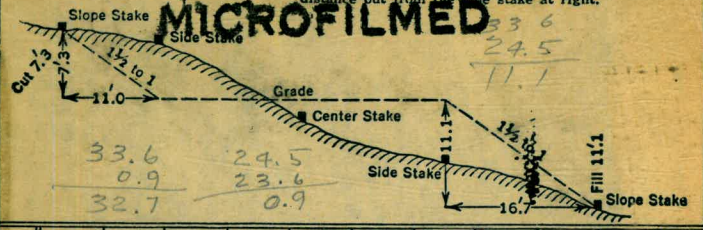
DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

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.



33.6
24.5
11.1

33.6
0.9
32.7

24.5
23.6
0.9

Cut or Fill	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	0.0	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	38.8	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.

Book No. 49

Locations & Layouts

Project No 40

1115.00
828.75
286.25

1.90
1.50

28.74
28.38
.36

1.17
.33
1.50

1.83
.25
1.58
.08
1.66

33.6
24.5
9.

288.44

4.54
1.46
3.08

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Page	Index	Date
20	Set elevations 6" below Bearing Grades on Pier #1	
21	Bench levels. Midway Drive Bridge	
22	Top of curb elevations on West side, Midway Drive	
23-26	Check on Bridge Shoe levels ~~as~~ poured	
27	Triangulation of Ref. Points on S-Abut & Bearing E. & W.	
28	Bench marks at Bridge seats for fin. elev. (Pier #1)	
29-30	Existing Elevations Near (Pier #1) Bridge Seats, Detail Grade	
31	Bench for Pile cut-offs.	
32	Bench marks at Bridge seats for fin. conc. elev. (Pier #2)	
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45	Check levels for footing Pier #8	

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46	Level check on N. Abutment	
47	Set B.M. on Center footing South Abutments	
48	Bench levels for Pier #8	
49	Grade on pour strip Pier #9	
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52	Benches set for Grade Piers #6 & #7.	
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54	Grades set for Bridge seats on North Abutment.	
55	Stakes set on toe of slope for waterline grade.	
56	Set Grade nails (Pier #8)	
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58	Check top of Bridge seats on Piers #7 & 9	7-12-50
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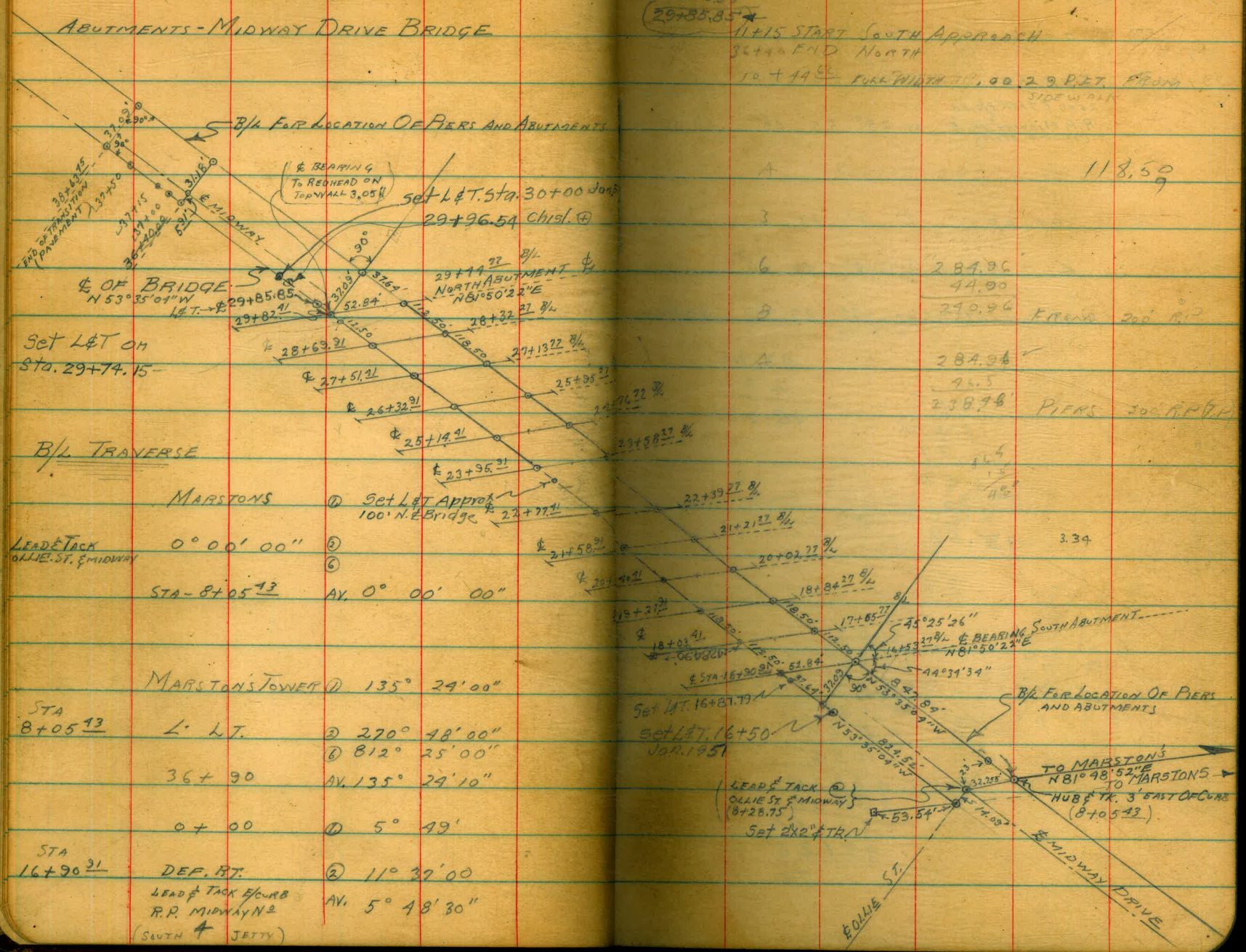
35'

Location Of (℄ Of Bearing) Of Piers And Abutments - Midway Drive Bridge



B/L Traverse

	Marstons	①	Set L&T Approx. 100' N. ℄ Bridge
Lead & Tack Ollie St. & Midway	0° 00' 00"	②	
		⑥	
	Sta - 8+05.43	Av. 0° 00' 00"	
	Marstons Tower	①	135° 24' 00"
Sta 8+05.43	L. L.T.	②	270° 48' 00"
		⑥	812° 25' 00"
	36+90	Av. 135° 24' 10"	
	0+00	①	5° 49'
Sta 16+90.91	Def. Rt.	②	11° 39' 00
	Lead & Tack E/Curb R.R. Midway No. 4 (South Jetty)	Av.	5° 48' 30"

29+82.41
3.05
29+85.46
0.39
(29+85.85)

Stamper Barragan.

11+15 Start South Approach
36+40 End North
10+44 Full Width 30.00 29 P.S.T. From Sidewalk

118.50
9

284.96
44.90
240.96 From 200' R.P.

284.96
46.5
238.46 Piers 200' R.P.

3.34

B/L FOR LOCATION OF PIERS & ABUTMENTS

29+43	0+00	① 25° 55' 30"			
29+44.77	DEF. LT.	② 51° 50' 00"			(58.17 ACRES)
	LEAD & TACK E/CURB R.P. "MIDWAY" No 5 (MIDDLE JETTY)	AV. 25° 55' 00"			19.84'
	0+00	① 7° 23'			
34+00	L. RT.	② 14° 46' 00"			
	U.S.E.D. "FLATS"	AV. 7° 23' 00			31.36'

42.75
2.31
45.06

14.25
1.45
12.77
28.50
2.31
43.58

28

31.92
1.33
.7018) 30.590 (43.57
28072
25180
21054
40260
35090
51700
49126
74

110
35

30
60
110
35

6+60
① 187° 23'
182
7° 23' DEF-R
7° 23'
FLATS

34+00 31.36' T. "FLATS"

202.98' ON ℄

44°39'39" { COS .71231874
SIN .70185612 }

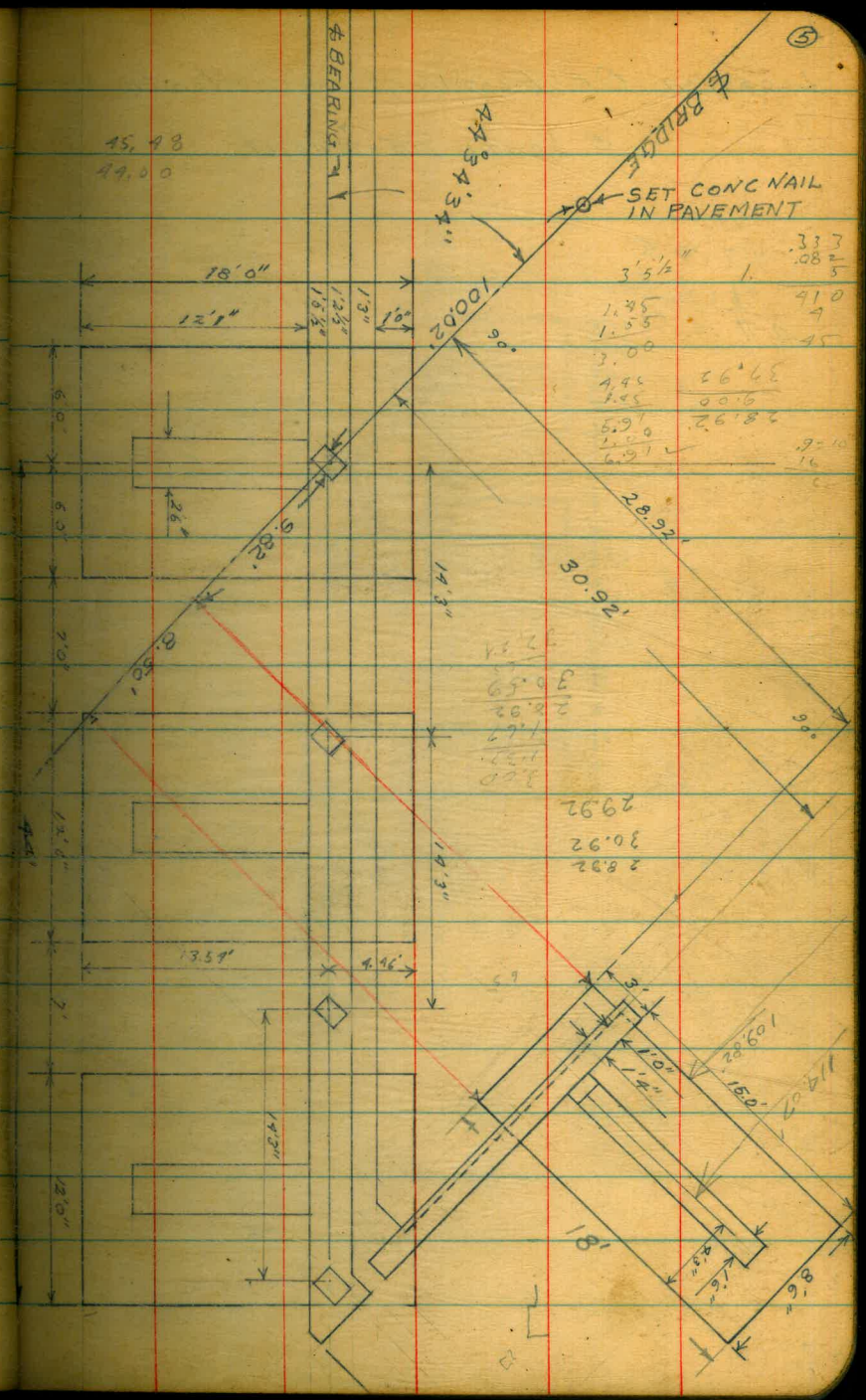
.702) 1.460 (2.08
1404
5600

7123
208
56984
142460
148084

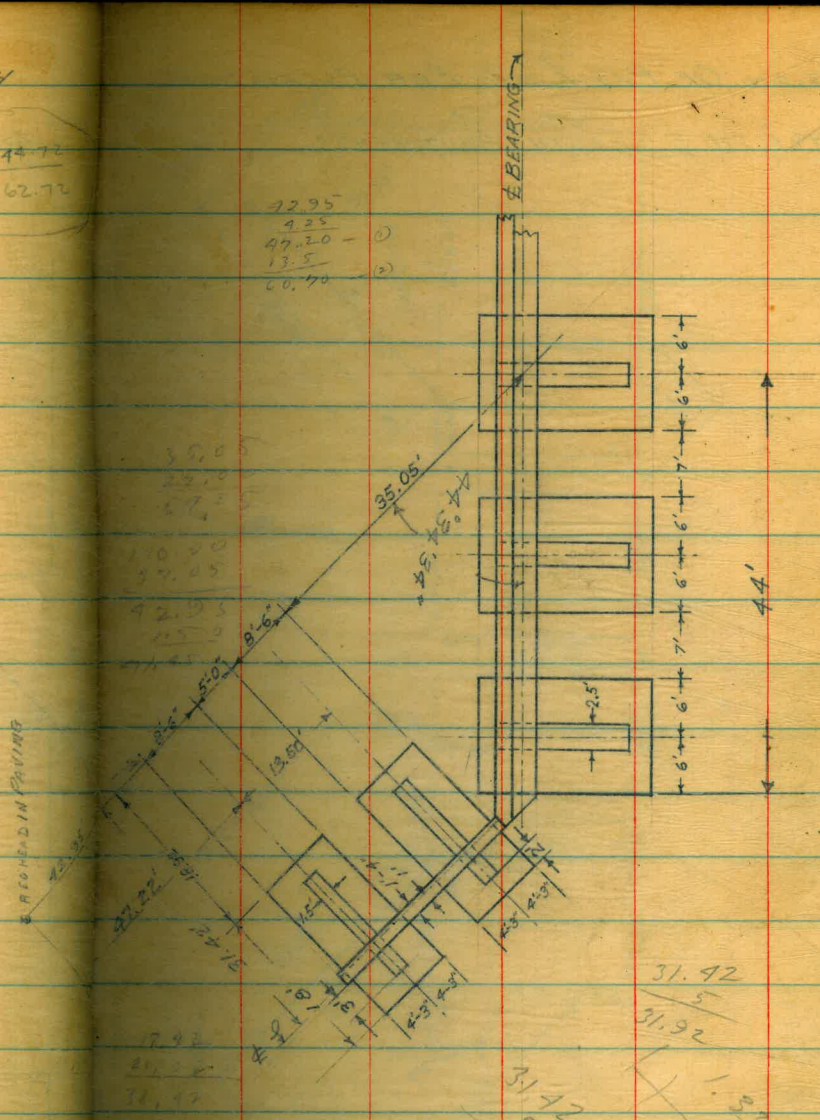
7018
45.06
42108
35090
28072
31.623108

LOCATION OF FOOTINGS AT NORTH.

& SOUTH ABUTMENTS



LOCATION OF FOOTINGS AT NORTH & SOUTH ABUTMENTS



42.95
4.25
47.20

47.22
13.50
60.72

45.22

14.72
62.72

42.95
4.25
47.20
13.5
60.70

42.95
4.25
47.20
13.5
60.70

42.95
13.50
56.45

42.95
22
64.95
70.00
5.05

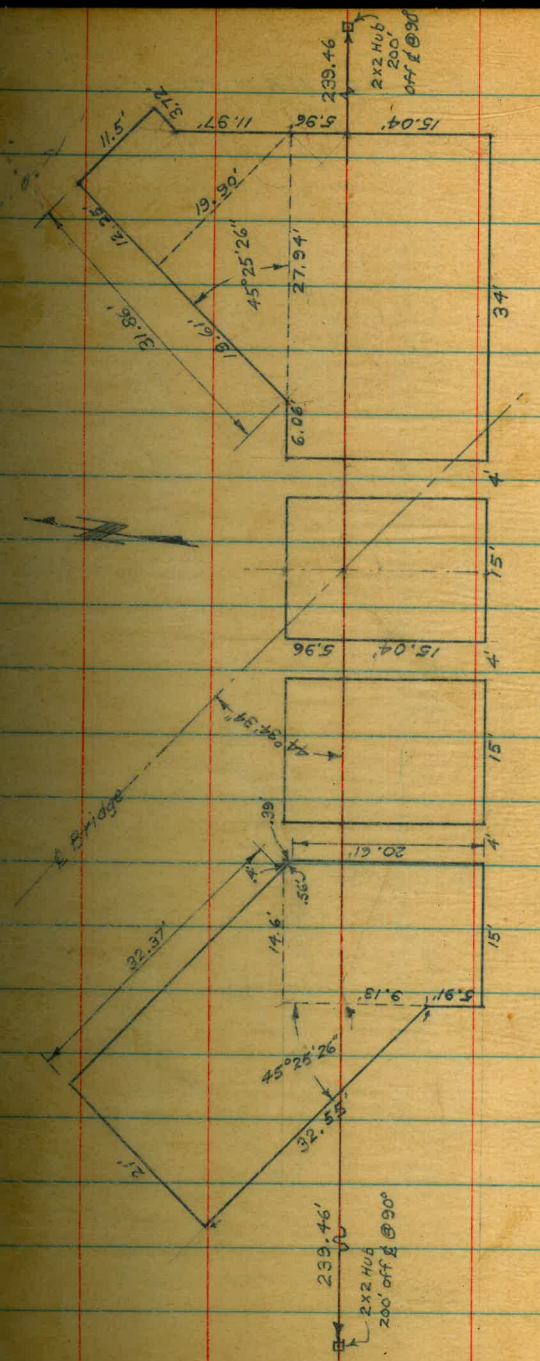
31.42
5
31.92

31.42
5
31.92

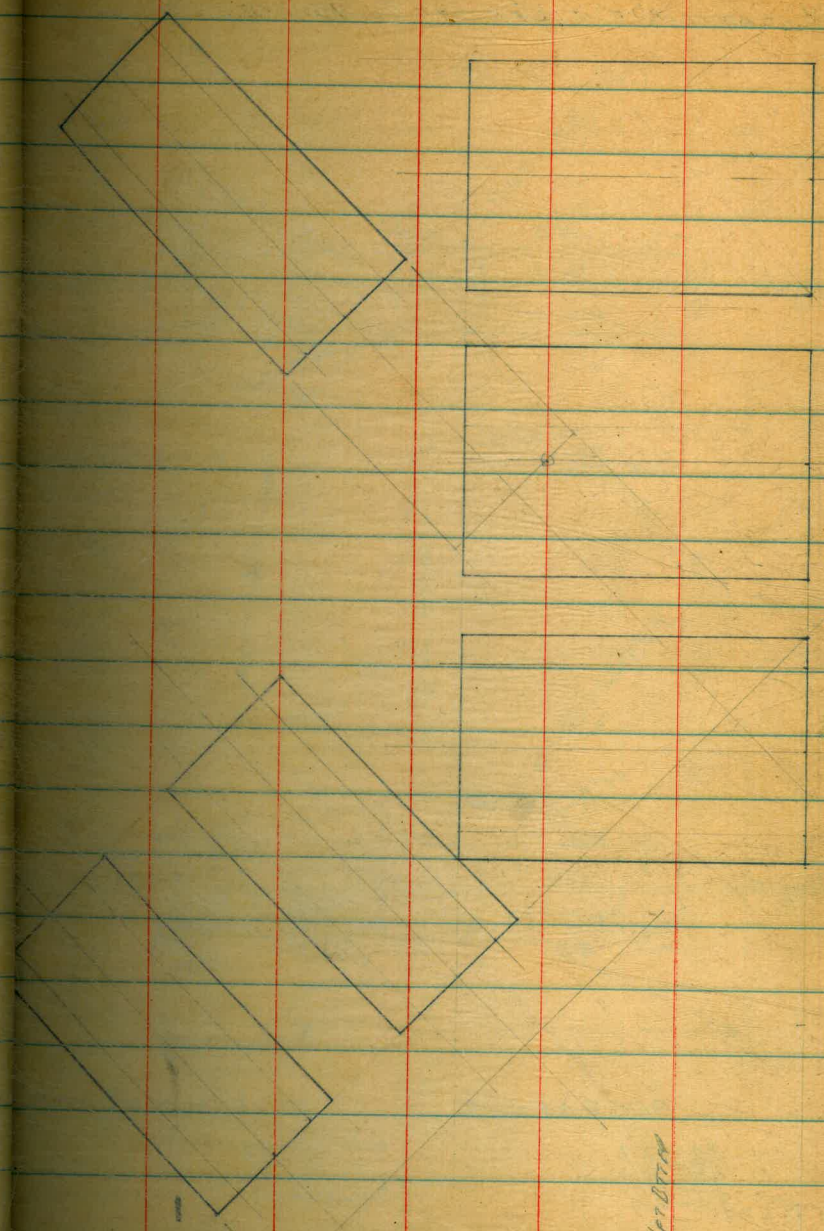
LOCATION OF PAY LINE FOR EXCAVATION

NORTH & SOUTH ABUTMENTS

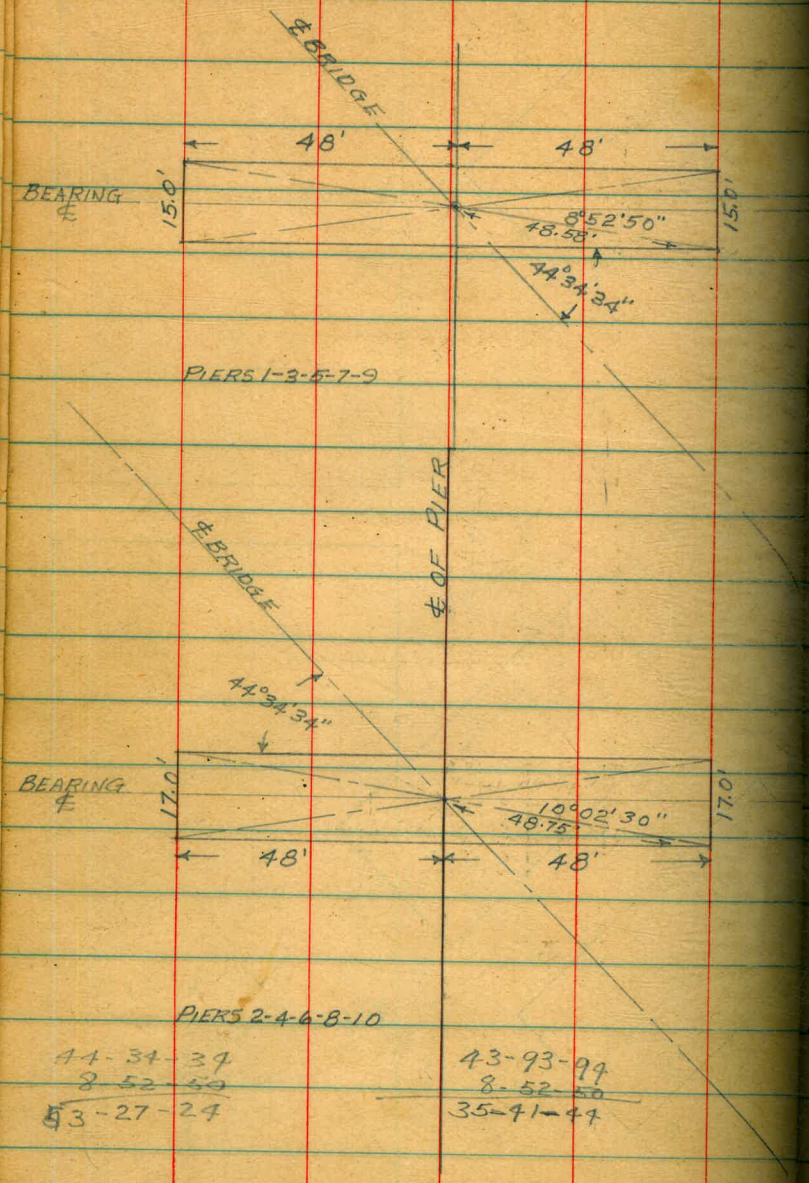
19.61
12.25
31.86



LOCATION OF PILES AT ABUTMENTS

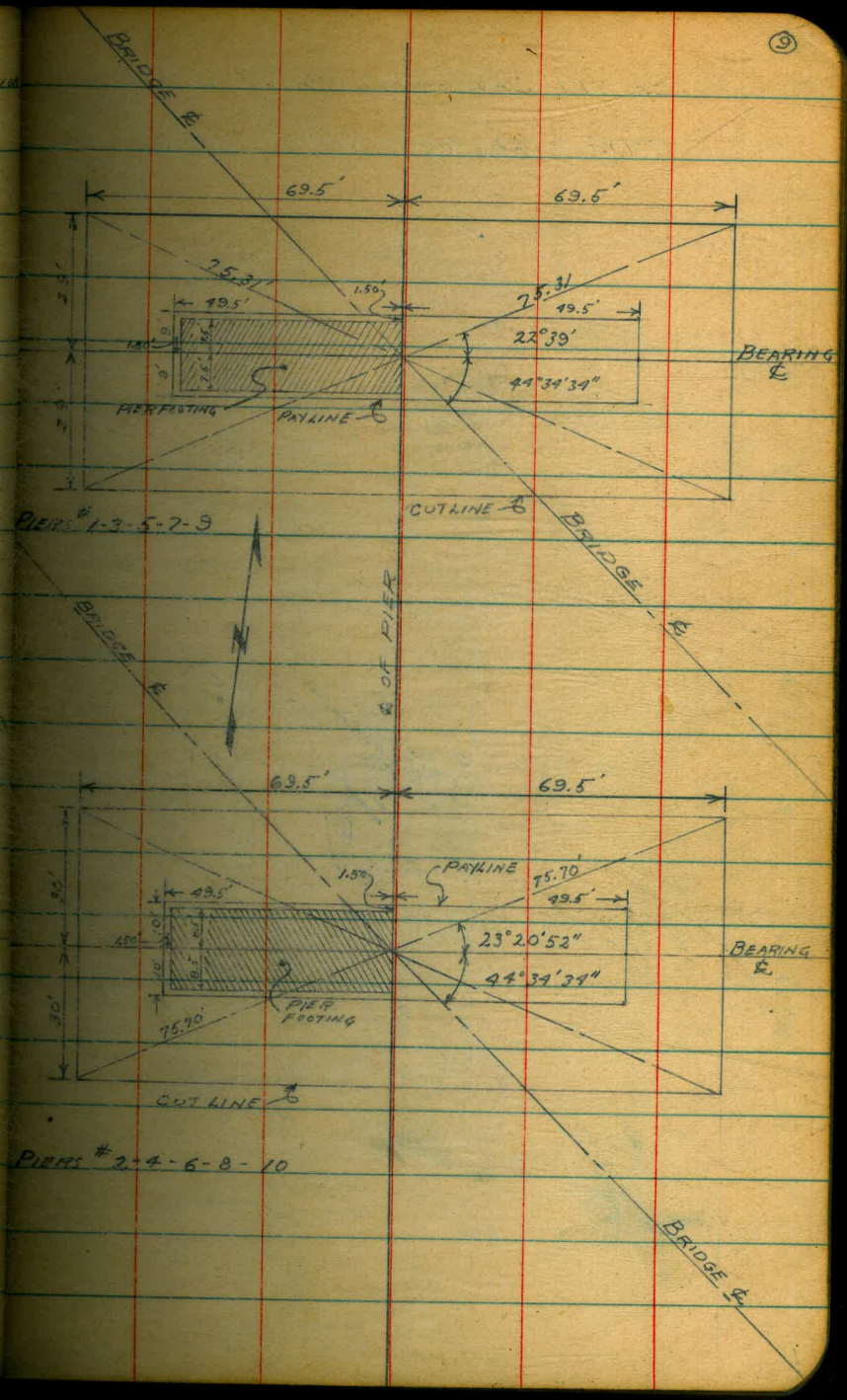


LOCATION OF OFFSETS TO PAY-LINE (EXCAVATION) OF PIERS



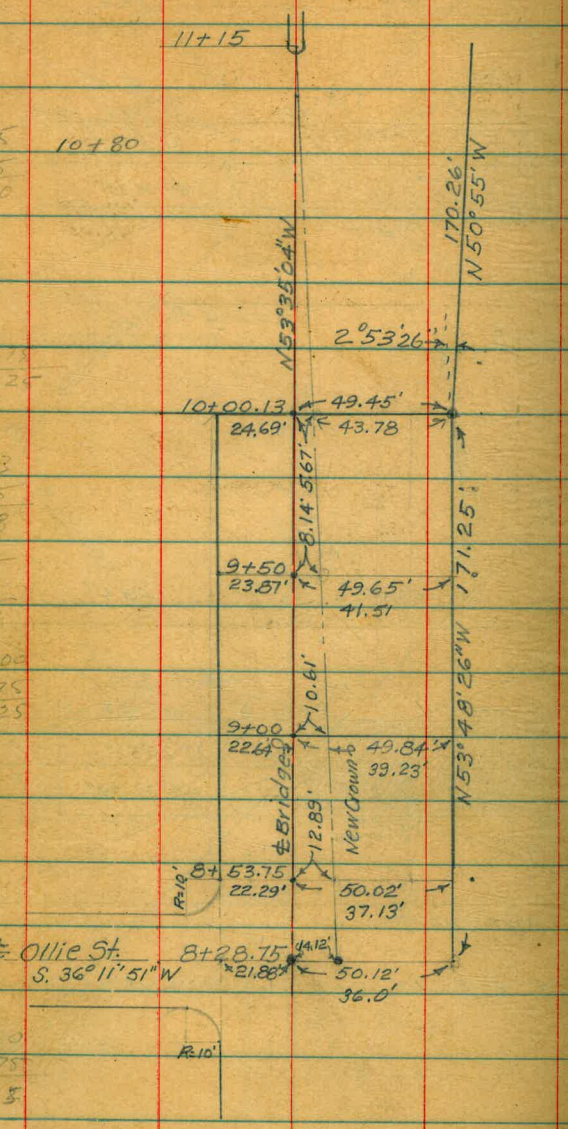
44-34-34
8-52-50
53-27-24

43-93-94
8-52-50
35-41-44

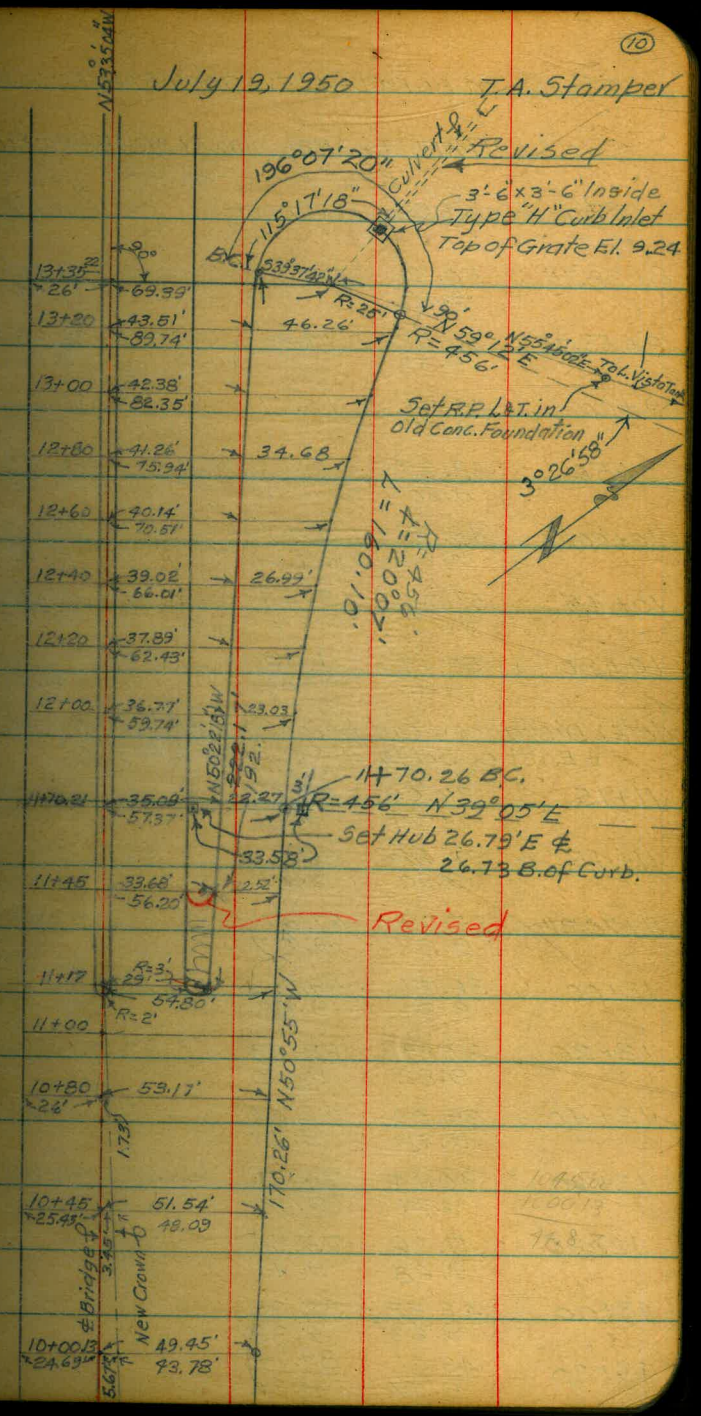


LAYOUT PLAN STREET WIDENING &

PARKING AREA MIDWAY DRIVE PROJ. No. 40



July 19, 1950 T.A. Stamper



SUBGRADE ELEVATIONS STREET WIDENING

& PARKING AREA MIDWAY DRIVE PROJ #40

Sta	East ← New Curb Line	New Crown ℄	→ West New Curb Line
8+28.75	50.12 / 9.48	0	21.88 / 9.48
8+53.75	50.02 / 9.52	12.89	22.29 / 9.52
9+00	49.84 / 9.57	10.61 / Fin. 10.63	22.64 / 9.57
9+50	49.65 / 9.60	8.14 / Fin 10.66	23.87 / 9.60
10+00.13	49.45 / 9.69	5.67 / Fin. 10.69	24.69 / 9.69
10+45	51.54 / 9.75	3.45 / Fin. 10.73	25.43 / 9.75
10+80	53.17 / 9.70	1.73 / Fin. 10.86	26.00 / 9.85

NOTE: Distances out below are to Parking Area Curb & East of Bridge ℄ See Sketch Page 10

	S.Gr. W. Gut	S.Gr. E Gut.
11+15	32.00 / 9.94	54.80 / 9.65
11+45	33.68 / 9.90	56.20 / 9.61
11+70.21	35.09 / 9.87	57.37 / 9.57
12+00	36.77 / 9.84	59.74 / 9.53
12+20	37.89 / 9.82	62.43 / 9.50
12+40	39.02 / 9.78	66.01 / 9.47
12+60	40.14 / 9.74	70.51 / 9.44
12+80	41.26 / 9.68	75.94 / 9.41
13+00	42.38 / 9.63	82.35 / 9.38
13+20	43.51 / 9.57	89.74 / 9.36

(6)
10.32
0.25
0.31

July 19, 1950 T.A. Stamper

NOTE: Numerators Indicate Distances out From Bridge ℄
Denominators Indicate Subgrade Elevations

unless Shown otherwise

NOTE: 6" Crusher Base
3" A.C. Paving

NOTE: From Sta 11+15 North Bridge Curb is 26' E. & W. OF ℄

Δ @ Center 25' Radius object B.C. West = 0°

Sta	Int. & Rt.	Dist	Subgrade Elev.	
Center 25'	7° 30'	25'	9.55	
"	52° 20'	"	9.42	
"	99° 00'	"	9.34	
"	115° 17' 18"	"	9.32	℄ Drain Outlet
"	164° 00'	"	9.34	
"	199° 34' 18"	"	9.36	

PROGRESS X-SECTIONS OF NORTH APPROACH FILL

SECTION	NORMAL STA -	TO ℄ BRIDGE 32+00		
DIST	+	H.I.	−	ELEV
T.B.M.	8.40	19.16 2/		10.76
EAST-64'			12.6	6.6
E - 56'			12.9	6.3
E - 46'			6.0	13.2
E - 16'			6.0	13.2
E - 13'			5.2	14.0
℄ 0+00			4.9	15.3
WEST - 13'			5.1	14.1
W - 33'			5.0	14.2
W - 46'			4.7	14.5
W - 56'			11.4	7.8
W - 74'			12.3	6.9

C. BARRAGAN
E. WATSON
5-10-50

(12)

STA - 31+00

DIST	+	H.I.	−	ELEV.
EAST-60		19.16 2/	14.2	5.0
E 50'			5.2	14.0
E 25			4.9	14.3
℄ 0+00			4.8	14.4
W - 25			5.7	13.5
W - 50'			5.9	13.3
W 53'			7.2	11.0
W - 68'			9.8	9.4
W 75'			10.8	8.4

DISTANCES CUT TO EDGE OF WEST SHOULDER FROM EXISTING WEST CURB

(INCREASE WEST AT NORTH END OF PROJ.)

36+40		OK			
37+00		+0 16 5'	37' W TOE		
38+00		+1 15 5	22' W TOE		
38+63 45		+1 15 5	-		
			27.27		
			5.365		
			21.905		
	20.39				
	1.41				
24.7	24.800	24.80	24.80	24.80	24.8

NORTH ABUTMENT CHECKED 6-2

STA	+	H.I.	−	ELEV
				19.635
	9.11	28.830		~~19.72~~
TP			9.475	19.355
	1.715	21.070		
TP.			8.055	13.015
	2.76	15.775		
B.M.			4.93	10.845

LEVELS & BENCH FOR BRIDGE SEATS

NORTH ABUTMENT

STA	+	H.I.	−	ELEV	
					21.54
					1.15
					20.39
B.M. SET	1.82	21.54		19.72	RED HEAD + ℄ OF BEARING N/ABUT.
B.M.	~~4.25~~		1.15	20.39	" " "
B.M.	4.83	25.22		20.39	CHISEL "□" E/SIDE PIER #2 (TOP)
B.M.	6.03	27.245	3.805	21.415	5TH BRIDGE SEAT FROM W/END PIER #3
T.P.			5.53	21.91	T.T.P. (RAISED EDGE)
					CHISEL "□" E/SIDE PIER #2 (TOP)
B.M.	5.86	27.27		21.41	CONC NAIL E/SIDE (TOP) PIER #4
B.M.			4.92	22.35	CONC. NAIL E/END (TOP)
B.M.			5.365	21.905	PIER #3
					CONC NAIL E/END (TOP)
			6.03	21.24	PIER #2

NOTE See Pg. 19

S.W. Cor M.H. at Detour Road

WORK LEVELS FOR PIER # 7

STA	+	H.I.	−	ELEV
B.M	-(1.89)	17.83		19.72
				9.94
T.P	4.47	14.41	7.89	~~9.84~~
T.P	5.17	14.80	4.78	9.63
T.B.M			10.08	4.72
T.P	4.72	15.06	4.46	10.34
SET				(KNOCKED OUT)
T.B.M	4.875	15.51^{5}	4.42	10.64
T.B.M SET			4.82	10.69^{5}
T.B.M	4.66	15.35^{5}		10.69^{5}
CHECK			10.65	4.70
T.B.M.	4.62	15.31		10.69^{5}
SET 5-27-50				
T.B.M	~~4.62~~		4.735	10.57^{5}

3.74
4.47
15.31

10.69
4.62
15.31

.92

PROGRESS X-SECTIONS N/ABBUT.

STA - 36+00

STA	+	H.I.	-	ELEV
B.M.	3.86	14.62		10.76
E - 35			4.4	10.2
E - 31			4.4	10.2
E - 15			4.5	10.1 (9.8)
0+00			5.1	9.5
W - 15			5.3	9.3 (+9.6)
W - 23			4.9	9.7
W - 31			4.5	10.1

5-18-50

(15)

STA - 35+00

STA	+	H.I.	-	ELEV
B.M.	5.19	15.95		10.76
34			5.2	10.7 (10.6)
- 25			5.6	10.3
- 15			5.5	10.4
- 10			5.7	10.2 (10.9)
- 00			5.3	10.6
- 11			5.6	10.3 ~~4.~~ (10.6)
- 14			4.9	11.0
- 31			5.0	10.9

STA - 34+00

STA	+	H.I.	-	ELEV
B.M.	6.48	17.24		10.76
E- 34			4.6	12.2 (12.9)
E- 26'			5.0	12.2
E- 19'			4.7	12.5
E- 10'			5.1	12.1 (13.2)
0+00			5.2	12.0
W- 14'			5.0	12.2 (12.9)
W- 27'			4.8	12.4
W- 35'			4.7	12.5

LEVELS FOR B.M.'S AT SOUTH ABBUTMENT

STA	+	H.I.	−	ELEV
B.M	4.24	15.40		11.16
T.P.	4.40	15.30	4.50	10.90
SET B.M.			4.83	10.47
B.M. 2" GAS PIPE TOP	4.70	15.17		10.47
			5.33	9.84

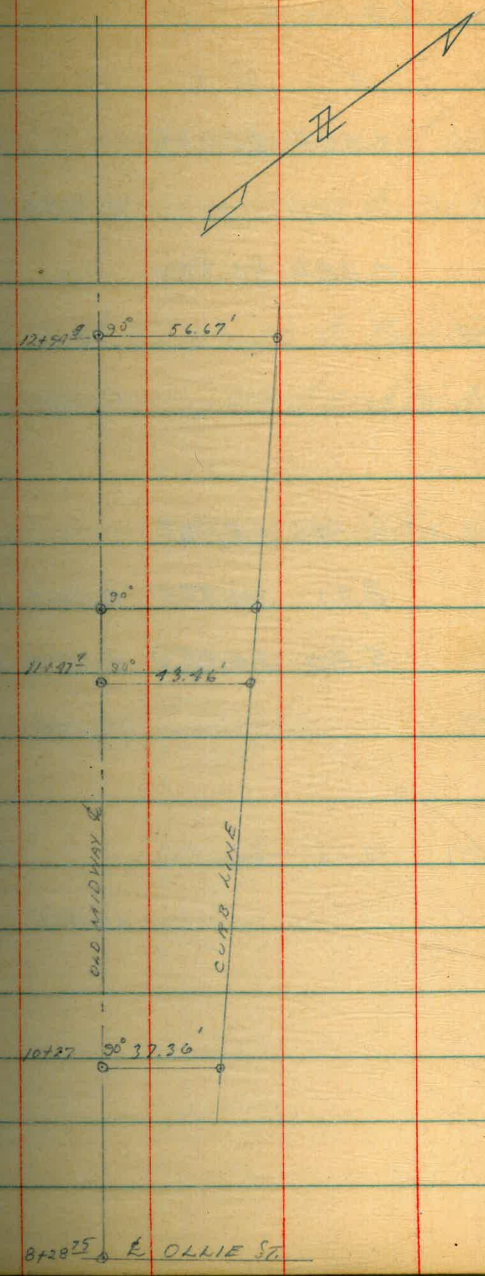
PE STAKES FOR SOUTH ABBUTMENT 5-23-50 STAMPER BARTAGAN WATSON SAFTRY (17)

F. 61.0	16+00	F. 60.5	
F. 52.4	15+50	F. 52.1	
F. 54.4	15+00	F. 53.8	11.16 4.24 15.40 4.50 10.90 4.40 15.30 4.83 10.47
F. 53.0	14+50	F. 51.5	
F. 46.5	14+00	F. 46.4	
F. 45.4	13+50	F. 43.1	
F. 43.4	13+00	F. 40.6	
F. 40.3	12+50	F. 38.0	
F. 36.5	11+95	F. 37.5	
N.G.	11+45	F. 34.4	
F. 35.0	11+15	F. 34.6	

LOCATION OF POLES FOR TELEPHONE CO.

T. STAMPER
C. BARRAGAN
E. WATSON
A. SHERRY

5-29-50



NORTH ABUTMENT CHECK

June 2, 1950

T. Stamper
C. Barragan
A. Sherry

LEVELS

Sta	+	H.I.	−	Elev.	
B.M.	1.625	21.255		19.635	Rd Target on E. Face Abutment (See P. 13)
T.B.M.			0.290	20.965	Conc. Nail E. End Bridge Seat & Bearing
	0.385	21.350			
T.B.M.			1.07	20.28	Top Conc Nail & Bridge ⊄ & Bearing
T.B.M.			1.76	19.59	Top Conc. Nail & Bearing West End Bridge Seat
B.M	6.145	16.905		10.76	Conc. Nail S.W. Cor M.H. E. Side Midway @ N. End Detour
TP.	8.21	24.375	0.740	16.165	
TP.	5.80	29.735	0.440	23.935	
T.B.M.			10.105	19.630	Rd Target Rd E/(FACE) EDGE N/ABUT
T.B.M	0.16	21.125		20.965	
			10.425		

June 2, 1950

SET ELEVATIONS 6" BELOW
BEARING GRADES ON PIER No. 1.

Sta	+	H.I	−	Elev.	Gr	
TBM.	4.43	24.71		20.28		Conc. Nail & Bearing N. Abut. (± Center)
			SEE BELOW	18.95	# 1	West End
			5.65	19.06	# 2	East to
			5.49	19.22	# 3	
			5.34	19.37	# 4	
			5.19	19.52	# 5	
			5.06	19.65	# 6	
			4.87	19.84	# 7	
SET B.M.			4.59	20.12	T.B.M.	Conc. Nail at East End Pier # 1 (T.P.)
	4.94	25.06		20.12		
			6.11	18.95	# 1	
			4.78	20.28		Conc. Nail ± Center Of North Abut.
T.B.M.	5.90	27.10	3.86	21.20	21.3	PREV. EL. = 21.24 Conc. Nail East End Pier # 2 T.P. (6-2-50)
T.B.M.			5.235	21.865	21.3	Conc. Nail East End Pier # 3
T.B.M.	5.630	27.94	4.79	22.31	22.	Conc. Nail East End Pier # 4
T.B.M.			5.45	22.49		Conc. Nail East End Pier # 5
T.B.M.						Conc. Nail East End Pier # 6

BENCH LEVELS MIDWAY DRIVE BRIDGE

June 7, 1950

T. Stamper
A. Sherry
H. Brown

BM.				10.76	(See Pg. 19)	4.95
	5.70	16.46				.45
TP			0.95	15.51		
	11.48	26.99				
T.B.M.			6.72	20.27	(See Pg. 19)	
	4.67	24.94				
B.M.			4.82	20.12	East End Pier #1 Side Shot	
TP.						
B.M.			3.74	21.20	East End Pier #2	
	5.515	26.715				
B.M.			4.85	21.865	East End Pier #3 Side Shot	
TP.						
B.M.			4.41	22.305	East End Pier #4	
	5.07	27.375				
B.M.			4.89	22.485	East End Pier #5 Side Shot	
B.M.			4.925	22.450	East End Pier #6	26.715 4.865 21.850
	4.915	27.400				
			5.05	22.35	East End Pier #7 Pour Strip	
			5.14	22.26	East End Pier #7 " "	

June 8, 1950 — T Stamper, A. Sherry

TOP OF CURB ELEVATIONS ON WEST SIDE MIDWAY DRIVE

Sta	+	H.I	−	ELEV.
B.M.				10.97
	5.63	16.10		
8+43.75			5.35	10.75
8+53.75			5.33	10.77
9+00			5.29	10.81
+50			5.24	10.86
10+00			5.18	10.92
10+45			5.08	11.02
10+80			4.88	11.22
			5.39	10.71

Sec. Nail & Valve Vault Box on East Side of Opposite A.B.C. Plumming Shop (See pg 17)

Top Existing E.C. 8+43.75

CHECK ON BRIDGE SHOE — June 8, 1950

LEVELS AS POURED — T. Stamper, A. Sherry

Sta	+	H.I.	−	Elev.	Description
B.M.				20.12	(See Pg. 21) Top Conc Nail East End Pier #1
	6.37	26.49			
1			6.17	20.32	[illegible]st Top Conc. at Shoe Pier #1
2			6.41	20.08	[illegible]st Step west "
3			6.53	19.96	[illegible]nd " " "
4			6.66	19.83	[illegible]rd " " "
5			6.83	19.66	[illegible]th " " "
6			6.96	19.53	[illegible]th " " "
7			7.08	19.41	[illegible]th " " "
1			5.50	20.99	[illegible]st Step 1
2			5.73	20.76	[illegible]st Step west 2
3			5.94	20.55	[illegible]nd " " 3
4			6.16	20.33	[illegible]rd " " 4
5			6.40	20.09	[illegible]th " " 5
6			6.62	19.87	[illegible]th " " 6
7			6.85	19.64	[illegible]th " " 7
			6.23	20.26	Seating Top Conc. Nail.

Pier #1 ℄ Pier No. 10

N. Abutment → ℄ South Abutment

BRIDGE SHOE CHECK LEVELS Con Data June 8, 1950

Sta	+	H.I	−	Elev.	Grad +0.0	
		26.49				
1			5.10	21.39	21.4	East Shoe
2	↑		5.23	21.26	21.1	1st " West
3	Pier # 2		5.26	21.23	21.2	2nd " "
4	Pier No 9		5.43	21.06	21.0	3rd " "
5			5.42	21.07	21.0	4th " "
6			5.56	20.93	20.9	5th " "
7	↓		5.55	20.94	20.9	6th " "
			5.30	21.19		B.M. East End Pier # 2
1			4.41	22.08	22.0	East Step
2	↑		4.60	21.89	21.9	1st " West
3			4.63	21.86	21.9	2nd " "
4	Pier # 3		great low .73 4.71	21.78	21.8	3rd " "
5	Pier No 8		4.68	21.81	21.8	4th " "
6			4.73	21.76	21.7	5th " "
7	↓		4.70	21.79	21.7	6th " "
			4.63	21.86		B.M East End Pier # 3

BRIDGE SHOE CHECK LEVELS (Cont.) June 8, 1950

Sta	+	H.I.	−	Elev	Detail Grade +0.00	
		26.49				
1			4.13	22.36	22.3	East Shoe
2			4.15	22.34	22.3	1st " West
3	Pier # 4 ℄ PIER No 7		4.14	22.35	22.3	2nd " "
4			4.22	22.27	22.2	3rd " "
5			4.24	22.25	22.2	4th " "
6			4.20	22.29	22.2	5th " "
7			4.18	22.31	22.3	6th " "
TP.						
B.M.			4.18	22.32	22.3	Top Conc. Nail East End Pier #4
	5.525	27.830	5.~~36~~ 345	22.~~47~~ 485		BM East End Pier # 5
1			5.35	22.48	22.4	East Shoe
2			5.34	22.49	22.4	1st " West
3	Pier # 5 ℄ PIER No 6		5.31	22.52	22.5	2nd " "
4			5.35	22.48	22.4	3rd " "
5			5.32	22.51	22.5	4th " "
6			5.33	22.50	22.5	5th " "
7			5.33	22.50	22.5	6th " "

BRIDGE SHOE CHECK LEVELS Con'd

June 8, 1950

Sta	+	H.I.	−	Elev.	Grade Detail
		27.83			+0.0
1			5.34	22.49	22.5
2	↑		5.34	22.49	22.5
3			5.34	22.49	22.5
4			5.37	22.46	22.5
5	Pier #6		5.34	22.49	22.5
6			5.34	22.49	22.5
7	↓		5.33	22.50	22.5
B.M.			5.38	22.45	Top Conc Wall East End Pier #6

TRIANGULATION OF REF.

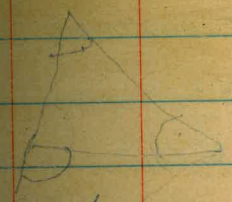
POINTS ON SOUTH ABUTMENT

℄ OF BEARING EAST & WEST.

Sta	Object	Angle	Mean
	100' S. ℄ Bearing R/H. ℄ Rd	1. 29° 45' 30"	
2"X2" Hub. R.P. East	R ↻	2. 59° 31' 00"	29°45'
	R.P. West on ℄ Bearing	6. 178° 31' 30"	
	℄ Bridge North	1. 105° 40' 30"	
R.P. 100' S. ℄ Bearing	R ↻	2. 211° 20' 00"	105°
	R.P. East on ℄ Bearing East & West	6. 634° 01' 45"	
	R.P. West on ℄ Bearing E. & W.	1. 33° 23' 00"	
R.P. 100' S. ℄ Bearing	R ↻	2. 66° 46' 30"	33°23'
	℄ Bridge North	6. 200° 19' 15"	
	R.P. East on ℄ Bearing E. & W.	1. 11° 11' 00"	
R.P. West 2"X2" Hub	R ↻	2. 22° 21' 30" 45	11°10'
	R.P. 100' S. on ℄ Bridge	6. 67° 05' 30"	

June 12, 1950

T. Stamper
C. Barragan
A. Sherry
H. Brown



Sta	Object	Angle	Mean
	R.P. West 2X2 ℄ Bearing	1. 139° 03' 45"	
R.P. 100' S. ℄ Bearing	R ↻	2. 278° 07' 00"	139° 03' 32"
	R.P. East 2X2" on ℄ Bearing	6. 834° 21' 10"	

~~120~~
~~140~~

139-03-32
29-45-15
11-10-55
179 59-42

105-40-135
29-45-15
135-25-325
44-34-075
~~180-00-400~~ 44-34-075

179 59 600
135-25-325
44-34-275

33-23-125
11-10-55
44 34-07
179 59-60
135 25 53
44 34 275
180-00-205

C. BARRAGAN
A. SHERRY
H. BROWN

JUNE-13-50

BENCH MARKS AT BRIDGE SEATS - PIER

FOR FINISH ELEVATIONS (CONC)

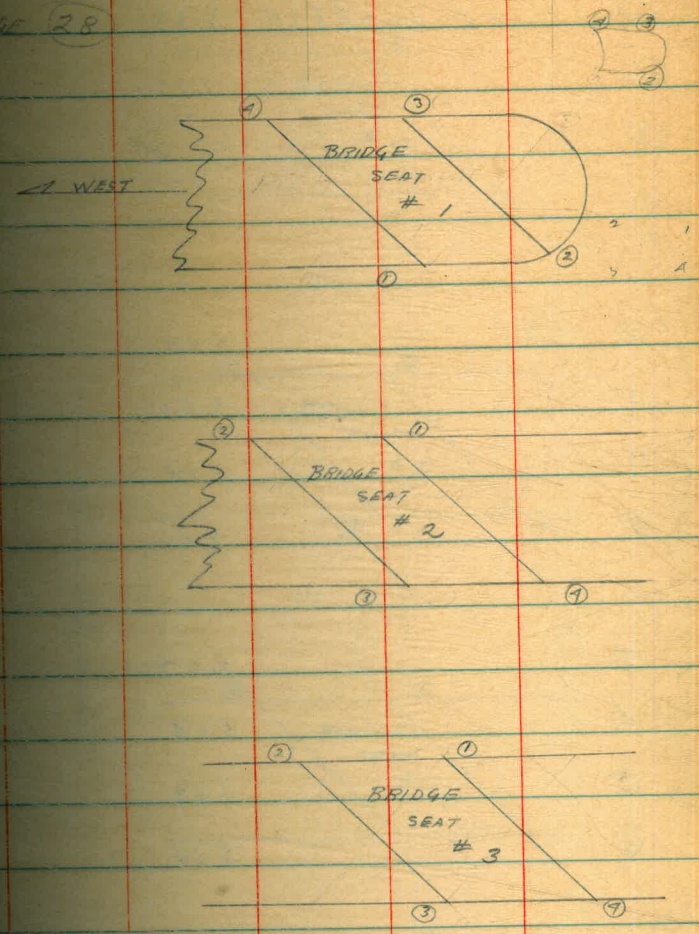
STA	+	H.I.	−	ELEV	PAR FLE		
B.M.	3.94	25.140		21.20		SPIKE NAIL @ EAST END PIER #2	21.20 3.94 25.14 4.19 20.95
			4.19	20.95	20.9	SPIKE NAIL @ EAST END NORTH ABUT.	25.14 4.88 20.26
			4.88	20.26	20.2	SPIKE NAIL @ CENTER ± N/ABUT.	25.140 5.585 19.555
			5.585	19.555	19.5	SPIKE NAIL @ WEST END N/ABUT.	
			5.02	20.12	20.1	SPIKE NAIL @ ~~#5~~ EAST END PIER #1	25.14 5.02 20.12
PIER #1 (SEAT)						SEAT #1 IS THE MOST ELY. BRIDGE SEAT PIER #1)	
B.M. #1 PIER #1 (SEAT)			4.80	20.34		SPIKE NAIL WEST OF BRIDGE SEAT (@ ℄)	25.14 20.34 4.80
B.M. #2 PIER #1 (SEAT)			4.99	20.15		" " EAST " " " (@ ℄)	25.14 20.15 4.99
B.M. #3 PIER #1 (SEAT)			5.12	20.02		" " WEST " " " "	25.14 20.02 5.12
B.M. #4 PIER #1 (SEAT)			5.27	19.87		" " EAST " " " "	25.14 19.87 5.27
B.M. #5 PIER #1 (SEAT)			5.42	19.72		" " EAST " " "	25.14 19.72 5.42
B.M. #6 PIER #1 (SEAT)			5.58	19.56		" " WEST " " "	25.14 19.56 5.58
B.M. #7			5.69	19.45		" " EAST " " "	25.14 19.45 5.69

C. BARRAGAN
A. SHEIPRY
H. BROWN
JUNE-13-50

EXISTING ELEVATIONS NEAR BRIDGE SEATS (AT DESIGN GRADE) PIER No 1

STA	+	H.I.	−	ELEV
B.M.		25.14		
1			4.85	
2			4.87	
3			4.84	
4			4.85	
1			5.03	
2			5.05	
3			5.03	
4			5.04	
1			5.17	
2			5.18	
3			5.18	
4			5.19	

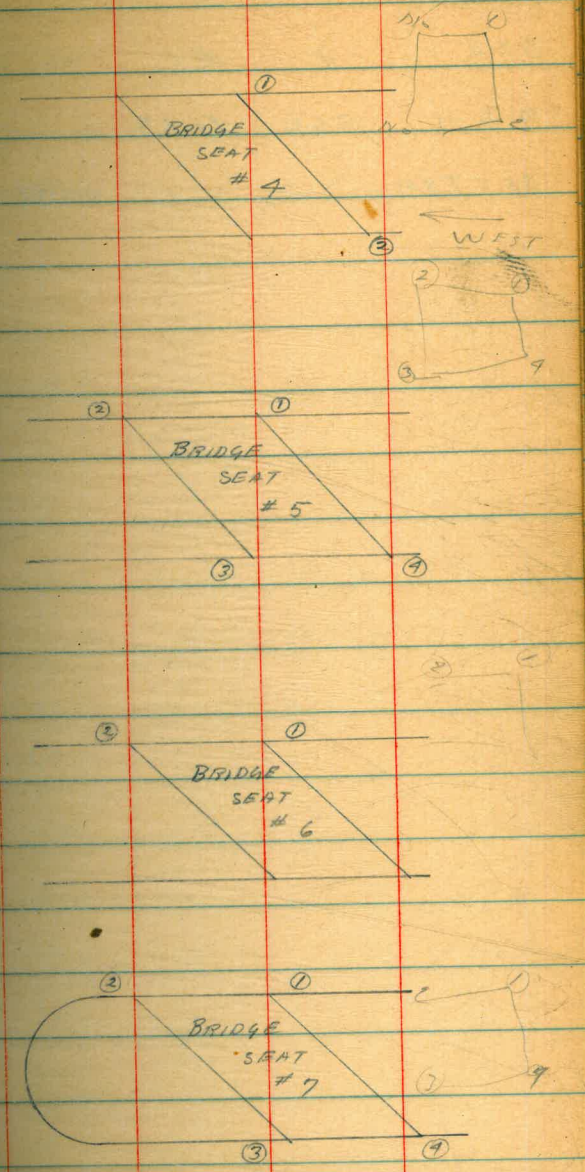
SEE PAGE 28



C. BARRAGAN JUNE-13-50
A. SHERRY
H. BROWN

EXISTING ELEVATIONS NEAR BRIDGE SEATS (DETAIL GRADE) PIER No. 1

STA	+	H.I.	-	ELEV
① FROM LAST PAGE		25.14	5.33	
②			5.34	
③			TOO CLOSE	
④			TOO CLOSE	
①			5.49	
②			5.50	
③			5.48	
④			5.46	
①			5.69	
②			5.64	
③			5.63	
④			5.64	
①			5.74	
②			5.71	
③			5.72	
④			5.76	



T. STAMPER
C. BARRAGAN
A. SHERRY
H. BROWN

JUNE-13-50

BENCH FOR PILE CUT OFFS

STA	+	H.I.	−	ELEV
T.B.M	0.66	11.23		10.57
SET T.B.M			10.52	+0.71

CORE "A" TOP W/CURB OLD MIDWAY

SQUARED TOP OF PILE INSIDE S/W CORN.

BENCH MARKS AT BRIDGE SEATS PIER #2

FOR FINISH CONC ELEVATIONS

STA	+	H.I.	-	ELEV		
T.B.M	6.21	26.34 ~~26.33~~ CORRECTED		20.12	20.12	CONC NAIL TOP OF EAST END PIER #1
CHECK BM			4.475	21.855	21.84	" " " " " PIER #3
CHECK B.M.			5.14	21.19	21.20	" " " " " PIER #2
BRIDGE SEAT PIER T.B.M #1			4.90	21.44		NAIL IN LEAD AT MOST ELY BRIDGE SEAT PIER #2
BRIDGE SEAT PIER T.B.M #2			5.07	21.27		NOT SET 6-13-50
SEAT PIER T.B.M #3						
T.B.M.	6.235	26.345 ~~26.355~~ CORRECTED		20.12		CONC NAIL TOP OF EAST END PIER #1
CHECK B.M			4.48	21.875	21.8	" " " " " PIER #3
CHECK B.M			5.145	21.21	21.2	" " " " " PIER #2
T.B.M #2			5.075	21.27		NAIL IN LEAD AT 2ND SEAT WEST
T.B.M #3			5.075	21.27		" " " 3RD SEAT WEST
T.B.M. #4			5.225	21.12		" " " " 4TH SEAT WEST
T.B.M. #5			5.225	21.12		" " " " 5TH SEAT WEST
T.B.M #6			5.355	20.99		" " " " 6TH SEAT WEST
T.B.M #7			5.355	20.99		" " " " 7TH SEAT WEST

6-13-50
6-14-50 21.91

26.33
4.48
21.85

20.12
6.21
26.33

26.33
4.475
21.855

26.34
5.14
21.20

26.34
21.44
4.90

26.34
21.27
5.07

26.345
21.44
4.905

20.12
6.235
26.355
4.48
21.875

26.355
5.145
21.210

6.01 26.345
21.27
6.12 5.075

6.22

26.345
21.12
6.48 5.225

6.63

26.345
20.99
6.79 5.355

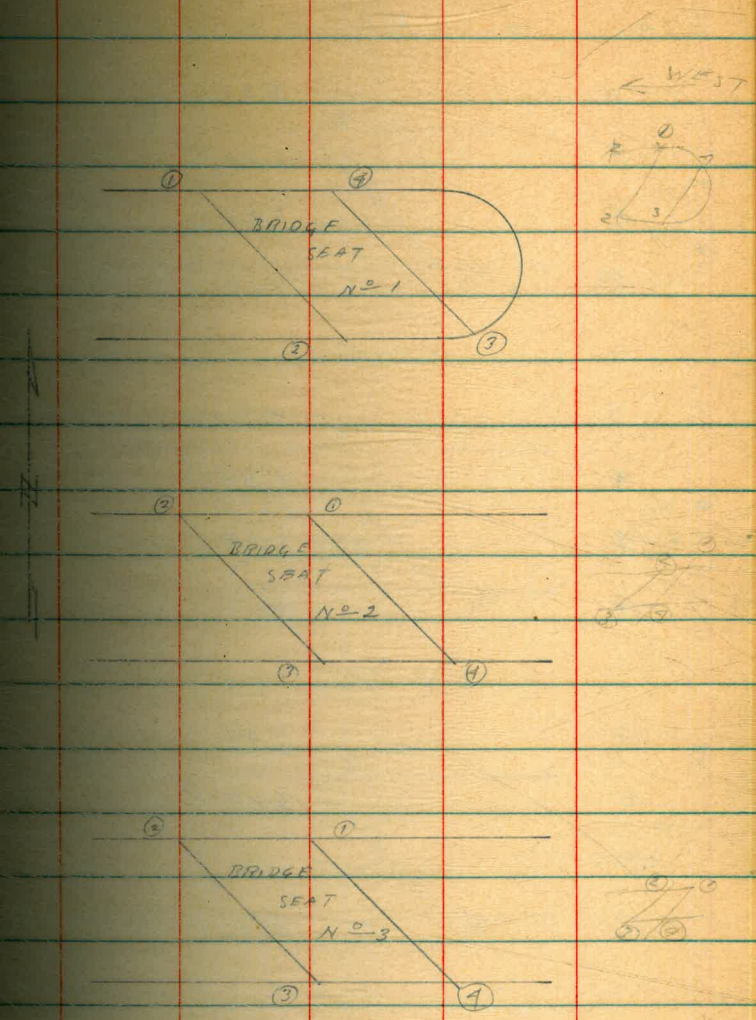
6.89

BARRAGAN
SHERRY
BROWN

JUNE-14-50

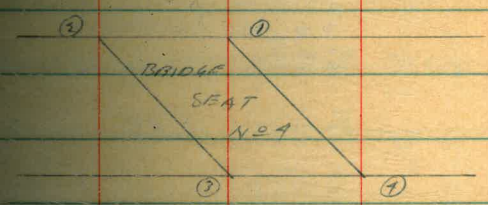
EXISTING ELEVATIONS NEAR BRIDGE SEAT (DETAIL GRADE) PIER No 2

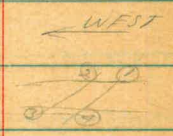
STA	+	H. I.	−	ELEV
1		26.35	4.96	
2			4.96	
3			4.99	
4			4.98	
1			5.14	
2			5.14	
3			5.15	
4			5.12	
1			5.15	
2			5.15	
3			5.14	
4			5.14	

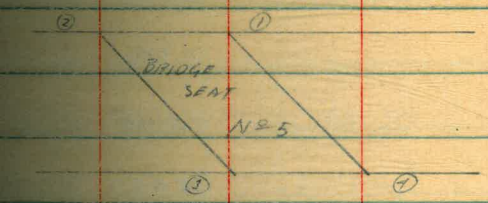


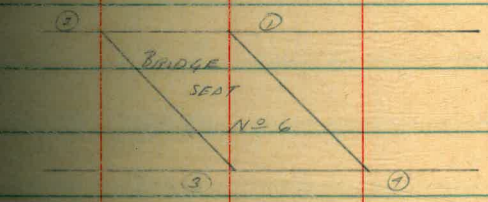
EXISTING ELEVATIONS NEAR BRIDGE SEATS (DETAIL GRADE) PIER Nº 2

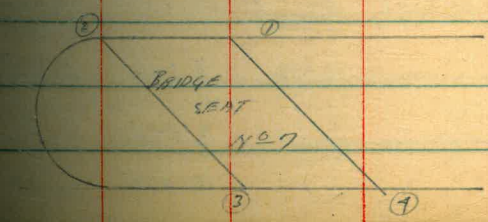
STA	+	H.I.	−	ELEV
1			5.31	
2			5.31	
3			5.31	
4			5.29	
1			5.30	
2			5.28	
3			5.28	
4			5.29	
1			5.43	
2			5.42	
3			5.41	
4			5.42	
1			5.43	
2			5.43	
3			5.40	
4			5.41	

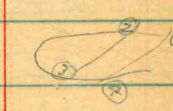












C. BRIGGAGAN 6-15-50
d. SHERRY
H. BROWN

BENCH MARKS NEAR BRIDGE SEATS PIER Nº 3

STA	+	H.I.	−	ELEV	
		27.045 CORRECTED			
B.M	4.735	27.09		22.305	22.3
			5.85	21.19	21.2
CHECK					
			5.18	21.86	21.9
CHECK					
①			5.60	21.44	
②			5.77	21.27	
③			5.77	21.27	
④			5.92	21.12	
⑤			5.92	21.12	
⑥			6.055	20.985	
⑦			6.055	20.985	
1			4.985	22.06	
2			5.125	21.92	
3			5.125	21.92	
4			5.215	21.83	
5			5.215	21.83	
6			5.275	21.77	
7			5.275	21.77	

Nail Nº 1 E/End Pier Nº 4

22.310
4.735
27.045
5.880
20.195

22.305
4.735
27.040
5.85
21.19

" " " " Nº 2

27.045
5.180
21.865

27.04

" " " " Nº 3

27.04
5.60
21.44

27.04
5.77
21.27

27.04
5.77
21.27

27.04
5.92
21.12

Check On Bridge Seats (1 to 7)
Pier Nº 2 (6-15-50)
(Numbered East to West)

27.040
6.055
20.985

27.045
22.060
4.985

27.045
21.92
5.125

Nail In Lead By Each Bridge Seat
Pier Nº 3 (6-15-50)
(Numbered East to West)

27.045
21.83
5.215

27.045
21.770
5.275

C. BARRAGAN
A. SHEITRY
H. BROWN

6-15-50

EXISTING ELEVATIONS NEAR BRIDGE (SEE DETAIL GRADE) PIER No 3

STA	+	H.I.	−	ELEV
1		27.05	5.00	
2			5.00	
3			5.01	
4			4.98	
1			5.18	
2			5.17	
3			5.20	
4			5.20	
1			5.18	
2			5.17	
3			5.15	
4			5.18	
1			5.27	
2			5.27	
3			5.26	
4			5.28	

C. BARRAGAN
A. SHERRY
H. BROWN
6-15-50

EXISTING ELEVATIONS NEAR BRIDGE SEE (DETAIL GRADE) PIER No 3

STA	+	H.I.	−	ELEV
1		27.05	5.27	
2			5.24	
3			5.24	
4			5.26	
1			5.33	
2			5.33	
3			5.30	
4			5.32	
1			5.33	
2			5.26	
3			5.26	
4			5.28	

BENCH LEVELS MIDWAY DR BRID

STA	+	H.I.	—	ELEV	
B.M.	4.35	15.51 ~~15.41~~		11.16	
T.P.	4.08	15.16 ~~15.06~~	4.43	11.08 ~~10.98~~	
T.B.M. CHECK			4.69	10.47	
T.P	5.105	17.77	2.495	12.665	
SET T.B.M			9.84	7.93	
T.P	5.83	14.67	8.93	8.84	
"	3.23	13.26	5.14	9.53	
SET T.B.M			3.38	9.88	
T.B.M	1.91	10.75		8.84	
SET NAILS			8.75	+2.00	
SET NAILS			11.75	~~-1.00~~	
CHECK			1.91	8.84	
B.M	5.53 ~~3.53~~	13.46		7.93 ~~7.93~~	
SET B.M			11.54	1.92	GRADE 2.00
SET B.M			11.61	1.85	GRADE 2.00
SET B.M			11.51	1.95 ~~11.51~~	GRADE 2.00

(38)

42 700
6.0 Tiles
7.1 Bolt

15.16
4.69
10.47

15.51
9.93
14.06
4.06
15.16

14.16
4.35
15.51
4.43
10.08
4.08
15.06

Nail "X" On West Curb P.I. Nashville & Midway

T.P.

Nail Center Valve Vault Front (A.B.C. Plug)

15.16.0
2.495
12.665
5.105
17.770
9.84 17.77
7.93 8.93
8.84
8.93
14.67
5.14
9.53
3.23
13.26
3.38
9.88

T.P.

(Opposite & East of South Abut.)
Nail To Deadman Pile 12" Water Line

T.P. W/Pile South Abut. 2"x2"

Pile 8 (2x3")

Top Of Pile No 8 (On Sand Levee)

T.P. W/Pile South Abut. (2"x2")

Top Of Footing Abutment (2 West Ftng)

Top Of Footing (3rd Ftng East)

T.P. W/Pile South Abut (2"x2")
(Opposite & East Of South Abutment)
Nail To Deadman Pile (12" Water Line)

7.93
5.53
13.46
11.54
1.92

Nail Cut (Seen) Most Way Footing (South Edge)

Nail South Edge Of Center Footing (In N.E.S.E.)

Nail " " " 2nd Ftng East (On N.E.S.E.)

3.39

RECHECK ON LEVELS ON PIER Nº 1

STA	+	H.I.	−	ELEV	
B.M.	3.39	25.26 25.255		21.865	
CHECK			4.06	21.195	21.20
CHECK			5.145	20.11	
			GR. 4.92		
SEAT ①		25.260	4.925	20.335	20.33
			GR 5.11		
" ②			5.11	20.15	20.15
			GR. 5.24		
" ③			5.24	20.02	20.02
			GR 5.39		
" ④			5.40	19.86	19.86
			GR. 5.54		
" ⑤			5.545	19.705	19.70
			GR. 5.70		
" ⑥			5.705	19.555	19.55
			GR. 5.81		
" ⑦			5.82	19.44	19.44

BARRAGAN
SHERRY
BROWN

6-15-50

(39)

	25.26 4.05 21.20	21.20 4.06 25.26
GENE NAIL E/END PIER Nº 3		21.865 3.39 25.255 4.06 21.195
" " " " Nº 2		25.255 5.145 20.110
" " " " Nº 1		25.260 5.145 20.115
		25.260 4.925 20.335
		25.26 5.11 20.15
		25.26 5.24 20.02
RECHECK ON LEVELS PIER Nº 1		25.26 5.40 19.86
(SEATS NUMBERED EAST TO WEST) (JUNE-15-50)		25.260 5.545 19.705
(NAILS RESET TO CORR. ELEV)		25.260 5.705 19.555
		25.26 5.82 19.44

BENCHS AT BRIDGE SEATS PIER Nº 4

STA	+	H.I.	−	ELEV		
B.M	5.695	27.56		21.865	21.8[illegible]	Conc NAIL TOP END PIER Nº 3
CHECK			5.07	22.49	22.49	" " " " " Nº 5
CHECK			5.26	22.30	22.3[illegible]	" " " " " Nº 4
SEAT ①			5.21	22.35		
SEAT ②			5.21	22.35		
SEAT ③			5.21	22.35		
SEAT ④			5.30 (295)	22.26		
SEAT ⑤			5.30	22.26		
SEAT ⑥			5.30	22.26		
SEAT ⑦			5.30	22.26		

BARRAGAN
SHERRY
BROWN

6-15-50

(40)

21.865
5.695
27.560

27.56
5.07
22.49

27.56
5.26
22.30

27.56
22.35
5.21

NAIL IN LEAD BY EACH BRIDGE SEAT
PIER Nº 4
(NUMBERED EAST TO WEST)

27.56
22.26
5.30

C. BARRAGAN 6-15-50
A. SHERRY
H. BROWN

EXISTING ELEVATIONS NEAR BRIDGE SEATS (DETAIL GRADE) PIER No 4

STA	+	H.I.	-	ELEV
1		27.56	5.24	22.32
2			5.25	22.31
3			5.25	22.31
4			5.24	22.32
1			5.25	22.31
2			5.24	22.32
3			5.24	22.32
4			5.24	22.32
1			5.25	22.31
2			5.23	22.33
3			5.24	22.32
4			5.23	22.33

SEE PAGE 40 (H.I.)

EXISTING ELEVATIONS NEAR BRIDGE SEATS

STA	+	H.I.	−	ELEV
1		27.56	5.34	22.22
2			5.31	22.25
3			5.30	22.26
4			5.30	22.26
2			5.30	22.26
3			5.30	22.26
4			5.30	22.26
1			5.32	22.24
2			5.31	22.25
3			5.30	22.26
4			5.30	22.26
1			5.31	22.25
2			5.29	22.27
3			5.28	22.28
4			5.29	22.27

CHECK ON PIER Nº 7 FOR DETAIL GRADE (POURED)

STA	+	H.I.	−	ELEV
	5.275	27.76		
B.M	~~5.29~~	~~27.775~~		22.485
				22.25
SET B.M			5.51	~~22.265~~
				22.445
			5.315	~~22.46~~ 22.45
1			5.51	22.25
2			5.52	22.24
3			5.54	22.22
4			5.54	22.22
5			5.55	22.21
6			5.54	22.22
7			5.56	22.20
8			5.54	22.22
9			5.45	22.31
10			5.45	22.31
11			5.45	22.31
12			5.45	22.31
SEAT Nº (7)			5.38	22.38
" " (6)			5.38	22.38
" " (5)			5.40	22.36
" " (4)			5.49	22.27
" " (3)			5.46	22.30
" " (2)			5.47	22.29
" " (1)			5.45	22.32

Top Nail Top Pier Nº 5 (East End)			22.485
			5.29
			27.775
			5.51
			22.265
" " " Nº 7 ("	"		
			27.775
			5.315
" " " " Nº 6 ("	"		22.460
	1	2	
	3	4	
	5	6	
	7	8	
	9	10	
Shots On Detail	11	12	
Grade Of Pier Nº 7			
(Setting Of Pour Strip)			
Top Of Bridge Seat	(1)		
" " " "	(2)		
" " " "	(3)		
" " " "	(4)		
" " " "	(5)		
" " " "	(6)		
" " " "	(7)		

E

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H. BROWN
6-20-50

DETAIL GRADES ON PIER No 8

STA	+	H.I.	−	ELEV
B.M.	5.13	27.58		22.45
CHECK B.M.			5.33	22.25
			5.81 SET	21.77
1ST STEP			GR	21.75
			5.75 SET	21.83
2ND STEP			GR	21.81
			5.66 SET	21.92
3RD STEP			GR	21.90
			5.52 SET	22.06
4TH STEP			GR	22.04

CHECK ON FOOTING ELEV (−2.0) PIER No 8

STA	+	H.I.	−	ELEV
B.M.	4.64	12.57		7.93
T.P.	3.98 ~~3.93~~	13.92	2.58	9.99
			9.67	4.30
T.P.	3.77		9.67	4.25
T.P.	1.65	5.95 ~~5.90~~		4.30 ~~4.25~~
POUR STRIP			12.75	12.61
" "			12.73	12.61
T.P. SHEET PILE			1.31	4.64 ~~4.59~~
T.P.	10.15	14.45 ~~14.40~~		4.30 ~~4.25~~
CHECK T.B.M.			4.56	9.89 ~~9.84~~

Cinc Nail Top Pier No 6 (East End) 22.45 + 5.13 = 27.58

" " " " No 7 (East End) 27.58 − 5.33 = 22.25

Set Pour Strips For Detail Grade .02' Higher Than Grade On Plan

27.58 − 21.75 = 5.83
27.58 − 21.81 = 5.77
27.58 − 21.90 = 5.68
27.58 − 22.04 = 5.54

5.95
7.00
12.95
.33
12.62

(Opposite & East of Abutment (South))
Sheet Top of Anchor Pile (12" Water Line)

7.93 + 4.64 = 12.57
12.57 − 2.58 = 9.99
9.99 − 3.93 = 4.28

Level T.P.
T.P. T.P.

14.40 − 4.56 = 9.84
14.40 − 3.77 = 10.63
8.02 − 7.00 = 1.02
7.00 − 5.90 = 1.10
12.90 − .33 = 12.57
5.90 − 1.31 = 4.59
14.40 − 4.57 = 9.83

" " " "

14.40 − 4.30 = 10.10
+1.65
~~2.65~~ 12.59
5.95
7.00 − .33 = 6.67
5.90
4.25
10.15
14.40 − 9.53 = 4.87

Pour Strip On Pier No 8 (On Sand Fill)

CHECK LEVELS FOR FOOTING PIER Nº 8

STA	+	H.I.	−	ELEV
	4.58			
	4.28	14.46		9.88
CHECK			4.47	9.99
T.T.P.			10.16	4.30

1'x2' WEST OF PIER ON SAND LEVEE

PREVIOUS T.P. EL. = 9.99

T.P. + CENTER SHEET PILING

9.88
4.58
14.46
4.47
9.99
14.46
10.16
4.30

CHECK ON GRADE NAILS PIER Nº 1

5.16	25.28		20.12

No RECORD

25.28
20.39
4.99
25.28
20.15
5.13
25.28
20.02
5.26
25.28
5.43
19.85
25.28
19.87
5.41
25.28
5.72
19.56
25.28
5.83
19.45

CHECK LEVELS N. ABUTMENT — June 23, 1950 — T. Stamper, C. Barragan, H. Brown, A. Sherry

Sta	+	H.I	−	Elev		
	3.40	25.265		21.865		Conc. Nail E. End Pier #3
	4.065	25.265		21.20		Conc. Nail E. End Pier #2
	5.145	25.265		20.12	Check June 5	Conc. Nail E. End Pier #1
			4.32	20.945	20.95	Conc. Nail E. End N. Abut
			5.03	20.235	20.24	Conc. Nail ℄ N. Abut.
			5.73	19.535	19.55	Conc. Nail W. End N. Abut.

June 26, 1950

					Check	
T.B.M.	3.40	25.265		21.865	21.865	Conc. Nail E. End Pier #3
			4.065	21.200	21.200	Conc. Nail E. End Pier #2
			5.145	20.120	20.120	Conc. Nail E. End Pier #1
			4.330	20.935	@	Conc. Nail E. End N. Abut
			5.035	20.230	@	Conc. Nail ℄ N. Abut
			5.740	19.525	@	Conc. Nail W. End N. Abut.

Note: See Pg. 50 for check on Pier #1

BENCH MARKS

SET B.M. ON CENTER FOOTING S/ABUT

STA	+	H.I.	−	ELEV		
B.M.	5.70	13.63		7.93	(OPPOSITE & EAST OF SOUTH ABUT.)	7.93 5.70 13.63 11.79 1.84
			11.79	1.84	TOP OF ANCHOR PILE (12" WATER LINE) (ON ℄ N/E/S)	
			11.705	1.92	CONC. NAIL ON SOUTH EDGE CENTER FOOTING SOUTH ABUT. CONC NAIL ON ℄ N/E/S (SOUTH EDGE) WEST WAY FOOTING SOUTH ABUT	
			11.69	1.94	CONC NAIL ON ℄ N/E/S SOUTH EDGE 2ND FOOTING EAST SOUTH ABUT	

SET GRADES ON EAST WINGWALL FOOTINGS

STA	+	H.I.	−	ELEV		
B.M	4.30	12.23		7.93	TOP OF ANCHOR PILE E/SOUTH ABUT.	6-28-50
			10.23	2.00 (DETAIL GRADE)	SET GRADES 0.04' ABOVE (DETAIL GRADE) FOR SETTLEMENT	
B.M	6.06	13.99		7.93		
SET T.B.M.			9.73	4.26	T.B.M. ON SHEET PILE AT S/E COR PIER No 10 (BLUE)	6-28-50

6-23-50
6-23-50

BENCH LEVELS FOR PIER Nº 8

STA	+	H.I.	−	ELEV		
		27.755		22.485		
B.M	5.27	~~27.92~~		~~22.45~~		Conc. Nail Top East End Pier Nº 5 — 22.45 + 5.27 = 27.72
B.M			5.31	22.445	22.45	" " " " " " Nº 6 — 5.31 = 22.41
RE-SET				22.240		
B.M			5.515	~~22.245~~	22.24	" " " " " " Nº 7 — 22.485 − 5.27 = 27.755

June 27, 1950

B.M.				22.240		Conc. Nail Top East End Pier Nº 7
	5.130	27.~~370~~ 385				
			4.935	22.~~435~~ 450	22.445	Conc. Nail Top East End Pier Nº 6
B.M.			5.600	21.785		Set Conc. Nail Top East End Pier Nº 8
B.M.	5.890	27.755 27.760		21.865		Conc Nail Top East End Pier Nº 3
B.M.			+5.455	22.300 5	22.305	Conc. Nail Top East End Pier Nº 4
B.M.			5.280	22.475 22.480	22.485	Conc. Nail Top East End Pier Nº 5
B.M.			5.310	22.450	22.445	Conc Nail Top East End Pier Nº 6
B.M.			5.505	22.255	22.240	Conc Nail Top East End Pier Nº 7
T.B.M.'S			5.23	22.530		Set "7" Nails in Lead For Grinding Conc. along ℄ Axis East & West (see pg 25)

GRADE ON POUR STRIP PIER Nº 9

Sta	+	H.I	—	Elev.
B.M.	4.965	27.220		22.255
B.M.			5.765	22.455 22.450
B.M.			5.435	21.785
			5.78	21.44
			5.95	21.27
			5.95	21.27
			6.10	21.12
			6.10	21.12
			6.23	20.99
			6.23	20.99

June 29, 1950

T. Stamper
C. Barragan
A. Sherry
H. Brown

Conc Nail Top East End Pier Nº 7

" " " " " " Nº 6

" " " " " " Nº 8

West step		27.22
1-st " East		21.44
		5.78
2-nd " "		27.22
3-rd " "		27.27
		5.95
4-th " "		27.22
5-th " "		21.12
		6.10
6-th " "		27.22
		20.99
		6.23

CHECK ON CONC. BEARING BASE

PLATE SHOES ON PIER Nº 1

June 26, 1950

Note: Red Indicates Check on Shoes Marked O.K.

T. Shimper
C. Barragan
A. Sherry
H. Brown

Sta	+	H.I	GRADE ROD	GRADE Elev	DIFFERENCE RODS	
B.M.	3.40	25.265		21.865	4.91, 4.91	Top Conc. Nail E. End Pier #3
			4.925	20.34	4.916, 4.96	East Nail
			5.115	20.15	5.105, 5.10	2nd Nail West
			5.245	20.02	5.235, 5.23	3rd " "
			5.395	19.87	5.38, 5.38	4th " "
			5.545	19.72	5.535, 5.54	5th " "
			5.70		5.70, 5.70	
			5.705	19.56	5.70, 5.70	6th " "
					5.81, 5.81	
			5.815	19.45	5.81, 5.81	7th " "

← Pattern of Rod Shots

Note Rod Readings in Red indicate Variations from grade Rods Shown in Pencil

CHECK ON N. ABUTMENT
FOR SETTLEMENT

June 29, 1950

T. Stamper
C. Barragan
A. Sherry
H. Brown

Sta	+	H.I.	−	Elev.		
B.M.	3.960	25.16		21.20		Conc Nail Top East End Pier No 2
B.M.			3.295	21.865		" " " " " " No 3
B.M.			5.04	20.12		" " " " " " No 1
			4.222	20.938	June 26 20.935	" " " " " N. Abutment
			4.930	20.230	20.230	" " " ℄ " "
			5.635	19.525	19.525	" " " W. End N. Abutment

CHECK ON NORTH ABUTMENT JULY 5-1950

STA	+	H.I.	−	ELEV		
B.M	3.96	25.16		21.20		CONC NAIL TOP EAST END PIER No 2
B.M.			3.295	21.865		" " " " " " No 3
B.M.			5.04	20.12		" " " " " " No 1
CHECK			4.223	20.937	JUNE 29 20.938	" " " " " NORTH ABUT. EAST
CHECK			4.93	20.23	JUNE 29 20.238	" " " " " NORTH ABUT. ±℄
CHECK			5.635	19.525	JUNE 29 19.525	" " " " " NORTH ABUT. WEST

BENCHES SET FOR GRADES ON PIER Nº 6, 7,

June 30, 1950

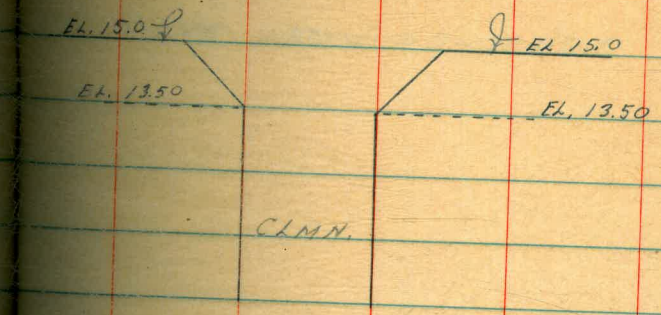
T. Stamper
C. Barragan
A. Sherry

Sta	+	H.I.	−	Elev.		
B.M.	5.280	27.765		22.485		Conc. Nail East End Pier #5
B.M.			5.45	22.305		Conc Nail East End Pier #4
B.M.			5.312	22.455	22.450	Conc. Nail East End Pier #6
			5.235	22.53		All Shoes Same Elev. Set 20d Nails in Lead Plug
			5.510	22.255	22.255	Conc. Nail East End Pier Nº 7
	5.29	27.545		22.255		Conc. Nail East End Pier Nº 7
			5.085	22.455	22.450	Conc. Nail East End Pier Nº 6
			5.755	21.790	21.785	Conc. Nail East End Pier Nº 8
			5.285	22.26		East Shoe
			5.285	22.26		2nd " West Set 20d Nails in Lead Plug
			5.285	22.26		3rd " " " " " " "
			5.285	22.26		4th " " " " " " "
			5.195	22.35		5th " " " " " " "
			5.195	22.35		6th " " " " " " "
			5.195	22.35		7th " " " " " " "

SET GRADES ON SOUTH ABUTMENT

STA	+	H.I.	−	ELEV	
B.M.	7.61	15.54		7.93	7.93 7.61 15.54 13.50 2.04
SET GRADE			2.04	13.50	
SET GRADE			0.54	15.00	

SPIKE TOP ANCHOR PILE E/OF SOUTH ABUT.



SET BENCH MARK PIER Nº 9

STA	+	H.I.	−	ELEV	
B.M	4.963	27.218		22.255	
B.M			4.762	22.456	22.456
B.M			5.433	21.785	21.785
SET B.M			6.197	21.021	FIRST WK 7-6-50

SPIKE NAIL TOP PIER Nº 7 (EAST)

"	"	"	"	"	6	"	
"	"	"	"	"	8	"	
"	"	"	"	"	9	"	7-6-50

SET GRADES FOR BRIDGE SEATS NORTH ABUTMENT

STA	+	H.I.	−	ELEV	
B.M	0.865	21.095		20.23	CONC NAIL ± ℄ NORTH ABUTMENT
B.M			1.57	19.525	" " AT WEST END NORTH ABUT.
SEAT 1					
" 2					
" 3					
" 4					
" 5					
" 6					
" 7					

STAKES SET ON TOE OF SLOPE
FOR WATERLINE CRADLE

Sta	+	H.I.	-	Elev.	Grade
B.M.	6.07	16.83		10.76	See Pg 19
34+50			9.9	6.9	
32+00			10.4	6.4	

July 10, 1950

CHECK ON N. ABUT. FOR SUBSIDENCE

Sta	+	H.I.	-	Elev.		
B.M.	4.15	25.350		21.20		Conc Nail East End Pier #2
B.M.			3.48	21.87	21.865	Conc Nail East End Pier #3
B.M.			5.23	20.12	20.12	Conc Nail East End Pier #1
T.B.M.			4.415	20.935	20.937	Conc. Nail East End N. Abut.
T.B.M.			5.130	20.220	20.230	Conc Nail ℄ N. Abut
T.B.M.			5.840	19.510	19.525	Conc. Nail W. End N. Abut.

29.5

July 10, 1950

NOTE: 10' is added to Distances out from Toe of Slope to make Cradle for Water Line

East ℄ West

13.2
6.3
51.5

22.1
6.4
65.6

22.1
6.4
15.7

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SET GRADE NAILS FOR PIER Nº 8

STA	+	H.I.	-	ELEV		
		27.33 CORRECTED				
B.M.	5.075	~~27.325~~		22.255	22.255	Conc. Nail East End Top Pier Nº 7
"			4.872	22.453	22.455	" " " " " " Nº 6
"			5.545	21.78	21.785	" " " " " " Nº 8
"			6.316	21.009	21.021	" " " " " " Nº 9
(7)		27.33	5.27	22.06		Nail In Lead Plug By Bridge Seat
(6)		"	5.41	21.92		" " " " " " "
(5)		"	5.41	21.92		" " " " " " "
(4)		"	5.50	21.83		" " " " " " "
(3)		"	5.50	21.83		" " " " " " "
(2)		"	5.56	21.77		" " " " " " "
(1)		"	5.56	21.77		" " " " " " "

(STATS NUMBERED EAST TO WEST)

Note - ~~Grade~~ Top Of Nail Is At Detail Grade + 0.02'

27.33
5.55
21.78

22.255
5.070
27.325

27.325
4.872
22.453

27.325

27.33
22.06 27.33
5.27 22.06
5.27

27.33
21.92
5.41

27.33
21.92
5.41

27.33
21.83
5.50

27.33
21.83
5.50

27.33

27.33
21.77
5.56

CHECK ON DETAIL GRADE PIER No 8

STA	+	H.I.	-	ELEV	
1		27.33	5.56	21.77	
2			5.56	21.77	
3			5.52	21.81	
4		BOTH SIDES	5.54	21.79	
4			5.50	21.83	
5			5.41	21.92	
6			5.41	21.92	
7			5.28	22.05	
					GRADE
7		27.33	5.22	22.11	22.08
6			5.35	21.98	21.95
5			5.34	21.99	21.92
4			5.46	21.87	21.83
3			5.46	21.87	21.83
2			5.47	21.86	21.77
1			5.48	21.85	21.77

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27.37
5.46
21.91

(POUR STRIP GRADE T.P. CONCRETE) 1ST SEAT EAST END BY

" " 2ND SEAT WEST BY

" " " " "

" " " " "

" " " " "

" " " " "

" " " " "

" " " " "

POUR STRIP GRADE (SEATS No EAST TO WEST)

TOP OF BRIDGE SEATS (DETAIL + 0.02')
(SEATS NUMBERED EAST TO WEST)

CHECK TOP OF BRIDGE SEATS PIER Nº 7

STA	+	H.I.	−	ELEV
SEAT ①		27.33	5.04	22.29
" ②			5.04	"
" ③			5.04	"
" ④			5.04	"
" ⑤			4.95	22.38
" ⑥			4.95	"
" ⑦			4.93	22.40

(SEATS NUMBERED

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CHECK TOP BRIDGE SEATS PIER Nº 9

STA	+	H.I.	−	ELEV
SEAT ①		27.33	6.29	21.04
" ②			6.30	21.03
" ③			6.18	21.15
" ④			6.18	21.15
" ⑤			6.02	21.31
" ⑥			5.99	21.34
" ⑦			5.83	21.50

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SET GRADE NAILS FOR BRIDGE SEATS PIER Nº 9

STA	+	H.I.	−	ELEV	GRADE
B.M	5.075	27.33		22.255	
①			6.34	20.99	
②			6.34	20.99	
③			6.21	21.12	
④			6.21	21.12	
⑤			6.06	21.27	
⑥			6.06	21.27	
⑦			5.89	21.44	

27.77
6.32
21.61

SINC NAIL TOP PIER Nº 7 (EAST END) (SEE PAGE Nº 56)

27.33
5.89
21.44

27.33
20.99
6.34

21.44
20.99

27.33
21.12
6.21

27.33
21.12
6.21

NAILS IN LEAD PLUG BY BRIDGE SEATS

27.33
21.27
6.06

27.33
21.44
5.89

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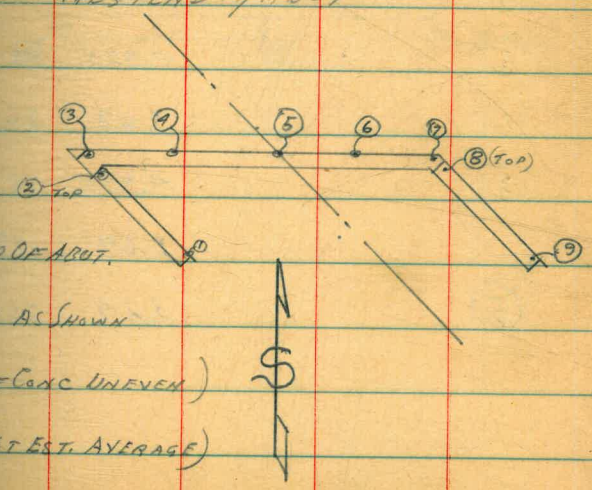
W. CARVER

CHECK ON NORTH ABUTMENT FOR SETTLEMENT

STA	+	H.I.	−	ELEV		
B.M.	4.072	25.272		21.20		CONC NAIL E/END (TOP) PIER Nº 2
"			3.410	21.862	21.865 ~~25.~~	" " " " " Nº 3
"			5.15	20.122	20.12	" " " " " Nº 1
B.M			4.335	20.937	20.937	CONC NAIL EAST END N/ABUT.
B.M.			5.05 ~~4.05~~	20.222	20.235	" " 5/E CENTER N/ABUT
B.M.			5.754	19.518	19.525	" " WEST END N/ABUT
B.M	8.64	29.577		20.937		" " EAST END N/ABUT
"			10.06	19.517		" " WEST END N/ABUT
					Grade / Evidence	
①			1.29	28.29	28.37 .08	
②			1.00	28.58	28.74 .16	
③			2.715	26.86	26.99 .13	
④			3.05	26.53		SHOTS ON TOP OF ABUT.
⑤			3.41	26.17	26.315 .145	& WING WALLS AS SHOWN
⑥			3.81	25.77		(SURFACE OF CONC UNEVEN)
⑦			4.14	25.44	25.64 .20	(SHOTS TAKEN AT EST. AVERAGE)
⑧			2.45	27.13	27.39 .26	
⑨			3.02	26.56	26.86 .30	



CHECK ON NORTH ABUTMENT FOR SETTLEMEN

STA	+	H.I.	−	ELEV	
B.M	3.933	25.133			21.200
"			3.267	21.866	21.865
"			5.013	20.12	20.12 (7-12-50)
CHECK ②			4.203	20.93	20.937 (7-18-50)
" ③			4.920	20.213	20.222 (7-12-50)
" ④			5.628	19.505	19.51
	8.855	29.785		20.93	
①			1.51	28.275	
			1.21	28.575	
			2.925	26.860	
			3.63	26.155	
			4.355	25.430	
			2.67	27.13	
⑤			3.24	26.545	
					20.213

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CONC NAIL HEAD TOP PIER Nº 2

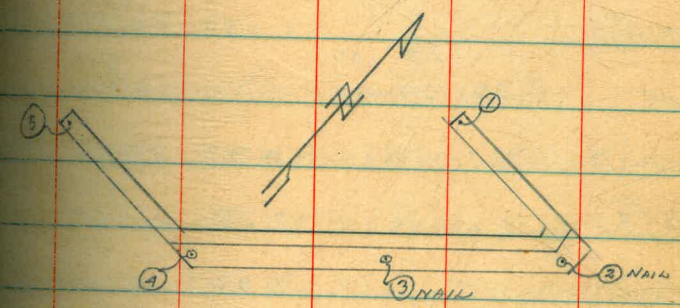
" " " " " Nº 3

" " " " " Nº 1

" " NORTH ABUTMENT

" ± ℄ NORTH ABUTMENT

" WEST END NORTH ABUT.



CHECK ON NORTH ABUTMENT FOR SETTLEMENT

STA	+	H.I.	-	ELEV		
		27.115		22.315		
B.M	4.800	~~27.105~~		~~22.305~~	CONC. NAIL EAST END TOP PIER Nº 4	
				21.860		
"			5.255	~~21.850~~	" " " " " " Nº 3	
				.195		
"			5.920	~~21.185~~	" " " " " " Nº 2	
		25.254		.195		
"	4.059	~~25.244~~		21.185	" " " " " " Nº 2	
				.110		
"			5.144	~~20.100~~	" " " " " " Nº 1	
				.917		
SHOT (2)			4.337	~~20.907~~	" " " " NORTH ABUTMENT	EAST
				.204		
SHOT (3)			5.050	~~20.794~~	" " " " " "	CENTER
		29.187		.917		
B.M	8.27	~~29.177~~		~~20.907~~	CONC NAIL EAST END NORTH ABUTMENT	
				.257		
SHOT Nº (1)			0.93	~~28.247~~	TOP CONC EAST WING WALL N/ABUT	(1)
				.537		
" " (5)			2.65	~~26.527~~	" " WEST WING WALL N/ABUT	(5)
				.257		
SET B.M			0.93	~~28.247~~	SET CONC NAIL EAST WING WALL N/ABUT	(NEAR (1))
				.552		
SET B.M			2.635	~~26.542~~	" " " WEST " " "	(NEAR (5))
				.487		
SHOT (4)			9.700	~~19.477~~	CONC. NAIL WEST END NORTH ABUT	
				.197		.199
CHECK BM			8.990	~~20.187~~	CONC " ± CENTER N/ABUT	~~20.184~~

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CHECK ON NORTH ABUTMENT & PIERS FOR SETTLEMENT

STA	+	H.I.	−	ELEV		
B.M	5.292	27.747		22.455 (7-24-50)	(7-21-50)	CONC NAIL E/END TOP PIER Nº 6
"			5.258	22.489	22.485	" " " " " Nº 5
"			5.430	22.317	22.315	" " " " " Nº 4
B.M.	4.842	27.159		22.317	22.315	" " " " " "
"			5.300	21.859	21.85[illegible]	" " " " " Nº 3
"			5.965	21.194	21.195	" " " " " Nº 2
B.M.	4.060	25.254		21.194	21.195	" " " " "
"			5.145	20.109	20.110	" " " " " Nº 1
NAIL Nº (2)			4.340	20.914	20.917	" " TOP NORTH ABUTMENT (NAIL (2))
" " (3)			5.053	20.201	20.204	" " ± CENTER NORTH ABUTMENT (NAIL (3))
B.M.	8.566	29.480		20.914		" " TOP NORTH ABUTMENT NAIL (2)
CONC.			9.296	20.184		(SHOT IS ON CONC. APPROX. (.01) LOWER THAN NAIL) " ± CENTER NORTH ABUT. NAIL (3)
SHOT Nº (4)			9.995	19.485	19.487	" WEST END NORTH ABUT. NAIL (4)
CONC NAIL SHOT Nº (1)			1.225	28.255	28.257	" EAST WING WALL N/ABUT. NAIL (1)
CONC. NAIL SHOT Nº (5)			2.932	26.548	26.552	" WEST " " " " (5)
SET BM			8.351	21.129		TIE BOLT ON FACE OF E/WING WALL

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CHECK LEVELS ON BRIDGE SEATS N. ABUT.

STA	+	H.I.	-	ELEV	GRADE
B.M	9.041	29.955		20.914	
CONC 1			8.830	21.125	GRADE 21.08
" 2			9.045	20.910	20.88
" 3			9.253	20.702	20.69
" 4			9.465	19.490	20.46
" 5			9.697	20.258	20.29
" 6			9.938	20.017	20.01
" 7			10.152	19.803	19.78
CHECK B.M			7.830	22.125	22.129
CHECK B.M			9.044	20.911	20.914

CONC. NAIL EAST END NORTH ABUT. NAIL No 2

TOP BRIDGE SEAT No 1 (AT FINISH GRADE)

" " " No 2 " "

" " " No 3 " "

" " " No 4 " "

" " " No 5 " "

" " " No 6 " "

" " " No 7 " "

TIE BOLT ON FACE OF EAST WING WALL

CONC NAIL EAST END N/ ABUT NAIL No 2

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CHECK LEVELS FROM M.H. NORTH APPROCH TO SOUTH APPROCH

STA	+	H.I.	−	ELEV	
B.M	4.557	27.012		22.455	CONC NAIL TOP E/END PIER Nº 6
"			4.762	22.250	" " " " " Nº 7
T.P.(B.M)			5.230	21.782	" " " " " Nº 8
"	4.298	26.080		21.782	" " " " " Nº 8
"			5.078	21.002	" " " " " Nº 9
"	4.303	25.305		21.002	" " " " " Nº 9
T.P	4.192	18.462	11.035	14.270	T.P. ON 3/4" BAR TOP OF 2ND CLM. FROM EAST SOUTH ABUT
"			2.368	16.094	T.P. ON SOUTH APPROACH
"	0.527	16.621		16.094	" " "
T.B.M			6.143	10.478	CONC NAIL ± CENTER OF 12" WATER LINE VALVE VAULT.
"	4.560	15.038		10.478	" " " " " " "
T.P			3.922	11.116	T.P. (TEMP)
"	4.945	16.061		11.116	
T.B.M			4.893	11.168	CHISEL "X" @ P.E NASHVILLE & MIDWAY
T.P	4.570	16.710	3.921	12.140	T.P. (TEMP)
			4.933	11.777	BRASS PLUG @ W/END TRIPLE CULV. HEADWALL.

CHECK LEVEL TO NORTH ABUTMENT

STA	+	H.I.	−	ELEV
B.M.	3.628	14.768		11.140
T.B.M			4.016	10.752
"	4.538	15.29		10.752
T.P			0.520	14.770
"	7.168	21.938		14.770
T.P.			0.845	21.093
"	2.395	23.488		21.093
T.B.M			2.576	20.912

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CHISELED "□" TOP W/CURB 15' N/OF NORTH END OF PROJ,

CONC NAIL S/W COR 12" WATER LINE VAULT N/APPROACH

10.752
4.538
15.290
0.520
14.770
7.168
21.938
0.845
21.093
2.395
23.488
2.576
20.912

NAIL NO 2

CONC. NAIL EAST END NORTH ABUT.

(SEE PAGE 63 THIS BOOK)

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H. BROWN
W. CARVER

30.631
8.700
21.931

21.194
9.437
30.631
10.520
20.111

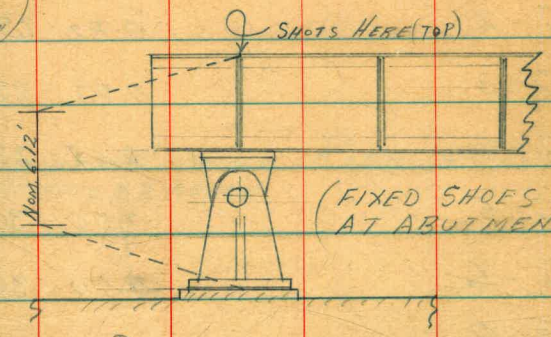
CHECK ON GIRDER ELEVATIONS AT BEARINGS.

STA	+	H.I.	−	ELEV.	
B.M	9.437	30.631		21.194	
"			10.52	20.111	20.110
CHECK T.P.			8.700	21.931	21.938
G-1			4.675	25.956	
G-2			4.46	26.191	
G-3			4.22	26.411	
G-4			3.99	26.641	
G-5			3.78	26.85	
G-6			3.57	27.06	
G-7			3.35	27.28	
G-1			2.44	28.19	28.20
G-2			2.22	28.41	28.38
G-3			2.06	28.57	28.54
G-4			1.90	28.73	28.69
G-5			1.75	28.88	28.84
G-6			1.62	29.01	28.97
G-7			1.53	29.10	29.09

CONC NAIL TOP E/END PIER Nº 2

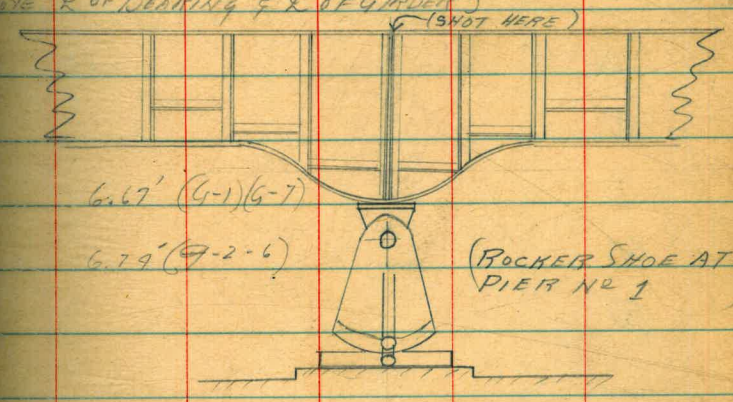
" " " " Nº 1

(T.P SET 9-27-50 & APPROACH 2"x2")



(FIXED SHOES AT ABUTMENT)

SHOTS ON TOP OF GIRDER DIRECTLY ABOVE ℄ OF BEARING & ℄ OF GIRDER } NORTH ABUTMENT



(ROCKER SHOE AT PIER Nº 1)

SHOTS ON TOP OF GIRDER DIRECTLY ABOVE ℄ OF BEARING & ℄ OF GIRDER } PIER Nº 1

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CHECK ON GIRDER ELEVATIONS AT BEARINGS

STA	+	H.I.	−	ELEV
		30.631		
G-1			0.95	29.48
G-2			0.82	29.81
G-3			0.73	29.90
G-4			0.65	29.98
G-5			0.56	30.07
G-6			0.50	30.13
G-7			0.50	30.13

SHOTS ON TOP OF GIRDER DIRECTLY ABOVE ℄ OF BEARING ℄ GIRDER

PIER Nº 2

① LONG NAIL

②

③

④

⑤

SET GRADES FOR POUR STRIP
ON PIER Nº 10

STA	+	H.I.	−	ELEV	GRADE (DETAIL +0.02)
B.M. (CHECK)	4.517	26.299		21.782	
"			5.300	20.999	21.002
POUR STRIP			5.96		20.34
"			6.15		20.15
"			6.28		20.02
"			6.43		19.87
"			6.58		19.72
"			6.74		19.56
			6.85		19.45

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CONC NAIL TOP PIER EAST END PIER Nº 8
" " " " " " PIER Nº 9
POUR STRIP (DETAIL) GRADE @ G-1
" " " " @ G-2
" " " " @ G-3
" " " " @ G-4
" " " " @ G-5
" " " " @ G-6
@ G-7

NOTE: POUR STRIP SET 0.02' HIGHER THAN DETAIL GRADE

6.75 [illegible]
71.25
13.90

26.30
20.34
5.96

26.30
20.15
6.15

26.30
20.02
6.28

26.30
19.87
6.43

26.30
19.72
6.58

26.30
19.56
6.74

26.30
19.45
6.85

SET GRADE NAILS FOR FINISH GRADE ON BRIDGE SEATS PIER No 10

STA	+	H.I.	−	ELEV GRADE
B.M.	4.055	25.057		21.002
G-7			5.607	19.45
G-6			5.497	19.56
G-5			5.337	19.72
G-4			5.187	19.87
G-3			5.037	20.02
G-2			4.907	20.15
G-1			4.717	20.34

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(71)

CONC NAIL TOP E/END PIER No 9

NAIL IN LEAD BY CONC. BRIDGE SEATS

POUR STRIP GRADE (DETAIL) ON SOUTH ABUTMENT. (BEAM)

STA	+	H.I.	-	ELEV	GRADE	
B.M				21.002		CONC NAIL HEAD TOP PIER No 9
CHECK			4.46	20.342	20.340	GRADE NAIL ON G-1 PIER 10
G-1			3.72	21.08	21.06	POUR STRIP SET 0.02' HIGH FOR SETTLEMENT
G-2			3.92	20.88	20.86	
G-3			4.13	20.67	20.65	
G-4			4.34	20.46	20.44	
G-5			4.56	20.24	20.22	
G-6			4.79	20.01	19.99	
G-7			5.02	19.78	19.76	
T.P			2.33	17.47		ON 1" Ø BAR 2ND CLM. FROM WEST
T.P	5.76	26.10		20.34		" " " "
CHECK			8.63	17.47		ON 1" Ø BAR 2ND CLM. FROM WEST
POUR STRIP			+2.27	28.37		~~NORTH~~ SOUTH END WEST WING WALL } SET POUR STRIP
			+2.64	28.74		~~SOUTH~~ NORTH " " " " } SET POUR STRIP

GRADES ON BACK WALL SOUTH ABUTMENT

STA	+	H.I.	-	ELEV	
B.M.	4.543	24.883		20.34	
CHECK			4.737	20.146	20.15
CHECK			5.433	19.45	19.45
SET GR.			+2.107		26.99
"			+0.757		25.64
"			+1.427		26.31

GRADE NAIL G-(1)
" " G-(2)
" " G-(3) } PIER No 10

20.390
4.543
24.883
4.737
20.146

24.883
5.433
19.450

EXTREME WEST END @ TOP
" EAST END " "
CENTER @ TOP

26.990
24.883
+2.107

25.640
24.883
0.757

26.310
24.883
1.427

2.11
7
2.00

26.99
25.64
1.35
96
290
351
01.9
5
07.0

SET GRADE NAILS FOR BRIDGE SEATS ON SOUTH ABUTMENT

STA	+	H.I.	-	ELEV	GRADE	
T.B.M	1.493	21.213			19.72	GRADE NAIL @ G-5
"			1.652	20.561	19.56	" " @ G-6
B.M.			1.752	19.461	.752	CONC NAIL @ EAST END (TOP) PIER Nº 10
B.M.			0.34	20.873		LEAD PLUG @ WEST END SOUTH ABUTMENT.
G-1			0.133		21.08	NAIL IN LEAD PLUG NEAR SEAT FOR G-1 $\frac{21.213 - 21.080 = 0.133}{}$
G-2			0.333		20.88	" " " " G-2 $\frac{21.213 - 20.880 = 0.333}{}$
G-3			0.543		20.67	" " " " G-3 $\frac{21.213 - 20.670 = 0.543}{}$
G-4			0.753		20.46	" " " " G-4 $\frac{21.213 - 20.460 = 0.753}{}$
G-5			0.973		20.24	" " " " G-5 $\frac{21.213 - 20.240 = 0.973}{}$
G-6			1.203		20.01	" " " " G-6 $\frac{21.213 - 20.010 = 1.203}{}$
G-7			1.433		19.78	" " " " G-7 $\frac{21.213 - 19.780 = 1.433}{}$
T.B.M.			0.86			GRADE NAIL @ G-7 PIER 10

SET GRADE FOR POUR STRIP TOP

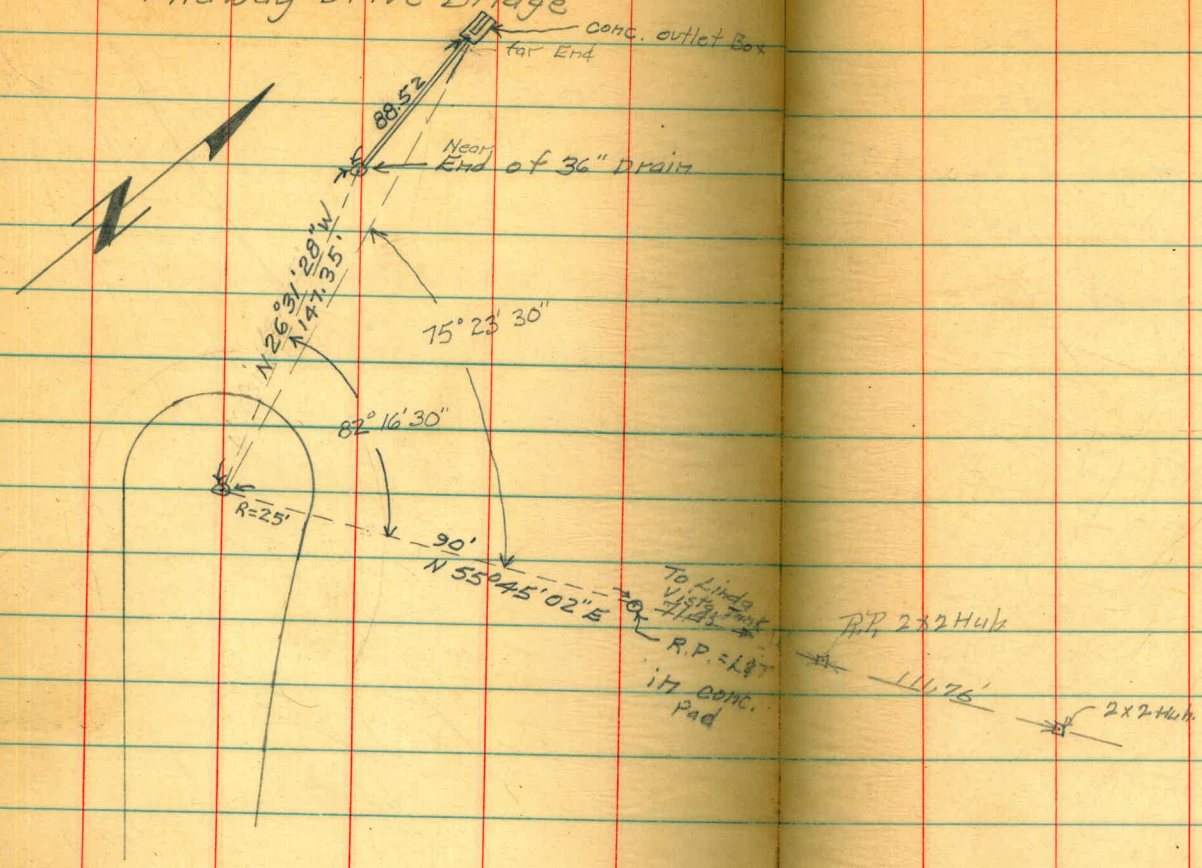
EAST WING WALL

STA	+	H.I.	−	ELEV	
BM.	5.600	26.473		20.873	20.873 5.600 26.473
GRADE			+0.92	27.39	EXTREME NORTH END @ TOP
"			+0.39	26.86	" SOUTH END @ TOP

26.86
26.47
00.39

27.39
26.47
0.92

Location of 36" Storm Drain 22 Nov 50
East of South APPROACH
Midway Drive Bridge



STA	+	H.I.	−	ELEV.	
		11.03 / 10.03			
T.B.M	−10.03	18.70		28.73	T.B.M. TOP EAST WING WALL S/E COR
T.P.	3.58	18.00	4.28	14.42	T.T.P
T.P	2.24	15.24	5.00	13.00	T.T.P
T.B.M			4.44	10.80	

		11.03 / 1.00 / −10.03	28.73		
			10.03		
			18.70		
			4.28		
			14.42		
			3.58		
			18.00		
			5.00		
			13.00		
			2.24		
			15.24		
			4.44		
			10.80	10.76	
			4.44	4.44 +	
			15.24	15.20	
			2.24	2.24 −	
	WATER VALT		.00	12.96	
				4.28	
				17.24	
				3.58	
				13.66	
				10.03	
				23.69	

+	HI	−	Elev
4.70	15.15		10.45
		4.15	11.00

218.00 130
21.79 88
239.79 218.00
21.79
239.79

13.5

29+85.85
65

30.631
3.50 21
7281

1.865
4.98
26.395
5.195
21.200

463.34'
+ Midway
463.34
41.98
505.32
Latn, To Hub

19
2
21

13
13
26

32.50
65.81
5.19

86

85.85
80.19
16

6
7
19
7
6

26
13
35

32
13
19

.1515
11.00
.415

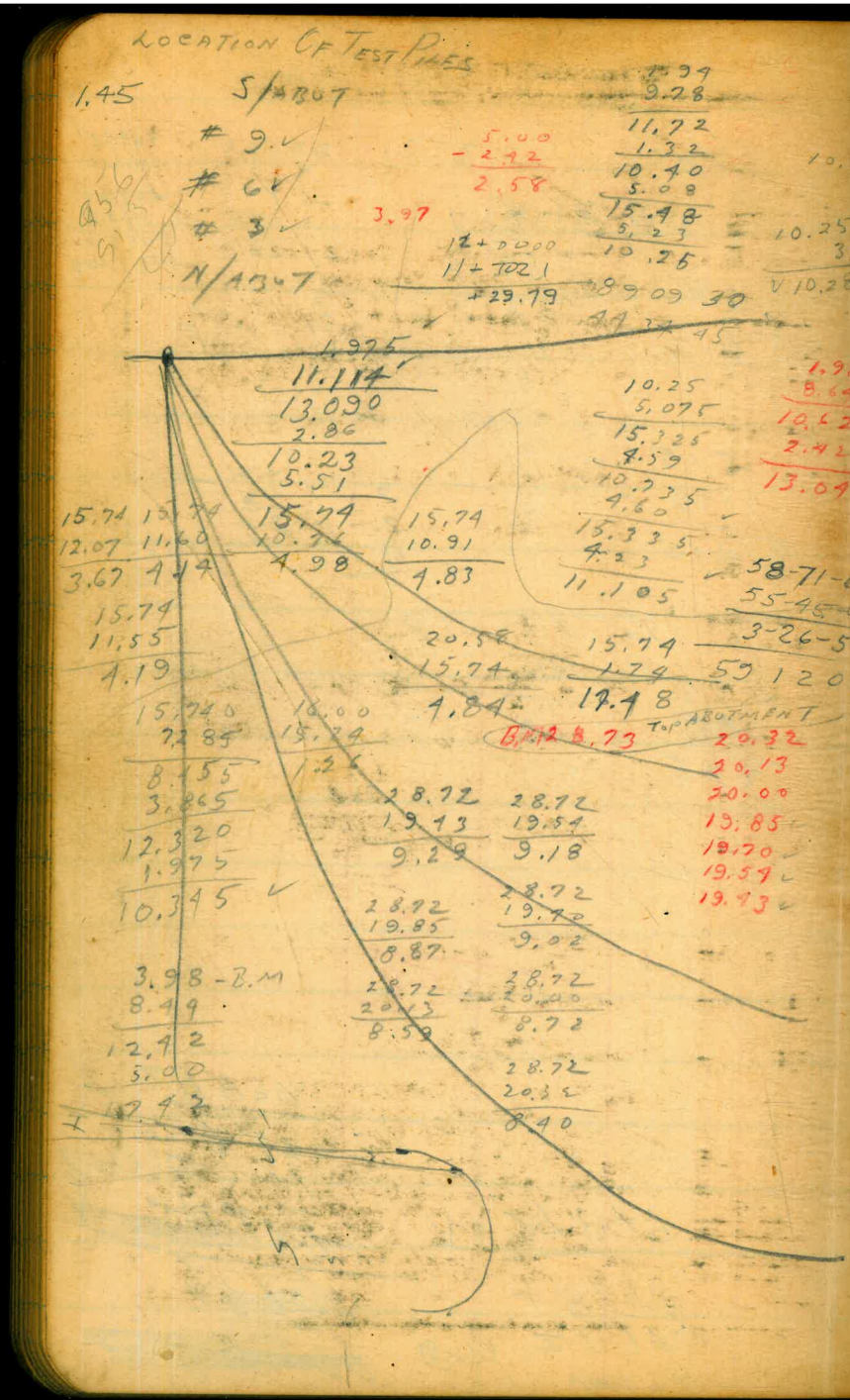
16 87 79
11 45
5 42 79

415
7.80
365

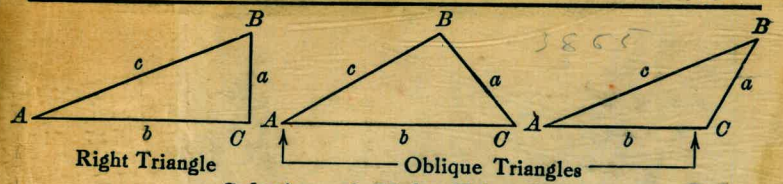
38+63.45
37+50
1 13.45

114.13
113.45
68

by the
19.4 ft.
° 10′=
slope
th the
follow-
=.0041.
be dist-
=14 ft.,
28 ft.
U. S. A.



TRIGONOMETRIC FORMULÆ



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	$\text{area} = \frac{b\,c \sin A}{2}$
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′. 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.