**NOTES:**

1. Allowable spans for Bulb-T girders are approximately 2'-0" greater than those shown for the companion Bulb-T girder in the Estimated Number of Strands chart.

2. Girder end blocks should be used at girder ends made continuous for live load or when girders are partially post tensioned.

3. Debonding strands to control compressive stresses at girder ends is permitted provided that the required development length for debonded strands is obtained. Do not depend any strands in the bottom row.

4. Do not debond strands in the bottom row in vertical section.

5. Debonded strands may be bundled between hold-down points.

**Assumptions for Estimating Strand Requirements:**

25 psf allowance for future wearing surface

100 psf allowance for girders for rails and utilities

HL-33 in loading with 60% of allowable final tension

8" deck with 1" ballast on top of girder

0.5% of final allowable compressive stress

He and Ye values provided for preliminary purposes only and are based on He = 1/3 * girder depth.

Adjust as needed to meet design requirements.

---

**BULL-BT GIRDER SPAN ALIGNMENT—VERTICAL (PRECAST PRESTRESSED CONCRETE) GIRDERS**

<table>
<thead>
<tr>
<th>Girder</th>
<th>Span, ft.</th>
<th>Design Load, kips</th>
<th>Traffic Load, kips</th>
<th>Midspan Section, kips</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT48</td>
<td>30</td>
<td>344</td>
<td>320</td>
<td>312</td>
</tr>
<tr>
<td>BT56</td>
<td>30</td>
<td>344</td>
<td>320</td>
<td>312</td>
</tr>
<tr>
<td>BT60</td>
<td>30</td>
<td>344</td>
<td>320</td>
<td>312</td>
</tr>
<tr>
<td>BT64</td>
<td>30</td>
<td>344</td>
<td>320</td>
<td>312</td>
</tr>
<tr>
<td>BT84</td>
<td>30</td>
<td>344</td>
<td>320</td>
<td>312</td>
</tr>
</tbody>
</table>

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**DET3320**

Weight estimated at 155 lbs. per cubic foot.

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**GIRDER PROPERTIES**

<table>
<thead>
<tr>
<th>Girder</th>
<th>Area, in²</th>
<th>Tw, in</th>
<th>J, in⁴</th>
<th>St, in³</th>
<th>Sh, in³</th>
<th>Wt, kip</th>
<th>V/S, in</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT48</td>
<td>556</td>
<td>254.1</td>
<td>177.2</td>
<td>7.564</td>
<td>7.230</td>
<td>0.598</td>
<td>2.58</td>
</tr>
<tr>
<td>BT56</td>
<td>629</td>
<td>304.7</td>
<td>207.9</td>
<td>9.420</td>
<td>8.100</td>
<td>0.676</td>
<td>2.65</td>
</tr>
<tr>
<td>BT60</td>
<td>690</td>
<td>355.1</td>
<td>238.8</td>
<td>11.200</td>
<td>9.000</td>
<td>0.752</td>
<td>2.71</td>
</tr>
<tr>
<td>BT64</td>
<td>772</td>
<td>405.6</td>
<td>269.8</td>
<td>12.900</td>
<td>10.000</td>
<td>0.829</td>
<td>2.77</td>
</tr>
<tr>
<td>BT84</td>
<td>955</td>
<td>588.7</td>
<td>352.7</td>
<td>15.600</td>
<td>11.900</td>
<td>0.905</td>
<td>2.83</td>
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<tr>
<td>BT102</td>
<td>1138</td>
<td>785.2</td>
<td>435.5</td>
<td>18.300</td>
<td>13.800</td>
<td>0.981</td>
<td>2.89</td>
</tr>
</tbody>
</table>

---

**ESTIMATED NO. OF STRANDS**

**NOTE TO DESIGNER:**

Check deflection and tension prior to placing concrete, as well as on structural details. Stability and service restrictions can be a problem.

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**ORIGIN DEPARTMENT OF TRANSPORTATION**

**DETAIL NO. DET3320**

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**Bulb-BT and T (Precast Prestressed Concrete) Girders Design Sheet**

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**Concrete Insert E**

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**Deflected Strands at 1/2" ctrs. Vertical between hold-downs. Split upper and lower groups as shown.**

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**End View**

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**Midspan Section**

Bulb-BT girder section between hold-downs.