JOINT COORDINATES

1	0.0	$27.9333 + .02\frac{1}{2}(\overset{1.2017'}{61.0833}) = 29.1550'$	Support
2	16.5833	$29.1550 - .02\frac{1}{2}(16.5833) = 28.8233$	
3	31.4167	$28.8233 - .02\frac{1}{2}(14.8333) = 28.5267$	
4	46.25	$28.5267 - .02\frac{1}{2}(14.83) = 28.2300$	
5	61.0833	$28.23 - .02(14.83) = 27.9333$	
6	75.9167	$27.9333 - .02(2.1667) + .02\frac{1}{2}(10.6667) = 28.1033$	
7	90.7500	$28.1033 + .02(14.8333) = 28.4000$	
8	106.1667	$28.4000 + .02(15.4167) = 28.7083$	
9	16.5833	0	support
10	31.4167	0	support
11	46.25	0	support
12	61.0833	0	support
13	75.9167	0	support
14	90.75	0	support.

Member properties prismatic

9 10 11 12 $AX = \frac{7}{12} = .5833$ $IZ = \frac{(\frac{7}{12})^3}{12} = .0165^{ft^3}$ $YD = .583^{ft}$ $YC = .2917^{ft}$

3300333 22

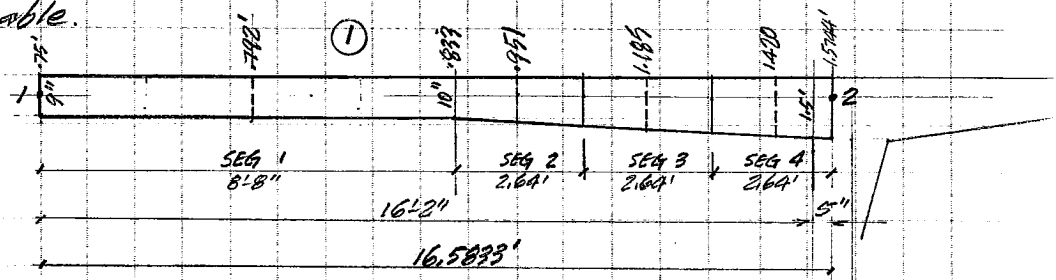
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash Floating Br. Stage 2 Sheet No. 161 of ____ sheets

S. R. 90 Made by YMT Check by ____ Date ____ Supv. ____

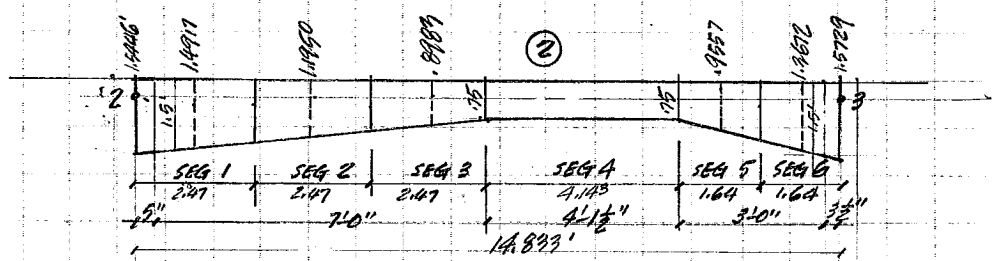
Member properties variable.

IZ: HP25 ↑ 3 f 3 12 1/1



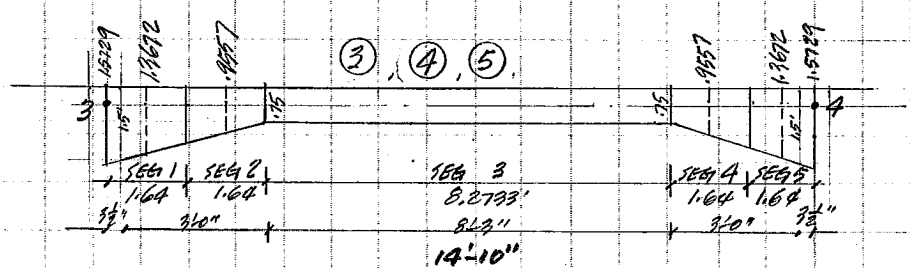
①

SEG 1	AX = .792	IZ = .0413	YD = .792	YC = .396	L = 8.66	16.58'
2	.951	.0716	.951	.475	2.64	
3	1.1853	.1388	1.185	.593	2.64	
4	1.420	.2386	1.420	.710	2.64	



②

SEG 1	AX = 1.4917	IZ = .2766	YD = 1.4917	YC = .7458	L = 2.47	14.83'
2	1.1950	.1422	1.1950	.5975	2.47	
3	.8983	.0604	.8983	.4492	2.47	
4	.75	.0352	.75	.3750	4.14	
5	.9557	.0727	.9557	.4779	1.64	
6	1.3672	.2130	1.3672	.6836	1.64	



③ ④ ⑤

SEG 1	AX = 1.3672	IZ = .2130	YD = 1.3672	YC = .6836	L = 1.64	14.83'
2	.9557	.0727	.9557	.4779	1.64	
3	.75	.0352	.75	.3750	8.27	
4	.9557	.0727	.9557	.4779	1.64	
5	1.3672	.2130	1.3672	.6836	1.64	

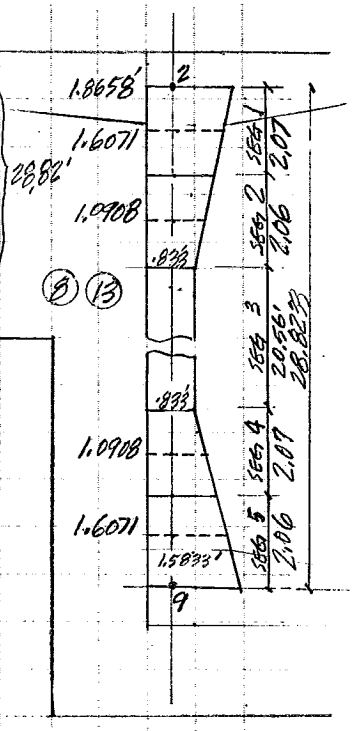
⑥ reverse of member ②

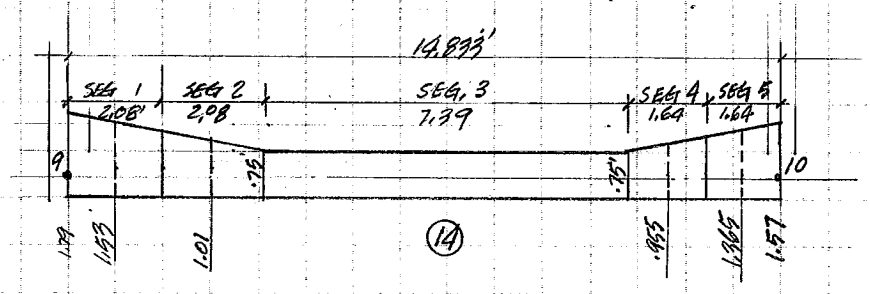
⑦ reverse of member ① but member length 15'-5" (15.4167') vs 16'-7" (16.583') and seg. length.

33003333

(8) (13)

SEG	1	AX=1.6071	IZ=.3459	YD=1.6071	YC=.8035	L=2.07
	2	1.0908	.1082	1.0908	.5454	2.06
	3	.8333	.0482	.8333	.4167	20.56
	4	1.0908	.1082	1.0908	.5454	2.06
	5	1.6071	.3459	1.6071	.8035	2.07





(14)

SEG	1	AX=1.530	IZ=.2985	YD=1.530	YC=.765	L=2.08
	2	1.010	.0859	1.010	.505	2.08
	3	.750	.0352	.75	.375	7.39
	4	.955	.0726	.955	.478	1.64
	5	1.365	.2119	1.365	.683	1.64

(15) (16) (17) similar to (3), (4), (5)

(18) reverse of member (14)

CONSTANTS

$E_c = W^{1.5}\, 33\sqrt{f'_c} = 155^{1.5}\, 33\sqrt{5000}\ \frac{144}{1000} = 648{,}424\ k/\square'$ ALL

$G = \frac{E}{2(1+\nu)} = \frac{648{,}424\ k/\square'}{2(1+.15)} = 281{,}923\ k/\square'$ ALL

CTE .000006 ALL

33003334

Loading 1 (DEAD LOAD)

JOINT 1 LOAD FORCE Y $\frac{-15^{\#}}{1000} = -.015^{k/}$ Railing Lt.

" 8 " " Y = $-.409^{k/}$ Traffic Barrier Rt.

MEMBER LOADS

1 FORCE Y GLO CON P -.357 L = 10.45' Traffic Barrier

5 " " " " P -.491 L = 3.17' Traffic Barrier

1 THRU 7 FORCE Y GLO UNI W -.139 — ½ asphalt $\frac{1\frac{1}{2}}{12}(.15) = .0188^{k/}$, 9" slab $.75(.16) = .12$ } $.1388^{k/}$

1 FORCE Y GLO ~~LIN~~ UNI FR ~~WA 0.0~~ W -.006 ~~WB -.013~~ LA 0.0 LB .52 — $\frac{11}{12}(.16^{kf}) = .0133$

1 " " " " " ~~" -.013~~ W -.053 ~~" -.132~~ LA .52 LB 1.00 — $(1.5744 - .75).16 = .1319^{k/}$

2 FORCE Y GLO ~~LIN~~ UNI FR ~~WA -.127~~ W -.052 ~~WB 0.0~~ LA 0.0 LB .50 — $(1.5446 - .75).16 = .1271$

2 " " " " " ~~0.0~~ W -.048 ~~-.132~~ LA .78 LB 1.0 — $(1.5729 - .75).16 = .1317$

3 4 5 FORCE Y GLO ~~LIN~~ UNI FR ~~WA -.132~~ W -.048 ~~WB 0.0~~ LA 0.0 LB .22

3 4 5 " " " " " ~~0.0~~ W -.048 ~~" -.132~~ LA .78 LB 1.0

6 FORCE Y GLO ~~LIN~~ UNI FR ~~WA -.132~~ W -.048 ~~WB 0.0~~ LA 0.0 LB .22

6 " " " " " ~~WA 0.0~~ W -.052 ~~WB -.127~~ LA .50 LB 0.0

7 FORCE Y GLO ~~LIN~~ UNI FR ~~WA -.132~~ W -.053 ~~WB -.013~~ LA 0.0 LB .50

7 " " " " " ~~WA -.013~~ W -.006 ~~WB 0.0~~ LA .50 LB 1.00

8 13 FORCE Y GLO UNI W -.133 — $\frac{10''}{12}(.160) = .133$

8 13 FORCE Y GLO ~~LIN~~ UNI FR ~~WA -.165~~ W -.058 ~~WB 0.0~~ LA 0.0 LB .14 — $(1.8658 - \frac{10}{12}).16 = .1652^{k/}$

8 13 " " " " " ~~WA 0.0~~ W -.058 ~~WB -.165~~ LA .86 LB 1.0

9 10 11 12 FORCE Y GLO UNI W -.093 — $\frac{7}{12}(.16) = .0933^{k/}$

14 THRU 18 FORCE Y GLO UNI W -.120$^{k/}$ — $.75(.16) = .120^{k/}$

14 FORCE Y GLO ~~LIN~~ UNI FR ~~WA -.166~~ W -.062 ~~WB 0.0~~ LA 0.0 LB .28 — $(1.77 - .75).16 = .1669^{k/}$

14 FORCE Y GLO ~~LIN~~ UNI FR ~~WA 0.0~~ W -.048 ~~WB -.131~~ LA .78 LB 1.0 — $(1.57 - .75).16 = .1312^{k/}$

15 16 17 FORCE Y GLO ~~LIN~~ UNI FR ~~WA -.132~~ W -.048 ~~WB 0.0~~ LA 0.0 LB .22

15 16 17 " " " " " ~~0.0~~ W -.048 ~~-.132~~ " .78 " 1.0

3300333325

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project..... Sheet No. 170 of ..... sheets

S. R..... Made by..... Check by..... Date..... Supv.....

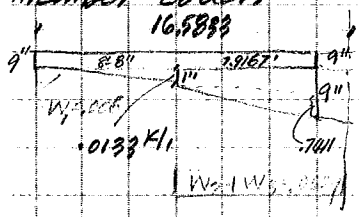
18	FORCE	Y	GLO	~~LIN~~ UNI	FR	~~WA -.131~~ WI -.048	WB 0.0	LA 0.0	LB .22
18	"	"	"	~~LIN~~ UNI	"	WA 0.0	~~WB -.166~~ WI -.062	LA .72	LB 1.00

33003326

Revised the triangular load to fit our inhouse "STRUDL" program work limitation.

member Loads

(1)



Moment effect:

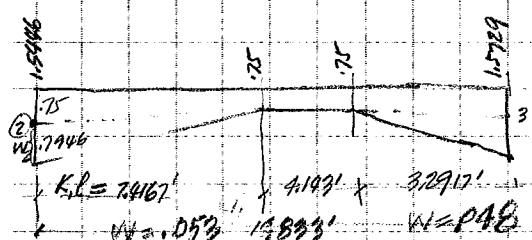
$$\left[\tfrac{1}{2}(8.67')\left(\tfrac{1}{12}\right).160^{kcf}\right]\cdot\left(\frac{8.67}{3}+7.9167\right) = W_1(8.87)\left(\frac{8.87}{2}+7.9167\right) \qquad W_1 = .0059^{K/'}$$

.6234

$$\left[\tfrac{1}{2}(7.917)(.7411).160\right]\left(\frac{7.9167}{3}\right) = W_2\left(\frac{7.9167}{2}\right)^2 \qquad W_2 = .0395^{K/'}$$

$$W_3 = \tfrac{1}{12}(.16) = .0133 \quad \Big\} .0529^{K/'}$$

(2)



$K_1 = \frac{7.4167}{l}$

$W_2 = .7946(.16) = .1271$

$k_2 = \frac{3.2917}{14.833} = .2219$

$w = (1.5729 - .75).16 = .1317$

$$\frac{W_2 L^2 k_1^2}{60}(10-10k_1+3k_1^2) = \frac{wL^2}{12}k_1^2(6-8k_1+3k_1^2)$$

HP11C

STO W_2 7
STO L 8
STO k_1 9

g P/R
f CLR PRGM
f LBL $\boxed{A}$

$10-10k_1+3k_1^2$:
RCL 9
ENTER X
3 X
RCL 9
10 X
−
10 +

$6-8k_1+3k_1^2$:
RCL 9
ENTER X
3 X
RCL 9
8 X
−
6 +
1/1

$\frac{W_2 L^2 k_1^2}{60}$:
RCL 9
ENTER X X
RCL 8
ENTER X X
RCL 7 X
60 1/1

STO 4
(f PSE) 2

RCL 9
ENTER X 1/1
RCL 8
ENTER X 1/1
12 X
STO 5
(f PSE) 2

check $\frac{W_2 L^2 k^2}{60}(10-10k_1+3k_1^2)$

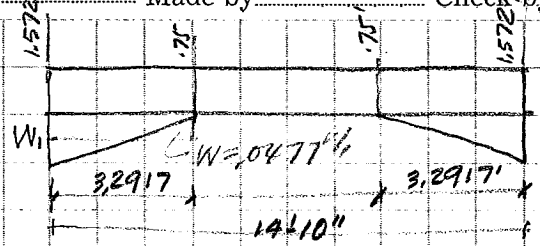
check $\frac{wL^2}{12}k_1^2(6-8k_1+3k_1^2)$

RCL 9
ENTER X
3 X
RCL 9
8 X
−
6 +

RCL 9
↑ X X
RCL 8
↑ X X
12 1/1
RCL 5 X
STO 6
g RTN
g P/R

33003327

(3), (4), (5)



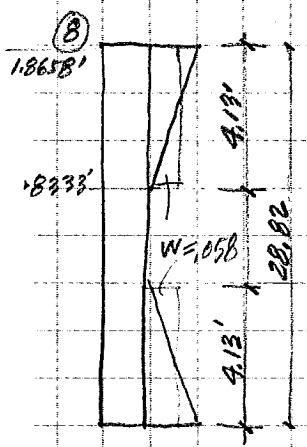
$W_1 = (1.5729 - .75).16 = .1317^k$ STO 7

$k = \frac{3.2917}{14.83} = .2219$ STO 9

$L = 14.83$ STO 8

Equiv. $W = .0477^{k}/'$

(8)



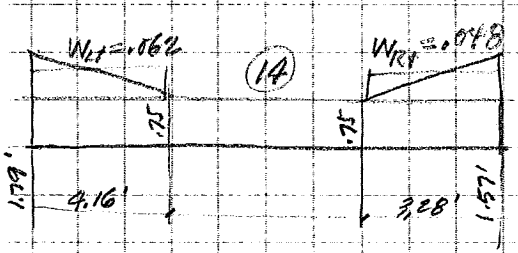
$W_1 = (1.8658 - .83).16 = .1652$

$L = 28.82$

$k = \frac{4.13}{28.82} = .1433$

Equiv. $W = .0580$

(14)



$W_{Lt} = (1.79 - .75).16 = .1664$

$L = 14.833'$

$k = \frac{4.16}{L} = .2804$

$W_{Lt} = .062^{k}/'$

$W_{Rt} = (1.57 - .75).16 = .1312$

$L = 14.83$

$k = \frac{3.28}{L} = .2211$

$W_{Rt} = .048$

3300338