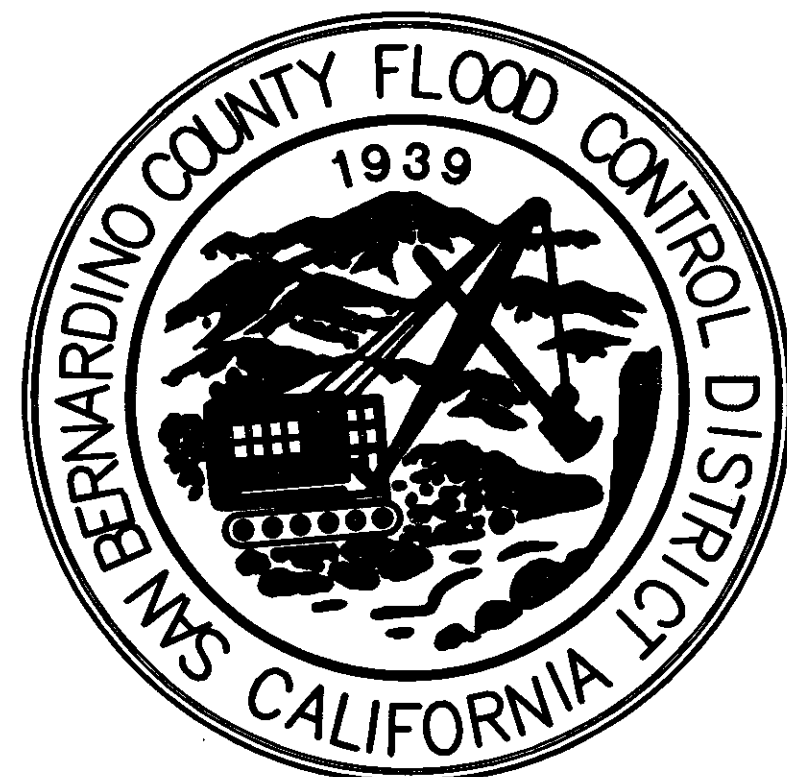


PRIVATE ENGINEER'S NOTICE TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES, CONDUITS OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN ON THESE DRAWINGS. THE CONTRACTOR FURTHER ASSUMES ALL LIABILITY AND RESPONSIBILITY FOR THE UTILITY PIPES, CONDUITS OR STRUCTURES SHOWN OR NOT SHOWN ON THESE DRAWINGS. CONTRACTOR AGREES THAT HE SHALL ASSUME FULL AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE COUNTY, THE OWNER, AND THE ENGINEER HARMLESS FROM ANY LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.

THE CONTRACTOR SHALL PROVIDE THE RAILROAD WITH DETAILS, DESIGN, AND PROCEDURE FOR ALL TEMPORARY SHORING AND/OR BRACING. ALL TEMPORARY SHORING AND BRACING SHALL BE DESIGNED, SIGNED, AND SEALED BY A PROFESSIONAL ENGINEER IN THE STATE OF CALIFORNIA. THE UPRR CHIEF ENGINEER DESIGN PRIOR TO BEGINNING CONSTRUCTION, MUST APPROVE ALL TEMPORARY SHORING AND BRACING. THE PROVISIONS OF UPRR STANDARD DWG. NO. 106613 SHALL BE MET.

THE UPSTREAM JOIN POINTS BETWEEN SEGMENT IIIA AND IIIC OF CONSTRUCTION IS AT MOUNTAIN AND BENSON BETWEEN UPRR TRACKS AND STATE STREET. THE CURRENT DESIGN OF SEGMENT IIIA IS TO HAVE THREE 6X6 BOX STRUCTURES. THE SEGMENT IIIA CONTRACTOR MAY HAVE AN ALTERNATE DESIGN OF THREE 78-INCH RCP'S. IF THIS OCCURS MODIFICATIONS TO THESE PLANS AT THE JOIN POINTS SHALL BE ISSUED.



SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

PLANS FOR RECONSTRUCTION

ON

DISPOSITION NOTES

- 1 PROTECT EXISTING IMPROVEMENT IN PLACE.
- 2 REMOVE EXISTING IMPROVEMENT.
- 3 RELOCATE EXISTING IMPROVEMENT AS DIRECTED.
- 4 IMPROVEMENT RELOCATED BY OTHERS, PROTECT NEW IMPROVEMENT IN PLACE.
- 5 ABANDON ITEM IN PLACE.
- 6 COORDINATE WITH UPRR FOR TEMPORARY CONSTRUCTION REMOVAL OF TRACKS & FENCE.
- 7 ADJUST FIBER OPTIC CONDUIT AS NECESSARY.
- 8 REMOVE AND DISPOSE.

CONSTRUCTION NOTES

- 1 CONSTRUCT CURVE TRANSITION FROM TRIPLE 5'W x 8'H TO TRIPLE 6'W x 6'H BOX PER PROFILE AND SHEET 10.
- 2 CONSTRUCT CURVE TRANSITION FROM TRIPLE 4'W x 9'H TO TRIPLE 6'W x 6'H BOX PER PROFILE & DETAILS ON SHEET 11.
- 3 CONSTRUCT BOX SECTIONS ON PER PROFILE AND ON SHEETS 13, 14, & 15.
- 8 CONSTRUCT VARYING W/2 (7' TO 8') BY 12'H SOUTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 8. LIMITS PER PROFILE.
- 9 CONSTRUCT FENCE SPEC I & II PER SHEETS 6 & 7.
- 10 CONSTRUCT VARYING W/2 (7' TO 8') BY VARYING H (10-12') NORTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 9. LIMITS PER PROFILE.
- 11 CONSTRUCT 10.5 W/2 BY 12'H SOUTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 8. LIMITS PER PROFILE.
- 12 CONSTRUCT VARYING W/2 (3.5' TO 11.25') BY 12'H NORTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 9,13-15. LIMITS PER PROFILE.
- 15 CONSTRUCT CONCRETE BARRIER TYPE 50D PER STATE STD PLAN A75A.
- 17 CONSTRUCT 8'W/2 BY 10'H NORTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 9. LIMITS PER PROFILE.
- 18 CONSTRUCT 8' W/2 BY 10'H SOUTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 8. LIMITS PER PROFILE.

NOTE:

FINAL PAY QUANTITY FOR BAR REINFORCING STEEL FOR SEGMENT III C = 110,851 LBS. THIS QUANTITY IS EXCLUSIVE OF ANY AND ALL BAR REINFORCING STEEL THAT IS INVOLVED IN THE COMPONENTS OF WORK, IDENTIFIED ON THE DRAWINGS OR THE SPECIAL PROVISIONS, FOR WHICH PAYMENT IS BEING MADE UNDER SEPERATE CONTRACT ITEMS.

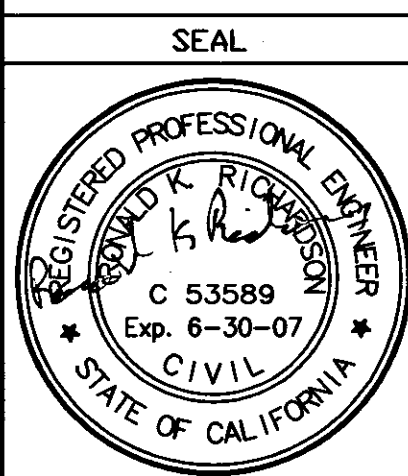
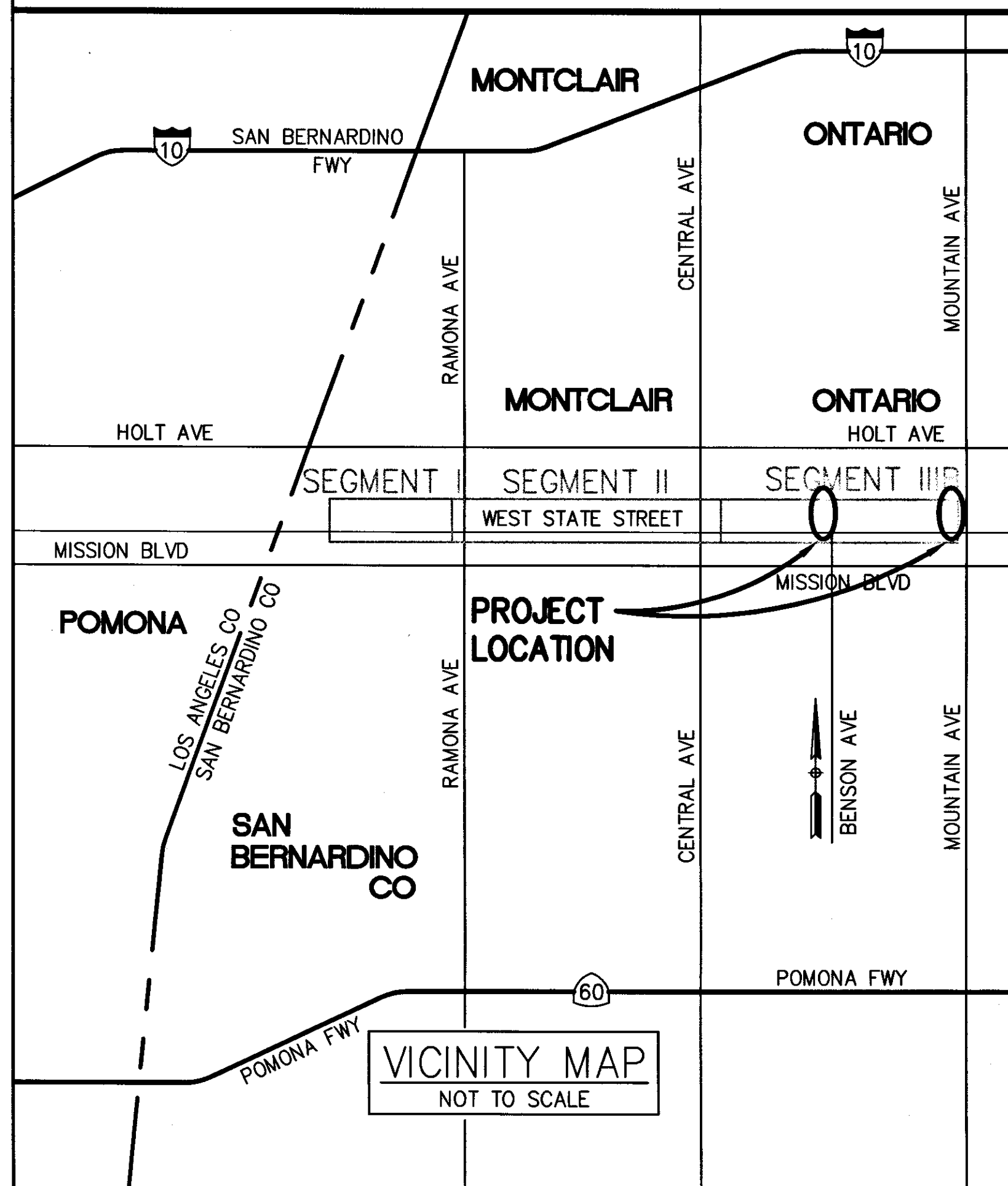
WEST STATE STREET STORM DRAIN

SEGMENT III C

CONSTRUCTION OF TRANSITION STRUCTURES AT BENSON AVENUE AND MOUNTAIN AVENUE

F01087

SAN ANTONIO CREEK SYSTEM



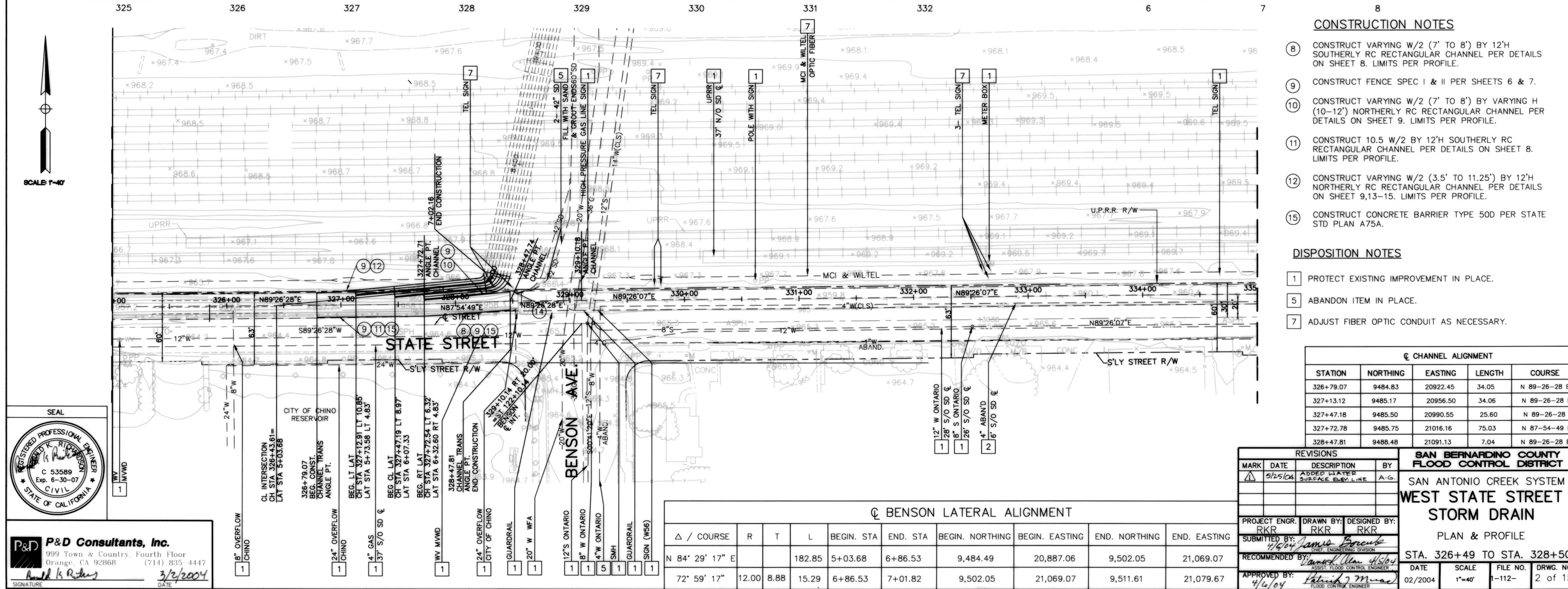
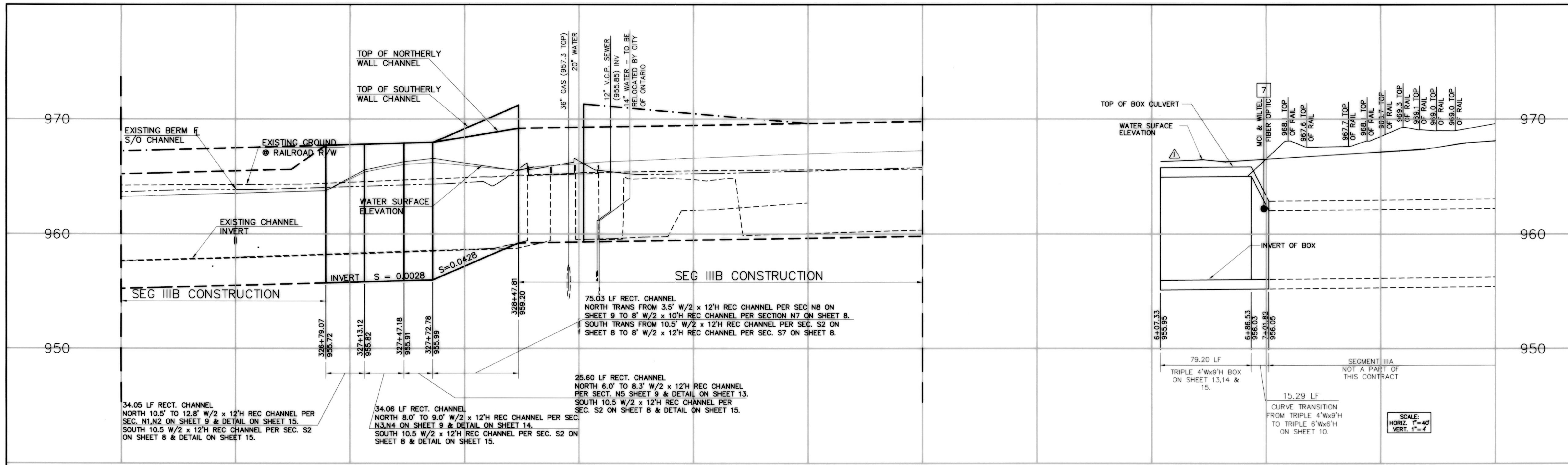
PREPARED BY
P&D Consultants, Inc.
999 Town & Country, Ste 400
Orange, CA 92668 (714) 835-4447
Signature: *David K. Richardson* DATE: 3/31/2004

APPROVED BY: *Patrick J. Mead* 4/6/04
FLOOD CONTROL ENGINEER R.C.E. 24903 DATE

BENCH MARK

B.M. 701-12, Fd 2" BRASS DISC STAMPED "701-12"
IN TOP OF CURB, SOUTH SIDE OF STATE ST. 121' +
WEST OF CHANNEL AVE. PER CSFB 4013/830 ELEV = 956.91'

CITY OF ONTARIO	
RECOMMENDED BY: <i>Louis W. ...</i>	8-19-04
ASSISTANT CITY ENGINEER	DATE
ACCEPTED BY: <i>John P. ...</i>	8-23-04
CITY ENGINEER	DATE



- ### CONSTRUCTION NOTES
- 8 CONSTRUCT VARYING W/2 (7' TO 8') BY 12'H SOUTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 8. LIMITS PER PROFILE.
 - 9 CONSTRUCT FENCE SPEC I & II PER SHEETS 6 & 7.
 - 10 CONSTRUCT VARYING W/2 (7' TO 8') BY VARYING H (10-12') NORTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 9. LIMITS PER PROFILE.
 - 11 CONSTRUCT 10.5 W/2 BY 12'H SOUTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 8. LIMITS PER PROFILE.
 - 12 CONSTRUCT VARYING W/2 (3.5' TO 11.25') BY 12'H NORTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 9,13-15. LIMITS PER PROFILE.
 - 15 CONSTRUCT CONCRETE BARRIER TYPE 50D PER STATE STD PLAN A75A.

- ### DISPOSITION NOTES
- 1 PROTECT EXISTING IMPROVEMENT IN PLACE.
 - 5 ABANDON ITEM IN PLACE.
 - 7 ADJUST FIBER OPTIC CONDUIT AS NECESSARY.

CL CHANNEL ALIGNMENT				
STATION	NORTHING	EASTING	LENGTH	COURSE
326+79.07	9484.83	20922.45	34.05	N 89-26-28 E
327+13.12	9485.17	20956.50	34.06	N 89-26-28 E
327+47.18	9485.50	20990.55	25.60	N 89-26-28 E
327+72.78	9485.75	21016.16	75.03	N 87-54-49 E
328+47.81	9488.48	21091.13	7.04	N 89-26-28 E

CL BENSON LATERAL ALIGNMENT									
Δ / COURSE	R	T	L	BEGIN. STA	END. STA	BEGIN. NORTHING	BEGIN. EASTING	END. NORTHING	END. EASTING
N 84° 29' 17" E			182.85	5+03.68	6+86.53	9,484.49	20,887.06	9,502.05	21,069.07
72° 59' 17"	12.00	8.88	15.29	6+86.53	7+01.82	9,502.05	21,069.07	9,511.61	21,079.67

REVISIONS			
MARK	DATE	DESCRIPTION	BY
Δ	5/25/04	ADDED WATER SURFACE ELEV. LINE	A.G.

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

SAN ANTONIO CREEK SYSTEM WEST STATE STREET STORM DRAIN

PLAN & PROFILE

STA. 326+49 TO STA. 328+50

DATE: 02/2004 SCALE: 1"=40' FILE NO.: 1-112- DRWG. NO.: 2 of 15

SEAL

REGISTERED PROFESSIONAL ENGINEER

ANDREW K. RICHARDS

C 53589

Exp. 6-30-07

CIVIL

STATE OF CALIFORNIA

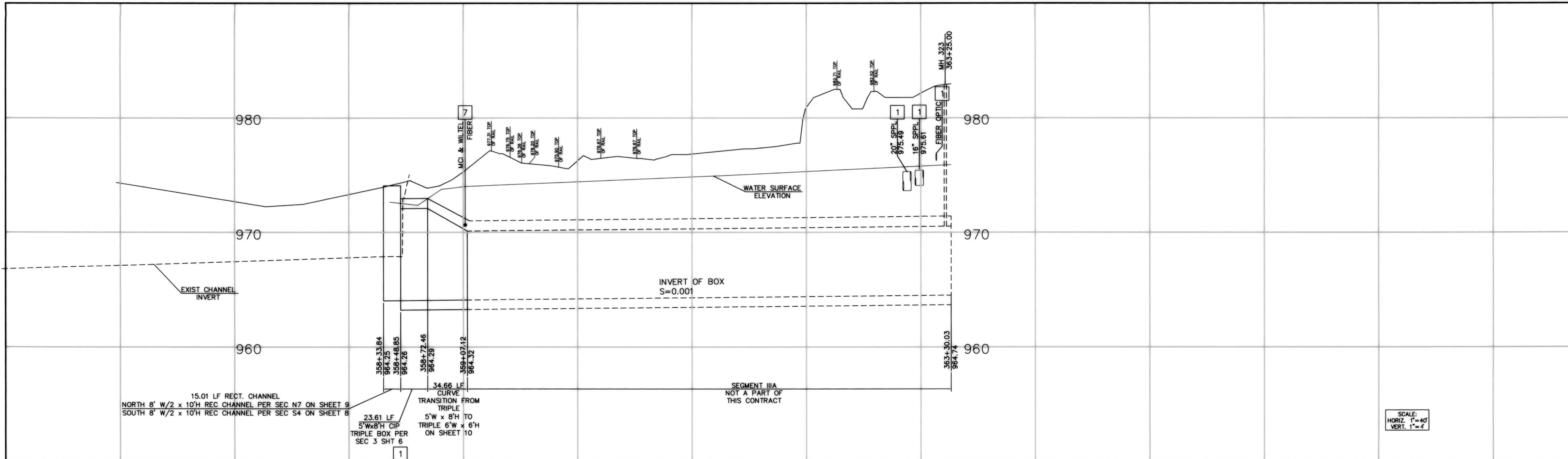
P&D Consultants, Inc.

999 Town & Country, Fourth Floor

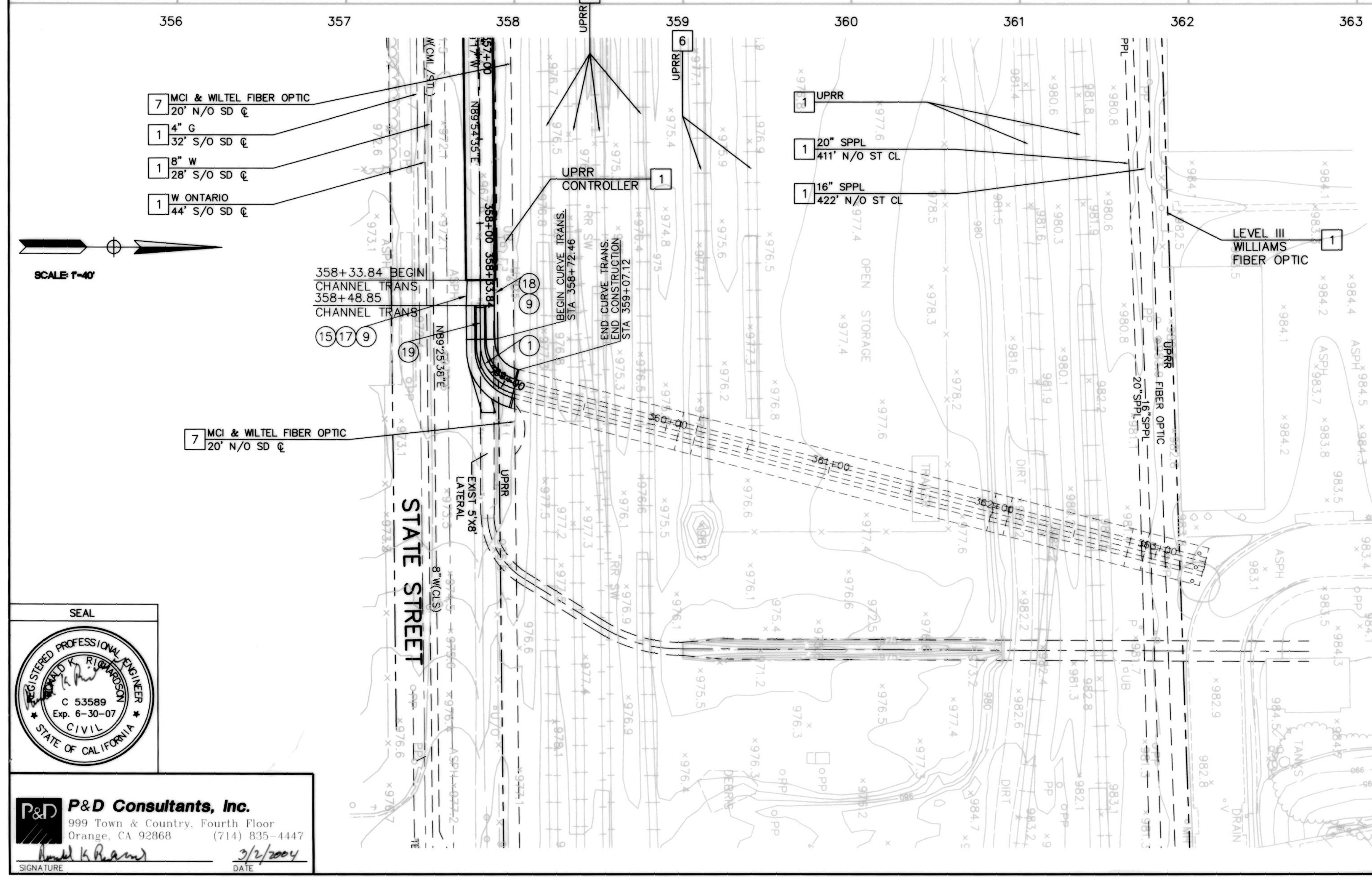
Orange, CA 92868 (714) 835-4447

3/2/2004

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SCALE:
HORIZ. 1"=40'
VERT. 1"=4'



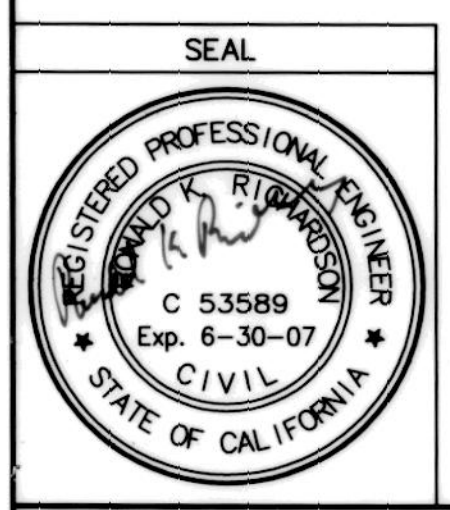
C ALIGNMENT									
Δ / COURSE	R	T	L	BEGIN. STA	END. STA	BEGIN. NORTHING	BEGIN. EASTING	END. NORTHING	END. EASTING
S 88° 38' 30" E			15.01	358+33.84	358+48.85	9,517.84	24,077.10	9,517.49	24,092.10
N 89° 26' 02" E			23.61	358+48.85	358+72.46	9,517.49	24,092.10	9,517.72	24,115.71
74° 56' 02"	26.50	20.31	34.66	358+72.46	359+07.12	9,517.72	24,115.71	9,537.57	24,141.11

CONSTRUCTION NOTES

- ① CONSTRUCT CURVE TRANSITION FROM TRIPLE 5' W X 8' H TO TRIPLE 6' W X 6' H BOX PER PROFILE AND SHEET 10.
- ⑨ CONSTRUCT FENCE SPEC I & II PER SHEETS 6 & 7.
- ⑮ CONSTRUCT CONCRETE BARRIER TYPE 50D PER STATE STD PLAN A75A.
- ⑰ CONSTRUCT 8' W/2 BY 10' H NORTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 9. LIMITS PER PROFILE.
- ⑱ CONSTRUCT 8' W/2 BY 10' H SOUTHERLY RC RECTANGULAR CHANNEL PER DETAILS ON SHEET 8. LIMITS PER PROFILE.

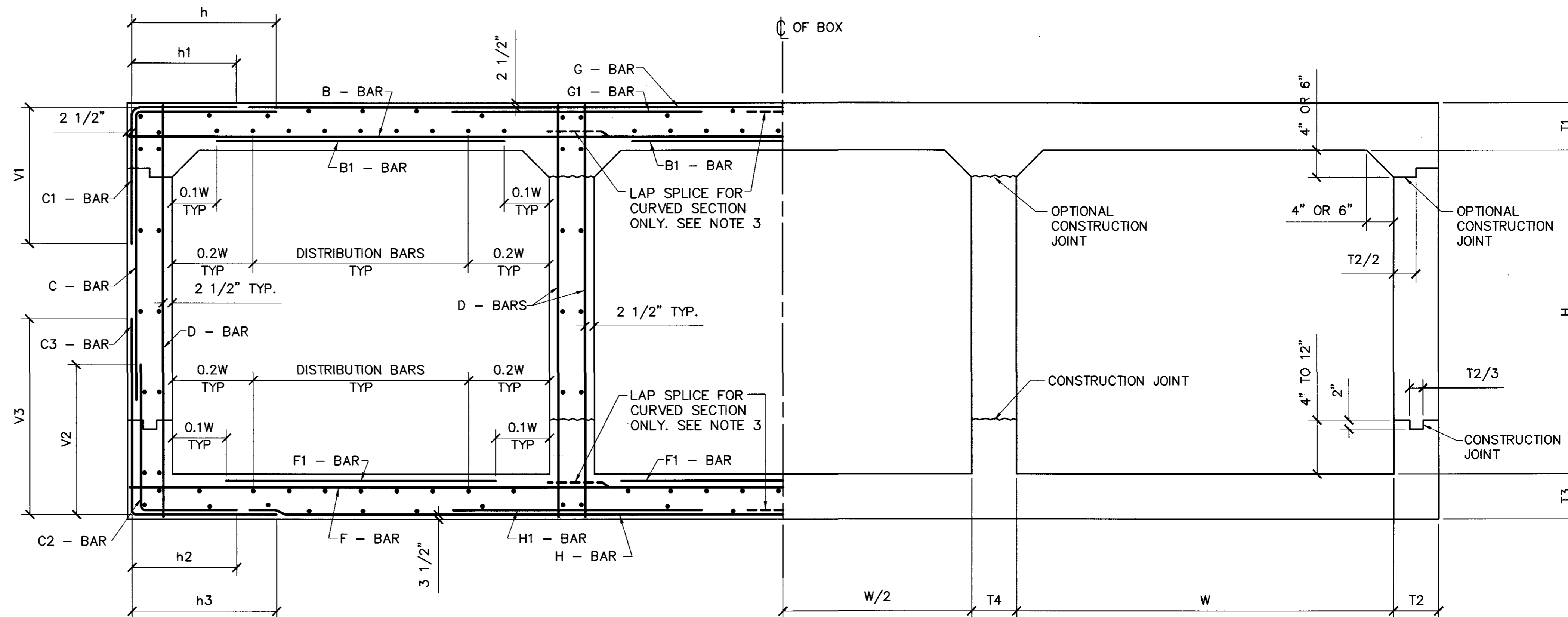
DISPOSITION NOTES

- ① PROTECT EXISTING IMPROVEMENT IN PLACE.
- ⑥ COORDINATE WITH UPRR FOR TEMPORARY CONSTRUCTION REMOVAL OF TRACKS & FENCE.
- ⑦ ADJUST FIBER OPTIC CONDUIT AS NECESSARY.
- ⑧ REMOVE AND DISPOSE.



P&D Consultants, Inc.
999 Town & Country, Fourth Floor
Orange, CA 92668 (714) 835-4447
DATE: 2/2/2004

REVISIONS				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
MARK	DATE	DESCRIPTION	BY				
				SAN ANTONIO CREEK SYSTEM			
				WEST STATE STREET			
				STORM DRAIN			
				PLAN & PROFILE			
				STA 358+33 TO STA 359+07			
PROJECT ENGR.	DRAWN BY:	DESIGNED BY:		DATE	SCALE	FILE NO.	DRWG. NO.
RKR	RKR	RKR		02/2004	1"=40'	1-112-	3 of 15
SUBMITTED BY: <i>James Boruck</i>							
RECOMMENDED BY: <i>David Allen</i>							
APPROVED BY: <i>Patricia J. Mead</i>							



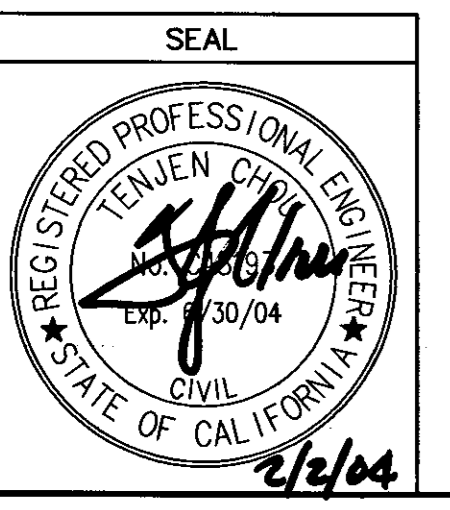
TYPICAL TRIPLE BOX CONDUIT SECTION
NOT TO SCALE

BOX SECTION		1	2	3	4	5	6
Design Cover		5'-0"	5'-0"	5'-0"			
Width	W	7'-0"	6'-0"	5'-0"			
Height	H	6'-0"	6'-0"	8'-0"			
Top Slab Thickness	T1	10 1/2"	10 1/2"	10 1/2"			
Side Wall Thickness	T2	10"	10"	10"			
Bottom Slab Thickness	T3	10"	10"	10"			
Interior Wall Thickness	T4	10"	10"	10"			
B Bars	Bar No. & Spacing	6 @ 12"	6 @ 12"	6 @ 12"			
	Length	24'-0"	21'-0"	18'-0"			
B1 Bars	Bar No. & Spacing	6 @ 12"	5 @ 12"	5 @ 12"			
	Length	5'-8"	4'-10"	4'-0"			
C Bars	Bar No. & Spacing	6 @ 12"	5 @ 12"	5 @ 12"			
	Hor. Length	4'-4"	3'-4"	3'-4"			
C1 Bars	Bar No. & Spacing	6 @ 12"	6 @ 12"	6 @ 12"			
	Hor. Length	3'-4"	2'-10"	2'-10"			
C2 Bars	Bar No. & Spacing	5 @ 12"	5 @ 12"	5 @ 12"			
	Hor. Length	2'-6"	2'-6"	2'-6"			
C3 Bars	Bar No. & Spacing	6 @ 12"	6 @ 12"	6 @ 12"			
	Hor. Length	3'-4"	2'-10"	2'-10"			
D Bars	Bar No. & Spacing	6 @ 12"	5 @ 12"	5 @ 12"			
	Length	7'-4"	7'-4"	9'-4"			
F Bars	Bar No. & Spacing	6 @ 12"	6 @ 12"	6 @ 12"			
	Length	24'-0"	21'-0"	18'-0"			
F1 Bars	Bar No. & Spacing	5 @ 12"	N/A	N/A			
	Length	5'-8"	N/A	N/A			
G Bars	Bar No. & Spacing	7 @ 12"	6 @ 12"	6 @ 12"			
	Length	18'-9"	16'-9"	14'-0"			
G1 Bars	Bar No. & Spacing	6 @ 12"	6 @ 12"	6 @ 12"			
	Length	4'-0"	3'-6"	3'-0"			
H Bars	Bar No. & Spacing	7 @ 12"	7 @ 12"	7 @ 12"			
	Length	18'-9"	16'-9"	14'-0"			
H1 Bars	Bar No. & Spacing	6 @ 12"	6 @ 12"	6 @ 12"			
	Length	4'-0"	3'-6"	3'-0"			
NUMBER OF LONGITUDINAL REINFORCEMENT # 5 BARS (EXCEPT AS NOTED)							
Top Slab (includes distribution reinforcement)		34	32	32			
Bottom Slab		34	32	32			
Side Walls		48	42	42			
TOTAL		116	106	106			
QUANTITIES							
Concrete Cu. Yds./Lin. Ft.		2.76	2.57	2.75			
Steel Lbs./Lin. Ft.		466.80	377.81	374.82			

DIMENSION AND REINFORCEMENT SCHEDULE

STRUCTURAL NOTES

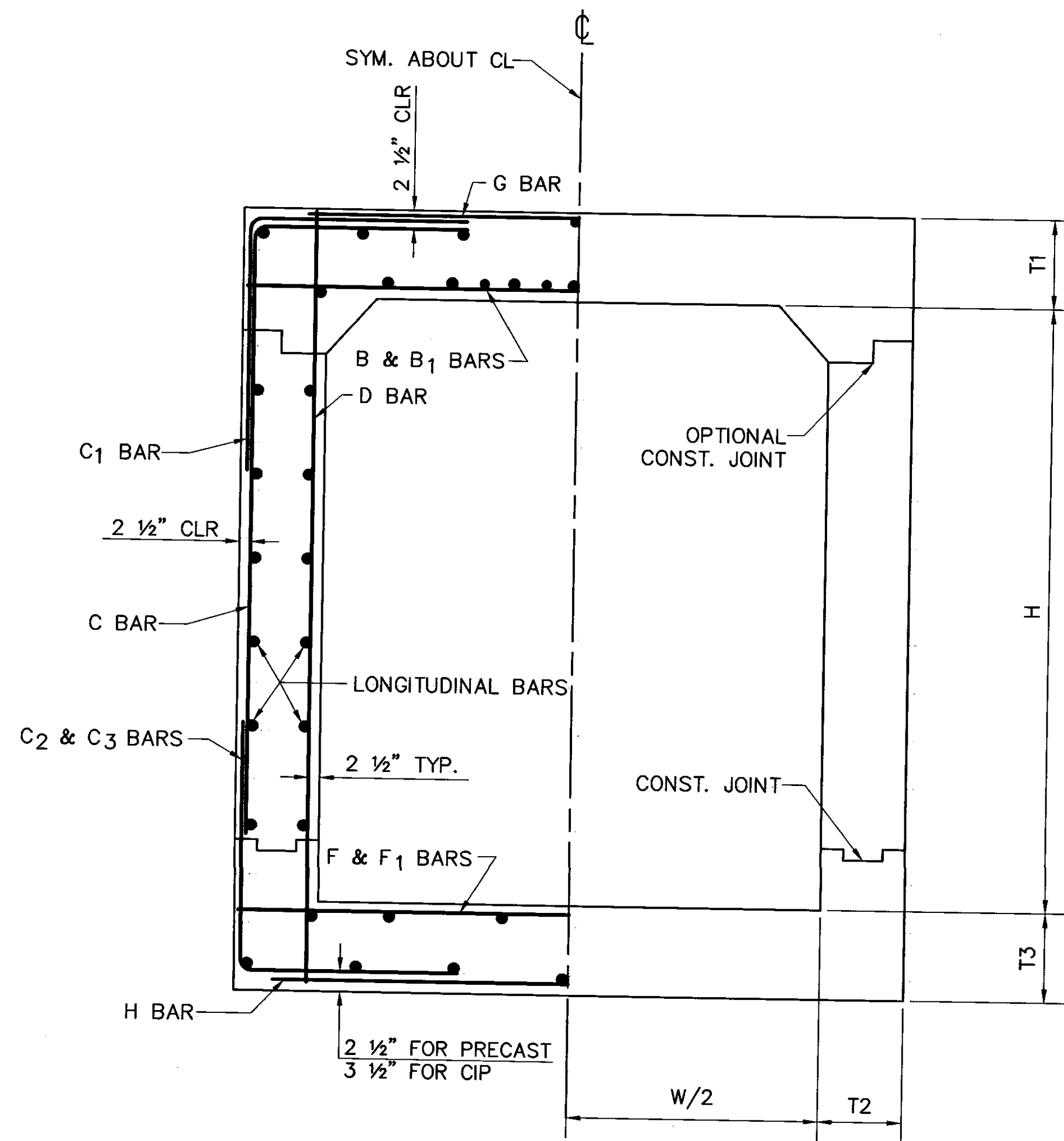
- SEE SHEET 5 FOR FURTHER STRUCTURAL NOTES
- SEE SHEET 5 FOR STRUCTURAL DESIGN CRITERIA
- UNLESS OTHERWISE SHOWN OF THE DETAILS, IN CURVED SECTIONS TRANSVERSE BARS SHALL BE PLACED RADIALLY. THE SPACING OF STRAIGHT TRANSVERSE BARS IN TOP AND BOTTOM SLABS SHALL BE MEASURED AT THE CENTERLINE OF EACH CELL FOR POSITIVE MOMENT REINFORCING STEEL AND AT THE CENTERLINE OF INTERIOR WALL FOR NEGATIVE MOMENT REINFORCING STEEL. B,F AND G BARS SHALL BE SPLICED 15 BAR DIAMETERS, OR 12 INCHES MINIMUM AT INDICATED LOCATIONS THROUGHOUT THE CURVED SECTIONS. THE SPACING OF STRAIGHT BARS AND L-BARS IN WALLS SHALL BE MEASURED BETWEEN THE VERTICAL LYS OF BARS.
- * WHERE THE TRIPLE BOX CONDUITS VARY IN WIDTH AND THE INTERIOR WALLS VARY IN THICKNESS BETWEEN SECTIONS SHOWN IN SCHEDULE, VARY THE CONCRETE THICKNESS UNIFORMLY BETWEEN THE TWO ADJACENT SECTIONS. REINFORCING STEEL SHALL BE THAT FROM WHICH EVER ADJOINING SECTION PROVIDES THE GREATER STEEL AREA. VARY THE LENGTH OF BARS NOTED WITH * UNIFORMLY ALONG THE TRANSITION.



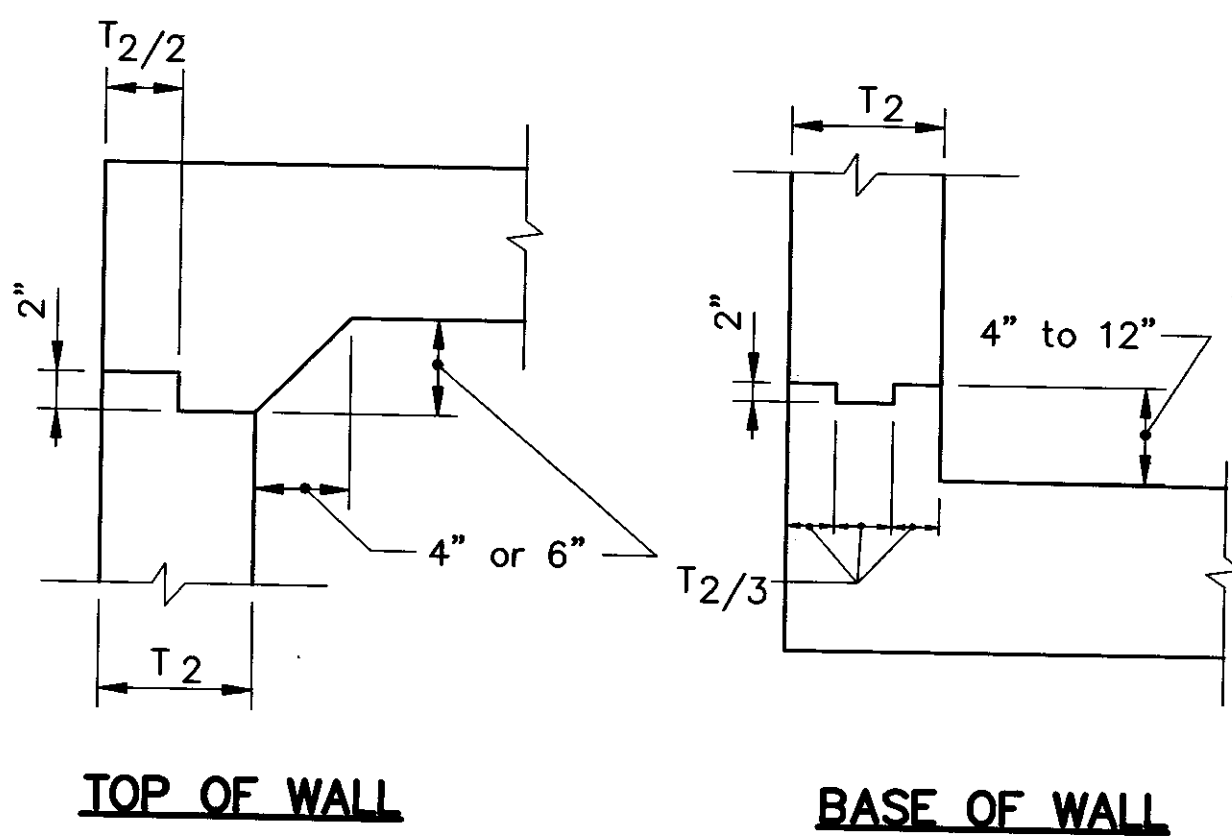
P&D Consultants, Inc.
999 Town & Country, Fourth Floor
Orange, CA 92668 (714) 835-4447

REVISIONS				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
MARK	DATE	DESCRIPTION	BY	SAN ANTONIO CREEK SYSTEM			
				RC TRIPLE BOX CONDUIT SECTION AND SCHEDULE			
				DETAILS			
PROJECT ENGR.	DRAWN BY:	DESIGNED BY:		DATE	SCALE	FILE NO.	DRWG. NO.
TJC	DD	RO		3/01/04	VARIES	1-112-	4 of 15
SUBMITTED BY:	4/5/04 <i>James Breuck</i>						
RECOMMENDED BY:	4/6/04 <i>David M. Mead</i>						
APPROVED BY:	4/6/04 <i>David M. Mead</i>						

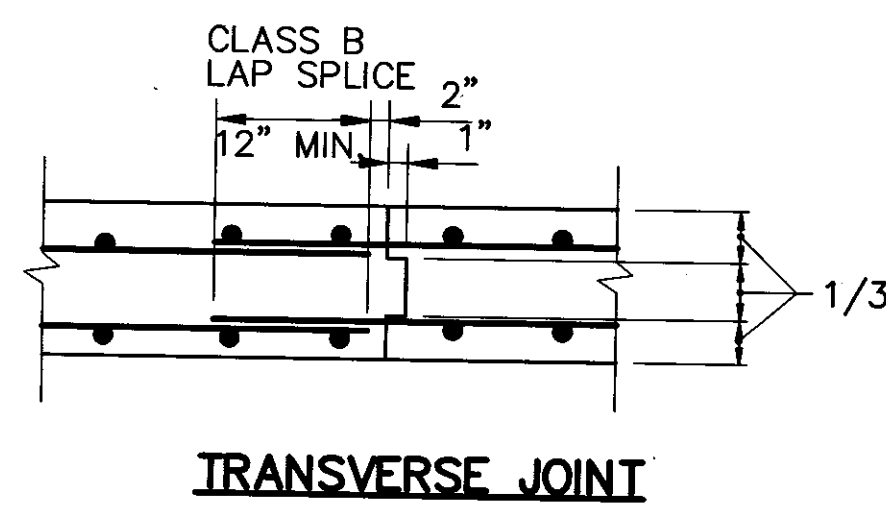
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TYPICAL RC BOX SECTION
NOT TO SCALE



LONGITUDINAL JOINT



CONSTRUCTION JOINT DETAILS
NOT TO SCALE

STRUCTURAL NOTES

- DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO CENTER OF BAR, UNLESS OTHERWISE SHOWN. CONCRETE DIMENSIONS SHALL BE MEASURED HORIZONTALLY OR VERTICALLY ON THE PROFILE, AND PARALLEL TO OR AT RIGHT ANGLES (OR RADIIALLY) TO CENTERLINE OF CONDUIT ON THE PLAN EXCEPT AS OTHERWISE SHOWN.
- ALL BAR BENDS AND HOOKS SHALL CONFORM TO THE AREMA MANUAL FOR RAILWAY ENGINEERING, CHAP. 8, CONCRETE STRUCTURES AND FOUNDATIONS.
- PLACING OF REINFORCEMENT BARS SHALL CONFORM TO THE AREMA MANUAL FOR RAILWAY ENGINEERING, CHAP. 8, CONCRETE STRUCTURES AND FOUNDATIONS.
- TRANSVERSE CONSTRUCTION JOINTS SHALL NOT BE PLACED WITHIN 30 INCHES OF MANHOLE OR JUNCTION STRUCTURE OPENINGS.
- TRANSVERSE CONSTRUCTION JOINTS IN WALLS AND SLABS SHALL BE IN THE SAME PLANE. NO STAGGERING OF JOINTS WILL BE PERMITTED. TRANSVERSE CONSTRUCTION JOINTS SHALL BE NORMAL OR RADIAL TO THE CENTERLINE OF CONSTRUCTION.
- THE TRANSVERSE REINFORCING BARS B AND F SHALL TERMINATE TWO INCHES FROM THE CONCRETE SURFACES UNLESS OTHERWISE SHOWN ON THE STRUCTURAL DETAILS. D BARS SHALL TERMINATE 2 INCHES FROM THE TOP SURFACE OF CONCRETE AND 3 INCHES FROM THE BOTTOM SURFACE OF CONCRETE FOR CAST-IN-PLACE CONSTRUCTION, AND CONCRETE 2\"/>
- EXPOSED SURFACES OF CONCRETE MEMBERS SHALL BE ROUNDED OR BEVELED.
- NO SPLICES IN TRANSVERSE BARS REINFORCEMENT WILL BE PERMITTED OTHER THAN SHOWN ON THE DRAWING WITHOUT APPROVAL OF THE ENGINEER. NO MORE THAN TWO SPLICES WILL BE PERMITTED IN ANY LONGITUDINAL BAR BETWEEN TRANSVERSE JOINTS. SPLICES SHALL BE STAGGERED.
- LONGITUDINAL BARS SHALL BE LAPPED USING CLASS B SPLICES. TRANSVERSE BARS SHALL BE LAPPED USING CLASS C SPLICES. MINIMUM LAP SHALL BE 12 INCHES. LONGITUDINAL BARS SHALL BE CONTINUOUS AND EXTEND THROUGH ALL CONSTRUCTION JOINTS.
- UNLESS OTHERWISE SHOWN ON THE DRAWINGS, TRANSVERSE CONSTRUCTION JOINTS (IN BOTH SLABS AND WALLS), SHALL BE PLACED AT THE END OF EACH POUR, BUT THE SPACING THEREOF SHALL NOT EXCEED 50 FEET NOR BE LESS THAN 10 FEET.
- UNLESS OTHERWISE SHOWN ON THE DETAILS, IN CURVED SECTIONS TRANSVERSE BARS SHALL BE PLACED RADIIALLY. THE SPACING OF STRAIGHT TRANSVERSE BARS IN TOP AND BOTTOM SLABS SHALL BE MEASURED AT THE CENTERLINE OF CONSTRUCTION. THE SPACING OF STRAIGHT BARS AND L-BARS IN WALLS SHALL BE MEASURED BETWEEN THE VERTICAL LEGS OF BARS. AT THE BEGINNING AND ENDING OF ALL POURS, A CURTAIN OF REINFORCEMENT COMPOSED OF B, C, C2, D, F, G, AND H BARS SHALL BE PLACED THREE INCHES FROM THE TRANSVERSE CONSTRUCTION JOINT.
- D BARS MAY BE SPLICED 24 BAR DIAMETERS AT THE LOWER LONGITUDINAL CONSTRUCTION JOINT, AT CONTRACTOR'S OPTION.
- IN ALL SECTIONS LAP C WITH C2 BARS AND C1 WITH C3 BARS. THE VERTICAL LENGTH OF ALL C TYPE BARS HAS BEEN CALCULATED FOR A FOUR-INCH STARTER WALL. IF THE HEIGHT OF THE STARTER WALL IS VARIED, THE VERTICAL LENGTH OF THE C TYPE BARS SHALL BE VARIED CORRESPONDINGLY SO AS TO MAINTAIN A CLASS C LAP BETWEEN THE TWO BARS. THE LAPS SHALL BE BASED ON THE SMALLER BARS.
- CONCRETE QUANTITIES ARE BASED ON A SIX-BY-SIX INCH FILLET AND STEEL QUANTITIES DO NOT INCLUDE ANY OPTIONAL SPLICES.
- IF WALL THICKNESS IS SIX INCHES, PLACE REINFORCEMENT AT THE CENTERLINE OF THE WALL.

ADDITIONAL NOTES FOR SECTIONS TO BE JACKED IN PLACE

- CONCRETE SECTION THICKNESS' AND REINFORCING STEEL SHOWN IN THE DETAILS AND THE TABLE ARE BASED ON THE FINAL IN-PLACE DESIGN LOADS AND DO NOT INCLUDE ALLOWANCES FOR ANY ADDITIONAL FORCES DUE TO THE JACKING OPERATION. THE CONTRACTOR IS RESPONSIBLE FOR ADJUSTING THE CONCRETE THICKNESS' AND THE REINFORCING STEEL QUANTITIES REQUIRED TO PROVIDE FOR ADDITIONAL LOAD CAPACITIES DURING CONSTRUCTION. ALL MODIFICATIONS ARE SUBJECT TO THE REVIEW OF THE ENGINEER. THE CONTRACTOR SHALL SUBMIT ALL CALCULATIONS AND DRAWINGS PERTAINING TO THE PROPOSED MODIFICATIONS TO THE ENGINEER FOR ACCEPTANCE PRIOR TO ORDERING OR FABRICATING ANY MATERIALS.
- THE CONTRACTOR SHALL USE JACKING HEADS OR LOAD SPREADING BEAMS OF SUCH DESIGN AND SIZE TO SPREAD THE JACKING FORCE UNIFORMLY OVER THE ENTIRE INVERT SECTION.
- IF THE LOAD SPREADING DEVICE OR JACKING HEAD SELECTED DOES NOT PERMIT THE REQUIRED 20 BAR DIAMETER EXTENSION OF THE NORMAL LONGITUDINAL STEEL, CONTINUITY MAY BE MAINTAINED BY DOWELING FROM THE ADJACENT SECTION.
- THE LEADING EDGE OF THE CONDUIT SHALL BE EQUIPPED WITH A JACKING HEAD OR SHIELD SECURELY ANCHORED THERETO. THE LENGTH AND DETAILS OF THE JACKING HEAD SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
- THE USE OF GUIDE RAILS, SLABS, CRADLES, ETC. WILL BE SUBJECT TO THE WRITTEN APPROVAL OF THE ENGINEER.

BOX SECTION		1	2	3	4	5	6
Design Cover	W	4'-6"	7'-6"	8'-6"	4'-6"		
Width	H	6'-0"	6'-0"	6'-0"	8'-0"		
Height	T1	10 1/2"	10 1/2"	10 1/2"	10 1/2"		
Top Slab Thickness	T2	10"	10"	10"	10"		
Side Wall Thickness	T3	10"	10"	10"	10"		
Bottom Slab Thickness							
B	Bar No. & Spacing	7 @ 12"	7 @ 12"	7 @ 12"	6 @ 12"		
Bars	Length	7'-4"	7'-4"	7'-4"	9'-6"		
B1	Bar No. & Spacing	4 @ 12"	4 @ 12"	4 @ 12"	5 @ 12"		
Bars	Length	4'-4"	4'-6"	4'-4"	7'-4"		
C	Bar No. & Spacing	4 @ 14"	4 @ 14"	4 @ 14"	4 @ 12"		
Bars	Hor. Length	3'-4"	3'-4"	3'-0"	3'-10"		
	Vert. Length	6'-4"	6'-4"	6'-4"	5'-3"		
C1	Bar No. & Spacing	4 @ 14"	4 @ 14"	4 @ 14"	4 @ 14"		
Bars	Hor. Length	1'-6"	1'-4"	1'-4"	1'-6"		
	Vert. Length	1'-6"	1'-4"	1'-4"	2'-4"		
C2	Bar No. & Spacing	4 @ 14"	4 @ 14"	4 @ 14"	4 @ 14"		
Bars	Hor. Length	3'-4"	3'-4"	3'-4"	3'-10"		
	Vert. Length	2'-11"	2'-11"	2'-11"	3'-0"		
C3	Bar No. & Spacing	4 @ 14"	4 @ 14"	4 @ 14"	4 @ 14"		
Bars	Hor. Length	3'-4"	1'-6"	1'-6"	1'-6"		
	Vert. Length	2'-2"	2'-2"	2'-2"	1'-2"		
D	Bar No. & Spacing	4 @ 18"	4 @ 18"	4 @ 18"	4 @ 12"		
Bars	Length	7'-6"	7'-6"	7'-6"	6'-6"		
F	Bar No. & Spacing	6 @ 14"	7 @ 18"	6 @ 12"	5 @ 12"		
Bars	Length	7'-6"	7'-6"	7'-6"	9'-6"		
F1	Bar No. & Spacing	4 @ 14"	4 @ 18"	4 @ 12"	5 @ 12"		
Bars	Length	5'-1"	4'-2"	5'-0"	6'-2"		
G	Bar No. & Spacing	4 @ 18"	4 @ 18"	4 @ 18"	4 @ 14"		
Bars	Length	5'-0"	5'-0"	5'-0"	4'-0"		
H	Bar No. & Spacing	4 @ 14"	4 @ 14"	4 @ 14"	4 @ 14"		
Bars	Length	3'-0"	3'-0"	3'-0"	3'-0"		
NUMBER OF LONGITUDINAL REINFORCEMENT # 5 BARS (EXCEPT AS NOTED)							
Top Slab (includes distribution reinforcement)		12	12	12	15		
Bottom Slab		12	12	12	15		
Side Walls		20	20	20	16		
TOTAL		44	44	44	46		
QUANTITIES							
Concrete Cu. Yds./Lin. Ft.		.87	.87	.86	.93		
Steel Lbs./Lin. Ft.		112.33	109.13	109.43	103.90		

DIMENSION AND REINFORCEMENT SCHEDULE

STRUCTURAL DESIGN CRITERIA

- L.A.C.F.C.D. STRUCTURAL DESIGN MANUAL DATED APRIL 1982
- AREMA MANUAL FOR RAILWAY ENGINEERING
- CALTRANS BRIDGE DESIGN SPECIFICATIONS, LATEST EDITION

LIVE LOAD

E - 80 RAILROAD UNLESS OTHERWISE NOTED
BOX SECTION 4 = HS20-44

DEAD LOAD

EARTH LOAD PER MARSTON'S FORMULA: w=120 PCF
Ku=Ku'=0.150
Bd=OUTSIDE WIDTH OF BOX PLUS 3 FEET
INTERNAL WATER PRESSURE: 62.4 PSF PER FOOT OF DEPTH
WEIGHT OF CONCRETE: 150 PCF

ALLOWABLE STRESSES

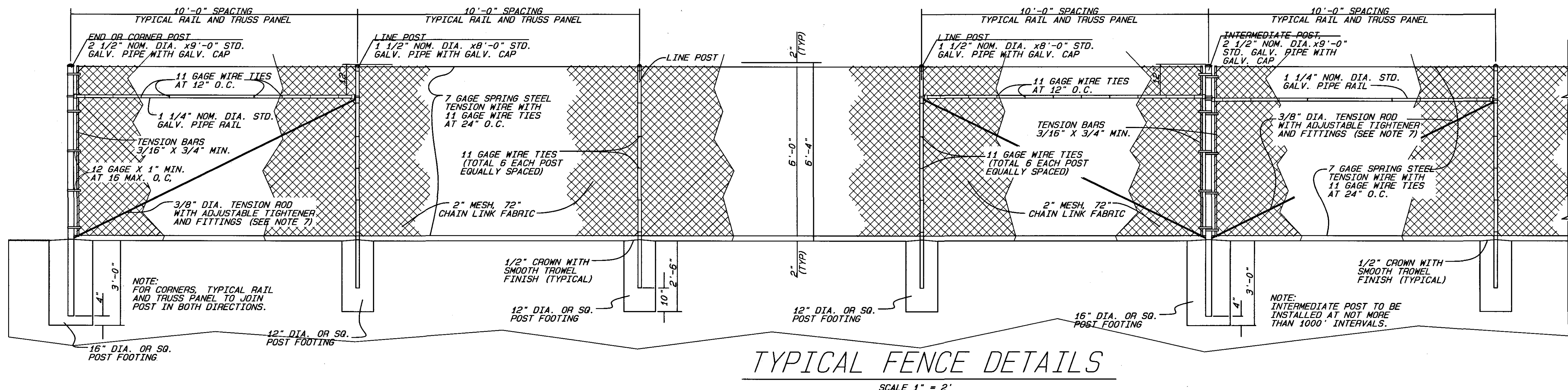
SHEAR AND BOND STRESSES PER A.C.I. 318-63
f'c=4300 PSI AT 28 DAYS
fc=1720 PSI
fs=24,000 PSI
n=8
fv=92 PSI

SEAL

P&D Consultants, Inc.
999 Town & Country, Fourth Floor
Orange, CA 92868 (714) 835-4447

SIGNATURE: _____ DATE: _____

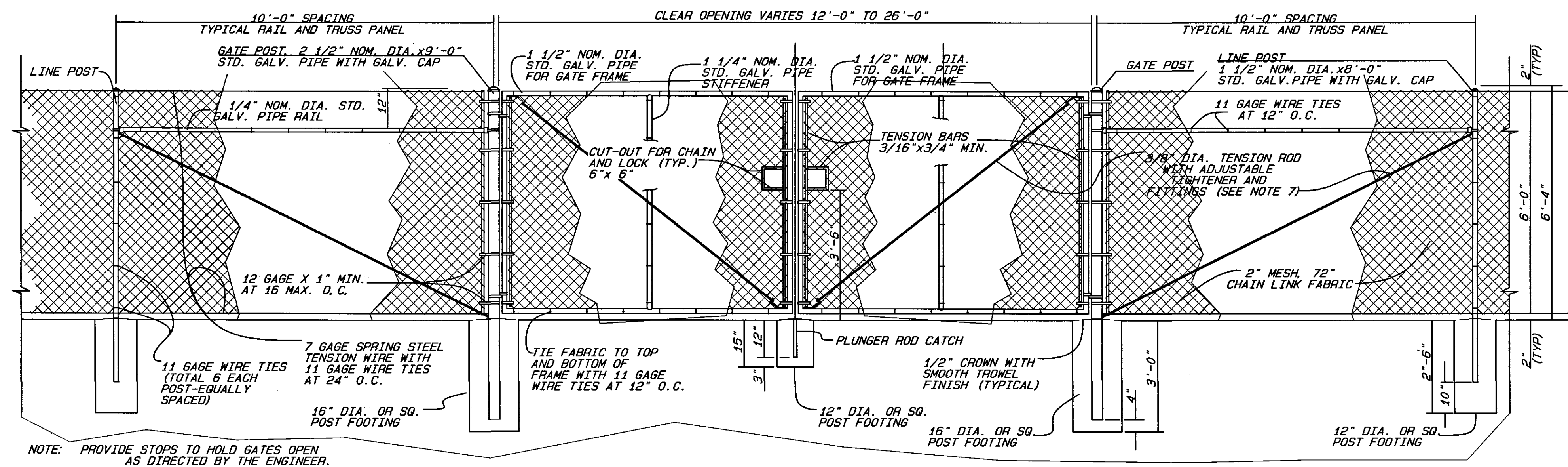
REVISIONS				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
MARK	DATE	DESCRIPTION	BY	SAN ANTONIO CREEK SYSTEM			
				RC SINGLE BOX CONDUIT SECTION, SCHEDULE, NOTES AND DETAILS			
PROJECT ENGR.	TJC	DRAWN BY:	DESIGNED BY:				
SUBMITTED BY:	4/6/04	James Brunk	RO				
RECOMMENDED BY:	4/6/04	David Chen	ASST. FLOOD CONTROL ENGINEER	DATE	SCALE	FILE NO.	DRWG. NO.
APPROVED BY:	4/6/04	Richard J. Mead	FLOOD CONTROL ENGINEER	3/01/04	NTS	1-112-	5 of 15



TYPICAL FENCE DETAILS
SCALE 1" = 2'

PIPE MATERIAL LIST

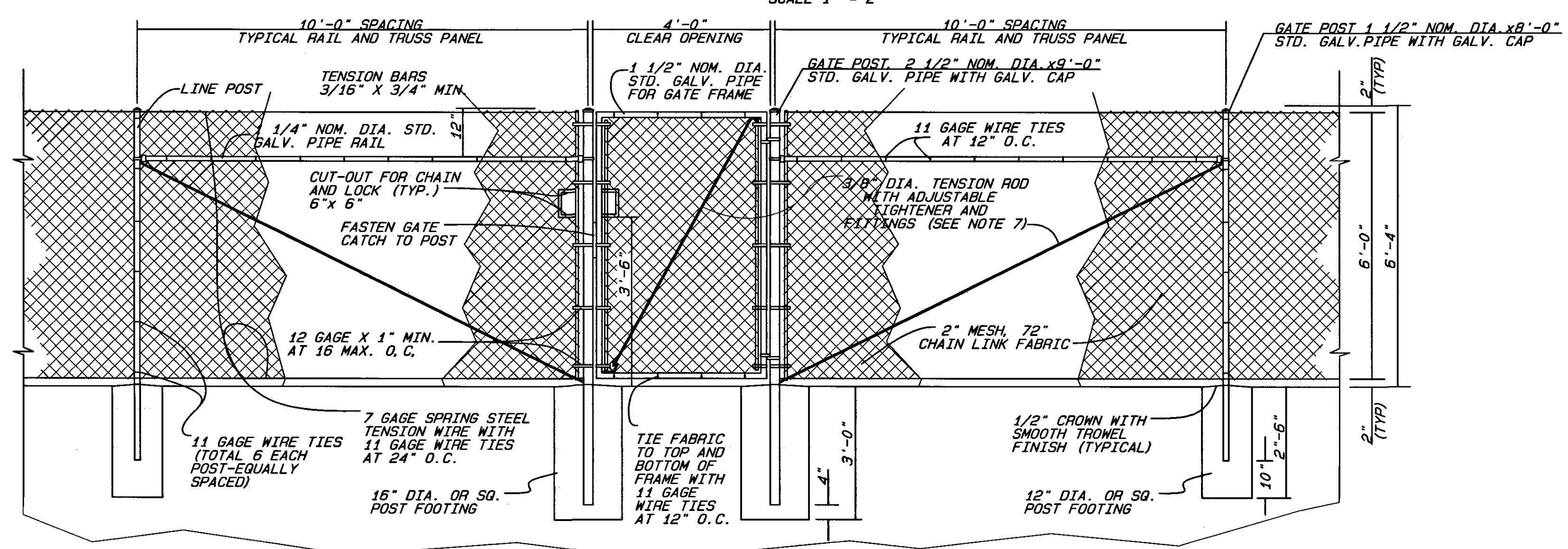
Nominal Diameter (Inches)	Outside Diameter (Inches)	Inside Diameter (Inches)	Weight per Foot Lbs.
1 1/4	1.660	1.380	2.270
1 1/2	1.900	1.610	2.720
2	2.375	2.067	3.650
2 1/2	2.875	2.469	5.790
3	3.500	3.068	7.580
3 1/2	4.000	3.548	9.110
4	4.500	4.026	10.790
6	6.625	6.065	18.970
8	8.625	7.981	28.55



DOUBLE DRIVE GATE DETAILS
SCALE 1" = 2'

GENERAL NOTES

- ALL CHAIN LINK FENCE MATERIALS, FITTINGS AND INSTALLATION SHALL CONFORM TO THE LATEST EDITION OF THE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, SECTION 80, "FENCES" AND THIS SPECIAL DRAWING.
- THE FENCE FABRIC SHALL BE PLACED ON THE OUTWARD FACING SIDE OF THE POSTS, STRECHED TAUT, AND SECURELY FASTENED, UNLESS OTHERWISE SHOWN ON THE PLANS.
- CLEARANCE BETWEEN RIGHT-OF-WAY AND FENCE FABRIC SHALL BE 6" UNLESS OTHERWISE SHOWN ON THE PLANS.
- ALL GATES SHALL OPEN INWARD, EXCEPT IF OTHERWISE NOTED IN THE SPECIAL PROVISIONS.
- ALL CHAIN LINK FENCE MATERIALS, FITTINGS AND INSTALLATION SHALL CONFORM TO THE LATEST EDITION OF THE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, SECTION 80, "FENCES" AND THIS SPECIAL DRAWING.
- SECURE GALVANIZED CAP TO POST WITH 1/4" GALVANIZED ROUND HEAD RIVET, OR TACK WELD.
- ADJUSTABLE TIGHTENER SHALL BE TURNBUCKLE OR EQUIVALENT, HAVING A 6" MINIMUM TAKEUP.
- DIAMETER SIZE OF LINE, INTERMEDIATE, CORNER, END AND GATE POSTS TO BE AS SHOWN ON THIS SPECIAL DRAWING.
- ALL BOLTED HARDWARE ITEMS SHALL ALSO BE TACK WELDED IN SUCH A MANNER AS TO PREVENT REMOVAL BY UNAUTHORIZED INDIVIDUALS.
- ALL FENCE FABRIC SHALL HAVE A 12" WIDE HORIZONTALLY PAINTED STRIPE ALONG THE CENTER OF THE FABRIC. THE PAINT SHALL BE A REFLECTIVE TYPE ORANGE OR APPROVED EQUAL. AFTER FENCE FABRIC HAS BEEN PAINTED, A SAMPLE OF SAID PAINT SHALL BE GIVEN TO THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT, OPERATIONS DIVISION, ALONG WITH MANUFACTURER'S NAME AND PAINT SPECIFICATIONS.
- THE FENCE FABRIC SHALL BE 9-GAGE UNLESS OTHERWISE SPECIFIED.



WALK GATE DETAILS
SCALE 1" = 2'

		REVISIONS MARK DATE DESCRIPTION BY:		SUBMITTED BY: <i>James E. Brant</i> 4/1/04 CHIEF ENGINEERING DIVISION	SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT SAN ANTONIO CREEK SYSTEM	DATE
		RECOMMENDED BY: <i>James E. Brant</i> 4/5/04 ASSET FLOOD CONTROL ENGINEER	APPROVED BY: <i>Patricia M. Mead</i> 4/6/04 FLOOD CONTROL ENGINEER	BOUNDARY FENCING SPEC. DRWG. I 6" CHAIN LINK FENCE (TYPE CL-6 = 72" FABRIC)	DATE F.B. REF. FILE NO. DRWG. NO. 6 of 15	

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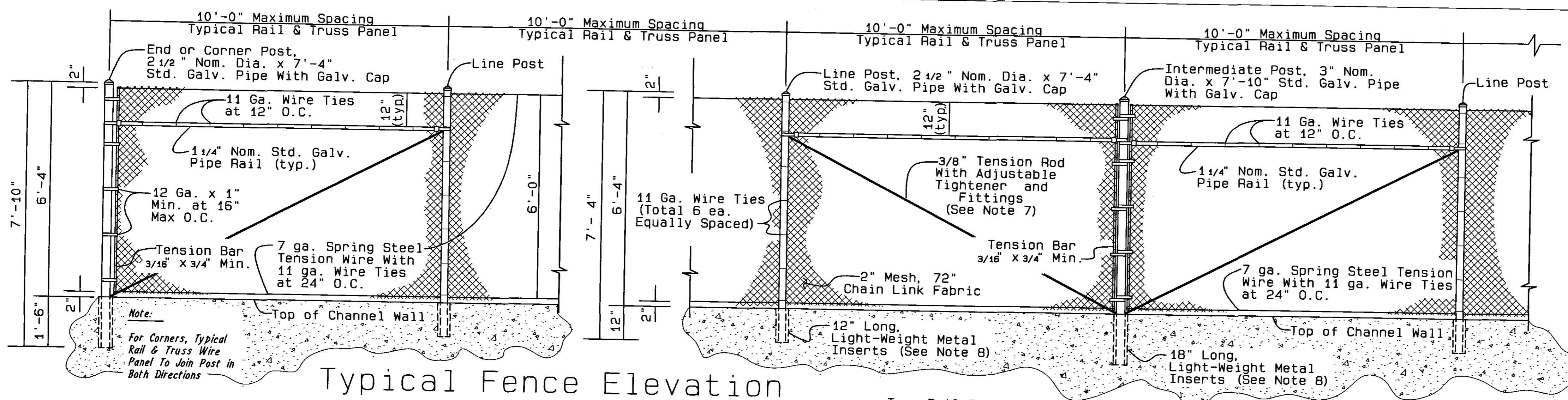
SCALE: 1" = 2'

PIPE MATERIAL LIST

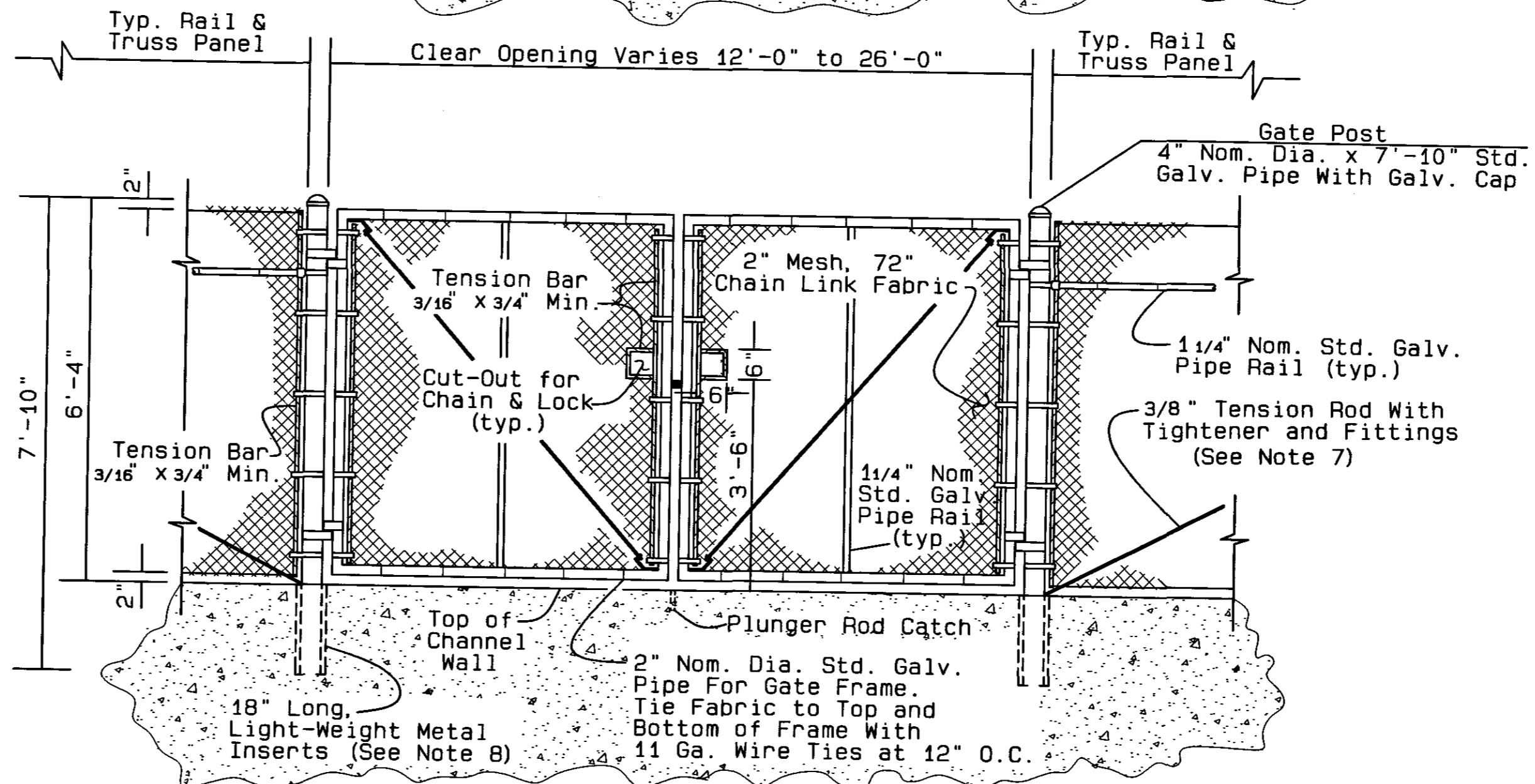
Nominal Diameter (Inches)	Outside Diameter (Inches)	Inside Diameter (Inches)	Weight per Foot Lbs.
1 1/4	1.660	1.380	2.270
1 1/2	1.900	1.610	2.720
2	2.375	2.067	3.650
2 1/2	2.875	2.469	5.790
3	3.500	3.068	7.580
3 1/2	4.000	3.548	9.110
4	4.500	4.026	10.790
6	6.625	6.065	18.970
8	8.625	7.981	28.55

GENERAL NOTES

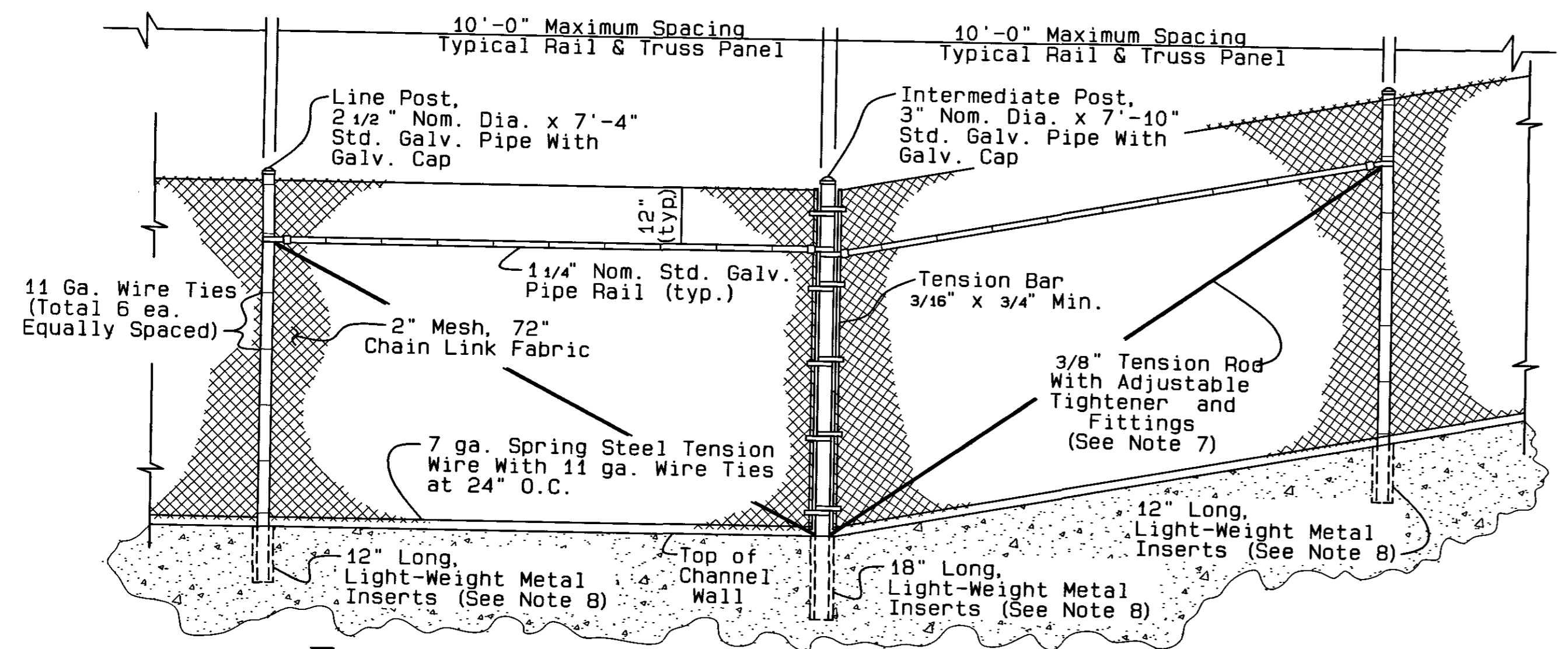
- ALL CHAIN LINK FENCE MATERIALS, FITTINGS AND INSTALLATION SHALL CONFORM TO THE LATEST EDITION OF THE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, SECTION 80, "FENCES" AND THIS SPECIAL DRAWING.
- THE FENCE FABRIC SHALL BE PLACED ON THE OUTWARD FACING SIDE OF THE POSTS, STRETCHED TAUT, AND SECURELY FASTENED, UNLESS OTHERWISE SHOWN ON THE PLANS.
- THE FENCE FABRIC SHALL BE 9 GAUGE UNLESS OTHERWISE SPECIFIED.
- ALL GATES SHALL OPEN INWARD, EXCEPT IF OTHERWISE NOTED IN THE SPECIAL PROVISIONS.
- ALL GATE HINGES SHALL BE HEAVY DUTY MALLEABLE IRON OR STEEL, INDUSTRIAL SERVICE TYPE 270 DEGREE SWING, NON-REMOVABLE, OF APPROVED QUALITY AND DESIGN, AND SHALL BE FASTENED FROM THE INSIDE.
- SECURE GALVANIZED CAP TO POST WITH 1/4" GALVANIZED ROUNDED HEAD RIVET, OR TACK WELD.
- ADJUSTABLE TIGHTENER SHALL BE TURNBUCKLE OR EQUIVALENT, HAVING A 6" MINIMUM TAKEUP.
- LIGHT-WEIGHT METAL INSERTS SHALL BE SHEET METAL TUBES WITH I.D. 3/4" GREATER THAN O.D. OF PIPE USED. POSTS ARE TO BE GROUTED INTO INSERTS USING NEAT GROUT OF 1 PART OF CEMENT AND 2 PARTS OF WATER.
- ALL BOLTED HARDWARE ITEMS SHALL ALSO BE TACK WELDED IN SUCH A MANNER AS TO PREVENT REMOVAL BY UNAUTHORIZED INDIVIDUALS.
- ALL FENCE FABRIC SHALL HAVE A 12" WIDE HORIZONTALLY PAINTED STRIPE ALONG THE CENTER OF THE FABRIC. THE PAINT SHALL BE A REFLECTIVE TYPE ORANGE OR APPROVED EQUAL. AFTER FENCE FABRIC HAS BEEN PAINTED, A SAMPLE OF SAID PAINT SHALL BE GIVEN TO THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT, OPERATIONS DIVISION, ALONG WITH MANUFACTURER'S NAME AND PAINT SPECIFICATIONS.
- FOR WALL THICKNESSES 12" OR GREATER, USE POST SIZES AS SHOWN. FOR WALL THICKNESS LESS THAN 12", USE POST SIZES AS FOLLOWS:
 END, CORNER, INTERMEDIATE, HEADWALL, PARAPET & WALK GATE POSTS - 2 1/2" NOM. DIA.
 LINE POSTS - 2" NOM. DIA.
 DOUBLE DRIVE GATE POSTS - 3" NOM. DIA.



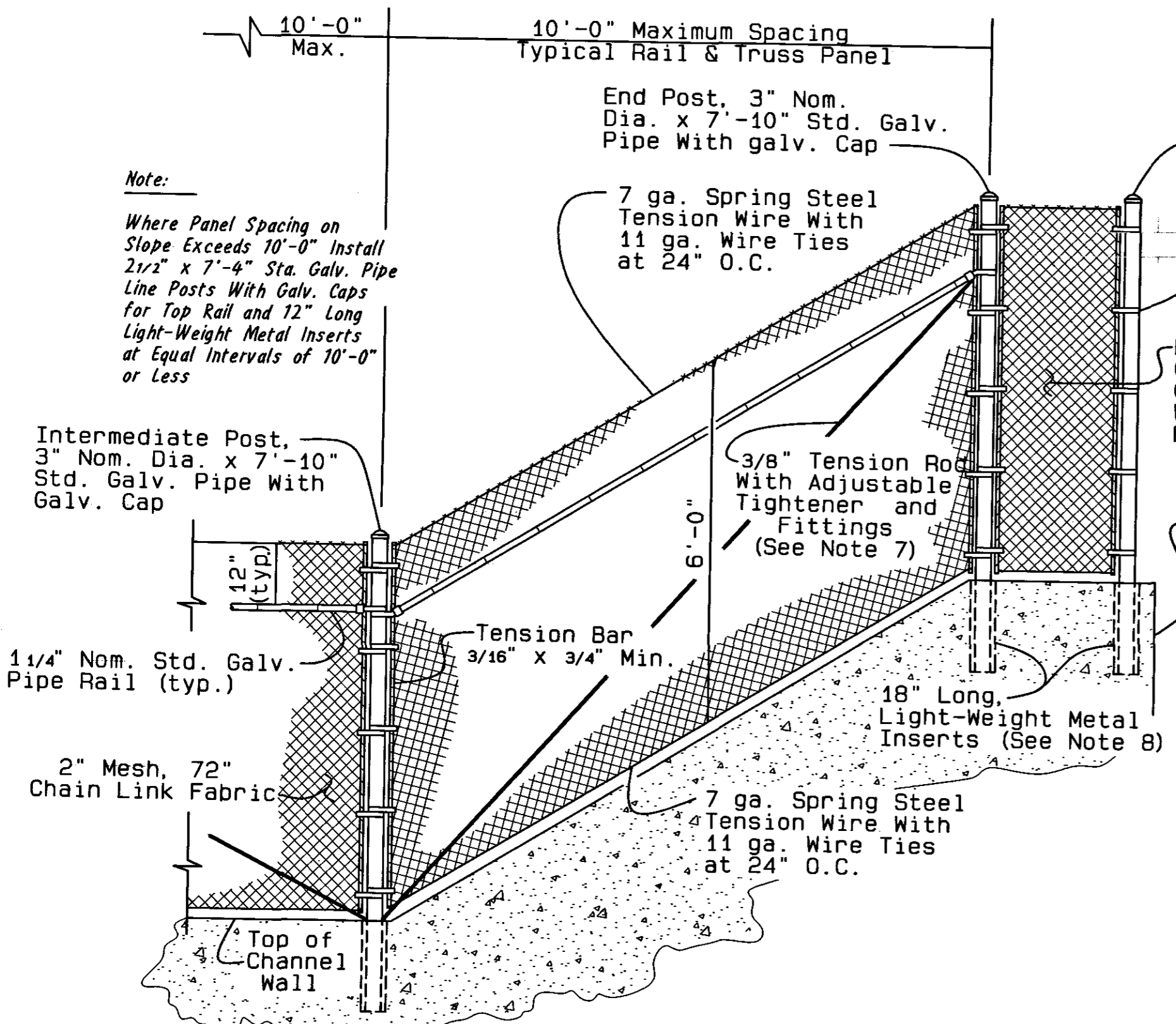
Typical Fence Elevation



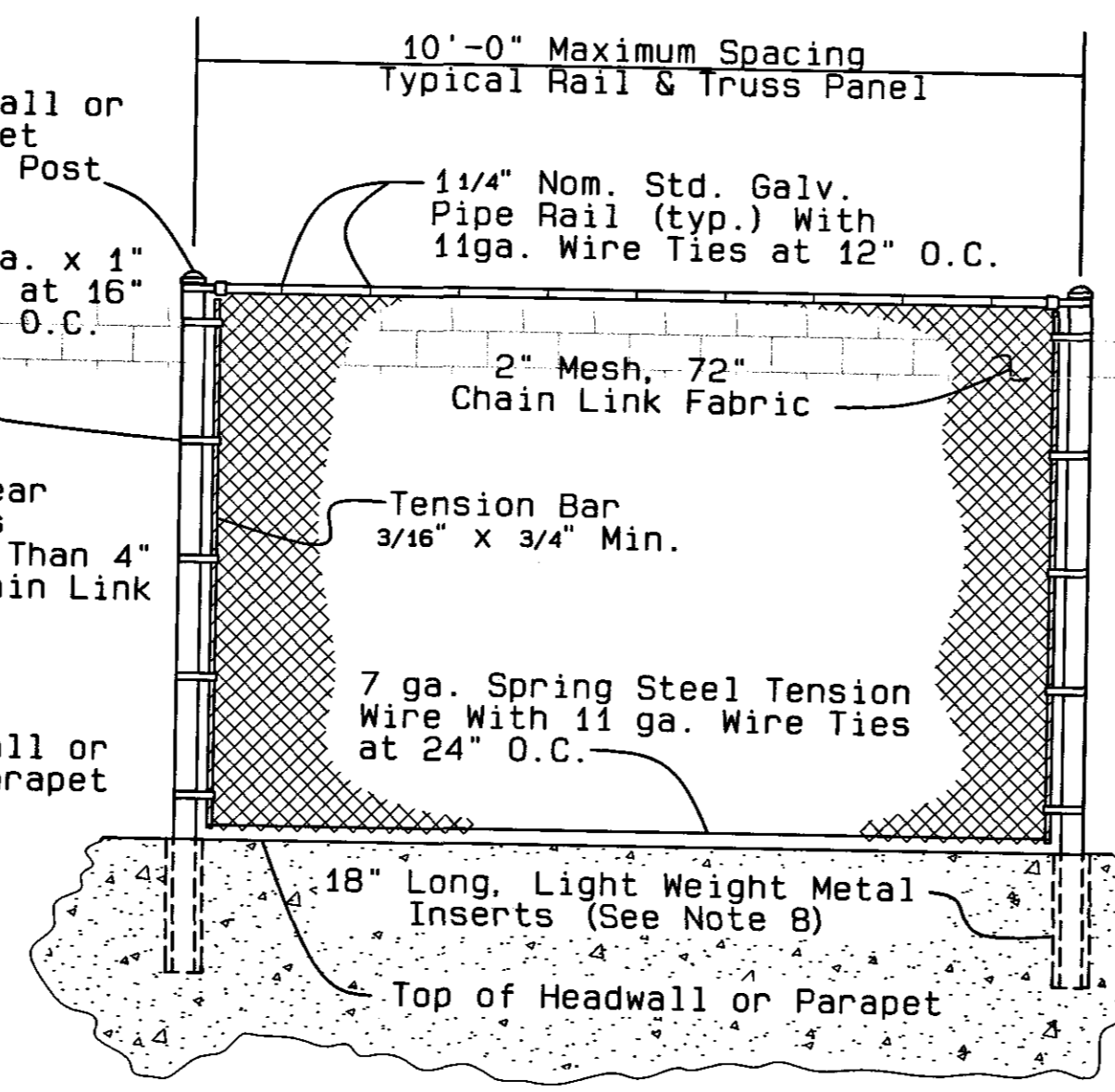
Typical Double Drive Gate



Typical Fence Elevation on Slope

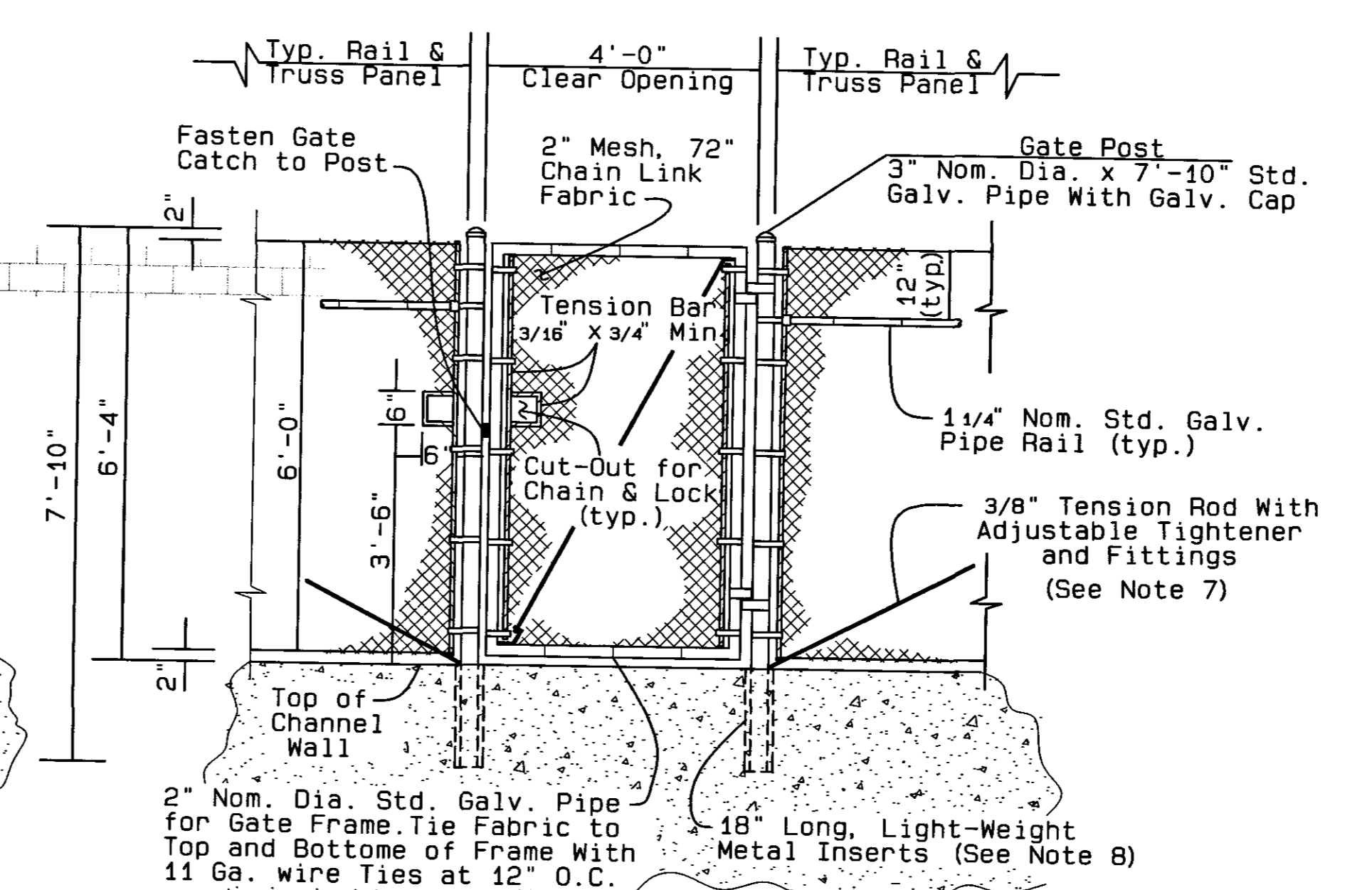


Typical Fence Elevation at Headwall (Includes RCB Parapets)

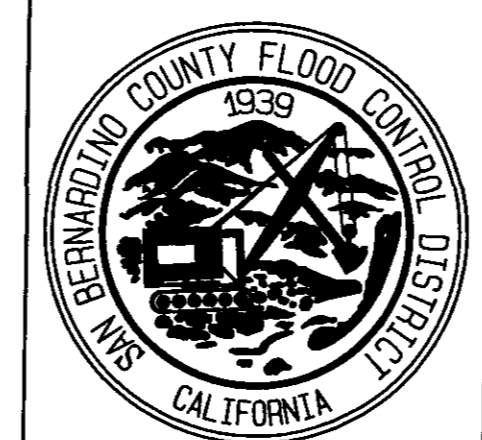
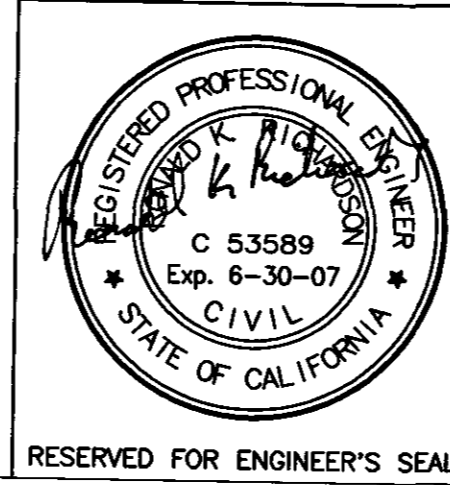


Typical Head Wall Fence Elevation (Includes RCB Parapets)

Note: Where Spacing Exceeds 10'-0" Install 2 1/2" x 7'-4" Sta. Galv. Pipe Line Posts With Galv. Eye Type Caps for Top Rail and 12" Long Light Weight Metal Inserts at Equal Intervals of 10'-0" or Less



Typical Walk Gate



REVISIONS	
MARK	DATE

SUBMITTED BY:	<i>Jamie Brunck</i>	4/1/04
RECOMMENDED BY:	<i>Vanessa Allen</i>	4/15/04
APPROVED BY:	<i>Patrick Mead</i>	4/16/04
PROJ. ENG.	DES. BY:	REV. BY:
	A.H.	M.J.R.

SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT

CHANNEL WALL FENCING SPEC. DRWG. II

6" CHAIN LINK FENCE (TYPE CL-6 = 72" FABRIC)

DATE: 8/04/99

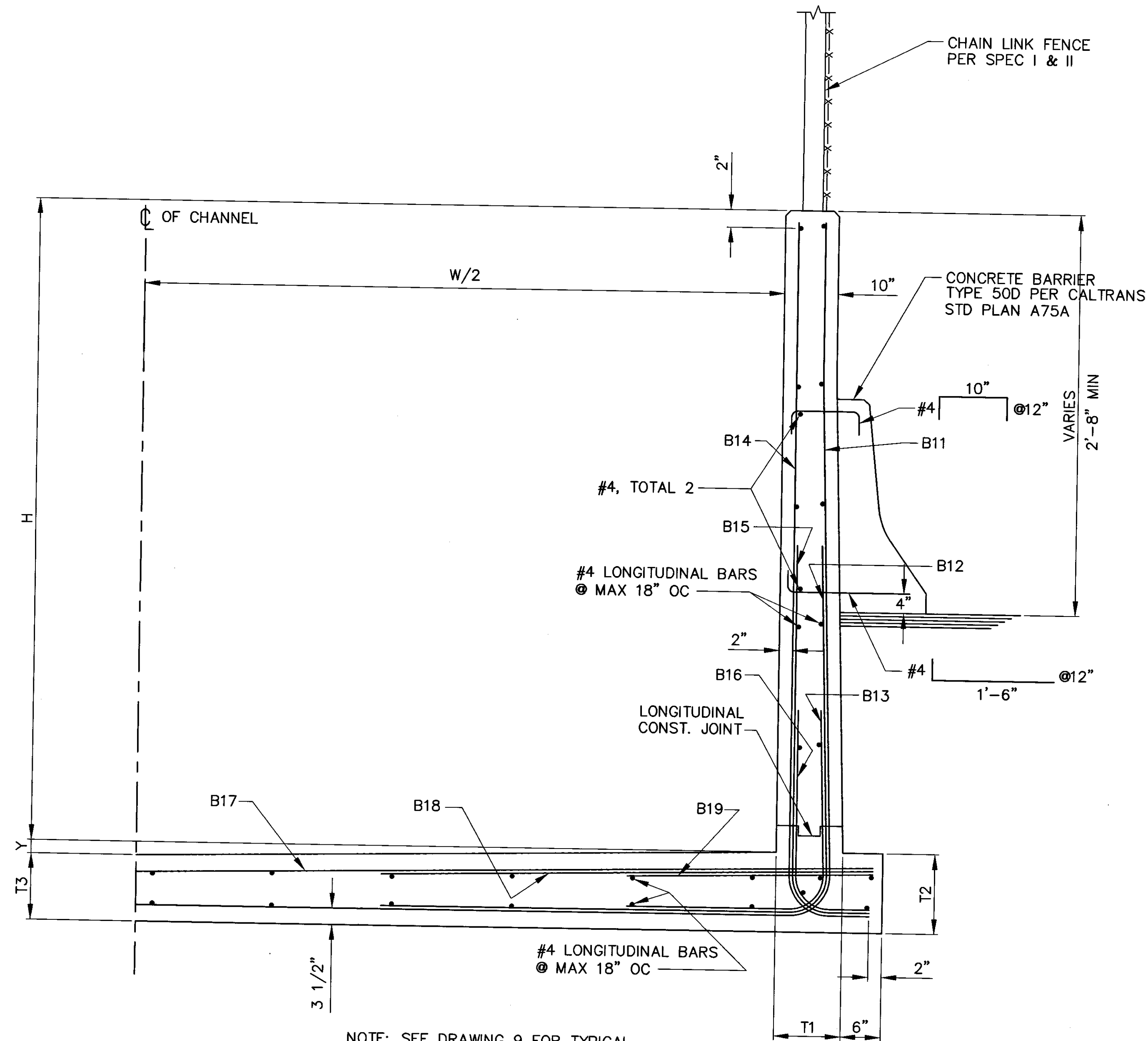
F.B. REF.

FILE NO.

DRWG. NO: 7 of 15

REINFORCED CONCRETE RECTANGULAR CHANNEL SCHEDULE (SOUTHERLY SIDE)

SECTION	SECTION DATA							TRANSVERSE REINFORCEMENT STEEL																			LONG REINF			QUANTITIES					
	SIZE (FT)		THICK (IN)			Y (IN)	B11			B12			B13			B14			B15			B16			B17		B18		B19		WALL	SLAB	TOTAL	CONC CY/LF	REINF STEEL LBS/LF
	W/2	H	T1	T2	T3		BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	LENGTH	BAR NO & SPA	LENGTH	BAR NO & SPA	LENGTH					
S1	10'-6"	12'-0"	10'	10"	8"	0"	7@12"	PER SECT.	5'-6"	6@12"	7'-0"	7'-6"	5@12"	5'-0"	12'-6"	5@12"	PER SECT.	PER SECT.	6@12"	6'-6"	PER SECT.	N/A	N/A	N/A	5@12"	13'-0"	6@12"	7'-6"	N/A	N/A	14	18	32	0.70	126
S2	8'-0"	10'-0"	10"	10"	8"	0"	7@12"	PER SECT.	4'-0"	6@12"	6'-6"	6'-0"	5@12"	5'-0"	10'-3"	5@12"	PER SECT.	PER SECT.	5@12"	6'-6"	PER SECT.	N/A	N/A	N/A	5@12"	10'-9"	6@12"	6'-0"	N/A	N/A	12	12	24	0.57	113
S3	8'-0"	12'-0"	10"	10"	8"	0"	7@12"	PER SECT.	4'-0"	6@12"	7'-0"	5'-0"	5@12"	5'-0"	8'-9"	5@12"	PER SECT.	PER SECT.	6@12"	7'-0"	PER SECT.	N/A	N/A	N/A	5@15"	9'-0"	6@12"	4'-6"	N/A	N/A	14	12	26	0.63	119
S4	7'-0"	12'-0"	10"	10"	8"	0"	7@12"	PER SECT.	3'-6"	6@12"	7'-0"	5'-0"	5@12"	5'-0"	9'-0"	5@12"	PER SECT.	PER SECT.	6@12"	7'-0"	PER SECT.	N/A	N/A	N/A	5@12"	9'-6"	6@12"	5'-0"	N/A	N/A	14	12	26	0.61	117



NOTE: SEE DRAWING 9 FOR TYPICAL CHANNEL SECTION FOR NORTHERLY SIDE

TYPICAL CHANNEL SECTION SOUTHERLY SIDE
NOT TO SCALE

STRUCTURAL NOTES

- 1 DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO OUTSIDE FACE OF BAR AND SHALL BE TWO INCHES UNLESS OTHERWISE SHOWN.
- 2 CONCRETE DIMENSIONS SHALL BE MEASURED HORIZONTALLY OR VERTICALLY ON THE PROFILE, AND PARALLEL TO OR AT RIGHT ANGLES (OR RADIALY) TO CENTERLINE OF CHANNEL ON THE PLAN EXCEPT AS OTHERWISE SHOWN.
- 3 ALL BAR BENDS AND HOOKS SHALL CONFORM TO THE AMERICAN CONCRETE INSTITUTE'S "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION.
- 4 PLACING OF REINFORCEMENT SHALL CONFORM TO THE AMERICAN CONCRETE INSTITUTE'S "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION.
- 5 TRANSVERSE EXPANSION JOINTS SHALL NOT BE PLACED WITHIN 30 INCHES OF INLETS.
- 6 TRANSVERSE EXPANSION JOINTS IN WALLS AND SLABS SHALL BE IN THE SAME PLANE. NO STAGGERING OF JOINTS WILL BE PERMITTED. TRANSVERSE CONSTRUCTION JOINTS SHALL BE NORMAL OR RADIAL TO THE CENTERLINE OF CONSTRUCTION.
- 7 THE TRANSVERSE REINFORCING STEEL SHALL TERMINATE ONE AND ONE-HALF INCHES FROM THE CONCRETE SURFACES UNLESS OTHERWISE SHOWN ON THE STRUCTURAL DETAILS.
- 8 EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE ROUNDED OR BEVELED.
- 9 NO SPLICES IN TRANSVERSE STEEL REINFORCEMENT WILL BE PERMITTED OTHER THAN SHOWN ON THE DRAWING WITHOUT APPROVAL OF THE ENGINEER. NO MORE THAN TWO SPLICES WILL BE PERMITTED IN ANY LONGITUDINAL BAR BETWEEN TRANSVERSE JOINTS. SPLICES WILL BE STAGGERED. SPLICING SHALL BE IN ACCORDANCE WITH THE LATEST ACI CODE REQUIREMENTS.
- 10 LONGITUDINAL STEEL SHALL TERMINATE TWO INCHES FROM TRANSVERSE EXPANSION JOINTS.
- 11 TRANSVERSE JOINTS SHALL BE SPACED NOT TO EXCEED 50 FEET NOR BE LESS THAN 10 FEET, MEASURED ALONG THE CENTERLINE OF CONSTRUCTION, EXCEPT AS OTHERWISE SHOWN ON THE DRAWINGS.
- 12 TRANSVERSE JOINTS SHALL BE PLACED AT THE JUNCTION OF RECTANGULAR OPEN CHANNEL SECTIONS WITH CLOSED CONDUIT SECTIONS.
- 13 ALL RECTANGULAR OPEN CHANNEL WALLS SHALL BE FENCED IN ACCORDANCE WITH SPEC I & II, EXCEPT AS OTHERWISE SHOWN ON THE DRAWINGS.
- 14 UNLESS OTHERWISE SHOWN ON THE DRAWINGS, IN CURVED SECTIONS, THE MAXIMUM SPACING OF BARS SHALL NOT EXCEED THAT SHOWN ON THE TYPICAL SECTIONS. STEEL SHALL BE PLACED RADIALY FROM THE MAXIMUM SPACING.
- 15 AT THE BEGINNING AND ENDING OF ALL POURS, A COMPLETE CURTAIN OF REINFORCEMENT COMPOSED OF B1, B4, B7, B11, B14 AND B17 BARS SHALL BE PLACED THREE INCHES FROM THE TRANSVERSE EXPANSION JOINT.
- 16 WHERE CHANNELS VARY IN HEIGHT OR WIDTH BETWEEN SECTIONS SHOWN IN SCHEDULE VARY THE CONCRETE THICKNESS UNIFORMLY BETWEEN THE TWO ADJOINING SECTIONS. REINFORCING SHALL BE THAT FROM WHICHEVER ADJOINING SECTION PROVIDES THE GREATER STEEL AREA. VARY THE LENGTH OF BARS B1, B4, B7, B11, B14 AND B17 UNIFORMLY ALONG THE TRANSITION. EXCEPT AS OTHERWISE SHOWN ON THE DRAWINGS THE CHANNEL WIDTH AND/OR HEIGHT MAY EXCEED THE SCHEDULED WIDTH/HEIGHT BY SIX INCHES MAXIMUM BEFORE CHANGING TO THE NEXT HIGHEST WIDTH/HEIGHT IN THE SCHEDULE.
- 17 FOR WEEPHOLE LOCATIONS AND DETAIL. SEE DRAWING 9.

STRUCTURAL DESIGN CRITERIA

L.A.C.F.C.D. STRUCTURAL DESIGN MANUAL DATED APRIL 1982

LIVE LOAD

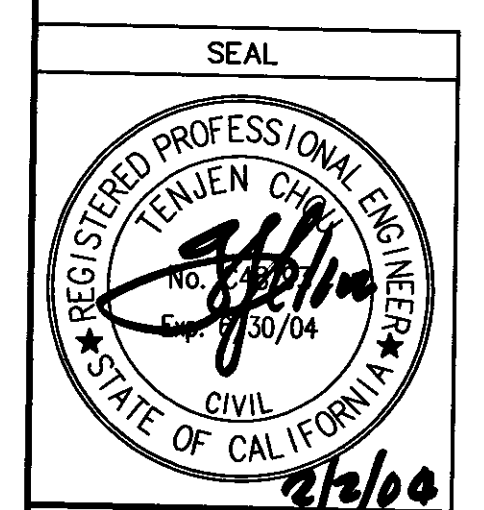
HS20-44 UNLESS NOTED OTHERWISE

DEAD LOAD

DRY BACK FILL = 40 PCF EQUIVALENT FLUID PRESSURE
FLOODED BACK FILL = 62.5 PCF EQUIVALENT FLUID PRESSURE
INTERNAL WATER = 40 PCF NET EQUIVALENT FLUID PRESSURE

ALLOWABLE STRESSES

FC' = 4300 PSI
FC = 1720 PSI
FS = 24000 PSI
N = 8
SHEAR AND BOND STRESSES PER ACI 318-99
FOUNDATION MODULES, K = 165 PCI

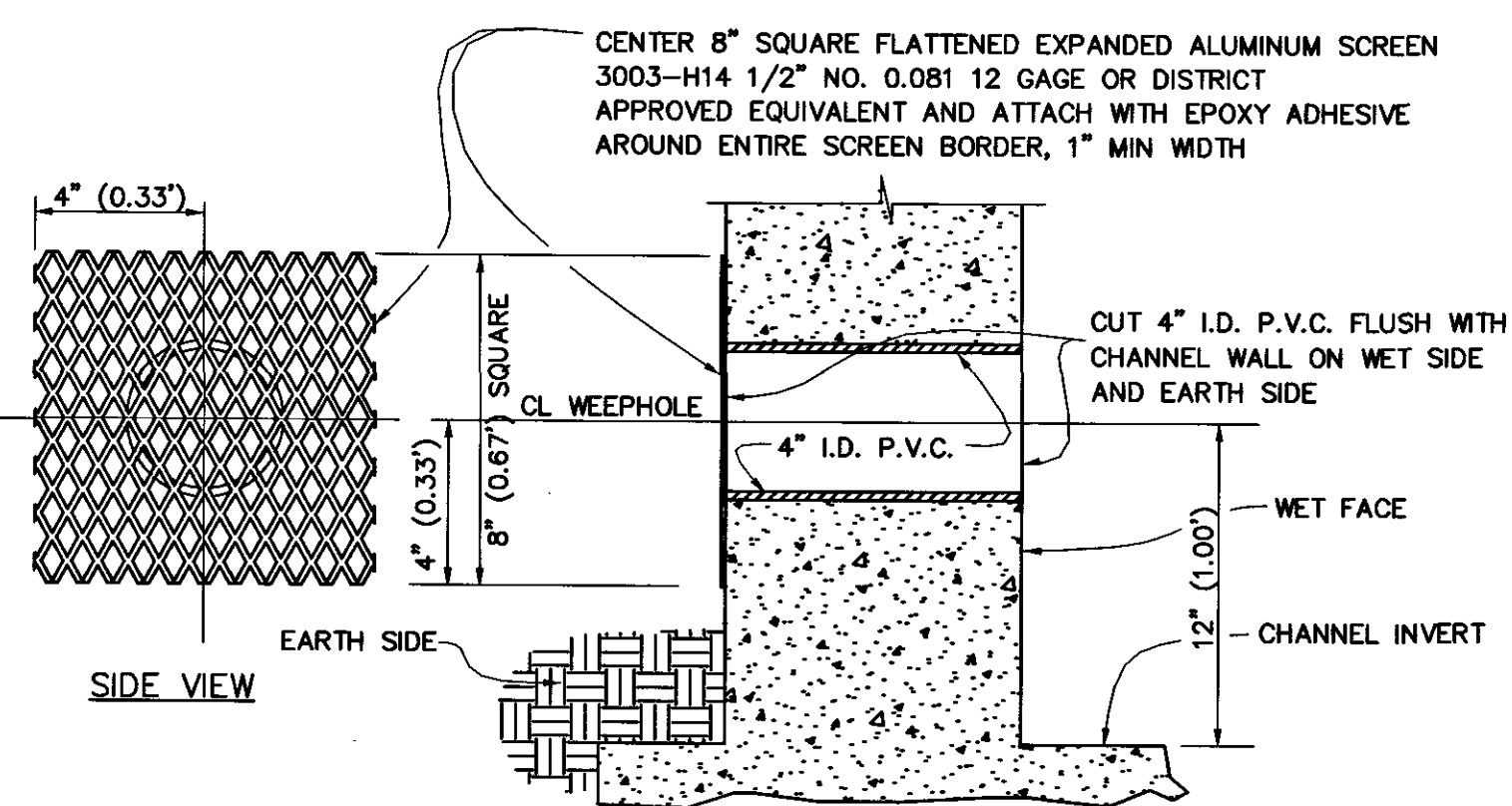
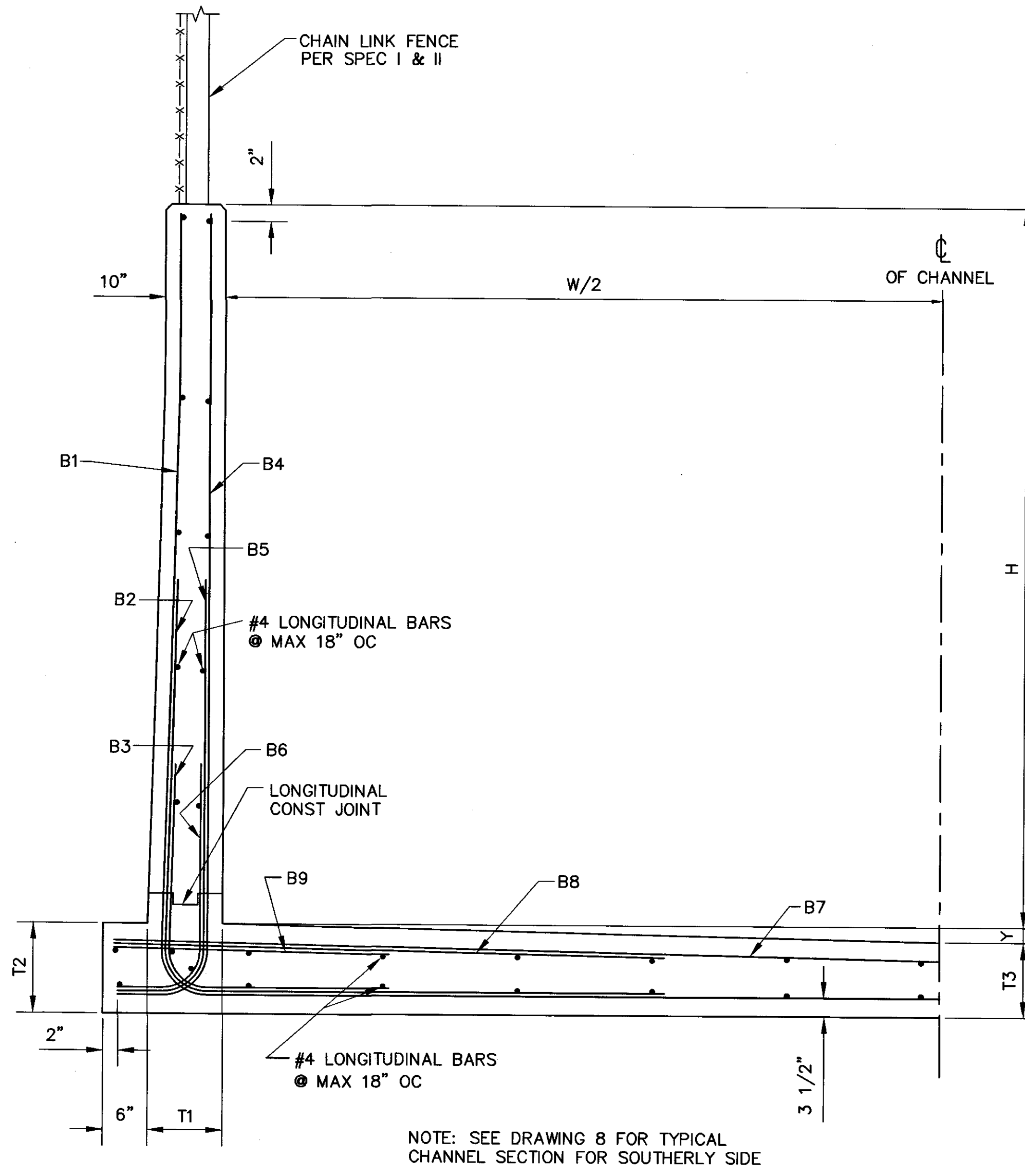


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999 Town & Country, Fourth Floor
Orange, CA 92668 (714) 835-4447

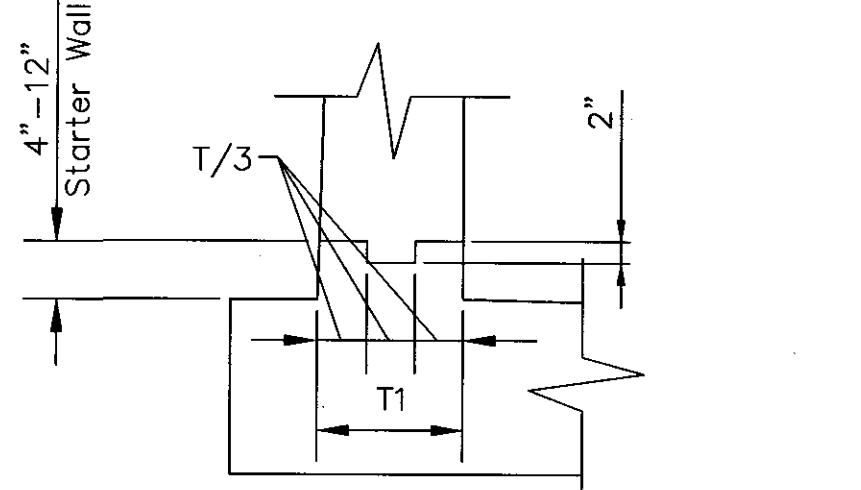
REVISIONS				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
MARK	DATE	DESCRIPTION	BY	SAN ANTONIO CREEK SYSTEM			
				REINFORCED CONCRETE RECTANGULAR CHANNEL SECTION AND SCHEDULE (SOUTHERLY SIDE)			
PROJECT ENGR.	TJC	DRAWN BY:	DD	DESIGNED BY:	RO		
SUBMITTED BY:	4/6/04	James Boruck					
RECOMMENDED BY:	4/5/04	David Allen					
APPROVED BY:	4/6/04	Flood Control Engineer		DATE	3/01/04	SCALE	N.T.S.
FILE NO.	1-112-	DRWG. NO.	8 of 15				

REINFORCED CONCRETE RECTANGULAR CHANNEL SCHEDULE (NORTHERLY SIDE)

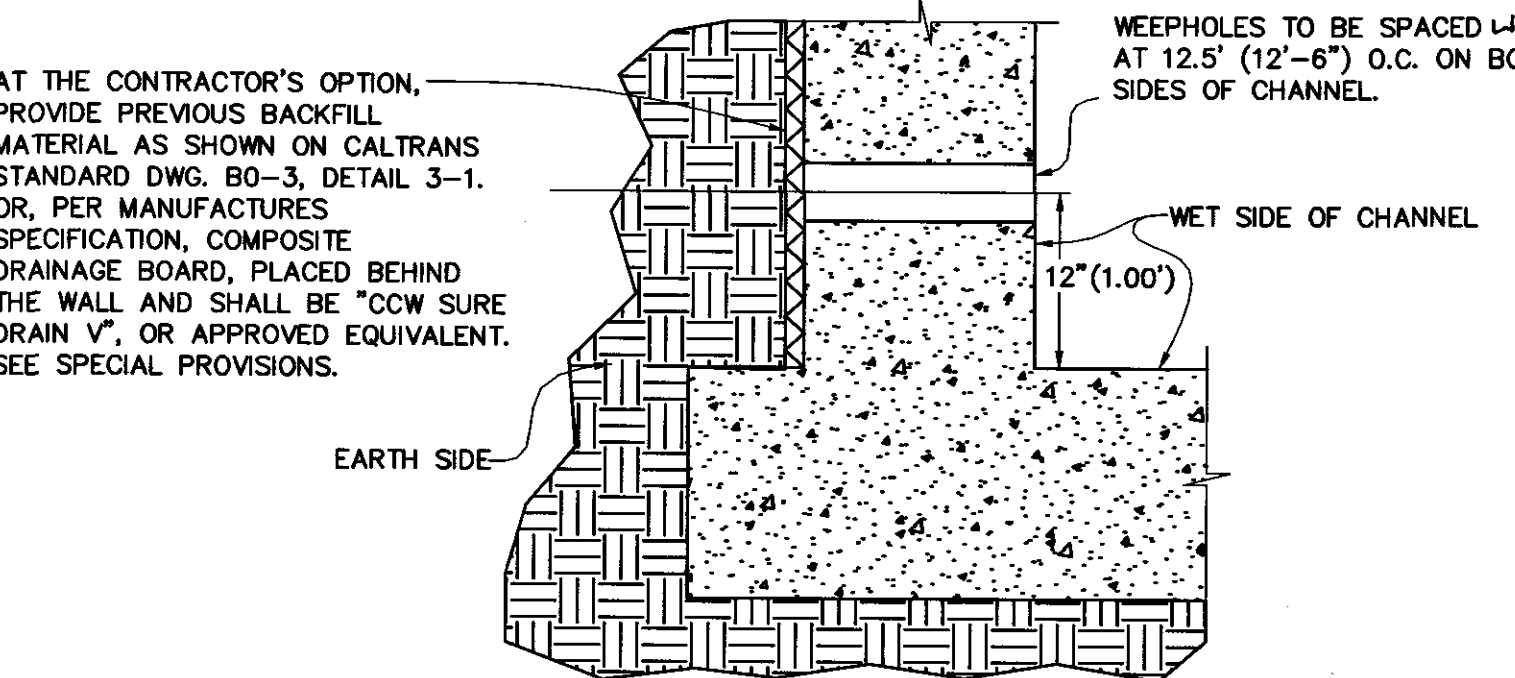
SECTION	SECTION DATA							TRANSVERSE REINFORCEMENT STEEL																		LONG REINF			QUANTITIES								
	SIZE (FT)		THICK (IN)			Y (IN)	B1		B2			B3			B4			B5			B6			B7			B8			B9			NO. OF #4 BARS			CONC CY/LF	REINF STEEL LBS/LF
	W/2	H	T1	T2	T3		BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	VERT LENGTH	HORIZ LENGTH	BAR NO & SPA	LENGTH	BAR NO & SPA	LENGTH	BAR NO & SPA	LENGTH	WALL	SLAB	TOTAL				
N1	12'-10"	12'-0"	10"	10"	8"	0"	7@12"	PER SECT.	7'-0"	6@12"	7'-0"	9'-0"	5@12"	5'-0"	14'-6"	5@12"	PER SECT.	PER SECT.	6@12"	7'-0"	PER SECT.	N/A	N/A	N/A	5@12"	14'-3"	6@12"	9'-0"	N/A	N/A	14	20	34	0.77	140		
N2	10'-6"	12'-0"	10"	10"	8"	0"	7@12"	PER SECT.	5'-6"	6@12"	7'-0"	7'-6"	5@12"	5'-0"	12'-6"	5@12"	PER SECT.	PER SECT.	6@12"	7'-0"	PER SECT.	N/A	N/A	N/A	5@12"	13'-0"	6@12"	7'-6"	N/A	N/A	14	18	32	0.70	126		
N3	8'-0"	10'-0"	10"	10"	8"	0"	7@12"	PER SECT.	4'-0"	6@12"	6'-6"	6'-0"	5@12"	5'-0"	10'-3"	5@12"	PER SECT.	PER SECT.	6@12"	6'-6"	PER SECT.	N/A	N/A	N/A	5@12"	10'-9"	6@12"	6'-0"	N/A	N/A	12	12	24	0.57	113		
N4	7'-0"	12'-0"	10"	10"	8"	0"	7@12"	PER SECT.	3'-6"	6@12"	7'-0"	5'-0"	5@12"	5'-0"	9'-0"	5@12"	PER SECT.	PER SECT.	6@12"	7'-0"	PER SECT.	N/A	N/A	N/A	5@12"	9'-6"	6@12"	5'-0"	N/A	N/A	14	12	26	0.61	117		



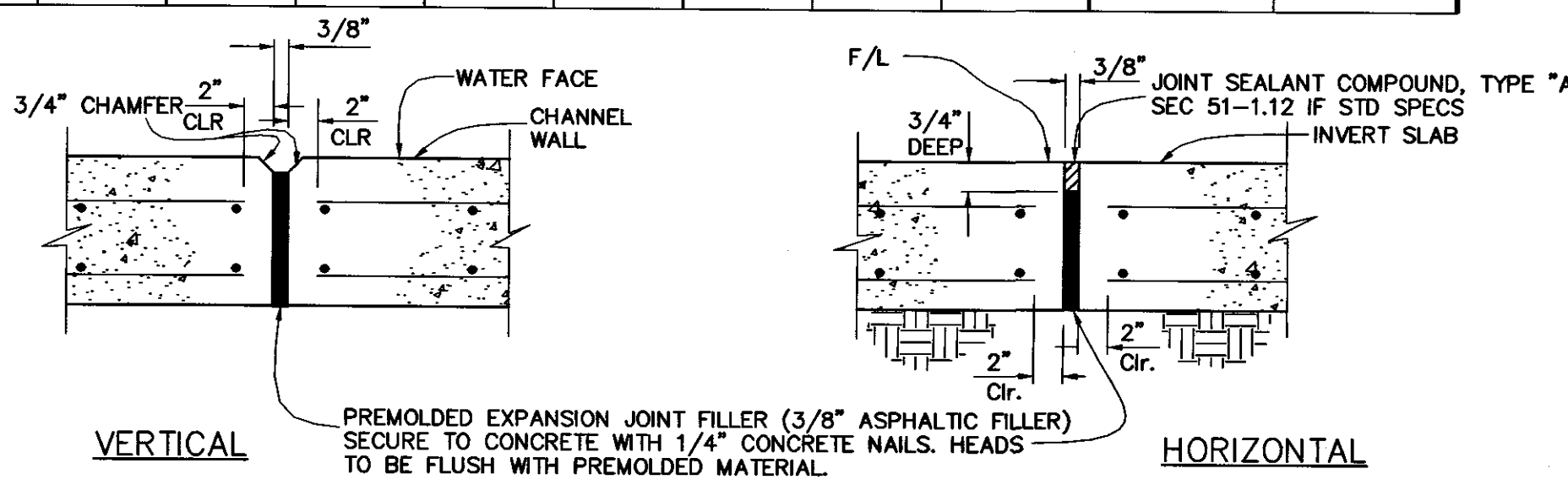
WEEPHOLE DETAIL
NOT TO SCALE



LONGITUDINAL CONSTRUCTION JOINT
NOT TO SCALE

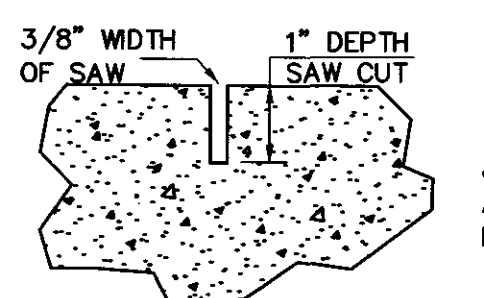
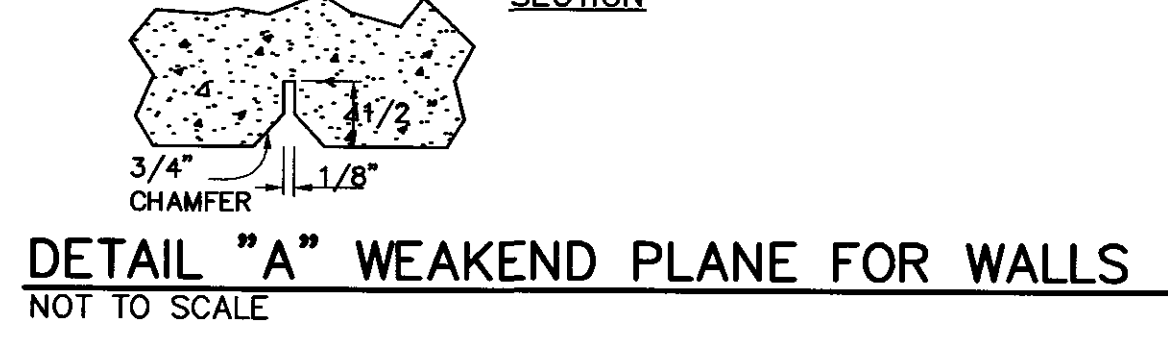
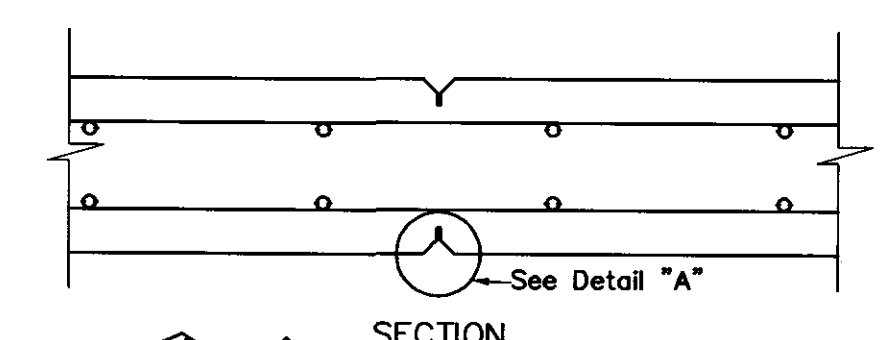


CONTINUOUS WALL FILTER MATERIAL DETAIL
NOT TO SCALE



TRANSVERSE EXPANSION JOINT DETAIL
NOT TO SCALE

NOTE: 1. LOCATE TRANSVERSE EXPANSION JOINTS AT 50' MAX SPACING ALONG OPEN CHANNEL AND AT LOCATIONS SHOWN ON THE PLANS

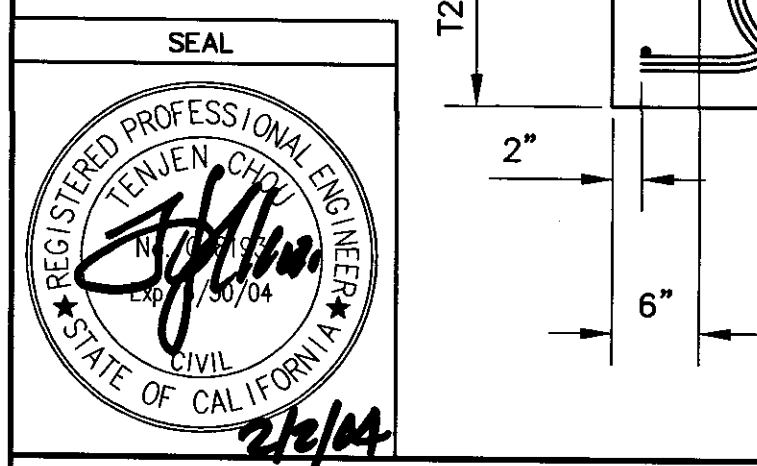


NOTE: SPACING OF WEAKENED PLANE JOINTS SHALL AT WEEPHOLE SHALL NOT EXCEED 12.5' MAX. JOINTS IN WALLS & SLAB ARE TO BE IN THE SAME PLANE.

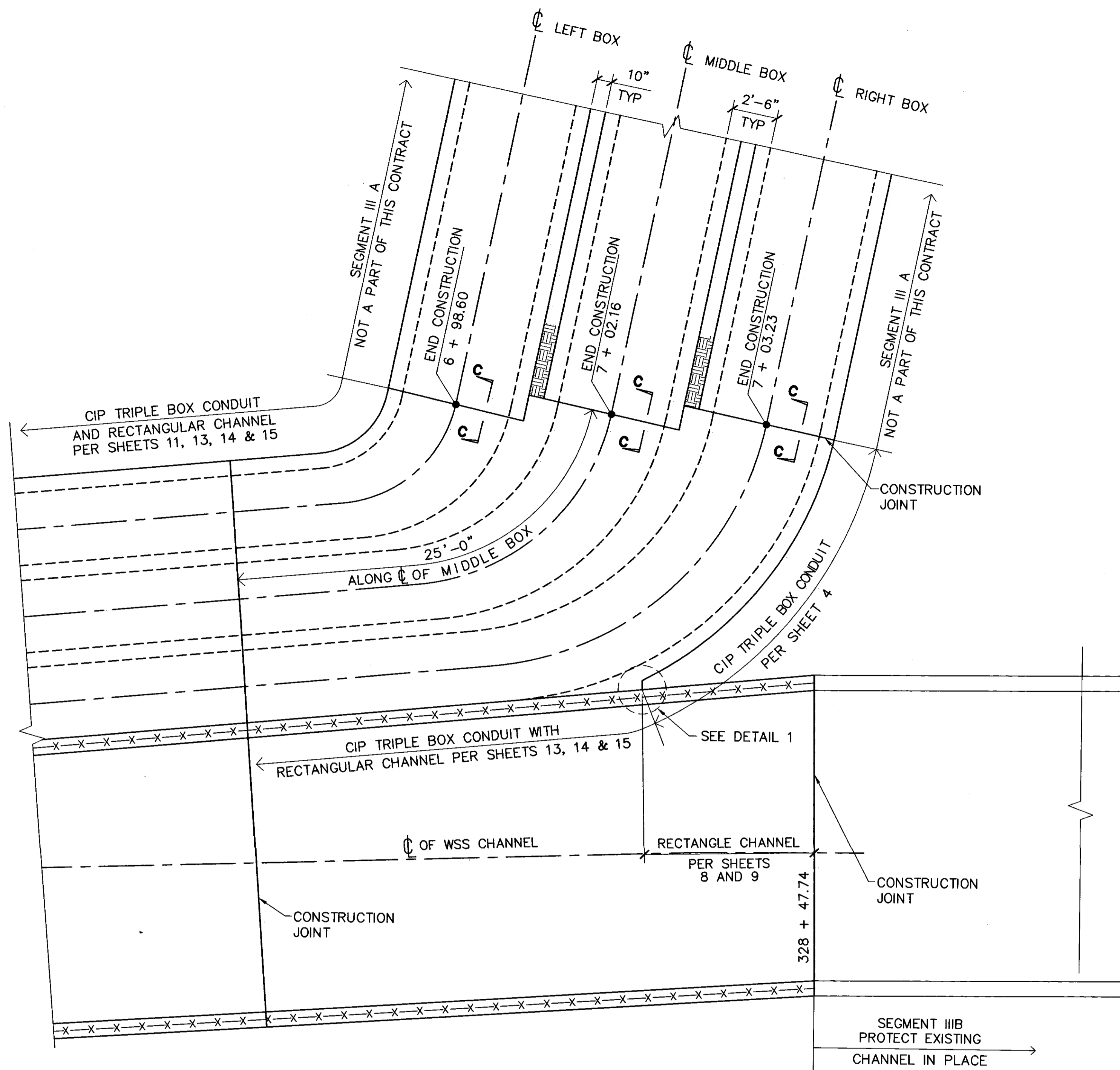
NOTE: FOR STRUCTURAL NOTES AND DESIGN CRITERIA SEE SHEET 8

REVISIONS			
MARK	DATE	DESCRIPTION	BY
Δ	5/12/04	REVISED CALL OUT	A.G.

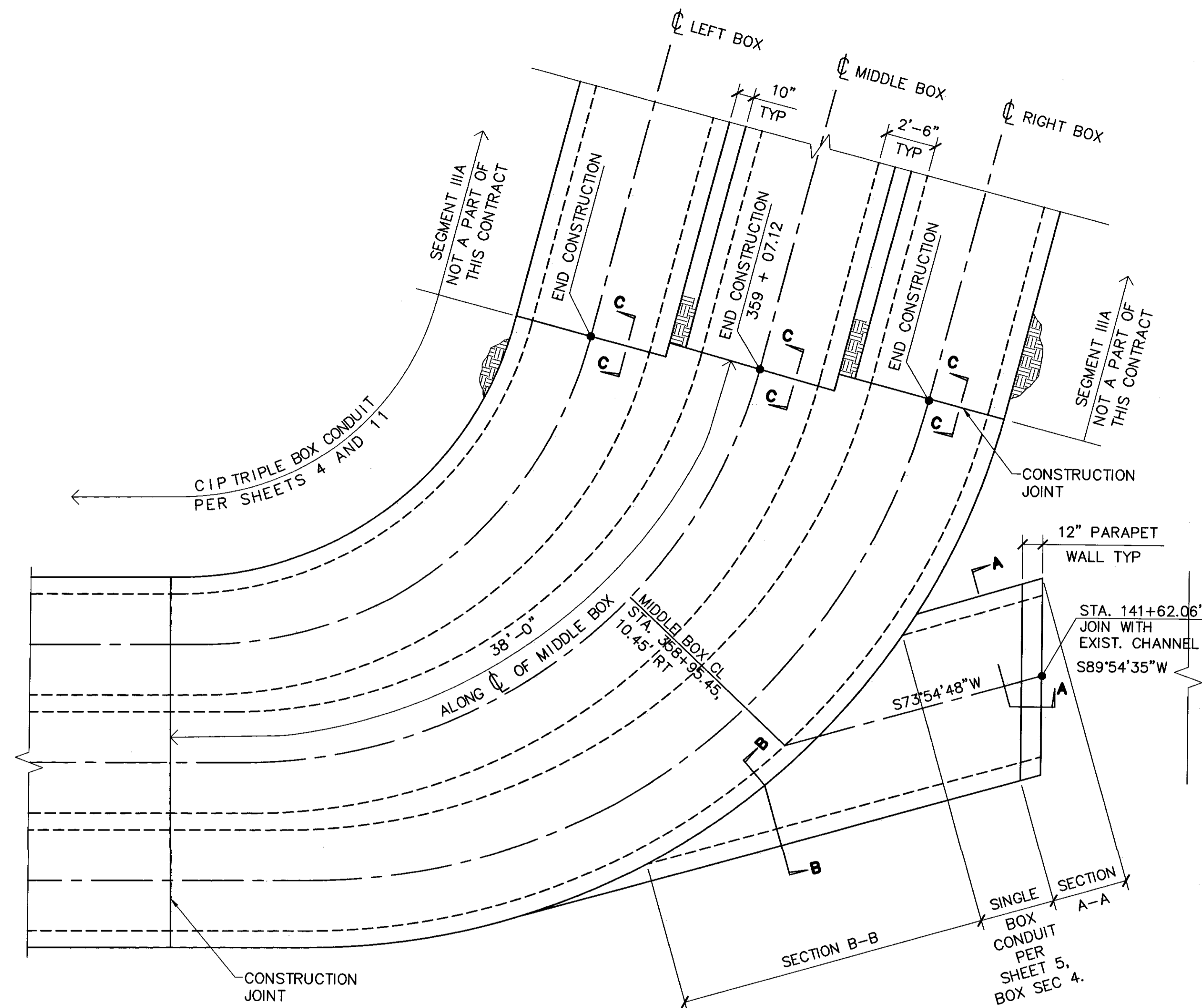
SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
SAN ANTONIO CREEK SYSTEM			
REINFORCED CONCRETE RECTANGULAR CHANNEL SECTION AND SCHEDULE (NORTHERLY SIDE)			
PROJECT ENGR. T.J.C.	DRAWN BY: DD	DESIGNED BY: RO	
SUBMITTED BY: 4/5/04 <i>Diana Borcut</i>	CHECKED: <i>Patricia M. Mead</i>		
RECOMMENDED BY: <i>Patricia M. Mead</i>	APPROVED BY: <i>Patricia M. Mead</i>		
DATE: 3/01/04	SCALE: VARIES	FILE NO.: 1-112-	DRWG. NO.: 9 of 15



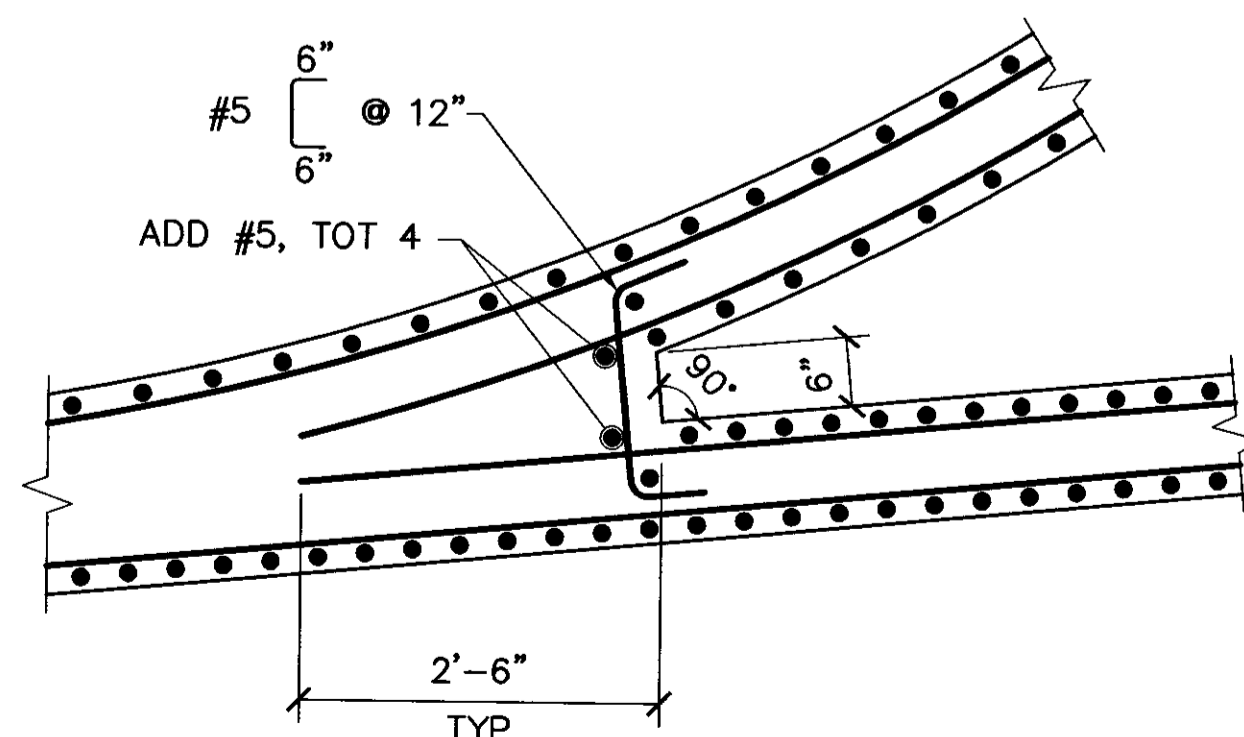
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PLAN AT BENSON AVE.
1/4"=1'-0"



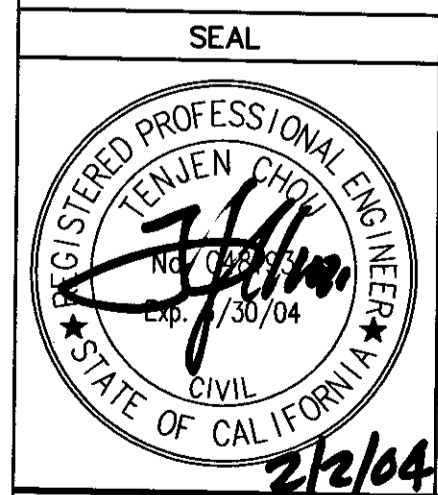
PLAN AT MOUNTAIN AVE.
1/4"=1'-0"



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

NOTES

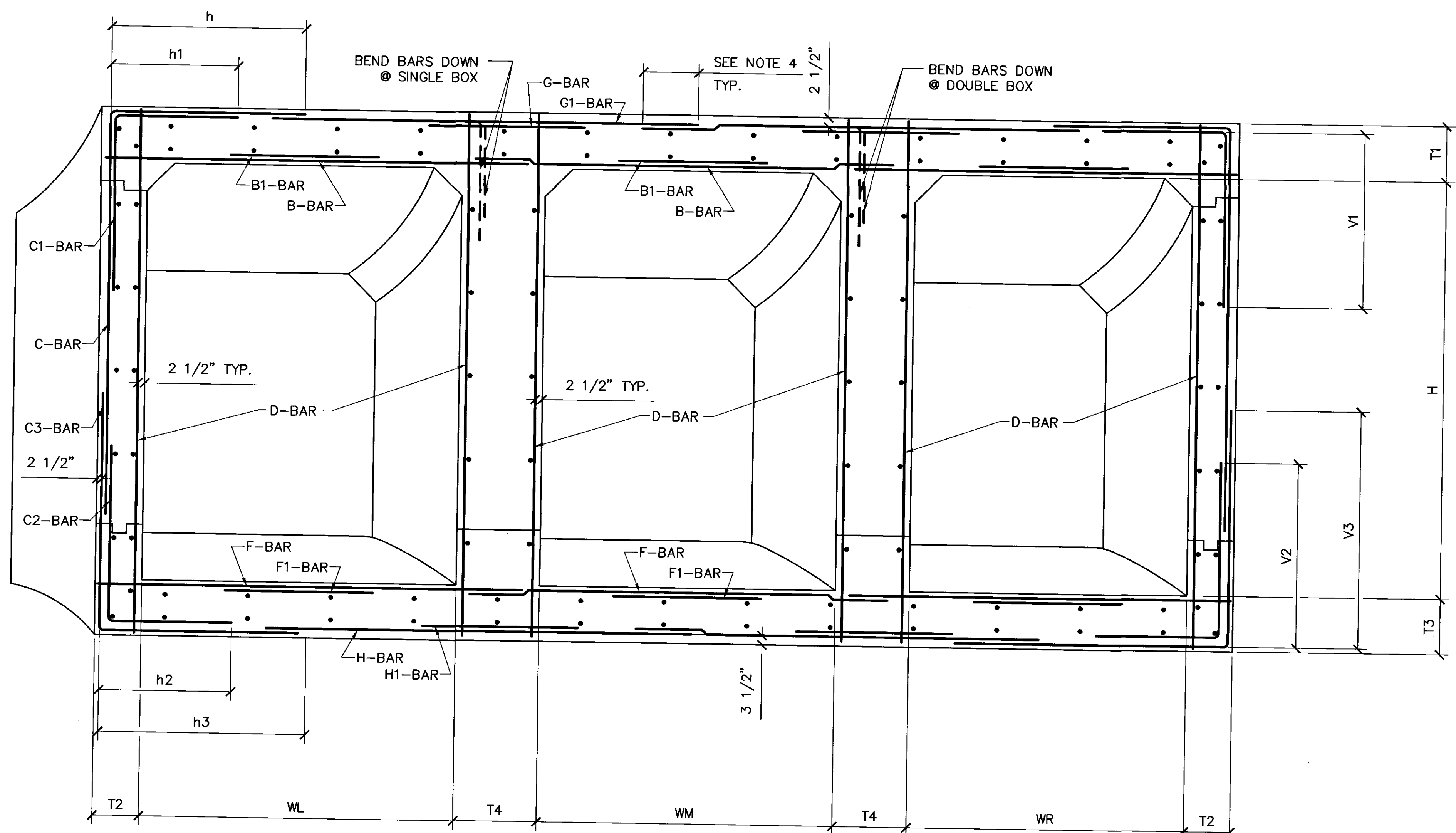
1. SEE "ADDITIONAL NOTES FOR SECTIONS TO BE JACKED IN PLACE" ON SHEET 5 FOR DETAILS.
2. VARIATION FROM THEORETICAL ALIGNMENT AND GRADE OF THE ENDS OF THE BOX'S AT THE TIME OF COMPLETION SHALL NOT EXCEED 1.2". THE CONTRACTOR SHALL INFORM THE ENGINEER IF THE LIMIT IS EXCEEDED, AND PROPOSE "FIX DETAIL" TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
3. FOR CONSTRUCTION JOINT DETAIL AT INTERFACE BETWEEN PRECAST JACKED BOX AND CIP TRIPLE BOX TRANSITION SEE SHEET 5.
4. FOR SECTIONS A-A, B-B AND SECTION C-C SEE SHEET 12. FOR SECTION D-D, SEE SHEET 17.
5. SEE "DRILL AND BOND DOWEL" ON SHEET 17 FOR CONNECTION OF NEW STRUCTURE AT EXISTINGS.



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SIGNATURE _____ DATE _____

REVISIONS				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
MARK	DATE	DESCRIPTION	BY	SAN ANTONIO CREEK SYSTEM			
				CURVED TRANSITION STRUCTURAL PLAN SECTION AND DETAILS			
PROJECT ENGR.	TJC	DRAWN BY:	DD	DESIGNED BY:	RO	DATE	3/01/04
SUBMITTED BY:	4/5/04 James P. Broun			SCALE VARIES			
RECOMMENDED BY:	James P. Broun 4/5/04			FILE NO.	1-112-	DRWG. NO.	10 of 15
APPROVED BY:	4/6/04 [Signature]			F:\PROJECTS\WSSDJACKING\old\dwg\sheet\TRANS-SEC.dwg, 3/17/2004 1:30:25 PM			

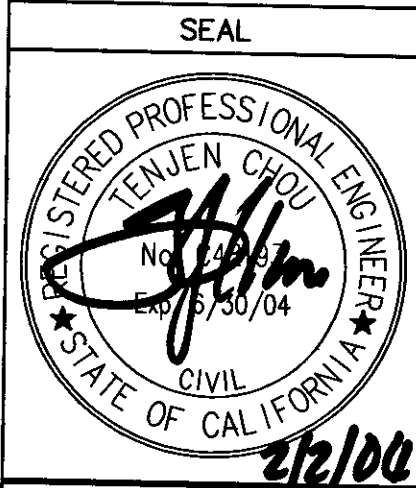


TRIPLE BOX SECTION
3/4"=1'-0"

BOX SECTION	MOUNTAIN AVE		BENSON AVE			
	1	2	3	4	5	6
Design Cover	VARIES		VARIES			
Width	6'-0" TO 5'-0"	6'-0" TO 4'-0"				
Height	6'-0" TO 8'-0"	6'-0" TO 9'-0"				
Top Slab Thickness T ₁	12"	12"				
Side Wall Thickness T ₂	10"	10"				
Bottom Slab Thickness T ₃	12"	12"				
Interior Wall Thickness T ₄	10" TO 2'-6"	10" TO 2'-6"				
Concrete Cover	Y					
B	Bar No. & Spacing	6 @ 12"	6 @ 12"			
Bars	Length	VARIES	VARIES			
B ₁	Bar No. & Spacing	5 @ 12"	5 @ 12"			
Bars	Length	VARIES	VARIES			
C	Bar No. & Spacing	5 @ 12"	6 @ 12"			
Bars	Hor. Length	VARIES	VARIES			
	Vert. Length	VARIES	VARIES			
C ₁	Bar No. & Spacing	6 @ 12"	7 @ 12"			
Bars	Hor. Length	42"	42"			
	Vert. Length	52"	52"			
C ₂	Bar No. & Spacing	5 @ 12"	6 @ 12"			
Bars	Hor. Length	42"	42"			
	Vert. Length	52"	52"			
C ₃	Bar No. & Spacing	6 @ 12"	N/A			
Bars	Hor. Length	VARIES	N/A			
	Vert. Length	58"	N/A			
D	Bar No. & Spacing	5 @ 12"	6 @ 12"			
Bars	Length	VARIES	VARIES			
F	Bar No. & Spacing	6 @ 12"	6 @ 12"			
Bars	Length	VARIES	VARIES			
F ₁	Bar No. & Spacing	N/A	N/A			
Bars	Length	N/A	N/A			
G	Bar No. & Spacing	6 @ 12"	7 @ 12"			
Bars	Length	VARIES	VARIES			
G ₁	Bar No. & Spacing	6 @ 12"	6 @ 12"			
Bars	Length	VARIES	VARIES			
H	Bar No. & Spacing	6 @ 12"	6 @ 12"			
Bars	Length	VARIES	VARIES			
H ₁	Bar No. & Spacing	7 @ 12"	6 @ 12"			
Bars	Length	VARIES	VARIES			
NUMBER OF LONGITUDINAL REINFORCEMENT # 5 BARS (EXCEPT AS NOTED)						
Top Slab (includes distribution reinforcement)	33	33				
Bottom Slab	33	33				
Side Walls	42	42				
TOTAL	108	108				
QUANTITIES						
Concrete Cu. Yds./Lin. Ft.	-	-				
Steel Lbs./Lin. Ft.	-	-				

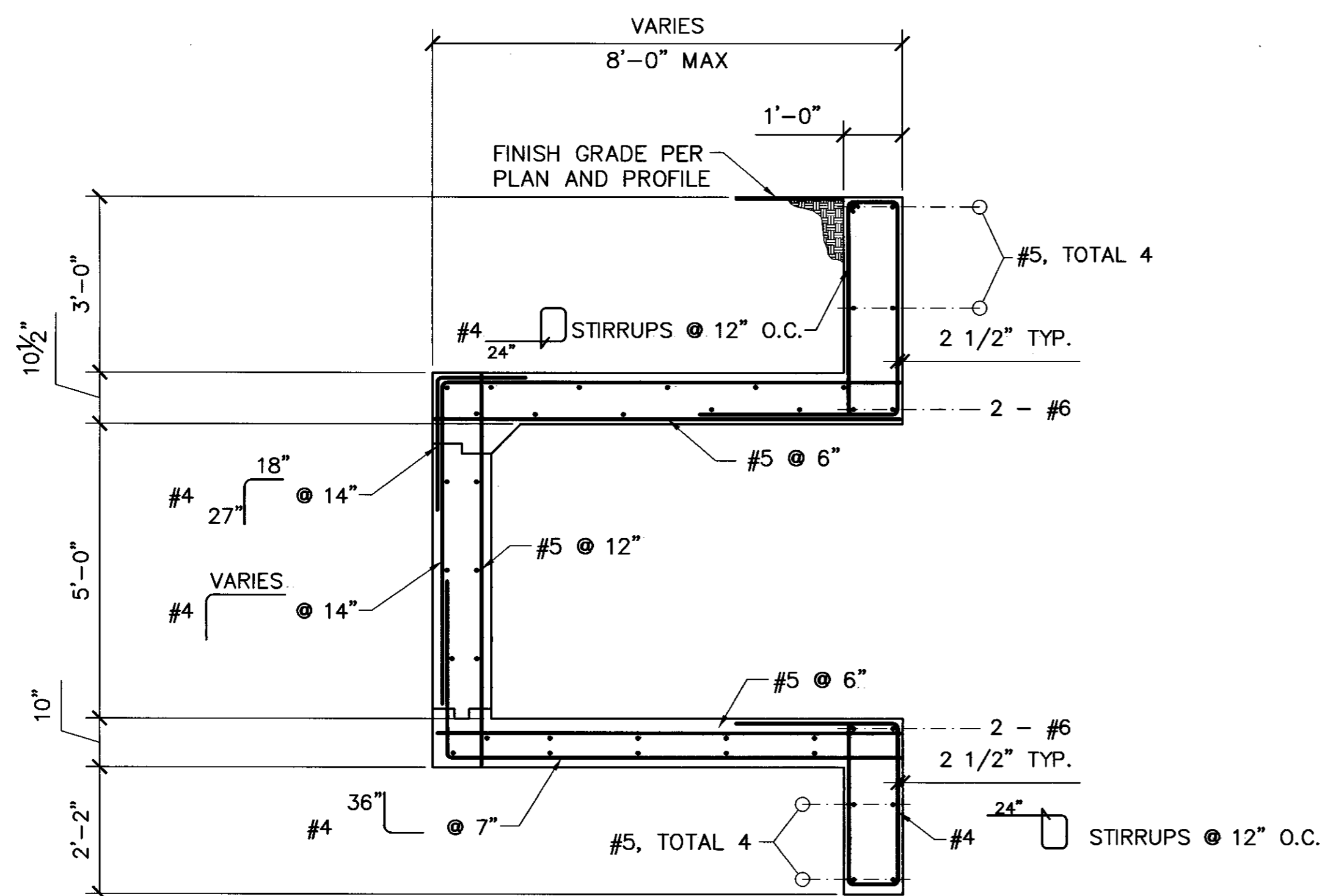
DIMENSION AND REINFORCEMENT SCHEDULE

- NOTES**
- SEE SHEET 5 FOR CONCRETE STRENGTH AND ALLOWABLE STRESSES.
 - BARS ARE SHOWN IN SEPARATE LAYERS FOR CLARITY ONLY, ALL BARS IN THE SAME FACE OF THE MEMBER SHALL BE IN THE SAME LINE.
 - CONCRETE AND REINFORCEMENT QUANTITIES ARE BASED ON AVERAGE DIMENSIONS.
 - BAR LENGTHS VARY DUE TO CHANGING DIMENSIONS OF TRANSITION, LENGTHS SHALL BE EXTENDED AS SHOWN IN THE SECTION. MINIMUM LAP SHALL BE 15 BAR DIAMETERS, OR 12 INCHES MINIMUM UNLESS OTHERWISE NOTED, AND SHALL OCCUR AT CENTERLINE OF CELL OR WALL.
 - DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO CENTER OF BAR, UNLESS OTHERWISE SHOWN.

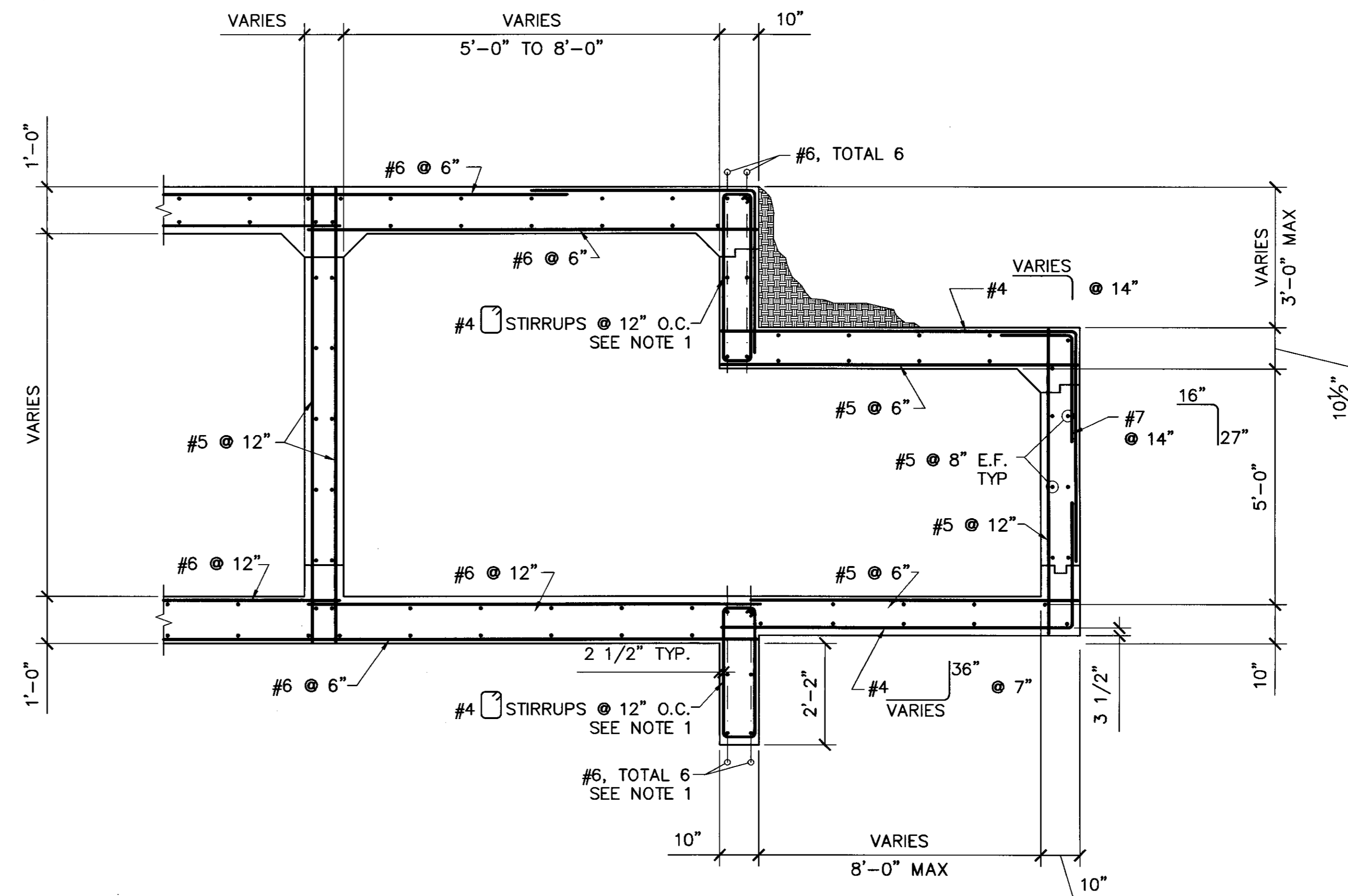


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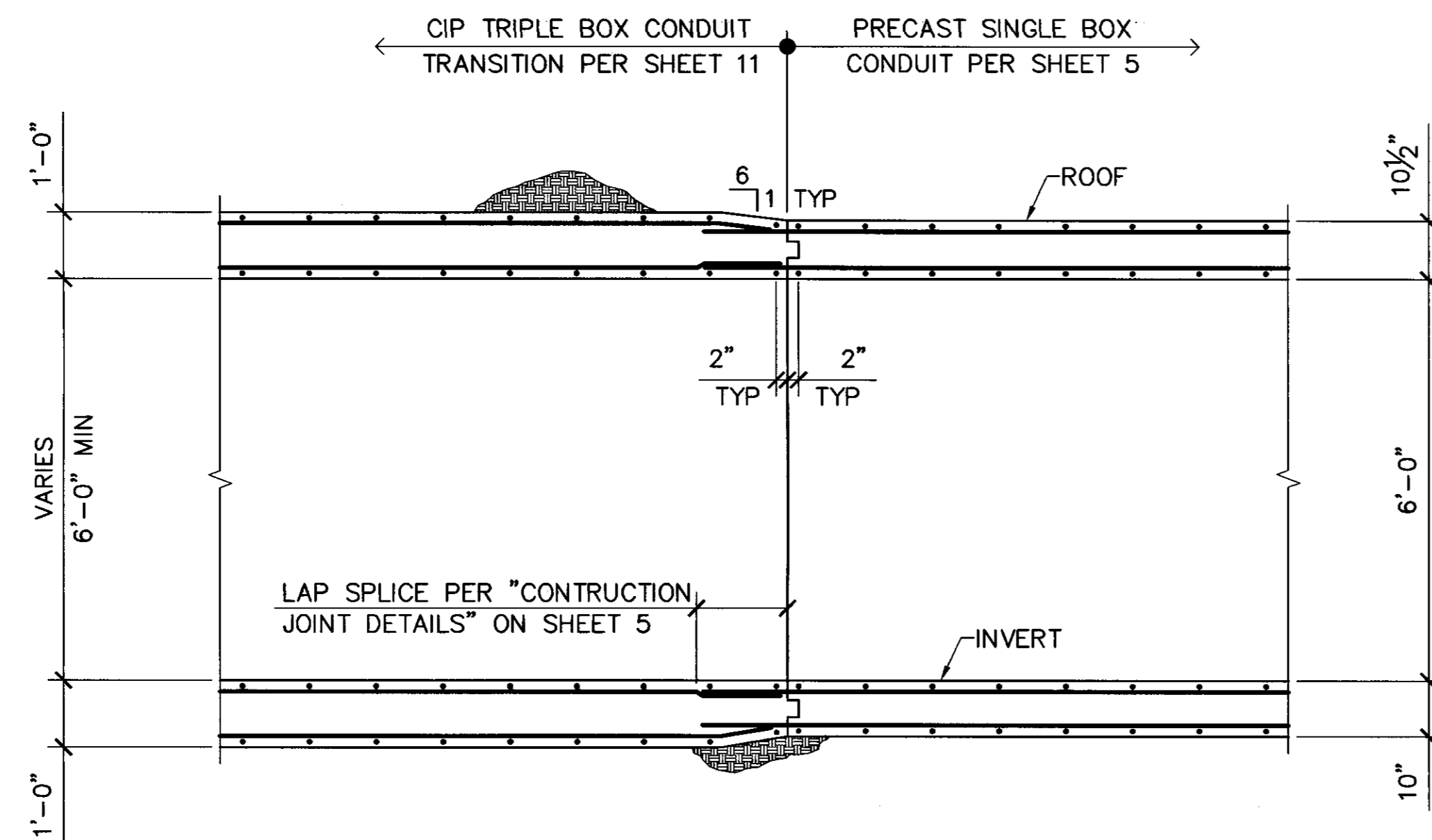
REVISIONS				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT	
MARK	DATE	DESCRIPTION	BY		
				SAN ANTONIO CREEK SYSTEM	
PROJECT ENGR. TJC				DRAWN BY: DD	
DESIGNED BY: RO				SUBMITTED BY: <i>Jamie Borcub</i>	
RECOMMENDED BY: <i>James Alan Hobb</i>				DATE: 3/01/04	
APPROVED BY: <i>Patricia M. ...</i>				SCALE: 3/4"=1'-0"	
DATE: 4/6/04				FILE NO. 1-112-	
				DRWG. NO. 11 of 15	



SECTION A-A
1/2"=1'-0"



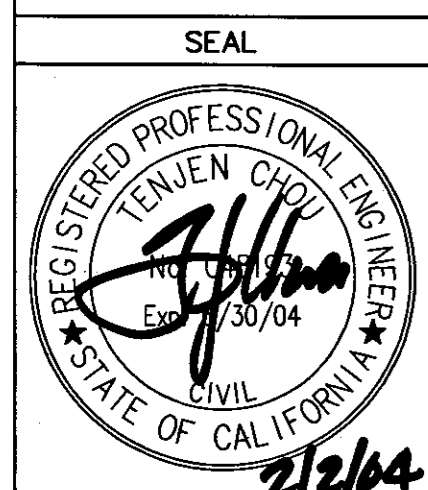
SECTION B-B
1/2"=1'-0"



SECTION C-C
1/2"=1'-0"

NOTES

1. EXTEND 6 - #6 & #4 STIRRUPS IN THE CURVED BOND BEAM 2'-6" BEYOND EDGES OF WALL OPENING
2. SEE SHEET 11 FOR CURVED TRIPLE BOX TRANSITION STRUCTURE REINFORCING STEEL, AND SHEET 5 FOR SINGLE BOX
3. FOR REINFORCING STEEL AND CONCRETE COVER REQUIREMENTS, SEE TYPICAL SECTION OF BOX CULVERTS ON DWG 5, 6, AND 11.

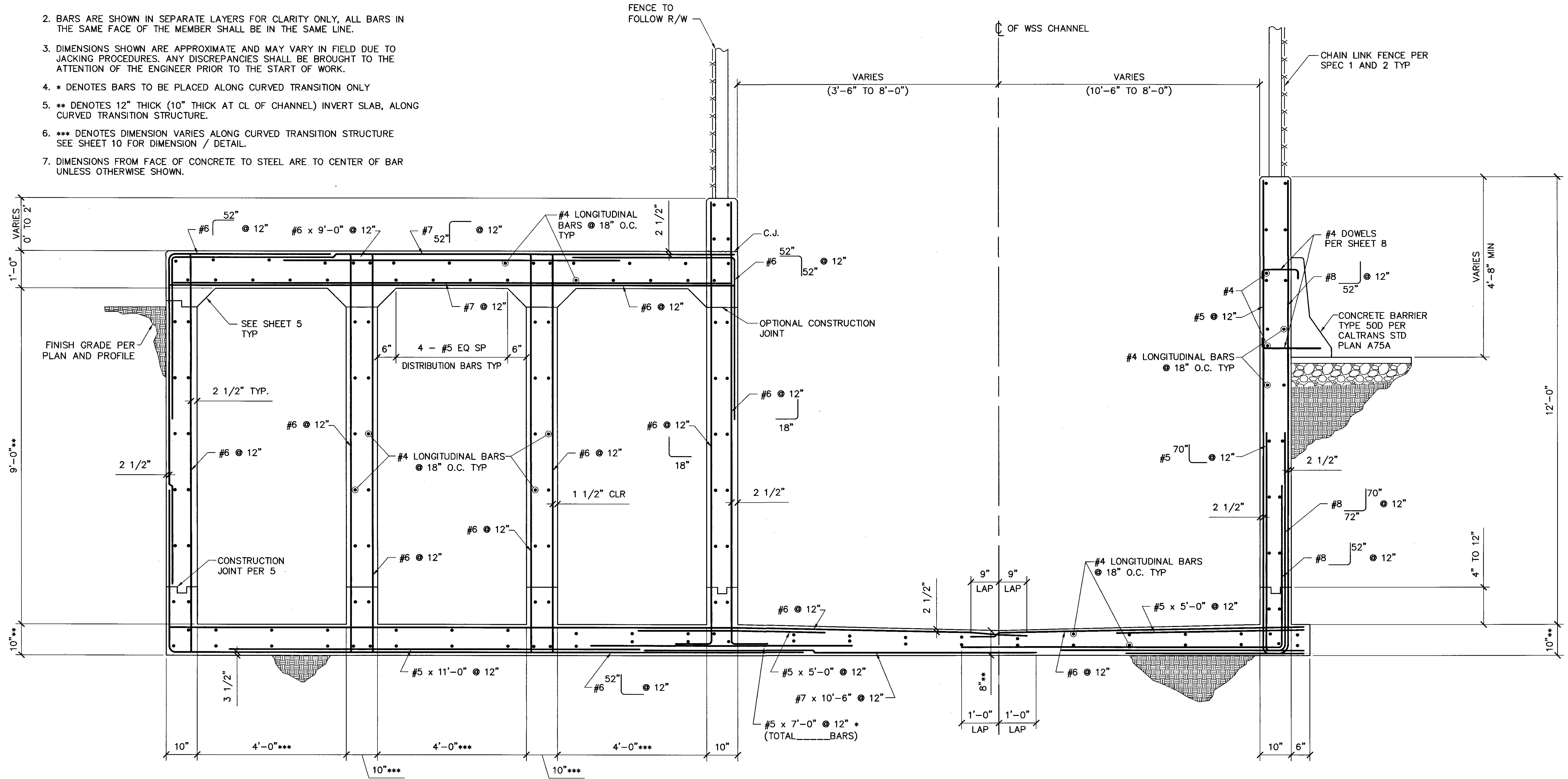


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REVISIONS				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
MARK	DATE	DESCRIPTION	BY	SAN ANTONIO CREEK SYSTEM			
PROJECT ENGR. TJC		DRAWN BY: DD		DESIGNED BY: RO			
SUBMITTED BY: <i>Jamie Brunk</i>							
RECOMMENDED BY: <i>Vanar Ram 4/6/04</i>							
APPROVED BY: <i>Patricia J. Mead</i>				DATE	SCALE	FILE NO.	DRWG. NO.
4/6/04				3/01/04	VARIES	1-112-	12 of 15

NOTES

1. SEE STRUCTURAL DESIGN CRITERIA ON SHEET 5
2. BARS ARE SHOWN IN SEPARATE LAYERS FOR CLARITY ONLY, ALL BARS IN THE SAME FACE OF THE MEMBER SHALL BE IN THE SAME LINE.
3. DIMENSIONS SHOWN ARE APPROXIMATE AND MAY VARY IN FIELD DUE TO JACKING PROCEDURES. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE START OF WORK.
4. * DENOTES BARS TO BE PLACED ALONG CURVED TRANSITION ONLY
5. ** DENOTES 12" THICK (10" THICK AT CL OF CHANNEL) INVERT SLAB, ALONG CURVED TRANSITION STRUCTURE.
6. *** DENOTES DIMENSION VARIES ALONG CURVED TRANSITION STRUCTURE SEE SHEET 10 FOR DIMENSION / DETAIL.
7. DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO CENTER OF BAR UNLESS OTHERWISE SHOWN.



SECTION
N.T.S

SEAL

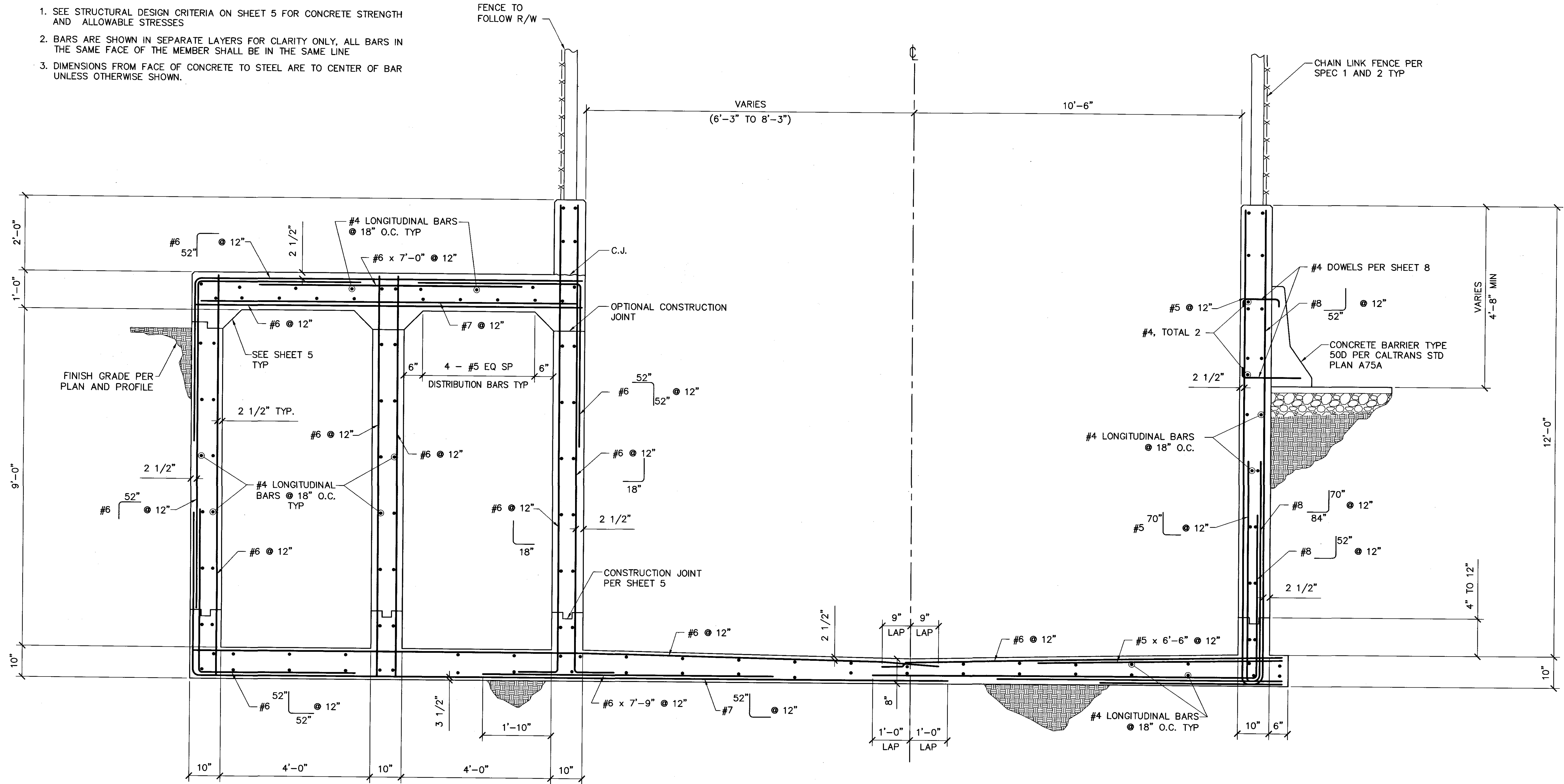
P&D Consultants, Inc.
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Orange, CA 92868 (714) 835-4447

SIGNATURE: _____ DATE: _____

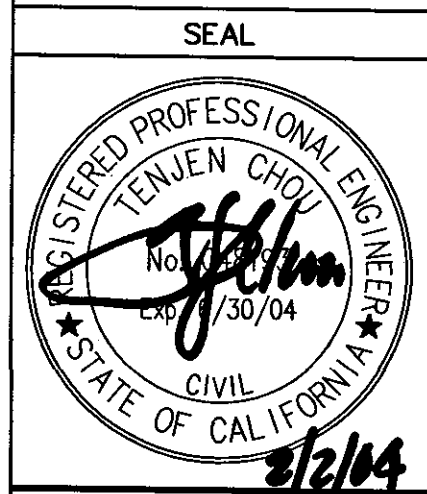
REVISIONS				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
MARK	DATE	DESCRIPTION	BY	SAN ANTONIO CREEK SYSTEM			
				REINFORCED CONCRETE TRIPLE BOX CONDUIT AND RECTANGULAR CHANNEL			
PROJECT ENGR.	TJC	DRAWN BY:	DD	DESIGNED BY:	RO	DATE	3/01/04
SUBMITTED BY:	4/5/04 <i>Jama Brewster</i>			CHIEF, ENGINEERING DIVISION			
RECOMMENDED BY:	4/6/04 <i>David Chen</i>			ASSIST. FLOOD CONTROL ENGINEER			
APPROVED BY:	4/6/04 <i>Timothy J. Mead</i>			FLOOD CONTROL ENGINEER			
SCALE	FILE NO.	DRWG. NO.					
NTS	1-112-	13 of 15					

NOTES

1. SEE STRUCTURAL DESIGN CRITERIA ON SHEET 5 FOR CONCRETE STRENGTH AND ALLOWABLE STRESSES
2. BARS ARE SHOWN IN SEPARATE LAYERS FOR CLARITY ONLY, ALL BARS IN THE SAME FACE OF THE MEMBER SHALL BE IN THE SAME LINE
3. DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO CENTER OF BAR UNLESS OTHERWISE SHOWN.



SECTION
N.T.S.



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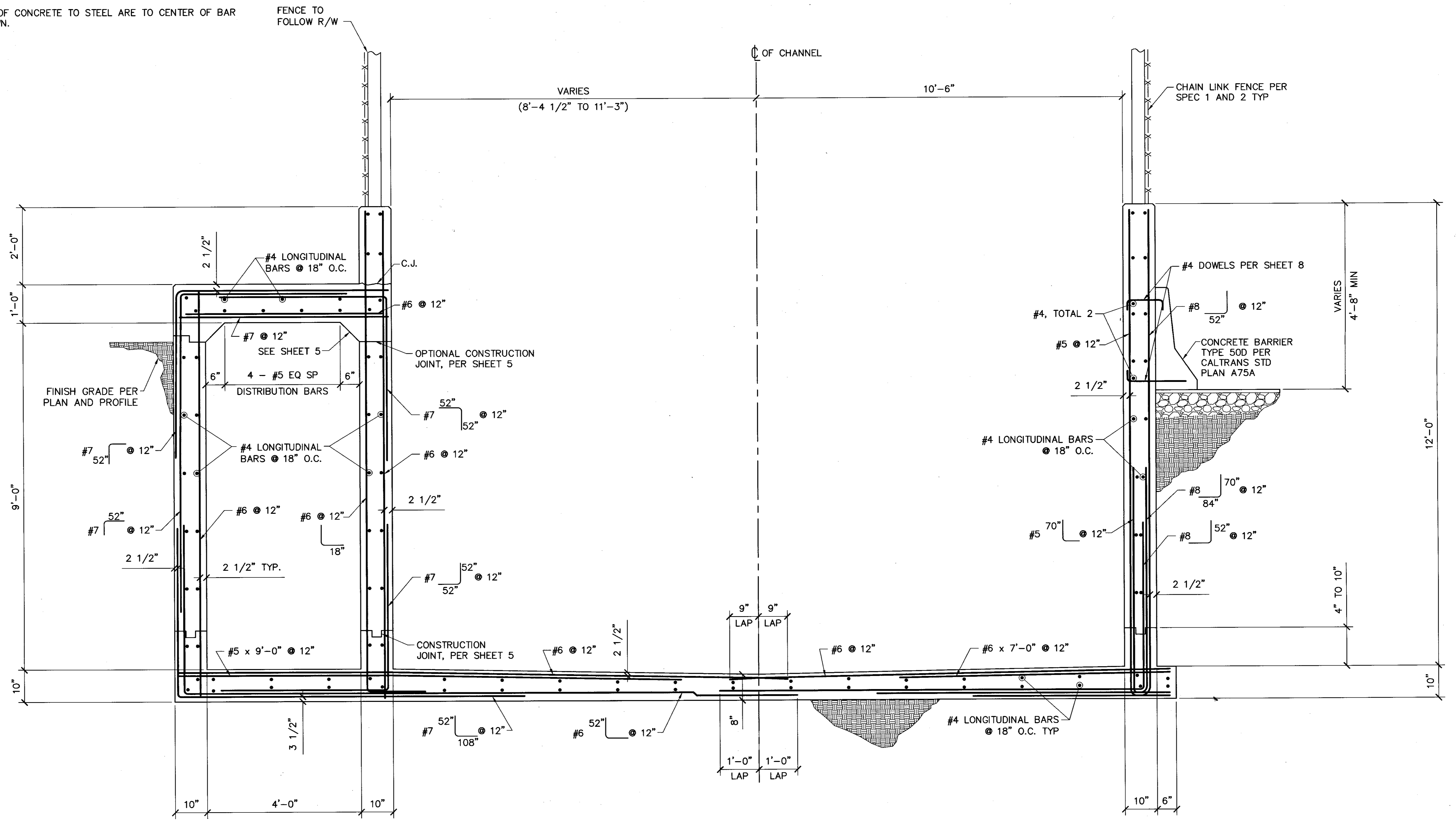
SIGNATURE _____ DATE _____

REVISIONS			
MARK	DATE	DESCRIPTION	BY

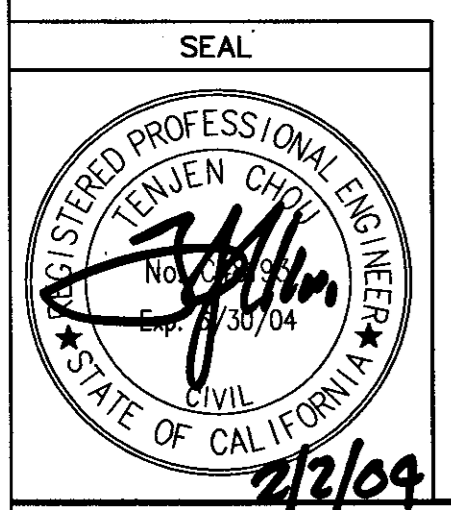
PROJECT ENGR. TJC				DRAWN BY: DD				DESIGNED BY: RO			
SUBMITTED BY: James Bruch 4/5/04				RECOMMENDED BY: David Allen 4/6/04				APPROVED BY: [Signature] 4/6/04			
DATE: 3/01/04				SCALE: NTS				FILE NO.: 1-112-			
DRG. NO.: 14 of 15				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT				SAN ANTONIO CREEK SYSTEM			
REINFORCED CONCRETE DOUBLE BOX CONDUIT AND RECTANGULAR CHANNEL											

NOTES

1. SEE STRUCTURAL DESIGN CRITERIA ON SHEET 5 FOR CONCRETE STRENGTH AND ALLOWABLE STRESSES
2. BARS ARE SHOWN IN SEPARATE LAYERS FOR CLARITY ONLY, ALL BARS IN THE SAME FACE OF THE MEMBER SHALL BE IN THE SAME LINE
3. DIMENSIONS FROM FACE OF CONCRETE TO STEEL ARE TO CENTER OF BAR UNLESS OTHERWISE SHOWN.



SECTION
N.T.S.



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REVISIONS				SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT			
MARK	DATE	DESCRIPTION	BY	SAN ANTONIO CREEK SYSTEM			
				REINFORCED CONCRETE SINGLE BOX CONDUIT AND RECTANGULAR CHANNEL			
PROJECT ENGR.	TJC	DRAWN BY:	DD	DESIGNED BY:	RO	DATE	3/01/04
SUBMITTED BY:	4/5/04	James Brown	CHEF, ENGINEERING DIVISION	SCALE	NTS	FILE NO.	1-112-
RECOMMENDED BY:	4/16/04	James Brown	ASST. FLOOD CONTROL ENGINEER	DRWG. NO.	15 of 15		
APPROVED BY:	4/16/04	James Brown	FLOOD CONTROL ENGINEER				

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