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SURVEY DATA

FOR

THUNDERBIRD ROAD

ARIZONA CANAL DIVERSION CHANNEL

Sverdrup

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SURVEY DATA

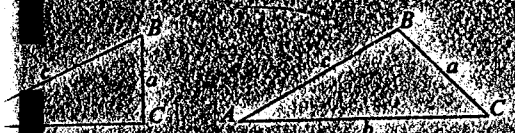
FOR

THUNDERBIRD ROAD

ARIZONA CANAL DIVERSION CHANNEL

BOOK #1/Pg #1

ULAE FOR SOLVING RIGHT TRIANGLES



$A = \frac{a}{c} = \text{Cos } B \qquad \text{Cot } A = \frac{b}{a} = \text{Tan } B$

$= \frac{b}{c} = \text{Sin } B \qquad \text{Sec } A = \frac{c}{b} = \text{Cosec } B$

$= \frac{a}{b} = \text{Cot } B \qquad \text{Cosec } A = \frac{c}{a} = \text{Sec } B$

equired	Solution
b	$B = 90° - A,\ a = C \sin A,\ b = C \cos A.$
c	$B = 90° - A,\ a = b \tan A,\ c = \frac{b}{\cos A}.$
c	$B = 90° - A,\ b = a \cot A,\ c = \frac{a}{\sin A}.$
b	$\sin A = \frac{a}{c},\ \cos B = \frac{a}{c},\ b = \sqrt{(c+a)(c-a)}$
c	$\tan A = \frac{a}{b},\ \cot B = \frac{a}{b},\ c = \sqrt{a^2 + b^2}$

ULAE FOR SOLVING OBLIQUE TRIANGLES

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

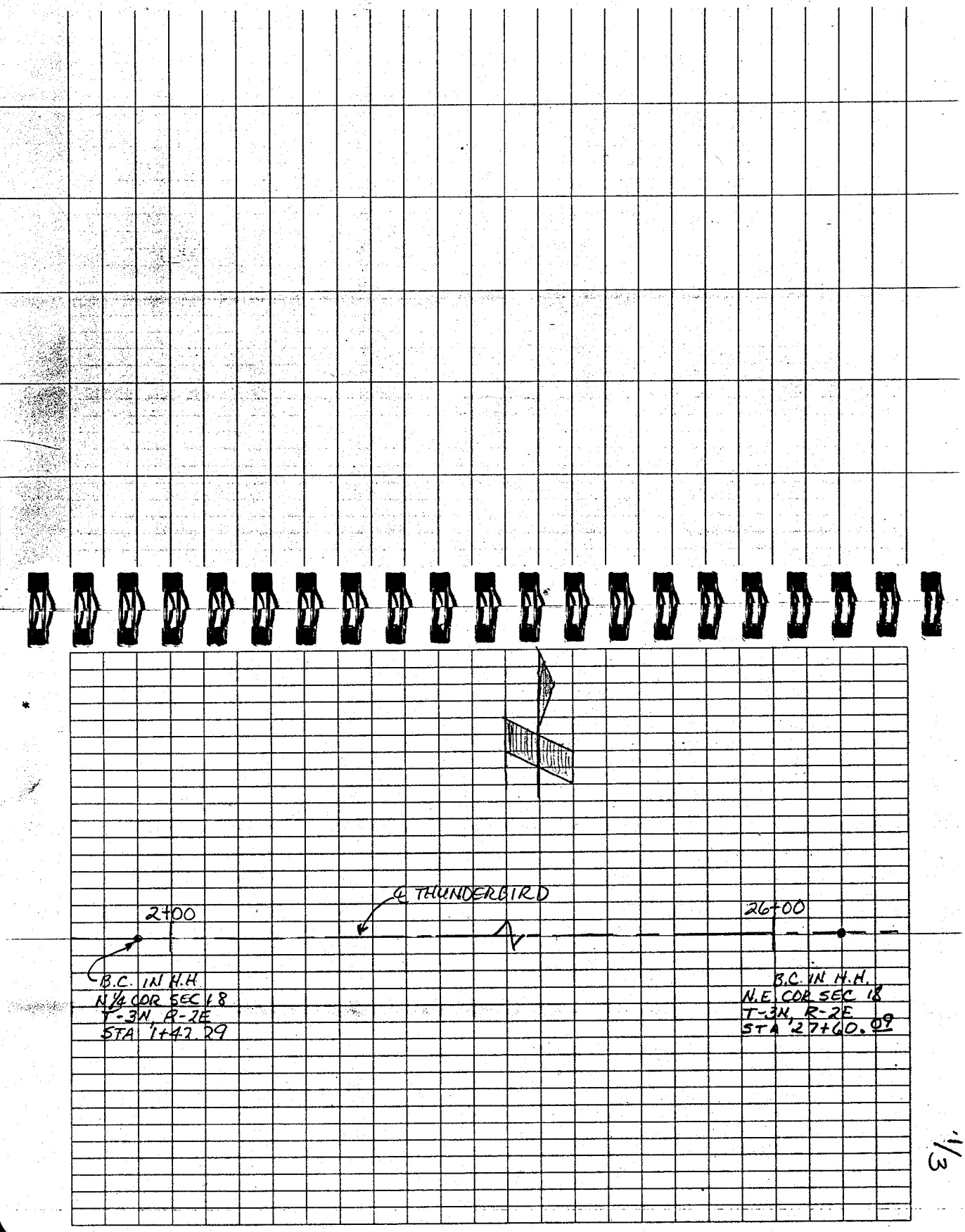
Printed in England

S&P
59th AVE & THUNDERBIRD
CONTROL LAYOUT FOR
℄ THUNDERBIRD

13 JUL 82
GENE H.
JIM C.

⊼ WILD-T16

100° CLEAR


2+00
℄ THUNDERBIRD
26+00
B.C. IN H.H.
N¼ COR SEC 18
T-3N, R-2E
STA 1+42.29
B.C. IN H.H.
N.E. COR SEC 18
T-3N, R-2E
STA 27+60.09

S&P
59th AVE & THUNDERBIRD
SITE BENCH-LOOP

13 JUL 82
GENE H.
JIM C.

↑ SOKKISHA B-1 LEVEL

CLEAR 100°

STA	BS	HI	FS	ELEV	
B.M. "A"	1.51	19.64		1218.13	
B.M. "B"			0.85	18.79	1218.78 .01
T.B.M. #1	1.18	15.16	5.66	13.98	
T.B.M #2	1.27	12.71	3.72	11.44	
T.B.M #3	2.21	12.59	2.33	10.38	
T.B.M #4	3.43	12.69	3.38	09.21	

REMARKS

STA AC-5 : ℄ THUNDERBIRD RD, APROX 2' WEST OF WEST APPROACH SLAB ON EXISTING CANAL BRIDGE. R/R SPIKE FLUSH W/ PAVEMENT ℄ THUNDERBIRD RD. (PRIMARY BENCH) ELEV = 1218.13

B.C. FLUSH W/CONC ON SOUTH CURB OF BRIDGE, 15' FROM WEST END OF WEST APPROACH SLAB AT BASE OF GUARD-RAIL (SECONDARY BENCH) ELEV = 1218.78 (PRIMARY BENCH GOVERNS)

SET C.P SPIKE IN P.POLE N. SIDE THUNDERBIRD; APROX STA 14+40

SET C.P. SPIKE IN P.POLE N. SIDE THUNDERBIRD; APROX STA 9+10

SET C.P. IN P.POLE N. SIDE THUNDERBIRD; APROX STA 3+95

B.C. ON N.W. COR ON TOP OF S.R.W.U.A. IRR STRUCTURE, S. SIDE THUNDERBIRD; APROX STA 1+00

STA	BS	HI	FS	ELEV	
		12.64			
T.B.M. #3	2.46	12.83	2.27	10.37	10.38 .01
T.B.M #2	4.07	15.50	1.40	11.43	11.44 .01
T.B.M. #1	5.95	19.92	1.53	13.97	13.98 .01
B.M "A"			1.81	18.11	18.13 .02
B.M "A"	4.97	23.10		18.13	
T.B.M #5	3.40	22.93	3.57	19.53	
B.M "A"			4.80	18.13	18.13 ✓

REMARKS

TOP OF NW BONNET BOLT ON FIRE HYD
N. SIDE THUNDERBIRD, APPROX STA 25+30

SEP
59th AVE & THUNDERBIRD
ADDITIONAL LOCATIONS TO X-SECTIONS
STA 2400 + 26+00

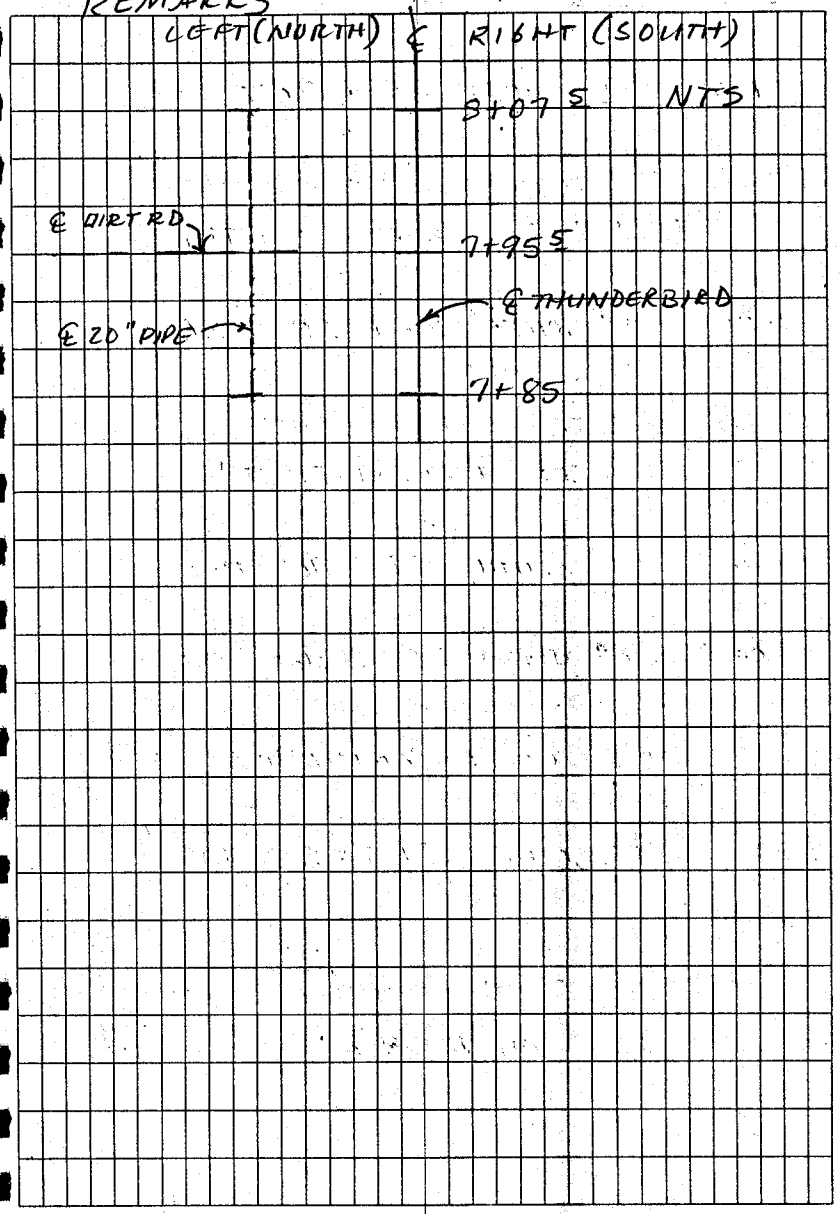
14 JUL 82
GENE H.
JIM C.
GARY N.

ADDITIONAL LOCATIONS IN
BOOK II

STA	DESCRIPTION	REMARKS
2+00	58' SOUTH, FENCE LINE	NOTE: FENCE LINE CONTINUES EAST AND WEST AT SAME LOCATION SOUTH
2+59 3	53' SOUTH, 3" DIA EUC. TREE, 10' HIGH	
3+31 7	53' SOUTH, 3" DIA. EUC. TREE, 10' HIGH	
3+72	35 S NORTH, ℄ P. POLE	NOTE: BURIED TELE CABLE RUNS UNDER P. POLE LINE (PARALLELS)
3+97 5	53' SOUTH, 3" DIA EUC. TREE, 10' HIGH	
4+71 6	53 S' SOUTH, 2" DIA EUC. TREE, 8' HIGH	
5+40 5	53' SOUTH, 4" DIA EUC. TREE, 10' HIGH	
6+05 5	53' SOUTH, 5" DIA EUC. TREE, 12' HIGH	
6+40 7	35 S NORTH, ℄ P. POLE	
6+53 7	53' SOUTH, 5" DIA EUC. TREE, 12' HIGH	
7+18 3	53 S SOUTH, 4" DIA EUC. TREE, 12' HIGH	

STA	DESCRIPTION
7+85 0	45' NORTH, BEGIN ℄ 20" DIA CONC. PIPE
7+95 5	℄ 26' WIDE DIRT RD. TO NORTH
8+07 5	45' NORTH, END ℄ 20" DIA CONC. PIPE
7+87 5	53' SOUTH, 2" DIA EUC. TREE, 10' HIGH
8+50 3	52 5' SOUTH, 6" DIA EUC. TREE, 15' HIGH
9+04 5	35 5 NORTH, ℄ P. POLE
9+15 7	53' SOUTH, 3" DIA EUC. TREE, 10' HIGH
9+22 7	29 0' SOUTH, ℄ WATER VALVE
9+67 0	53' SOUTH, 2" DIA EUC TREE, 10' HIGH
10+03 8	52' SOUTH, 4" DIA. EUC. TREE, 12' HIGH
10+55 8	52 SOUTH, 3" DIA EUC. TREE, 10' HIGH

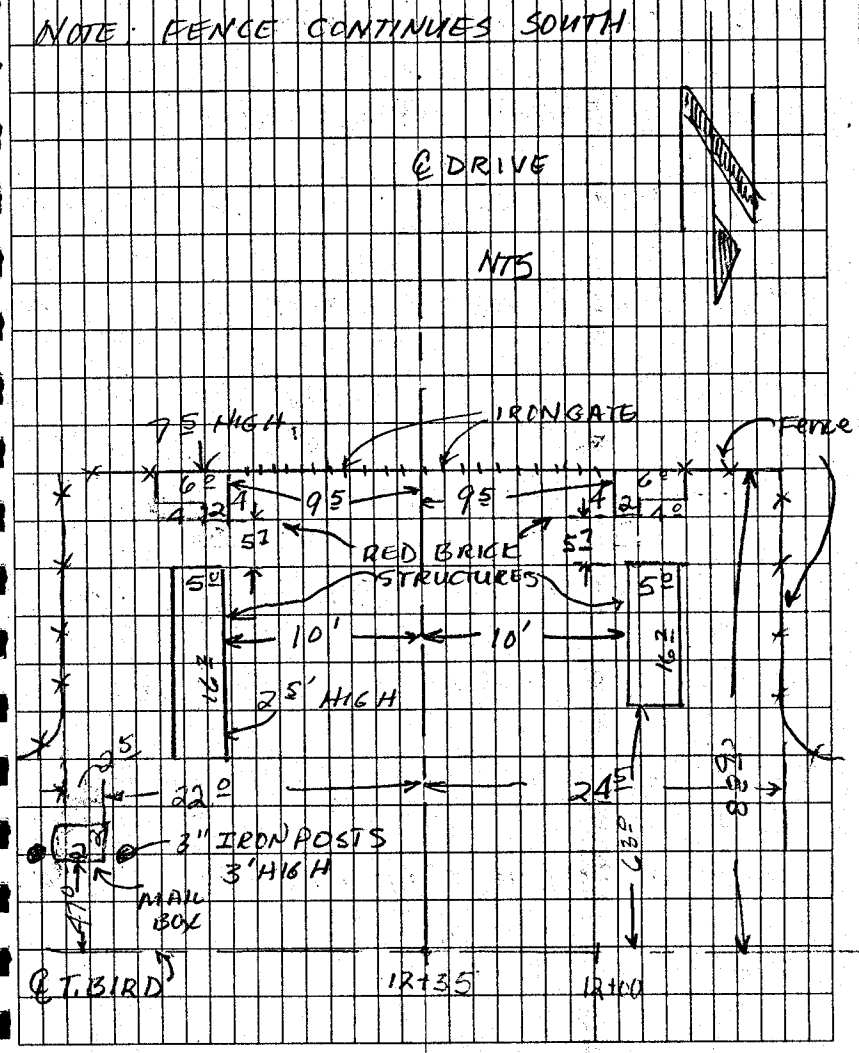
REMARKS



STA	DESCRIPTION
11+75.4	35.5 NORTH, ℄ P.POLE
11+84	58.0 SOUTH, P.C. FENCE LINE (26.0 Rad CURVE TO SOUTH)
12+10.4	84.0 SOUTH, P.T. FENCE LINE
12+35	℄ DIRT DRIVE TO SOUTH (SEE DETAIL AT RIGHT)
12+59.5	84.0 SOUTH, P.T. FENCELINE
12+88.5	58.4 SOUTH, P.C. FENCE LINE (CURVE TO SOUTH) (NOTE: FENCE CONTINUES EAST)
12+81.0	41.4 SOUTH, ℄ 1.5 X 2.5 WATER METER BOX (E+W)x(N-S)
12+83.0	49.4 SOUTH, SPRINKER VALUE (1.0' ABOVE N/G)

REMARKS

NOTE: FENCE CONTINUES SOUTH

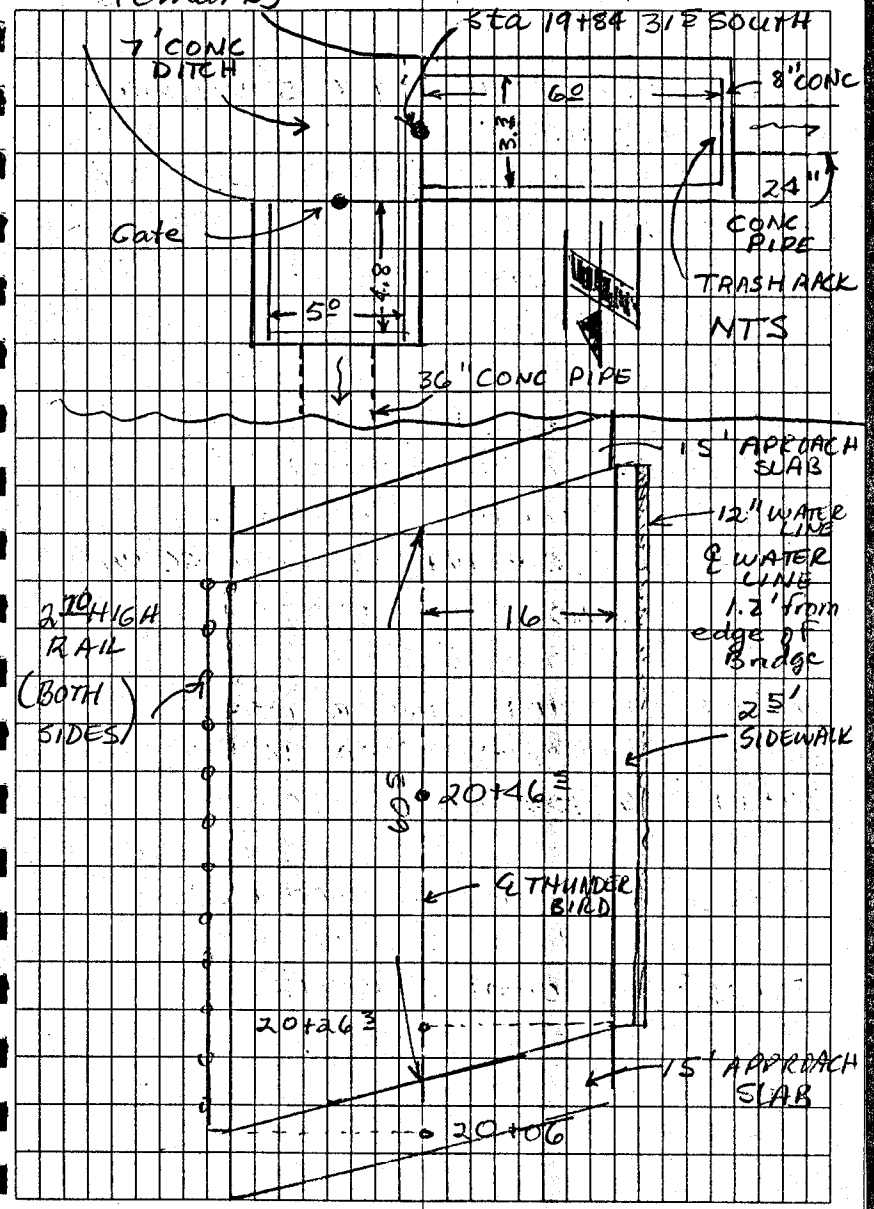


STA	DESCRIPTION	REMARKS
3+02 5	51 7' SOUTH, 6" DIA PINE TREE, 15' HIGH	NOTE: ALL PINETREES HAVE IRR. BUBBLERS
+52 0	52 0 SOUTH, 6" DIA PINETREE, 15' HIGH	
+98 5	20 5 NORTH, SPEED LIMIT SIGN	
4+04 4	52 4 SOUTH, 4" DIA PINETREE 15' HIGH	
4+42 5	35 5 NORTH, ℄ P. POLE	
4+53 4	52' SOUTH, 5" DIA. PINETREE, 15' HIGH	
4+68 5	21' SOUTH, ℄ S.S.M.H.	
+03 0	52 4 SOUTH, 6" DIA. PINETREE, 15' HIGH	
+05	53 0 SOUTH, 6" DIA. PINETREE 15' HIGH	
6+53 7	52 4 SOUTH, 6" DIA. PINETREE, 15' HIGH	
7+03 5	52 0 SOUTH, 5" DIA PINE TREE, 15' HIGH	
7+09 5	34 7 NORTH, ℄ P. POLE	

STA	DESCRIPTION	REMARKS
17+54^{0}	52^{4} SOUTH, 6" DIA. PINETREE, 15' HIGH	
18+03^{5}	52^{4} SOUTH, 6" DIA PINETREE, 15' HIGH	
19+04	52^{0} SOUTH, 4" DIA. PINETREE, 12' HIGH	
19+34^{5}	34^{6} NORTH, ℄ P. POLE	
19+39^{7}	27^{0} SOUTH, WATER VALVE	
19+52^{7}	52^{0} SOUTH, 4" DIA. PINETREE, 12' HIGH	
19+42^{5}	39^{6} NORTH, SW COR CONC. HEADWALL (CONAINS 36" CONC. PIPE)	
19+47^{5}	39^{6} NORTH, SRP R/W MARKER	
19+52^{5}	44^{0}' NORTH, NE COR CONC. HEADWALL (same headwall as sta 19+42^{5})	
19+60	GUY WIRE FOR P. POLE STA 19+34^{5}	
19+62^{5}	37^{0}' NORTH, ℄ P. POLE (GUY WIRE 25' TO NW)	

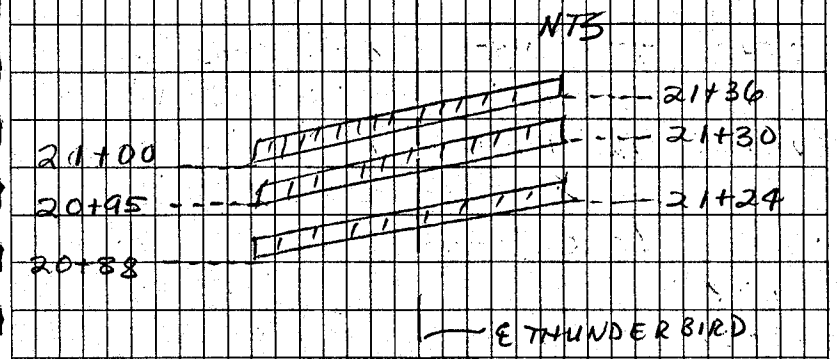
STA	DESCRIPTION
19+84	31^{5} SOUTH, ℄ IRR. GATE VALUE (see detail at right)
	note: water runs to west underground to irr. str. @ 1+00 (S. side) and north to headwall @ 19+42^{5}
19+72^{6}	58^{4} SOUTH, END FENCE EAST, BEGIN FENCE SE PARALLELING CANAL
20+06^{3}	NW COR CONC. BRIDGE (see detail at right)
20+23	℄ S.S. M.H.
20+26^{3}	SW COR CONC. BRIDGE
20+46^{5}	℄ ℄ CENTER OF BRIDGE

Remarks



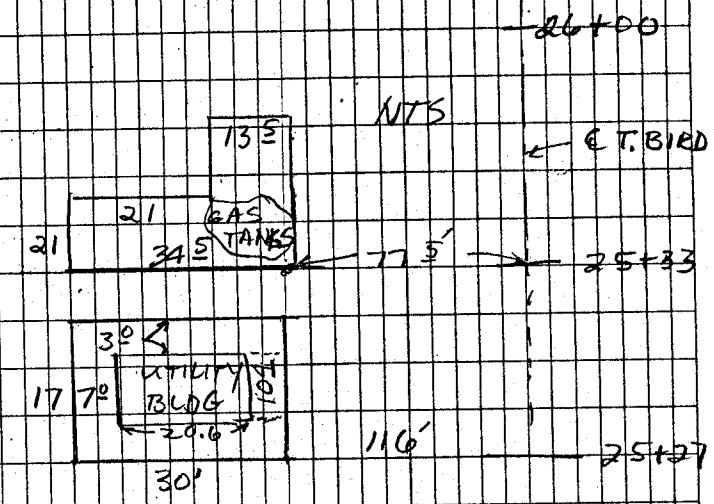
STA	DESCRIPTION
20+88	32' NORTH ℄ 4'X2.5' ELLIPTICAL C.M.P.
20+95	32' NORTH ℄ 4'X2.5' ELLIP. C.M.P.
21+00	" " " " "
21+24	38' SOUTH " " " "
21+30	" " " " " "
21+36	" " " " " "
21+02	44' NORTH, WEST END 24" CONC. PIPE
21+41	20' SOUTH ℄ WATER VALVE
21+47	30' SOUTH ℄ S.S. M.H.
21+24	℄ DRIVEWAY NORTH 44' WIDE
21+46	44' NORTH, EAST END 24" CONC PIPE
21+50	47' NORTH ℄ (EW x N-S) 1.5 x 2.5 WATER METER BOX
24+68	44' SOUTH CENTER (EW x NS) 15' x 10' BUSH
24+75	25' NORTH SPEED SIGN
24+97	26' SOUTH GUY WIRE
25+03	44' SOUTH CENTER 10X10 BUSH
25+25	20' SOUTH ℄ WATER VALVE
25+25	40' NORTH ℄ FIRE HYD.
25+26	26' SOUTH ℄ P.POLE
25+30	34' NORTH TO B/C, BEGIN CURB, GUTTER & S/W TO EAST
25+90	40' SOUTH 13" DIA PALO VERDE TREE

Remarks



STA	DESCRIPTION
25+33	77.5' NORTH TO SW COR BURIED GAS TANK SLAB
25+33	112' NORTH TO NW COR BURIED GAS TANK SLAB (see detail right)
25+27	116' NORTH SW COR UTILITY BLDG SLAB
25+27	146' " NW " " " " (See detail right)
25+32	65' NORTH ℄ LIGHT POST
25+32	91' NORTH ℄ PHONE BOOTH
25+80	55 5 NORTH TO SW COR GAS PUMP PAD
25+80	139 5 " " NW " " "
	pad has over-hang with pumps & pay booth beneath pad dem. (N-S X E-W) (34 X 48)
25+20	36' NORTH W. END 30" CONC. PIPE
25+26	33 60 TO FACE OF CURB BEGIN CURB & GUTTER & SIDEWALK
25+57	℄ D/W to NORTH 50' WING TO WING (3' WINGS)
25+33	Begin asphal parkinglot NORTH

Remarks



S&P
59th AVE & THUNDERBIRD
X-SECTIONS
STA 2+00 TO 26+00

LEGEND:
G.B = GRADE BREAK
E.R = EDGE ROAD
T.D. = TOP OF DITCH
B.D = BOT. OF DITCH
E.F = EDGE OF FIELD
T.B = TOP OF BANK
BOT = BOTTOM
HDWL = HEAD WALL
T.C. = TOP OF CURB
B.W = BACK OF WALK

14 JUL 82
GENE H.
JIM C.
GARY N.

100° CLEAR
SOKKISHA B-1 LEVEL

TYP X-SECTION
NOTE:
A = ELEV
B = FIELDSHOT
C = DIST FROM
D = DESCRIPTION

STA	BS	HI	FS	ELEV
T.B.M #3	2.18	12.56		1210.38
2+00				
2+50				

LEFT (NORTH) : ℄ : RIGHT (SOUTH)

08.0	08.6	06.2	06.71	07.00	06.71	06.2	07.0	06.1
4.6	4.0	6.4	5.85	5.56	5.85	6.4	5.6	6.5
40	36	22'	13'	℄	13'	24'	39'	45
T.D.	G.B.	G.B	E.R		E.R	G.B	G.B	G.B

05.3	07.2	06.3	06.8	06.1
7.3	5.4	6.3	5.8	6.5
47	51	60	100'	58
B.D.	T.D.	E.F.		FENCE

07.6	08.0
5.0	4.6
200'	300'

06.9	08.9	06.0	06.82	07.15	06.88	06.2	06.9	06.1
4.7	3.7	6.6	5.74	5.41	5.68	6.4	5.7	6.5
40	36	22	13	℄	13'	24'	39'	45
T.D	G.B	G.B	E.R		E.R	G.B	G.B	G.B

05.4	07.5	06.7	07.0	06.2
7.2	5.1	5.9	5.6	6.4
46	51	60	100'	58
B.D	T.D	E.F		FENCE

07.8	07.6
4.8	4.9
200'	300'

STA	BS	HI	FS	ELEV
		12.56		
3+00				
3+50				

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/33

12.56

08.2	08.9	06.3	06.92	07.17	06.93	06.5	06.9	06.1
4.4	3.7	6.3	5.64	5.39	5.63	6.1	5.7	6.5
40	36	22	13	℄	13	24	39	45
T.D.	6.B	6.B	E.R		E.R	6.B	6.B	6.B

05.1	07.6	06.8	07.0	06.1
6.9	5.0	5.8	5.6	6.5
46	51	60	100'	58
B.D.	T.D	E.F		FENCE.

07.8	08.1
4.8	4.5
200'	300'

08.2	08.8	06.5	07.09	07.28	06.98	06.5	07.2	06.2
4.4	3.8	6.1	5.47	5.28	5.58	6.1	5.4	6.4
40	36	22	13	℄	13	24	39	45
T.D.	6.B	6.B	E.R.		E.R	6.B	6.B	6.B.

05.6	07.8	07.0	07.2	06.0
7.0	4.8	5.6	5.4	6.6
46	51	58	100'	58
B.D	T.D	E.F.		FENCE

08.0	07.9
4.6	4.7
200'	300'

STA	BS	HI	FS	ELEV
		12.56		
4+00				
4+50				

LEFT (NORTH) RIGHT (SOUTH) 1/35

[12.56]

08.5	08.4	06.7	07.09	07.34	07.10	06.7	07.3	06.3
4.1	4.2	5.9	5.47	5.22	5.46	5.9	5.3	6.3
40	36	22	13	℄	13	24	39	45
T.D.	6.B	6.B	E.R		E.R	6.B	6.B	6.B

05.9	07.7	07.1	07.4	06.2
6.7	4.9	5.5	5.2	6.4
47	51	56		55
B.D	T.D.	E.F	100'	FENCE

08.1	08.2
4.5	4.4
200'	300'

05.9	09.1	06.7	07.29	07.44	07.24	06.8	07.5	06.0
6.7	3.5	5.9	5.27	5.12	5.32	5.8	5.1	6.6
46	35	22	13	℄	13	24	39	45
B.D	T.D	6.B	E.R		E.R.	6.B	6.B	6.B

08.0	07.2	07.3	08.3	06.0
4.6	5.4	5.3	4.3	6.6
51	56	100'	200'	58
T.D	E.F			FENCE

08.4
4.2
300'

STA	BS	HI	FS	ELEV
		12.56		
4+00				
4+50				

LEFT (NORTH) RIGHT (SOUTH) 1/35

12.56

08.5	08.4	06.7	07.09	07.34	07.10	06.7	07.3	06.3
4.1	4.2	5.9	5.47	5.22	5.46	5.9	5.3	6.3
40	36	22	13	℄	13	24	39	45
T.D.	6.B	6.B	E.R.		E.R	6.B	6.B	6.B

05.9	07.7	07.1	07.4	06.2
6.7	4.9	5.5	5.2	6.4.
47	51	56		55
B.D	T.D.	E.E	100'	FENCE

08.1	08.2
4.5	4.4
200'	300'

05.9	09.1	06.7	07.29	07.44	07.24	06.8	07.5	06.0
6.7	3.5	5.9	5.27	5.12	5.32	5.8	5.1	6.6
46	35	22	13	℄	13	24	39	45
B.D	T.D	6.B	E.R		E.R.	6.B	6.B	6.B

08.0	07.2	07.3	08.3	06.0
4.6	5.4	5.3	4.3	6.6
51	56	100'	200'	58
T.D	E.E			FENCE

08.4
4.2
300'

STA	BS	HI	FS	ELEV
		12.56		
5+00				
5+50				

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/37

12.56

06.4	09.2	06.9	07.41	07.63	07.47	06.9	07.6	06.3
6.2	3.4	5.7	5.15	4.93	5.09	5.7	5.0	6.3
46	38	22	13	℄	13	24	39	45
B.D.	T.D	G.B	E.F		E.R.	G.B	G.B	G.B

08.2	07.3	07.5	08.1	06.3
4.4	5.3	5.1	4.5	6.3
51	56	100'	200'	58
T.D	E.F.			FENCE

08.3
4.3
300'

06.4	09.4	07.0	07.52	07.75	07.57	07.1	07.6	06.1
6.2	3.2	5.6	5.04	4.81	4.99	5.5	5.0	6.5
46	38	22	13	℄	13	24	39	45
B.D	T.D	G.B	E.R		E.R	G.B	G.B	G.B

08.3	07.4	07.6	08.4	06.2
4.3	5.2	5.0	4.2	6.4
51	56	100'	200'	58
T.D	E.F			FENCE

08.4
4.0
300'

STA	BS	HI	FS	ELEV
		12.56		
6+00				
6+50				
T.P.	5.88	14.07	4.37	08.19

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/39

12.56

08.9	10.1	07.1	07.70	07.94	07.65	07.2	07.7	06.2
3.7	2.5	5.5	4.86	4.62	4.91	5.4	4.9	6.4
40	38	22	13	℄	13	24	39	45
T.D	G.B	G.B	E.R.		E.R	G.B	G.B	G.B

06.6	08.3	07.4	07.8	06.2
6.0	4.3	5.2	4.8	6.4
46	51	56	100'	58
B.D	T.D	E.F		FENCE

08.6	08.5
4.0	4.1
200'	300'

09.1	09.1	07.2	07.87	08.04	07.85	07.2	07.8	06.1
3.5	3.5	5.4	4.69	4.52	4.71	5.4	4.8	6.5
40	38	22	13	℄	13	24	39	45
T.D.	G.B	G.B	E.R		E.R	G.B	G.B	G.B

07.0	08.6	07.8	08.0	06.2
5.6	4.0	4.8	4.6	6.4
46	51	56	100'	58
B.D	T.D	E.F		FENCE

08.5	08.9
4.1	3.7
200'	300

STA	BS	HI	FS	ELEV
		14.07		
7+00				
7+50				

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/41

14.07

09.1	09.7	07.4	07.97	08.19	08.00	07.5	08.4	08.3
5.0	4.4	6.7	6.10	5.88	6.07	6.4	5.7	5.8
40	38	22	13	℄	13	24	39	45
T.D	6.B	6.B	E.R.		E.R.	6.B	6.B	6.B

06.9	08.7	08.1	08.1	08.8
7.2	5.4	6.0	6.0	6.3
47	51	56	100'	58
B.D	T.D	E.F		FENCE

08.7	09.1
5.4	5.0
200	300

09.3	10.0	07.7	08.15	08.44	08.19	07.6	08.6	08.0
4.8	4.1	6.4	5.92	5.63	5.88	6.5	5.5	6.1
40	38	22	13	℄	13	24	39	45
T.D	6.B	6.B	E.R.		E.R	6.B	6.B	6.B

07.3	09.1	08.2	08.1	08.0
6.8	5.0	5.9	6.0	6.1
46	51	56	100	55
B.D	T.D	E.F		FENCE

08.8	09.1
5.3	5.0
200	300

STA	BS	HI	FS	ELEV
		14.07		
7+85	℄ PIPE INV. (see location notes)		4.51	09.56
8+00	DIRT RD NORTH (see location notes)			
8+07	℄ PIPE INV (see location notes)		4.25	09.82
8+50				
9+00				

LEFT (NORTH) ℄ RIGHT (SOUTH)

14.07

08.3	08.7	07.9	08.31	08.58	08.36	07.8	08.5	08.2
5.8	5.4	6.2	5.76	5.49	5.71	6.3	5.6	5.9
100	46	22	13	℄	13	24	39	45
	6.B	6.B	E.R		E.R.	6.B	6.B	6.B

08.3	08.8	08.1
5.8	5.3	6.0
200	300	58
		Fence

08.8	09.3	08.1	08.57	08.71	08.60	08.0	08.6	08.2
5.3	4.8	6.0	5.50	5.36	5.47	6.1	5.5	5.9
40	38	22	13	℄	13	24	39	45
E.F	6.B	6.B	E.R		E.R.	6.B	6.B	6.B

08.5	08.8	09.2	07.9
5.6	5.3	4.9	6.2
100	200	300	58
			Fence

08.8	09.8	08.3	08.70	08.95	08.77	08.2	08.7	08.4
5.3	4.3	5.8	5.37	5.12	5.3	5.9	5.4	5.7
40	38	22	13	℄	13	24	39	45
E.F.	6.B	6.B	E.R		E.R	6.B	6.B	6.B

08.7	08.9	09.4	08.1
5.4	5.2	4.7	6.0
100	200	300	55
			Fence

STA	BS	HI	FS	ELEV	
		14.07			
9+50					
10+00					
T.B.M #2			2.63	11.44	11.44
T.B.M. #2	3.83	15.27		1211.44	
10+50					

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/45

14.07

08.9	10.0	08.5	08.97	09.16	08.97	08.2	08.8	08.0
5.2	4.1	5.6	5.10	4.89	5.10	5.9	5.3	6.1
40	38	22	13	℄	13	24	39	45
E.F	6.B	6.B	E.R		E.R	6.B	6.B	6.B

09.0	09.2	09.6	07.9
5.1	4.9	4.5	6.2
100	200	300	58 Fence

09.6	10.1	08.8	09.20	09.42	09.22	08.6	08.9	08.4
4.5	4.0	5.3	4.87	4.65	4.85	5.5	5.2	5.7
40	38	22	13	℄	13	24	39	45
E.F	6.B	6.B	E.R.		E.R.	6.B	6.B	6.B

09.1	09.3	09.7	08.1
5.0	4.8	4.4	6.0
100	200	300	58 Fence

15.27

09.2	10.1	08.8	09.50	09.71	09.50	08.8	09.2	08.3
6.1	5.1	6.4	5.77	5.56	5.77	6.5	6.1	7.0
40	38	22	13	℄	13	24	39	45
E.F.	6.B	6.B	E.R		E.R	6.B	6.B	6.B

09.2	09.6	09.8	08.1
6.1	5.7	5.5	7.2
100	200	300	58 Fence

STA	BS	HI	FS	ELEV
		15.27		
11+00				
11+50				
12+00				
12+10 4	G.B. SOUTH SIDE			

Left (NORTH) ℄ RIGHT (SOUTH) 1/47

15.27

09.5	10.5	09.1	09.78	10.02	09.86	08.8	09.3	08.2
5.7	4.8	6.2	5.49	5.25	5.41	6.5	6.0	7.1
40	38	22	13	℄	13	24	39	45
E.F.	G.B	G.B	E.R		E.R	G.B	G.B	G.B

09.5	09.6	10.1
5.7	5.7	5.2
100	200	300

08.1
7.2
58
Fence

09.7	10.9	09.6	10.22	10.39	10.21	09.2	09.6	08.5
5.6	4.4	5.7	5.05	4.88	5.06	6.1	5.7	6.8
40	38	22	13	℄	13	24	39	45
E.F	G.B	G.B	E.R		E.R	G.B	G.B	G.B

09.7	09.9	10.3
5.6	5.4	5.0
100	200	300

08.1
7.2
58
Fence

10.1	10.8	09.9	10.60	10.83	10.54	09.9	10.1	08.8
5.2	4.5	5.4	4.67	4.44	4.73	5.4	5.2	6.5
40	38	22	13	℄	13	24	39	45
E.F.	G.B	G.B	E.R		E.R	G.B	G.B	G.B

10.0	10.2	10.5
5.3	5.1	4.8
100	200	300

08.5
6.8
65
Fence

10.85	10.64	10.0	10.5	09.3
4.42	4.63	5.3	4.8	6.0
℄	13	24	39	45
	E.R.	G.B	G.B	G.B

09.5	09.2
5.8	6.1
89	72
Fence	G.B

STA	BS	HI	FS	ELEV
		15.27		
12+20 S	G.B. SOUTH SIDE			
12+35 S	℄ DIRT DRIVE SOUTH SIDE			
12+50				
13+00				
13+50				

LEFT (NORTH) ℄ RIGHT (SOUTH)

1/49

15.27

10.92	10.70	10.2	10.9	10.8
4.35	4.57	5.1	4.4	4.5
℄	13	24	39	89
	E.R.	G.B	G.B	Fence

10.89	10.81	10.5	11.3	11.5
4.29	4.46	4.8	4.0	3.8
℄	13	24	39	89
	E.R.	G.B	G.B	GATE

10.2	11.1	10.1	11.01	11.10	10.98	10.7	11.4	11.4
5.1	4.2	5.2	4.26	4.17	4.29	4.6	3.9	3.9
40	38	22	13	℄	13	24	39	89
E.F	G.B	G.B	E.R		E.R.	G.B	G.B	Fence

10.2	10.5	10.8
5.1	4.8	4.5
100	200	300

10.5	11.7	10.6	11.38	11.58	11.32	11.1	11.8	11.4
4.8	3.6	4.7	3.89	3.69	3.95	4.2	3.5	3.9
40	38	22	13	℄	13	31	43	48
E.F	G.B	G.B	E.R		E.R.	G.B	G.B	G.B.

10.5	10.8	11.2	11.3
4.8	4.5	4.1	4.0
100	200	300	58 S Fence

11.1	11.7	10.7	11.77	12.01	11.72	11.2	11.7	11.4
4.2	3.6	4.6	3.5	3.26	3.55	4.1	3.6	3.9
40	38	22	13	℄	13	31	43	59
E.F	G.B.	G.B.	E.R		E.R.	G.B	G.B	fence

10.7	11.0	11.3
4.6	4.3	4.0
100	200	300

STA	BS	HI	FS	ELEV	
		15.27			
14+00					
14+50					
14+68	NORTH RIM M.H.		2.81	11.46	(12.45)
15+00					

LEFT (NORTH) RIGHT (SOUTH) 1/51

(15.27)

11.2	11.8	11.1	12.27	12.38	12.16	11.5	11.8	11.4
4.1	3.5	4.2	3.0	2.89	3.11	3.8	3.5	3.9
40	38	22	13	℄	13	31	43	48
E.F	6.B	6.B	E.R		E.R	6.B	6.B	6.B

11.1	11.2	11.5	11.4
4.2	4.1	3.8	3.9
100	200	300	59 Fence

11.5	12.8	11.6	12.63	12.88	12.59	11.7	12.3	11.7
3.8	2.5	3.7	2.64	2.92	2.68	3.6	3.0	3.6
40	38	22	13	℄	13	31	43	48
E.F	6.B	6.B	E.R		E.R	6.B.	6.B	6.B.

11.4	11.7	11.7	11.3
3.9	3.6	3.6	4.0
100	200	300	59 Fence

12.1	12.9	12.1	12.97	13.19	12.97	12.10	12.40	11.6
3.2	2.4	3.2	2.30	2.08	2.3	3.2	2.9	3.7
40	38	22	13	℄	13	31	43	48
E.F	6.B	6.B	E.R		E.R.	6.B	6.B	6.B

11.7	11.9	12.0	11.2
3.6	3.4	3.3	4.1
100	200	300	59 Fence

STA	BS	HI	FS	ELEV	
		15.27			
15+50					
16+00					
T.B.M. #1	6.63	20.61	1.31	13.96	13.98 → .02
16+50					

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/53

15.27

12.7	13.4	12.6	13.38	13.63	13.40	12.5	12.6	11.6
2.6	1.9	2.7	1.89	1.64	1.87	2.8	2.7	3.7
40	38	22	13	℄	13	31	43	48
E.F	G.B	G.B	E.R		E.R.	G.B	G.B	G.B

12.3	12.2	12.3	11.3
3.0	3.1	3.0	4.0
100	200	300	59 Fence

13.0	13.9	13.0	13.88	14.06	13.84	12.1	12.7	11.4
2.3	1.4	2.3	1.42	1.21	1.43	2.6	2.6	3.9
40	38	22	13	℄	13	31	42	44
E.F	G.B	G.B	E.R.		E.R	G.B	G.B	G.B

12.7	12.5	12.5	11.3
2.6	2.8	2.8	4.0
100	200	300	59 Fence

20.61

13.2	13.9	13.2	14.4	14.67	14.38	12.8	11.5	11.1
7.4	6.7	7.4	6.2	5.49	6.23	7.8	9.1	9.5
40	38	22	13	℄	13	31	44	59
E.F	G.B	G.B	E.R		E.R	G.B	G.B	Fence

13.1	12.9	12.8	
7.5	7.7	7.8	
100	200	300	

STA	BS	HI	FS	ELEV
		20.61		
17+00				
17+50				
18+00				
18+50				

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/55

20.61

13.2	14.2	13.6	14.96	15.21	14.90	13.1	11.5	11.3
7.4	6.4	5.0	5.65	5.40	5.71	7.5	9.1	9.3
40	38	22	13	℄	13	34	44	59
E.F	G.B	G.B	E.R		E.R.	G.B	G.B	Fence

13.4	13.2	13.1
7.2	7.4	7.5
100	200	300

13.4	14.4	14.3	15.54	15.80	15.5	13.9	11.9	11.3
7.2	6.2	6.3	5.07	4.81	5.11	6.7	8.7	9.3
40	38	22	13	℄	13	34	44	59
E.F	G.B	G.B	E.R		E.R	G.B	G.B	Fence

13.4	13.6	13.4
7.2	7.0	7.2
100	200	300

13.9	14.8	14.7	16.09	16.34	16.06	14.1	11.7	11.4
6.7	5.8	5.9	4.52	4.27	4.55	6.5	8.9	9.2
40	38	22	13	℄	13	34	44	59
E.F	G.B	G.B	E.R		E.R.	G.B	G.B	Fence

13.7	14.0	14.2	14.99
6.9	6.6	6.4	5.62
100	200	292 TOE	299 T.D.

13.9	15.0	15.0	16.54	16.91	16.7	13.9	11.4	11.4
6.7	5.6	5.6	4.07	3.70	3.91	6.7	9.2	9.2
40	38	22	13	℄	13	34	44	59
E.F	G.B	G.B	E.R.		E.R.	G.B	G.B	Fence

13.7	14.6	15.56
6.9	6.0	5.05
100	208 TOE	214 T.D.

STA	BS	HI	FS	ELEV	
		20.61			
19+00					
B.M. "A"			2.48	18.13	18.13
B.M "A"	4.81	22.94		1218.13	
19+50					
19+87	TOP HDWL		6.91		
	INV NORTH		11.00		
	INV WEST		13.36		
20+00					
20+06?	NW COR BRIDGE				

LEFT (NORTH) RIGHT (SOUTH) 1/57

[20.61]

14.5	15.5	15.9	17.14	17.37	17.14	15.0	11.6	11.4
6.1	5.1	4.7	3.47	3.24	3.47	5.6	9.0	9.2
40	38	22	13	℄	13	34	49	59
E.F.	G.B.	G.B	E.R		E.R	G.B	G.B	Fence

11.9	14.3	15.17
6.7	6.3	5.44
100	124	130
	TOE	T.D

[22.94]

15.94	16.24	17.62	17.83	17.58	15.84	13.94	11.44
7.0	6.7	5.32	5.11	5.36	7.1	9.1	11.5
42	32	13	℄	13	38	48	56
MATCH CANAL V-SECTION	G.B	E.R		E.R	G.B	G.B	G.B

11.34
11.6
59
Fence

17.91	18.13	17.94	17.74	17.64
5.03	4.81	5.00	5.2	5.3
19	℄	13	25	31
EDGE BRIDGE		E.R.	G.B	G.B

18.75	18.67	17.99
4.19	4.27	4.95
18	16	16
B.W	T.C.	GUTTER

STA	BS	HI	FS	ELEV
		22.94		
20+16				
20+26 3	SW COR BRIDGE			
20+67 2	NE COR BRIDGE			
20+76				
20+86 8				
20+85	29' NORTH SW COR FLOODWAY			
20+88	INV C.M.P		8.53	
20+95	INV C.M.P		8.47	
21+00	INV C.M.P.		8.45	
21+07	29' NORTH SE COR FLOODWAY			

LEFT (NORTH) ℄ RIGHT (SOUTH)

1/59

22.94

18.27
4.67
℄

18.11 18.77 18.81
4.83 4.17 4.13
16 16 18
GUTTER T.C B.W

18.98 18.91 18.26
3.96 4.03 4.68
18 16 16
B.W T.C GUTTER

18.42
4.52
℄

18.21 18.84 18.91
4.73 4.10 4.03
16 16 18
GUT. T.C. B.W

14.54 17.84
8.4 5.1
32 29
BOT T.B

15.24 17.54
7.7 5.4
34 29
BOT T.B

STA	BS	HI	FS	ELEV	
21+22	35' SOUTH, NW COR FLOODWAY				
21+24	INV C.M.P		5.96		
21+30	INV C.M.P		5.74		
21+36	INV C.M.P.		5.95		
21+44	35' SOUTH, NE COR FLOODWAY				
B.M. "A"	4.25	22.38	4.81	18.13	18.13
21+00					
21+02	W. END PIPE, INV		7.64		
21+46	E. END PIPE, INV		6.95		
21+46	N. RIM M.H.		5.13		
21+50					

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/61

22.94

18.04	15.24
4.9	7.7
35	40
T.B	BOT

17.54	15.04
5.4	7.9
35	39
T.B	BOT

22.38

17.48	18.26	18.46	18.30	17.78
4.9	4.12	3.92	4.08	4.6
26	15	℄	13	35
G.B	E.R.		E.R.	T.B

17.7	15.5	16.7	18.12	18.37	18.02	17.37	17.2
4.7	6.9	5.7	4.26	4.01	4.36	5.01	5.2
51	41	36	16	℄	17	27	40
G.B	G.B	G.B	E.R		E.R	G.B	G.B

18.0	19.2	18.2			17.3	14.9	15.1
4.4	4.2	4.2			5.1	7.5	7.3
100	200	300			98	80	60
					G.B	G.B	G.B

STA	BS	HI	FS	ELEV
		22.38		
22+00				
22+50				
23+00				
23+50				

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/63

22.38

18.4	16.0	15.9	11.52	18.29	18.12	17.4	16.6	16.1
4.0	6.4	6.5	4.36	4.09	4.26	5.0	5.8	6.3
52	47	36	18	℄	18	38	42	100
G.B.	G.B	G.B	E.R		E.R	G.B	G.B	

17.4	17.8	18.1	17.9
5.0	4.6	4.3	4.5
57	100	200	292
G.B.			

18.6	16.4	16.0	17.85	18.20	17.86	17.3	15.6	15.2
3.8	6.0	6.4	4.53	4.18	4.52	5.1	6.8	7.2
52	46	35	18	℄	18	37	47	100
G.B	G.B	G.B	E.R		E.R	G.B	G.B	

17.3	18.0	18.0	18.0
5.1	4.4	4.4	4.4
57	100	200	292
G.B			

18.6	16.5	16.0	17.67	17.90	17.72	16.8	15.5	15.3
3.8	5.9	6.4	4.7	4.48	4.66	5.6	6.9	7.1
52	47	37	18	℄	18	36	44	100
			E.R		E.R.	G.B	G.B	

16.9	18.5	18.6	18.5
5.5	3.9	3.8	3.9
57	100	200	292

19.5	16.7	16.2	17.59	17.81	17.51	17.0	15.8	16.0
2.9	5.7	6.2	4.19	4.57	4.87	5.4	6.6	6.4
52	44	35	18	℄	18	38	48	100
G.B	G.B	G.B	E.R		E.R	G.B	G.B	

17.6	18.7	18.7	18.0
4.8	3.7	3.7	4.4
56	100	200	292
G.B			

STA	BS	HI	FS	ELEV
		22.38		
24+00				
24+50				
25+00	4 pt	for E.R. ON	NORTHSIDE	
25+20	PIPE	INV	8.25	
25+26	BEGIN CURB & GUTTER			

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/65

22.38

17.9	16.5	16.0	17.67	17.90	17.52	13.1	16.0	
2.5	5.9	6.4	4.81	4.48	4.86	9.3	6.4	6.1
50	44	35	18	℄	18	38	48	
G.B	G.B	G.B.	E.R.		E.R	G.B	G.B	100

16.3	18.5	18.4	18.0
4.7	3.9	3.8	4.4
55	100	200	300
G.B			

19.4	16.9	16.3	17.72	17.93	17.61	17.0	15.5	17.2
3.0	5.5	6.1	4.66	4.45	4.77	5.4	6.9	5.2
50	43	35	18	℄	18	38	55	
G.B	G.B	G.B	E.R.		E.R.	G.B.	G.B	100

4.5	3.9	3.9	4.4
54			
G.B	100	200	300

17.9	18.0	16.4	17.73	18.05	17.39	16.9	16.3	16.7
3.5	4.4	6.0	4.65	4.33	4.60	5.5	6.1	5.7
100	52	37	21	℄	20	40	48	
	G.B	G.B	E.R.		E.R	G.B	G.B	100

18.8	18.4
3.6	4.0
200	300

17.96	17.92	17.43
4.42	4.46	4.95
38 6	34	33 6
B.W	T.C	GUT.

STA	BS	HI	FS	ELEV	
		22.38			
25+50					
26+00					
T.B.M #5			2.84	19.54	19.53 → .01

LEFT (NORTH) ℄ RIGHT (SOUTH) 1/67

22.38

18.58	18.38	17.75	17.64	18.31	17.87	17.5	16.3	16.9
3.80	4.00	4.63	4.74	4.07	4.51	4.9	6.1	5.5
50'	38.6 B.W	34 T.C.	33.6 GUT	℄	20 E.R	40 G.B	48 G.B	100

18.87	18.63	19.88
3.51	3.75	2.50
100'	185 G.B	2+90 FENCE

19.95	18.34	18.24	17.75	18.45	18.17	17.6	16.5	16.8
2.43	4.04	4.14	4.63	3.93	4.21	4.8	5.9	5.6
50	38.5 B.W	34 T.C	33.6 GUT.	℄	20 E.R.	35 G.B	50 G.B	100

18.83	19.17	18.64
3.55	3.21	3.74
100	185 G.B	290

SEE BOOK II

FOR ADDITIONAL TOPO

INFORMATION

FORMULAE FOR SOLVING RIGHT TRIANGLES

$$\text{Sin } A = \frac{a}{c} = \text{Cos } B \qquad \text{Cot } A = \frac{b}{a} = \text{Tan } B$$

$$\text{Cos } A = \frac{b}{c} = \text{Sin } B \qquad \text{Sec } A = \frac{c}{b} = \text{Cosec } B$$

$$\text{Tan } A = \frac{a}{b} = \text{Cot } B \qquad \text{Cosec } A = \frac{c}{a} = \text{Sec } B$$

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

FORMULAE FOR SOLVING OBLIQUE TRIANGLES

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

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BOOK #2 / Pg 1

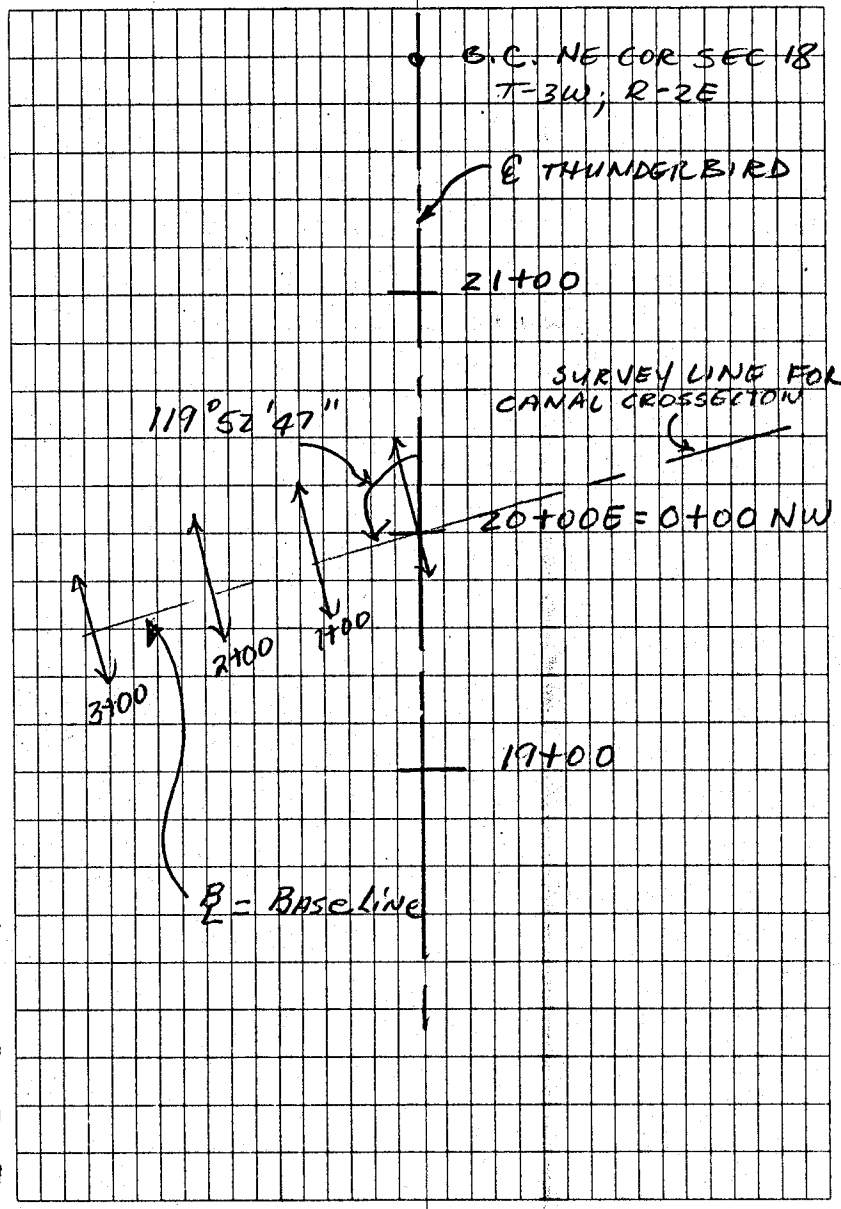
S.E. P
59th AVE & THUNDERBIRD
CONTROL LAYOUT FOR
CANAL X-SECTIONS

15 JUL 82
GENE H.
JIM C.
GARY N.

π WILD T-16
100° CLEAR

Pt Occ	BS	FS	Horz ∡
20+00E		∡ LEFT	
	B.C. NE COR SEC 18		0-00-00
		Pt A (1)	119-53-05
		(2)	239-46-00
		(3)	359-38-20
		Mean ∡ =	119-52-47

note: crossections on canal are perpendicular to canal ℄, stations increasing to NW



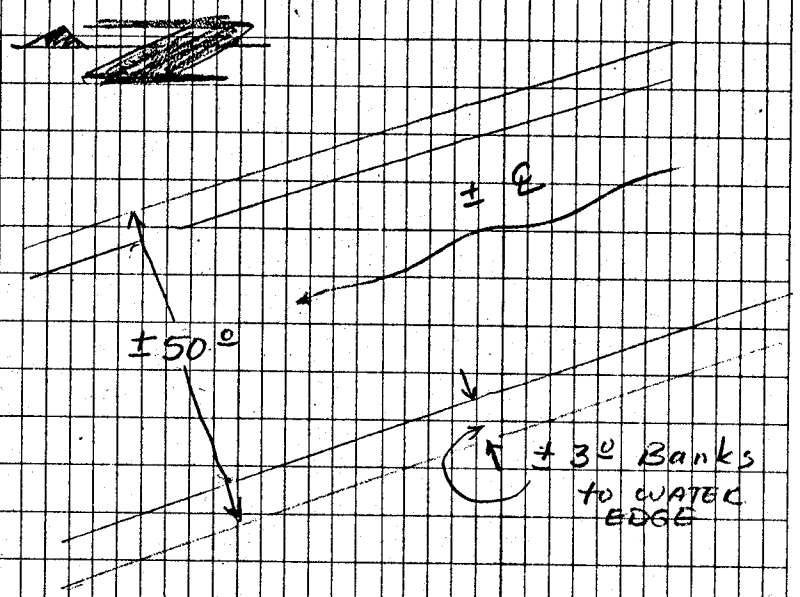
S & P
59th AVE & THUNDERBIRD
LOCATIONS FOR
CANAL CROSSECTIONS

19 JUL 82
GENE H.
JIM C.
GARY N.

STA	DESCRIPTION
-1+02	WATER INLET PIPE BENEATH WATER SURFACE ON EAST BANK OF CANAL
-0+34	12' LEFT, BEND IN IRR. DITCH FROM PARALLEL WITH CANAL TO HDWL (see location notes for Thunder bird V-section sta 19+84
0+93	INLET PIPE BENEATH WATER SURFACE ON E. BANK CANAL
2+63.5	102 RIGHT E.S.S. M.H.

Remarks

Diagram of Canal: TYP



S&P
59th AVE & THUNDERBIRD
CANAL CROSSECTIONS

T.B = TOP OF BANK ON CANAL
T.D = TOP OF DITCH
B.D = BOTT. OF DITCH
G.B = GRADE BREAK
E.F = EDGE OF FIELD
HDWL = HEAD WALL

20 JUL 82
GENE H.
JIM C.
GARY N.
π SOKKISHA B-1 LEVEL
100° CLEAR

STA	BS	HI	FS	ELEV
B.M "A"	4.81	22.94		
-1+00				
0+00				

TYP CROSSECTION OF
CANAL UNDER BRIDGE
(measured from NORTH-SIDE
BRIDGE; parallel with Bridge)

TOP OF WATER
AT SAME LOCATION 8.22 14.72

LEFT (SW) ℄ RIGHT (NE) 2/13

22.94

14.29	16.30	17.2	16.4	17.2	17.9	17.4	17.7	15.0
8.65	6.64	5.7	6.5	5.7	5.0	5.5	5.2	7.9
19.5	16	12	11		17	68	83	91
G.D	T.D	G.B	G.B	B/L	T.B.	T.B.	G.B	G.B

16.49	16.7	12.3	11.3	16.9	15.0	
6.45	6.2	10.6	11.6	6.0	7.9	
23	26	31	41	112	102	
T.D	G.B	G.B	G.B	G.B	G.B	

18.13	17.8	17.6	16.4	17.4
4.81	5.1	5.3	6.5	5.5
	66	86	90	91
B/L	T.B	G.B	G.B	G.B

5.5	8.2
115	106
G.B	G.B

11.24	10.98	11.24
11.70	11.96	11.70
BOT OF W. BANK	℄ CANAL	BOT OF E. BANK
ALONG NORTH SIDE OF BRIDGE		ALONG NORTH SIDE OF BRIDGE

STA	BS	HI	FS	ELEV
		22.94		
0+61.5	24' LEFT ℄ HDWL			
	(Same HDWL AS STA 19+42 E)			
		INV	11.37	11.57
		4'		
0+86	⊥ pt on conc ditch 19.5 LEFT			
	FROM HDWL STA 0+61.5			
	to paralleling canal			
1+00				
2+00				

LEFT (SW) ℄ RIGHT (NE) 2/15

22.94

16.41
6.53
24
HDWL

13.49
9.45
19.5
℄

15.10	13.46	15.10	15.8	17.1	18.0	17.3	17.3	14.5
7.84	9.48	7.84	7.1	5.8	4.9	5.6	5.6	8.4
21	19	17	4	B	15	66	86	98
T.D	B.D	T.D.	G.B	℄	T.B.	T.B	G.B	G.B

14.0	17.5	14.7
8.9	5.4	8.2
25	112	105
E.F.	G.B	G.B

13.57	15.11	16.2	16.6	17.8	18.3	17.4	17.4	14.4
9.37	7.83	6.7	6.3	5.1	4.6	5.5	5.5	8.5
20	18	15	5	B	14	62	84	96
B.D	T.D.	G.B	G.B	℄	T.B.	T.B	G.B	G.B

15.15	14.5	14.1	14.6
7.79	8.4	4.8	8.3
22	26	114	104
T.D	E.F	G.B	G.B

STA	BS	HI	FS	ELEV	
		22.94			
2+63	NORTH RIM M.H.		8.32	14.62	
3+00					
4+00					
B.M # "A"			4.81	18.13	18.13

LEFT (SW) ℄ RIGHT (NE) 2/17

22.94

13.45	15.15	16.5	16.9	17.8	18.2	17.2	17.1	14.2
9.49	7.79	6.4	6.0	5.1	4.7	5.7	5.8	8.7
19	17	14	4	8	14	62	84	41
B.D.	T.D	G.B	G.B	E	T.B	T.B	G.B	G.B

15.04	14.3	15.5	14.2
7.88	8.6	7.4	8.7
21	25	112	104
T.D.	E.F.	G.B.	G.B

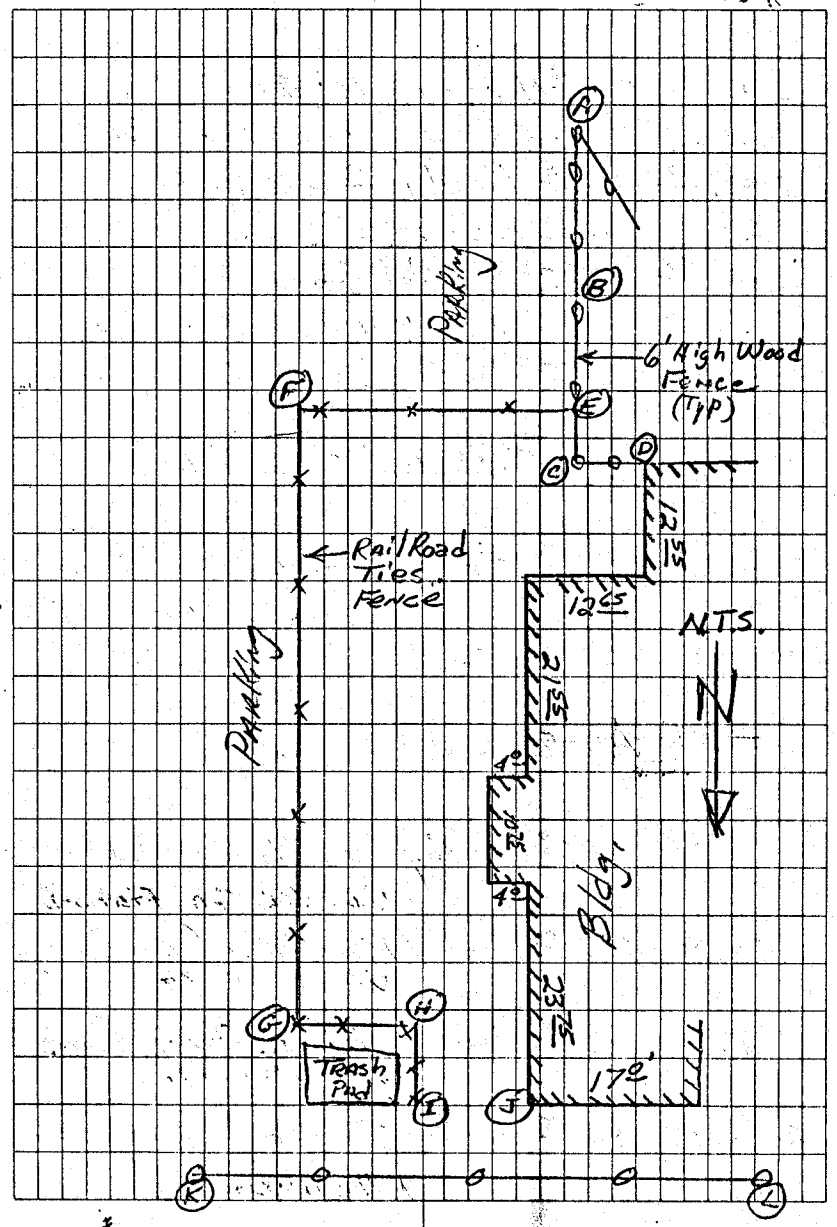
13.26	14.82	16.0	16.2	17.3	17.8	16.8	16.8	13.9
9.68	8.12	6.9	6.7	5.6	5.1	6.1	6.1	9.0
22	18	14	4	8	14	61	84	98
B.D.	T.D	G.B	G.B	E	T.B	T.B	G.B	G.B

14.91	14.0	15.0	14.2
8.03	8.9	7.9	8.7
24	25	11	107
T.D.	E.F.	G.B	G.B

Additional Location
from STA 20+86 to STA 25+76

7/20/82
P.C. = Lyman H.
☒ = Ed. K.

℄ Sta	North or South	Description
20+86	89° North /	Cor. 6' High Wood Fence (A)
20+87	200° North /	⊥ Pt. 6' High Wood Fence (B)
20+87	214° North /	Cor. 6' High Wood Fence (C)
20+81.25	214° North /	End Fence / Cor. Bldg. (D)
20+87	207.40 North /	Cor. Bldg (E)
21+07	207.46 North /	Cor. parking Lot. (F)
21+07.30	270.46 North /	Cor. parking Lot (G)
21+00	270.46 North /	Cor. R.R. Tie Fence (H)
21+00	282.50 North /	Cor. R.R. Tie Fence (I)
20+93.50	282.50 North /	Cor. Bldg (J)
21+32.50	287.50 North /	Cor. 6' High Wood Fence (K)
21+33.50	281.50 North /	3" Tree



℄ Sta	North or South	Description
21+33.50	276.5 North /	18" Tree
21+37.50	261.0' North /	Guard Post
21+37.50	232.0 North /	Guard Post
19+98.50	288.5 North /	Cor. 6' High Wood Fence
20+59	289.50 North /	Power Pole
20+33.50	289.0 North /	Anchor Cor. P.P.
22+84	289.5 North /	Power Pole
25+19	288.5 North /	Power Pole
25+53.10	290.35 North /	Cor. Block Wall at N.W. Cor. Gas Station
25+78	270.0 North /	N.W. Cor. of overhange Vacuum Area
25+78	250.0 North /	S.W. Cor. of over hange Vacuum Area.
26+91	288.5 North /	Power Pole

℄ STA	North or south	Description
26+91	289 E	North/ S. Face Block Wall
25+76	201 E	North/ S.W. Cor Wash Bay
25+76	229 L	North/ N.W. Cor. Wash Bay

END