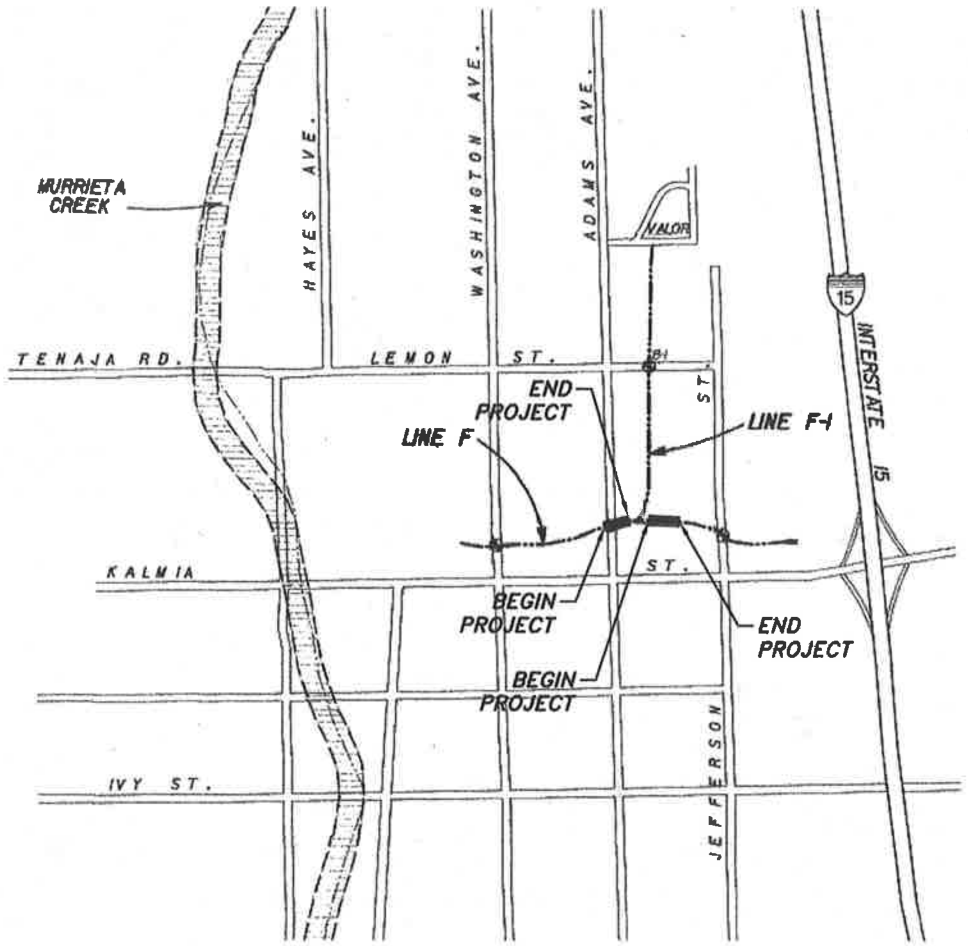
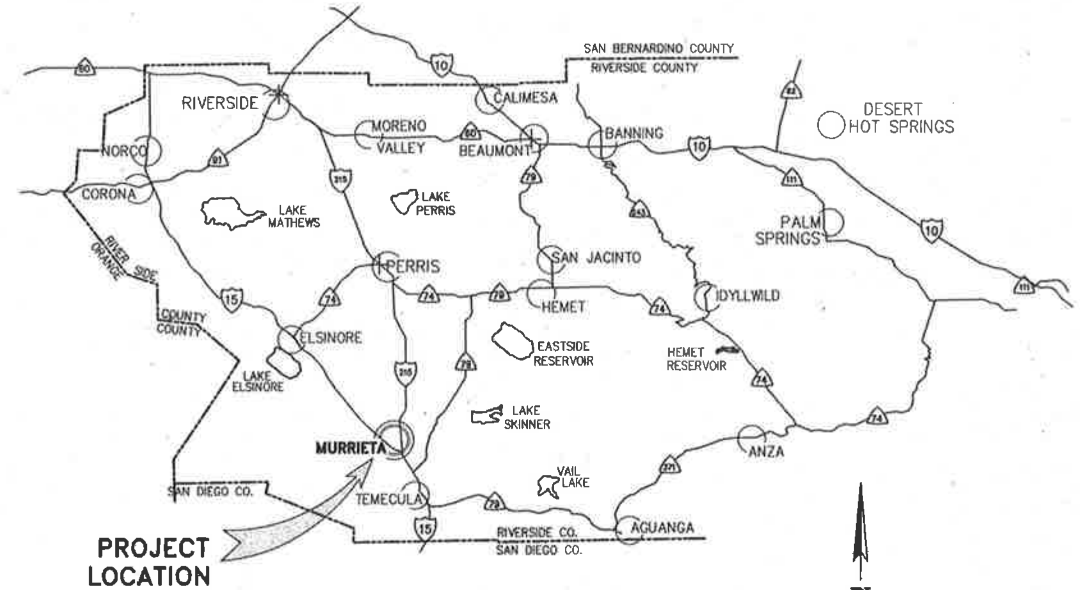
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT



INDEX MAP
N.T.S.



VICINITY MAP
N.T.S.

INDEX

R.C.F.C. & W.C.D. STANDARD DRAWINGS

CH326	TRAPEZOIDAL CHANNEL (MODIFIED)
CH332	SUBDRAIN DETAILS
CH333	CONCRETE DRAINAGE APRON (MODIFIED)
JS232	JUNCTION STRUCTURE No. 7

GENERAL NOTES

1. TOPOGRAPHIC AND PLAINMETRIC FEATURES ARE BASED ON R.C.F.C. PHOTOGRAMMETRY DATED SEPTEMBER 5, 1991.
2. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
3. ALL ELEVATIONS ARE IN FEET, BASED ON U.S.C. AND G.S. DATUM.
4. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION.
5. LOCATION AND ELEVATION OF UTILITIES ARE APPROXIMATE UNLESS NOTED. CONTACT UNDERGROUND SERVICE ALERT AT (800) 422–4133 PRIOR TO EXCAVATING.
6. ALL UTILITIES TO BE PROTECTED IN PLACE UNLESS OTHERWISE NOTED.

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JONIS C. SMITH R.C.E 58654 — 12/23/10 DATE

REGISTERED PROFESSIONAL ENGINEER — JONIS C. SMITH — C058654 — Exp. 12/31/10 — CIVIL — STATE OF CALIFORNIA

Don't Dig...Until You Call U.S.A. Toll Free
1–800–227–2600
for the location of buried utility lines.
Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

DESIGNED BY: J.C.S.
DRAWN BY: L.T.C.
DATE DRAWN: APRIL 2010
CHECKED BY: J.C.S.

BENCH MARK:
B.M. NO. R–3–70
BRASS DISK IN CONCRETE AT INTERSECTION OF JEFFERSON AVE. AND KALMIA ST.

REVISIONS

Rev.	DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: [signature]
CHIEF DESIGN & CONSTRUCTION
DATE: 15-Feb-2011

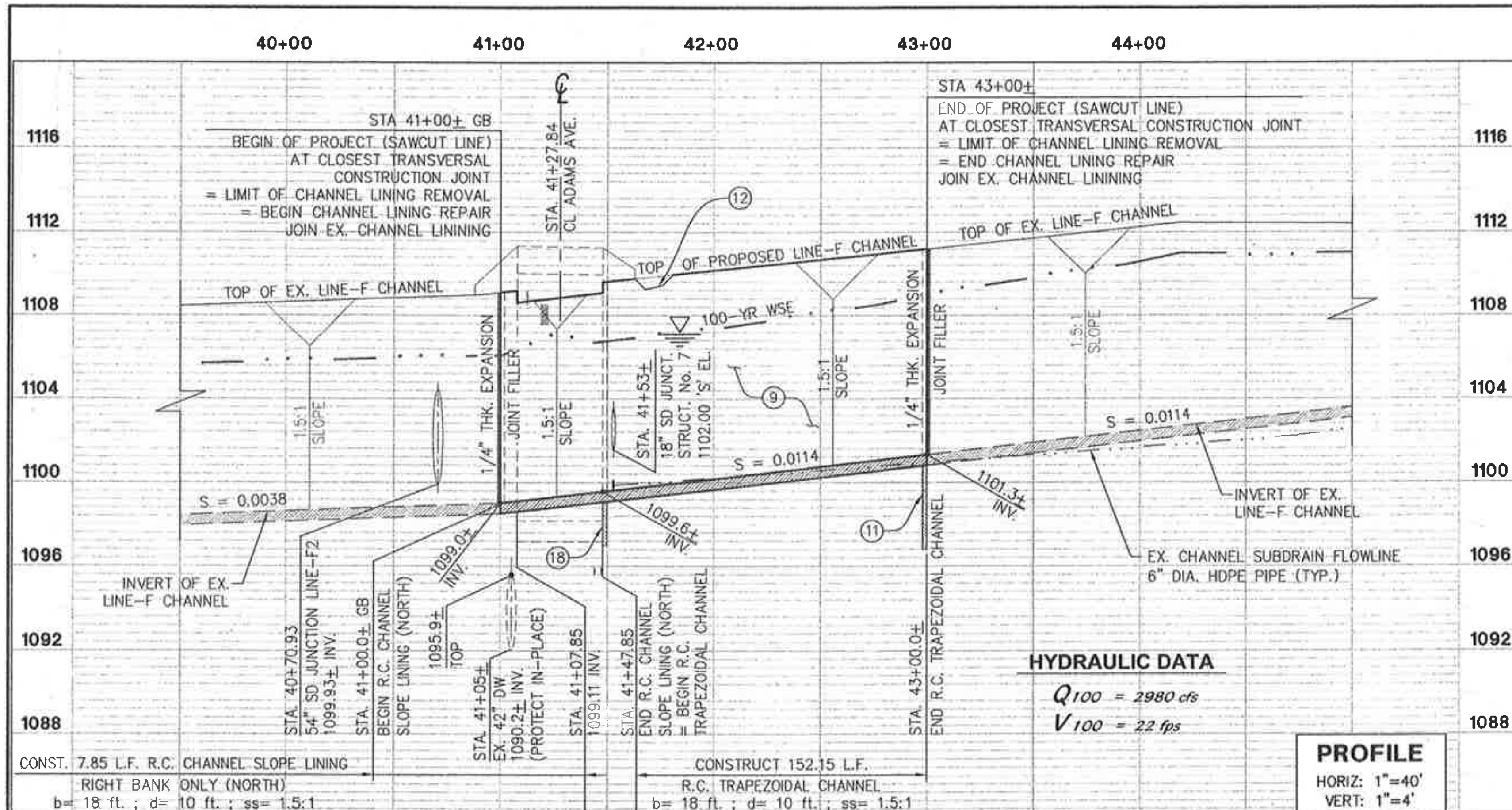
APPROVED BY: Steve Thomas
FOR CHIEF ENGINEER
DATE: FEB 24, 2011

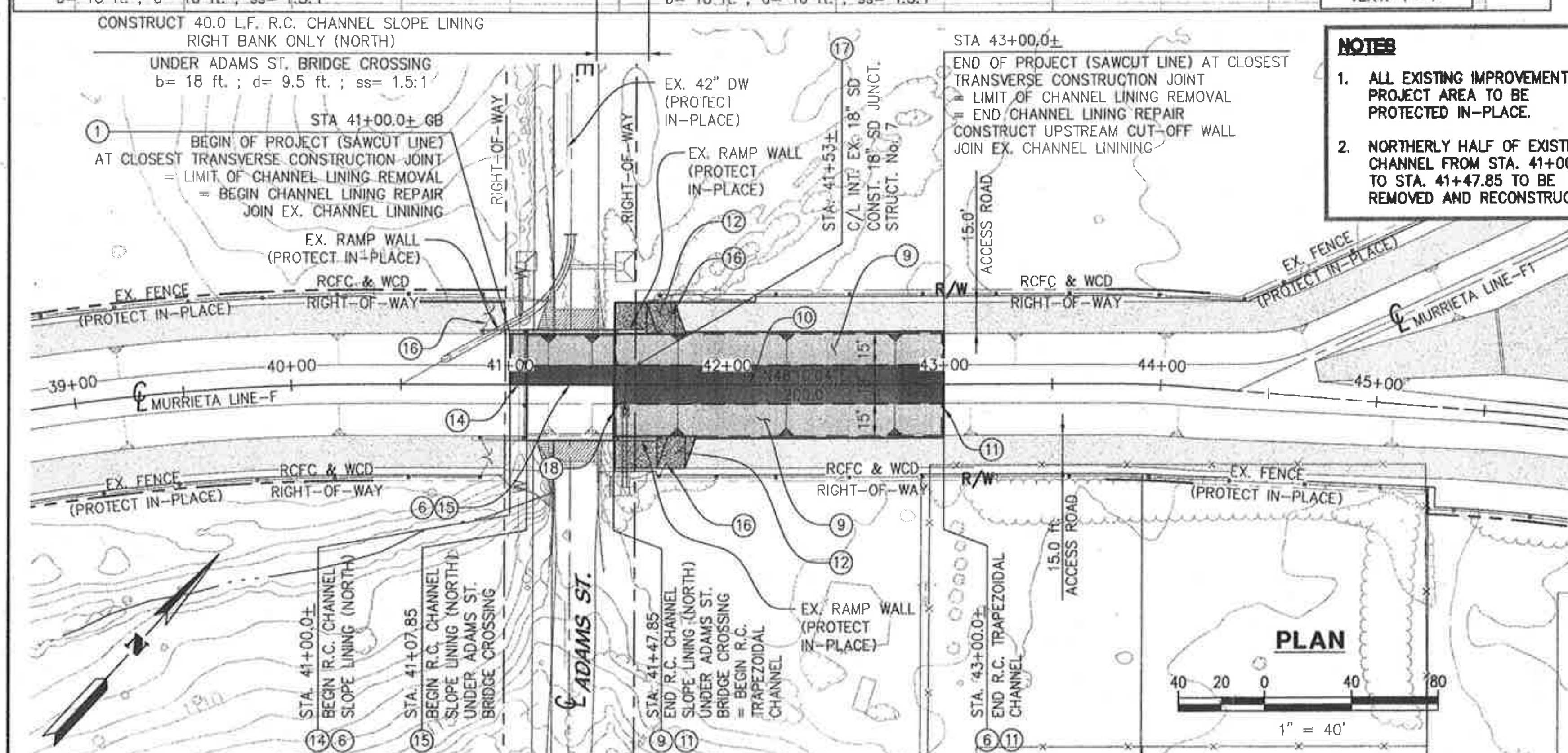
MURRIETA LINE F REPAIR

TITLE SHEET

4

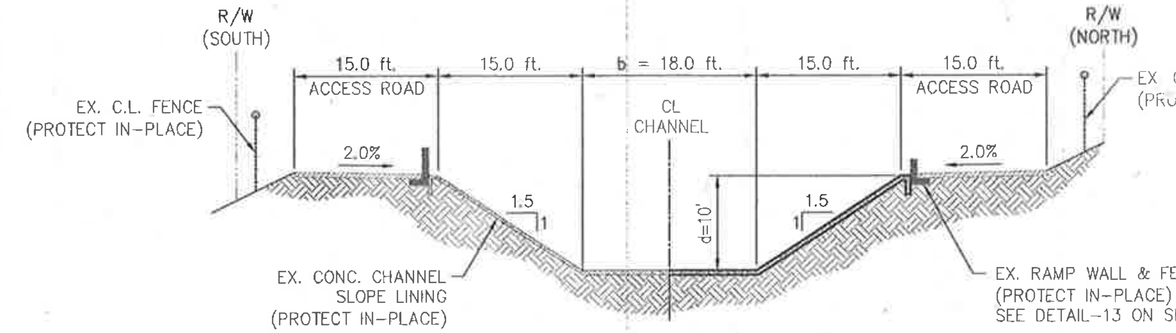
6/14





NOTES

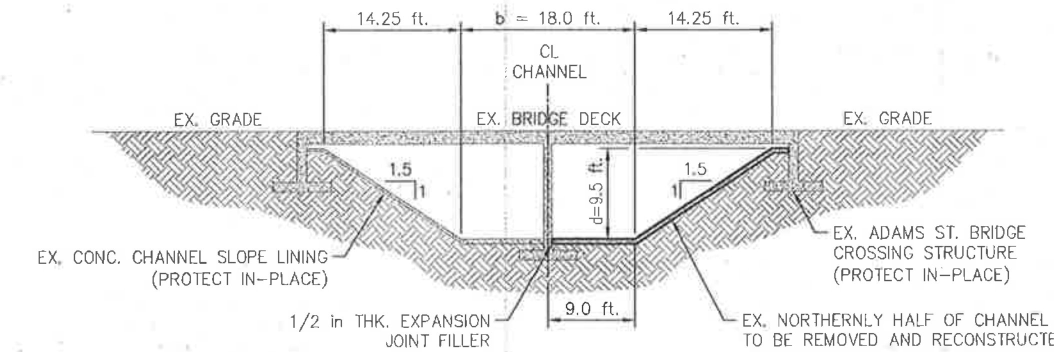
1. ALL EXISTING IMPROVEMENTS IN PROJECT AREA TO BE PROTECTED IN-PLACE.
2. NORTHERLY HALF OF EXISTING CHANNEL FROM STA. 41+00± TO STA. 41+47.85 TO BE REMOVED AND RECONSTRUCTED.



TYPICAL CHANNEL SECTION

SCALE: 1" = 10'

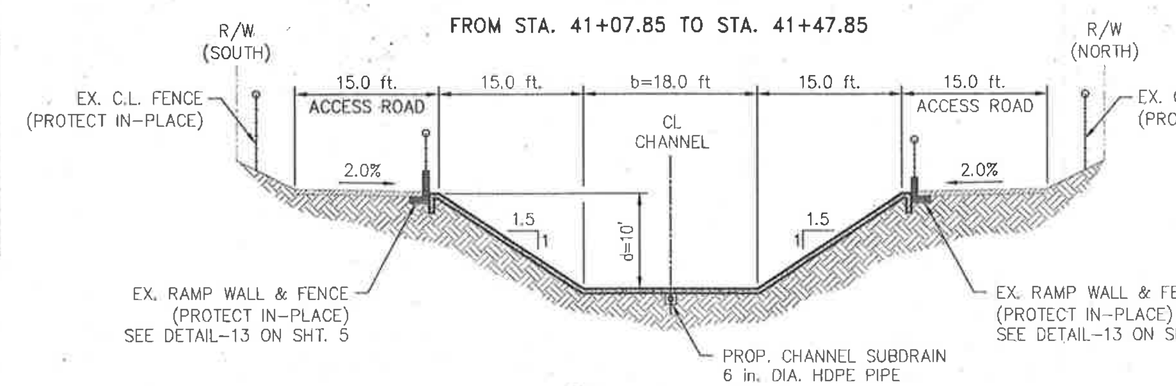
FROM STA. 41+00± TO STA. 41+07.85



TYPICAL CHANNEL SECTION UNDER ADAMS ST. BRIDGE

SCALE: 1" = 10'

FROM STA. 41+07.85 TO STA. 41+47.85



TYPICAL CHANNEL SECTION

SCALE: 1" = 10'

FROM STA. 41+47.85 TO STA. 43+00±

CONSTRUCTION NOTES

(1) SAWCUT, REMOVE, AND DISPOSE OF EXISTING 4 in CONCRETE CHANNEL LINING TO SAWCUT LIMITS.

(6) FURNISH AND INSTALL 1/4 in THK. EXPANSION JOINT FILLER BETWEEN EXISTING AND PROPOSED SLOPE LININGS.

(9) CONSTRUCT REINFORCED CONCRETE CHANNEL SLOPE LINING PER PLAN, PROFILE AND DETAIL-9 ON SHT. 5.

(10) CONSTRUCT CHANNEL SUBDRAINS PER PLAN & RCFC&WCD STD. DWG. CH332.

(11) CONSTRUCT UPSTREAM 4 ft. CUT-OFF WALL PER PLAN, PROFILE AND DETAIL-11 ON SHT. 6.

(12) CONSTRUCT CONCRETE DRAINAGE APRON PER RCFC&W CH333 (MODIFIED), PLAN AND DETAIL-12 ON SHT. 5.

(14) CONSTRUCT REINFORCED CONCRETE HALF-CHANNEL S PER PLAN, PROFILE AND DETAIL-14 ON SHT. 4.

(15) CONSTRUCT REINFORCED CONCRETE HALF-CHANNEL S PER PLAN, PROFILE AND DETAIL-15 ON SHT. 4.

(16) EXISTING GATE TO BE REMOVED AND REINSTALLED.

(17) CONSTRUCT S.D. JUNCTION STRUCTURE No. 7 PER RC DWG. JS232. D=18 in., C=12.56 ft., ELEV. 'S'=1102.0, SS=1.5:1

(18) CONSTRUCT DOWNSTREAM 2 ft. CUT-OFF WALL PER P AND DETAIL-18 ON SHT. 6.

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JONIS C. SMITH R.C.E. 58654 — 12/23/10 DATE

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DESIGNED BY:	J.C.S.
DRAWN BY:	L.T.C.
DATE DRAWN:	APRIL 2010
CHECKED BY:	J.C.S.

BENCH MARK:

B.M. NO. R-3-70

BRASS DISK IN CONCRETE AT INTERSECTION OF JEFFERSON AVE. AND KALMIA ST.

REVISIONS

Rev.	DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

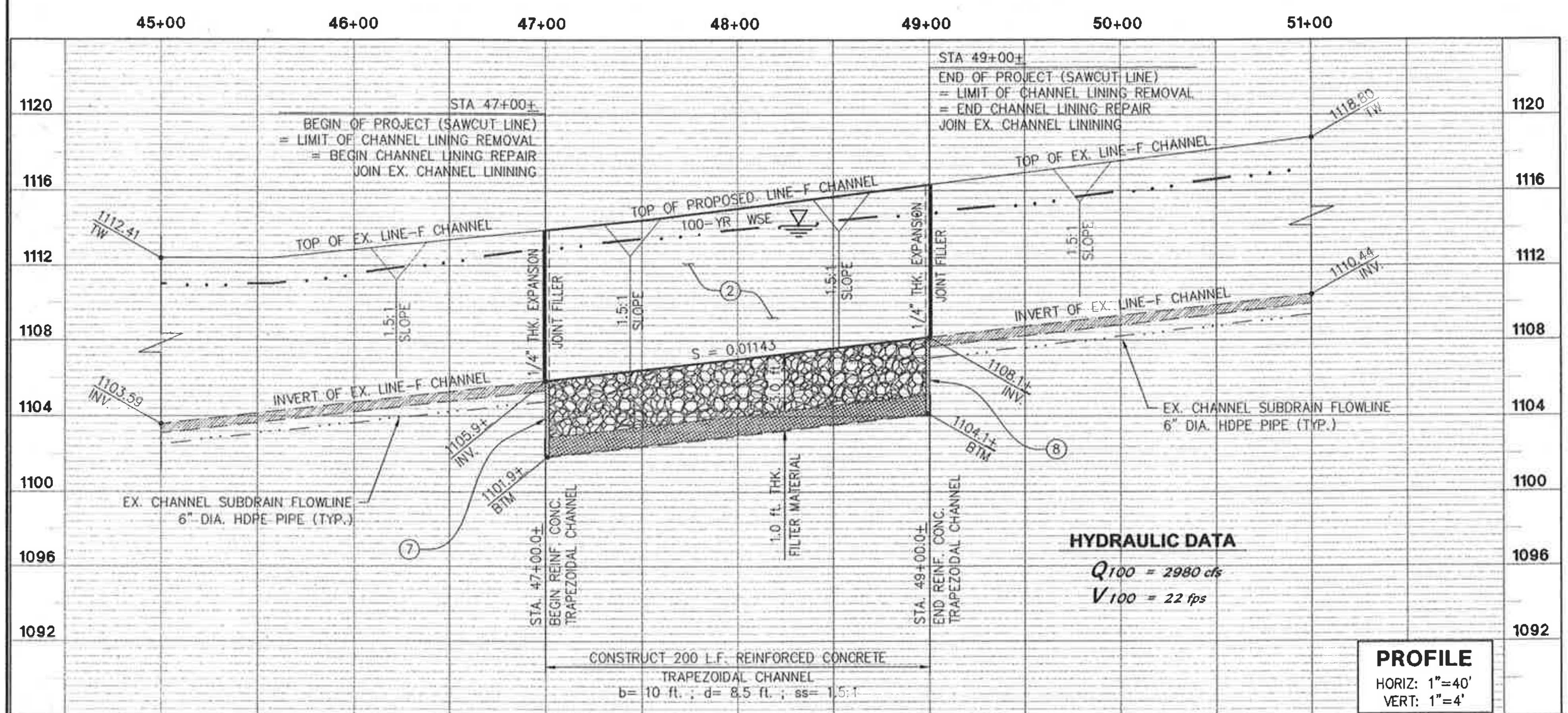
RECOMMENDED FOR APPROVAL BY: [signature] DATE: 15 FEB 2011

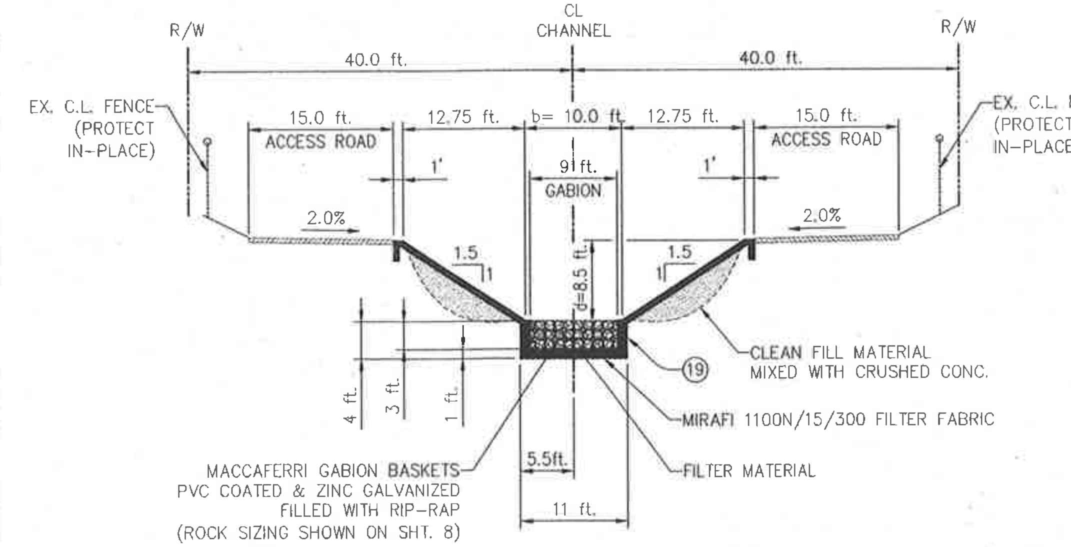
APPROVED BY: [signature] DATE: 15-Feb-2011

MURRIETA LINE F REPAIR

PLAN AND PROFILE

STA 41+00.00 TO STA 43+00.00





TYPICAL CHANNEL SECTION

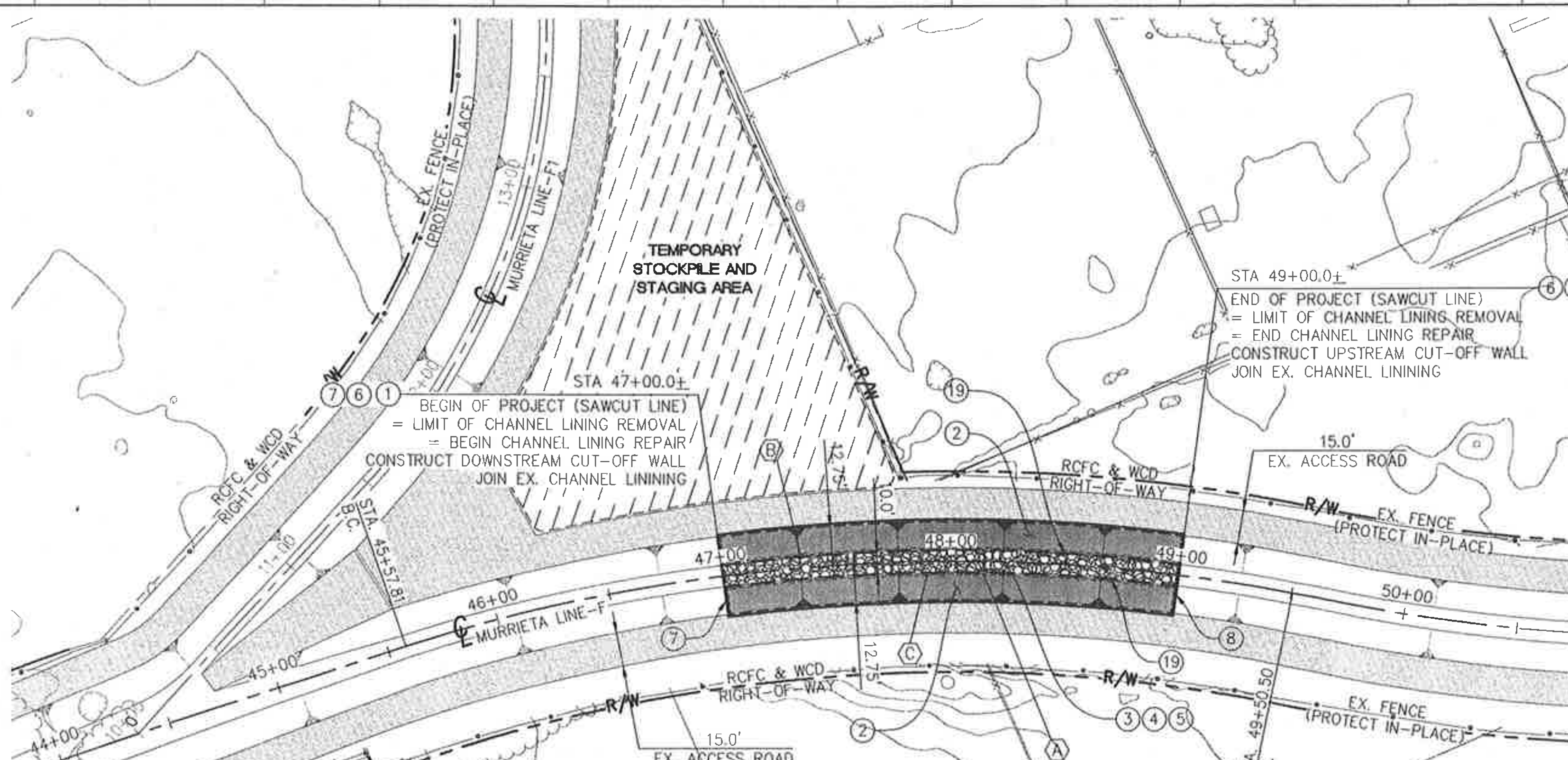
SCALE: 1" = 10'

FROM STA. 47+00 TO STA. 49+00

CURVE DATA						
CURVE	DELTA	RADIUS	TANGENT	LENGTH	B.C. STA.	E.C. STA.
A	30°00'00"	750.00'	201.00'	392.69'	45+57.81	49+50.50
B	30°00'00"	755.00'	202.34'	395.31'	45+57.81	49+50.50
C	30°00'00"	745.00'	199.66'	390.07'	45+57.81	49+50.50

NOTE

ALL EXISTING IMPROVEMENTS IN PROJECT AREA TO BE PROTECTED IN-PLACE.



PLAN

40 20 0 40 80

1" = 40'

CONSTRUCTION NOTES

(1) SAWCUT, REMOVE, AND DISPOSE OF EXISTING 4" CONCRETE CHANNEL LINING TO SAWCUT LIMITS.

(2) CONSTRUCT REINFORCED CONCRETE CHANNEL SLOPE LINING PER RCFC&WCD STD. DWG. NO CH326 (MODIFIED), PLAN, PROFILE AND DETAIL ON SHTS. 6 & 7.

(3) EXISTING 1/4-TON RIP-RAP TO BE REMOVED, TEMPORARILY STOCK PILED AND REUSED.

(4) FURNISH AND CONSTRUCT MACCAFERRI PVC COATED & ZINC GALVANIZED GABION BASKETS, 3.0 ft. DEEP WITH RIP-RAP COBBLES PER PLAN, TYPICAL SECTION, GRADATION DATA TABLE AND DETAILS ON SHTS. 8 & 9.

(5) FURNISH AND INSTALL FILTER MATERIAL, 12 in THK. AND MIRAFI 1100N/15/300 FILTER BLANKET PER PLAN AND TYPICAL SECTION.

(6) FURNISH AND INSTALL 1/4 in THK. EXPANSION JOINT FILLER BETWEEN EXISTING AND PROPOSED SLOPE LININGS.

(7) CONSTRUCT 4 ft. DOWNSTREAM CUT-OFF WALL PER PLAN, PROFILE AND DETAIL-7 ON SHT. 6.

(8) CONSTRUCT 4 ft. UPSTREAM CUT-OFF WALL PER PLAN, PROFILE AND DETAIL-8 ON SHT. 6.

(19) CONSTRUCT CUT-OFF WALL PER LONGITUDINAL DETAIL-A ON SHT 7.

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JONIS C. SMITH R.C.E 58654 — 1/12/11 DATE

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Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG

DESIGNED BY: J.C.S.
DRAWN BY: L.T.C.
DATE DRAWN: APRIL 2010
CHECKED BY: J.C.S.

BENCH MARK:
B.M. NO. R-3-70
BRASS DISK IN CONCRETE AT INTERSECTION OF JEFFERSON AVE. AND KALMIA ST.

REVISIONS		ENGINEER		RCFC/	
Rev.	DESCRIPTION	APPR.	DATE	APPR.	DATE

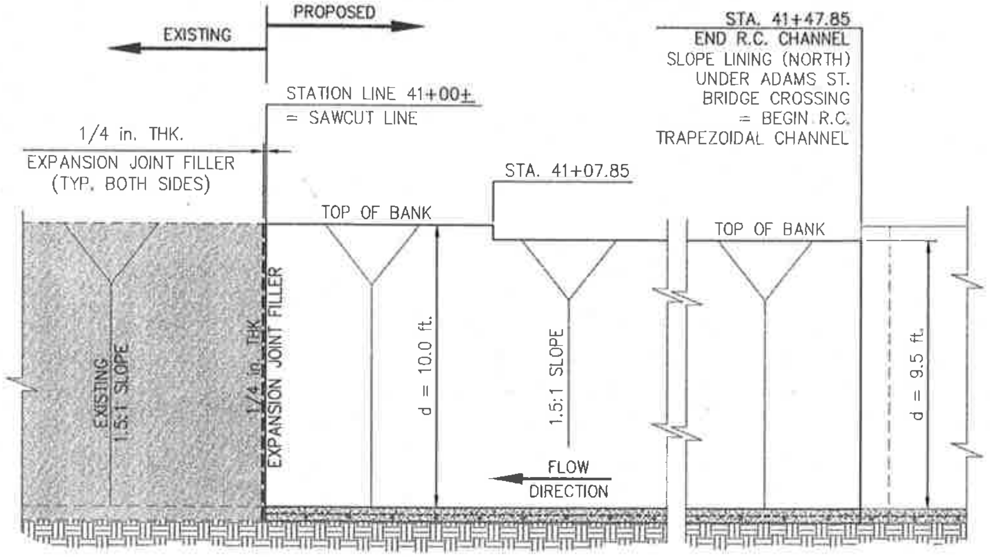
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: — DATE: 15 FEB 2011
APPROVED BY: — DATE: 15-Feb-2011

MURRIETA LINE F REPAIR

PLAN AND PROFILE

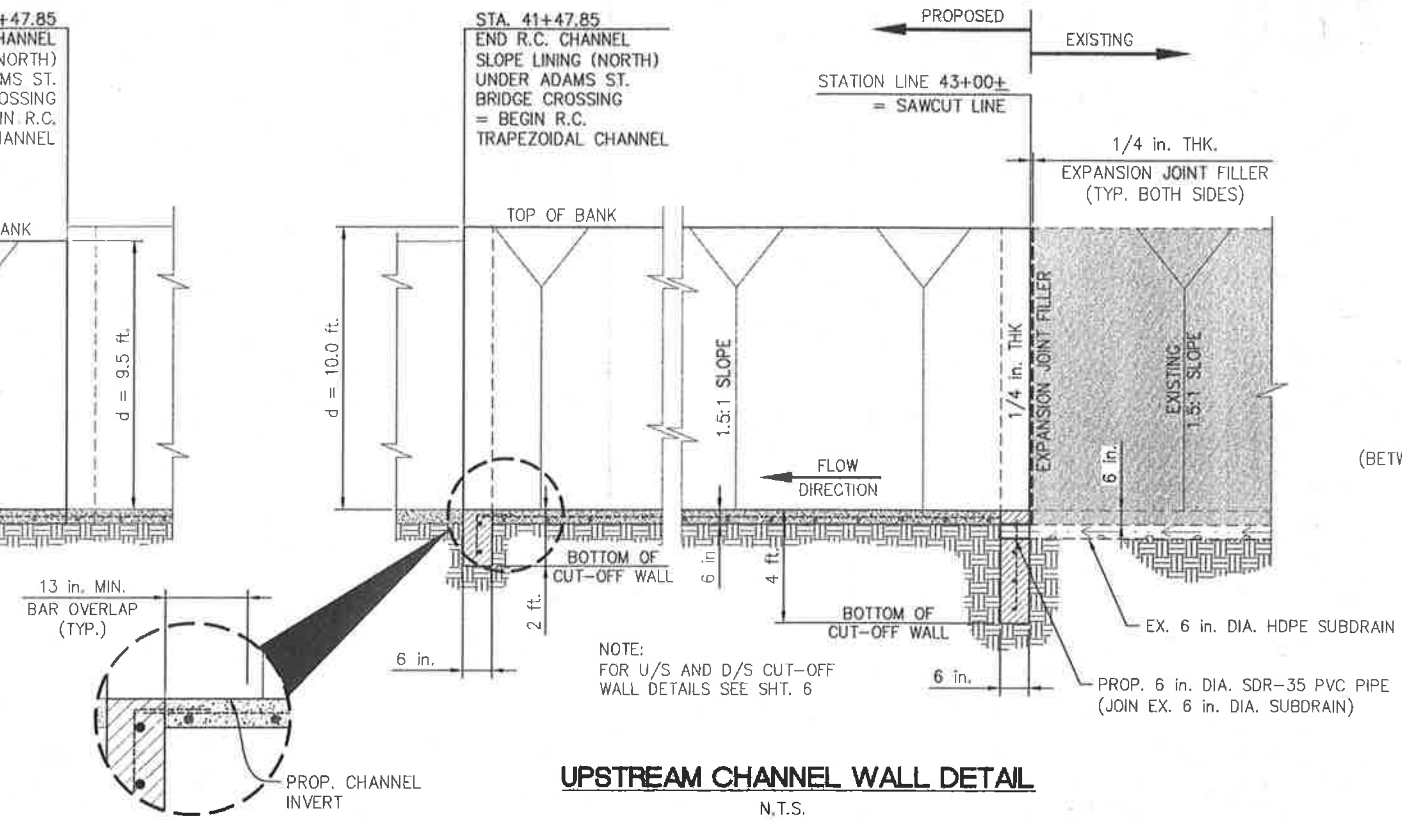
STA 47+00.00 TO STA 49+00.00

PROJECT NO. 7-0-01
DRAWING NO. 7-4
SHEET NO. 3 O



DOWNSTREAM CHANNEL WALL DETAIL

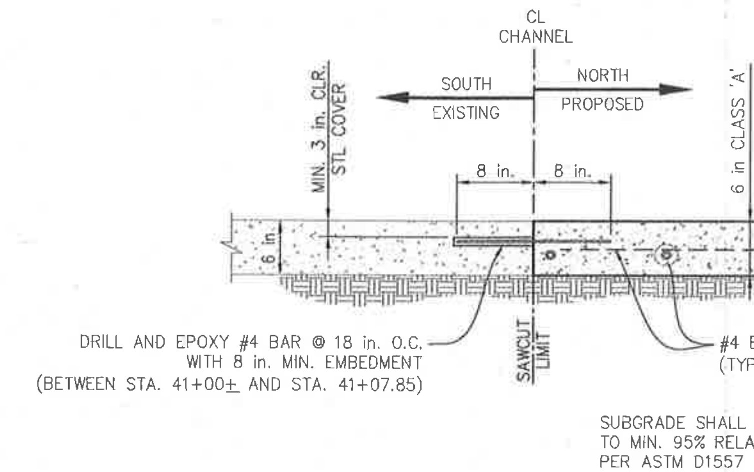
N.T.S.



UPSTREAM CHANNEL WALL DETAIL

N.T.S.

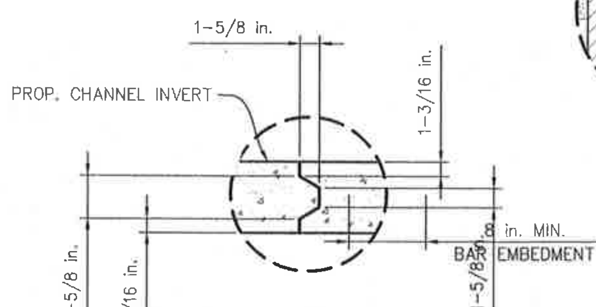
DETAIL-18: DOWNSTREAM 2 ft. CUT-OFF WALL AT STA. 41+47.85
DETAIL-11: UPSTREAM 4 ft. CUT-OFF WALL AT STA. 43+00±



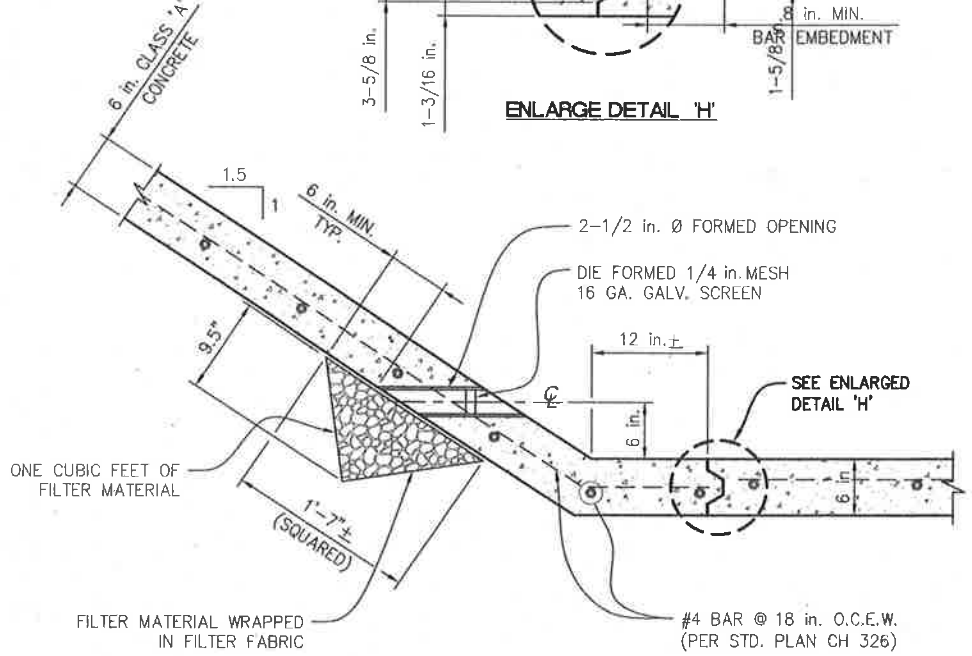
DETAIL 'E'

CENTERLINE INVERT JOINT DETAIL
AT STATIONS 41+07.85 & 41+47.85

N.T.S.



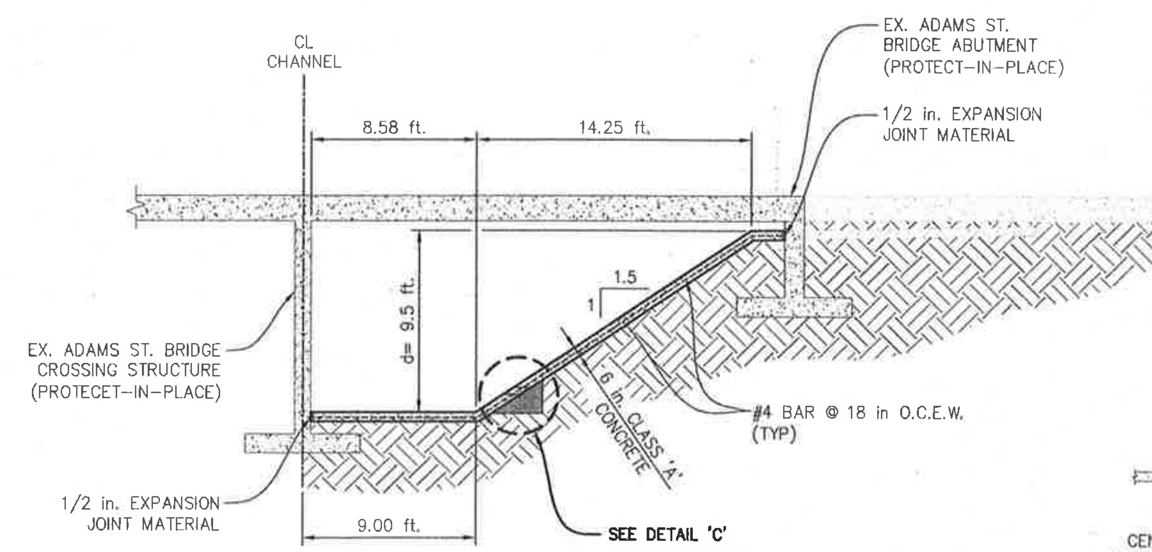
ENLARGE DETAIL 'H'



DETAIL 'C'

TYPICAL SECTION AND LOGITUDINAL CONSTRUCTION JOINT

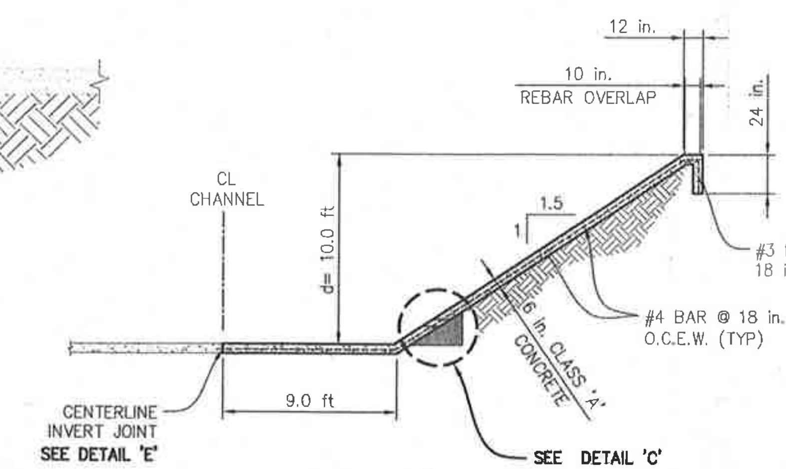
N.T.S.



DETAIL-15

CHANNEL SLOPE LINING UNDER ADAMS ST. BRIDGE CROSSING

SCALE: 1"= 5'



DETAIL-10 AND DETAIL-14

CHANNEL SLOPE LINING FROM STA. 41+00 TO STA. 41+07.85

SCALE: 1"= 5'

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JONIS C. SMITH R.C.E 58654
12/29/10
DATE

REGISTERED PROFESSIONAL ENGINEER JONIS C. SMITH C58654 Exp. 12/31/10 CIVIL STATE OF CALIFORNIA

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CHECKED BY:	J.C.S.

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B.M. NO. R-3-70

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RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: [signature] DATE: 15 FEB 2011

APPROVED BY: [signature] DATE: 15-Feb-2011

MURRIETA LINE F REPAIR

DETAILS

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Xrefs: 9320-details_final.dwg; 9320-tblk.dwg
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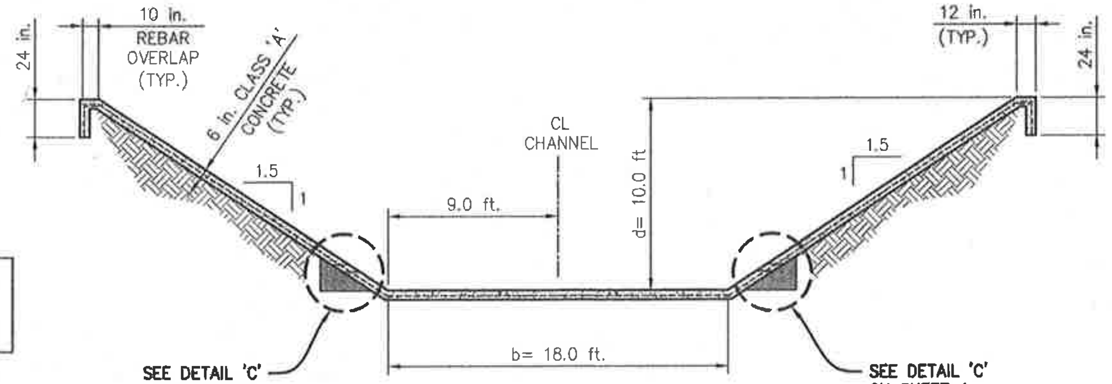


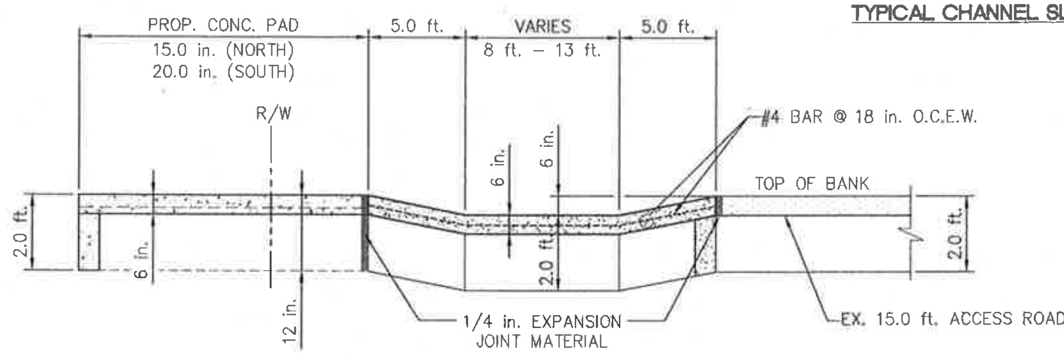
NOTE:

FOR U/S AND D/S CUT-OFF WALLS, SEE DETAILS 7, 8, 11 & 18 ON SHT. 6

DETAIL-9 AND DETAIL-15

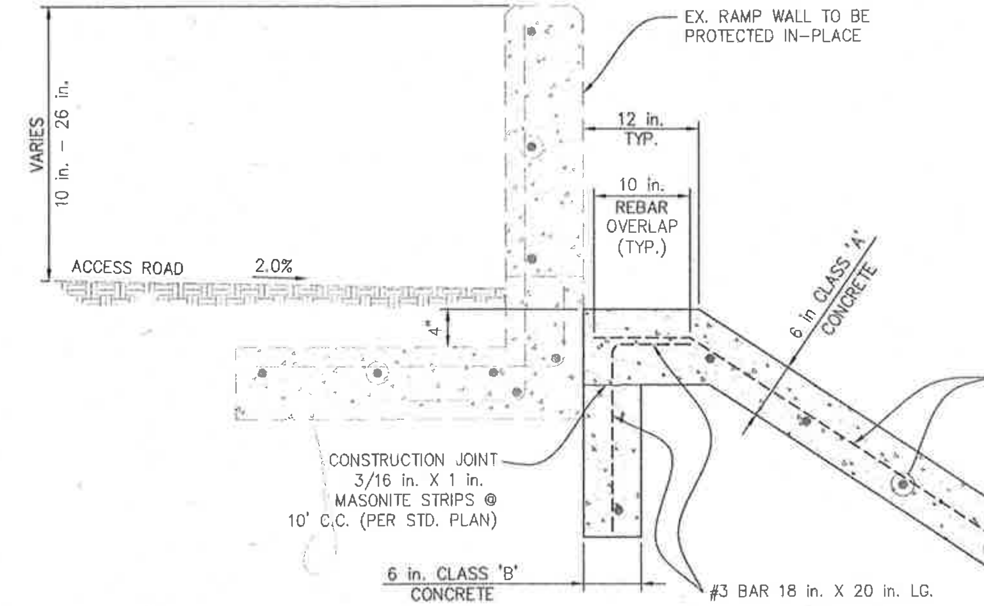
TYPICAL CHANNEL SLOPE LINING FROM STA. 41+47.85 TO STA. 43+00

SCALE: 1"=5'



SECTION N-N

N.T.S.



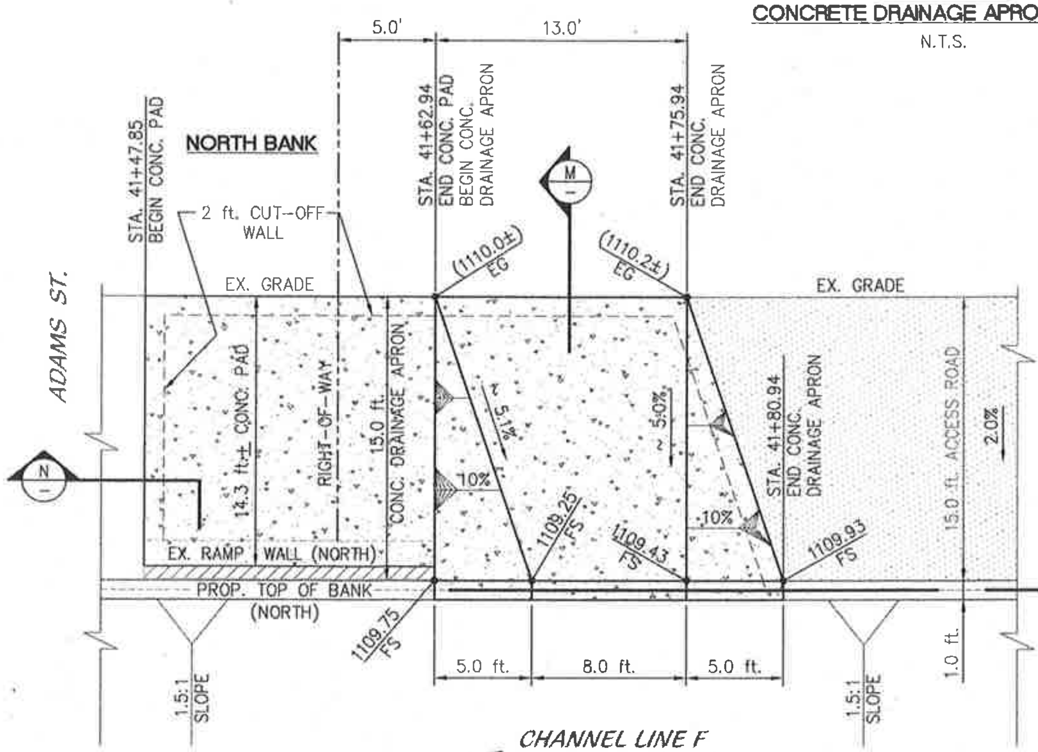
PROPOSED CHANNEL SLOPE LINING AT EXISTING RAMP WA

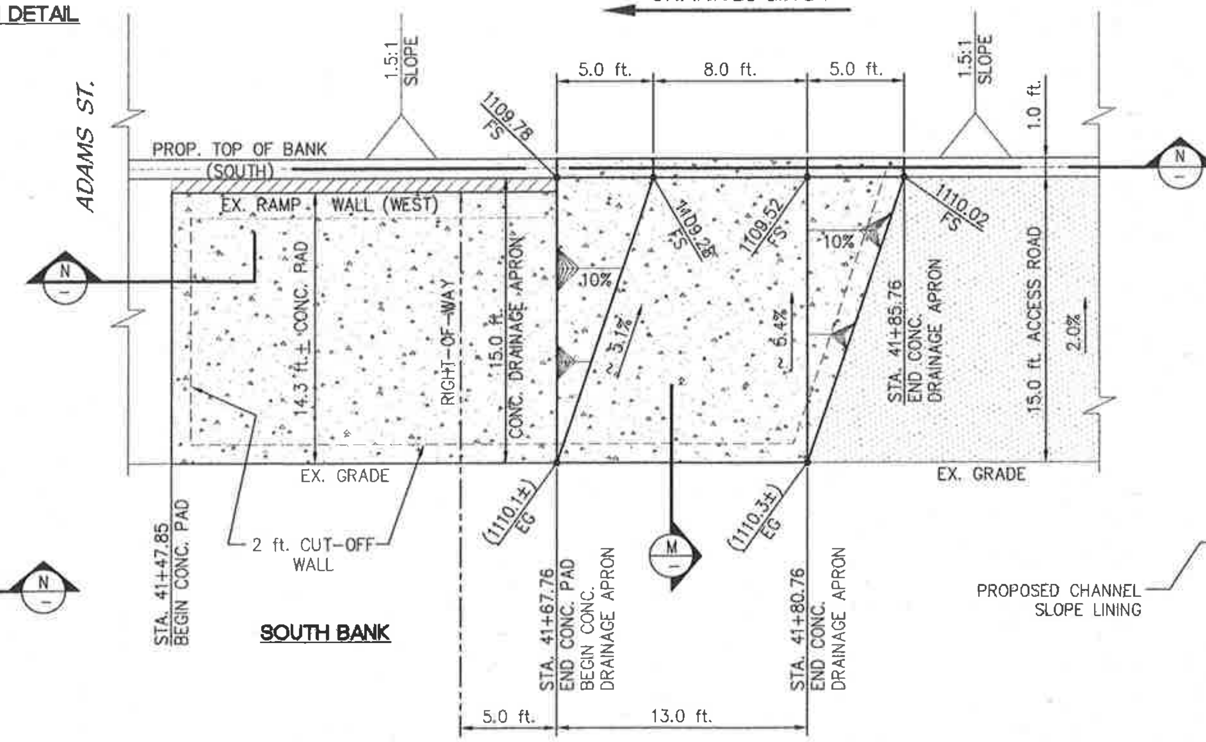
N.T.S.

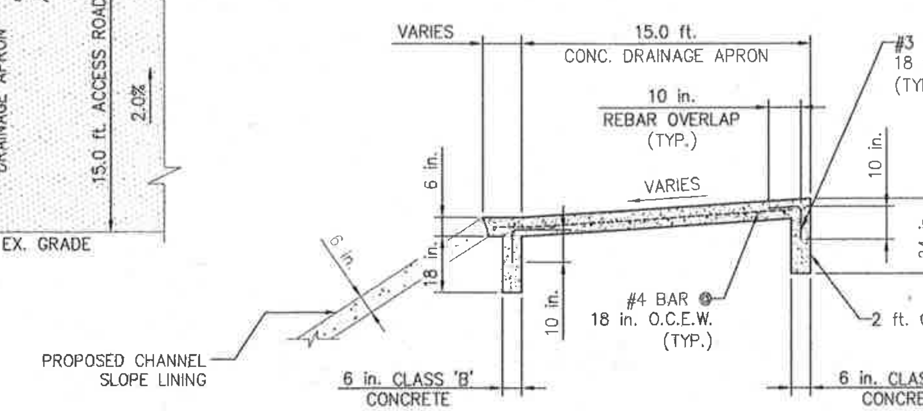
DETAIL-12

CONCRETE DRAINAGE APRON DETAIL

N.T.S.







SECTION 'M'

N.T.S.

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JONIS C. SMITH R.C.E. 58654 — 12/23/10 DATE

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MURRIETA LINE F REPAIR

DETAILS

Dimscale = 5; LTscale = 1; PSltscale = 1; ACAD Ver. = 17.1s (LMS Tech) ; Visretain = 1
Xrefs: 9320-details_final.dwg; 9320-tblk.dwg - Tab: SHT 5_DETAILS - by ltran on 12/23/10 at 1:32.05 PM
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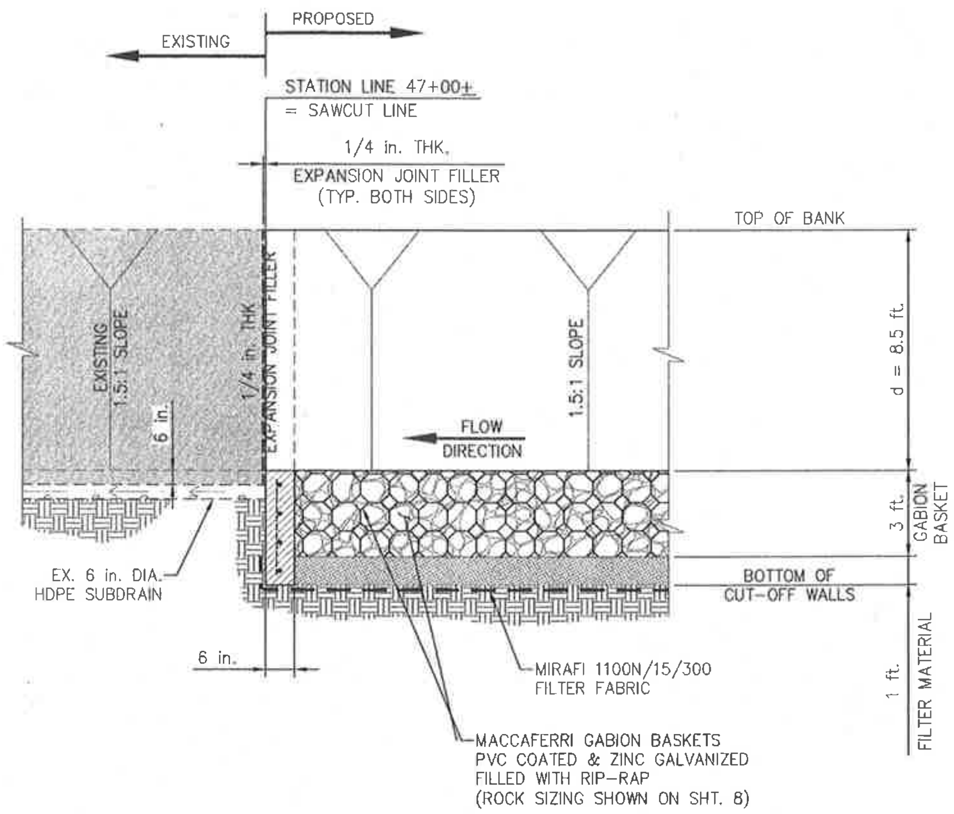
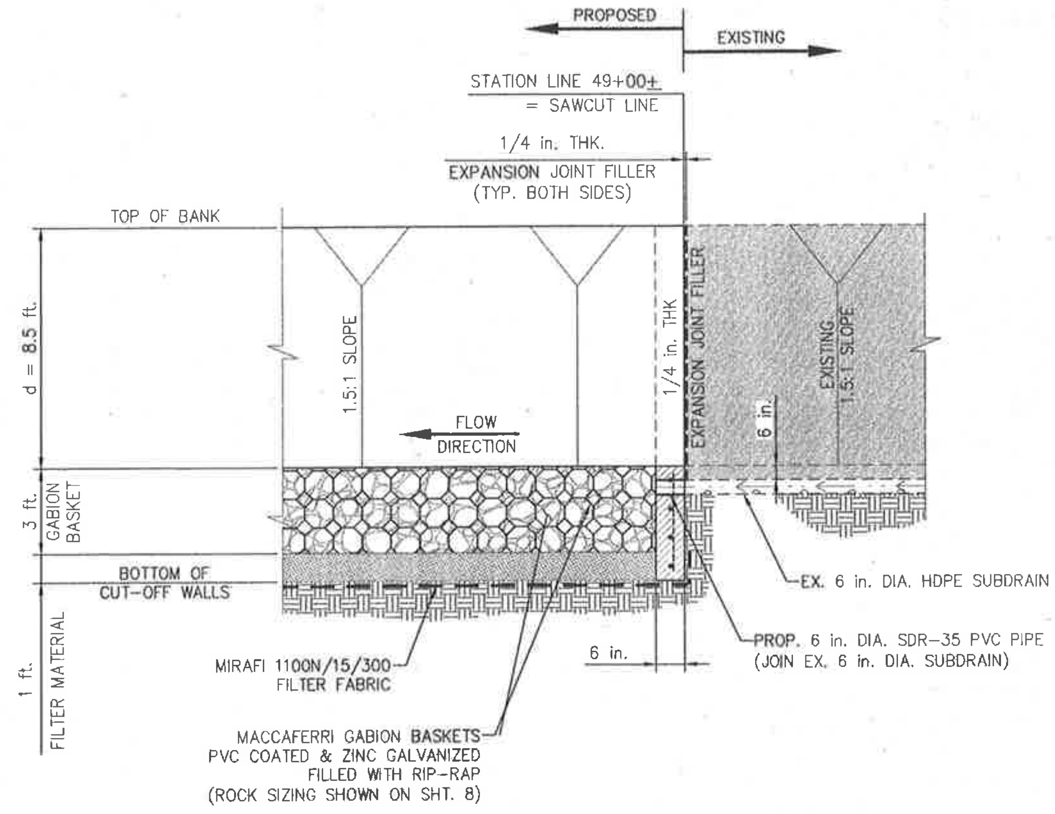


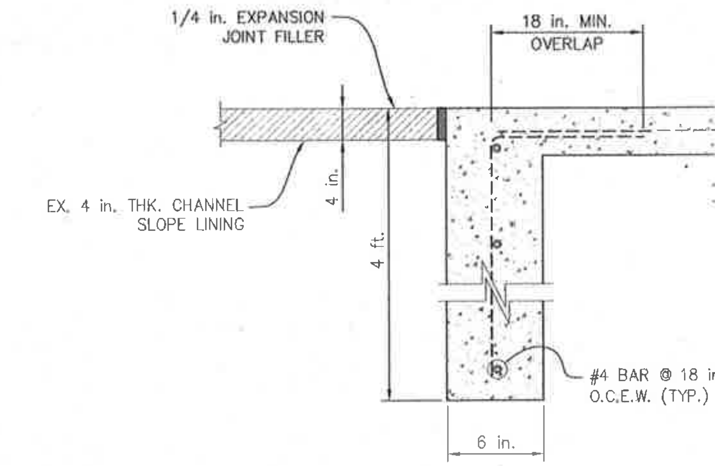
DOWNSTREAM TERMINUS TRANSVERSE CUT-OFF WALL DETAIL

N.T.S.



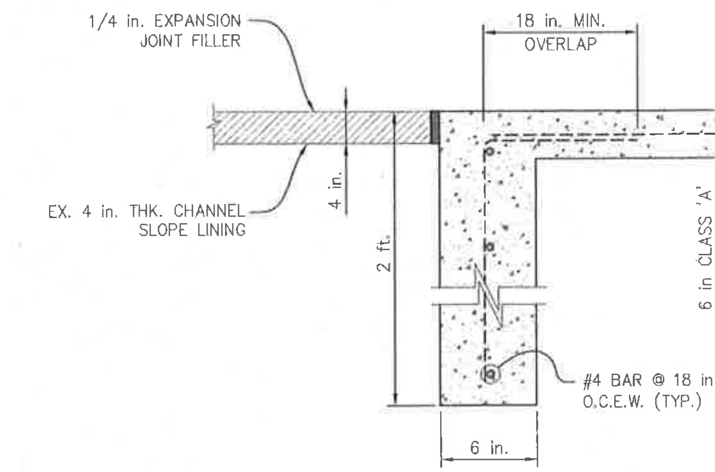
UPSTREAM TERMINUS TRANSVERSE CUT-OFF WALL DETAIL

N.T.S.



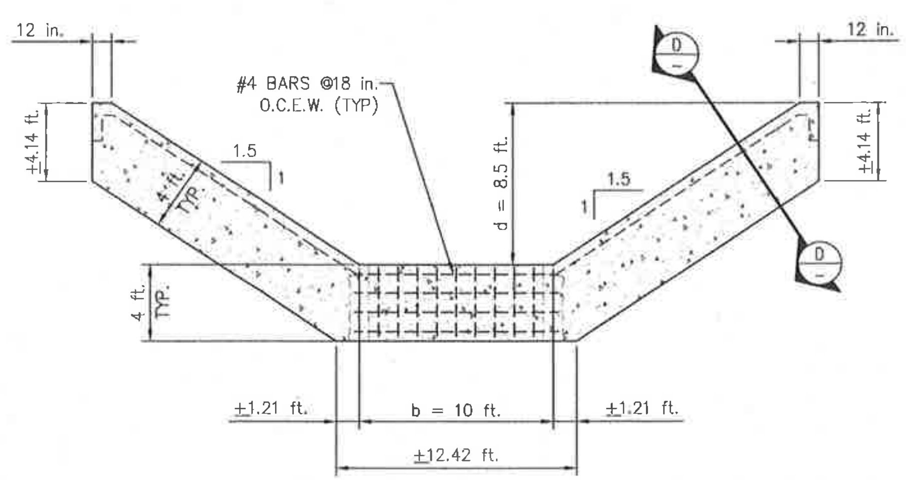
SECTION D-D

N.T.S.



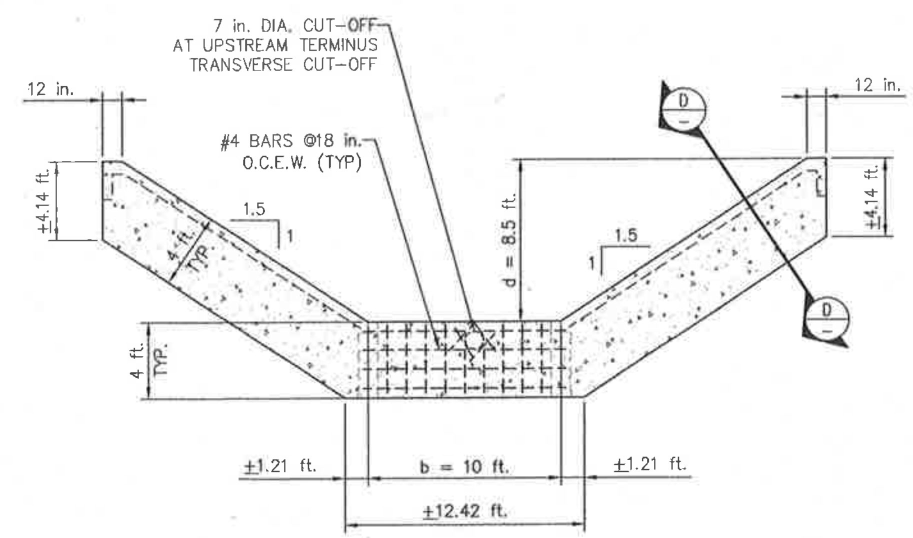
SECTION E-E

N.T.S.



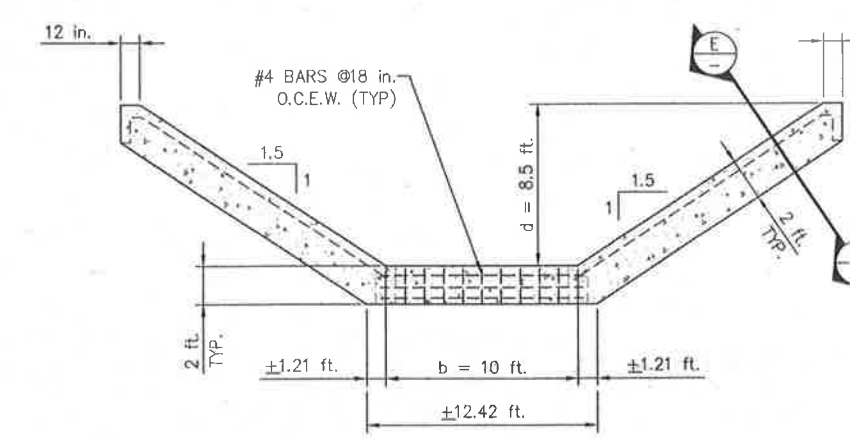
DOWNSTREAM END 4 ft. CUT-OFF WALL DETAIL-7

SCALE: 1"= 5'



UPSTREAM END 4 ft. CUT-OFF WALL DETAIL-8 AND DETAIL-11

SCALE: 1"= 5'



DOWNSTREAM END 2 ft. CUT-OFF WALL DETAIL-18

SCALE: 1"= 5'

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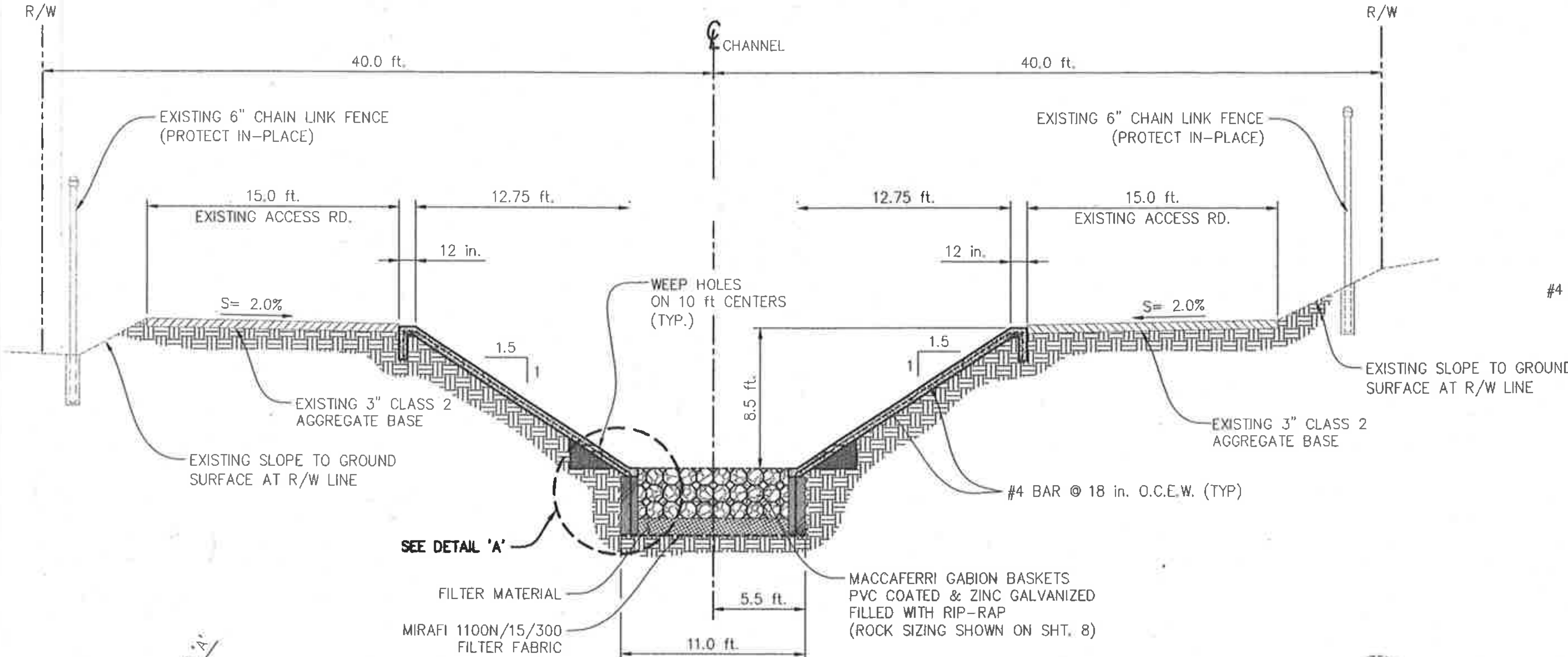
MURRIETA LINE F REPAIR

DETAILS

Dimscale = 5; Ltscale = 1; PSltscale = 1; ACAD Ver = 17.1s (LMS Tech); Visretain = 1 - Job: SHT 6_DETAILS_Final - by ltran on 12/23/10 at 1:38:19 PM
Xrefs: 9320-details_final.dwg, 9320-tblk.dwg
P:\9320E\Engineering\9320-XX (Channel Line F)\sheets\9320-SHT 4-7_DETLS_Final.dwg

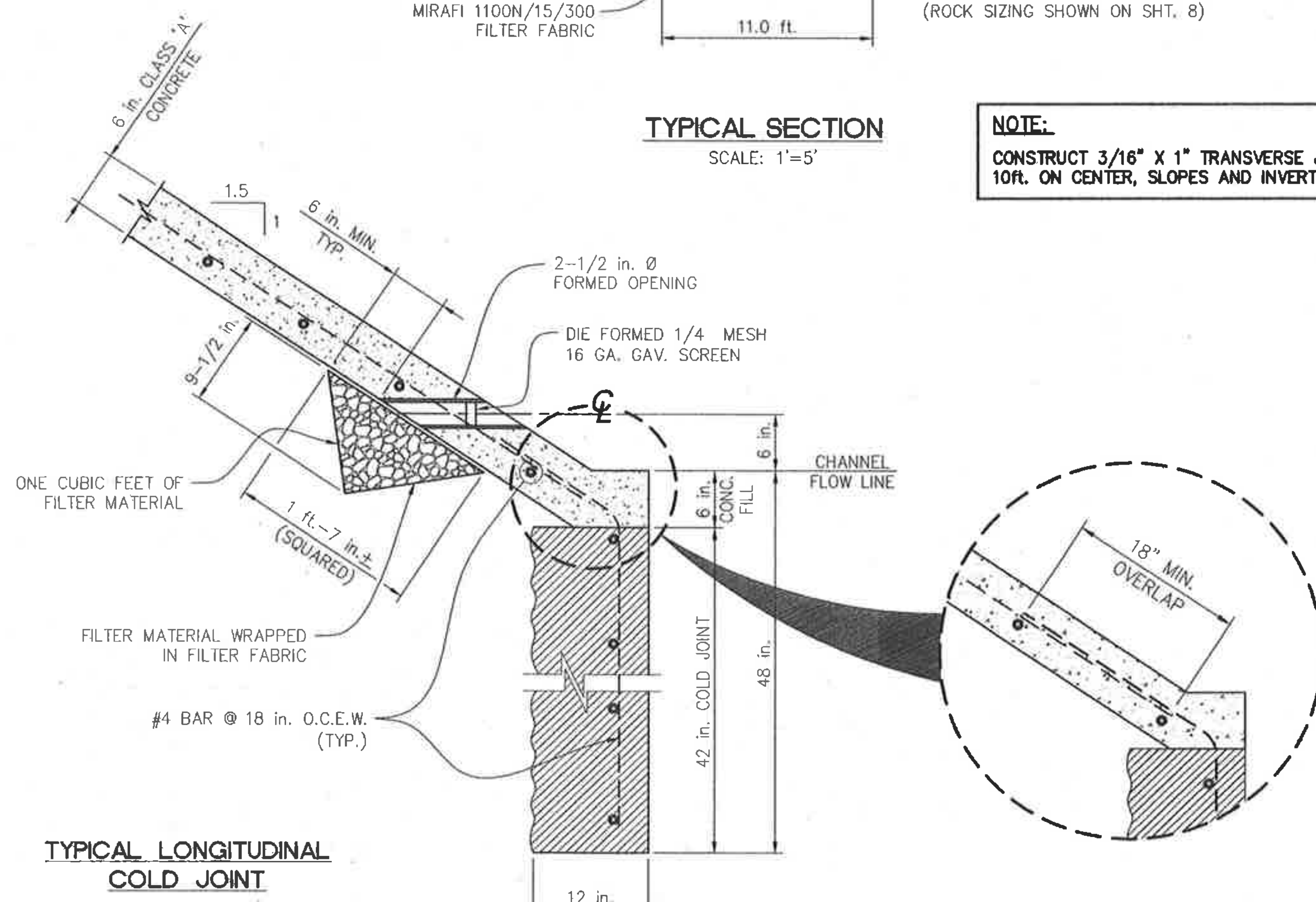


TYPICAL SECTION

SCALE: 1'=5'

NOTE:

CONSTRUCT 3/16" X 1" TRANSVERSE JOINTS 10ft. ON CENTER, SLOPES AND INVERT.



TYPICAL LONGITUDINAL COLD JOINT

DETAIL 'A'

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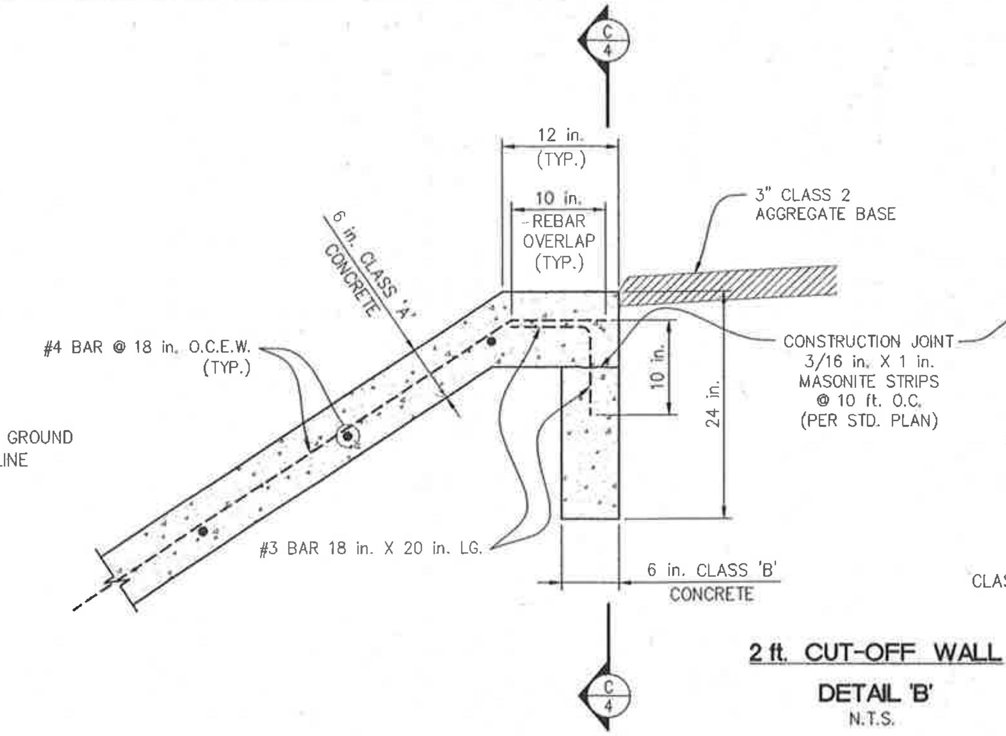

2 ft. CUT-OFF WALL

DETAIL 'B'

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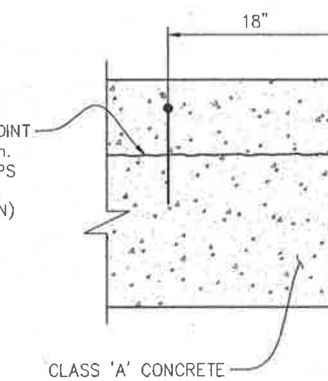
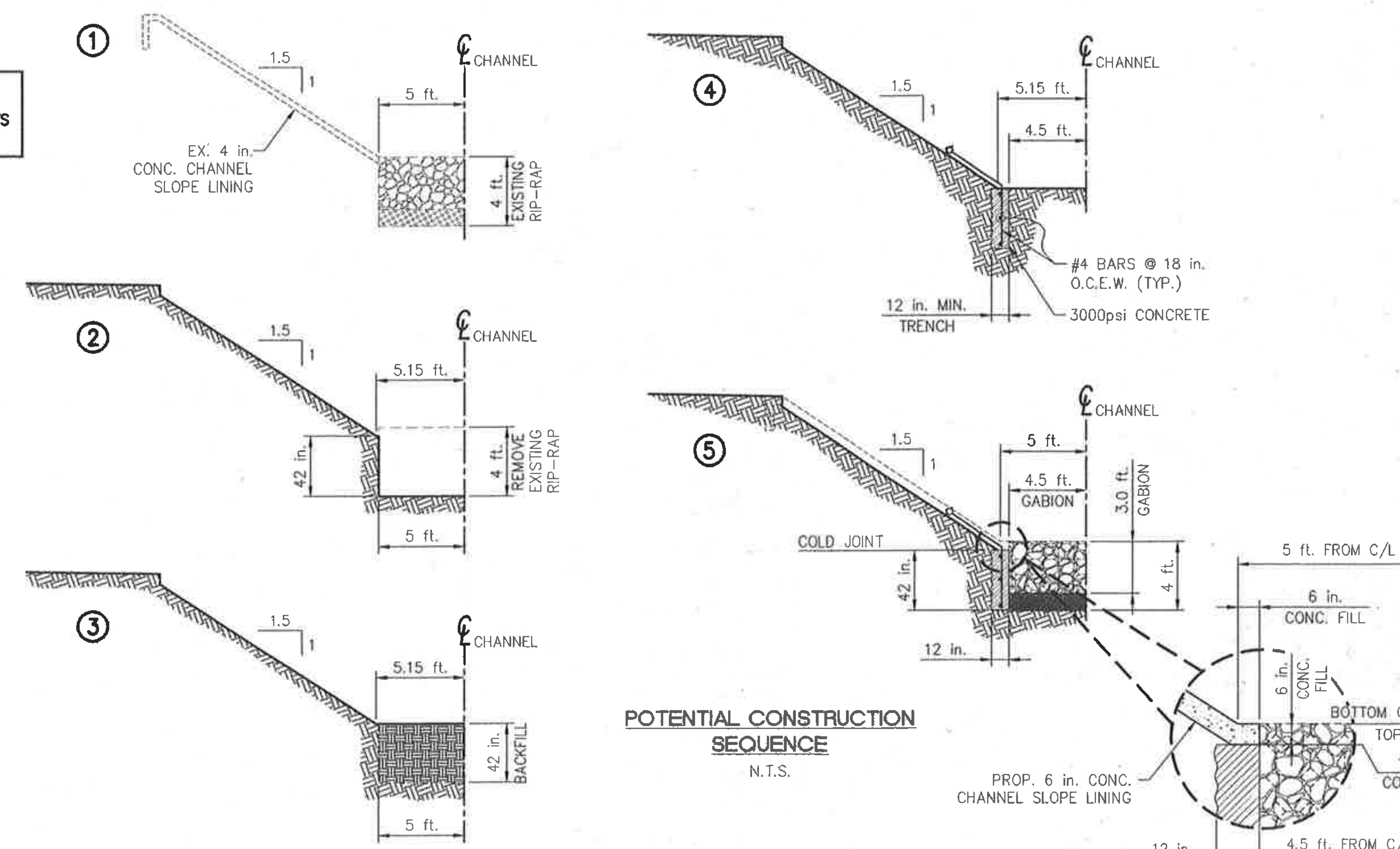


SECTION C-C



POTENTIAL CONSTRUCTION SEQUENCE

N.T.S.

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P:\9320E\Engineering\9320-XX (Channel Line F)\sheets\9320-SHT 4-7_DETLS_Final.dwg

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JONIS C. SMITH R.C.E 58654 — 1/12/11 DATE

REGISTERED PROFESSIONAL ENGINEER — JONIS C. SMITH — C058654 — Exp. 12/31/12 — CIVIL — STATE OF CALIFORNIA

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DESIGNED BY:	J.C.S.
DRAWN BY:	L.T.C.
DATE DRAWN:	APRIL 2010
CHECKED BY:	J.C.S.

BENCH MARK:

B.M. NO. R-3-70

BRASS DISK IN CONCRETE AT INTERSECTION OF JEFFERSON AVE. AND KALMIA ST.

REVISIONS

Rev.	DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: (signature) DATE: 15 FEB 2011

APPROVED BY: (signature) DATE: 15-FEB-2011

MURRIETA LINE F REPAIR

MODIFIED TRAPEZOIDAL CHANNEL DETAILS

PROJECT N[O.] 7-0-01[…]

DRAWING N[O.] 7-4[…]

SHEET NO. 7

GABION STRUCTURES - GALVANIZED AND PVC COATED TYPICAL CONSTRUCTION NOTES

1. **PRODUCT DESCRIPTION**

1.1 PVC GABIONS ARE BASKETS MANUFACTURED FROM 8X10 DOUBLE TWISTED HEXAGONAL WOVEN STEEL WIRE MESH, HEAVILY GALVANIZED THEN PVC COATED, AS PER ASTM A975-97 (SEE GABION TYPICAL DETAIL HEREON). GABIONS ARE FILLED WITH STONES AT THE PROJECT SITE TO FORM FLEXIBLE, PERMEABLE, MONOLITHIC STRUCTURES SUCH AS RETAINING WALLS, CHANNEL LININGS, AND WEIRS FOR EROSION CONTROL PROJECTS. THE STEEL WIRE USED IN THE MANUFACTURE OF THE GABION IS HEAVILY GALVANIZED SOFT TEMPER STEEL. THE STANDARD SPECIFICATIONS FOR MESH-WIRE ARE SHOWN IN TABLE 2 HEREON. THE GABION IS DIVIDED INTO CELLS BY DIAPHRAGMS POSITIONED AT APPROXIMATELY 3 FT (0.9 m) CENTERS (SEE GABION TYPICAL DETAIL HEREON). TO REINFORCE THE STRUCTURE, ALL MESH PANEL EDGES ARE SELVEDGED WITH A WIRE HAVING A GREATER DIAMETER (TABLE 3 HEREON). DIMENSIONS AND SIZES OF PVC COATED GABIONS ARE SHOWN IN TABLE 1 HEREON. GABIONS SHALL BE MANUFACTURED AND SHIPPED WITH ALL COMPONENTS MECHANICALLY CONNECTED AT A PRODUCTION FACILITY.

2. **MATERIALS**

BACKFILL MATERIAL SPECIFIED BELOW SHALL BE FREE DRAINING. BACKFILL MATERIALS SHALL BE APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE, AND SHALL MEET THE PHYSICAL PROPERTIES REQUIREMENTS AS RECOMMENDED BY GEOTECHNICAL ENGINEER OR AS SPECIFIED.

2.1 COBBLES MATERIAL SHALL BE A CLEAN CRUSHED STONE OR GRANULAR FILL MEETING THE FOLLOWING GRADATION.

Table 0 - Rock Sizing for Gabions

SIEVE SIZE	PERCENT PASSING
8"	100%
4"	0% to 50%

2.2 GABION WALL UNITS SHALL BE GALVANIZED THEN PVC COATED 8X10 HEXAGONAL DOUBLE TWIST WIRE MESH TYPE AS PER ASTM A975-97.

Table 1 - Size for Gabions

L= Length ft (m)	W= Width ft (m)	H= Height ft (m)	# of cells
4.5 (1.4)	3 (0.9)	3 (0.9)	1

Table 2—Standard mesh-wire

Type	D in. (mm)	Tolerance	Internal Wire Dia in. (mm)	External Wire Dia in. (mm)
8x10/ ZN+PVC	3.25 (83)	±10%	0.106 (2.70)	0.146 (3.70)

Table 3—Standard wire diameters

	Lacing Wire	Mesh Wire	Selvedge Wire / Preformed
PVC Mesh Diameter ø in. (mm)	0.087/0.127 (2.2/3.2)	0.106/0.146 (2.7/3.7)	0.134/0.174 (3.4/4.4)
Wire Tolerance (±) ø in. (mm)	0.004 (0.10)	0.004 (0.10)	0.004 (0.10)
Minimum Quantity/Zinc oz/ft² (g/m²)	0.70 (214)	0.80 (244)	0.85 (259)
Wire+PVC diameter in. (mm)	0.127 (3.20)	1.46 (3.70)	0.174 (4.40)

2.3 WIRE – ALL TESTS ON WIRE MUST BE PERFORMED PRIOR TO MANUFACTURING THE MESH. ALL WIRE SHALL COMPLY WITH ASTM A975-97. WIRE USED FOR THE MANUFACTURE OF GABIONS AND THE LACING WIRE, SHALL HAVE A MAXIMUM TENSILE STRENGTH OF 75,000 PSI (515 MPA) AS PER ASTM A641/A641M-03, SOFT TEMPER STEEL.

2.4 WOVEN WIRE MESH TYPE 8X10 -- THE MESH AND WIRE CHARACTERISTICS SHALL BE IN ACCORDANCE WITH ASTM A975-97 TABLE 1, MESH TYPE 8X10. THE NOMINAL MESH OPENING D = 3.25 IN. (83 mm) (FIG. 2 ON SHEET 9). THE MINIMUM MESH PROPERTIES FOR STRENGTH AND FLEXIBILITY SHALL BE IN ACCORDANCE WITH THE FOLLOWING: MESH TENSILE STRENGTH SHALL BE 3500 LB/FT (51.1 KN/m) MINIMUM WHEN TESTED IN ACCORDANCE WITH ASTM A975-97 SECTION 13.1.1. PUNCH TEST RESISTANCE SHALL BE A MINIMUM OF 6000 LB (26.7 KN) WHEN TESTED IN COMPLIANCE WITH ASTM A975-97 SECTION 13.1.4 CONNECTION TO SELVEDGES SHALL BE 1400 LB/FT (20.4 KN/m) WHEN TESTED IN ACCORDANCE WITH ASTM A975-97.

3. **FOUNDATION PREPARATION**

3.1 THE FOUNDATION ON WHICH THE GABIONS ARE TO BE PLACED SHALL BE LEVEL, AND GRADED TO THE ELEVATIONS AS SHOWN ON THE PROJECT CONSTRUCTION DRAWINGS. THE FOUNDATION FOR GABIONS SHALL BE LEVEL, SMOOTH, AND FREE OF SURFACE IRREGULARITIES, LOOSE MATERIAL, AND VEGETATION, IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. APPROPRIATE MEASURES SHALL BE TAKEN FOR FILTERING AND DRAINAGE OF THE FOUNDATION, AS PER THE PROJECT SPECIFICATIONS (FILTER CLOTH, DRAIN WORKS, ETC.). GEOTEXTILES REQUIRED TO BE INSTALLED BEHIND GABION STRUCTURES SHALL COMPLY WITH THE REQUIREMENTS FOR SUBSURFACE DRAINAGE APPLICATIONS.

4. **CONSTRUCTION**

4.1 ASSEMBLY – OPEN AND UNFOLD EACH GABION ON A FLAT, HARD SURFACE AND REMOVE ANY SHIPPING FOLDS IF NECESSARY. THIS CAN BE DONE BY PLACING THE FOLD OVER A 2' X 4' BOARD AND WALKING ALONG THE SIDES. LIFT UP THE SIDES, ENDS AND DIAPHRAGMS INTO A VERTICAL POSITION TO FORM AN OPEN BOX SHAPE (STEP 3 OF GABION FOLDING PROCESS). CONNECT THE EDGES OF THE GABION AND DIAPHRAGMS BY USING EITHER LACING WIRE OR RING FASTENERS (FIG. 3 ON SHEET 9). THE USE OF PLIERS TO AID ASSEMBLY AND TYING OF THE UNITS USING THE LACING WIRE SUPPLIED WITH THE GABIONS IS NORMALLY RECOMMENDED.

4.2 FASTENING PROCEDURE – WHEN USING LACING WIRE, CUT OFF A PIECE OF WIRE APPROXIMATELY 1.5 TIMES THE LENGTH OF THE EDGE TO BE TIED. LONGER EDGES SHALL BE JOINED BY SEVERAL LENGTHS OF WIRE. TIE WIRES SHALL BE SECURED AROUND THE SELVEDGE WIRE OR HEAVIER EDGE WIRE, WHERE PRESENT, BY LOOPING AND TWISTING THE LACING WIRE AROUND ITSELF. PROCEED TYING WITH ALTERNATE DOUBLE AND SINGLE LOOPS. DOUBLE LOOPS SHALL BE MADE AT INTERVALS NOT GREATER THAN 6 IN. (150 MM). PULL BASKETS TIGHTLY TOGETHER DURING THE TYING OPERATION. THE OTHER END OF THE TIE WIRE SHALL BE SECURED BY AGAIN LOOPING AND TWISTING THE WIRE AROUND ITSELF. WHEN STEEL RING FASTENERS ARE USED (FIG. 4 ON SHEET 9). THE USE OF EITHER A MECHANICAL OR A PNEUMATIC FASTENING TOOL (FIG. 5 ON SHEET 9) IS REQUIRED. SPACING OF THE RINGS SHALL BE IN ACCORDANCE WITH ASTM A975-97, TABLE 2 MINIMUM STRENGTH REQUIREMENTS OF MESH AND CONNECTIONS IN ANY CASE, RING FASTENERS SPACING SHALL NOT EXCEED 6 IN. (150 MM). RINGS SHALL BE INSTALLED AT THE END AND CENTER DIAPHRAGMS AND ALONG ALL EDGES. CARE SHALL BE TAKEN TO ENSURE THE STEEL RING FASTENER IS COMPLETELY CLOSED AFTER INSTALLATION.

4.3 INSTALLATION AND FILLING – GABIONS SHALL BE CONNECTED TOGETHER AND ALIGNED BEFORE FILLING THE BASKETS WITH ROCK. ROCKS FOR GABIONS MAY BE PRODUCED BY ANY SUITABLE QUARRYING METHOD, AND BY THE USE OF ANY DEVICE THAT YIELDS THE REQUIRED SIZES WITHIN THE GRADATION LIMITS CHOSEN. ROCKS SHALL BE HARD, ANGULAR TO ROUND, DURABLE AND OF SUCH QUALITY THAT THEY SHALL NOT DISINTEGRATE ON EXPOSURE TO WATER OR WEATHERING DURING THE LIFE OF THE STRUCTURE. GABION ROCKS SHALL RANGE BETWEEN 4 AND 8 IN. (100 – 200 MM). THE RANGE IN SIZES MAY ALLOW FOR A VARIATION OF 5% OVERSIZE AND/OR 5% UNDERSIZE ROCK, PROVIDED IT IS NOT PLACED ON THE GABION'S EXPOSED SURFACE. IN ALL CASES, THE OVERSIZE ROCK SHALL NOT BE LARGER THAN 10 IN. (250 MM), AND THE UNDERSIZE ROCK SHALL NOT BE SMALLER THAN 2 IN. (50 MM). DURING THE FILLING OPERATION SOME MANUAL STONE PLACEMENT IS REQUIRED TO MINIMIZE VOIDS. THE EXPOSED FACES OF VERTICAL STRUCTURES MANY BE CAREFULLY HAND PLACED TO GIVE A NEAT, FLAT, AND COMPACT APPEARANCE. THE CELLS SHALL BE FILLED IN STAGES SO THAT LOCAL DEFORMATION MAY BE AVOIDED. THAT IS, AT NO TIME, SHALL ANY CELL BE FILLED TO A DEPTH EXCEEDING 1 FT (300 MM) HIGHER THAN THE ADJOINING CELL (FIG. 6a – 6c ON SHEET 9). GALVANIZED AND PVC COATED STIFFENERS OR CROSSTIES SHALL BE INSTALLED AS INDICATED (FIGS 8a & 8b, 9a & 9b HEREON), FIXED AT 1/3 AND 2/3 OF THE HEIGHT FOR 3 FT OR 1 M GABIONS AS THE CELL IS BEING FILLED. IN 1.5 FT (500 MM) HIGH UNIT STIFFENERS MAY BE FIXED AT THE HALF HEIGHT LEVEL, IF REQUIRED. PREFORMED CORNER STIFFENERS ARE INSTALLED AT 45° TO THE FACE/SIDE OF THE UNIT, EXTENDING AN EQUAL DISTANCE ALONG EACH SIDE BEING BRACED (APPROXIMATELY 1 FT [300MM]). WHEN MORE THAN ONE LAYER OF GABIONS IS REQUIRED, IN ORDER FOR THE INDIVIDUAL UNITS TO BECOME INCORPORATED INTO ONE CONTINUOUS STRUCTURE, THE NEXT LAYER OF GABIONS MUST BE CONNECTED TO THE LAYER UNDERNEATH AFTER THIS LAYER HAS BEEN SECURELY CLOSED.

4.4 CUTTING AND FOLDING – WHERE SHOWN ON THE DRAWINGS OR OTHERWISE DIRECTED BY THE ENGINEER, THE GABION MESH SHALL BE CUT, FOLDED AND FASTENED TOGETHER TO SUIT EXISTING SITE CONDITIONS. THE MESH MUST BE CLEANLY CUT AND THE SURPLUS MESH FOLDED BACK AND NEATLY WIRED TO AN ADJACENT GABION. THE CUT EDGES OF THE MESH SHALL BE SECURELY FASTENED TOGETHER WITH LACING WIRE OR FASTENERS IN THE MANNER DESCRIBED IN THE NOTES HEREON. ANY RESHAPED GABIONS SHALL BE ASSEMBLED, INSTALLED, FILLED AND CLOSED AS SPECIFIED IN THE NOTES HEREON.

4.5 CLOSING – TO ALLOW FOR SETTLEMENT, LEVEL OFF THE FILL 1-1.5 IN. (25-40 MM) ABOVE THE TOP OF THE MESH. FOLD THE LID DOWN AND PULL THE EDGES OF THE PANELS TO BE CONNECTED USING AN APPROPRIATE TOOL SUCH AS A LID CLOSER (FIG. 5 ON SHEET 9). THE LIDS SHALL BE TIGHTLY LACED ALONG ALL EDGES, ENDS AND DIAPHRAGMS IN THE SAME MANNER AS DESCRIBED FOR ASSEMBLING UNITS (FIG. 7a – 7b ON SHEET 9). ADJACENT LIDS MAY BE SECURELY ATTACHED SIMULTANEOUSLY. ALL END WIRES SHALL THEN BE TURNED IN TO AVOID PROTRUSIONS.

4.6 TESTING METHODS – TESTING METHODS AND FREQUENCY, AND VERIFICATION OF MATERIAL SPECIFICATIONS AND COMPACTION SHALL BE THE RESPONSIBILITY OF THE OWNER'S GEOTECHNICAL ENGINEER, UNDER THE DIRECTION OF THE OWNER. THE SHEAR STRENGTH TESTING OF REINFORCED BACKFILL SHALL BE REQUIRED FOR EVERY 1000 CUBIC YARDS PLACED OR IF THE NATURE OF BACKFILL SOIL VISUALLY CHANGES.

5. **TECHNICAL REQUIREMENTS**

5.1 THE CONTRACTOR SHALL HAVE AN APPROVED SET OF CONSTRUCTION DRAWINGS AND CONTRACT SPECIFICATIONS ON-SITE AT ALL TIMES DURING CONSTRUCTION OF THE GABION WALL STRUCTURE.

5.2 GABION SHALL BE PLACED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE PROJECT DRAWING SHEETS.

5.3 TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GABION WALL. A MINIMUM FILL THICKNESS OF 6 IN. (150MM) IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GABION WALL. TURNING OF TRACKED VEHICLES SHALL BE KEPT TO A MINIMUM TO PREVENT DISPLACING THE FILL AND/OR THE GABION WALL.

6. **DRAINAGE**

6.1 THE BACKFILL SURFACE SHALL BE GRADED AWAY FROM THE WALL FACE. A MINIMUM OF 2 PERCENT SLOPE AND A TEMPORARY SOIL BERM SHALL BE CONSTRUCTED NEAR THE WALL CREST TO PREVENT SURFACE AND WATER RUNOFF FROM OVERTOPPING THE WALL. GRADING SHALL BE PERFORMED AT THE END OF EACH WORK DAY.

6.2 AT THE END OF EACH WORK DAY, BACKFILL SURFACE SHALL BE COMPACTED WITH A SMOOTH WHEEL ROLLER TO MINIMIZE PONDING OF WATER AND SATURATION OF THE BACKFILL.

6.3 THE ENGINEERING, DESIGN ANALYSIS, DETAILING AND MITIGATION OF BOTH SURFACE DRAINAGE AND SEEPAGE OF GROUNDWATER SHALL BE THE RESPONSIBILITY OF THE OWNER OR OWNER'S REPRESENTATIVE.

6.4 PERMANENT SURFACE WATER DIVERSION AND / OR COLLECTION SHALL BE AS REQUIRED AND PROVIDED BY THE OWNER OR OWNER'S REPRESENTATIVE.

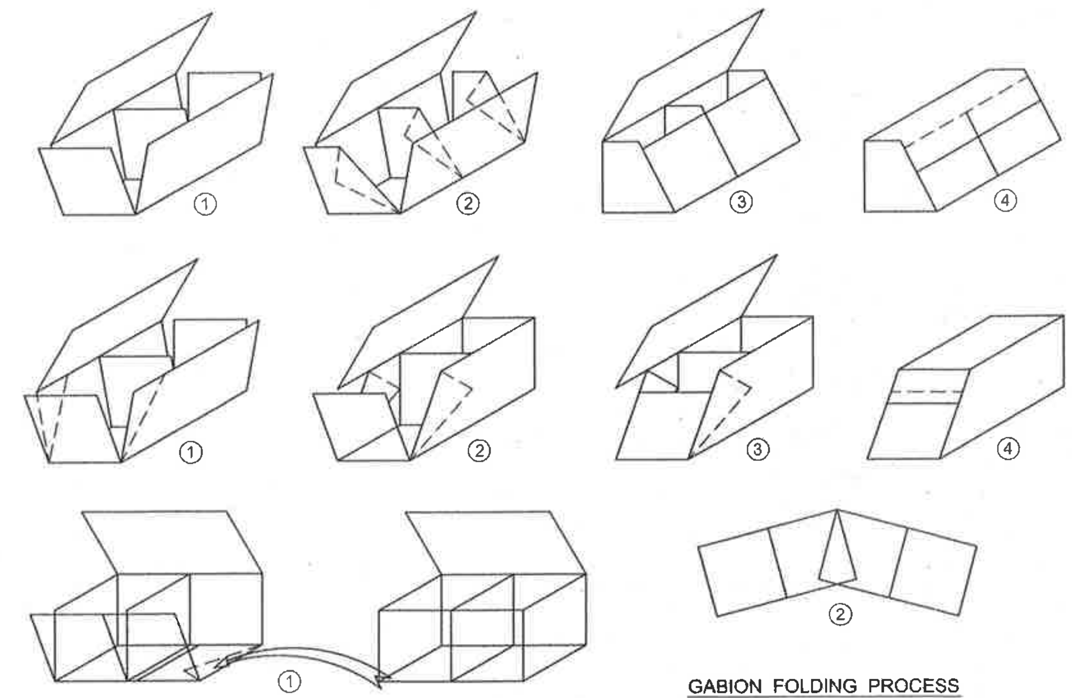
GABION TYPICAL DETAIL NOTES

1. MACCAFERRI GABIONS ARE DELIVERED TO THE JOB SITE IN BUNDLES. THEY ARE COMPRESSED AND STRAPPED IN THE FACTORY FOR EASIER SHIPPING AND HANDLING.
2. OPEN AND UNFOLD THE GABIONS ONE BY ONE ON A FLAT, HARD SURFACE. ELIMINATE ALL FOLDS DUE TO THE PACKAGING.
3. PULL UP THE SIDES AND THE DIAPHRAGMS TO FORM AN OPEN BOX. BE SURE THE TOP OF THE FACE AND THE SIDE ARE AT THE SAME LEVEL.
4. FOLD BY HAND THE END OF THE REINFORCING WIRE OF THE MAIN UNIT AND THE DIAPHRAGMS ALLOWING THE GABION TO STAND BY ITSELF.
5. EDGES ARE JOINED TOGETHER, USING THE APPROPRIATE LACING TECHNIQUES OR FASTENERS.

   LACING: GALVENIZED AND PVC COATED CONTINUOUS WIRE LOOPED TIGHTLY AROUND EVERY OTHER MESH OPENING, ALTERNATING SINGLE AND DOUBLE LOOPS (FIG. 3a ON SHEET 9).

   FASTENERS: USE A PNEUMATIC OR HAND POWER TOOL, EMPLOYING STAINLESS STEEL "C" SHAPED FASTENERS OR EQUIVALENT (FIG. 4 ON SHEET 9). FOR CONTINUITY AND STRENGTH, THE RECOMMENDED SPACING IS 8 TO 12 cm, MAX. 150mm (FIG 3b ON SHEET 9).

6. FILL THE CELLS WITH STONE IN 1/3 HEIGHT INCREMENTS UTILIZING CROSSTIES OR STIFFENERS PER GABION TYPICAL CONSTRION NOTES 4.3 & 4.4 AND REINFORCING DETAILS HEREON.
7. LACE OR RING THE GABION LID TO THE SIDES, ENDS, DIAPHRAGMS AND ADJOINING GABIONS PER GAION TYPICAL CONSTRUION NOTE 4.4 HEREON. GABIONS WITH LIDS AT FINISH GRADE ELEVATIONS SHALL UTILIZE THE LID ASSEMBLE DETAILS ON SHEET 9.



GABION FOLDING PROCESS
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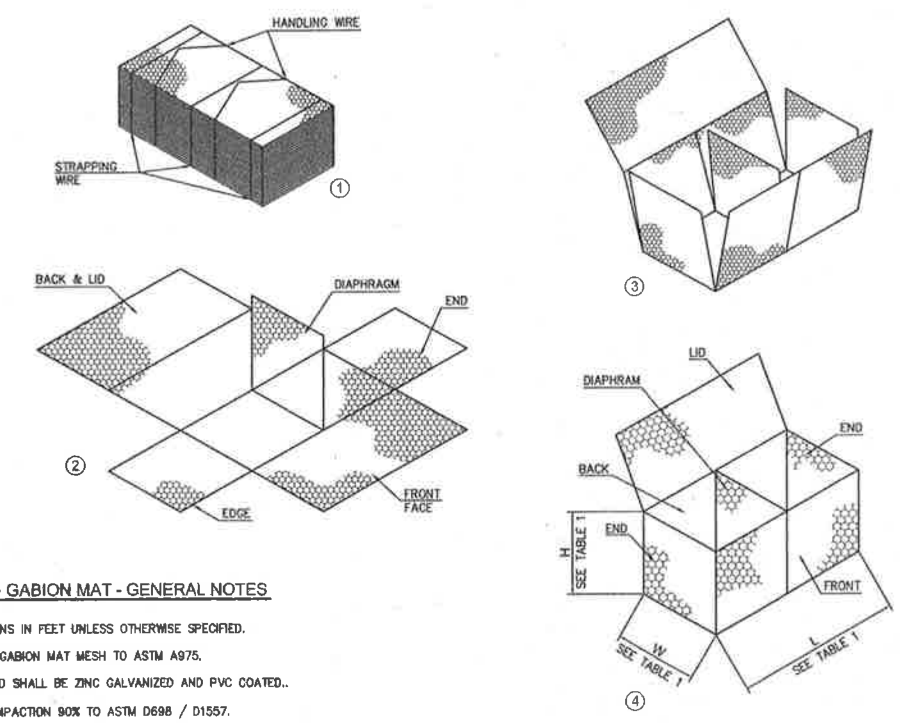


GABION TYPICAL DETAIL
N.T.S.

GABION AND GABION MAT - GENERAL NOTES

1. ALL DIMENSIONS IN FEET UNLESS OTHERWISE SPECIFIED.
2. GABION AND GABION MAT MESH TO ASTM A975.
3. GABIONS USED SHALL BE ZINC GALVANIZED AND PVC COATED..
4. BACKFILL COMPACTION 90% TO ASTM D698 / D1557.
5. GABION FILL TO ASTM D6711:
   - 5.1. ROCK SIZE — 4" TO 8", D50= 6"
   - 5.2. ROCK UNIT WEIGHT — 157 PCF MIN.
   - 5.3. VOIDS — 30% MAX.
6. GABION SIZE 4.5x3x3 WITH 6x8 MESH LIDS PER LID ASSEMBLY DETAIL CAN BE USED IN LIEU OF GABION MATS.
7. THIS IS A TYPICAL DESIGN AND IS VALID ONLY FOR THE STATED DESIGN PARAMETERS ANY VARIATION FROM THE DESIGN PARAMETERS RENDERS THE DESIGN VOID AND WILL REQUIRE A NEW DESIGN.
8. IT IS THE RESPONSIBILITY OF THE OWNER OR THE OWNER'S REPRESENTATIVE TO VERIFY THE SOIL PARAMETERS PRIOR TO CONSTRUCTION.

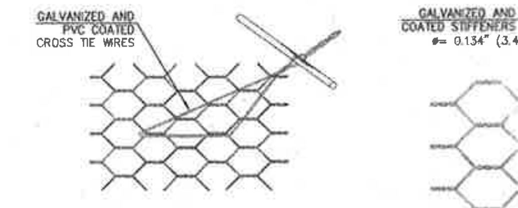
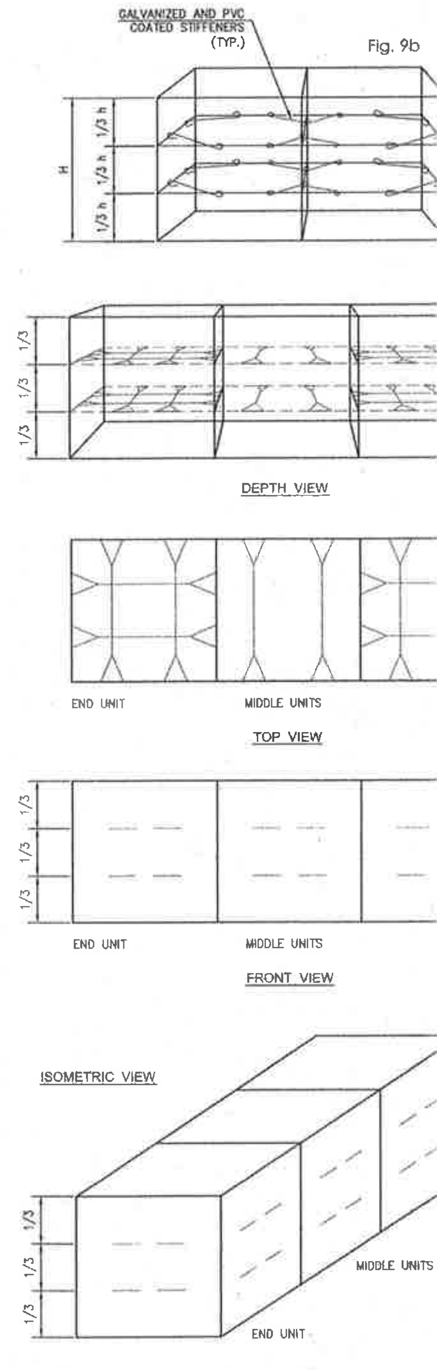


Fig. 8a



GABION REINFORCING DETAILS
N.T.S.

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JONIS C. SMITH R.C.E 58654 — 12/23/10 DATE

REGISTERED PROFESSIONAL ENGINEER JONIS C. SMITH C058654 CIVIL STATE OF CALIFORNIA

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DRAWN BY: L.T.C.
DATE DRAWN: APRIL 2010
CHECKED BY: J.C.S.

BENCH MARK:
B.M. NO. R-3-70
BRASS DISK IN CONCRETE AT INTERSECTION OF JEFFERSON AVE. AND KALMIA ST.

REVISIONS		ENGINEER		RCFC/	
Rev.	DESCRIPTION	APPR.	DATE	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: (signature) DATE: 15 FEB 2011
APPROVED BY: (signature) DATE: 15-Feb-2011

MURRIETA LINE F REPAIR

GABION NOTES AND DETAILS

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MESH TYPE 8x10

MESH TYPE 6x8

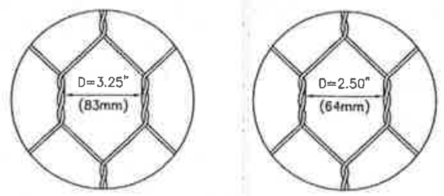

Fig. 2

NOTES:

a. THE TOLERANCE OF THE MESH OPENING "D" (THE DISTANCE BETWEEN THE AXIS'S OF TWO PARALLEL TWISTS) IS ACCORDING TO ASTM A975-97.

b. MESH TYPE 6x8 SHALL BE USED FOR THE LIDS OF ALL GABION MATS AND GABIONS AT FINISH GRADE ELEVATIONS PER LID ASSEMBLY DETAIL HEREON.

MESH TYPE DETAIL

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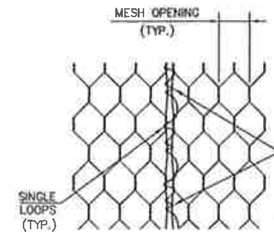
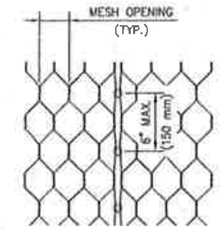


LACING WIRE
GALVANIZED AND PVC COATED
(SEE NOTE 2.1.4 HEREON)

Fig. 3a

Fig. 3



GALVANIZED FASTENERS
SPENAX OR EQUIVALENT
(SEE NOTE 2.1.6 HEREON)

Fig. 3b

JOINING DETAIL

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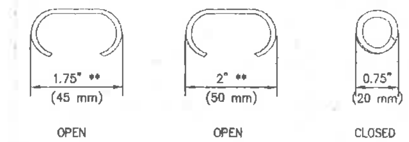

** SEE NOTE a. BELOW

Fig. 4

NOTES:

a. SPENAX FASTENER ø = 2 In (50mm) OPEN TO BE USED FOR 8x10 MESH AND SPENAX FASTENER ø = 1.75 in (45mm) OPEN TO BE USED FOR 6x8 MESH. SPENAX FASTENER ø = 0.75 in (20mm) CLOSED WITH 1 In (25mm) OVERLAP.

b. SPENAX FASTENER HAS 170 KG/mm² BREAKING LOAD.

c. SPENAX FASTENER WIRE ø = 0.120 In (3.00mm)

d. SPENAX FASTENER SHALL BE ZINC GALVANIZED.

e. SEE NOTE 2.1.6 HEREON.

f. SPENAX OR APPROVED EQUIVALENT.

FASTENER DETAIL

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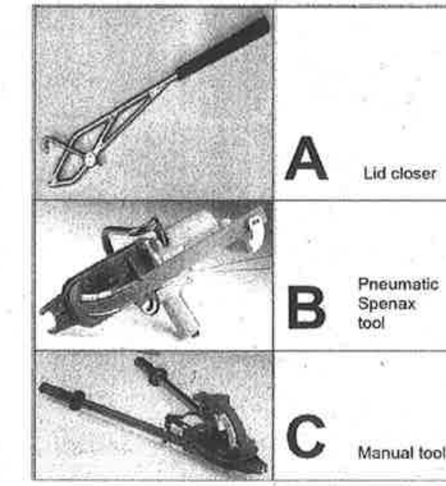


FASTENING TOOL

Fig. 5

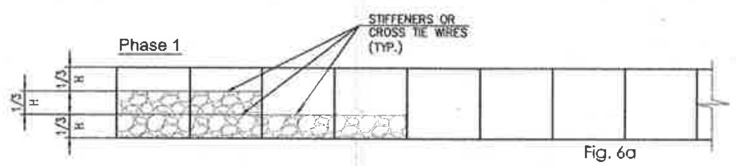


Fig. 6a

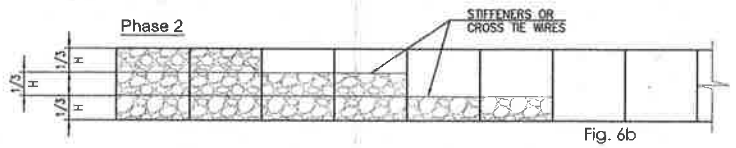


Fig. 6b

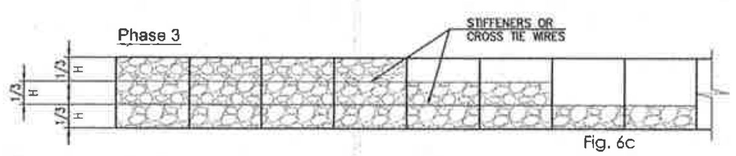


Fig. 6c

FILLING SEQUENCE

N.T.S.

Fig. 7a

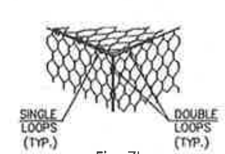


Fig. 7b

LACING WIRE

GALVANIZED AND PVC COATED

Fig. 7c

Fig. 7d

GALVANIZED FASTENERS

SPENAX OR EQUIVALENT

2.1.4 GALVANIZED AND PVC COATED LACING WIRE AND INTERNAL STIFFENERS:

- PVC COATING THICKNESS: NOMINAL – 0.02 IN. (0.5 mm), MIN. – 0.015 IN. (0.38 mm)
- LACING WIRE: DIAMETER – 0.087 IN. (2.20 mm) INTERNAL, 0.127 IN. (3.20 mm) EXTERNAL
- CROSS TIE/STIFFENER WIRE: DIAMETER – 0.087 IN. (2.20 mm) INTERNAL, 0.127 IN. (3.20 mm) EXTERNAL
- PREFORMED STIFFENER: DIAMETER – 0.134 IN. (3.4 mm) INTERNAL, 0.174 IN. (4.4 mm) EXTERNAL

GABION CLOSING DETAILS

N.T.S.

2.1.6 SPENAX FASTENERS (OVERLAPPING FASTENERS)

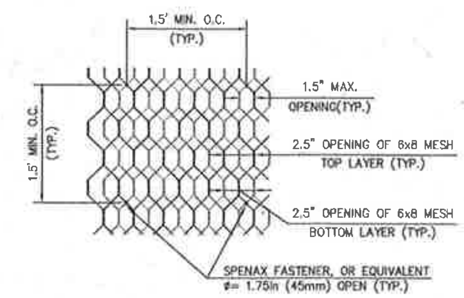
OVERLAPPING FASTENERS MAY BE USED IN LIEU OF, OR TO COMPLEMENT, LACING WIRE FOR MATTRESS ASSEMBLY AND INSTALLATION. THE SPACING OF THE FASTENERS DURING ALL PHASES OF ASSEMBLY AND INSTALLATION SHALL BE IN ACCORDANCE WITH SPACING BASED ON COMPLIANCE WITH 1200 LB/FT (17.5 KN/M) PULL APART RESISTANCE FOR GABION MATS WHEN TESTED IN ACCORDANCE WITH ASMT A975 SECTION 13.1.2 WITH A NOMINAL SPACING OF 4 IN. (100 mm) AND NOT TO EXCEED 6 IN. (150 mm).

STAINLESS STEEL FASTENERS

DIAMETER: 0.120 IN. (3.00 mm), ACCORDING TO ASTM A313/A313M-98, TYPE 302, CLASS I.

TENSILE STRENGTH: 222,000 TO 253,000 PSI (1530-1744 MPA) IN ACCORDANCE WITH ASTM A313/A313M-98.

PROPERLY FORMED RINGS AND INSTALLATION OF RINGS – A PROPERLY FORMED SPENAX FASTENER SHALL HAVE A NOMINAL OVERLAP OF 1 IN. (25 mm) AFTER CLOSURE (FIG. 2).



LID ASSEMBLY DETAIL NOTES:

a. MESH TYPE 6x8 SHALL BE USED AS THE TOP AND BOTTOM LID LAYERS FOR ALL GABION MATS. GABIONS WITH LIDS AT FINISH GRADE ELEVATIONS SHALL ALSO UTILIZE THIS LID ASSEMBLY DETAIL.

b. MESH TYPE 6x8 TOP AND BOTTOM LID LAYERS SHA BE OFFSET TO PROVIDE 1.5" MAXIMUM OPENINGS.

c. MESH TYPE 6x8 TOP AND BOTTOM LID LAYERS SHA BE SECURELY FASTENED TO THE SIDES, ENDS, DIAPHRAGMS AND ADJOINING GABON MATS AND/OR GABIONS AS DESCRIBED IN SECTION 3 ON SHEET 9 AND SECTION 4 ON THIS SHEET.

d. MESH TYPE 6x8 TOP AND BOTTOM LID LAYERS SHA BE ADDITIONALLY SECURELY FASTENED TO EACH OTHERS USING SPENAX FASTENERS, OR EQUIVALENT AT 1.5' MINIMUM INTERVALS ON CENTER.

LID ASSEMBLY DETAIL

N.T.S.

PACE
Advanced Water Engineering
17520 Newhope Street, Suite 200 | Fountain Valley, CA 92708
P: (714) 481-7300 | www.pacewater.com

JONIS C. SMITH R.C.E. 58654 — 12/23/10 DATE

REGISTERED PROFESSIONAL ENGINEER JONIS C. SMITH C058654 Exp 12/31/10 CIVIL STATE OF CALIFORNIA

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG

DESIGNED BY: J.C.S.
DRAWN BY: L.T.C.
DATE DRAWN: APRIL 2010
CHECKED BY: J.C.S.

BENCH MARK:
B.M. NO. R-3-70
BRASS DISK IN CONCRETE AT INTERSECTION OF JEFFERSON AVE. AND KALMIA ST.

REVISIONS					
		ENGINEER		RCFC/	
Rev.	DESCRIPTION	APPR.	DATE	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: [signature] DATE: 15 FEB 2011
APPROVED BY: [signature] DATE: 15-FEB-2011

MURRIETA LINE F REPAIR

GABION DETAILS

Dimscale = 40 ; LTscale = 1 ; PSltscale = 1 ; ACAD Ver = 17.1s (LMS Tech) ; Visretain = 1
Xrefs: 9320-tblk.dwg; 2007 - Gabion Construction Processes.dwg
P:\9320E\Engineering\9320-XX (Channel Line F)\sheets\9320-SHT 8-9_SPECS_Final.dwg = Tab: SHT 9_SPECS_Final - by ltran on 12/23/10 at 1:40:38 PM