Structures Update

Some 500 Section, Structures Revisions since January 1, 2010

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Item 501 Structures-General

501.04 Shop Drawings

501.04A. Contractor Acceptance of Shop Drawings for Item 513 and 515.

Add to the following sentence:
The Registered Engineer shall seal and date each drawing confirming that the drawings meet the intent of the plan, (as designed).
501.05 Submittal of Working Drawings and Calculations

After references to:
Department acceptance is not required.

Add the sentence:
The absence of Department acceptance does not supersede the Engineer’s authority as defined in 105.01.

501.05.B.6 Submittal of Construction Plans and Calculations

Projects without Railroad Involvement
Replace the entire subsection with the following:
When the total load applied to a structure during construction, (new or structure being rehabilitated), exceeds 75% of the legal limit, (The Legal Limit is 80,000 lbs. or percentage thereof if posted), the load effects on the structure shall be analyzed based on the operating level calculated by the Load Factor Rating Method as given in the AASHTO Manual for Bridge Engineers.
Item 503 Excavation for Structures

503.08 Backfill
Replace the first 2 sentences with the following:
Backfill all excavations made under this item includes all replaced excavation and new embankment adjacent to structures. Use backfill embankment with materials conforming to 203.02R., except behind abutments and below the approach slabs, use materials conforming to Item 203 Granular Material Type B.

503.09 Method of Measurement
Replace the first sentence with the following:
After the requirements of Items 201, 202, and 203 have been met, the Department will measure excavation on a lump sum basis or by the number of cubic yards (cubic meters) as follows:

Item 503 Excavation for Structures

503.09 Method of Measurement
Deleted the sentence:
For abutment excavation quantities, the Department will include material removed above the bench (if any), in front of the vertical plane described in 503.09.C.1, and by the finished slope of the cut or embankment.
Also deleted the sentence:
The Department will measure Unclassified Excavation on a lump sum basis when shown on the plans.
507.03 Materials
Eliminate references to 711.01

507.04 Driving of Piles
After the last paragraph, add:
Ensure that the actual pile embedment into the concrete is within 2 inches (50mm) of the embedment shown in the plans.

507.05 Determination of Required Driving Criteria
After the 1st paragraph, add:

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Item 507 Bearing Piles

To determine the minimum blow count for battered piles, divide the minimum blow count for vertical piles with the same ultimate bearing value by an efficiency factor \( D \) that is less than one. This will result in an increased minimum blow count for the battered piles. Compute the efficiency factor \( D \) as follows:

\[
D = \frac{1 - (U \cdot G)}{(1 + G^2)^{\frac{1}{2}}}
\]

Where: \( U \) = Coefficient of Friction
Use 0.05 for double-acting air operated or diesel hammers,
Use 0.1 for single-acting air operated or diesel hammers,
Use 0.2 for drop hammers.
\( G \) = Amount of batter (H/V; 1/3, 1/4, etc.)
Item 507 Bearing Piles

507.06 Cast-in-Place Reinforced Concrete Piles
In D., in the formula for minimum pile wall thickness, Delete the last part of the description for R after the following:
\[ R = \text{Ultimate bearing value in pounds(newtons)} \]

507.09 Splices
After the 4th paragraph, Add the following paragraph:
Pile Points. When specified in the plans, select a product from the Department’s approved list. Weld the pile points to the pile in accordance with AWS D1.5 or the manufacturer’s written welding procedure supplied to the Engineer before welding is performed. Submit a notarized copy of the mill test report to the Engineer.

Item 508 Falsework and Forms

508.03 Forms
After the 2nd paragraph add:
In forming Pier, Intermediate, or End Diaphragms for Prestressed or Post Tensioned Concrete members, do not place post installed anchors in these members. Properly brace diaphragm forms externally or use approved form tie inserts cast into these members.
Item 511 Concrete for Structures

511.06 Concrete Test Specimens
The Engineer will make test cylinders as follows:

A. Structures over 20-foot (6.1 m) span. Two set of test cylinders for each 200 cubic yards (150 m³) of concrete, or fraction thereof incorporated into the work each day.

B. Structures of 20-foot (6.1 m) span or less. At least two one set of test cylinders for each 50 yd³ (35m³) of concrete that is incorporated into the work.

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Item 511 Concrete for Structures

511.10 Placing Concrete
After the first paragraph, Add:

Place and finish concrete to the lines and grades shown in the plans. Provide coverage over or around reinforcing steel as described in 509.04.

Conform to the following tolerances from plan dimensions:

<table>
<thead>
<tr>
<th>Deviation from plumb for exposed surfaces</th>
<th>± ¾ inch (19 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical alignment (Deviation from a line parallel to the grade line)</td>
<td>± ½ inch in 20 feet (13 mm in 6 m)</td>
</tr>
<tr>
<td>Longitudinal alignment (Deviation from a line parallel to the centerline or baseline)</td>
<td>±½ inch in 20 feet (13 mm in 6 m)</td>
</tr>
<tr>
<td>Width dimensions of walls for exposed surfaces</td>
<td>±½ inch (13 mm)</td>
</tr>
<tr>
<td>Bridge Slab thickness</td>
<td>±¼ inch (6 mm)</td>
</tr>
<tr>
<td>Elevations of beam seats</td>
<td>±1/8 inch (3 mm)</td>
</tr>
<tr>
<td>Slope, Vertical Deviation from Plane</td>
<td>±0.2%</td>
</tr>
<tr>
<td>Slope, Horizontal Deviation from Plane</td>
<td>±0.4%</td>
</tr>
</tbody>
</table>
Item 511 Concrete for Structures

511.20 Bridge Deck Grooving

Change the first two sentences to:

After Class S concrete has cured, saw **transverse** longitudinal grooves into the deck.

After water curing Class HP concrete and either before applying curing compound or some period after applying curing compound and before opening the bridge to traffic, saw **transverse** longitudinal grooves into the deck.

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Item 511 Concrete for Structures

511.20 Bridge Deck Grooving

Change the 5th paragraph to:

Begin and end grooves 9 to 12 inches (220 to 300 mm) from curbs, parapet toes, or deck edges, and saw grooves **perpendicular** parallel to the bridge centerline.

Change the 4th sentence of the 7th paragraph to:

- Saw grooves in a **random** uniform pattern spaced at 3/8 to 1 3/4 inch minus ⅛ inch or plus 0 (10 to 4519 mm minus 6 mm or plus 0), with 50 percent of spacings less than 1-inch (25 mm).

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Item 512 Treating Concrete

512.03 Sealing of Concrete Surfaces

E. Surface Condition
Change the 3rd sentence of the 1st paragraph:
*Remove pair any structurally unsound surfaces and weak sections or spalled areas before applying sealer.*
Add the following two sentences:
*Perform all concrete patching prior to surface profiling. Perform concrete patching on areas identified by the Engineer according to 519.*

Item 512 Treating Concrete

512.03 Sealing of Concrete Surfaces

Added the following to the Section title:
*F. Surface Preparation and Profiling*
Add the following sentence at the end of this section:
*Ensure that all wastes generated by the surface preparation operation are managed to prevent the direct or indirect discharge to the environment according to 107.19.*
Item 512 Treating Concrete

512.03 Sealing of Concrete Surfaces

Measure sealing of concrete surfaces by the number of square yards of coated area projected to a 2-dimensional surface.

Documentation – New CA-S-21 Form

Came up with new pay item for Removal of Existing Coating (S.Y.)

Presently in Proposal Note 552

Remove existing coatings completely.

Item 512 Treating Concrete

512.08 Waterproofing

General.

After the 4th paragraph of this section add:

Do not apply waterproofing fabric or membranes over attachments and hardware. Seal the discontinuities in waterproofing with Asphalt, 702.06, or hot applied joint sealer, 705.04.
Item 513 Structural Steel Members

513.22 Stud Shear Connectors

In the third paragraph, add:
For galvanized structures with welded shear connectors, remove the galvanic coating by grinding at each connector location prior to welding.

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Item 514 Painting of Structural Steel

514.02 Materials

Change the last sentence of the 2nd paragraph to:
The Contractor is responsible for ensuring the compatibility of the intermediate and finish coats with the prime coat. The Contractor may supply the prime coat from a manufacturer other than the manufacturer of the intermediate and finish coats.

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Item 514 Painting of Structural Steel

514.04 Quality Control

514.04.A. Quality Control Specialist

Change the 1st sentence of the 5th paragraph to:

The quality control specialist will be immediately removed from their duties as the quality control specialist and disqualified from future work duties as the quality control specialist if any quality control failure occurs.

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Item 514 Painting of Structural Steel

514.13 Surface Preparation

514.13.C. Abrasive Blasting (QCP#3).

In the 4th paragraph, change the 1st sentence to:

For field blasting use a recyclable steel grit, a recyclable natural mineral, low dusting abrasive.

Add the sentence:

Do not use silica sands, mineral slags, and other types of non-metallic abrasives that contain more than 0.5 percent free silica, by weight, have a chlorides salts content more than 25 ppm, and contain any organic material.

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Item 515 Prestressed Concrete Bridge Members

515.01 Description
Change the first paragraph to:
This work consists of preparing shop drawings, furnishing and manufacturing prestressed concrete members, testing, fabricator performed quality control, documentation, shop coating, and handling, transporting, storing, and erecting prestressed concrete bridge members. Prepare shop drawings and erect prestressed concrete bridge members, according to Item 501 and the additional requirements below. Shop painting shall conform to Item 512.

Item 515 Prestressed Concrete Bridge Members

515.19 Handling, Storage, and Erection
In the 6th paragraph, delete the following sentence:
If erection of prestressed members requires placing cranes or launching devices on previously erected spans, submit erection procedure for approval according to Item 501.
Item 516 Expansion & Contraction Joints, Joint Sealers & Bearing Devices

516.07 Bearing Devices

After the 4th paragraph add:
If the beams seats are sealed with an epoxy or non-epoxy sealer prior to setting the bearings, do not apply sealer to the concrete surfaces under the proposed bearing locations. If these locations are sealed, remove the sealer to the satisfaction of the Engineer prior to setting the bearings. The Department will not pay for this removal.

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Item 516 Expansion & Contraction Joints, Joint Sealers & Bearing Devices

516.07 Bearing Devices

After the 5th paragraph add:
If the steel is erected at an ambient temperature higher than 80°F or lower than 40°F and the bearing shear deflection exceeds 1/6 of the bearing height at 60°F (+/-) 10°F, raise the beams or girders to allow the elastomeric bearings to return to their undeformed shape at 60°F (+/-) 10°F.
Item 516 Expansion & Contraction Joints, Joint Sealers & Bearing Devices

516.07 Bearing Devices

After the last paragraph add:
Where the load plate of an elastomeric bearing is to be connected to the structure by welding, control welding so that the plate temperature at the elastomer bonded surface does not exceed 300° F as determined by use of pyrometric sticks or other temperature monitoring devices.

Item 519-Patching Concrete Structures

519.03 Removal of Disintegrated Concrete.

Change the 3rd paragraph to:
If working around reinforcing steel, avoid damaging or debonding any the reinforcing steel that is un-corroded and completely embedded in sound concrete. Ensure no or shattering of the concrete, beyond the area to be patched.
Item 526-Approach Slabs

526.04 Placing and sampling Concrete
In the 1st paragraph, change the 2nd sentence to:
The Engineer will make at least two one set of test cylinders for each 50 cubic yards (35 cubic meters) of concrete.

S. S. 842
CORRECTING ELEVATION OF CONCRETE APPROACH SLABS WITH HIGH DENSITY POLYURETHANE

842.04 Equipment.
Electric or pneumatic drill
The (Pumping) unit shall be equipped with certified flow meters to measure flow of both component materials separately to measure the amount of high-density polyurethane injected at each location. The certified flow meter shall have a digital output to show both pounds and gallons of each component material and help insure a one to one mix ratio.
S. S. 842
CORRECTING ELEVATION OF CONCRETE APPROACH SLABS WITH HIGH DENSITY POLYURETHANE

842.07 Raising Slabs.
Reset flow meters on material pumping units to zero, prior to performing the work each day. Perform a test shot of material of a minimum of 1 gallon. Compare the digital output in gallons of each component to determine the actual ratio. If ratio is less than 0.95 or greater than 1.05, check system for problems, fix, and recheck ratio. ...Record final elevations of the approach slab and adjacent pavement in the same locations as were recorded for existing elevations prior to beginning work.

S. S. 848
BRIDGE DECK REPAIR AND OVERLAY WITH CONCRETE USING HYDRO-DEMOLITION

Changed to longitudinal grooves.
Gave alternative for land application of waste water.
PN 555 - SURFACE SMOOTHNESS FOR BRIDGES AND APPROACHES

Modifies C&MS 451.12
10-ft rolling straight edge
Max. variation = 1/8” in 10-ft
Defines “Bridge Encounter”
25-ft of approach pavement
Entry approach slab
Bridge deck
Exit approach slab
25-ft of exit pavement
International Roughness Index (IRI)
According to ASTM E 1926

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PN 555 - SURFACE SMOOTHNESS FOR BRIDGES AND APPROACHES

Provide ODOT accepted smoothness measuring equipment per Supplement 1058
Provide certified Profiler and Operator on approved list at:
www.dot.state.oh.us/Divisions/Planning/TechServ/prod_services/Documents/Infrastructure/RideQuality/Cert_ProfilersNOpeters.pdf

Furnish Diamond Grinding Equipment per C&MS 257.02

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PN 555 - SURFACE SMOOTHNESS FOR BRIDGES AND APPROACHES

Measure both wheelpaths per lane
Lead-up & runout lengths = 250-ft
Final wearing course removed
May occur after deck grooving
Measure IRI using continuous 25-ft base length MRI

Provide ProVal data files
New Supplement 1112 – Submittal and Application Requirements for ProVAL Highway Smoothness Software for Bridge Encounters

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PN 555 - SURFACE SMOOTHNESS FOR BRIDGES AND APPROACHES

4.0 MANDATORY CORRECTIVE WORK:
For MRI:
Corrective work when MRI > 130 in/mile
Corrected MRI ≤ 100 in/mile
No corrective work: Bridge Length ≤ 265-ft
For IRI:
Corrective work when IRI in 25 ft section > 250 in/mile
Except segments that include steel armored expansion joint system, where limit is 350 in/mile
Corrected IRI ≤ 250 in/mile
No bridge length limit

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PN 555 - SURFACE SMOOTHNESS FOR BRIDGES AND APPROACHES

Corrective Work Limitations
Maximum Removal Depth = 0.5 inch
No grinding within 1.5-ft of joint armor

Corrective Work Plan
Develop & submit for Engineer approval
7-day turnaround
Re-measure surface smoothness to ensure final IRI & MRI
Re-groove diamond ground surfaces according to 511.20 if the existing grooves are less than .008 inches deep.

Item Special Noise Barriers

Supplement 1073
Precast Concrete Certification Program.

Lists requirements that the Precasting Plants have to meet.

Panels and Posts are rejected at the plants.
Item Special Noise Barriers

Standard Drawing
NBS-1-09

Requires the Contractor to deliver to the job site a full size noise barrier control panel and full size control post, which will be compared to subsequent panels and posts for acceptance or rejection.

Item Special Noise Barriers

Standard Drawing
NBS-1-09

Posts and Panels should be rejected that are damaged during installation.

Documentation of Rejected Item - Special Noise Barrier Panels/Posts Form
Per Standard Drawing NBS-1-09 and Supplement 1073

- Project Number
- County/Route/Sect.
- PID Number
- Manufacturer
- Panel/Post #
- Contractor
- Inspection Date
- Wall Location