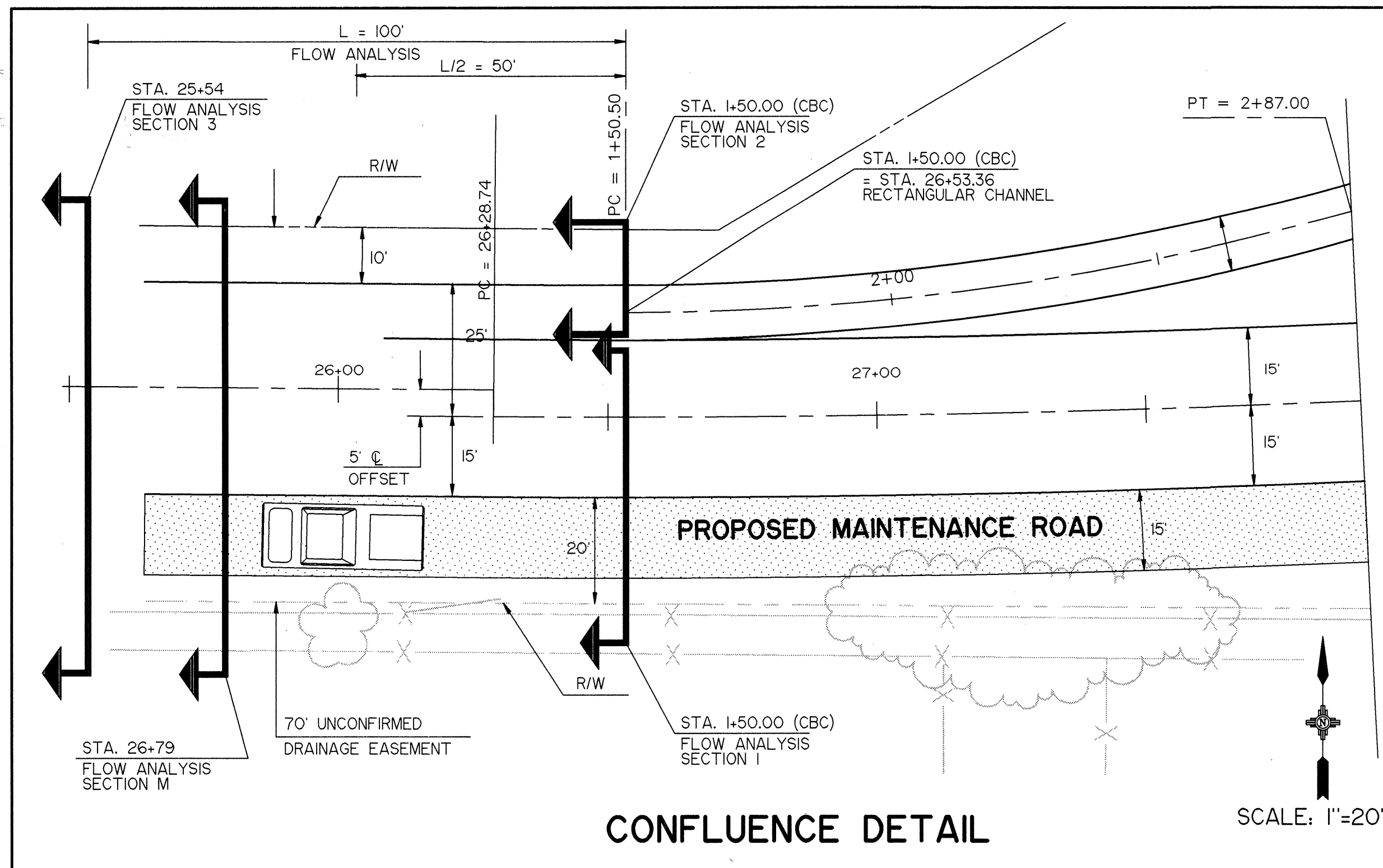




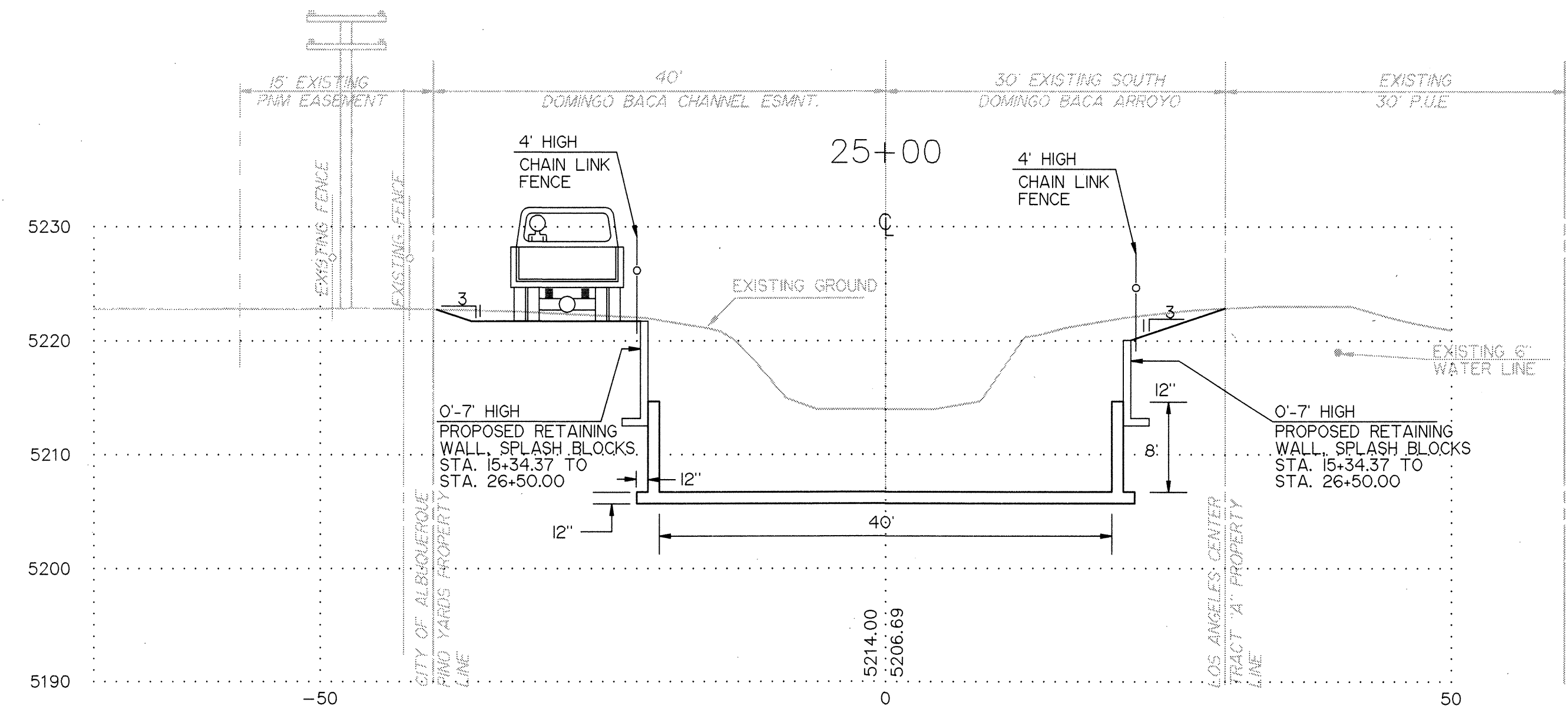
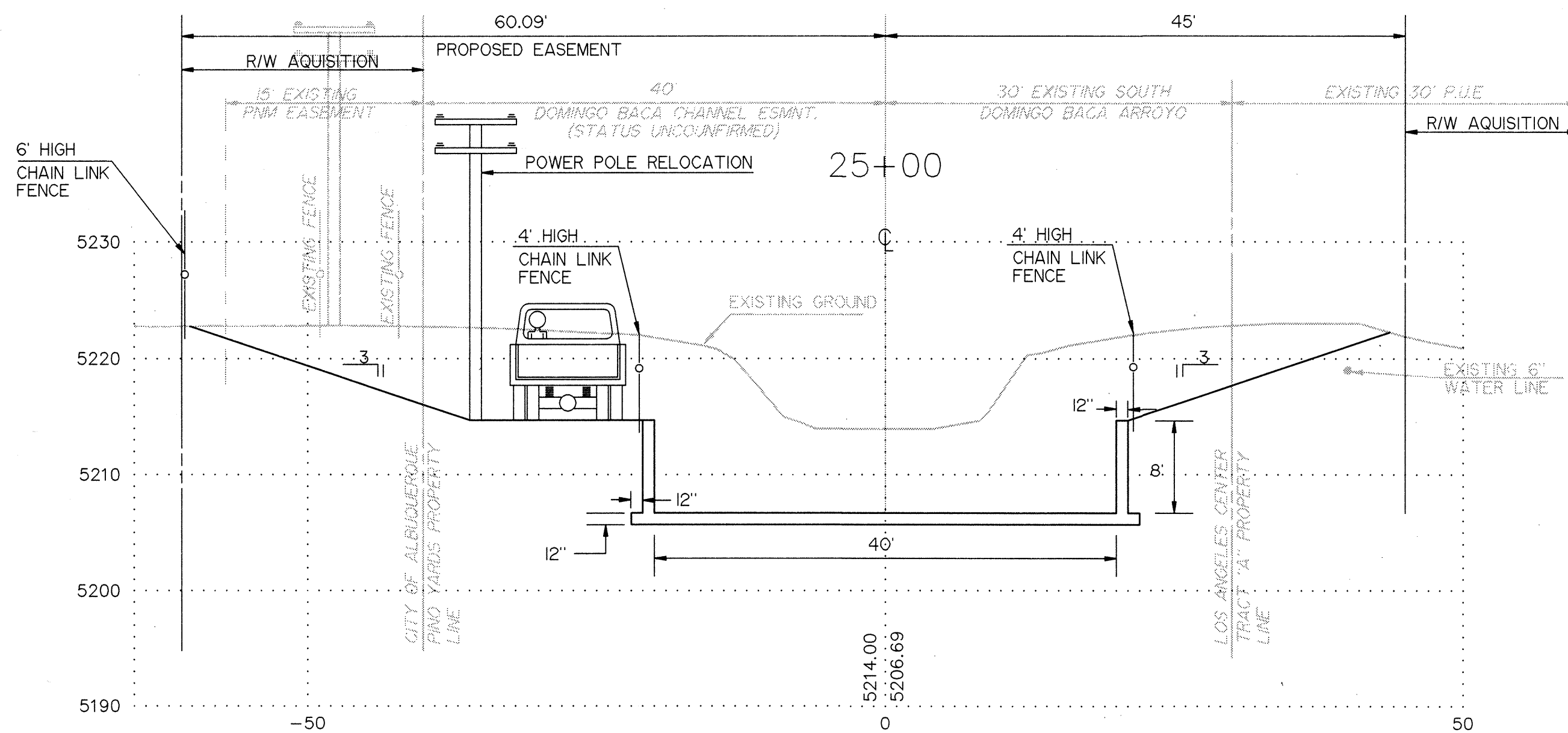
DOMINGO BACA ARROYO SAN PEDRO TO I-25 HYDRAULIC COMPUTATION SUMMARY ALTERNATIVE NO. 1													
JOB NO. 2833.1													
REACH NO.	STATION TO STATION	100 YEAR FLOW RATE (CFS)	BOTTOM WIDTH (ft)	SIDE SLOPE (H:V)	MANNING "n"	FLOW DEPTH (ft)	VELOCITY (fps)	FROUDE #	FREE-BOARD (ft)	CURVE RADIUS (ft)	SUPER-ELEV. (ft)	EASEMENT CURVE LENGTH (ft)	TOTAL CHANNEL DEPTH (ft)
1	1207.53	1634.57	5450	40.00	0.00	0.013	3.75	36.30	3.30	3.00	0.00	0.00	6.75
2	1634.57	1761.43	5310	40.00	0.00	0.013	3.77	35.55	3.23	3.00	1000.00	1.57	322.71
3	1761.43	1983.49	5310	40.00	0.00	0.013	3.92	33.83	3.01	3.00	500.00	2.84	304.44
4	1983.49	2110.35	5310	40.00	0.00	0.013	3.95	33.52	2.97	3.00	1000.00	1.40	301.15
5	2110.35	2628.74	5310	40.00	0.00	0.013	3.85	34.23	3.08	3.00	0.00	0.00	6.85
6	2628.74	2810.52	5310	40.00	0.00	0.013	3.97	33.95	3.03	3.00	3000.00	0.48	304.68
7	2810.52	2895.30	4280	30.00	0.00	0.013	4.07	35.06	3.06	3.00	1500.00	0.76	257.37
8	2895.30	3077.08	4280	30.00	0.00	0.013	4.18	37.70	3.52	3.00	3000.00	0.44	270.85

NOTES:

- FLOW DEPTH WAS DETERMINED USING THE HEC-2 COMPUTER MODEL.
- FREEBOARD PER DPM 22.3.C.4.a(4) OR DPM 22.3.C.4.b(2): $F = 3.0'$ Rectangular or $F = 0.7' [2 + 0.25VD^{1/3}]$ Trapezoidal
- EASEMENT CURVE LENGTH PER DPM 22.3.C.3.b(2): $L = 0.32 (b + 2d) \frac{V}{\sqrt{g}}$
- SUPERELEVATION TRAPEZOIDAL PER DPM 22.3.C.3.a(2): $S = 1.3 \frac{V^3 (b + 2d)}{32.2R}$
- SUPERELEVATION RECTANGULAR PER DPM 22.3.C.3.a(1): $S = \frac{V^3 b}{32.2R}$
- SUPERELEVATION LESS THAN 0.50' NOT INCLUDED IN TOTAL CHANNEL DEPTH

FLOW ANALYSIS OF OPEN CHANNEL JUNCTIONS FROM SCS TR-25 (FIGURE 5.1) ALTERNATIVE NO. 1 100 YR. IN DOMINGO BACA CHANNEL - 100 YR. IN PASEO DEL NORTE CHANNEL JOB NO. 2833.1													
HEC-2 DATA													
h=	4	FT	L=	100	FT	n=	0.013	Z=	0	h=	15	ft	ft
SECTION 1 STATION 26+54				SECTION 2 STATION 1+50				SECTION 3 STATION 25+54				SECTION 4 STATION 25+79	
Q ₁ =	4280	CFS	Q ₂ =	1030	CFS	Q ₃ =	5310	CFS	Q ₄ =	5310	CFS	Q ₅ =	5310
b ₁ =	30	FT	b ₂ =	10	FT	b ₃ =	40	FT	b ₄ =	40	FT	b ₅ =	40
d ₁ =	4.28	FT	d ₂ =	6	FT	d ₃ =	3.81	FT	d ₄ =	3.86	FT	d ₅ =	3.86
F ₁ =	2.84		F ₂ =	1.2		F ₃ =	3.16		F ₄ =	3.09		F ₅ =	3.09
h=	4	FT	h=	4	FT	h=	4	FT	h=	4	FT	h=	4
A ₁ =	128.5	SQ FT	A ₂ =	60	SQ FT	A ₃ =	152.09	SQ FT	A ₄ =	154.18	SQ FT	A ₅ =	154.18
V ₁ =	33.29	FT/SEC	V ₂ =	17.3	FT/SEC	V ₃ =	34.91	FT/SEC	V ₄ =	34.44	FT/SEC	V ₅ =	34.44
P ₁ =	38.56	FT	P ₂ =	22	FT	P ₃ =	47.62	FT	P ₄ =	47.72	FT	P ₅ =	47.72
R ₁ =	3.33	FT	R ₂ =	2.73	FT	R ₃ =	3.19	FT	R ₄ =	3.23	FT	R ₅ =	3.23
L=	100	FT	L=	100	FT	L=	100	FT	L=	100	FT	L=	100
n=	0.013		n=	0.013		n=	0.013		n=	0.013		n=	0.013
CONDITION													
RECTANGULAR CHANNEL WITH UNEQUAL WIDTH, MAIN CHANNEL AND SUPERCRITICAL VELOCITY FLOW IN ALL BRANCHES													
FORMULA													
$\frac{Q_1^2}{gA_1^3} + \frac{b_1 d_1^2}{2} - \frac{b_2 d_2^2}{2} = \frac{Q_1^2}{gA_1^3} + \frac{Q_2^2}{gA_2^3} + \frac{b_3 d_3^2}{2} - \frac{b_4 d_4^2}{2} - \frac{b_5 - b_1}{2} (d_5^2) - \frac{P_5 \ln V_5^2}{2.216 \times 10^8}$													
5757.48 + 290.32 - 304.80 = 4425.47 + 549.12 + 342.40 + 274.78 + 180.00 - 292.78													
5743.00 = 5478.99													
Δ = 264.02													
Δ% = 4.82													

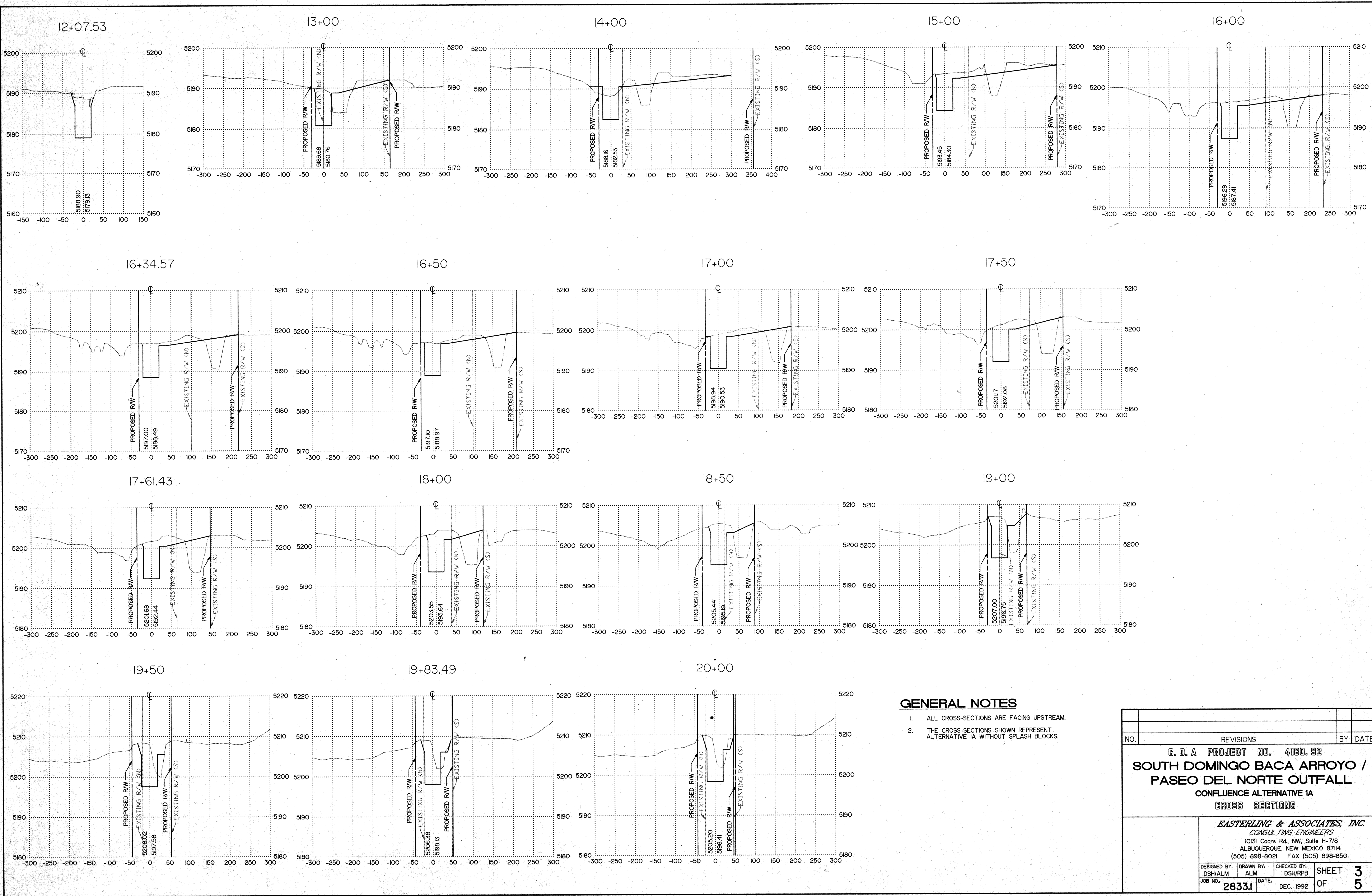
HYDRAULIC ANALYSIS SUMMARY



ALTERNATIVE 1A SUMMARY OF QUANTITIES AND COST					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	R/W ACQUISITION FOR L.A. TRACT "A"	SF	106,745	\$ 4.00	\$426,980.00
2	R/W ACQUISITION FOR PINO YARDS	SF	17,256	\$ 4.00	\$69,024.00
3	STRUCTURAL CONC. CHANNEL LINING	CY	3,930	\$265.00	\$1,041,450.00
4	8" SLOPE PAVING	SF	1,800	\$6.00	\$10,800.00
5	EXCAVATION / BACKFILL FOR CHANNEL	CY	35,650	\$3.65	\$130,122.50
6	SUBGRADE PREPARATION FOR MAINTENANCE RD.	SY	3,345	\$1.00	\$3,345.00
7	6" SANITARY SEWER LINE RELOCATION	LS	1	\$6,700.00	\$6,700.00
8	6" WATERLINE RELOCATION	LS	1	\$11,400.00	\$11,400.00
9	PINO YARD RUNDOWN	LS	1	\$22,700.00	\$22,700.00
10	48" PIPE PENETRATION	EA	1	\$2,500.00	\$2,500.00
11	10" WATERLINE RELOCATION	LS	1	\$4,850.00	\$4,850.00
12	4" AND 6" HIGH CHAINLINK FENCING	SF	19,900	\$1.80	\$35,820.00
13	POWER POLE RELOCATION	LS	1	\$7,500.00	\$7,500.00
14	2" GAS LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
15	TELEPHONE LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
16	CMU CORE FILLED SPLASH BLOCKS	SF	775	\$8.80	\$6,820.00
17	STRUCTURAL CONCRETE FOR BOX CULVERT	CY	830	\$285.00	\$236,550.00
18	EXCAVATION / BACKFILL FOR BOX CULVERT	CY	23,240	\$5.75	\$133,630.00
19	CLEARING AND GRUBBING	AC	6	\$600.00	\$3,600.00
20	SEEDING	AC	3	\$1,200.00	\$3,600.00
21	REMOVE & DISPOSE OF RIP-RAP / UNSUITABLE MATERIAL	LS	1	\$30,000.00	\$30,000.00
SUBTOTAL					\$2,197,391.50
15% CONTINGENCIES					\$329,608.73
TOTAL FOR ALTERNATIVE 1A					\$2,527,000.23

ALTERNATIVE 1B SUMMARY OF QUANTITIES AND COST					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	R/W ACQUISITION L.A. CENTER TACT "A"	SF	97,931	\$ 4.00	\$391,724.00
2	STRUCTURAL CONC. CHANNEL LINING	CY	3,930	\$265.00	\$1,041,450.00
3	8" SLOPE PAVING	SF	1,800	\$6.00	\$10,800.00
4	CMU CORE FILLED RETAINING WALL	SF	4,160	\$8.80	\$36,608.00
5	RETAINING WALL FOOTING	CY	195	\$240.00	\$46,800.00
6	EXCAVATION / BACKFILL FOR CHANNEL	CY	35,650	\$3.65	\$130,122.50
7	SUBGRADE PREPARATION FOR MAINTENANCE RD.	SY	3,345	\$1.00	\$3,345.00
8	6" SANITARY SEWER LINE RELOCATION	LS	1	\$6,700.00	\$6,700.00
9	6" WATERLINE RELOCATION	LS	1	\$11,400.00	\$11,400.00
10	PINO YARD RUNDOWN	LS	1	\$22,700.00	\$22,700.00
11	48" PIPE PENETRATION	EA	1	\$2,500.00	\$2,500.00
12	10" WATERLINE RELOCATION	LS	1	\$4,850.00	\$4,850.00
13	4" HIGH CHAINLINK FENCING	SF	14,200	\$1.80	\$25,560.00
14	2" GAS LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
15	TELEPHONE LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
16	CMU CORE FILLED SPLASH BLOCKS	SF	775	\$8.80	\$6,820.00
17	STRUCTURAL CONCRETE FOR BOX CULVERT	CY	830	\$285.00	\$236,550.00
18	EXCAVATION / BACKFILL FOR BOX CULVERT	CY	23,240	\$5.75	\$133,630.00
19	CLEARING AND GRUBBING	AC	6	\$600.00	\$3,600.00
20	SEEDING	AC	3	\$1,200.00	\$3,600.00
21	REMOVE & DISPOSE OF RIP-RAP / UNSUITABLE MATERIAL	LS	1	\$30,000.00	\$30,000.00
SUBTOTAL					\$2,158,759.50
15% CONTINGENCIES					\$323,813.93
TOTAL FOR ALTERNATIVE 1A					\$2,482,573.43

NO.	REVISIONS	BY	DATE
C.O.A PROJECT NO. 4160.02 SOUTH DOMINGO BACA ARROYO / PASEO DEL NORTE OUTFALL CONFLUENCE ALTERNATIVE 1A AND 1B TYPICAL SECTIONS, ESTIMATED COSTS			
EASTERLING & ASSOCIATES, INC. CONSULTING ENGINEERS 10131 Coors Rd., NW, Suite H-718 ALBUQUERQUE, NEW MEXICO 87114 (505) 898-8021 FAX (505) 898-8501			
DESIGNED BY: DSH/ALM	DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET 2
JOB NO. 2833.1	DATE: DEC. 1992	OF	5



GENERAL NOTES

- 1. ALL CROSS-SECTIONS ARE FACING UPSTREAM.
- 2. THE CROSS-SECTIONS SHOWN REPRESENT ALTERNATIVE 1A WITHOUT SPLASH BLOCKS.

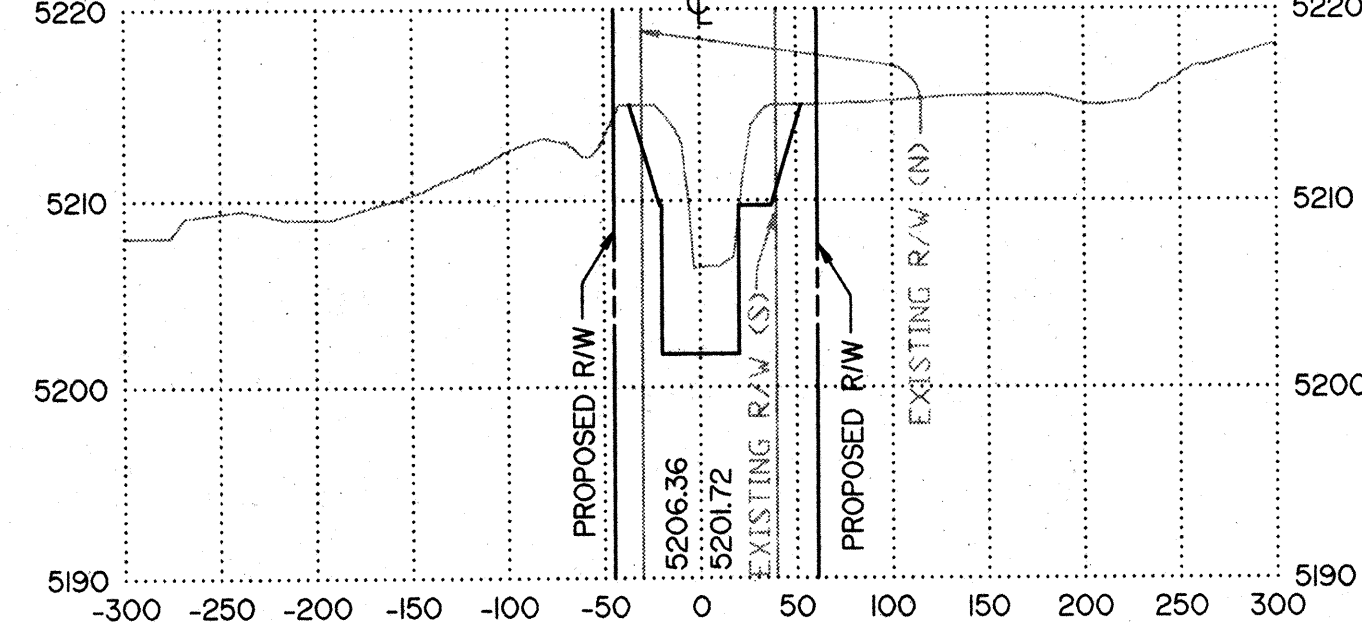
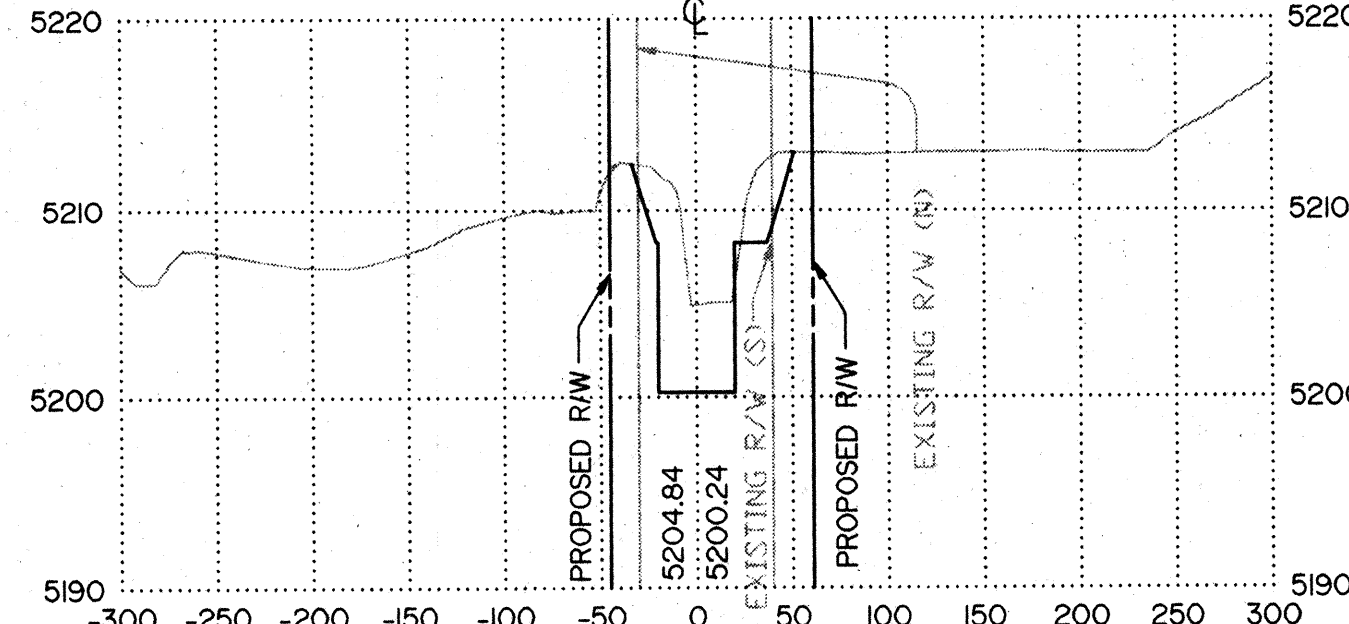
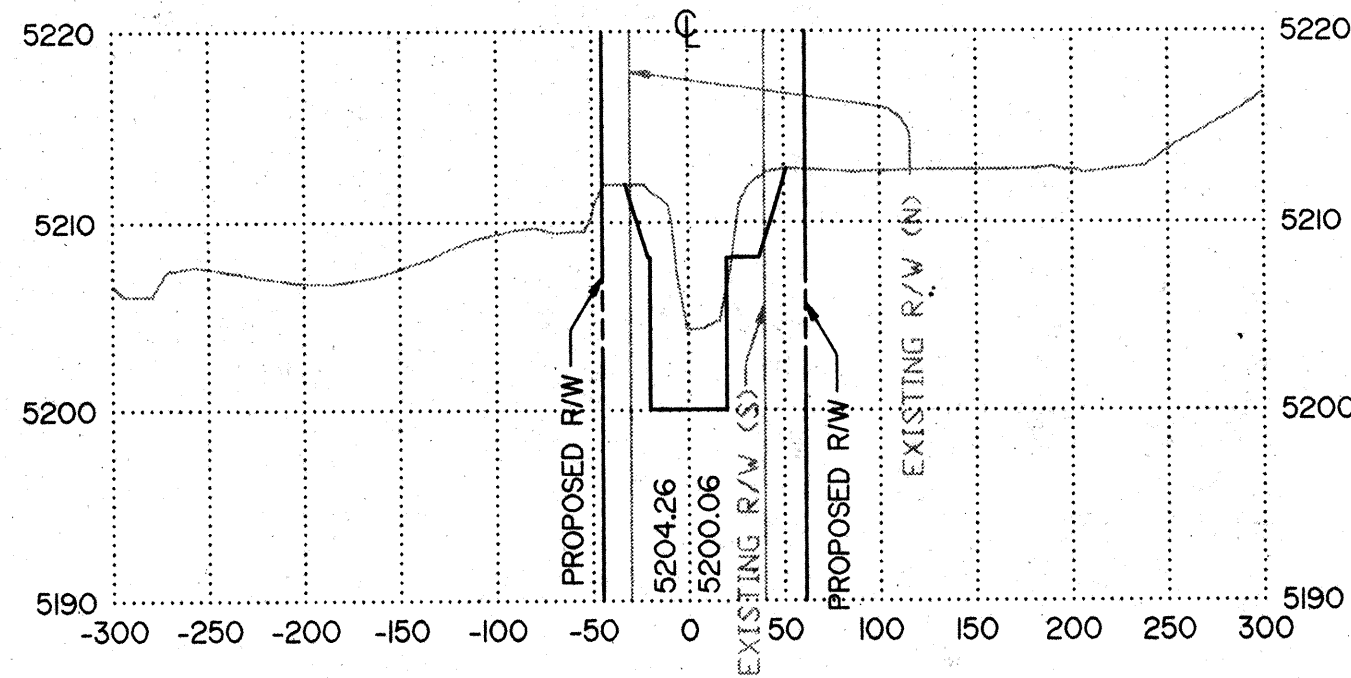
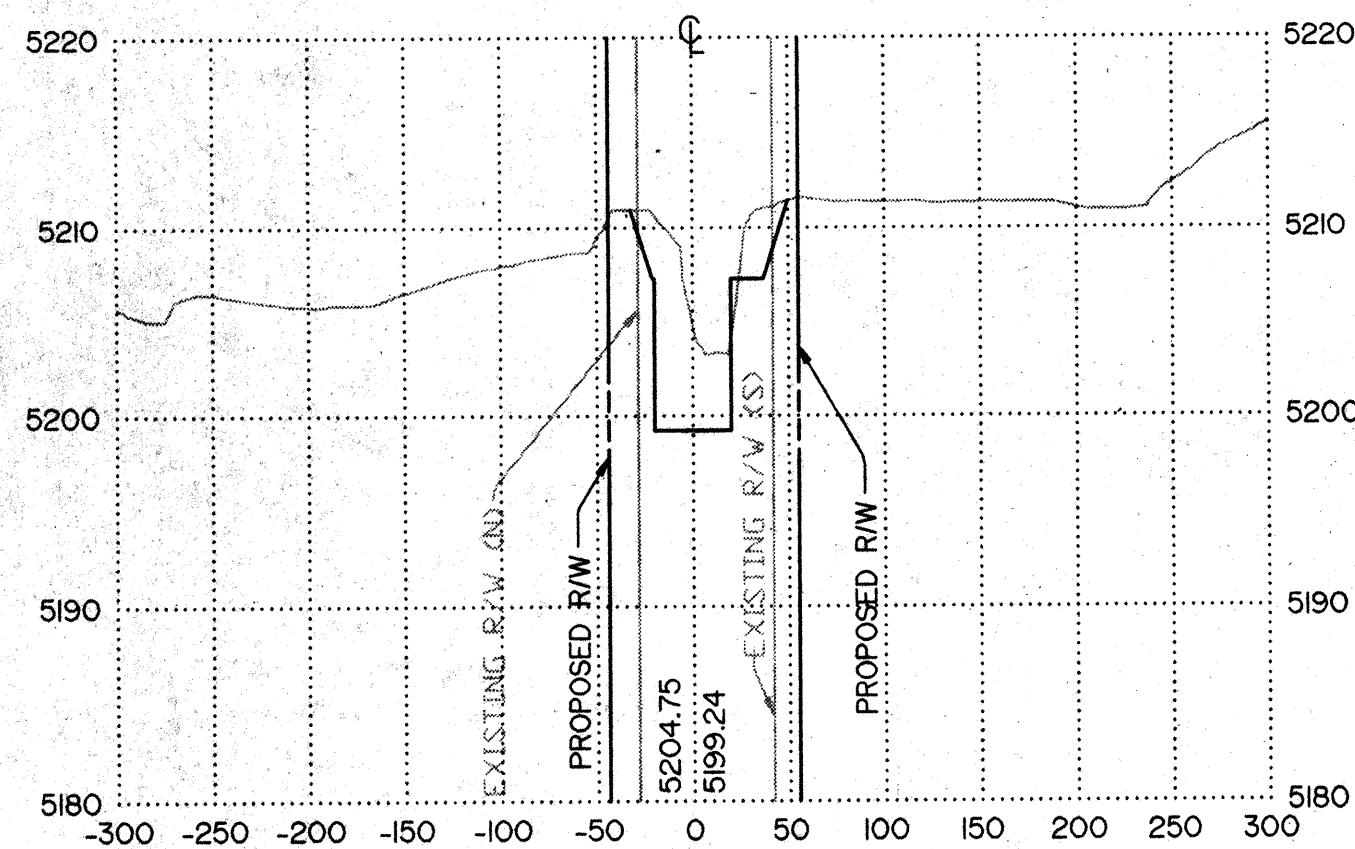
NO.		REVISIONS	BY	DATE
C.O.A PROJECT NO. 4180.92				
SOUTH DOMINGO BACA ARROYO /				
PASEO DEL NORTE OUTFALL				
CONFLUENCE ALTERNATIVE 1A				
CROSS SECTIONS				
EASTERLING & ASSOCIATES, INC.				
CONSULTING ENGINEERS				
10131 Coors Rd., NW, Suite H-7/8				
ALBUQUERQUE, NEW MEXICO 87114				
(505) 898-8021 FAX (505) 898-8501				
DESIGNED BY: DSH/ALM	DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET 3	
JOB NO. 2833.1	DATE:	DEC. 1992	OF 5	

20+50

21+00

21+0.35

22+00

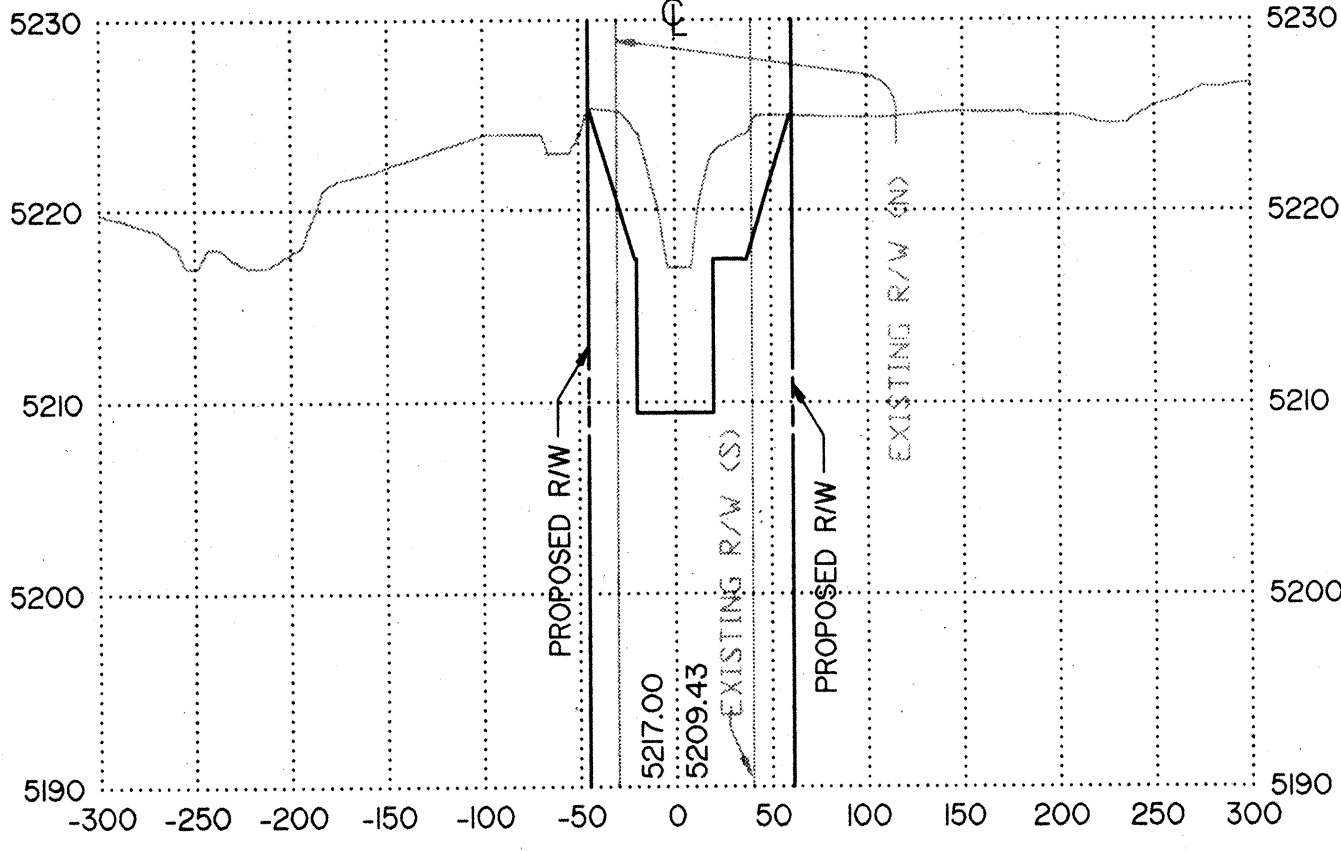
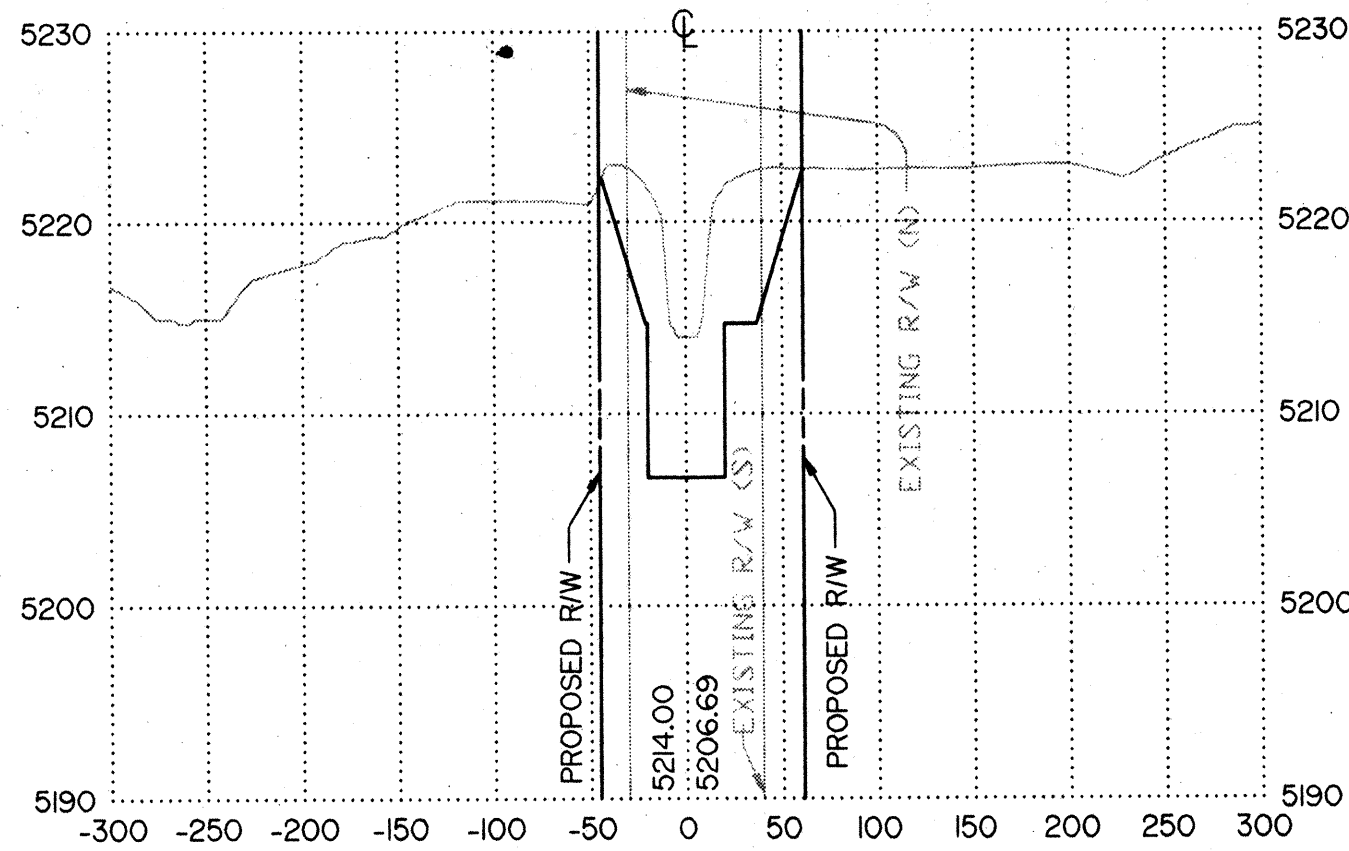
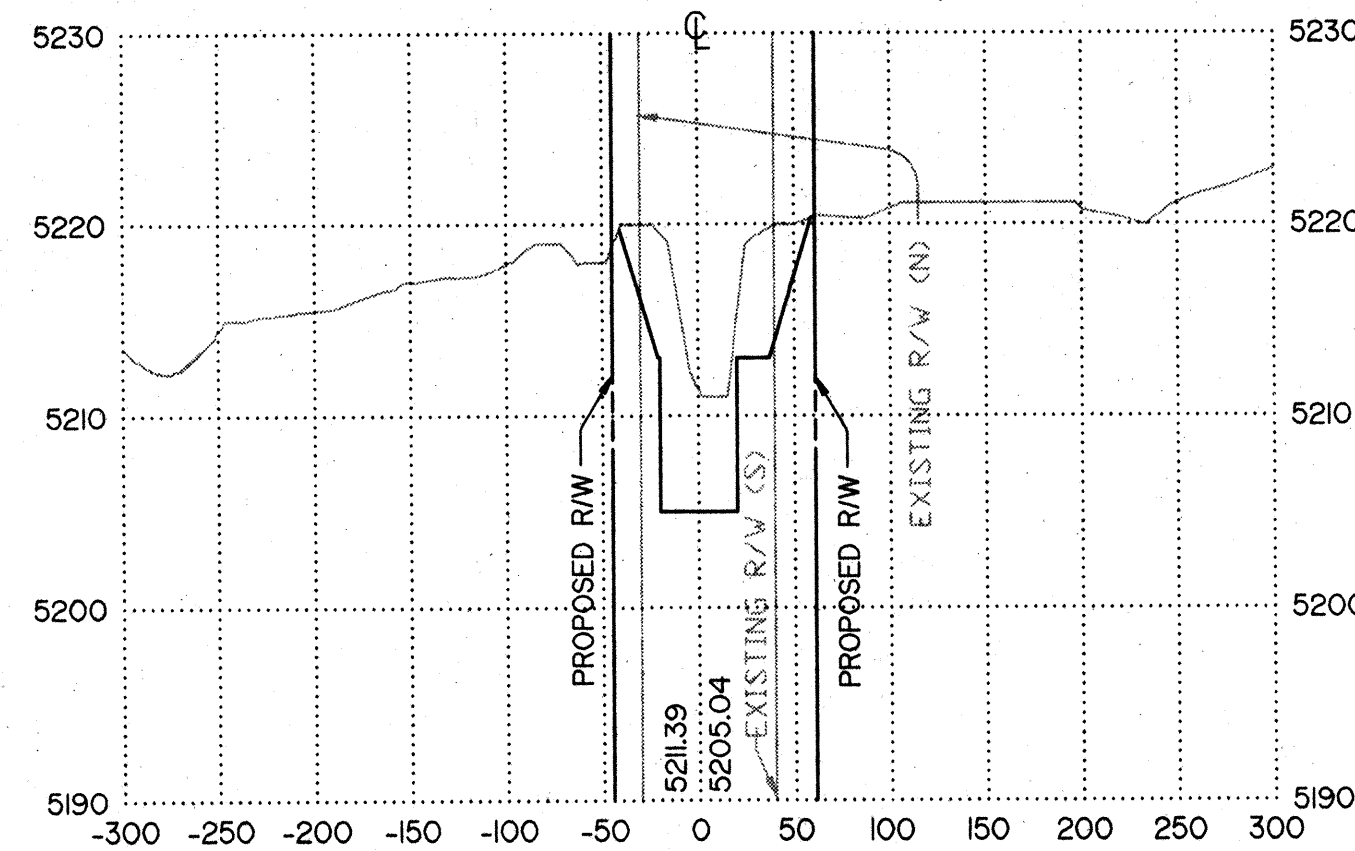
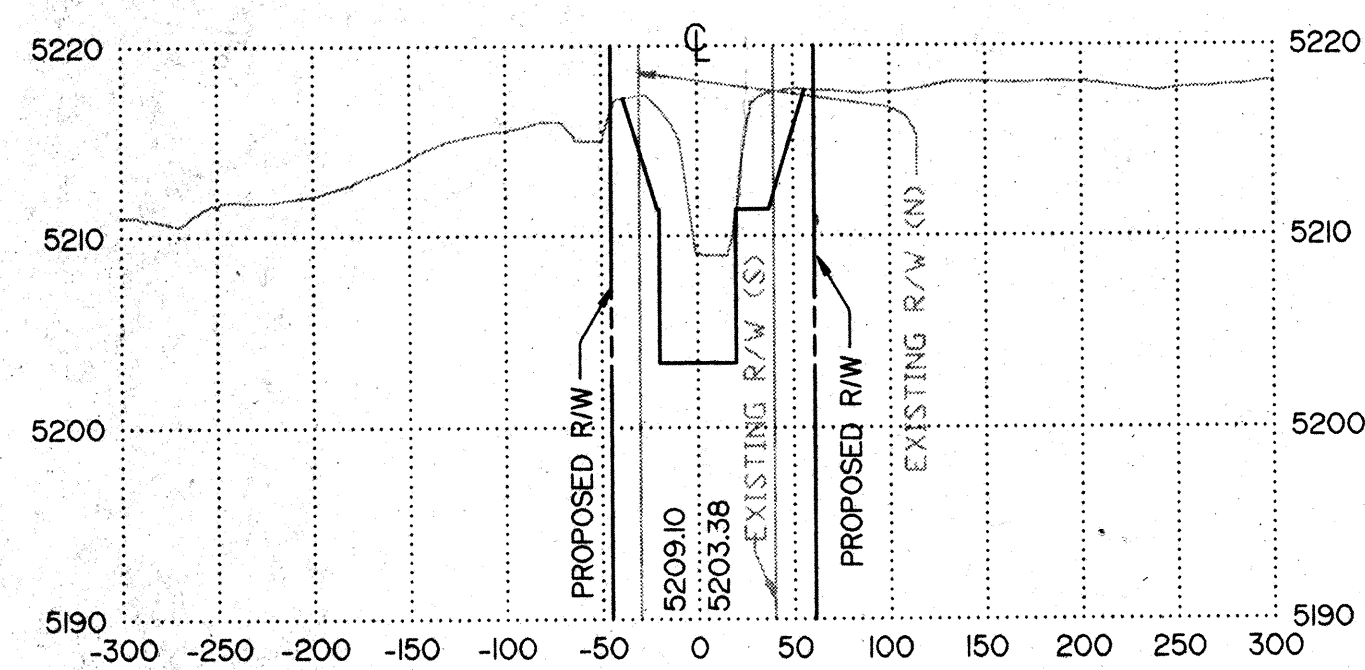


23+00

24+00

25+00

26+00

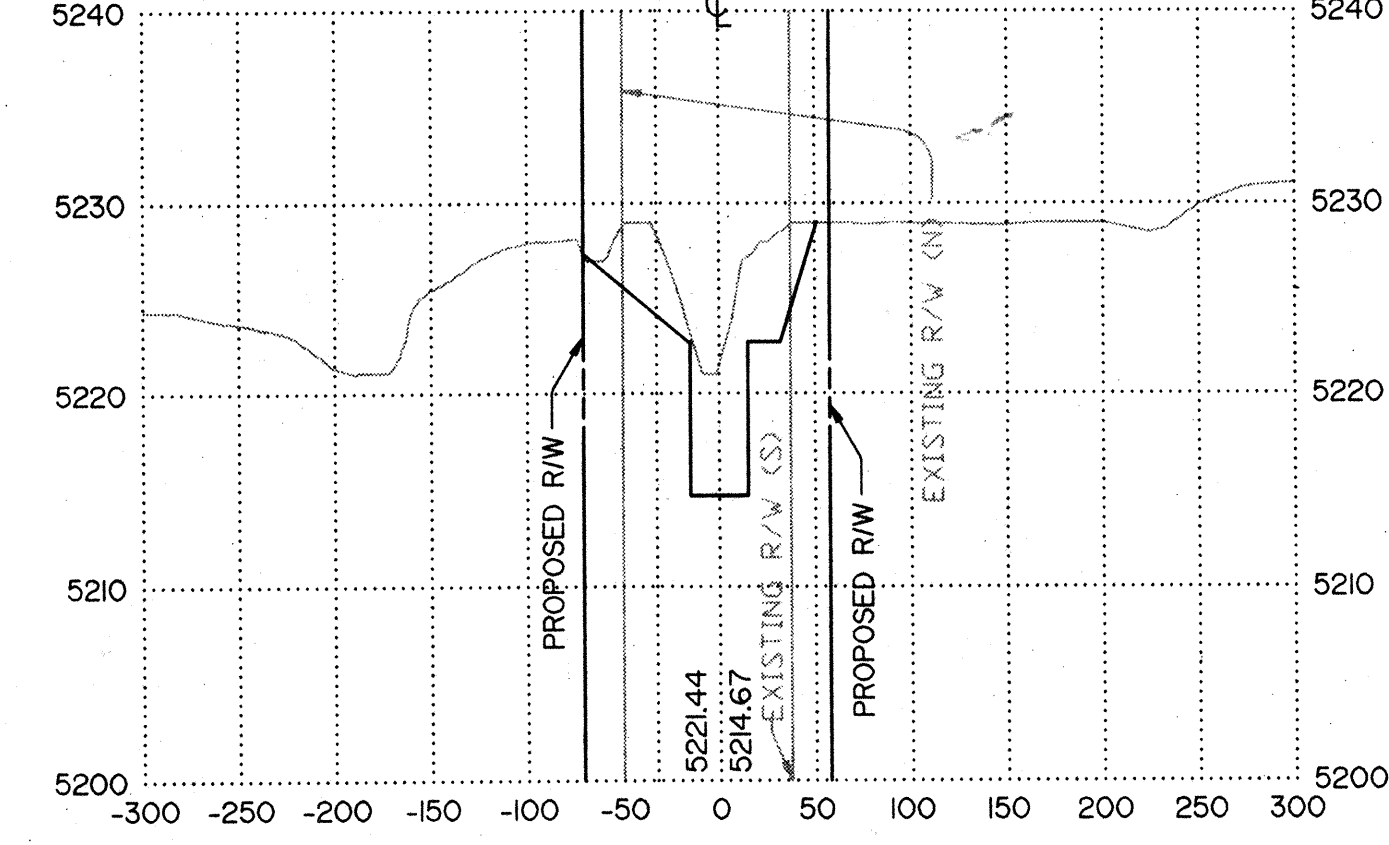
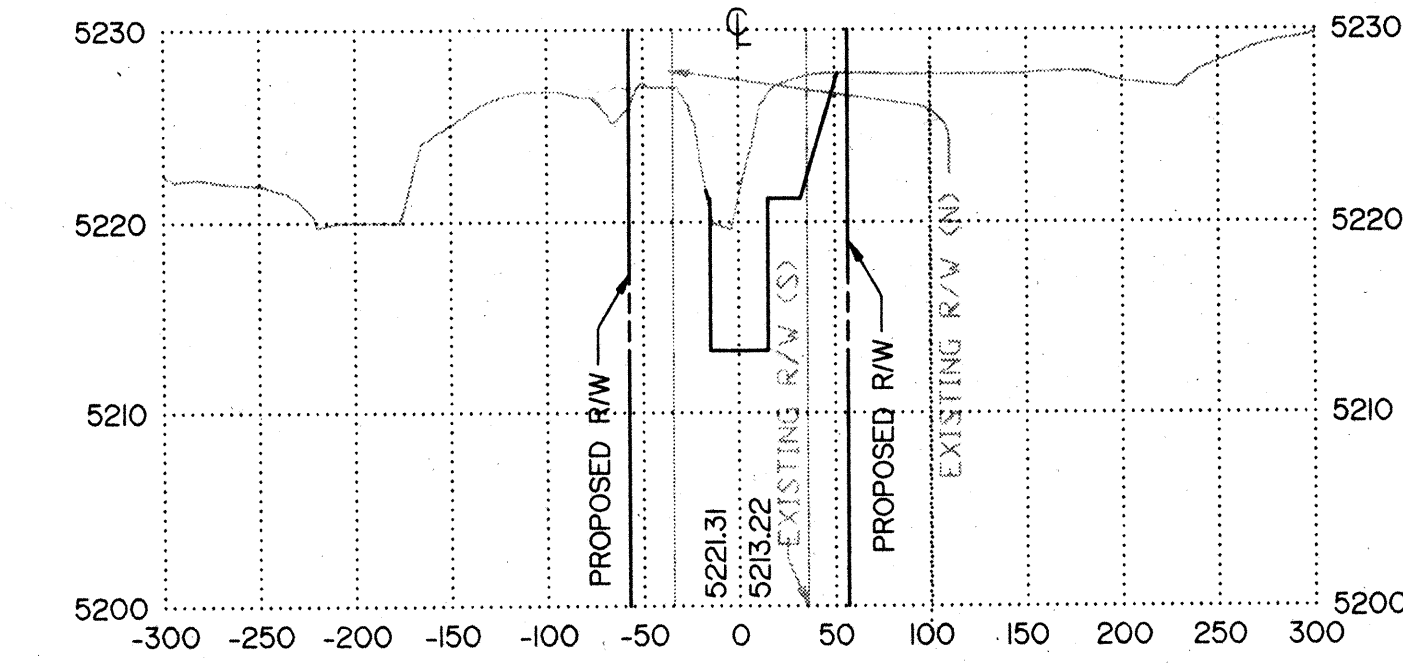
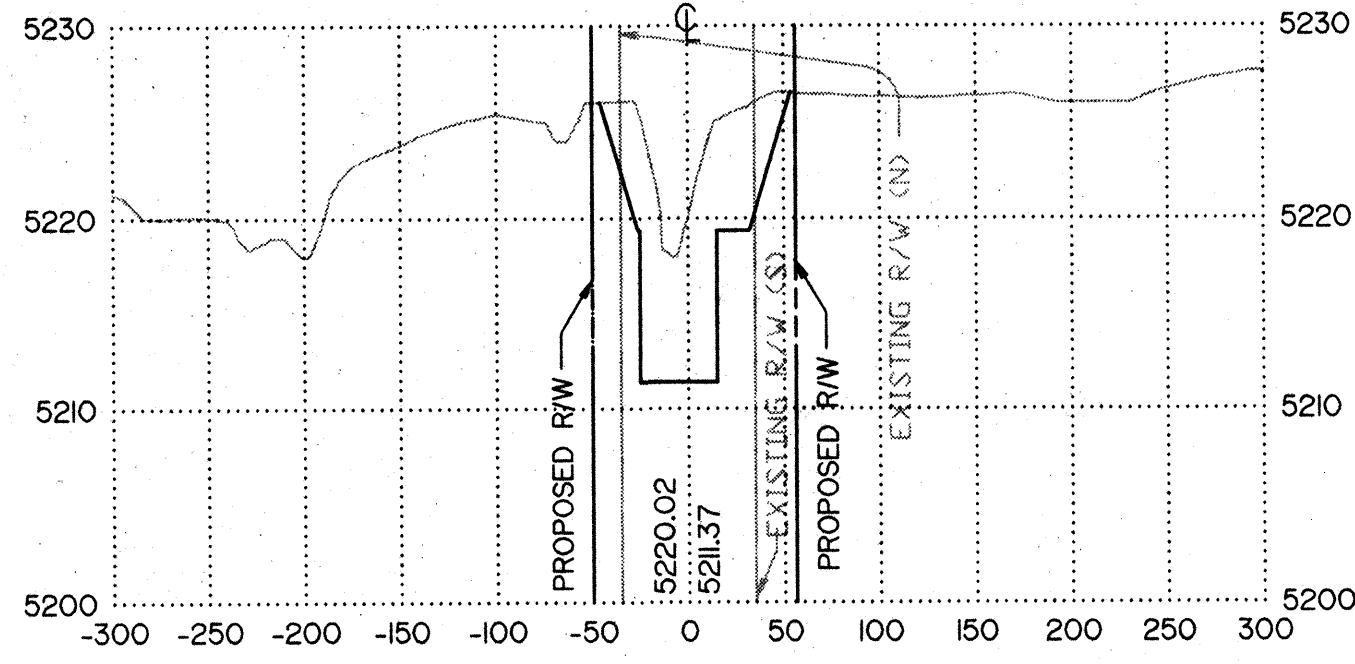
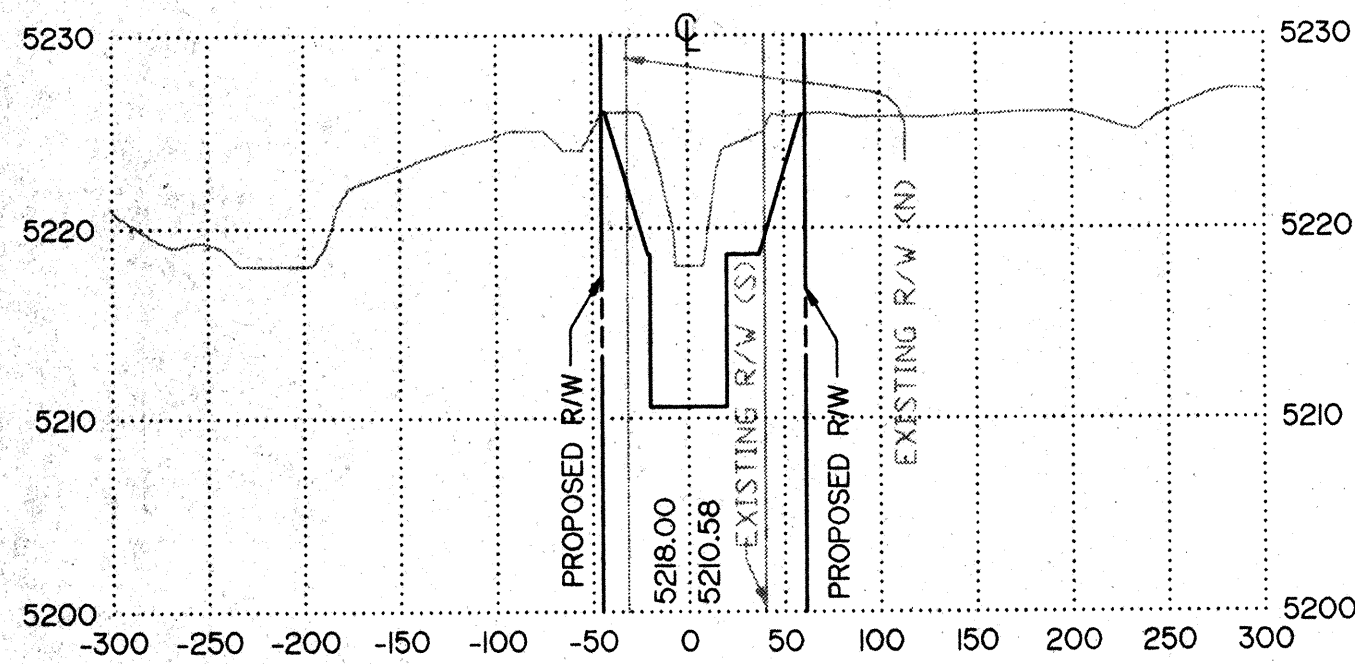


26+28.73

26+50

27+00

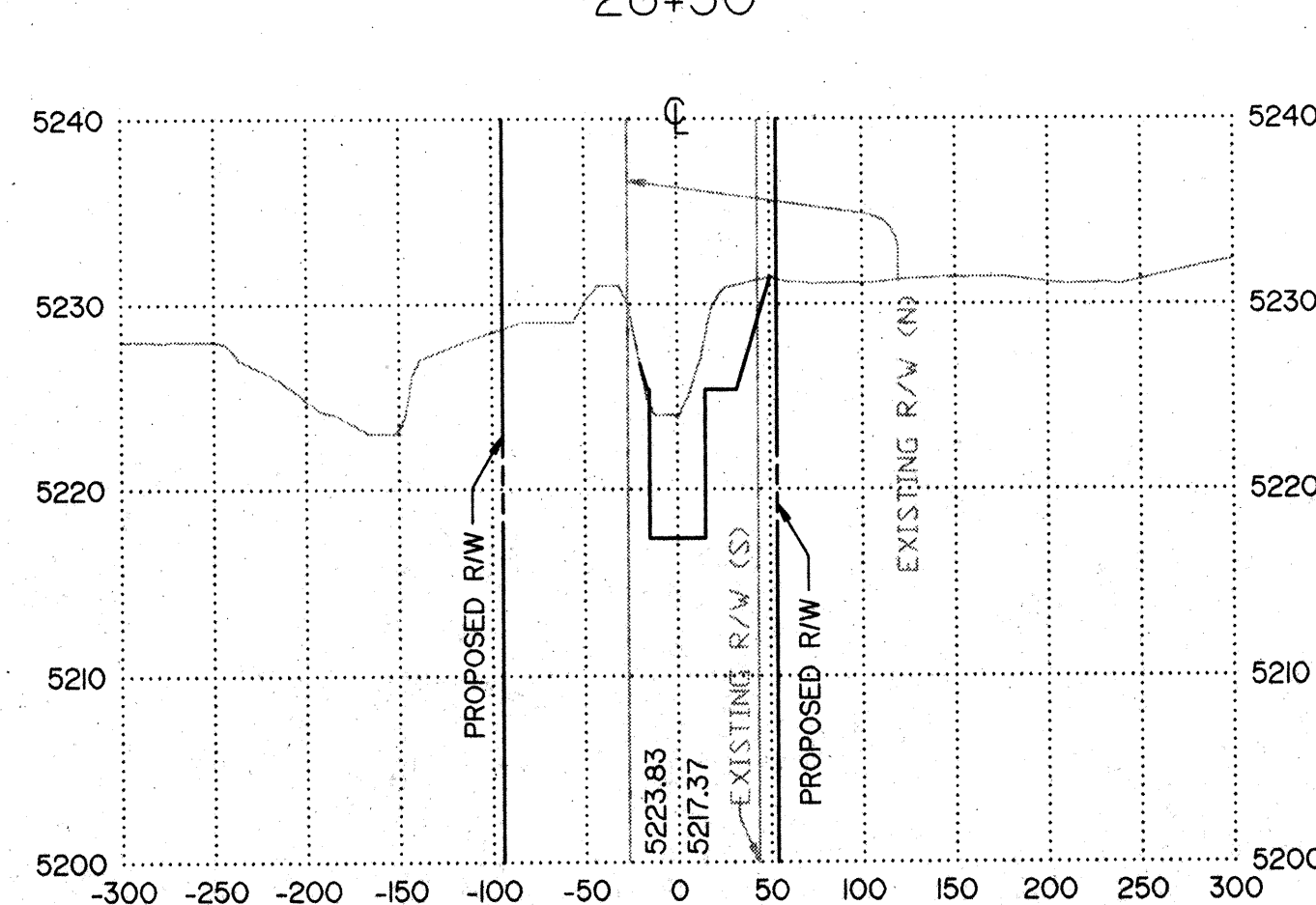
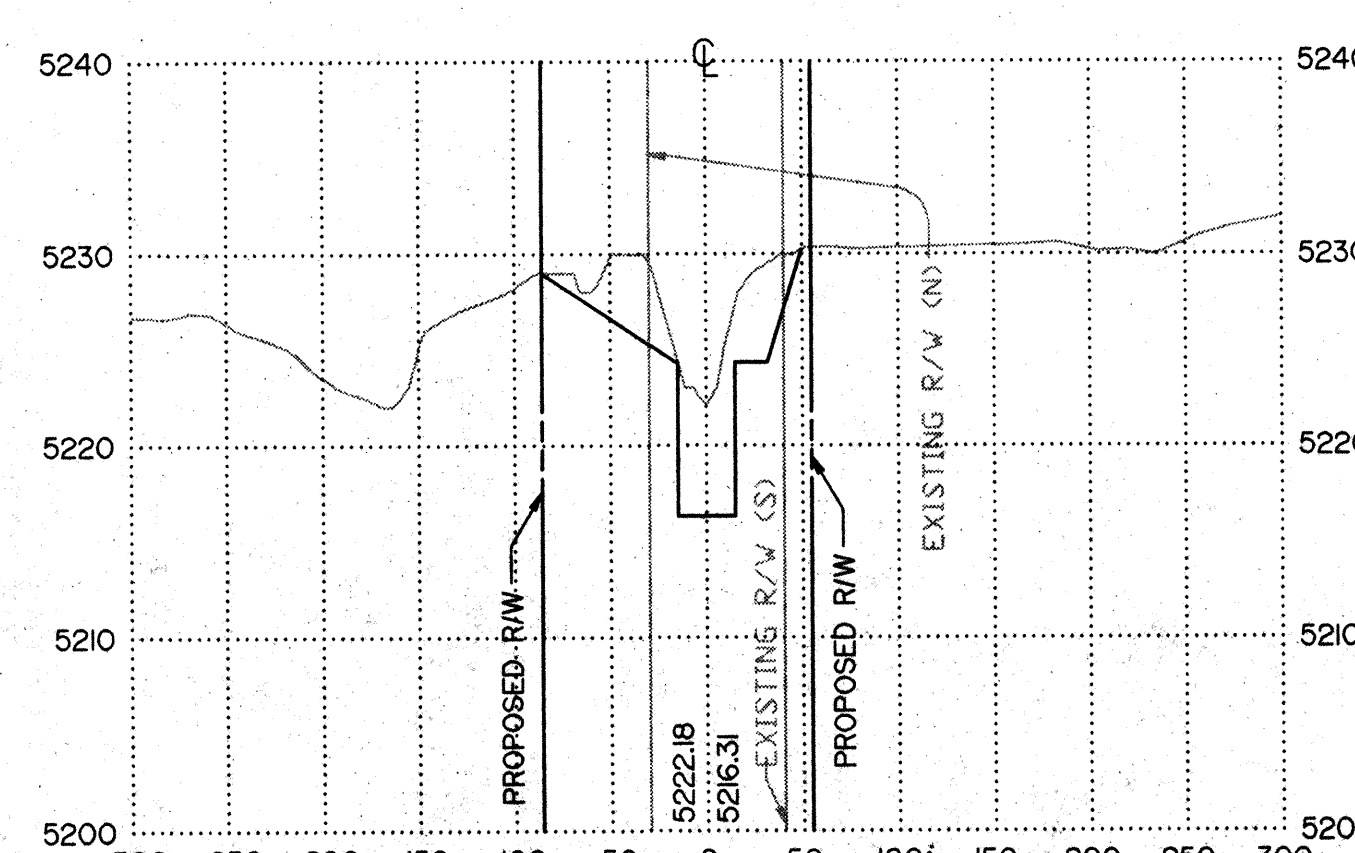
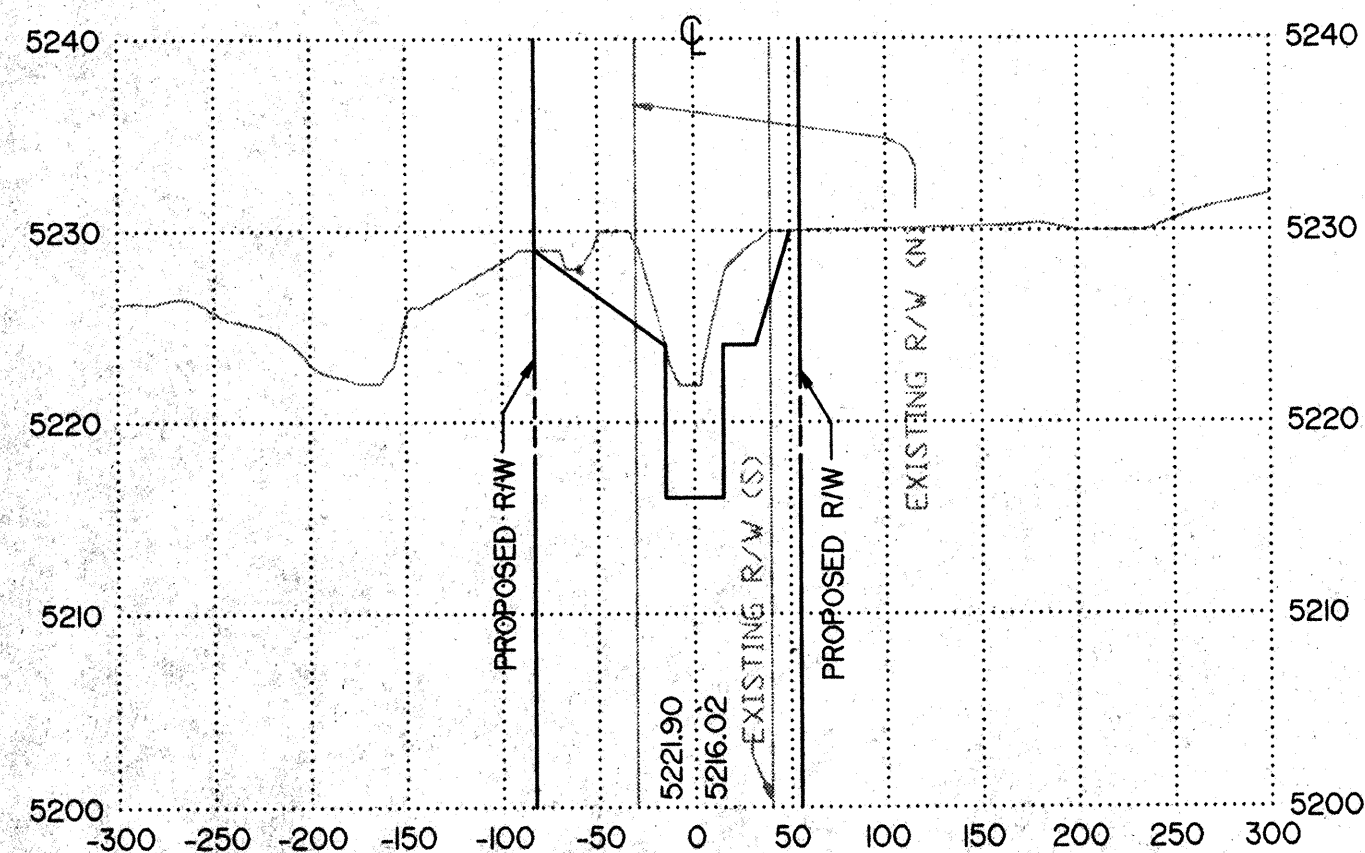
27+50



28+00

28+0.52

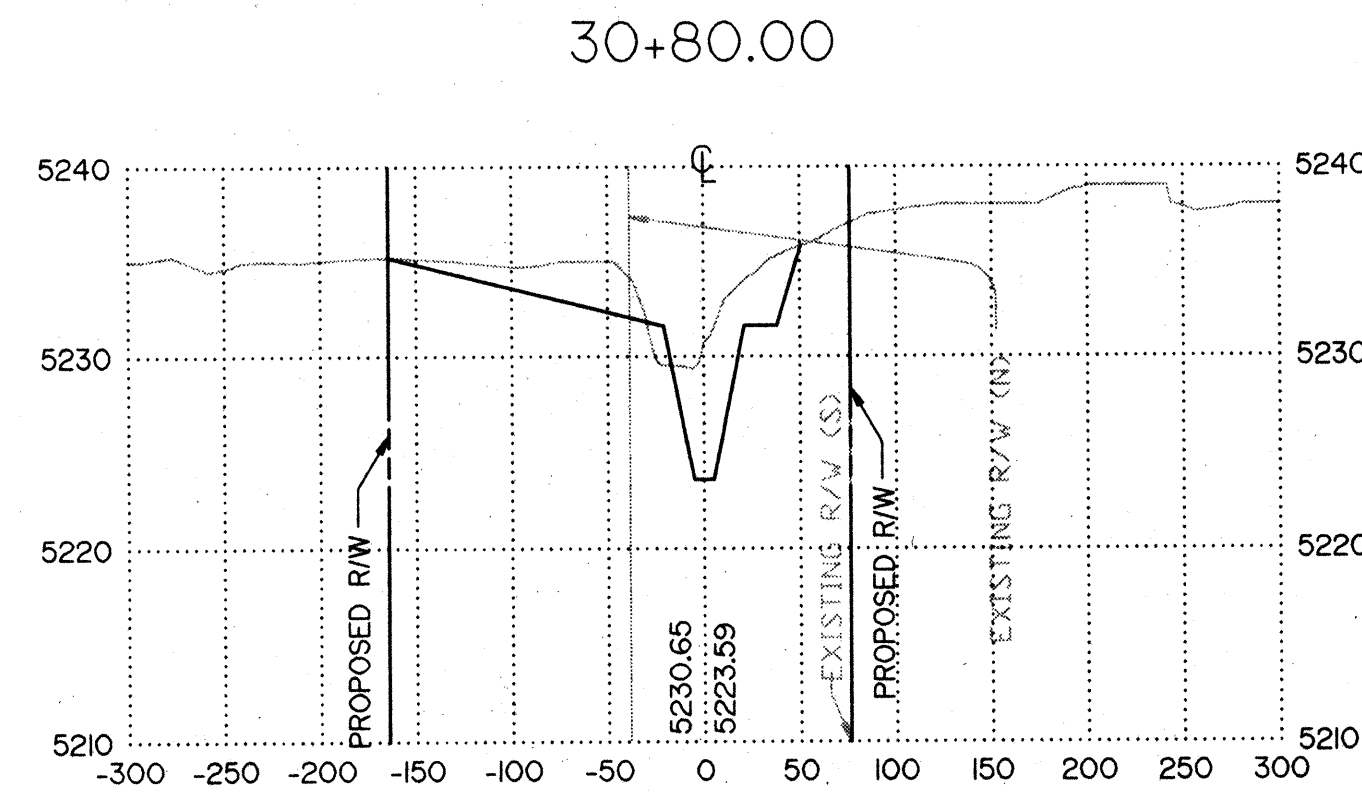
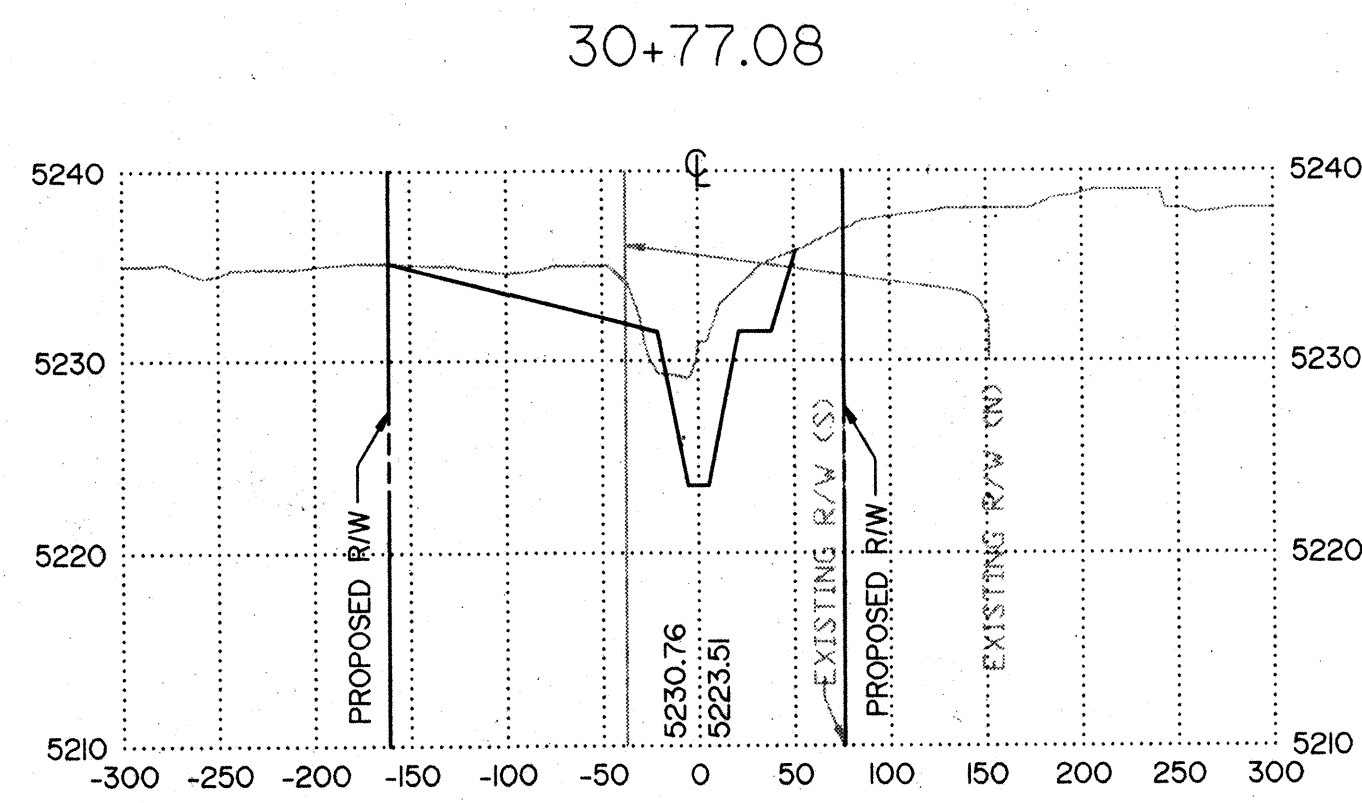
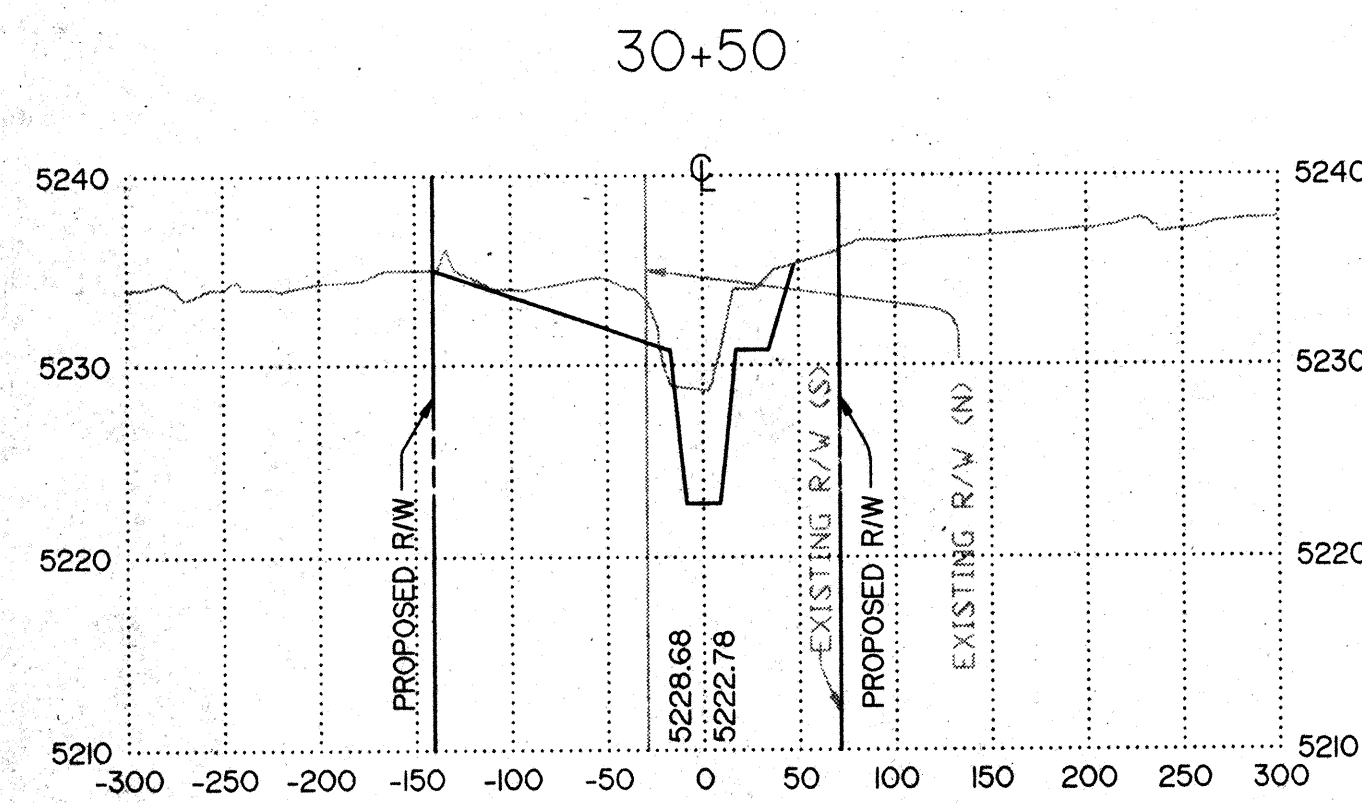
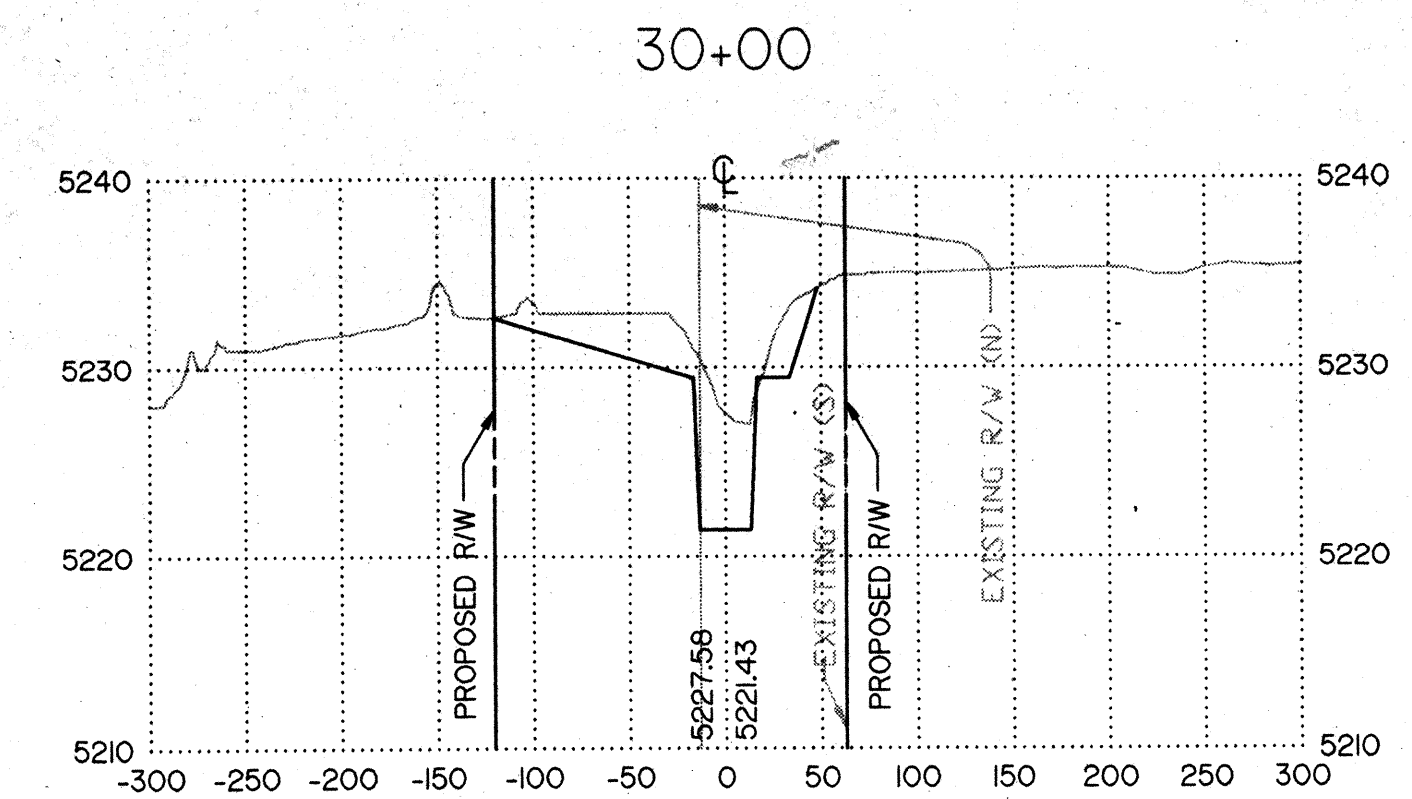
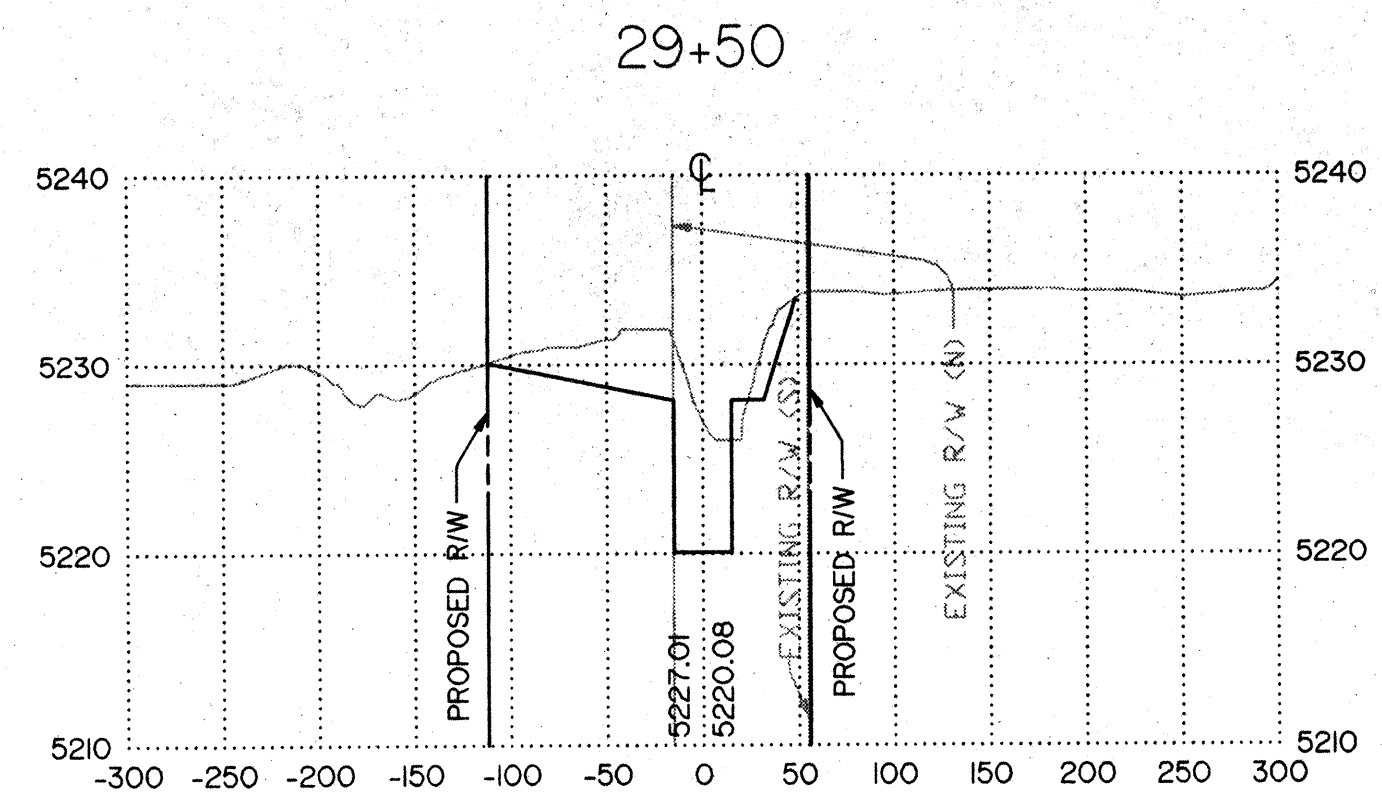
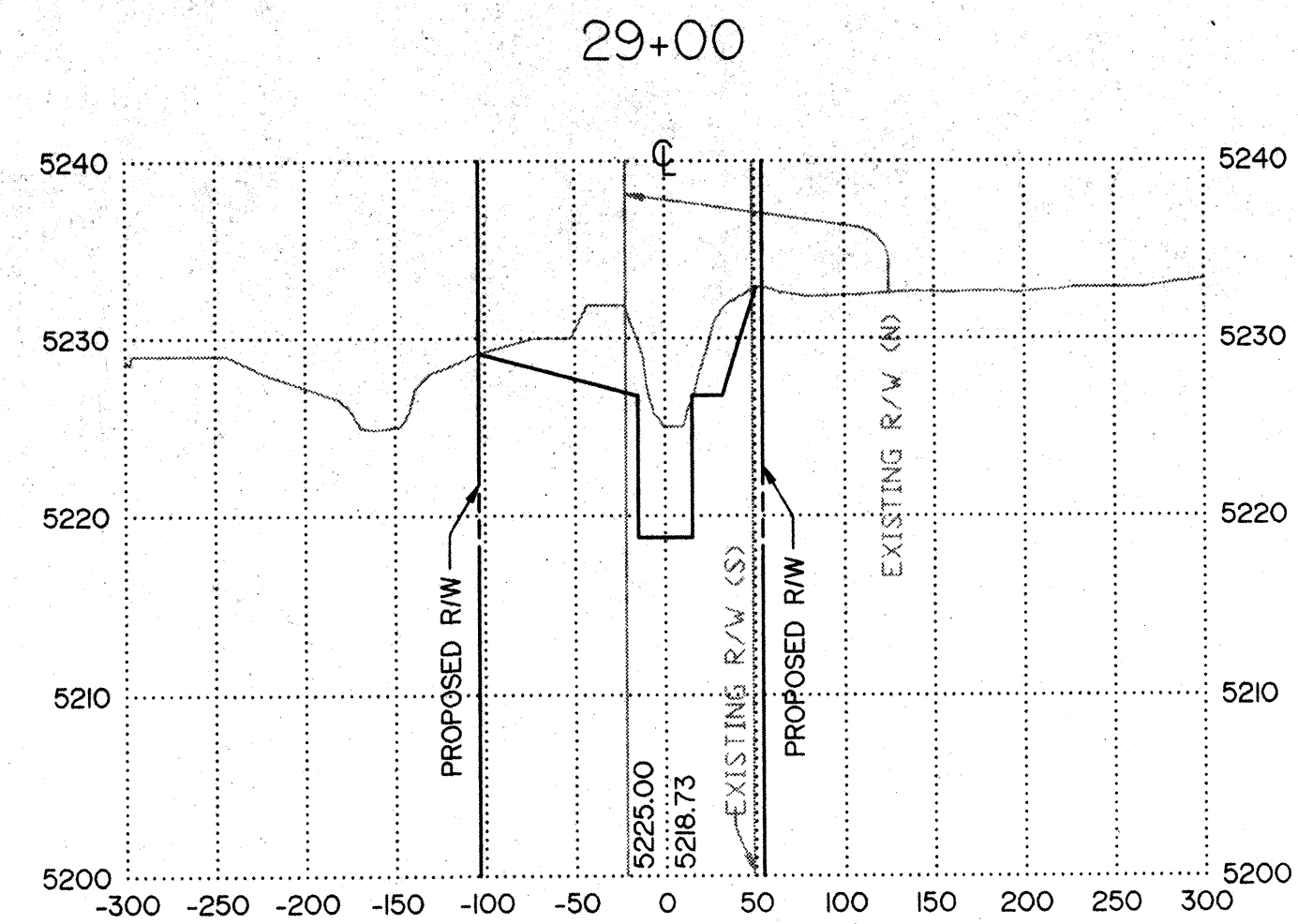
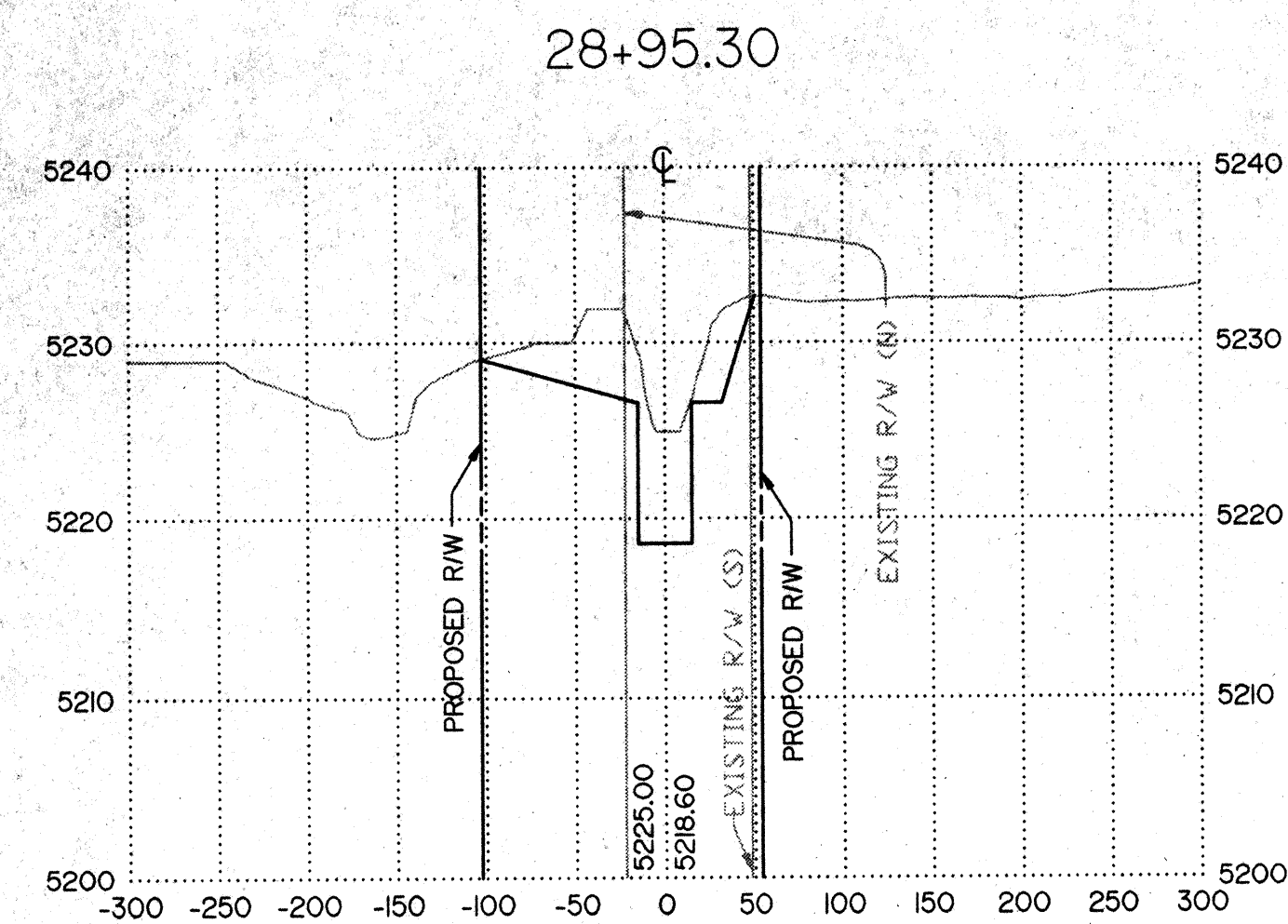
28+50



GENERAL NOTES

1. ALL CROSS-SECTIONS ARE FACING UPSTREAM.
2. THE CROSS-SECTIONS SHOWN REPRESENT ALTERNATIVE 1A WITHOUT SPLASH BLOCKS.

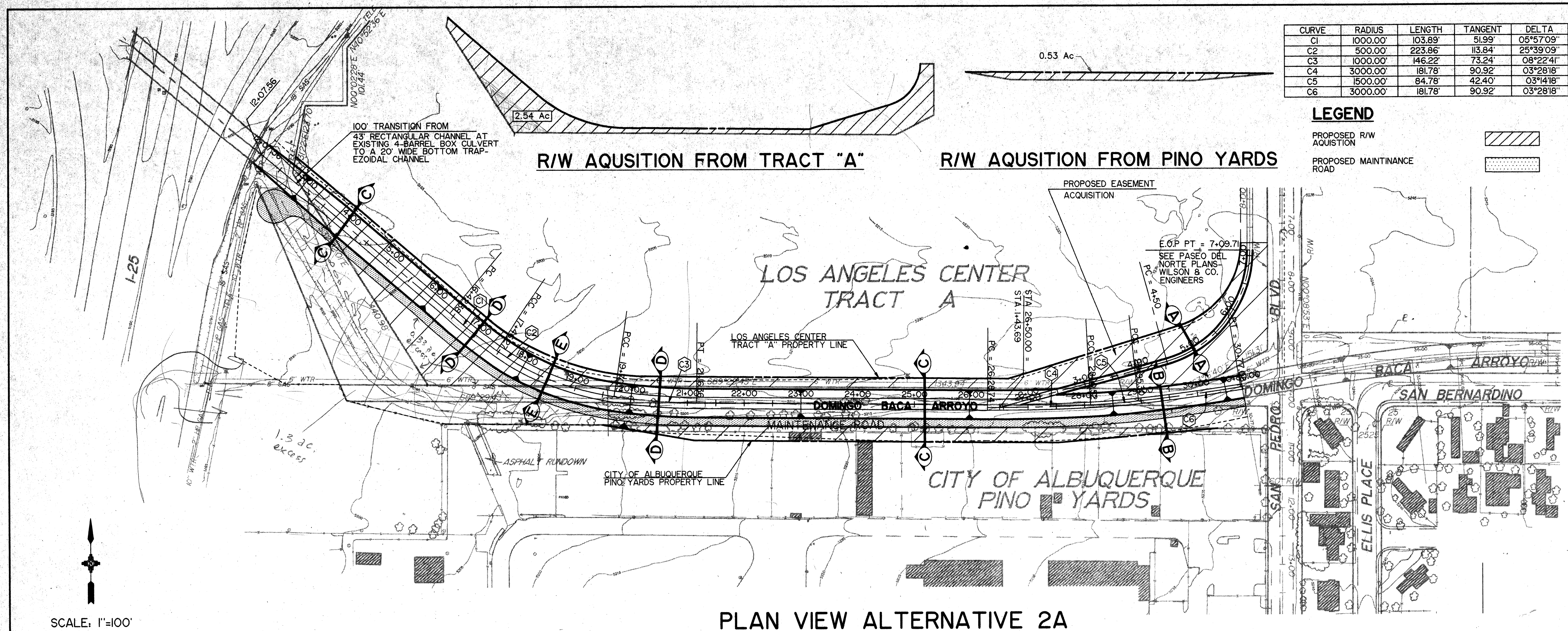
NO.		REVISIONS	BY	DATE
C. O. A PROJECT NO. 4180.92				
SOUTH DOMINGO BACA ARROYO /				
PASEO DEL NORTE OUTFALL				
CONFLUENCE ALTERNATIVE 1A				
CROSS SECTIONS				
EASTERLING & ASSOCIATES, INC.				
CONSULTING ENGINEERS				
10131 Coors Rd., NW, Suite H-718				
ALBUQUERQUE, NEW MEXICO 87114				
(505) 898-8021 FAX (505) 898-8501				
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SHEET	
DSH/ALM	ALM	DSH/RFB	4	
JOB NO.	DATE:	DEC. 1992	OF	
2833.1			5	



GENERAL NOTES

- ALL CROSS-SECTIONS ARE FACING UPSTREAM.
- THE CROSS-SECTIONS SHOWN REPRESENT ALTERNATIVE 1A WITHOUT SPLASH BLOCKS.

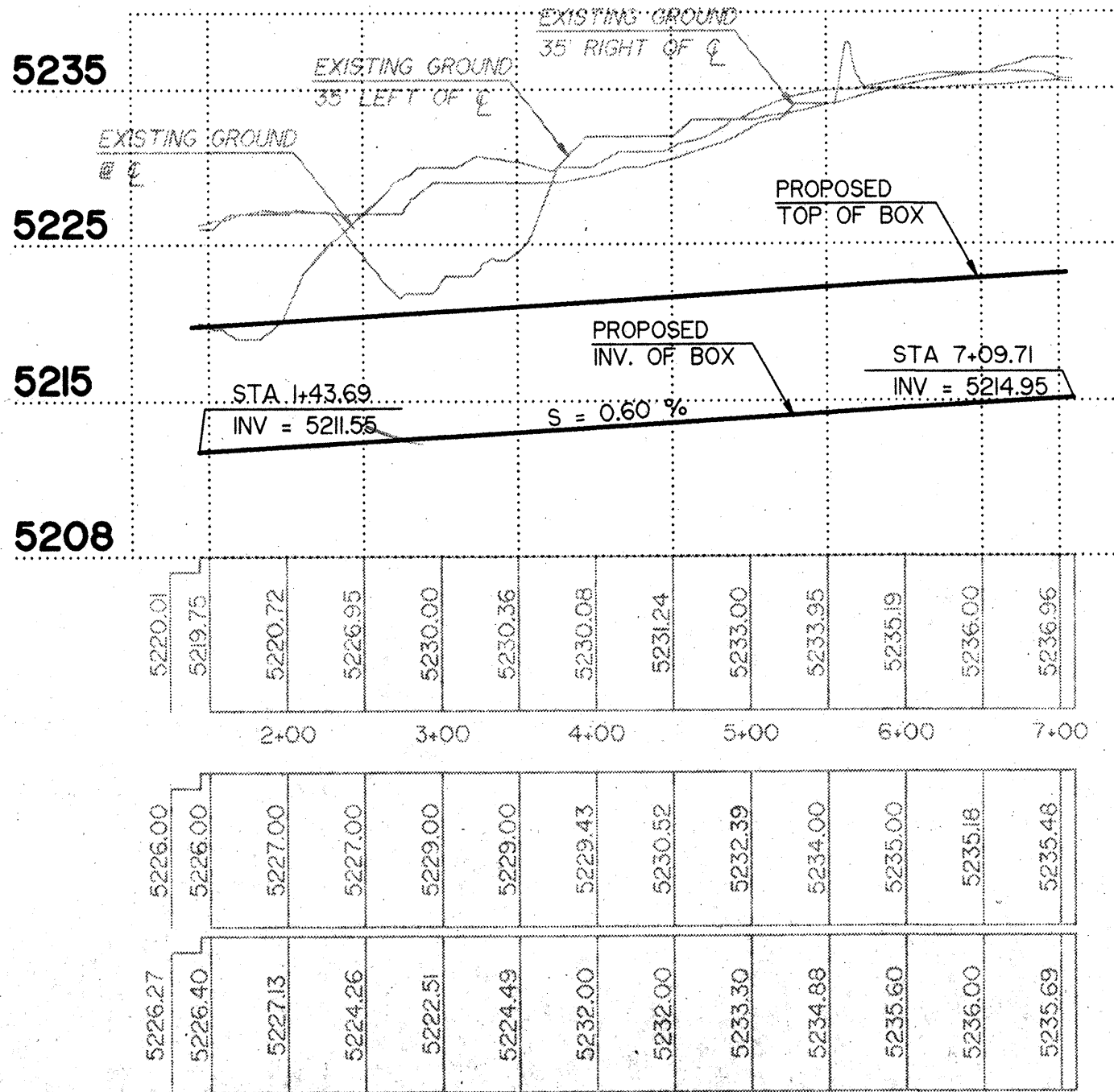
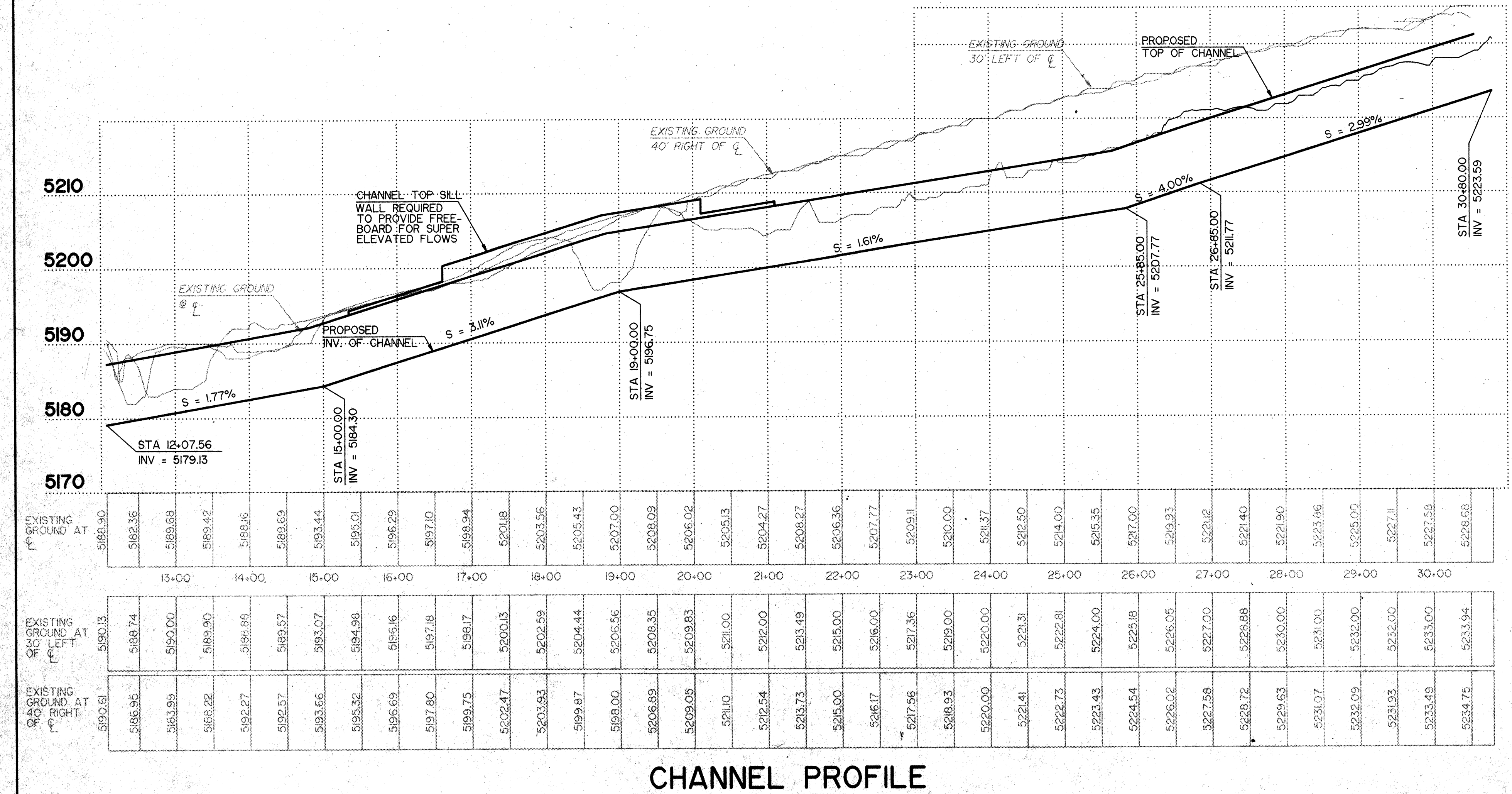
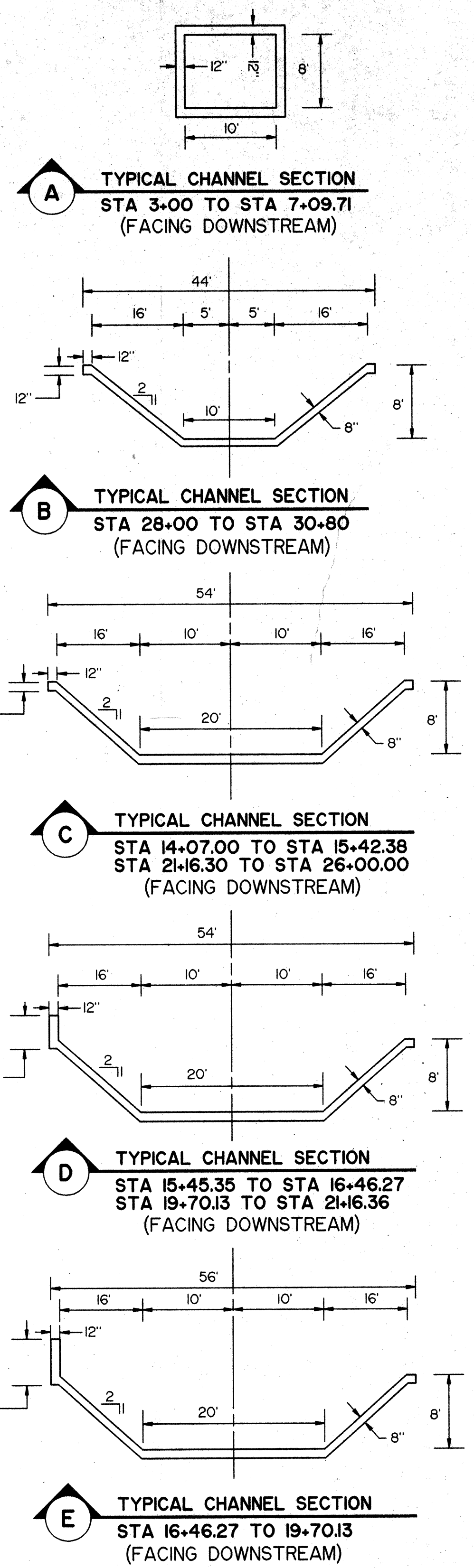
NO.	REVISIONS			BY	DATE
C. O. A PROJECT NO. 4160.92					
SOUTH DOMINGO BACA ARROYO /					
PASEO DEL NORTE OUTFALL					
CONFLUENCE ALTERNATIVE 1A					
CROSS SECTIONS					
EASTERLING & ASSOCIATES, INC. CONSULTING ENGINEERS 10131 Coors Rd., NW, Suite H-718 ALBUQUERQUE, NEW MEXICO 87114 (505) 898-8021 FAX (505) 898-8501					
DESIGNED BY: DSH/ALM	DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET 5		
JOB NO.	DATE		OF 5		
2833.1	DEC. 1992				



CURVE	RADIUS	LENGTH	TANGENT	DELTA
C1	1000.00'	103.89'	51.99'	05°57'09"
C2	500.00'	223.86'	113.84'	25°39'09"
C3	1000.00'	146.22'	73.24'	08°22'41"
C4	3000.00'	181.78'	90.92'	03°28'18"
C5	1500.00'	84.78'	42.40'	03°14'18"
C6	3000.00'	181.78'	90.92'	03°28'18"

LEGEND

PROPOSED R/W ACQUISITION	
PROPOSED MAINTENANCE ROAD	



NO.	REVISIONS	BY	DATE

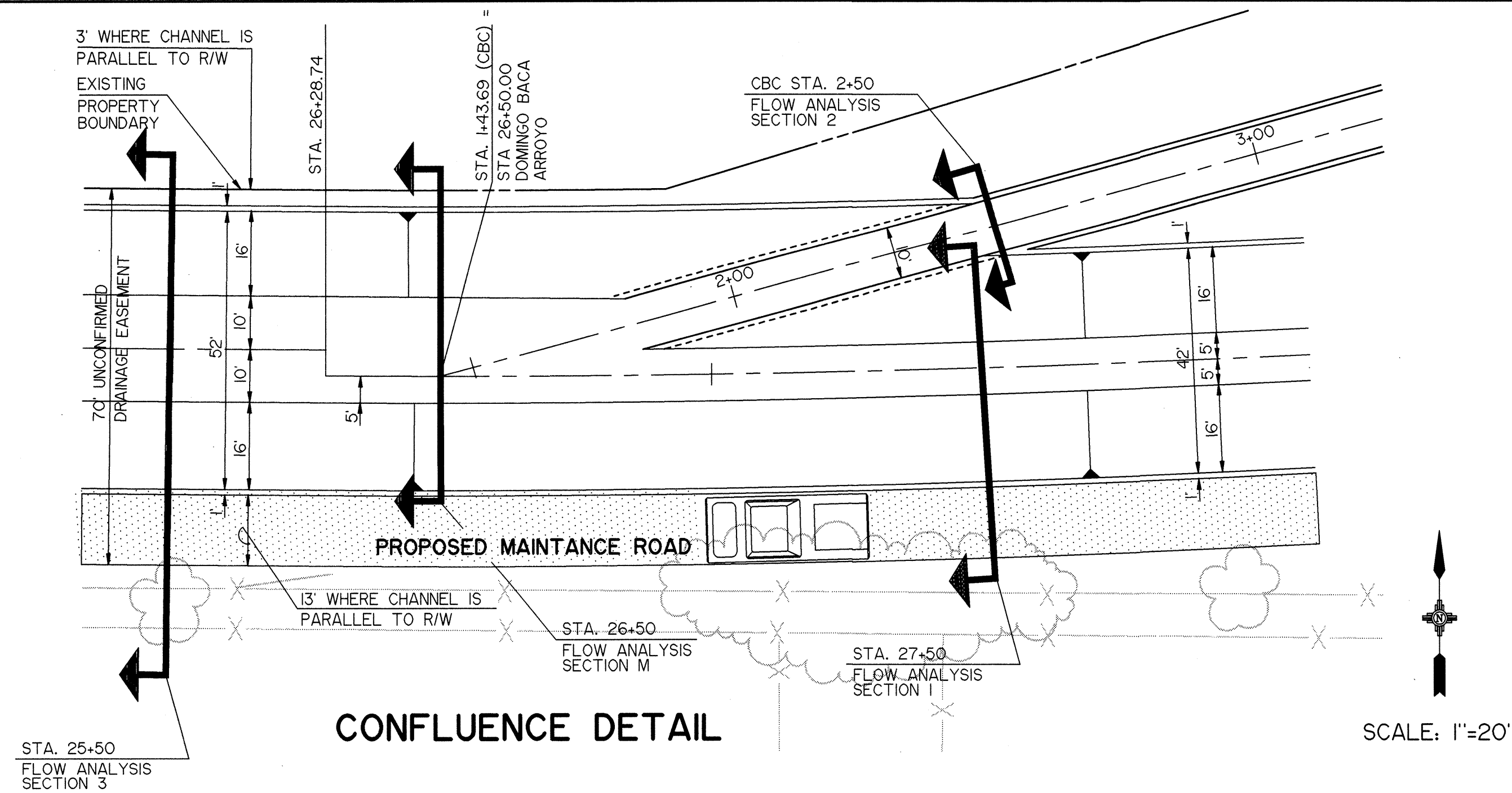
G.O.A PROJECT NO. 4160.92

SOUTH DOMINGO BACA ARROYO / PASEO DEL NORTE OUTFALL CONFLUENCE ALTERNATIVE 2A

PLAN AND PROFILE, TYPICAL SECTIONS

EASTERLING & ASSOCIATES, INC.
CONSULTING ENGINEERS
10131 Coors Rd., NW, Suite H-7/B
ALBUQUERQUE, NEW MEXICO 87114
(505) 898-8021 FAX (505) 898-8501

DESIGNED BY: DSH/ALM	DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET OF
JOB NO. 2833.1	DATE DEC. 1992		1 5



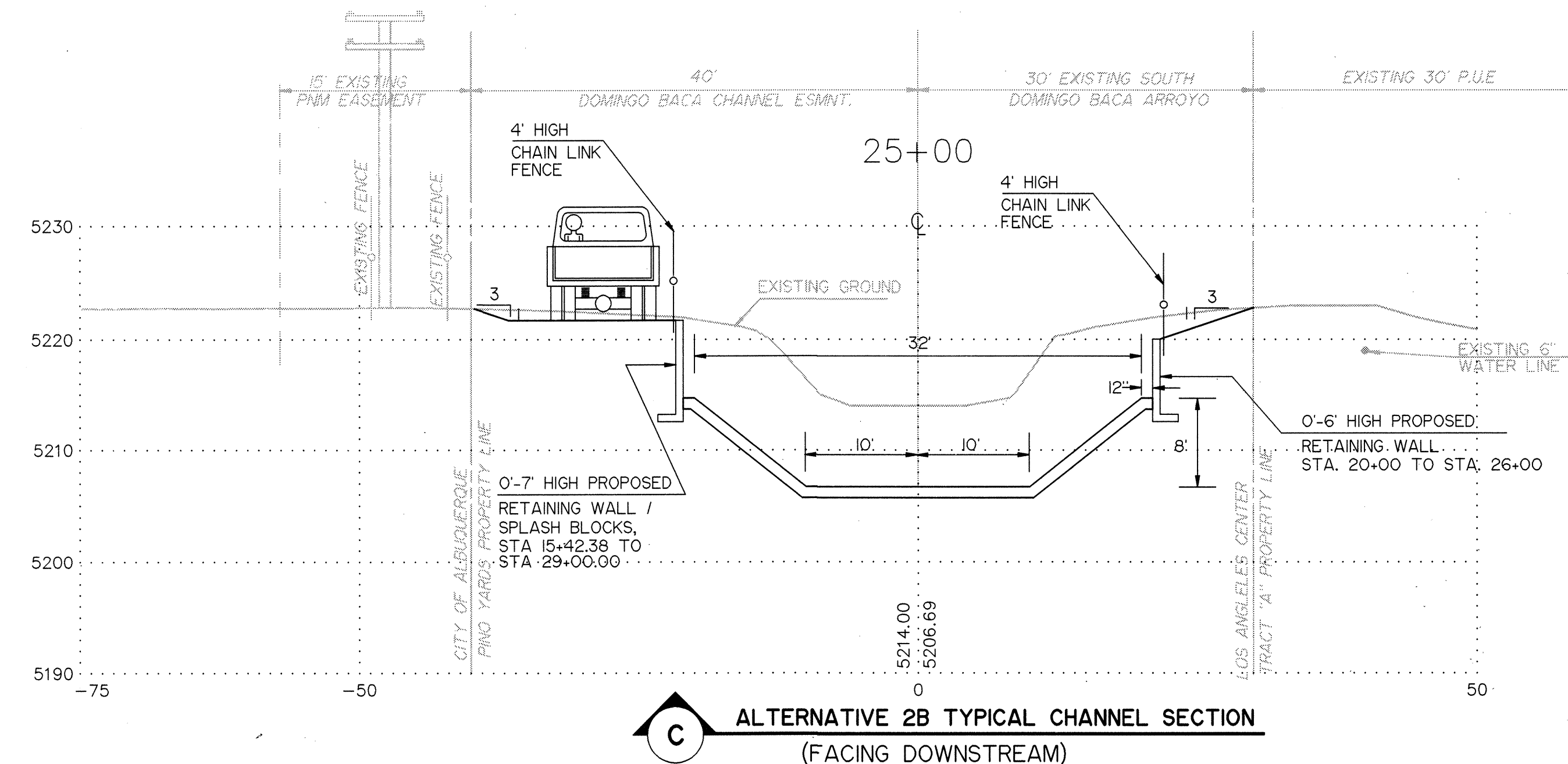
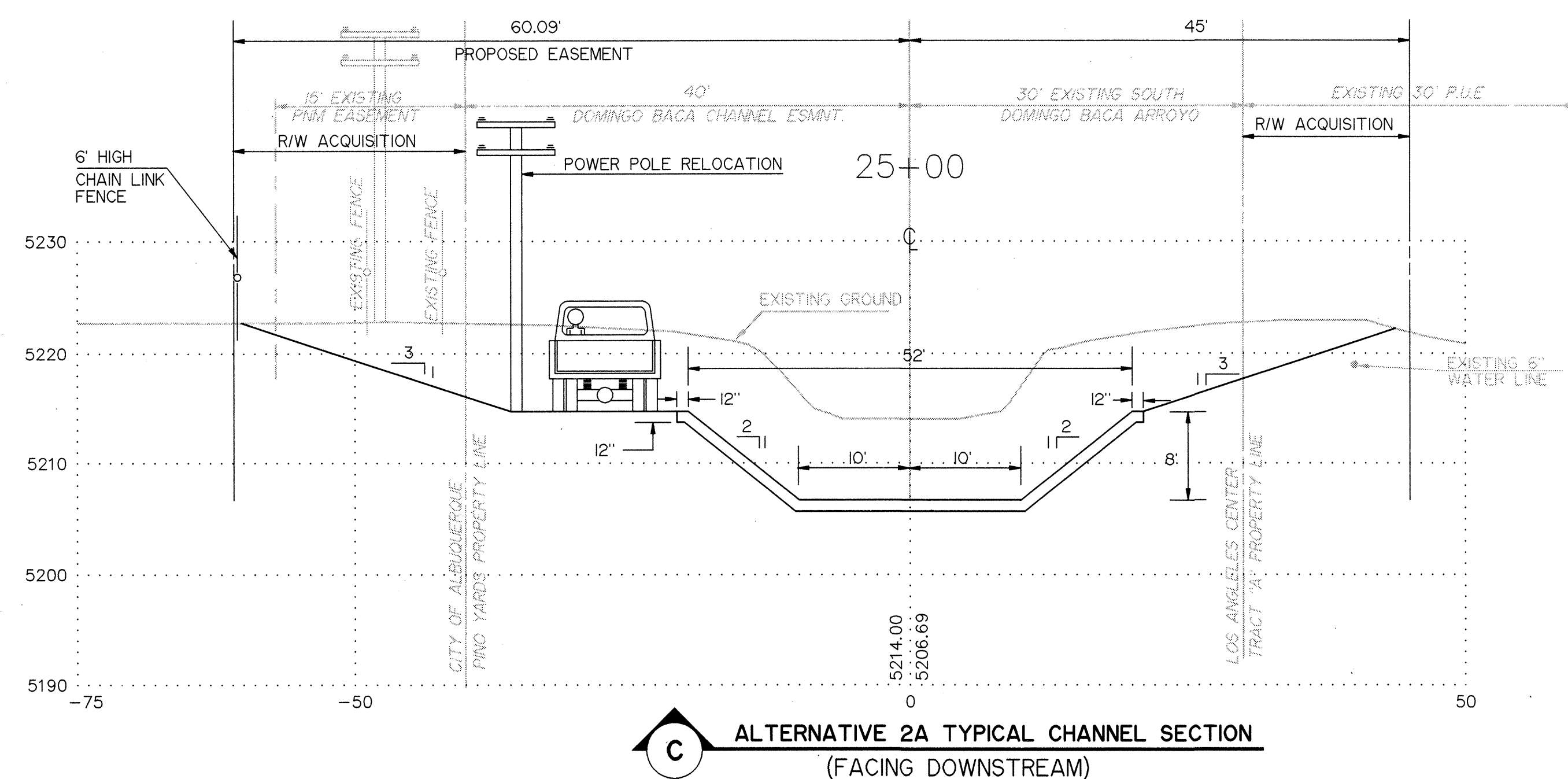
FLOW ANALYSIS OF OPEN CHANNEL JUNCTIONS FROM SCS TR-25 (FIGURE 5.1) ALTERNATIVE NO. 2 100 YR. IN DOMINGO BACA CHANNEL - 100 YR. IN PASEO DEL NORTE CHANNEL JOB NO. 2833.1 12/23/92											
HEC-2 DATA											
h _m	4	FT	L _m	100	FT	n _m	0.013	Z _m	2	0 _m	15
SECTION 1 STATION 27+50			SECTION 2 STATION 2+50			SECTION 3 STATION 25+50			SECTION 4 STATION 26+50		
Q ₁	4280	CFS	Q ₂	1030	CFS	Q ₃	5310	CFS	Q ₄	5310	CFS
b ₁	10	FT	b ₂	10	FT	b ₃	20	FT	b ₄	20	FT
d ₁	5.17	FT	d ₂	6	FT	d ₃	4.42	FT	d ₄	4.41	FT
P ₁	3.87		P ₂	1.2		P ₃	3.99		P ₄	3.99	
A ₁	105.19	SQ FT	A ₂	60	SQ FT	A ₃	127.47	SQ FT	A ₄	127.29	SQ FT
V ₁	40.69	FT/SEC	V ₂	17.3	FT/SEC	V ₃	41.66	FT/SEC	V ₄	41.64	FT/SEC
P ₁	33.12	FT	P ₂	22	FT	P ₃	39.77	FT	P ₄	39.72	FT
R ₁	3.18	FT	R ₂	2.73	FT	R ₃	3.21	FT	R ₄	3.20	FT
α ₁	1.7126°		α ₂	0.34377°		α ₃	0.92238°				
CONDITION											
TRAPEZOIDAL CHANNEL WITH UNEQUAL WIDTH, MAIN CHANNEL AND SUPERCRITICAL VELOCITY FLOW IN ALL BRANCHES NOTE: FOR FLOWS AT SUPERCRITICAL VELOCITIES, THESE EQUATIONS MAY BE USED ONLY FOR PRELIMINARY DESIGN. FINAL DESIGN MUST BE BASED ON RESULTS OF SUPPLEMENTAL HYDRAULIC MODEL STUDIES.											
FORMULA											
$\frac{Q_1^2}{gA_1} \cos^2 \alpha_1 + \left(\frac{b_1}{2} + \frac{Zd_1}{3} \right) \left(d_1^2 \cos^2 \alpha_1 + \frac{Q_1^2}{gA_1} \cos^2 \alpha_1 + \frac{Q_2^2}{gA_2} \cos^2 \alpha_2 + \left(\frac{b_2}{2} + \frac{Zd_2}{3} \right) \left(d_2^2 \cos^2 \alpha_2 + (P_2 + Zd_2) d_2 \right) - \frac{P_2 \ln V_2^2}{2.218 \ln^{10}} \right)$											
6866.43 + 252.93 = 5405.84 + 530.40 + 359.09 + 508.39 - 357.24											
7119.36 = 6446.48											
Δ = 672.88											
Δ% = 10.44											

DOMINGO BACA ARROYO SAN PEDRO TO I-25 HYDRAULIC COMPUTATION SUMMARY ALTERNATIVE NO. 2														12/23/92
JOB NO. 2833.1														
REACH NO.	STATION TO STATION	100 YEAR FLOW RATE (cfs)	BOTTOM WIDTH (ft)	SIDE-SLOPE (ft/ft)	MANNING "n"	FLOW DEPTH (ft)	VELOCITY (fps)	FROUDE #	FREEBOARD (ft)	CURVE RADIUS (ft)	SUPER-ELEV. (ft)	EASEMENT CURVE LENGTH (ft)	TOTAL CHANNEL DEPTH (ft)	
1	1207.53	1642.35	5450	20.00	2.00	0.013	4.78	38.55	3.57	2.54	0.00	0.00	7.32	
2	1642.35	1746.24	5310	20.00	2.00	0.013	4.74	38.04	3.54	2.52	1000.00	2.28	217.83	
3	1746.24	1970.10	5310	20.00	2.00	0.013	4.87	36.66	3.37	2.49	500.00	4.28	209.87	
4	1970.10	2116.23	5310	20.00	2.00	0.013	4.84	36.96	3.41	2.49	1000.00	2.17	211.60	
5	2116.23	2628.74	5310	20.00	2.00	0.013	4.87	39.90	3.77	2.56	0.00	0.00	7.13	
6	2628.74	2810.58	5310	20.00	2.00	0.013	4.88	41.00	3.91	2.62	3000.00	0.89	234.72	
7	2810.58	2895.30	5310	10.00	2.00	0.013	5.19	40.46	3.84	2.63	1500.00	1.36	174.81	
8	2895.30	3077.08	5310	10.00	2.00	0.013	5.23	40.04	3.79	2.62	3000.00	0.67	173.23	

NOTES:

- FLOW DEPTH WAS DETERMINED USING THE HEC-2 COMPUTER MODEL.
- FREEBOARD PER DPM 22.3.C.4.a(4) OR DPM 22.3.C.4.b(2): $F = 3.0'$ Rectangular or $F = 0.7' (2 + 0.25VD^{1/3})$ Trapezoidal
- EASEMENT CURVE LENGTH PER DPM 22.3.C.3.b(2): $L = 0.32 (b + 2d) \frac{V}{D^{3/2}}$
- SUPERELEVATION TRAPEZOIDAL PER DPM 22.3.C.3.a(2): $S = 1.3 \frac{V^2 (b + 2d)}{32.2R}$
- SUPERELEVATION RECTANGULAR PER DPM 22.3.C.3.a(1): $S = \frac{V^2 b}{32.2R}$
- SUPERELEVATION LESS THAN 0.50' NOT INCLUDED IN TOTAL CHANNEL DEPTH

HYDRAULIC ANALYSIS SUMMARY

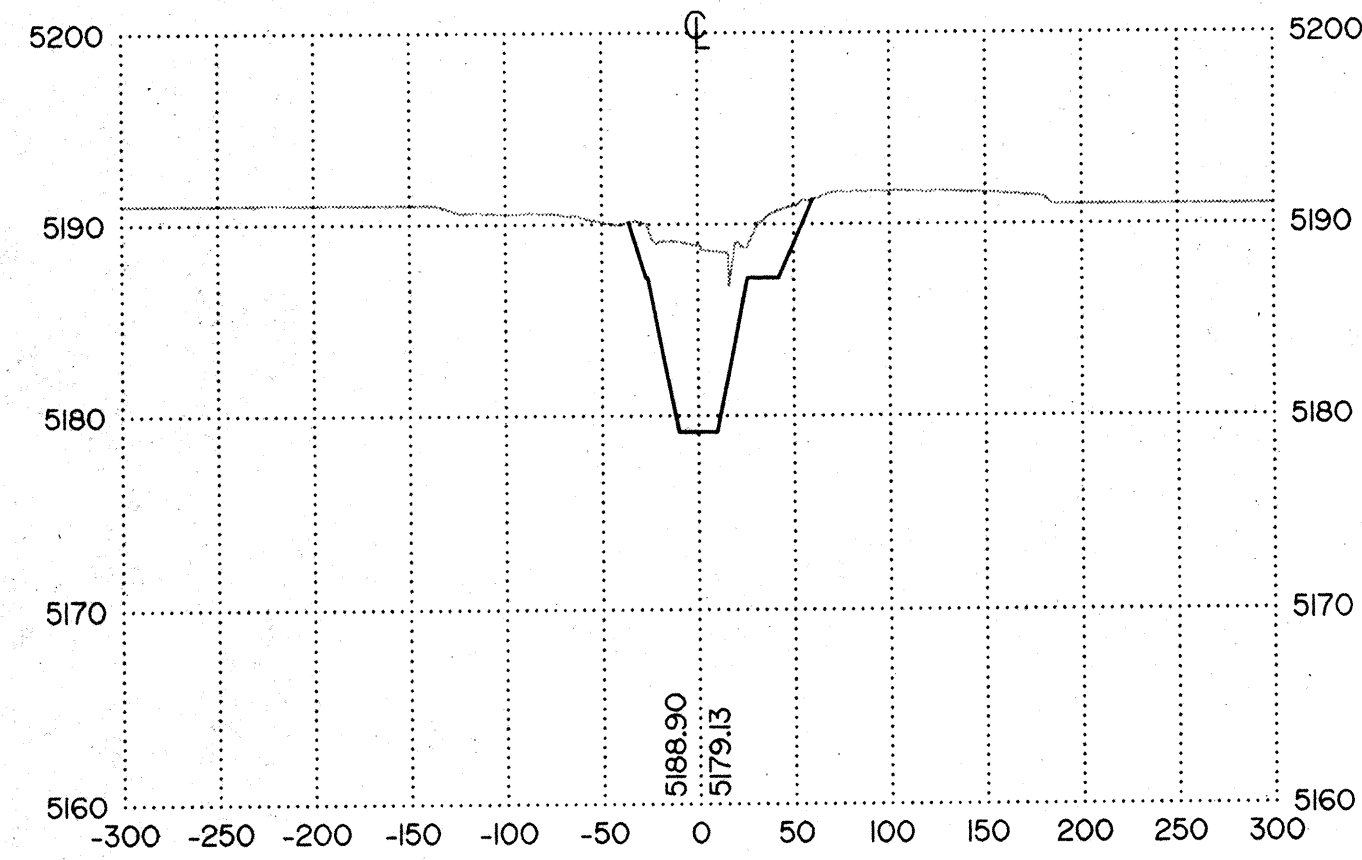


ALTERNATIVE 2A SUMMARY OF QUANTITIES AND COST					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	R/W ACQUISITION FOR L.A. TRACT "A"	SF	110,888	\$ 4.00	\$443,552.00
2	R/W ACQUISITION FOR PINO YARDS	SF	23,278	\$ 4.00	\$93,112.00
3	8" SLOPE PAVING	SF	103,455	\$4.50	\$465,547.50
4	EXCAVATION / BACKFILL FOR CHANNEL	CY	34,750	\$3.65	\$126,837.50
5	SUBGRADE PREPARATION FOR MAINTENANCE RD.	SY	3,345	\$1.00	\$3,345.00
6	6" SANITARY SEWER LINE RELOCATION	LS	1	\$6,700.00	\$6,700.00
7	6" WATERLINE RELOCATION	LS	1	\$15,600.00	\$15,600.00
8	PINO YARD RUNDOWN	LS	1	\$22,700.00	\$22,700.00
9	48" PIPE PENETRATION	EA	1	\$2,500.00	\$2,500.00
10	10" WATERLINE RELOCATION	LS	1	\$4,850.00	\$4,850.00
11	4' AND 6' HIGH CHAINLINK FENCING	LS	5,700	\$1.80	\$10,260.00
12	POWER POLE RELOCATION	LS	1	\$7,500.00	\$7,500.00
13	2" GAS LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
14	TELEPHONE LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
15	CMU CORE FILLED SPLASH BLOCKS	SF	2,175	\$8.80	\$19,140.00
16	STRUCTURAL CONCRETE FOR BOX CULVERT	CY	705	\$285.00	\$200,925.00
17	EXCAVATION / BACKFILL FOR BOX CULVERT	CY	23,240	\$5.75	\$133,630.00
18	CLEARING AND GRUBBING	AC	6	\$600.00	\$3,600.00
19	SEEDING	AC	3	\$1,200.00	\$3,600.00
20	REMOVE & DISPOSE OF RIP-RAP / UNSUITABLE MATERIAL	CS	1	\$30,000.00	\$30,000.00
SUBTOTAL					\$1,603,399.00
15% CONTINGENCIES					\$240,509.85
TOTAL FOR ALTERNATIVE 1A					\$1,843,908.85

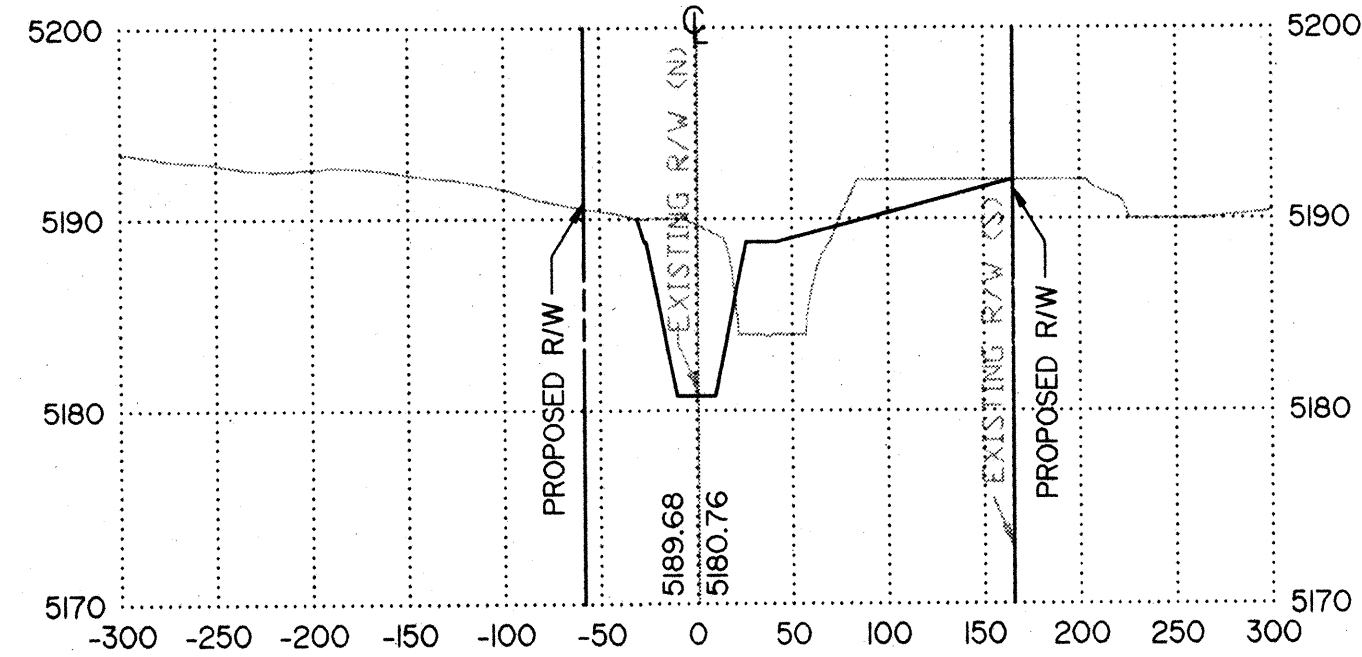
ALTERNATIVE 2B SUMMARY OF QUANTITIES AND COST					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	R/W ACQUISITION FOR L.A. TRACT "A"	SF	99,245	\$ 4.00	\$396,980.00
2	8" SLOPE PAVING	SF	103,455	\$4.50	\$465,547.50
3	CMU CORE FILLED RETAINING WALL	SF	7,450	\$8.80	\$65,560.00
4	RETAINING WALL FOOTING	CY	280	\$240.00	\$67,200.00
5	EXCAVATION / BACKFILL FOR CHANNEL	CY	34,750	\$3.85	\$133,787.50
6	SUBGRADE PREPARATION FOR MAINTENANCE RD.	SY	3,345	\$1.00	\$3,345.00
7	6" SANITARY SEWER LINE RELOCATION	LS	1	\$6,700.00	\$6,700.00
8	6" WATERLINE RELOCATION	LS	1	\$15,600.00	\$15,600.00
9	PINO YARD RUNDOWN	LS	1	\$22,700.00	\$22,700.00
10	48" PIPE PENETRATION	EA	1	\$2,500.00	\$2,500.00
11	10" WATERLINE RELOCATION	LS	1	\$4,850.00	\$4,850.00
12	4' HIGH CHAINLINK FENCING	SF	6,200	\$1.80	\$11,160.00
13	2" GAS LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
14	TELEPHONE LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
15	CMU CORE FILLED SPLASH BLOCKS	SF	2,175	\$8.80	\$19,140.00
16	STRUCTURAL CONCRETE FOR BOX CULVERT	CY	705	\$285.00	\$200,925.00
17	EXCAVATION / BACKFILL FOR BOX CULVERT	CY	23,240	\$5.75	\$133,630.00
18	CLEARING AND GRUBBING	AC	6	\$600.00	\$3,600.00
19	SEEDING	AC	3	\$1,200.00	\$3,600.00
20	REMOVE & DISPOSE OF RIP-RAP / UNSUITABLE MATERIAL	CS	1	\$30,000.00	\$30,000.00
SUBTOTAL					\$1,595,385.00
15% CONTINGENCIES					\$239,307.75
TOTAL FOR ALTERNATIVE 1A					\$1,834,692.75

NO.	REVISIONS	BY	DATE
C.O.A PROJECT NO. 4160.92 SOUTH DOMINGO BACA ARROYO / PASEO DEL NORTE OUTFALL CONFLUENCE ALTERNATIVE 2A AND 2B TYPICAL SECTIONS, ESTIMATED COSTS			
EASTERLING & ASSOCIATES, INC. CONSULTING ENGINEERS 10131 Coors Rd., NW, Suite H-718 ALBUQUERQUE, NEW MEXICO 87114 (505) 898-8021 FAX (505) 898-8501			
DESIGNED BY: DSH/ALM	DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET 2 OF 5
JOB NO. 2833.1	DATE DEC. 1992		

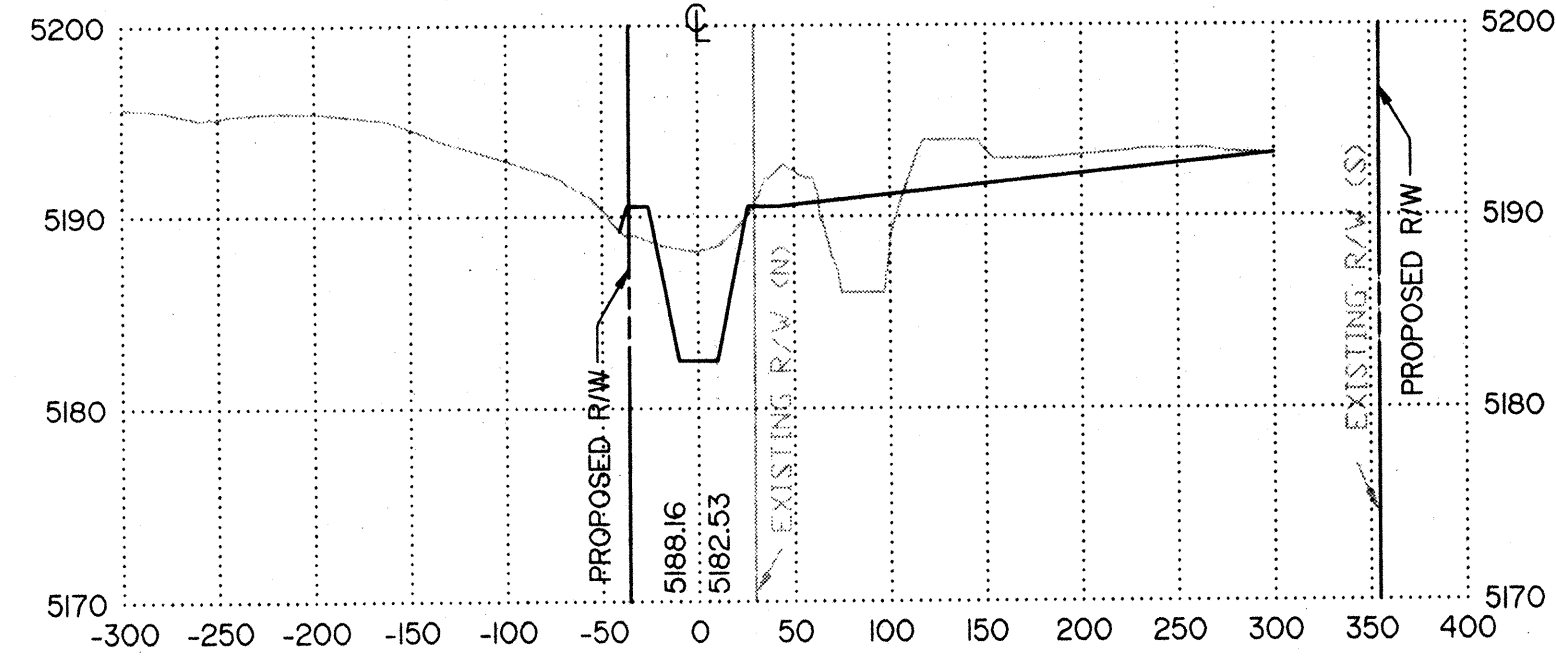
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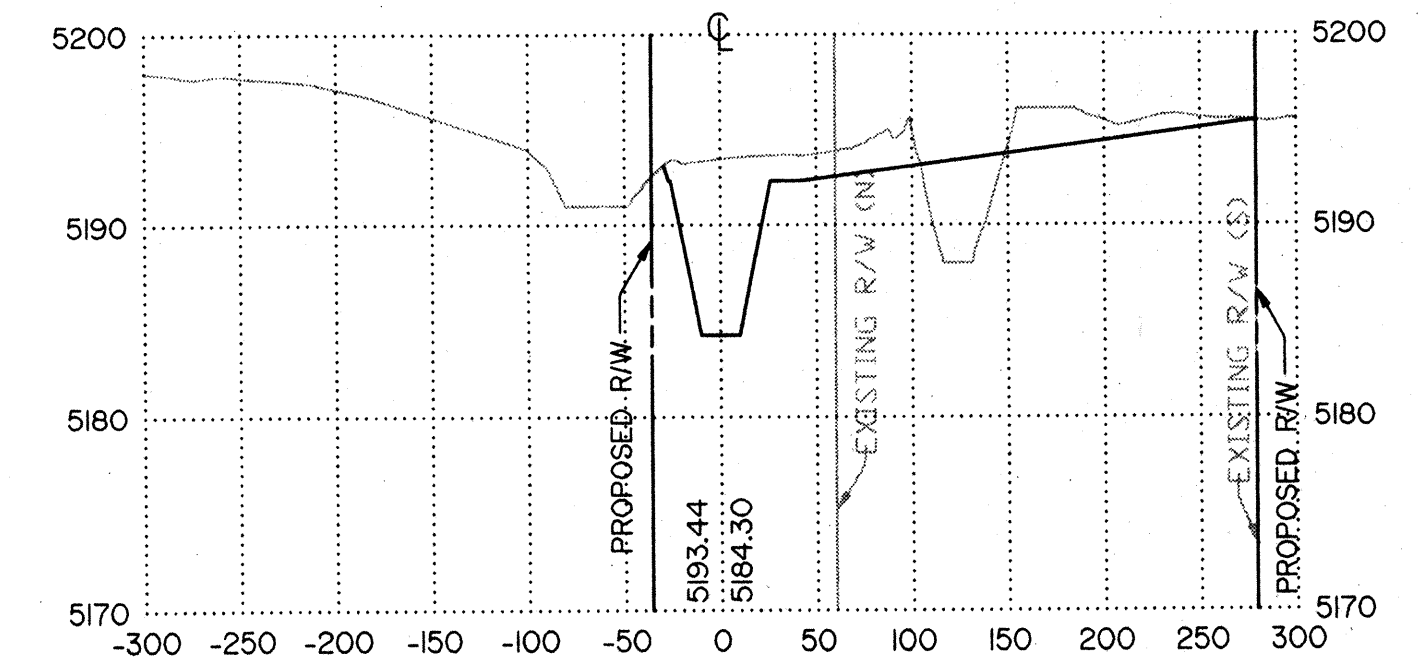
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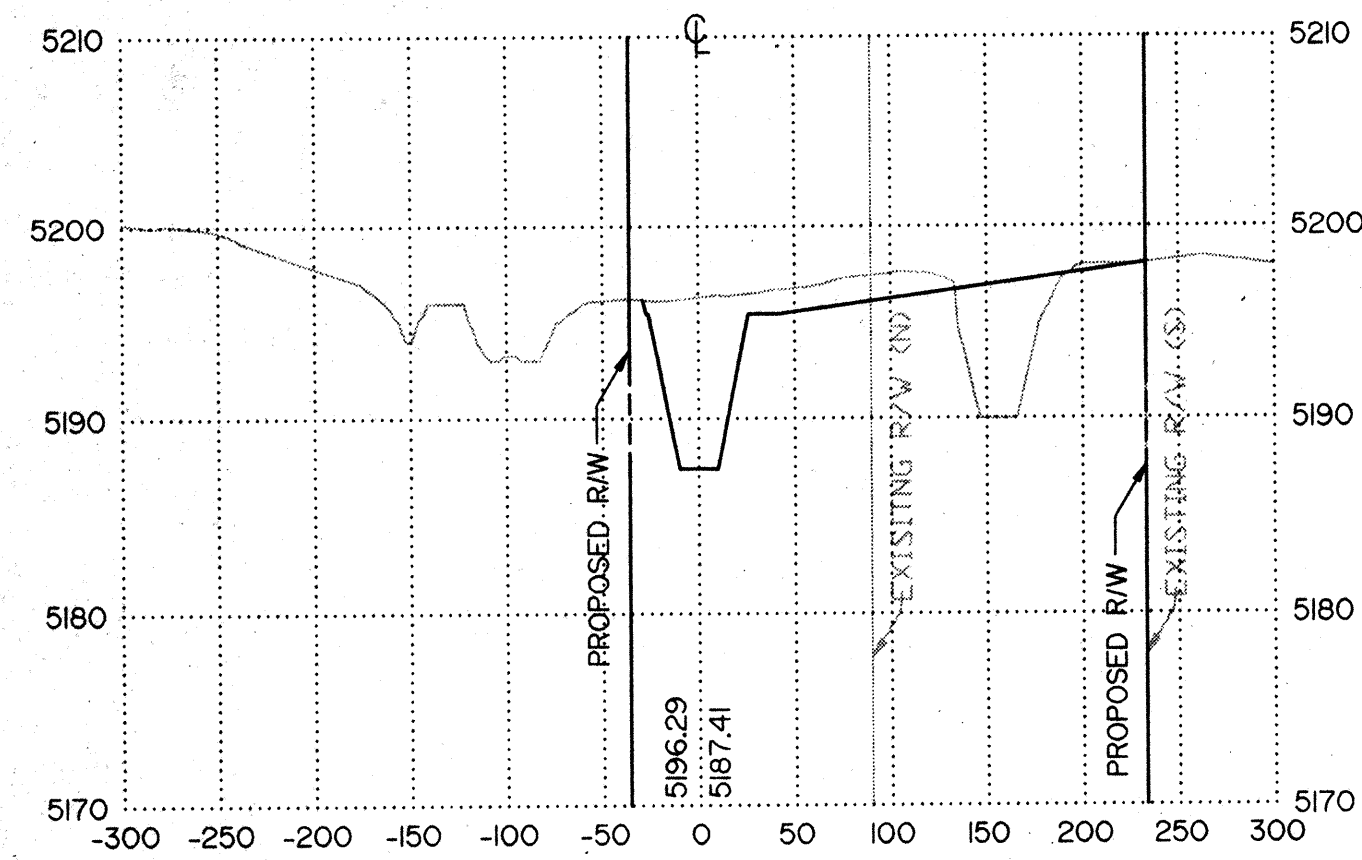
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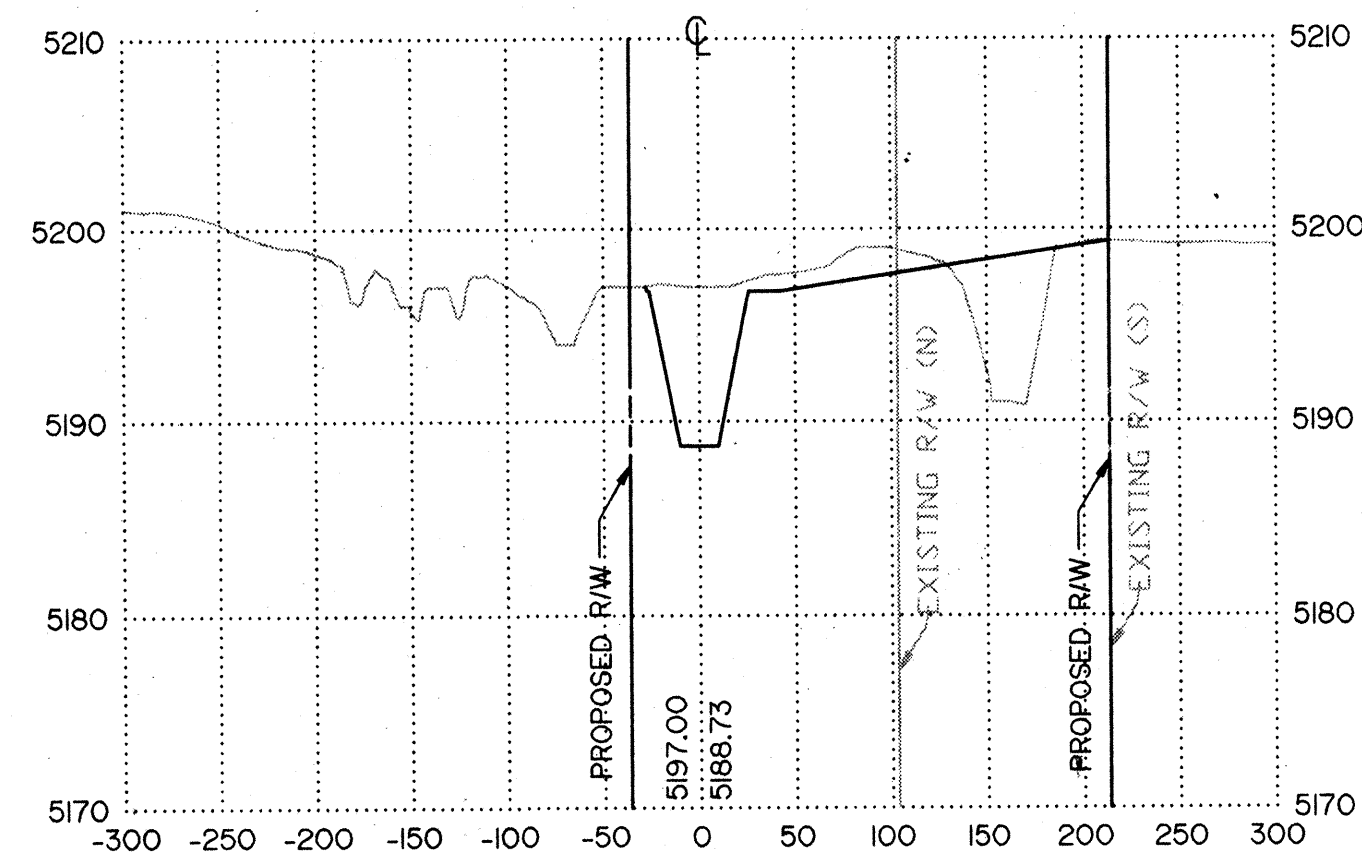
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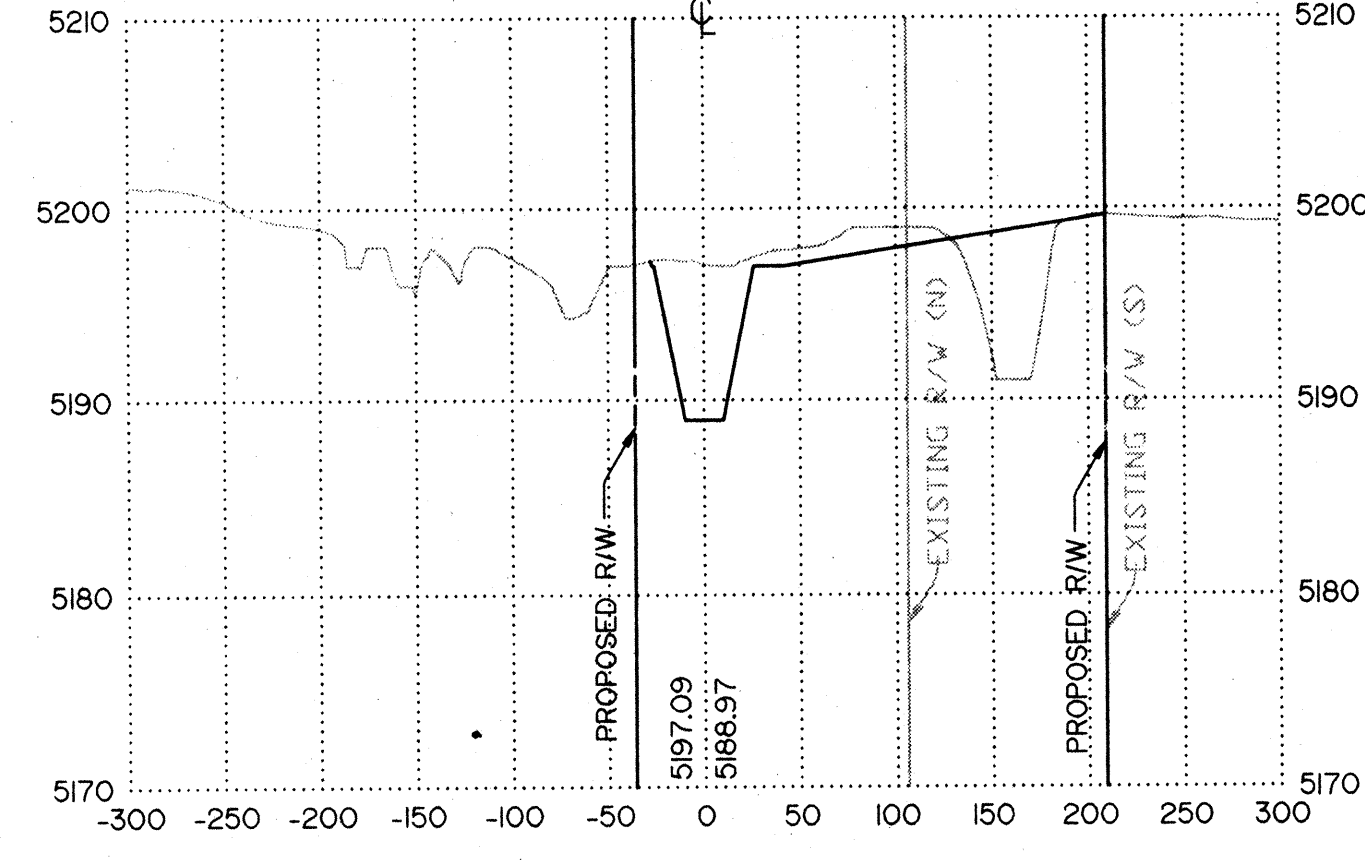
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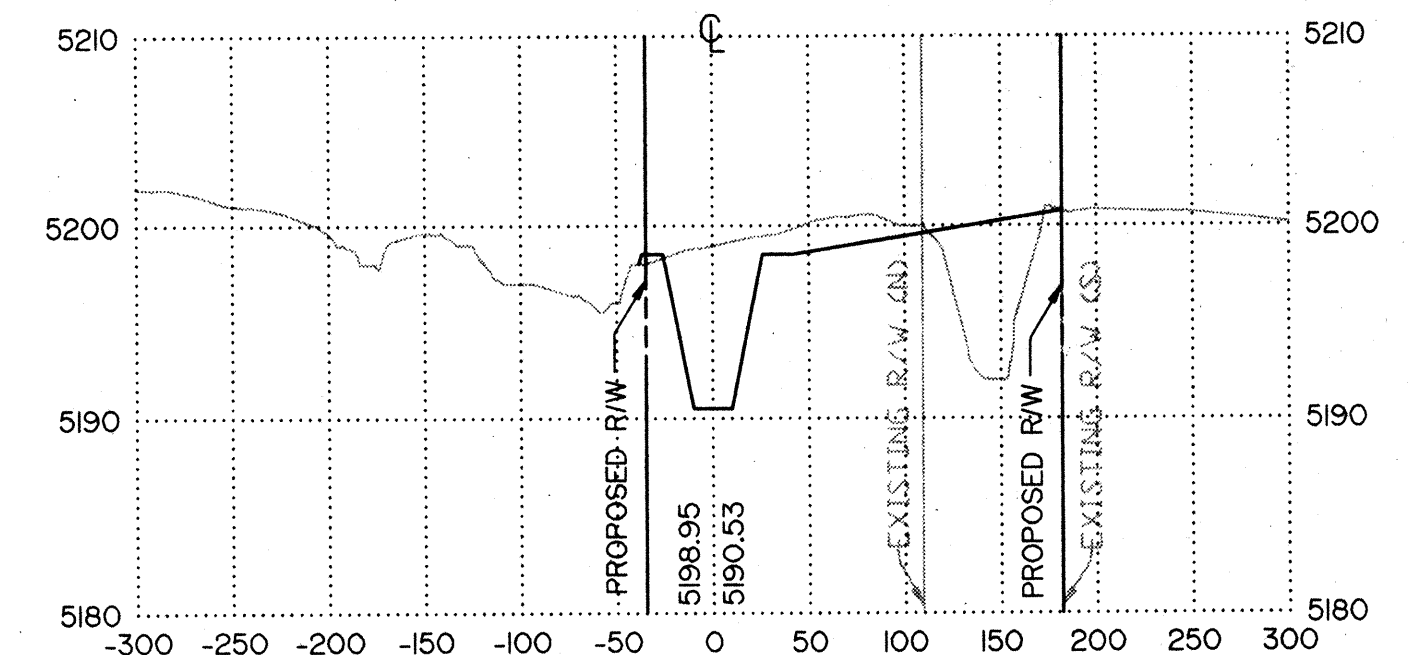
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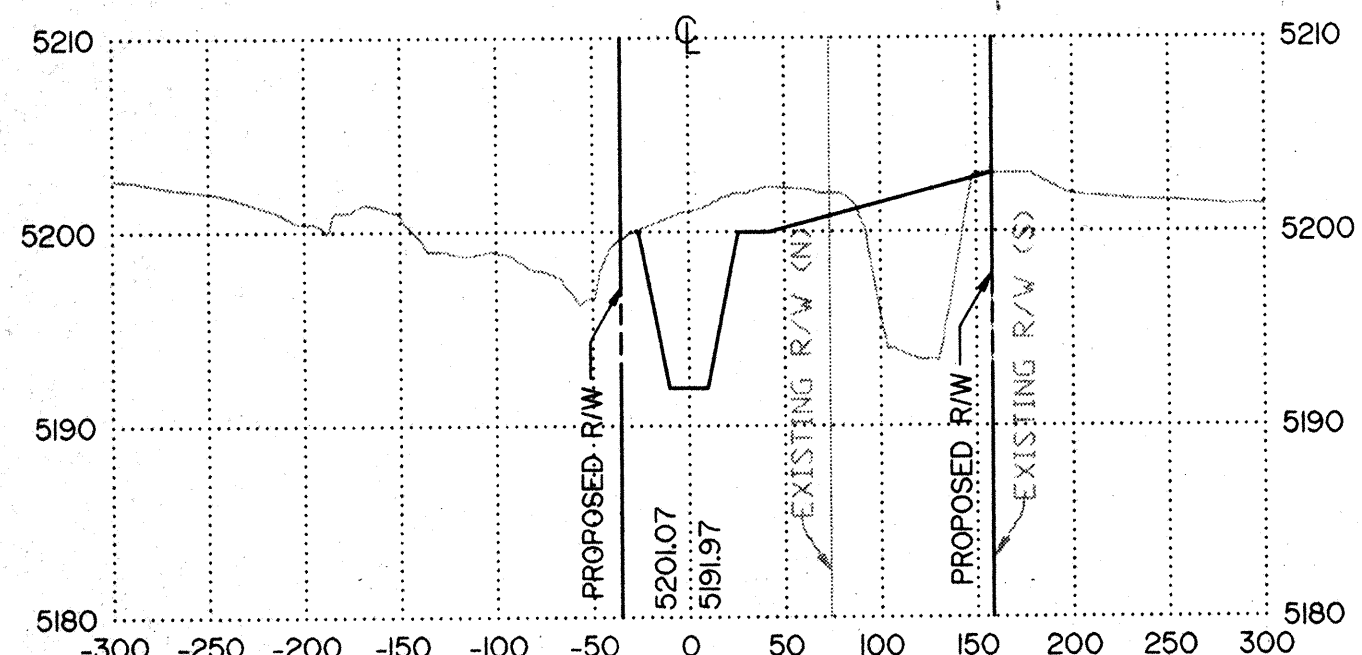
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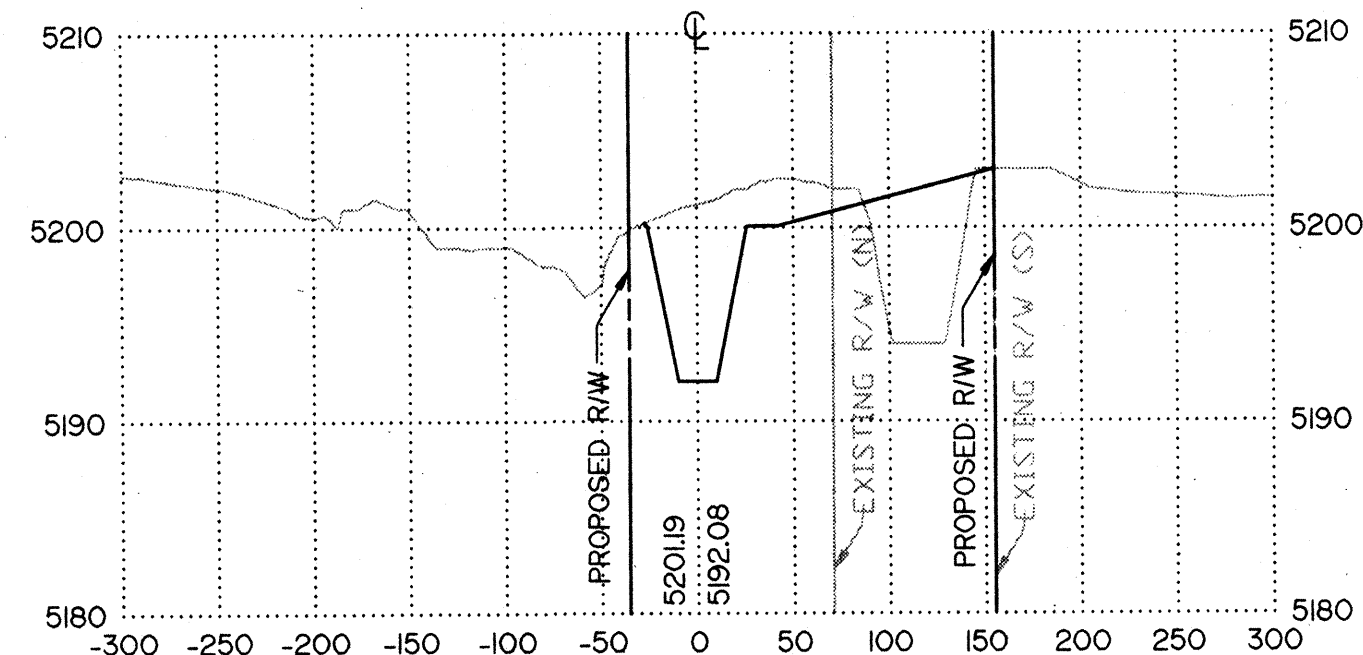
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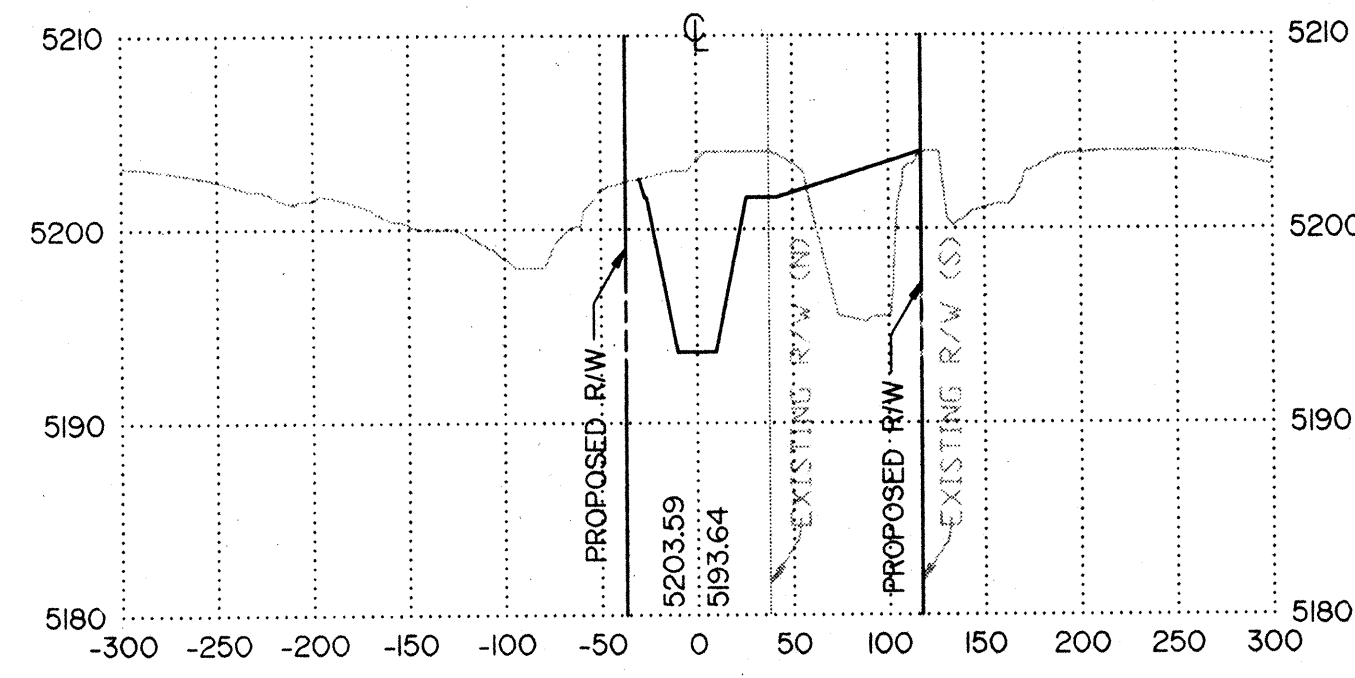
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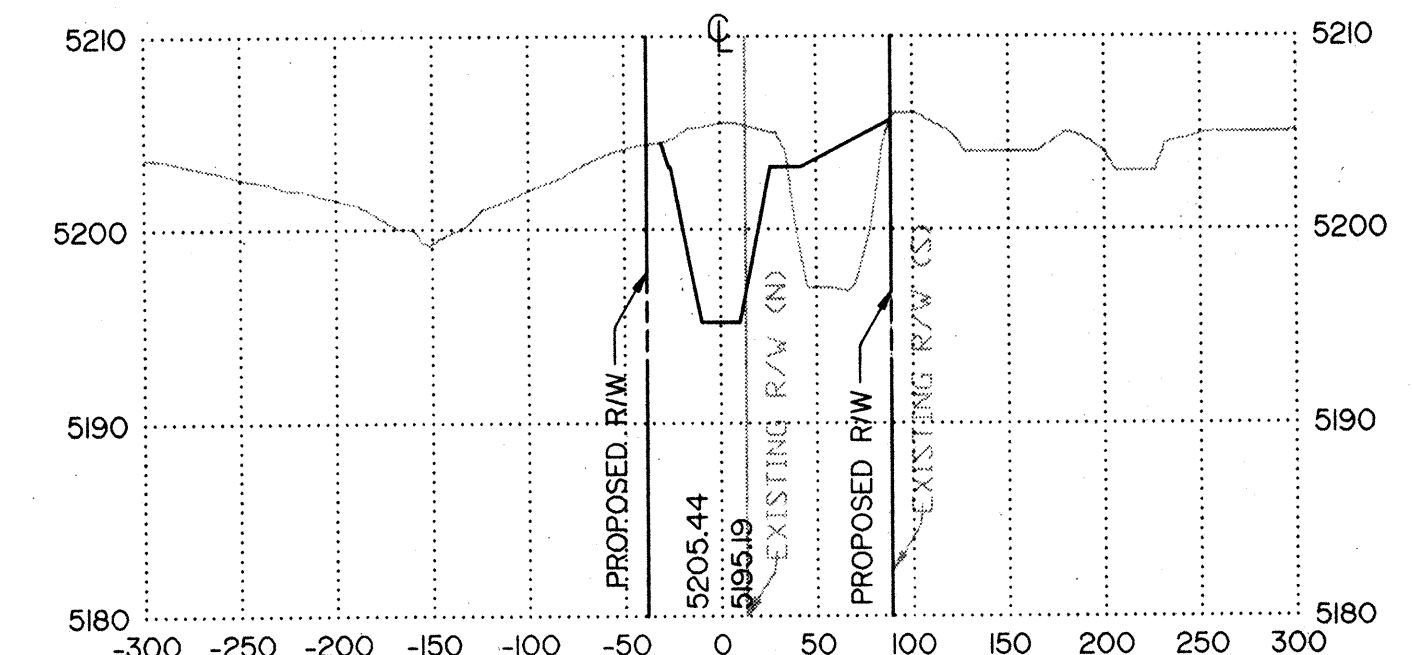
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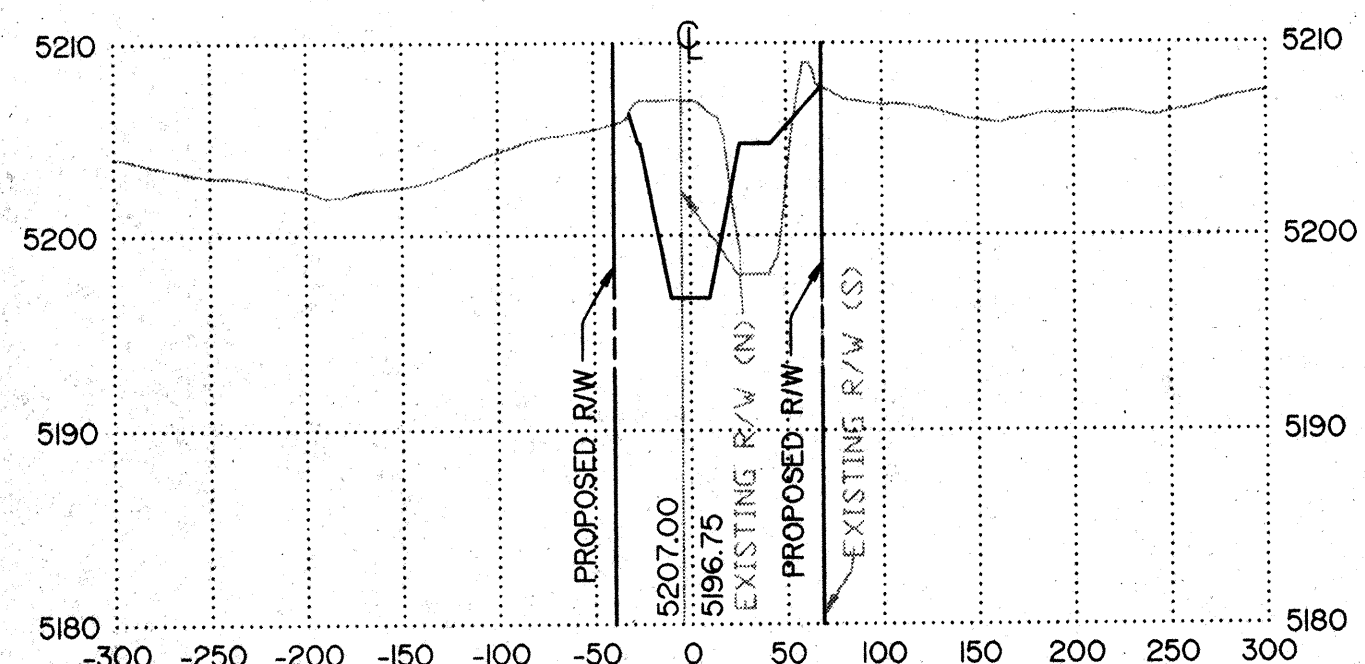
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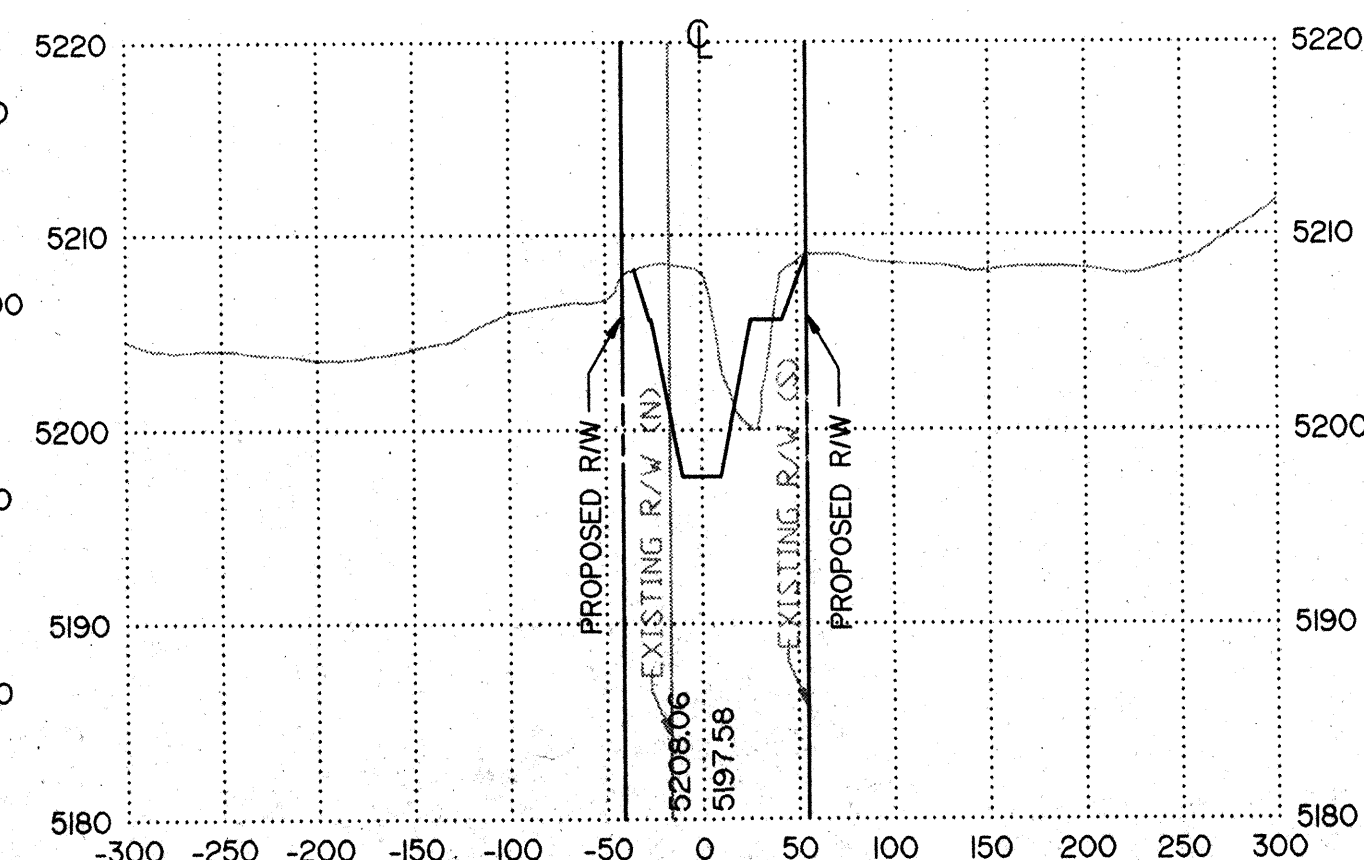
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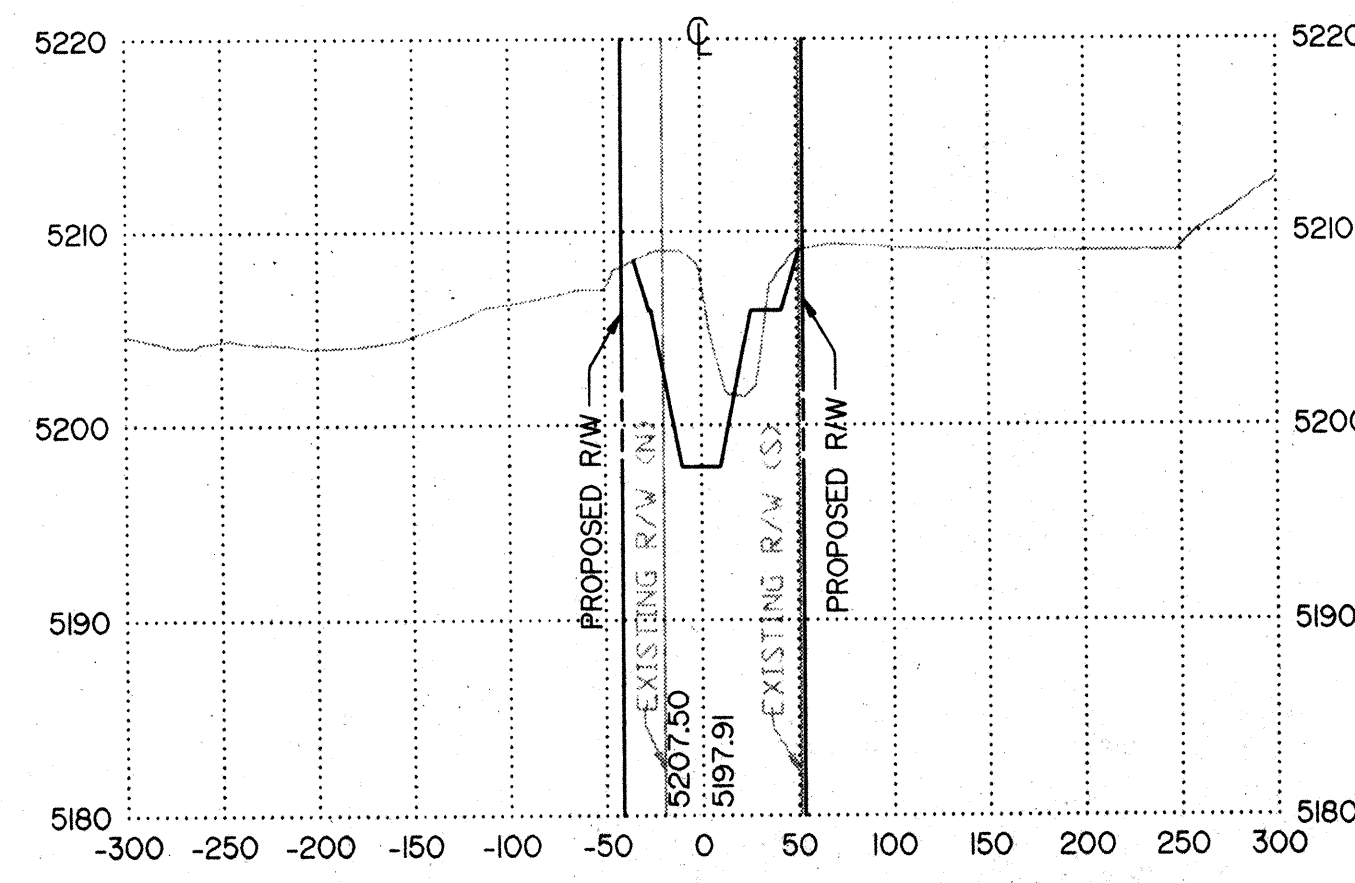
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19+50



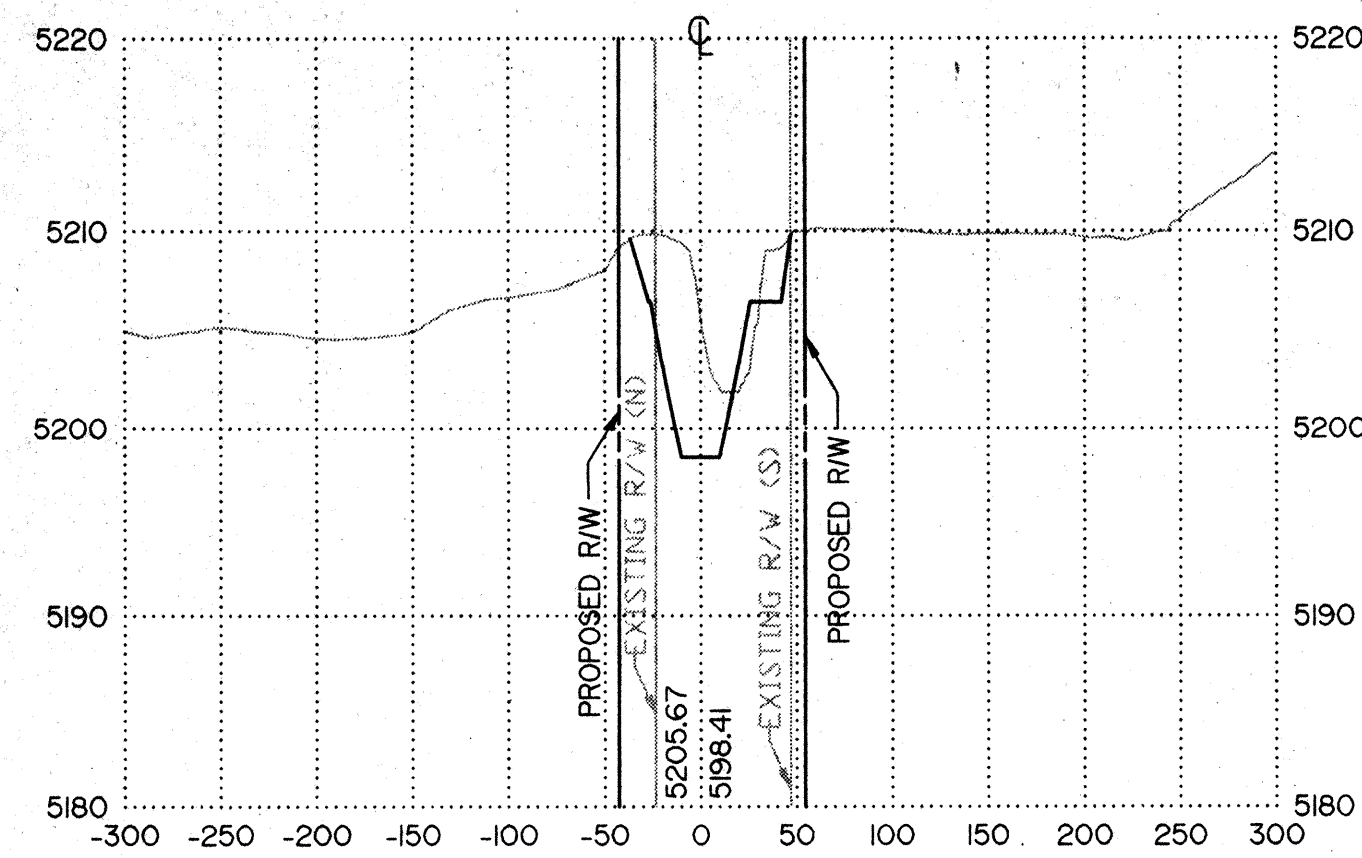
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**GENERAL NOTES**

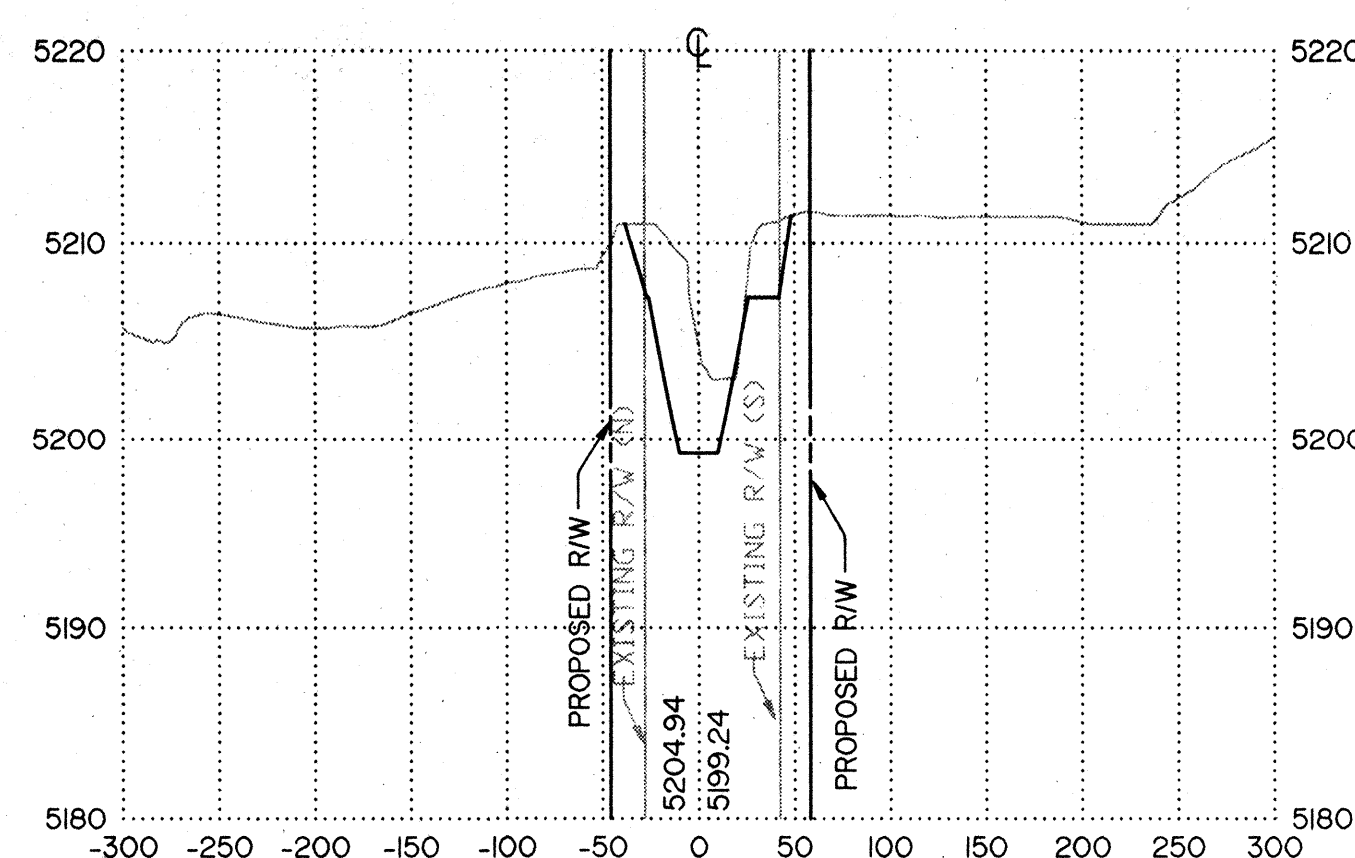
- ALL CROSS-SECTIONS ARE FACING UPSTREAM.
- THE CROSS-SECTIONS SHOWN REPRESENT ALTERNATIVE 2A WITHOUT SPLASH BLOCKS.

NO.	REVISIONS		BY DATE
C. O. A PROJECT NO. 4160.92			
SOUTH DOMINGO BACA ARROYO /			
PASEO DEL NORTE OFFFALL			
CONFLUENCE ALTERNATIVE 2A			
CROSS SECTIONS			
<i>EASTERLING & ASSOCIATES, INC.</i> <i>CONSULTING ENGINEERS</i> 10131 Coors Rd., NW, Suite H-718 ALBUQUERQUE, NEW MEXICO 87114 (505) 898-8021 FAX (505) 898-8501			
DESIGNED BY: ALM/DSH	DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET 3
JOB NO. 2833.1	DATE: DEC. 1992		OF 5

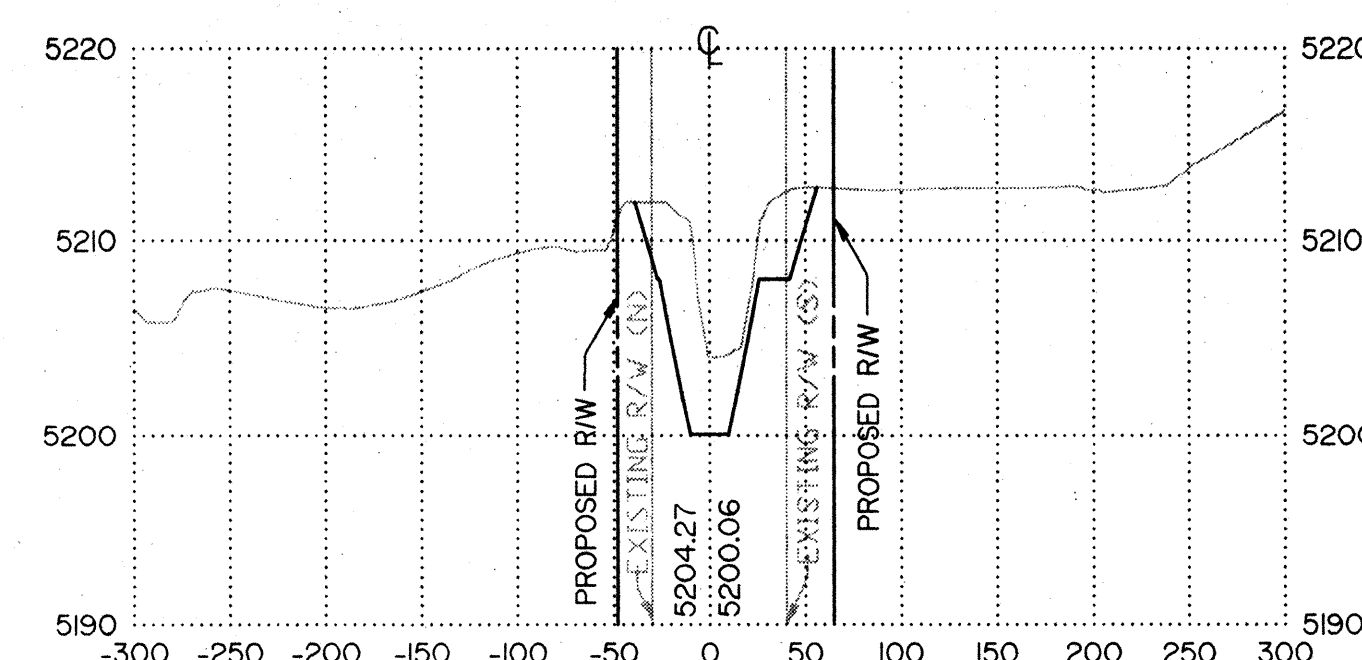
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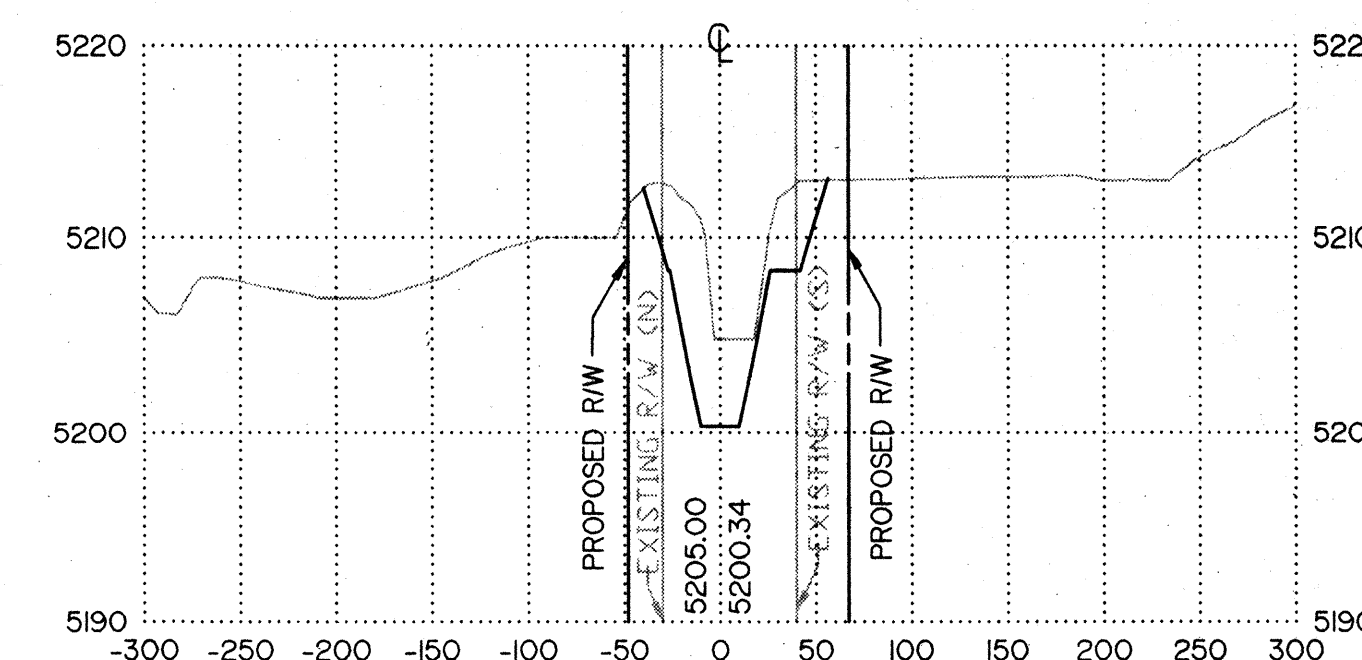
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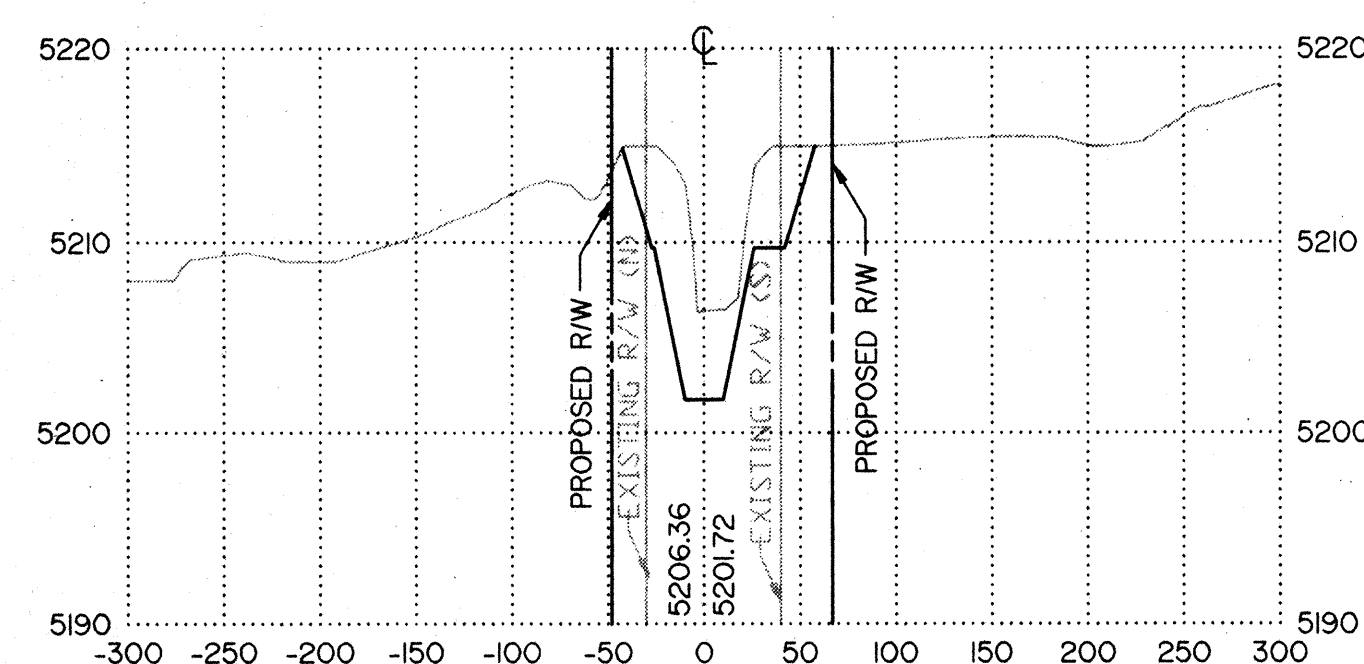
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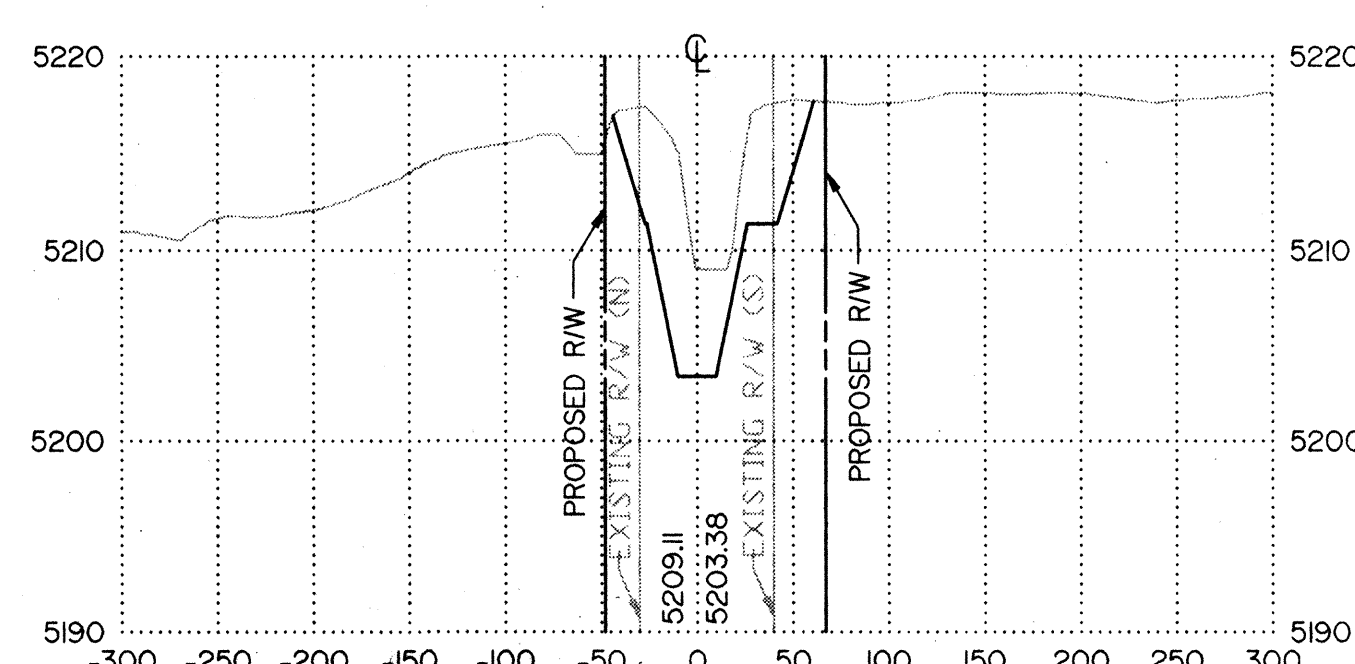
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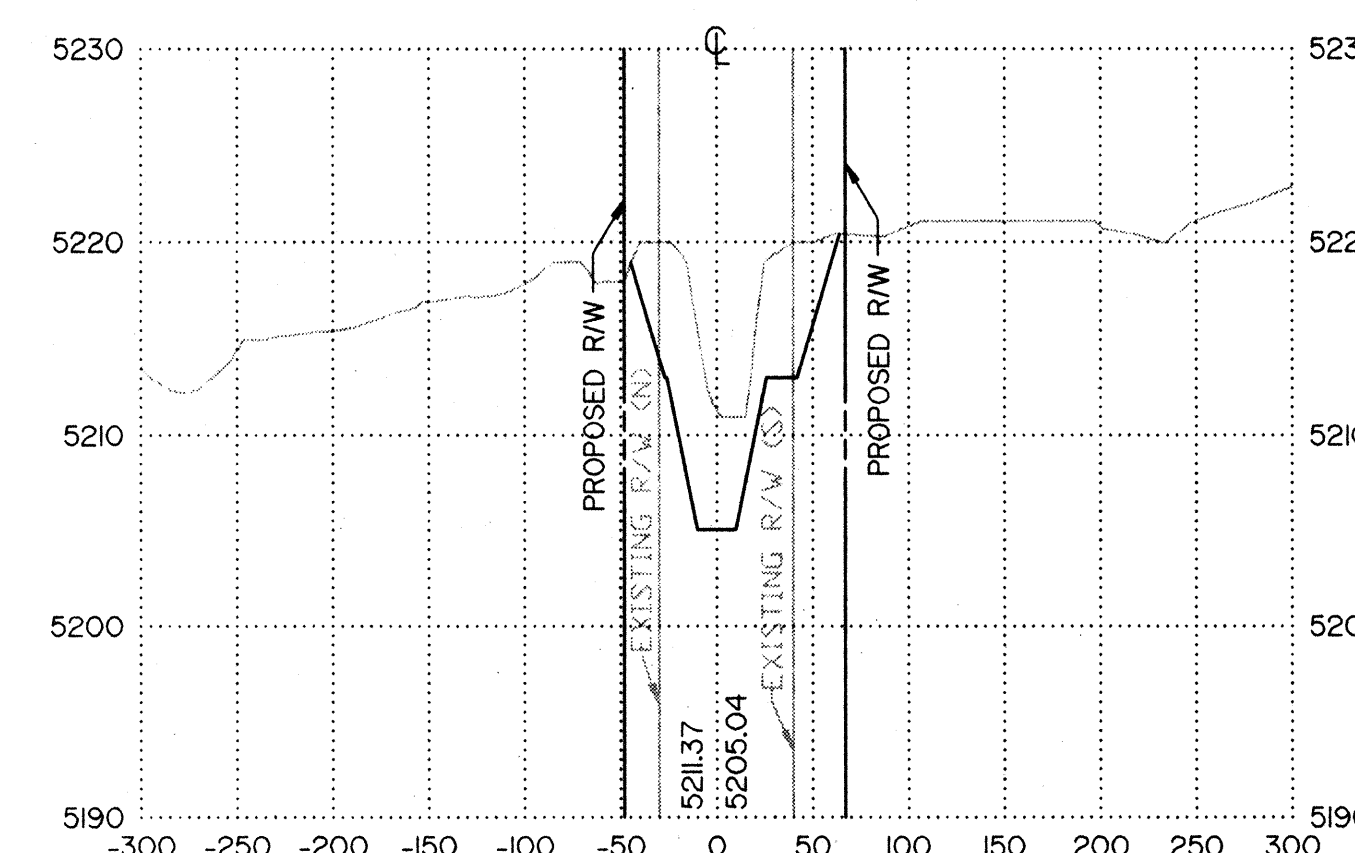
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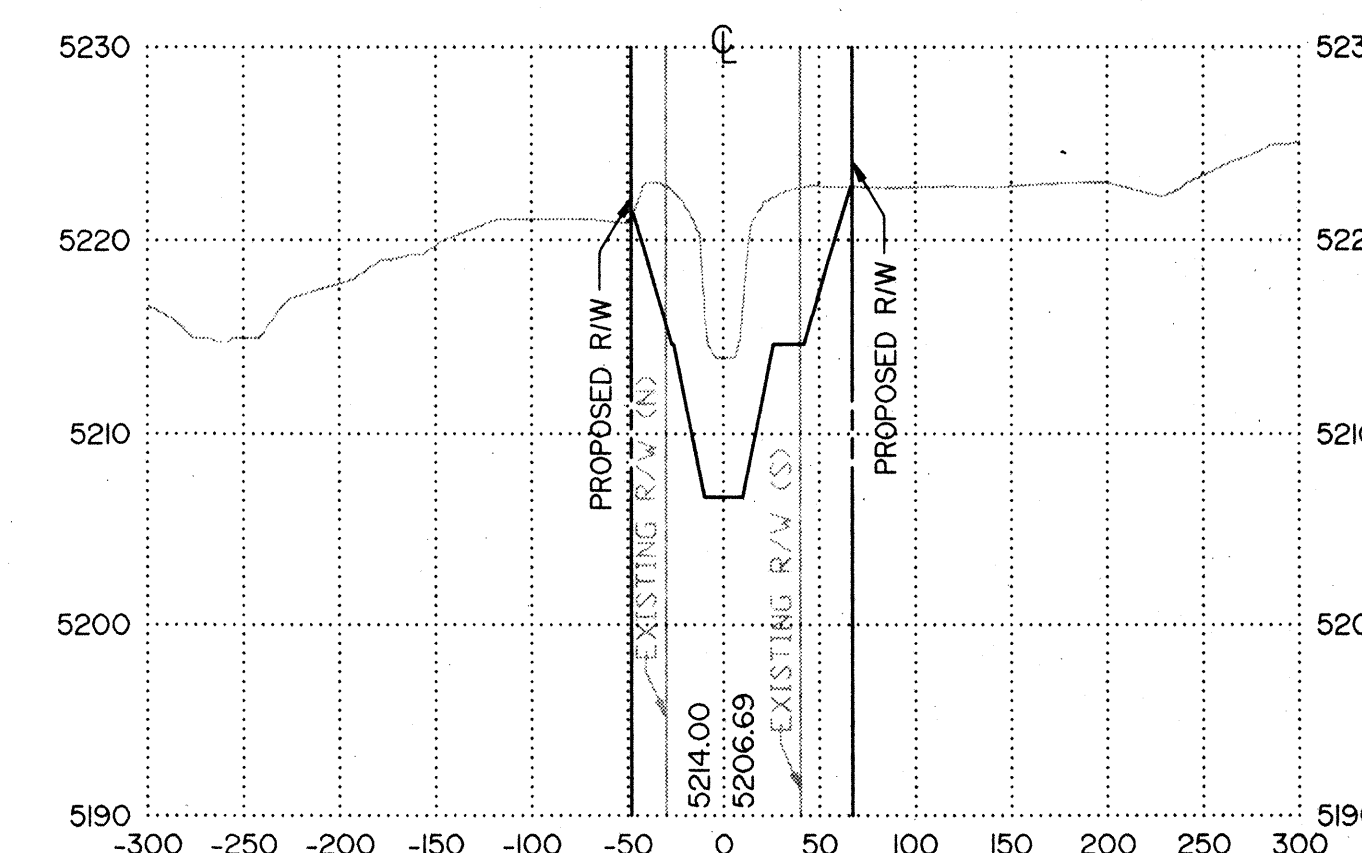
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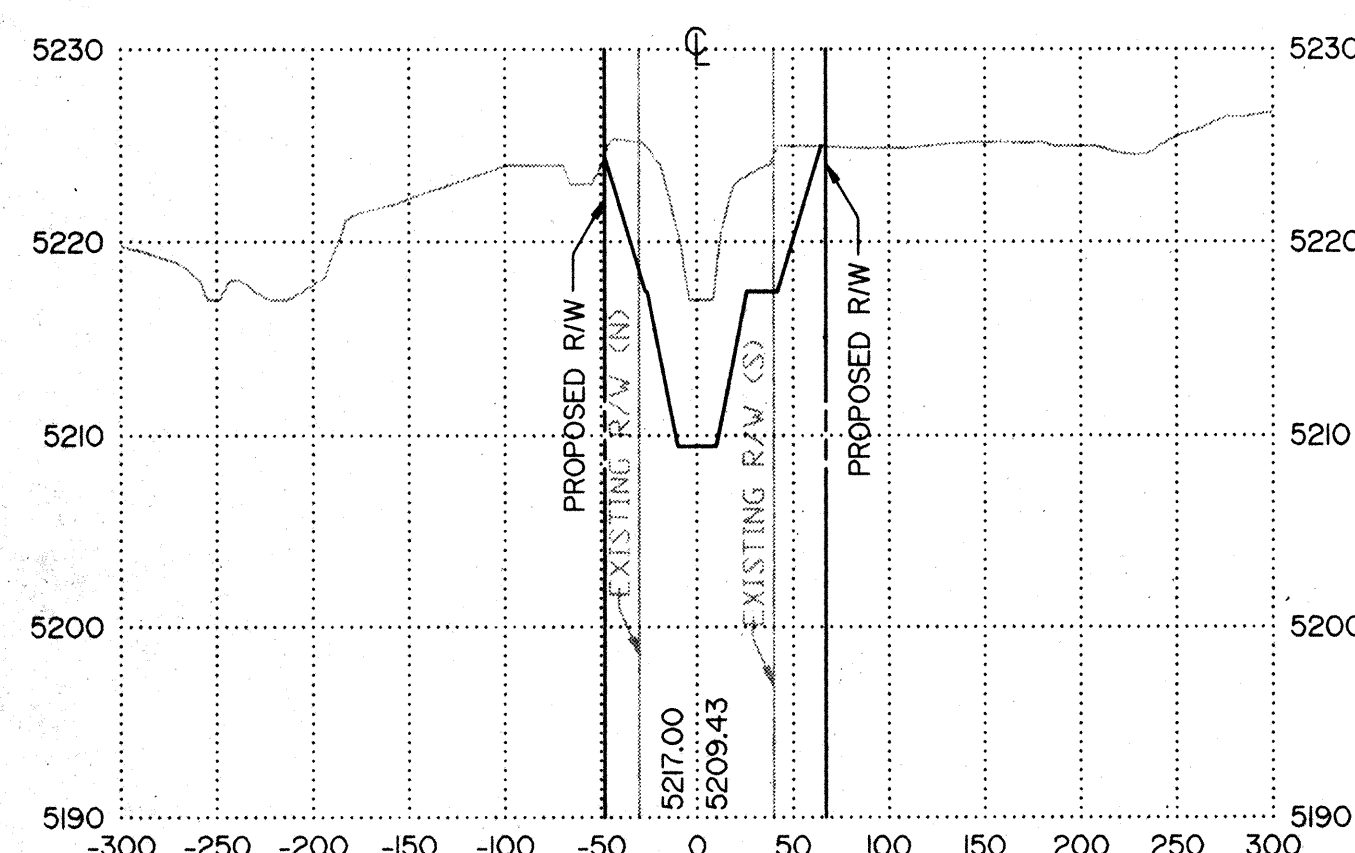
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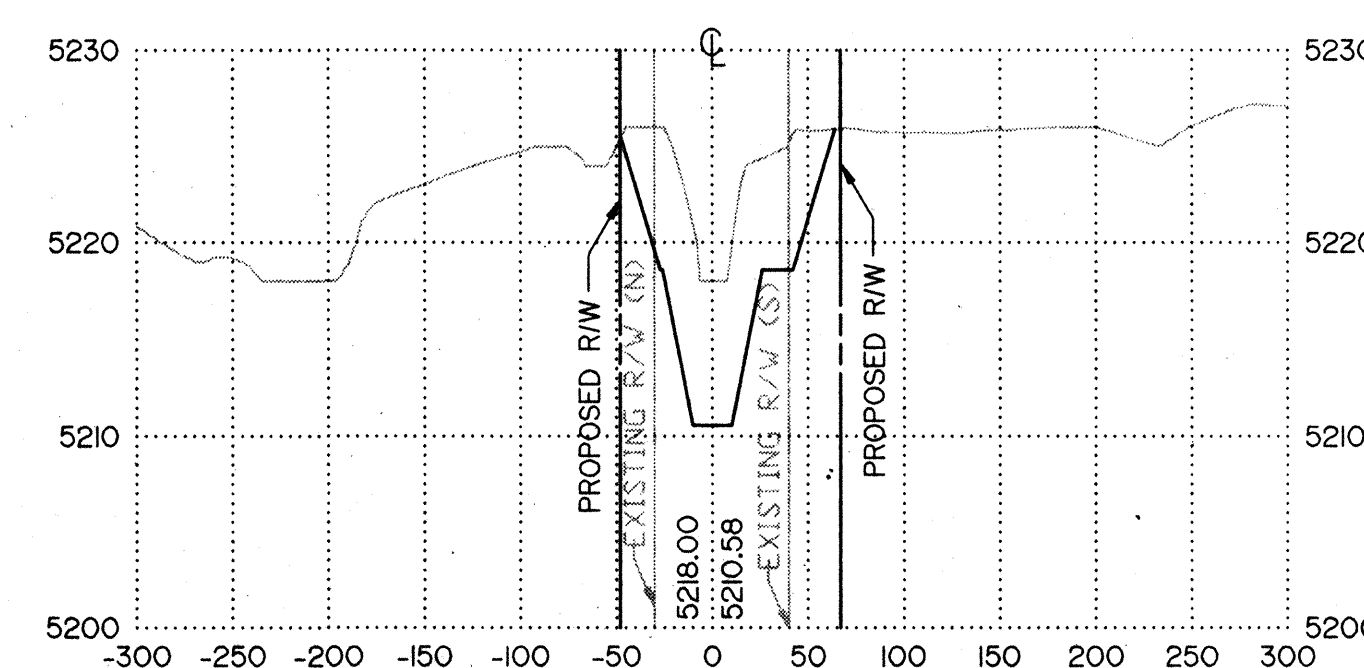
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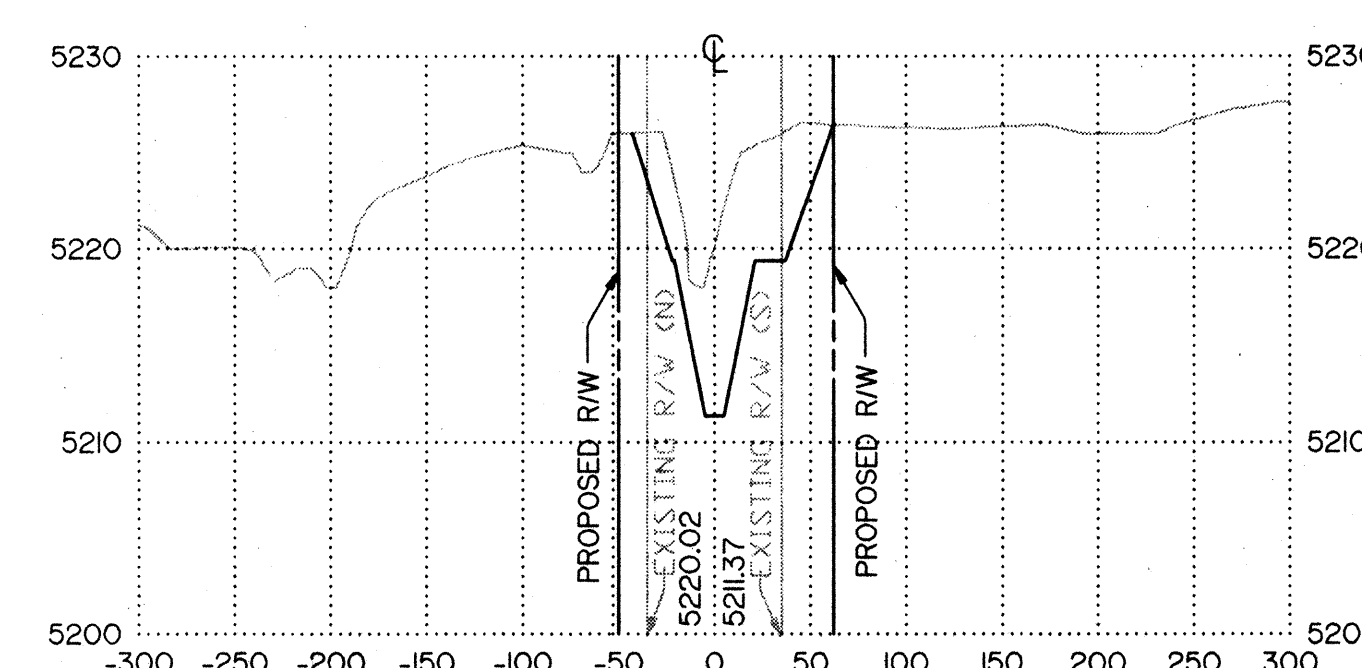
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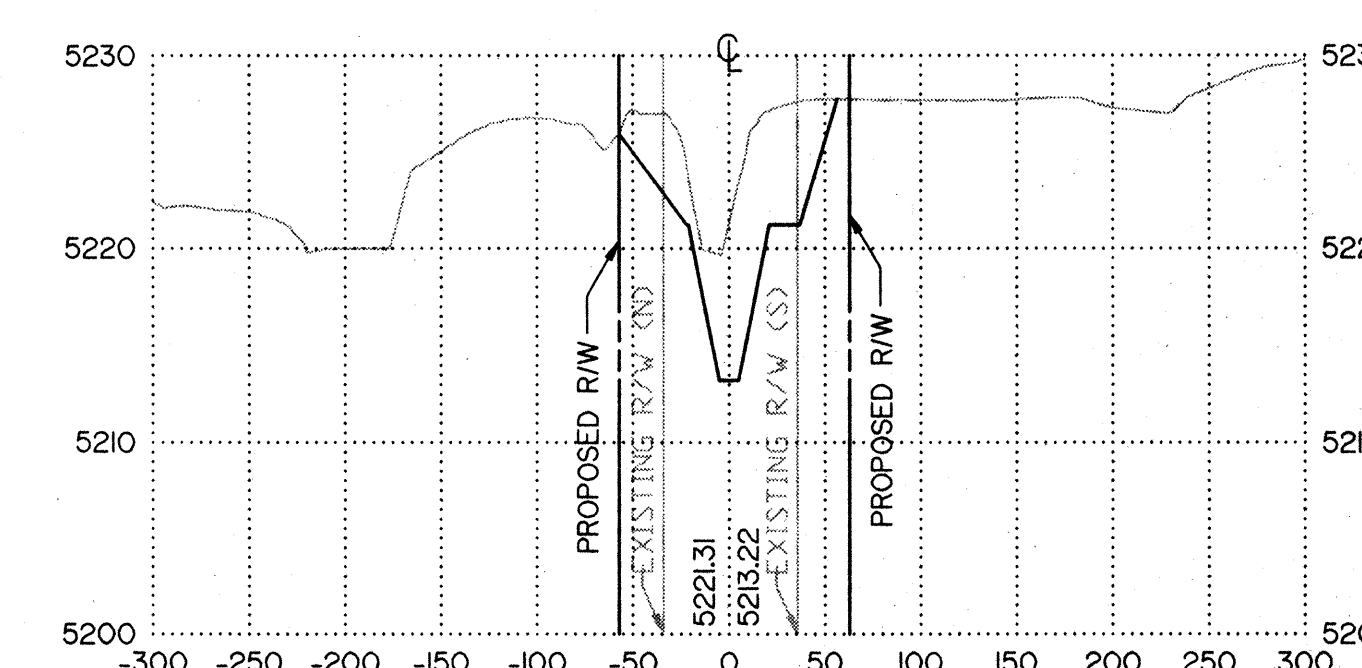
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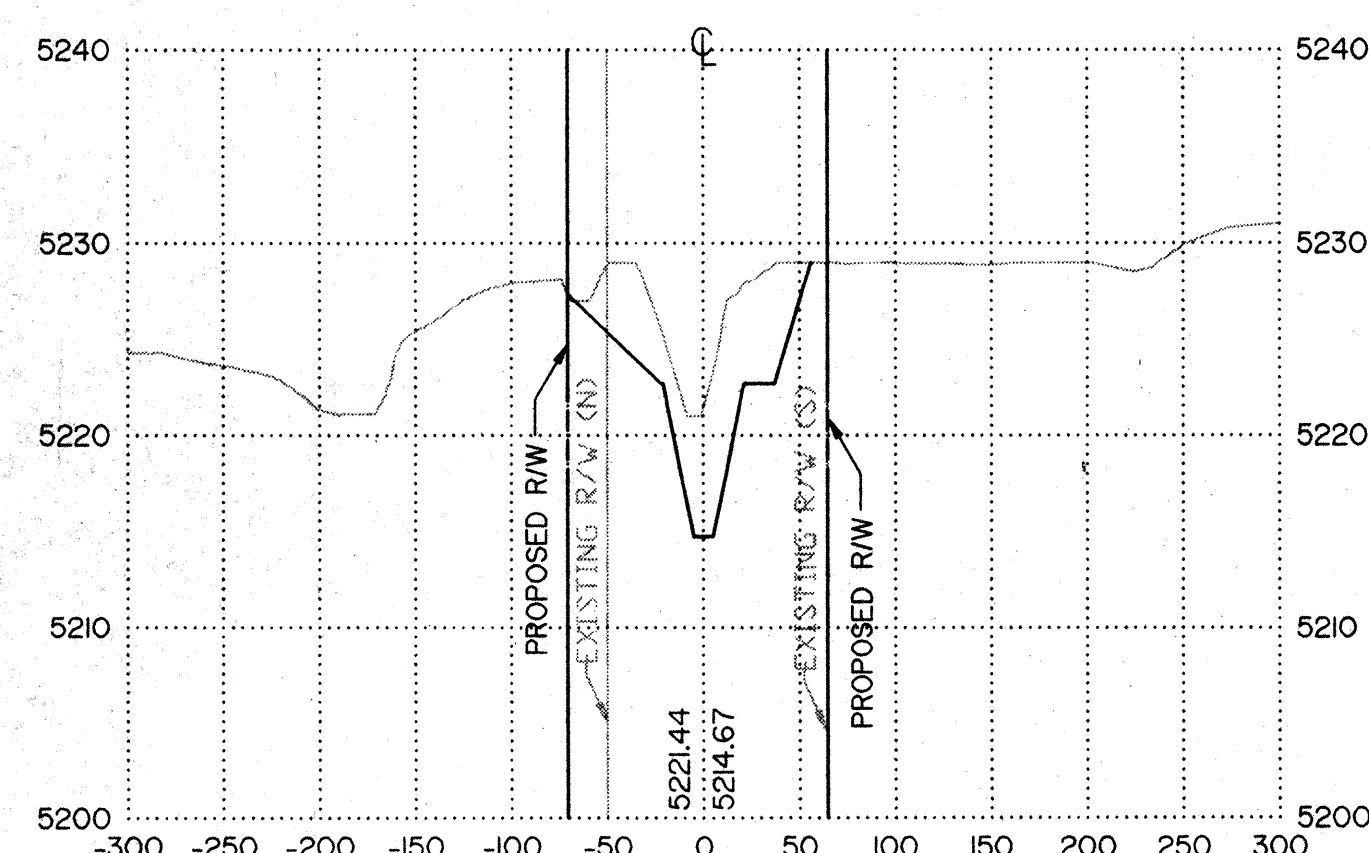
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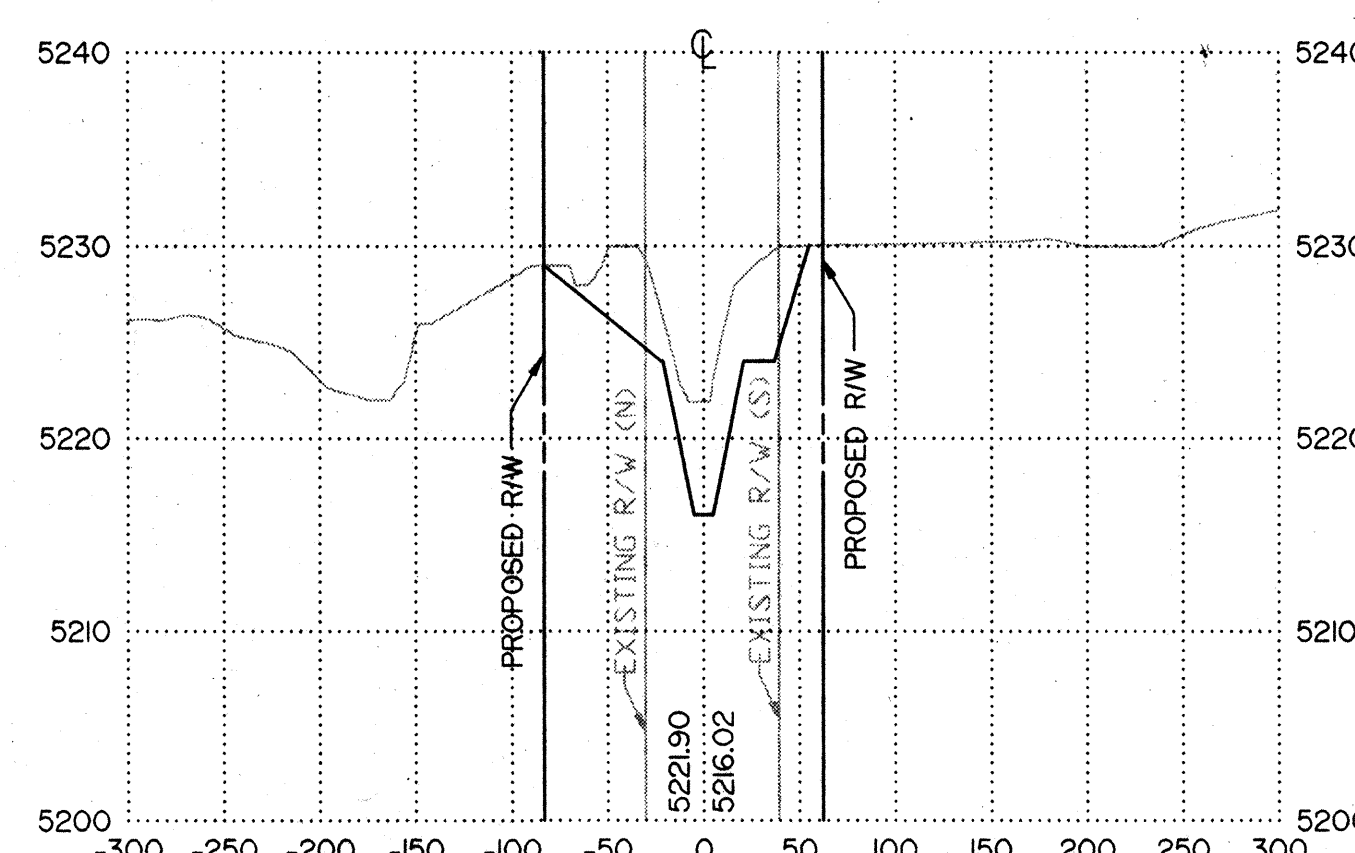
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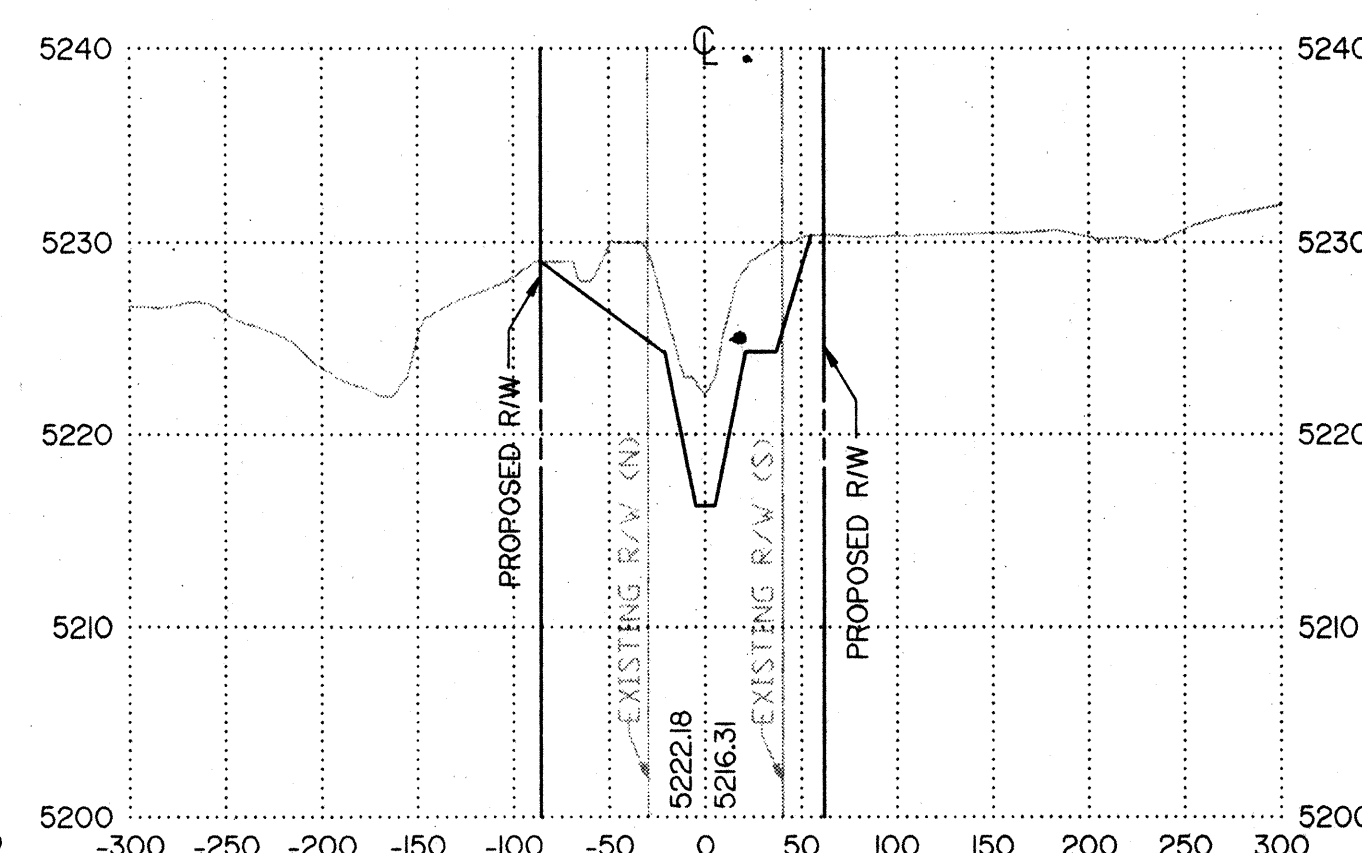
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28+00

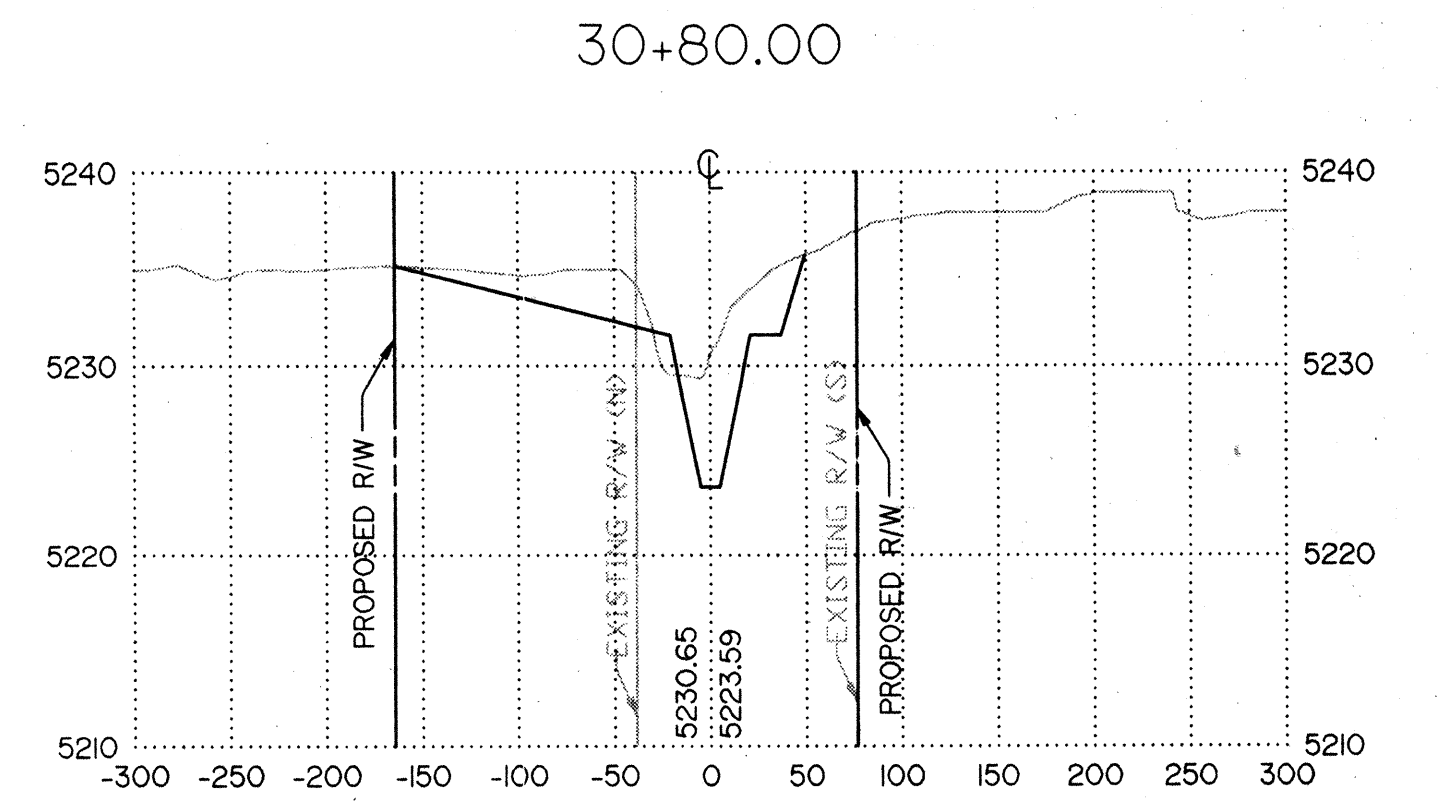
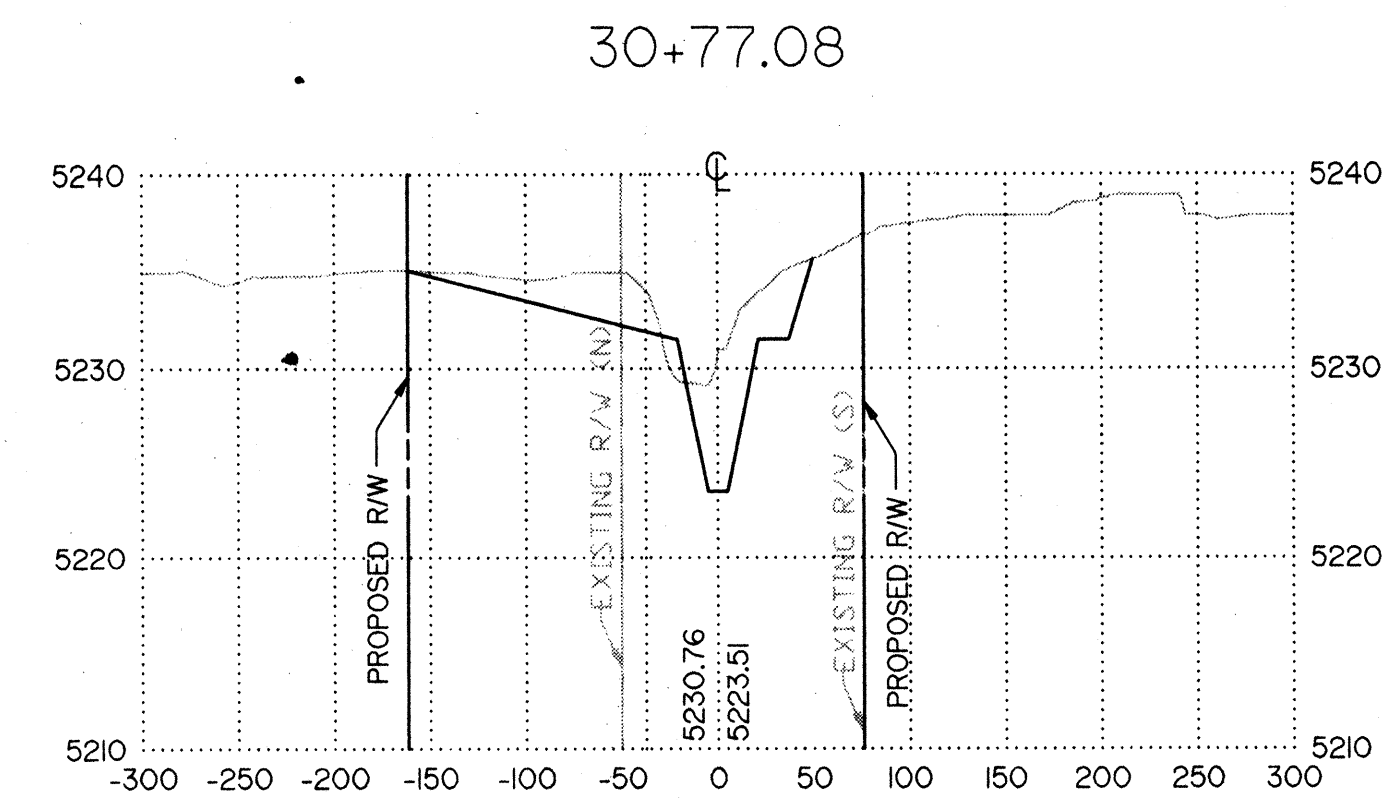
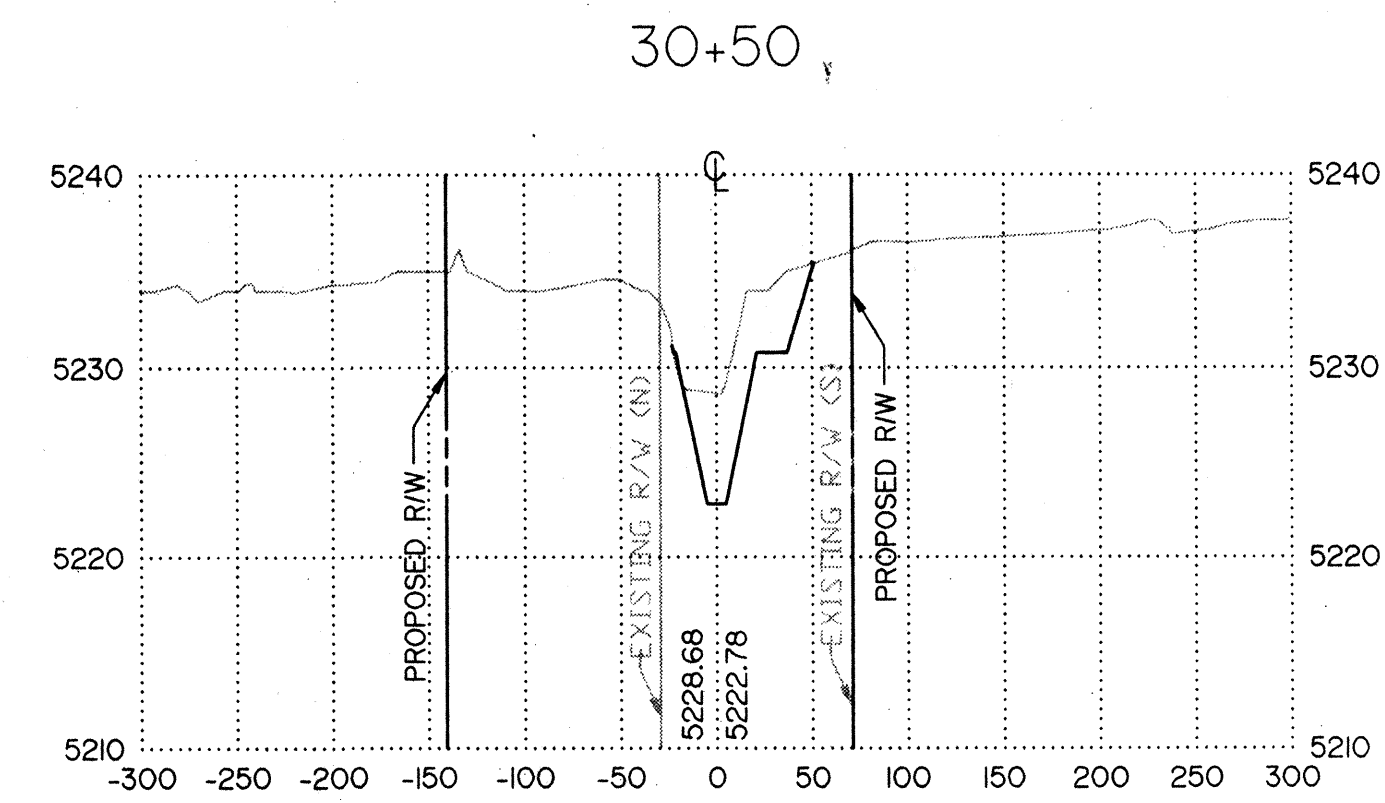
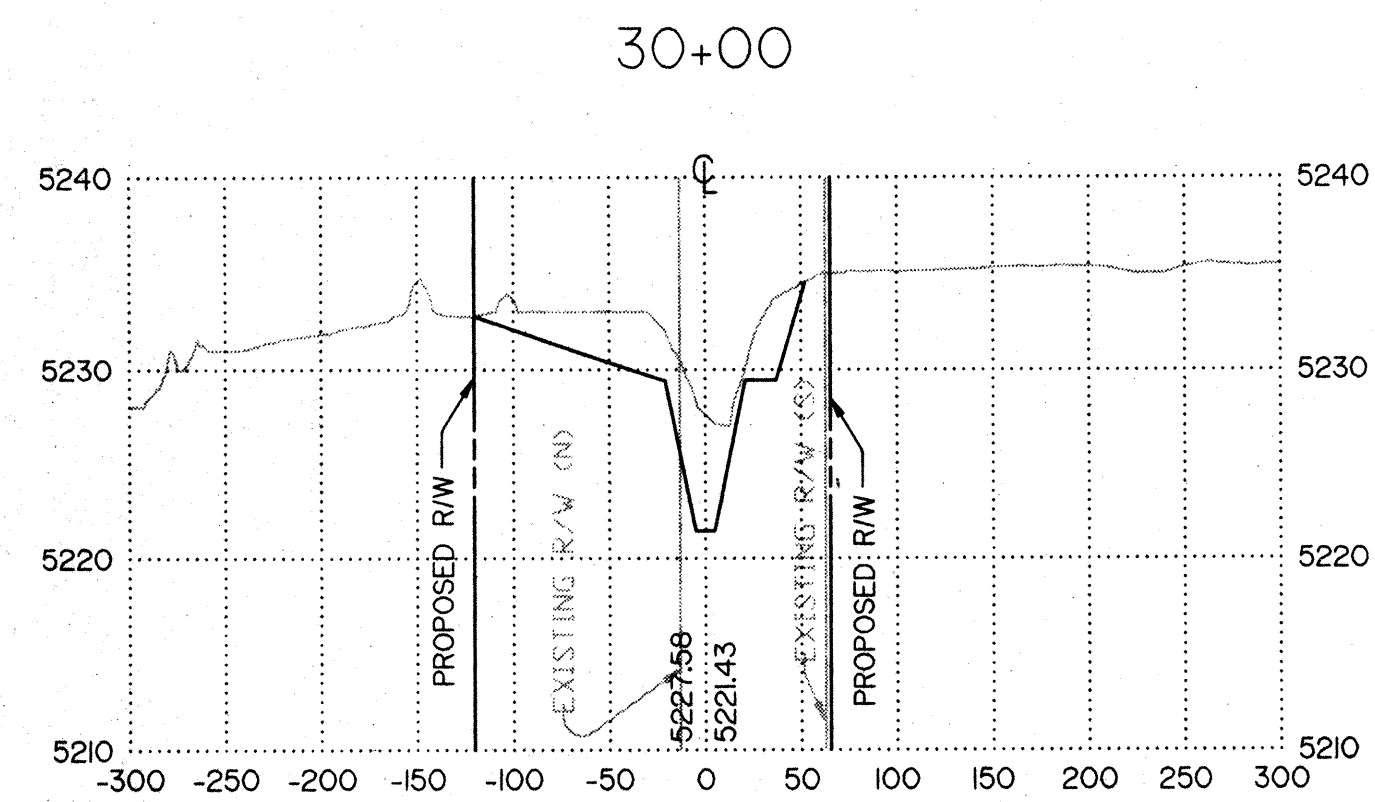
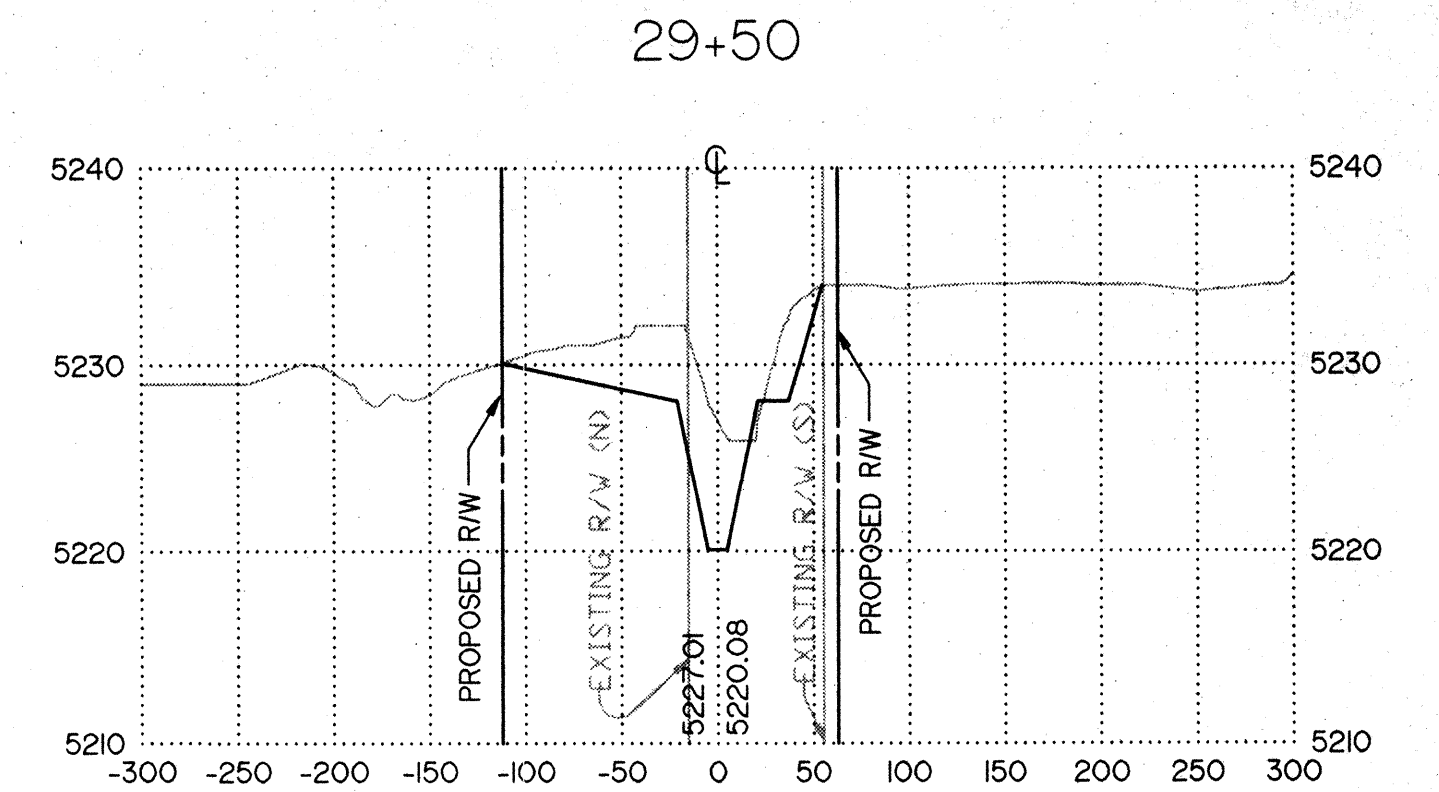
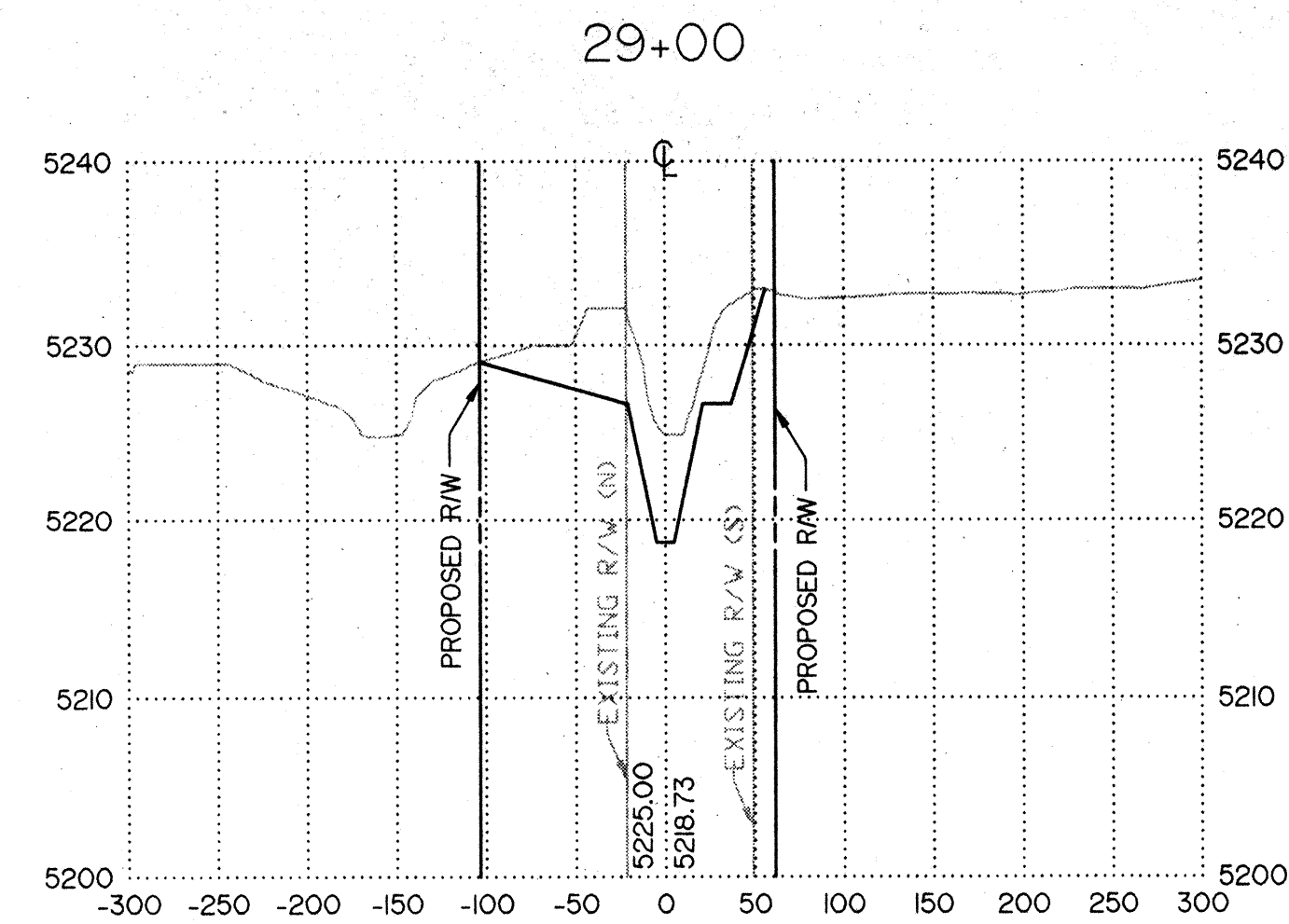
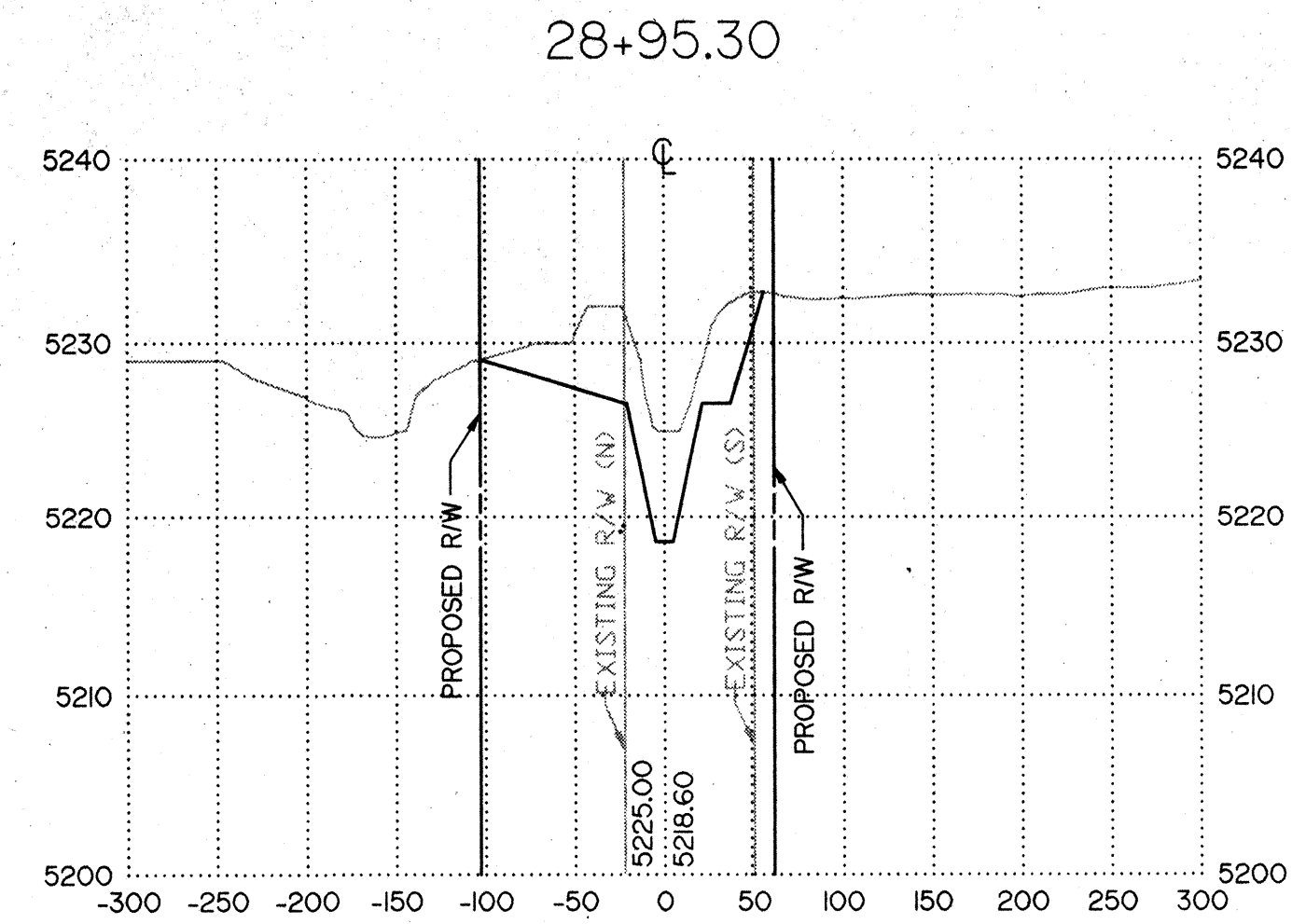
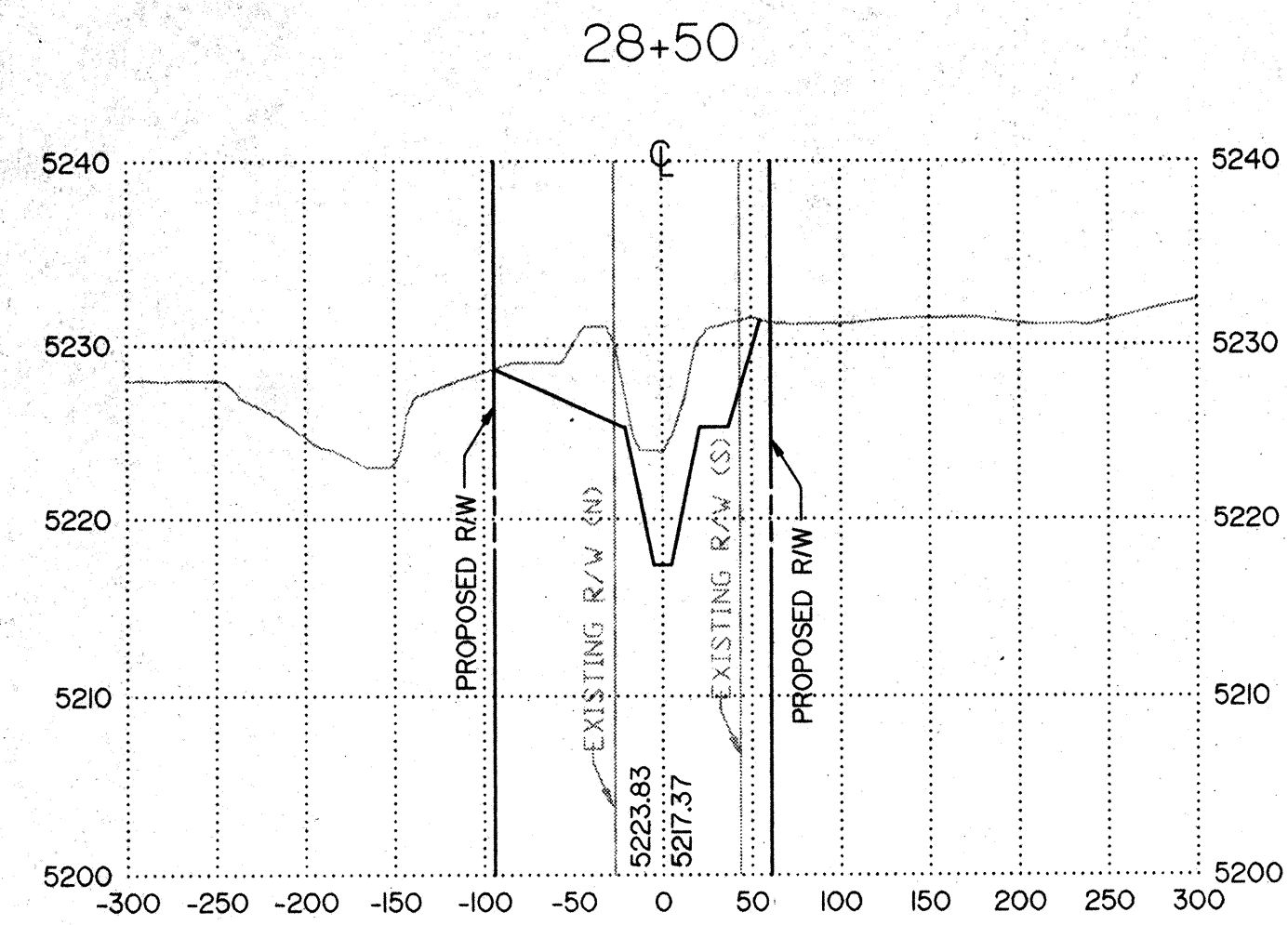


28+10.52

**GENERAL NOTES**

1. ALL CROSS-SECTIONS ARE FACING UPSTREAM.
2. THE CROSS-SECTIONS SHOWN REPRESENT ALTERNATIVE 2A WITHOUT SPLASH BLOCKS.

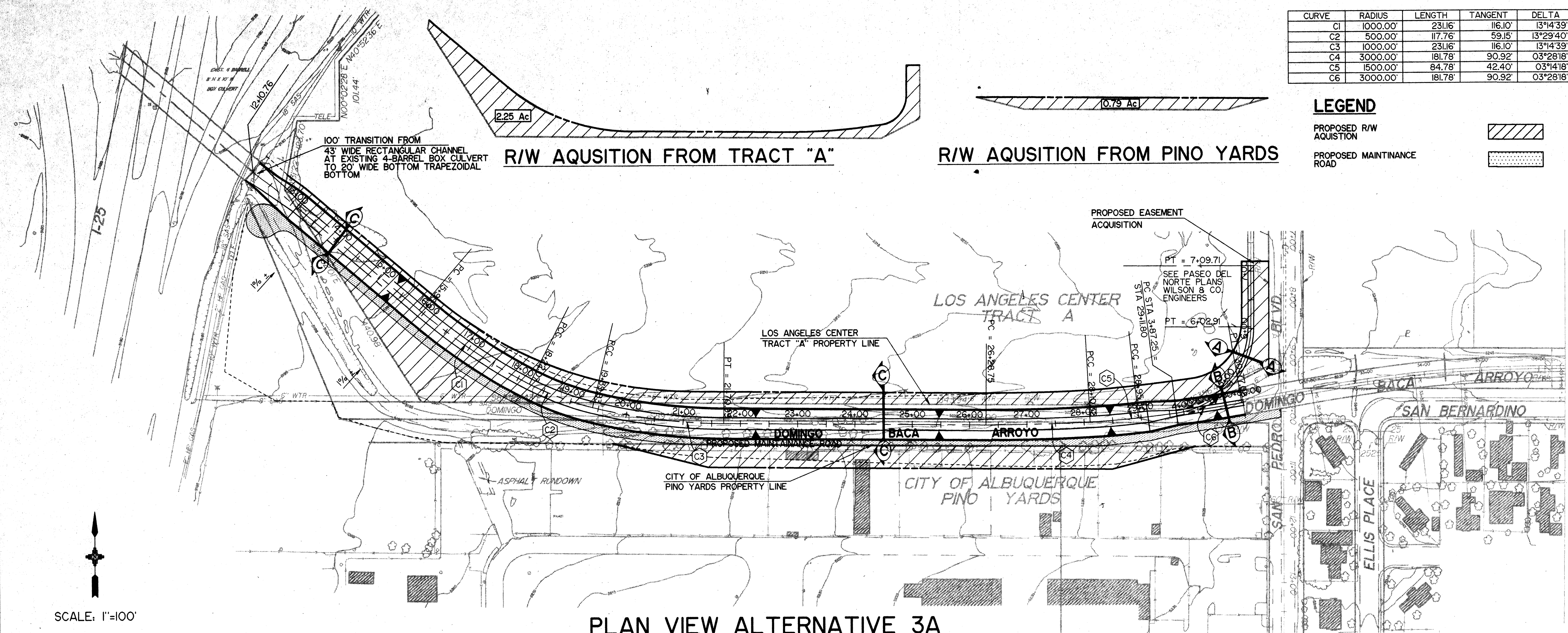
NO.	REVISIONS	BY	DATE
C. O. A PROJECT NO. 4180.92 SOUTH DOMINGO BACA ARROYO / PASEO DEL NORTE OUTFALL CONFLUENCE ALTERNATIVE 2A CROSS SECTIONS			
EASTERLING & ASSOCIATES, INC. CONSULTING ENGINEERS 10131 Coors Rd., NW, Suite H-718 ALBUQUERQUE, NEW MEXICO 87114 (505) 896-8021 FAX (505) 896-8501			
DESIGNED BY: ALM/DSH	DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET 4
JOB NO. 28331	DATE: DEC. 1992	OF	5



GENERAL NOTES

- ALL CROSS-SECTIONS ARE FACING UPSTREAM.
- THE CROSS-SECTIONS SHOWN REPRESENT ALTERNATIVE 2A WITHOUT SPLASH BLOCKS.

NO.	REVISIONS	BY	DATE
G. O. A PROJECT NO. 4160.92 SOUTH DOMINGO BACA ARROYO / PASEO DEL NORTE OUTFALL CONFLUENCE ALTERNATIVE 2A CROSS SECTIONS			
EASTERLING & ASSOCIATES, INC. CONSULTING ENGINEERS 10131 Coors Rd., NW, Suite H-7/8 ALBUQUERQUE, NEW MEXICO 87114 (505) 898-8021 FAX (505) 898-8501			
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SHEET
ALM/DSH	ALM	DSH/RPB	5
JOB NO.	DATE:	OF	
28331	DEC. 1992		5

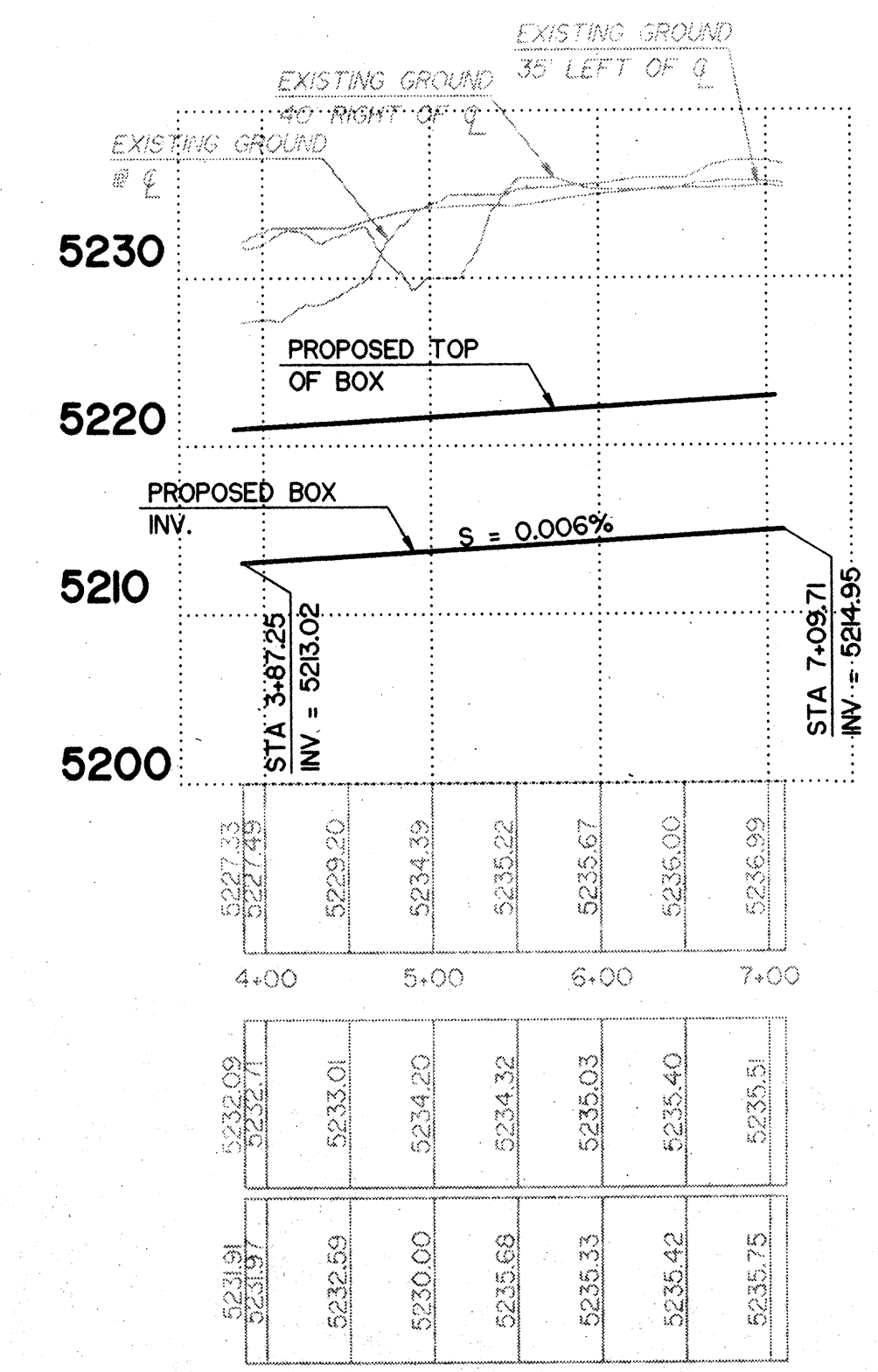
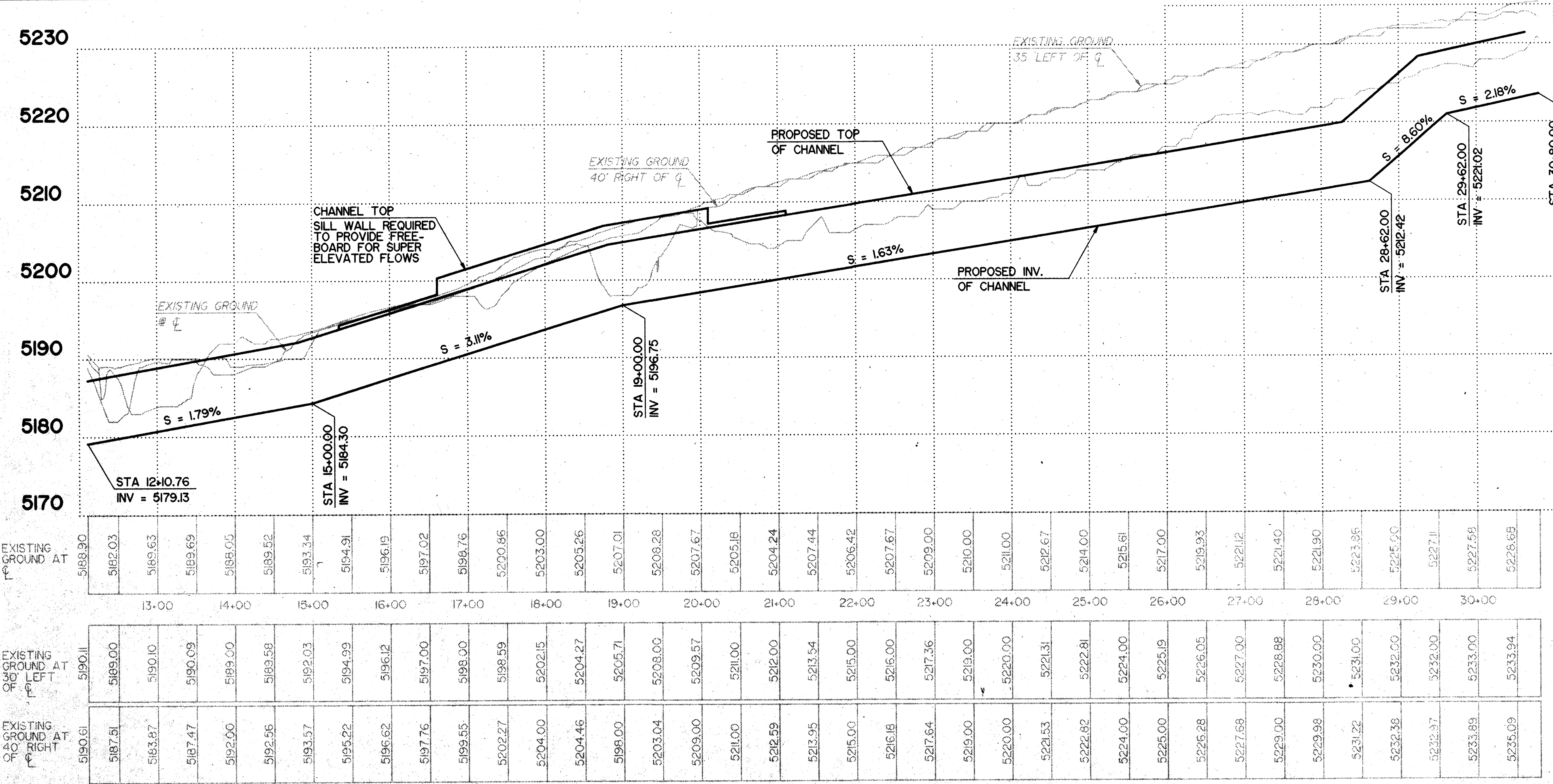
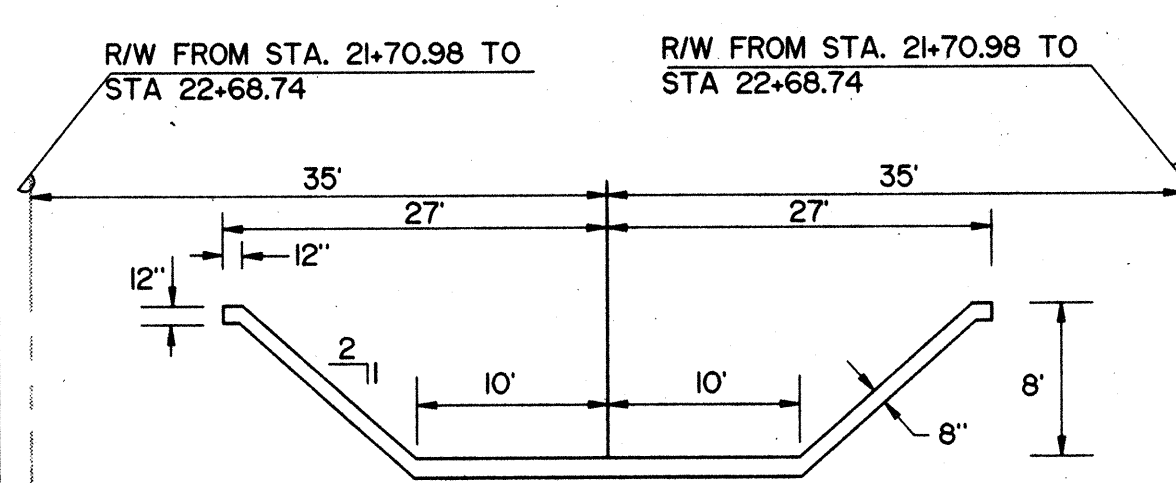
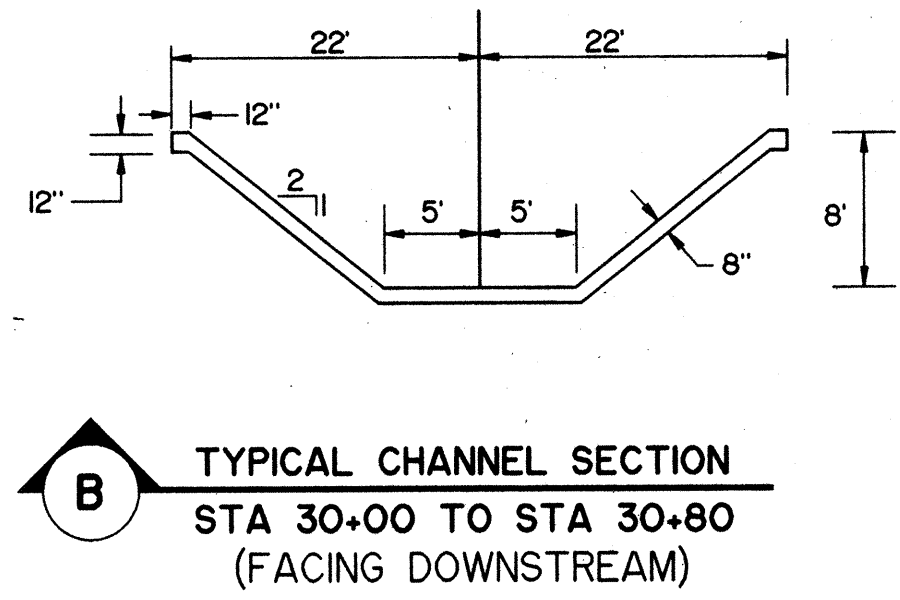
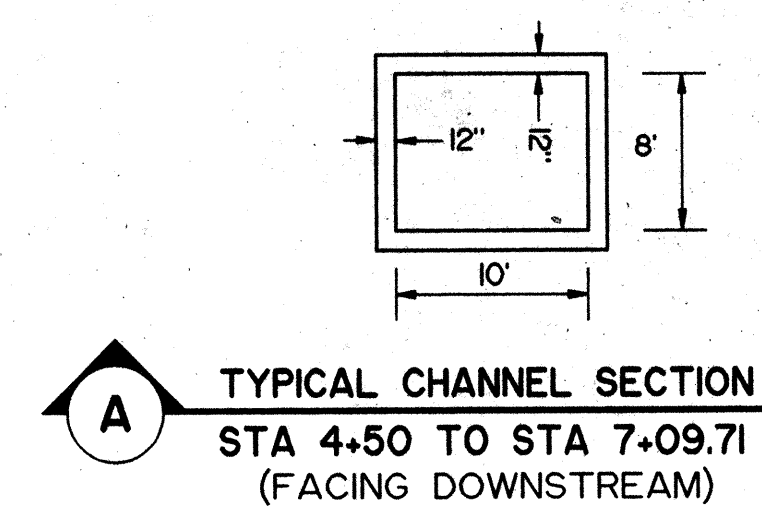


CURVE	RADIUS	LENGTH	TANGENT	DELTA
C1	1000.00'	231.16'	116.10'	13°14'39"
C2	500.00'	117.73'	59.15'	13°29'40"
C3	1000.00'	231.16'	116.10'	13°14'39"
C4	3000.00'	181.78'	90.92'	03°28'18"
C5	1500.00'	84.78'	42.40'	03°14'18"
C6	3000.00'	181.78'	90.92'	03°28'18"

LEGEND

PROPOSED R/W ACQUISITION

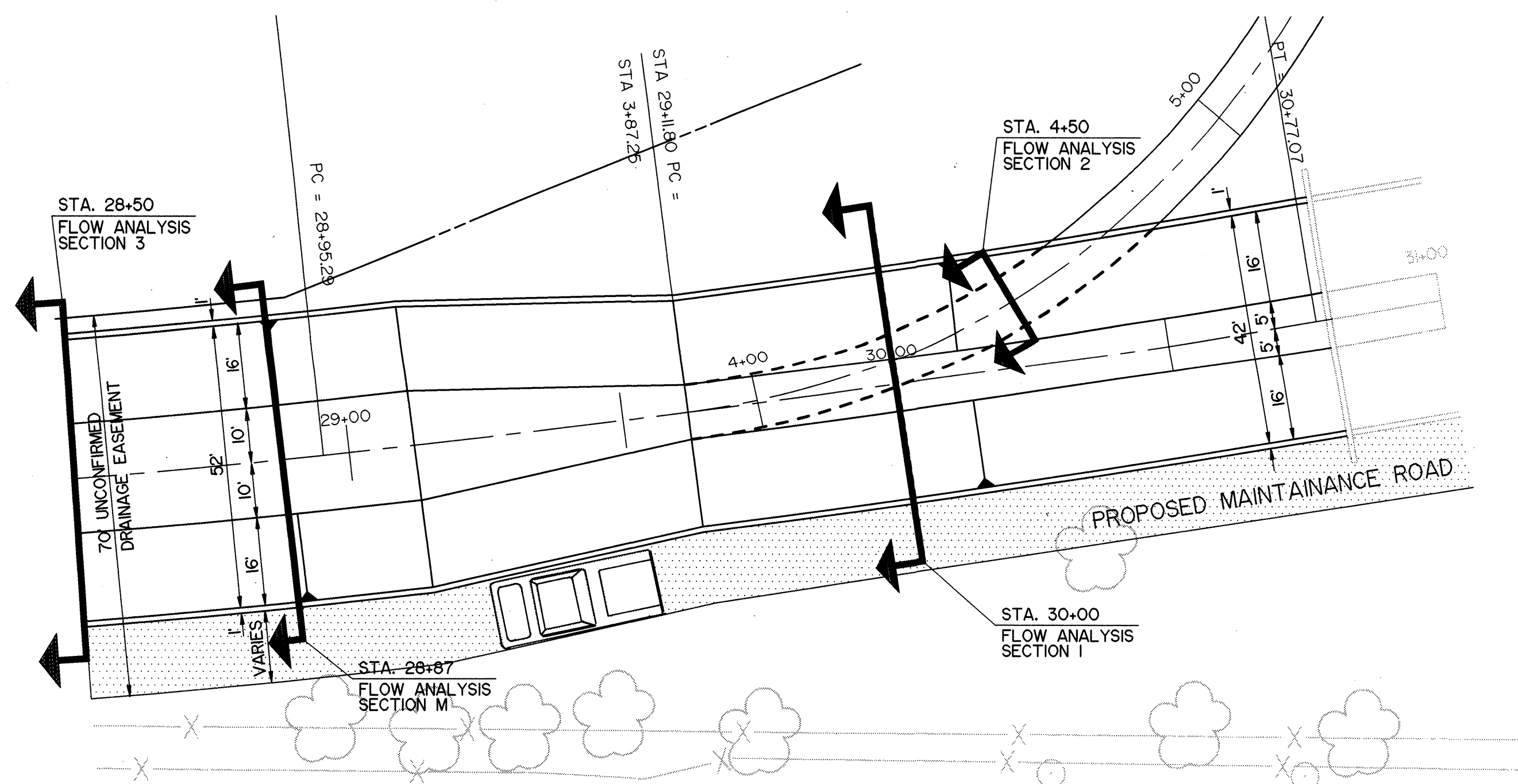
PROPOSED MAINTENANCE ROAD



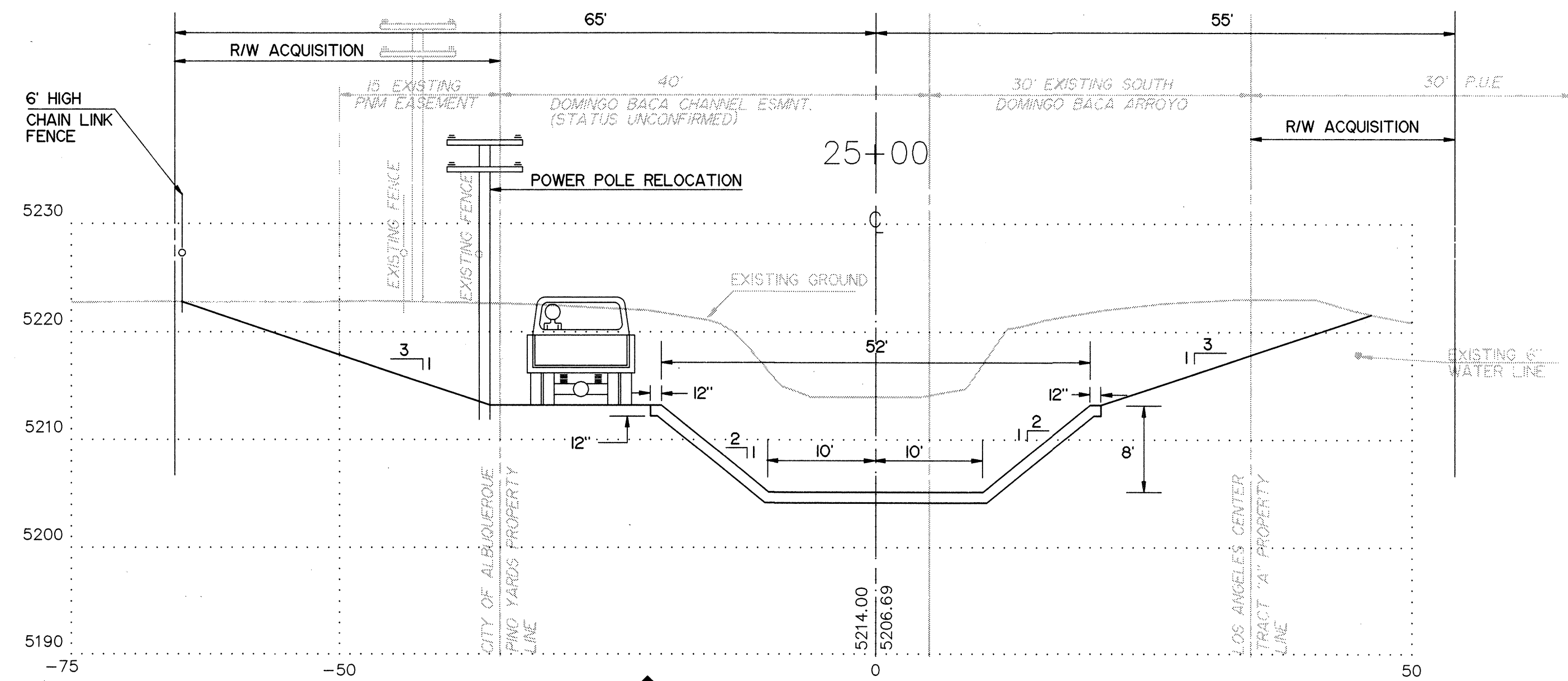
PASEO DEL NORTE OUTFALL BOX CULVERT PROFILE

NO.		REVISIONS		BY	DATE
G. O. A PROJECT NO. 4160.92 SOUTH DOMINGO BACA ARROYO / PASEO DEL NORTE OUTFALL CONFLUENCE ALTERNATIVE 3A PLAN AND PROFILE, TYPICAL SECTIONS					
EASTERLING & ASSOCIATES, INC. CONSULTING ENGINEERS 10131 Coors Rd., NW, Suite H-7/8 ALBUQUERQUE, NEW MEXICO 87114 (505) 898-8021 FAX (505) 898-8501					
DESIGNED BY:	DRAWN BY:	CHECKED BY:	SHEET	1	
DSH/ALM	ALM	DSH/RPB	OF	5	
JOB NO.	2833.1	DATE:	DEC. 1992		

SCALE: 1"=20'



CONFLUENCE DETAIL

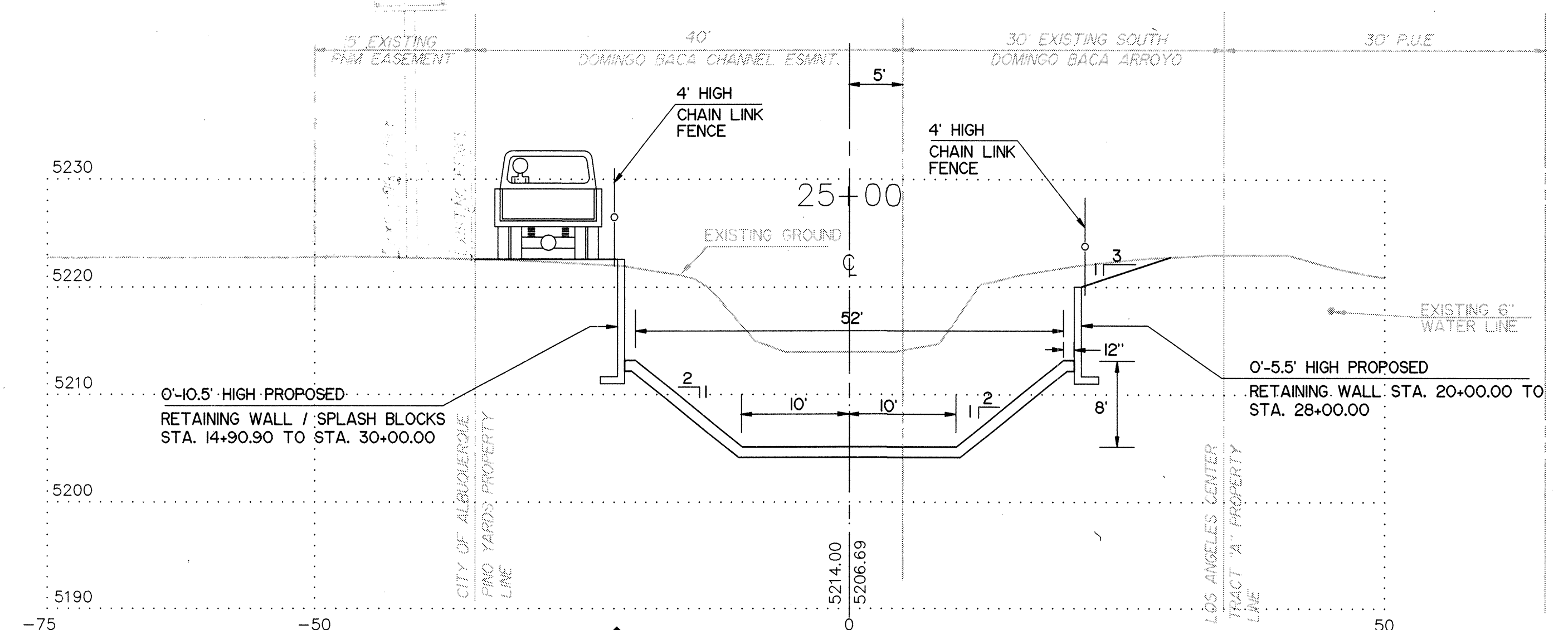


ALTERNATE 3A TYPICAL CHANNEL SECTION
(FACING DOWNSTREAM)

ALTERNATIVE 3A SUMMARY OF QUANTITIES AND COST					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	R/W ACQUISITION FROM L.A. TRACT "A"	SF	98,010	\$ 4.00	\$392,040.00
2	R/W ACQUISITION FROM PINO YARDS	SF	34,412	\$ 4.00	\$137,648.00
3	8" SLOPE PAVING	SF	103,300	\$4.50	\$464,850.00
4	EXCAVATION / BACKFILL FOR CHANNEL	CY	41,900	\$3.85	\$161,315.00
5	SUBGRADE PREPARATION FOR MAINTENANCE RD.	SY	3,345	\$1.00	\$3,345.00
6	6" SANITARY SEWER LINE RELOCATION	LS	1	\$6,700.00	\$6,700.00
7	6" WATERLINE RELOCATION	LS	1	\$15,600.00	\$15,600.00
8	PINO YARD RUNDOWN	LS	1	\$22,700.00	\$22,700.00
9	48" PIPE PENETRATION	EA	1	\$2,500.00	\$2,500.00
10	10" WATERLINE RELOCATION	LS	1	\$4,850.00	\$4,850.00
11	4' AND 6' HIGH CHAINLINK FENCING	SF	5,700	\$1.80	\$10,260.00
12	POWER POLE RELOCATION	LS	1	\$7,500.00	\$7,500.00
13	2" GAS LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
14	TELEPHONE LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
15	CMU CORE FILLED SPLASH BLOCKS	SF	1,850	\$8.80	\$16,280.00
16	STRUCTURAL CONCRETE FOR BOX CULVERT	CY	605	\$285.00	\$172,425.00
17	EXCAVATION / BACKFILL FOR BOX CULVERT	CY	13,900	\$5.75	\$79,925.00
18	CLEARING AND GRUBBING	AC	6	\$600.00	\$3,600.00
19	SEEDING	CY	3	\$1,200.00	\$3,600.00
20	REMOVE & DISPOSE OF RIP-RAP / UNSUITABLE MATERIAL	CY	1	\$30,000.00	\$30,000.00
21	EXCAVATION AND SHORING @ SAN PEDRO	LS	1	\$25,000.00	\$25,000.00
22	STEEL HYDRAULIC VANES	LS	1	\$12,500.00	\$12,500.00
SUBTOTAL					\$1,582,638.00
15% CONTINGENCIES					\$237,395.70
TOTAL FOR ALTERNATIVE 3A					\$1,820,033.70

FLOW ANALYSIS OF OPEN CHANNEL JUNCTIONS FROM SCS TR-25 (FIGURE 5.1) ALTERNATIVE NO. 3 100 YR. IN DOMINGO BACA CHANNEL - 100 YR. IN PASEO DEL NORTE CHANNEL JOB NO. 2833.1 12/23/92					
HEC-2 DATA					
h=	8	FT	L=	100	FT
SECTION 1 STATION 30+00	SECTION 2 STATION 4+50		SECTION 3 STATION 28+50		SECTION 4 STATION 28+87
Q ₁ = 4280 CFS	Q ₂ = 1050 CFS		Q ₃ = 5310 CFS	Q ₄ = 5310 CFS	
b ₁ = 10 FT	b ₂ = 10 FT		b ₃ = 20 FT	b ₄ = 20 FT	
d ₁ = 5.26 FT	d ₂ = 6 FT		d ₃ = 4.26 FT	d ₄ = 4.31 FT	
F ₁ = 3.74	F ₂ = 1.2		F ₃ = 4.25	F ₄ = 4.15	
A ₁ = 108.00 SQ FT	A ₂ = 60 SQ FT		A ₃ = 121.60 SQ FT	A ₄ = 123.70 SQ FT	
V ₁ = 39.63 FT/SEC	V ₂ = 17.3 FT/SEC		V ₃ = 43.67 FT/SEC	V ₄ = 42.93 FT/SEC	
P ₁ = 33.52 FT	P ₂ = 22 FT		P ₃ = 39.05 FT	P ₄ = 39.27 FT	
R ₁ = 3.22 FT	R ₂ = 2.73 FT		R ₃ = 3.11 FT	R ₄ = 3.15 FT	
α ₁ = 1.2488°	α ₂ = 0.34377°		α ₃ = 0.93384°		
CONDITION					
TRAPEZOIDAL CHANNEL WITH UNEQUAL WIDTH, MAIN CHANNEL AND SUPERCRITICAL VELOCITY FLOW IN ALL BRANCHES					
NOTE: FOR FLOWS AT SUPERCRITICAL VELOCITIES, THESE EQUATIONS MAY BE USED ONLY FOR PRELIMINARY DESIGN. FINAL DESIGN MUST BE BASED ON RESULTS OF SUPPLEMENTAL HYDRAULIC MODEL STUDIES.					
FORMULA					
$\frac{Q_1^2}{gA_1} \cos^2 \alpha_1 + \left(\frac{b_1}{2} + \frac{Zd_1}{3} \right) \left(d_1^2 \right) \cos^2 \alpha_1 = \frac{Q_2^2}{gA_2} \cos^2 \alpha_2 + \frac{Q_3^2}{gA_3} \cos^2 \alpha_3 + \left(\frac{b_1}{2} + \frac{Zd_1}{3} \right) \left(d_1^2 \right) \cos^2 \alpha_1 + (b_1 + Zd_1) d_1 h - \frac{P_1 \ln V_1^2}{2.21 R_1^{4/3}}$					
7199.40 + 233.02 = 5266.28 + 549.110 + 373.52 + 986.82 - 377.61					
7432.42 = 6798.12					
Δ = 634.30					
Δ% = 9.34					

HYDRAULIC ANALYSIS SUMMARY

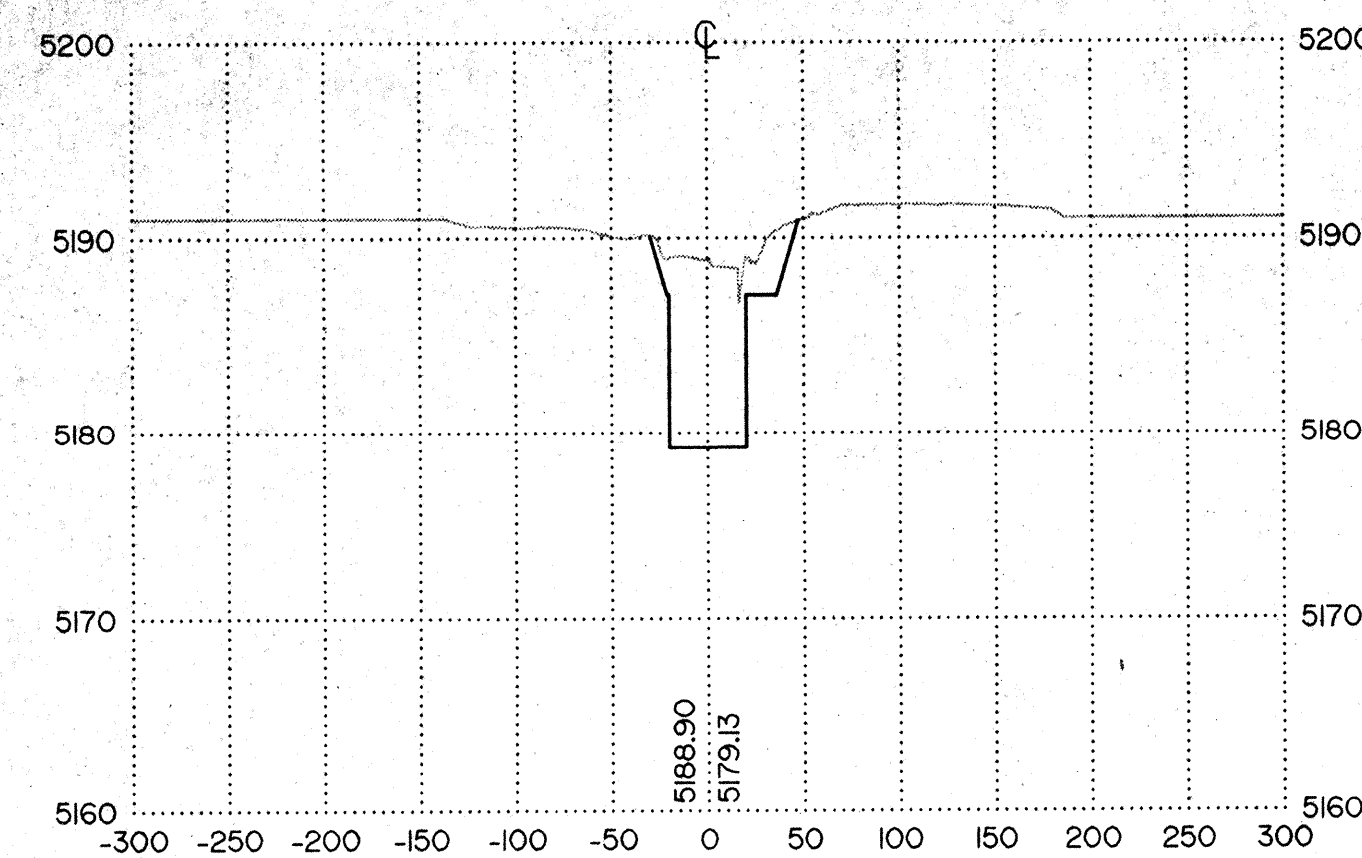


ALTERNATIVE 3B TYPICAL SECTION
(FACING DOWNSTREAM)

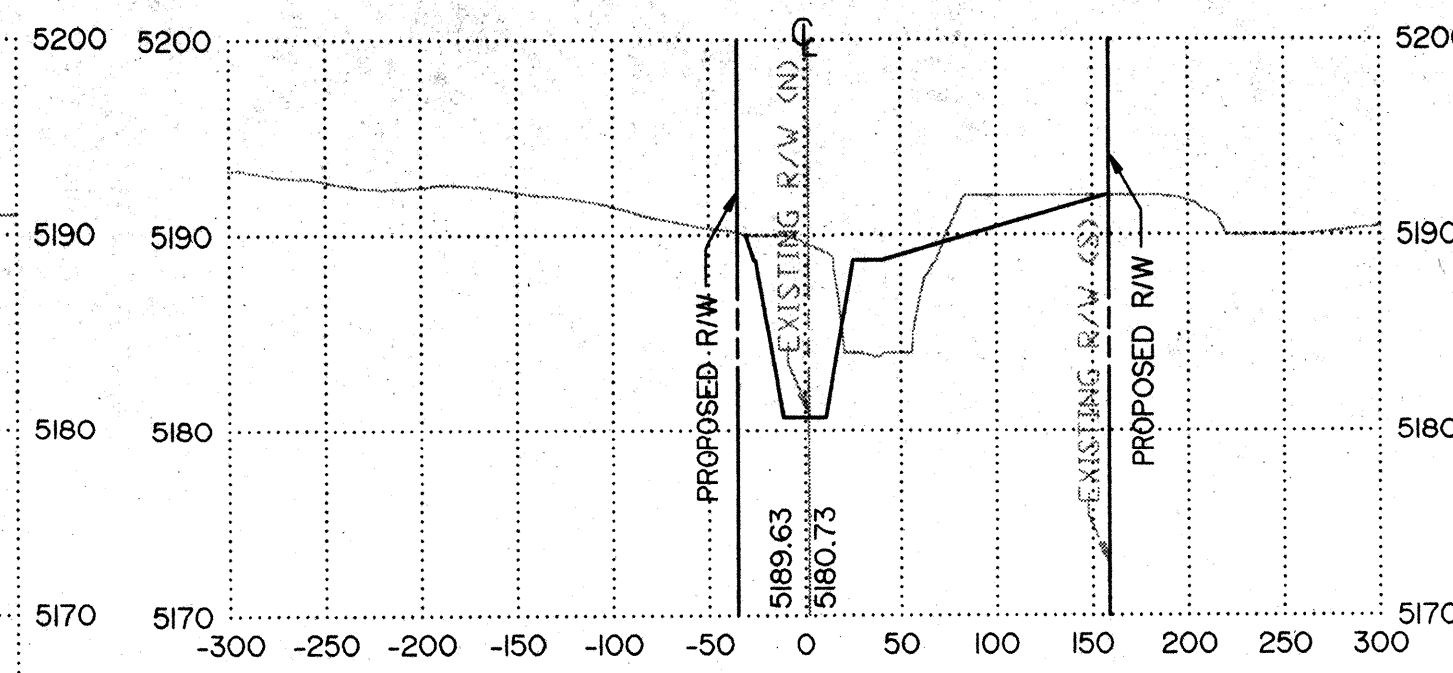
ALTERNATIVE 3B SUMMARY OF QUANTITIES AND COST					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	R/W ACQUISITION FROM L.A. TRACT "A"	SF	86,249	\$ 4.00	\$344,996.00
2	8" SLOPE PAVING	SF	103,300	\$4.50	\$464,850.00
3	EXCAVATION / BACKFILL FOR CHANNEL	CY	41,900	\$3.85	\$161,315.00
4	SUBGRADE PREPARATION FOR MAINTENANCE RD.	SY	3,345	\$1.00	\$3,345.00
5	6" SANITARY SEWER LINE RELOCATION	LS	1	\$6,700.00	\$6,700.00
6	6" WATERLINE RELOCATION	LS	1	\$15,600.00	\$15,600.00
7	PINO YARD RUNDOWN	LS	1	\$22,700.00	\$22,700.00
8	48" PIPE PENETRATION	EA	1	\$2,500.00	\$2,500.00
9	10" WATERLINE RELOCATION	LS	1	\$4,850.00	\$4,850.00
10	4' HIGH CHAINLINK FENCING	SF	7,120	\$1.80	\$12,816.00
11	RETAINING WALL FOOTING	CY	330	\$240.00	\$79,200.00
12	2" GAS LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
13	TELEPHONE LINE RELOCATION	LS	1	\$5,000.00	\$5,000.00
14	CMU CORE FILLED SPLASH BLOCKS	SF	1,850	\$8.80	\$16,280.00
15	STRUCTURAL CONCRETE FOR BOX CULVERT	CY	605	\$285.00	\$172,425.00
16	EXCAVATION / BACKFILL FOR BOX CULVERT	CY	13,900	\$5.75	\$79,925.00
17	CLEARING AND GRUBBING	AC	6	\$600.00	\$3,600.00
18	SEEDING	CY	3	\$1,200.00	\$3,600.00
19	REMOVE & DISPOSE OF RIP-RAP / UNSUITABLE MATERIAL	CY	1	\$30,000.00	\$30,000.00
20	EXCAVATION AND SHORING @ SAN PEDRO	LS	1	\$25,000.00	\$25,000.00
21	STEEL HYDRAULIC VANES	LS	1	\$12,500.00	\$12,500.00
22	CMU CORE FILLED RETAINING WALL	SF	9,550	\$8.80	\$84,040.00
SUBTOTAL					\$1,556,242.00
15% CONTINGENCIES					\$233,436.30
TOTAL FOR ALTERNATIVE 3B					\$1,789,678.30

NO.	REVISIONS	BY	DATE
C.O.A PROJECT NO. 4180.92			
SOUTH DOMINGO BACA ARROYO /			
PASEO DEL NORTE OUTFALL			
CONFLUENCE ALTERNATIVE 3A AND 3B			
DETAILS AND COST ESTIMATE			
EASTERLING & ASSOCIATES, INC.			
CONSULTING ENGINEERS			
10131 Coors Rd., NW, Suite H-718			
ALBUQUERQUE, NEW MEXICO 87114			
(505) 898-8021 FAX (505) 898-8501			
DESIGNED BY: DSH/ALM	DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET 2
JOB NO. 2833.1	DATE: DEC. 1992	OF	5

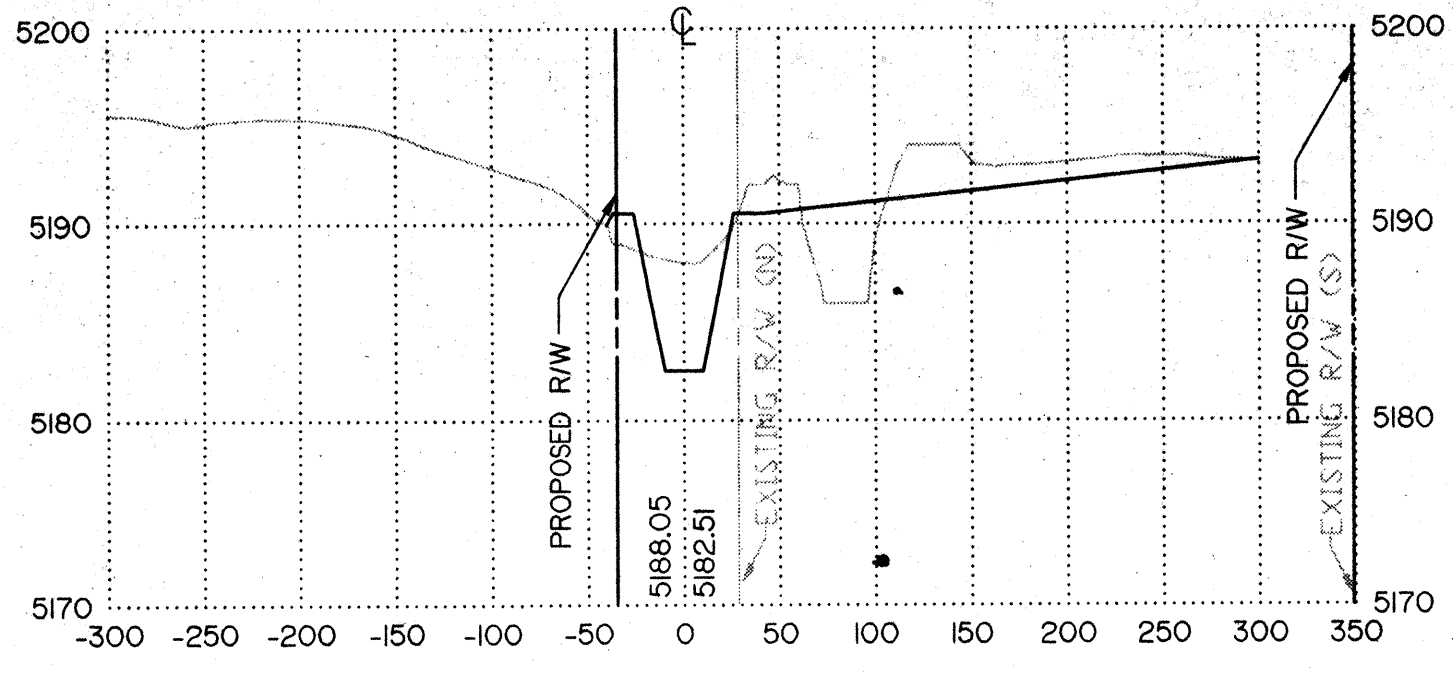
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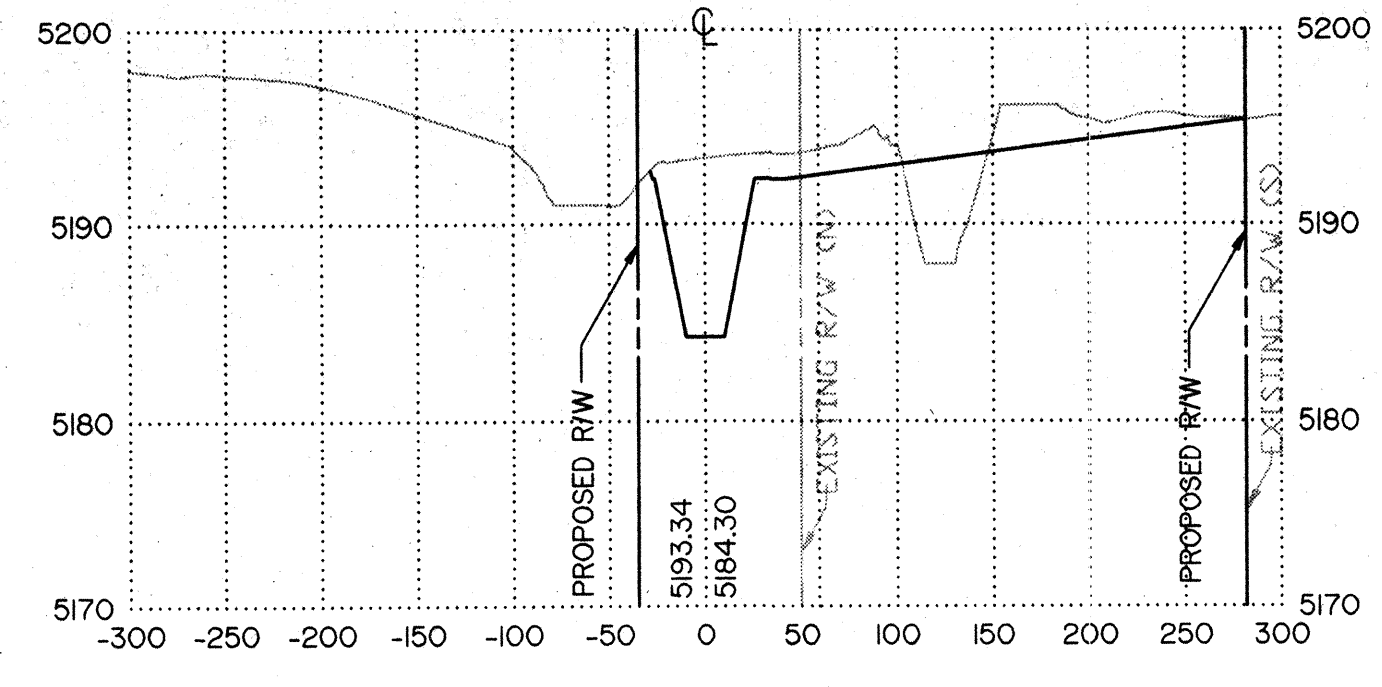
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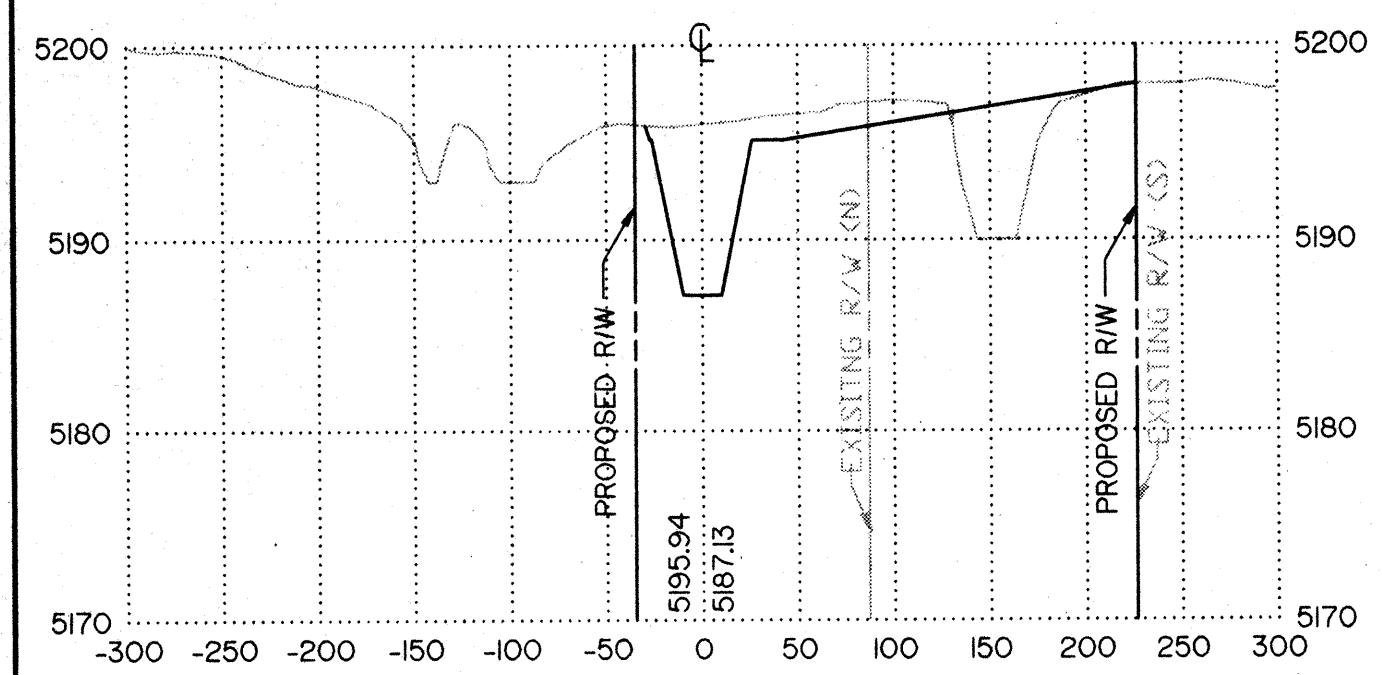
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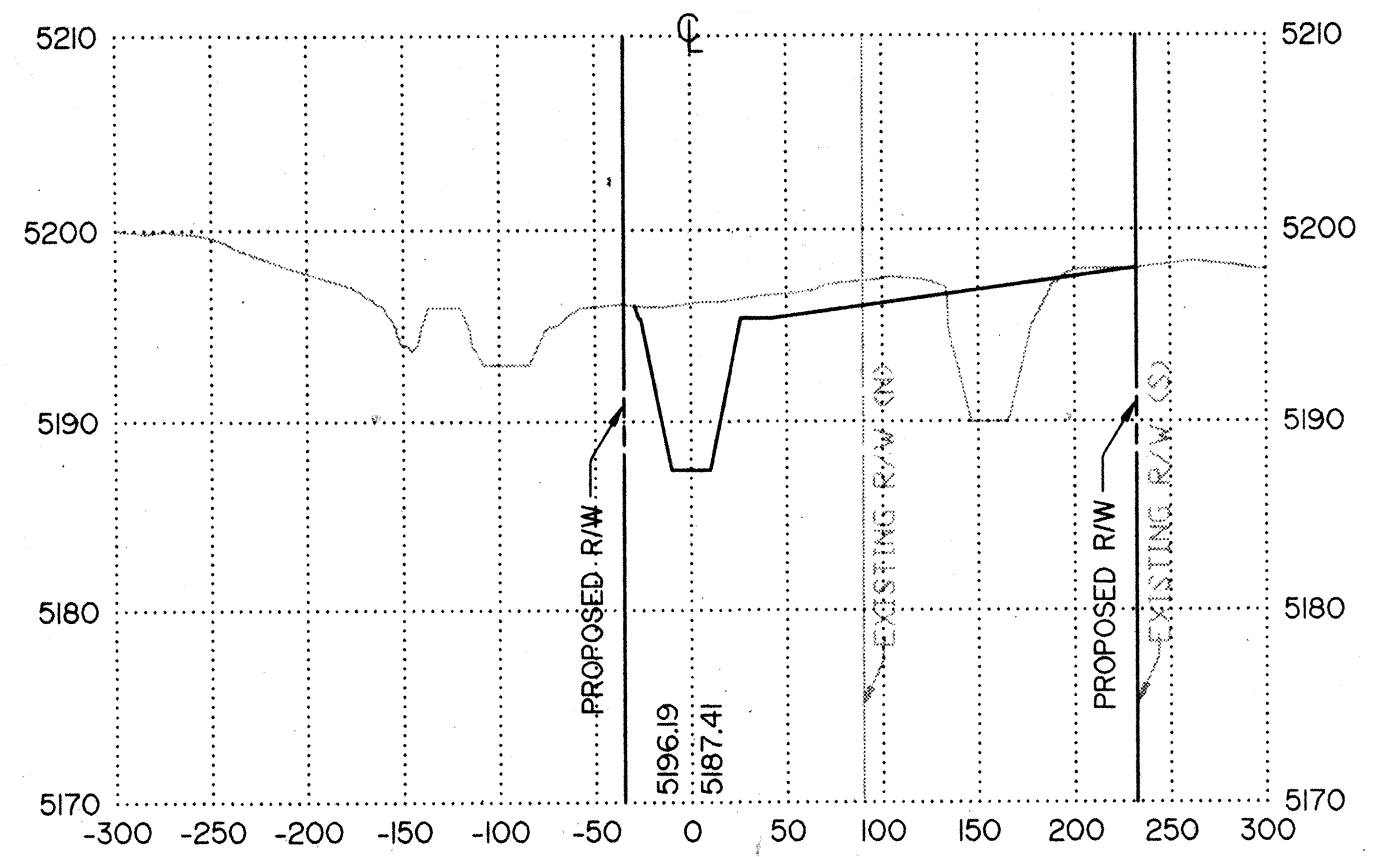
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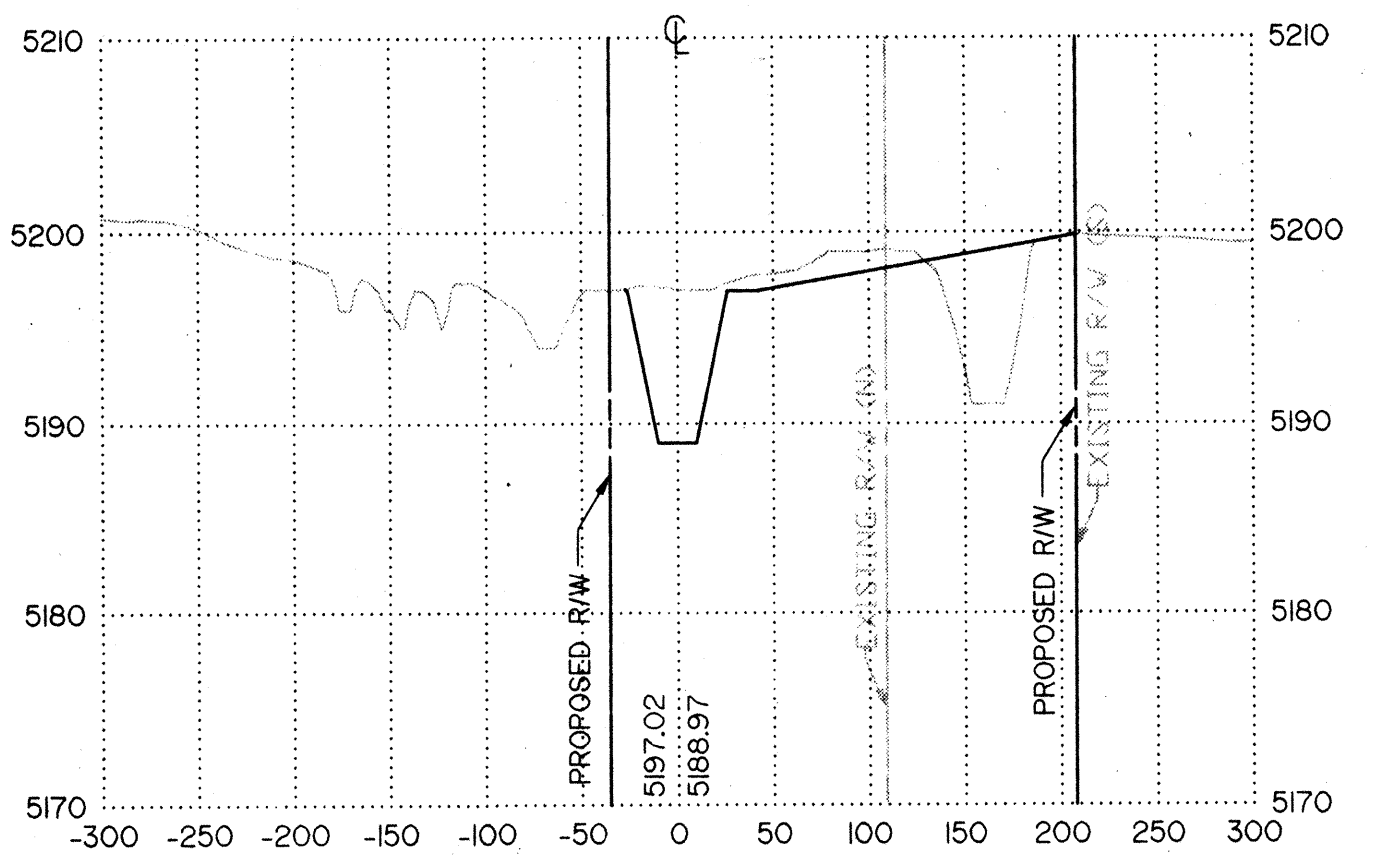
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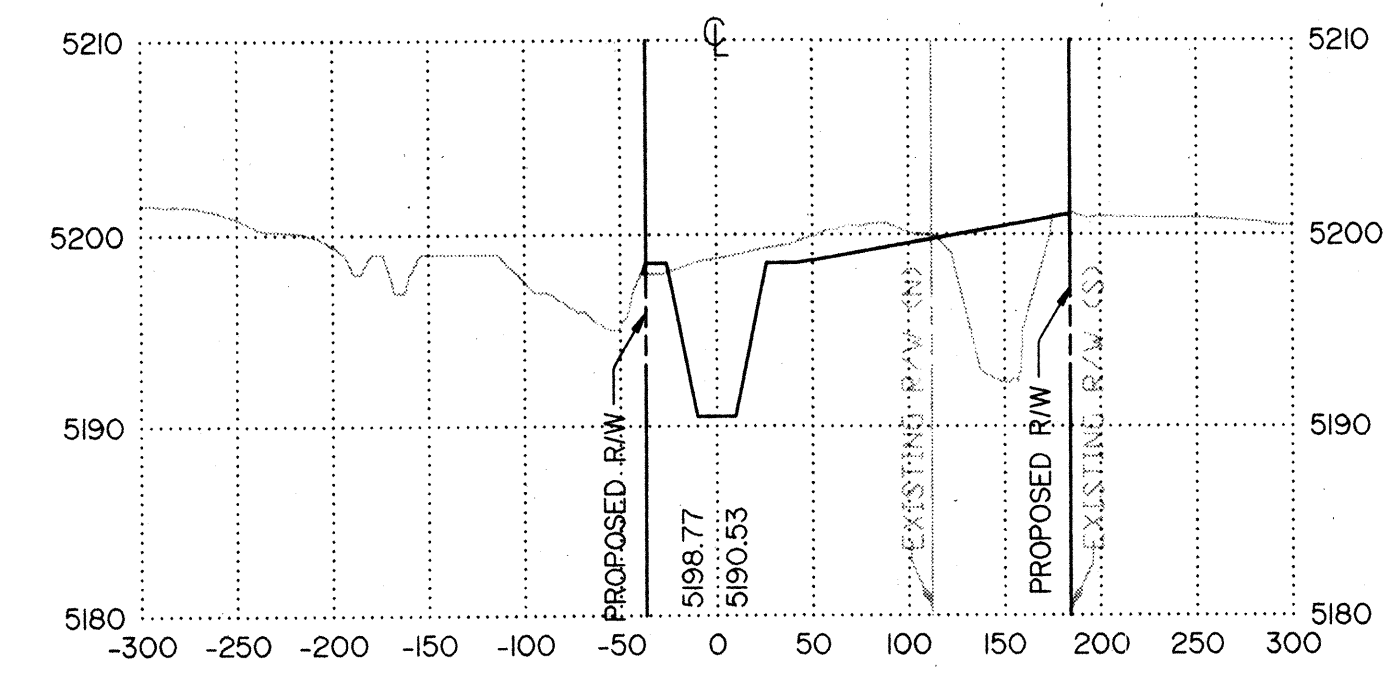
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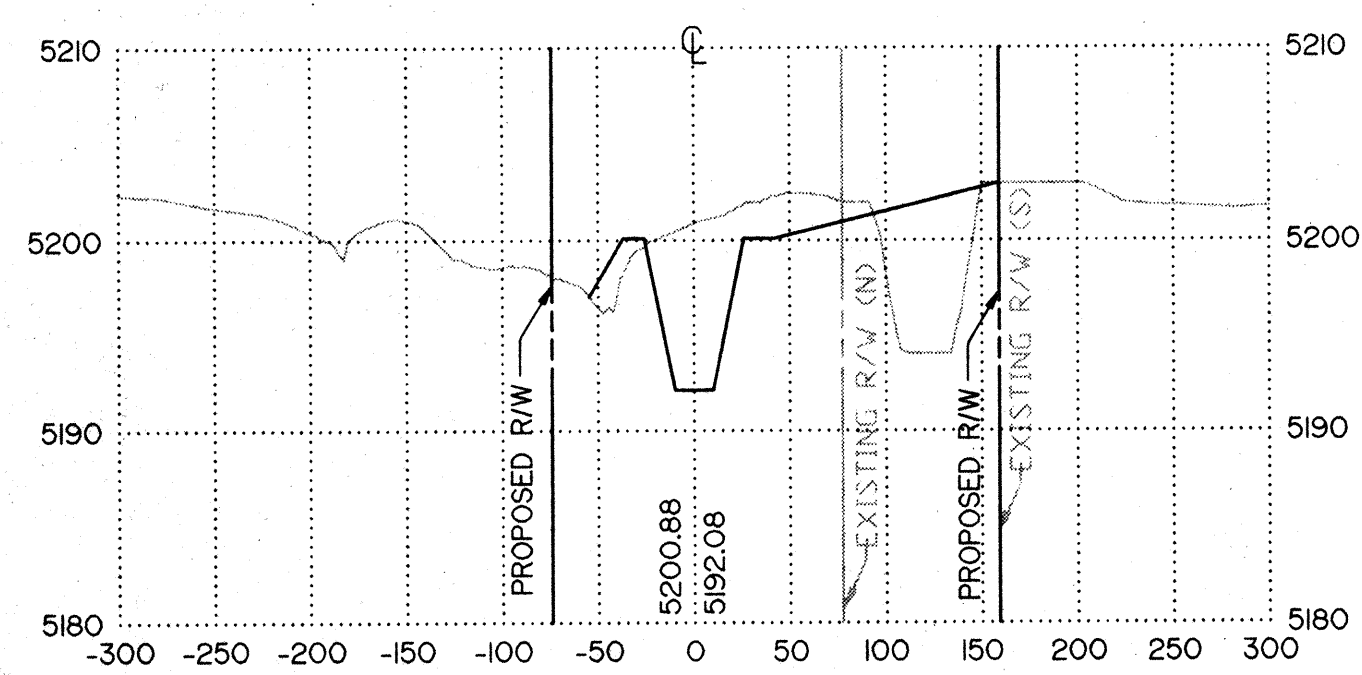
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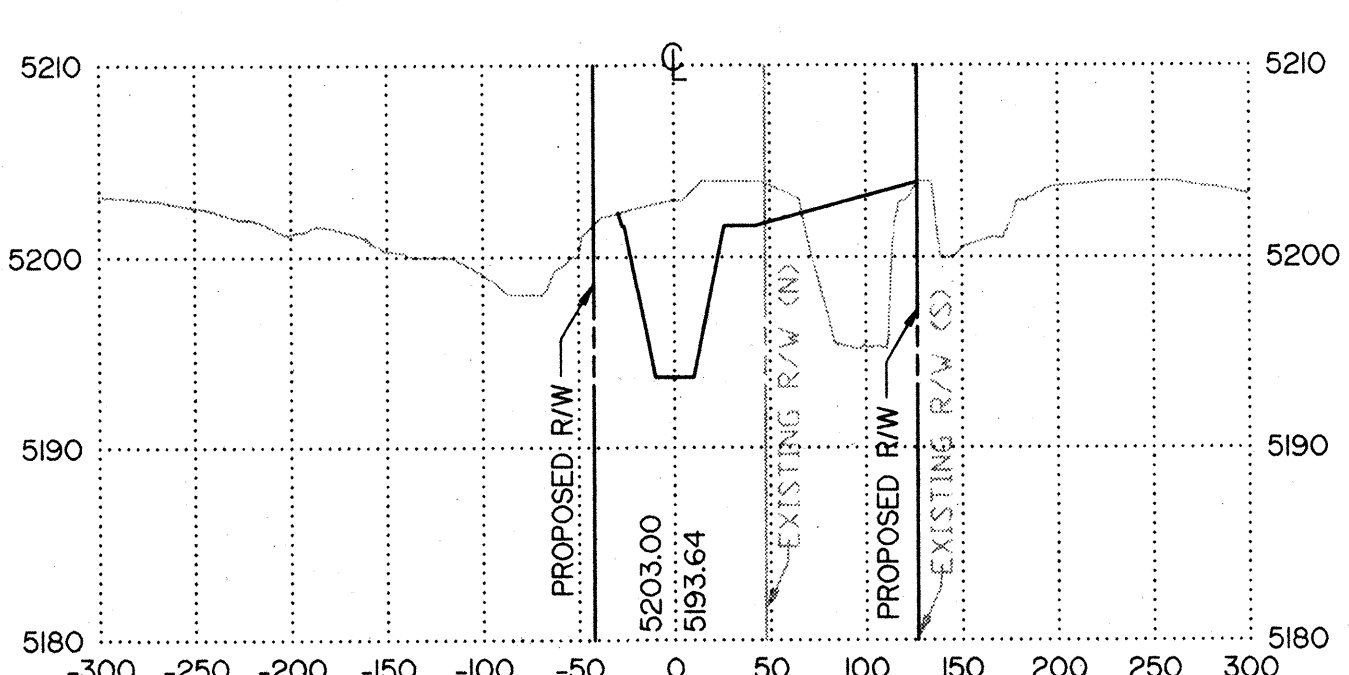
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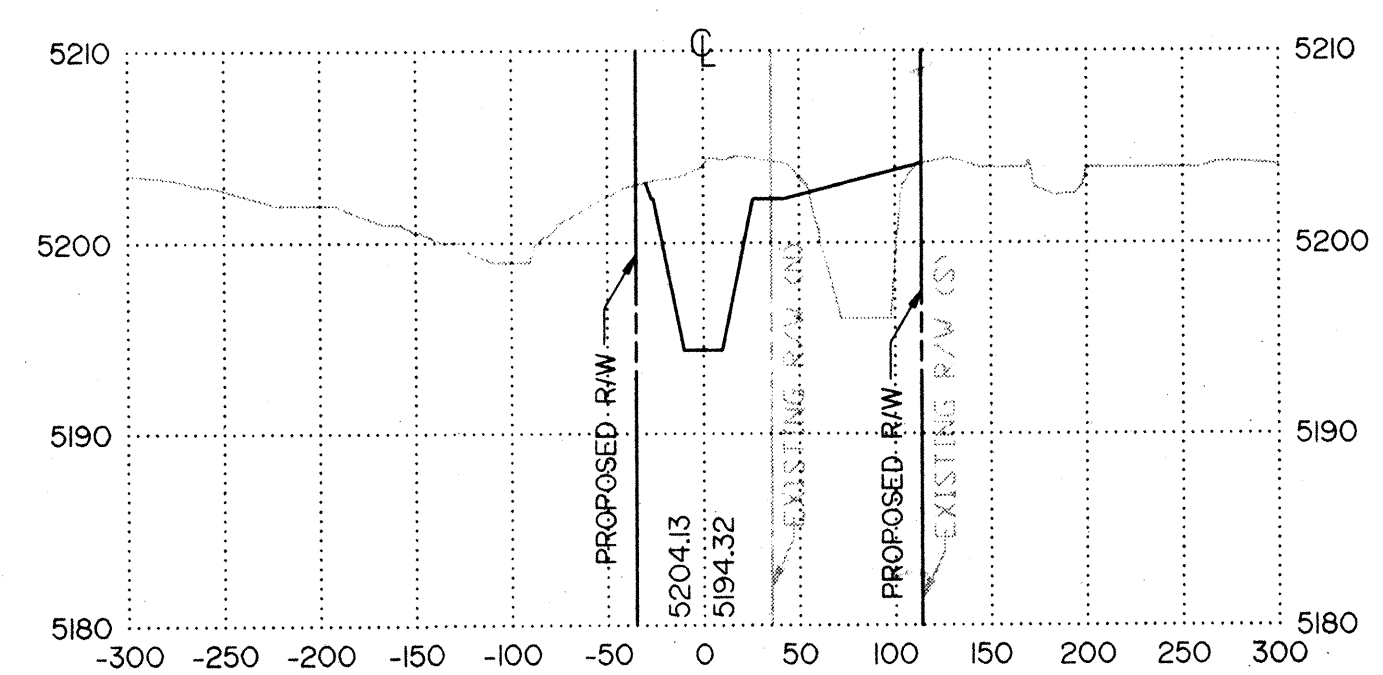
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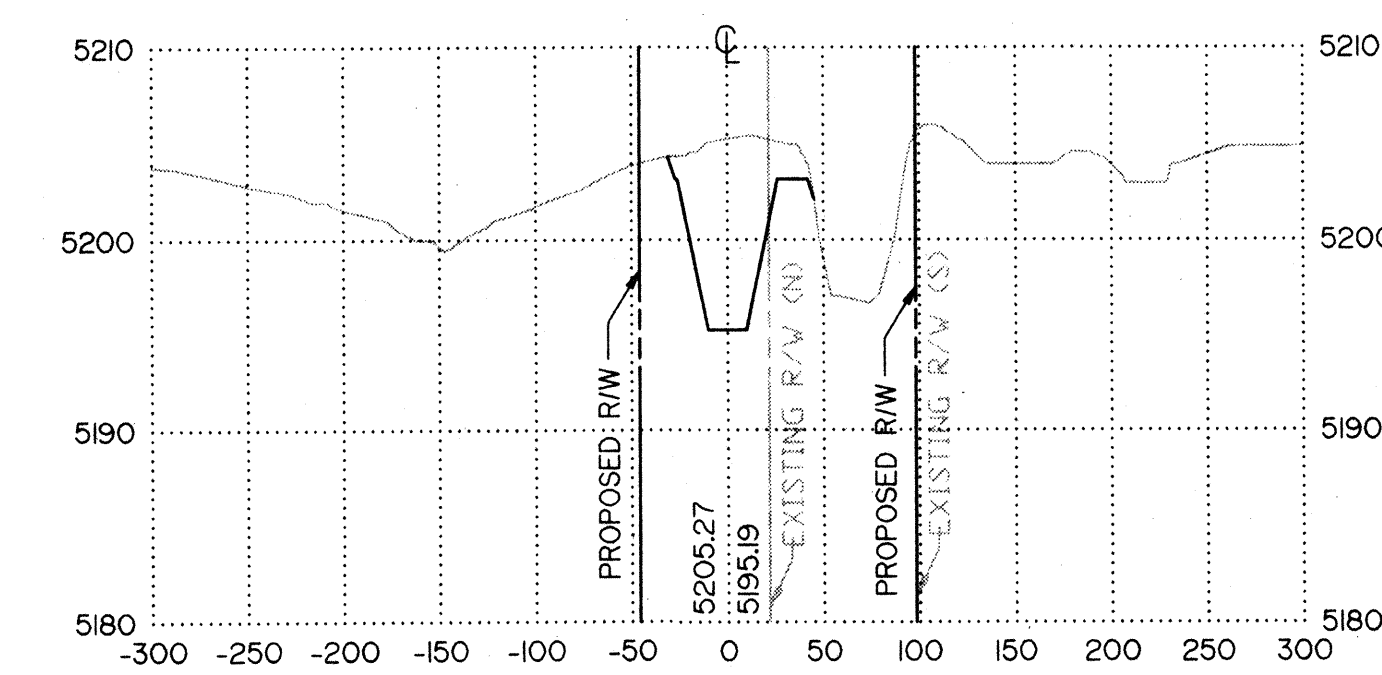
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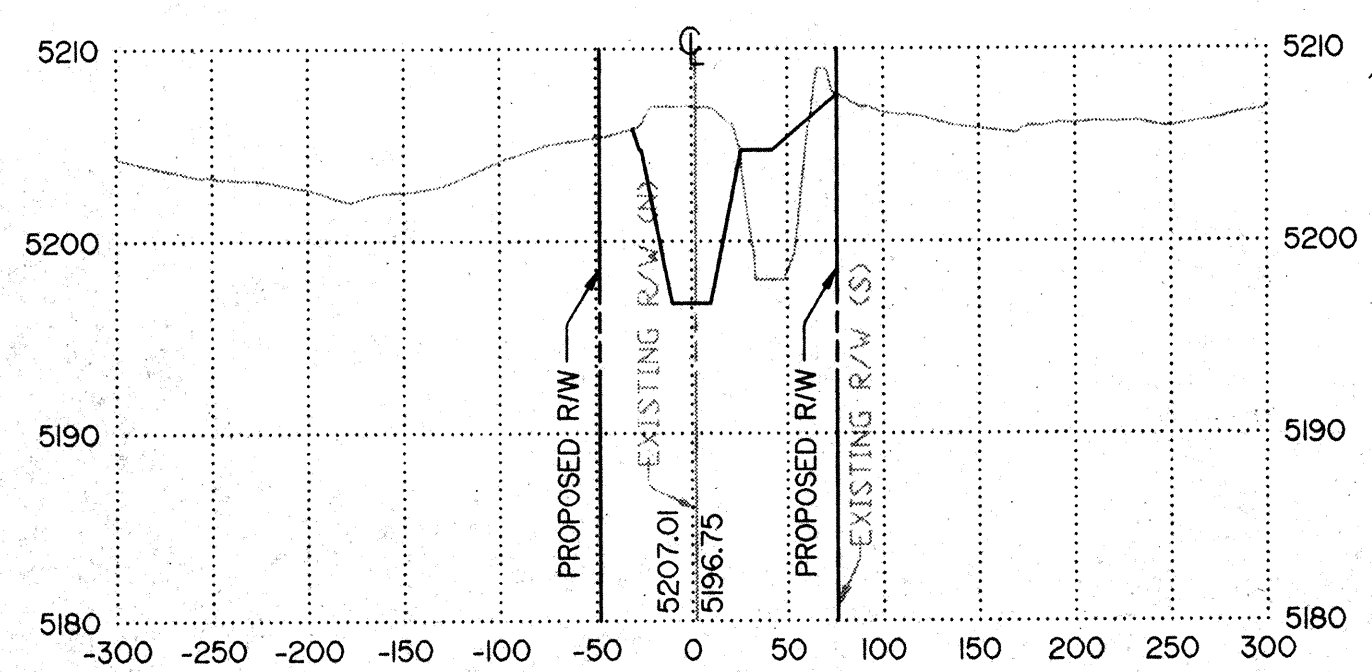
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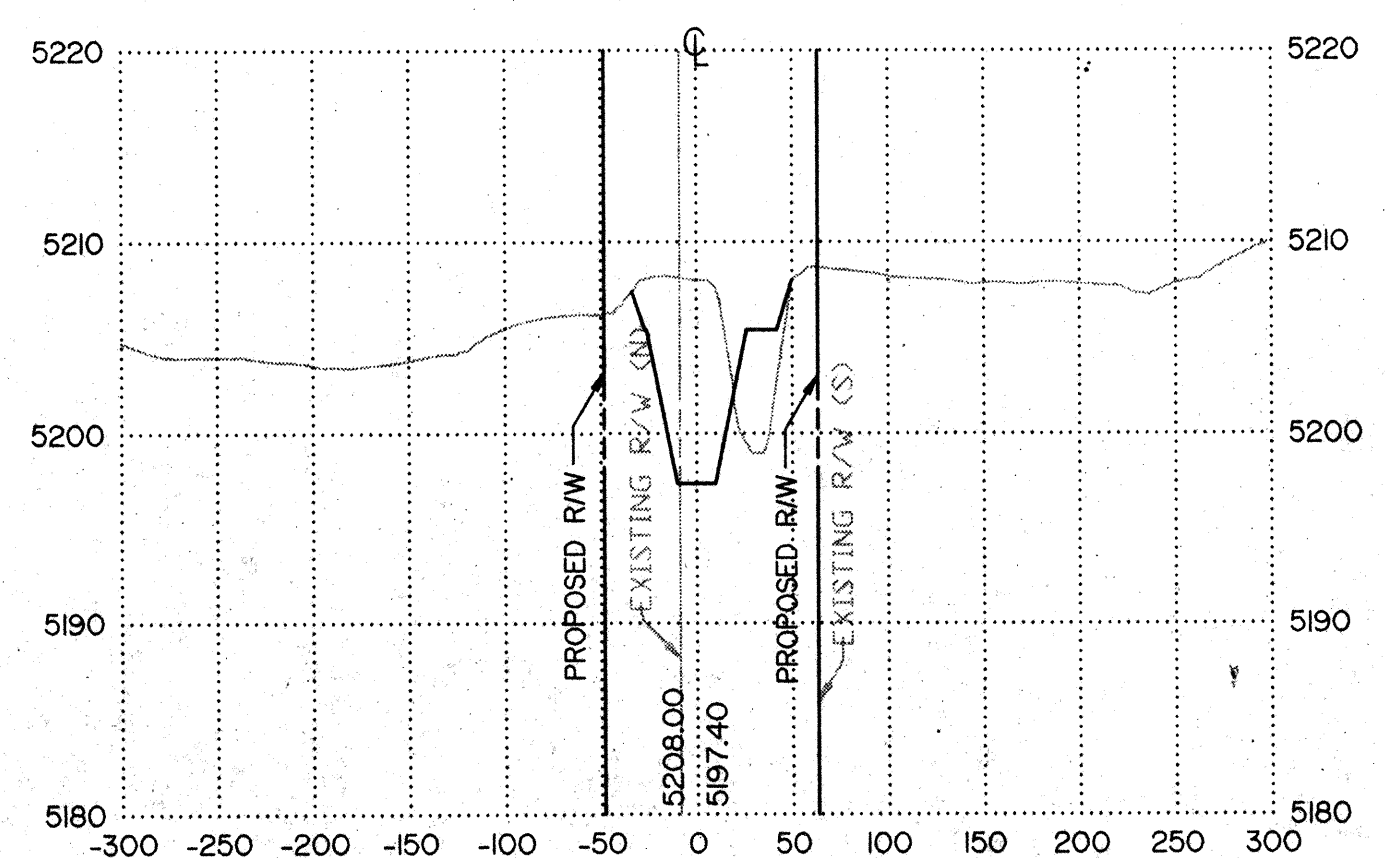
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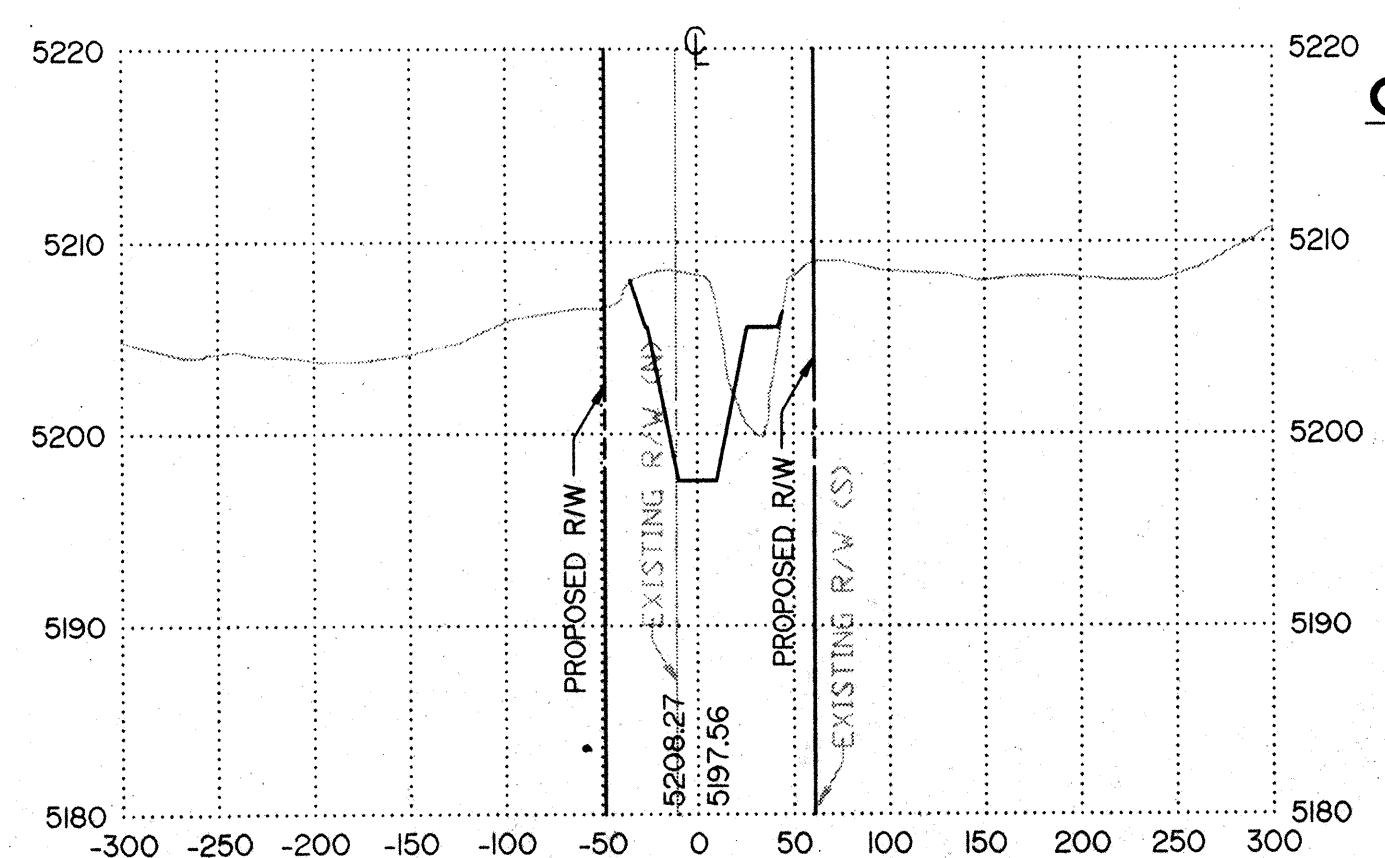
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19+39.83



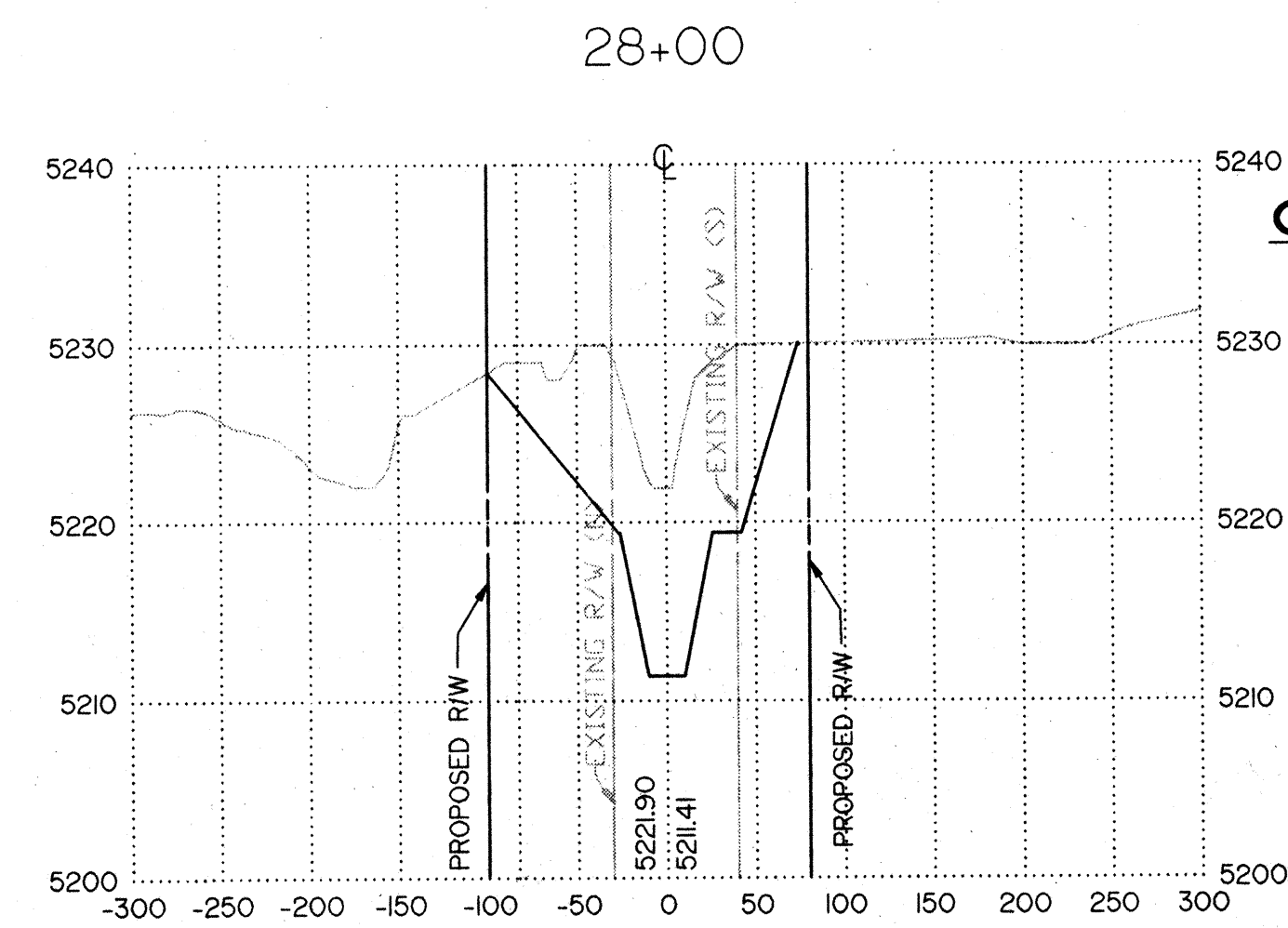
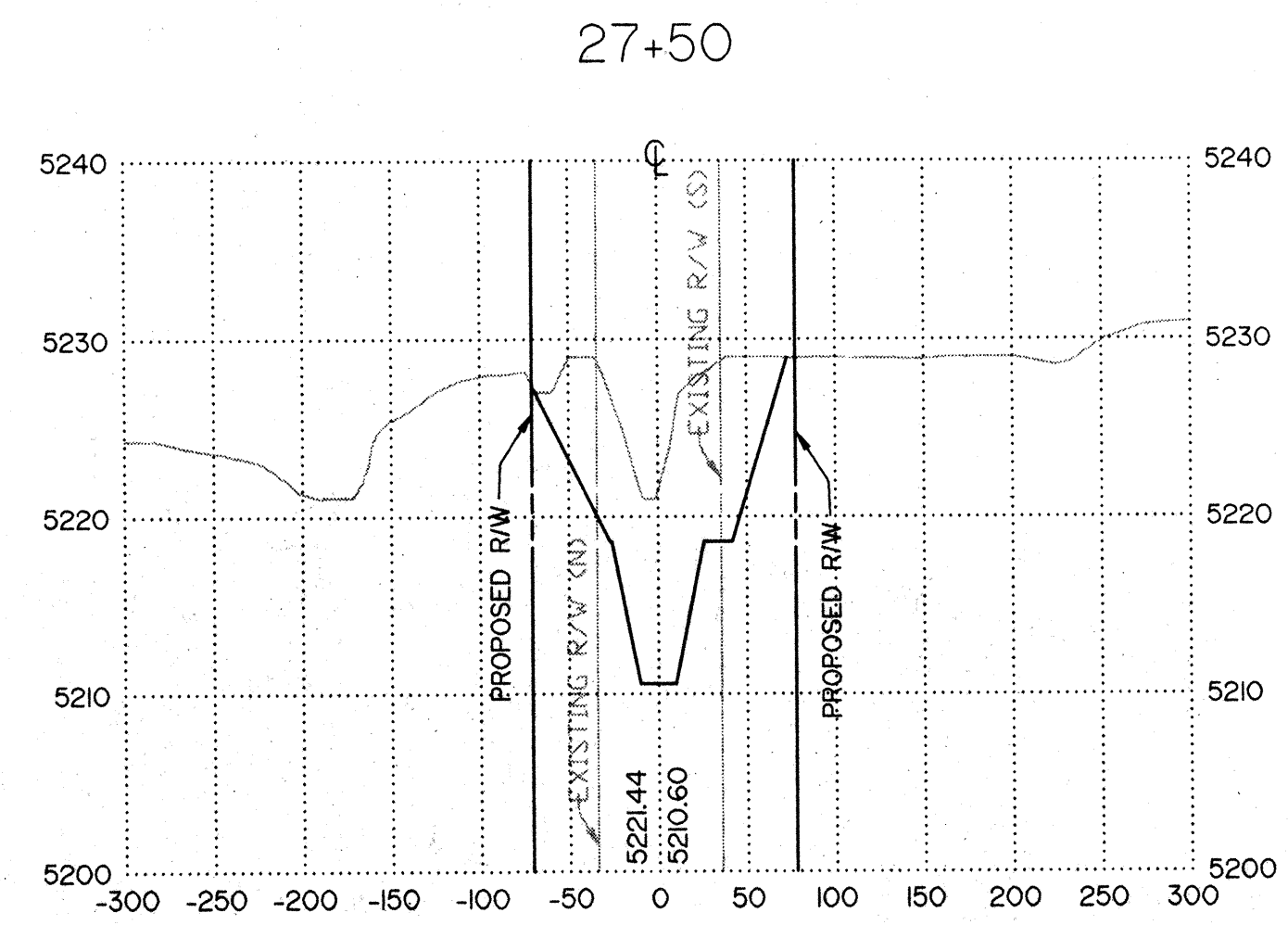
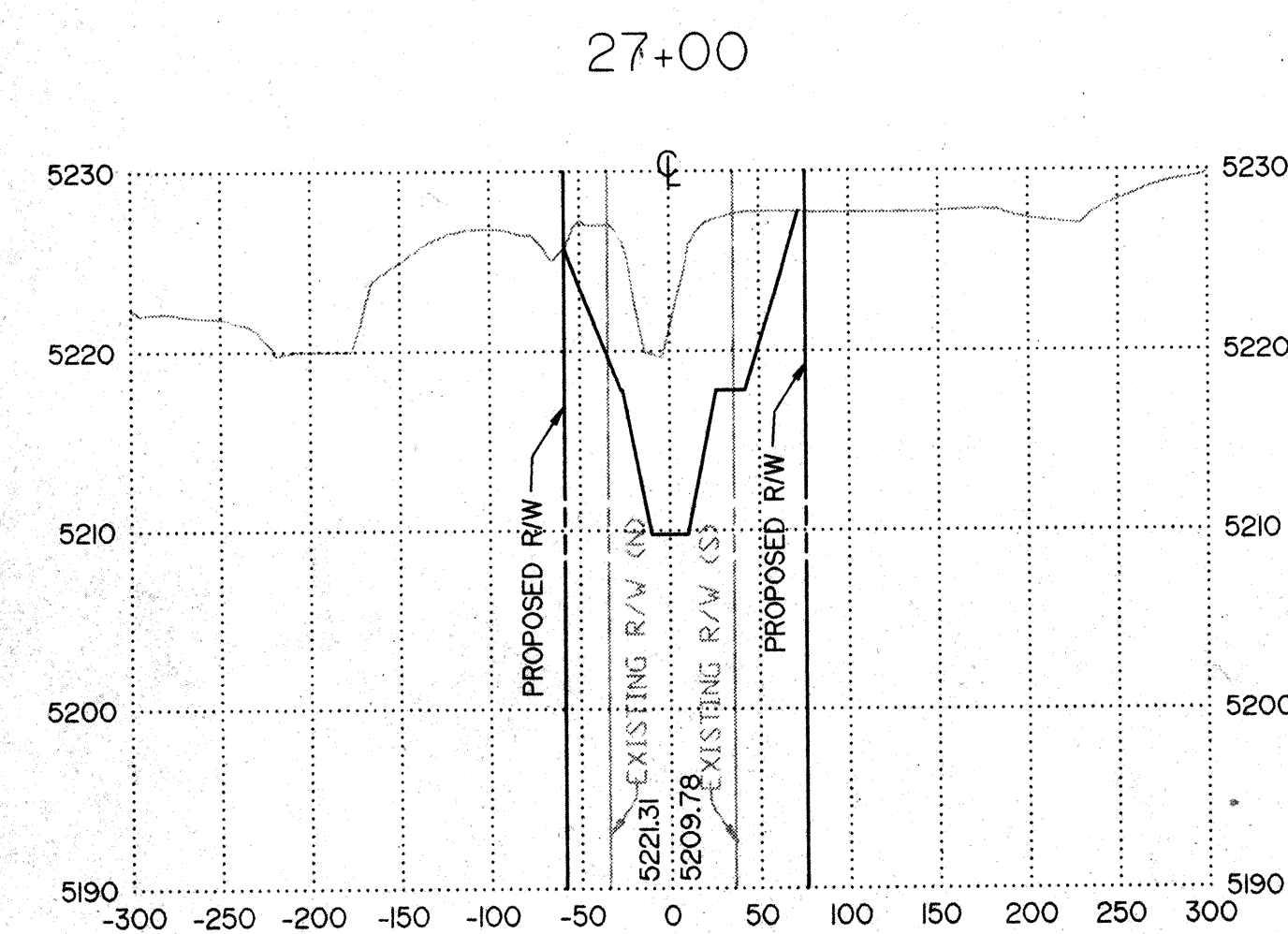
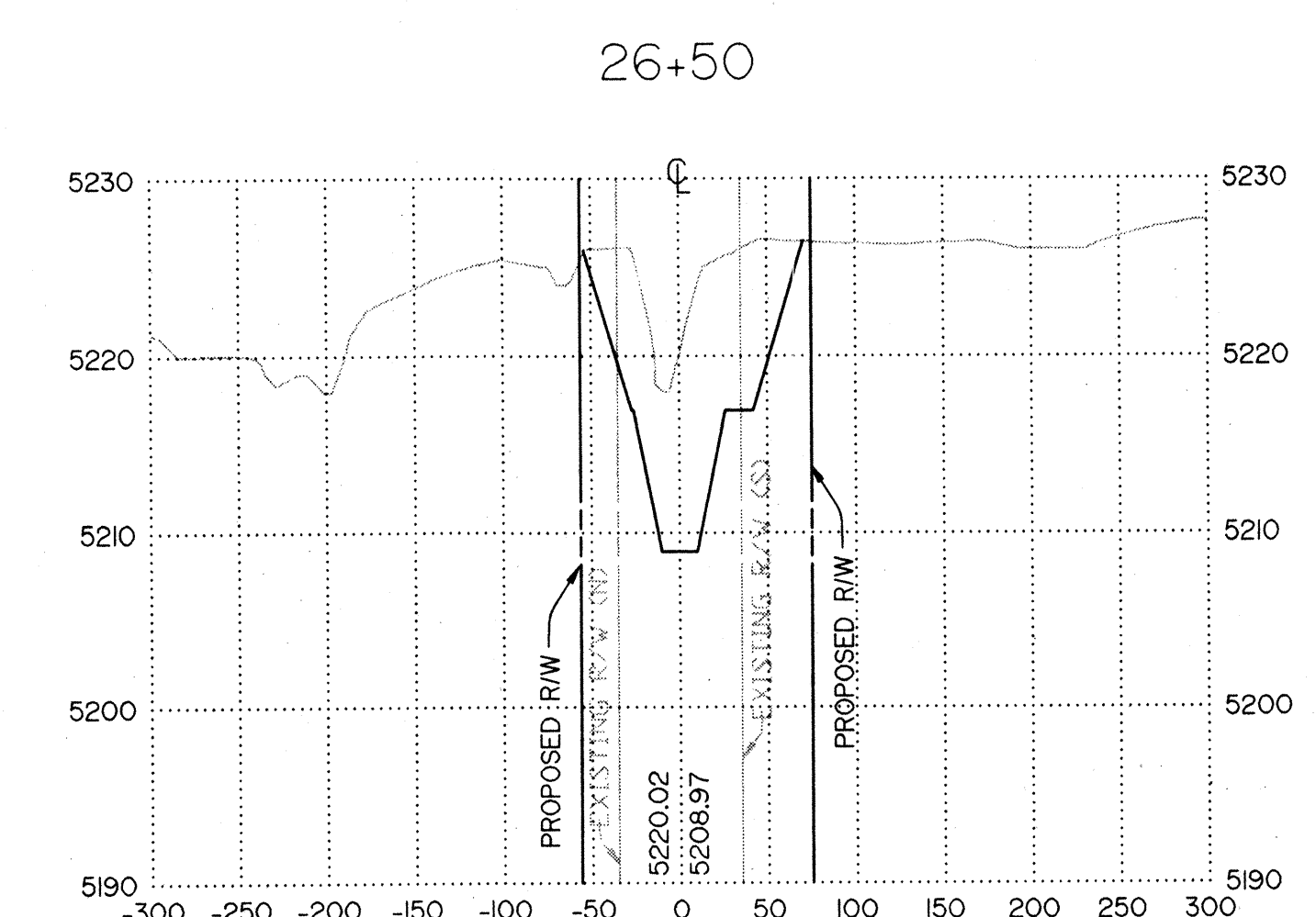
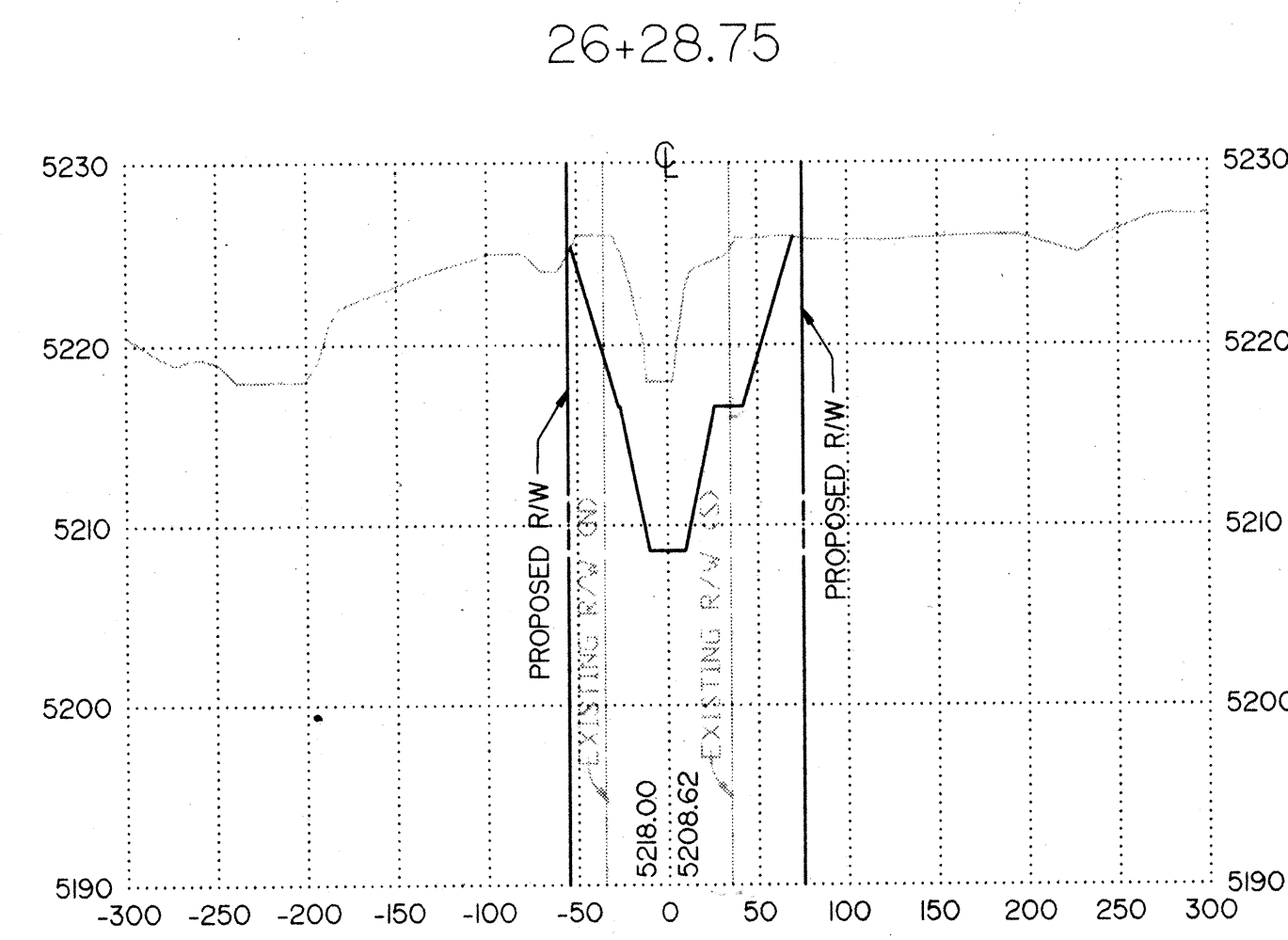
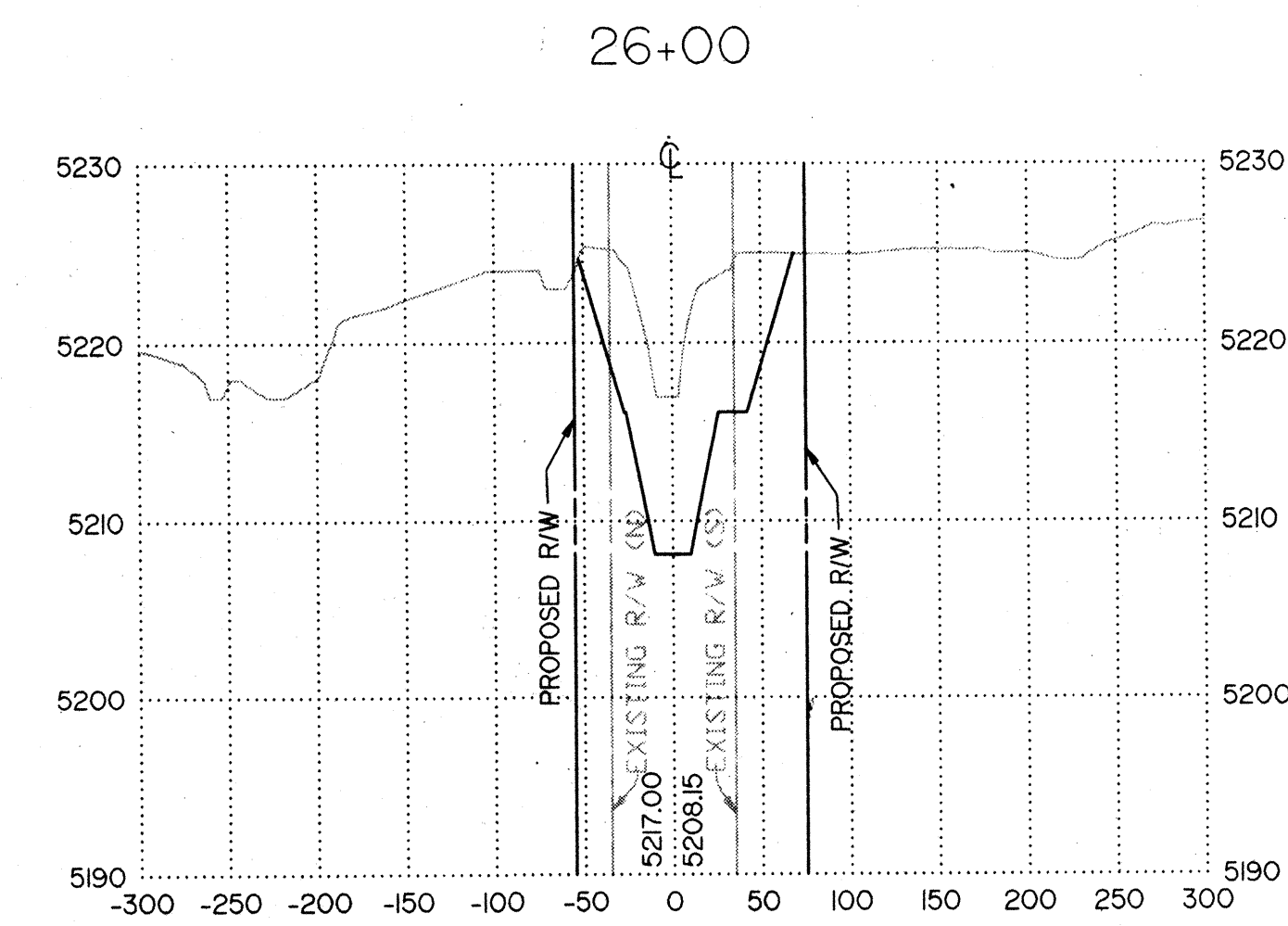
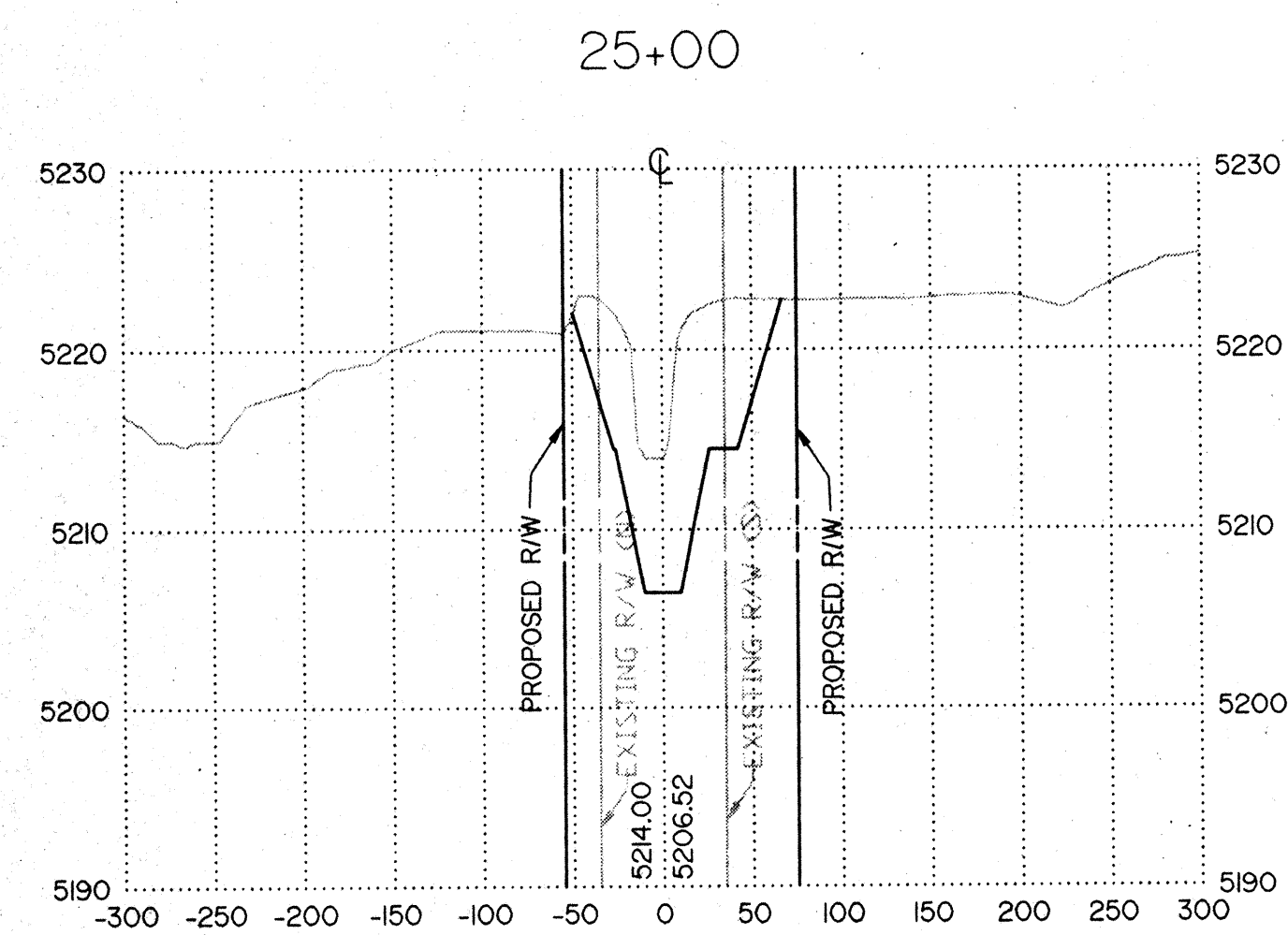
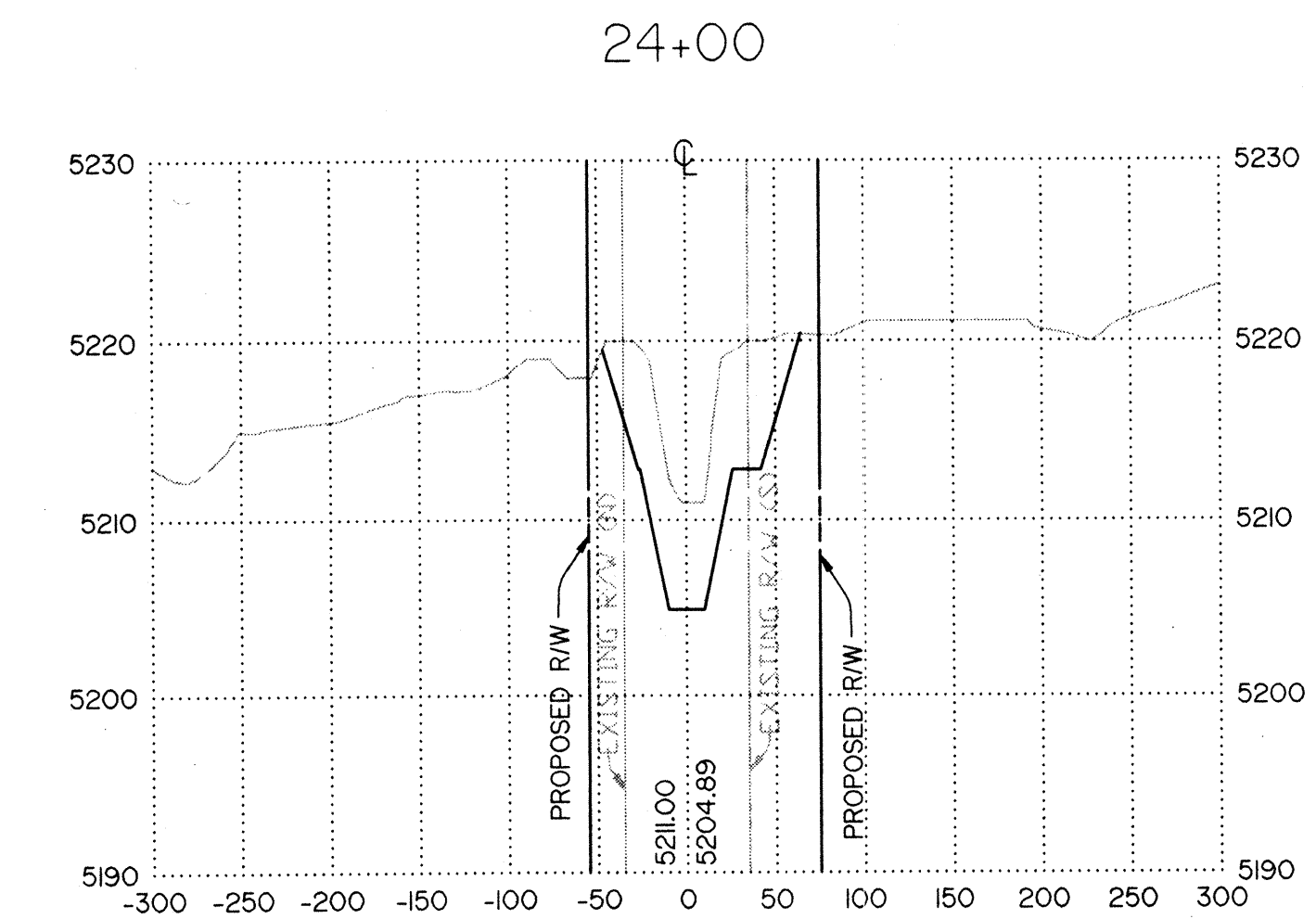
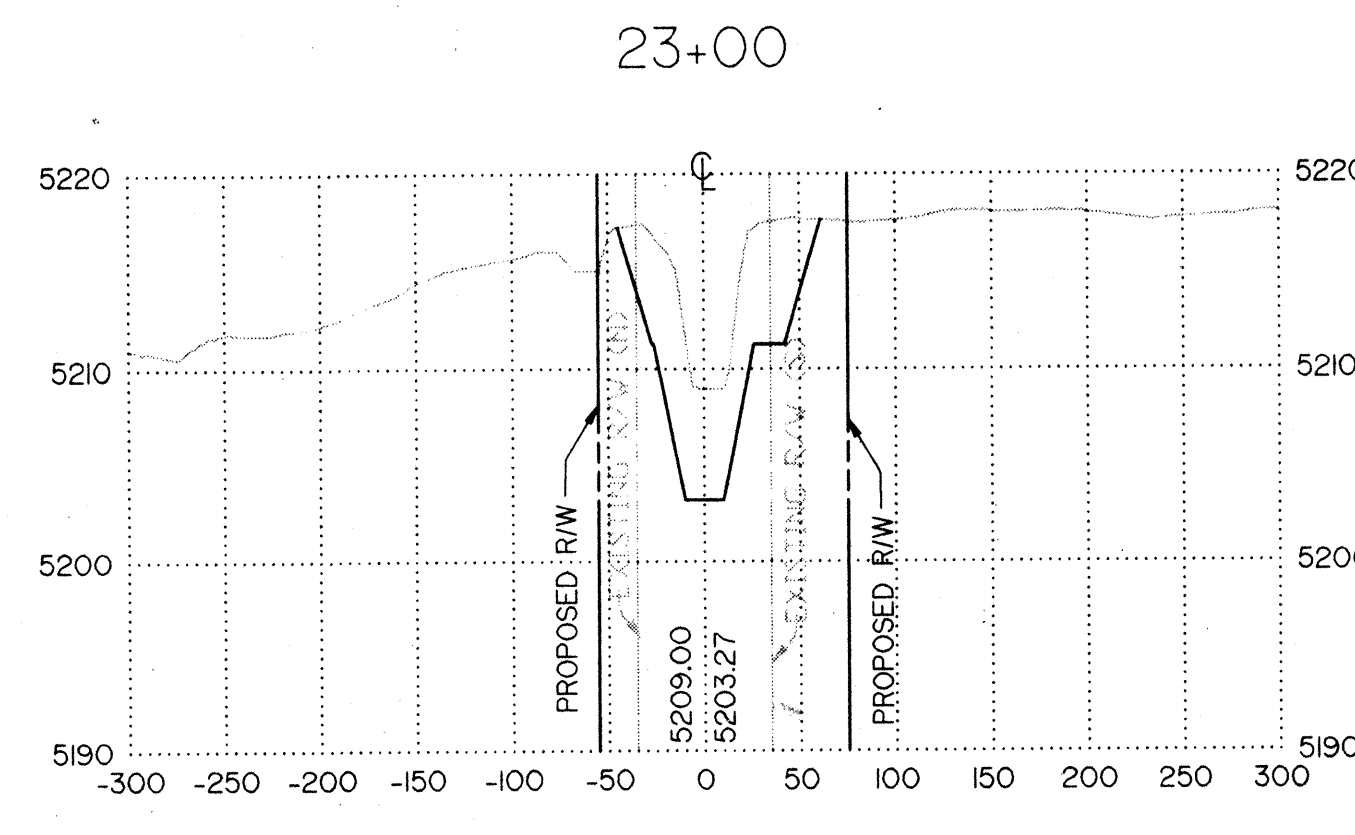
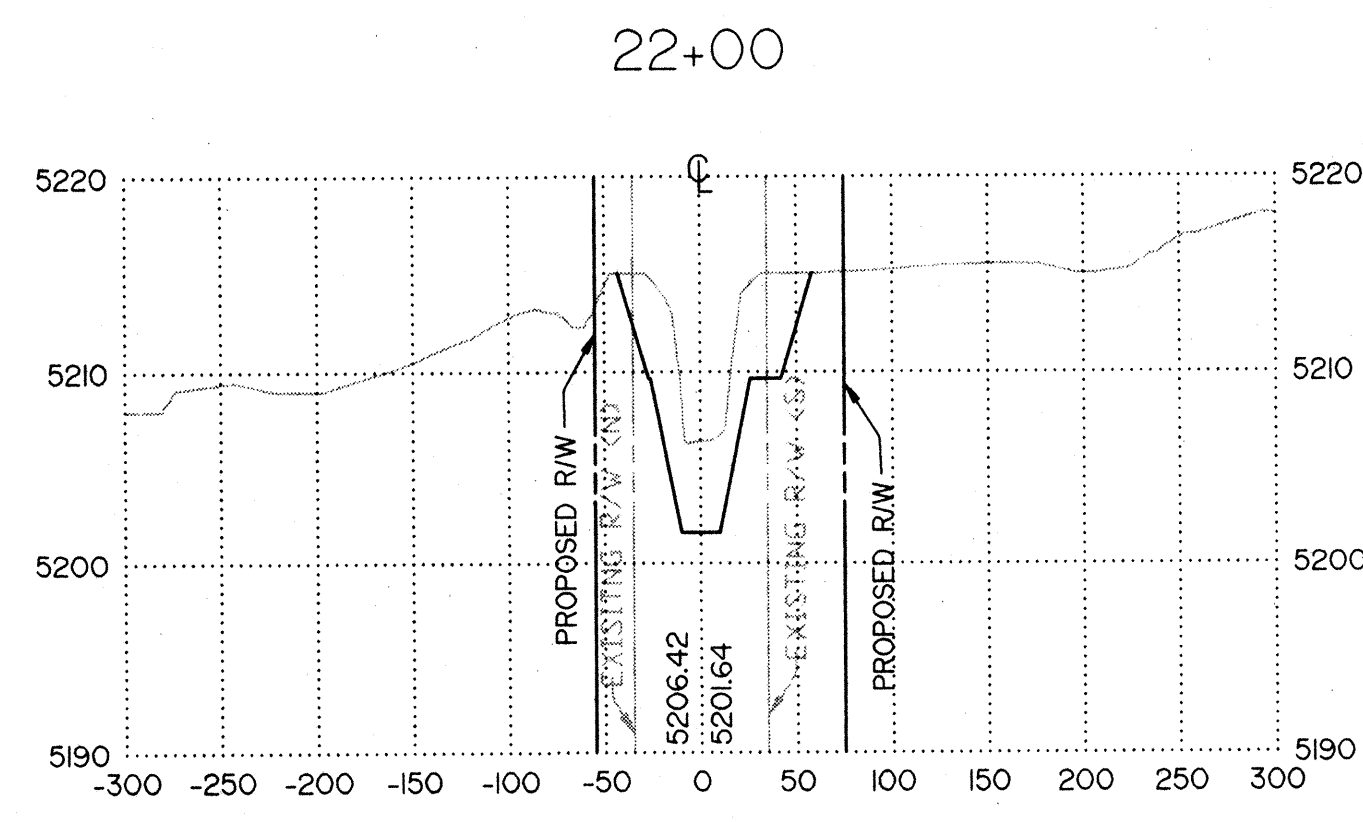
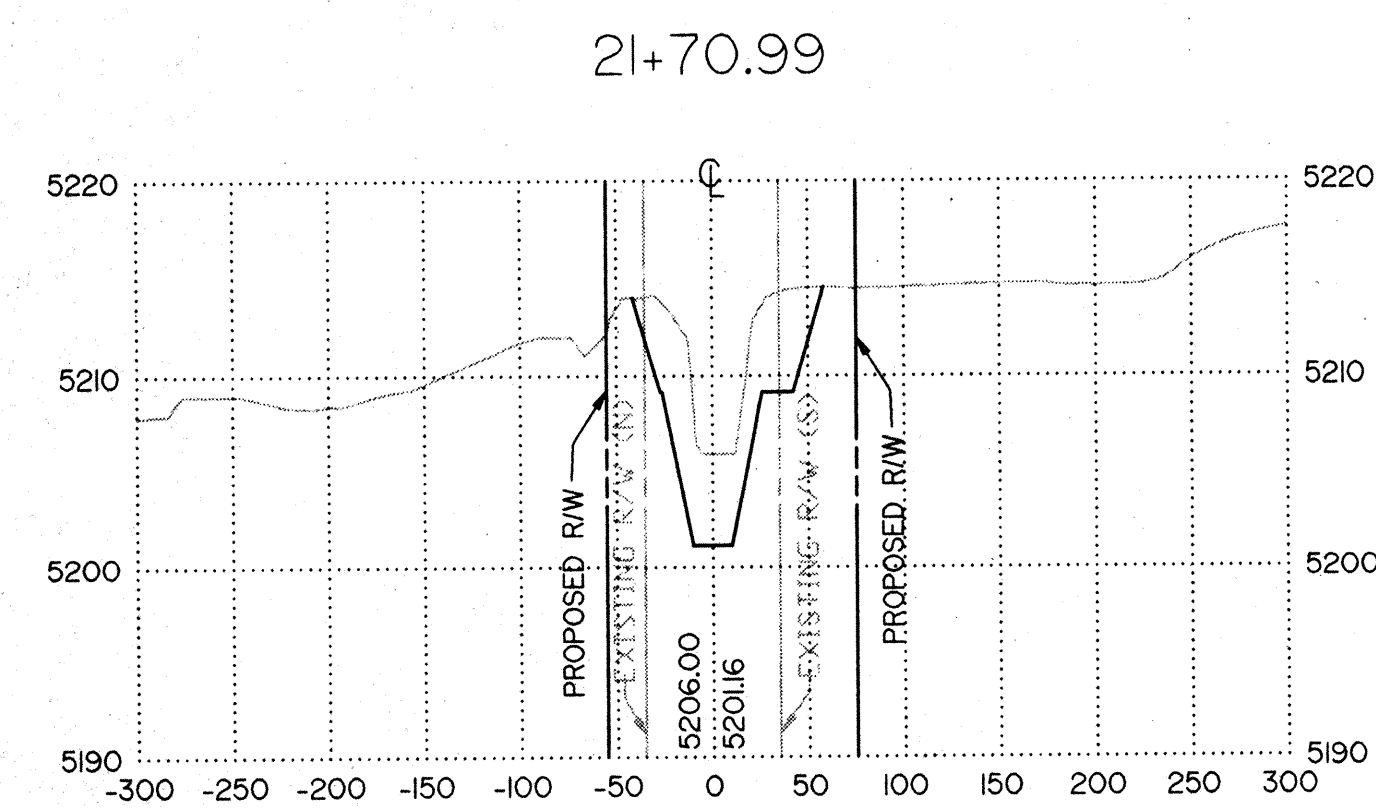
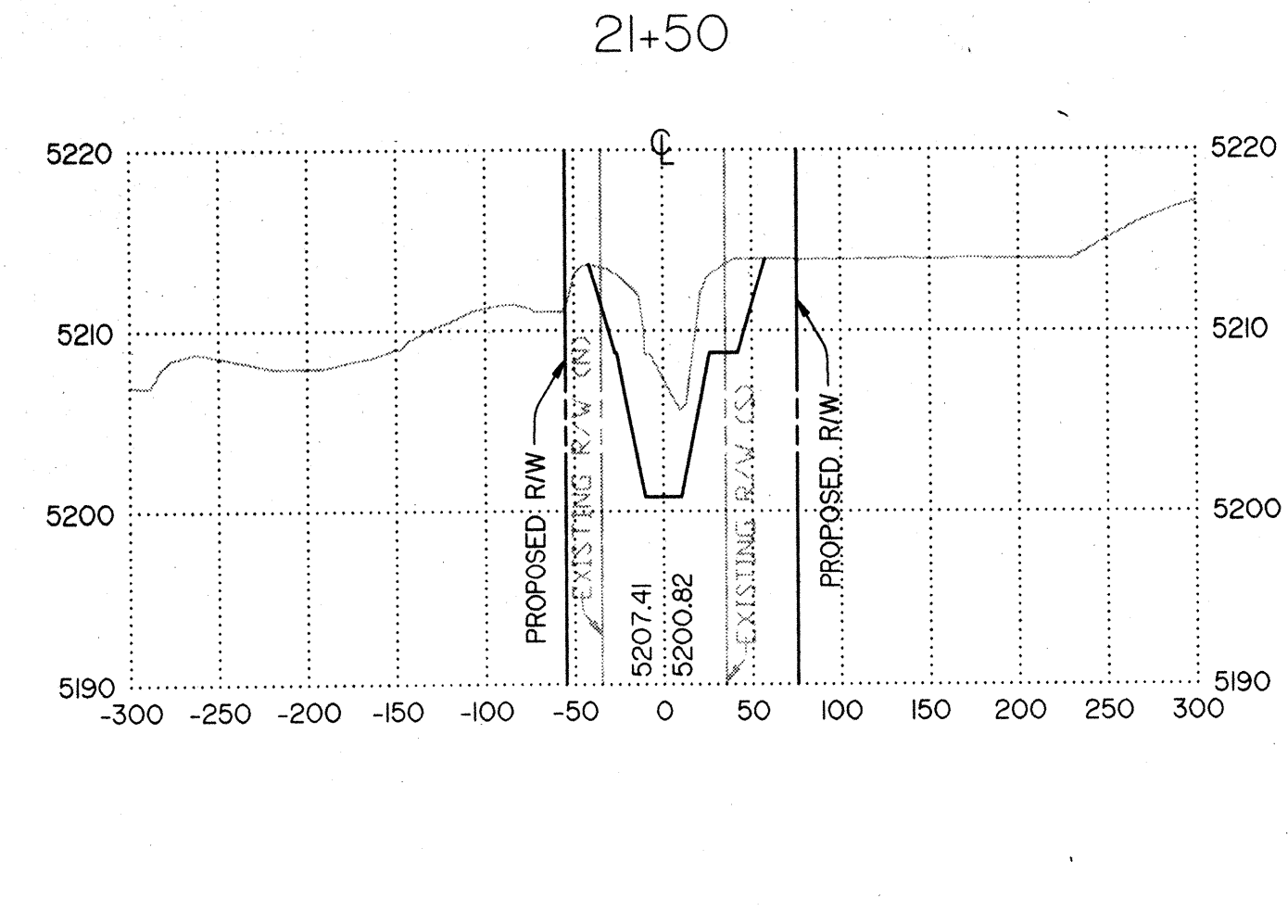
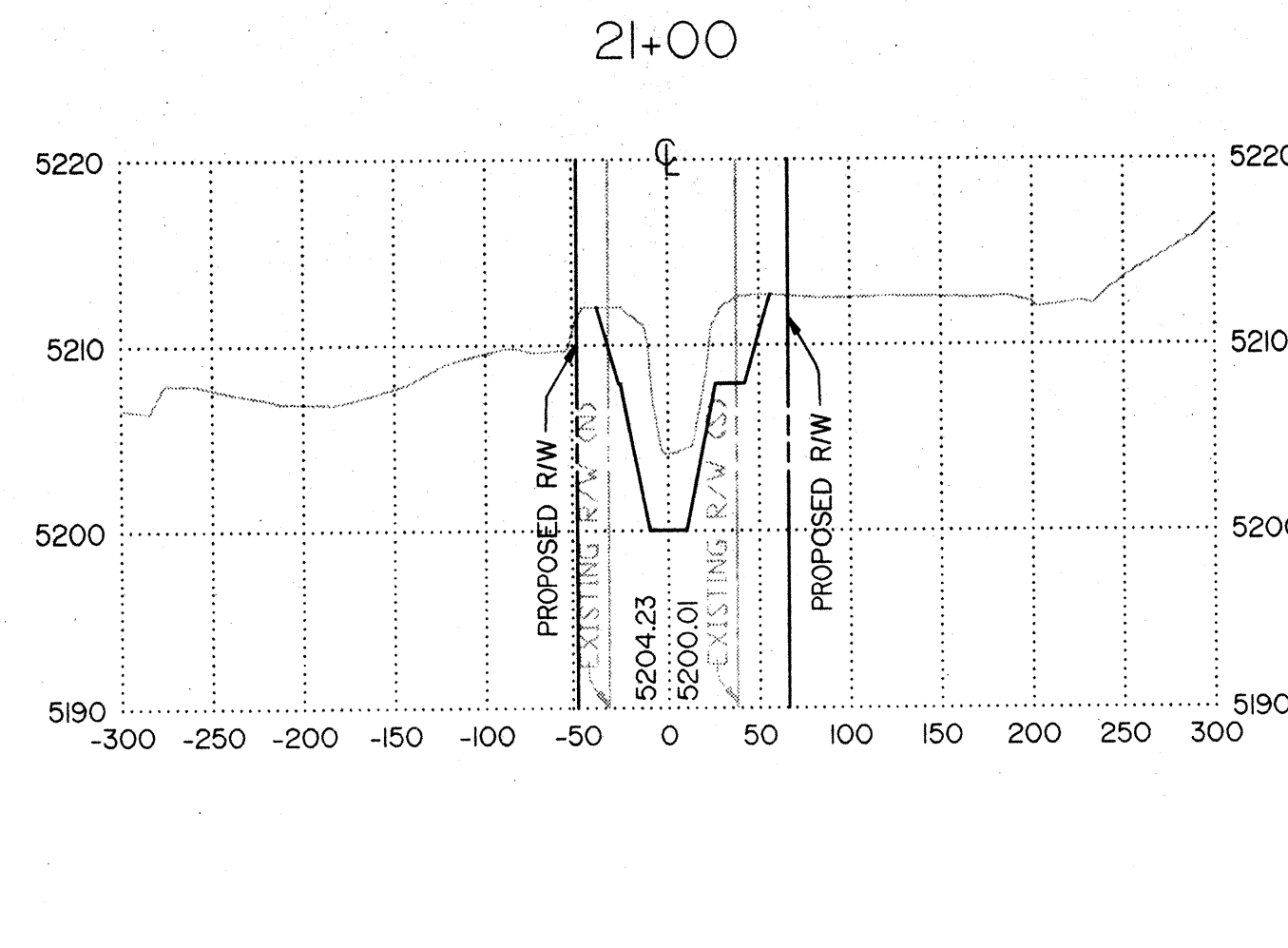
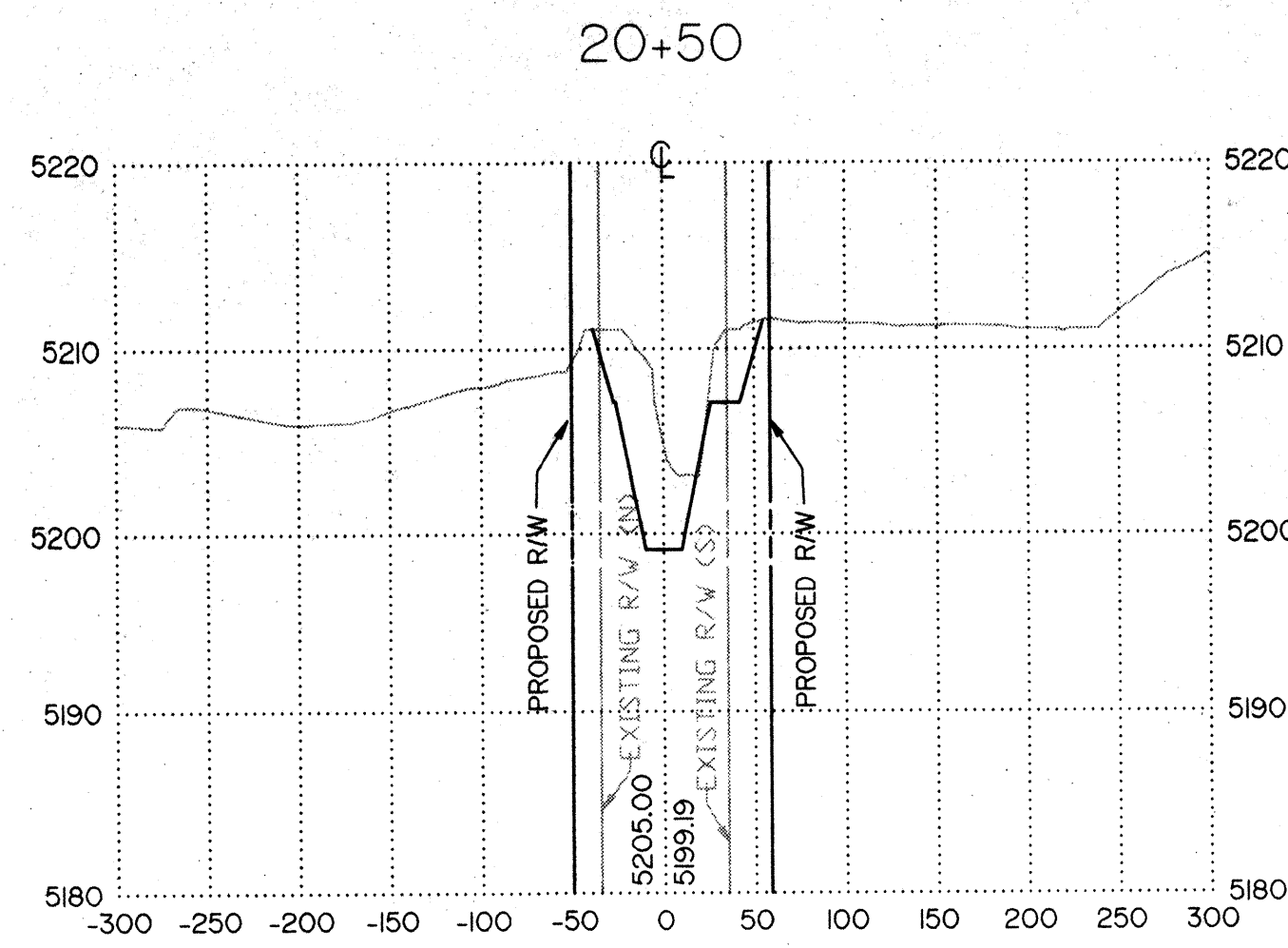
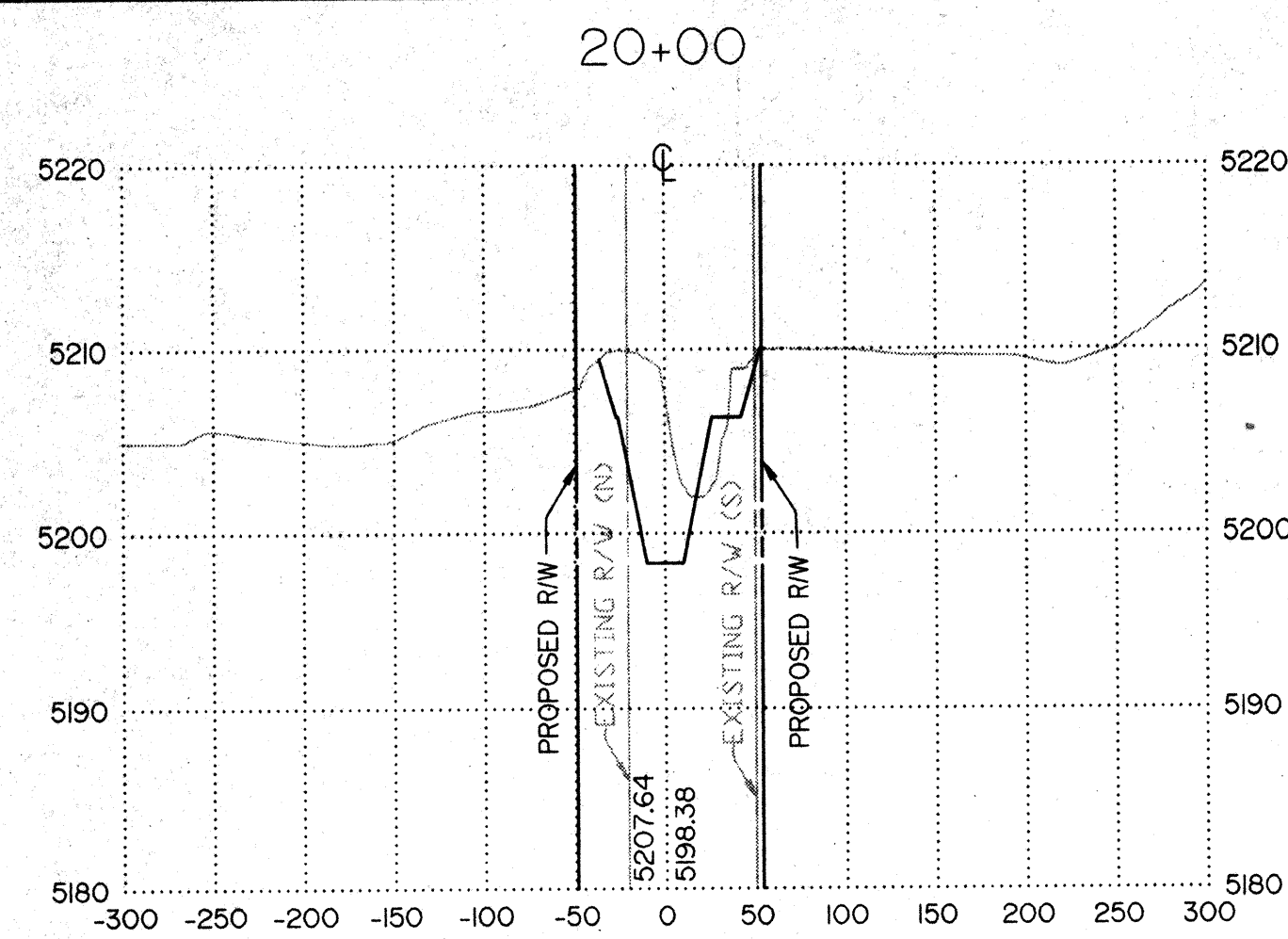
19+50



GENERAL NOTES

1. ALL CROSS-SECTIONS ARE FACING UPSTREAM.
2. THE CROSS-SECTIONS SHOWN REPRESENT ALTERNATIVE 3A WITHOUT SPLASH BLOCKS.

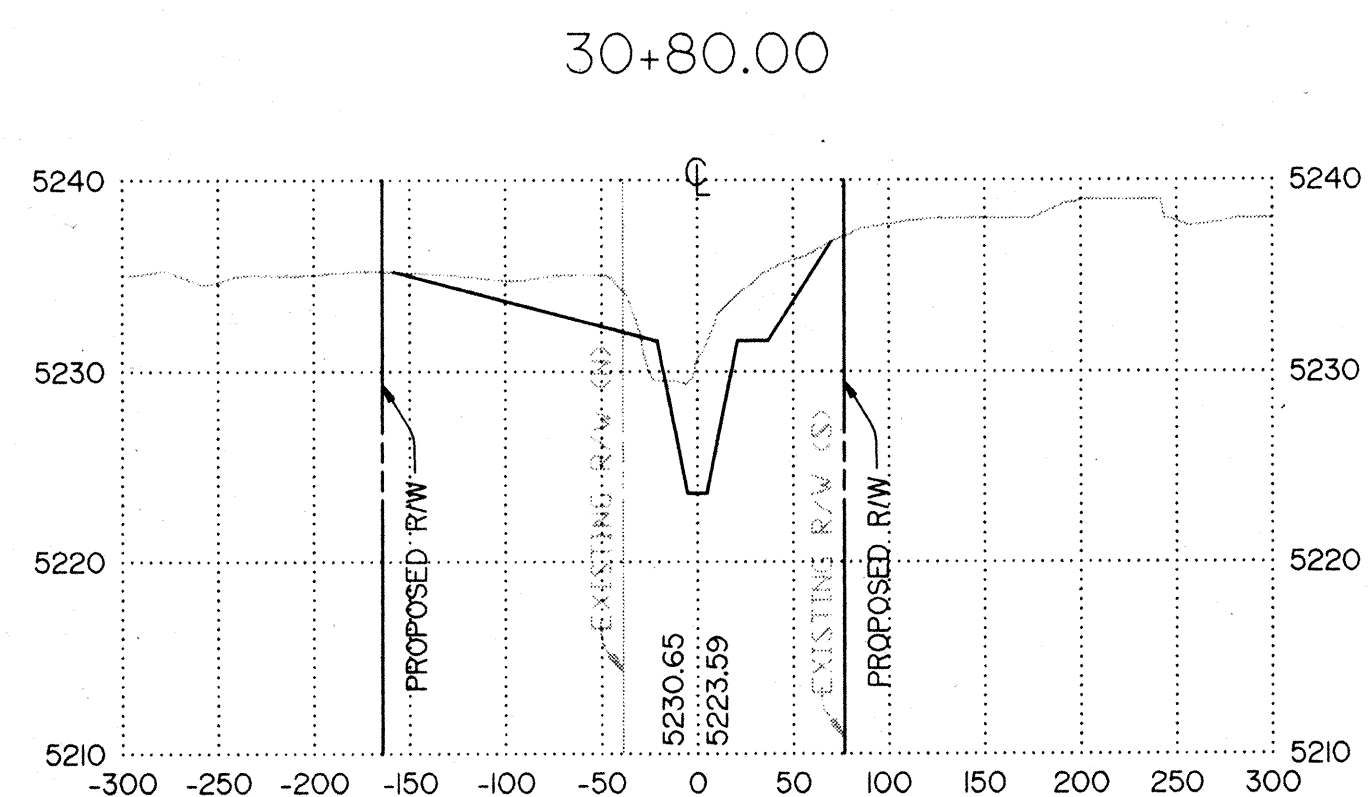
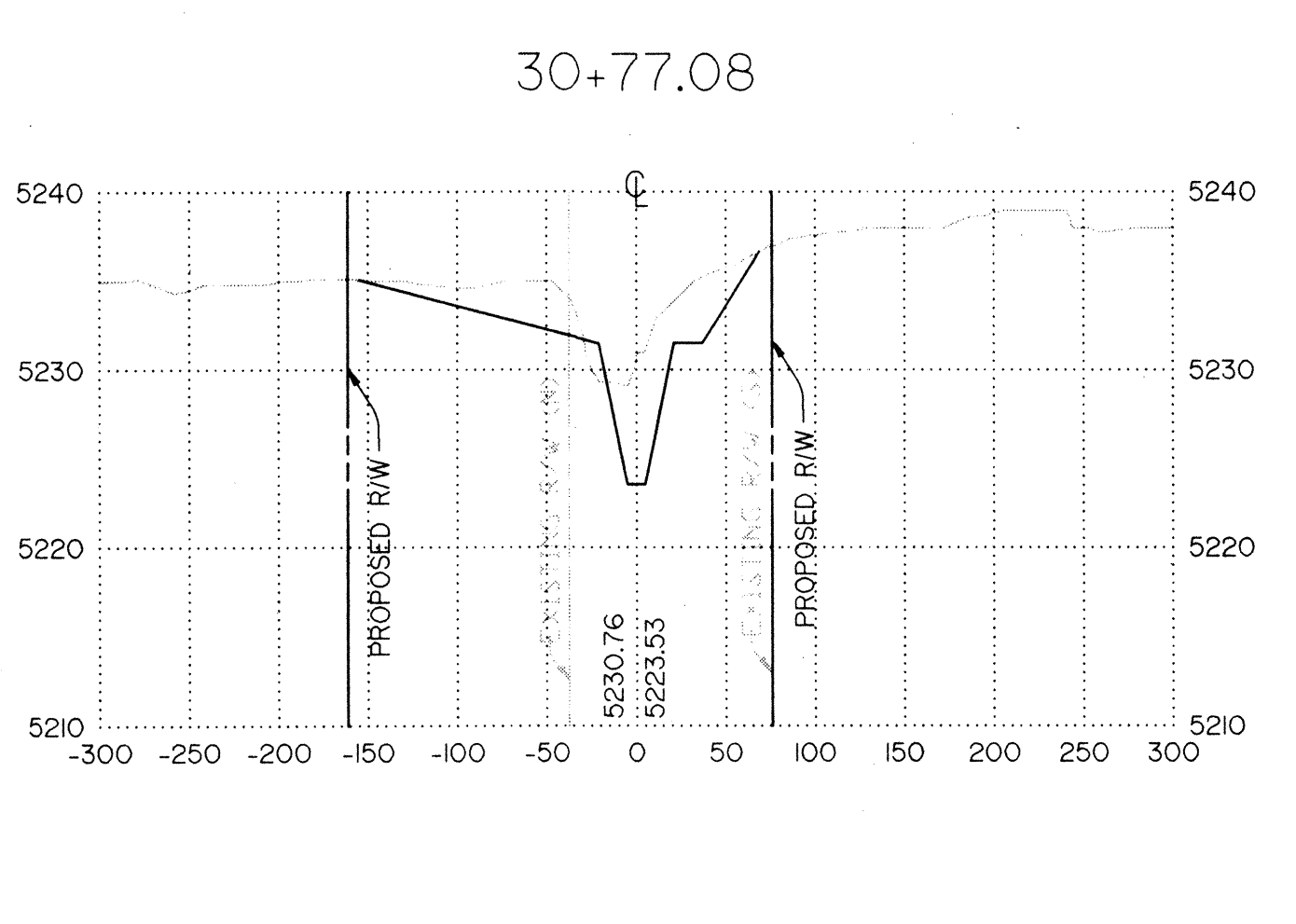
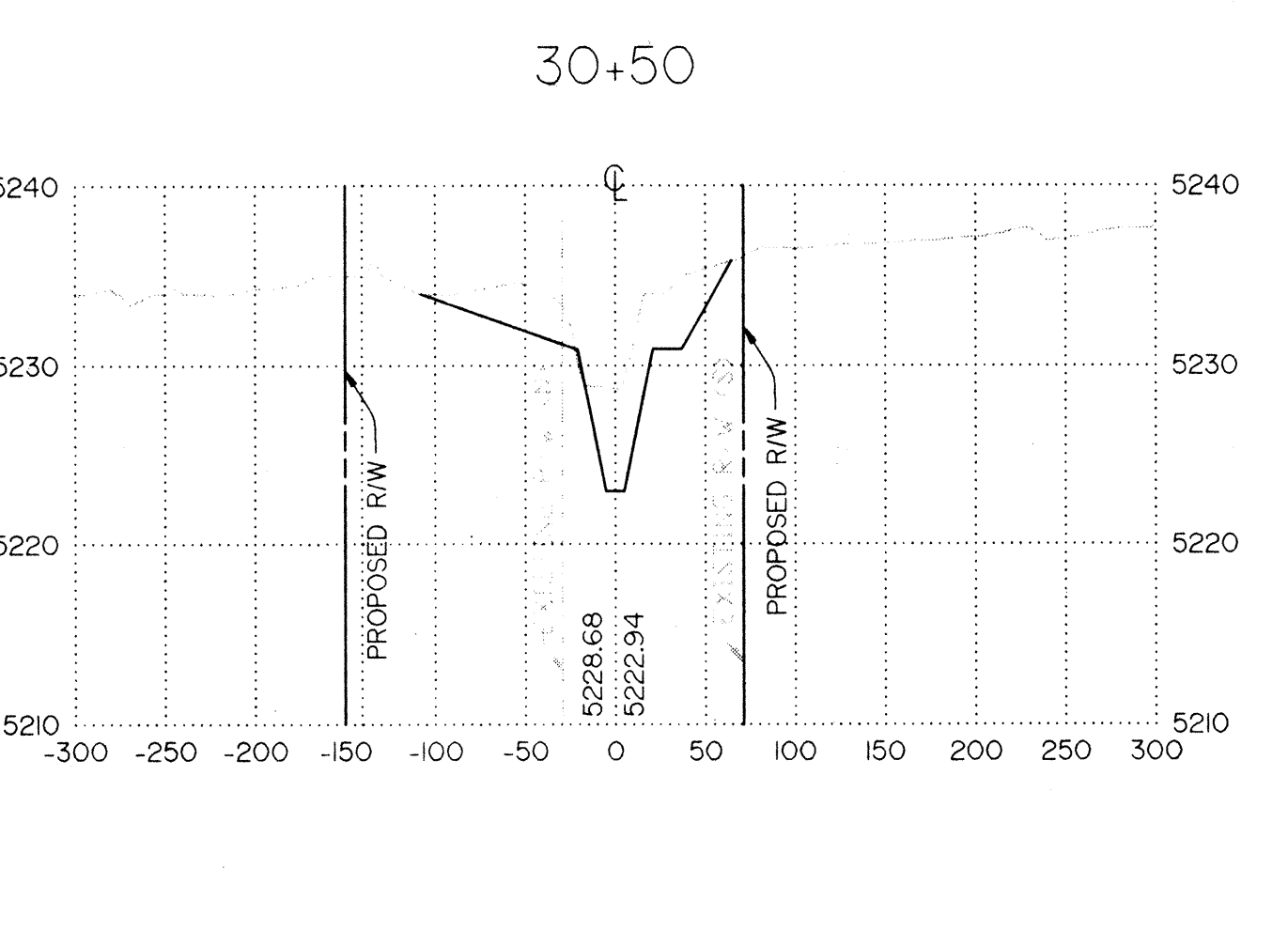
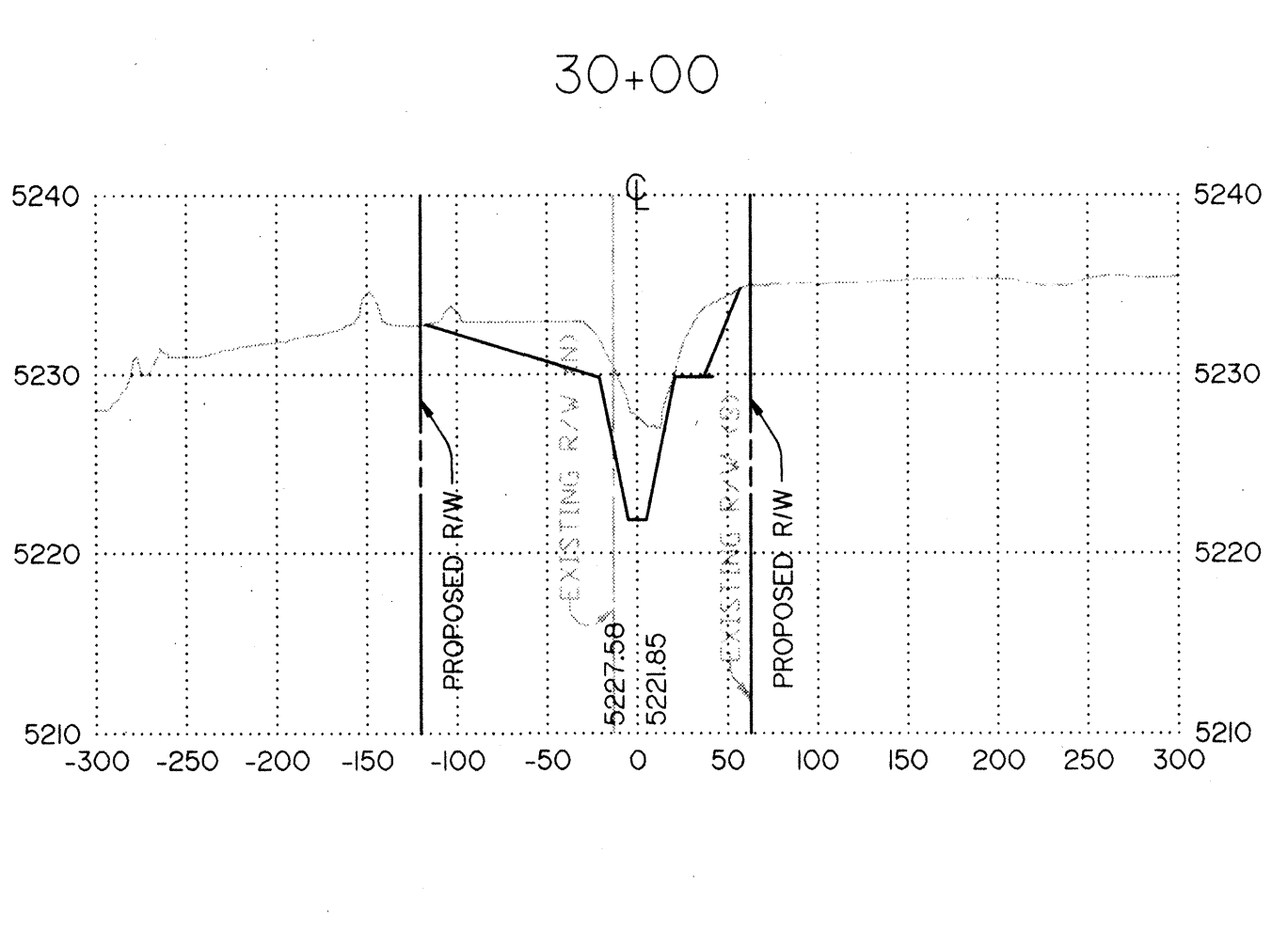
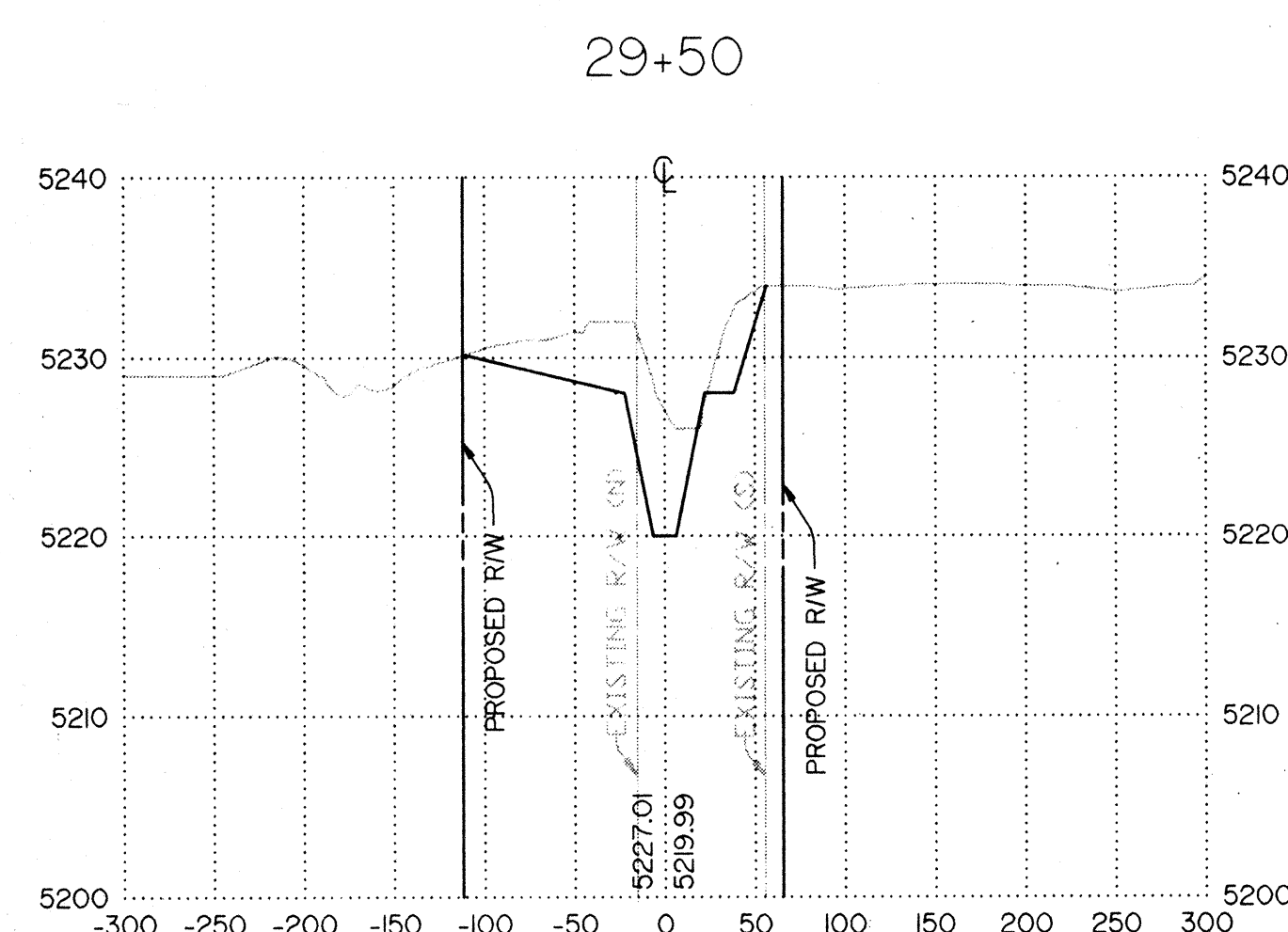
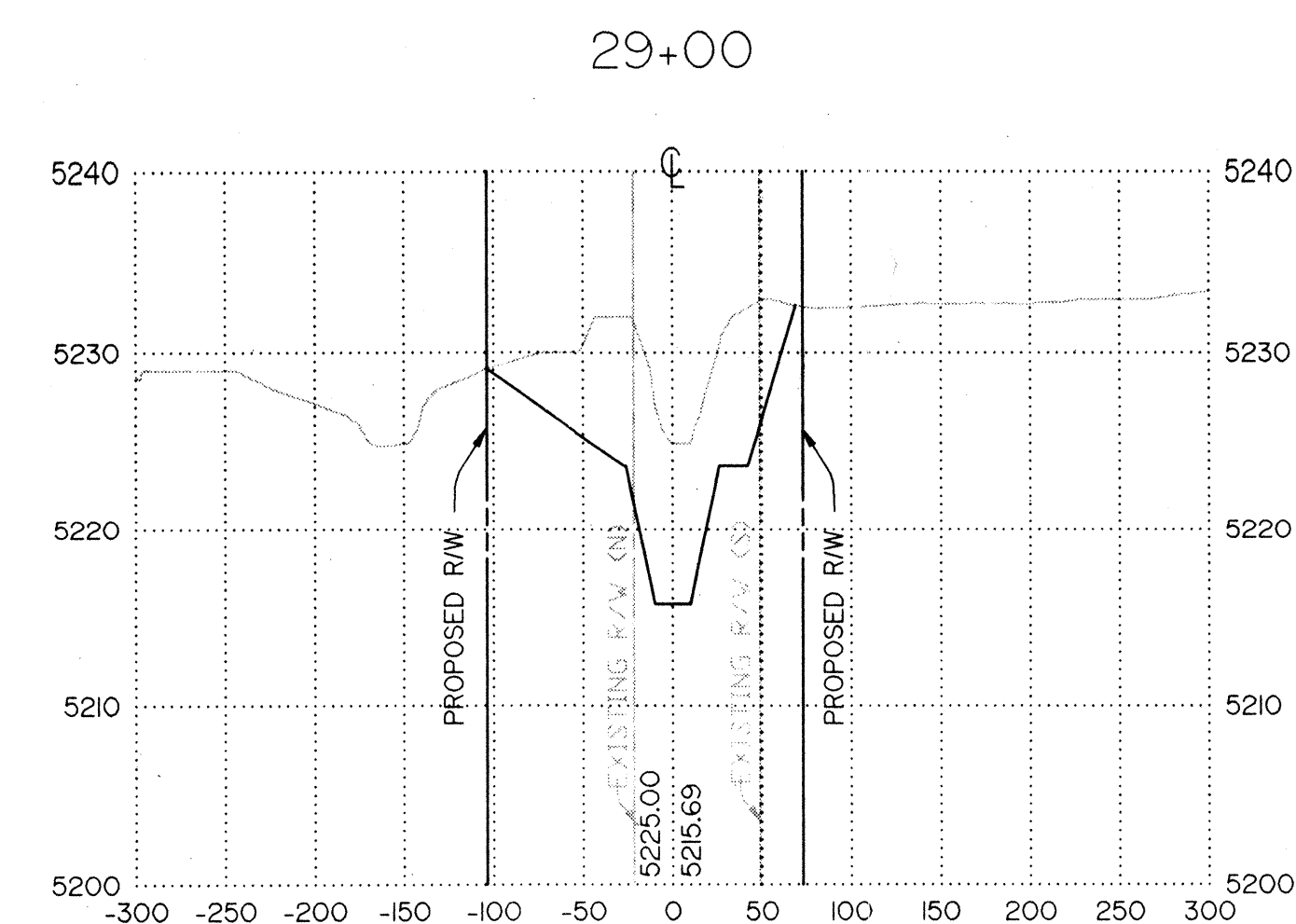
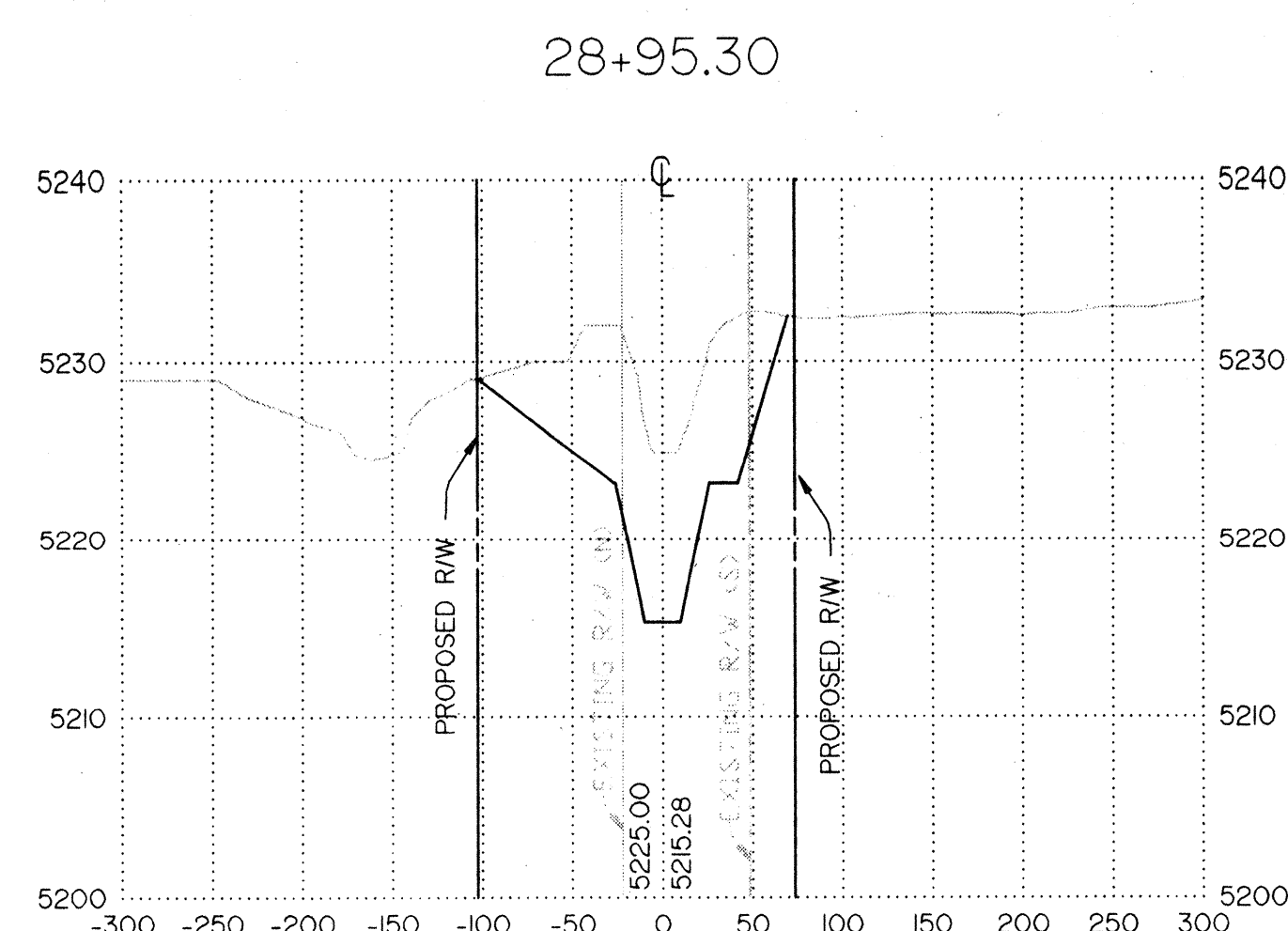
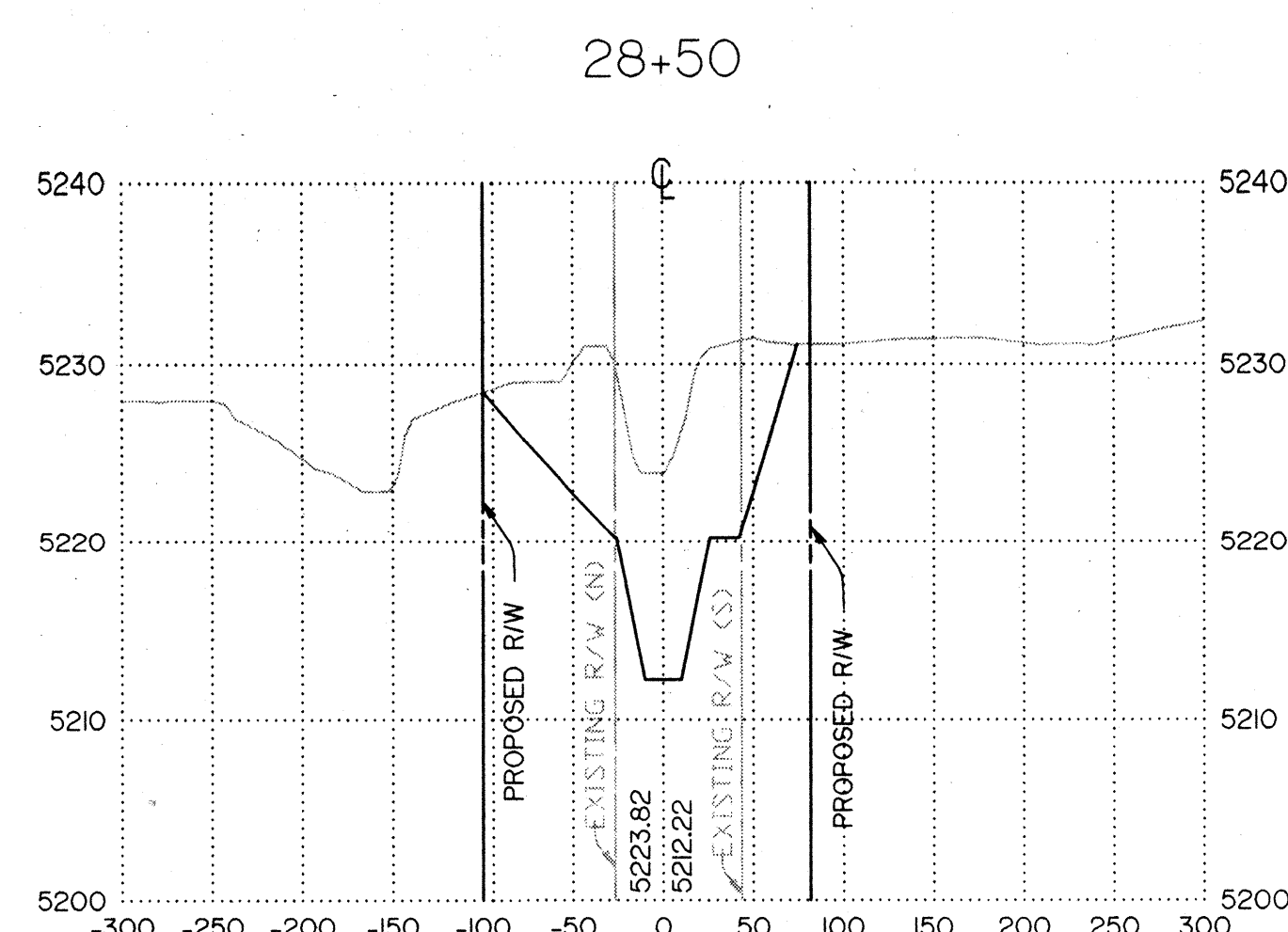
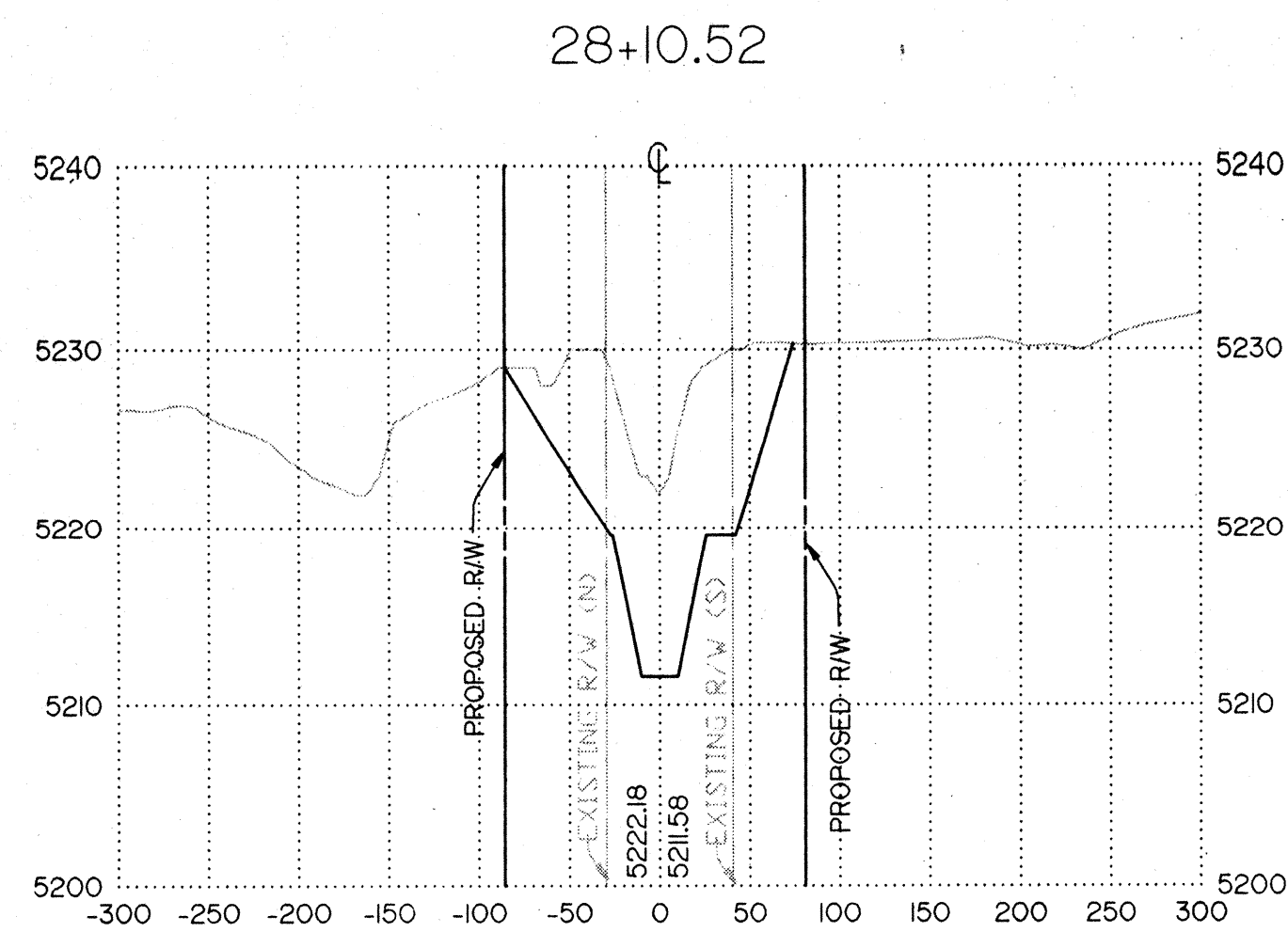
NO.	REVISIONS			BY	DATE
G. O. A PROJECT NO. 4160.92 SOUTH DOMINGO BACA ARROYO / PASEO DEL NORTE OUTFALL CONFLUENCE ALTERNATIVE 3A CROSS SECTIONS					
		EASTERLING & ASSOCIATES, INC. CONSULTING ENGINEERS 10131 Coors Rd., NW, Suite H-7/8 ALBUQUERQUE, NEW MEXICO 87114 (505) 898-8021 FAX (505) 898-8501			
DESIGNED BY: DSH/ALM		DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET 3	
JOB NO. 28331		DATE: DEC. 1992	OF 5		



GENERAL NOTES

1. ALL CROSS-SECTIONS ARE FACING UPSTREAM.
- 30 2. THE CROSS-SECTIONS SHOWN REPRESENT
ALTERNATIVE 3A WITHOUT SPLASH BLOCKS.

NO.	REVISIONS	BY	DATE
C. O. A PROJECT NO. 4160.92 SOUTH DOMINGO BACA ARROYO / PASEO DEL NORTE OUTFALL CONFLUENCE ALTERNATIVE 3A CROSS SECTIONS			
<i>EASTERLING & ASSOCIATES, INC.</i> <i>CONSULTING ENGINEERS</i> 10131 Coors Rd., NW, Suite H-718 ALBUQUERQUE, NEW MEXICO 87114 (505) 898-8021 FAX (505) 898-8501		DESIGNED BY: DSH/ALM DRAWN BY: ALM CHECKED BY: DSH/RPB DATE: DEC. 1992	
JOB NO. 28331		SHEET 4 OF 5	



GENERAL NOTES

1. ALL CROSS-SECTIONS ARE FACING UPSTREAM.
2. THE CROSS-SECTIONS SHOWN REPRESENT ALTERNATIVE 3A WITHOUT SPLASH BLOCKS.

NO.	REVISIONS	BY	DATE
C. O. A PROJECT NO. 4160. 92 SOUTH DOMINGO BACA ARROYO / PASEO DEL NORTE OFFALL CONFLUENCE ALTERNATIVE 3A CROSS SECTIONS			
<i>EASTERLING & ASSOCIATES, INC.</i> <i>CONSULTING ENGINEERS</i> 10131 Coors Rd., NW, Suite H-7/8 ALBUQUERQUE, NEW MEXICO 87114 (505) 898-8021 FAX (505) 898-8501			
DESIGNED BY: DSH/ALM	DRAWN BY: ALM	CHECKED BY: DSH/RPB	SHEET 5
JOB NO. 28331	DATE: DEC. 1992	OF	5