, ASPHALT, OIL SOLVENTS, CONCRETE, MORTAR, ETC. WITHIN THE CANOPY AREA OF THE EXISTING TREES SHALL NOT BE ALLOWED.
3. NO ATTACHMENTS OR WIRES OF ANY KIND, OTHER THAN THOSE OF A PROTECTIVE NATURE, SHALL BE ATTACHED TO ANY TREE.
4. NO FILL OR EXCAVATION OF ANY NATURE SHALL OCCUR WITHIN THE DRIPLINE OF A TREE TO BE PRESERVED, UNLESS THERE IS A SPECIFIED WELL OR RETAINING WALL SHOWN ON THE GRADING PLAN.
5. NO MATERIALS SHALL BE STORED WITHIN THE DRIPLINE AREA OF A TREE TO BE PRESERVED.



AUGUST 1,
2002

TREE PROTECTION

STANDARD DETAILS

CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

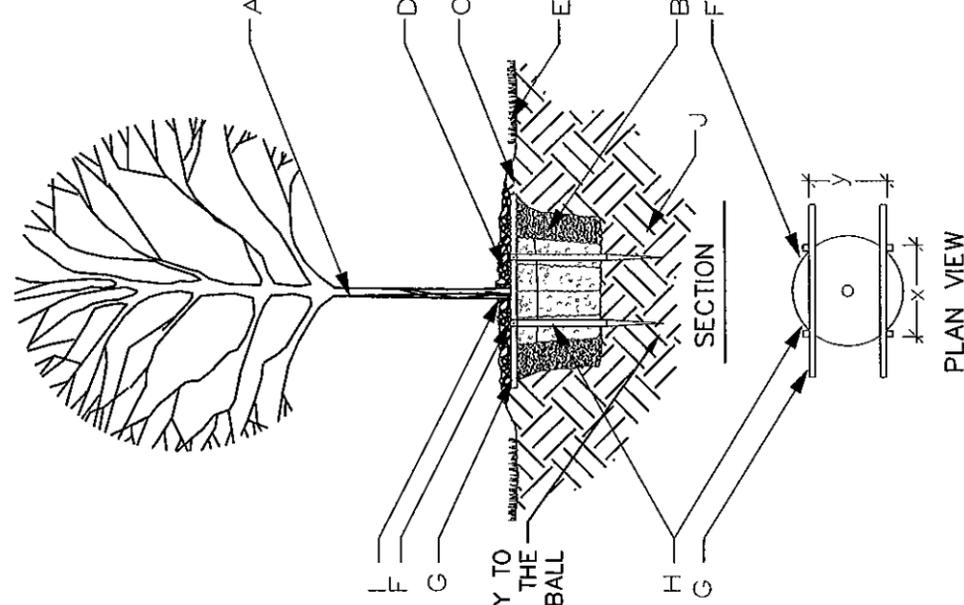
22

GENERAL NOTES:

1. STABILIZE SOIL BELOW ROOT BALL PRIOR TO PLANTING TO PREVENT TREE FROM SETTLING.
2. TOP OF ROOTBALL SHALL BE 1" TO 2" ABOVE FINISH GRADE
3. ALL WIRE ROPE AND SYNTHETIC MATERIALS SHALL BE REMOVED COMPLETELY FROM ROOTBALL AND REMOVE TOP 1/3 OF BURLAP.
4. PLANTING PITS SHALL BE THOROUGHLY SCARIFIED/ROUGHENED.

CONSTRUCTION NOTES:

- A. TREE.
- B. LOOSEN NATIVE BACKFILL (NO SOIL AMENDMENTS IN CONTRACT)
- C. WATER RETENTION BASIN.
- D. 3" DEPTH OF BARK MULCH; NO MULCH WITHIN 2" OF TRUNK
- E. FINISH GRADE.
- F. 2 1/2" DRYWALL SCREW (unfinished)
- G. 2"x2"x4' CROSS MEMBER (untreated lumber)
NOTE : CROSS MEMBERS TO BE ORIENTED PARALLEL TO NORTH / SOUTH BEARING AND SHALL BE PROPORTIONAL IN LENGTH TO ROOT BALL (4' MIN.)
- H. 2"x2"x4' STAKE WITH 18" min. TAPER (untreated lumber) INSTALL STAKE ADJACENT TO ROOT BALL
- I. REMOVE TOP 1/3 OF BURLAP SURROUNDING ROOTBALL AFTER INSTALLATION (to prevent "wicking" of moisture)
- J. UNDISTURBED SOIL BELOW ROOT BALL
- X. DIMENSION EQUAL TO "y"
- Y. DIMENSION EQUAL TO "x"



TREE PLANTING DETAIL

NOT TO SCALE



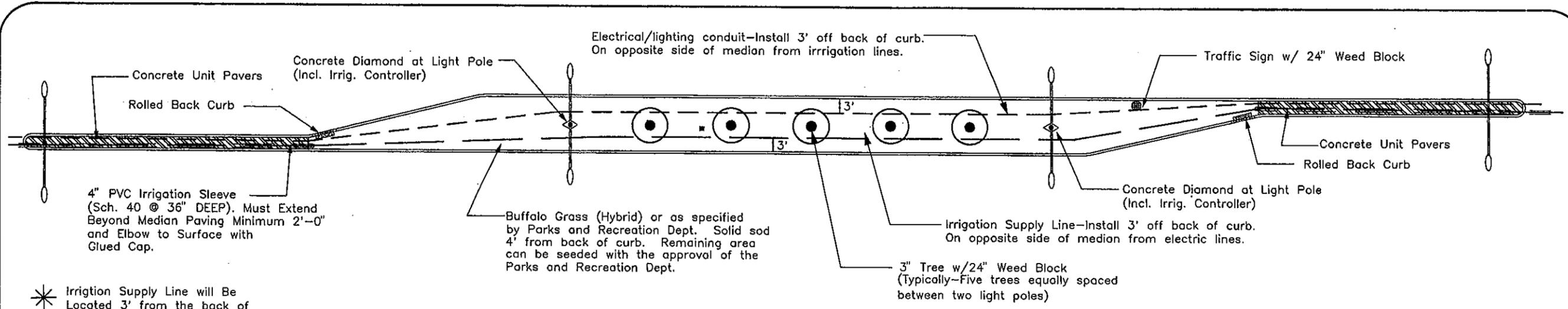
AUGUST 1,
2002

TREE PLANTING DETAIL

STANDARD DETAILS

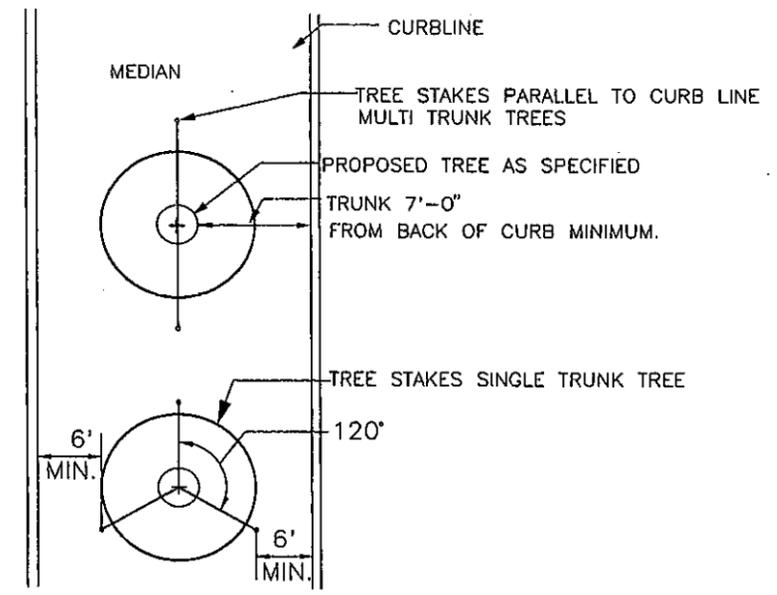
CITY OF PLANO PARKS AND
RECREATION DEPARTMENT

23



- * Irrigation Supply Line will Be Located 3' from the back of On opposite side from electrical line. Under no circumstance shall irrigation lines be allowed down the centerline of the roadway.
- * Electrical/Lighting Conduit Will be located 3' from back of curb for full width roadway section. On opposite side from irrigation line.
- * 6" Clean Friable Topsoil to be provided in median.

TYPICAL MEDIAN AMENITIES
NOT TO SCALE



TYPICAL MEDIAN TREE LOCATION
NOT TO SCALE



THE CITY OF PLANO
PARK PLANNING & DEVELOPMENT
1400 AVE. K
PLANO, TX 75074
214/578-7250

STANDARD
MEDIAN DETAILS
PLANO, TEXAS

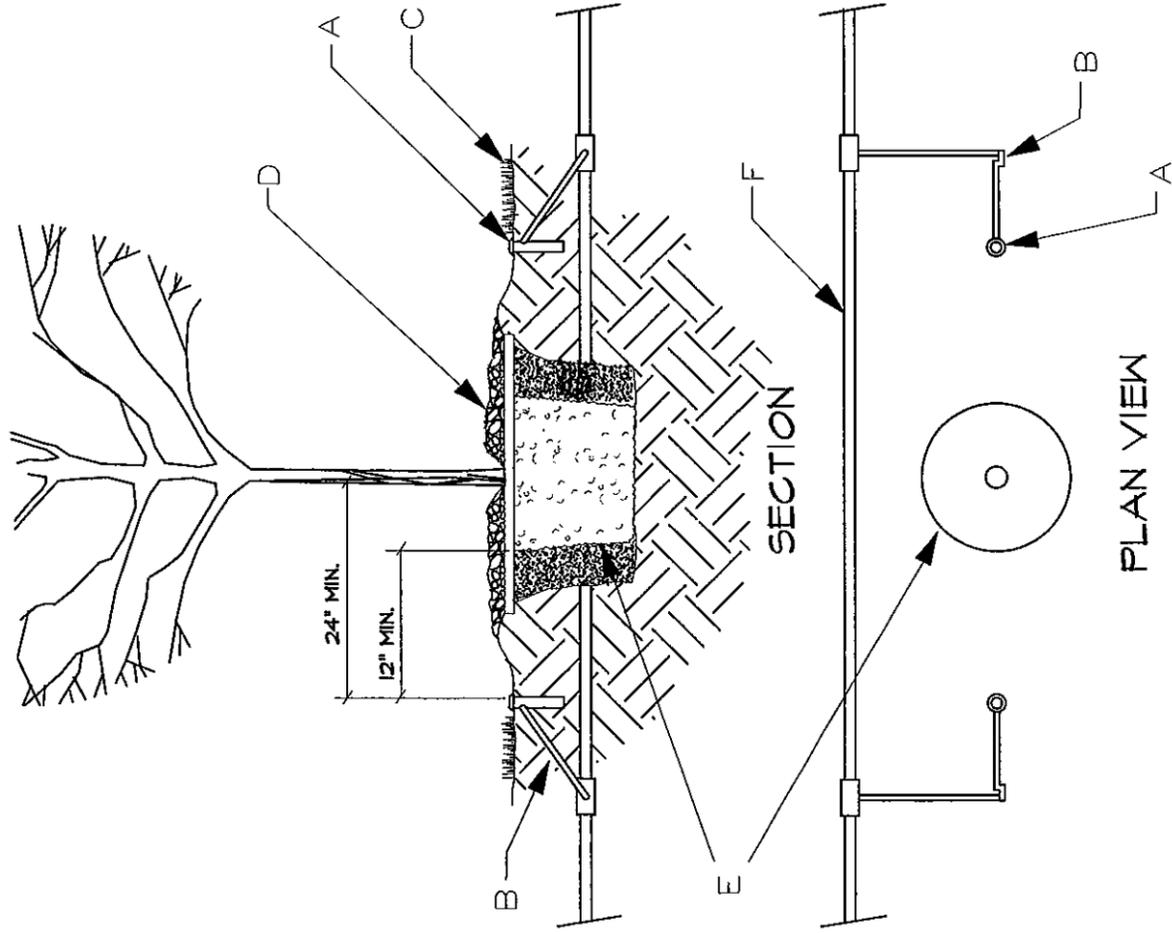
Scale: N.T.S.
Date: 11/96
Drawn By: KCP
Revisions:

Job: MEDN-TYP.

SD-35

IRRIGATION DETAIL FOR NEWLY PLANTED TREES

NOT TO SCALE



GENERAL NOTES:

- I. ALL TREE IRRIGATION HEADS ARE TO BE TORO STO SERIES 6" POP-UP W/ 8' Q NOZZLES.

CONSTRUCTION NOTES:

- A. IRRIGATION HEAD (2 PER TREE) - SHALL BE INSTALLED OUTSIDE OF AND ON OPPOSITE SIDES OFF THE TREE WELL. HEADS SHALL BE A MINIMUM OF 24" FROM THE BASE OF THE TREE AND A MINIMUM OF 12" FROM THE ROOT BALL - NOT TO BE COVERED WITH MULCH.
- B. SWING JOINT TO BE A HUNTER SJ-506
- C. FINISHED GRADE
- D. MULCH TREE WELL (SEE PLANTING DETAIL)
- E. TREE ROOT BALL.
- F. LATERAL IRRIGATION LINE TO REMAIN A MINIMUM OF 12" OUTSIDE OF ROOTBALL AND A MINIMUM OF 24" FROM THE TRUNK OF THE TREE.



January 23, 2006

Irrigation Detail for New Trees	
STANDARD DETAILS	
CITY OF PLANO PARKS AND RECREATION DEPARTMENT	23B

4-#4 BARS CONT. WITH #3 STIRRUP @ 24" O.C.

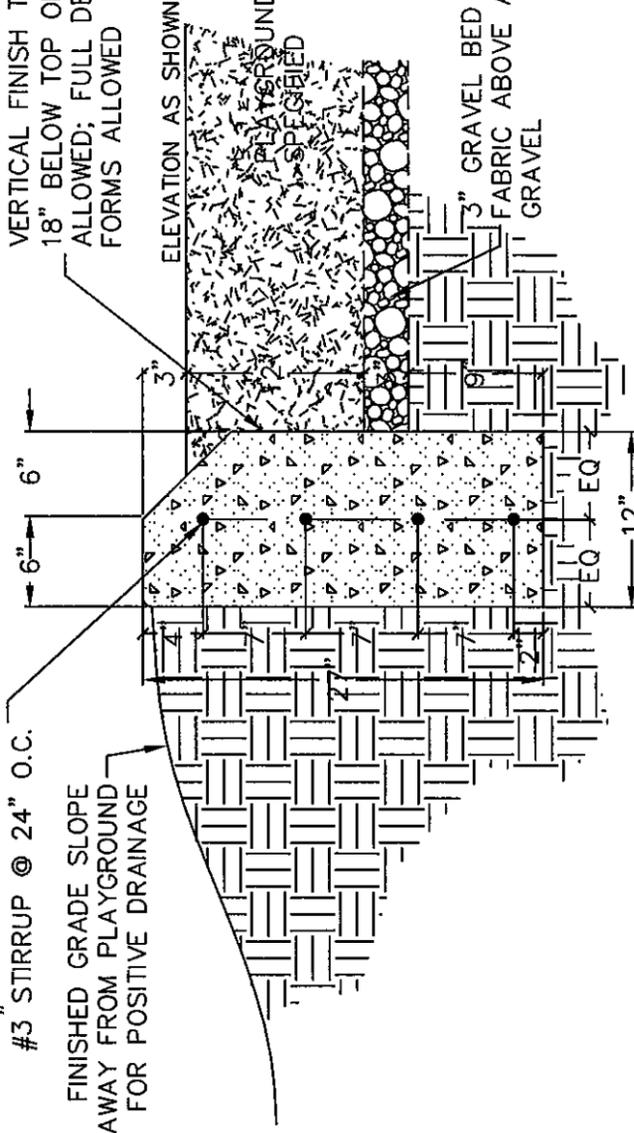
FINISHED GRADE SLOPE AWAY FROM PLAYGROUND FOR POSITIVE DRAINAGE

VERTICAL FINISH TO BE HAND RUBBED MIN. 18" BELOW TOP OF EDGE; NO HONEYCOMBS ALLOWED; FULL DEPTH FORM; NO EARTH FORMS ALLOWED

ELEVATION AS SHOWN

PLAYGROUND SURFACE AS SPECIFIED

3" GRAVEL BED WITH FILTER FABRIC ABOVE AND BELOW GRAVEL



CONCRETE PLAYGROUND EDGE

SCALE : 1"=1'-0"

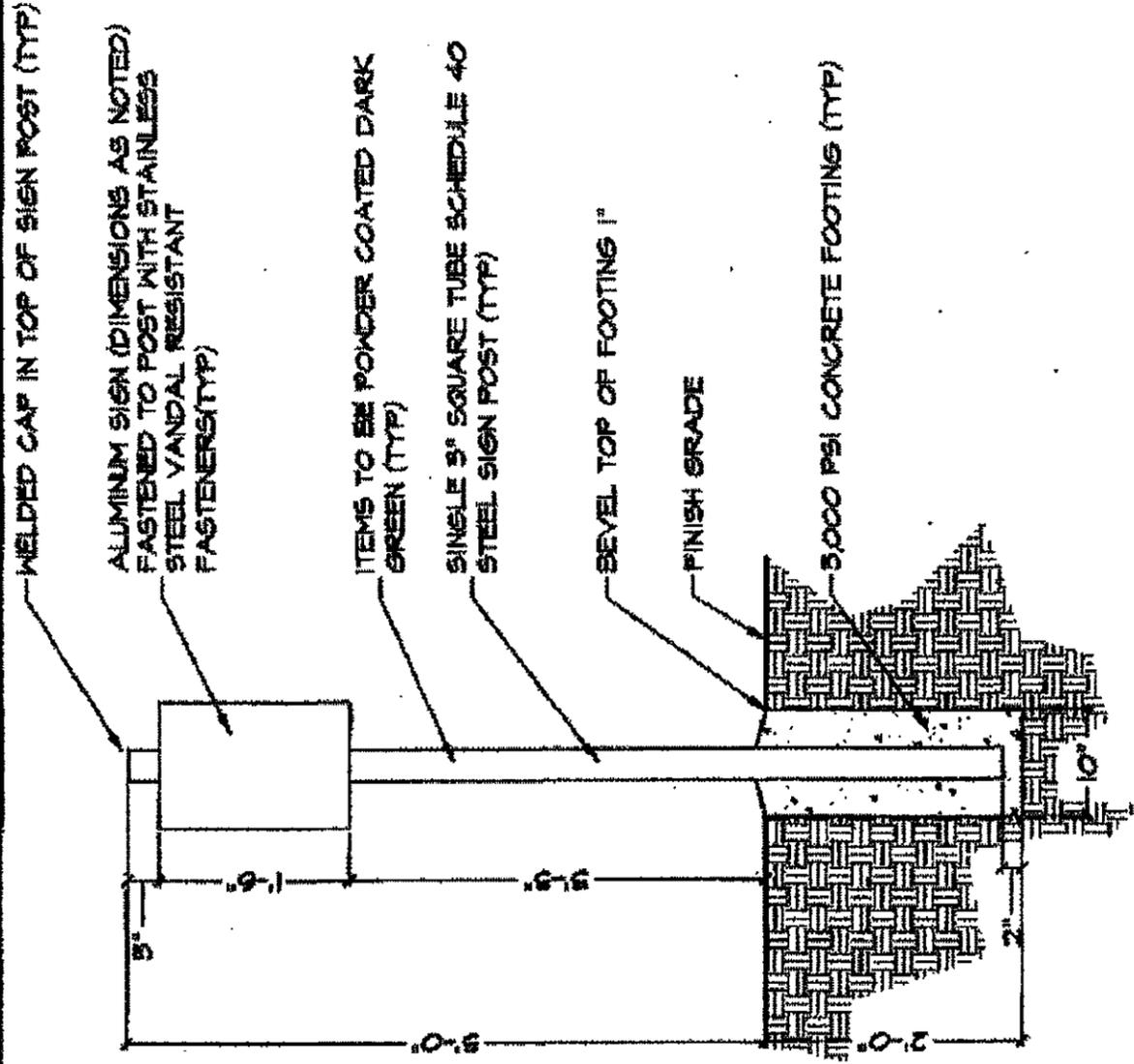
NOTES :

- 1. PLAYGROUND SURFACE TO BE ENGINEERED HARDWOOD FIBER CHIPS "FIBAR" BY GAME TIME OR APPROVED EQUAL.
- 2. 1/2" REDWOOD EXPANSION JOINTS SHALL BE PROVIDED WHERE SHOWN ON THE PLAN. EXPANSION JOINTS SHALL BE CONTINUOUS THROUGH THE WALK AND CONCRETE EDGE WHERE ADJACENT. INSTALL VERTICAL EXPANSION JOINTS IN PLAYGROUND EDGE ON MAXIMUM 30-FOOT CENTERS.



AUGUST 1, 2002

CONCRETE PLAYGROUND EDGE	
STANDARD DETAILS	
CITY OF PLANO PARKS AND RECREATION DEPARTMENT	24



SINGLE POST SIGN DETAIL

SCALE: 3/4" = 1'-0"



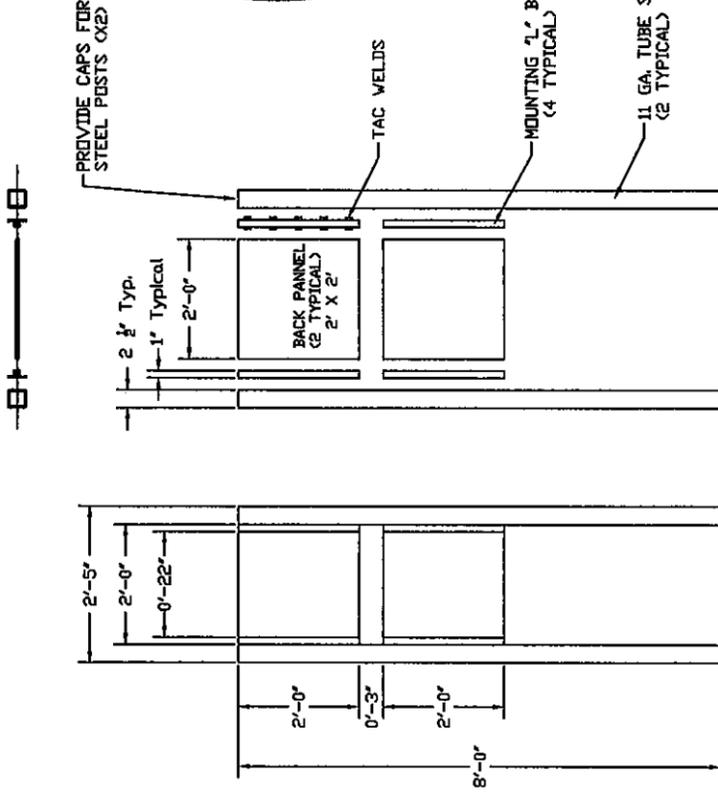
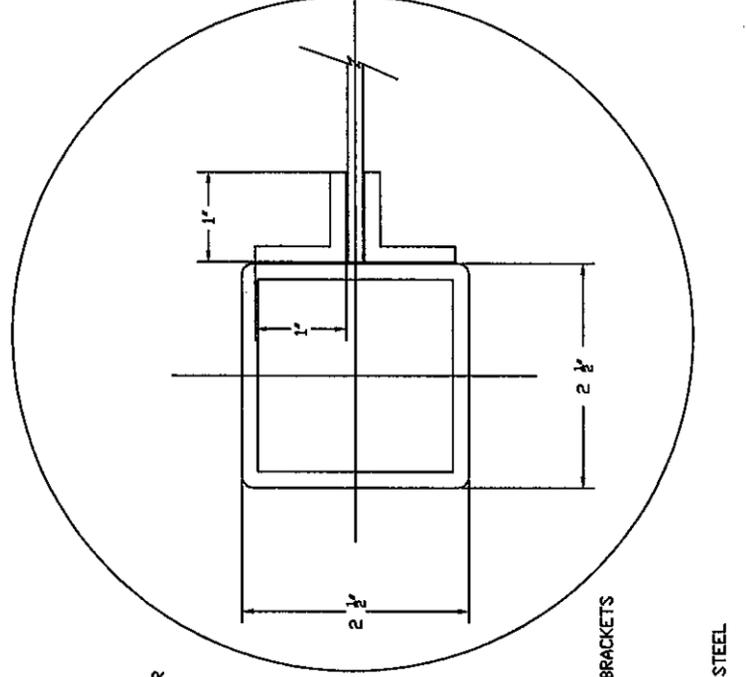
OCTOBER 17, 2003

SINGLE POST PARK SIGN

STANDARD DETAILS

CITY OF PLANO PARKS AND RECREATION DEPARTMENT

28



TYPICAL TRAIL SIGN ELEVATION

ALL 11 GAUGE MATERIALS
ALL SIGNAGE IS 22" X 22"

POST DETAIL

TAC WELD L BRACKETS TO POSTS
AND L BRACKETS TO BACK PANNELS
(1' long beads no more than 4' apart)
AS SHOWN ON ELEVATION (TYPICAL)

Not to Scale

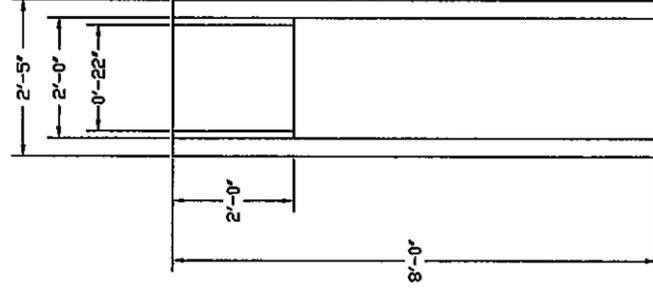
City of Plano, Texas
Parks & Recreation Department
Park Planning Division

Rev.	Revised/Issue	Date

Standard Details

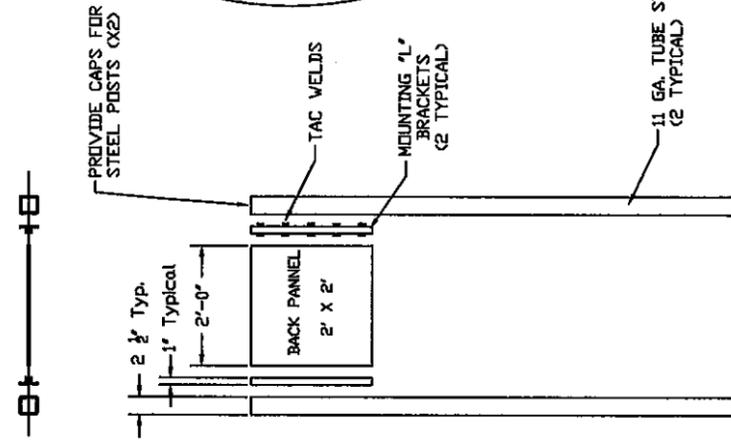
Double Trail Sign

T.L.B.	
4-8-02	1 of 1
1' = 1'	



TYPICAL TRAIL SIGN ELEVATION

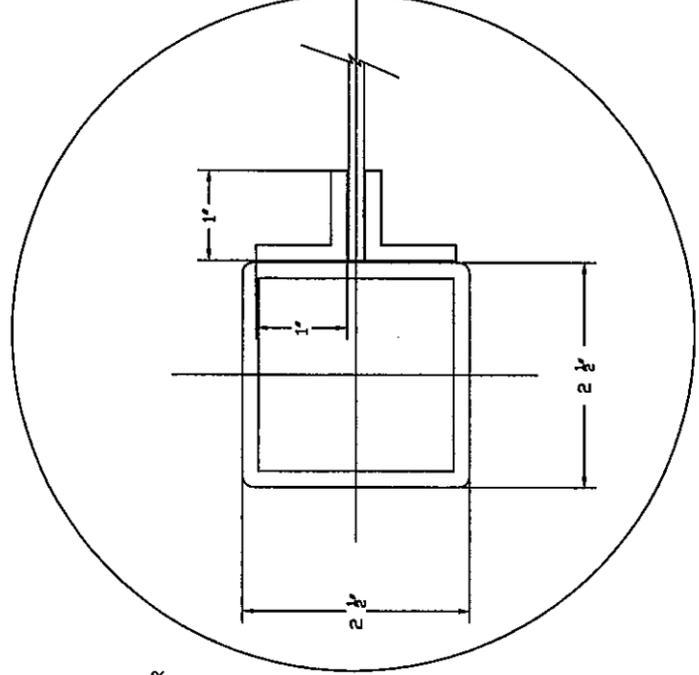
ALL 11 GAUGE MATERIALS
ALL SIGNAGE IS 22" X 22"



POST DETAIL

TAC WELD 'L' BRACKETS TO POSTS
AND 'L' BRACKETS TO BACK PANNELS
(1' long beads no more than 4" apart)
AS SHOWN ON ELEVATION (TYPICAL)

Not to Scale



City of Plano, Texas
Parks & Recreation Department
Park Planning Division

No.	Revised/Notes	Date

Standard
Details

Single
Panel
Trail Sign

T.L.B.	1 of 1
4-8-02	1 of 1
1' = 1'	1 of 1