### DESIGN NOTES:
- Designed in accordance with AASHTO LRFD Bridge Design Specifications.
- Prestress losses for the designed beams have been calculated for a relative humidity of 95%.
- Optional designs must otherwise conform.

### FABRICATION NOTES:
- Provide Class I concrete.
- Use low relaxation strands, each pretensioned to 75 percent of fpu.
- Provide Grade 60 reinforcing steel bars.
- Provide Class H concrete.
- Use low relaxation strands, each pretensioned to 75 percent of fpu.
- Prestress losses for the designed beams have been calculated for a relative humidity of 95%.
- Optional designs must likewise conform.
- The use of this standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

### PATTERN STRANDS
- Full-length debonded strands are only permitted in positions marked "x".
- Do not debond strands in position "o". Distribute debonded strands equally about the vertical centerline. Decrease debonded lengths working inward, with full-length debonded lengths working inward, with remaining staggered in each row.
- Stand debonding must comply with Item 424.4.2.2.4.

### FABRICATION NOTES:
- All design submittals and shop drawings must be signed, sealed, and dated by a Professional Engineer registered in the State of Texas.
- When shown on this sheet, the Fabricator has the option of furnishing 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.
- Do not provide any non-standard strand pattern. Provide Grade 60 reinforcing steel bars.
- Design submittals and shop drawings must be signed, sealed, and dated by a Professional Engineer registered in the State of Texas.

### DESIGN NOTES:
- Based on the following allowable stresses (ksi):
  - Compression = 0.85 f'c
  - Tension = 0.24 f'c
- Optional designs must likewise conform.

### Optional Design
- Portion of full HL93.

### PRESTRESSED CONCRETE X-BEAM DESIGNS
- (NON-STANDARD SPANS)

### TABLE 1: DESIGNED BEAMS (STRAIGHT STRANDS)

<table>
<thead>
<tr>
<th>SPAN NO.</th>
<th>BEAM NO.</th>
<th>BEAM TYPE</th>
<th>NO. STRAND PATTERN</th>
<th>NO. TOTAL STRANDS</th>
<th>SIZE (in)</th>
<th>STRAND NO.</th>
<th>TOTAL NO.</th>
<th>BOND END</th>
<th>STRAND TYPE</th>
<th>NO. DEBONDED</th>
<th>STRENGTH (ksi)</th>
<th>NO. STD</th>
<th>STD PATTERN LENGTH (ft)</th>
</tr>
</thead>
<tbody>
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### TABLE 2: OPTIONAL DESIGN

<table>
<thead>
<tr>
<th>SPAN NO.</th>
<th>BEAM NO.</th>
<th>BEAM TYPE</th>
<th>NO. STRAND PATTERN</th>
<th>NO. TOTAL STRANDS</th>
<th>SIZE (in)</th>
<th>STRAND NO.</th>
<th>TOTAL NO.</th>
<th>BOND END</th>
<th>STRAND TYPE</th>
<th>NO. DEBONDED</th>
<th>STRENGTH (ksi)</th>
<th>NO. STD</th>
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</table>

### DIAGRAM
- The diagram illustrates the X-beam designs for various spans.
- The X-beam designs are marked with "x" and "o" to indicate debonded and bonded strands, respectively.
- The diagram includes designations for TxDOT XB40, XB34, XB28, and XB20 beams.

### HL93 LOADING
- The diagram also includes the HL93 loading criteria for X-beam designs.