314 A
FILE NO. 5-53
W314A

TRAVERSE TABLE FOR TRANSIT BOOK.

From 1° to 90° for a distance of 100.

Degrees.	DEGREES.		¼ DEGREE.		½ DEGREE.		¾ DEGREE.		Degrees.
	Lat	Dep.	Lat	Dep.	Lat.	Dep.	Lat.	Dep.	
0			100.00	[illegible].44	100.00	0.87	99.99	1.31	89
1	99.98	1 75	99 98	[illegible].98	99 97	2.62	99.95	3.05	88
2	99.94	3.[illegible]	99 92	[illegible].93	99 91	4 36	99.88	4.80	87
3	99.86	[illegible]	99 8[illegible]	5 67	99.81	6.10	99.79	6.54	86
4	99 76	[illegible].98	99.7[illegible]	7.41	99.69	7.85	99.66	8.28	85
5	99 62	[illegible].72	99.5[illegible]	9.15	99 54	9.58	99.50	10 02	84
6	99.45	10.45	[illegible].41	10 89	99.36	11.32	99.31	11.75	83
7	99.[illegible]	12.19	99.20	12.62	99.14	13.05	99.09	13.49	82
8	99.[illegible]	13.92	98.97	14.35	98.90	14.78	98.84	15.21	81
9	98.77	15.64	98.70	16.07	98.63	16 50	98.56	16.93	80
10	98 48	17.36	98.40	17.79	98.33	18.22	98.25	18.65	79
11	98 16	19.08	98 08	19 51	97.99	19.94	97.90	20.36	78
12	97.81	20.79	97.72	21.22	97.63	21 64	97.53	22.07	77
13	97.44	22.50	97.34	22.92	97.24	23.34	97.13	23.77	76
14	97.03	24.19	96.92	24 62	96.81	25 04	96.70	25.46	75
15	96.59	25 88	96.48	26.30	96.36	26.72	96.25	27.14	74
16	96.16	27.56	96.00	27 98	95.88	28 40	95.76	28.82	73
17	95.63	29.24	95.50	29.65	95.37	30 07	95.24	30.49	72
18	95.11	30.90	94.97	31.32	94.83	31.73	94.69	32.14	71
19	94.55	32.56	94.41	32.97	94.26	33.38	94.12	33.79	70
20	93.97	34.20	93.82	34.61	93.67	35.02	93.51	35 43	69
21	93.36	35.84	93.20	36.24	93.04	36.65	92.88	37.06	68
22	92.72	37.46	92.55	37.86	92.39	38.27	92.22	38 67	67
23	92.05	39.07	91.88	39 47	91.71	39.87	91.53	40.27	66
24	91.35	40.67	91.18	41.07	91.00	41.47	90.81	41.87	65
25	90.63	42.26	90.45	42.66	90.26	43.05	90.07	43.44	64
26	89.88	43.84	89 69	44.23	89.49	44.62	89.30	45.01	63
27	89.10	45.40	88.90	45.79	88.70	46.17	88.50	46.56	62
28	88.29	46.95	88.09	47.33	87.88	47.72	87.67	48.10	61
29	87.46	48.48	87.25	48 86	87.04	49.24	86.82	49.62	60
30	86.60	50.00	86.38	50.38	86.16	50.75	85.94	51.13	59
31	85.72	51.50	85.49	51.88	85.26	52.25	85.04	52.62	58
32	84.80	52 99	84.57	53.36	84.34	53.73	84.10	54.10	57
33	83.87	54.46	83.63	54.83	83.39	55.19	83.15	55.56	56
34	82.90	55.92	82.66	56.28	82.41	56.64	82.16	57.00	55
35	81.92	57.36	81.66	57.71	81.41	58.07	81.16	58.42	54
36	80.90	58.78	80.64	59.13	80.39	59.48	80.13	59.83	53
37	79.86	60.18	79.60	60 53	79.34	60.88	79.07	61 22	52
38	78.80	61.57	78.53	61.91	78.26	62.25	77.99	62.59	51
39	77.71	62.93	77.44	63.27	77.16	63.61	76.88	63.94	50
40	76.60	64.28	76.32	64.61	76.04	64.94	75.76	65.28	49
41	75.47	65.61	75.18	65.93	74.90	66.26	74.61	66.59	48
42	74.31	66.91	74.02	67.24	73.73	67.56	73.43	67.88	47
43	73.14	68.20	72.84	68.52	72.54	68.84	72.24	69.15	46
44	71.93	69.47	71.63	69.78	71.33	70.09	71.02	70.40	45
45	70.71	70.71							
Degrees.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Dep.	Lat.	Degrees.
	DEGREES.		¾ DEGREE.		½ DEGREE.		¼ DEGREE.		

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ENGINEERING OFFICES OF
J. B. LIPPINCOTT
1104-1106 CENTRAL BLDG.
LOS ANGELES, - CALIF.

KQ Dolin

Pusnal

No 1 - 54°3
No 2 - 59°2

July 10-23
Rainfall record to date.
Max Temp.

Pt.	Std.	V∠	V	Rod +	BS	HI	− Rod	7.5	Elev	Course	Dist	Slope Angle L	Slope Angle R	Remarks
0+00									100.00					
	200	−1°−0″	+34.5	+5.5	8.5	108.5				N10°W		+15	−15	Sidehill clint.
1							−5.0		103.5					
	300	+3°−0″	+15.6				−2.0	+13.6	122.05	N15°W				
2														
3														
4														
5														
6														

Nomenclature –

< Left of Line

> Right of Line

D Dirt –

R or S.R. Solid Rock.

RO Rock Out Crop –

L.R. Loose Rock

B Brush –

L.B. Light Brush –

H.B. Heavy "

T Timber

L.T. Light Timber

H.T. Heavy "

S.O. Scrub oak

LSO Light Scrub Oak –

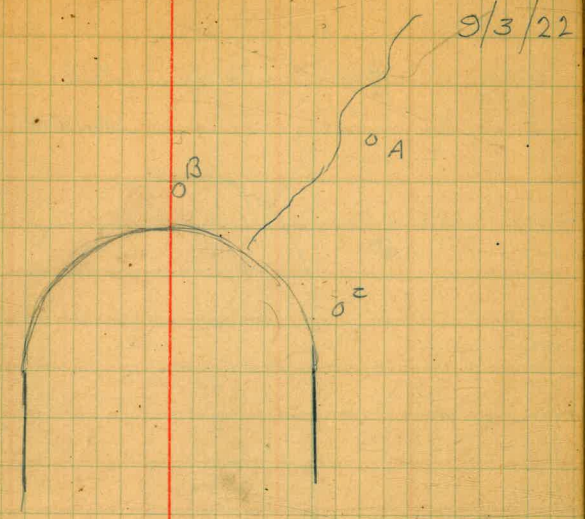
PoT. Point on Trail.

Buttress # 18 South side

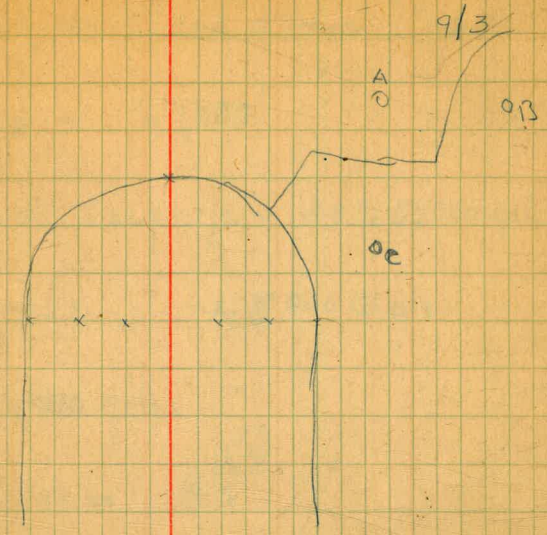
Date	Hour.	Temp	A.B.	BC	CA
9/3/22	2[15]	82'	14.1142	14.0804	14.3657

Weather

Clear



Date	Hour	Temp	A.B	AC.
			14.6080	151048



Losses on Wood stave Pipe.

18" Line – 27,000'

Loss due to Seepage = 40 to 50,000 gals/day

Avx Loss = 45,000' Gals.

1" = 13,000 gals.

45 000 gals = 3½"

San Dieguito Mutual W. Co.

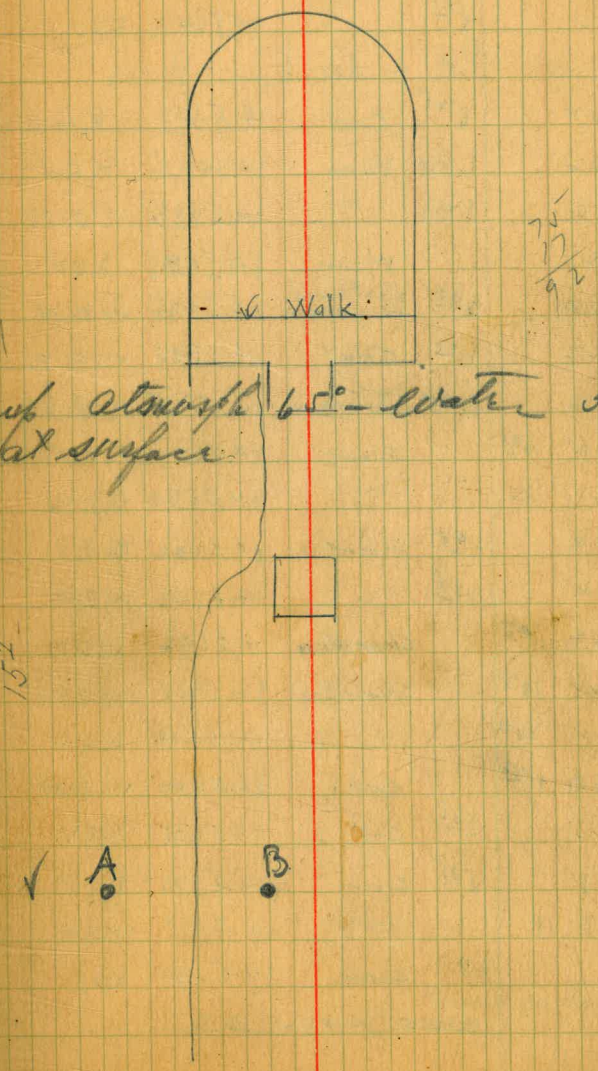
Del Marx.

Date	Hour AM	Hour P.M.	Temp	AB	Remarks
9/5/22 KQV WM7.	10 00	0	Not Taken	15.2237"	(B Loose)
9/9/22	11 15		Not Taken	15.2222	(B Loose) K.Q.V.
		Set New Plugs 9/9/22			
9/10/22		1 30	Cool	14.6925	KQV
10/1/22		3 00	Warm.	14.6960	KQV
10/24-22		2 45	Very warm	14.6995	W.D.M.
11/7-22		12 30	Cool.	14.7127	W.D.M.
11/10/22		4 00	Showers	14.7140	K.Q.V. & J.B.L.
11/25-22	10 30		Clear	14.7180	KQV
11/25/22	1 30		"	14.7179	W.D.M
12/7-22		1 45	Cloudy.	14.7205	KQV
12/7/22		1 45	"	14.7195	W.D.M
12/22-22	11 00		Clear Warm.	14.7192	W.D.M.
12/30-22	9 40		" Cool	14.7210	K.Q.V.
12/30-22	9 40		" cool.	14.7224	W.D.M.
1/1-23	11 50		Cool.	14.7210	W.D.M.
1/26/23		3 40	Cool	14.7227	K.Q.V.
5/24/23		5 40	Clear.	14.7130	KQV
6/23/23	10		Clear.	14.7155	W.D.M.
6/30/23		4 35	Clear	14.7100	K.Q.V.

See page 34

Buttress No 15 9/5/22

South Side below Walk.

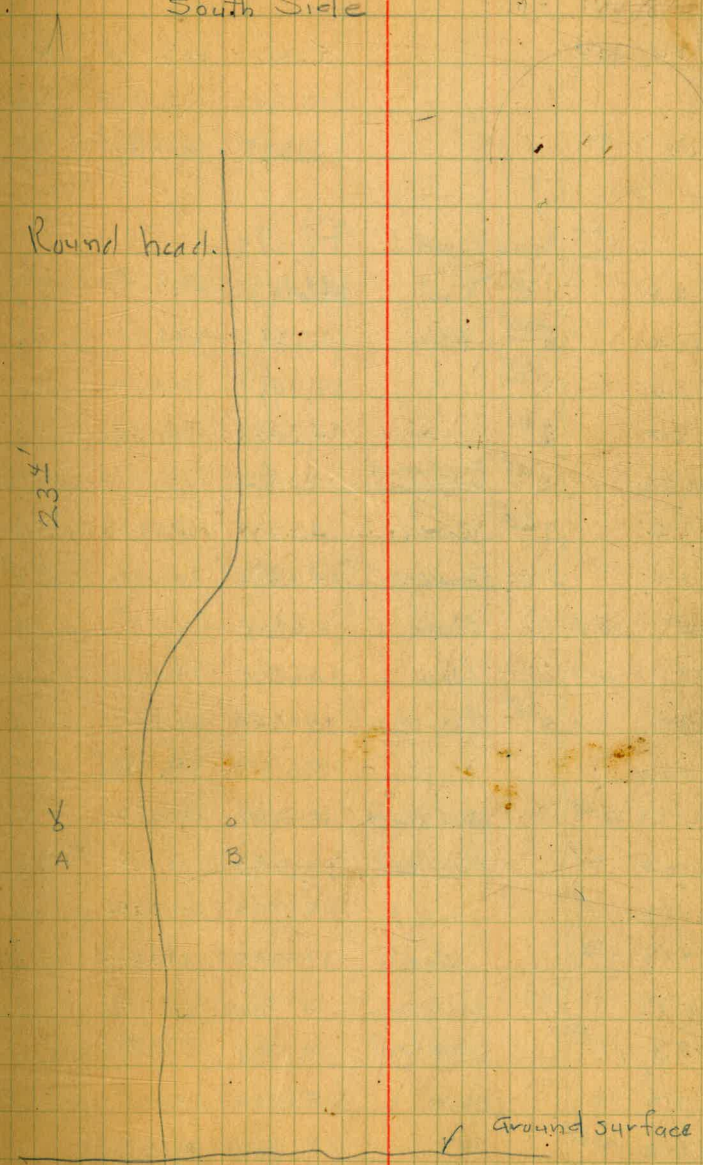


Date	Time AM	Time PM	Temp	A – B	Remarks
				14 8634	W.M.S.T.
9/5/22	10.10		–	14.8640	KQV
9/9/22	9.54			14.8640	KQV
9/10/22		5.25		14.8640.	KQV.
		Put in Set Round Heads			
9/10/22		5.25	Cool	14.5443	KQV
9/18/22		6 P.M.	Warm	14.5495	K.Q.V.
9/18-22		6 P.M.	"	14.5482	W.D.M.
10/11/22			Warm	14.5485	KQV.
10/24/22		2.30	East wind very warm.	14.5475	W.D.M
11/7-22		1.00	Cool	14.5535	W.D.M.
11/10/22		3.45	Showers	14.5535	K.Q.V. x J.B.L
11/25.22	10.45		Clear	14.560	K.Q.V.
11/25/22	"		"	14.5590	WDM
12/7-22		1.45	cloudy	14.5602	K.Q.V.
12/7-22		1.45	"	14.5606	W.D.M.
12/22.22	11.45		Clear Warm.	14.5592	W.D.M.
12-30-22	10.30		Clear Cool	14.5615	WDM
12-30-22	10.30		" "	14.5618	KQV
1-1-23	11.50		Cool	14.5600	W.D.M
1/26/23		3.35	Cool	14.5605	KQV.
5/24/23		5.35	Clear	14.5570	KQV.
6/23-23	10		Clear	14.5575	W.D.M.
6/30/23		4.30	Clear	14.5570	KQV.

See page 33

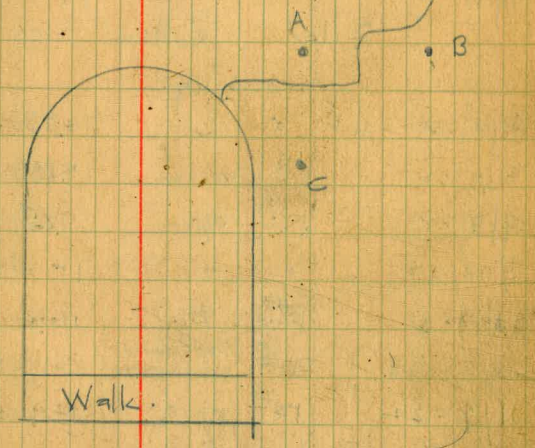
Buttress No 16 9/5/22

South Side



Date	Hour A.M.	Hour P.M.	Temp	A.B	A.C.	Remarks
9/5/22	10 20			15.1045	14.6093	W.M.C.
"				15.1046	14.6078	KQV.
9/9/22	9 00			15.1047	14.6090	KQV.
	Changed		Points			
9/10/22		1 20	Cool	14.6463	14.3212	KQV
9/18/22		5 40	Warm	14.6482	14.3240	KQV.
9/18/22		5 40	"	14.6487	14.3246	WDMc
10/1/22		2 40	"	14.6490	14.3240	KQV
10/24-22		2 05	East wind very warm	14.6520	14.3230	W.D.M.
11/7-22		1 00	Cool.	14.6687	14.3326	W.D.M.
"/10/22		3:30	Showers	14.6675	14.3325	K.Q.V.
11/25/22	10 25	11 15	Clear	14.6708	14.3360	WDM
11/25/22	10 15	1 00	Clear	14.6700	14.3360	KQV
12/7-22		2 15	Cloudy.	14.6750	14.3375	K.Q.V.
12/7-22		"	"	14.6750	14.3375	W.D.M.
12/22-22	10 55	"	Clear Warm	14.6707	14.3302	WDM
12/30-22	9 00		Clear Cool	14.6793	14.3365	WDM
12/30-22	"		" "	14.6790	14.3355	KQV
1-1-17	11 30		Cool.	14.6740	14.3323	W.D.M.
1-26-23		3 10	Clear Warm	14.6800	14.3340	KQV
2-3-23	10 30		Clear Cool	14.6897	14.3386	W.D.M.
3-10-23	10		Cloudy "	14.6803	14.3350	WDM
3/20/23	10 00		" "	14.6740	14.3335	
4/24/23		5 25	Clear	14.6695	14.3300	KQV
6/23-23	9 30		Clear.	14.6715	14.3325	WDM

South Side Buttress #15

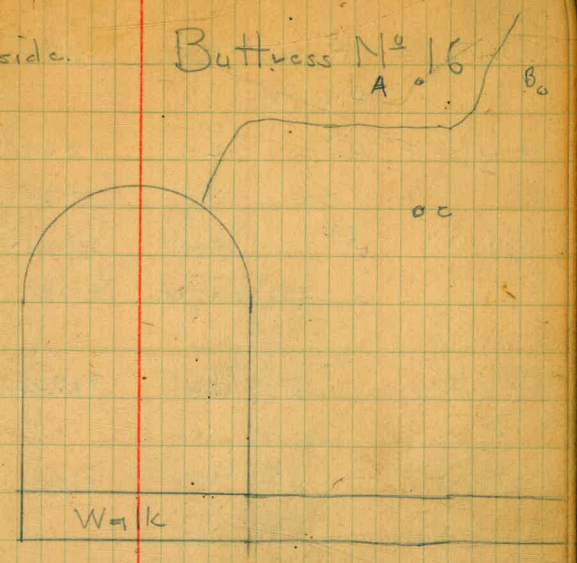


Temp 58° KQV.

See page 29.

	Date	Hour AM	Hour PM	Temp.	AB	AC	Obs.
9	9/5/22	10 30		Cool	14.8097	14.3303	W.D.M.
	"				14.8097	14.3300	KQV
9	9/9/22	8 45		Cool	14.8095	14.3303	KQV
		Filed		Rods -	Flat	to Facilitate	
		measuring.					
9	9/9/22	11 15		Cool	14.8597	14.413	KQV
9	9/12/22		5 15	Warm	14.8582	14.4140	KQV
9	9/18/22		5 45	Warm	14.8590	14.4160	M.C.T.
10	9/18/22		"	"	14.8588	14.4160	KQV
10	10/1/22		2 40	"	14.8665	14.4205	KQV
11	10/24-22		2 15	East wind very warm	14.9035	14.4245	W.D.M.
"	11/7-22		12 30	Cool	14.9030	14.4378	W.D.M.
11	11/10/22			Showers	14.9005	14.4370	K.Q.V. & J.B.L.
11	11/25-22	10 15		Clear	14.9030	14.4418	K.Q.V.
11	"	"		"	14.9030	14.4412	W.D.M.
12	12/7/22		1 45	Cloudy	14.9107	14.4435	W.D.M.
12	12-7-22		1 45	"	14.9104	14.4436	W.D.M.
12	12-22-22	11 00		Clear Warm.	14.9031	14.4385	W.D.M.
12	12-30-22	9 15		Clear Cool	14.9150	14.4456	W.D.M.
1	12-30-22	9 15		" "	14.9150	14.4455	KQV
1	1-1-23	11 35		Cool	14.9120	14.4440	W.D.M.
2	1/26/23		3 20	Clear Warm	14.9190	14.4485	KQV
3	2/3/23	10 45		Clear Cool	14.9300	14.4523	W.D.M.
3	3/10-23	10		Cloudy Cool	14.9202	14.4505	W.D.M.
3	3/20-23	10	5 30	" "	14.9090	14.4455	
4/2	5/24/23			Clear	14.9050	14.4450	KQV

Southside. Buttress No. 16



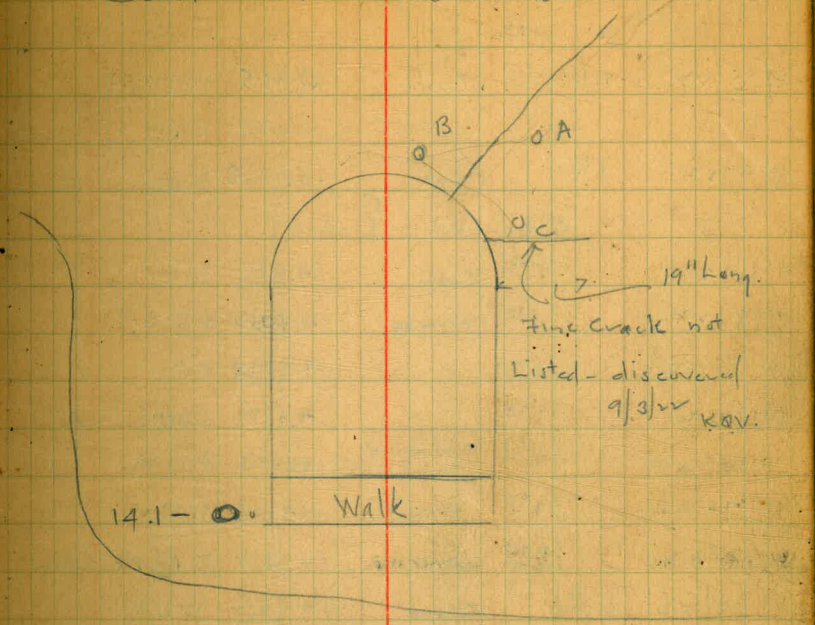
Temp 57°

See page 30

See p. 18

Date	Hour AM	Hour PM	Temp	A.B.	B.C.	Obs.
9/5/22	10 45		Cool	14.1015	14.0833	WDM
				14.1015	14.0830	KQV
9/8/22	8 30		Cool	14.1152	14.0835	KQV
		Changed Points				
9/10/22		5 05	Cool	To Close.	14.0920	KQV.
9/18/22		5 30	Warm day	To close	14.0907	Mc.F.
9/18/22		5 30	" "		14.0907	KQV.
10/1/22		2 30			14.100	KQV
10/24-22		2 20	East wind very warm		14.1087	WDM
11/7-22		12 30	Cool		14.1368	WDM
11/10/22		3 20	Showers		14.1355	KQV
11/25-22	10 30		Clear.		14.1422	K.Q.V.
"	"		"		14.1378	WDM
12-7-22		2 00	Cloudy		14.1467	WDM
12-7-22		2 00	"		14.1470	KQV.
12-22-22	11 15		Clear Warm.		14.1447	W.D.M
12-30-22	9 30		Clear Cool		14.1515	WDM
12-30-22	9 30		" "		14.1525	KQV
1/-1-23	11 40		Cool.		14.1480	W.D.M
1/26-23		3 30	Cool		14.1575	KQV.
2/3/23	10 50		Clear Cool		14.1703	WDM
3/10-23	10 10		Cloudy Cool		14.1587	W.D.M.
6/23-23	10		Clear.		14.1515	
6/23-23			Clear.		14.1525	WDM

South Side Buttress # 18.



J.B.L

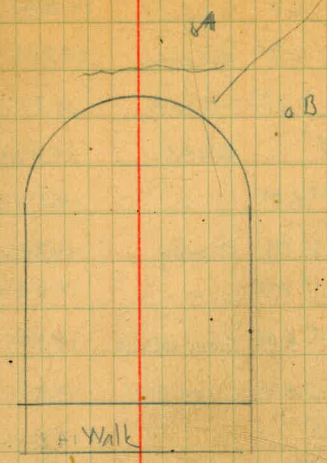
7/17/92

5/24/23	3 00 PM Clear.	14.1440	KQV
6/2/23	3 P.M. Clear.	14.1537	L.V.A.

See page 31

Date	Hour AM	Hour PM	Temp	A.B.	Remarks
9/5/22	11 10		Cool.	14.905	W.D.M.C.
				14.905	K.Q.V.
9/9/22	8 30		Cool	14.9060	K.Q.V. ✓
	Changed Rods-				
9/10/22		5 05	Cool	14.9030	K.Q.V ✓
9/18/22		5 20	Warm Dry	14.9010	W.D.M.C.
9/18/22		5.20	" "	14.9010	K.Q.V. ✓
10/1/22		2 20	" "	14.9120	K.Q.V. ✓
10/24-22		2 20	East wind " "	14.9213	W.D.M.
11/7-22		1 00	Cool	14.9468	W.D.M.
11/10/22		3 40	Showers	14.9450	K.Q.V & J.B.C.
11/25/22	10 30		Clear	14.9469	W.D.M
11/25/22	"		"	14.9470	K.Q.V.
12/7-22		2 00	Cloudy	14.9545	K.Q.V.
12/7-22		2 00	"	14.9545	W.D.M
12/22-22	11 25		Clear Warm	14.9502	W.D.M
12/30-22	9 40		" Cool	14.9605	K.Q.V.
12/30-22	9 40		Clear Cool	14.9600	W.D.M.
1/-1-23	11 45		Cool 1.64°	14.9570	W.D.M.
1/26/23		3 35	Cool	14.9635	K.Q.V.
2/3/23	10 50		Clear Cool	14.9710	W.D.M.
3/10-23	10 45		Cloudy Cool	14.9650	W.D.M.
				14.9538	
5/24/23	5 10		Clear	14.9520	K.Q.V.
6/23-23	10 AM		Clear.	14.9595	W.D.M.
6/30-23	5 P.M.		"	14.9456	K.Q.V.
9/25-23			Clear.		

South Side Buttress No 19



14.9 -.120.

See page 32

Buttress # 17 North Side

Date	Hour AM. PM	Temp	A.B.			
9/10	5:10	Cool	14.8096	KQV		
10/24-22	2:30	Hot day.	14.8155	W.D.M.		
11/7-22	12:30	Cool	14.8355	W.D.M.		
11/25-22	10:30	Clear.	14.8374	WDM		
11/25-22	10:30 AM	"	14.8373	KQV		
12/7-22	2:10 PM	Cloudy	14.8425	WDM		
12/7-22	2:10 PM	"	14.8430	KQV.		
12/22-22	11:10 A.M.	Clear Warm	14.8385	WDM		
12/30-22	9:25 AM	Clear Cool	14.8460	KQV		
12/30-22	9:25	" "	14.8462	WDM.		
1/-1-23	11:45	Cool	14.8430	W.D.M.		
1/26-23	3:25 PM	Clear Warm	14.8545	KQV.		
2/3/23	10:45	Clear Cool	14.8658	WDM.		
3/10-23	10:10 AM.	Cloudy Cool	14.8562	WDM.		
			14.8487			
5/24/23	5:30 AM	Clear	14.8430	KQV		
6/23-23	10 AM.	Clear.	14.8475	WDM		
6/30-23	5 PM	"	14.8390	KQV.		
7/9-23	10:40 AM.	66°	14.8413	W.D.M.		
7/15-23	11:20 AM	Clear 73°	14.8390	KQV.		
8/11/23	10:03 AM.	Clear 70°	14.8403	WDM		
8/26-23	3 P.M.	Warm.	14.8395	W.D.M.	Strain Gage.	
9/-8-23	Noon.	Warm.	14.8362	WDM	8.204	
9/-12-23	"	"	14.8378	WDM	8.200	
9/-25-23	10.10 AM.	Cool	14.8440	WDM.	8.164	
					8.130	

See page 36

11/10/22
KQV.

Temperatures Hodges Dam -

Extremes of Temp of Air by
Maxm + Min Thermometer 10/1/22
11-1/22

Outside extremes = 48° to 88° F.

Inside extremes = 50 — 84° F.

Temps by — Stevens -

12-30-22
K Q Volk
W D McFadden

Placed Two Maxm + Min Thermometers at Dam. Marked #1 + #2

Therm #1 placed under Walk between buttresses #14 + 15

Therm. #2 placed behind most southerly Outlet gate at base of Dam between Buttresses 16 + 17

Plotted
E.H.C. Jr.
6-30-23

Jan 1923	No 1 Temp. Min	No 1 Max	No 2 Min	No 2 Max
Noon.				
1/1-23	51°	69°	52°	64°
(11:00 A.M. 2/3/23	43°	55°)		
3	45	64	48	60
4	—	—	—	—
5	44½	64½	48½	60
6	47	64	49	59
7	49	67	51	61
8	49½	74	51	68
9	55	77	55	71½
10	52	72	53	67
11	49	73	52	65½
12	50	70	51	65
13	48	62	49	61
14	49	60	42	61
15	50	70	51	66
16	50	69	51	67
17	50	68	52	63½
18	52	69	53	66
19	55	66	55	62
20	54	61	55	60
21	49	61	51	59
22	54	64	54	59
23	—	—	—	—
24	55	62	52	58
25	50	54	51	56
26	50	56	50	56

#16 Cont'd From p. 11

Feb 1923	#1 Min	#1 Max	#2 Min	#2 Max
1	44	52		
2	43	51		
3	44	51		
4	44	52		
5	45	56		
6	46	58		
7	46	60		
8	44	51		
9	44	51		
10	44	52		
11	46	51		
12	46	53		
13	46	56		
14	46	57		
15	46	63		
16	50	70		
17	50	72		
18	55	74		
19	54	76		
20	54	68		
21	—	—		
22	54	62		
23	53	63		
24	52	64		
25	52	63		
26	50	62		
27	51	60		
28	52	60		

#2 Thermometer Stolen –

#1

March	Min	Max
1	52	65
2	50	63
3	51	58
4	49	55
5	49	55
6	48	60
7	50	62
8	54	63
9	53	60
10	51	60
11	48	59
12	49	65
13	51	66
14	54	64
15	53	66
16	53	67
17	54	66
18	54	67
19	54	71
20	54	63
21	53	68
22	54	68
23	52	70
24	50	72
25	50	69

#1

March	Min	Max
26	54	75
27	52	73
28	52	72
29	54	72
30	52	70
31	54	67

Continued from page 19

#1

April 1923	Min	Max			
1	54	58	143107	144475	WDM
2	54	60			
3	54	62			
4	54	61			
5	—	—			
6	56	60			
7	54	62			
8	54	63			
9	54	66			
10	57	64			
11	56	62			
12	55	64			
13	54	65			
14	56	65			
15	57	66			
16	58	66			
17	54	65			
18	51	65			
19	53	58			
20	54	65			
21	54	62			
22	52	60			
23	52	60			
24	52	62			
25	53	63			

#1

April 1923	Min	Max
26	54	63
27	56	64
28	57	63
29	57	63
30	57	66
31		

#1

May	Min	Max
1	57	67
2	56	70
3	55	75
4	58	78
5	57	75
6	57	76
7	58	78
8	61	81
9	65	83
10	62	81
11	61	69
12	60	69
13	60	66
14	61	66
15	60	68
16	61	67
17	60	68
18	57	66
19	57	67
20	57	66
21	58	68
22	58	70
23	57	71
24	57	72
25	57	72

#1

May	Min	Max
26	57	67
27	58	69
28	57	68
29		
30		
31		

#1

1923 June	Min	Max
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18	57	72
19	59	62
20	58	64
21	64	68
22	60	66
23	61	68
24	58	68
25	60	65

#1

	Min	Max
26	60	66
27	62	73
29	60	70
29	60	78
30	62	77

1923

July	Min	Max
1	63	76
2	62	72
3	61	76
4	61	75
5	63	70
6	62	69
7	62	68
8	62	67
9	62	68
10	61	71
11	61	71
12	62	74
13	62	75
14	63	75
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

	Min	Max
26		
27		
28		
29		
30		
31		

Record Temperature
Lake Hodges Dam

1925 Date	Temp Air	Temp W.S.	Temp Water 90' deep
3/31	—	64	56
4/7	72	62	56
4/14	67	64	56
4/21	70	64	56
4/28	74	66	56
5/8	84	74	57
5/16	78	73	57
5/24	70	70	57
5/29	72	67	57
6/21			58
6/26			57
7/2	No Record Taken.		57
7/10			58

Hodges Dam –
Record Temperatures
Concrete Buttress # #16

Date 1923	Foot Stairs #1	West Exit – #2
Mar. 18	54°	60°
19	55°	61
20	54	59
21	54	60
22	54	61
23	54	59
24	55	61
25	55	61
26	55	64
27	55	63
28	55	62
29	56	63
30	56	63
31	56	63

Kow.

Hodges Dam
Record Buttress Temp #16

Date	Under Stairs	West End
Apr - 1923		
1	56	62
2	56	60.5
3	56	60.5
4	56	59
5	—	—
6	56	60
7	56	60
8	56	59
9	55	61
10	56	60.5
11	56	60.5
12	55	61.5
13	55	61
14	55	61.5
15	55	62
16	56	62
17	56	61
18	56	61
19	56	59
20	56	60
21	55	59½
22	55	58
23	55	59

#16
Cont'd.

Apr.	Under Stairs	W. End.
24	55	59
25	56	60
26	56	60
27	56	61
28	56	60
29	56	61
30	56	61

Hodges Dam

Record Temp Concrete
Buttress # 16

Date	Under Stairs	West End
May 1	56	62
2	56	62
3	57	63½
4	57	64
5	57	64
6	57	65
7	57	66
8	58	67
9	60	68
10	61	69
11	61	68
12	61	67
13	60	66
14	60	65
15	60	66
16	60	67
17	60	66
18	60	67
19	60	66
20	59	66
21	59½	65
22	59	66
23	60	65
24	59½	64
25	59½	65
26	60	65
27	59	66
28	59½	65

June 30 – 23
61.2° 69.8° KQV –

July 15 – 1930 AM
62.5° 70° KQV –

Hodges Dam

Record of Buttress Temp. #16

June	Under stairs	West End
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18	59	65
19	58½	65½
20	59½	65
21	58½	67
22	58½	69
23	60	69½
24	60	69½
25	61	66½
26	59	67
27	58½	67½
28	60	68½
29	60½	69½
30	61	69½

Record Not Taken by Stevens.

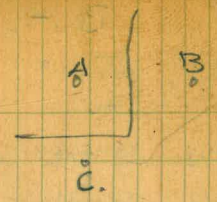
Record Taken by Du Bois.

Continued on Page 40.

Copy

Buttress #15

Cont. from Pg 10

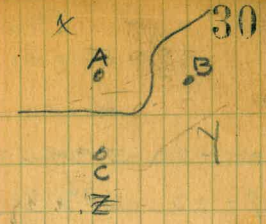


Date	Hour	Temp	AB	AC	OBS.	
6/23/23	9 30 AM	Clear	14.6715	14.3325	WDM	
6/30/23	4 15 PM	Clear	14.6648	14.3305	KQV	
7/9/23	10 A.M.	66° Cloudy	14.6745	14.3295	W.D.M	
7/15/23	11 AM	73° Clear	14.6665	14.3315	KQV	Max 73° Min 65°
8/11/23	10 AM	Clear 70	14.6560	14.3245	WDM	
8/26-23	3 PM	Warm.	14.6562	14.3260	W.D.M.	A.C. Strain Gage.
9/7-23	Noon	Hot	14.6610	14.3295	W.D.M	8.177
9/12-23	Noon	Cool	14.6636	14.3315	W.D.M.	8.174
9/25-23	10 A.M.	"	14.6673	14.3345	W.D.M.	8.165
10/9-23	10 A.M.	cloudy cool.	14.6716	14.3350	W.D.M	8.155
10/19-23	1 P.M.	warm.	14.6670	14.3325	W.D.M.	8.164
11-12-23	9 A.M.	Cool	14.6750	14.3385	W.D.M.	8.140
1/-23-24	9 AM	Cool	14.6940	14.3470	W.D.M.	8.095
2/-8-24	10 25 A.M.	Cool.	14.6883	14.3440	W.D.M.	8.104
3/29-24	9 15 AM	Cool.	14.6923	14.3470	W.D.M.	8.083
4/-24-24	2 P.M.	Cool.	14.6850	14.3450	A.R.M. W.D.M.	8.093
5/14 24	9 A.M.	Warm.	14.6831	14.3438	A.R.M.	8.094
6/3-24	10 20 A.M.	Warm	14.6878	14.3490	A.R.M	8.107
6/15-24	2 20 P.M.	Warm	14.6712	14.3401	A.R.M.	8.114
7/2-24	2 50 P.M.	"	14.6750	14.3705	A.R.M.	8.108
8/1-24	3 10 PM	"	14.6752	14.3710	A.R.M.	8.112
8/17-24	12 30 P.M.	"	14.6800	14.3401	A.R.M.	8.098
9/2-24	2 30 P.M.	"	14.6782	14.3398	A.R.M.	8.088
9/14-24	3 10 P.M.	"	14.6717	14.3407	A.R.M.	8.099

CONTINUED ON Page 42

Buttress # 16
Cont Pg # 11

Strain Gage



Date	Hr.	Temp	A-B	AC	Obs	AB.	AC.	
6/23-23	10 AM	Clear	14.9107	14.4475	WDM			
6/30-23	4 35	Clear	14.8985	14.4415	K.Q.V.			
7/9-23	10 30 A.M.	66° cloudy.	14.9022	14.4450	W.D.M.			
7/15-23	11 15 AM	73° Clear Cool	14.9000	14.4425	K.Q.V.			
8/11/23	10 AM	Clear 70°	14.9005	14.4425	WDM.			
8/26-23	3 P.M.	Warm.	14.8970	14.4420	W.D.M.			
9/5/23	3:20PM	Hot	14.8915	14.4400	W.D.M.	8.203	8.178	
9/-7-23	Noon	Hot	14.8908	14.4392	W.D.M.	8.191	8.189	reset. use small holes.
9/-12-23	Noon	Cloudy.	14.8950 .0145	14.4416 .0047	W.D.M.	8.165 .0126	8.174 .0056	
9/-25-23	10 A.M.	Cool Clear.	14.9095	14.4463	W.D.M.	8.102	8.146	
10/-9-23	10 A.M	Cool Cloudy.	14.9163	14.4511	W.D.M.	8.060	8.126	
10/-19-23	1 P.M.	Warm.	14.9045	14.4470	W.D.M	8.108	8.148	
11/-12-23	9 AM	Cool	14.9209	14.4537	Clarkson	8.031	8.113	
11/" "	"	"	14.9211	14.4537	W.D.M.	8.035	8.112	
12/17-23	2 10 PM	Warm.	14.9300	14.4555	W.D.M.		8.094	Not possible to take measurement being less than 8.000
12/17-23	"	"	14.9302	14.4554	Clarkson		8.094	
1/-23-24	9 A.M.	Cool	14.9425	14.4598	W.		8.076	Repunched 2/8/24 WDM.
2/8/24	10:17 AM	Cool	14.9370	14.4575	W.D.M.	8.182	8.088	
3/29-24	9.25	Cool	14.9445	14.4610	"	8.147	8.071	
4/29-24	2 20 P.M.	Cool	14.9347	14.4574	F.R.M. W.D.M	8.196	8.086	
5/14-24	9.20 AM.	Warm	14.9350	14.4560	F.R.M.	8.226	8.095	
6/3-24	10 A.M.	Warm	14.9327	14.4551	F.R.M.	8.222	8.085	
6/15-24	2 30 P.M.	Warm.	14.9068	14.4453	F.R.M.	8.307	8.131	
7/2-24	2 40 P.M.	Warm	14.8700	14.4509	F.R.M.	8.321	8.136	
7/15 24	4.30 P.M.	Warm.	14.9058	14.4507	F.R.M.	8.285	8.112	

(Page 37)

Buttress No 18

From page 12

	Hour.	Temp.	B.C.	
6/30-23	5 P.M.		14.1368	KQV
7/9-23	10 30 A.M.	66°	14.1433	W.D.M.
7/N-23	11 30	Clear 73°	14.1385	KQV.
8/11/23	10 06 AM.	Cloudy 70°	14.1395	WDM.
8/26-23	3 PM	Warm	14.1395	W.D.M.
9/7-23	Noon	Hot	14.1282	WDM.
9/12-23	Noon	Cloudy.	14.1356 .0134	W.D.M.
9/25-23	10 15 AM	Cool	14.1490	W.D.M.
10/9-23	10 AM	Cloudy Cool	14.1564	WDM.
10/19-23	10 A.M.	Warm.	14.1457	W.D.M.
11/12-23	9:40 AM	Cool	14.1624	W.D.M.
"	"	"	14.1622	Clarkson
12/17-23	2 30 P.M.	Warm.	14.1662	W.D.M.
" "	"	"	14.1668	Clarkson
1/23-24	9 20 AM	Cold	14.1803	W.D.M.
2/8/24	10:34 AM	Cool	Pin loose. NG	WDM
3/29-24	9 40 AM	Cool	"	W.D.M.
4-24-24	2 40 PM	"	"	W.D.M.
5-14-24	9 40 AM.	Warm	"	ARM.
6-3-24	10 25 A.M.	Warm	14.0736	A.R.M.
6/15-24	3 P.M.	Warm.	14.0739	A.R.M.
7/2-24	3 25 P.M.	"	14.0723	A.R.M.
7/15-24	4 50 P.M.	"	14.0658	ARM.
8/1-24	3 35 P.M.	"	14.0629	A.R.M.
8/17-24	1 30 P.M.	"	14.0617	A.R.M.

(Continued on Page 38)

J B Lippincott & Duluth Here Today

Strain Gage.

8.185

8.161 .0142

8.090

8.051

8.108

8.020

8.021

No reading acct expansion over 8".

" " " " " "

8.181 Repunched 2/8/24 WDM

8.145

8.200

8.228

8.231

8.309

8.311

8.291

8.299

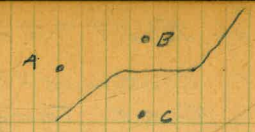
8.292

BUTTRESS 19

Continued from page. 13

DATE	Hour	Temp.	A.B.	Observer
7/9-23	10:40 AM	65°	14.9518	W.D.M.
7/15-23	11-30 AM	Clear - 73°	14.9470	W.D.M.
8/11/23	10 10 AM.	Cloudy 70°	14.9500	W.D.M.
8/26-23	3 P.M.	Warm	14.9495	W.D.M.
9/7-23	Noon	Hot.	14.9404	W.D.M.
9/12-23	Noon	Cloudy.	.005 14.9454	W.D.M.
9/25-23	10:20	Cool	.0128 14.9582	W.D.M.
10/9-23	10 AM	Cool Cloudy.	14.9654	W.D.M.
10/19-23	1 P.M.	Warm	14.9556	W.D.M.
11/12-23	9:45 A.M.	Cool	14.9705	W.D.M.
" "	"	"	14.9708	Clarkson
12/17-23	2 35 PM	Warm.	14.9780	W.D.M.
"	"	"	14.9787	Clarkson.
1/23-24	9 30 AM	cold	14.9880	W.D.M.
2/8/24	10:38 AM	Cool	14.9823	W.D.M.
3/29-24	9-45 AM	Cool	14.9887	W.D.M.
4/24-24	2 50 PM.	Cool	14.9811	W.D.M.
5/14-24	10 20 AM.	Warm	14.9808	A.R.M.
6-3-24	10 45 A.M.	Warm	14.9801	A.R.M.
6-15-24	3 20 PM	Warm.	14.9706	A.R.M.
7/2-24	3 40 P.M.	"	14.9737	A.R.M.
7/15-24	5 P.M.	"	14.9623	A.R.M.
8-1-24	3 40 PM.	"	14.9614	A.R.M.
8/17-24	1 45 PM.	"	14.9627	A.R.M.
9/2-24	4 25 P.M.	"	14.9631	A.R.M.

(Continued on Page 39)



A.C.	B.C.
8.177	8.173
.005	.0028
8.152	8.159
.0155	.008
8.077	8.119
8.038	8.096
8.093	8.119
8.009	8.077
8.009	8.076
No reading (over 8")	8.059
" "	8.057
Repunched 2/8/24	8.042
8.172	8.056
8.132	8.028
8.183	8.048
8.212	8.058
8.198	8.039
8.328	8.092
8.341	8.107
8.281	8.079
8.287	8.081
8.278	8.076
8.281	8.077

5.6
2.5
2.8

Base of BUTTRESS No 16

Continued from page 9.

DATE	TIME	Temp.	A.B.	Observer
7/9-23	10:45	66°	14.5634	W.D.M.
7/15-23	11 45	73°	14.5570	KQV.
8/11/23	10 16 AM	Cloudy 70°	14.5530	W.D.M.
8/27-23	3 P.M.		14.5532	W.D.M.
9/7-23	Noon	Hot.	14.5503	W.D.M.
9/12-23	Noon	Cloudy.	14.5565	W.D.M.
9/25-23	10:35 AM	Cool	14.5582	W.D.M.
10/9-23	10 A.M.	Cloudy Cool	14.5594	W.D.M.
10/19-23	1 P.M.	Warm	14.5566	W.D.M.
11/12-23	10 A.M.	Cool	14.5592	W.D.M.
"	"	"	14.5592	Clarkson.
12/17-23	2 45 PM	Warm.	14.5613	" "
12/17-23	2 45 "	"	14.5613	W.D.M.
1-23-24	9 30 AM	Cold	14.5656	W.D.M.
2/8/24	10/47 AM	Cool	14.5623	WDM
3/29-24	10/55 AM	Cool.	14.5630	W.D.M.
4-24-24	3.10 P.M.	Cool	14.5600	WDM
5/14-24	10 50 AM	warm.	14.5598	A.R.M.
6/3-24	11 10 AM	Warm	14.5601	A.R.M.
6/15-24	3 45 P.M.	Warm	14.5542	A.R.M.
7/2-24	3 55 P.M.	"	14.5563	A.R.M.
7/15-24	5 10 P.M.	"	14.5611	A.R.M.
8-1-24	4 10 P.M.	"	14.5627	A.R.M.
8/17-24	2 10 P.M.	"	14.5538	A.R.M.
9/2-24	5 10 P.M.	"	14.5529	A.R.M.

(Continued on Page No 40)

Strain Gage.

8.220
8.223
8.215
8.211
8.218
8.208
8.208
8.193
8.194
8.178
8.190
8.185
8.200
8.202
8.210
8.211
8.229
8.214
8.210
8.211
8.214

Base of BUTTRESS No 15

Continued from page 8

DATE	Hour.	Temp	A.B.	Observer
7/9-23	10:45AM.	66°	14.7119	WDM
7/16-23	11-45 AM	73°	14.7110	KQV
8/11/23	10 19 AM	70° Cloudy	14.7122	WDM
8/26-23	3 PM	Warm.	14.7105	WDM
9/7-23	Noon	Hot	14.7080	WDM
9-12-23	Noon	Cloudy.	14.7094	W.D.M.
9/25-23	10:35AM	Cool.	14.7111	WDM.
10/9-23	10 AM	Cloudy Clear.	14.7132	W.D.M.
10/19-23	1 P.M.	Warm.	14.7105	W.D.M.
11-12-23	10:15AM	Cool	14.7165	W.D.M.
" "	" "	"	14.7160	Clarkson
12-17-23	2 50 P.M.	Warm	14.7265	W.D.M.
"	"	"	14.7269	Clarkson
1/23-24	9 35 AM	cold.	14.7342	W.D.M.
2/8/24	10:50AM	Cool	14.7292	WDM
3/29/24	11 00 AM.	Cool	14.7305	W.D.M
4/24-24	3 P.M.	Cool	14.7250	WDM
5/14-24	10 40 AM.	warm.	14.7258	ARM.
6-3-24	11. 30 A.M.	Warm	14.7239	ARM.
6/15-24	4 P.M.	Warm	14.7079	A.R.M.
7/2-24	4 20 P.M.	"	14.7066	A.R.M.
7/15-24	5 20 PM	"	14.7086	A.R.M.
8-1-24	4 25 P.M.	"	14.7082	A.R.M.
8/17-24	2 25 PM	"	14.7235	A.R.M.
9/2-24	5 25 P.M.	"	14.7220	A.R.M.

(Continued on Page 41)

Buttress No 21 Strain Gage.

DATE	Hour	Temp		Observer
9/7-23	Noon		8.267	W.D.M.
9/12-23	Noon	Cool Cloudy	8.263	W.D.M.
9/25-23	10:30	Cool	8.245	W.D.M.
10/-9-23	10 A.M	Cloudy Cool.	8.225	W.D.M.
10/-19-23	1 P.M.	Warm.	8.245	W.D.M.
11/-12-23	9^{50} AM	Cool	8.208	W.D.M.
" " "	"	"	8.208	Clarkson.
"	"	"	8.208	Volk.
12/17-23	2^{45} PM	Warm.	8.182	W.D.M.
"	"	"	8.182	Clarkson.
1/23-24	9^{25} AM	Cold.	8.152	W.D.M.
2/8/24	10/42 AM.	Cool	8.169	WDM
3/29-24	10:50 AM	Cool	8.159	"
4-24-24	3 P.M.	Cool	8.177	A.R.M. W.D.M.
5-14-24	10^{40} A.M.	Warm	8.168	A.R.M.
6/15-24	3^{40} P.M.	"	8.210	A.R.M.
7/2-24	4^{35} P.M.	"	8.214	A.R.M.
7/15-24	5^{10} P.M.	"	8.221	A.R.M.
8-1-24	4^{40} P.M.	"	8.214	A.R.M.
8/17-24	1^{55} P.M.	"	8.236	A.R.M.
9/2-24	4^{45} P.M.	"	8.229	A.R.M.
9/14-24	4^{30} P.M.	"	8.226	A.R.M.
10/3-24	3^{40} P.M.	Moderate	8.234	A.R.M.
10/20 24	2^{25} P.M.	Moderate	8.196	A.R.M.

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Buttress No 17
North side. From pg. 14

DATE	Hour	Temp.	Micro.	Strain Gage	
10/9-23	10 AM	Cloudy Cool	14.8506	8.134	W.D.M.
10/19-23	1 P.M.	Warm.	14.8420	8.172	W.D.M.
11/12-23	9.30 AM	Cool	14.8549	8.107	W.D.M.
" "	"	"	14.8542	8.108	Clarkson
12/17-23	2.20 PM	Warm.	14.8650	8.046	W.D.M.
12/17-23	2.20 PM	" "	14.8647	8.044	Clarkson
1/23-24	9.10 AM	Cold	14.8775	N.G.	W.D.M.
2/8/24	10:30 AM	Cool	14.8710	8.016	W.D.M.
3/29-24	9 30 AM	Cool	14.8761		W.D.M.
4/24-24	2-30 P.M.	Cool.	14.8648	8.189	W.D.M.
5/14-24	10 A.M.	Warm..	14.8649	8.203	A.R.M.
6/3-24	10.10 A.M.	Warm	14.8692	8.227	A.R.M.
6/15-24	3.40 P.M.	Warm	14.8723	8.258	A.R.M.
7/2-24	3.20 P.M.	"	14.8627	8.274	A.R.M.
7/15-24	4.40 P.M.	"	14.8545	8.257	A.R.M.
8/1-24	5 P.M.	"	14.8532	8.252	A.R.M.
8/17-24	1.10 PM	"	14.8439	8.265	A.R.M.
9/2-24	3.20 PM	"	14.8431	8.269	A.R.M.
9/14-24	3.45 P.M.	"	14.8421	8.262	A.R.M.
10/3-24	2.50 P.M.	Modorate	14.8418	8.269	A.R.M.
10/20-24	1.45 P.M.	Modarate	14.8568	8.182	A.R.M.
11/5-24	2.20 P.M.	Modorate	14.8593	8.187	A.R.M.
11/16-24	2.10 P.M.	Warm	14.8722	8.109	A.R.M.
14/5-24	11.20 A.M.	Cool Cloudy	14.8717	8.107	A.R.M.
12/16-24	1.05 P.M.	Cool Rain	14.8713	8.109	A.R.M.

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No reading on account of Expansion being over 8"
Repunched

Buttress No 16 Continued From Page 30 ~~29~~

Date	Houre	Tempt.	A.B.	A.C.	Obs	AB	A.C.	
8/1-24	3 20 PM	warm	149052	14.4529	A.R.M.	8.280	8.120	
8/17-24	12 50 P.M.	"	149.072	14.4507	A.R.M.	8.296	8.129	
9/2-24	2 55 P.M.	"	149067	14.4513	ARM	8.287	8.124	
9/14-24	3 25 P.M.	"	149011	14.4500	A.R.M.	8.288	8.116	
10/3-24	2.30 P.M.	Modorate	149014	14.4516	A.R.M.	8.297	8.127	
10/20-24	140 P.M.	Modarate	149.304	14.4554	A.R.M.	8.191	8.075	
11/4-24	2.10 PM	"	149.317	14.4590	ARM	8.195	8.099	
11/16-24	2 P.M.	warm	149418	14.4623	A.R.M.	8.106	8.045	
12/5-24	11 10 AM	Cool Cloudy	14.9426	144626	A.R.M.	8.112	8.056	
12/16-24	12 50 P.M.	Cool Rain	14.9439	14.4618	ARM.	8.109	8.047	
1/2-25	11.10 A.M.	Clear Moderate	149540	14.4581	A.R.M.	8.063	8.041	
1/15-25	10 20 AM	Clear Moderate	149527	14.4572	A.R.M.	8064	8.037	
2/4-25	10 40 AM	Clear Cool	149.523	14.4575	ARM	8.325	8.215	Repunched strain Gage
2/18-25	2 20 P.M.	Cloudy Cool	14.9543	14.4579	A.R.M.	8.329	8221	
3/2-25	2 50 P.M.	Clear WARM	14.9553	14.4543	A.R.M.	8.327	8.251	
3/16-25	140 P.M.	Clear WARM	149488	14.4558	A.R.M.	8.327	8.222	
4/3-25	155 PM	Clear warm	149553	14.4578	A.R.M.	8.326	8.208	
4/16-25	825 AM	light Clouds WARM	149221	14.4545	ARM.	8.327	8.267	
5-2-25	120 PM.	Clear WARM	149278	14.4560	A.R.M.	8.326	8.233	
5/14-25	11.10 AM	Clear WARM	149279	14.4569	ARM	8.327	8.231	
6/1-25	3.15 p.m	Cloudy Cool	14.9411	14.4511	C.L.M	8327	8.202	
6/13-25	3:10 PM	Clear Warm	14.9258	14.4510	C.L.M	8334	8256	
7/1-25	3.05 PM	Clear Warm	14.9260	14.4514	C.L.M	8061	8270	Repunched strain gague A-B
7/17-25	7.19 AM	Clear hot	14.9010	14.4523	C.L.M	8051	8280	
8/7-25	2 35 PM	"	149016	14.4529	CLM	8060	8280	Contin Page 45
8-16-25	340 PM	Clear Warm	149020	144520		8050	8275	

Buttress No 18

Date	Time	Temp.	B.C.		Strain Gage	
9/2-24	3 50 P.M.	warm	14.0631	A.R.M.	8.285	
9/14-24	3 55 PM	"	14.0614	A.R.M.	8.301	
10/3-24	3.10 P.M.	Modorate	14.0631	A.R.M.	8.311	
10/20-24	2 05 P.M.	Modorate	14.0707	A.R.M.	8.198	
11/5-24	2 30 PM	"	14.0735	M.R.M.	8.203	
11/16-24	2.20 PM	warm	14.0748	A.R.M.	8.110	
12/5-24	11 30 A.M.	Cool Cloudy	14.0829	A.R.M.	8.111	
12/16-24	120 P.M.	Cool Rain	14.0831	A.R.M.	8.104	
1/2-25	11.30 A.M.	Clear Moderate	14.0785	A.R.M.	8.063	
1/15-25	11 A.M.	Clear Moderate	14.0781	A.R.M.	8.055	
2/4-25	11 20 A.M.	Clear Cool	14.0779	A.R.M.	8.231	Repunched Strain Gage
2/18-25	2 45 P.M.	Coudy Cool	14.0788	A.R.M.	8.233	
3/2-25	3 05 P.M.	Clear WARM.	14.0587	A.R.M.	8.328	
3/16-25	2 P.M.	Clear WARM	14.0615	A.R.M.	8.326	
4/3-25	2 15 P.M.	Clear warm.	14.0747	A.R.M.	8.342	
4/16-25	8 40 AM.	light Clouds WARM	14.0691	A.R.M.	8.327	
5-2-25	1 35 P.M.	Clear WARM	14.0726	A.R.M.	8.289	
5/14-25	11 25 A.M.	Clear WARM	14.0727	A.R.M.	8.289	
6/1/25	3 35 Pm	Cloudy Cool	14.0618	C.L.M	8.294	
6/15/25	3:30 Pm	Clear warm	14.0763	C.L.M	8.332	
7/1/25	3 20 P.M	Clear warm	14.0765	C.L.M	8.042	Repunched strain gauge
7/17-25	7 30 A M	Clear hot	14.0754	C.L.M	8.096	
8/2-25	2 50 Pm	"	14.0760	C.L.Mc	8.060	
8-16 25	3 55 Pm	Clear Warm	14.0760	C.L.M	8.020	
9-2-25	8 50 AM	"	14.0722	C.L.M	8.002	

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From Page 32

Buttress No 19

Date	Time	Temp.	A.B.	observer		A.C. Strain Gage	B.C. Strain Gage	
9/14-24	4 15 P.M.	WARM.	149605	A.R.M.	SEMENT	8.280	8.071	
10/3-24	3.30 P.M	Modorate	14.9617	A.R.M.		8.299	8.076	
10/20-24	2.15 P.M.	Modarate	14.9737	A.R.M.		8.180	8.019	
11/5-24	2.45 PM	"	14.9720	A.R.M.		8.207	8.030	
11/16-24	2.35 PM	warm.	14.9915	A.R.M.		8.103	No Reading	
12/5-24	11.35 A.M.	Cool Cloudy	15.0003	A.R.M.		8.096	8.232	BC Repunched strain Gage
12/16-24	1.30 P.M.	Cool Rain	—	A.R.M.		8.093	8.228	
1/2-25	11.35 AM	Clear Moderate	15.0028	A.R.M.		8.055	8.221	
1/15-25	11.10 AM.	Clear Moderate	15.0036	A.R.M.		8.057	8.231	
2/4-25	11.30 AM.	Clear Cool	14.3118	A.R.M.	Reset on account over 15 min	8.327	8.225	AC Repunched
2/18-25	3 P.M.	Cloudy Cool	15.0055 14.3137	A.R.M.		8.331	8.237	
3/2-25	3.10 P.M.	Clear WARM.	14.9769 14.2851	A.R.M.		8.326	8.274	
3/16-25	2.10 PM	Clear WARM	14.9823 14.2905	A.R.M.		8.329	8.245	
4/3-25	2.20 P.M.	Clear WARM	14.9969? 14.3051	A.R.M.		8.327	8.219	
4/16-25	8.45 AM.	light Cloud WARM	14.9684 14.2766	A.R.M.		8.326	8.271	
5-2-25	1.40 PM	Clear WARM.	14.9711 14.2793	A.R.M.		8.327	8.232	
5/14-25	11.30 A.M.	Clear WARM	14.9714 14.2796	A.R.M.		8.326	8.228	
6/1-25	3.40 pm	Cloudy Cool	14.9834 14.2914	C.L.M.		8.320	8.223	
6/1-25	1.30 P.M.	Clear.	14.9878 14.2960	W.D.H.				
6/15-25	3.40 pm	Clear warm	14.2767	C.L.M.		8.332	8.261	
7/1-25	3.30 P.M	Clear warm	14.2781	C.L.M.		8.009	8.083	Repunched B.C and A C
7/17-25	7.40 AM	Clear Hot	14.2614	C.L.M.		8.060	8.039	
8/2-25	3.00 Pm	"	14.2750	C.L.Mc		8.092	8.061	
8-16-25	4.05 PM	Clear Warm	14.2741	C.L.Mc		8.021	8.022	
9-2-25	9.00	"	14.2718	C.L.M.		8.000	8.002	

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Base of Buttress No. 16

Date	Time	Temp.	A. B.	observer	Strain Gage
9/14-24	445 PM.	warm.	145505	A.R.M.	8.211
10/3-24	4.25 P.M.	Moderate	14.5528	A.R.M.	8.226
10/20-24	2.35 P.M.	Moderate	14.5537	A.R.M.	8.198
11/5-24	325 PM	"	14.5571	A.R.M.	8.179
11/16-24	2.50 PM	warm	14.5603	A.R.M.	8.182
12/5-24	1150 AM	Cool Cloudy	14.5611	ARM	8.177
12/16-24	2 P.M.	Cool Rain	145633	A.R.M.	8.175
1/2-25	1150 A.M.	Clear Moderate	14.5573	A.R.M.	8.161
1/15-25	1140 A.M.	Clear Moderate	14.5570	A.R.M.	8.154
2/4-25	1150 AM.	Clear Cool	14.5573	A.R.M.	8.161
2/18-25	320 P.M.	Cloudy Cool	14.5591	A.R.M.	8.167
3/2-25	3.20 PM	Clear warm	145545	A.R.M.	8.188
3/16-25	2-25 pm.	Clear warm.	14.5549	A.R.M.	8.167
4-3-25	230 PM.	Clear warm	14.5561	A.R.M.	8.172
4/16-25	855 AM.	light Clouds warm	14.5544	A.R.M.	8.188
5-2-25	150 PM.	Clear warm	14.5551	A.R.M.	8.168
5/14-25	1.35 AM.	Clear warm	14.5551	A.R.M.	8.179
6/1-25	4 pm	Cloudy Cool	14.5510	C.L.M.	8.160
6/15-25	3.45 pm	Clear warm	14.5510	C.L.M.	8.196
7/1-25	3.40 pm	Clear warm	14.5517	C.L.M.	8203
7/17-25	7.15 AM	Clear hot	14.5516	C.L.M.	8215
8/2-25	2.10 PM	Clear ~~Hot~~	14.5532	C.L.M.	8220
8-16-25	4.25 Pm	Clear warm	14.5550	C.L.M.	8190
9-7-25	9.20 AM	"	14.5540	C.L.M.	8177
9-19-25	9.60 AM	Cloudy ~~Hot~~	14.5560	C.L.M.	8190

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Base of Buttress No 15

Date	Time	Temp.	A.B.	observer
9/14-24	5 P.M.	warm	14.7312	A.R.M.
10/3-24	4 20 P.M.	Moderate	14.7309	A.R.M.
10/20-24	245 P.M.	Moderate	14.7216	A.R.M.
11/5-24	3-40 P.M.	"	14.7251	A.R.M.
11/16-24	3 P.M.	warm	14.7255	A.R.M.
12/5 24	11.55 AM	Cool Cloudy	14.7256	A.R.M.
12/16-24	2 20 P.M.	Cool Rain	14.7239	A.R.M.
1/2-25	11 55 A.M.	Clear Moderate	14.7293	A.R.M.
1/15-25	11 50 AM	Clear Moderate	14.7281	A.R.M.
2/4-25	11 55 AM	Clear Cool	14.7298	A.R.M.
2/18-25	330 P.M.	Cloudy Cool	14.7291	A.R.M.
3/2-25	325 P.M.	Clear warm	14.7137	A.R.M.
3/16-25	235 P.M.	Clear warm.	14.7139	A.R.M.
4/3-25	240 AM	Clear warm.	14.7258	A.R.M.
4/16-25	9.5 A.M.	light Clouds warm	14.7298	A.R.M.
5-2-25	155 P.M.	Clear warm	14.7248	A.R.M.
5/14-25	1.40 A.M.	Clear warm	14.7220	A.R.M.
6/1-25	4.05 P.m	Cloudy cool	14.7202	C.L.m
6/15-25	4. P.m	Clear warm	14.7251	C.L.m
7/1-25	3.45 P.m	Clear warm	14.7271	C.L.m
7/17-25	7 a.m	Clear Hot	14.7236	C.L.m
8/2-25	2 Pm	Clear Hot	147242	C.L.M
8-16 25	4 35 Pm	Clear warm	147195	C.L.m
9-2-25	925 AM	Clear warm	147155	C.L.M
9/17.25	950 AM	Cloudy Hot	147181	C.L.M

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Buttress No 15

Continued From Page 10

Date	Hours	Temp.	A.B.	A.C.	OBS.	A.C. Strain Gage	
10/3-24	2.15 P.M.	Moderate	14.6729	14.3412	A.R.M.	8.103	
10/20-24	1.30 P.M.	Moderate	14.6768	14.3427	A.R.M.	8.061	
11/5-24	1.50 P.M.	"	14.6794	14.3456	A.R.M.	8.088	
11/16-24	1.40 P.M.	Warm	14.6888	14.3524	A.R.M.	8.031	
12/5-24	10.55 A.M.	Cool Cloudy	14.6928	14.3523	A.R.M.	8.147	Repunch
12/16-24	12.40 P.M.	Cool Rain	14.6907	14.3536	A.R.M.	8.153	
1/2-25	11 A.M.	Clear Moderate	14.7048	14.3535	A.R.M.	8.134	
1/15-25	10.10 A.M.	Clear Moderate	14.7051	14.3547	A.R.M.	8.128	
2/4-25	10.45 A.M.	Clear Cool	14.7040	14.3548	A.R.M.	8.127	
2/18-25	2.10 P.M.	Cloudy Cool	14.7071	14.3539	A.R.M.	8.131	
3/2-25	2.35 P.M.	Clear Warm	14.6774	14.3500	A.R.M.	8.159	
3/16-25	1.30 P.M.	Clear Warm	14.6833	14.3518	A.R.M.	8.144	
4/3-25	1.40 P.M.	Clear Warm	14.7025	14.3551	A.R.M.	8.123	
4/16-25	8.15 A.M.	Light Clouds Warm	14.6766	14.3542	A.R.M.	8.161	
5/2-25	1.15 P.M.	Clear Warm	14.6793	14.3532	A.R.M.	8.136	
5/14-25	10.50 A.M.	Clear Warm	14.6908	14.3526	A.R.M.	8.136	
6/1-25	3 P.M.	Cloudy Cool	14.6714	14.3504	C.L.M.	8.113	
6/15-25	3 P.M.	Clear Warm	14.6765	14.3504	C.L.M.	8.165	
7/1/25	3. P.M.	Clear Warm	14.6769	14.3506	C.L.M.	8.164	
7/17-25	7. A.M.	Clear Hot	14.6772	14.3521	C.L.M.	8.192	
8/1-25	2.20 P.M.	"	14.6782	14.3533	C.L.M.	8.198	
8/16-25	3.30 P.M.	Clear Warm	14.6753	14.3525	C.L.M.	8.138	
9-7-25	8.15 A.M.	Clear Warm	14.6735	14.3504	C.L.M.	8.125	
9-17-25	9.00 A.M.	Cloudy Hot	14.6780	14.3540	C.L.M.	8.142	
10-4-25	10.30 A.M.	Warm Raining	14.6772	14.3500	C.L.M.	8.131	

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Date	Buttress No 21			Strain Gage
Date	Houre	Temp		Observer
11/5-24	3.15 P.M	Moderate	8.319	A.R.M.
11/16-24	2.45 P.M.	Warm	8.259	A.R.M.
12/5 24	11.40 A.M.	Cool Cloudy	8.160	A.R.M.
12/16-24	1.45 P.M.	Cool Rain	8.153	A.R.M
1/2-25	11.45 A.M.	Clear Moderate	8.138	A.R.M.
1/15-25	11.25 A.M.	Clear Moderate	8.137	A.R.M.
2/4-25	11.40 A.M.	Clear Cool	8.147	A.R.M.
2/18-25	3.10 P.M.	Coudy Cool	8.151	A.R.M.
3/2-25	3.15 P.M.	Clear Warm	8.191	A.R.M.
3/16-25	2.15 P.M.	Clear Warm	8.176	A.R.M.
4/3-25	2.25 P.M.	Clear Warm	8.158	A.R.M.
4/16-25	8.50 A.M.	light Clouds Warm	8.190	A.R.M.
5-2-25	1.45 P.M.	Clear Warm	8.171	A.R.M.
5/14 25	11.25 A.M.	Clear Warm.	8.173	A.R.M.
6/1-25	3.50 pm	Cloudy Cool	8.157	C.L.M
6/15-25	3.35 P.M	Clear Warm	8.162	C.L.M
7/1-25	3.40 P.M	Clear Warm	8.170	C.L.M.
7/17-25	7.45 AM	Clear Hot	8.211	C.L.M
8/2-25	3.15 Pm	"	8.236	C.L.M
8-16-25	4.20 Pm	Clear Warm	8.202	C.L.M
9.2.25	9.10 Am	"	8.184	C.L.M
9-17-25	9.40 Am	Cloudy Hot	8.204	C.L.M
10-4-25	11.15 Am	Rainy Warm	8.191	C.L.M
10-16-25	12.55 Pm	Cloudy Cool	8.152	C.L.M

(Contin Page 51)

Buttress No 17
North Side From page No. 36

Date	Hour	Temp.	Micro	Strain Gage		
1/2-25	11.25 AM.	Clear Moderate	14.8769	8.058	A.R.M.	
1/15-25	10.35 AM	Clear Moderate	14.8773	8.056	A.R.M.	
2/4-25	11.10 AM.	Clear Cool	14.8760	8.249	A.R.M.	Repunched Strain Gage
2/18-25	2.35 PM	Cloudy Cool	14.8759	8.241	A.R.M.	
3/2-25	3 P.M.	Clear WARM	14.8567	8.323	A.R.M.	
3/16-25	1.55 PM	Clear WARM	14.8596	8.305	A.R.M.	
4/3-25	2.05 P.M.	Clear WARM.	14.8763	8.359	A.R.M.	
4/16-25	8.35 A.M.	Light Clouds WARM	148554	8.328	A.R.M.	
5-2-25	1.30 PM.	Clear WARM.	14.8710	8.301	A.R.M.	
5/14-25	11.20 AM	Clear WARM	14.8696	8.304	A.R.M.	
6/1-25	3.30 P.M	Cloudy Cool	14.8614	8.298	C.L.M.	
6/15-25	3.20 P.M	Clear warm	14.8512	8.332	C.L.M.	
7/1-25	3.15 P.M	Clear warm	14.8514	8.102	C.L.M.	Repunched strain gauge
7/17-25	7.20 AM	Clear Hot	14.8423	8.133	C.L.M.	
8/2 25	2.45 PM		148760	8.142	C.L.M.	
8-16-25	3.50 PM	Clear Warm	148416	8106	C.L.M.	
9-2-25	8.45 AM	"	14.8400	8065	C.L.M.	
9-17-25	9.20 AM	Cloudy Half-f	148447	8096	C.L.M.	
10-4-25	9.45 AM	Rainy Warm	148440	8082	C.L.M.	
10.16.25	12.20 PM	Cloudy Cool	148514	8000	C.L.M.	
11-2-25	3.10 PM	Cloudy Cool	148520	8000	C.L.M.	
11-17-25	9.25 AM	Clear Cool	148673	8163	C.L.M.	
12-4-25	3.35 PM	CLEAR WARM	148610	8139	C.L.M.	
12-16-25	3.20 PM	Cloudy Cool	148633	8157	C.L.M.	
1-3-26	9.25 AM	CLOUDY Cool	148612	8130	C.L.M.	
1-[illegible]	Continued	to Page 52			C.L.M.	

Buttress No 16 From Page No 37

Date	Hour	Temp	AB	AC	Obs	Strain Gauge A.B.	Strain Gauge AC
9-2-25	8 30 Am	Clear Warm	149010	144500	CLM	8016	8242
9-17 25	9 10 Am	Cloudy Hot	149062	144584	CLM	8067	8291
10-4-25	10 35 Am	Raining Warm	149048	144543	CLM	8050	8278
10-16-25	12 10 Pm	Cloudy Cool	149140	144515	CLM	8009	8210
11-2-25	2 50 Pm	Cloudy Cool	149152	144521	CLM	8000	8215
11-17-25	9 10 Am	Clear Cool	149290	144760	CLM	8122	8294
12-4-25	3 25 Pm	Clear Warm	149270	144705	CLM	8103	8252
12-16-25	3 10 Pm	Cloudy Cool	149286	144721	CLM	8112	8265
1-3-26	9 10 Am	Clouds Cool	149250	144700	CLM	8100	8251
1-17-26	2 25 Pm	Cloudy Cool	149341	144802	CLM	8192	8322
2-3-26	11 05 Am	Clouds Cool	149420	144870	CLM	8211	—
2-16-26	10.30 a.m	Raining Cool	149440	144881	CLM	8230	—
3-1 26	11 00 am	Clear Warm	149356	144790	CLM	8200	—
3-17-26	8 20 am	Clouds Warm	149305	144761	CLM	8170	—
4. 3. 26	8 10 "	Clouds Cool	149411	144879	CLM	8271	
4 9 26	8 20		149316	144760			
5-1-26	no reading by order of Mr. Howard						
5-10-26	12 10 Pm	Clear warm	1495010	144523	CLM		
6-2-26	8 10 a.m	foggy warm	149498	144506	CLM		
7-19-26	10 35 am	Clear Hot	149399	144410	"		
8-2-26	11 10 am	"	149409	144460	"		
8-18-26	1 25 Pm	"	149378	144409	"		

Butress #18

DATE	TIME	TEMP.	BC	OBSERV
9-17-25	9 25 Am	Cloudy Hot	140762	CLM
10-4-25	10 55	Raining Warm	140736	CLM
10-16-25	12 30 Pm	Cloudy Cool	140720	CLM
11-2-25	3 15 Pm	"	140712	CLM
11-17-25	9 35 Am	Clear Cool	140901	CLM
12-4-25	3 45 Pm	Clear Warm	140865	C.L.M.
12 16-25	3 30 Pm	CLOUDY Cool	140892	CLM
1-3 26	9 35 Am	CLOUDY Cool	140883	CLM
1-17-26	2 45 Pm	Cloudy Cool	140990	C.L.M
2-3-26	11 20 a.m	"	140998	CLM
2-16-26	10 45 a.m	Raining Cool	141013	C.L.M
3-2-26	11 25 am	CLAR Warm	140922	CLM
3-17-26	8 40 am	CLOUDY WARM	140900	CLM
4-3-26	8 25 "	CLOUDY Cool	140983	CLM
4.9-26	8 35 "		140881	
5-1-26	no reading by order, Mr. Pincard			
5-10-26	12 30 Pm	Clear warm	140810	C.L.M
6-2-26	8.40 am	Foggy warm	140796	C.L.M
7-19-26		CLEAR Hot	140698	CLM
8-2-26	11.30 Am	"	140704	"
8-18-26	1.35 Pm	"	140716	"
9-10-26	2 30 P.M.	Clear Warm	140516	F.R.L.

Butress No 18

Strain Gauge	From Page 38
8.041	
8 023	
8 000	
8.000	
8 091	
8060	
8079	
8063	
8167	
8192	
8203	
8131	
8113	
8147	

From Page 39
Buttress No 19

Date	Time	Temp	AB	Observ
9-17-25	9 35 AM	Cloudy Hot	14.2743	CLM
10-9-25	11 10 AM	Raining Warm	142727	CLM
10-16-25	12 35 PM	Cloudy. Cool	142920	CLM
11-2-25	3 25 PM	"	142900	CLM
11-17-25	9 40 AM	Clear Cool	143960	CLM
12-4-25	3 55 PM	CLEAR WARM	142895	CLM
12-16-25	3 35 PM	CLOUDY COOL	142912	CLM
1-3-26	9 45 AM	CLOUDY COOL	142901	CLM
1-17-26	3 00 PM	Cloudy Cool	143019	C.L.M
2-3-26	11 25 AM	"	143087	CLM
2-16-26	10 55 A.M	Rainy cool	143092	C.L.M
3-2-26	11 35 "	CLEAR WARM	143002	CLM
3-17-26	8 50 AM	CLOUDY WARM	142981	C.L.M
4-3-26	8 35 "	CLOUDY COOL	143016	CLM
4-9-26	8 40 "		142993	
5-1-26	no reading by order Mr Kincaid			
5-10-26	12 40	clear warm	143270	C.L.M
6-2-26	8 50	foggy warm	143199	C.L.M
7-19-26	10 50 AM	Clear Hot	143104	CLM
8-2-26	11 40 AM	"	143122	"
8-18-26	1 40 PM	"	143100	"
9-10-26	2 40 P.M.	Clear. Warm.	14,3030	F.R.L.

Strain Gauge

AC	BC	
8.028	8021	
8001	8236	B.C. Repunchal Strain gauge
8070	8208	" " AC
8023	8216	
8151	8321	
8101	8285	
8116	8298	
8100	8269	
8201	8321	
8243	8 —	
8251	—	
8178	8 —	
8176	—	
8204	—	

From Page 41.

BASE Buttress 7015

DATE	TIME	TEMP	AB	OBSERV.
10-4 25	11 45 AM	Rain Warm	147164	CLM
10-16-25	1 15 Pm	Cool Cloudy	147088	CLM
11-2-25	4 10 Pm	"	147021	CLM
11-17 25	10 12 AM	Clear Cool	147135	CLM
12-4-25	4 25 Pm	CLEAR WARM	147100	CLM
12-16-25	3 55 Pm	CLOUDY COOL	147133	CLM
1-3-26	10 15 AM	CLOUDY COOL	147100	CLM
1-17-26	3 10 Pm	Cloudy Cool	147202	CLM
2-3-26	11 45 AM	"	147268	CLM
2-16-26	10 a.m	Rainy Cool	147275	C.L.M
3-2-26	11 50 "	CLEAR WARM	147100	CLM
3-17-26	9 10 am	CLOUDY WARM	147090	CLM
4-3-26	9 15 AM	CLOUDY COOL	148001	CLM
7-19-26	11 10 am	CLEAR Hot	147910	CLM
8-2-26	No Reading			
8-18-26	No Reading			

From Page 40

BASE BUTTRESS No 16

DATE	TIME	TEMP	AB	OBSERVER	STRAIN GAUGE
10-4-25	11 40 AM	Rainy Warm	14.5535	CLM	8196
10-16-25	1 00 PM	Cloudy Cool	145500	CLM	8103
11-2-25	3 55 PM	"	145519	CLM	8122
11-17-25	10 05 AM	Clear Cool	145702	CLM	8201
12-4-25	4 15 PM	CLEAR WARM	145668	CLM	8157
12-16-25	4 10 PM	CLOUDY COOL	145699	CLM	8177
1-3-26	10 10 AM	CLOUDY COOL	145663	CLM	8163
1-17-26	3 20 PM	Cloudy Cool	145730	C.L.M	8204
2-3-26	12 00	"	145794	CLM	8240
2-16-26	10 05	Rainy Cool	145800	C.L.M	8245
3-2-26	12 00	CLEAR WARM	145714	CLM	8164
3-17-26	9 00	CLOUDY WARM	145700	CLM	8140
4-3-26	9 05 AM	CLOUDY COOL	145711	CLM	8183
5-4-26	no reading				
5-10-26	12 50	Clear warm	145613	C.L.M	
6-2-26	9 P.M	foggy warm	145306	C.L.M	
7-19-26	11 05 AM	CLEAR HOT	145216	CLM	
8-2-26				"	
8-18-26	Did not Read			"	
9-10-26	2 10 P.M.	Clear Warm.	14.4513	F.R.L.	

From Page 42 BOTTOSS NO 15 STRIM GAUGE A/C B 50

DATE	HOURS	TEMP	A B	A C		
10-16-25	12 noon	Cloudy Cool	146995	143531	CLM	8100
11-2-25	2 40 PM	"	146814	143550	CLM	8141
11-17-25	9 00 AM	Clear Cool	147007	143615	CLM	8190
12-4-25	3 15 PM	CLEAR WARM	147000	143601	CLM	8128
12-16-25	3 00 PM	CLOUDY COOL	147021	143631	CLM	8139
1-3-26	9 10 AM	CLOUDY COOL	147000	143620	CLM	8130
1-17-26	2 20 PM	Cloudy Cool	147101	143701	CLM	8200
2-3-26	11 00 AM	CLOUDY COOL	147172	143783	CLM	8210
2-16-26	10 30 AM	Cool Rainy	147180	143792	CLM	8275
3-2-26	10 50 AM	CLEAR WARM	147091	143700	CLM	8121
3-17-26	8 10 AM	CLOUDY WARM	147020	143673	CLM	8091
4-3-26	8 00 "	CLOUDY COOL	147121	143789	CLM	8110
4-9-26	8 00 "	COOL CLOUDY	147010	143678		
5-1-26	no reading by order of Mr Kneed					
5-10-26	12 noon	Clear warm	147000	143680	CLM	
6-2-26	8. a.m	foggy warm	146992	143650	CLM	
7-19-26	10 20 am	CLEAR HOT	146910	143528	CLM	
8-2-26	11. am	"	146993	143564	"	
8-18-26	1 20 PM	"	146921	143512	"	
9-10-26	2 00 P.M.	Clear. Warm.	14.6767	14.3675	F.R.L.	
10-7-26	Noon	—	14.619		H.C.R.	
10-8-26	✓	✓	14.695		✓	
10-9-26	✓	✓	14.695		✓	
10-10-26	✓	✓	14.7005		✓	
10-11-26	✓	✓	14.703		✓	

Continued on page 60

(From Page 43)

Buttress No 21 . Strain Gauge

Date	Hour	Temp	Observer	
11-2-25	3 40 Pm	Cloudy Cool	8169	CLM
11-17-25	9 55 Am	Clear Cool	8182	CLM
12-4-25	4 05 Pm	CLEAR WARM	8159	CLM
12-16-25	3 45 Pm	CLOUDY COOL	8169	CLM
1-3-26	10 00 Am	CLODY COOL	8153	CLM
1-17-26	3 05 Pm	Cloudy Cool	8193	CLM
2-3-26	11 35 a.m	"	8200	CLM
2-16-26	11 05 a.m	Rainy Cool	8212	CLM
3-2-26	11 45 am	CLEAR WARM	8164	CLM
3-17-26	8 50 am	CLOUDY WARM	8170	CLM
4-3-26	8 45 "	CLOUDY COOL	8209	CLM
4-9-26				

Discontinued Reading Strain Gauge

From PAGE #44

Buttress #17

Date	Hour	Temp.	Micro	Strain	
1-17-26	2 35 PM	cool Cloudy	148714	8201	C.L.M.
2-3-26	11 15 AM	"	148746	8223	C.L.M.
2-16-26	10 30 A.M.	Rainy cool	148758	8232	C.L.M.
3-2-26	11 20 am	CLEAR WARM	148659	8148	C.L.M.
3-17-26	8 30 am	CLOUDY WARM	148619	8179	C.L.M.
4-3-26	8 15 "	CLOUDY COOL	148723	8154	C.L.M.
4-9-26	8 25		148609		
5-1-26	no reading		by order of Mr Kinney		
5-10-26	12 20	Clear warm	148812		C.L.M.
6-2-26	8 20	foggy warm	148790		C.L.M.
7-19-26	10 40 am	CLEAR HOT	148705		C.L.M.
8-2-26	11.20 am	"	148681		"
8-18-26	1 30 PM	"	148700		"
9-10-26	2 20 P.M	Clear Warm	14,8514		F.R.L.
10-7-26	Noon.	—	14.866		A.C.R.
10-8-26	✓	✓	14.867		✓
10-9-26	✓	✓	14.8675		✓
10-10-26	✓	✓	14.8725		✓
10-11-26	✓	✓	14.874		✓
10-12-26	✓	✓	14.876		✓
10-13-26	✓	✓	14.8505		✓
10-14-26	✓	✓	14.877		✓
10-22-26	✓	✓	14.881		✓
11-2-26	✓	✓	14.880		✓
11-13-26	✓	✓	14.879		✓

Continued on next page

Buttress #17

Date	Hour	Temp	Micro	Observer
12-2-26	Noon	—	14.893	H.C.R.
12-8-26	✓	✓	14.901	✓
12-25-26	✓	✓	14.914	✓

Buttress #15

Continued from page 50

Date	Hour	Weather	A.B. Micro	Observer
10-12-26	Noon.	—	14.7005	H.C.R.
10-13-26	✓	✓	14.7005	H.C.R.
10-14-26	✓	✓	14.705	✓
10-22-26	✓	✓	14.706	✓
11-2-26	✓	✓	14.704	✓
11-13-26	✓	✓	14.7105	✓
12-2-26	✓	✓	14.716	✓
12-8-26	✓	✓	14.725	✓
12-25-26	✓	✓	14.736	✓

Readings to be taken. page.

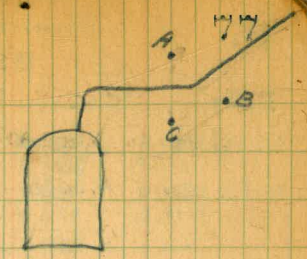
1- North side Buttress No 15 - 29
2- South side " No 16 - 30
3- North " " No 17 - 31
4- South " " No 18 - 31
5 " " " No 19 - 32
6 North " " No 21 - 35

Base of Buttress

7 South side Buttress No 16 33
8 " " " No 15 34

Hourly Readings Buttress No 16

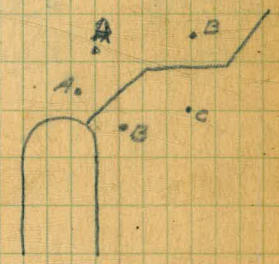
Date	Time	Temp	A.B.	A.C.	Strain A.B	Strain A.C
11/12-23	9:40 AM	66°	14.9210	14.4537	8.033	8.1125
"	10.45	67°	14.9215	14.4535	8.030	8.1135
"	noon	68°	14.9215	14.4532	8.032	8.114
"	1 P.M.	68°	14.9210	14.4536	8.032	8.115
"	2 P.M	70°	14.9198	14.4524	8.036	8.117
"	3 P.M	70°	14.9201	14.4528	8.039	8.118
"	4 P.M.	69°	14.9206	14.4529	8.041	8.117



Recorded by Clarkson & McFadden

Hourly Readings Buttress No 19

			A.B.	A.C.	B.C.
11/12-23	9:50	66°	14.9707	8.009	8.077
"	11 00	67°	14.9708	8.008	8.077
"	12 30	68°	14.9708	8.011	8.077
"	1 P.M.	68°	14.9708	8.014	8.078
"	2 P.M.	70°	14.9693	8.021	8.081
"	3. P.M.	70°	14.9702	8.022	8.080
"	4 P.M.	69°	14.9703	8.024	8.081



Hourly Readings Buttress No 16

E. end - Temp: W. end

			A.B.	A.B.		
11/12-23	10.30	66°	14.5592	8.208		
"	11.30	67°	14.5592	8.208		
"	1245	68°	14.5592	8.208		
"	1 P.M.	68°	14.5589	8.208	60°	66.5°
"	2 P.M.	70°	14.5588	8.209		
"	3 P.M.	69°	14.5585	8.210	60°	66°
	4 P.M.	69°	14.5590	8.209		

Hourly Readings
Buttress #16

Date	Time.	Temp	AB	AC	AB	Strain gauge AC –
11/12/23	10:40 PM	60°	14.9198	14.4532	8.0380	8.115
11-13-13	4.30 AM.	56°	14.9215	14.4544	8.0300	8.111

{E.H.C. Jr. K.Q.U.

✓	14.4547	8.030	8.109
14.9218	14.4543	8.028	8.111
14.9210	14.4546	8.031	8.113
14.9217		8.028	8.117
14.9219	14.4539	8.037	8.111
59	174		
14.9215	14.4544		

94
06

Buttress No 19

			AB	AC	BC.
11/12/13	10:15 PM	60°	14.9700	8.0195	8.077
11/13/13	4:30 AM	56°	14.9719	8.0140	8.078

AB	AC	BC
c 14.9697	8.077 c	8.022 c
14.9697	8.079	8.022
14.9710	8.078 v.	8.017
14.9702	8.077	8.017
14.9700	8.078	8.0195

Buttress No 16 – Bottom –

			AB	
11-12-23	12:55 P.M.	60°	14.5589	8.208
11-13-23	8.30 AM.	56°	14.5603	8.204

14.5589	8.208	
14.5588	8.208	
14.5590	8.208	
14.5590	8.208	
59.8	62.0	
14.5607	8.202	
14.5605	8.204	
14.5602	8.204	
14.5604	8.205	

Sta | Deft. Bearing Rod

Station	+	H.I.	-	Elev	Grade.
B.M.				100.00	
	5.00	105.00			
0+00			4.6	95.4	
1+00			4.5	95.5	
2+00			43	95.7	
			5.10	99.90	
	4.00	103.90			
3+00			4.6		

Tangents and Externals to a 1° Curve.

Angle	Tangent	External	Angle	Tangent	External	Angle	Tangent	External
1°	50.00	.22	11°	551.70	26.50	21°	1061.9	97.57
10′	58.34	.30	10′	560.11	27.31	10′	1070.6	99.16
20	66.67	.39	20	568.53	28.14	20	1079.2	100.75
30	75.01	.49	30	576.95	28.97	30	1087.8	102.35
40	83.34	.61	40	585.36	29.82	40	1096.4	103.97
50	91.68	.73	50	593.79	30.68	50	1105.1	105.60
2	100:01	.87	12	602.21	31.56	22	1113.7	107.24
10	108.35	1.02	10	610.64	32.45	10	1122.4	108.90
20	116.68	1.19	20	619.07	33.35	20	1131.0	110.57
30	125.02	1.36	30	627.50	34.26	30	1139.7	112.25
40	133.36	1.55	40	635.93	35.18	40	1148.4	113.95
50	141.70	1.75	50	644.37	36.12	50	1157.0	115.66
3	150.04	1.96	13	652.81	37.07	23	1165.7	117.38
10	158.38	2.19	10	661.25	38.03	10	1174.4	119.12
20	166.72	2.43	20	669.70	39.01	20	1183.1	120.87
30	175:06	2.67	30	678.15	39.99	30	1191.8	122.63
40	183.40	2.93	40	686.60	40.99	40	1200.5	124.41
50	191 74	3.21	50	695.06	42.00	50	1209.2	126.20
4	200.08	3.49	14	703.51	43.03	24	1217.9	128.00
10	208.43	3.79	10	711.97	44.07	10	1226.6	129.82
20	216.77	4.10	20	720.44	45.12	20	1235.3	131.65
30	225.12	4.42	30	728.90	46.18	30	1244.0	133.50
40	233.47	4.76	40	737.37	47.25	40	1252.8	135.35
50	241.81	5.10	50	745.85	48.34	50	1261.5	137.23
5	250.16	5.46	15	754.32	49.44	25	1270.2	139.11
10	258.51	5.83	10	762.80	50.55	10	1279.0	141.01
20	266.86	6.21	20	771.29	51.68	20	1287.7	142.93
30	275.21	6.61	30	779.77	52.89	30	1296.5	144.85
40	283.57	7.01	40	788.26	53.97	40	1305.3	146.79
50	291.92	7.43	50	796.75	55.13	50	1314.0	148.75
6	300.28	7.86	16	805.25	56.31	26	1322.8	150.71
10	308.64	8.31	10	813.75	57.50	10	1331.6	152.69
20	316.99	8.76	20	822.25	58.70	20	1340.4	154.69
30	325.35	9.23	30	830.76	59.91	30	1349.2	156.70
40	333.71	9.71	40	839.27	61.14	40	1358.0	158.72
50	342.08	10.20	50	847.78	62.38	50	1366.8	160.76
7	350.44	10.71	17	856.30	63.63	27	1375.6	162.81
10	358.81	11.22	10	864.82	64.90	10	1384.4	164.86
20	367.17	11.75	20	873.35	66.18	20	1393.2	166.95
30	375.54	12.29	30	881.88	67.47	30	1402.0	169.04
40	383.91	12.85	40	890.41	68.77	40	1410.9	171.15
50	392.28	13.41	50	898.95	70.09	50	1419.7	173.27
8	400.66	13.99	18	907.49	71.42	28	1428.6	175.41
10	409.03	14.58	10	916.03	72.76	10	1437.4	177.55
20	417.41	15.18	20	924.58	74.12	20	1446.3	179.72
30	425.79	15.80	30	933.13	75.49	30	1455.1	181.89
40	434 17	16.43	40	941.69	76.86	40	1464.0	184.08
50	442.55	17.07	50	950.25	78.26	50	1472.9	186.29
9	450.93	17.72	19	958.81	79.67	29	1481.8	188:51
10	459.32	18.38	10	967.38	81.09	10	1490 7	190.74
20	467.71	19.06	20	975.96	82.53	20	1499 6	192.99
30	476.10	19.75	30	984.53	83.97	30	1508.5	195.25
40	484.49	20.45	40	993.12	85.43	40	1517.4	197.53
50	492.88	21.16	50	1001.7	86.90	50	1526.3	199.82
10	501.28	21.89	20	1010.3	88.39	30	1535.3	202.12
10	509.68	22.62	10	1018.9	89.89	10	1544.2	204 44
20	518.08	23.38	20	1027.5	91.40	20	1553.1	206.77
30	526.48	24.14	30	1036.1	92.92	30	1562.1	209.12
40	534.89	24.91	40	1044.7	94.46	40	1571.0	211.48
50	543.29	25.70	50	1053.3	96.01	50	1580.0	213.86

Table of Stadia Reductions.—Continued.

Min	8°		9°		10°		11°	
	Hor Dist.	Diff. Elev	Hor Dist	Diff. Elev	Hor Dist.	Diff Elev	Hor Dist	Diff Elev.
0'	98.06	13.78	97.55	15.45	96 98	17.10	96 36	18.73
2	98.05	13.84	97 53	15.51	96.96	17.16	96.34	18 78
4	98.03	13.89	97.52	15.56	96 94	17.21	96 32	18 84
6	98.01	13.95	97.50	15.62	96.92	17 26	96.29	18.89
8	98.00	14.01	97.48	15.67	96 90	17.32	96 27	18.95
10	97.98	14 06	97.46	15.73	96 88	17 37	96.25	19.00
12	97.97	14.12	97.44	15.78	96 86	17.43	96 23	19 05
14	97.95	14.17	97.43	15.84	96 84	17.48	96 21	19.11
16	97.93	14 23	97.41	15.89	96.82	17.54	96 18	19.16
18	97.92	14 28	97.39	15.95	96.80	17 59	96.16	19.21
20	97.90	14.34	97.37	16.00	96 78	17.65	96.14	19.27
22	97.88	14.40	97.35	16 06	96.76	17.70	96.12	19.32
24	97.87	14.45	97.33	16.11	96.74	17.76	96.09	19.38
26	97.85	14.51	97.31	16 17	96.72	17.81	96.07	19.43
28	97.83	14.56	97.29	16.22	96 70	17.86	96.05	19.48
30	97.82	14.62	97.28	16.28	96.68	17.92	96.03	19.54
32	97.80	14.67	97.26	16 33	96 66	17 97	96.00	19.59
34	97.78	14.73	97 24	16.39	96.64	18 03	95 98	19 64
36	97.76	14.79	97 22	16.44	96 62	18 08	95 96	19 70
38	97.75	14.84	97.20	16.50	96.60	18.14	95.93	19.75
40	97.73	14.90	97.19	16.55	96 57	18 19	95.91	19.80
42	97.71	14.95	97.16	16 61	96.55	18.24	95.89	19 86
44	97.69	15.01	97.14	16 66	96 53	18 30	95.86	19 91
46	97.68	15 06	97.12	16 72	96.51	18.35	95.84	19 96
48	97.66	15.12	97.10	16.77	96 49	18 41	95.82	20 02
50	97.64	15.17	97.08	16.83	96 47	18.46	95.79	20 07
52	97.62	15.23	97.06	16.88	96 45	18.51	95 77	20.12
54	97.61	15 28	97.04	16 94	96 42	18.57	95 75	20.18
56	97.59	15.34	97 02	16 99	96 40	18 62	95.72	20.23
58	97.57	15.40	97.00	17.05	96.38	18 68	95.70	20.28
60	97.55	15.45	96.98	17 10	96 36	18.73	95.68	20.34
c= .75	74	.11	74	12	74	14	.73	15
c=1.15	1.14	.17	1.13	.19	1 13	21	1.13	.23
c=1.90	1.88	.28	1.87	.31	1.87	35	1 86	.38

Min.	12°		13°		14°		15°	
	Hor. Dist	Diff. Elev	Hor Dist	Diff. Elev	Hor Dist	Diff Elev	Hor. Dist	Diff. Elev.
0'	95.68	20.34	94.94	21.92	94.15	23.47	93.30	25.00
2	95.65	20.39	94.91	21.97	94.12	23.52	93.27	25.05
4	95.63	20.44	94.89	22.02	94.09	23.58	93.24	25.10
6	95.61	20 50	94.86	22.08	94.07	23.63	93.21	25.15
8	95 58	20.55	94.84	22.13	94.04	23.68	93.18	25 20
10	95.56	20.60	94.81	22.18	94.01	23.73	93.16	25.25
12	95.53	20 66	94 79	22 23	93.98	23.78	93.13	25.30
14	95.51	20 71	94.76	22.28	93.95	23.83	93.10	25.35
16	95.49	20.76	94 73	22.34	93.93	23.88	93 07	25.40
18	95.46	20 81	94.71	22.39	93.90	23.93	93.04	25.45
20	95.44	20.87	94.68	22.44	93.87	23.99	93.01	25.50
22	95 41	20.92	94.66	22.49	93.84	24.04	92.98	25.55
24	95.39	20.97	94.63	22.54	93.81	24.09	92.95	25.60
26	95.36	21.03	94.60	22.60	93.79	24.14	92.92	25.65
28	95.34	21.08	94.58	22.65	93.76	24.19	92.89	25.70
30	95.32	21.13	94.55	22.70	93.73	24.24	92.86	25.75
32	95 29	21.18	94.52	22.75	93.70	24.29	92.83	25.80
34	95.27	21.24	94.50	22 80	93.67	24.34	92.80	25.85
36	95.24	21.29	94.47	22.85	93.65	24.39	92.77	25.90
38	95.22	21.34	94.44	22.91	93.62	24.44	92.74	25.95
40	95.19	21.39	94.42	22 96	93.59	24.49	92.71	26.00
42	95.17	21.45	94 39	23 01	93.56	24.55	92.68	26 05
44	95 14	21.50	94.36	23.06	93.53	24.60	92.65	26 10
46	95 12	21.55	94.34	23 11	93.50	24.65	92.62	26.15
48	95.09	21.60	94.31	23.16	93.47	24.70	92.59	26.20
50	95.07	21.66	94.28	23.22	93.45	24.75	92.56	26 25
52	95.04	21.71	94.26	23.27	93.42	24.80	92.53	26.30
54	95.02	21.76	94 23	23.32	93.39	24.85	92.49	26.35
56	94.99	21 81	94.20	23.37	93.36	24.90	92.46	26.40
58	94.97	21 87	94.17	23.42	93 33	24.95	92.43	26.45
60	94.94	21.92	94 15	23.47	93.30	25.00	92.40	26 50
c= .75	73	16	.73	17	.73	19	.72	20
c=1.15	1.12	.25	1.12	27	1 11	29	1.11	.31
1 90	1.85	.41	1.85	44	1.84	48	1.83	.51

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Table of Stadia Reductions.—Continued.

Min	16°		17°		18°		19°	
	Hor. Dist.	Diff Elev	Hor. Dist.	Diff. Elev.	Hor. Dist.	Diff. Elev.	Hor. Dist.	Diff. Elev.
0'	92.40	26 50	91.45	27.96	90.45	29.39	89.40	30.78
2	92.37	26.55	91.42	28.01	90.42	29.44	89.36	30.83
4	92.34	26.59	91.39	28.06	90.38	29.48	89.33	30.87
6	92.31	26 64	91.35	28.10	90.35	29.53	89.29	30 92
8	92 28	26 69	91.32	28.15	90.31	29.58	89.26	30.97
10	92.25	26.74	91 29	28.20	90 28	29.62	89.22	31.01
12	92.22	26.79	91.26	28.25	90.24	29.67	89.18	31 06
14	92.19	26.84	91.22	28.30	90.21	29.72	89.15	31.10
16	92.15	26 89	91.19	28.34	90.18	29.76	89 11	31.15
18	92.12	26.94	91.16	28.39	90.14	29.81	89.08	31.19
20	92.09	26.99	91 12	28.44	90 11	29.86	89.04	31.24
22	92 06	27 04	91.09	28.49	90 07	29.90	89.00	31.28
24	92 03	27 09	91.06	28.54	90 04	29.95	88.96	31 33
26	92.00	27 13	91.02	28 58	90.00	30.00	88.93	31.38
28	91 97	27.18	90.99	28.63	89.97	30 04	88.89	31.42
30	91.93	27 23	90.96	28.68	89.93	30.09	88.86	31.47
32	91.90	27.28	90 92	28.73	89 90	30.14	88 82	31.51
34	91 87	27.33	90.89	28.77	89.86	30.19	88.78	31.56
36	91.84	27.38	90 86	28 82	89 83	30.23	88 75	31.60
38	91.81	27 43	90 82	28.87	89.79	30 28	88.71	31.65
40	91.77	27 48	90.79	28.92	89.76	30.32	88.67	31.69
42	91.74	27.52	90.76	28 96	89.72	30 37	88.64	31.74
44	91 71	27 57	90 72	29 01	89 69	30.41	88.60	31.78
46	91.68	27 62	90 69	29 06	89.65	30.46	88.56	31.83
48	91.65	27 67	90 66	29 11	89.61	30.51	88.53	31.87
50	91.61	27 72	90.62	29 15	89 58	30.55	88.49	31.92
52	91 58	27 77	90.59	29.20	89.54	30.60	88.45	31.96
54	91.55	27.81	90.55	29 25	89.51	30.65	88.41	32 01
56	91 52	27 86	90 52	29.30	89.47	30 69	88.38	32.05
58	91 48	27.91	90.48	29.34	89.44	30 74	88.34	32.09
60	91 45	27.96	90.45	29.39	89.40	30.78	88 30	32.14
c= .75	.72	.21	72	.23	.71	.24	.71	.25
c=1.15	1 10	33	1 10	35	1.09	.37	1.08	.38
c=1.90	1 82	.54	1 81	57	1.80	60	1.79	.63

Min.	20°		21°		22°		23°	
	Hor. Dist.	Diff. Elev.	Hor. Dist.	Diff. Elev.	Hor. Dis.	Diff. Elev.	Hor. Dist.	Diff. Elev
0'	88.30	32.14	87.16	33 46	85.97	34 73	84.73	35 97
2	88.26	32.18	87.12	33.50	85.93	34.77	84.69	36.01
4	88 23	32 23	87.08	33.54	85.89	34.82	84.65	36 05
6	88.19	32.27	87.04	33.59	85.85	34 86	84.61	36 09
8	88.15	32.32	87.00	33.63	85.80	34.90	84 57	36.13
10	88.11	32.36	86.96	33.67	85.76	34.94	84.52	36.17
12	88 08	32.41	86.92	33.72	85.72	34.98	84.48	36.21
14	88 04	32.45	86.88	33.76	85.68	35 02	84.44	36.25
16	88 00	32.49	86.84	33.80	85.64	35.07	84.40	36 29
18	87.96	32.54	86.80	33.84	85.60	35.11	84.35	36.33
20	87.93	32.58	86.77	33.89	85.56	35 15	84.31	36 37
22	87.89	32.63	86.73	33.93	85.52	35.19	84.27	36.41
24	87.85	32.67	86.69	33.97	85.48	35.23	84.23	36.45
26	87.81	32.72	86.65	34.01	85.44	35.27	84.18	36.49
28	87.77	32.76	86.61	34.06	85.40	35 31	84.14	36.53
30	87.74	32.80	86.57	34.10	85.36	35.36	84.10	36.57
32	87.70	32.85	86.53	34.14	85.31	35.40	84.06	36 61
34	87.66	32.89	86.49	34.18	85.27	35.44	84.01	36.65
36	87.62	32.93	86 45	34 23	85.23	35.48	83 97	36.69
38	87.58	32 98	86.41	34.27	85.19	35.52	83.93	36.73
40	87.54	33.02	86.37	34.31	85.15	35.56	83.89	36.77
42	87.51	33.07	86.33	34.35	85.11	35.60	83.84	36 80
44	87.47	33.11	86.29	34.40	85.07	35.64	83.80	36.84
46	87.43	33.15	86.25	34.44	85.02	35.68	83.76	36.88
48	87.39	33.20	86.21	34.48	84.98	35.72	83 72	36.92
50	87.35	33.24	86.17	34.52	84.94	35.76	83 67	36.96
52	87.31	33.28	86.13	34.57	84.90	35.80	83 63	37.00
54	87 27	33.33	86.09	34.61	84.86	35.85	83.59	37.04
56	87 24	33.37	86.05	34.65	84.82	35 89	83.54	37 08
58	87 20	33.41	86.01	34.69	84.77	35.93	83.50	37.12
60	87.16	33.46	85.97	34.73	84.73	35.97	83.46	37.16
c= .75	.70	.26	.70	.27	.69	.29	.69	.30
c=1.15	1.08	.40	1.07	.42	1.06	.44	1.05	.46
c=1.90	1.78	.66	1.77	70	1.76	.73	1.74	.76

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NATURAL TRIGONOMETRICAL RATIOS

Angle. ° ′	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
16	.2756	.2867	1.0403	3.628	3.487	.96126	74
10	.2784	.2899	1.0412	3.592	3.450	.96046	50
20	.2812	.2931	1.0423	3.556	3.412	.95964	40
30	.2840	.2962	1.0429	3.521	3.376	.95882	30
40	.2868	.2994	1.0438	3.487	3.340	.95799	20
50	.2896	.3026	1.0448	3.453	3.305	.95715	10
17	.2924	.3057	1.0457	3.420	3.271	.95630	73
10	.2952	.3089	1.0466	3.388	3.237	.95545	50
20	.2979	.3121	1.0476	3 357	3.204	.95459	40
30	.3007	.3153	1.0485	3.326	3.172	.95372	30
40	.3035	.3185	1.0495	3.295	3.140	.95284	20
50	.3062	.3217	1.0505	3.265	3.108	.95195	10
18	.3090	.3249	1.0515	3.236	3.078	.95106	72
10	.3118	.3281	1.0525	3.207	3.048	.95015	50
20	.3145	.3314	1.0535	3.179	3.018	.94924	40
30	.3173	.3346	1.0545	3.152	2.989	.94832	30
40	.3201	.3378	1.0555	3.124	2.960	.94740	20
50	.3228	.3411	1.0566	3.098	2.932	.94646	10
19	.3256	.3443	1.0576	3.072	2.904	.94552	71
10	.3283	.3476	1 0587	3.046	2.877	.94457	50
20	.3311	.3508	1.0598	3.020	2.850	.94361	40
30	.3338	.3541	1.0608	2.996	2.824	.94264	30
40	.3365	.3574	1.0619	2.971	2.798	.94167	20
50	.3393	.3607	1.0631	2.947	2.773	.94068	10
20	.3420	.3640	1.0642	2.924	2.747	.93969	70
10	.3448	.3673	1.0653	2.900	2.723	.93869	50
20	.3475	.3706	1.0665	2.878	2.699	.93769	40
30	.3502	.3739	1.0676	2.856	2.675	.93667	30
40	.3529	.3772	1.0688	2.833	2.651	.93565	20
50	.3557	.3805	1.0700	2.811	2.628	.93462	10
21	.3584	.3839	1.0711	2.790	2.605	.93358	69
10	.3611	.3872	1.0723	2.769	2.583	.93253	50
20	.3638	.3906	1.0736	2.749	2.560	.93148	40
30	.3665	.3939	1.0748	2.729	2.539	.93042	30
40	.3692	.3973	1.0760	2.709	2.517	.92935	20
50	.3719	.4006	1.0773	2.689	2.496	.92827	10
22	.3746	.4040	1.0785	2.670	2.475	.92718	68
10	.3773	.4074	1.0798	2.650	2.455	.92609	50
20	.3800	.4108	1.0811	2.632	2.434	.92499	40
30	.3827	.4142	1.0824	2.613	2.414	.92388	30
40	.3854	.4176	1.0837	2.595	2.394	.92276	20
50	.3881	.4210	1.0850	2.577	2.375	.92164	10
23	.3907	.4245	1.0864	2.559	2.356	.92050	67
10	.3934	.4279	1.0877	2.542	2.337	.91936	50
20	.3961	.4314	1.0891	2.525	2.318	.91822	40
30	.3987	.4348	1.0904	2.508	2.300	.91706	30
40	.4014	.4383	1.0918	2.491	2.282	.91590	20
50	.4041	.4417	1.0932	2.475	2.264	.91472	10
							66
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.

Angle. ° ′	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
24	.4067	.4452	1.0946	2.459	2.246	.91355	66
10	.4094	.4487	1.0961	2.443	2.229	.91236	50
20	.4120	.4522	1.0975	2.427	2.211	.91116	40
30	.4147	.4557	1.0989	2.411	2.194	.90996	30
40	.4173	.4592	1.1004	2.396	2.177	.90875	20
50	.4200	.4628	1.1019	2.381	2.161	.90753	10
25	.4226	.4663	1.1034	2.366	2.145	.90631	65
10	.4253	.4699	1.1049	2.351	2.128	.90507	50
20	.4279	.4734	1.1064	2.337	2.112	.90383	40
30	.4305	.4770	1.1079	2.323	2.097	.90259	30
40	.4331	.4806	1.1095	2.309	2.081	.90133	20
50	.4358	.4841	1.1110	2.295	2.066	.90007	10
26	.4384	.4877	1.1126	2.281	2.050	.89879	64
10	.4410	.4913	1.1142	2.268	2.035	.89752	50
20	.4436	.4950	1.1158	2.254	2.020	.89623	40
30	.4462	.4986	1.1174	2.241	2.006	.89493	30
40	.4488	.5022	1.1190	2.228	1.991	.89363	20
50	.4514	.5059	1.1207	2.215	1.977	.89232	10
27	.4540	.5095	1.1223	2.203	1.963	.89101	63
10	.4566	.5132	1.1240	2.190	1.949	.88968	50
20	.4592	.5169	1.1257	2.178	1.935	.88835	40
30	.4617	.5206	1.1274	2.166	1.921	.88701	30
40	.4643	.5243	1.1291	2.154	1.907	.88566	20
50	.4669	.5280	1.1308	2.142	1.894	.88431	10
28	.4695	.5317	1.1326	2.130	1.881	.88295	62
10	.4720	.5354	1.1343	2.119	1.868	.88158	50
20	.4746	.5392	1.1361	2.107	1.855	.88020	40
30	.4772	.5430	1.1379	2.096	1.842	.87882	30
40	.4797	.5467	1.1397	2.085	1.829	.87743	20
50	.4823	.5505	1.1415	2.073	1.816	.87603	10
29	.4848	.5543	1.1434	2.063	1.804	.87462	61
10	.4874	.5581	1.1452	2.052	1.792	.87321	50
20	.4899	.5619	1.1471	2.041	1.780	.87178	40
30	.4924	.5658	1.1490	2.031	1.767	.87036	30
40	.4950	.5696	1.1509	2.020	1.756	.86892	20
50	.4975	.5735	1.1528	2.010	1.744	.86748	10
30	.5000	.5774	1.1547	2.	1.732	.86603	60
10	.5025	.5812	1.1566	1.990	1.720	.86457	50
20	.5050	.5851	1.1586	1.980	1.709	.86310	40
30	.5075	.5890	1.1606	1.970	1.698	.86163	30
40	.5100	.5930	1.1626	1.961	1.686	.86015	20
50	.5125	.5969	1.1646	1.951	1.675	.85866	10
31	.5150	.6009	1.1666	1.942	1.664	.85717	59
10	.5175	.6048	1.1687	1.932	1.653	.85567	50
20	.5200	.6088	1.1707	1.923	1.643	.85416	40
30	.5225	.6128	1.1728	1.914	1.632	.85264	30
40	.5250	.6168	1.1749	1.905	1.621	.85112	20
50	.5275	.6208	1.1770	1.896	1.611	.84959	10
							58
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.

NATURAL TRIGONOMETRICAL RATIOS

Angle. ° ′	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
32	.5299	.6249	1.1792	1.887	1.600	.84805	58
10	.5324	.6289	1.1813	1.878	1.590	.84650	50
20	.5348	.6330	1.1835	1.870	1.580	.84495	40
30	.5373	.6371	1.1857	1.861	1.570	.84339	30
40	.5398	.6412	1.1879	1.853	1.560	.84182	20
50	.5422	.6453	1.1901	1.844	1.550	.84025	10
33	.5446	.6494	1.1924	1.836	1.540	.83867	57
10	.5471	.6536	1.1946	1.828	1.530	.83708	50
20	.5495	.6577	1.1969	1.820	1.520	.83549	40
30	.5519	.6619	1.1992	1.812	1.511	.83389	30
40	.5544	.6661	1.2015	1.804	1.501	.83228	20
50	.5568	.6703	1.2039	1.796	1.492	.83066	10
34	.5592	.6745	1.2062	1.788	1.483	.82904	56
10	.5616	.6787	1.2086	1.781	1.473	.82741	50
20	.5640	.6830	1.2110	1.773	1.464	.82577	40
30	.5664	.6873	1.2134	1.766	1.455	.82413	30
40	.5688	.6916	1.2158	1.758	1.446	.82248	20
50	.5712	.6959	1.2183	1.751	1.437	.82082	10
35	.5736	.7002	1.2208	1.743	1.428	.81915	55
10	.5760	.7046	1.2233	1.736	1.419	.81748	50
20	.5783	.7089	1.2258	1.729	1.411	.81580	40
30	.5807	.7133	1.2283	1.722	1.402	.81412	30
40	.5831	.7177	1.2309	1.715	1.393	.81242	20
50	.5854	.7221	1.2335	1.708	1.385	.81072	10
36	.5878	.7265	1.2361	1.701	1.376	.80902	54
10	.5901	.7310	1.2387	1.695	1.368	.80730	50
20	.5925	.7355	1.2413	1.688	1.360	.80558	40
30	.5948	.7400	1.2440	1.681	1.351	.80386	30
40	.5972	.7445	1.2466	1.675	1.343	.80212	20
50	.5995	.7490	1.2494	1.668	1.335	.80038	10
37	.6018	.7536	1.2521	1.662	1.327	.79864	53
10	.6041	.7581	1.2549	1.655	1.319	.79688	50
20	.6065	.7627	1.2577	1.649	1.311	.79512	40
30	.6088	.7673	1.2605	1.643	1.303	.79335	30
40	.6111	.7720	1.2633	1.636	1.295	.79158	20
50	.6134	.7766	1.2661	1.630	1.288	.78980	10
38	.6157	.7813	1.2690	1.624	1.280	.78801	52
10	.6180	.7860	1.2719	1.618	1.272	.78622	50
20	.6202	.7907	1.2748	1.612	1.265	.78442	40
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle.

Angle. ° ′	Sine.	Tan.	Sec.	Cosec.	Cotg.	Cosin.	
30	.6225	.7954	1.2778	1.606	1.257	.78261	30
40	.6248	.8002	1.2808	1.601	1.250	.78079	20
50	.6271	.8050	1.2838	1.595	1.242	.77897	10
39	.6293	.8098	1.2868	1.589	1.235	.77715	51
10	.6316	.8146	1.2898	1.583	1.228	.77531	50
20	.6338	.8195	1.2929	1.578	1.220	.77347	40
30	.6361	.8243	1.2959	1.572	1.213	.77162	30
40	.6383	.8292	1.2991	1.567	1.206	.76977	20
50	.6406	.8342	1.3022	1.561	1.199	.76791	10
40	.6428	.8391	1.3054	1.556	1.192	.76604	50
10	.6450	.8441	1.3086	1.550	1.185	.76417	50
20	.6472	.8491	1.3118	1.545	1.178	.76229	40
30	.6494	.8541	1.3151	1.540	1.171	.76041	30
40	.6517	.8591	1.3184	1.535	1.164	.75851	20
50	.6539	.8642	1.3217	1.529	1.157	.75661	10
41	.6561	.8693	1.3251	1.524	1.150	.75471	49
10	.6583	.8744	1.3284	1.519	1.144	.75280	50
20	.6604	.8796	1.3318	1.514	1.137	.75088	40
30	.6626	.8847	1.3352	1.509	1.130	.74896	30
40	.6648	.8899	1.3386	1.504	1.124	.74703	20
50	.6670	.8952	1.3421	1.499	1.117	.74509	10
42	.6691	.9004	1.3456	1.494	1.111	.74314	48
10	.6713	.9057	1.3492	1.490	1.004	.74120	50
20	.6734	.9110	1.3527	1.485	1.098	.73924	40
30	.6756	.9163	1.3563	1.480	1.091	.73728	30
40	.6777	.9217	1.3600	1.476	1.085	.73531	20
50	.6799	.9271	1.3636	1.471	1.079	.73333	10
43	.6820	.9325	1.3673	1.466	1.072	.73135	47
10	.6841	.9380	1.3711	1.462	1.066	.72937	50
20	.6862	.9435	1.3748	1.457	1.060	.72737	40
30	.6884	.9490	1 3786	1.453	1.054	.72537	30
40	.6905	.8545	1.3824	1.448	1.048	.72337	20
50	.6926	.9601	1.3863	1.444	1.042	.72136	10
44	.6947	.9657	1.3902	1.440	1.036	.71934	46
10	.6967	.9713	1.3941	1.435	1.030	.71732	50
20	.6988	.9770	1.3980	1.431	1.024	.71529	40
30	.7009	.9827	1.4020	1.427	1.018	.71325	30
40	.7030	.9884	1.4061	1.422	1.012	.71121	20
50	.7050	.9942	1.4101	1.418	1.006	.70916	10
	.7071	1.	1.414	1.414	1.	.70711	45
	Cosin.	Cotg.	Cosec.	Sec.	Tan.	Sine.	Angle

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