

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

|                     |         |                           |              |           |
|---------------------|---------|---------------------------|--------------|-----------|
| F.A.P. RTE.         | SECTION | COUNTY                    | TOTAL SHEETS | SHEET NO. |
| 307                 | 130 R-2 | DUPAGE, KANE              | 647          | 476       |
| STA. 3356+37.74     |         | TO STA. 3359+24.72        |              |           |
| FED. ROAD DIST. NO. |         | ILLINOIS FED. AID PROJECT |              |           |

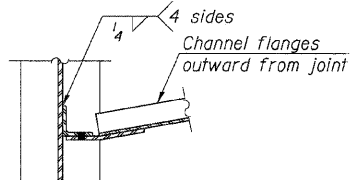
62410

|                            | 0.4 Span 1<br>0.6 Span 4 | Pier 1 & 3 | 0.5 Span 2 & 3 | Pier 2 |
|----------------------------|--------------------------|------------|----------------|--------|
| $I_s$                      | (in <sup>4</sup> ) 4760  | 5630       | 4760           | 6990   |
| $I_c$ (n)                  | (in <sup>4</sup> ) 12819 | -          | 12189          | -      |
| $I_c$ (3n)                 | (in <sup>4</sup> ) 9042  | -          | 9042           | -      |
| $S_s$                      | (in <sup>3</sup> ) 345   | 411        | 345            | 503    |
| $S_c$ (n)                  | (in <sup>3</sup> ) 520   | -          | 520            | -      |
| $S_c$ (3n)                 | (in <sup>3</sup> ) 460   | -          | 460            | -      |
| $Q$                        | (k/ft.) 0.73             | 1.16       | 0.73           | 1.19   |
| $M_Q$                      | ('k) 134                 | -558       | 209            | -768   |
| $s_Q$                      | (k/ft.) 0.4              | -          | 0.4            | -      |
| $M_{sQ}$                   | ('k) 91                  | -          | 154            | -      |
| $M_L$                      | ('k) 302                 | -239       | 409            | -306   |
| $M$ (Imp)                  | ('k) 82                  | -60        | 96             | -72    |
| $5_3[M_L + M(\text{Imp})]$ | ('k) 641                 | -499       | 842            | -629   |
| $M_a$                      | ('k) 1126                | -1374      | 1567           | -1816  |
| * $M_u$                    | ('k) 2333                | -1921      | 2333           | -2363  |
| $f_s Q$ non-comp           | (ksi) 4.7                | -16.3      | 7.3            | -18.3  |
| $f_s Q$ (comp)             | (ksi) 2.4                | -          | 4.0            | -      |
| $f_s 5_3 M_L + \text{Imp}$ | (ksi) 14.8               | -14.6      | 19.4           | -15.0  |
| $f_s$ (Overload)           | (ksi) 21.8               | -30.8      | 30.7           | -33.3  |
| VR                         | (k) 44.5                 | -          | 33.4           | -      |

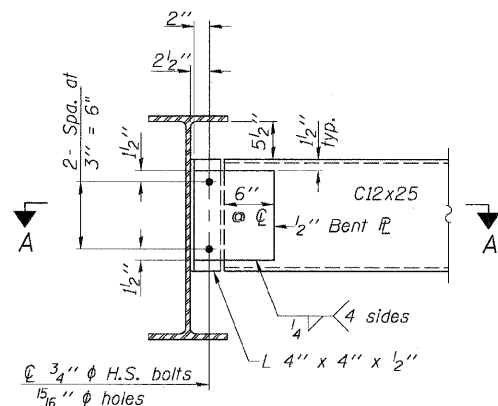
|             | W. Abut. | Pier 1 & 3 | Pier 2 | E. Abut. |
|-------------|----------|------------|--------|----------|
| $R_P$       | (k) 22.1 | 86.1       | 99.8   | 22.1     |
| $R_L$       | (k) 31.4 | 36.5       | 40.0   | 31.4     |
| Imp.        | (k) 10.9 | 8.0        | 7.8    | 10.9     |
| $R$ (Total) | (k) 64.4 | 130.5      | 147.6  | 64.3     |

\* Compact section

- $I_s, S_s$ : Non-composite moment of inertia and section modulus of the steel section used for computing  $f$  (Total and Overload) due to non-composite dead loads (in<sup>4</sup> and in<sup>3</sup>).
- $I_c(n), S_c(n)$ : Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing  $f$  (Total and Overload) due to short-term composite live loads (in<sup>4</sup> and in<sup>3</sup>).
- $I_c(3n), S_c(3n)$ : 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 and Overload) due to long-term composite (superimposed) dead loads (in<sup>4</sup> and in<sup>3</sup>).
- $Q$ : Un-factored non-composite dead load (kips/ft.).
- $M_Q$ : Un-factored moment due to non-composite dead load (kip-ft.).
- $s_Q$ : Un-factored long-term composite (superimposed) dead load (kips/ft.).
- $M_{sQ}$ : Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).
- $M_L$ : Un-factored live load moment (kip-ft.).
- $M_I$ : Un-factored moment due to impact (kip-ft.).
- $M_a$ : Factored design moment (kip-ft.).  
 $1.3 [M_Q + M_{sQ} + \frac{5}{3} (M_L + M_I)]$
- $M_u$ : Compact composite moment capacity according to AASHTO LFD 10.50.1.1 or compact non-composite moment capacity according to AASHTO LFD 10.48.1 (kip-ft.).
- $f_s$  (Overload): Sum of stresses as computed from the moments below (ksi).  
 $M_Q + M_{sQ} + \frac{5}{3} (M_L + M_I)$
- $f_s$  (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).  
 $1.3 [M_Q + M_{sQ} + \frac{5}{3} (M_L + M_I)]$
- VR: Maximum + impact shear range within the composite portion of the span for stud shear connector design (kips).

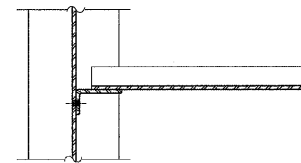


SECTION A-A

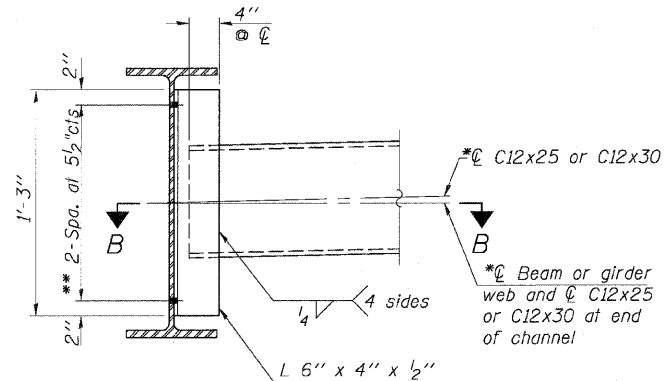


END DIAPHRAGM D1  
 (48 Required)

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



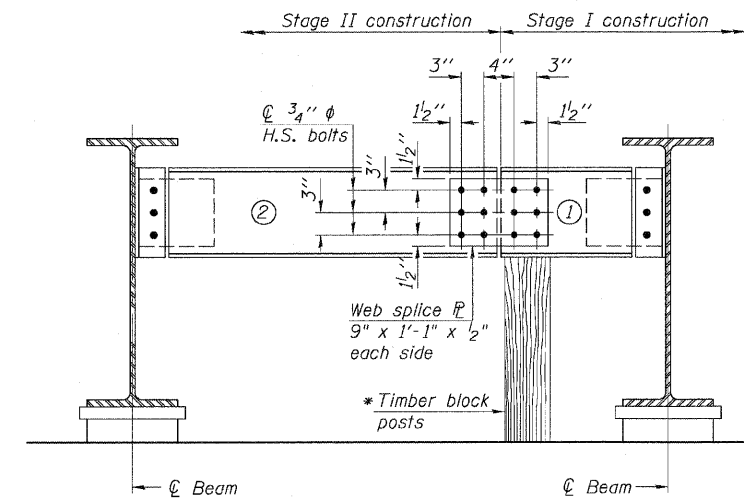
SECTION B-B



INTERIOR DIAPHRAGM D2  
 (360 Required)

Note:  
 Two hardened washers required for each set of oversized holes.  
 \*Alternate channels are permitted to facilitate material acquisition. Calculated weight of structural steel is based on the lighter section. The alternate, if utilized, shall be provided at no additional cost to the Department.  
 \*\*3/4"  $\phi$  HS bolts, 5/16"  $\phi$  holes except at the stage construction line, where one end shall be 3/4"  $\phi$  HS bolts with 13/16" x 1 7/8" long slotted holes.

\* Cost of Timber Block Posts is included with Structural Steel.



END DIAPHRAGM  
 4 locations

END DIAPHRAGM STAGE CONSTRUCTION SEQUENCE

- Order diaphragm in two sections.
- Attach section ① of diaphragm to beam
- Place timber block posts between section ① of diaphragm and abutment bearing section.
- Attach section ② of diaphragm to both beam and section ① of diaphragm during stage II construction with splice plates.
- Remove timber block posts.

All diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

Sheet B33 of 56

| REVISIONS |      | F.A.P. ROUTE 307 ILLINOIS ROUTE 64<br>(NORTH AVENUE)<br>OVER E.J.&E. AND U.P. R.R.<br>FRAMING DETAILS |
|-----------|------|---|
| NAME      | DATE |   |
|           |      | STRUCTURE NUMBER 022-0190<br>FAP 307 SECTION 130 R-2<br>DUPAGE COUNTY<br>STA. 3357+81.21              |
|           |      |   |
|           |      |   |
|           |      |   |
|           |      |   |

SCALE: None  
 DATE: MAY 13, 2011  
 DRAWN BY: MRK  
 CHECKED BY: MJM

