

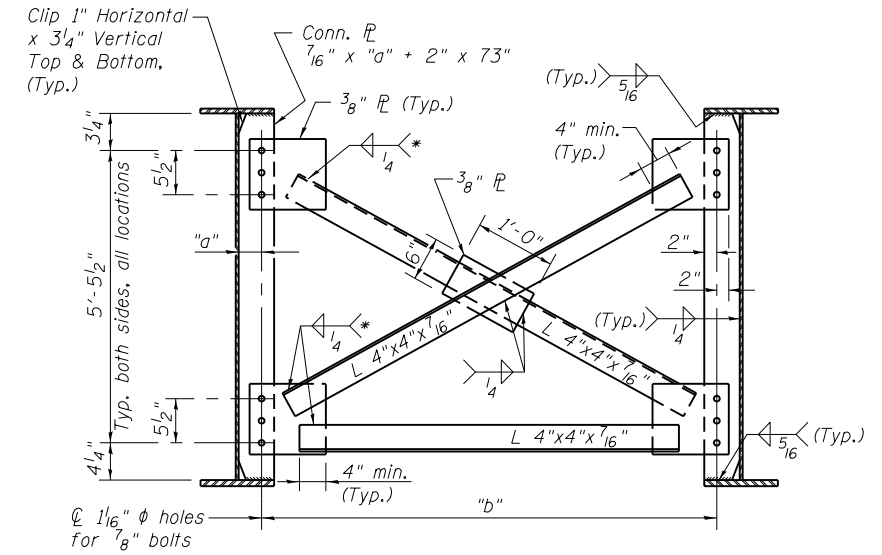
CROSS FRAME DIMENSIONS (a)

| BAY | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | D16 | D17 | D18 | D19 | D20 | D21 |
|------------|---------|---------|---------|--------|---------|---------|---------|--------|--------|---------|---------|--------|--------|---------|---------|--------|--------|--------|--------|-----|-----|
| Girder 1-2 | 6" | 6" | 6" | 6" | 6" | 6" | 6" | 6 1/8" | 6 1/8" | 6" | 6" | 6 1/8" | 6 1/8" | 6" | 6" | 6 1/8" | 6 1/8" | 6 1/8" | 6 1/8" | | |
| Girder 2-3 | 6 3/16" | 6 3/16" | 6 3/16" | 6 7/8" | 6 3/16" | 6 3/16" | 6 3/16" | 6 1/4" | 6 1/4" | 6 3/16" | 6 3/16" | 6 1/4" | 6 1/4" | 6 3/16" | 6 3/16" | 6 1/4" | 6 1/4" | 6 1/4" | 6 1/4" | | |
| Girder 3-4 | | | | | | | | | | | | | | | | | | | | 6" | |
| Girder 4-5 | | | | | | | | | | | | | | | | | | | | 6" | |
| Girder 5-6 | | | | | | | | | | | | | | | | | | | | | 6" |
| Girder 6-7 | | | | | | | | | | | | | | | | | | | | | 6" |
| Girder 7-8 | | | | | | | | | | | | | | | | | | | | | 6" |
| Girder 8-9 | | | | | | | | | | | | | | | | | | | | | 6" |

| BAY | D22 | D23 | D24 | D25 | D26 | D27 | D28 | D29 | D30 | D31 | D32 | D33 | D34 | D35 | D36 | D37 | D38 | D39 | D40 | D41 | D42 |
|--------------|-----|-----|---------|---------|--------|--------|----------|---------|--------|----------|--------|----------|---------|----------|--------|----------|---------|---------|----------|---------|--------|
| Girder 10-11 | 6" | | | | | | | | | | | | | | | | | | | | |
| Girder 11-12 | 6" | | | | | | | | | | | | | | | | | | | | |
| Girder 12-13 | 6" | | | | | | | | | | | | | | | | | | | | |
| Girder 13-14 | 6" | | | | | | | | | | | | | | | | | | | | |
| Girder 14-15 | | 6" | | | | | | | | | | | | | | | | | | | |
| Girder 15-16 | | | 6" | 6" | 6" | 6" | 6" | 6" | 6" | 6 1/8" | 6 1/8" | 6" | 6" | 6 1/8" | 6 1/8" | 6" | 6" | 6 1/8" | 6" | 6" | 6 1/8" |
| Girder 16-17 | | | 6 1/4" | 6 1/4" | 6 1/4" | 6 1/4" | 6 1/4" | 6 5/16" | 6 1/4" | 6 5/16" | 6 3/8" | 6 1/4" | 6 5/16" | 6 3/8" | 6 1/4" | 6 1/4" | 6 5/16" | 6 1/4" | 6 3/8" | 6 7/16" | |
| Girder 17-18 | | | 6 7/16" | 6 7/16" | 6 1/2" | 6 1/2" | 6 1/2" | 6 9/16" | 6 1/2" | 6 9/16" | 6 5/8" | 6 1/2" | 6 9/16" | 6 5/8" | 6 1/2" | 6 1/2" | 6 5/8" | 6 9/16" | 6 1/2" | 6 3/4" | |
| Girder 18-19 | | | 6 5/8" | 6 1/8" | 6 1/8" | 6 3/4" | 6 13/16" | 6 7/8" | 6 1/8" | 6 13/16" | 6 7/8" | 6 13/16" | 6 7/8" | 6 15/16" | 6 3/4" | 6 13/16" | 6 7/8" | 6 7/8" | 6 15/16" | 7 1/8" | |

CROSS FRAME DIMENSIONS (b)

| D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | D11 | D12 | D13 | D14 | D15 | D16 | D17 | D18 | D19 | D20 | D21 |
|-------|-----------|-----------|------------|-----------|-----------|-----------|-------|-----------|-----------|-----------|-----------|------------|------------|-----------|-----------|-----------|------------|-----------|-------|-----------|
| 6'-6" | 6'-7 1/2" | 6'-9" | 6'-10 5/8" | 7'-0 1/8" | 7'-1 1/4" | 7'-2 1/2" | 7'-3" | 7'-4 1/4" | 7'-5 1/2" | 7'-6 3/4" | 7'-7 3/4" | 7'-9" | 7'-10 3/4" | 8'-0" | 8'-1 1/2" | 8'-3" | 8'-4 1/2" | 8'-6" | 8'-2" | 8'-0" |
| D22 | D23 | D24 | D25 | D26 | D27 | D28 | D29 | D30 | D31 | D32 | D33 | D34 | D35 | D36 | D37 | D38 | D39 | D40 | D41 | D42 |
| 8'-0" | 8'-3" | 5'-1 1/2" | 5'-4 1/8" | 5'-6 3/4" | 5'-9 3/8" | 6'-0" | 6'-2" | 6'-4" | 6'-5" | 6'-7" | 6'-9 1/4" | 6'-11 1/4" | 7'-1 1/4" | 7'-3 1/4" | 7'-6" | 7'-8 1/4" | 7'-10 3/4" | 8'-1 1/2" | 8'-4" | 8'-6 1/2" |



TYPICAL INTERIOR CROSS FRAME

(2 ea. D1-D19, 38-D20, 76-D21 for SN 025-0111 (WB))
(76-D22, 19-D23, 4 ea. D24-D42 for SN 025-0112 (EB))

* Fillet weld angles along 3 sides of one face of gusset plate

Notes:
Two hardened washers required for each set of oversized holes.

All cross frames between girders shall be installed with erection pins and bolts according to the erection plan approved by the Engineer. Individual cross frames at supports may be temporarily disconnected to install bearing anchor rods.
All cross frames shall be Grade 50W.

| | 0.4 Sp. 1 | Pier | 0.6 Sp. 2 |
|------------------------------------|---------------------------|--------|-----------|
| I_s | (in ⁴) 80956 | 150013 | 99291 |
| $I_c(n)$ | (in ⁴) 17266 | - | 224293 |
| $I_c(3n)$ | (in ⁴) 129197 | - | 159632 |
| $I_c(cr)$ | (in ⁴) - | 168588 | - |
| S_s | (in ³) 2284 | 4017 | 3133 |
| $S_c(n)$ | (in ³) 3065 | - | 4122 |
| $S_c(3n)$ | (in ³) 2768 | - | 3740 |
| $S_c(cr)$ | (in ³) - | 4191 | - |
| DC1 | (k/ft) 1.32 | 1.45 | 1.34 |
| M _{DC1} | (k) 2506 | 6766 | 3672 |
| DC2 | (k/ft) 0.17 | 0.17 | 0.17 |
| M _{DC2} | (k) 342 | 824 | 471 |
| DW | (k/ft) 0.45 | 0.45 | 0.45 |
| M _{DW} | (k) 891 | 2143 | 1224 |
| $M_{\phi} \cdot IM$ | (k) 3175 | 3714 | 3595 |
| M_u (Strength I) | (k) 10453 | 19202 | 13306 |
| $\phi_r M_n$ | (k) 14966 | - | 19220 |
| f_s DC1 | (ksi) 13.17 | 20.21 | 14.06 |
| f_s DC2 | (ksi) 1.48 | 2.37 | 1.51 |
| f_s DW | (ksi) 3.86 | 6.14 | 3.93 |
| f_s ($\phi + IM$) | (ksi) 12.43 | 10.63 | 10.47 |
| f_s (Service II) | (ksi) 34.67 | 42.54 | 33.11 |
| 0.95R _n F _{yt} | (ksi) 47.50 | 65.84 | 47.50 |
| f_s (Total)(Strength I) | (ksi) - | 56.04 | - |
| $\phi_r F_n$ | (ksi) - | 62.39 | - |
| V _r | (k) 81.6 | 70.4 | 81.4 |

I_s, S_s : Non-composite moment of inertia and section modulus of the steel section used for computing f_s (Total-Strength I, and Service II) due to non-composite dead loads (in⁴ and in³).

$I_c(n), S_c(n)$: Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing f_s (Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads (in⁴ and in³).

$I_c(3n), S_c(3n)$: Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing f_s (Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in⁴ and in³).

$I_c(cr), S_c(cr)$: Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing f_s (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads (in⁴ and in³).

DC1: Un-factored non-composite dead load (kips/ft.).

M_{DC1}: Un-factored moment due to non-composite dead load (kip-ft.).

DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).

M_{DC2}: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).

DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).

M_{DW}: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).

$M_{\phi} \cdot IM$: Un-factored live load moment plus dynamic load allowance (kip-ft.).

M_u (Strength I): Factored design moment (kip-ft.).

$1.25 (M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_{\phi} \cdot IM$

$\phi_r M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft.).

f_s DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).

M_{DC1} / S_c

f_s DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).

$M_{DC2} / S_c(3n)$ or $M_{DC2} / S_c(cr)$ as applicable.

f_s DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).

$M_{DW} / S_c(3n)$ or $M_{DW} / S_c(cr)$ as applicable.

f_s ($\phi + IM$): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).

$M_{\phi} \cdot IM / S_c(n)$ or $M_{DW} / S_c(cr)$ as applicable.

f_s (Service II): Sum of stresses as computed below (ksi).

$f_{SDC1} + f_{SDC2} + f_{SDW} + 1.3 f_s (\phi + IM)$

0.95R_nF_{yt}: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).

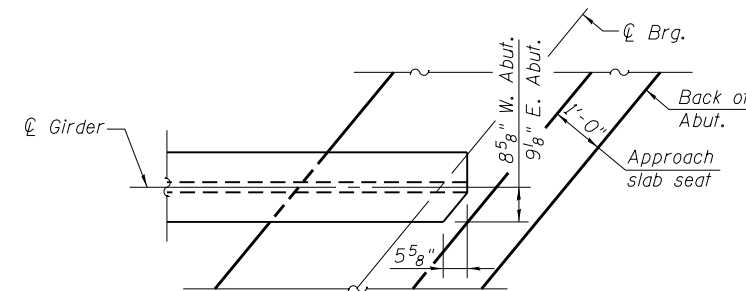
f_s (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).

$1.25 (f_{SDC1} + f_{SDC2}) + 1.5 f_{SDW} + 1.75 f_s (\phi + IM)$

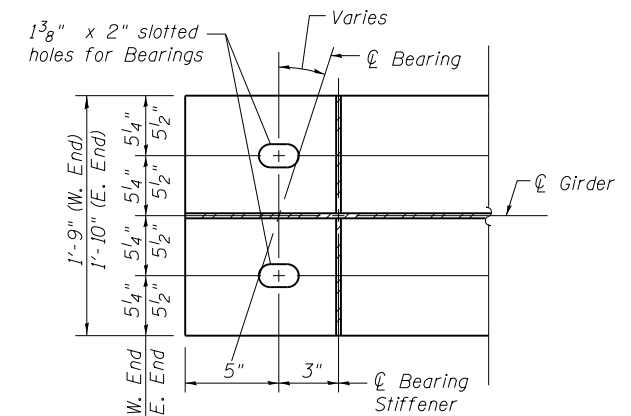
$\phi_r F_n$: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).

V_r: Maximum factored shear range in span computed according to Article 6.10.10.

| | W. Abut. | Pier | E. Abut. |
|--------------------|------------|--------|----------|
| R _{DC1} | (k) 78.71 | 339.63 | 101.81 |
| R _{DC2} | (k) 11.12 | 41.07 | 12.93 |
| R _{DW} | (k) 28.91 | 106.83 | 35.18 |
| R $\phi \cdot IM$ | (k) 138.83 | 292.93 | 143.66 |
| R _{Total} | (k) 257.57 | 780.46 | 293.58 |



END GIRDER TOP FLANGE CLIP DETAIL
(Showing top flange of steel beam at integral abutment)



END GIRDER DETAIL