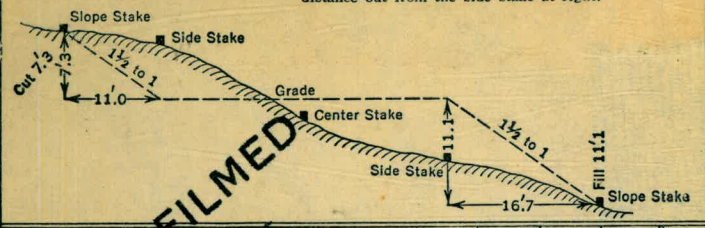
DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.

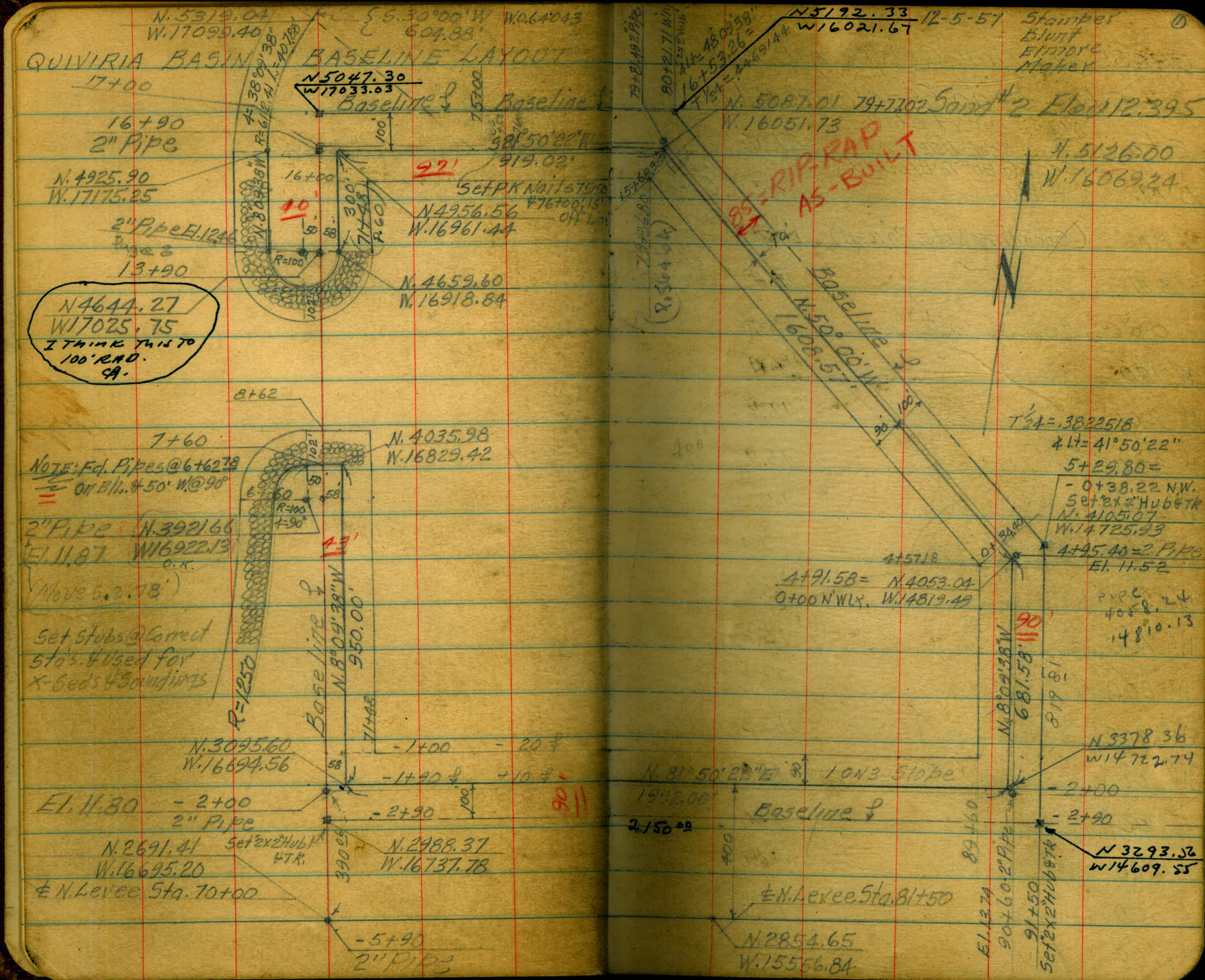


Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	1.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

KEUFFEL & ESSER CO., N. Y.

M. B. 103

PAGES	INDEX	DATE
1	BASELINE FOR SOUNDINGS QUIVIRA BASIN	12-5-57
2-60	X-SEC'S WLY SHORE QUIVIRA BASIN	12-5-57
	SOUNDINGS WLY. SHORE QUIVIRA BASIN	1-3-58
61	LOCATION OF TEST HOLES QUIVIRA BASIN	



QUIVIRIA BASIN BASELINE LAYOUT
12-5-57
Stamper
Blunt
Elmore
Maker
N.5319.04
W.17099.40
S.50°00'W
604.88'
W.0.64043
N5047.30
W17033.03
N5192.33
W16021.67
17+00
16+90
2" Pipe
Baseline ℄
100'
381°50'22"W
919.02'
92'
Set PK Nails 75+00 & 76+00 15' off line
N.4925.90
W.17175.25
16+00
300'
N4956.56
W.16961.44
2" Pipe El.12.44
13+90
R=100
N.4659.60
W.16918.84
N4644.27
W17025.75
I think this to 100' RAD.
8+62
7+60
N.4035.98
W.16829.42
NOTE: Fd. Pipes @ 6+62.78 on B/L & 50' W @ 90°
R=100
2" Pipe
N.3921.66
W16922.13
El.11.87
O.K.
Set Stubs @ Correct Sta's & Used for X-Secs & Soundings
R=1250
Baseline ℄
N.8°09'38"W
950.00'
N.3095.60
W.16694.56
-1+00
-1+90 ℄
-2+90
El.11.80
-2+00
2" Pipe
N.2691.41
W.16695.20
Set 2"x2" Hub & TK.
390'
N.2988.37
W.16737.78
℄ N.Levee Sta.70+00
-5+90
2" Pipe
N.5087.01
W.16051.73
79+77.07
Sand #2 Elev 12.395
N.5126.00
W.16069.24
85' RIP-RAP AS-BUILT
Baseline ℄
N.50°00'W
1608.57'
100'
90
T1/2 Δ = .3822518
Δ Lt = 41°50'22"
5+29.80 =
-0+38.22 N.W.
Set 2"x2" Hub & Tk
N.4105.07
W.14725.93
4+95.40 = 2" Pipe
El. 11.52
4+57.18
4+91.58 =
0+00 N.W.L.X.
N.4053.04
W.14819.49
N.8°09'38"W
681.58'
90'
N.81°50'22"E
1 on 3 Slope
1992.00'
2150.00
Baseline ℄
400'
N3378.36
W14722.74
-2+00
-2+90
N3293.56
W14609.55
℄ N.Levee Sta.81+50
N.2854.65
W.15556.84
El.13.74
90+60 2" Pipe
91+50
Set 2"x2" Hub & Tk

12-6-57 W.O. 64043

CROSS SECTION QUIVIRA BASIN

N 2691.41
W 16695.20

Sta - 5+90 SEC. ALONG ℄ N. LEVEE

NOTE: Direct Elev ≂ Rod Used

(Sec's @ 90° To B/L. Ely. & W'ly.)

(Sounding Notes Pg. 10-17)

Sta	Elev.	
B.M.	11.87	Top 2" Pipe (See Sketch Pg. 1)
T.B.M.	11.81	Top 2" Pipe - 2+00
T.B.M.	15.67	2" Pipe - 5+90 ℄ N. Levee Sta 70+00
0	15.9	
W 100	16.1	
W 200	15.6	
W 300	15.9	
W 400	15.4	
W 500	15.4	
W 600	15.6	
W 700	15.2	
W 800	15.2	
W 900	15.3	
W 1000	15.3	
E 100	16.1	
E 200	16.0	
E 300	15.9	
E 400	15.9	

On W'ly Baseline N 8°09'38" W.

STA - 5+00 ELY. & WLY.

Sta	Elev	
0	13.7	
W 100	13.0	
W 200	11.6	
W 300	11.8	
W 400	12.4	
W 500	13.6	
W 600	13.1	
W 700	13.1	
W 800	14.4	
W 890	14.6	Top Jetty
E 100	14.1	
E 200	15.2	
E 300	15.4	
E 400	15.8	
		1-st M.H. 51' S/y of Pump Sta. Sewer MH No
T.B.M.	11.52	12-Chisl'd Nly Rim

12-6-57

STA - 4+00 on w'ly. Baseline. N8°09'38"W →

Sta.	Elev	
0	10.6	
W100	10.5	
W200	11.3	
W300	10.4	
W400	11.2	
W500	11.6	
W600	12.3	Top Jetty
W700	13.1	
E100	10.4	
E200	10.8	
E300	12.5	
E400	12.4	

STA. - 3+00

0	11.4	
W. 100	11.4	
W. 200	11.4	
W 300	11.5	
W. 400	11.0	
W 500	10.9	

STA - 3+00

Sta.	Elev	
W585	11.8	Top Jetty
E100	11.2	
E200	11.4	
E300	11.8	
E400	12.2	

STA - 1+90

0	10.9	
W100	11.2	
W200	12.0	
W300	11.5	
W400	11.2	
W470	12.0	Top Jetty
E58	11.3	
E148	11.3	
E200	11.8	
E300	11.1	
E400	10.0	

12-6-58

STA-1+00

Sta.	Elev	
0	11.3	
W 100	11.6	
W 200	12.9	
W 300	12.2	
W 400	11.4	Top Jetty
E 45	11.5	
E 58	9.8	
E 61	9.4	
E 62	6.9	
E 75	4.2	

STA-0-50

0	11.0	
E 48	11.4	
E 56	10.1	
E 58	6.9	
E 73	3.9	

STA 0+00

Sta.	Elev	
0	11.4	
W 100	13.0	
W 200	12.7	
W 300	12.7	
W 345	12.0	Top Jetty
E 47	11.1	
E 52	6.4	
E 58	5.4	
E 63	4.0	

STA. 0+50

0	11.5	
E 48	11.0	
E 58	9.2	
E 62	8.9	
E 63	6.9	
E 74	3.8	

12-6-57

STA. 1+00

Sta.	Elev	
0	11.5	
W 100	12.6	
W 200	12.3	
W 305	11.2	Top Jetty
E. 50	10.4	
E. 54	6.8	
E. 58	6.4	
E 69	3.7	

STA 1+50

TP	11.16	
0	11.2	
E 40	11.4	
E 47	6.4	
E 58	4.1	

STA 2+00

0	11.7	
W 100	11.8	
W 200	11.9	
W 245	10.8	Top Jetty

STA 2+00

Sta	Elev	
E 50	11.5	
E 58	10.0	
E 59	6.9	
E 77	3.4	

STA. 2+50

0	11.5	
E 40	11.8	
E 45	7.0	
E 56	3.7	

STA 3+00

0	10.5	
W 100	11.2	
W 200	11.9	
W 210	11.8	Top Jetty
E 38	10.5	
E 38	7.1	
E 53	3.6	

12-6-57

STA. 3+50

Sta.	Elev	
0	11.1	
E 37	11.5	
E 41	7.1	
E 58	3.1	

STA. 4+00

0	12.1	
W 100	11.0	
W 185	11.2	Top Jetty
E 30	12.0	
E 32	7.0	
E 48	3.1	

STA. 4+50

0	11.4	
E 22	11.2	
E 25	7.0	
E 42	3.0	

STA. 5+00

Sta.	Elev	
0	11.0	
W. 100	10.7	
W 170	11.1	Top Jetty
E 12	10.9	
E 15	7.2	
E 26	4.3	
E 40	3.3	

STA 5+50

0	11.4	
E 4	11.4	
E 7	7.3	
E 50	4.0	
E 58	3.0	

STA. 6+00

0	11.2	
W 100	10.7	
W 160	11.4	Top Jetty
E 5	11.3	
E 9	7.5	
E 30	5.6	Elev
E 50	3.5	E58 — 2.5

12-6-57

STA. 6+60

Sta.		Elev	
0		11.2	
E 10		11.0	
E 13		7.2	
E 48		3.2	
W 100		10.9	
W 155		11.4	Top Jetty

STA 7+10

0		7.8	
W 8		11.7	
W 100		11.6	
W 145		11.4	Top Jetty
E 22		5.3	
E 48		2.5	

STA 7+60

0		11.3	
W 50		11.7	
E 11		11.6	
E 25		7.2	
E 58		3.1	

W'ly. Baseline N8°09'38"W

(7)

STA 7+60 50' WLY OF B/L SEC. NLY &

// TO BASELINE.

Sta	Elev
0	11.7
N. 13	11.6
N. 28	2.3

STA 7+60 B/L SEC. N'LY ALONG B/L

0	11.3
N 13	11.4
N 29	2.3

STA 7+60 58' ELY OF B/L; // & NLY.

0	3.1
N 20	2.2

W'ly baseline N8°09'38"W

12-6-57

RADIAL SECTIONS N'LY ENTRANCE QUIVIRA BASIN. RAD. PT. = 0+00

SEC. ALONG LINE N.81°50'22" E (BC)

Sta	Elev	
B.M.	12.46	Top 2" Ø Centerline
0	12.4	
E 50	11.7	
E 83	12.2	
E 108	7.7	
E 128	2.7	

RADIAL SEC S 75°39'38" E

S 54	11.9	
S 105	13.0	
S 122	3.6	

RADIAL SEC. S 53°09'38" E

S 54	12.7	
S 107	12.4	
S 130	0.0	

RADIAL SECTION S. 30°39'38" E

Sta	Elev	
S 54	12.3	
S 100	12.7	
S 126	0.8	

RADIAL SECTION (EC.) S 8°09'38" E

S 50	12.6	
S 107	12.8	
S 128	2.6	

W'ly. Baseline N 8°09'38" W Corresponding Soundings on P. 16

STA. 14+00 (See B/L Pg. 1)

0	12.0	✓
W 100	12.1	✓
W 160	11.8	✓ Top Jetty
E 27	11.8	✓
E 58	1.8	✓
E 81	0.5	✓

W'ly. Baseline N 8°09'38" W See P. 17

STA. 14+50 (Add'l. Sec. P. 63)

0	12.2	✓
E 28	12.0	✓
E 52	0.5	✓

W'ly. baseline N 8°09'38" W
See P. 17 & P. 63

12-6-57.

STA. 15+00

Sta.	Elev	
0	11.9	✓
E W. 93	12.3	✓
E E. 33	11.4	✓
E E 49	2.0	✓
E E 62	0.5	✓

W'ly. baseline N 8°09'38" W
See P. 17 & P. 63

STA. 15+50

0	12.3	✓
E 38	11.6	✓
E 54	2.5	✓
E 63	2.0	✓
E 67	1.5	✓

W'ly. baseline N 8°09'38" W
See P. 17 & P. 63

STA 16+00

0	12.6	✓
W. 13	13.0	✓
W. 28	11.2	✓
W. 85	12.0	✓
E 37	11.4	✓
E 40	6.2	✓
E 55	3.0	✓
E 61	2.0	✓
E 64	1.4	✓

W'ly. baseline N 8°09'38" W

STA 16+50 (Also P. 63)

Sta	Elev	
0	12.6	✓
E 55	11.5	✓
E 58	7.0	✓
E 82	2.4	✓
E 90	1.3	✓

W'ly. Baseline N 8°09'38" W

STA. 16+90 (Also P. 63)

0	12.4	✓
W 92	11.7	✓
E 58	11.8	✓
E 96	11.6	✓
E 104	7.0	✓
B.M.	12.96 ~ 12.46	

W'ly. B/L N8°09'38"W 12-9-57

SOUNDINGS QUIVIRIA BASIN STA -1+00; SOUND ELY. 0+00=B/L (See Skt Pg. 1)

Dist	Sound	Elev	Dist	Sound	Elev
0+60				25.0	18.0
(7.0)	2.0	+5.0	50	26.2	19.2
10:00	4.2	+2.8	(7.0)	26.0	19.0
	7.1	0.1	10:05	26.0	19.0
1+00	11.3	4.3		26.1	19.1
	13.9	6.9		26.1	19.1
	14.8	7.8	2+00	26.1	19.1
30	20.0	14.0			

STA 0+00; 0+00=B/L SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+60	2.6	+4.4		26.8	19.8
(7.0)	5.7	+1.3	50	27.6	20.6
10:20	10.3	3.3		27.5	20.5
	13.9	6.9		27.7	20.7
1+00	15.4	8.4		27.8	20.8
	16.4	9.4		27.8	20.8
	19.0	12.0	2+00	27.8	20.8
	21.4	14.4			

W'ly. B/L N8°09'38"W (10)

STA -0+50 0+00=B/L; SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+50				28.0	21.0
(7.0)			50	28.1	21.1
10:13	3.0	+4.0		28.1	21.1
	5.9	+1.1		28.3	21.3
	10.5	3.5		28.2	21.2
1+00	16.0	9.0		28.0	21.0
	19.5	12.5	2+00	28.5	21.5
	22.0	15.0			
30	24.0	17.0			

STA. 0+50; 0+00=B/L; SOUND ELY

Dist	Sound	Elev	Dist	Sound	Elev
0+60				27.5	20.5
(7.0)	1.9	+5.1	50	27.8	20.8
10:25	5.0	+2.0		27.5	20.5
	9.2	2.2		28.0	21.0
1+00	14.8	7.8		28.0	21.0
	18.0	11.0		28.0	21.0
	18.5	11.5	2+00	28.0	21.0
	23.3	16.3			

12-9-57 W'ly. B/L ~ N80°09'38"W

STA. 1+00; 0+00 = B/L. SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+60	1.5	+5.4	(6.9)	28.1	21.2
(6.9)	3.4	+3.5	50	28.0	21.1
10:32	6.2	+0.7	10:35	28.6	21.7
	10.7	3.8		29.0	22.1
1+00	15.3	8.4		29.0	22.1
	15.0	8.1		29.0	22.1
	18.6	11.7	2+00	28.4	21.5
30	24.3	17.4			

STA. 1+50; 0+00 = B/L. SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+60	3.1	+3.7	50	30.4	23.6
(6.8)	7.4	0.6	(6.8)	29.5	22.7
10:38	12.8	6.0	10:40	29.0	22.2
	16.0	9.2		29.0	22.2
1+00	17.4	10.6		27.2	20.4
	19.1	12.3	2+00	29.0	22.2
	19.7	12.9			
	23.8	17.0			
	27.0	20.2			

STA. 2+00; 0+00 = B/L; SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+60				27.9	21.2
(6.7)	2.3	+4.4	50	28.3	21.6
10:45	4.1	+2.6		28.2	21.5
	6.3	+0.4		28.3	21.6
1+00	10.0	3.3		28.3	21.6
	14.4	7.7		28.4	21.7
	20.1	13.4	2+00	28.4	21.7
30	26.2	19.5			

STA. 2+50; 0+00 = B/L; SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+10				26.8	20.2
50	0.6	+6.0		27.8	21.2
(6.6)	2.7	+3.9	50	28.0	21.4
10:50	4.8	+1.8		28.0	21.4
	7.1	0.5		28.4	21.8
	12.0	5.4		28.4	21.8
1+00	15.8	9.2		28.1	21.5
	17.9	11.3	2+00	28.0	21.4
	22.3	15.7			

12-9-57 W 1/4. B/L — N 8° 09' 38" W

(12)

STA. 3+00; 0+00 = B/L; SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+40	0.1	+6.4		26.3	19.9
50	2.8	+3.7		28.9	22.4
(6.5)	5.6	+0.9	50	28.7	22.2
10:55	10.0	3.5		29.0	22.5
	14.3	7.8		29.4	22.9
	15.3	8.8		29.1	22.6
1+00	16.4	9.9		29.2	22.7
	17.7	11.2	2+00	29.1	22.6
20	21.0	14.5			

STA. 3+50; 0+00 = B/L. SOUND ELY

0+50	1.4	+5.1		28.1	21.6
(6.5)	3.2	+3.3	50	29.0	22.5
11:00	5.1	+1.4		28.5	22.0
	7.8	1.3		27.8	21.3
	11.0	4.5		27.6	21.1
1+00	12.0	5.5		27.8	21.3
	13.8	7.3	2+00	27.1	20.6
	17.5	11.0			
	22.6	16.1			

STA. 4+00; 0+00 = B/L. SOUND ELY.

Dist	Sound	Elev.	Dist	Sound	Elev.
0+10	1.1	+5.2	(6.3)	26.4	20.1
50	3.9	+2.3	11:10	27.0	20.7
(6.3)	8.2	1.9	50	27.0	20.7
11:06	12.2	5.9		27.3	21.0
	12.8	6.5		27.3	21.0
	14.7	8.4		27.7	21.4
1+00	16.6	10.3		28.0	21.7
	17.0	10.7	2+00	28.1	21.8
	21.0	14.7			

STA. 4+50; 0+00 = B/L; SOUND ELY.

0+30	0.3	+6.0		21.3	15.0
(6.3)	2.8	+3.5		24.3	18.0
50	4.8	+1.5		26.6	20.3
11:15	7.0	0.7	50	26.7	20.4
	9.8	3.5		27.9	21.6
	8.2	1.9		28.0	21.7
	11.2	4.9		28.2	21.9
1+00	13.8	7.5		28.8	22.5
	15.4	9.1	2+00	28.8	22.5

12-9-57 N'ly. B.L. ~ N 8° 09' 38" W

STA. 5+00; 0+00 = B.L.; SOUND ELV.

Dist	Sound	Elev	Dist	Sound	Elev
0+20	0.0	+6.2		18.1	11.9
(6.2)	2.4	+3.8		23.2	17.0
11:20	2.9	+3.3		27.5	21.3
50	3.1	+3.1	50	27.5	21.3
	6.0	+0.2		27.3	21.1
	10.3	4.1		27.4	21.2
	12.6	6.4		27.6	21.4
	12.3	6.1		28.1	21.9
1+00	11.8	5.6	2+00	28.1	21.9
	13.2	7.0			

STA. 5+50; 0+00 = B/L. SOUND ELV.

0+50	2.0	+4.1	(6.1)	22.4	16.3
(6.1)	2.6	+3.5	11:30	25.9	19.8
11:27	3.6	+2.5	50	27.0	20.9
	7.1	1.0		27.6	21.5
	12.3	6.2		27.9	21.8
1+00	15.8	9.7		28.1	22.0
	17.4	11.3		28.4	22.3
	18.4	12.3	2+00	28.6	22.5

STA. 6+00; 0+00 = B/L. SOUND ELV.

Dist	Sound	Elev
0+10		
(6.0)		
11:35	0.1	+5.9
	1.2	+4.8
50	2.1	+3.9
	3.5	+2.5
	4.1	+1.9
	7.0	1.0
	11.2	5.2
1+00	12.6	6.6
	13.9	7.9
	15.6	9.6
	19.3	13.3
	23.2	17.2
50	26.9	20.9
	27.0	21.0
	27.1	21.1
	27.1	21.1
	26.9	20.9

Dist	Sound	Elev
2+00	27.0	21.0

12-9-57 W'ly. B/L ~~~ N 8°09'38" W

STA. 6+60; 0+00 = B/L; SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+20				18.8	12.9
(5.9)	0.0	+5.9		19.1	13.2
11:40	1.8	+4.1		24.5	18.6
50	2.8	+3.1	50	26.8	20.9
	4.7	+1.2		27.3	21.4
	9.2	3.3		27.3	21.4
	13.0	7.1		27.0	21.1
	15.3	9.4		27.0	21.1
1+00	15.8 (15.5)	9.9 (9.6)	2+00	27.0	21.1

STA. 7+10; 0+00 = B/L; SOUND ELY.

0+30	1.2	+4.5		18.9	13.2
	2.0	+3.7		20.1	14.4
50	3.1	+2.6		23.7	18.0
(5.7)	3.8	+1.9	50	26.5	20.8
11:50	4.3	+1.4		26.6	20.9
	6.5	0.8		26.6	
	9.9	4.2		26.6	
1+00	13.7	8.0		26.6	
	16.0	10.3	2+00	26.6	20.9

STA. 7+60; 0+00 = B/L.; SOUND ELY.

Dist	Sound	Elev.	Dist	Sound	Elev
0+30			(5.5)	17.4	11.9
			12:00	20.9	15.4
50				26.1	20.6
(5.5)	2.2	+3.3	50	26.9	21.4
11:58	4.3	+1.2		26.9	
	4.9	+0.6		26.9	
	6.6	1.1		26.9	21.4
1+00	10.8	5.3		25.8	20.3
	14.2	8.7	2+00	26.5	21.0

STA. 7+60; 0+00 = B/L. SOUND N'LY.

0+30	4.3	+1.0		23.5	18.2
(5.3)	11.7	6.4		24.2	18.9
50	15.1	8.8		26.0	20.7
12:10	18.1	12.8	50	26.3	21.0
	19.0	13.7		26.4	21.1
	21.1	15.8		26.6	21.3
	22.2	16.9		26.9	21.6
1+00	23.1	17.8		26.5	21.2
	24.2	18.9	2+00	26.6	21.3

12-9-57 W'LY. B/L — N 8°09'38" W

7+60; 0+00 = 50' WLY B/L @ 90°; SOUND NLY

Dist	Sound	Elev	Dist	Sound	Elev
0+30			(5.1)	24.8	19.7
(5.1)	9.3	4.2	12:20	24.7	19.6
50	15.0	9.9		25.6	20.5
12:18	16.1	11.0	50	25.8	20.7
	14.7	9.6		26.0	20.9
	21.2	16.1		26.2	21.1
	22.3	17.2		26.4	21.3
1+00	22.3	17.2		26.7	21.6
	23.3	18.2	2+00	26.6	21.5

STA. 7+60; 58' ELY B/L. @ 90°; SOUND NLY.

Dist	Sound	Elev	Dist	Sound	Elev
0+30	7.2	1.9		23.2	17.9
(5.3)	11.5	6.2		24.2	18.9
50	14.5	9.2		25.0	19.7
12:06	16.2	10.9	50	25.0	19.7
	17.4	12.1		25.2	19.9
	17.9	12.6		25.3	20.0
	19.9	14.6		25.5	20.2
1+00	22.2	16.9		25.7	20.4
	23.0	17.7	2+00	25.8	20.5

RADIAL SOUNDINGS @ NLY. ENTRANCE 0+00 = CENTER 100' RADIUS PT SOUND N.81°50'22"E

Dist	Sound	Elev	Dist	Sound	Elev
1+10				25.0	21.4
(3.6)			2+00	25.2	21.6
1:25	1.3	+2.3		25.0	21.4
	5.9	2.3		24.4	20.8
50	9.9	6.3		25.0	21.4
	15.0	11.4		27.0	23.4
	18.6	15.0	50	26.6	23.0
	23.4	19.8			

0+00 = RADIUS PT. SOUND S.75°39'38"E

Dist	Sound	Elev	Dist	Sound	Elev
1+20				23.3	20.0
(3.3)	6.5	3.2	(3.3)	24.8	21.5
1:33	12.3	9.0	1:35	25.0	21.7
50	14.3	11.0		25.4	22.1
	14.0	10.7	50	25.7	22.4
	16.2	12.9		25.1	21.8
	17.4	14.1			
	23.2	19.9			
2+00	23.7	20.4			

12-9-57 W'ly. B/L — N8°09'38" W

(16)

RADIAL SEC. 0+00 = CENTER 100'R. SOUND S. 53°09'38" E

Dist	Sound	Elev	Dist	Sound	Elev
1+30	3.2	0.0		23.3	20.1
(3.2)	9.0	5.8		23.1	19.9
50	10.8	7.6		23.6	20.4
1;40	13.9	10.7	50	24.1	20.9
	17.0	13.8		24.0	20.8
	22.2	19.0		24.0	20.8
	24.0	20.8		24.4	21.2
2+00	23.8	20.5		24.5	21.3
10	24.5	21.3	3+00	24.1	20.9

RADIAL SEC. 0+00 = CENTER 100'R, SOUND S. 30° 39'38"E

1+30	3.8	0.7		23.1	20.0
(3.1)	9.2	6.1		23.4	20.3
50	13.1	10.6		23.4	20.3
1;47	14.6	11.5	50	23.3	20.2
	17.2	14.1		23.3	20.2
	22.0	18.9		22.8	19.7
	23.0	19.9		23.0	19.9
2+00	23.0	19.9		23.0	19.9
	23.0	19.9	3+00	23.2	20.1

RADIAL SEC. 0+00 = CENTER 100'R; SOUND S. 8°09'38" E

Dist	Sound	Elev	Dist	Sound	Elev
1+30	1.0	+2.0		22.0	19.0
(3.0)	9.3	6.3		22.6	19.6
50	15.4	12.4		22.8	19.8
1;52	16.3	13.3	50	22.8	19.8
	17.1	14.1		23.0	20.0
	18.0	15.0		23.1	20.1
	18.4	15.4		22.8	19.8
2+00	19.9	16.9		23.0	20.0
10	20.6	17.3	3+00	23.5	20.5

W'ly N8°09'38" W corresponding sections on P. 8

STA. 14+00; 0+00 = B/L; SOUND E'LY.

0+00	2.0	+0.7		23.2	20.5
(2.7)	2.9	0.2		23.8	21.1
1+00	8.5	5.8		23.8	21.1
10 2;00	12.8	10.1	2+00	21.8	19.1
20	16.0	13.3			
30	20.0	17.3			
40	22.9	20.2			
50	23.1	20.4			
	23.5	20.8	50		

W'ly. baseline N 8°09'38" W 12-9-57
See P.8
STA. 14+50; 0+00 = B/L. SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+60	2.2	+0.3	(2.5)	24.1	21.6
(2.5)	4.5	2.0	50	24.0	21.5
2:08	8.0	5.5	2:10	24.0	21.5
	9.3	6.8		23.8	21.3
1+00	8.9	6.4		23.4	20.9
	14.2	11.7		23.2	20.7
	18.6	16.1	2+00	23.0	20.5
30	22.9	20.4			

W'ly. baseline N 8°09'38" W See P.9 & 67
STA. 15+00; 0+00 = B/L. SOUND ELY.

0+70	8.2	5.9		24.1	21.8
(2.3)	9.4	7.1		24.0	21.7
2:15	10.2	7.9		24.0	21.7
1+00	12.0	9.7	2+00	23.8	21.5
	16.0	13.7			
	20.2	17.9			
	23.9	21.6			
	24.3	22.0			
50	24.0	21.7			
	24.1	21.8			

W'ly. baseline N 8°09'38" W
See P.9
STA. 15+50; 0+00 = B/L. SOUND ELY.

Dist	Sound	Elev	Dist	Sound	Elev
0+70	1.2	+1.0	50	24.0	21.8
(2.2)	5.8	3.6		23.8	21.6
2:20	8.4	6.2		23.6	21.4
1+00	9.3	7.1		23.8	21.6
	14.0	11.8		23.7	21.5
	16.9	14.7	2+00	23.8	21.6
	22.5	20.3			
40	24.0	21.8			

W'ly. baseline N 8°09'38" W See P.9
STA. 16+00; 0+00 = B/L.; SOUND ELY.

0+70	3.2	1.1		21.8	19.7
(2.1)	5.8	3.7		22.4	20.3
2:27	7.0	4.9			
1+00	10.0	7.9	2+00		
	12.2	10.1			
	17.8	15.7			
	20.9	18.8			
	22.0	19.9			
50	22.0	19.9			
	22.0	19.9			

12-12-57

STA. 70+58 (See B/L. Pg. 1) (N 81° 50' 22" E)

CROSS SECTION QUIVIRA BASIN SLY BDRY.

Sta.	Elev
BM.	11.81
0	11.0
N 100	11.6
N 109	11.8

STA 71+48; 0+00 = B/L.

0	11.6
N 100	11.6
N 103	10.4
N 115	5.6

STA 72+00; 0+00 = B/L

0	11.4
N 92	11.7
N 100	6.5

STA 72+50; 0+00 = B/L

0	11.2
N 84	11.4
N 86	7.2
N 93	5.4

2" Pipe -2+00

Sly. Bdry.

STA. 73+00; 0+00 = B/L

Sta	Elev
0	11.7
N. 78	11.0
N. 80	7.0
N. 86	5.5

STA. 73+50; 0+00 = B/L

0	11.3
N 93	10.4
N 96	5.7

STA 74+00; 0+00 = B/L

0	11.2
N 64	10.4
N 100	9.0
N 108	8.7
N 110	4.0

STA 74+50; 0+00 = B/L

0	11.8
N 100	10.4
N 102	7.0
N 110	5.7

STA. 75+00; 0+00 = B/L

Sta	Elev.
0	12.2
N. 92	10.9
N. 95	7.0
N 100	5.3
S 100	14.1
S 200	14.8
S 275	16.2
S 300	16.5

STA 75+50; 0+00 = B/L

0	12.2
N 90	11.7
N 99	7.1
N 100	6.6
N 107	6.3

STA 76+00; 0+00 = B/L

0	12.6
N. 81	11.6
N. 91	3.9
S. 100	14.1

STA. 76+00; CONTD

Sta.	Elev
S 200	14.8
S 269	15.3
S 279	16.3
S 300	16.3

STA 76+50; 0+00 = B/L

0	12.3
N 88	12.6
N 97	6.8
N 100	6.1
N 105	5.4

STA 77+00; 0+00 = B/L

0	12.4
N 87	12.4
N 97	7.1
N 100	5.1
S 100	13.8
S 200	14.8
S 255	14.8
S 278	16.3
S 300	16.2

12-12-57

STA. 77+50; 0+00 = B/L

Sta.	Elev
0	12.5
N. 88	11.8
N. 95	7.1
N. 100	6.7

STA. 78+00; 0+00 = B/L

0	12.8
N 88	12.0
N 90	7.0
N 95	6.0
S 100	14.5
S 200	15.2
S 300	16.2

STA. 78+50; 0+00 = B/L

0	13.2
N 87	12.4
N 89	7.0
N 95	5.6

S'LY. Bdry.

STA. 79+00; 0+00 = B/L

Sta.	Elev.
0	13.0
N 93	12.9
N 98	7.0
N 100	6.6
S 100	14.7
S 200	15.0
S 275	16.0
S 281	16.4
S 300	16.5

STA. 79+50; 0+00 = B/L

0	13.3
N 94	13.6
N 100	10.7
N 105	6.9
N 110	5.4

STA. 80+00; 0+00 = B/L

0	13.3
N 91	12.6
N 97	7.0

STA. 80+00 CONTD

Sta.	Elev
N100	6.6
N105	5.6
S100	15.0
S200	15.2
S252	158
S277	17.1
S300	16.8 ✓

STA. 80+50; 0+00 = B/L

0	13.8
N 90	12.9
N 96	7.0
N 100	6.0

STA. 81+00; 0+00 = B/L

0	13.5
N 90	12.4
N 96	7.0
N 100	6.3
S 100	15.2
S 200	15.4

STA. 81+00 CONTD

Sta.	Elev	
S 271	16.6	
S 277	17.1	
S 300	17.4 ✓	
TP	13.50	Top Stub 81+00

STA. 81+50; 0+00 = B/L

0	13.1
N 95	12.4
N. 100	6.3
N. 105	5.6

STA. 82+00; 0+00 = B/L

0	12.8
N 97	12.2
N. 100	6.6
N. 103	6.4
N 109	5.1
S. 100	14.4
S. 200	15.6
S. 269	17.1
S 277	17.8
S 300	17.6 ✓

12-12-57

STA. 82+50; 0+00 = B/L

Sta.	Elev
0	12.9
N 96	11.2
N 100	7.0
N 104	6.3

STA. 83+00; 0+00 = B/L

0	13.0
N 90	12.0
N 100	5.7
S 100	14.5
S 200	15.9
S 258	16.9
S 272	17.3
S 300	17.6 ✓

STA 83+50; 0+00 = B/L

0	13.3
N 87	12.2
N 90	6.8
N 95	5.7

S'ly. Bdry.

STA. 84+00; 0+00 = B/L

Sta.	Elev
0	13.5
N 81	11.9
N 84	6.8
N 87	5.4
S 100	15.0
S 200	15.9
S 261	17.6
S 300	17.6 ✓

STA. 84+50; 0+00 = B/L

0	13.6
N 92	12.6
N 95	6.6
N 100	5.6

STA. 85+00; 0+00 = B/L

0	13.7
N 90	13.0
N 92	6.9
N 100	5.4
S 100	14.4

12-12-57

STA 85+00; CONTD

Sta	Elev	
S 200	15.9	
S 300	17.5	✓

STA. 85+50; 0+00 = B/L

0	13.8	
N 88	12.4	
N 90	6.7	
N 95	5.5	

STA. 86+00; 0+00 = B/L

0	13.0	
N 84	12.2	
N 86	7.0	
N 88	4.7	
S 100	14.6	
S 200	15.9	
S 248	16.6	
S 263	17.9	
S 300	17.5	✓

Sly. Bdry.

STA. 86+50; 0+00 = B/L

Sta.	Elev	
0	13.0	
N 85	12.1	
N 87	6.9	
N 93	5.4	

STA. 87+00; 0+00 = B/L

0	12.4	
N 86	11.8	
N 96	6.2	
N 100	5.4	
S 100	13.8	
S 200	16.4	
S 278	18.1	
S 300	17.6	✓

STA. 87+50; 0+00 = B/L

0	12.7	
N 88	11.3	
N 94	5.0	

12-12-57

STA 88+00; 0+00 = B/L

Sta.	Elev
0	12.2
N 82	11.4
N 84	6.7
N 89	5.4
S 100	14.0
S 200	16.6
S 277	18.1
S 300	17.6 ✓

STA. 88+50; 0+00 = B/L

0	12.8
N 82	11.9
N 84	7.0
N 90	5.3

STA. 89+00; 0+00 = B/L

0	12.0
N 82	11.6
N 84	6.9
N 90	5.7
N 95	3.6

S'l'y. Bdry.

STA. 89+00 CONTD

Sta.	Elev.
S 100	13.7
S 174	15.3
S 200	17.7
S 300	17.8 ✓

STA. 89+60; 0+00 = B/L

0	13.0
N 75	12.2
N 78	7.0
N 85	4.8
S 100	13.9
S 200	15.4
S 267	17.9
S 300	17.6 ✓

STA 90+50; 0+00 = B/L

0	13.7
N 100	12.5
N 135	11.6
N 147	6.3

Sely. cor. 12-12-57

STA. 91+50; 0+00 = B/L

Sta	Elev	
0	14.0	
N 100	12.8	
S 100	15.2	
S 200	16.0	
S 226	16.2	
S 232	17.5	
S 300	17.5	

STA. 91+50 (Sec. S. 53°09'38"E) 0+00 = B/L

Sta	Elev	
0	14.0	
SE 100	15.4	
SE 200	15.8	Fill Toe R
TBM.	14.04	2x2 H B/L 9+

Ely. Baseline N8°09'38"W

STA - 2+90; 0+00 = B/L

Sta	Elev	
0	14.0	
E 100	14.8	
E 200	15.3	
E 287	15.4	Toe R

E'ly. baseline N8°09'38"W

STA. - 1+90; 0+00 = B/L

Sta	Elev	
0	12.8	
W 100	12.3	
W 138	12.0	
W 145	7.0	
E 100	13.6	
E 200	14.2	
E 300	15.3	

STA - 1+00; 0+00 = B/L

Sta	Elev	
0	11.9	
W 79	11.3	
W 83	7.0	
W 93	4.5	✓
E 100	13.4	
E 200	14.2	
E 300	14.9	✓

STA - 0+50; 0+00 = B/L

Sta	Elev	
0	11.0	
W 83	10.7	
W 84	7.0	✓

12-12-57

STA. - 0+50 CONTD

Sta.	Elev.	
W 88	6.2	
W 89	5.4	
W 92	4.8	
W 94	2.7	✓
STA. 0+00; 0+00 = B/L		
0	10.5	
W 82	10.3	
W 85	5.9	
W 88	5.0	
W 91	3.6	✓
E 100	12.5	
E 200	13.7	
E 300	13.9	✓
TBM.	11.64	
STA. 0+50		
0	10.7	
W. 42	12.8	
W. 55	10.2	
W 87	10.4	

E'ly. baseline N, 8° 09' 38" W

STA. 0+50 CONTD.

Sta.	Elev.	
W 89	4.6	
W 95	4.5	✓
STA. 1+00; 0+00 = B/L		
W. C	10.7	
W 75	11.1	
W 77	7.1	
W 83	6.2	
W 88	4.8	✓
E 100	12.1	
E 200	12.5	
E 300	12.9	✓
STA 1+50; 0+00 = B/L		
0	10.7	
W 82	10.1	
W 84	6.8	
W 90	5.8	✓

12-13-57

STA. 2+00; 0+00 = B/L

Sta.	Elev	
0	10.8	
W 95	10.4	
W 98	6.6	
W 100	6.2	
W 103	5.0	✓
E 100	12.2	
E 200	12.6	
E 300	13.3	✓

STA. 2+50; 0+00 = B/L

0	10.5	
W. 92	10.3	
W. 94	6.7	
W. 100	4.2	✓

STA. 3+00; 0+00 = B/L

0	10.2	
W 97	10.7	
W 100	6.2	
W 105	4.8	✓
E 100	11.4	

E'ly. baseline N8°09'38"W

STA. 3+00 CONTD

Sta.	Elev	
E 200	12.2	
E 280	13.3	

STA 3+50; 0+00 = B/L

0	10.5	
W 69	9.1	
W 96	10.5	
W 98	6.9	
W 100	6.9	
W 110	4.7	✓

STA. 4+00; 0+00 = B/L

0	10.8	
W 94	11.2	
W 96	6.4	
W 100	5.2	✓
E 100	11.7	
E 200	12.3	
E 241	13.0	✓

12-13-57

STA. 4+57.18; 0+00 = B/L

Sta.	Elev
0	11.3
W 94	9.7
W 98	6.9
W 100	6.3 ✓
E 100	11.4
E 200	12.9
E 220	12.8 ✓

NOTE; (Sec's Taken @ 90° To B/L

STA. 0+34.40; 0+00 = B/L

E'ly. Baseline N 50° 00' W

0	10.2
W 100	11.3
W 102	11.4
W 103	6.8
W 108	5.7 ✓
E 100	11.0
E 200	11.6
E 225	12.1

E'ly. Baseline N 50° 00' W

STA. 1+00; 0+00 = B/L

Sta.	Elev
0	10.5
W 100	10.8
W 104	10.8
W 106	7.0
W 110	6.1 ✓
E 100	11.0
E 200	11.4
E 255	12.0 ✓

STA. 1+50; 0+00 = B/L

0	10.8
W 100	10.6
W 107	10.2
W 113	5.7 ✓

STA. 2+00; 0+00 = B/L

0	10.6
W 88	10.5
W 90	7.0
W 100	5.5 ✓
E 100	10.7

E'ly. baseline 12-13-57 N50°00'W

STA 2+00 CONTD

Sta.	Elev.	
E200	11.0	
E 287	12.2	✓
STA 2+50; 0+00 = B/L		
0	11.1	
W 80	10.5	
W 82	7.4	
W 90	6.0	✓
STA. 3+00; 0+00 = B/L		
0	11.3	
W 92	11.1	
W 93	6.8	
W100	5.9	✓
E100	10.7	
E 200	11.1	
E 300	11.2	✓
STA. 3+50		
0	10.9	
W 97	11.2	
W 98	6.9	
W 100	6.6	✓

E'ly. baseline N50°00'W

STA 4+00; 0+00 = B/L

Sta.	Elev.	
0	10.5	
W100	10.8	
W110	10.9	
W113	6.8	✓
E100	10.7	
E200	11.0	
E300	10.6	✓
STA. 4+50; 0+00 = B/L		
0	10.0	
W100	10.1	
W107	10.2	
W112	6.4	
W115	5.7	✓
STA. 5+00; 0+00 = B/L		
0	10.0	
W100	9.8	
W108	10.0	
W111	6.9	
W115	5.7	✓

12-13-57 E'ly. baseline N 50°00' W

STA. 5+00; CONT'D.

Sta.	Elev.	
E100	10.9	
E200	11.0	
E300	10.9	✓

STA. 5+50; 0+00 = B/L

0	9.8	
W100	10.1	
W108	9.2	
W110	6.8	✓

STA. 6+00; 0+00 = B/L

0	10.3	
W100	10.8	
W110	10.2	
W114	6.6	
W117	6.0	✓
E100	10.6	
E200	10.9	
E300	11.2	✓

STA. 6+50; 0+00 = B/L

Sta.	Elev.	
0	10.3	
W88	10.4	
W90	7.0	
W96	6.0	✓

STA. 7+00; 0+00 = B/L

0	10.6	
W81	10.2	
W84	7.0	
W90	5.7	✓
E100	10.8	
E200	11.2	
E300	11.8	✓

STA 7+50; 0+00 = B/L

0	10.6	
W87	10.4	
W91	6.4	
W96	4.7	✓

12-13-57 E'ly. baseline = N 50° 00' W

STA. 8+00; 0+00 = B/L

Sta	Elev
0	10.3
W 95	10.6
W 98	6.8 ✓
E 100	10.7
E 200	11.4
E 226	12.0 ✓

STA. 8+50; 0+00 = B/L

0	10.6
W 100	10.2
W 107	10.0
W 114	5.8 ✓
TP.	10.56 STA 8+50

STA 9+00; 0+00 = B/L

0	11.0
W 100	12.0
W 103	12.0
W 105	6.9
W 110	4.6 ✓
E 100	11.1

STA 9+00 CONT'D.

Sta.	Elev	Edge Topsoiled Area
E 185	11.6 ✓	

STA 9+50; 0+00 = B/L

0	11.6
W 90	12.0
W 94	7.0
W 100	5.4 ✓

STA. 10+00; 0+00 = B/L

0	12.1
W 91	11.4
W 93	7.0 ✓
E 100	11.1
E 124	11.1 ✓

STA 10+50; 0+00 = B/L

0	12.6
W 80	10.7
W 82	7.0
W 86	4.6 ✓

12-13-57 E'ly baseline N50°00'W

STA 11+00; 0+00 = B/L

Sta.	Elev	
0	13.2	
W 80	10.7	
W 81	7.1	
W 91	5.0	✓
E 100	14.3	
E 140	14.8	✓

STA. 11+50; 0+00 = B/L

0	13.9	
W 80	10.8	
W 83	6.6	
W 88	5.1	✓

STA. 12+00; 0+00 = B/L

0	13.6	
W 75	10.4	
W 76	5.9	✓
E 96	14.4	

STA 12+50; 0+00 = B/L

Sta.	Elev	
0	13.3	
W 73	10.4	
W 74	7.4	
W 79	4.9	✓

STA. 13+00; 0+00 = B/L

0	13.3	
W 37	13.5	
W 57	10.7	
W 73	10.5	
W 76	7.2	
W 82	4.6	✓
E 54	14.0	✓

STA. 13+50; 0+00 = B/L

0	12.3	
W 34	12.4	
W 75	10.6	
W 79	6.7	✓

12-13-57 E'ly. baseline N50°00'W

STA. 14+00; 0+00 = B/L Elev

Sta	Elev
0	12.7
W75	10.8
W78	6.6
W83	4.9

STA 14+50; 0+00 = B/L

Sta	Elev
0	13.6
W69	11.4
W72	7.0

STA. 15+00; 0+00 = B/L

Sta	Elev
0	13.3
W44	12.9
W85	10.6
W88	6.9
W100	5.2

Nely. Corner

STA. 15+68.35 + 0+00 = B/L

Sta	Elev
0	13.3
W45	12.9
W54	11.0
W92	10.5
W94	6.4

N50°00'W

STA 15+68.35 CONTD

Sta	Elev
W100	5.1

Nely. Corner

STA 79+36.80; 0+00 = B/L

N'ly. baseline - S81°50'22" W

Sta	Elev
0	12.5
S93	10.5
S97	7.0
S100	6.2

STA 79+00; 0+00 = B/L

Sta	Elev
0	12.4
S94	10.6
S95	6.8
S98	6.1
S100	5.1

STA. 78+50; 0+00 = B/L

Sta	Elev
0	12.5
S88	10.6
S93	5.1

12-13-57 N'ly. baseline S 81° 50' 22" W

STA 78+00; 0+00 = B/L

Sta	Elev.	
0	11.8	✓
S 63	10.9	
S 65	7.1	
S 71	5.0	✓

STA 77+50; 0+00 = B/L

0	11.9	
S 52	10.6	
S 58	8.9	✓

STA 77+00; 0+00 = B/L

0	11.8	✓
S 91	10.5	
S 100	5.1	

STA 76+50; 0+00 = B/L

0	12.2	
S 98	11.3	
S 100	8.2	

STA 76+00; 0+00 = B/L

Sta	Elev.	
0	12.5	✓
S 58	12.6	
S 100	12.3	
S 102	12.3	✓

STA 75+50; 0+00 = B/L

TP.	12.49	Stob 76+00
0	12.3	✓
S 54	12.6	
S 100	12.4	
S 104	12.4	✓

STA 75+00; 0+00 = B/L

0	11.8	
S 100	11.9	
S 103	11.9	
S 111	6.0	✓

12-13-57 N'ly. baseline ~S81° 50' 22" W

STA. 74+50; 0+00 = B/L

Sta	Elev	
0	11.8	✓
S 100	11.7	
S 105	11.7	
S 107	5.4	✓

STA 74+00; 0+00 = B/L

0	11.9	✓
S 100	11.8	
S 101	6.8	✓

STA 73+50; 0+00 = B/L

0	11.8	✓
S 90	11.6	
S 91	7.0	
S 100	4.5	✓

STA. 73+00; 0+00 = B/L

0	12.0	
S 85	11.2	
S 87	6.9	✓

STA. 72+50; 0+00 = B/L

Sta.	Elev	
0	11.8	✓
S 80	11.2	
S 82	6.9	
S 90	4.6	✓

STA 72+00; 0+00 = B/L

0	12.0	
S 86	11.2	
S 88	6.5	✓

STA. 71+48; 0+00 = B/L

0	12.0	
S 87	10.9	
S 89	6.5	
S 95	4.5	✓

STA. 70+58; 0+00 = B/L

0	12.2	
S 100	11.8	
S 136	11.6	G-364/27
S 137	6.8	13.75
S 150	4.9	Top Fire Hydrant
B.M.	13.69	

S'ly. baseline 12-16-57 (See Sketch Pg)
N 81°50' 22" E
SOUNDINGS QUIVIRA BASIN S'LY B/H. E'LY

STA. 71+48; 0+00 = B/L; SOUND N'LY. @ 90° TO B/L

Dist	Sound	Elev.	Dist	Sound	Elev
1+20			20	21.0	19.0
20	0.0	+2.0	2+00	20.8	18.8
10:47	5.0	3.0		21.1	19.1
50	10.4	8.4		22.2	20.2
	12.0	10.0	10:50	22.3	20.3
	17.0	15.0		23.0	21.0
1+80	20.9	18.9	50	23.0	21.0

STA. 72+00; 0+00 = B/L; SOUND N'LY.

1+10			20	22.5	20.5
20	1.7	+0.3		23.0	21.0
10:53	6.9	4.9		22.9	20.9
	11.4	9.4		23.0	21.0
50	16.0	14.0	50	22.9	20.9
	19.2	17.2			
	20.5	18.5			
	20.9	18.9			
	21.3	19.3			
2+00	22.1	20.1			

S'ly. baseline

STA 72+50; 0+00 = B/L; SOUND N'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			20	21.5	19.5
20	0.5	+1.5		22.3	20.3
11:00	4.8	2.8	2+00	22.7	20.7
	8.1	6.1		23.1	21.1
	11.0	9.0		23.5	21.5
50	15.5	13.5		23.6	21.6
	20.0	18.0		23.6	21.6
1+70	21.1	19.1	50	23.0	21.0

STA 73+00; 0+00 = B/L. SOUND N'LY.

0+90	1.2	+4.8		29.7	23.7
1+00	4.9	+1.1	2+00	29.5	23.5
30	8.5	2.5		29.5	23.5
11:50	11.5	5.5		29.7	23.7
	12.5	6.5		30.0	24.0
Dec 57	18.0	12.0		29.0	23.0
50	22.5	16.5	50	28.8	22.8
	23.0	17.0			
	23.5	17.5			
	28.0	22.0			

12-16-57 S'ly. baseline ~ N 81° 56' 22" E

STA.73+50; 0+00=B/L; SOUND N'LY						STA.74+50; 0+00=B/L; SOUND N'LY.					
Dist	Sound	Elev	Dist	Sound	Elev	Dist	Sound	Elev	Dist	Sound	Elev
1+00			(2.4)	22.6	20.2	1+20	0.0	+2.5	(2.5)	23.3	20.8
(2.4)	0.4	+2.0		23.5	21.1	(2.5)	3.4	0.9	2+00	23.8	21.3
2:13	3.2	0.8	2+00	23.8	21.4	2:20	9.3	6.8		24.2	21.7
	7.3	4.9		24.0	21.6	50	15.1	12.6		25.3	22.8
	9.7	7.3		24.3	21.9		18.1	15.6		25.3	22.8
50	11.8	9.4		25.5	23.1		22.2	19.7		25.3	22.8
	16.9	14.5		25.0	22.6	1+80	23.1	20.6	50	25.5	23.0
1+70	20.8	18.4	50	25.7	23.3	STA.75+00; 0+00=B/L; SOUND N'LY.					
STA.74+00; 0+00=B/L; SOUND N'LY						1+10	4.0	+1.8		28.9	23.1
1+20				28.3	22.4	(5.8)	11.1	5.2		28.8	23.0
(5.9)	9.5	3.6		29.0	23.1	9:00	12.0	6.2		28.9	23.1
8:55	13.0	7.1		29.1	23.2		13.9	8.1	50	28.9	23.1
50	18.0	12.1	50	29.2	23.3	50	18.9	13.1			
	20.0	14.1					23.0	17.2			
	24.0	18.1					27.0	21.2			
	28.0	22.1					29.5	23.7			
	28.0	22.1					28.3	22.5			
2+00	27.9	22.0				2+00	28.2	22.4			
	28.0	22.1					28.2	22.4			

12-16-57 — S'LY. baseline — ~N 81° 50' 22" E

STA. 75+50; 0+00 = B/L; SOUND N'LY.

DIST	Sound +3° +Tide	Elev	DIST	Sound	Elev
1+08	+5.7		(27)	23.1	20.4
1+20	2.2	+0.5	2+00	26.2	23.5
(27)	6.0	3.3		26.7	24.0
2:30	10.8	8.1		24.3	21.6
50	16.5	13.8		25.0	22.3
	19.0	16.3		25.1	22.4
	21.0	18.3	50	25.4	22.7
1+80	22.3	19.6			

STA. 76+00; 0+00 = B/L; SOUND N'LY.

1+00	4.0	+1.7	2+00	28.0	22.3
	8.3	2.6		28.3	22.6
(57)	11.0	5.3		28.2	22.5
9:05	16.5	10.8		28.0	22.3
	19.9	14.2		28.5	22.8
50	21.9	16.2	50	28.8	23.1
	24.5	18.8			
	25.0	19.3			
	25.9	20.2			
	27.0	21.3			

STA. 76+50; 0+00 = B/L; SOUND N'LY.

DIST	Sound	Elev.	DIST	Sound	Elev
1+10	0.4	+2.3	(27)	24.1	21.4
(27)	3.4	0.7	2+00	25.3	22.6
2:35	11.5	8.8		24.6	21.9
	13.9	11.2		24.9	22.2
50	16.3	13.6		24.8	22.1
	21.5	18.8		25.0	22.3
	23.8	21.1	50	25.3	22.6
1+80	23.2				

STA. 77+00; 0+00 = B/L; SOUND N'LY.

1+10	5.5	+0.2		28.5	22.8
(57)	12.0	6.3		29.0	23.3
9:10	15.0	9.3		29.5	23.8
	20.0	14.3		29.0	23.3
50	20.5	14.8	50	29.1	23.4
	24.8	19.1			
	24.1	18.4			
	28.5	22.8			
	28.5	22.8			
2+00	28.2	22.5			

12-16-57   S'ly. baseline ~ N 81° 50' 22" E

STA. 77+50; 0+00 = B/L; SOUND N'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+10	0.0	+2.9	(2.9)	24.0	21.1
(2.9)	2.7	+0.2	2+00	24.1	21.2
2:45	8.0	5.1		24.8	21.9
	11.1	8.2		25.0	22.1
50	15.1	12.2		25.0	22.1
	19.1	16.2		25.0	22.1
	19.5	16.6	50	24.8	21.9
1+80	23.6	20.7			

STA. 78+50; 0+00 = B/L; SOUND N'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			(3.0)	22.8	19.8
(3.0)	2.1	+0.9		24.3	21.3
2:50	7.8	4.8	2+00	25.5	22.5
	10.0	7.0		25.8	22.8
	10.5	7.5		25.4	22.4
50	13.0	10.0		25.6	22.6
	16.0	13.0		25.8	22.8
1+70	18.0	15.0	50	25.5	22.5

STA. 78+00; 0+00 = B/L; SOUND N'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00	2.5	+3.1	2+00	27.0	21.4
	6.0	0.4		27.7	22.1
(5.6)	10.8	5.2		28.0	22.4
9:15	13.0	7.4		27.9	22.3
	14.5	8.9		27.7	22.1
50	15.2	9.6	50	28.0	22.4
	18.9	13.3			
	24.5	18.9			
	26.8	21.2			
	27.0	21.4			

STA. 79+00; 0+00 = B/L; SOUND N'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+10	5.0	+0.5		28.5	23.0
(5.5)	10.8	5.3		28.7	23.2
	13.0	7.5		28.5	23.0
9:20	14.5	9.0		28.9	23.4
50	15.9	10.4	50	28.8	23.3
	16.9	11.4			
	19.0	13.5			
	24.5	19.0			
	28.8	23.3			
2+00	29.0	23.5			

12-16-57 S'ly. baseline

STA. 79+50; 0+00 = B/L; SOUND N'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+20	2.7	+0.4	(31)	25.9	22.8
(31)	8.3	5.2	2+00	25.3	22.2
2;55	13.1	10.0		25.0	21.9
50	15.4	12.3		25.2	22.1
	18.5	15.4		25.2	22.1
	19.3	16.2		25.7	22.6
1+80	22.6	19.5	50	25.7	22.6

STA. 80+00; 0+00 = B/L; SOUND N'LY.

1+00				26.0	21.4
06	0.0	+4.6		26.0	21.4
(46)				25.7	21.1
1:55	4.0	+0.6		25.9	21.3
	5.0	0.4	50	26.0	21.4
50	13.0	8.4			
	14.1	9.5			
	19.8	15.2			
	24.0	19.4			
	26.3	21.9			
2+00	25.9	21.3			

N 81° 50' 22" E

(40)

STA. 80+50; 0+00 = B/L; SOUND N'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+10	+ Trace	+4.1	(31)	24.8	21.7
(31)	2.3	+0.8	2+00	24.1	21.0
3100	6.1	3.6		25.0	21.9
	10.1	7.0		25.3	22.2
50	12.9	9.8		26.3	23.2
	16.0	12.9		25.9	22.8
	19.5	16.4	50	24.9	21.8
1+80	24.0	20.9			

STA. 81+00; 0+00 = B/L; SOUND N'LY.

1+10	1.5	+3.2		27.5	22.8
210	5.0	0.3		27.0	22.3
(47)	10.0	5.3		26.5	21.8
	13.5	8.8		26.7	22.0
50	15.5	10.8	50	26.1	21.4
	18.0	13.7			
	20.3	15.6			
	26.3	21.6			
	27.2	22.5			
2+00	27.5	22.8			

12-16-57 S 1/4 baseline N 81° 50' 22" E

STA 81+50; 0+00 = B/L; SOUND N&Y.

Dist	Sound	Elev.	Dist	Sound	Elev.
1+10			(33)	25.0	21.7
(33)	1.0	+2.3	2+00	25.2	21.9
3:08	4.2	0.9		25.0	21.7
	10.4	7.1		25.3	22.0
50	13.6	10.3		25.1	21.8
	15.3	12.0		25.5	22.0
	20.5	17.2	50	25.2	21.9
1+80	23.8	20.5			

STA 82+00; 0+00 = B/L; SOUND N&Y.

1+10	0.0	+4.8		27.5	22.1
(48)	3.8	+1.0		27.7	22.9
2:20	9.0	4.2		27.0	22.2
	13.5	8.7		27.2	22.4
50	16.0	11.2	50	27.0	22.2
	18.8	14.0			
	22.1	17.3			
	27.0	22.2			
	27.2	22.4			
2+00	27.3	22.5			

STA 82+50; 0+00 = B/L; SOUND N&Y.

Dist	Sound	Elev.	Dist	Sound	Elev.
1+10			(33)	25.5	22.2
(33)	2.3	+0.8	2+00	25.5	22.2
3:13	8.4	5.1		25.5	22.2
	12.5	9.2		25.7	22.4
50	15.3	12.0		26.0	22.7
	17.0	13.7		25.6	22.3
	19.6	16.3	50	25.5	22.2
1+80	25.0	21.7			

STA 83+00; 0+00 = B/L; SOUND N&Y.

1+10	1.5	+2.8		27.0	22.7
(43)	6.0	3.7		26.9	22.6
7:35	12.5	8.2		27.0	22.7
	16.4	12.1		26.9	22.6
50	18.3	14.0	50	26.8	22.5
	19.5	15.2			
	22.3	18.2			
	25.0	20.7			
	26.1	21.8			
2+00	27.0	22.7			

12-17-57 S'14. baseline - N81° 50' 22" E

STA. 83+50; 0+00 = B/L; SOUND N.L.Y.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			0.9	21.1	20.2
0.9				21.9	21.0
1.27	3.2	2.3	2+00	22.5	21.6
	6.6	5.7		22.4	21.5
	9.2	8.3		22.5	21.6
50	12.0	11.1		22.8	22.9
	15.8	14.9		23.7	22.6
1+70	18.7	17.8	50	23.7	22.8

STA. 84+00; 0+00 = B/L.; SOUND N.L.Y.

1+00	3.0	+1.2	2+00	26.5	22.1
1.2	7.5	5.3		27.0	22.6
7.55	9.9	5.7		27.0	22.8
	12.0	7.8		27.0	22.8
	13.2	9.0		26.9	22.7
5.0	15.3	11.1	50	26.8	22.6
	17.0	12.8			
	21.9	17.7			
	23.3	21.3			
	26.1	21.9			

STA. 84+50; 0+00 = B/L; SOUND N.L.Y.

Dist	Sound	Elev	Dist	Sound	Elev
1+10			0.9	22.8	21.9
0.9	00	+0.9	2+00	23.0	22.1
1.35	5.9	5.0		22.9	22.0
	11.6	10.7		22.9	22.0
50	13.9	12.0		23.1	22.2
	14.6	13.7		23.3	22.4
	16.0	15.1	50	23.3	22.4
1+80	20.9	20.0			

STA. 85+00; 0+00 = B/L; SOUND N.L.Y.

1+10	5.5	1.6		26.5	22.6
3.9	11.0	7.1		26.5	22.6
8.25	13.8	9.9		26.5	22.6
	16.2	12.3		26.5	22.6
50	17.8	13.9	50	26.1	22.2
	19.0	15.1			
	19.5	15.6			
	25.0	21.1			
	26.0	22.1			
2+00	26.0	22.1			

12-17-57, S'ly baseline — N 81° 50' 22" E

STA. 85+50; 0+00 = B/L; SOUND NLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			(0.)	20.7	19.8
(0.9)	0.0	+0.9		21.6	20.7
1;40	5.5	4.6	2+00	22.0	21.1
	7.8	6.9		22.2	21.3
	9.3	8.4		22.6	21.7
50	11.9	11.0		22.6	21.7
	14.1	13.2		22.6	21.7
1+70	17.7	16.8	50	22.6	21.7

STA. 86+00; 0+00 = B/L; SOUND NLY.

0+90	0.0	+3.9		23.8	21.9
1+00	4.0	0.1	2+00	26.0	22.1
(3.9)	9.5	5.6		26.4	22.5
	11.5	7.6		26.5	22.6
8.45	12.5	8.6		26.4	22.5
	13.4	9.5		26.1	22.2
50	15.1	11.2	50	25.9	22.0
	18.0	14.1			
	18.8	14.9			
	23.3	19.4			

STA. 86+50; 0+00 = B/L; SOUND NLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			(1.0)	19.6	18.6
(1.0)	2.4	1.4		22.1	21.1
1;48	8.3	7.3	2+00	23.0	22.0
	11.9	10.9		23.4	22.4
	12.9	11.9		23.8	22.8
50	13.8	12.8		23.8	22.8
	14.8	13.8		23.8	22.8
1+70	15.5	14.5	50	24.0	23.0

STA. 87+00; 0+00 = B/L; SOUND NLY.

1+10	2.0	+1.9		26.7	22.8
(3.9)	5.3	1.4		26.9	23.0
9.00	10.8	6.9		26.9	23.0
	13.8	9.9		27.0	23.1
50	17.0	13.1	50	27.4	23.5
	17.9	14.0			
	18.0	14.1			
	23.0	19.1			
	26.7	22.8			
2+00	26.8	22.9			

12-17-57 S'ly base line

STA. 87+50; 0+00 = B/L; SOUND N'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			(10)	20.0	19.0
(10)	1.2	0.2		22.9	21.9
1:55	7.7	6.7	2+00	23.1	22.1
≈	8.9	7.9		23.0	22.0
	9.5	8.5		23.0	
50	10.0	9.0		23.0	
	13.1	12.1		23.0	22.0
1+70	14.0	13.0	50	22.8	21.8

STA. 88+00; 0+00 = B/L; SOUND N'LY.

0+90	0.0	+3.9		23.0	21.1
1+00	4.0	0.1	2+00	23.0	21.1
(39)	9.5	5.6		24.8	20.9
9:25	14.0	10.1		24.9	21.0
≈	14.5	10.6		24.8	20.9
	15.7	11.8		24.9	21.0
50	16.5	12.6	50	24.9	21.0
	16.9	13.0			
	17.2	13.3			
	24.5	20.6			

N 81° 50' 22" E

STA. 88+50; 0+00 = B/L; SOUND N'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			(11)	19.3	18.2
(11)	1.6	0.5		23.3	22.2
2:00	5.7	4.6	2+00	23.7	22.6
≈	8.2	7.1		23.6	22.5
	11.0	9.9		23.4	22.3
50	11.9	10.8		23.8	22.7
	15.2	14.1		23.3	22.2
1+70	15.4	14.3	50	23.1	22.0

STA 89+00; 0+00 = B/L; SOUND N'LY.

1+00	1.0	+2.8	2+00	23.0	19.2
(38)	3.0	1.2		23.0	19.2
9:40	8.3	4.5		23.1	19.3
≈	9.0	5.2		24.0	20.2
	9.0	5.2		24.1	20.3
50	10.0	6.2	50	25.0	21.2
	12.5	8.7			
	19.5	15.7			
	23.0	19.2			
	23.9	20.1			

N 81° 50' 22" E 12-17-57 S'ly. baseline
STA. 89+60; 0+00 = B/L; SOUND N'LY.
S'ly. corner

Dist	Sound	Elev	Dist	Sound	Elev
0+95	0.0	+3.8		20.8	17.0
1+10	6.6	2.8	2+00	22.0	18.2
(3.8)	7.1	3.3		22.9	19.1
	8.1	4.3		23.0	19.2
	8.5	4.7		23.8	20.0
	12.5	8.7		24.0	20.2
60	16.0	12.2	50	24.1	20.6
	17.1	13.3			
1+80	18.0	14.2			

E'ly. baseline (see sketch Pg 1) N 8° 09' 38" W
STA. -1+00; 0+00 = B/L. SOUND W'LY.

1+00			(1.1)	18.8	17.1
(1.1)	4.7	3.6	2+00	19.7	18.6
2:10	9.3	8.2		21.0	19.9
	9.9	8.8		21.0	19.9
	10.3	9.2		21.3	20.2
50	10.3	9.2		21.8	20.7
	10.6	9.5	50	21.7	20.6
	13.6	12.5			
	16.4	15.3			

E'LY. baseline
STA. -0+50, 0+00 = B/L; SOUND W'LY.

Dist	Sound	Elev	Dist	Sound	Elev
0+90			(1.2)	17.3	16.1
1+00				21.2	20.0
(1.2)	2.3	1.1		21.9	20.7
2:20	9.5	8.3	2+00	22.6	21.4
	12.4	11.2		23.0	21.8
	12.0	10.8		22.7	21.5
50	11.6	10.4		22.1	20.9
	13.1	11.9		22.2	21.0
			50	22.4	21.2 ✓

STA. 0+00; 0+00 = B/L; SOUND W'LY.

0+90			(1.3)	24.3	23.0
1+00	0.0	+1.3	2+00	24.6	23.3
(1.3)	4.7	3.4		23.8	22.5
2:27	8.1	6.8		23.0	21.7
	9.6	8.3		23.0	
	11.4	10.1		23.0	
50	11.7	10.4	50	23.0	21.7 ✓
	12.9	11.6			
	18.4	17.1			
	22.9	21.6			

12-17-57

STA. 0+50; 0+00 = B/L E'ly.; SOUND W'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			(1.5)	22.3	20.8
(1.5)	2.4	0.9		23.8	22.3
2:45	8.1	6.6	2+00	24.5	23.0
	9.6	8.1		23.9	22.4
	9.9	8.4		23.3	21.8
50	10.5	9.0		22.8	21.3
	13.9	12.4		23.1	21.6
1+70	19.0	17.5	50	23.9	22.4 ✓

STA. 1+00; 0+00 = B/L E'ly.; SOUND W'LY.

0+90			(1.6)	21.4	19.8
1+00			2+00	24.0	22.4
(1.6)	0.9	+0.7		25.1	23.5
2:50	5.8	4.2		24.0	22.4
	8.3	6.7		23.4	21.8
	10.0	8.4		23.1	21.5
50	11.6	10.0	50	23.1	21.5 ✓
	12.2	10.6			
	14.7	13.1			
	18.0	16.4			

STA. 1+50; 0+00 = B/L E'ly.; SOUND W'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			(1.7)	24.5	22.8
(1.7)	0.8	+0.9		24.1	22.4
3:00	5.4	3.7	2+00	23.4	21.7
	8.4	6.7		23.5	21.8
	9.0	7.3		24.6	22.9
50	10.5	8.8		25.2	23.5
	17.1	15.4		25.1	23.4
1+70	22.4	20.7	50	25.2	23.5 ✓

STA. 2+00; 0+00 = B/L E'ly.; SOUND W'LY.

1+10	3.0	+2.1		27.0	21.9
(5.1)	6.9	1.8		26.3	21.2
3:22	12.7	7.6		26.0	20.9
	14.1	9.0		26.0	20.9
50	14.4	9.3	50	26.0	20.9 ✓
	15.9	10.8			
	18.4	13.3			
	23.8	18.7			
	27.0	21.9			
2+00	27.1	22.0			

E'ly. baseline 12-18-57

STA 2+50: 0+00 = B/L; SOUND W'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+10	3.7	+1.3		26.1	21.1
(5.0)	8.3	3.3	2+00	26.9	21.9
9:30	10.2	5.2		26.2	21.2
	10.5	5.5		25.5	20.5
50	14.6	9.6		25.5	20.5
	16.3	11.3		25.5	20.5
	20.7	15.7	50	25.8	20.8
1+80	24.7	19.7			

STA. 3+00: 0+00 = B/L; SOUND W'LY.

1+10	4.0	+0.8		27.0	22.2
(4.8)	7.8	3.0		26.4	21.6
9:35	10.1	5.3		25.5	20.7
	11.1	6.3		25.5	20.7
50	12.0	7.2	50	25.5	20.7
	16.1	11.3			
	19.3	14.5			
	24.5	19.7			
	26.4	21.6			
2+00	26.8	22.0			

E'ly. baseline

STA 3+50: 0+00 = B/L; SOUND W'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+20	3.5	+1.1		26.0	21.4
(4.6)	7.1	2.5	2+00	27.0	22.4
9:43	10.3	5.7		27.1	22.5
50	10.3	5.7		26.9	22.3
	12.4	7.8		26.7	22.1
	17.6	13.0		27.7	23.1
1+80	23.7	19.1	50	26.8	22.2

STA. 4+00: 0+00 = B/L; SOUND W'LY.

1+10	1.3	+3.1		27.3	22.9
(4.4)	2.4	+2.0		27.3	22.9
9:50	5.8	1.4		27.1	22.7
	7.2	2.8	50	27.0	22.6
50	10.6	6.2			
	12.4	8.0			
	16.0	11.6			
	22.0	17.6			
	26.2	21.8			
2+00	27.3	22.9			
	27.5	23.1			

E'ly. baseline 12-18-57

STA. 4+57.18; 0+00 = B/L; SOUND WLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+10	0.9	+3.5		24.8	20.7
(4.1)	3.1	+1.0	2+00	26.3	22.[illegible]
10:00	7.6	3.5		26.4	22.3
	8.0	3.9		25.9	21.8
50	9.0	4.9		25.5	21.4
	9.3	5.2		25.0	20.9
	14.3	10.2	50	24.9	20.8
1+80	20.6	16.5	Approx P.I. NOTE:	Check Location	Plans for 18" DM

E'ly. B/L N 50° W

STA. 0+34.40; 0+00 = B/L; SOUND WLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+10				25.6	21.6
(4.0)	2.1	+1.9		25.3	21.3
10:08	6.2	2.2		25.2	21.2
	8.2	4.2		25.2	21.[illegible]
50	8.6	4.6	50	25.2	21.[illegible]
	9.7	5.7			
	12.2	8.2			
	19.4	15.4			
	24.2	20.2			
2+00	25.6	21.6			

STA. 1+00; 0+00 = B/L; SOUND WLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+20	0.8	+3.0		24.2	20.4
(3.8)	3.6	+0.2	2+00	22.9	19.1
10:15	7.2	3.4		25.3	21.5
50	7.9	4.1		25.3	21.5
	10.5	6.7		24.3	20.5
	13.0	9.2		23.8	20.0
1+80	17.5	13.7	50	24.0	20.2

STA. 1+50; 0+00 = B/L; SOUND WLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+20	0.0	+3.6		24.8	21.2
(3.6)	1.4	+2.2		24.9	21.3
10:20	3.7	0.1	50	25.1	21.5
50	9.8	6.2			
	14.0	10.4			
	18.4	14.8			
	22.0	18.4			
	23.1	19.5			
2+00	23.3	19.7			
	23.9	20.3			
	24.3	20.7			

12-18-57 E'ly. B/L

STA. 2+00; 0+00 = B/L; Sound W.L.:

Dist	Sound	Elev
1+10		
(3.4)		
10:27	2.9	+0.5
	7.4	4.0
50	13.1	9.7
	15.9	12.5
	17.2	13.8
1+80	19.3	15.9

STA. 2+50; 0+00 = B/L; Sound W.L.:

Dist	Sound	Elev
1+00		
(3.3)	0.0	+3.3
10:35	1.1	+2.2
	1.9	+1.4
	5.5	2.2
50	11.5	8.2
	16.4	13.1
	17.0	13.7
	21.1	17.8
	24.2	20.9

Dist	Sound	Elev
	23.4	20.0
2+00	24.6	21.2
	24.9	21.5
	25.0	21.6
	25.1	21.7
	24.7	21.3
50	24.8	21.4

Dist	Sound	Elev
2+00	27.0	23.7
	26.8	23.5
	26.9	23.6
	27.0	23.7
	27.0	23.7
50	27.1	23.8

N 50° W

STA. 3+00; 0+00 = B/L; Sound W.L.:

Dist	Sound	Elev
1+10		
(3.2)	1.1	+2.1
10:40	5.0	1.8
	11.1	7.9
50	14.0	10.8
	18.2	15.0
	21.3	18.1
1+80	23.3	20.1

Dist	Sound	Elev
2+00	24.1	20.9
	24.2	21.0
	24.3	21.1
	24.4	21.2
	24.5	21.3
50	24.6	21.4 ✓

STA. 3+50; 0+00 = B/L; Sound W.L.:

Dist	Sound	Elev
1+10		
(3.1)	1.2	+1.9
10:48	4.8	1.7
	10.3	7.2
50	14.0	10.9
	16.8	13.7
	20.4	17.3
	23.6	20.5
	23.8	20.7
2+00	24.0	20.9

Dist	Sound	Elev
	23.9	20.7
2+00	24.1	20.9
	24.2	21.0
	24.3	21.1
	24.4	21.2
	24.5	21.3
50	24.6	21.4 ✓

Dist	Sound	Elev
	24.0	20.9
	24.0	20.9
	23.8	20.7
	24.0	20.9
50	24.1	21.0 ✓

12-17-57 E14 B/L ~ N50°W

STA. 4+00; 0+00 = B/L; SOUND W.L.

Dist	Sound	Elev	Dist	Sound	Elev
1+20	0.0	+4.1	(41)	25.1	21.0
(41)	3.4	+0.7	2+00	25.1	21.0
9:23	9.0	4.9		24.9	20.8
50	15.6	11.5		24.7	20.6
	18.9	14.8		24.7	20.6
	21.9	17.8		25.0	20.9
1+80	24.3	20.2	50	25.0	20.9

STA. 4+50; 0+00 = B/L; SOUND W.L.

1+20	0.0	+4.0	(40)	24.7	20.6
(40)	4.2	0.2		24.6	20.6
9:30	9.5	5.5	50	24.7	20.7
50	14.4	10.4			
	19.5	15.5			
	22.6	18.6			
	24.3	20.3			
	24.4	20.4			
2+00	24.5	20.5			
	24.0	20.0			
	24.2	20.2			

STA. 5+00; 0+00 = B/L; SOUND W.L.

Dist	Sound	Elev	Dist	Sound	Elev
1+20	3.4	+0.5	(39)	23.3	19.4
(39)	10.2	6.3	2+00	23.3	19.4
9:35	13.4	9.5		23.3	19.4
50	17.0	13.1		23.7	19.8
	20.1	16.2		24.1	20.2
	21.5	17.6		23.9	20.0
1+80	22.6	18.7	50	23.9	20.0 ✓

STA. 5+50; 0+00 = B/L; SOUND W.L.

1+20			(36)	25.3	21.7
(36)	1.6	+2.0		25.3	21.7
9:45	7.0	3.4	50	24.7	21.1 ✓
50	14.2	10.6			
	19.6	16.0			
	23.6	20.0			
	26.0	22.4			
	26.0	22.4			
2+00	25.9	22.3			
	25.9	22.3			
	24.9	21.3			

12-17-57 Elv. B/L N 58° W

STA. 6+00; 0+00 = B/L; SOUND WLY.

Dist	Sound	Elev
1+20	0.0	+3.5
(35)	4.3	0.5
9:50	11.0	7.5
50	17.8	14.3
	22.3	19.8
	23.3	19.8
1+80	23.9	20.4

STA. 6+50; 0+00 = B/L; SOUND WLY.

Dist	Sound	Elev
1+00		
(3.0)	1.4	+1.6
10:12	7.2	4.2
	11.4	8.4
	16.4	13.4
50	20.6	17.6
	23.1	20.1
	24.0	21.0
	24.2	21.2
	24.1	21.1
2+00	24.2	21.2

Dist	Sound	Elev
(35)	24.2	20.7
2+00	24.6	21.1
	24.8	21.3
	25.0	21.5
	25.0	21.5
	25.1	21.6
50	25.2	21.7
(30)	24.3	21.3
	24.2	21.2
	24.2	21.2
	24.1	21.1
50	23.9	20.9

STA. 7+00; 0+00 = B/L; SOUND WLY.

Dist	Sound	Elev.
1+00	0.4	+2.7
(31)	5.0	1.9
10:05	8.8	5.7
	10.8	7.7
	15.7	12.6
50	19.4	16.3
	22.3	19.2
1+70	23.5	20.4

STA. 7+50; 0+00 = B/L; SOUND WLY.

Dist	Sound	Elev
1+00		
(28)	3.4	0.6
10:20	10.2	7.4
	13.5	10.7
	16.3	13.5
50	18.1	15.3
	21.1	18.3
	23.8	21.0
	23.9	21.1
	24.1	21.3

Dist	Sound	Elev
(3.1)	24.2	21.1
	24.3	21.4
2+00	24.8	21.7
	24.6	21.5
	24.8	21.7
	25.3	22.2
	25.0	21.9
50	24.9	21.8 ✓
2+00	24.3	21.5
(2.8)	24.6	21.8
	24.8	22.0
	25.0	21.2
	24.3	21.5
50	24.0	21.2 ✓

12-17-57 E'14 B/L ~ N 50° W

STA. 8+00; 0+00 = B/L; SOUND WLK.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			(25)	23.4	20.9
(23)				24.1	21.6
10:33	1.6	+0.9	2+00	24.5	22.0
	4.8	2.3		24.3	21.8
	8.3	5.8		24.1	21.6
50	14.1	11.6		24.2	21.7
	19.0	16.5		24.2	21.7
1+70	23.0	20.5	50	24.6	22.1

STA. 8+50; 0+00 = B/L; SOUND WLK.

1+20	0.0	+2.4	(24)	23.8	21.4
(24)	5.0	2.5		23.8	21.4
10:40	9.8	7.3		23.7	21.3
50	13.7	11.2	50	23.8	21.4
	19.2	16.7			
	22.2	19.7			
	23.2	20.7			
	23.6	21.1			
2+00	23.8	21.3			
	24.0	21.5			

STA. 9+00; 0+00 = B/L; SOUND WLK.

Dist	Sound	Elev	Dist	Sound	Elev
1+20	2.2	0.1	(21)	22.0	19.9
(21)	8.1	6.0	2+00	22.3	20.2
1053	11.4	9.3		23.1	21.0
50	14.7	12.6		23.6	21.5
	19.2	17.1		23.7	21.6
	20.8	18.7		23.9	21.8
1+80	21.1	19.0	50	23.9	21.8 ~

STA. 9+50; 0+00 = B/L; SOUND WLK.

1+10			(20)	22.2	20.2
(20)	1.3	+0.7		22.3	20.3
1051	8.9	6.9		22.2	20.2
	13.3	11.3	50	22.1	20.1 ~
50	15.5	13.5			
	18.3	16.3			
	20.0	18.0			
	22.9	20.9			
	23.0	21.0			
2+00	23.0	21.0			
	22.8	20.8			

12-17-57 E'ly B/L — N 50° W

STA. 10+00; 0+00 = B/L; SOUND W.L.Y.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			(1.9)	22.9	21.3
(1.9)				23.0	21.1
11:05	1.0	+0.9	2+00	23.2	21.3
	4.8	2.9		23.7	21.8
	10.0	8.1		23.9	22.0
50	13.2	11.3		23.8	21.9
	18.2	16.3		23.3	21.4
1+70	21.9	20.0	50	23.1	21.2

STA. 10+50; 0+00 = B/L; SOUND W.L.Y.

0+90			(1.7)	21.2	19.5
1+00	0.0	+1.7	2+00	21.3	19.6
(1.7)	4.5	2.8		22.2	20.5
11:15	7.3	5.6		22.8	21.1
	10.1	9.0		23.0	21.3
	12.3	10.6		23.2	21.5
50	15.4	13.7	50	23.4	21.7
	18.8	17.1			
	18.2	16.5			
	18.9	17.2			

STA. 11+00; 0+00 = B/L; SOUND W.L.Y.

Dist	Sound	Elev	Dist	Sound	Elev
1+00	0.0	+1.6	(1.6)	20.1	18.5
(1.6)	5.4	3.8		20.9	19.3
11:25	8.1	6.5	2+00	21.3	19.7
	12.9	11.3		21.4	19.8
	14.1	12.5		21.7	20.1
50	15.9	14.3		21.4	19.8
	18.8	17.2		21.4	19.8
1+70	19.8	18.2	50	21.6	20.0

STA. 11+50; 0+00 = B/L; SOUND W.L.Y.

0+90			(1.5)	22.2	20.7
1+00			2+00	22.2	20.7
(1.5)	3.0	1.5		22.3	20.8
11:30	8.0	6.5		22.6	21.1
	10.9	9.4		22.9	21.4
	13.1	11.6		23.0	21.5
50	17.8	16.3	50	23.1	21.6
	18.2	16.7			
	21.9	20.4			
	22.1	20.6			

12-17-57 E'ly. B/L ~ N50° W

STA. 12+00; 0+00 = B/L; SOUND W'LY.

Dist	Sound	Elev	Dist	Sound	Elev
0+90			(1.3)	20.8	19.5
1+00	2.9	1.6		22.0	20.7
(1.3)	6.9	5.6	2+00	22.6	21.3
11+40	8.1	6.8		22.9	21.6
	10.5	9.2		22.9	21.6
	12.0	10.7		22.3	21.0
50	16.0	14.7		22.5	21.3
	20.0	18.7	50	22.8	21.5 ✓
1+70	20.4	19.1			

STA. 12+50; 0+00 = B/L; SOUND W'LY.

0+80			(1.3)	21.1	19.8
(1.3)				22.0	20.7
1+00	1.5	0.2		22.5	21.2
11+45	6.8	5.5	2+00	23.0	21.7
	7.3	6.0		22.9	21.6
	10.6	9.3		22.8	21.5
	11.9	10.6		22.7	21.4
50	17.0	15.7		22.8	21.5
	17.1	15.8	50	22.5	21.2 ✓

STA. 13+00; 0+00 = B/L; SOUND W'LY.

Dist	Sound	Elev.	Dist	Sound	Elev
0+90	0.0	+2.6		24.0	21.4
1+00	3.7	1.1		24.0	21.4
(2.6)	10.5	7.9	2+00	23.9	21.3
11+00	12.6	10.0		24.1	21.5
	13.2	10.6		23.9	21.3
	14.8	12.2		23.9	21.3
50	17.6	15.0		24.0	21.4
	18.8	16.2	50	24.1	21.5 ✓
1+70	22.8	20.2			

STA. 13+50; 0+00 = B/L; SOUND W'LY.

				20.7	18.2
0+80				24.4	21.9
				24.8	22.3
1+00	0.2	+2.3		24.9	22.5
(2.5)	2.4	+0.1	2+00	25.1	22.6
11+05	5.5	3.0		25.0	22.5
	8.2	5.7		24.9	22.4
	11.9	9.4		24.8	22.3
50	15.4	12.9		24.9	22.4 ✓
	16.7	14.2	50		

12-18-57 E'ly B/L — N50°W

STA. 14+00; 0+00=B/L; SOUND WLY.

Dist	Sound	Elev	Dist	Sound	Elev
0+90				22.8	20.4
1+00	0.0	+2.4		23.1	20.7
(2.4)	5.2	2.8	2+00	23.1	20.7
11:10	9.1	6.7		23.7	21.3
	10.2	7.8		24.4	22.0
	12.2	9.8		24.1	21.7
50	13.5	11.1		24.0	21.6
	14.4	12.0	50	24.0	21.6
1+70	19.2	16.8			

STA 14+50; 0+00=B/L; SOUND WLY.

Dist	Sound	Elev	Dist	Sound	Elev
0+80				21.5	19.3
(2.2)				23.7	21.5
1+00				23.7	21.5
11:18	0.0	+2.2	2+00	23.4	21.2
	5.4	3.2		23.3	21.1
	10.3	8.1		23.6	21.4
	12.9	10.7		23.6	21.4
50	16.3	14.1		23.7	21.5
	19.1	16.9	50	23.9	21.7

STA. 15+00; 0+00=B/L; SOUND WLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+10	0.0	+2.1		22.0	19.9
(2.1)	4.4	2.3	2+00	23.0	20.9
11:23	8.6	6.5		23.3	21.2
	11.1	9.0		23.5	21.4
50	14.9	12.8		23.1	21.0
	17.8	15.7		23.1	21.0
	22.3	20.2	50	23.3	21.2
1+80	22.1	20.0			

(Also P. 64)

E'ly N50°W Nely corner

STA. 15+68.35; 0+00=B/L; SOUND WLY. (Also P. 64)

Dist	Sound	Elev	Dist	Sound	Elev
1+10				22.6	20.9 ✓
(2.0)	1.6	+0.4 ✓		22.9	20.9 ✓
11:30	6.2	4.2 ✓		22.9	20.9 ✓
	9.7	7.7 ✓		23.0	21.0 ✓
50	10.5	8.5 ✓	50	23.2	21.2 ✓✓
	16.4	14.4 ✓			
	22.6	20.6 ✓			
	22.0	20.0 ✓			
	22.2	20.2 ✓			
2+00	22.1	20.1 ✓			

Nely. Corner 12-18-57 N'ly. B/L ——— S 81° 50' 22" W

STA. 79+36.80; 0+00 = B/L; SOUND SLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+10				22.0	20.2
(1.8)	0.0	+1.8 ✓	2+00	22.3	20.5
11:40	6.0	4.2 ✓		22.3	20.5
	10.8	9.0 ✓		22.0	20.2
50	14.1	12.3 ✓		21.8	20.0
	19.0	17.2 ✓		22.3	20.5
	21.5	19.7 ✓	50	22.8	21.0 ✓
1+80	21.8	20.0 ✓			

STA. 79+00; 0+00 = B/L; SOUND SLY.

1+10				22.8	21.2
(1.6)	1.1	+0.5 ✓		23.1	21.5
11:47	6.8	5.2 ✓		23.1	21.5
	10.6	9.0 ✓		22.9	20.3
50	14.4	12.8 ✓	50	22.7	20.1
	19.1	17.5 ✓			
	21.8	20.2 ✓			
	22.2	20.6 ✓			
	22.2	20.6 ✓			
2+00	22.6	21.0 ✓			

STA 78+50; 0+00 = B/L; SOUND SLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00				22.8	21.4 ✓
(1.4)	0.0	+1.4 ✓		22.8	21.4 ✓
11:53	7.1	5.7 ✓	2+00	23.0	21.6 ✓
	9.4	8.0 ✓		22.6	21.2 ✓
	13.0	11.6 ✓		22.6	21.2 ✓
50	16.0	14.6 ✓		22.4	21.0 ✓
	16.9	15.5 ✓		22.7	21.3 ✓
1+70	22.1	20.7 ✓	50	23.0	21.6 ✓

STA. 78+00; 0+00 = B/L; SOUND SLY.

0+80	(Also P. 63)			21.6	21.3 ✓
(0.3)	0.4	0.1 ✓		22.0	21.7 ✓
1+00	2.0	1.7 ✓	2+00	22.0	21.7 ✓
1:00	2.2	1.9 ✓		21.7	21.4 ✓
	3.4	3.1 ✓		21.7	21.4 ✓
	7.9	7.6 ✓		21.5	21.2 ✓
	12.7	12.4 ✓		21.9	21.6 ✓
50	17.4	17.1 ✓	50	22.1	21.8 ✓
	18.0	17.7 ✓			
	18.8	18.5 ✓			

(Begin Rip-Rap) 12-18-57 N'ly B/L — ~S 81°50'22" W

STA. 77+50; 0+00 = B/L; SOUND SLY

Dist	Sound	Elev	Dist	Sound	Elev
0+60			50	16.5	16.2 ✓
(0.3)				17.2	16.9 ✓
1:07	3.4	3.1 ✓		17.2	16.9 ✓
	5.2	4.9 ✓		22.2	21.9 ✓
1+00	8.8	8.5 ✓		23.0	22.7 ✓
	9.1	8.8 ✓	2+00	23.0	22.7 ✓
	10.2	9.9 ✓		22.6	22.3 ✓
				22.0	21.7 ✓
	11.9	11.6 ✓		21.0	20.6 ✓
				21.5	21.2
1+40	16.1	15.8 ✓	50	21.2	20.9 ✓

STA. 77+00; 0+00 = B/L; SOUND SLY

Dist	Sound	Elev	Dist	Sound	Elev
1+10			2+00	21.5	21.2
(0.3)	4.5	4.2 ✓		21.7	21.4
1:15	9.9	9.6 ✓		21.4	21.1
	12.8	12.5 ✓		21.1	20.8
50	14.0	13.7 ✓		21.0	20.7
	15.0	14.7 ✓	50	21.4	21.1
	14.8	14.5 ✓			
	16.4	16.1 ✓			
	20.9	20.6 ✓			

STA 76+50; 0+00 = B/L; SOUND SLY.

Dist	Sound	Elev	Dist	Sound	Elev ✓
1+10				21.2	20.9 ✓
(0.3)	1.2	0.9 ✓	2+00	21.8	21.5 ✓
1:20	7.0	6.7 ✓		21.5	21.2 ✓
	9.0	8.7 ✓		21.6	21.3 ✓
50	9.5	9.2 ✓		21.4	21.1 ✓
	10.9	10.6 ✓		21.2	20.9 ✓
	15.8	15.5 ✓	50	21.4	21.1 ✓
1+80	16.0	15.7	+85		

STA. 76+00; 0+00 = 15' NLY BULKHEAD SOUND SLY.

Dist	Sound	Elev	Dist	Sound	Elev
0+20				21.6	21.3 ✓
(0.3)				21.6	21.3 ✓
1:27	3.1	2.8 ✓		21.6	21.3 ✓
50	6.3	6.0 ✓	50	21.9	21.6 ✓
	9.0	8.7 ✓		21.9	21.6 ✓
	9.3	9.0 ✓	1+70	21.9	21.6 ✓
	11.8	11.5 ✓			
	15.3	15.0 ✓			
1+00	20.1	20.8 ✓			
	21.1	20.8 ✓			

12-18-57 N¼ B/L — 81° 50' 22" W

STA. 75+50; 0+00 = 15 N'LY OF BULKHEAD; SOUND SL.Y.

Dist	Sound	Elev	Dist	Sound	Elev
0+20			1+00	19.0	18.7
(0.3)				20.9	20.6
1:35	3.7	3.4		21.2	20.9
50	7.2	6.9		21.2	20.9
	8.9	8.6		21.0	20.7
	10.1	9.8	50	20.8	20.5
	10.6	10.3		20.8	20.5
0+90	13.5	13.2	1+70	21.3	21.0

(End RIP-RAP)

STA. 75+00; 0+00 = B/L; SOUND SL.Y.

1+20				18.0	18.7
(0.3)	4.6	4.3		19.4	19.1
1:45	7.2	6.9		20.0	19.7
50	9.0	8.7	50	20.4	20.1
	10.1	9.8		20.4	20.1
	12.8	12.5			
	14.8	14.5			
	15.0	14.7			
2+00	16.1	15.8			
	16.2	15.9			

STA. 74+50; 0+00 = B/L; SOUND SL.Y.

Dist	Sound	Elev	Dist	Sound	Elev
1+10				19.8	19.5
(0.3)			2+00	19.8	19.5
1:53	0.3	0.0		19.5	19.2
	5.8	5.5		19.4	19.1
50	10.4	10.1		19.8	19.5
	14.0	13.7		20.1	19.8
	14.5	14.2	50	20.3	20.0
1+80	17.9	17.6	(Also P. 62)		

STA. 74+00; 0+00 = B/L; SOUND SL.Y.

1+10				24.2	23.9
(0.3)				23.3	23.0
2:00	0.0	+0.3		24.1	23.8
	5.5	5.2		23.2	22.9
50	9.3	9.0	50	23.0	22.7
	10.1	9.8			
	13.6	13.3	(Also P. 62)		
	18.5	18.2			
	22.1	22.4			
2+00	23.6	23.3			

12-18-57 N'LY. B/L. — S 81° 50' 22" W

STA. 73+50; 0+00 = B/L; SOUND SLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+10					
(0.3)	2.0	1.7 ✓	2+00		
2+10	6.0	5.7 ✓			
	8.8	8.5 ✓			
50	10.9	10.6 ✓			
	13.4	13.1 ✓			
	20.3	20.0 ✓	50		
1+80	also P. 62				

STA. 73+00; 0+00 = B/L; SOUND SLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00			2+00		21.2
(0.3)					21.3
2+15	6.1	5.8 ✓			21.4
	10.0	9.7 ✓			21.4
	14.2	13.9 ✓			21.5
50	15.7	15.4 ✓	50		21.6
	18.3	18.0 ✓			
	20.6	20.3 ✓			
		20.9 ✓	Also P. 62		
		21.1 ✓			

NOTE: These Secs Could not be Completed because of boats & Piers on Line

STA 72+50; 0+00 = B/L; SOUND SLY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00				21.1	20.7 ✓
(0.4)	3.2	2.8 ✓		21.4	21.0 ✓
2+20	7.5	7.1 ✓	2+00		
	9.9	9.5 ✓	(also P. 61)		
	11.0	10.6 ✓			
50	14.3	13.9 ✓			
	18.3	17.9 ✓			
1+70	21.1	20.7 ✓	50		

STA 72+00; 0+00 = B/L; SOUND SLY.

Dist	Sound	Elev	Dist	Sound	Elev
0+90	(Also P. 61)			22.0	21.6 ✓
1+00			2+00		22.1 ✓
(0.4)	0.6	0.2 ✓			22.2 ✓
2+25	5.2	4.8 ✓			22.1 ✓
	7.7	7.3 ✓			22.0 ✓
	9.6	9.2 ✓			22.0 ✓
✓ 50	12.5	12.1 ✓	50		22.1 ✓
	17.5	17.1 ✓			
	19.4	19.0 ✓			
	21.8	21.4 ✓			

12-18-57 N'ly. B/L S81°50'2[illegible]

STA. 71+48; 0+00 = B/L; SOUND S'LY.

Dist	Sound	Elev	Dist	Sound	Elev
1+00				20.2	19.7 ✓
(0.5)	0.0	+0.5 ✓			20.1
21, 30	5.3	5.8 ✓	2+00		20.2 ✓
	6.3	5.8 ✓			20.0 ✓
	6.6	6.1 ✓			20.0 ✓
50	8.0	7.5 ✓			20.1 ✓
	12.8	12.3 ✓			20.9 ✓
1+70	14.9	14.4 ✓	50		22.0 ✓
					22.3

(Additional P. 61)

LOCATION OF TEST HOLES QUIVIRA BASIN MISSION BAY W.O. 64043

		Ground Elev
HOLE No 1	N5,020; W16547	12.0
HOLE No 2	N3188; W15908	12.4

N'ly. B/L 1-31-58 (See S 81° 50' 22" W (61)

ADDITIONAL CROSS SECTIONS QUIVIRA BASIN

0+00 = B/L. (See Sketch Pg 1) N'LY SIDE

STA. 71+48 (Direct Elev Rod used)

Sta	Elev
B.M.	13.75 Top Fire Hyd. (See Pg. 35)
S81	11.0 ✓
S85	6.2 ✓
S108	1.9 ✓
S111 (Also P. 60)	0.2 ✓

STA. 72+00 (Also P. 59)

S83	11.3 ✓
S85	6.0 ✓
S108	1.9 ✓
S111	0.2 ✓

STA. 72+50 (Also P. 59)

S78	11.2 ✓
S81	6.4 ✓
S100	2.1 ✓
S105	0.2 ✓

N'ly. B/L 1-31-58 S81° 50'22"W

STA. 73+00 = BEGIN RIP-RAP

STA	Elev	
579	11.4 ✓	
582	6.0 ✓	
5106	2.4 ✓	
5112 (Also P. 59)	0.2 ✓	

STA. 73+20 SEC. THROUGH RIP-RAP

590	11.2	
5102	2.4	Toe Rip-Rap

STA. 73+50 - Rip-Rap

590	11.6 ✓	
5103	3.4 ✓	Toe Rip-Rap
5121	2.1 ✓	
5123 (Also P. 59)	0.3 ✓	

STA. 73+64 = East End Rip-Rap

585	11.8	
586	5+	
5105	3.5	Toe

(62)

STA. 74+00 (Also P. 58)

Sta	Elev	
5.84	12.2 ✓	
5.89	6.7 ✓	
5.128	2.8 ✓	
5.134	0.5 ✓	

STA. 74+50 (Also P. 58)

582	11.5 ✓	
589	7.4 ✓	
5128	2.5 ✓	
5134	1.6 ✓	

NOTE: STA. 74+87 = Begin Rip-Rap

5101	12.0	
5105	6.9	
5115	2.9	Toe Rip Rap

NOTE: No Change @ Sta. 75+00; Rip-Rip Continues through Sta. 77+50 E'ly)

(Also P. 8 & 17) 1-31-58

STA 14+50 (See Sketch Pg. 1)

Sta.	Elev	
E 32	11.8	
E 48	0.6	Toe Rip-Rap

(Also P. 9 & 17) STA. 15+00

E 39	10.8	
E 51	1.2	Toe Rip-Rap

(Also P. 9 & 17) STA. 15+50

E 42	11.6	
E 58	1.4	Toe Rip-Rap

(Also P. 9 & 17) STA. 16+00

E 38	11.2	
E 53	2.2	Toe Rip-Rap
E 71	0.3	

(Also P. 9)

STA. 16+50 = NLY. End of Rip-Rap

E 52	11.7 ✓	
E 65	2.6	Toe Rip-Rap
E 85	1.0 ✓	

STA. 16+90 (Also P. 9)

Sta.	Elev	
E 92	11.2 ✓	
E 94	6.2 ✓	
E 115	3.3 ✓	
E 150	2.0 ✓	

NLY SEC'S CONTD ELY.

STA. 78+00 (Also P. 56)

S. 54	11.0 ✓	
S. 57	6.1 ✓	
S. 66	2.6 ✓	
S. 77	1.5 ✓	

STA. 78+50 (Also P. 56)

S 60	11.0 ✓	
S 62	6.3 ✓	
S 111	2.4 ✓	
S 112	1.1 ✓	

STA 79+00 (Also P.56)

Sta.	Elev.	✓
S 85	10.8	✓
S 88	6.8	✓
S 115	2.8	✓
S 119	1.2	✓

(Also P.56) STA 79+36.80 (see sketch)

S 85	11.0	✓
S 87	6.7	✓
S 117	2.0	✓

(Also P.55) STA. 15+68.35

W. 76	10.9	✓
W. 79	6.6	✓
W 112	1.7	✓

STA. 15+00 (Also P.55)

W. 60	11.4	✓
W. 62	6.7	✓
W. 92	4.0	✓
W 94	1.9	✓
B.M.	~13.75 P9.61	

2-27-58 (64)

ADDITIONAL SEC'S QUIVIRA BASIN AREA

STA. 70+00; 0+00 = NLY B/L

STA	Elev	
BM	13.75	Top Fire Hyd.
N 100	11.4	
N 200	11.8	
N 236	12.1	Top Fill
N 247	5.6	Toe

STA. 70+58; 0+00 = NLY B/L.

N 100	11.9	
N 200	12.1	
N 300	12.5	
N 312	12.5	Top Fill
N 324	6.2	Toe

STA 71+48; 0+00 = NLY B/L

N 100	12.5	
N 200	12.0	
N 300	12.2	
N 400	12.6	
N 442	12.3	Top Fill
N 450	8.7	Toe

2-27-58

STA 72+00; 0+00 = NLY B/L

STA	Elev	
N. 100	12.5	
N. 200	11.5	
N. 300	11.9	
N. 400	11.9	
N. 489	12.4	Top Fill
N 495	8.4	Toe

STA. 73+00; 0+00 = NLY B/L

N 100	11.9	
N 200	11.3	
N 300	11.3	
N 400	11.5	
N 500	12.4	

STA. 74+00; 0+00 = NLY. B/L.

N 100	11.9	
N 200	11.4	
N 300	11.4	
N 400	11.6	
N 500	11.9	

STA. 75+00; 0+00 = NLY. B/L

Sta	Elev	
N 100	11.8	
N 200	11.6	
N 300	11.7	
N 400	11.7	

STA. 76+00; 0+00 = NLY. B/L

N 100	11.9	
N 200	11.4	
N 300	11.6	
N 400	11.9	

STA 77+00; 0+00 = NLY B/L

N 47	12.69	S14 E.P.
N 77	12.67	N14 E.P.
N 100	12.2	
N 200	11.9	
N 300	12.2	

2-27-58

STA. N 78+00; 0+00 = N'LY. B/L

Sta	Elev	
N. 5	12.4	
N. 40	12.0	
N. 46±	13.01	S'LY E.P.
N. 77±	13.14	N'LY E.P.
N. 100	12.2	
N. 194	11.8	
N. 220	12.9	
N. 285	13.2	
N 288	13.5	
N 300	13.8	

STA 79+00; 0+00 = N'LY. B/L

N 36	12.6	
N 42±	13.46	S'LY E.P.
N 73±	13.57	N'LY E.P.
N 100	12.6	
N 159	12.8	
N 187	13.8	
N 200	13.8	

STA. 80+00; 0+00 = N'LY B/L

Sta	Elev	
N. 8	13.1	
N. 17±	13.89	S'LY E.P.
N. 49±	13.96	N'LY E.P.
N. 54	13.4	
N 100	13.3	

STA. 15+00; 0+00 = N'ELY. B/L

E 100	13.8

ST 14+00; 0+00 = N'ELY B/L

E 10	13.1
E 100	13.6
E 175	13.5
E 200	14.3

STA 13+00; 0+00 = N'ELY B/L

E 100	13.4
E 200	13.7

STA 12+00; 0+00 = N'ELY B/L

E 100	14.3
E 200	14.4

2-27-58

STA. 11+00; 0+00 = NELY B/L	
Sta	Elev
E177	15.0
E200	15.1
E300	15.1
STA 10+00; 0+00 = NELY. B/L	
E150	15.3
E200	15.0
E210	15.5
E300	15.5
STA. 9+00; 0+00 = NELY B/L	
E200	14.8
E247	15.2
E300	15.0
STA. 8+00; 0+00 = NELY. B/L	
E242	12.2
E259	14.6
E300	15.4
E400	15.4

STA. 7+00; 0+00 = N'ELY B/L		
Sta	Elev	
E308	14.3	
E346	14.5	
E360	15.0	
E400	14.8	
STA. 6+00; 0+00 = N'ELY B/L		
E343	11.8	Toe Road
E360	14.1	Top Shldr
E400	13.7	
STA. 5+00; 0+00 = N'ELY. B/L		
E374	11.5	
E400	12.1	Toe
E426	13.7	Top Rd
E500	13.6	
STA. 4+00; 0+00 = N'ELY B/L		
E400	11.6	
E434	11.2	Toe
E446	13.0	Top Rd
E500	13.4	

2-27-58

STA 3+00; 0+00 = N'ELY B/L

Sta	Elev
E 400	11.3
E 500	11.0

STA. 2+00; 0+00 = N'ELY B/L

E 300	12.0
E 400	11.2
E 500	10.3

STA 1+00; 0+00 = N'ELY B/L

E 300	11.6
E 400	11.0
E 500	10.7

STA 0+34.40; 0+00 = N'ELY B/L

E 300	11.4
E 400	11.0
E 500	11.2
TP	10.80

B/L Sta 1+50

STA. 5+29.80; 0+00 = B/L SEC. ELY N 60° 55' 11" E

Sta	Elev
0	11.2
E 100	11.5
E 177	12.4
E 200	11.7
E 300	11.1
E 400	10.8
E 500	11.4

STA. 4+57.18; 0+00 = ELY. B/L

E 300	11.6
E 400	11.4
E 500	11.1

STA. 4+00; 0+00 = E'LY B/L.

E 300	12.2
E 400	12.2
E 500	11.5

2-27-58

STA. 3+00; 0+00 = E'LY B/L

Sta	Elev
E 300	12.6
E 400	12.2
E 500	12.3

STA. 2+00; 0+00 = E'LY B/L

E 300	12.9
E 400	12.8
E 500	12.0

TBM.	14.07	(P9.25) ≈14.04

3:5 1:20

1:6 2:40

TR 13.50 - 13.69 FK

300

9 - ~~400~~

10 - ~~350~~ 250

11 - " - 250

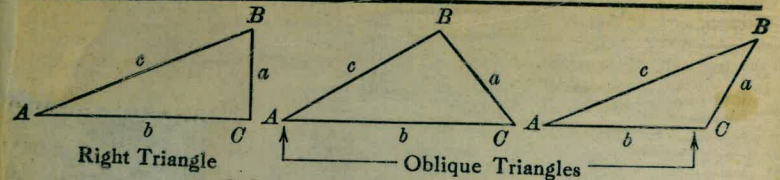
12 - ~~300~~ 200

13 - ~~260~~ 160

14 - ~~250~~ 150

15 - ~~200~~ 100

TRIGONOMETRIC FORMULÆ



Right Triangle — Oblique Triangles

Solution of Right Triangles

For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\text{cosec} = \frac{c}{a}$

Given	Required	
a, b	A, B, c	$\tan A = \frac{a}{b} = \cot B,\ c = \sqrt{a^2 + b^2} = a\sqrt{1 + \frac{b^2}{a^2}}$
a, c	A, B, b	$\sin A = \frac{a}{c} = \cos B,\ b = \sqrt{(c+a)(c-a)} = c\sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90° - A,\ b = a \cot A,\ c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90° - A,\ a = b \tan A,\ c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90° - A,\ a = c \sin A,\ b = c \cos A$,

Solution of Oblique Triangles

Given	Required	
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A},\ C = 180° - (A + B),\ c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a},\ C = 180° - (A + B),\ c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180° - C,\ \tan \frac{1}{2}(A - B) = \frac{(a-b)\tan \frac{1}{2}(A+B)}{a+b},\ c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2},\ \sin \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{bc}},\ \sin \frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{ac}},\ C = 180° - (A+B)$
a, b, c	Area	$s = \frac{a+b+c}{2},\ \text{area} = \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area	$\text{area} = \frac{bc \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

70+7.5

90+17.5

REDUCTION TO HORIZONTAL

Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus: slope distance = 319.4 ft. Vert. angle = 5° 10′. From Table, Page IX. cos 5° 10′ = .9959. Horizontal distance = 319.4 × .9959 = 318.09 ft. Horizontal distance also = Slope distance minus slope distance times (1 — cosine of vertical angle) With the same figures as in the preceding example, the following result is obtained. Cosine 5° 10′ = .9959. 1 — .9959 = .0041. 319.4 × .0041 = 1.31. 319.4 — 1.31 = 318.09 ft.

When the rise is known, the horizontal distance is approximately:—the slope distance less the square of the rise divided by twice the slope distance. Thus: rise = 14 ft., slope distance = 302.6 ft. Horizontal distance $= 302.6 - \frac{14 \times 14}{2 \times 302.6} = 302.6 - 0.32 = 302.28$ ft.