BRIDGE DESIGN PRECERTIFICATION

Jamie F. Farris, PE
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Licensure Requirement

- Minimum requirements for licensure - applicant must be licensed in one of the 50 United States or territories.
- For a PE, the minimum requirement may also be met if the applicant is licensed in Canada or in the United Mexican States.
- Input the earliest license obtained with date the license was first acquired.
Bridge Design Definition

- Bridge Design in terms of precertification means the person applying for precertification has designed the bridges personally
  - Design superstructure
  - Design substructure

- Does not include:
  - Checking
  - Managing a bridge design project
  - Managing a bridge construction project
  - Organizing the bridge sheets
  - GEC
Bridge Design Categories

- 5.1.1 Minor Bridge Design
- 5.2.1 Major Bridge Design
- 5.3.1 Multi-Level Interchange Design
- 5.4.1 Exotic Bridge Design
### 5.1.1 Minor Bridge Design

<table>
<thead>
<tr>
<th>Category Description</th>
<th>Certification Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>This category includes the design of conventional, non-complex bridges, bridge replacements, simple bridge widening, railroad overpasses, non-standard retaining walls, and pedestrian bridges.</td>
<td>The firm must employ one professional engineer with a minimum of <strong>two years structural bridge</strong> design experience after licensure as a professional engineer.</td>
</tr>
</tbody>
</table>
### 5.2.1 Major Bridge Design

<table>
<thead>
<tr>
<th>Category Description</th>
<th>Certification Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>This category includes the design of bridges with complex geometry, complexity of design, spans less than 350 feet, non-conventional substructures, substructures requiring ship impact design, design of dolphins for bridge pier protection, railroad underpasses, complex bridge widening, steel truss spans, and concrete arch bridges.</td>
<td>The firm must employ one professional engineer with a minimum of five years of structural bridge design experience after licensure as a professional engineer.</td>
</tr>
</tbody>
</table>

**5 years after licensure**  Structural Bridge Design
5.3.1 Multi-Level Interchange Design

<table>
<thead>
<tr>
<th>Category Description</th>
<th>Certification Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>This category includes design of bridges with three levels or more.</td>
<td>The firm must employ one professional engineer with a minimum of seven years of structural bridge design experience in multi-level interchanges after licensure as a professional engineer.</td>
</tr>
</tbody>
</table>
### 5.4.1 Exotic Bridge Design

<table>
<thead>
<tr>
<th>Category Description</th>
<th>Certification Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>This category includes the design of bridges with spans greater than 350 feet, suspension bridges, cable-stayed bridges, precast, post-tensioned segmental bridges, bridges requiring unique analytical methods, and movable bridges.</td>
<td>The firm must employ one professional engineer with a minimum of <strong>seven years of</strong> structural bridge design experience <strong>in exotic bridge design</strong> after licensure as a professional engineer.</td>
</tr>
</tbody>
</table>
Application Tips

- Be descriptive, be descriptive, **be descriptive**
- Fill out the Description of Work
- Only state what applicant personally worked on in Description of Work
- Bridge description
  - Superstructure type – prestressed concrete, steel, cable stay, arch, truss...
  - Span lengths
  - Geometry – straight or curved; skewed
  - Substructure type – multi-column, single column, inverted-tee, post-tensioned
- For 5.3.1, state number of levels for the interchange
**Application Tips**

- Total Project Duration – should be the amount of time applicant worked on the design, not the entire design and construction duration
- Units – helpful if they are in English
- Years of experience and Description of Work should be experience in bridge design:
  - NOT Bridge Retrofits
  - NOT Bridge Inspection
  - NOT Bridge Layouts
  - NOT Buildings
  - NOT Feasibility Studies
  - NOT Hydraulics
  - Etc.
Example 1

5.1.1

<table>
<thead>
<tr>
<th>Category of Work (5.1.1)</th>
<th>MINOR BRIDGE DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Work Completed in This Category</td>
<td>REVIEWED DESIGN OF BRIDGES AS A MEMBER OF DESIGN-BUILT TEAM AT ALL DESIGN STAGES. PROVIDE SOLUTIONS TO BRIDGE NCRS</td>
</tr>
</tbody>
</table>

REVIEWED DESIGN OF BRIDGES AS A MEMBER OF DESIGN-BUILD TEAM AT ALL STAGES...

NOT DESIGN – THIS PROJECT WOULD NOT BE ACCEPTED TOWARDS PRECERTIFICATION
Example 2

5.2.1

<table>
<thead>
<tr>
<th>Category of Work (5.2.1)</th>
<th>MAJOR BRIDGE DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Work Completed in This Category</td>
<td></td>
</tr>
<tr>
<td>DESIGN OF 35 SPANS OF STRUCTURE STRETCHING ACROSS 6,295 FEET.</td>
<td></td>
</tr>
</tbody>
</table>

DESIGN OF 35 SPANS OF STRUCTURE STRETCHING ACROSS 6,295 FEET

NO DESCRIPTION OF TYPE OF BRIDGE – THIS PROJECT WOULD NOT BE ACCEPTED TOWARDS PRECERTIFICATION
Example 3

5.3.1

<table>
<thead>
<tr>
<th>Category of Work (5.3.1)</th>
<th>MULTI-LEVEL INTERCHANGE DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Work Completed in This Category</td>
<td></td>
</tr>
<tr>
<td>PROVIDED QC FOR LAYOUT &amp; BRIDGE DESIGN OF A 4 LEVEL FLYOVER BRIDGE OVER SH</td>
<td></td>
</tr>
</tbody>
</table>

PROVIDED QC FOR LAYOUT & BRIDGE DESIGN OF 4 LEVEL FLYOVER BRIDGE OVER SH.

NO DESCRIPTION OF TYPE OF BRIDGE – IS THIS QC OF THE LAYOUT ONLY OR LAYOUT AND DESIGN? THIS PROJECT MAY NOT BE ACCEPTED TOWARDS PRECERTIFICATION, IF MORE DESCRIPTION IS NOT GIVEN IN THE PROJECT GENERAL DESCRIPTION
Example 4

5.2.1

REVIEWED PAVEMENT DESIGN FOR OVERPASS AND EBFR DETOUR

PAVEMENT DESIGN IS NOT BRIDGE DESIGN
REVIEWING DOES NOT COUNT AS DESIGNING
– THIS PROJECT WOULD NOT BE ACCEPTED TOWARDS PRECERTIFICATION
Example 5

5.3.1

<table>
<thead>
<tr>
<th>Category of Work</th>
<th>(5.3.1) MULTI-LEVEL INTERCHANGE DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Work Completed in This Category</td>
<td></td>
</tr>
<tr>
<td>I PROVIDED QC/QA &amp; PEER REVIEWS OF THE DESIGN. CHECKED/ TROUBLESHOOTING CONSTRUCTABILITY.</td>
<td></td>
</tr>
</tbody>
</table>

I PROVIDED QC/QA & PEER REVIEWS OF THE DESIGN. CHECKED/TROUBLESHOOTING CONSTRUCTABILITY.

NOT DESIGN – THIS PROJECT WOULD NOT BE ACCEPTED TOWARDS PRECERTIFICATION
Example 6

STRUCTURAL ENGINEER RESPONSIBLE FOR THE ENTIRE CONCRETE SECTION OF 2700-FT BRIDGE CROSSING OVER XXX ROAD. I WORKED CLOSELY W/ ROADWAY ENGINEERS TO DETERMINE THE LOCATIONS OF BENTS & TO FINALIZE LIMITS OF BRIDGE. VERIFIED AND WORKED WITH ROADWAY ENGINEER TO MODIFY VERTICAL PROFILE.
### Project Details

- **Project Name:** EXTENSION OF NB & SB MAINLANES
- **Location:** TX
- **Date Began:** 04 / 01 / 2014
- **Date Completed:** 09 / 01 / 2016
- **Total Project Duration Represented in Days:** 884
- **Total Project Duration Represented in Months:** 28.52
- **Total Project Duration Represented in Years:** 2.38

### Project General Description

STRUCTURAL ENGINEER RESPONSIBLE FOR THE ENTIRE CONCRETE SECTION OF 2700-FT BRIDGE CROSSING OVER [REDACTED] ROAD. I WORKED CLOSELY W/ROADWAY ENGINEERS TO DETERMINE LOCATIONS OF BENTS & TO FINALIZE LIMITS OF BRIDGE. VERIFIED AND WORKED WITH ROADWAY ENGINEER TO MODIFY VERTICAL PROFILE.

### Category of Work

<table>
<thead>
<tr>
<th>Category of Work</th>
<th>Description of Work Completed in This Category</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(5.1.1) MINOR BRIDGE DESIGN</strong></td>
<td></td>
</tr>
<tr>
<td><strong>(5.2.1) MAJOR BRIDGE DESIGN</strong></td>
<td></td>
</tr>
<tr>
<td><strong>(5.3.1) MULTI-LEVEL INTERCHANGE DESIGN</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Span Lengths?**

**Straight or Curved?**

**Steel or Conc?**

**No. of Levels?**

**Not Enough Information to Determine– This Project Would Not Be Accepted Towards Precertification**
### Example 7

#### 5.3.1

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>RECONSTRUCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td></td>
</tr>
<tr>
<td>Date Began:</td>
<td>03 / 16 / 2007</td>
</tr>
<tr>
<td>Date Completed:</td>
<td>11 / 01 / 2009</td>
</tr>
<tr>
<td>Total Project Duration Represented in Days:</td>
<td>960</td>
</tr>
<tr>
<td>Total Project Duration Represented in Months:</td>
<td>30.97</td>
</tr>
<tr>
<td>Total Project Duration Represented in Years:</td>
<td>2.58</td>
</tr>
</tbody>
</table>

### Project General Description

RECONSTRUCTION AND WIDENING OF THE 6 LANE HIGHWAY WITH BRIDGE RECONSTRUCTION, RETAINING AND NOISE WALL CONSTRUCTION AS WELL AS DESIGN OF RAMP J WITH A SUPERSTRUCTURE OF 3 UNITS A TOTAL OF 2390 FEET LONG, EACH UNIT ABOUT 770 FEET LONG MAX SPAN OF 280 FEET A CONTINUOUS PLATE GIRDER DESIGN.

### Category of Work (5.3.1) MULTI-LEVEL INTERCHANGE DESIGN

**Description of Work Completed in This Category**

DESIGN OF 2390 FEET LONG SUPERSTRUCTURE, (3 UNITS EACH UNIT 770 FEET LONG) CONTINUOUS PLATE GIRDER DESIGN.

- Span length dimensions ✅
- Continuous plate girder ✅
- Number of Levels ❌
### Example 8

#### Category(s) Of Work Covered In This Project

<table>
<thead>
<tr>
<th>Category of Work</th>
<th>Description of Work Completed in This Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.1.1 MINOR BRIDGE DESIGN</td>
<td>DESIGN OF PHASED BRIDGE REPLACEMENT.</td>
</tr>
</tbody>
</table>

- Beam Type ✓
- Clear that applicant performed the design ✓
- Description of Work ✓
- Bridge Type suitable for category ✓
Summary

- Input the earliest license obtained with date the license was first acquired
- Bridge Design = designing bridges
- The certification requirements are number of years experience after licensure
- Be descriptive and fill out the Description of Work
- Only state what applicant personally worked on in Description of Work
Questions?

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