### Design Notes:

Load rated in accordance to 'The Manual for Bridge Evaluation'.

- Prestress losses for the designed beam have been included for a fatigue factor of 60 percent. Optional designs must likewise conform.

### Fabrication Notes:

- Precast Grade 60 reinforcing steel bars shall be used with the exception of 75 percent of the total required tension. 
- When shown on this sheet, the Fabricator has the option to furnish either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas. 
- Locate strands for the designed beam as low as possible on the 2" grid system unless a non-standard strand pattern is indicated. Fill row "2.5", then row "4.5".
- Place strand symmetrically about the vertical centerline. Decrease strand lengths inward, with debonding staggered in each row.
- Do not debond strands in position "1". 
- Full-length debonded strands are not permitted in positions "1" through "3".

### Optional Design

- Optional designs must likewise conform.

**ML93 Loading**

- Load rated in accordance to 'The Manual for Bridge Evaluation'.

- Based on the following allowable stresses (ksi):
  - Tension: 0.24 $f'_{ci}$
  - Compression: 0.65 $f'_{ci}$

- Based on the following allowable stresses (ksi):
  - Shear: 0.14 $f_{ci}$

**Standard Designs**

- 24" Roadway

**TxDOT DS20 Decked Slab Beam**

- (Showing interior beam, exterior beam similar.)

**TxDOT DS23 Decked Slab Beam**

- (Showing interior beam, exterior beam similar.)

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**Table: Designed Beams (Straight Strands)**

<table>
<thead>
<tr>
<th>No.</th>
<th>Beam Type</th>
<th>Total No.</th>
<th>Total Size</th>
<th>A'</th>
<th>A''</th>
<th>A' x A''</th>
<th>Total</th>
<th>A'</th>
<th>A''</th>
<th>$f_{cc}$</th>
<th>$f_{cs}$</th>
<th>$f_{ci}$</th>
<th>$f_{fc}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>ALL</td>
<td>10</td>
<td>6.0 270</td>
<td>31</td>
<td>31</td>
<td>9.31</td>
<td>4.500</td>
<td>6.0</td>
<td>6.0</td>
<td>8.31</td>
<td>8.31</td>
<td>8.31</td>
<td>8.31</td>
</tr>
</tbody>
</table>

**Table: Optional Design**

- Optional designs must likewise conform.

---

**Diagram: TxDOT DS20 Decked Slab Beam**

- (Showing interior beam, exterior beam similar.)

**Diagram: TxDOT DS23 Decked Slab Beam**

- (Showing interior beam, exterior beam similar.)