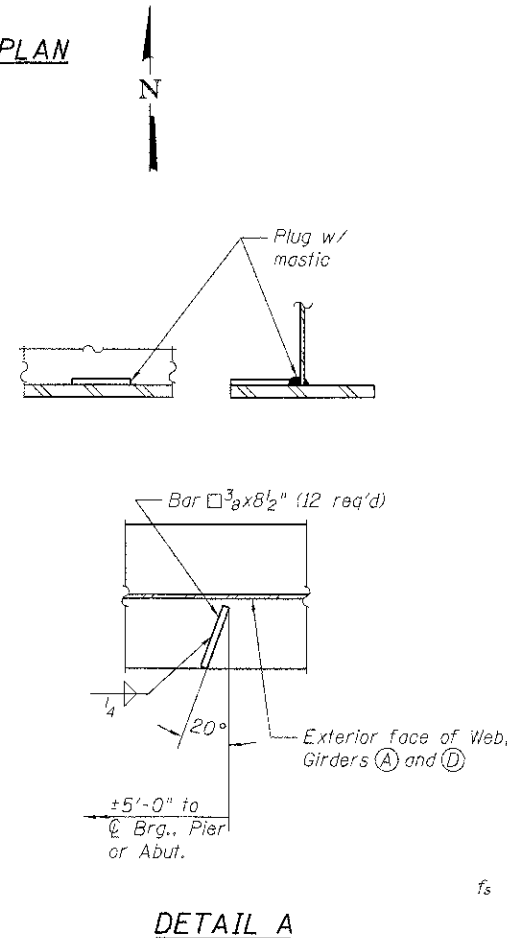


| | 0.4 Span 1 or 0.6 Span 5 | | Pier 1 or 4 | | 0.5 Span 2 or Span 4 | | Pier 2 or 3 | | 0.5 Span 3 | | |
|---------------------------|--------------------------|----------|-------------|----------|----------------------|----------|-------------|----------|------------|----------|--------|
| | INTERIOR | EXTERIOR | INTERIOR | EXTERIOR | INTERIOR | EXTERIOR | INTERIOR | EXTERIOR | INTERIOR | EXTERIOR | |
| I_s | (in ⁴) | 28476 | 28476 | 48055 | 48055 | 29592 | 29592 | 51290 | 51290 | 29592 | 29592 |
| $I_d(n)$ | (in ⁴) | 71487 | 68572 | - | - | 75496 | 72329 | - | - | 75496 | 72329 |
| $I_d(3n)$ | (in ⁴) | 52111 | 49598 | - | - | 54595 | 51911 | - | - | 54595 | 51911 |
| S_x | (in ³) | 1260.0 | 1260.0 | 1796.5 | 1796.5 | 1347.7 | 1347.7 | 1908.5 | 1908.5 | 1347.7 | 1347.7 |
| $S_d(n)$ | (in ³) | 1684.1 | 1667.5 | - | - | 1798.5 | 1780.9 | - | - | 1798.5 | 1780.9 |
| $S_d(3n)$ | (in ³) | 1552.8 | 1531.0 | - | - | 1659.0 | 1635.7 | - | - | 1659.0 | 1635.7 |
| DC1 | (k/ft) | 1.130 | 1.005 | 1.222 | 1.097 | 1.137 | 1.012 | 1.237 | 1.112 | 1.137 | 1.012 |
| M_{DC1} | (ft-k) | 857.9 | 760.4 | 2048.9 | 1822.3 | 812.2 | 722.5 | 2132 | 1899.1 | 775.9 | 689.3 |
| DC2 | (k/ft) | 0.225 | 0.225 | 0.225 | 0.225 | 0.225 | 0.225 | 0.225 | 0.225 | 0.225 | 0.225 |
| M_{DC2} | (ft-k) | 194.9 | 193.2 | 359.5 | 363.8 | 204.0 | 200.2 | 382.7 | 386.2 | 192.5 | 189.0 |
| DW | (k/ft) | 0.350 | 0.350 | 0.350 | 0.350 | 0.350 | 0.350 | 0.350 | 0.350 | 0.350 | 0.350 |
| M_{DW} | (ft-k) | 303.1 | 300.5 | 559.3 | 565.8 | 317.4 | 311.3 | 595.2 | 600.7 | 299.4 | 293.9 |
| M_{LL+IM} | (ft-k) | 1791.9 | 2200.8 | 1699.9 | 2135.6 | 1915.6 | 2486.0 | 1831.6 | 2359.3 | 1936.4 | 2512.8 |
| M_u (Strength I) | (ft-k) | 4906.5 | 5494.1 | 6824.4 | 7318.7 | 5098.8 | 5970.8 | 7241.4 | 7886.5 | 5048.2 | 5936.1 |
| $\phi_r M_r$ | (ft-k) | 6463.6 | 6510.4 | 7485.2 | 7485.2 | 6947.2 | 7005.1 | 7951.9 | 7951.9 | 6966.0 | 7021.7 |
| f_s DC1 | (ksi) | 8.2 | 7.3 | 13.7 | 12.2 | 7.2 | 6.4 | 13.4 | 11.9 | 6.9 | 6.2 |
| f_s DC2 | (ksi) | 1.5 | 1.5 | 2.4 | 2.4 | 1.5 | 1.5 | 2.4 | 2.4 | 1.4 | 1.4 |
| f_s DW | (ksi) | 2.3 | 2.3 | 3.7 | 3.8 | 2.3 | 2.3 | 3.7 | 3.8 | 2.2 | 2.2 |
| f_s 1.3(LL + IM) | (ksi) | 16.6 | 20.6 | 14.8 | 18.6 | 16.6 | 21.8 | 15.0 | 19.3 | 16.8 | 22.0 |
| f_s (Service II) | (ksi) | 28.6 | 31.7 | 34.6 | 36.9 | 27.6 | 31.9 | 34.6 | 37.4 | 27.2 | 31.7 |
| f_s (Total)(Strength I) | (ksi) | 38.0 | 42.2 | 45.6 | 48.9 | 36.7 | 42.6 | 45.5 | 49.6 | 36.2 | 42.3 |
| V_r | (k) | 41.4 | 41.6 | - | - | 44.6 | 44.8 | - | - | 44.7 | 44.9 |



I_s, S_x : 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) 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) due to long-term composite (superimposed) dead loads (in⁴ and in³).

Z: Plastic Section Modulus of the steel section in non-composite areas. Omit line in Moment Table if not used in design calculations (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.).

$M_L + IM$: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).

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

$1.25 (M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_L + IM$

$\phi_r M_r$: Compact composite positive moment capacity computed according to Article 6.10.7.1 (kip-ft.).

$\phi_r M_{nc}$: Compact non-composite negative moment capacity computed according to Article A6.1.1 (kip-ft.).

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

$M_{DC1} + M_{DC2} + M_{DW} + 1.3 M_L + IM$

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

$1.25 (M_{DC1} + M_{DC2}) + 1.5 M_{DW} + 1.75 M_L + IM$

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

NOTES

- All cross frames or diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted.
- This bridge superstructure was designed assuming non-composite behavior in the negative moment regions (consistent with IDOT practice prior to 2012). Slab reinforcement was extended and headed shear studs were added to the negative moment regions later in order to take advantage of composite behavior.

**STEEL FRAMING PLAN
STRUCTURE NO. 056-3190**

| | Abutments | | Pier 1 or 4 | | Pier 2 or 3 | | |
|-------------|-----------|----------|-------------|----------|-------------|----------|--------|
| | INTERIOR | EXTERIOR | INTERIOR | EXTERIOR | INTERIOR | EXTERIOR | |
| R_{DC1} | (k) | 44.94 | 39.84 | 164.43 | 146.51 | 166.69 | 148.77 |
| R_{DC2} | (k) | 9.39 | 9.35 | 31.74 | 31.78 | 32.34 | 32.33 |
| R_{DW} | (k) | 14.61 | 14.55 | 49.37 | 49.43 | 50.3 | 50.29 |
| R_{LL+IM} | (k) | 100.28 | 94.29 | 192.43 | 181.33 | 199.23 | 187.7 |
| R_{TOTAL} | (k) | 169.22 | 158.03 | 437.97 | 409.06 | 448.56 | 419.1 |

| | |
|----------|-----|
| DESIGNED | SSM |
| CHECKED | RGD |
| DRAWN | WJH |
| CHECKED | RGD |



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| | | | |
|----------------------------------|------------------|------------------------|----------------|
| WB CHARLES J. MILLER ROAD BRIDGE | | DATE: 7/23/12 | |
| SHEET NO. S-21 | F.A.U. RTE. 3860 | SECTION 09-00372-00-PW | COUNTY McHENRY |
| S-41 SHEETS | TOTAL SHEETS 252 | | SHEET NO. 144 |
| FED. ROAD DIST. NO. 1 ILLINOIS | | FED. AID PROJECT | |
| | | CONTRACT NO. 63633 | |