WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash Fltg Bridge stage II Sheet No. 150 of ..... sheets
S. R. 90 Made by YMT Check by ..... Date 5/83 Supv. YFC/RTS

Rdwy slab reinf. steel @ Temp. construction condition

1. without cantilever slab in place.
2. H-10
3. secondary moment effect due to P.S. of vertical wall, Bot. slab or combination of both

Moments @ Face of support – Ext. cell near $\cdot 1L_2$

$-M_D = 1.763 - (1.763 - .216)\frac{(21'-5'')/12}{1.483}$ (.8989) $= .372^{k'}$ tension top

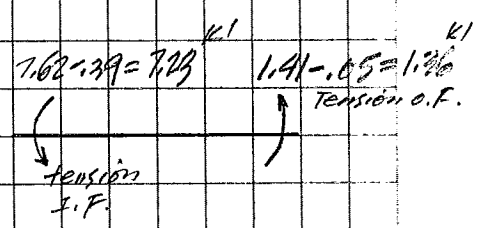
$-M_{L+I} = \frac{1}{2}[4.171 - (4.171 - .626)\cdot 899] = .492^{k'}$ H-10 equiv. approx $\frac{1}{2}$(HS-20)

$-M_H = 5.504 - (5.504 - 4.791)\cdot 899 = 4.863^{k'}$

$-M_{NW} = 30\%[22.03 - (22.03 - 19.16)\cdot 899] = 5.835^{k'}$

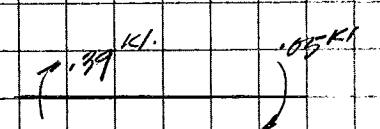
$-M_T = 5.727 - (5.727 - 4.938)\cdot 899 = 5.018^{k'}$

M_S case C. Vertical & Bot slab P.T.



$M_S = 7.23 - (7.23 + 1.36)\cdot 0899 = 6.458^{k'}$

Case D. Bot. slab P.T.



$M_S = .39 - (.39 + .05)\cdot 0899 = .350^{k'}$

33003306

DOT FORM 232-007 REVISED 9/81

Sheet No. 1

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash. Floating Bridge - Stage II Sheet No. 151 of ____ sheets
S. R. 90 Made by YMT. Check by ____ Date ____ Supv. [illegible]

Transverse Design → pontoon D near Wall S (Rdwy. slab reinf. @ Temp. construction condition)
Section at Face of support

$t = 21''$ $e =$ $M_{pe} =$
$A =$ $S =$ * case C secondary Moment by Vertical Wall P.T.
D " " " Vert. wall + Bot. slab P.T.

Group S①: D + H + (L + I) + $M_{P/S}$ 100%

	Case C	Case D	Case E
M_D	-.372		
M_H	-4.863		
M_L	-.492		
M_{pe}	—		
M_{end}	7.23	-.39	
	1.503	-6.117	

Group S③: S① + .3 Wave 125%

	Case A	Case B	Case C
S①	1.503	-6.117	
.3W	-5.835	-5.835	
	-4.332	-11.952	

Group S④: S① + T 125%

	Case A	Case B	Case C
S①		-6.117	
T		-5.018	
		-11.135	

Group S⑥: S③ + T 140%

	Case A	Case B	Case C
S③		-11.952	
T		-5.018	

$M_W = -16.970$ @ 140% $= 12.12^{k'}$

#5 @ 7" $A_s = .53^{in^2/1}$

$d = 21'' - 1\frac{1}{2}'' - 1.5(\overset{\#5}{.7}) = 18.45''$

$p = \frac{A_s}{bd} = \frac{.53}{12(18.45)} = .0024$ $n = \frac{E_s}{E_c} = \frac{29{,}000^{ksi}}{4502} \doteq 7$ $K = .167$ $j = .94$

$M_R = A_s f_s j d = .53(24^{ksi}).94(18.4)\frac{1}{12} = 18.4^{k'} > M_W.$

33003307

Rdwy slab reinf. steel.

Moments @ .3L3

$M_D = 1.61^{K'}$

$M_{L+I} = -.33^{K'}, +3.23^{K'}$

$M_H = -3.36^{K'}$

$M_{NAW} = 30\%(-13.42^{K'}) = -4.03^{K'}$

$M_T = \pm 3.36^{K}$

M_s case C $= 7.23 - (7.23 + 1.36) \cdot .3 = 4.65^{K'}$ tension I.F.

D $= .39 - (.39 + .05) \cdot .3 = .26$ "

Moments @ .5L3

$M_D = 1.75^{K'}$

$M_{L+I} = -1.06^{K'}, +3.96.$

$M_H = -1.99^{K'}$

$M_{NAW} = 30\%(-7.68) = -2.30^{K'}$

$M_T = \pm 1.78^{K'}$

M_s case C $= 7.23 - (7.23 + 1.36) \cdot .5 = 2.94^{K}$ Tension I.F.

D $= .39 - (.39 + .05) \cdot .5 = .17^{K'}$ "

Moments @ .7L3

$M_D = .42^{K'}$

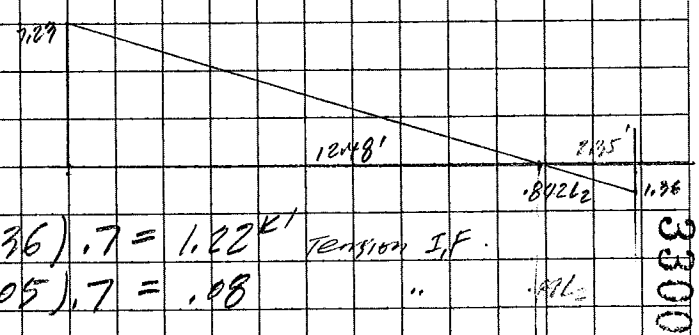
$M_{L+I} = -1.80 \quad +2.78^{K'}$

$M_H = -.51$

$M_{NAW} = 30\%(-1.94) = -.58^{K'}$

$M_T = \pm .20$

$X = \frac{7.23}{7.23 + 1.36}(14.83)$



M_s case C $= 7.23 - (7.23 + 1.36) \cdot .7 = 1.22^{K'}$ Tension I.F.

D $= .39 - (.39 + .05) \cdot .7 = .08$ "

.7L

330033308

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash. Floating Bridge - Stage II Sheet No. 157 of ____ sheets
S. R. 90 Made by YMT. Check by ____ Date ____ Supv. YFC/RTS

Transverse Design — pontoon D near Wall 5 (Rdwy. slab reinf. @ Temp. construction condition)
Section at .3L2

$t = 17.34''$ $e =$ $M_{pe} =$
$A =$ $S =$

Group S①: D + H + (L + I) + $M_{H/S}$ 100%

	Case A	Case B	Case C
M_D	1.61		
M_H	-3.36		
M_L	$-\left(\frac{.66}{2}\right)$	$+\left(\frac{6.46}{2}\right)$	
M_{pe}	—		
M_{end}	4.65 (2.90)	.26 (-1.49)	
	1.91	6.13	-1.82 1.74

Group S③: S① + .3 Wave 125%

	Case A	Case B	Case C
S①	6.13	-1.82	
.3W	-4.03	-4.03	
	2.10	-5.85	

Group S④: S① + T 125%

	Case A	Case B	Case C
S①	6.13		
T	3.36		
M_W =	9.49		

Group S⑥: S③ + T 140%

	Case A	Case B	Case C
S③	2.10	-5.85	
T	3.36	-3.36	
	5.46	-9.21	

#5 @ 7" $A_s = .53^{in^2/'}$

$d = 17.34'' - 1\frac{1}{2}'' - 1.5(.7) = 14.78''$

$p = \frac{A_s}{bd} = \frac{.53}{12(14.78)} = .003$ $K = .185$ $j = .94$

$M_R = A_s f_s jd = .53(24^{ksi})\,.94\,(14.78)\frac{1}{12} = 14.71^{k'} > M_W$
O.K.

33003309

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash. Floating Bridge - Stage II Sheet No. 154 of ____ sheets
S. R. 90 Made by YMT. Check by ____ Date ____ Supv. YPC/RTS

Transverse Design -- pontoon D near Wall 5 (Rdwy. slab reinf. @ Temp. construction condition)
Section at .5L2

$t = 13.85$ $e =$ $M_{pe} =$
$A =$ $S =$

Group S①: D + H + (L + I) + $M_{P/S}$ 100%

	Case A	Case B	Case C
M_D	1.75		
M_H	-1.94		
M_L	$-(\frac{2.12}{2})$	$(\frac{7.92}{2})$	
M_{pe}	—		
M_{grd}	2.94	.17	
	(2.75)	(-.02)	
	1.69	6.71	-1.08
			3.94

Group S③: S① + .3 Wave 125%

	Case A	Case B	Case C
S①	6.71	-1.08	
.3W	-2.30	-2.30	
	4.41	-3.38	

Group S④: S① + T 125%

	Case A	Case B	Case C
S①	6.71	-1.08	
T	1.78	-1.78	
	8.49	-2.86	

Group S⑥: S③ + T 140%

	Case A	Case B	Case C
S③	4.41	-3.38	
T	1.78	-1.78	
	6.19	-5.16	

#5 @ 7" $A_s = .53 \text{ in}^2/1$

$d = 13.85 - 1\frac{1}{2} - 1.5(.7) = 11.3''$

$p = \frac{.53}{12(11.3)} = .0039$ $pn = .0274$ $K = .208$ $j = .93$

$M_R = A_s f_s j d = .53(29^{ksi}) .93 (11.3) \frac{1}{12} = 11.14^{k'} > M_W$ o.k.

33003310

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash. Floating Bridge - Stage I Sheet No. 155 of ____ sheets
S. R. 90 Made by YMT. Check by ____ Date ____ Supv. YPC/RTS

Transverse Design — pontoon D near Wall 5 (Rdwy. slab reinf. @ Temp. construction condition)
Section at .7L2

$t = 10.36$ $e =$ $M_{pe} =$
$A =$ $S =$

Group S①: D + H + (L + I) + $M_{P/S}$ 100%

	Case A	Case B	Case C
M_D	.42 k'	"	
M_H	-.51		
M_L	$-\frac{3.59}{2}$ $\frac{5.56}{2}$	"	
M_{pe}	—		
M_{end}	1.22 (1.13)	.08 -.01	
	-.67 3.91	-1.81 2.77	

Group S③: S① + .3 Wave 125%

	Case A	Case B	Case C
S①	3.91	-1.81	
.3W	-.58	-.58	
	3.33	-2.39	

Group S④: S① + T 105%

	Case A	Case B	Case C
S①	3.91	-1.81	
T	.20	-.20	
	4.11	-2.01	

Group S⑥: S③ + T 140%

	Case A	Case B	Case C
S③	3.33	-2.39	
T	+.20	-.20	
	3.53 k'	2.59 k'	

$A_s = .53^{in^2}/'$ #5 @ 7"

$d = 10.36 - 2.55" = 7.81^{in}$

$p = \frac{.53}{12(7.81)} = .0057$ $pn = .0396$ $k = .2446$ $j = .919 \pm .92$

$M_R = A_s f_s j d = .53(24^{ksi}).92(7.81)\frac{1}{12} = 7.6^{k'} > M_W$
O.K.

33003311

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project..... Sheet No. 106 of..... sheets

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

Moments @ .9 L_2

$M_D = -2.20^{k'}$

$M_{L+I} = -7.24^{k'} \quad +4.01^{k'}$

$M_H = .92^{k'}$

$M_{NW} = 30\%(3.80) = 1.14$

$M_T = 1.38^{k}$

M_S case A $= 7.23 - (7.23 + 1.36)\,.9 = -.50$ tension o.f.

" B $= .39 - (.39 + .05)\,.9 = -.006 \pm 0$

Moments @ Face of support

$-M_D = 4.115 - (4.115 - 2.202)\frac{3\frac{1}{2}/12}{1.483} = 3.74^{k'}$

$-M_{L+I} = [13.386 - (13.386 - 7.239)\ \text{"}]\frac{1}{2} = (12.18^{k'})\frac{1}{2} = 6.09^{k'}$

$M_H = 1.628 - (1.628 - .915)\ \text{"} = 1.49^{k'}$

$+M_{NW} = 30\%[6.67 - (6.67 - 3.80)\ \text{"}] = 6.11^{k'}$

$\pm M_T = \pm[2.165 - (2.165 - 1.376)\ \text{"}] = 2.01^{k'}$

M_S case C $= 1.36$ tension o.f.

D $= .05$ tension I.F.

33003312

DOT FORM 232-007
REVISED 9/81

Sheet No.

7

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash. Floating Bridge - Stage II Sheet No. 157 of ____ sheets
S. R. 90 Made by YMT. Check by ____ Date ____ Supv. YRG/RTS

Transverse Design — pontoon D near Wall 5 (Rdwy. slab reinf. @ Temp. construction condition)
Section at .96₂

t = 12.01" e = M_{pe} =
A = S =

Group S①: D + H + (L + I) + $M_{P/S}$ 100%

	Case A	Case B	Case C
M_D	-2.20		
M_H	.92		
M_L	$-\left(\frac{7.24}{2}\right)$ $+\left(\frac{4.01}{2}\right)$		
M_{pe}	-		
M_{bnd}	-.50 (-1.78)		
	-5.40 .23		

Group S③: S① + .3 Wave 125%

	Case A	Case B	Case C
S①	-5.40		
.3W	1.38		
	-4.02		

Group S④: S① + T 125%

	Case A	Case B	Case C
S①	-5.40		
T	-1.38		
	-6.78		

Group S⑥: S③ + T 140%

	Case A	Case B	Case C
S③	-4.02		
T	-1.38		
	-5.40		

$A_s = .53^{in^2}/'$ #5@7"

$d = 12" - 2.55 = 9.45"$

$p = \frac{.53}{12(9.45)} = .0047$ $pn = .0327$ $K = .225$ $j = .925$

$M_R = A_s f_s jd = .53(24^{ksi}) .925(9.45)\frac{1}{12} = 9.265^{k'} > M_W$ o.k.

33003313

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake wash. Floating Bridge - Stage II Sheet No. 158 of ____ sheets
S. R. 90 Made by YMT. Check by ____ Date ____ Supv. YMC/RTS

Transverse Design — pontoon D near Wall 5 (Rdwy. Slab reinf. @ Temp. construction condition)
Section at Face of support

$t = 14''$ $e =$ $M_{pe} =$
$A =$ $S =$

Group S①: D + H + (L + I) + $M_{P/S}$ 100%

	Case A	Case B	Case C
M_D	-3.74		
M_H	1.49		
M_L	-6.09		
M_{pe}	—		
M_{2nd}	-1.36	+.05	
	-9.70	-8.29	

Group S③: S① + .3 Wave 125%

	Case A	Case B	Case C
S①	-9.70		
.3W	6.11		
	-3.59		

Group S④: S① + T 125%

	Case A	Case B	Case C
S①	-9.70		
T	-2.01		
	$-11.71^{k'}$ @ 125% = $-9.37^{k'}$		

Group S⑥: S③ + T 140%

	Case A	Case B	Case C
S③	-3.59		
T	-2.01		
	-5.60		

$A_s = .53^{in^2}$ #5 @ 7"

$d = 14'' - 2.55 = 11.45$

$p = \frac{.53}{12(11.45)} = .0039$ $np = .027$ $K = .207$ $j = .93$

$M_R = A_s f_s j d = .53(24).93(11.45)\frac{1}{12} = 11.29^{k'} > M_W$
OK

33003314

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project..... Sheet No. 159 of..... sheets
S. R. ..... Made by ..... Check by ..... Date ..... Supv. .....

Member 3

Moments @ Face of support

$-M_D = 3.967 - (3.967 - 2.328)\frac{3\frac{1}{2}/12}{1.483} = 3.645^{k'}$

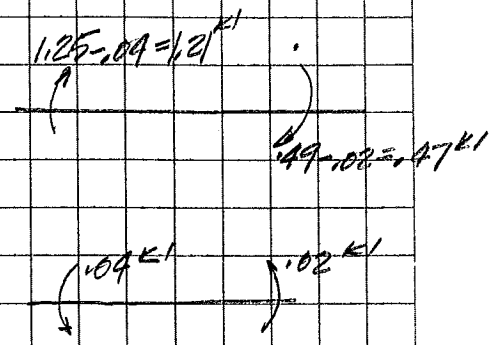
$-M_{L+I} = \frac{1}{8}[13.273 - (13.273 - 4.335)$ " $= 5.76^{k'}$

$M_H = 1.473 - (1.473 - 1.285)$ " $= 1.436^{k'}$

$M_{NW} = 6.30 - (6.30 - 5.42)\frac{3\frac{1}{2}/12}{1.483} = 6.13$

$M_T = .93$

M_S Case C vertical wall + Bot. slab P.T.



$M_S = 1.21 - (1.21 + .47)\frac{3\frac{1}{2}/12}{14.83} = 1.18$ tension o.r.

Case D. Bot. slab. P.T.

M_S = small.

Moments @ .2L3

$M_D = -1.10^{k'}$

$M_{L+I} = (-4.98)\frac{1}{2}$ $(+2.93^{k'})\frac{1}{2}$

$M_H = 1.10$

$M_{NW} = 30\%(4.54) = 1.36$

$M_T = \pm .71$

$M_S = 1.21 - (1.21 + .47) \cdot 2 = .87$ case C

± 0 case D.

Moments @ .5L3

$M_D = .53^{k'}$

$M_{L+I} = 5.02$

$M_H = .53$

$M_{NW} = 30\%(1.91) = .57$

$M_T = .37$

$M_S = 1.21 - (1.21 + .47) \cdot .5 = .37$ case C.

± 0 " D

inflection point @ 10.68' (.72L3)

33003315

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash. Floating Bridge - Stage II Sheet No. 160 of ____ sheets
S. R. 90 Made by YMT Check by ____ Date ____ Supv. [illegible]

Transverse Design — pontoon D near Wall 5 (Rdwy. Slab reinf. @ Temp. construction condition)
Section at Face of support member (3)

$t = 14''$ $e =$ $M_{pe} =$
$A =$ $S =$

Group S(1): $D + H + (L + I) + M_{P/S}$ 100%

	Case A	Case B	Case C
M_D	-3.645		
M_H	1.44		
M_L	-5.76		
M_{pe}	—		
M_{end}	-1.18		
	-9.15		

Group S(3): S(1) + .3 Wave 125%

	Case A	Case B	Case C
S(1)	-9.15		
.3W	6.13		
	-3.02		

Group S(4): S(1) + T 125%

	Case A	Case B	Case C
S(1)	-9.15		
T	-.93		
	-10.08		

Group S(6): S(3) + T 140%

	Case A	Case B	Case C
S(3)	-3.02		
T	-.93		
	-3.95		

$A_s = .53\ in^2/'$ #5@7"
$d = 14 - 2.55 = 11.45''$
$p = \frac{.53}{12(11.45)} = .0039$ $np = .027$ $k = .207$ $j = .93$

$M_R = A_s f_s j d = .53(24).93(11.45)\frac{1}{12} = 11.30^{k'} > M_W$
O.K.

33003316

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash. Floating Bridge - Stage 2 Sheet No. 16 of ____ sheets

S. R. 90 Made by VMT Check by ____ Date ____ Supv. [illegible]

Transverse Design — pontoon D near Wall 5 (Bdy. Slab reinf. @ ramp construction condition)

Section at .263

$t = 12''$ $c =$ $M_{pe} =$

$A =$ $S =$

Group 5①: $D + H + (L + I) + M_{P/S}$ 100%

	Case A	Case B	Case C
M_D	−1.10		
M_H	1.10		
M_L	−4.98	2.92	
M_{pe}	—		
M_{grd}	−.87 (+.87)	0	
	−3.96	.60	−2.49, 1.47

Group 5②: 5① + .3 WAVE 125%

	Case A	Case B	Case C
5①	.60	1.47	
.3W	+1.38	1.38	
	1.98	2.85	

Group 5④: 5① + T 125%

	Case A	Case B	Case C
5①	−3.96		
T	−.71		
	−4.07		

Group 5⑥: 5③ + T 140%

	Case A	Case B	Case C
5③		2.85	
T		.71	
		3.56	

$A_s = .53\ in^2/'$ #5 @ 7"

$d = 12'' - 2.55 = 9.45''$

$p = \frac{.53}{12(9.45)} = .0047$ $np = .0327$ $K = .225$ $j = .92$

$M_R = A_s f_s jd = .53(24).92(9.45)\frac{1}{12} = 9.27^{k'} > M_W$ O.K.

3300331 7

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash. Floating Bridge - Stage II Sheet No. 161 of ____ sheets
S. R. 90 Made by YMT. Check by ____ Date ____ Supv. ____

Transverse Design — pontoon D near Wall 5 (Bkwy. slab reinf. @ temp. construction condition)
Section at .56h

$t = 9''$ $c =$ $M_{pe} =$
$A =$ $S =$

Group 5①: D + H + (L + I) + M_{pfs} 100%

	Case A	Case B	Case C
M_p	.53		
M_H	.53		
M_L	$(5.02)\frac{1}{2}$		
M_{pe}	—		
M_{grd}	-.37		
	3.20	3.57	

Group 5③: 5① + .3 wave 125%

	Case A	Case B	Case C
5①		3.57	
.3W		.57	
		4.14 k'	

Group 5④: 5① + T 125%

	Case A	Case B	Case C
5①		3.57	
T		.37	
		3.94	

Group 5⑥: 5③ + T 140%

	Case A	Case B	Case C
5③		4.14	
T		.37	
		4.51	

$A_s = .53\ in^2/1$ #5@7''
$d = 9 - 2.55 \doteq 6.45''$
$p = \frac{.53}{12(6.45)} = .0068$ $pn = .0479$ $k = .265$ $j = .91$

$M_R = A_s f_s j d = .53(24).91(6.45)\frac{1}{12} = 6.23^{k'} > M_W$
0.K.

33003318

Moments @ .8 L3

$M_p = -.60^{k'}$

$M_{L+2} = -3.44$

$M_H = -.04$

$M_{NW} = -.72(30\%) = -.22$

$M_T = .03$

$M_G = -1.21 + (1.21 + .47).8 = +.13$ case C tension I.F.

$\doteq 0$ case D

Moments @ Face of support.

$-M_D = 3.13 - (3.13 - 1.66)\frac{3\frac{1}{2}/12}{1.483} = 2.87^{k'}$

$-M_{L+2} = [12.17 - (12.17 - 3.37)\ \text{"}]\frac{1}{2} = (10.44^{k'})\frac{1}{2} = 5.22$

$-M_H = .41 - (.41 - .22)\ \text{"} = .37$

$-M_{NW} = 30\%[2.48 - (2.48 - 1.60)\ \text{"}] = .69^{k'}$

$-M_T = .17$

$M_G = .47^{k'}$ case C tension I.F.

$\doteq 0$ D.

3300331 9

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake Wash. Floating Bridge - Stage II Sheet No. 169 of ____ sheets
S. R. 90 Made by YMT. Check by ____ Date ____ Supv. YFC/RTS

Transverse Design — pontoon D near Wall 5 (Rdwy. slab reinf. @ Temp. construction condition)
Section at .8L3

$t = 9.54''$ $c =$ $M_{pe} =$
$A =$ $S =$

Group S①: D + H + (L + I) + $M_{P/S}$ 100%

	Case A	Case B	Case C
M_D	-.60		
M_H	-.04		
M_L	(-3.44)½		
M_{pe}	—		
M_{end}	.13	0	
	-2.23	-2.36	

Group S③: S① + .3 Wave 125%

	Case A	Case B	Case C
S①		-2.36	
.3W		-.22	
		-2.58	

Group S④: S① + T 125%

	Case A	Case B	Case C
S①			
T			

Group S⑥: S③ + T 140%

	Case A	Case B	Case C
S③		-2.58	
T		-.03	
		2.61	

$A_s = .53^{in^2/'}$ #5 @ 7"
$d = 9.54 - 2.55 = 6.99$
$p = \frac{.53}{12(6.99)} = .0063$ $p_n = .0442$ $k = .256$ $j = .914$

$M_R = A_s f_s j d = .53(24).914(6.99)\frac{1}{12} = 6.78^{k'} > M_W$
O.K.

33003320

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
BRIDGE & STRUCTURES BRANCH

Project 3rd Lake wash. Floating Bridge - Stage II Sheet No. 165 of ____ sheets
S. R. 90 Made by YMT. Check by ____ Date ____ Supv. YRC/RTS

Transverse Design — pontoon D near Wall 5 (Rdwy. slab reinf. @ Temp. construction condition)
Section at Face of support.

$t = 14''$ $c =$ $M_{pe} =$
$A =$ $S =$

Group S①: $D + H + (L + I) + M_{P/S}$ 100%

	Case A	Case B	Case C
M_D	-2.84		
M_H	-.37		
M_L	-5.22		
M_{pe}	—		
M_{end}	.47	0	
	-7.96	-8.43	

Group S⑤: S① + .3 Wave 125%

	Case A	Case B	Case C
S①		-8.43	
.3W		-.69	
		-9.12	

Group S④: S① + T 125%

	Case A	Case B	Case C
S①			
T			

Group S⑥: S③ + T 140%

	Case A	Case B	Case C
S③		-9.12	
T		-.17	
		9.29	

$A_3 = .53\ in^2/1$ #5 @ 7"
$d = 14'' - 2.55 = 11.45$

$p = \frac{.53}{12(11.45)} = .0039$ $pn = .027$ $K = .207$ $j = .93$

$M_R = A_3 f_3 jd = .53(24).93(11.45)\frac{1}{12} = 11.3^{k'} > M_W$
O.K.

33003321