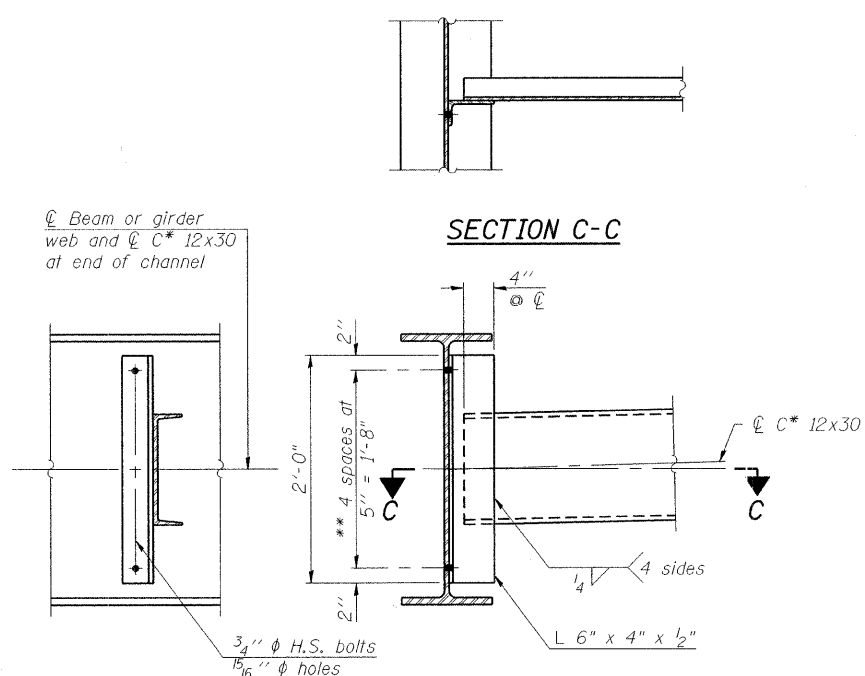


STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

| | | | | | |
|-----------------------|----------|-------------------|--------------|-----------|---------------------------|
| ROUTE NO. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. | SHEET NO. 17 25 SHEETS |
| 345 | ++ | DU PAGE | 65 | 47 | |
| FED. ROAD DIST. NO. 7 | ILLINOIS | FED. AID PROJECT- | | | |

++ 98-00153-02-BR
Contract No. 63077

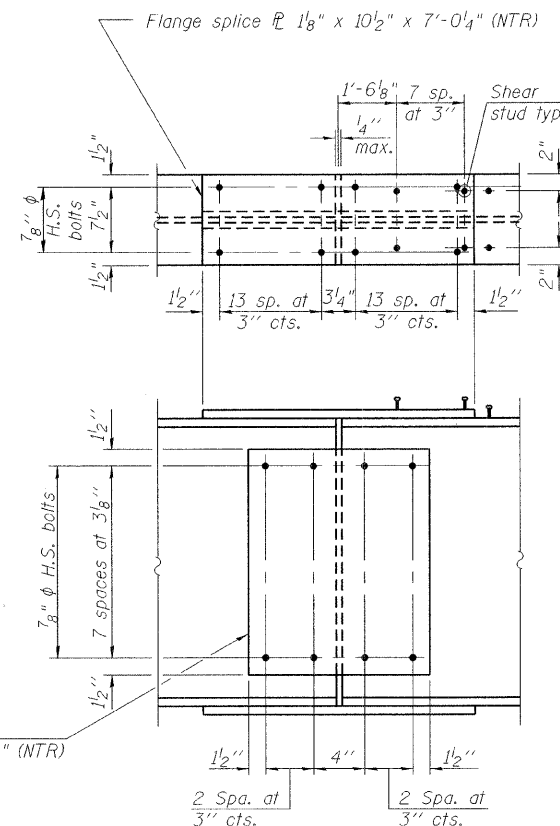


DIAPHRAGMS D AND D1

(48 Required for D)
(6 Required for D1)

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.
** 3/4 inch diameter H.S. bolts, 5/16 inch diameter holes



SPLICE DETAIL

(10 Required)

| | 0.4 Sp. 1 | Pier | 0.6 Sp. 2 |
|---|-----------|-------|-----------|
| I_s (in ⁴) | 6680 | 6680 | 6680 |
| $I_c(n)$ (in ⁴) | 19486 | | 19486 |
| $I_c(3n)$ (in ⁴) | 13915 | | 13915 |
| S_s (in ³) | 436 | 436 | 436 |
| $S_c(n)$ (in ³) | 678 | | 678 |
| $S_c(3n)$ (in ³) | 605 | | 605 |
| Z (in ³) | | | |
| ϕ (k/') | 0.860 | 1.280 | 0.860 |
| $M\phi$ (k) | 152 | 626 | 339 |
| $s\phi$ (k/') | 0.420 | | 0.420 |
| $M_s\phi$ (k) | 90 | | 179 |
| M_L (k) | 419 | 256 | 510 |
| M_{Imp} (k) | 116 | 68 | 131 |
| M_a (k) | 892 | 540 | 1068 |
| M_u (k) | 1476 | 1516 | 2062 |
| M_u (k) | 3169 | | 3169 |
| $f_s \phi$ non-comp (ksi) | 4.2 | 17.2 | 9.3 |
| $f_s \phi$ (comp) (ksi) | 1.8 | | 3.6 |
| $f_s \phi$ [M _L + M _{Imp}] (ksi) | 15.8 | 14.9 | 18.9 |
| f_s (Overload) (ksi) | 21.8 | 32.1 | 31.8 |
| f_s (Total) (ksi) | | 41.8 | |
| VR (k) | 56.9 | | 59.9 |

| | W. Abut. | Pier | E. Abut. |
|-----------------|----------|-------|----------|
| $R\phi$ (k) | 26.4 | 102.6 | 37.8 |
| R_L (k) | 41.8 | 53.1 | 45.3 |
| $Imp.$ (k) | 11.6 | 14.2 | 11.6 |
| R_{Total} (k) | 79.7 | 169.9 | 94.7 |

*** Compact section
**** Braced non-compact and partially braced section

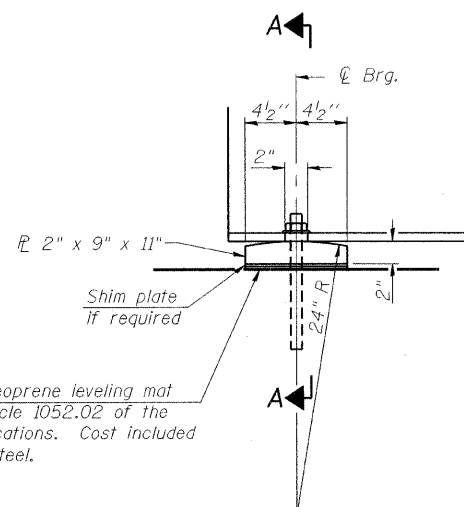
TOP OF BEAM ELEVATIONS

(For Fabrication Only)

| Beam | W. Abut. | Pier | Splice | E. Abut. |
|------|----------|--------|--------|----------|
| 1 | 686.35 | 686.07 | 685.95 | 685.72 |
| 2 | 686.50 | 686.23 | 686.10 | 685.88 |
| 3 | 686.65 | 686.38 | 686.26 | 686.03 |
| 4 | 686.80 | 686.54 | 686.41 | 686.19 |
| 5 | 686.96 | 686.69 | 686.57 | 686.34 |
| 6 | 686.96 | 686.70 | 686.58 | 686.35 |
| 7 | 686.83 | 686.57 | 686.45 | 686.22 |
| 8 | 686.69 | 686.44 | 686.32 | 686.09 |
| 9 | 686.56 | 686.31 | 686.19 | 685.96 |
| 10 | 686.42 | 686.18 | 686.06 | 685.83 |

I_s, S_s : Non-composite moment of inertia and section modulus of the steel section used for computing f_s (Total and Overload) 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 and Overload) 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 and Overload) due to long-term composite (superimposed) dead loads (in⁴ and in³).
 Z : Plastic Section Modulus of the steel section in non-composite areas (in³).
 ϕ : Un-factored non-composite dead load (kips/ft.).
 $M\phi$: Un-factored moment due to non-composite dead load (kip-ft.).
 $s\phi$: Un-factored long-term composite (superimposed) dead load (kips/ft.).
 $M_s\phi$: Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).
 M_L : Un-factored live load moment (kip-ft.).
 M_{Imp} : Un-factored moment due to impact (kip-ft.).
 M_a : Factored design moment (kip-ft.).
 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).
 f_s (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).
 VR : Maximum M_L + impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).

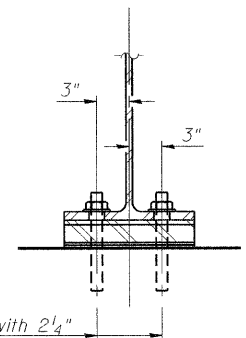
Notes:
Anchor bolts at fixed bearings may be built into the masonry.
See sheet 18 of 25 for Anchor Bolt installation.
All steel shall be conformed to AASHTO M270 Grade 50W.
Load carry components designated "NTR" shall conform to the supplemental requirements for notch toughness, zone 2.
All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.



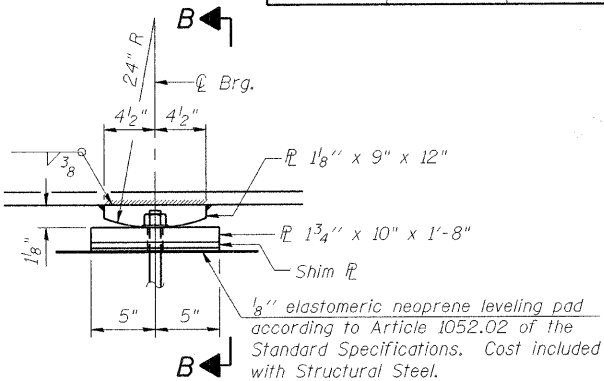
ELEVATION AT ABUTMENT

ABUTMENT BEARING

(20 Required)



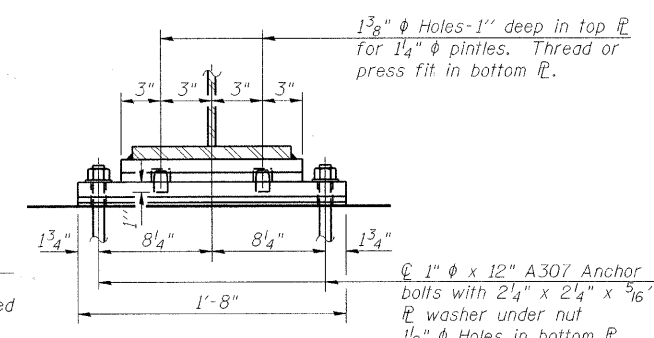
SECTION A-A



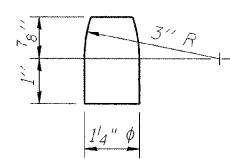
ELEVATION AT PIER

BILL OF MATERIAL

| ITEM | UNIT | QUANTITY |
|------------------------|------|----------|
| Anchor Bolts 1" ϕ | Each | 60 |



SECTION B-B



PINTLE

| | |
|----------|-------------|
| DESIGNED | J. ZUO |
| CHECKED | A. HAMMAD |
| DRAWN | D.C. PATEL |
| CHECKED | J. GRAINAWI |

STRUCTURAL STEEL DETAILS
F.A.P. RT. 345 - SEC. 98-00153-02-BR
DU PAGE COUNTY
STATION 107+17.50
STRUCTURE NO. 022-3011



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