

STRUCTURE BULLETIN

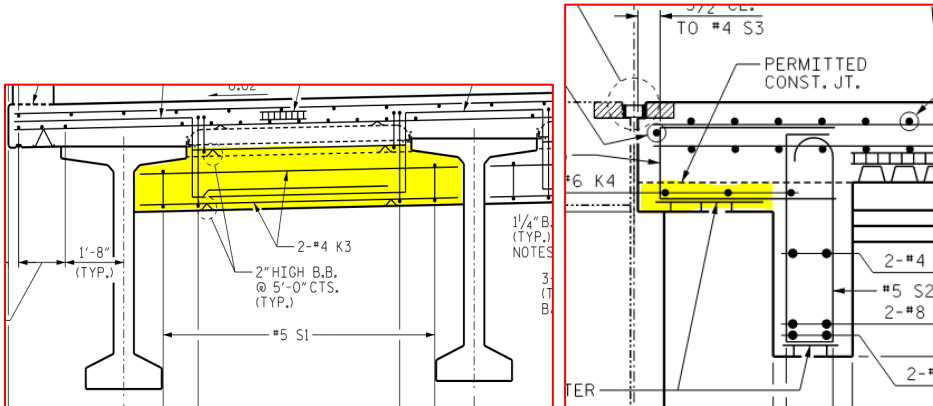
NCDOT Construction Unit

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Current Issues: **Wide Flange Girder Diaphragms**

1. Current Issues: Wide Flange Girder Diaphragms
2. Spec Question – Can fiber be used in concrete slope protection?



Diaphragms stiffen the end of the deck slab between the girders. As shown above, the diaphragm typically extends from the girder web to the adjacent girder web. This poses several potential problems during construction.

First, it is difficult to get the space directly under the flange and over the deep part of the diaphragm completely filled with concrete (pictures at right). You should always make sure the contractor thoroughly vibrates this area to reduce the chance of voids.

Second, it is almost impossible to get concrete between the top flange and the form in the shallow part of the diaphragm as you can see below. Even if you could, it is unreinforced and would likely spall out over time.



Diaphragm Details:

Void between the diaphragm and top flange



As a result, the best practice is to block out the area between the top flange and the shallow part of the diaphragm pour. There are several possible ways to accomplish this, but if urethane foam is used make sure to trim it neatly and clean it up thoroughly when the forms are removed.



Spec Question: Can a contractor use fibers in the concrete instead of wire mesh for slope protection?

Answer: No. This has been tried before and resulted in an unacceptable amount of cracking in the slope protection. Section 462 of the Standard Specifications states that wire reinforcement is required. As a side note, the wire is supposed to be in the middle of the slope protection thickness. Did you ever wonder what that hook on the back of a concrete rake was for? That's to pull the wire up to the proper height if the concrete pushes it down. Check out [the video](#).



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Videos:

Inspection training videos can be found on the [Construction Unit YouTube playlist](#).

Training:

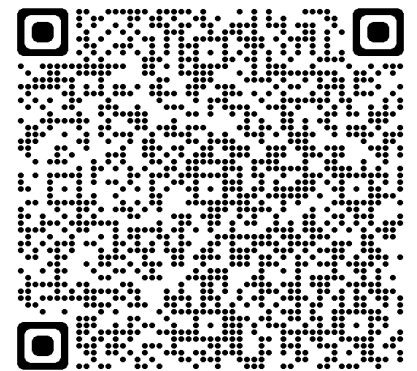
The 2023 Construction Inspector Training classes are in the bag. Thank you all for your participation. Videos of the classes are currently being edited and will be available on YouTube soon. This [Link](#) will take you to the location of the PDF versions of the presentations.

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