

STATE OF NEW HAMPSHIRE
BRIDGE DESIGN MEMORANDUM

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FROM: L. Robert Landry, Jr., PE
Administrator

DATE: January 25, 2018
AT (Office): Bureau of Bridge Design

SUBJECT: Design Memorandum 2018-01
Revised Cast-in-Place Deck Haunch Detail, Prestressed Partial-Depth Concrete Deck Panel

TO: Bureau of Bridge Design Staff, Bridge Design Consultants, FHWA, NHDOT Bureaus, Contractors

The Bureau of Bridge Design is updating the Bridge Design Manual. During this process, certain design decisions are being issued for immediate implementation. Consequently, the Bridge Design Manual, Bridge Details, and Bridge Detail Sheets have been modified as follows:

A. Bridge Details:

- Revised CIP Deck Haunch Detail – Interior Steel Girder
- Revised CIP Deck Haunch Detail – Interior Concrete Girder

B. Bridge Detail Sheets:

- Prestressed Partial-Depth Concrete Deck Panel – Steel Girder
- Prestressed Partial-Depth Concrete Deck Panel – Concrete Girder

C. Summary: The above noted revisions are being implemented to specify the following:

- NHDOT policy for design and construction of cast-in-place concrete deck interior girder haunch detail has been modified. The new concrete deck interior girder haunch detail extends straight up from the edges of the girder flange to the designed haunch depth. The horizontal extensions are eliminated (See enclosed detail). A note may be included on the plans with the new haunch detail requiring exposed deck haunch formwork hangers to be hot dipped galvanized. This new cast-in-place deck interior girder haunch detail shall be used on all new concrete bridge decks.
- NHDOT policy for required use of prestressed partial-depth or full-depth concrete deck panels has been added. All new concrete bridge decks that cross over Tier 1 and Tier 2 roads shall use prestressed partial-depth or full-depth concrete deck panels between girders, unless approved otherwise by the Bridge Design Chief. The deck exterior overhangs and deck block-outs at end spans can be cast-in-place concrete. There is no Contractor option for cast-in-place concrete in these locations. The contract plans shall show prestressed partial-depth or full-depth concrete deck panels with the corresponding item.
- Prestressed partial-depth concrete deck panel haunch detail remains the same and is included for reference.
- The Bridge Details (.dgn and .pdf format) are located on the Bureau of Bridge Design web page: <http://www.nh.gov/dot/org/projectdevelopment/bridgedesign/bridgedetails/index.htm>
- The Bridge Detail Sheets are located on the Bureau of Bridge Design web page: <http://www.nh.gov/dot/org/projectdevelopment/bridgedesign/detail sheets/index.htm>

D. Background:

This memorandum incorporates modifications to current NHDOT Bridge Manual, Bridge Details, and Bridge Detail Sheets and provides the modified details on the NHDOT Bridge Design Website.

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The previous concrete deck interior girder haunch detail extended the haunch 2 ½-in. horizontally from each side of the girder top flange (See enclosed detail). This detail has been shown on contract plans since approximately 2004 to the current date. This portion of the concrete deck is unreinforced and could spall off due to possible future cracking of the haunch.

From approximately 1999 to 2004, Bridge Design used a deck interior girder haunch detail that extended straight up from the girder flange edges (See enclosed detail). This detail made it difficult for Contractors to form the deck. The typical interior deck hangers could not be used since the metal end portions of the hanger would be exposed and rust. Other alternate hangers would be very costly. Therefore, the horizontal extension of 2 ½-in. was implemented so the typical interior deck hangers could be used.

An older deck girder detail that was used prior to 1999 extended the haunch 3-in. horizontally from each side of the girder bottom of top flange (See enclosed detail). Cracking of the unreinforced concrete haunch has loosened portions of the concrete due to forces generated by corrosion on the vertical edges of the flanges. This loosened concrete has separated and fallen onto the travel way below.

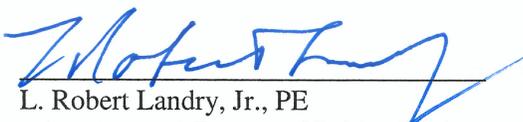
The objective of this new concrete deck interior girder haunch detail is to eliminate the horizontal extension of the concrete haunch from either side of the girder to prevent any future separation and falling of the unreinforced concrete onto the travel way below. The typical formwork hangers can be used but a note may be included with the haunch detail requiring exposed deck haunch formwork hangers to be hot dipped galvanized. Designers are directed to include the hot dipped galvanized note for only CIP concrete bridge decks over roadways, pedestrian paths, or railroads. The note will not be included for bridge decks requiring precast concrete panels, entirely over waterways, or rehabilitation projects with limits of work completely outside limits of undercrossing. The new detail shall be used for all new cast-in-place concrete deck bridge projects.

The objective of using prestressed partial-depth or full-depth concrete deck panels for all new concrete deck bridges that cross over Tier 1 and Tier 2 roads is to decrease the possibility of the concrete deck underside spalling over the travel way. The prestressed concrete deck panels are constructed with high strength, low permeability concrete with prestressing strands. Because this type of concrete construction is less prone to cracking, it is a more reliable material to place over a travel way due to safety concerns of spalling concrete. This policy shall be used unless directed otherwise by the Bridge Design Chief.

This Memorandum clarifies NHDOT's policy for the use of cast-in-place concrete deck interior girder haunch detail and prestressed partial-depth concrete deck panels and incorporates the details that shall be included in the contract plans.

E. Implementation:

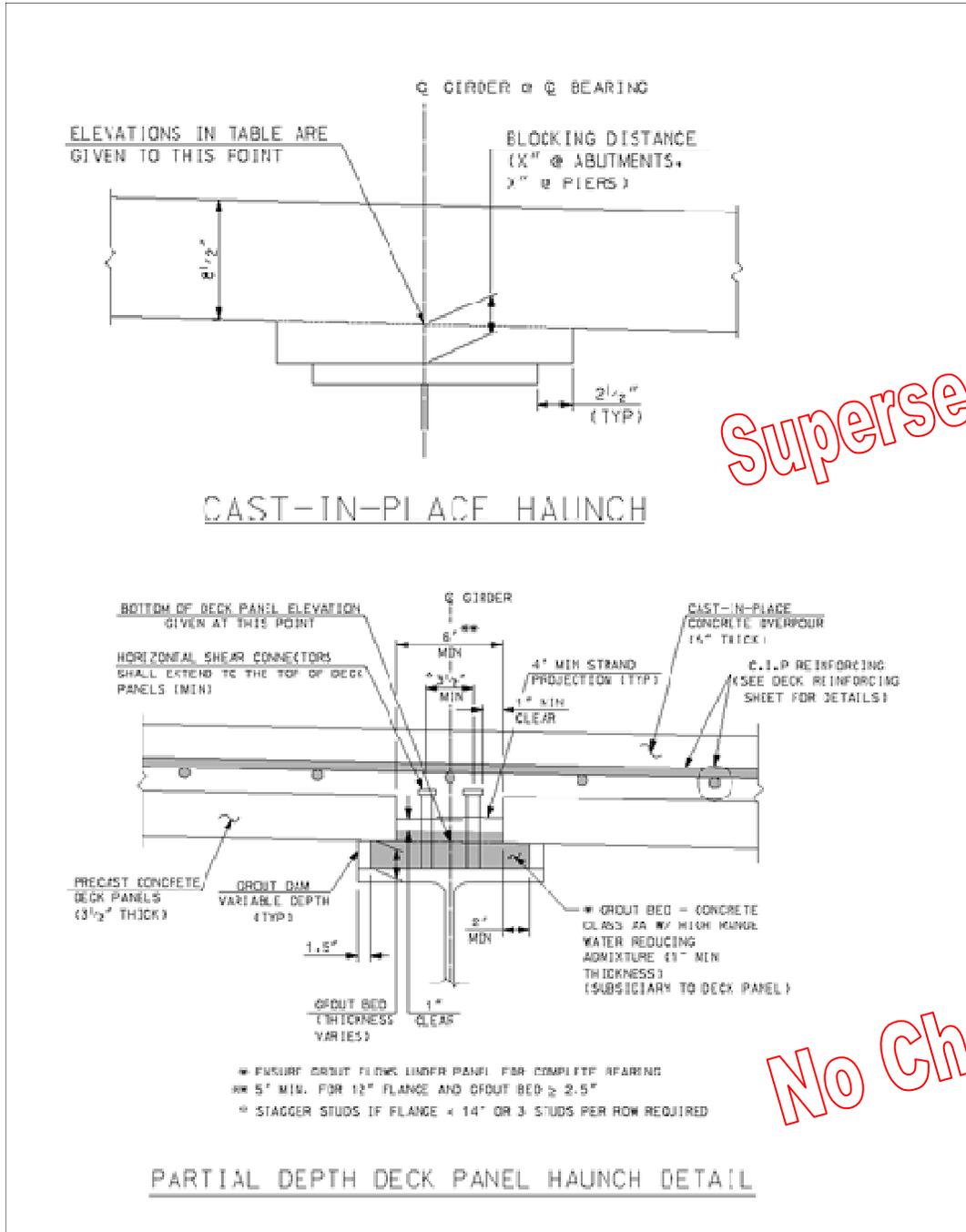
The update to the Bridge Design Manual, Bridge Details, and Bridge Detail Sheets shall be implemented as of the date of this memo and shall be used on all applicable projects.


L. Robert Landry, Jr., PE
Administrator, Bureau of Bridge Design

Enclosures

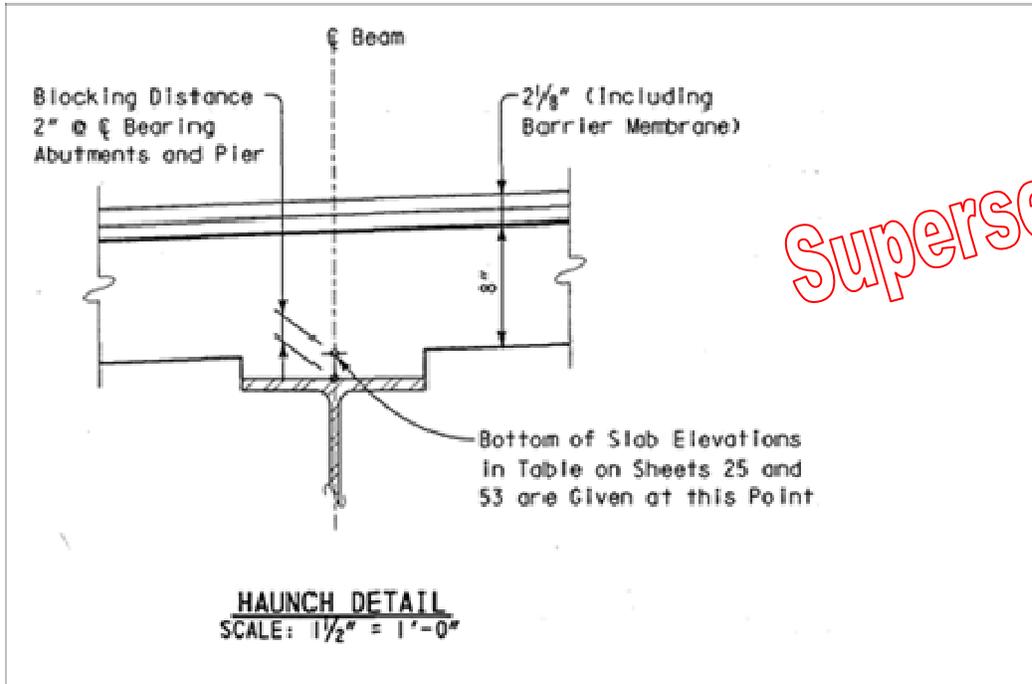
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Detail 2004 to 2017:



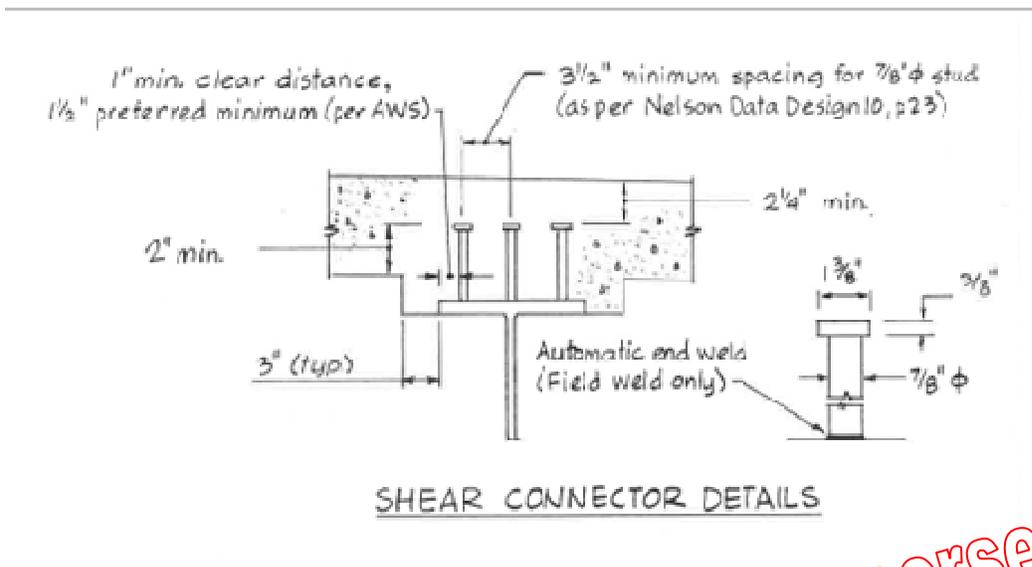
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Detail 1999 to 2004:



Superseded

Detail prior to 1999:



Superseded

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

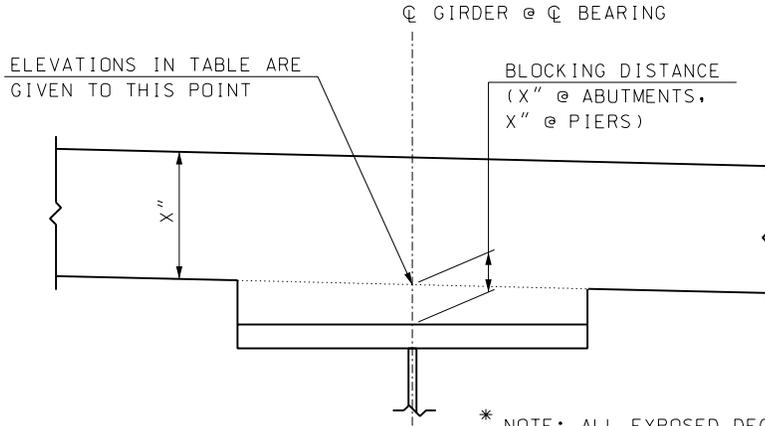


BUREAU OF BRIDGE DESIGN



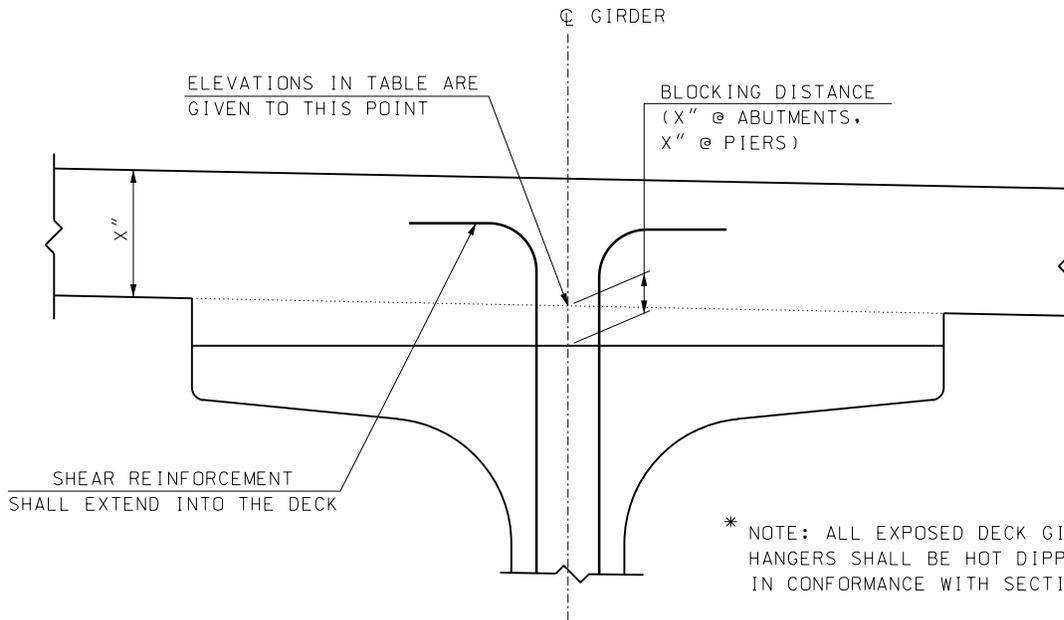
DESCRIPTION: **CONCRETE DECK DETAILS -
INTERIOR GIRDER DECK HAUNCH**

DATE REVISED:
1/25/2018



CAST-IN-PLACE STEEL GIRDER DECK HAUNCH

NEW DETAIL



CAST-IN-PLACE BULB-TEE GIRDER DECK HAUNCH

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION



BUREAU OF BRIDGE DESIGN

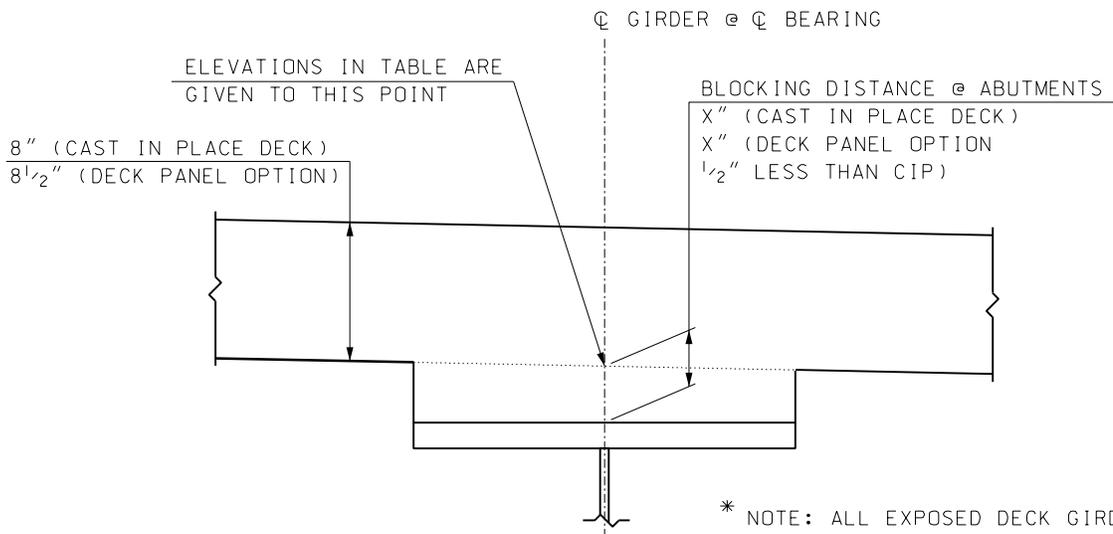


DESCRIPTION: **CONCRETE DECK DETAILS -
INTERIOR GIRDER DECK HAUNCH**

DATE REVISED:
1/25/2018

* INCLUDE NOTE WITH DETAIL ONLY FOR CIP CONCRETE BRIDGE DECKS OVER ROADWAYS, OR PEDESTRIAN PATHS, OR RAILROADS.
INCLUDE NOTE IF ITEM 520.7X026 CONCRETE BRIDGE DECK (QC/QA)(PANEL OPTION)(F) OVER ROADWAY, OR PEDESTRIAN PATH, OR RAILROADS IS USED.
DO NOT INCLUDE NOTE FOR BRIDGE DECKS REQUIRING PRECAST CONCRETE PANELS, OR ENTIRELY OVER WATERWAYS, OR REHABILITATION PROJECTS WITH LIMITS OF WORK COMPLETELY OUTSIDE LIMITS OF UNDERCROSSING.

**MODIFY TO
FIT PROJECT**



DECK PANEL OPTION DECK HAUNCH

NEW DETAIL