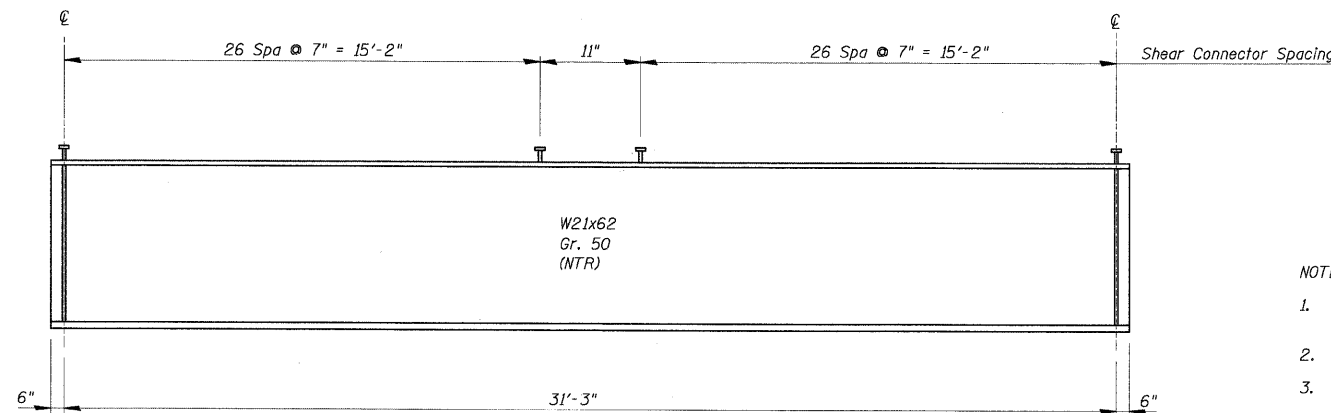
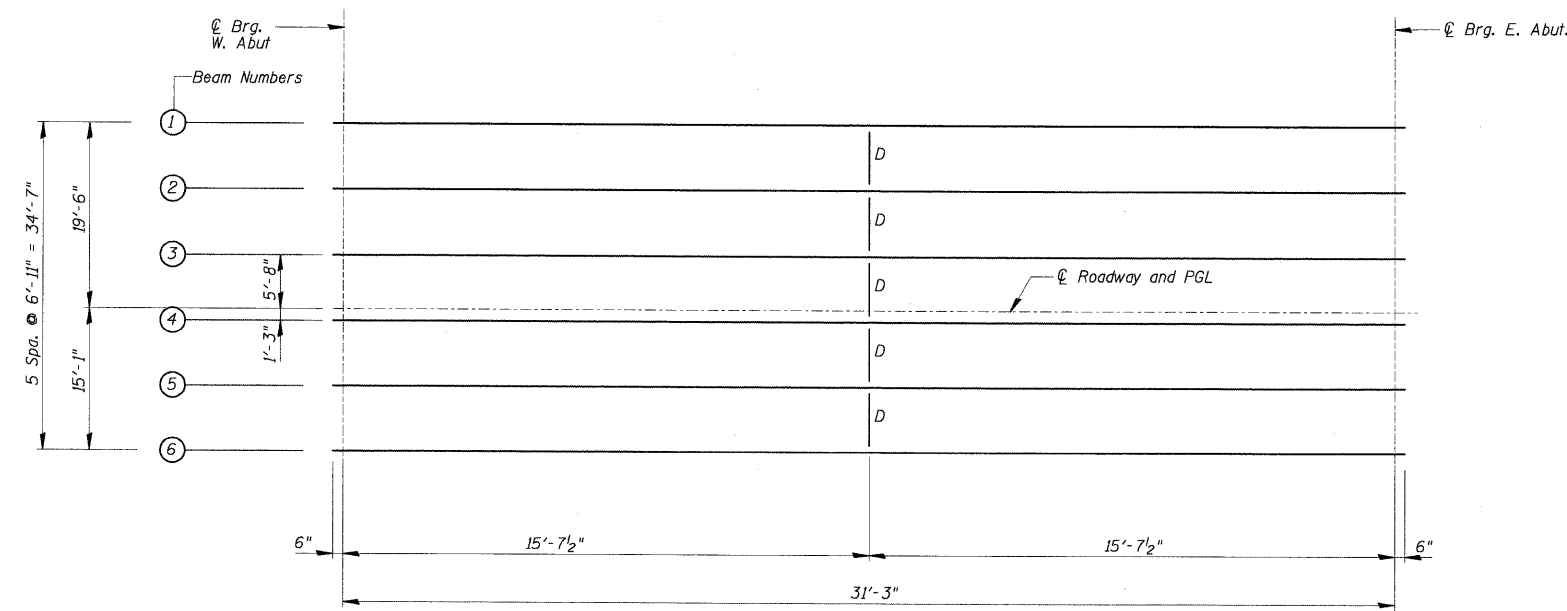


STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION



TOP OF BEAM ELEVATIONS-BEFORE DEFLECTION  
(For Fabrication use only)

| LOCATION        | BEAM 1 | BEAM 2 | BEAM 3 | BEAM 4 | BEAM 5 | BEAM 6 |
|-----------------|--------|--------|--------|--------|--------|--------|
| ℄ Brg. E. Abut. | 646.03 | 646.10 | 646.24 | 646.33 | 646.19 | 646.05 |
| ℄ Brg. W. Abut. | 646.26 | 646.34 | 646.48 | 646.56 | 646.43 | 646.29 |

|   |                    | 0.5 Sp. |
|---|--------------------|---------|
| $I_s$                                     | (in <sup>4</sup> ) | 1330    |
| $I_c$ (n)                                 | (in <sup>4</sup> ) | 4964.8  |
| $I_c$ (3n)                                | (in <sup>4</sup> ) | 3781.6  |
| $S_s$                                     | (in <sup>3</sup> ) | 126.8   |
| $S_c$ (n)                                 | (in <sup>3</sup> ) | 221.4   |
| $S_c$ (3n)                                | (in <sup>3</sup> ) | 198.9   |
| $\rho$                                    | (k/ft.)            | 0.765   |
| $M \rho$                                  | (k)                | 93.5    |
| $s \rho$                                  | (k/ft.)            | 0.37    |
| $M_s \rho$                                | (k)                | 44.5    |
| $M_t$                                     | (k)                | 189.1   |
| $M$ (Imp)                                 | (k)                | 56.7    |
| $S_s [M_t + M(\text{Imp})]$               | (k)                | 409.8   |
| $M_a$                                     | (k)                | 712.1   |
| * $M_u$                                   | (k)                | 1,239.8 |
| $f_s \rho$ non-comp (k.s.i.)              |                    | 8.84    |
| $f_s \rho$ (comp) (k.s.i.)                |                    | 2.69    |
| $f_s \rho_s (\rho + \text{Imp})$ (k.s.i.) |                    | 22.20   |
| $f_s$ (Overload) (k.s.i.)                 |                    | 33.73   |
| * $f_s$ (Total) (k.s.i.)                  |                    | 43.85   |
| $VR$                                      | (k)                | 47.0    |

\* Non-Compact Section

|               |     | Abut. |
|---------------|-----|-------|
| $R \rho$      | (k) | 17.7  |
| $R_t$         | (k) | 36.5  |
| $\text{Imp.}$ | (k) | 10.9  |
| $R$ (Total)   | (k) | 65.1  |

- $I_s, S_s$ : 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<sub>4</sub> and in<sub>3</sub>).
- $I_c(n), S_c(n)$ : 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<sub>4</sub> and in<sub>3</sub>).
- $I_c(3n), S_c(3n)$ : Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing  $f$  (Total and Overload) due to long-term composite (superimposed) dead loads (in<sub>4</sub> and in<sub>3</sub>).
- $\rho$ : Un-factored non-composite dead load (kips/ft.).
- $M \rho$ : Un-factored moment due to non-composite dead load (kip-ft.).
- $s \rho$ : Un-factored long-term composite (superimposed) dead load (kips/ft.).
- $M_s \rho$ : Un-factored moment due to long-term composite (superimposed) dead load (kip-ft.).
- $M_t$ : Un-factored live load moment (kip-ft.).
- $M_{\text{imp}}$ : Un-factored moment due to impact (kip-ft.).
- $M_a$ : Factored design moment (kip-ft.).
- $1.3 [M \rho + M_s \rho + \frac{5}{8} (M_t + M_{\text{imp}})]$
- $M_u$ : 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).
- $M \rho + M_s \rho + \frac{5}{8} (M_t + M_{\text{imp}})$
- $f_s$  (Total): Sum of stresses as computed from the moments below on non-compact section (ksi).
- $1.3 [M \rho + M_s \rho + \frac{5}{8} (M_t + M_{\text{imp}})]$
- $VR$ : Maximum  $\frac{1}{4}$  + impact horizontal shear range within the composite portion of the span for stud shear connector design (kips).

NOTES:

- N.T.R. designates members subject to the supplemental requirements for notch toughness (Zone 2).
- All structural steel for beams shall be AASHTO M270 Grade 50.
- Fasteners shall be high strength bolts, conforming to AASHTO M-164 Specification (ASTM A 325). Bolts  $\frac{3}{8}$ "  $\phi$ , open holes  $\frac{5}{16}$ "  $\phi$ , unless noted otherwise.
- Two hardened washers are required over all oversized holes.
- Number of shear connectors required, 108 beams x 6 = 648.

|            |                                    |
|------------|------------------------------------|
| DESIGNED - | 200                                |
| CHECKED -  | EXAMINED                           |
| DRAWN -    | PASSED                             |
| CHECKED -  | ENGINEER OF BRIDGES AND STRUCTURES |

|   |              |                |        |                 |              |
|---|--------------|----------------|--------|-----------------|--------------|
| SHEET NO.<br>S-10<br>SHEETS                   | F.A.<br>RTE. | SECTION        | COUNTY | TOTAL<br>SHEETS | SHEET<br>NO. |
|   | 4025         | 09-00071-00-BR | COOK   | 31              | 22           |
| CONTRACT NO. 63437                            |              |                |        |                 |              |
| FED. ROAD DIST. NO. ILLINOIS FED. AID PROJECT |              |                |        |                 |              |

FRAMING PLAN DETAILS  
WHITEHALL AVENUE OVER  
ADDISON CREEK  
F.A. RTE. 4025  
SECTION 09-00071-00-BR  
COOK COUNTY  
STATION 30+67.04  
STRUCTURE No. 016-7618