PSC Box Beam and PSC Cored Slab Beam Bridges Common Item and Quantity Errors

These two bridge types are being used frequently on Low Impact Bridge Program (LIBP) projects and some other bridge replacement projects. With both types the bridge deck and approach slabs are leveled and overlaid with recycled asphaltic concrete. For bridge decks with a crown such as a bridge on a tangent section leveling is used to create the crown. These types have been in GDOT Letting since January 2016 but are still relatively new to Roadway Designers designing the projects and Roadway Designers providing QC and QA reviews of project deliverables. Previously the minimum recycled asphaltic concrete thickness at the gutter line (face of barrier) was 1.5-inches and the previous version of this guide was based on that thickness. This minimum thickness at the gutter line has been changed to 3.5-inches. Often errors exist in the plan set and submittal package with these projects submitted for Field Plan Reviews and Programmed Construction Cost Estimate updates. These errors have been undiscovered even with projects advertised for letting. A general schematic is provided below followed by a section with common errors. Additional pages have annotated bridge plan drawings.

Common Errors:

- Both the Recycled Asphaltic Concrete Leveling, 19 mm Superpave (if specified) and Surface Course (9.5 mm or 12.5 mm Superpave) for bridge deck and approach slabs are not accounted for in the Summary of Quantities/Cost Estimate.

- Recycled Asphaltic Concrete quantity for bridge deck and approach slabs is incorrectly based on pavement being all Surface Course material.

- Recycled Asphaltic Concrete Surface Course for bridge deck and approach slabs is accounted for in Summary of Quantities/Cost Estimate but the Leveling is not.
• Approach slab specified is Standard 9017R which is not correct.

  ▪ The Low Impact Bridge Program Manual online at [http://www.dot.ga.gov/PartnerSmart/DesignManuals/BridgeandStructure/LIBP%20Manual.pdf](http://www.dot.ga.gov/PartnerSmart/DesignManuals/BridgeandStructure/LIBP%20Manual.pdf) includes the following:

    Approach Slab Standard 9017P has been the typical standard used on LIBP projects. However, SPECIAL DETAIL sheets 9017P-SD and 9017Q-SD (for the 30 ft and 20 ft approach lengths, respectively) have been created to provide a Modified Detail “A” to address the use of asphalt overlay on the approach slabs for LIBP projects. Please contact Carol Kalafut at ckalafut@dot.ga.gov for access to this standard until the original standards have been updated and approved by FHWA. (Approach slabs 9017M, can still be used for walls tied to a bridge and 9017K if curb and gutter are present.)

• Pavement Markings in the Summary of Quantities/Cost Estimate for the approach slabs and bridge deck are Preformed Plastic. They should not be Preformed Plastic since the surface is not concrete. They should be the same material (Thermoplastic or Paint) that is being used on the roadway.
Two Approaches for Leveling and Overlay on the Bridge Deck and Approach Slabs to Develop a Normal Crown Section

Preferred method is to specify a 2-inch layer (220 LB/SY) of 19 mm Superpave below the Surface Course. This should allow for ease of construction with the roadway paving as LIBP projects typically use an off-site detour with the road closed during construction.

Alternate method does not include a 19 mm Superpave layer.
Example 1 PSC Box Beam Bridge

General Notes - Continued

Test Ties - Place Test Ties at the Following Locations:

- 1 in 15 of PSC 2 x 12 ft at all Bents
- 1 in 15 of PSC 2 x 12 ft on 1 LF at 2 Bents

Shovel Dowel Bars - Place Shovel Dowel Bars informed 3" Diameter x 12" Deep Holes and Grout in Place Similar to Anchor bolts. See Subsection 5.13.9 of the Georgia DOT Specifications. Stirrups may be slotted to clear formed holes.

Heel - All welding on Georgia DOT projects shall be performed by certified welders who have in their possession a current welding certification card issued by the office of materials and testing. Use only welds conforming to the AWS D1.1, E70XX (excluding E70XX 6G) electrodes and SMAW process.

Bridge Removal - Remove Existing Bridge as per subsection 5.13.6 of the Georgia DOT Specifications.

Salvage Material - No material removed from the existing structure shall be salvaged for use by the Georgia DOT.

PSC Box Beam Bridge Span

Bridge Quantities Do Not Include the Recycled Asphallic Concrete or Tack Coat for the Levelling and Overlay of the Bridge Deck
NOTES:
1. SEE BOX BEAM DETAILS SHEETS FOR LOCATIONS OF HOLES FOR 1" DIA. PLAIN BAR.
2. CAST BARREER AFTER ALL KEYS HAVE BEEN FILLED WITH MORTAR FOR A MINIMUM OF 5 DAYS.
3. BARRIER EXPANSION JOINTS MAY BE SHIFTED SLIGHTLY TO AVOID 574 BARS CAST IN BEAMS.

PLACE 3' X 6' RECTANGULAR DECK DRAIN ON EACH SIDE OF BRIDGE. SPACE AT 10'-0" FROM THE INTERMEDIATE BENTS TO EXTERIOR FACE OF THE EXTERIOR SLOPE TO DRAIN TOWARDS OUTSIDE OF BRIDGE. OMIT OVER END FILLS. 3 FEET WIDE FOR FULL DEPTH OF BEAM CENTERED UNDER EACH DRAIN APPLY EPOXY PROTECTIVE COATING TO TOP OF DRAIN DETAIL. PLACE 3' X 6' RECTANGULAR DECK DRAIN ON EACH SIDE OF BRIDGE. SPACE AT 5'-0" FROM THE INTERMEDIATE BENTS TO EXTERIOR FACE OF THE EXTERIOR SLOPE TO DRAIN TOWARDS OUTSIDE OF BRIDGE. OMIT OVER END FILLS. 3 FEET WIDE FOR FULL DEPTH OF BEAM CENTERED UNDER EACH DRAIN APPLY EPOXY PROTECTIVE COATING TO TOP OF DRAIN DETAIL. PLACE 3' X 6' RECTANGULAR DECK DRAIN ON EACH SIDE OF BRIDGE. SPACE AT 5'-0" FROM THE INTERMEDIATE BENTS TO EXTERIOR FACE OF THE EXTERIOR SLOPE TO DRAIN TOWARDS OUTSIDE OF BRIDGE. OMIT OVER END FILLS. 3 FEET WIDE FOR FULL DEPTH OF BEAM CENTERED UNDER EACH DRAIN APPLY EPOXY PROTECTIVE COATING TO TOP OF DRAIN DETAIL. PLACE 3' X 6' RECTANGULAR DECK DRAIN ON EACH SIDE OF BRIDGE. SPACE AT 5'-0" FROM THE INTERMEDIATE BENTS TO EXTERIOR FACE OF THE EXTERIOR SLOPE TO DRAIN TOWARDS OUTSIDE OF BRIDGE. OMIT OVER END FILLS. 3 FEET WIDE FOR FULL DEPTH OF BEAM CENTERED UNDER EACH DRAIN APPLY EPOXY PROTECTIVE COATING TO TOP OF DRAIN DETAIL.

Minimum Overlay Thickness at Gutter Line/Face of Barrier
Example 1 PSC Box Beam Bridge

Review all the items outlined in red.

Notice that the cross slope for this tangent alignment bridge is 2.0% (2.5% has been used on some projects). Since the bridge deck is leveled and overlaid the approach slabs are also leveled and overlaid. See the End Bent Joint Detail. Roadway cross sections may have to account for cross slope transition to meet the bridge cross slope.

The Recycled Asphalitc Concrete Surface Course used on the bridge and approach slabs is the same as the roadway and should have the same spread rate. Typically this is either 135 LB/SY for 9.5 mm Superpave which is 1.25-inch thick or 165 LB/SY for 12.5 mm Superpave which is 1.5-inch thick. The preferred method is to use a 2-inch layer of 19 mm Superpave (220 LB/SY) between the Surface Course and leveling. In this case Leveling is used from the top surface of the Box Beams around the bottom of the 19-mm Superpave with the leveling creating the cross slope.

This project uses 9.5 mm Superpave thus after accounting for 19 mm Superpave layer the leveling thickness using the minimum overlay thickness specified is 0.25-inch thick at the gutter line and 3.875-inch thick at the CL.

Notes:
- All assembly overlays, top, see roadway plans for details and payment.
- Include cost of materials and work in price bid for PSC box beams.

DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION - OFFICE OF BRIDGES AND STRUCTURES

DECK SECTIONS
LBP - CR 32 (CAMP BRANCH ROAD)
OVER GREASY BRANCH
WARE COUNTY 006738

BRIDGE SHEET 4 OF 10
SCALE: ‰" = 1'-0" (UNLESS OTHERWISE NOTED)
Example 2 PSC Cored Slab Beam Bridge

Review all the items outlined in red.
Notice that the cross slope for this tangent alignment bridge is 2.0% (2.5% has been used on some projects).
Since the bridge deck is leveled and overlaid the approach slabs are also leveled and overlaid. See the End Bent Joint Detail.
Roadway cross sections may have to account for cross slope transition to meet the bridge cross slope.
The Recycled Asphaltic Concrete Surface Course used on the bridge and approach slabs is the same as the roadway and should have the same spread rate. Typically this is either 135 LB/SY for 9.5 mm Superpave which is 1.25-inch thick or 165 LB/SY for 12.5 mm Superpave which is 1.5-inch thick. The preferred method is to use a 2-inch layer of 19 mm Superpave (220 LB/SY) between the Surface Course and leveling. In this case Leveling is used from the top surface of the Box Beams to the bottom of the 19 mm Superpave with the leveling creating the cross slope. This project uses 9.5 mm Superpave thus after accounting for the 19 mm Superpave layer the leveling thickness using the minimum overlay thicknesses specified this 0.25-inch thick at the gutter line and 3.875-inch thick at the CL.