## **UHPC BEAM END REPAIR TABLE** NUMBER OF WEB/FLANGE STUDS PER LINE GIRDER | DETERIORATION (%) | APPROXIMATE LENGTH | APPROXIMATE HEIGHT BEAM END LENGTH OF | HEIGHT OF | HEIGHT OF PAINT SPAN TYPE A1 A2 A3 A4 A5 A6 A7 TOTAL | UHPC BLOCK UHPC BLOCK ABOVE UHPC LOCATION OF DETERIORATION OF DETERIORATION B1 | B2 | B3 | B4 | B5 | B6 | B7 **LEGEND** PORTION OF BEAM TO BE CLEANED AND PAID FOR UNDER THE ITEM "BEAM END REPAIRS WITH ULTRA HIGH PERFORMACE CONCRETE -PARTIAL HEIGHT" HT OF ABOVE PORTION OF BEAM TO BE CLEANED AND PAID FOR UNDER THE ITEM "LOCALIZED PAINT REMOVAL AND FIELD PAINTING OF **EXISTING STEEL"** PORTION OF BEAM TO BE PAINTED AND PAID FOR UNDER THE ITEM "LOCALIZED PAINT REMOVAL AND FIELD PAINTING OF EXISTING STEEL" LENGTH OF UHPC BLOCK LENGTH OF UHPC BLOCK SEE ABOVE TABLE SEE ABOVE TABLE PAINTING LIMITS SURFACE PREPARATION LIMITS SCALE: $\frac{3}{4}$ " = 1'-0" SCALE: $\frac{3}{4}$ " = 1'-0" $\mathcal{M}$ DETERMINATION OF IF FLANGE STUDS ARE NEEDED IS TO BE MADE BY THE ENGINEER ON A PROJECT BY PROJECT BASIS BASED ON THE NOTED DETERIORATION. ESIGNER/DRAFTER: PROJECT TITLE SIGNATURE/

REVISION DESCRIPTION

REV. DATE

## BEAM END REHABILITATION NOTES

- 1. THE FRAMING PLANS SHOWN ON DRAWING NOS. S-XX THROUGH S-XX HAVE BEEN PREPARED BASED ON INFORMATION GATHERED DURING FIELD INSPECTION AND FROM THE EXISTING BRIDGE PLANS. ACTUAL FIELD CONDITIONS MAY VARY AND MAY REQUIRE MODIFICATIONS TO CONSTRUCTION DETAILS AND WORK QUANTITIES. THE CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
- 2. NO PAINT SHALL BE APPLIED UNDER THE UHPC BLOCK.
- 3. THE "UHPC BEAM END REPAIR TABLE" INDICATES APPROXIMATE LIMITS OF THE DETERIORATED AREAS OF THE BEAM ENDS. ADDITIONAL LIMITS OR LOCATIONS MAY BE ADDED DURING CONSTRUCTION AS APPROVED BY THE ENGINEER.
- 4. BEAM ENDS SHALL BE REPAIRED BY ENCASING THE BEAM END IN ULTRA HIGH PERFORMANCE CONCRETE (UHPC) AS SHOWN ON DRAWING NO. S-XX AND IN ACCORDANCE WITH THE SPECIAL PROVISION "BEAM END REPAIRS WITH ULTRA HIGH PERFORMANCE CONCRETE - PARTIAL HEIGHT".
- 5. THE CONTRACTOR SHALL PROVIDE ACCESS TO BEAM END REPAIR LOCATIONS SHOWN ON THE PLANS. SEE SPECIAL PROVISIONS.
- 6. HEADED STUDS SHALL BE WELDED TO CLEAN SECTIONS OF THE WEB AND FLANGE. STUDS MAY BE WELDED IN SECTIONS OF THE WEB AND FLANGE WITH MINOR (UP TO  $\frac{1}{16}$ ") SECTION LOSS, STUDS SHALL BE PAID FOR UNDER THE ITEM "WELDED STUDS" AND THE STUD MATERIAL SHALL BE SPECIFIED AS ASTM A108, TYPE B. STUDS MUST BE INSTALLED FOLLOWING STANDARD PRACTICES OF STUD WELDING USING CONVENTIONAL STUD GUNS AND STUD WELDING. STIC WELDING SHALL NOT BE PERMITTED FOR THE WELDING OF THE STUDS, VERTICAL FERRULES SHALL BE USED FOR THE WELDING OF WEB STUDS.
- 7. THE STUD SPACING SHALL BE A MINIMUM OF 3" AND A MAXIMUM OF 6", THE SPACING MAY BE VARIED WITHIN THIS RANGE TO ACCOMMODATE THE NUMBER OF STUDS SHOWN IN THE PLANS. THE STUD PATTERN SHALL BE LAID OUT BY THE CONTRACTOR AND APPROVED BY THE ENGINEER IN THE FIELD PRIOR TO WELDING THE STUDS.
- 8. THE NUMBER OF STUDS SHOWN IN THE PLANS IS A MINIMUM VALUE BASED ON ANTICIPATED FIELD CONDITIONS. SHOULD THE CONTRACTOR BE UNABLE TO ACCOMMODATE THE MINIMUM NUMBER OF STUDS SHOWN IN THE PLANS DUE TO THE AREA OF DETERIORATED STEEL BEING LARGER THAN ANTICIPATED, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY. WORK AT THAT LOCATION SHALL NOT PROCEED UNTIL DIRECTION IS GIVEN BY THE ENGINEER.
- 9. ALL HEADED STUDS SHALL BE WELDED USING A STUD GUN. AT LOCATIONS WHERE THE USE OF A STUD GUN IS NOT POSSIBLE DUE TO LIMITED CLEARANCE, UP TO A MAXIMUM OF 3 STUDS MAY BE WELDED USING AN ALL-AROUND  $\frac{5}{16}$ " FILLET WELD. IF MORE THAN 3 STUDS IN ANY GIVEN BEAM END NEED TO BE WELDED USING A FILLET WELD, THE ENGINEER SHALL BE NOTIFIED. FILLET WELDED STUDS SHALL BE PLACED AT A SPACING OF 6".
- 10. THE DISTANCE FROM THE TOP OF THE BOTTOM FLANGE TO THE FIRST STUD SHALL BE A MINIMUM OF 6".
- 11. STUD WELDING DETAILS, PROCEDURES, AND TESTING METHODS SHALL CONFORM TO THE AASHTO/AWS D1.5/1.5: 2015 - BRIDGE WELDING CODE, UNLESS OTHERWISE NOTED ON THE PLANS OR IN THE SPECIAL PROVISION, "WELDED STUDS".
- 12. ALL EXPOSED INTERFACES BETWEEN THE UHPC PANEL AND STEEL GIRDER SHALL BE SEALED WITH JOINT SEALANT. THIS SHALL BE PAID FOR UNDER THE ITEM "BEAM END REPAIRS WITH ULTRA HIGH PERFORMANCE CONCRETE - PARTIAL HEIGHT."
- 13. FORMWORK SHALL BE SEALED TO CONTAIN THE FLUIDITY OF THE UHPC AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO POURING THE UHPC, SEE SPECIAL PROVISIONS.
- 14. ONCE THE BEAM ENDS ARE CLEANED, IF ADJUSTMENTS NEED TO BE MADE TO THE PLACEMENT OF STUDS IN ORDER TO WELD ONTO NON-DETERIORATED STEEL, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
- 15. IF THE TOP PITCH OF THE UHPC PANEL CANNOT BE MET DURING CASTING, THE CONTRACTOR SHALL GRIND THE TOP OF THE PANEL TO THE REQUIRED SLOPE AFTER THE REMOVAL OF THE FORMS. THE COST OF THIS WORK SHALL BE INCLUDED IN THE ITEM "BEAM END REPAIRS WITH ULTRA HIGH PERFORMANCE CONCRETE - PARTIAL HEIGHT."
- 16. THE SURFACE PREPARATION OF THE EXISTING STEEL FOR AREAS BENEATH THE UHPC BLOCK SHALL BE PAID FOR UNDER THE ITEM "BEAM END REPAIRS WITH ULTRA HIGH PERFORMANCE CONCRETE -PARTIAL HEIGHT." THE SURFACE PREPARATION OF THE EXISTING STEEL ABOVE THE UHPC BLOCK AND WITHIN THE LIMITS SHOWN ON THIS SHEET SHALL BE PAID FOR UNDER THE ITEM "LOCALIZED PAINT REMOVAL AND FIELD PAINTING OF EXISTING STEEL."
- 17. PAINTING LIMITS SHALL EXTEND 1" BELOW THE TOP OF THE UHPC BLOCK.
- 18. IF THE LENGTH OF THE DETERIORATION AT A BEAM END LOCATION EXCEEDS 10'-0", THE NUMBER OF FLANGE STUDS NEEDED SHALL BE 26 IN TOTAL. SEE DRAWING NO. S-XX FOR STAGGERED FLANGE STUD

## **NOTES FOR DESIGNERS:**

DESIGNERS SHALL DETERMINE IF FLANGE STUDS ARE NECESSARY FOR THE DESIGN OF THE BEAM END REPAIR BASED OFF THE NOTED DETERIORATION. SEE UHPC DESIGN GUIDELINES FOR DIRECTION.

- 2. IF NO FLANGE STUDS ARE NECESSARY, REFERENCE TO FLANGE STUDS WITHIN THE GUIDESHEET NOTES, TABLE, AND DETAILS SHALL BE REMOVED
- \* ITALICIZED TEXT WITHIN CLOUDS IS FOR DEISGNER USE ONLY. TEXT SHALL BE DELETED PRIOR TO THE GENERATION OF THE CONTRACT DOCUMENTS.

	THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.  Plotted Date: 1/12/2022	SCALE AS NOTED	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION  Filename:\UHPC Beam End Repair Details - 1 (2).dgn	OFFICE OF ENGINEERING  APPROVED BY:	DRAWING TITLE:  UHPC BEAM END REPAIR  DETAILS - 1	RAWING NO.	
SHEET NO.	Plotted Date: 1/12/2022		Filename:\UHPC Beam End Repair Details - 1 (2).dgn		DETAILS - 1		

