

**STRUCTURAL NOTES:**

**GENERAL:**

- ALL DETAILS MARKED "TYPICAL" SHALL BE USED WHEREVER APPLICABLE, UNLESS OTHERWISE INDICATED ON PLANS.
- ALL WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE SPECIAL PROVISIONS AND THE CALTRANS STANDARD SPECIFICATIONS, 2002 EDITION.
- CONTRACTOR SHALL PROVIDE ALL CONSTRUCTION JOINTS AS REQUIRED TO PERFORM THE WORK. THE PREFERRED LOCATIONS ARE SHOWN ON THE DRAWINGS. ADDITIONAL JOINTS OR REVISED LOCATIONS FROM THOSE SHOWN OR DELETION OF JOINTS SHOWN SHALL REQUIRE APPROVAL FROM THE ENGINEER.

**CONCRETE:**

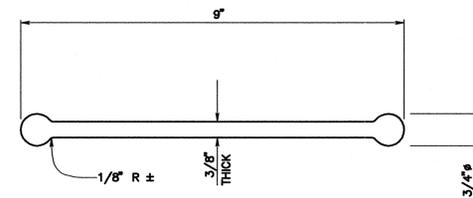
- CONCRETE SHALL ATTAIN THE FOLLOWING 28-DAY ULTIMATE COMPRESSIVE STRENGTHS:
  - CLASS A - 4,000 PSI: REINFORCED CONCRETE SPILLWAY WALLS, PIPE CRADLES, SADDLES AND ENCASEMENT, PIPE COLLAR, TYPE-A PIPE CLOSURE (CLASS A) ROADWAY SWALES USE 1" MAXIMUM AGGREGATE.
  - CLASS D - 5,000 PSI: REINFORCED CONCRETE SPILLWAY WALL FOOTING AND INVERT, LOW FLOW PIPE FLOOR SLAB, CUTOFF WALLS, AND FLOATER SLABS. USE 1 1/2" MAXIMUM AGGREGATE.
  - CLASS B - 3,250 PSI: CONCRETED ROCK SLOPE PROTECTION, OUTLET SPILLWAY, GROUDED ROCK FOR THE SPLASH PAD AND LOW FLOW PIPE OUTLET, CHAIN LINK FENCE POST FOOTING, FLARED END SECTION, V-DITCHES, CONCRETE SWALE. USE FINE AGGREGATE.
- CEMENT SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C150, TYPE II MODIFIED CONFORMING TO SECTION 90-4 OF THE CALTRANS STANDARD SPECIFICATIONS, 2002 EDITION.

**REINFORCING STEEL:**

- ALL REINFORCING STEEL SHALL BE NEW BILLET STEEL DEFORMED BARS AND SHALL CONFORM TO ASTM A 615, GRADE 60.
- THE CLEAR COVER OVER REINFORCING STEEL SHALL BE AS FOLLOWS:
  - A. CONCRETE CAST AGAINST EARTH.....3"
  - B. FORMED CONCRETE AGAINST EARTH.....3"
  - C. CONCRETE SLABS & WALLS NOT EXPOSED TO EARTH, WEATHER OR WATER..... 3/4"
  - D. TOP CURTAIN OF INVERT STEEL.....3"
  - E. WET CONCRETE WALL FACE..... 2 1/2"

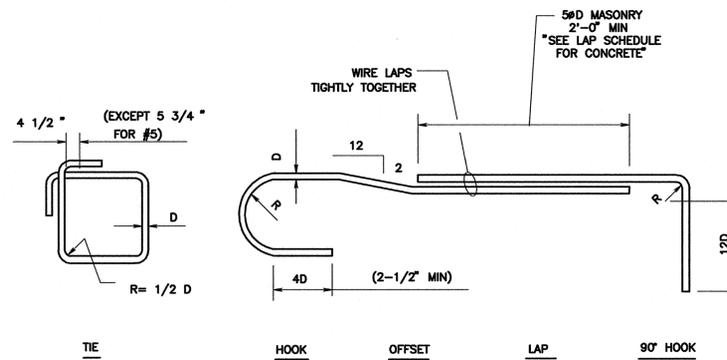
**NOTES:**

- AS SOON AS INITIAL SET HAS TAKEN PLACE, CLEAN CONCRETE SURFACE BY SANDBLASTING TO EXPOSE CLEAN COARSE AGGREGATE FIRMLY EMBEDDED.
- ROUGHENED CONSTRUCTION JOINT OR KEYWAY (SEE TO RIGHT)
- SEALANT SHALL BE PLACED ON WATER SIDE OF CONCRETE AFTER CONCRETE IS CURED.
- STARTER WALL IS REQUIRED WITH WATERSTOP ONLY
- CONSTRUCTION JOINT LOCATION WHERE WATERSTOP IS NOT REQUIRED.
- WATERSTOP WITHOUT CENTER BULB MAY BE USED AT ALL CONSTRUCTION JOINTS
- WATERSTOP SHALL BE SPLICED WATERTIGHT PER MFRS. SPECS.
- MANUFACTURED TEES, CROSSES AND CORNERS MAY BE SUBSTITUTED FOR FIELD THERMALLY WELDED DEVICES WITH FIELD THERMALLY WELDED JOINTS MADE IN PVC WATERSTOP RUNS



**DUMBELL WATERSTOP**

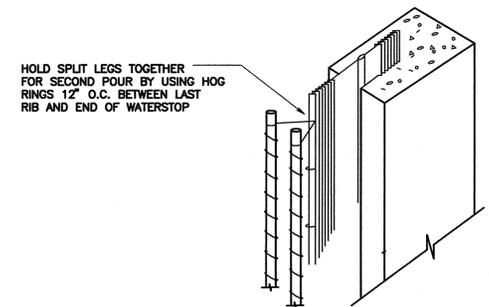
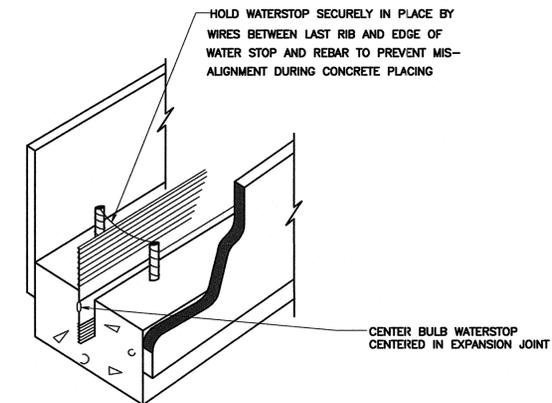
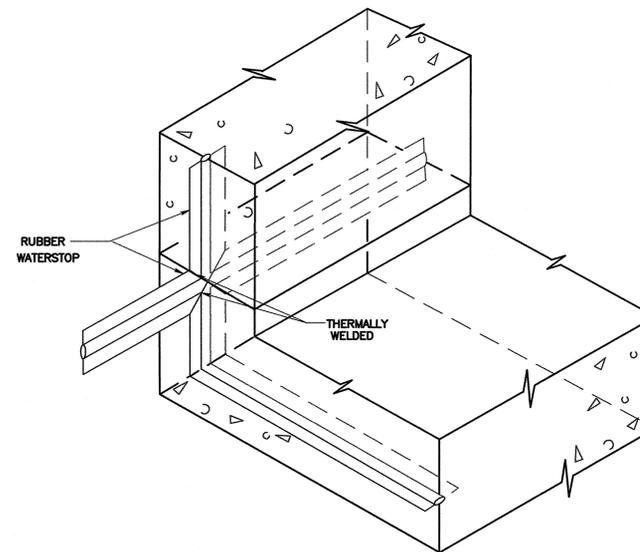
COMPRESSION LAP SPlice LENGTH (COLUMNS ONLY) = 3d  
 R: 3D FOR #3 THRU #8  
 4D FOR #9 THRU #11



**TYPICAL REINFORCING BAR DETAIL**

TENSION LAP SPlice SCHEDULE - ALL SPlices CLASS B			
BAR SIZE	l <sub>d</sub> *	SPlice LENGTHS	
		TOP BARS	OTHER BARS
#3	12	19"	14"
#4	14	24"	18"
#5	18	30"	23"
#6	21	35"	27"
#7	25	42"	33"
#8	30	51"	39"
#9	38	64"	49"
#10	48	81"	62"
#11	59	100"	77"

- \* l<sub>d</sub> = BAR DEVELOPMENT LENGTH FOR:
- f<sub>y</sub> = 60 ksi; f'<sub>c</sub> = 4,000 psi
  - CLEAR SPACING BETWEEN BARS > 3D
  - CONCRETE COVER > 2D
  - CONFORMANCE WITH ACI 318, WHERE APPLICABLE



**TYPICAL PVC WATERSTOP JOINT**

		<b>REVISIONS</b> <table border="1"> <thead> <tr> <th>MARK</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY:</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			MARK	DATE	DESCRIPTION	BY:																									<b>SUBMITTED BY:</b> _____ CHIEF, ENGINEERING DIVISION      DATE _____		SAN BERNARDINO COUNTY <b>FLOOD CONTROL DISTRICT</b>  FONTANA-RIALTO DRAINAGE SYSTEM <b>CACTUS BASINS NO. 3</b>  TYPICAL STRUCTURAL NOTES AND DETAILS	DATE DEC. , 2007
		MARK	DATE	DESCRIPTION	BY:																															
<b>APPROVED BY:</b> _____ FLOOD CONTROL ENGINEER      DATE _____		<b>RECOMMENDED BY:</b> _____ ASSIST. FLOOD CONTROL ENGINEER      DATE _____		SCALE AS SHOWN																																
PROJ. ENGR. T.R.      DES. BY: S.F.B./D.J.N.      REVD BY: J.B.      DRAWN BY: S.F.B./D.J.N.				FILE NO. 2-104-	SHEET NO. S-1																															