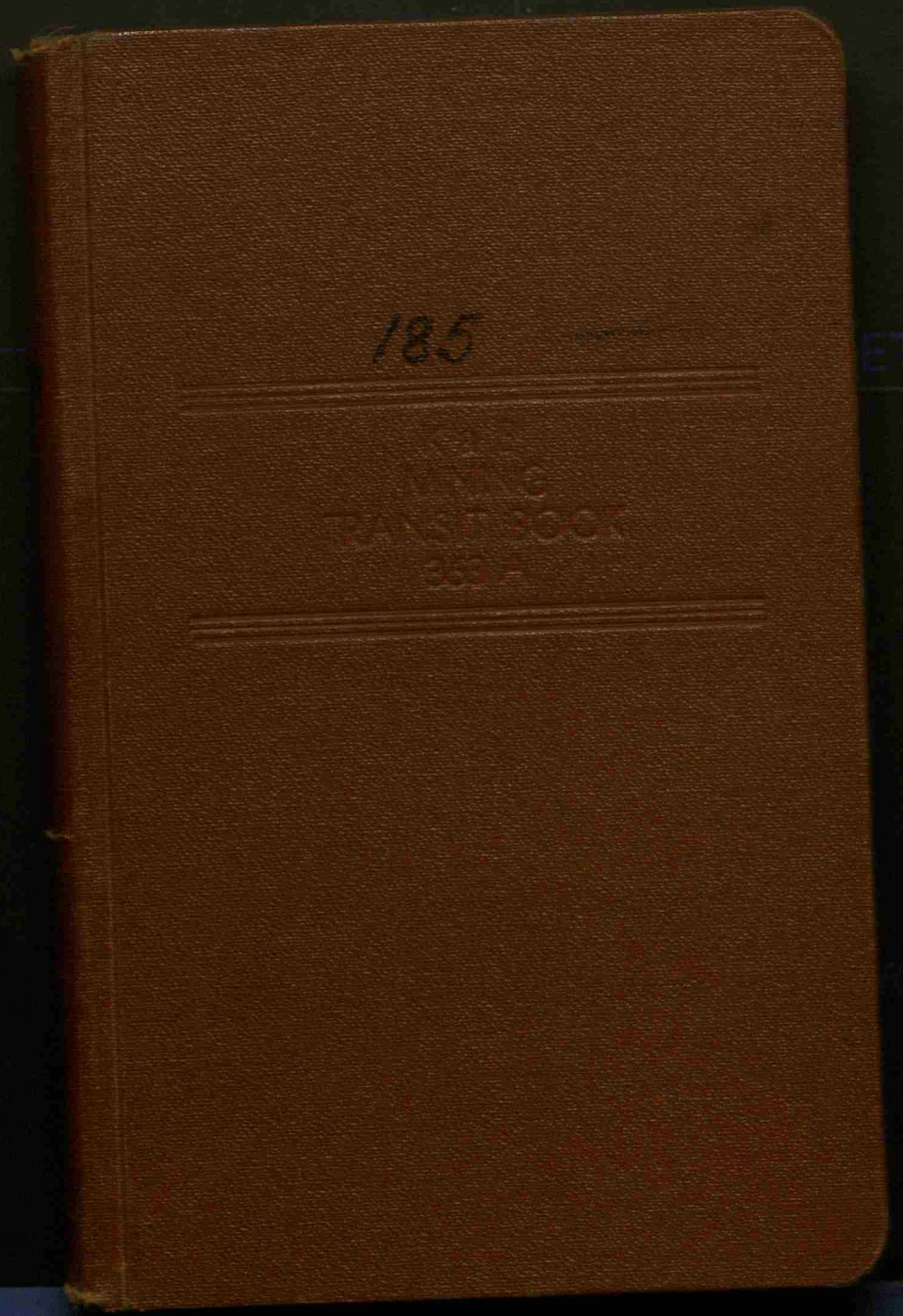

185
TRANSIT BOOK

KEUFFEL & ESSER CO.
DRAWING MATERIALS
AND
SURVEYING INSTRUMENTS.
NEW YORK.
CHICAGO. ST. LOUIS. SAN FRANCISCO. MONTREAL.

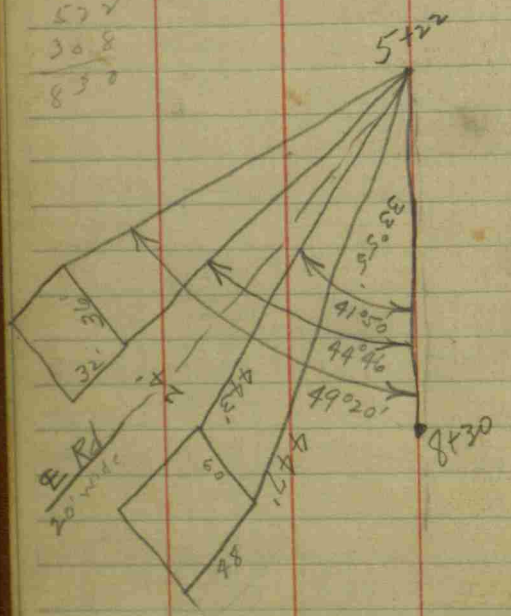
TABLES FOR EXCAVATIONS AND EMBANKMENTS.

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.
ROADWAY 18 FEET WIDE. SIDE SLOPES 1 TO 1.
FOR SINGLE TRACK EXCAVATION.

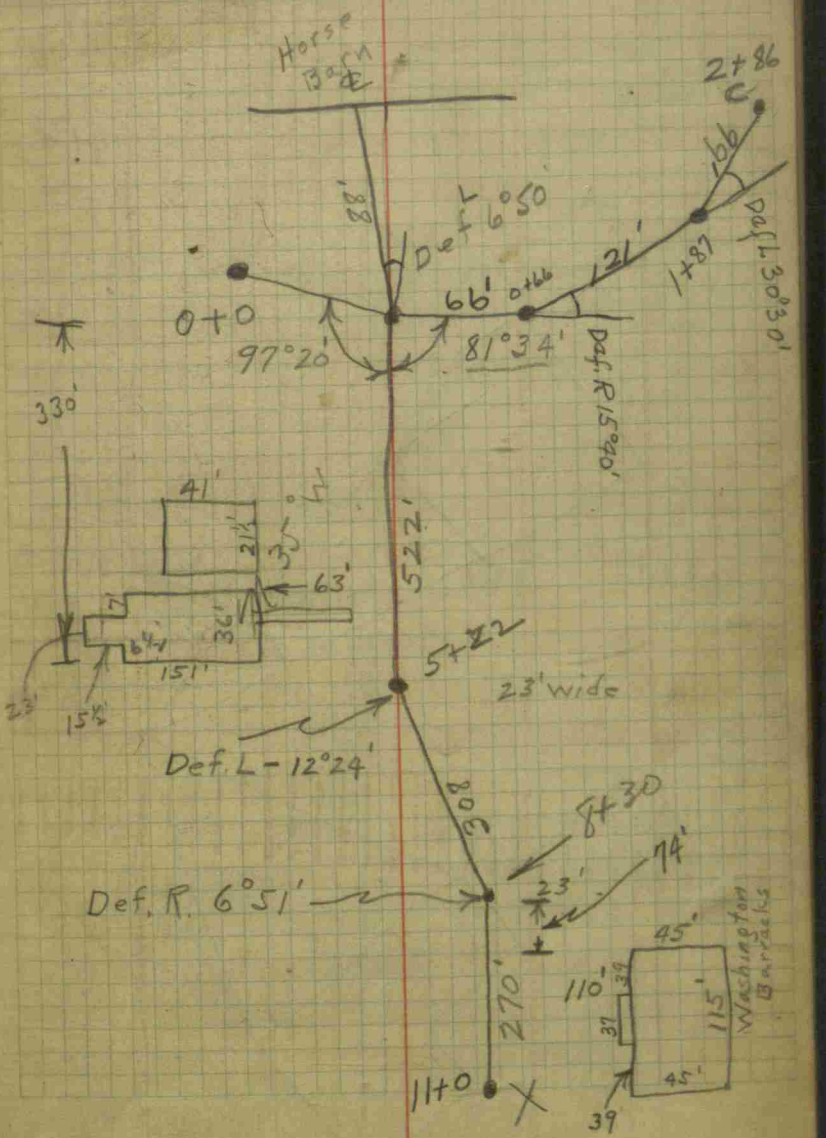
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	9.0	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	0
1	10.0	10.1	10.2	10.3	10.4	10.5	10.6	10.7	10.8	10.9	1
2	11.0	11.1	11.2	11.3	11.4	11.5	11.6	11.7	11.8	11.9	2
3	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	3
4	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	4
5	14.0	14.1	14.2	14.3	14.4	14.5	14.6	14.7	14.8	14.9	5
6	15.0	15.1	15.2	15.3	15.4	15.5	15.6	15.7	15.8	15.9	6
7	16.0	16.1	16.2	16.3	16.4	16.5	16.6	16.7	16.8	16.9	7
8	17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9	8
9	18.0	18.1	18.2	18.3	18.4	18.5	18.6	18.7	18.8	18.9	9
10	19.0	19.1	19.2	19.3	19.4	19.5	19.6	19.7	19.8	19.9	10
11	20.0	20.1	20.2	20.3	20.4	20.5	20.6	20.7	20.8	20.9	11
12	21.0	21.1	21.2	21.3	21.4	21.5	21.6	21.7	21.8	21.9	12
13	22.0	22.1	22.2	22.3	22.4	22.5	22.6	22.7	22.8	22.9	13
14	23.0	23.1	23.2	23.3	23.4	23.5	23.6	23.7	23.8	23.9	14
15	24.0	24.1	24.2	24.3	24.4	24.5	24.6	24.7	24.8	24.9	15
16	25.0	25.1	25.2	25.3	25.4	25.5	25.6	25.7	25.8	25.9	16
17	26.0	26.1	26.2	26.3	26.4	26.5	26.6	26.7	26.8	26.9	17
18	27.0	27.1	27.2	27.3	27.4	27.5	27.6	27.7	27.8	27.9	18
19	28.0	28.1	28.2	28.3	28.4	28.5	28.6	28.7	28.8	28.9	19
20	29.0	29.1	29.2	29.3	29.4	29.5	29.6	29.7	29.8	29.9	20
21	30.0	30.1	30.2	30.3	30.4	30.5	30.6	30.7	30.8	30.9	21
22	31.0	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9	22
23	32.0	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9	23
24	33.0	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9	24
25	34.0	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9	25
26	35.0	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9	26
27	36.0	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9	27
28	37.0	37.1	37.2	37.3	37.4	37.5	37.6	37.7	37.8	37.9	28
29	38.0	38.1	38.2	38.3	38.4	38.5	38.6	38.7	38.8	38.9	29
30	39.0	39.1	39.2	39.3	39.4	39.5	39.6	39.7	39.8	39.9	30
31	40.0	40.1	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9	31
32	41.0	41.1	41.2	41.3	41.4	41.5	41.6	41.7	41.8	41.9	32
33	42.0	42.1	42.2	42.3	42.4	42.5	42.6	42.7	42.8	42.9	33
34	43.0	43.1	43.2	43.3	43.4	43.5	43.6	43.7	43.8	43.9	34
35	44.0	44.1	44.2	44.3	44.4	44.5	44.6	44.7	44.8	44.9	35
36	45.0	45.1	45.2	45.3	45.4	45.5	45.6	45.7	45.8	45.9	36

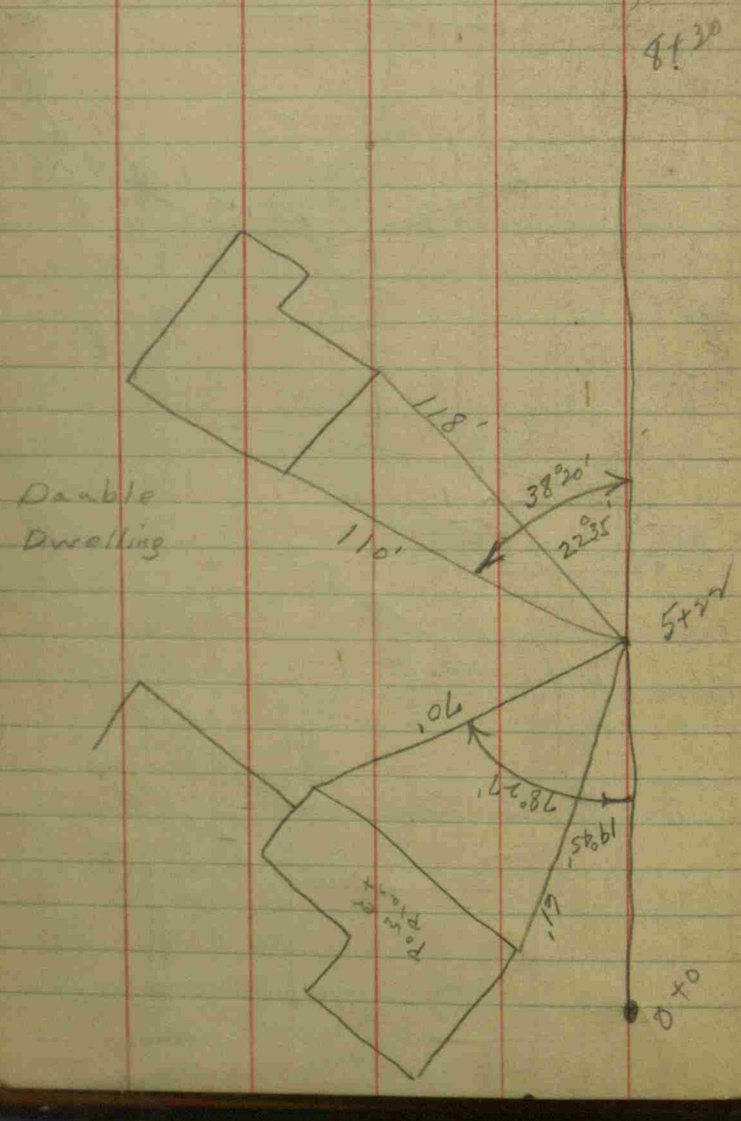
Calculated by Julien A. Hall, M. Am. Soc. C. E.

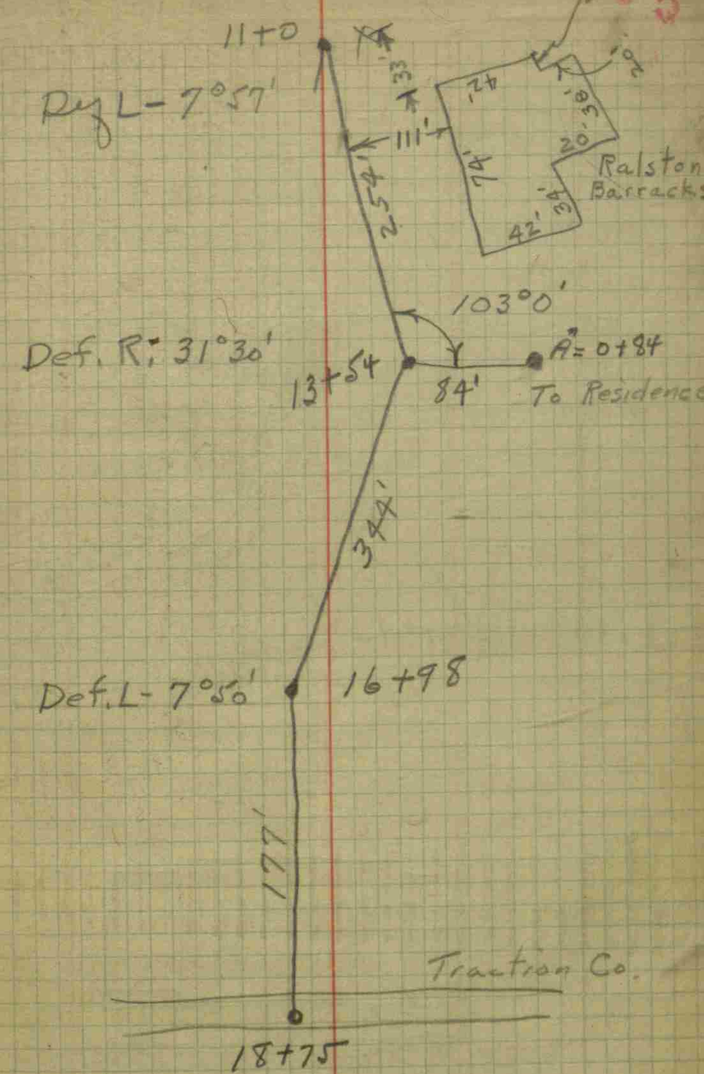
Indiana Boys School

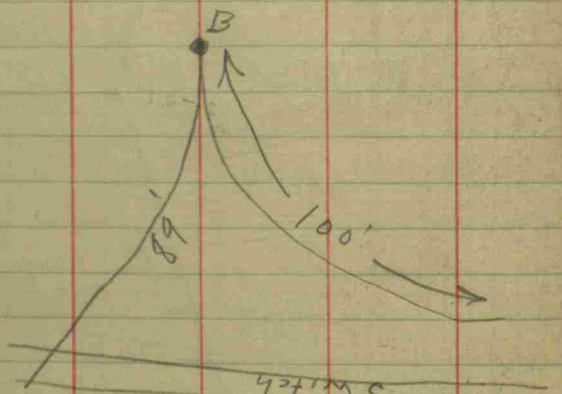


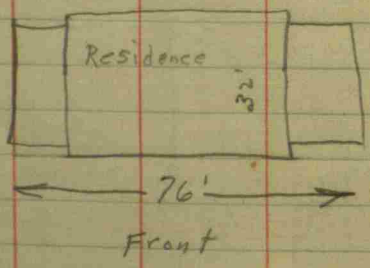
Vegetable Houses



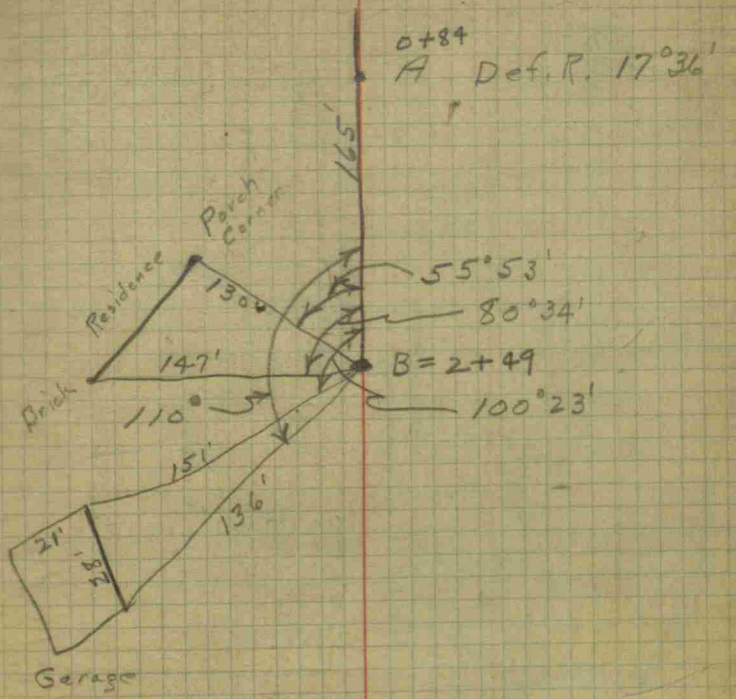

8+30
118'
38°20'
22°35'
Double
Dwelling
110'
5+24
90'
78°21'
19°45'
61'
Post
Office
0+0

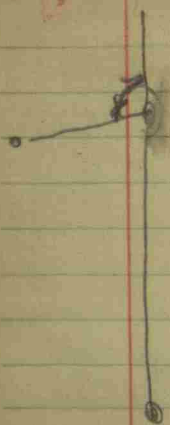

11+0
Def. L - 7°57'
33'
111'
254'
42'
74'
20.38'
34'
42'
Ralston
Barracks
103°0'
Def. R. 31°30'
13+54
84'
A = 0+84
To Residence
344'
Def. L - 7°50'
16+98
177'
Traction Co.
18+75

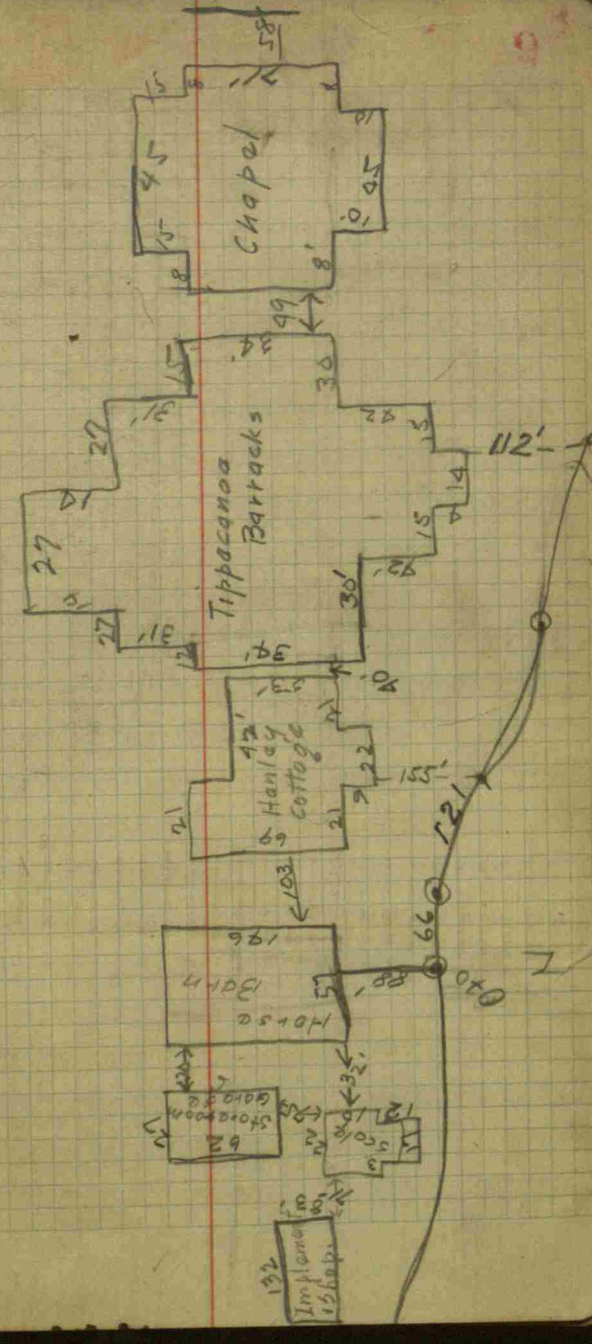




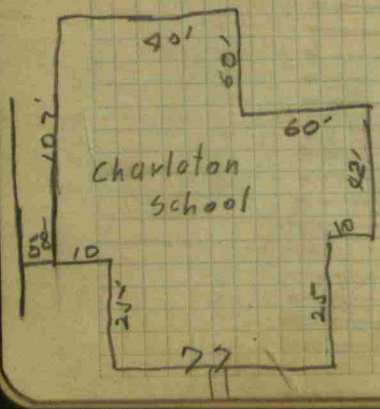
To Residence Line

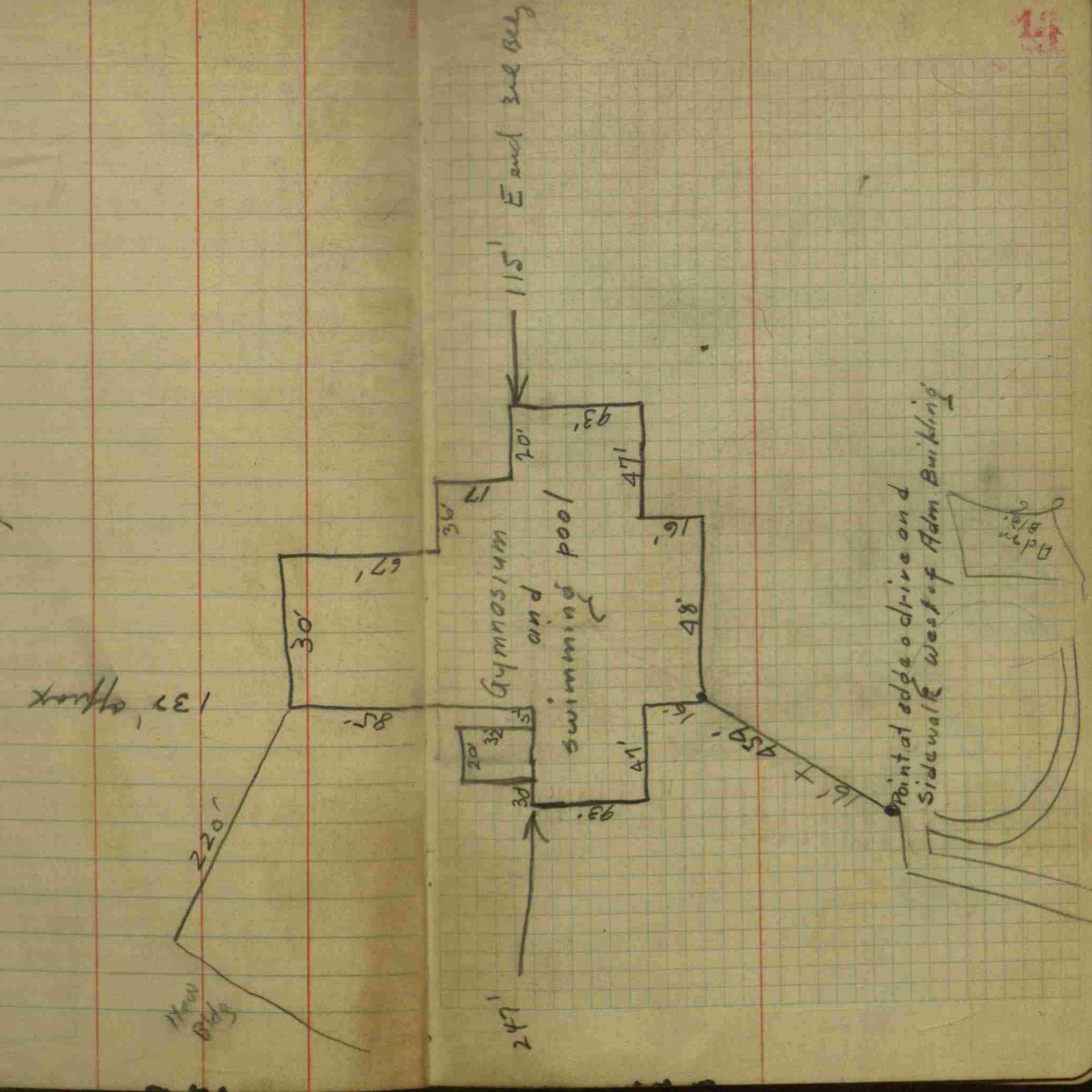




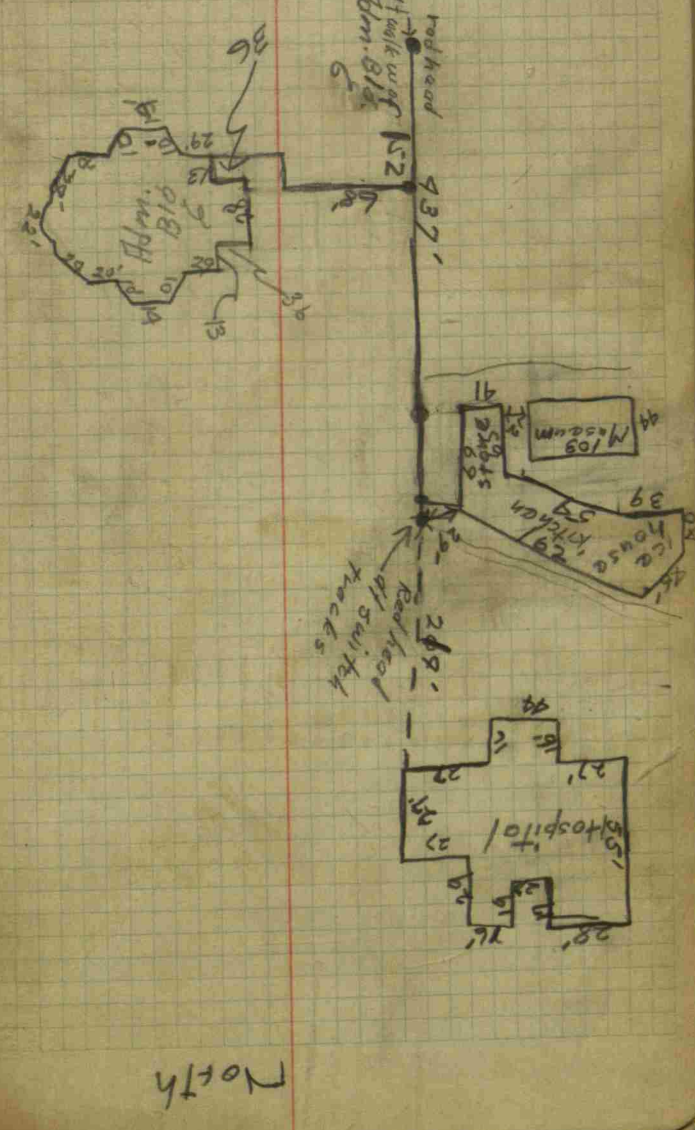


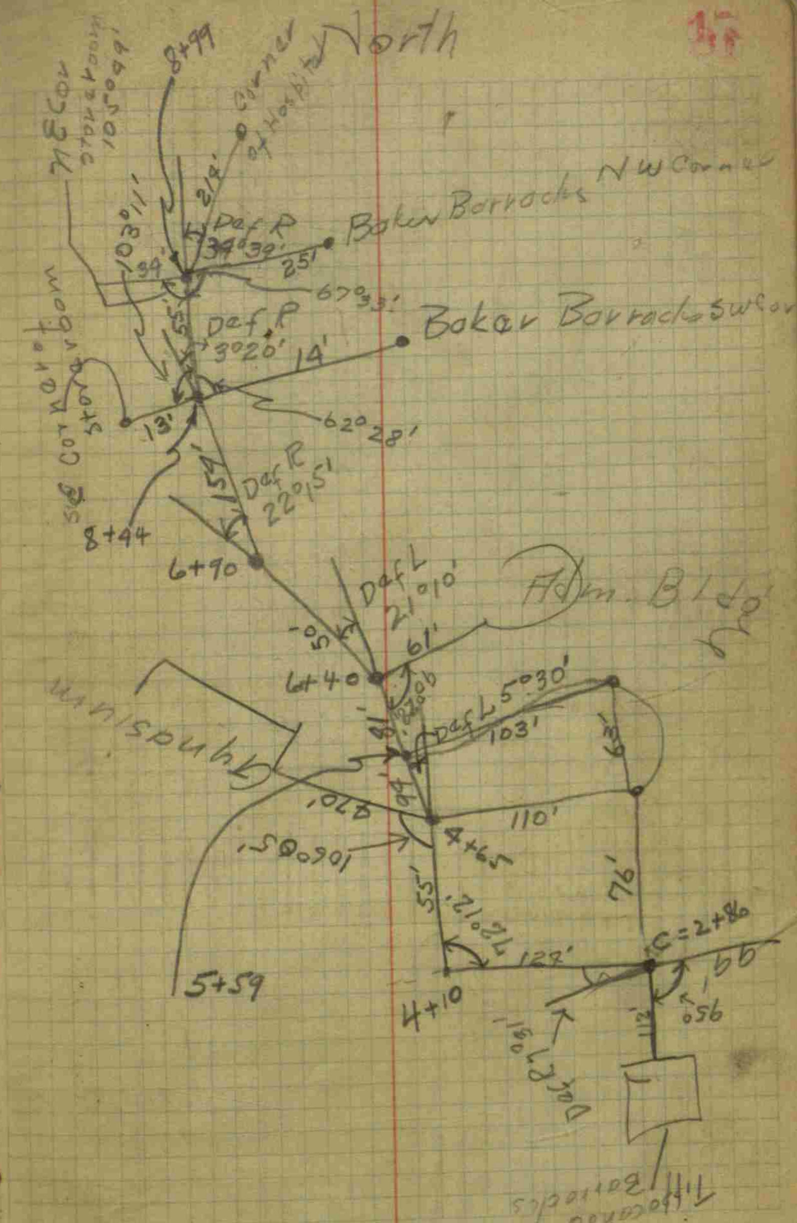
Chapel
Tippacanoe Barracks
Hanley cottage
Horse Barn
Storeroom Garage
Store
Implement Shop
112'
155'
121'
0+0


40'
60'
60'
107'
Charleston
School
22'
10
10
25'
25'
77


115' E and 3rd Bldg
Gymnasium and swimming pool
93'
20'
17'
36'
67'
30'
85'
137' approx
220'
New Bldg
5'
32'
20'
30'
93'
41'
16'
48'
16'
47'
459'
16'
247'
Point at edge of drive and Sidewalk west of Adm Building
Adm Bldg

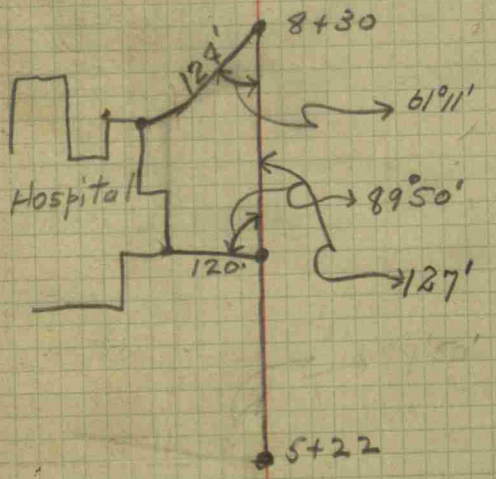
162
69
6


red head
at walk way
Adm. Bldg.
152
437'
Adm. Bldg
Museum
Store
Ice house
kitchen
Red head
at switch
tracks
269'
Hospital
North


North
8+99
Corner of Hospital
NW Corner
Baker Barracks
Def R
34°30'
25'
103°11'
34'
67°33'
Def R
3°20'
Baker Barracks SW cor
14'
13'
62°28'
Def R
22°15'
15'
8+44
6+90
Def L
21°10'
Adm. Bldg
61'
6+40
Def L 5°30'
103'
63'
110'
4+65
76'
55'
72°12'
122'
C=2+86
4+10
5+59

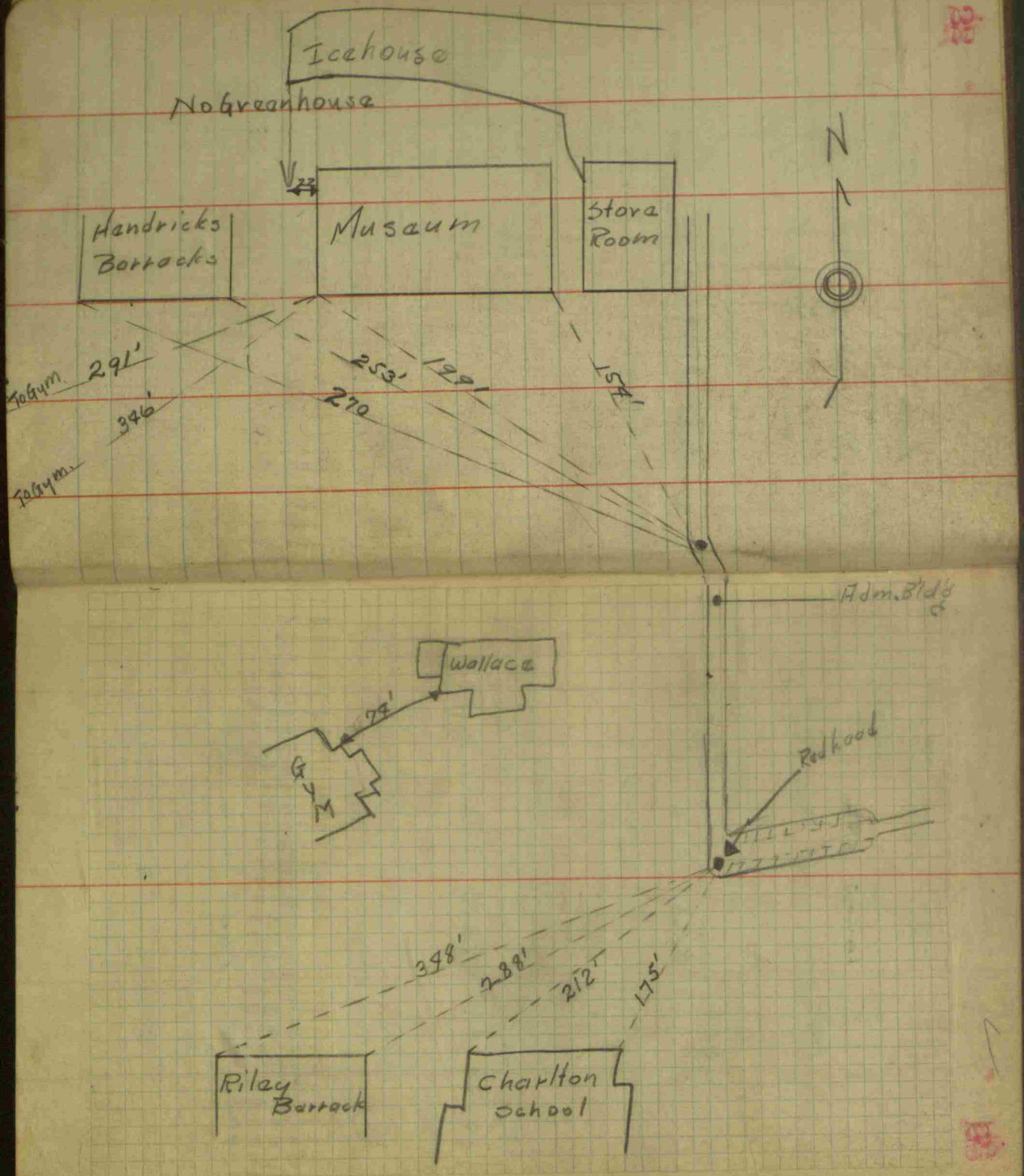
35
55
17.0

North



New tunnel starts
at NW cor of Cadar Bldg then
to School & then to Tippecanoe.

New Water Main 6" Size
pump house.


Icehouse
No Greenhouse
Hendricks Barracks
Musaum
Stora Room
N
Togym
291'
346'
Togym
253'
270
129'
154'
Adm. Bldg
Wallace
74'
G
Y
M
Redhood
348'
288'
212'
175'
Riley Barrack
Charlton School

−	⊼	+	BM	Red Head Mt Residence Road
			100.00	
	105.44	5.44		
~~6.65~~			~~93.35~~	
6.65			93.35	
	96.61	3.26		
7.00			89.61	
	93.13	3.52		
3.90			89.23	
	96.13	6.90		

Levels on Boys School

Top wall	℄	E	
	95.81 9.63		N. ↑
100.00 5.44	99.27 8.17	93.10 12.34	Residence Drive
102.39 3.05	98.79 6.65		
95.18 1.43	91.91 4.70	84.52 12.09	
92.91 3.70	89.61 7.00		
Slab at 90.11 3.02		87.03 6.10 Vegetable House	

Power House ~~88.18~~ 4.65 (70') · 84.38 8.75 (50') · 85.28 7.85 in front of greenhouse · 82.33 10.80 walk

89.23
3.90
(0+0)

90.29 5.84 40'S at fish pond	89.71 6.42 Barn	85.10 11.03 Drive E 100'	82.13 14.00 impl. shed

	−	π	+	BM
		96.13		
	0.30			95.83
		106.87	11.04	

	0.17		106.70
		112.73	6.03

℄

94.82
12.05
30'5

101.22
5 65
1+87

~~96~~ 92
9.95
ground

106.70
0/7
2+86

3.7 lower for flowline of 2' tile

109.53
3.20
Hanley Cottage

109.32
3.41
Tippecanoe

109.73
3.00
Chapel

102.43
10.30
N of Chapel

112.13
0.60
Charlton

−	⊼	+	BM	
	112.73			
1.63			111.10	
	115.60	4.50		
2.59			113.01	BM on con E of Five at Adm. Bldg

111.10
Drive
1.63

111.58
4.02
Front E
of Adm Bldg

107.13
8.47
First Terrace
E of Adm. Bldg.

98.10
17.50
2nd Terrace
E of Adm Bldg.

103.97
11.63
ground E+S
of Adm Bldg

—	π	+	BM
			113.01
	118.45	5.44	

℄

112.05
6.40
Drive W.
of Fireplug

113.45
5.00
W. Entrance
of Adm. Bldg.
℄

113.01
5.44
S Entrance
of Adm.

115.45
3.00
Laundry

116.15
2.30
Riley

119.95
−1.50
Roosevelt

116.52
1.93
Danbar

118.15
0.30
Lincoln

—	℄	+	BM
	118.45		
5.26			113.19
	120.12	6.93	
8.08			112.04
	115.95	3.91	

116 35
2 10
Wallace

114 82
3 63
Hendricks

113 05
5 90
Museum

112 17
6 28
Storeroom

118.54
1.58
Gym

111 42
4 53
Baker-Freeman

111 50
4 45
Back of Kitchen

112 08
3 87
Bakery

113 10
2 85
Storeroom (West)

	−	π	+	BM
		115.95		
	3.80			112.15
		118.04	5.89	

104 15
11 80
Ravine So of Hosp

111 60
4 35
Sidewalk to Hospital

98 95
17 00
Ravine E of Hospital SW
Back of Power House

111 60
4 35
Double Dwelling

112 35
3.60
Hospital

112 07
5.97
wash

112 24
5 80
Ralston

	—	℄	+	BM.
		118.04		
	4.58			113.96
		117.23	3.77	
	7.10			110.13
		110.96	0.83	

110 99
705
W. End of Ravine

117 44
060
Unheated
Garage.
℄

114 81
242
Garage
℄

115 42
181
Residence

110 13
7.10
℄
At house

—	π	+	BM.
	110.96		
10.45			100.51

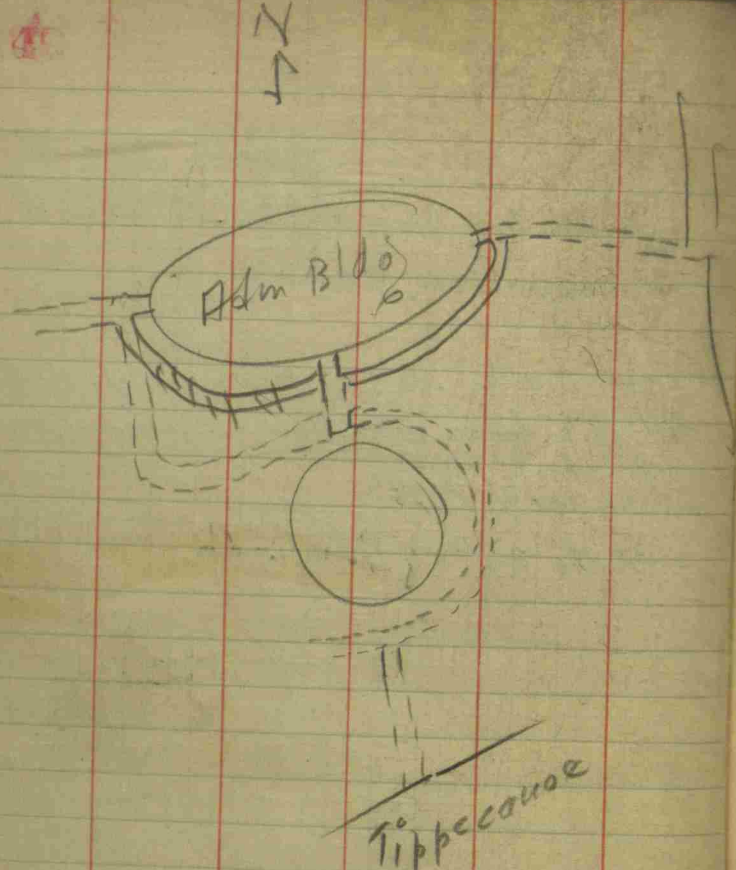
100.51
Rehead at curve to Resid.
10.45

New Tunnel from Adm. Bldg

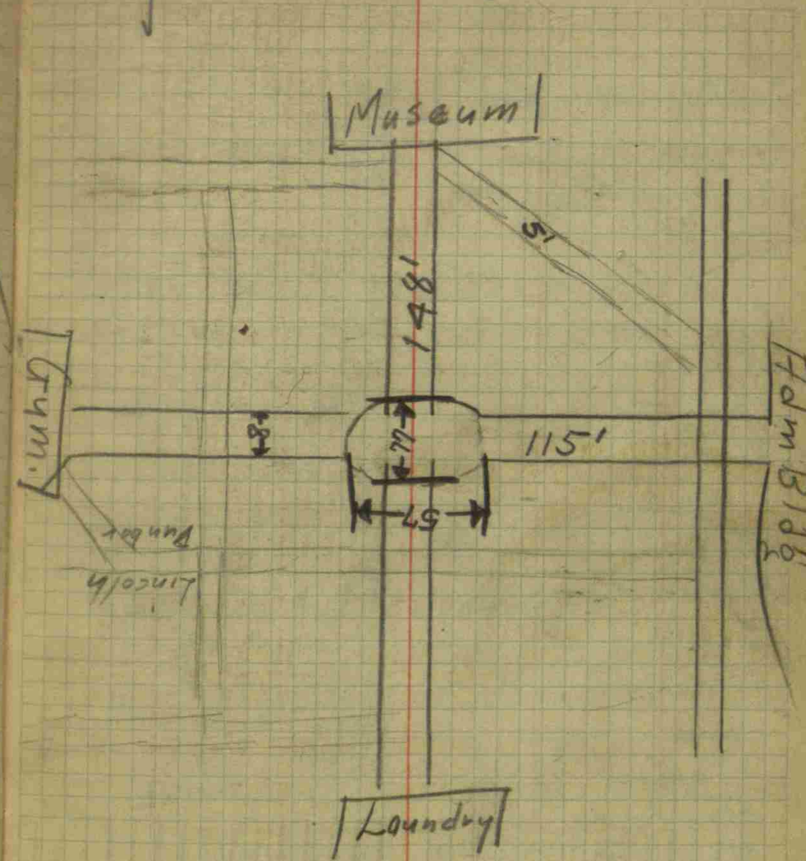
13' from NW corner of Adm. Bldg to Sidewalk N. of Charleton School then E to Tippecanoe Barracks.

New water main 6" main from 40' E of ~~Adm Bldg~~ Green House 682' to pump house which is 12' by 18'

Starts 35' N of Adm. Bldg.


N
Adm Bldg
Tippecanoe

Sidewalks


N
Museum
51'
148'
Gym.
8'
115'
57'
Adm Bldg
Dunbar
Lincoln
Laundry

First Floor Elev.

So. door Adm. Bldg 50" ✓
E " " " 67" ✓
W " " " 46" ✓
Hanley 49" ✓
Fire H. between Hanley & Tipp
Tippecanoe 59½" ✓
Chapel 50" ✓
Charlton 25" ✓
Plumbing 7" —
Laundry 6" ✓
Riley 20" ✓
Roosevelt 47" ✓
Dunbar 32½" ✓
Lincoln 24½" ✓
Gym 43" ✓
Wallace 39" ✓
Hendricks 37" ✓
Museum 76" ✓
Store Room 38" ✓
Freeman 22½" ✓
Fire Hyd. N. of Adm & So. of Freeman on W side of walk

Vegetable House — 28½" ✓
Store Room — 59"
Kitchen 58" ✓
Bakery 19" ✓
Pump House 8' ✓ — Canning Factory ✓ 10" above Pump House

Wash. Barracks — level ✓
Ralston " — 18" ✓
Residence — 20½" ✓
Double Barracks 16" ✓
Hospital 45" ✓
Implement Barn — level ✓

Power House
Lower Floor — level
Boiler room
Engine Room — 41"
Pump Room 13"
Fire Pool — W. end. 8.2' — El. 89.81
E. end. 8.6' 89.41
at door 8.5'

Levels	to	Fire	Tank
—	+	+	B.M.
			113.01
	116.59	3.58	
5.20			111.39
	111.93	0.54	
12.31			99.62
	102.71	3.09	

111.93
12.31
99.62

98.01
El. Tank step 4.70

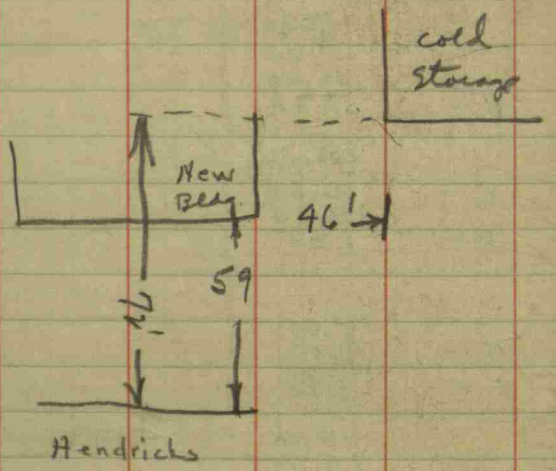
97.66
Floor of Power House 5.25

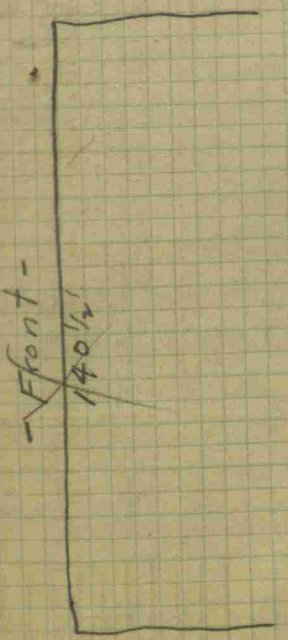
	−	+		B.M
				113.01
		119.70	6.69	
	2.70			117.00
		125.95	8.95	

125.95
11.20
114.75

	11.20			114.75
		118.99	4.24	
	5.77			113.22
118.99		117.49	4.27	
5.77	4.49			113.00
117.49				
4.49				

Front El.		120.35
	E −	5.60
1st Bldg.		122.70
	W −	3.25
		123.10
	S −	2.85
2nd Bldg		124.30
	N −	1.65
		121.85
3rd.	W −	4.10
Bldg.		117.25
	E −	8.70
		115.05
4th	W −	10.90
		112.79
Bldg.	E −	6.25


cold
Storage
New
Bldg.
46'
59
Hendricks


Front
140½'

New Barracks

3 bldgs 218'x87'

1 " 148'x116'

Wood. Working

91'

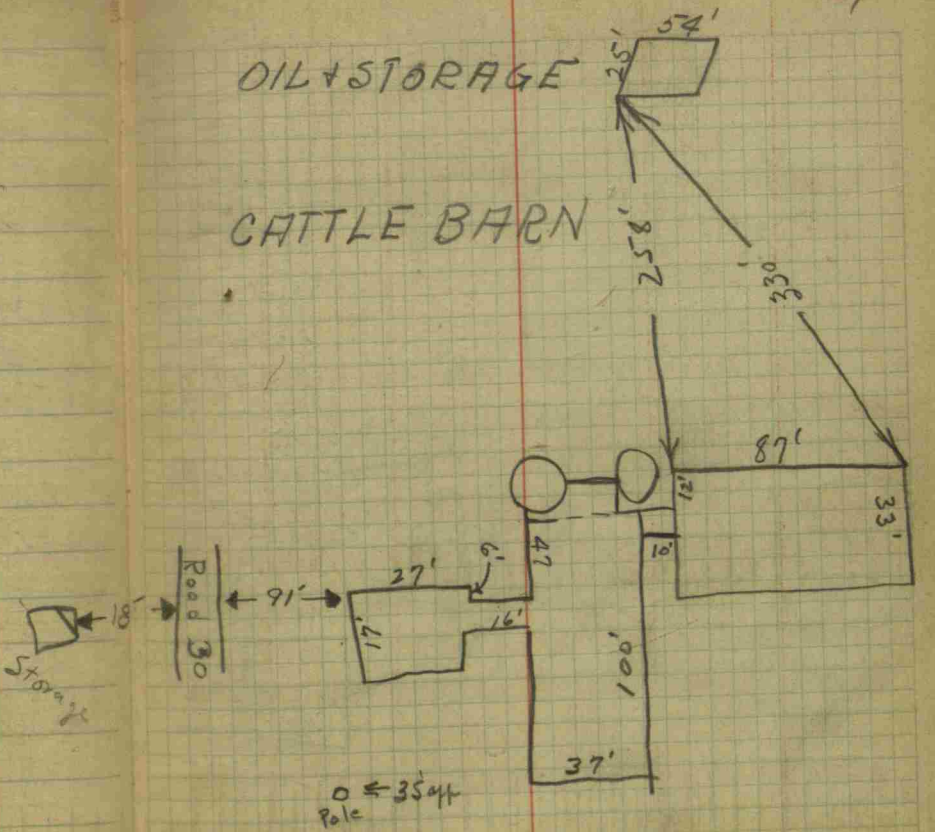
24

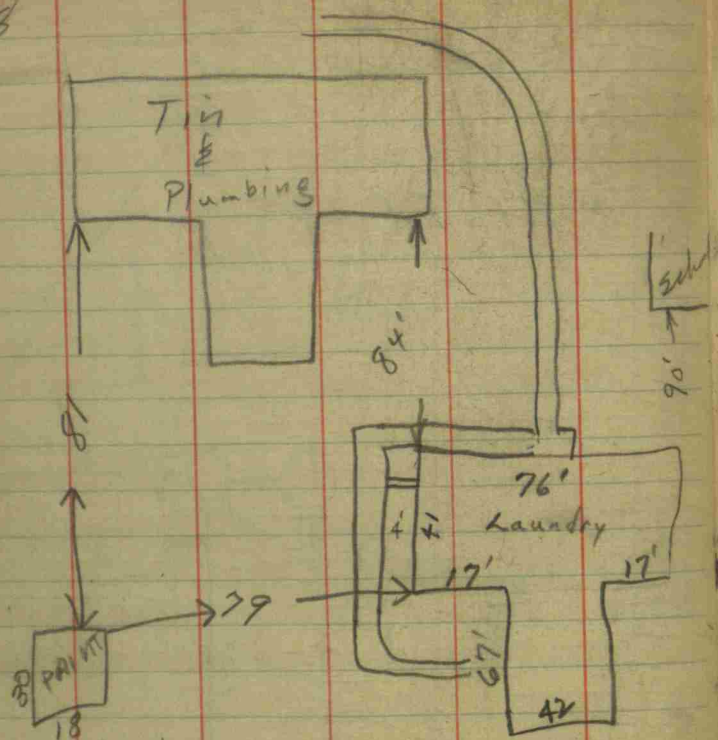
Storage

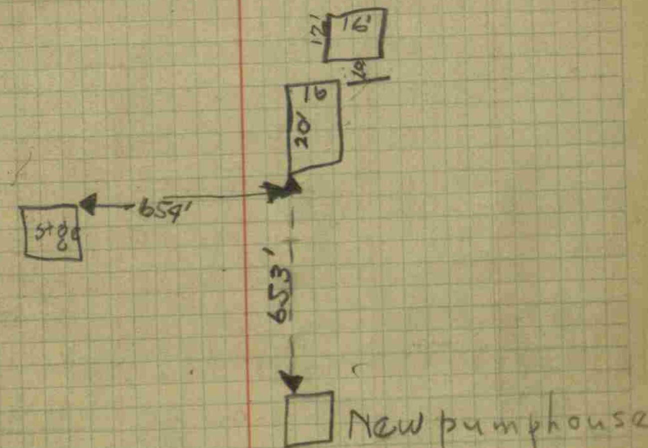
12'

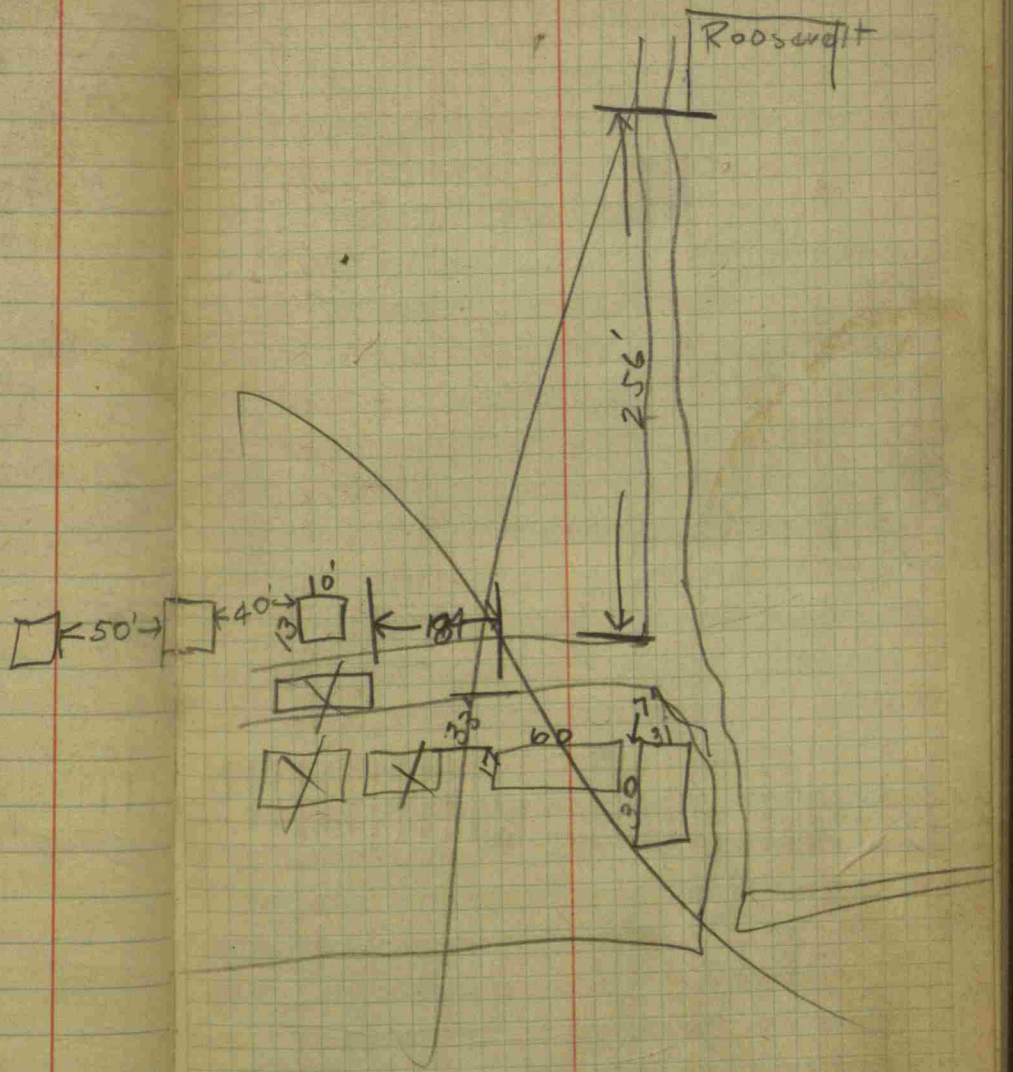
OIL + STORAGE

CATTLE BARN



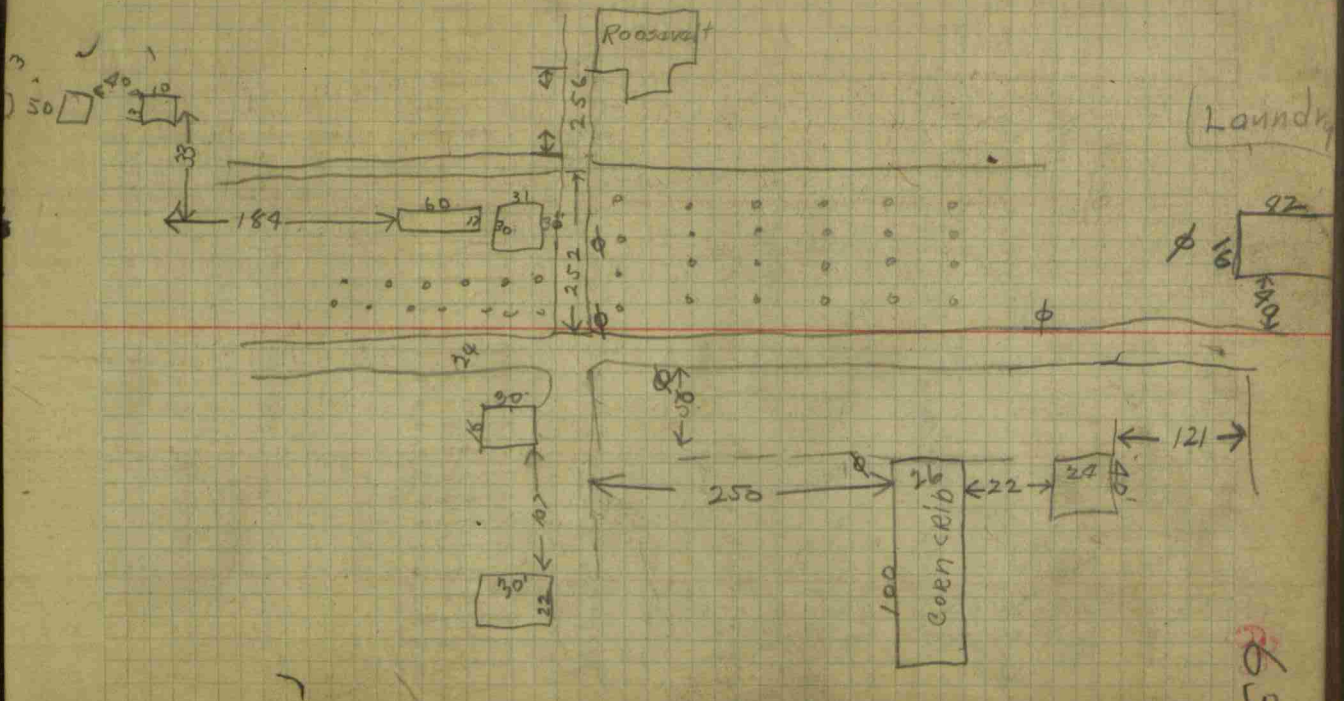

Tin
&
Plumbing
84'
81'
79
Paint
30
18
76'
Laundry
4'
4'
17'
17'
67'
42
Sch
90'


12'
16'
10
16
20'
654'
Stge
653'
New pumphouse


Roosevelt
256'
50'
40'
10'
33'
60'
31'
30'

Note

Road continues E past last chicken house 350' then goes north and connects with road past Cattle Barn.



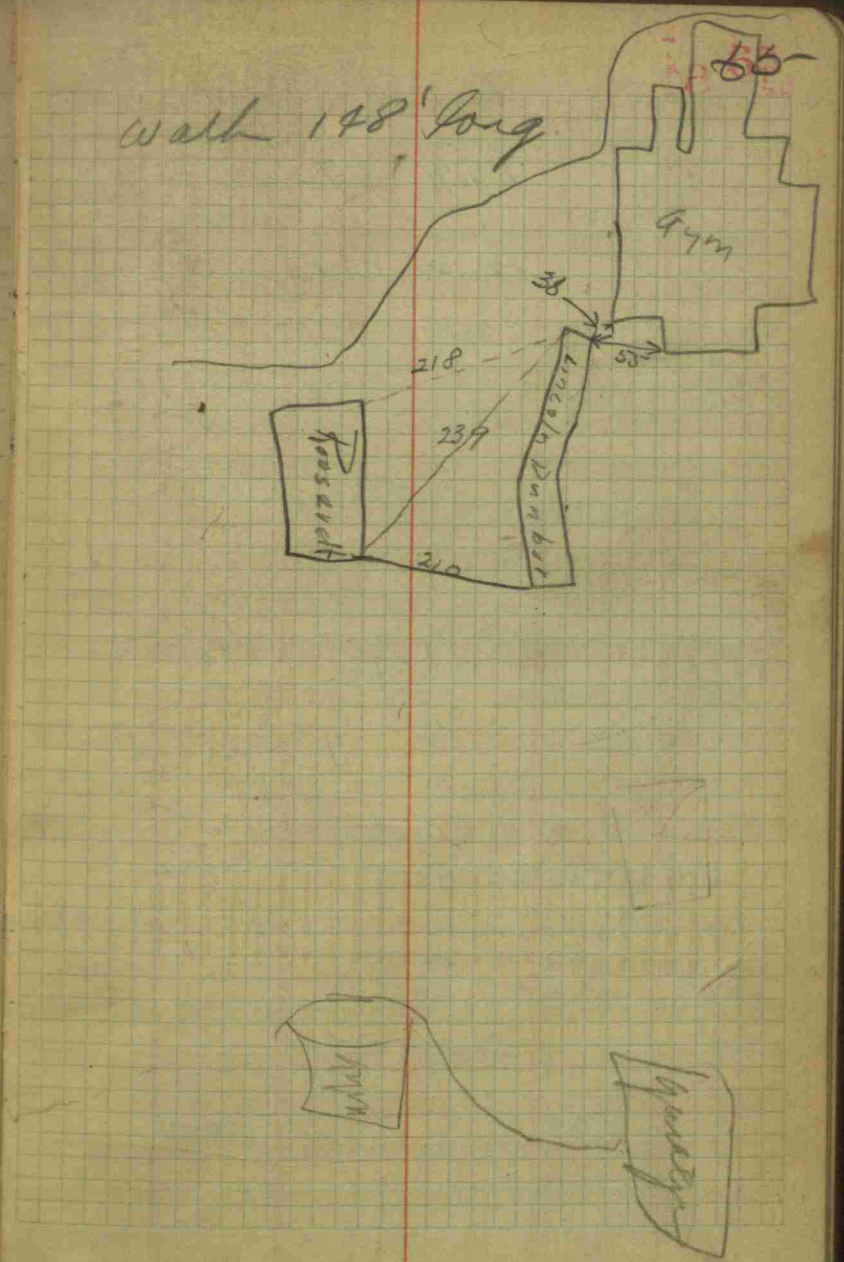
DA 64

Check gym with Lincoln Dunbar and Lincoln-Dunbar and Roosevelt-Barracks.

Check Elevations on all ground not checked.

Measure walk (new)

Note drive back of gym



−	⊼	+	BM
			113.01
	119.71	6.70	
.31			119.40
	124.54	5.14	
5.29			119.25

120 84
3 .70 100' S from Building #1 stake

123 82
.72 100' W from Building #2 stake

123 32
1 22 fence W of Gym

122 04
2 50 W End of Gym

121 51
3 03 SW cor of Gym

−	℄	+	BM
			119.25
	121.05	1.80	
4.31			
			116.74
	118.79	2.05	
5.77			113.02

119 51 1 54	Road N of Gym
113 53 7 52	powerhouse
112 15 8 90	walk back of Hdqt Barracks.

	−	π	+	BM
				113.01
		113.29	.28	
	9.23			104.06
		104.59	.53	
	11.04			93.55
		93.18	.37	
	7.80			85.38
		83.96	1.42	
	5.75			78.21
		82.93	4.72	

78.21 (new)
5.75 - Pump house

74.88
8.05 - old pump house

Frank Jackson Rd.

Crossection on Ditch & Channel straightning

March 5, 1941

Newman
Cook
Fisher
Franklin

Cloudy 28°

Line "B"

0+00 Start at ℄ channel

0+58 Cross old channel

1+12 Cross old channel

3+76 Stop at ℄ channel

Line "A" on Jackson

0+00	1+60 on Line "B"
2+35	℄ Jackson Rd.
4+88	Miles West P.L.
4+88	Horens East P.L.
19+32	Bridge
19+92	End.

LINE "B"

		T	+	B.M	
				100.00	ON TRUNK OF SYCAMORE NEAR O+0 LINE B
		103.45	3.45		
0+00	CREEK				11.55 91.90
0+00	STAKE				8.65 94.80
0+58					10.65 92.80
1+00					6.55 96.90
1+12					9.60 93.85
2+00					6.80 96.65
3+00					5.05 98.40
3+76					580 97.65
Creek					740 96.05

LINE "A"

Sta	−	=	+	BM	
				#1 100.00	SAME AS LINE 'B'
		103.45	3.45		
0+00					
1+00					
2+00					
	2.00			101.45	
		106.50	5.05		
2+35					
3+00					
4+00					
5+00					
6+00					
	2.25			104.25	
		111.00	6.75		

Rd ℄	Ditch Br.	N. BK	℄ Ditch	So. BK.	Br. So.	So Field
			6.25			
			97.20			
			5.55			
			97.90			
		7.10	7.00	7.35		
		96.35	96.45	96.10		
	2'	3'		11'	15'	18' 40'
	5.25	10.55		10.65	8.00	8.30 4.60
	101.25	95.95		95.85	98.50	98.20 101.90
	2'	3'		12'	18'	40'
	5.50	9.55		9.70	7.70	3.90
	101.00	96.95		96.80	98.80	102.60
	1'	12'		13'		23'
	4.20	9.15		9.20		3.65
	102.30	97.35		97.30		102.85
	℄	7'		9'		20'
	2.95	8.50		8.40		3.70
	103.55	98.00		98.10		102.80
	1'	7'		13'		28'
	2.80	8.50		8.35		3.80
	103.70	98.00		98.15		102.70

00	−	π	+	B M
		111.00		
7+00				
8+00				
9+00				
10+00				
11+00				
12+00				
13+00				
14+00				
15+00				
	0.30			110.70
		116.80	6.10	

1	6'	11'	13'	18'
7.30	8.70	12.50	12.50	8.70
103.70	102.30	98.50	98.50	102.30
2	10'	12	19'	
7.00	12.25	12.30	8.40	
104.00	98.75	98.70	102.60	
2	7'	9'	16'	
6.60	11.25	11.20	7.00	
103.40	99.75	99.80	104.00	
8'	8'	12'	14'	19'
6.05	8.50	10.55	12.50	6.25
104.95	102.50	100.45	98.50	104.75
3'	10'	13'	17'	
5.10	10.00	9.90	5.70	
105.90	101.00	101.10	105.30	
4'	7'	11'	13'	17'
4.90	6.45	8.95	8.70	4.90
106.10	104.55	102.05	102.30	106.10
3	6'	12'	14'	17'
4.45	7.35	7.90	8.00	4.00
106.55	103.65	103.10	103.00	107.00
2	9'	10'	17'	
2.85	6.65	6.70	2.75	
108.15	104.35	104.30	108.25	
2	11'	13'	17'	
1.75	5.80	5.85	1.65	
109.25	105.20	105.15	109.35	

		116.80			
16+00					
17+00					
18+00					
19+00					
19+32					
	1.98			114.82	
		119.31	4.47		
19+32					
	2.42			116.89	BM near 19+32
	12.00			107.31	
		107.51	0.20		
	7.52			99.99	BM #1

3'	10'	12'	19'
6.65	10.75	11.00	6.80
110.15	106.05	105.80	110.00

3'	10'	13'	20'
5.50	10.40	10.45	5.80
111.30	106.40	105.35	111.00

2'	9'	11'	17'
4.80	9.05	9.15	5.80
112.00	106.75	106.65	111.00

4	12'	14'	16'
2.20	8.15	8.00	4.20
114.60	108.65	108.80	112.60

5'	10'	13'	14'	20'
2.15	5.25	6.50	6.45	3.80
114.65	111.55	110.30	109.35	113.00

8.5'	4'	7'	12'
6.70	9.45	9.20	7.10
110.10	107.35	107.60	109.70

J W French Drain

87+54
~~33+70~~ N Line of Old St Rd

87+84
~~34+00~~ S " " " " "

94+84
~~41+00~~ S " of New # 34

102+14
~~48+30~~ End of Drain

~~48+30~~
~~54+40~~
~~102+70~~

144.—	℄	+	B.M
	24.49	4.49	20.00

Cradle

5.65
4.49
1.16

145

2449
565
1884
1379
505

El. ℄ Rd. - Water El
18.84
5.65

S. Hdwl. of culv.
18.09
6.40

2449
640
18.09

13.79 Bot El.
10.70

2449
1070
13.79

15.24
9.25

24.49
9.25
15.24

18.84
15.24
3.60

El. Stream W
20.34
4.15

24.49
4.15
20.34
18.84
1.50

Rosebrown tile

—	Λ	+	BM	
	25.07	5.07	20.00	
			outlet	0+0

Sta	Stake	Grade	Cut	Feet+inch
0+0	20.19	13.47	6.72	ok 6'-9"
1+0	19.25	13.78	5.47	5'-0" 5'-5½"
2+0	18.92	14.09	4.83	4'-2" 4'-11"
3+0	18.82	14.40	4.42	3'-9" 4'-5"
4+0	18.98	14.71	4.27	3'-9" 4'-3½"
5+0	19.99	15.02	4.97	4'-3" 4'-11½"
6+0	20.57	15.33	5.24	4'-6 5'-3"
7+0	20.12	15.64	4.48	4'-5" 4'-6"
8+0	21.27	15.95	5.32	5'-5" 5'-4"

1+0
2+0
3+0
4+0
5+0
6+0
7+0
8+0

BM. Cor. of Bridge

stk
20.19
4.88

19.25
5.82

18.92
6.15

18.82
6.25

18.98
6.09

19.99
5.08

20.57
4.50

20.12
4.95

21.27
3.80

11.60
925
2.35

.33
7) 2.35
21
25

Fl. 6+90
15.87
9.25

15.94
9.13

150

—	π	+	BM
	25.07	5.07	20.00

	Stk	Gal
0+0		15.57
1+0		15.70
2+0	19.98	15.83
3+0	21.07	15.96

3+0

Roseboom tile 151

13.47
11.60 Fl. at outlet
15.57
9.50 −0+0

9.08 15.99

9.54 15.53

9.40 − 15.67

9.34 −15.73

15.96
15.57
.39

9.09 15.96
Stk Fl

Sand

5.22

4.53 +
5.16 + 19.91 − 9.24
21.07
4.00

15.83

Roseboom tile

15.96
15.57
.39

— Sample —			
−	T	+	BM
	100.6	0.6	100.00
12.12			88.50
	89.63	1.13	

Red Ellis

154 —	⊼	+	BM
	15.45	5.45	10.00
3.95			11.50

1545
345
1.50

155 —

5.83 Floor
Basement.

11.50
3.95 at House

11.50
5.50
17.00
1
18.00 El.
1' below
base floor

9.00
2.33
6.67

15.45
6.67
22.12 Fl. Line
18.00
4.12 Fall

	Boys Cook	School Mileage	Newman	Mileage	Miles	
July 20	3 hrs.	22	3 hrs			
" 21	3 hrs	22	3 hrs			
Aug 8			5 hrs	22	5 hrs.	
Aug. 11			5 hrs	22	5 hrs.	
Aug 12			6 hrs	office		
Aug 13			4 hrs	office		Not Paid
Aug 16	2 hrs.	office	2 hrs	22		
Aug 17			3 hrs	22	3 hrs.	
Aug 25			8 hrs.			
Aug 26			6 "	22	2 hrs.	
" 27			7 hrs	office		
" 29			8 hrs	office		
" 30	3 "	22	8 "	22	5 hrs.	
" 31			8 "	office		
Sept 1			8 "			
			77 hrs.		20	
					Brown	
Sept 7	6 hrs	22	6 hrs			
" 8	5 "	22	8 hrs			
" 9			6 "	22	4 hrs	Pd newman
" 10	4		10 "			
" 11	4 "		4 "			
" 12			10	22	andrews 4 hrs	Pd. cook
" 13	8		8			

Sept. 6	Brown	3 hrs	Storms Ditch
Sept. 9	"	3 hrs.	Boy's School

Laundry to aunt mattie
Mrs Whyte.
Open House
oil Vacuum
Start Reg.

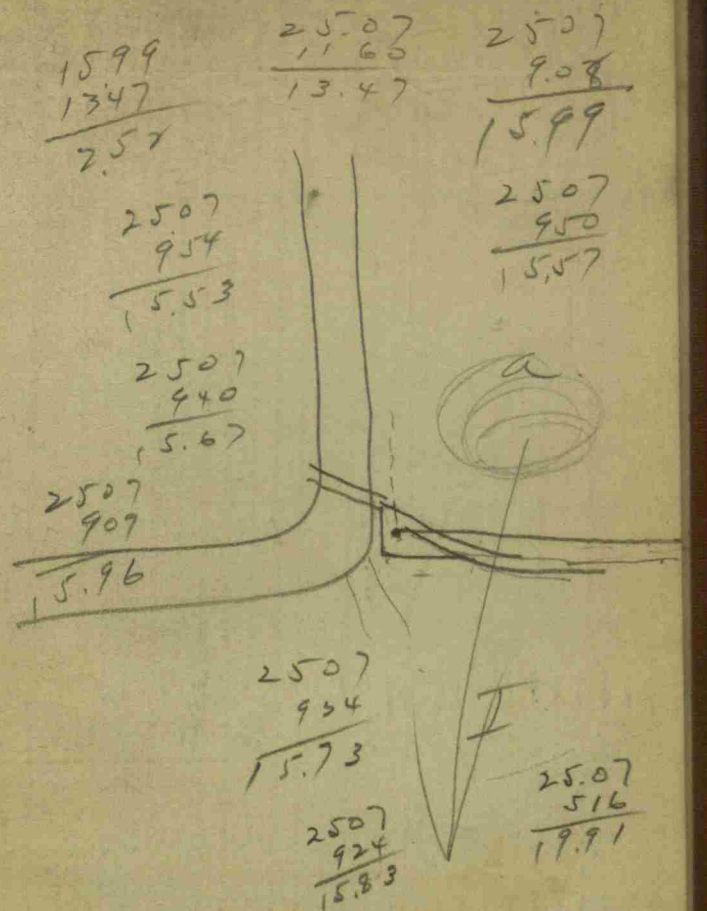
Baker

Middle Room

Natural Trigonometrical Functions

Angle.	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
0°	0	0	1.	∞	∞	1.	90
10	.0029	.0029		343.8	343.8	1.	50
20	.0058	.0058		171.9	171.9	.99998	40
30	.0087	.0087		114.6	114.6	.99996	30
40	.0116	.0116	1.0001	85.94	85.94	.99993	20
50	.0145	.0145	1.0001	68.76	68.75	.99989	10
1	.0175	.0175	1.0002	57.30	57.29	.99985	89
10	.0204	.0204	1.0002	49.11	49.10	.99979	50
20	.0233	.0233	1.0003	42.98	42.96	.99973	40
30	.0262	.0262	1.0003	38.20	38.19	.99966	30
40	.0291	.0291	1.0004	34.38	34.37	.99958	20
50	.0320	.0320	1.0005	31.26	31.24	.99949	10
2	.0349	.0349	1.0006	28.65	28.64	.99939	88
10	.0378	.0378	1.0007	26.45	26.43	.99929	50
20	.0407	.0407	1.0008	24.56	24.54	.99917	40
30	.0436	.0437	1.0010	22.93	22.90	.99905	30
40	.0465	.0466	1.0011	21.49	21.47	.99892	20
50	.0494	.0495	1.0012	20.23	20.21	.99878	10
3	.0523	.0524	1.0014	19.11	19.08	.99863	87
10	.0552	.0553	1.0015	18.10	18.07	.99847	50
20	.0581	.0582	1.0017	17.20	17.17	.99831	40
30	.0610	.0612	1.0019	16.38	16.35	.99813	30
40	.0640	.0641	1.0020	15.64	15.60	.99795	20
50	.0669	.0670	1.0022	14.96	14.92	.99776	10
4	.0698	.0699	1.0024	14.34	14.30	.99756	86
10	.0727	.0729	1.0027	13.76	13.73	.99736	50
20	.0756	.0758	1.0029	13.23	13.20	.99714	40
30	.0785	.0787	1.0031	12.75	12.71	.99692	30
40	.0814	.0816	1.0033	12.29	12.25	.99668	20
50	.0843	.0846	1.0036	11.87	11.83	.99644	10
5	.0872	.0875	1.0038	11.47	11.43	.99619	85
10	.0901	.0904	1.0041	11.10	11.06	.99594	50
20	.0929	.0934	1.0043	10.76	10.71	.99567	40
30	.0958	.0963	1.0046	10.43	10.39	.99540	30
40	.0987	.0992	1.0049	10.13	10.08	.99511	20
50	.1016	.1022	1.0052	9.839	9.788	.99482	10
6	.1045	.1051	1.0055	9.567	9.514	.99452	84
10	.1074	.1080	1.0058	9.309	9.255	.99421	50
20	.1103	.1110	1.0061	9.065	9.010	.99390	40
30	.1132	.1139	1.0065	8.834	8.777	.99357	30
40	.1161	.1169	1.0068	8.614	8.556	.99324	20
50	.1190	.1198	1.0072	8.405	8.345	.99290	10
7	.1219	.1228	1.0075	8.206	8.144	.99255	83
10	.1248	.1257	1.0079	8.016	7.953	.99219	50
20	.1276	.1287	1.0082	7.834	7.770	.99182	40
30	.1305	.1317	1.0086	7.661	7.596	.99144	30
40	.1334	.1346	1.0090	7.496	7.429	.99106	20
50	.1363	.1376	1.0094	7.337	7.269	.99067	10
							82
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.

Angle.	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
8°	.1392	.1405	1.0098	7.185	7.115	.99027	82
10	.1421	.1435	1.0102	7.040	6.968	.98986	50
20	.1449	.1465	1.0107	6.900	6.827	.98944	40
30	.1478	.1495	1.0111	6.766	6.691	.98902	30
40	.1507	.1524	1.0115	6.636	6.561	.98858	20
50	.1536	.1554	1.0120	6.512	6.435	.98814	10
9	.1564	.1584	1.0125	6.394	6.314	.98769	81
10	.1593	.1614	1.0129	6.277	6.197	.98723	50
20	.1622	.1644	1.0134	6.166	6.084	.98676	40
30	.1650	.1673	1.0139	6.059	5.976	.98629	30
40	.1679	.1703	1.0144	5.955	5.871	.98580	20
50	.1708	.1733	1.0149	5.855	5.769	.98531	10
10	.1736	.1763	1.0154	5.759	5.671	.98481	80
10	.1765	.1793	1.0160	5.665	5.576	.98430	50
20	.1794	.1823	1.0165	5.575	5.485	.98378	40
30	.1822	.1853	1.0170	5.488	5.396	.98325	30
40	.1851	.1883	1.0176	5.403	5.309	.98272	20
50	.1880	.1914	1.0181	5.320	5.226	.98218	10
11	.1908	.1944	1.0187	5.241	5.145	.98163	79
10	.1937	.1974	1.0193	5.164	5.066	.98107	50
20	.1965	.2004	1.0199	5.089	4.989	.98050	40
30	.1994	.2035	1.0205	5.016	4.915	.97992	30
40	.2022	.2065	1.0211	4.945	4.843	.97934	20
50	.2051	.2095	1.0217	4.877	4.773	.97875	10
12	.2079	.2126	1.0223	4.810	4.705	.97815	78
10	.2108	.2156	1.0230	4.745	4.638	.97754	50
20	.2136	.2186	1.0236	4.682	4.574	.97692	40
30	.2164	.2217	1.0243	4.620	4.511	.97630	30
40	.2193	.2247	1.0249	4.560	4.449	.97566	20
50	.2221	.2278	1.0256	4.502	4.390	.97502	10
13	.2250	.2309	1.0263	4.445	4.331	.97437	77
10	.2278	.2339	1.0270	4.390	4.275	.97371	50
20	.2306	.2370	1.0277	4.336	4.219	.97304	40
30	.2334	.2401	1.0284	4.284	4.165	.97237	30
40	.2363	.2432	1.0291	4.232	4.113	.9716[illegible]	20
50	.2391	.2462	1.0299	4.182	4.061	97100	10
14	.2419	.2493	1.0306	4.133	4.011	.97030	76
10	.2447	.2524	1.0314	4.086	3.962	.96959	50
20	.2476	.2555	1.0321	4.039	3.914	.96887	40
30	.2504	.2586	1.0329	3.994	3.867	.96[illegible]15	30
40	.2532	.2617	1.0337	3.949	3.821	.96742	20
50	.2560	.2648	1.0345	3.906	3.776	.9666[illegible]	10
15	.2588	.2679	1.0353	3.864	3.732	.96593	75
10	.2616	.2711	1.0361	3.822	3.689	.96517	50
20	.2644	.2742	1.0369	3.782	3.647	.96440	40
30	.2672	.2773	1.0377	3.742	3.606	.96363	30
40	.2700	.2805	1.0386	3.703	3.566	.96285	20
50	.2728	.2836	1.0394	3.665	3.526	.96206	10
							74
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.


15.99
13.47
2.52
25.07
11.60
13.47
25.07
9.08
15.99
2507
9.54
15.53
25.07
9.50
15.57
2507
9.40
15.67
2507
9.07
15.96
2507
9.34
15.73
2507
9.24
15.83
25.07
5.16
19.91

5.67

2.33
7.00
1.33
5.67

28

11.50
5.67
5.83

9.00
3.33
5.67

9'-0"

5.45
2.33

38 1/4
37 1/4
38
11 1/4

15.45 rail
2.33
13.12 El. string
9.00
~~22~~.12 El. Fl.

13.95 ✓
5.67
8.28 — Flow Base
1
7.28
4.12
3.16

3.95

6.45 ✓
3.95 ✓
2.50

DISTANCES FROM CENTER OF ROADWAY FOR CROSS-SECTIONING.

ROADWAY 14 FEET WIDE. SIDE SLOPES 1½ TO 1.

FOR SINGLE TRACK EMBANKMENT.

	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	7.0	7.2	7.3	7.5	7.6	7.8	7.9	8.1	8.2	8.4	0
1	8.5	8.7	8.8	9.0	9.1	9.3	9.4	9.6	9.7	9.9	1
2	10.0	10.2	10.3	10.5	10.6	10.8	10.9	11.1	11.2	11.4	2
3	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	3
4	13.0	13.2	13.3	13.5	13.6	13.8	13.9	14.1	14.2	14.4	4
5	14.5	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.7	15.9	5
6	16.0	16.2	16.3	16.5	16.6	16.8	16.9	17.1	17.2	17.4	6
7	17.5	17.7	17.8	18.0	18.1	18.3	18.4	18.6	18.7	18.9	7
8	19.0	19.2	19.3	19.5	19.6	19.8	19.9	20.1	20.2	20.4	8
9	20.5	20.7	20.8	21.0	21.1	21.3	21.4	21.6	21.7	21.9	9
10	22.0	22.2	22.3	22.5	22.6	22.8	22.9	23.1	23.2	23.4	10
11	23.5	23.7	23.8	24.0	24.1	24.3	24.4	24.6	24.7	24.9	11
12	25.0	25.2	25.3	25.5	25.6	25.8	25.9	26.1	26.2	26.4	12
13	26.5	26.7	26.8	27.0	27.1	27.3	27.4	27.6	27.7	27.9	13
14	28.0	28.2	28.3	28.5	28.6	28.8	28.9	29.1	29.2	29.4	14
15	29.5	29.7	29.8	30.0	30.1	30.3	30.4	30.6	30.7	30.9	15
16	31.0	31.2	31.3	31.5	31.6	31.8	31.9	32.1	32.2	32.4	16
17	32.5	32.7	32.8	33.0	33.1	33.3	33.4	33.6	33.7	33.9	17
18	34.0	34.2	34.3	34.5	34.6	34.8	34.9	35.1	35.2	35.4	18
19	35.5	35.7	35.8	36.0	36.1	36.3	36.4	36.6	36.7	36.9	19
20	37.0	37.2	37.3	37.5	37.6	37.8	37.9	38.1	38.2	38.4	20
21	38.5	38.7	38.8	39.0	39.1	39.3	39.4	39.6	39.7	39.9	21
22	40.0	40.2	40.3	40.5	40.6	40.8	40.9	41.1	41.2	41.4	22
23	41.5	41.7	41.8	42.0	42.1	42.3	42.4	42.6	42.7	42.9	23
24	43.0	43.2	43.3	43.5	43.6	43.8	43.9	44.1	44.2	44.4	24
25	44.5	44.7	44.8	45.0	45.1	45.3	45.4	45.6	45.7	45.9	25
26	46.0	46.2	46.3	46.5	46.6	46.8	46.9	47.1	47.2	47.4	26
27	47.5	47.7	47.8	48.0	48.1	48.3	48.4	48.6	48.7	48.9	27
28	49.0	49.2	49.3	49.5	49.6	49.8	49.9	50.1	50.2	50.4	28
29	50.5	50.7	50.8	51.0	51.1	51.3	51.4	51.6	51.7	51.9	29
30	52.0	52.2	52.3	52.5	52.6	52.8	52.9	53.1	53.2	53.4	30
31	53.5	53.7	53.8	54.0	54.1	54.3	54.4	54.6	54.7	54.9	31
32	55.0	55.2	55.3	55.5	55.6	55.8	55.9	56.1	56.2	56.4	32
33	56.5	56.7	56.8	57.0	57.1	57.3	57.4	57.6	57.7	57.9	33
34	58.0	58.2	58.3	58.5	58.6	58.8	58.9	59.1	59.2	59.4	34
35	59.5	59.7	59.8	60.0	60.1	60.3	60.4	60.6	60.7	60.9	35
36	61.0	61.2	61.3	61.5	61.6	61.8	61.9	62.1	62.2	62.4	36

Calculated by Julien A. Hall, M. Am. Soc. C. E.