

DIVISION 2

CONTRACT PLAN NOTES, TABLES & NOTICES

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Appendix A
PLAN NOTES

A.1 GENERAL NOTES

A.1.1 Guidelines for Use

Certain “General Notes” are required to be shown on the general plan sheets. The Designer shall develop the notes with the aid of the following guidelines:

<u>Note No.</u>	<u>Requirements for use</u>
G1	Must be shown on the General Plan Sheet.
G2	Must be shown on the General Plan Sheet.
G3	The classes of concrete and grades of reinforcing steel that are proposed for the structure shall be indicated. Indicate the applicable structural steel designations, F_y (specified minimum yield point of steel) and the corresponding thicknesses, for the type of steel used in the structure only.
G4	Use this note for all new structures and for projects that include rehabilitation or preservation of an existing bridge.
G5	Use this note for projects addressing rehabilitation or preservation of existing bridges that cannot support or be strengthened sufficiently to support all design, legal and permit loads.
G6	For structure detailed without a Bituminous Concrete Overlay.
G7	For structure detailed with a Bituminous Concrete Overlay.
G8	For structures designed with steel members, use this note.
G9	Use is limited to the repair of, repainting of, or alterations to existing structures.
G10	For all new structures that require painting.
G11	For all new structures of weathering steel that therefore will not require painting.
G12	For all new structures of weathering steel that will require the ends of the girders to be painted at deck joints.
G13	Must be shown on the General Plan Sheet.

Note No. Requirements for use

- G14 The words “AND PILE LOADS” shall be deleted when there are no piles in the structure.
- G15 Must be shown on the General Plan Sheet.
- G16 To be used where existing structures are being modified or repaired.
- G17 To be used where utilities are to be protected during construction. Designer to coordinate NTC as required.
- G18 Must be shown on the General Plan Sheet for new or modified traffic & combination rails.

A.1.2 LISTING OF GENERAL NOTES

G1 **SPECIFICATIONS:** Connecticut Department of Transportation Form 817 (2016), Supplemental Specification dated (mm/yy) and Special Provisions.

G2 **DESIGN SPECIFICATIONS:** *AASHTO LRFD Bridge Design Specifications* (Edition - Year), with the Interim Specifications up to and including (year), as supplemented by the Connecticut Department of Transportation *Bridge Design Manual* (2003).

G3 **MATERIAL STRENGTHS:**

Concrete:

- Class PCC 0334Z $f'_c = 3,000$ psi
- Class PCC 04462 $f'_c = 4,000$ psi
- Class PCC XXXYZ $f'_c = XX,000$ psi

The concrete strength, f'_c , used in design of the concrete components is noted above. The compressive strength of the concrete in the constructed components shall conform to the requirements of 6.01 – Concrete for Structures, and M.03 – Portland Cement Concrete.

Reinforcement:

- (ASTM A615 Grade 60) $f_y = 60,000$ psi

Structural Steel:

- (AASHTO M270, Grade 50) $F_y = 50,000$ psi
- (AASHTO M270, Grade 50W)..... $F_y = 50,000$ psi
- (AASHTO M270, Grade HPS 70W) $F_y = 70,000$ psi

- (AASHTO M270, Grade 100, up to 2 ½” thick) $F_y = 100,000$ psi
- (AASHTO M270, Grade 100W, up to 2½” thick)..... $F_y = 100,000$ psi
- (AASHTO M270, Grade 100, over 2½” to 4”)..... $F_y = 90,000$ psi
- (AASHTO M270, Grade 100W, over 2½” to 4”)..... $F_y = 90,000$ psi

- G4 LIVE LOAD: HL-93, Legal and Permit Vehicles
- G5 LIVE LOAD: (Designer to specify all vehicles for which the bridge Rating Factors greater than 1)
- G6 FUTURE PAVING ALLOWANCE: 40 pounds per square foot
- G7 FUTURE PAVING ALLOWANCE: None
- G8 STRUCTURAL STEEL: See Structural Steel Notes for designations and requirements.
- G9 PAINT: Paint shall conform to the requirements of the special provision, “Field Painting of Structure (Site No.)” The color of the topcoat material on the structural steel shall conform to Federal Standard Color No. , (Color).

ADD THE FOLLOWING IF STEEL BOX GIRDERS ARE USED:

The interior portions of the boxes shall be painted white.

- G10 PAINT: Paint shall conform to the requirements of the special provision, “Structural Steel (Site No.)” The color of the topcoat material on the structural steel shall conform to Federal Standard Color No. , (Color).

ADD THE FOLLOWING IF STEEL BOX GIRDERS ARE USED:

The interior portions of the boxes shall be painted white.

- G11 PAINT: No painting of structural steel is required. Steel surfaces are to be prepared for weathering in accordance with the *Specifications*.
- G12 PAINT: Painting of the structural steel is only required at the ends of the girders. Steel surfaces are to be prepared for weathering in accordance with the *Specifications*.
- G13 BITUMINOUS CONCRETE OVERLAY: (The Designer shall request a pavement design from Pavement Management and include the thicknesses and mix classes in this note)

- G14 FOUNDATION PRESSURES AND PILE LOADS: The various Group Loadings noted on the substructure plan sheets refer to the Group Loads as given in the *AASHTO LRFD Bridge Design Specifications*.
- G15 DIMENSIONS: When decimal dimensions are given to less than three decimal places, the omitted digits shall be assumed to be zeros.
- G16 EXISTING DIMENSIONS: Dimensions of the existing structure shown on these plans are for general reference only. They have been taken from the original design drawings and are not guaranteed. The Contractor shall take all field measurements necessary to assure proper fit of the finished work and shall assume full responsibility for their accuracy. When shop drawings based on field measurements are submitted for review, the field measurements shall also be submitted for reference by the reviewer.
- G17 UTILITIES: The following utilities are located within the project limits and shall be protected during construction: (List all utility companies). The Contractor shall coordinate all work related to utility relocation with the respective utility companies.
- G18 MASH TEST LEVEL: The (rail type) meets the TL-(Level) criteria for MASH 2016.

A.2 CONCRETE NOTES

A.2.1 Guidelines for Use

Certain Concrete Notes are required to be shown on the plans. The actual notes required shall be determined with the aid of the following guidelines:

<u>Note No.</u>	<u>Requirements for use</u>
C1	Use this note on structures where Remain-In-Place forms are not to be allowed.
C2	Use this note if the extra load for Remain-In-Place forms has been included in the design of the structure or any portion of it (such as box girders). Indicate the load in pounds per square foot and the location where it applies.
C3	For structures designed with steel members, use this note. For temporary supports, indicate only the type of construction that applies.
C4	For structures designed with prestressed, precast concrete members, use this note.
C5	For all concrete structure components.

C6	Vacant
C7	Vacant
C8	Vacant
C9	Vacant
C10	Vacant
C11	Vacant
C12	Vacant
C13	Must be shown on the General Plan Sheet.
C14	Must be shown on the General Plan Sheet.
C15	For structures designed with Grade 60 reinforcement.
C16	Vacant
C17	Vacant
C18	Vacant
C19	Must be shown on the General Plan Sheet where applicable. Generally, used only when the slab rides over the backwall.
C20	Must be shown on the General Plan Sheet.
C21	Must be shown on the General Plan Sheet. Generally, used only when the slab rides over the backwall and bridge is on elastomeric bearings.
C22	Must be shown on the General Plan Sheet.

A.2.2 LISTING OF CONCRETE NOTES

- | | |
|----|---|
| C1 | <u>REMAIN-IN-PLACE FORMS</u> : The use of remain-in-place forms on this structure is not allowed. |
| C2 | <u>REMAIN-IN-PLACE FORMS</u> : The use of remain-in-place forms shall be allowed inside of box girders only. The box girders have been designed for the additional weight of 15 pounds per square foot for the remain-in-place forms inside to boxes. |

C3 COMPOSITE CONSTRUCTION: No temporary intermediate supports shall be used during the placing and setting of the concrete deck slab. Temporary supports may be used for structural steel erection only. Construction loads and dead loads will be permitted when directed by the Engineer but only when the concrete has reached a strength of $f'_c = 3500$ psi. Live loads (traffic) will be permitted on the structure after the concrete has reached a strength of $f'_c = 4000$ psi.

C4 COMPOSITE CONSTRUCTION: No temporary intermediate supports shall be used prior to and during the placing and setting of the concrete deck slab. Construction loads and dead loads will be permitted when directed by the Engineer but only when the concrete has reached a strength of $f'_c = 3500$ psi. Live loads (traffic) will be permitted on the structure after the concrete has reached a strength of $f'_c = 4000$ psi.

C5 The following pay items and concrete classes are required for cast-in-place bridge components:

INCLUDE A TABLE SUCH AS THE FOLLOWING THAT INCLUDES APPLICABLE ITEMS, COMPONENTS AND MIX CLASSES:

Item	Bridge Components	PCC Class
Footing Concrete	Abutment and Wingwall Footings	PCC03340
Abutment and Wall Concrete	Abutment and Wingwall Stems, Concrete Bearing Pedestals, Keeper Blocks, Cheekwalls	PCC03340
Bridge Deck Concrete	Bridge Deck	PCC04462
Parapet Concrete	Wingwall Parapet	PCC03340
	Bridge Parapet	PCC04462

C6 Vacant

C7 Vacant

C8 Vacant

C9 Vacant

C10 Vacant

C11 Vacant

C12 JOINT SEAL: See Special Provisions.

- C13 EXPOSED EDGES: Exposed edges of concrete shall be beveled 1"x1" unless dimensioned otherwise.

- C14 CONCRETE COVER: All reinforcement shall have two inches cover unless dimensioned otherwise.

- C15 REINFORCEMENT: All reinforcement shall be galvanized after fabrication unless noted otherwise. All reinforcement shall conform to the requirements of ASTM A767, Class 1, including supplemental requirements. The cost of furnishing and placing this reinforcement shall be included in the item "Deformed Steel Bars – Galvanized."

- C16 Vacant

- C17 Vacant

- C18 Vacant

- C19 FELT: The cost of furnishing and placing 15-pound roofing felt is included in the item "Bridge Deck Concrete".

- C20 PREFORMED EXPANSION JOINT FILLER: The cost of furnishing and installing Preformed Expansion Joint Filler is paid for as "(Thickness and Type) Joint Filler for Bridges."

- C21 CLOSED CELL ELASTOMER: Furnishing and installing Closed Cell Elastomer shall be included in the item "(Thickness) Closed Cell Elastomer."

- C22 CONSTRUCTION JOINTS: Construction joints, other than those shown on the plans, will not be permitted without the prior approval of the Engineer.

A.3 INSPECTION OF FIELD WELDS

The following quantity table is required to be shown on all General Plan Sheets:

INSPECTION OF FIELD WELDS		
METHODS	UNIT	QUANTITY
Ultrasonic	inch	
Magnetic Particle	feet	

A.4 CONCRETE DISTRIBUTION

The following Concrete Distribution box is required to be shown on the General Plan Sheet for all structures except box culverts:

CONCRETE DISTRIBUTION		
Superstructure	C.Y.	
Substructure	C.Y.	
Footings	C.Y.	
Total	C.Y.	

A.5 NOTICE TO BRIDGE INSPECTORS

The following box shall be shown on the General Plan sheet for all bridges. The designer shall list any items that may require special inspection such as fracture critical members, hangers, joints, highly stressed members, etc.

NOTICE TO BRIDGE INSPECTORS	
<p>The Department's Bridge Safety procedures require this bridge to be inspected for, but not limited to, all appropriate components indicated in the governing manuals for bridge inspection. Attention must be given to inspecting the following special components and details. (The listing for components for specific attention shall not be construed to reduce the importance of inspection of any other component of the structure.) The frequency of inspection of this structure shall be in accordance with the governing manuals for bridge inspection, unless otherwise directed by the Manager of Bridge Safety and Evaluation.</p>	
Component or Detail	Structure Sheet Reference

APPENDIX B **STRUCTURAL STEEL NOTES**

B.1 GENERAL

Certain notes pertaining to the fabrication of structural steel are required to be shown on the plans. The actual notes required depend on the girder classification. Girder classifications shown below, and the notes required for each classification, are listed in TABLE B-1.

Note No. 13 should be used as required when the ratio of the unsupported top flange length (feet) to the top flange width (feet) at the section of maximum compressive stress is equal to or greater than one hundred (100).

Steel box girders require the same notes as for welded girders. In addition, Note No. 14 should be used for all box girder structures. Additional notes may be required for special conditions required by box girders.

B.2 GIRDER CLASSIFICATIONS

B.2.1 Simple Spans

- Class “A” - Rolled Beams.
- Class “B” - Welded Girders.
- Class “C” - Welded Girders with Field Splices.
- Class “D” - Welded Curved Girders with Field Splices (Heat curving allowed).
- Class “E” - Welded Curved Girders with Field Splices (Heat curving not allowed).
- Class “F” - Welded Curved Girders w/o Field Splices (Heat curving allowed).
- Class “G” - Welded Curved Girders w/o Field Splices (Heat curving not allowed).

B.2.2 Continuous Spans

- Class “H” - Rolled Beams.
- Class “I” - Curved Rolled Beams.
- Class “J” - Welded Girders.
- Class “K” - Welded Curved Girders (Heat curving allowed).
- Class “L” - Welded Curved Girders (Heat curving not allowed)

TABLE B-1: GIRDER CLASSIFICATIONS

	A	B	C	D	E	F	G	H	I	J	K	L
1	x	x	x	x	x	x	x	x	x	x	x	x
2	x	x	x	x	x	x	x	x	x	x	x	x
3	x	x	x	x	x	x	x	x	x	x	x	x
4				x		x					x	
5					x		x					x
6		x	x		x		x			x		x
7				x		x					x	
8	x	x	x	x	x	x	x	x	x	x	x	x
9		x	x	x	x	x	x			x	x	x
10		x	x	x	x	x	x			x	x	x
11		x	x	x	x	x	x			x	x	x
12	x	x	x	x	x	x	x	x	x	x	x	x
13	x	x	x	x	x	x	x	x	x	x	x	x

x designates notes that must be included on the plans.

B.3 LIST OF STRUCTURAL STEEL NOTES

1. For Non-Fracture Critical bridge members use one of the following notes:

- “Structural Steel (Low Alloy) shall conform to AASHTO M270, Grade 50 T2”
- “Structural Steel (Low Alloy) shall conform to AASHTO M270, Grade 50 WT2”

For Fracture Critical bridge members use one of the following notes:

- “Structural Steel (Low Alloy) shall conform to AASHTO M270, Grade 50 F2”
- “Structural Steel (Low Alloy) shall conform to AASHTO M270, Grade 50 WF2”

Where corrosion resistant steel is required:

- “ * shall conform to AASHTO M270, Grade 50 WT2”
- (* Insert component parts, such as bearings, expansion dams, troughs, etc.)

2. “Welding details, procedures and testing methods shall conform to the ANSI/AASHTO/AWS D1.5-(year) - *Bridge Welding Code*, unless otherwise noted on the plans.”

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3. “Field splices will not be allowed except with the written permission of the Engineer prior to the submission of shop drawings. If allowed, these splices shall be designed by the Contractor and approved by the Engineer. The cost of these splices, including the cost of design, shall be at no extra expense to the State.”

or

“Bolted field splices, other than those indicated on the plans, will not be allowed except with the written permission of the Engineer prior to the submission of shop drawings. If allowed, these splices shall be designed by the Contractor and approved by the Engineer. The cost of these splices, including the cost of design, shall be at no extra expense to the State. Welded field splices will not be allowed.”

4. “All welded girders shall be fabricated to the required horizontal curvature by heat curving or by cutting the flanges from larger size plates. Where curvature is provided by cutting the flanges, the Contractor shall indicate on the shop drawings the location of any additional splices required.”

5. “All welded girders shall be fabricated to the required horizontal curvature by cutting the flanges from larger size plates. Heat curving will not be allowed. The Contractor shall indicate on the shop drawings the location of any additional splices required.”

6. “All web to flange, web to bearing stiffener and bearing stiffener to flange fillet welds shall be inspected by the magnetic particle method.”

7. “All web to flange, web to bearing stiffener and bearing stiffener to flange fillet welds shall be inspected in their entirety by the magnetic particle method after heat curving.”

8. “Multiple pass welds, inspected by the magnetic particle method shall have each pass or layer inspected and accepted before proceeding to the next pass or layer, as determined by the Engineer.”

9. “Shop flange splices shall be located a minimum of 6 inches from web splices.”

10. “Flange or web splices shall be located a minimum of 6 inches from stiffeners and connection plates.”

11. “Ends of beams shall be vertical after the application of full dead loads.”

or

“Bearing stiffeners and the ends of girders shall be vertical after the application of full dead loads.”

or

“Bearing and intermediate stiffeners and the ends of girders shall be vertical after the application of full dead loads.”

12. For non-fracture critical members, include use one of the following notes:

“Structural steel fabricators shall be certified under the AISC Certification Program Category for either Bridge Fabricator Simple (SBR)” or “Bridge Component QMS (CPT).”

Typical work includes:

1. Bridge cross frames for straight bridges with skew angles less than 30 degrees
2. Highway sign structures
3. Bridge inspection catwalks
4. Grid decks
5. Scuppers
6. Expansion joints
7. Bearings

“Structural steel fabricators shall be certified under the AISC Certification Program Category Bridge Fabricator Simple (SBR).”

Typical work includes:

1. Straight simple un-spliced rolled beams

“Structural steel fabricators shall be certified under the AISC Certification Program Category Bridge Fabricator Intermediate (IBR).”

Typical work includes:

1. Rolled beam with field or shop splices, straight or with radius over 500 ft.
2. Built up I-shaped plate girder with constant depth except for dapped ends, with or without splices, either straight or with radius over 500 ft.
3. Built up I-shaped plate girder with variable depth, either straight or with a radius over 1000 ft
4. Truss with a length over 200 ft or less that is entirely pre-assembled at the certified facility and shipped in no more than three sub-assemblies

“Structural steel fabricators shall be certified under the AISC Certification Program Category Bridge Fabricator Advanced (ABR).”

Typical work includes:

1. Tub or trapezoidal box girders, closed box girder bridges
2. Curved girder with radius under 500 ft.
3. Large or no-preassembled trusses, arches
4. Moveable bridges
5. Cable stayed bridges

or

For fracture-critical members, include one of the following two notes:

“Structural steel fabricators shall be certified under the AISC Certification Program Category Bridge Fabricator Intermediate with Fracture Critical endorsement (IBR, F).”

Examples:

1. Rolled beam with field or shop splices, straight or with radius over 500 ft.

2. *Built up I-shaped plate girder with constant depth except for dapped ends, with or without splices, either straight or with radius over 500 ft.*
3. *Built up I-shaped plate girder with variable depth, either straight or with a radius over 1000 ft.*
4. *Truss with a length over 200 ft or less that is entirely pre-assembled at the certified facility and shipped in no more than three sub-assemblies*

“Structural steel fabricators shall be certified under the AISC Certification Program Category certified Bridge Fabricator Advanced with Fracture Critical endorsement (ABR, F).”

Examples:

1. *Tub or trapezoidal box girders, closed box girder bridges*
2. *Curved girder with radius under 500 ft.*
3. *Large or no-preassembled trusses, arches*
4. *Moveable bridges*
5. *Cable stayed bridges*

13. “The Contractor shall take the proper precautions to ensure the stability of all structural elements until the total structure is in being.”

14. “It shall be the Contractor’s responsibility to provide any additional temporary bracing required to maintain the geometry of the individual box girders, as well as the total steel structure, throughout all phases of construction including placement of the concrete deck.”