AGC-DOT Conference 2020

Structure Breakout

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Impervious Dike

When we need them and how we pay for them
Bridge Components or Excavation Below NWS

- Interior Bent Cap
- Unclassified Structure Excavation
- Rip Rap Key-In
- Footing Removal
- End Bent
Situation 1
Interior Bent Cap Below NWS

Cap Below NWS on Plans
Situation 2
Unclassified
Structure
Excavation
Below NWS

Excavation Below NWS on Plans
Situation 3
Rip Rap Key-In Below NWS
Situation 4

Footing Removal Below NWS
Situation 5

Bottom of End Bent Below NWS

End Bent Below NWS
Floating Turbidity Curtain on Erosion Control Plans
Impervious Dike
on Erosion Control Plans
SECTION 412
UNCLASSIFIED STRUCTURE EXCAVATION

412-1 DESCRIPTION
Excavate any material not classified as foundation excavation, box culvert excavation or channel excavation whose removal is required for the construction of bridges, retaining walls of reinforced concrete or reinforced masonry, arch culverts and box culverts without floor slabs, and which is classified as unclassified structure excavation in the plans, in accordance with the contract or as directed. Excavate, blast, brace, shore, provide sheeting and cribbing, backfill, haul and dispose of materials.

Do not deposit excavated materials, nor construct earth dikes or other temporary earth structures, in rivers, streams or impoundment or so near to such waters that they are carried into any river, stream or impoundment by stream flow or surface runoff.

Dispose of all timber, stumps and debris in accordance with Article 200-6.

412-2 PRESERVATION OF CHANNEL
Unless otherwise required by the contract, do not excavate in stream channels. Do not disturb the natural stream bed adjacent to the structure without permission.

Do not place material in a stream without approval. Remove materials placed within the stream area and leave the stream in its original condition, unless otherwise permitted.
SECTION 410
FOUNDATION EXCAVATION

410-1 DESCRIPTION
Excavate any material as necessary for the construction of foundations and end bent caps for bridges, retaining walls of reinforced concrete or reinforced masonry, arch culverts and box culverts without floor slabs in accordance with the contract or as directed. Excavate, perform exploratory drilling at footings to a depth not to exceed 5 feet, blast, drain, divert water, bail and pump. Provide and remove bracing, shoring, sheeting, cribbing and cofferdams; substructure scour protection, subsurface drainage and drawings; and backfill including hauling and disposal of materials.

Do not deposit excavated materials or construct earth dikes or other temporary earth structures in rivers, streams or impoundment or so near to such waters that they are carried into any river, stream or impoundment by stream flow or surface runoff. As an exception to the above, obtain written approval for the use of confined earth materials in cofferdams for structure foundations.
Impervious Dike on Erosion Control Plans
Structure Plan Note “Incidental”

THE BRIDGE WILL BE REMOVED FROM THE TOP DOWN, FIRST REMOVING THE ASPHALT WITH CONTAINMENT MEASURES IN PLACE TO PREVENT BRIDGE COMPONENTS FROM DROPING INTO THE STREAM. THE METHOD OF CONTAINMENT WILL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER, THIS WILL BE FOLLOWED BY REMOVAL OF THE DECKING, GIRDER, ETC. AND FINALLY THE WOODEN PILES, AN ATTEMPT SHALL BE MADE TO COMPLETELY REMOVE THE EXISTING TIMBER PILES (WITH CONCRETE ENCASEMENTS WHERE APPLICABLE) BEHIND AN IMPERVIOUS DIKE (THIS IS INCIDENTAL TO THE WORK); HOWEVER, IF THIS CANNOT BE ACCOMPLISHED WITH MINIMAL SUBSTRATE DISTURBANCE, THE PILES WILL BE PINCHED OFF ONE FOOT BELOW THE MUD LINE, BELOW THE RIP RAP OR CUT FLUSH WITH EXISTING RIP RAP AS DIRECTED BY THE ENGINEER. THE CONTRACTOR WILL NOT BE ALLOWED TO DRAG REMOVED TIMBER PILES ON OR ACROSS THE STREAM. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
Things To Consider

• NWS Elevation is not static
  • Seasonal
  • Tidal
  • Wind Driven
  • Beavers
  • Heavy Rainfall
  • Plan error

• Can work be done other ways?
  • Behind existing timber abutment
  • Only using turbidity curtain
  • Removing beavers
  • Waiting for wind to shift. How long?
  • Waiting for high water to recede. How long?
  • Timing tides
  • Precast Caps
  • Watertight Forms
  • Working within a causeway
Working Behind Turbidity Curtain and Timber Abutment
### Options for Discussion

<table>
<thead>
<tr>
<th>No Change</th>
<th>Impervious Dike - Incidental</th>
<th>Impervious Dike – Pay Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leave as-is, with current interpretation of specifications</td>
<td>Show Impervious Dike and note that it will be incidental if needed.</td>
<td>Show Impervious Dike and have a pay item if needed</td>
</tr>
<tr>
<td>Bidders may interpret differently</td>
<td>Clear to all bidders</td>
<td>Clear to all bidders</td>
</tr>
<tr>
<td></td>
<td>If need and don’t include in bid, Contractor’s risk</td>
<td>Reduces risk on all parties. If not needed, it is not paid, and nobody looses money or pays for something not needed</td>
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<tr>
<td></td>
<td>If included by Contractor and don’t need, DOT paying for something not needed</td>
<td>Will Contractors make less of an effort to construct without impervious dike if there are options or if waiting is an option?</td>
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<td>What if sheet piles delivered and water drops and not needed?</td>
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</tbody>
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CSL Testing

Why.... When....?
Temporary Bridges
Temporary Bridges
Damaged Material
Cracked Deck Panels
Temporary Bridges

• Any used material must be shown on the approved drawings (including damage)

• Inspections
  – Prior to loading (Written Certification)
  – Regularly scheduled
    • 1 Month after opening
    • Every 6 Months
    • Every 3 Months (if ADTT > 2000)
  – Inspection Report on SMU Website
Pre-Construction Questions & Training for Panel Bridges

• Contact M&T to verify condition of material prior to assembly.
  – Used material and condition should also be shown on design drawings

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Integral End Bents

Expansion gets pushed to End Bents
Rock

Concrete or Grout
Backfill
Integral End Bents

Sand

Concrete

Rock
Spalls

When in Rock
Look for the plan note!
Barrier Rail
Barrier Rail
Barrier Rail
Adhesive Anchors
Adhesive Anchors

Some of them didn’t look so good
Adhesive Anchors

• NCDOT policy prohibits installation of adhesive anchors in sustained tension

• This includes not only overhead, but some installations such as cantilever
Adhesive Anchors

Sustained Tension

\[ (W_{\text{pole+sign}})(x_{\text{bar}})(\frac{1}{s}) \]

Resultant from compression stress distribution

\[ W_{\text{pole+sign}} \]
Adhesive Anchors

• On a Case-by-Case, if there are no other options, may be done if approved by the Engineer (SMU) and only then by an ACI Certified Installer. Must use approved system.
Adhesive Anchors

Always follow the Manufacturers Printed Installation Instructions
Adhesive Anchors

Inspector Training Or Video Coming Soon.....
Crane Operator Certifications
Questions?

Or Other Topics......