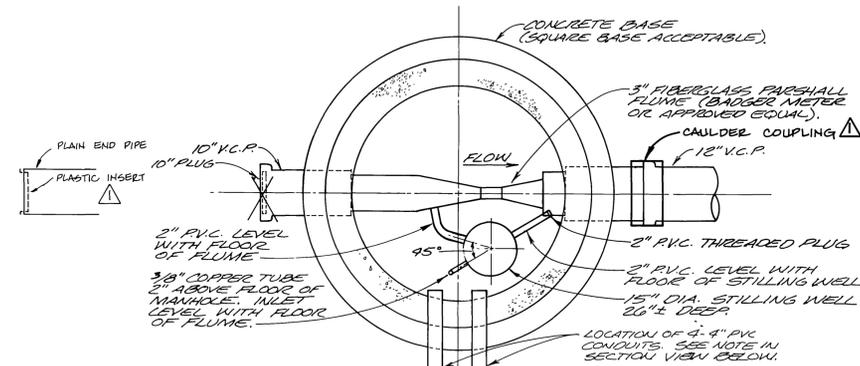
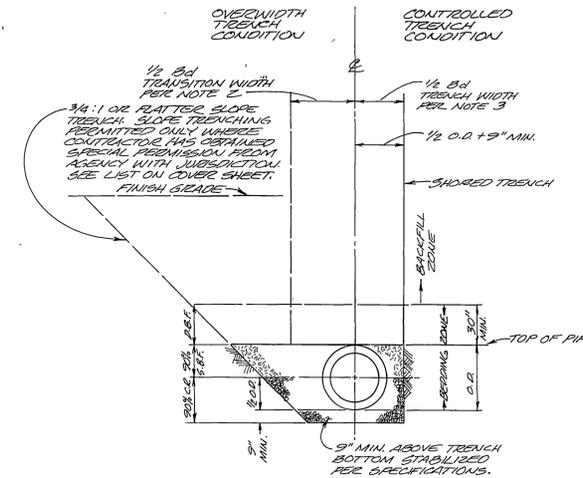


TYPICAL MANHOLE PLAN



METERING MANHOLE PLAN



PIPE BEDDING CONDITION

LEGEND

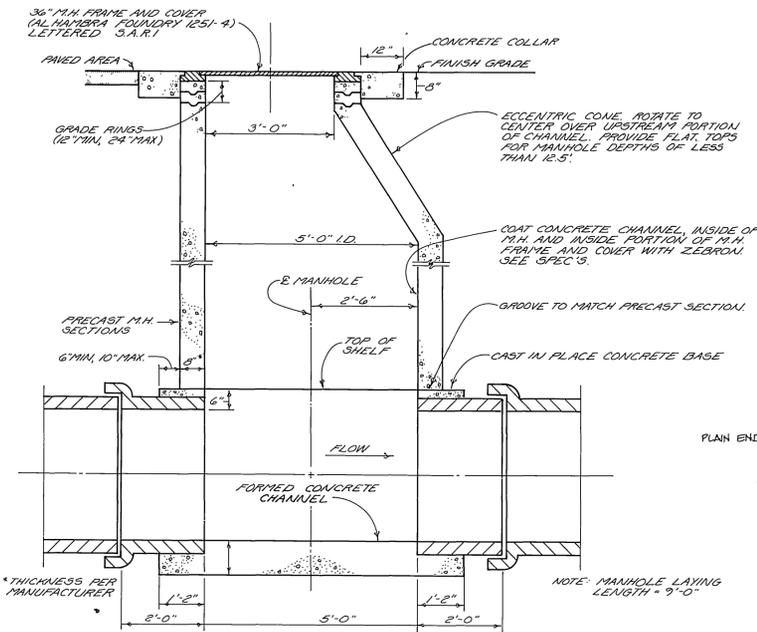
- C.R. 3/4" CRUSHED ROCK, SEE NOTE 6
 - D.B.F. DENSIFIED BACKFILL, SEE SPECIFICATIONS
 - S.B.F. SELECT BACKFILL, SEE SPECIFICATIONS
 - O.D. PIPE OUTSIDE DIAMETER
 - I.D. PIPE INSIDE DIAMETER
 - O.T. OVERWIDTH TRENCH
-

NOTES

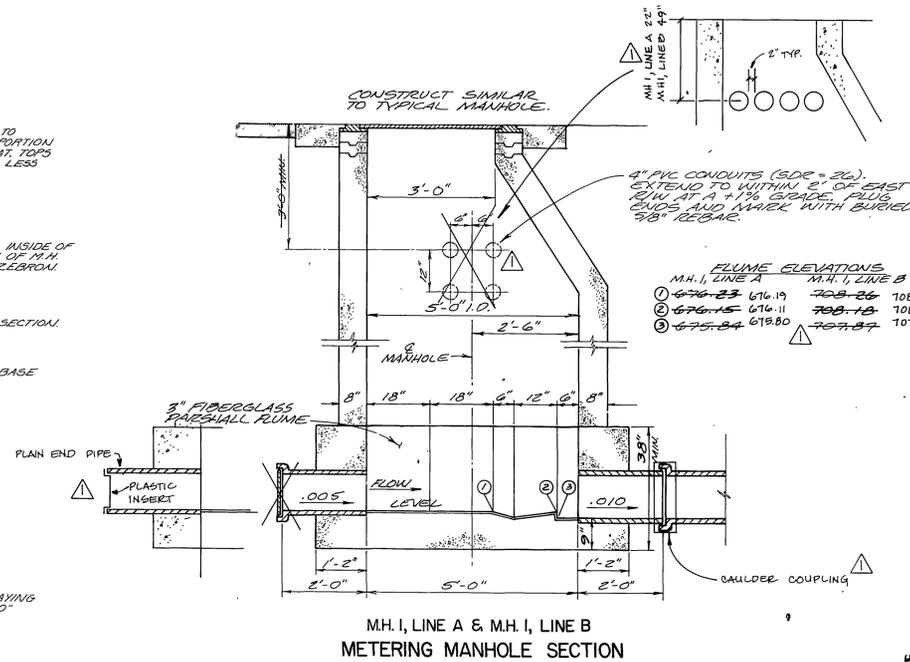
1. ALL PIPE SHALL BE EXTRA STRENGTH VITRIFIED CLAY PIPE.
2. "OVER WIDTH" REFERS TO LOAD CONDITIONS WHICH RESULT FROM TRENCH WIDTH AT THE TOP OF THE PIPE (84) APPROXIMATELY EQUAL TO OR GREATER THAN TRANSITION WIDTH. TRANSITION WIDTH SHALL BE AS DEFINED IN THE CLAY PIPE ENGINEERING MANUAL BY THE NATIONAL CLAY PIPE INSTITUTE. TRENCH WIDTH WHICH EXCEED THE FOLLOWING DEFINITION OF "CONTROLLED" TRENCH SHALL BE CONSIDERED "OVERWIDTH".
3. "CONTROLLED" TRENCH SHALL BE MAINTAINED AN EFFECTIVE WIDTH (84) AT THE TOP OF THE PIPE AS SPECIFIED IN THE PIPE BEDDING CONDITION. ANY TIMBER SHEETING USED SHALL BE CUT OFF AT THE TOP OF PIPE AND LEFT IN PLACE. THIN STEEL SHEETING MAY BE REMOVED. THE INSPECTOR SHALL DETERMINE THE WIDTH OF THE TRENCH AT THE TOP OF THE PIPE.
4. THE CONTRACTOR SHALL SUBMIT ENGINEERED SHORING AND TRENCH PLANS AS REQUIRED BY LAW.
5. ALL BACKFILL COMPACTION REQUIREMENTS ARE UNDER JURISDICTION OF CITY OF RIVERSIDE WITHIN STREET CROSSINGS, OR SECTION 130 OF THE SPECIFICATIONS. COMPACTION IN THE "BEDDING" ZONE SHALL BE THE HIGHER OF THE BEDDING DETAIL OR THE JURISDICTIONAL REQUIREMENT.
6. CRUSHED ROCK (C.R.) SHALL BE 3/4 INCH CRUSHED ROCK PER STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION SECTION 200, PLACED AT THE MINIMUM RELATIVE COMPACTION SHOWN AND WITH THE FOLLOWING GRADATION:

SIEVE	% PASSING
1"	100
3/4"	90-100
1/2"	20-55
3/8"	0-10
#4	---

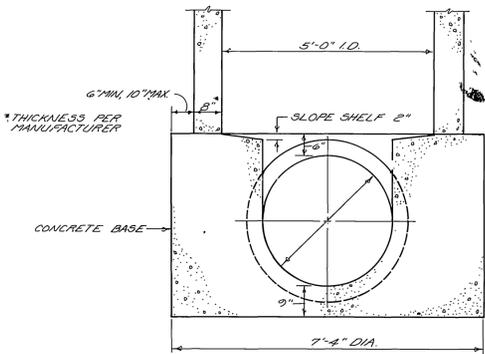
 ASTM C-131 TEST GRADING A
7. LINE LAYOUT DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL SHOWING THE SIZE/CLASS OF PIPE VERSUS TRENCH BEDDING, AS WELL AS ALL OTHER DETAILS REQUIRED BY THE SPECIFICATIONS, FOR CONTRACTOR'S PROPOSED COMBINATION.



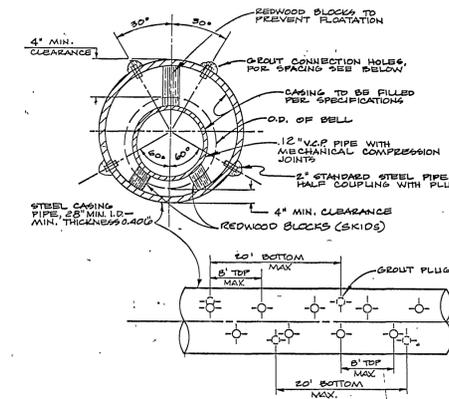
TYPICAL MANHOLE SECTION



M.H. I, LINE A & M.H. I, LINE B METERING MANHOLE SECTION



TYPICAL MANHOLE SECTION



STEEL CASING PIPE DETAIL

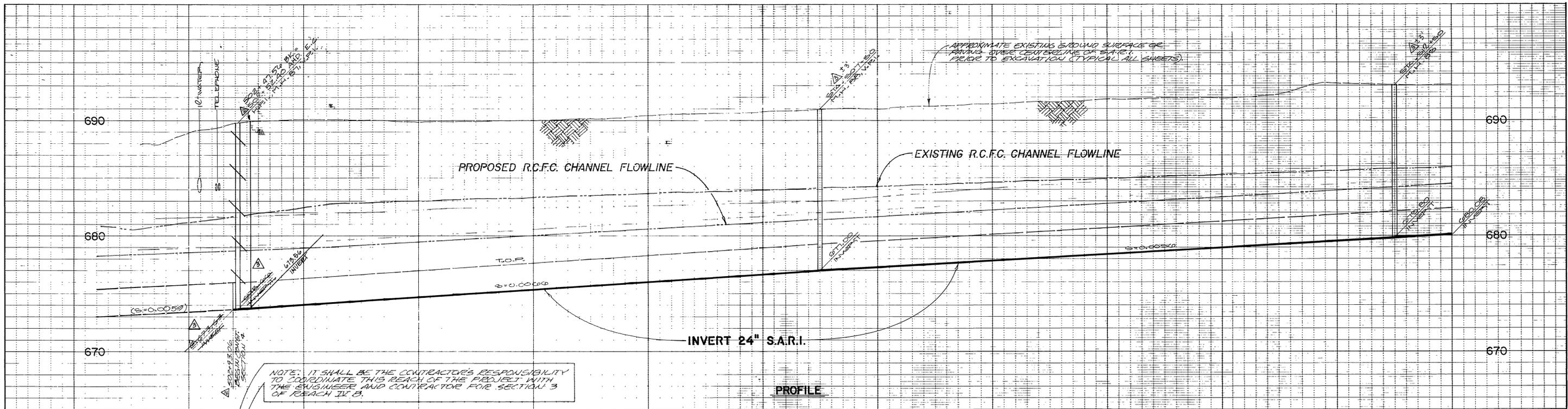
- NOTES:
1. ALL STEEL CASING PIPE FIELD JOINTS SHALL BE WELDED FULL CIRCUMFERENCE.
 2. SPACE BETWEEN BOREHOLE AND CASING SHALL BE PRESURE SEALED.
 3. CASING PIPE SHALL BE AIR TESTED PRIOR TO FILLING CASING.
 4. UPSTREAM AND DOWNSTREAM ELEVATIONS TO BE VERIFIED PRIOR TO FILLING CASING.
 5. BORING AND JACKING OF CASING AND PLACEMENT OF VCP IN CASING SHALL BE PER A.T.S.F. PRECAST AND THE SPECIFICATION SECTION 400.04, AS MODIFIED AND/OR MADE SPECIFIC BY THE DETAILS HEREON.
 6. BORE PIPE SHALL BE SIZED AND SPACED AS NECESSARY WITHIN RIGHT OF WAY. PROVIDE SHORING AND LOCATION PLAN FOR APPROVAL.

RECORD DRAWING
KRIEGER & STEWART
BY: *Richard J. R. K.* DATE: 11-29-82

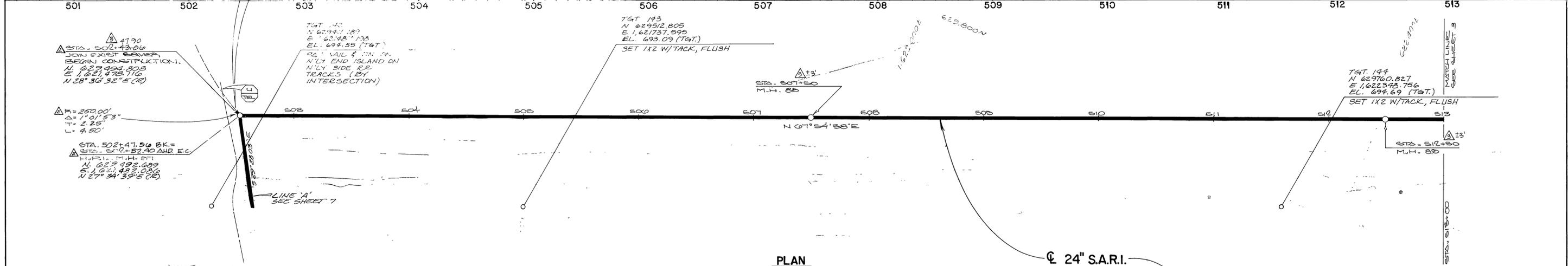
SCALE NONE	HORIZ. - VERT. -
FIELD BOOK	
DESIGNED R.J.D.	
DRAWN J.B., R.K.	
CHECKED	
ADDED RECORD DATA	10/14/82 FDB
REVISIONS	DATE BY

APPROVED	
<i>Richard J. R. K.</i>	2/23/83
GENERAL MANAGER	DATE
APPROVED BY <i>Richard J. R. K.</i>	
REGISTERED ENGINEER No. 24167	DATE 2-25-82

SANTA ANA WATERSHED PROJECT AUTHORITY	SHEET 5-1520
SANTA ANA REGIONAL INTERCEPTOR - REACH IV B	1 OF 7 SHEETS
MANHOLE & MISC. DETAILS	117-5.5
	PROJECT No



NOTE: IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THIS REACH OF THE PROJECT WITH THE BUSINESS AND CONTRACTOR FOR SECTION 3 OF REACH III B.



RECORD DRAWING
KRIEGER & STEWART
BY: Richard Dinkelman DATE: 11-21-82

SYMBOL	REVISIONS	DATE	BY
△	ADDED RECORD DATA	10/15/82	FPB
△	REMOVED M.H. BY CHANGED CON. SITUATION BEGINNING POINT.	01/11/82	R.K.
△	REMOVED S.A.W.P.A. PERMANENT EASEMENT.	5/14/82	R.K.

SCALE
HORIZ. 1"=40' VERT. 1"=4'
FIELD BOOK
120/6-8
DESIGNED
R.J.D.
DRAWN
F.B.
CHECKED

• KRIEGER & STEWART •
INCORPORATED
ENGINEERING CONSULTANTS
RIVERSIDE, CALIFORNIA (714) 684-6900

APPROVED BY Richard Dinkelman
REGISTERED ENGINEER NO 24169 DATE 2-25-82.

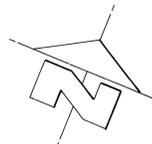
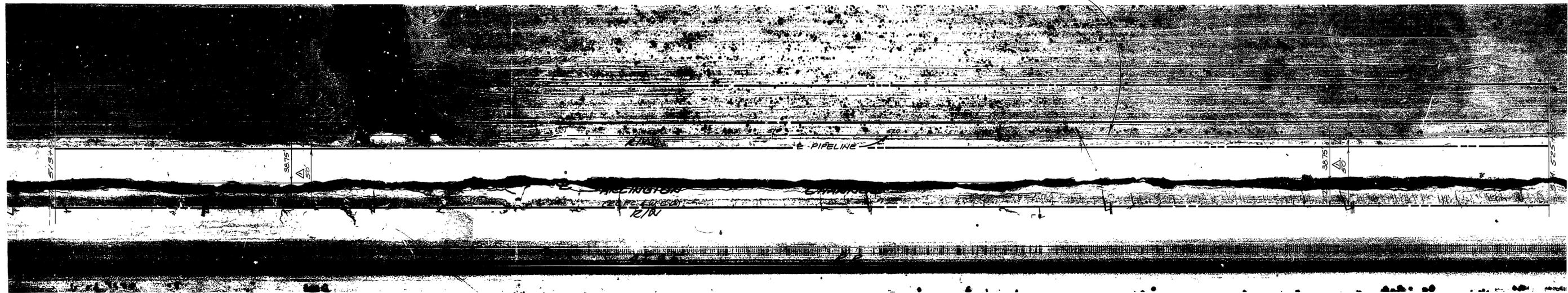
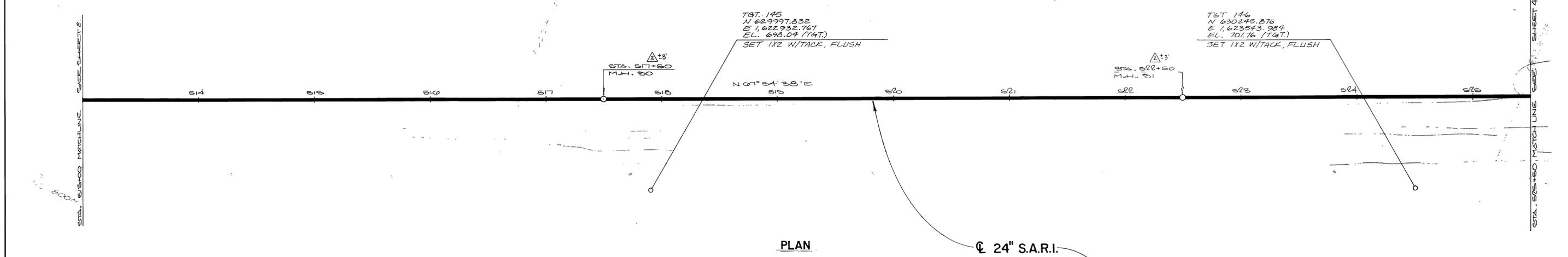
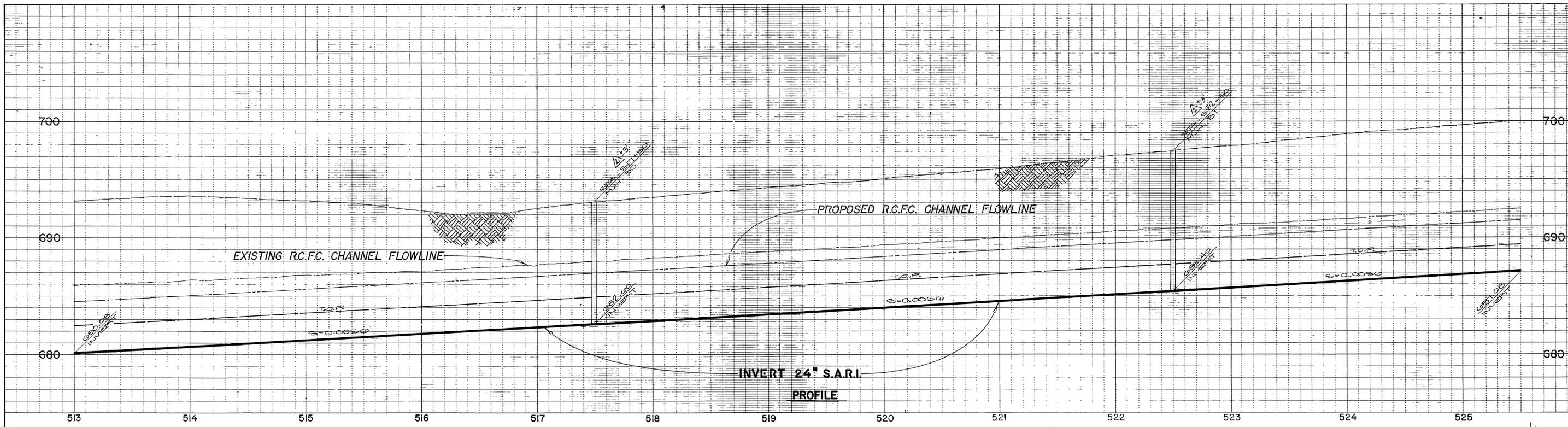
APPROVED
GENERAL MANAGER
DATE 2/22/82

APPROVED
DATE

SANTA ANA WATERSHED PROJECT AUTHORITY
SANTA ANA REGIONAL INTERCEPTOR—REACH IV B

24" S.A.R.I.
STA. 502+43.06 TO STA. 513+00

SHEET 2 OF 7 SHEETS
117-5.5 PROJECT NO
INDEXED 10-3-88



RECORD DRAWING
KRIEGER & STEWART
BY: *Richard R. Decker* DATE: 11-24-82

SYM	REVISIONS	DATE	BY
△	ADDED RECORD DATA	11/9/82	POB
△	REVISED R.C.F.C. CHANNEL FLOWLINE AND ADDED PROPOSED R.C.F.C. CHANNEL FLOWLINE	5/14/82	R.J.D.

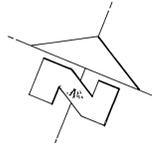
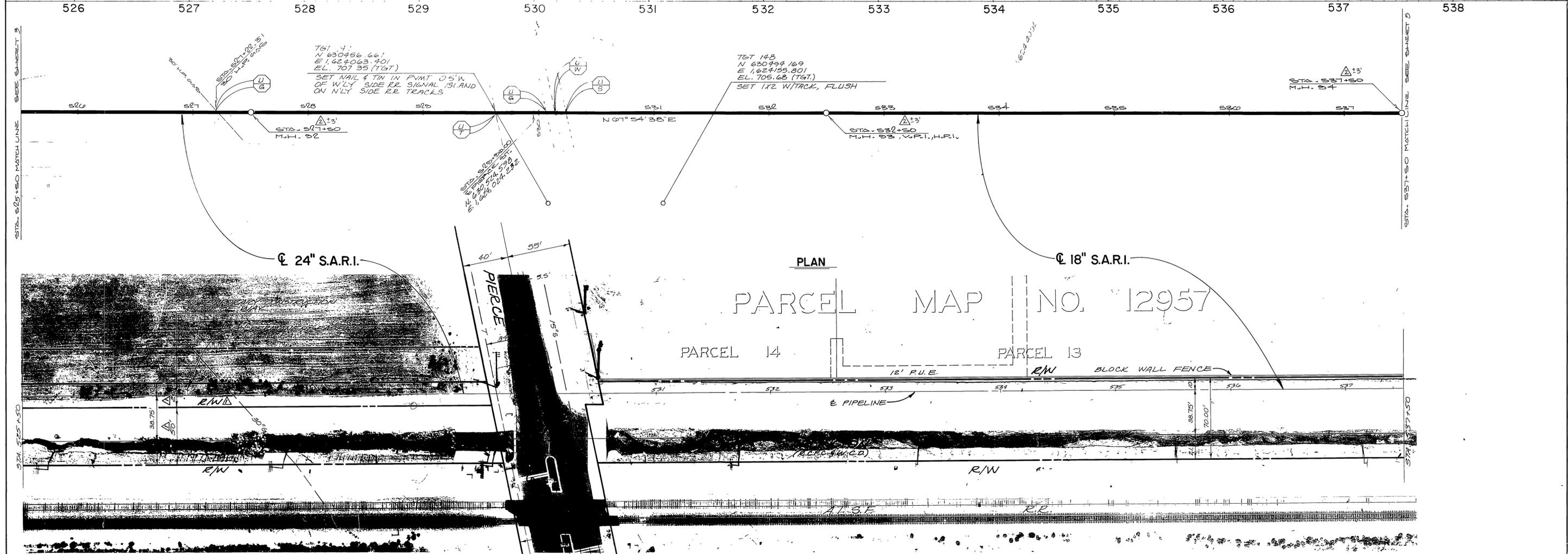
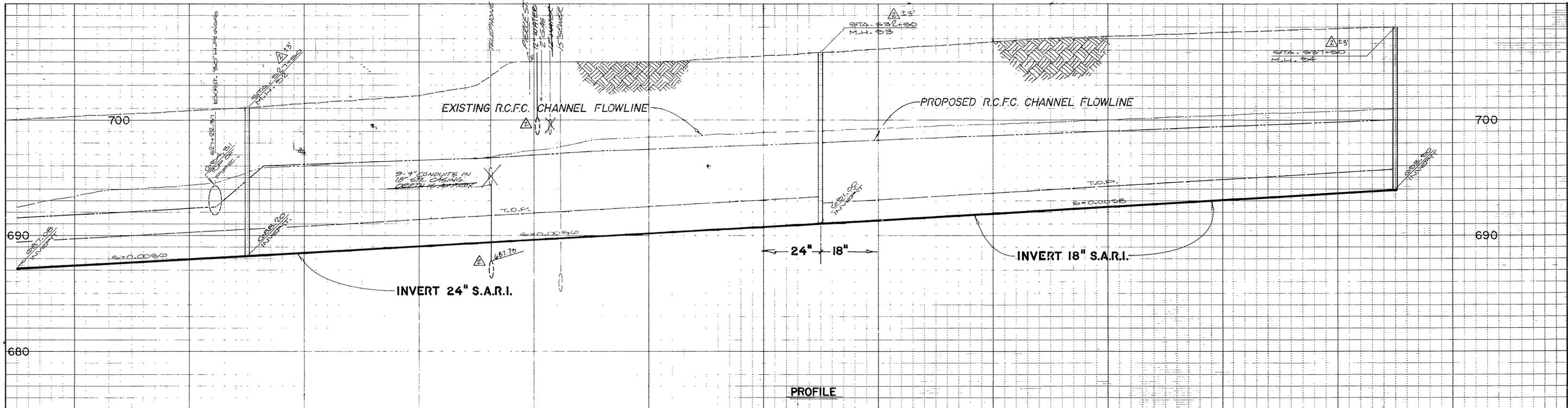
SCALE
HORIZ 1"=40' VERT 1"=4'
FIELD BOOK
120/8-10
DESIGNED
R.J.D.
DRAWN
F.B.
CHECKED

• KRIEGER & STEWART •
INCORPORATED
ENGINEERING CONSULTANTS
RIVERSIDE, CALIFORNIA (714) 684-6900
APPROVED BY *Richard R. Decker*
REGISTERED ENGINEER NO 24169 DATE 2-25-82

APPROVED
J. Andrew Alby
GENERAL MANAGER
DATE 2/22/82
APPROVED
DATE

SANTA ANA WATERSHED PROJECT AUTHORITY
SANTA ANA REGIONAL INTERCEPTOR—REACH IV B
24" S.A.R.I.
STA. 513+00 TO STA. 525+50

SHEET
S-1520
3
OF 5 SHEETS
117-5.5
PROJECT NO
INDEXED 10-3-88



RECORD DRAWING
 KRIEGER & STEWART
 BY: *Richard E. Dickman* DATE: 11-24-82

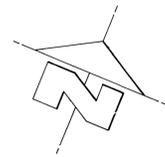
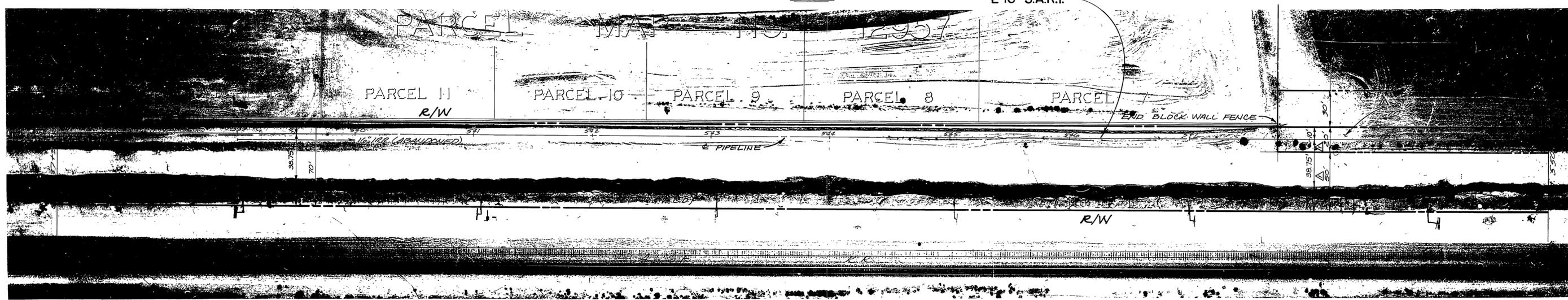
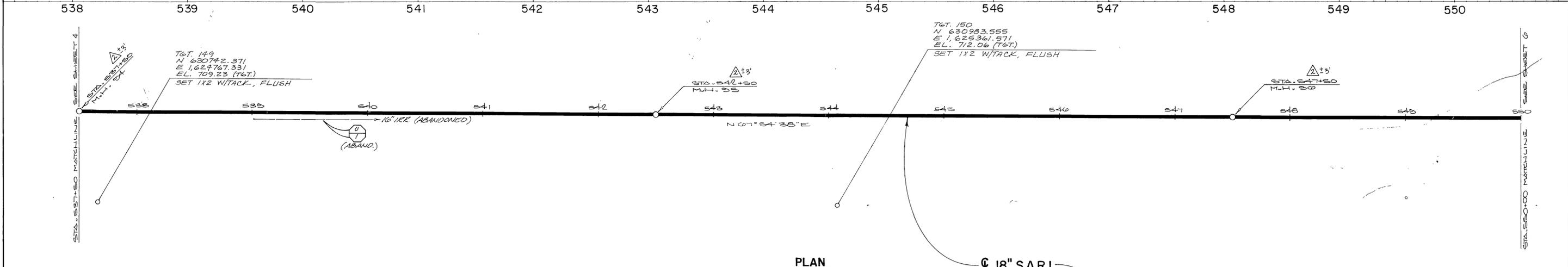
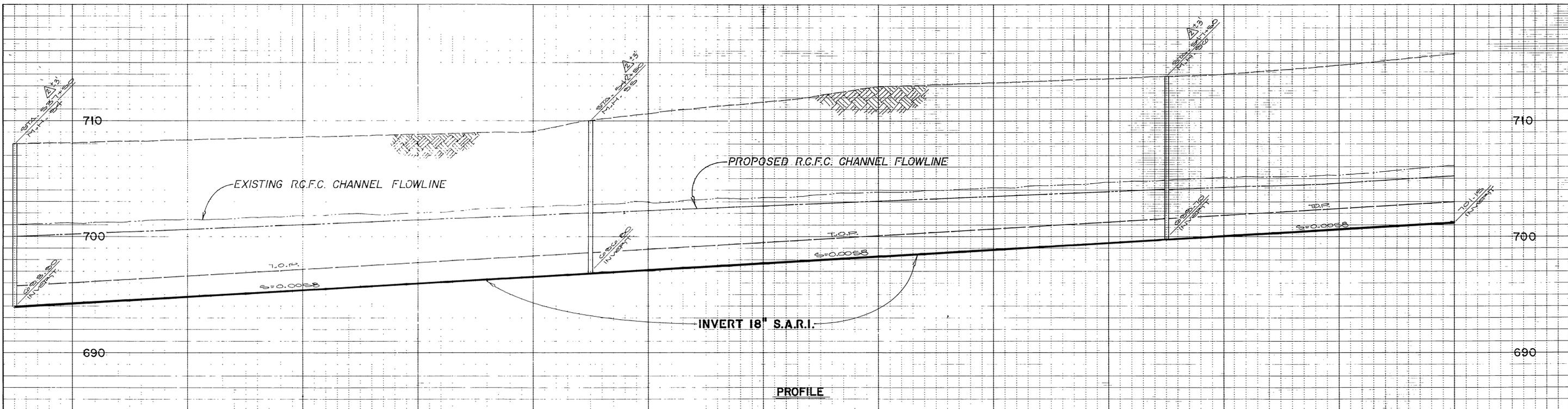
SYM	REVISIONS	DATE	BY
△	ADDED RECORD DATA	10/14/82	FDB
△	REVISION	3/14/82	R.E.

SCALE
 HORIZ 1"=40' VERT 1"=4'
 FIELD BOOK
 120/10
 DESIGNED
 R.J.D.
 DRAWN
 F.B.
 CHECKED

• KRIEGER & STEWART •
 INCORPORATED
 ENGINEERING CONSULTANTS
 RIVERSIDE, CALIFORNIA (714) 684-6900
 APPROVED BY *Richard Dickman*
 REGISTERED ENGINEER NO 24169 DATE 2-25-82

APPROVED
J. Debra DeLong
 GENERAL MANAGER 2/25/82 DATE
 APPROVED
 _____ DATE

SANTA ANA WATERSHED PROJECT AUTHORITY
 SANTA ANA REGIONAL INTERCEPTOR—REACH IV B
18" & 24" S.A.R.I.
 STA. 525+50 TO STA. 537+50
 SHEET 4 OF 8 SHEETS
 117-5.5 PROJECT NO
 INDEXED 10-3-88



RECORD DRAWING
 KRIEGER & STEWART
 BY: *Richard Binckman* DATE: 11-21-82

APPROVED RECORD DATA REVISED R.C.F.C. R/W & ADDED PERMANENT 3 A.W.P.A. EASEMENT	10/16/82 FDB 5/14/82 R.L.	DATE	BY
SYM	REVISIONS	DATE	BY

SCALE
 HORIZ 1"=40' VERT 1"=4'
 FIELD BOOK
 120/10-12
 DESIGNED
 R.J.D.
 DRAWN
 F.B.
 CHECKED

• KRIEGER & STEWART •
 INCORPORATED
 ENGINEERING CONSULTANTS
 RIVERSIDE, CALIFORNIA (714) 684-6900

APPROVED BY *Richard Binckman*
 REGISTERED ENGINEER NO 24169 DATE 2-25-82

APPROVED
Richard Binckman
 GENERAL MANAGER
 2/22/82
 DATE

APPROVED

 DATE

SANTA ANA WATERSHED PROJECT AUTHORITY
 SANTA ANA REGIONAL INTERCEPTOR—REACH IV B

18" S.A.R.I.
STA. 537+50 TO STA. 550+00

SHEET
 S-1520
5
 OF 8 SHEETS
 117-5.5
 PROJECT NO

720

710

700

720

710

700

550 551 552 553 554 555 556 557 558 559

T&T 151
N 631233.931
E 1,625978.457
EL. 716.79 (T&T)
SET 1X2 W/TACK, FLUSH

STA. 550+00 MATCH LINE SEE SHEET 5

SS1

SS2

STA. 552+50
M.H. 57

NG7°54'30"E

SS3

SS4

STA. 555+00
M.H. 58
N 631572.417
E 1,626606.556
EL. 718.00 (T&T)
SET 1X2 W/TACK, FLUSH

SS5

SS6

STA. 557+82.81
M.H. 58
N 631572.417
E 1,626606.556
VALVE BOX
557

SS7

STA. 557+77.1
FILL MOPE
N 631570.499
E 1,626601.827

SS8

SS9

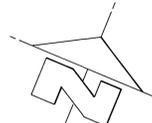
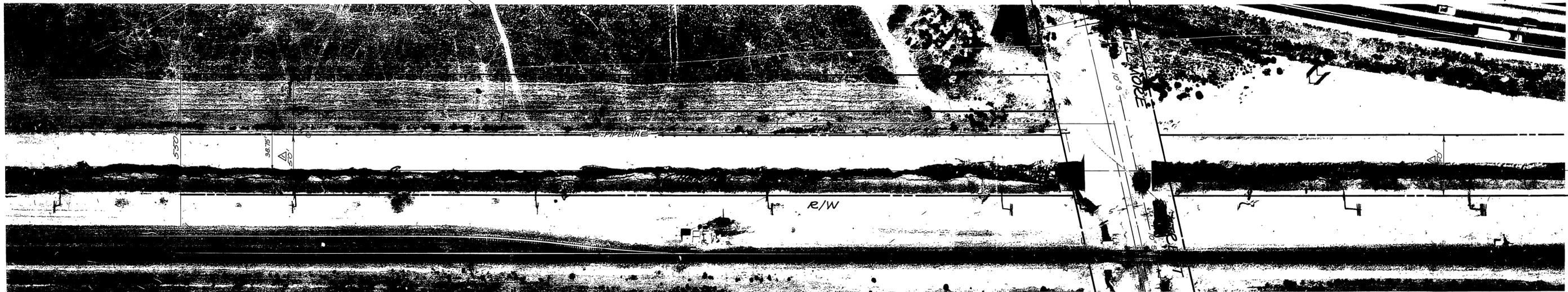
T&T 153
N 631504.704
E 1,626695.602
EL. 722.94 (T&T)
SET NAIL & TIN IN PMT.

U
S

LINE 8' SEE SHEET 7

18" S.A.R.I.

PLAN



RECORD DRAWING
KRIEGER & STEWART

BY: Richard Dinkler DATE: 11-24-82

SYM	REVISIONS	DATE	BY
△	ADDED RECORD DATA	10/15/82	FOB
△	REVISED RECORD DATA	5/14/82	FK
△	PERMANENT S.A.W.R. EASEMENT		

SCALE HORIZ 1"=40' VERT 1"=4'
FIELD BOOK 120/12
DESIGNED R.J.D.
DRAWN F.B.
CHECKED

• KRIEGER & STEWART •
INCORPORATED
ENGINEERING CONSULTANTS
RIVERSIDE, CALIFORNIA (714) 684-6900

APPROVED BY *Richard Dinkler*
REGISTERED ENGINEER NO 24169 DATE 2-25-82

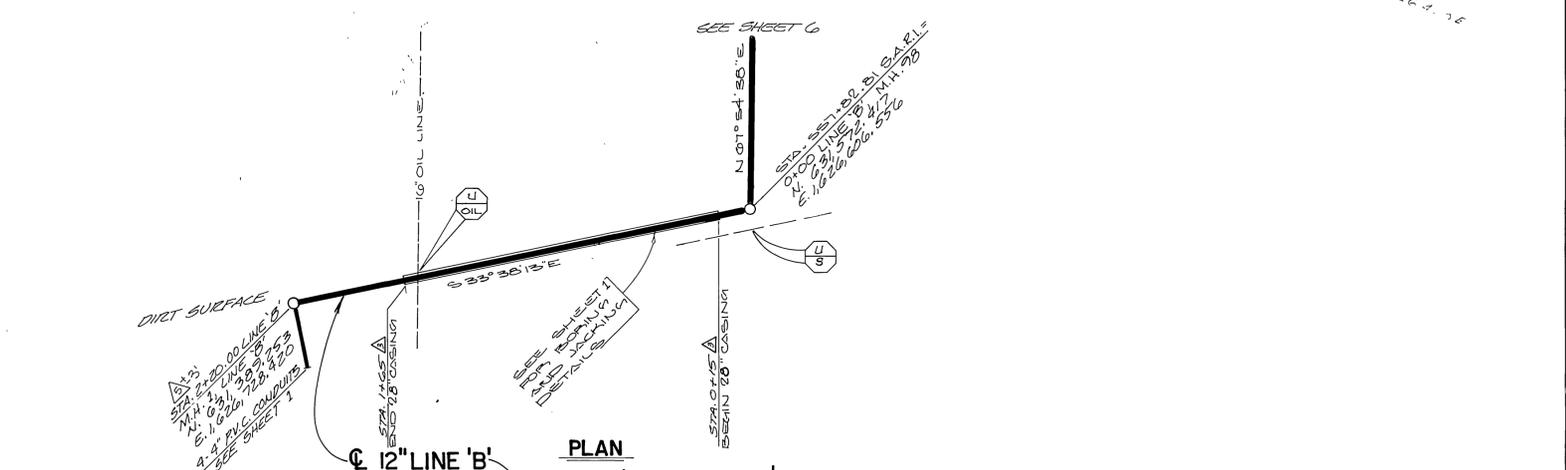
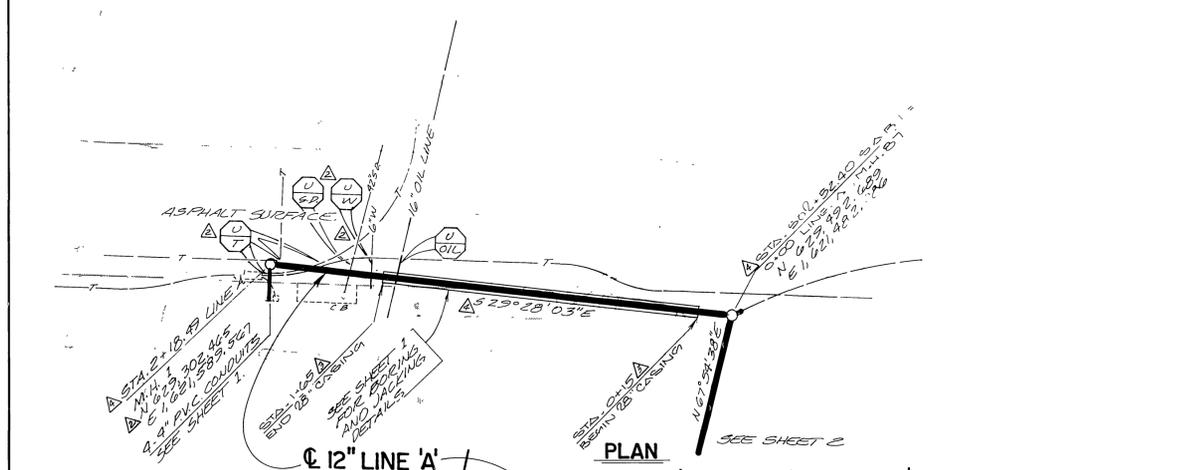
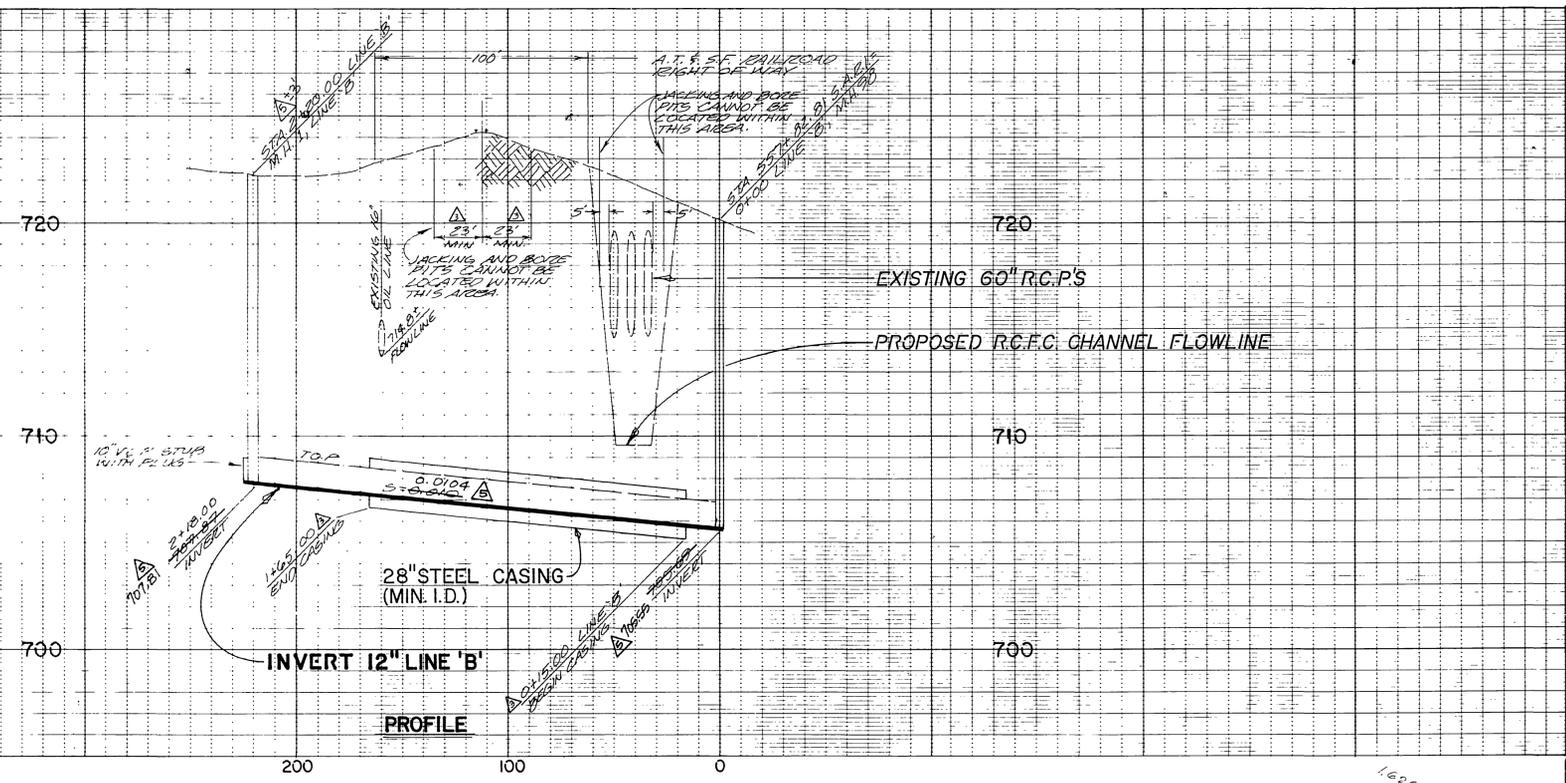
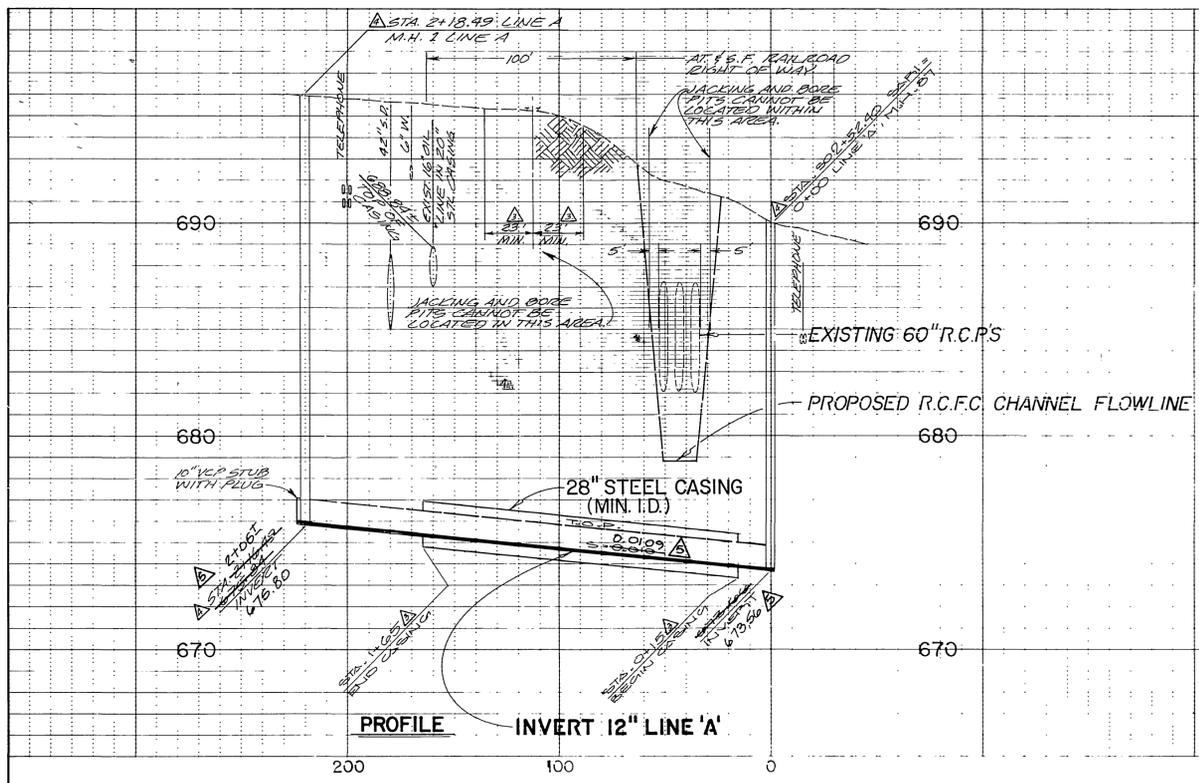
APPROVED
[Signature]
GENERAL MANAGER
DATE 2/20/82

APPROVED
DATE

SANTA ANA WATERSHED PROJECT AUTHORITY
SANTA ANA REGIONAL INTERCEPTOR—REACH IV B
18" S.A.R.I.
STA. 550+00 TO STA. 557+82.81

SHEET
S-1520
6
OF 7 SHEETS
117-5.5
PROJECT NO

INDEXED 10-3-88



RECORD DRAWING
KRIEGER & STEWART
BY: *Richard Dinkelman* DATE: 11-24-82

SYM	REVISIONS	DATE	BY
△	ADDED RECORD DATA	10/19/82	FDB
△	RELOCATE M.H. 87; REALIGN LINE 'A'	01/15/82	R.K.
△	CHG'D CASING SIZES (ADDITIONAL #1)	01/20/82	R.K.
△	ADD UTILITIES ON BUCHANAN; REALIGN LINE 'A'	01/19/82	R.K.
△	REVISED R.C.P. SIZES; ROW & ADDED TELEPHONE UTILITIES	01/14/82	R.K.

SCALE
HORIZ 1"=40' VERT 1"=4'
FIELD BOOK
120/6, 12
DESIGNED
R.J.D.
DRAWN
F.B.
CHECKED

• KRIEGER & STEWART •
INCORPORATED
ENGINEERING CONSULTANTS
RIVERSIDE, CALIFORNIA (714) 684-6900

APPROVED BY *Richard Dinkelman*
REGISTERED ENGINEER NO 24169 DATE 2-25-82

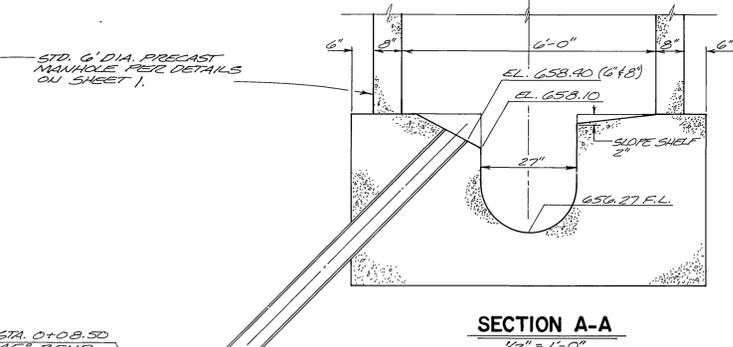
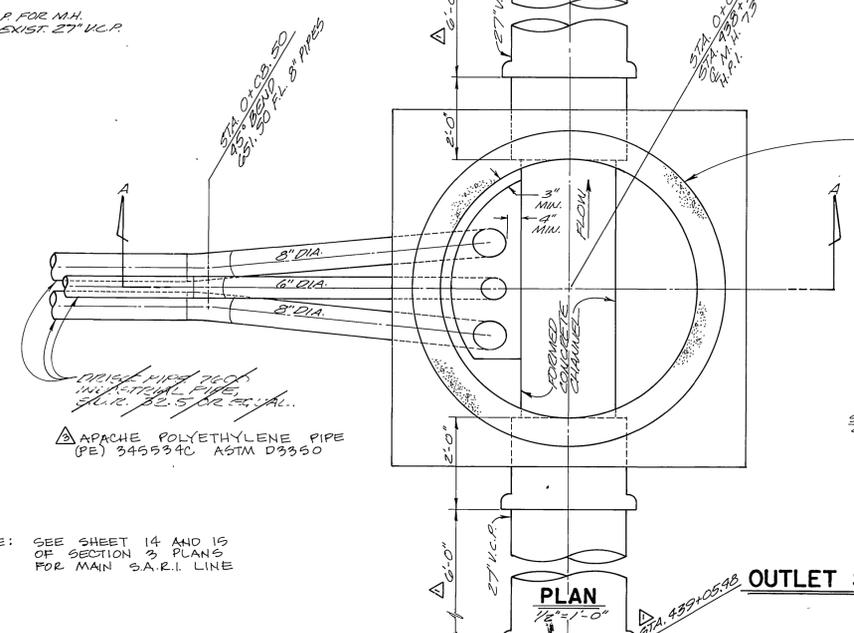
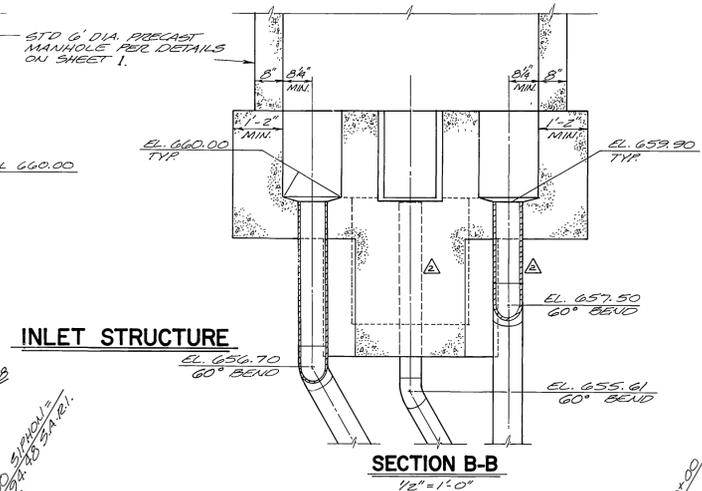
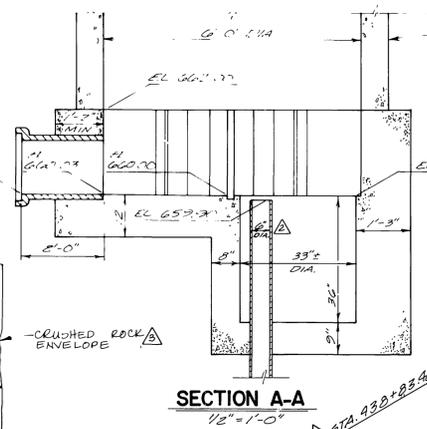
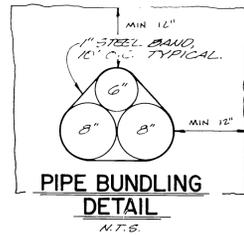
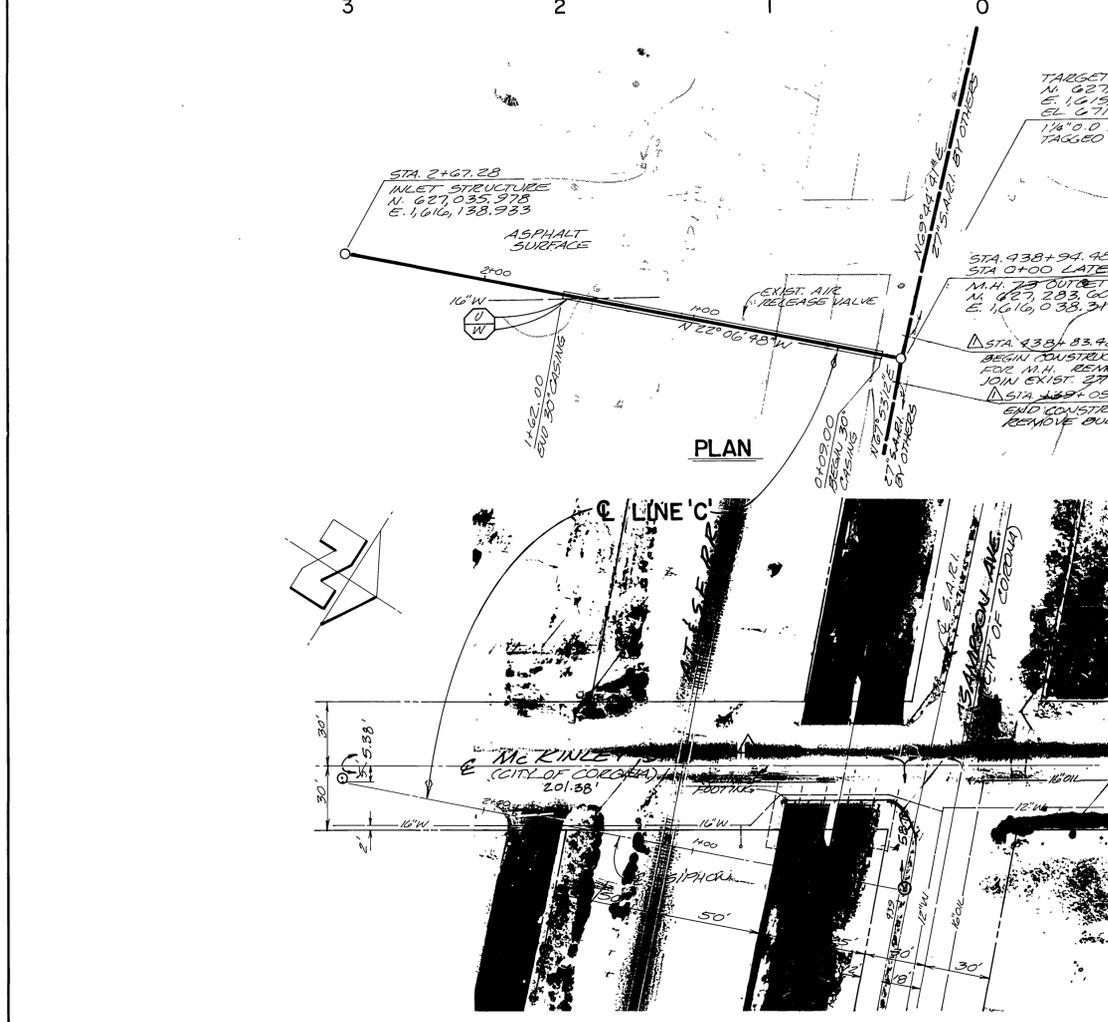
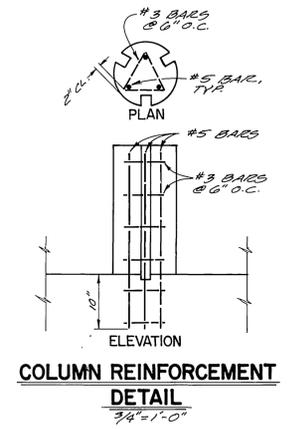
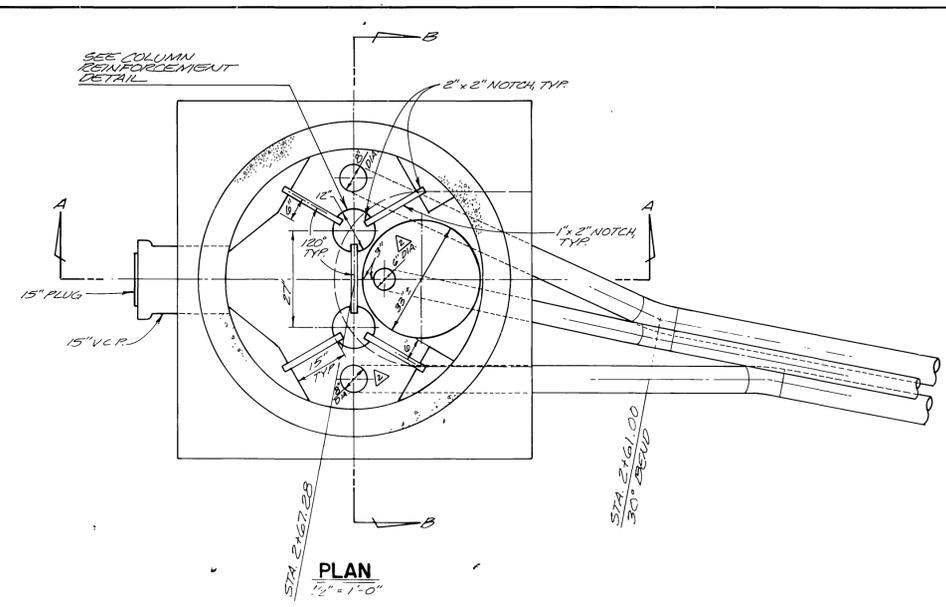
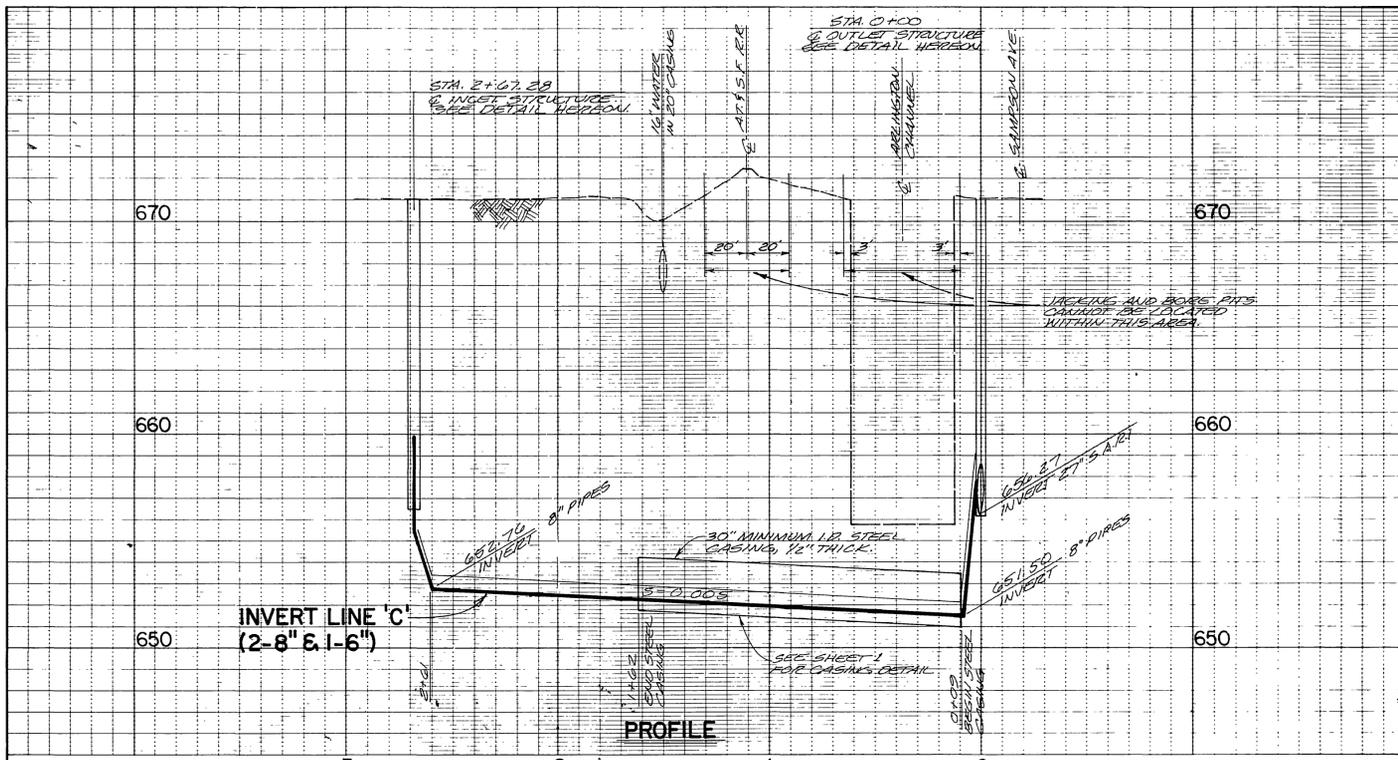
APPROVED
Richard Dinkelman
GENERAL MANAGER
DATE: 2/22/82

APPROVED
DATE

SANTA ANA WATERSHED PROJECT AUTHORITY
SANTA ANA REGIONAL INTERCEPTOR—REACH IV B

12" LINE 'A', STA. 0+00 TO STA. 2+18.49
12" LINE 'B', STA. 0+00 TO STA. 2+20

SHEET S-1520
7 OF 8 SHEETS
PROJECT NO. 117-5.5
INDEXED 10-3-88



NOTE: SEE SHEET 14 AND 15 OF SECTION 3 PLANS FOR MAIN S.A.R.I. LINE

RECORD DRAWING
KRIEGER & STEWART
BY: *Richard R. Krieger* DATE: 11-24-82

SYM	REVISIONS	DATE	BY
△	ADDED RECORD DATA	10-18-82	FOR
△	REVISIONS TO SECTION 3 PLANS	11/18/82	R.K.
△	ADDED 27\"/>		

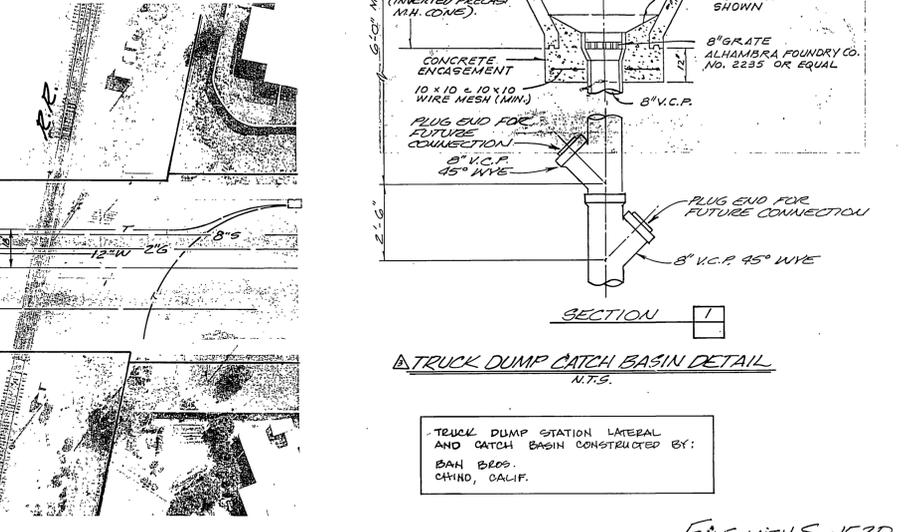
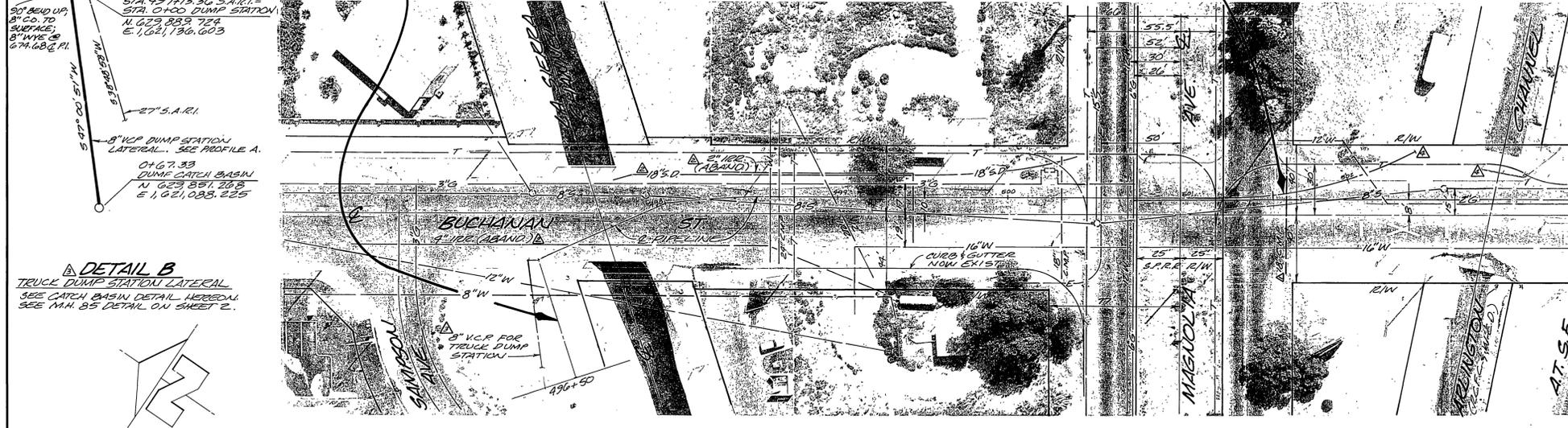
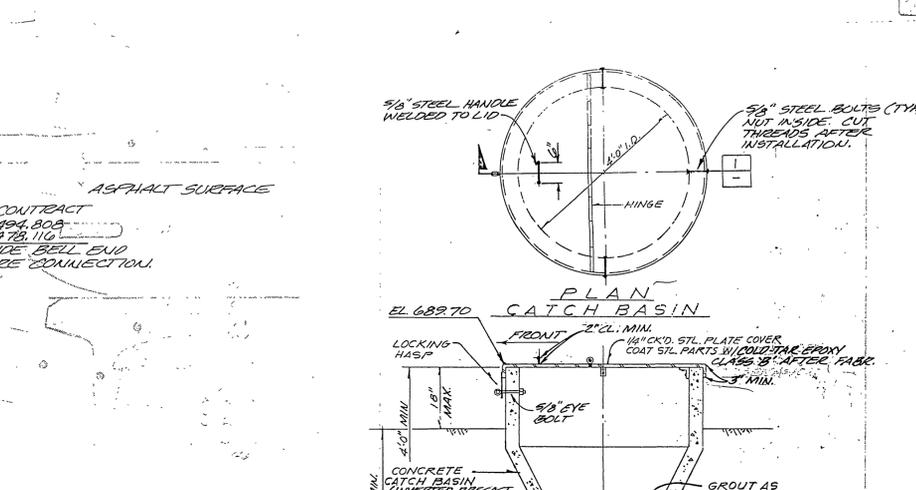
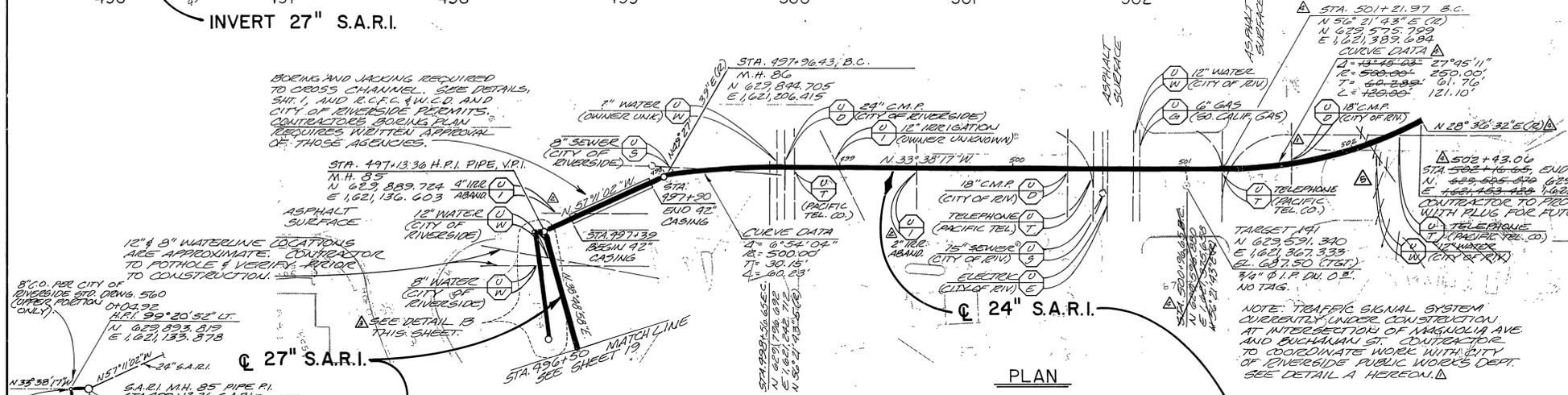
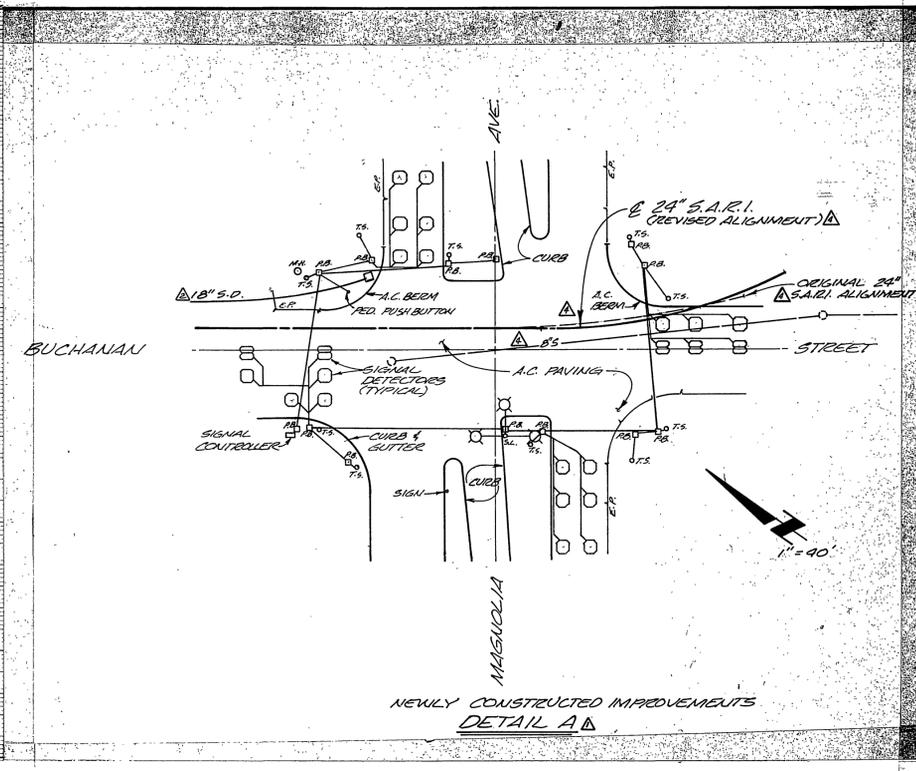
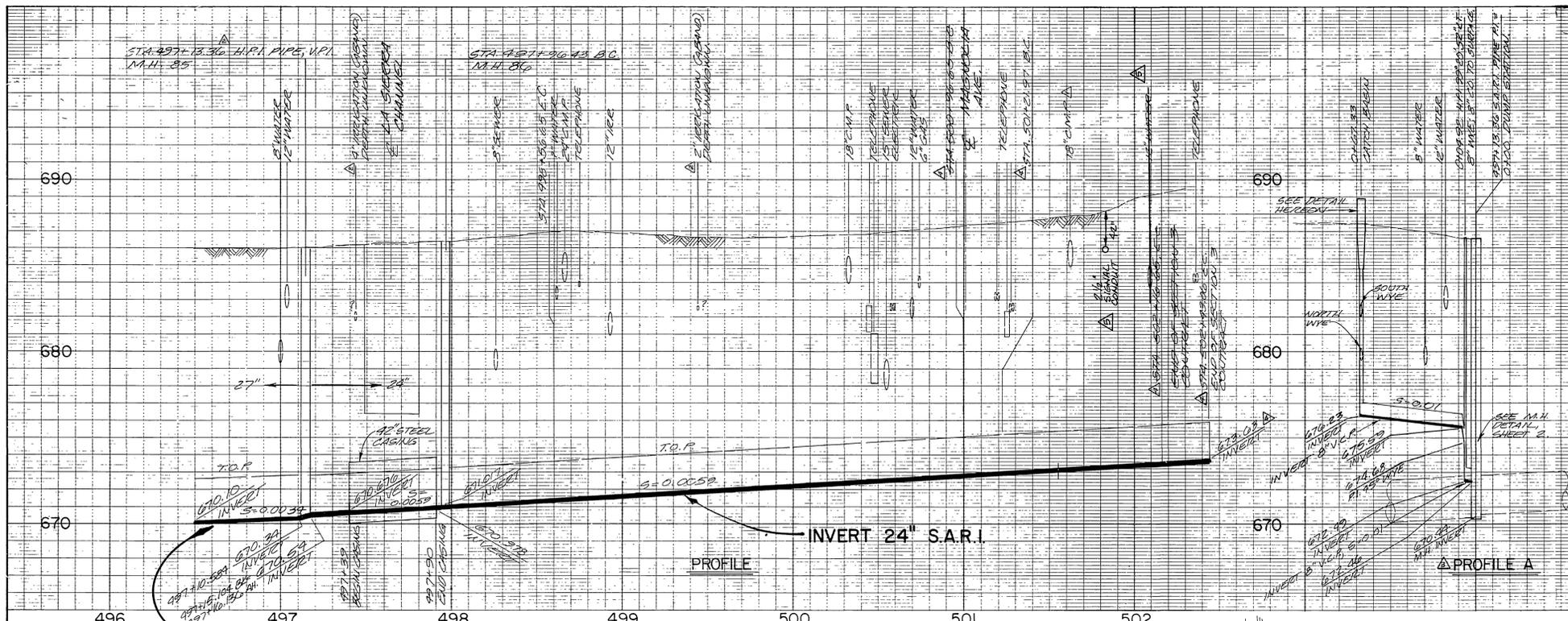
SCALE
HORIZ. 1"=40' VERT. 1"=4'
FIELD BOOK
118/134-159, 35
DESIGNED
R.J.D.
DRAWN
R.K.
CHECKED
APPROVED BY: *Richard R. Krieger*
REGISTERED ENGINEER NO. 24169 DATE 3-18-82

APPROVED
GENERAL MANAGER _____ DATE _____
APPROVED _____ DATE _____

SANTA ANA WATERSHED PROJECT AUTHORITY
SANTA ANA REGIONAL INTERCEPTOR-REACH IV B
INVERTED SIPHON
LINE 'C', STA. 0+00 TO STA. 2+67.28

SHEET
S-1520
8
OF 8 SHEETS
117-5.5
PROJECT NO

INDEXED 10-3-88



DETAIL B
TRUCK DUMP STATION LATERAL
SEE CATCH BASIN DETAIL HEREON
SEE M.H. 85 DETAIL ON SHEET 2.

RECORD DRAWING
KRIEGER & STEWART
BY: *John Regalado* DATE: 11-23-82

SYMBOL	REVISIONS	DATE	BY
△	ADDED RECORD DATA	11/9/82	FDD
△	REVISED CURB AND GUTTER POINTS, REALIGNED CURB	6-17-82	R.K.
△	ADD TRUCK DUMP LATERAL & DETAIL	7-14-82	R.K.
△	ADD 18\"/>		

SCALE
HORIZ. 1"=40' VERT. 1"=4'
FIELD BOOK
118/134-159; 35
DESIGNED
J.C.R./R.K.
DRAWN
F.B./J.B./R.K.
CHECKED
J.C.R.

KRIEGER & STEWART
INCORPORATED
ENGINEERING CONSULTANTS
RIVERSIDE, CALIFORNIA (714) 684-6900
APPROVED BY *Julius B. Stevens*
REGISTERED ENGINEER NO. 17661 DATE 11/3/81

SANTA ANA WATERSHED PROJECT AUTHORITY
SANTA ANA REGIONAL INTERCEPTOR—REACH IV B
24" & 27" S.A.R.I.
STA. 496+50 TO STA. 502+43.06
SHEET
20
OF 20 SHEETS
117-5.3
PROJECT NO.

FILE WITH S-1520