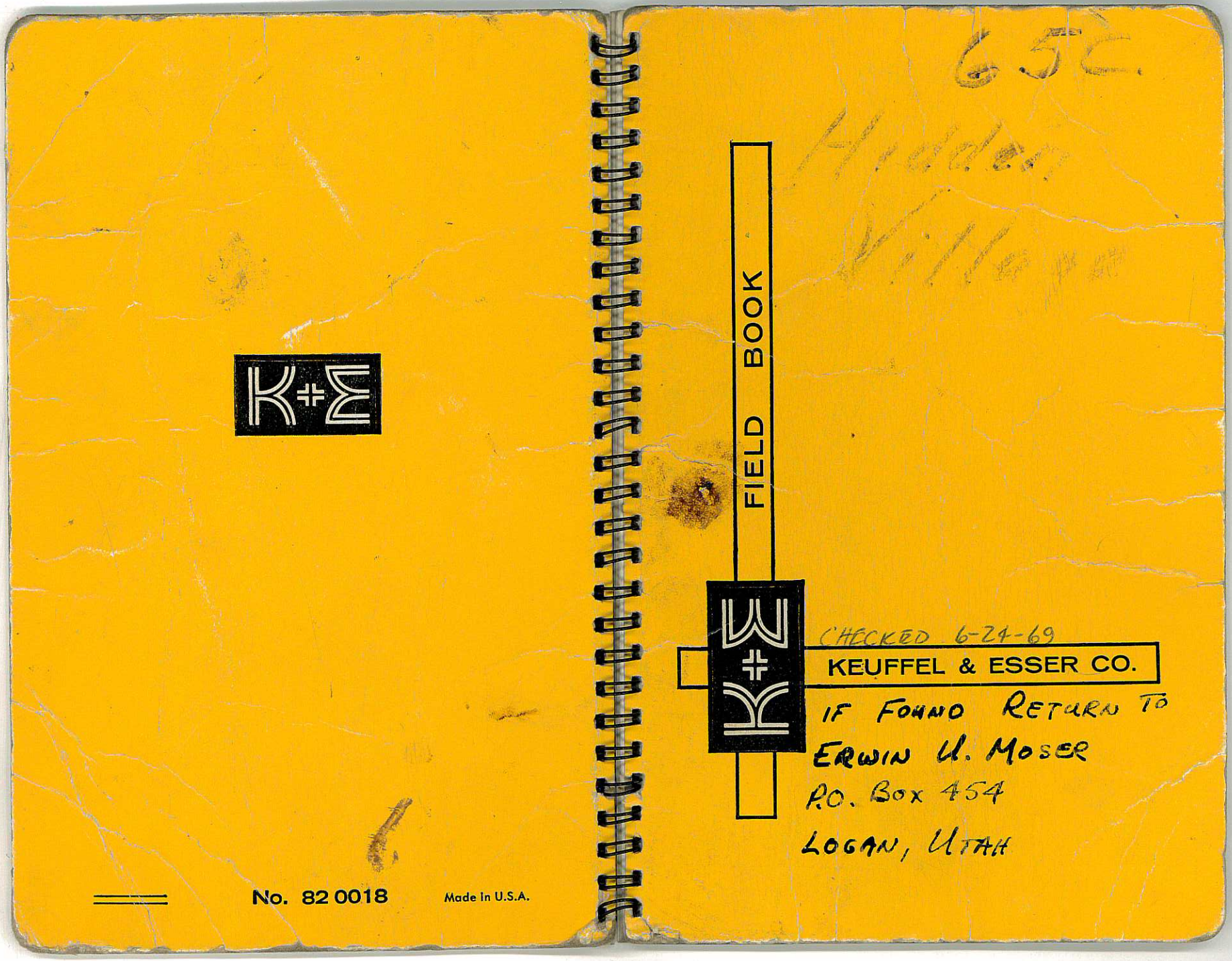

FIELD BOOK
KEUFFEL & ESSER CO.
No. 82 0018
Made in U.S.A.
CHECKED 6-24-69
IF FOUND RETURN TO
ERWIN U. MOSER
P.O. Box 454
LOGAN, UTAH

3-27-68 Pat and EUM

C & G grades

Sta	Rod	HI	Elev	Cut FS	Fill FS
	6.76	106.76	100.00	0.0	
	6.67		100.09		
P.I. 0+00	5.55		101.35 / 101.21		0.14
0+70E	5.53		101.25 / 101.23		0.22
0+79.45	5.3		101.75 / 101.46		0.29
1+57.01	5.04		102.14 / 101.72		0.42
2+39.03	4.69		102.55 / 102.07		0.48
3+27.03	4.85	Grade	102.98 / 101.91		1.04
4+24.03	2.84		103.92	0.0	0.0
	3.81		102.95	0.0	0.0
	4.32		101.98 / 102.44	1.46	
MH	5.51		101.71 / 101.25	0.04	
T.P.		106.56	101.21	5.55	5.35
	5.28		101.28		
	4.05		102.51	0.73?	

Grade 101.78

C & G grade in Red under Elev. Column

18 2

Date

① NE Cor of Melvin Smith Gutter
2 Dallas Elder NW Cor Gutter
3 SW Cor Lot Pat PI 101.35
4 P.C. "
5 SE Cor Pats Prop
6 SW Cor Thompson
7 SE " "
8 PI in East end at Turn North
9 SE Cor of School Prop
10 Nail on Telephone Pole
11 Nail on " " Pole W. side Rd
12 M.H. Cover in Rd. North of Line
13 PI
14 PI SW Cor of Pats prop
15 NW Cor Pats prop

Pt 1 to 11 = 189'
Pt 11 to 12 = 47'
Pt 12 to 3 = 29'
Pt 7 to 8 = 83
Pt 8 to 9 102

C&G grades Unit #4

3-28-68 Pat & Elvin

Sta	Rod	HI	Elev	desired Elev	C	E
0+00	8.98	108.98	100.00			
0+00	9.08		99.90	99.90	0.0	0.0
1+53 31	6.88		102.10	101.41	0.69	
2+73 10	6.38		102.60	102.59	0.01	
2+42 10	5.35		103.63			
3+74 66	4.75		104.23	103.59	0.64	
4+78 58	4.11		104.87	104.62	0.25	
5+88 13	4.82		104.66	105.70		1.04
7+09 93	2.06		106.92		0.0	0.0
	2.44		106.54			
MH 1 ~4+67 ~2+79	4.28		104.70			
MH 2	6.02		102.96			
MH 3 ~7+33	7.43		101.55			
T.P.		104.82	100.00	8.98	4.82	
	5.28		99.54			
	5.32		99.50			
	7.22		97.60			
	5.71		99.11			
		Apr 9 1968		Gary & Elvin		
	5.78	110.44	104.66			
	3.89		106.66			
	3.54		106.90			

SW Con - top of Existing Gutter

NW Con Lot 15 top of Curb

NE " " " " " 15

NE " " 14

FT 14

NE Con 13 Slope = 0.988/100'

NE Con 12

NE Con 11

NE Con 10

SE Con 9

North of Conc Lot 11-12

North of Conc " 13-14

South of SW Con Lot 1

148.5' Pt No1 Gutter to MH #3

top of gutter - Pt #1

Gutter at Hole Driveway

" at West side of Str (end of C-6)

South on " "

South on Hole side of Form

Lot Con 10-11 NE Con Lot 11

NE Con Rd NE Con Lot 10

NE Con Lot 10 SE Con Rd

3-29-68 Randy & EUM
Lot Corners Unit 5
616 Then 66

4-13-68 Randy-Ken-EUM.
Grades for C&G on North side of Str. Unit #5

Sta	Rod	HI	Elev	Desired Elev	C	F
SE Cor 9 gr	2.6	108.97	106.54	106.54	0.0	0.0
NE Cor 10 gr	2.07		106.90			
SW 9 gr	3.84		105.68	~~105.68~~ 0.0		
SW Cor Conc gr	2.79		106.13	106.13	0.0	0.0
SW Cor 8 gr	5.03		104.10	105.39 ~~1.29~~		1.29
M.H. gr	4.22		104.90	103.92 ~~0.98~~		
SW Cor 7 gr	5.17		104.00	103.59	0.41	
PC C-9 gr	4.95		104.33	103.65 103.58	0.75	
PI C-12 gr	5.56		103.63	103.07	0.56	
PC C-12 gr	5.41		104.01 102.47			
PT C-10	5.95					
PC C-6 gr	6.18 5.91		103.01	102.34	0.67	
PI C-6 gr	6.81		101.24	101.92	0.32	
~~PT C-6~~	7.39		101.53	101.50	0.03	
SW Cor Lot 1 gr	7.28		Huff 02.12			
PC C-3	8.14		100.78	100.96	0.	0.18
PI C-3	8.08		100.84			
PT C-3	9.13		99.79			
End of Old C&G	9.33		99.59	99.59	0	0
" " " C&G	8.83		100.09			

5

N 49° 14' 30" W
S 52° 47' 30" W
102° 0' 00"

4

top of bar 0+00
top of bar 0+92.65
1+62.68
Slope = 1.040 W/ 3+01.29
3+31.01
East side 3+86.92
North of Cul-de-sac
West side cul-de-sac 4+36.92
4+56.92
4+96.92
Lot line with hub in Conc 5+36.31 N of Cor
5+37.92
6+10.31
6+76.31
PT-C-3 Study end of C&G = 73' 7+36.16
North end of C&G on West side of Road 8+11.16
" " " " East " " "

4-20-68

Ken Gary EUM

Gutter grades West of Caldesac

Sta	Rod	HI	Elev		C.	F.
3.42		106.74	103.32	103.32	0	0
3.09			103.65	~~103.65~~		
3.70			103.04	103.04	0	0
3.51			103.23	103.23 ~~103.23~~	0	0
3.71			103.03	102.91	0.44 ~~0.12~~	
4.48			102.26		,04	
4.62		106.74	102.12	102.15		0.03
5.96			100.78	101.46		0.69
6.95			99.79	100.25		0.46
7.13			99.61	99.61	0	0
6.64			100.20			

103.32 610 106.74 103.03

103.23 / 28 / 95 / 2.

45 / 4.10

309 / 3.65

297 / .12

Gutter at PC E side of cal-de-sac
PC C7 S. side Road
Top of Conc Gutter at PC C-7
PT C-10 W side of cul de sac
PC C-10 " " " "
PI C-6
SW cor Lot 1
Next pt W of SW cor Lot 1 PC C-3
PT C-3
N. end of Existing Gutter
End of conc on S side of Rd

Hidden Village 4-22-68
C & G grade

Sta	Rd	HI	Elev	desired Elev	E.F. C	F
0+00	4.2	104.2	100.0	99.56	0.44	
0+28	4.35		99.85	99.33	0.52	
~~0~~+09	5.3		98.9	98.67	~~0.23~~	
1+89	6.64		97.56	98.02 ~~97.65~~		0.46
3+14	7.62		96.58	97.00		0.42
3+85	7.82		96.38	96.38	0	0

5-1-68 Randy & EDM.

Sewer grades to Cal-de-sac

Unit No. 4

Sta	Rod	HI	Elev	FS	C	F.
					8.9	
M.H.	4.87 ~~F.L. 13.77~~	113.77	F.L. 100.00	Wanted Elev	8.9	
F.L. 0+42.2	13.77✓		100.05	F.L. Elev 100.05	0	0
0+50	5.02✓		108.75	100.20	8.55	
1+00	5.91		107.86	100.40	7.46	
1+50	7.31		106.46	100.60	5.86	
2+00	5.49		108.28	100.80	7.48	
2+12.85	5.7		108.07	100.85	7.22✓	

113.77 − 5.49 = 108.28

113.77 − 5.02 = 108.75; 100 + 8.75

100 + 8.9; 4.87 = 113.77

113.77 − 5.91 = 107.86

113.77 − 5.7 = 108.07; .048

113.77 − 7.31 = 106.46

MH at Sumac & Cal-de-sac

108.75 − 100.2 = 8.55

106.46 − 60 = 5.86

108.28 − 100.80 = 7.48

108.07 − 85 = 7.22

.4

19/24 2+30.6

5-16-68 Sewer grades Units
Pat - Randy - EVM

~~0+00~~	Rod	HI	Elev	Wanted El	Cut
0+00	6.49	106.49	100.0	90.62	9.38
MH.	7.22		99.27	FL = 89.44	
0+50	4.92		101.57	90.87	10.70
1+00	4.74		101.75	91.12	10.63
1+50	5.37		101.12	91.38	9.74
1+69.64	4.24		102.25	91.48	10.77
2+19.64	3.07		103.42	92.04	11.38
2+69.64	2.50		103.99	92.60	11.34
3+19.64	3.68		102.81	93.16	9.63
3+69.64	4.66		101.94	93.73	8.21
4+19.64	5.02		101.47	94.29	7.18
4+69.64	6.08		100.41	94.85	5.56
5+19.64	3.67		102.82	95.42	7.40
5+44.64	3.5		102.99	95.70	7.29
~~5+07~~	~~0.84~~		~~105.65~~	~~96.26~~	~~9.39~~
5+84.64					
5+44.64	5.63	108.62	102.99	95.70	7.29
5+84.64	2.81		105.81	96.15	10.11

102.99
5.63
108.62
2.81
105.81

MH. in Existing line (West) top is 232' West MH. is 9.83' deep

~~Slope = 0.508 per 100'~~

Turn & M.H.

Slope = 1.127 per 100'

95.70
.45
96.15

105.81
95.7
10.11

1.127
.40
.45080

West line of Rd at NE Cor of Lot

1.18' = fall from 0+00 West to MH.
Dist. 0+00 West to MH. is 232'
Slope = 0.0050862
This slope must carry on to Next M.H. 1+69.64' East

Gary - Dave - EUM

7-1-68

Sewer going N on 1170 East off Thrushwood

Cut

Sta	Rod	HI	desired Elev	Elev	
M.H.	6.16	116.38	100.0	110.22	10.22
MH 0+96.6	5.77		100.53	110.61	10.08
1+50	5.03		100.82	111.35	10.53
2+00	4.66		101.09	111.72	10.63
2+50	4.53		101.37	111.85	10.48
2+98.35	4.04		101.63	112.34	10.71

FL at 0+96.6 15.85

Depth of M.H. 10.22 on Thrushwood

6.16
10.22
16.38
15.85
.53
.265

14.9
95
15.85

53.4

96.6) 53.00 (.0547
4830
4700
3864
8360
6762

48.35
100.53 55
293
823
275
109.8
275
273
3

110.22
6.16
06
265
16.38

111.72
1.09
10.63

110.61
100.53
08

.55
2670
2670
.29370
265
55.8
265
.823

116.38
4.66
111.72

116.38
503
111.35
100.82
5.3

116.38
404
112.34
101.63
10.71

116.38
453
111.85
1.37
10.48

50

116.38
5.77
110.61

TRAVERSE FOR HIDDEN VILLAGE

GARY J.

UNIT #6 KEN B.

Pt AT NE COR OF UNIT #5 → #1

#1 → #2

#2 → #3

#3 → #4

#4 → #5

#5 → #6

#6 → #7

#7 → #8

#8 → #9

#9 → #10

#10 → #11

#11 → #12

#12 → #13

#13 → #14

81.62

10

322.3' ALONG EAST HILL

221.7' (-) ALONG HILL

467.05' ALONG HILL

220.90' To East Fence

361.3' To River

240.3' ALONG RIVER

168.1' ALONG RIVER

~~178.0'~~ 84.45' NE CORNER

143.5' Along River

85.1' Along River Pt. IN RIVER

118.72 Along River

66.78' TO Field (head Gate)

297.64' Along Field

81.62' TO RIVER

TRAVERSE

UNIT # 6

AUG. 19-68

GARY J
KEN B
RANDY B.

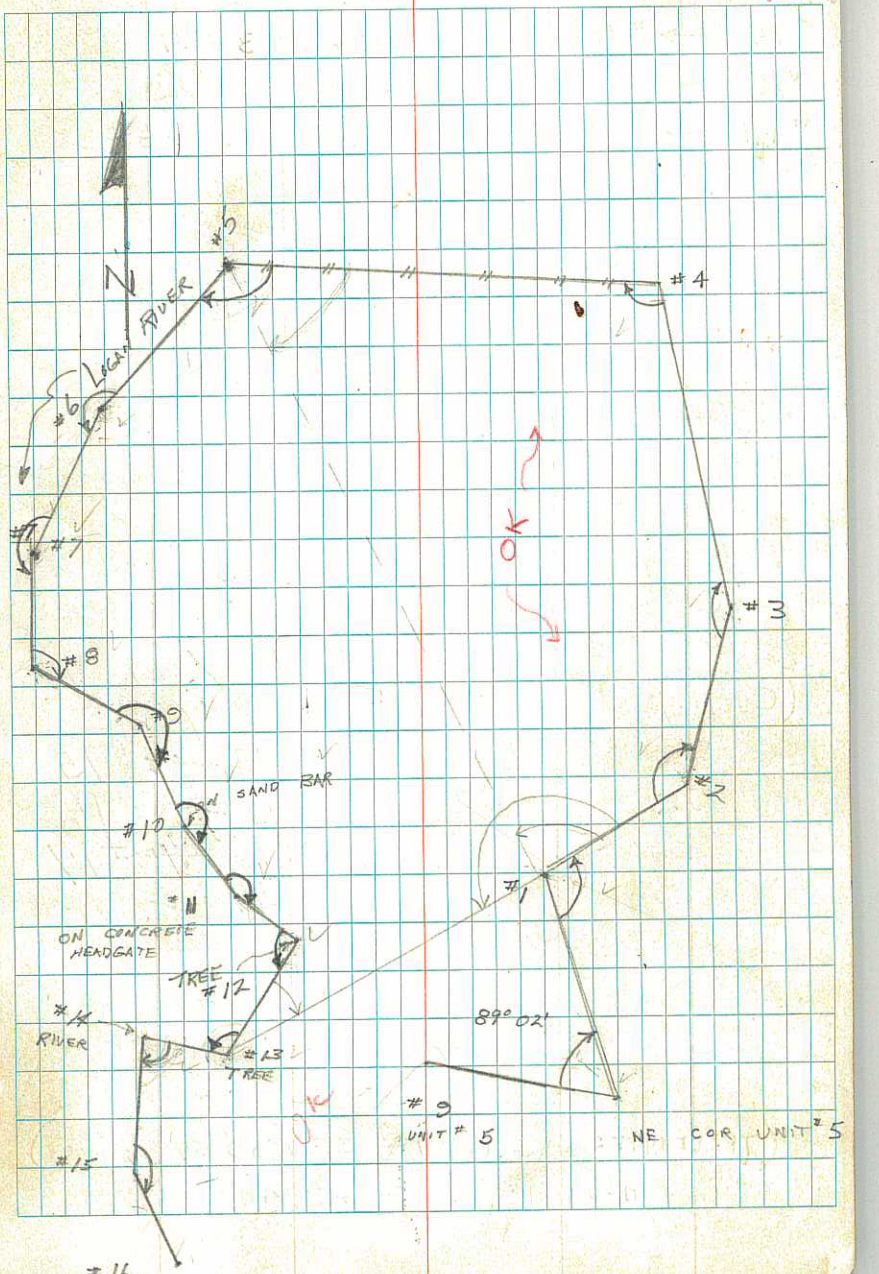
FROM	TO	ANGLE	DOUB. L.	
#9 UNIT FIVE	→ #1	89° 02'	178° 05' 30"	+1'
NE COR UNIT #5	→ #2	97° 02'	194° 04'	
#1	→ #3	159° 48' 30"	319° 37'	
#2	→ #4	137° 25'	274° 49' 30"	
#3	→ #5	82° 22'	164° 44'	
#4	→ #6	168° 47'	337° 33' 30"	
#5	→ #7	164° 11'	328° 22'	
#6	→ #8	166° 21'	332° 42'	
#7	→ #9	90° 20' 30"	180° 41'	
#8	→ #10	157° 05' 30"	314° 11'	

AUG. 24 - 68

GARY J
KEN B

#9	→ #11	172° 10' 30"	344° 21'	+1'
#10	→ #12	154° 48' 30"	309° 37'	
#11	→ #13	123° 36' 30"	247° 13' 30"	
#12	→ #14	155° 24' 30"	310° 48' 30"	+1'
#13	→ #15	107° 15'	214° 30' 30"	+30"
#14	→ #16	164° 58'	329° 56' 30"	+30"

(CONT.)



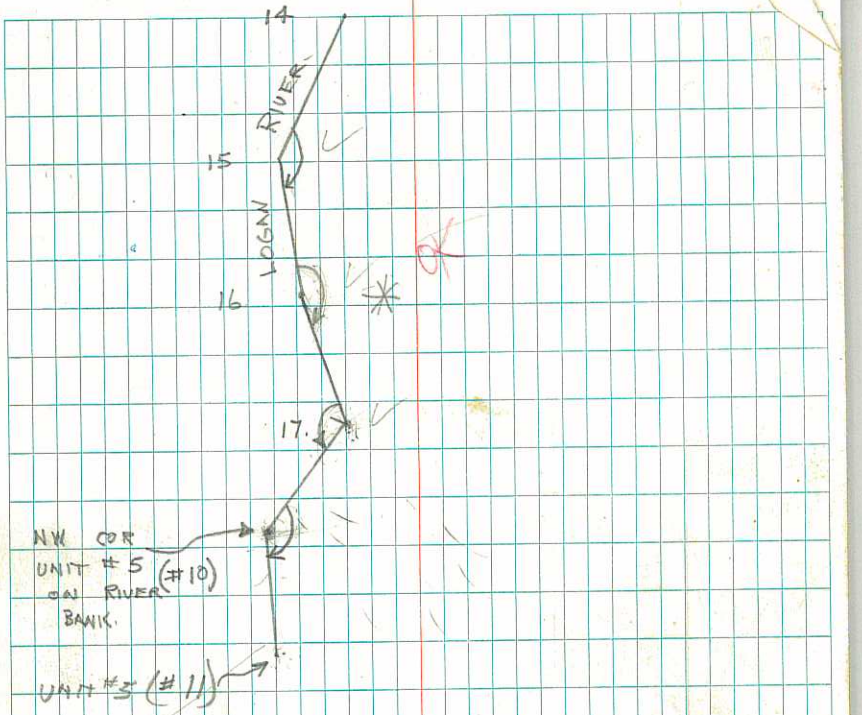
From	To		Angle	Doub Angle
#15	→ #17		179°48'30"	359°37'
#16	→ NW COR UNIT #5 (#11) UNIT #5		159°41'	319°22'
#17	→		153°52'	307°44'30"

(CONT.)

#14 → #15
#15 → #16
#16 → #17
#17 → #18

INTER. ANGLES = 3239°56'

(N-2) (180°) = 3240°



168.07' Along River
159.12' Along River
66.15 Along River
48.19 Along River.

CHECKING OF TRAVERSE
ON UNIT #6

AUG. 30-68

GARY J. T
KEN B.

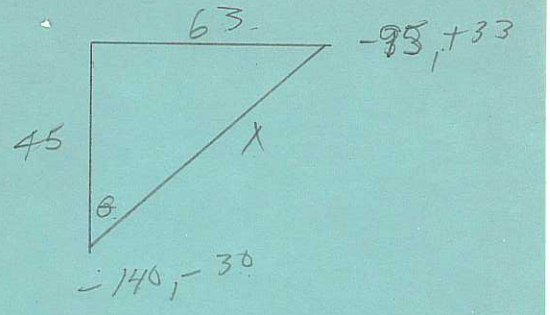
FROM →	TO		
#2	#13	175° 49' 30"	
#2	#5	48° 35' 30"	
#4	#1	111° 49' 30"	INT.
#4	#6	168° 47'	INT.
#12	#1	55° 28'	

SET UP ON NO. 1

"

SET UP ON NO 5.

SET UP ON NO. 13



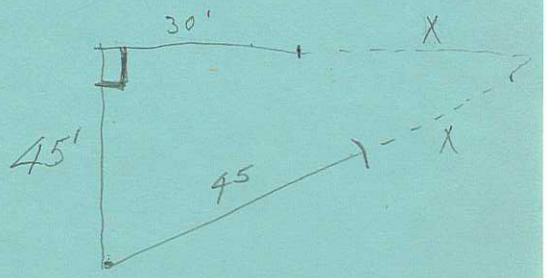
-95, +33

-140, -30

$\tan\theta = \frac{63}{45} = 1.40$

$\theta = 54° 27' 40''$

$X = \frac{63}{\sin\theta} = \frac{63}{.8137212}$



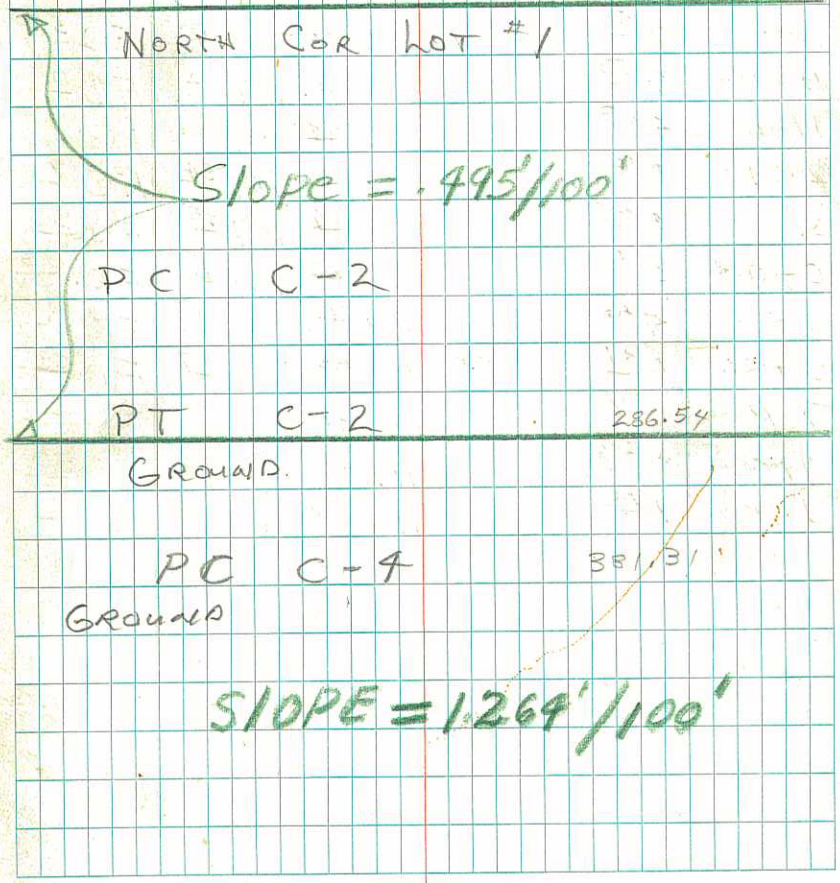
CURB & GUTTER GRADES

HIDDEN VILLAGE SCHOOL.

AUG. – 28, 1968

GARY S.
KEN B. x
RANDY B.

STA	ROD	HT	ELEV.	DESIRED ELEV.	
0+00	5 95	105 95	100 00	100 34	FO 34
0+50	5 52		100 43	100 59	FO 16
1+00	4 69		101 26	100 84	CO 42
1+50	5 66		100 29	101 08	FO 79
2+00	5 48		100 47	101 33	FO 86
2+08 76	5 30		100 65	101 37	FO 72
2+34	4 61		101 34	101 50	FO 16
2+59	4 42		101 53	101 62	FO 09
0+00	4 19		101 76	101 76	FO 00
0+00	4 47		101 48		
0+50	3 31		102 64	102 39	CO 25
0+94 77	2 20		103 25	102 96	CO 79
0+94 77	2 53		103 42		
1+20 +25	2 26		103 69	103 28	CO 41
1+45	1 95		104 00	103 59	CO 41
1+70	1 65		104 30	103 91	CO 39
1+95 +25	1 49		104 46	104 22	CO 24
2+20	1 72		104 23	104 54	FO 31



STA.	ROD	HI	ELEV.	Desired ELEV.	
0+00	2 13		103 92 BS	104 86	F1 04
245.56			FS 2 13	7 16	
TP.					
0+00	7 41	110 98	103 57		
0+50	6 97		104 01	105 50	F1 49
1+00	4 18		106 80	106 13	CO 67
1+36.35	4 89		106 09	106 59	FO 50
1+38.35	3 17		105 81		
1+61.35	4 66		106 32	106 90	FO 58
1+86.35	4 79		106 19	107 22	F1 03
1+86.35	5 29		105 69		
2+11.35	4 16		106 32	107 54	FO 72
2+36.35	4 08		106 90	107 85	FO 95
0+00	2 73		108 25	108 25	FO 00
0+00	3 66		107 92		
0+50	1 81		109 17	109 17	FO 00
			FS 7 85 BS		
TP		111 48	103 31		
1+00.5	0 88		110 60	110 10	CO 50
1+00.5	1 14		110 34		

PT. C-4 (5+32.1)

GROUND.

PC C-6 6+68.45

SLOPE = 1.269'/100'

GROUND.

PT C-6 (8+00.04)

GROUND

NW COR PROP. (9+00.54)

GROUND. SLOPE = 1.84'/100'

170.0
69.1
100.9

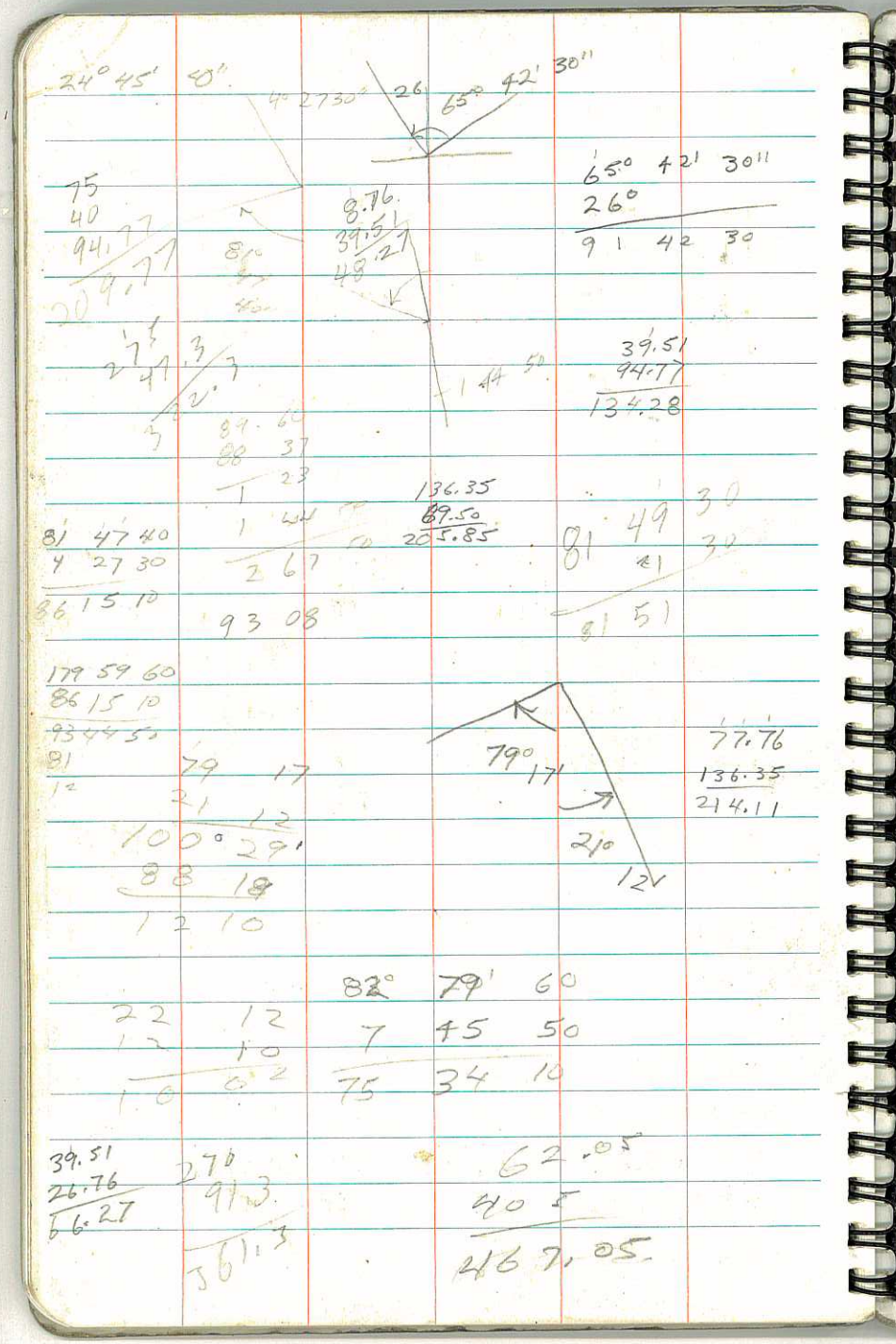
SADDLER SUB-DIVISION

AUG. 30, 1968 GARY J. T
KEN B.

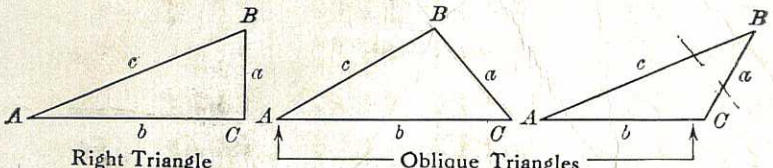
CURB & GUTTER (SOUTH SIDE) GRADES.

STA	ROD	HI	ELEV.	DESIRED GRADE	
0+00	4.80	104.80	100.00		
0+00	4.44		100.36		
0+45.5	4.50		100.30		
0+45.5	4.06		100.74		
0+57.5	4.27		100.53		
0+69.5	4.45		100.35	100.50	F 0.15
1+30.86	5.47		99.33	99.78	F 0.45
1+89.36	6.98		97.82	99.10	F 1.28
1+98	7.22		97.53	99.00	F 1.47
2+34.5	6.75		98.05	98.73	F 0.68
2+75.9	6.60		98.20	98.43	F 0.23
2+75.9	5.45		99.35		
3+02.9	6.62		98.18	98.24	F 0.06
3+02.9	5.44		99.36		
3+47.9	7.65		97.15	97.50	F 0.35
4+47.9	9.50		95.30		
3+08.9	6.61		98.19		

SE COR LOT #1
℄ OF ROAD
PC C-8
℄ OF CRICKET AVE
MID CURVE C-8
PT C-8
PC C-4
PT C-4 HOLE
PC C-1 HOLE
NE COR LOT #2
PT C-1
SIDEWALK 25' SOUTH OF PT C-1
E NW LOT #2
SIDEWALK 25' SOUTH OF NW LOT #2
PROPOSED PC
+100 W GROUND
TOP OF M.H



TRIGONOMETRIC FORMULAS



Solution of Right Triangles

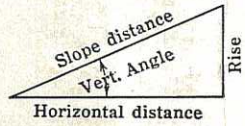
For Angle A. $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

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	$\text{area} = \frac{b\,c \sin A}{2}$
A, B, C, a	Area	$\text{area} = \frac{a^2 \sin B \sin C}{2 \sin A}$

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′. Since 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.