

GENERAL MACHINERY NOTES:

1. THESE PLANS WERE MADE USING RECORD SHOP DRAWINGS FOR ORIGINAL MACHINERY, WHICH ARE INCLUDED AS PART OF THIS CONTRACT. THE CONTRACTOR SHALL PERFORM ACCURATE FIELD MEASUREMENTS TO VERIFY ACTUAL SIZES OF EXISTING COMPONENTS, MEMBERS AND ALL DIMENSIONS SHOWN ON THE PLANS AND RECORD SHOP DRAWINGS. ADDITIONAL FIELD MEASUREMENTS TO ACCURATELY LOCATE THE EXACT POSITIONS AND/OR ALIGNMENTS OF ALL MACHINERY AND MACHINERY SUPPORTS PRIOR TO THEIR REMOVAL SHALL BE PERFORMED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER. ANY DEVIATIONS FROM THE CONTRACT PLANS OR RECORD SHOP DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER. RECORD ALL DEVIATIONS ON THE SUBMITTED SHOP DRAWINGS WHEN THEY ARE REQUIRED.
2. BASED ON THE VINTAGE OF THE EXISTING COMPONENTS, DESIGN OF MACHINERY SHALL CONFORM TO THE 1988 STANDARD SPECIFICATIONS FOR MOVABLE HIGHWAY BRIDGES PUBLISHED BY AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1992 AND 1993 REVISIONS, UNLESS OTHERWISE SHOWN ON THE PLANS, OR PROVIDED FOR IN THE SPECIFICATIONS.
3. ALL DIMENSIONS FOR MACHINE FINISHED SURFACES SHALL BE HELD TO 0.010 INCH, EXCEPT AS OTHERWISE REQUIRED BY THE PLANS OR SPECIFICATIONS.
4. PROVIDE ASTM A449 H.S. BOLTS, AS REQUIRED, TO CONNECT MACHINERY TO STRUCTURAL STEEL, UNLESS OTHERWISE NOTED. ALL ASTM A449 H.S. BOLTS CONNECTING MACHINERY TO STRUCTURAL STEEL SHALL HAVE A CLEARANCE OF NOT MORE THAN 0.010 INCH BETWEEN THE BOLT SHANK AND THE HOLE.
5. EACH BOLT SHALL HAVE A PLAIN HARDENED WASHER UNDER THE HEAD AND THE NUT. PLAIN HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND NUTS SHALL CONFORM TO ASTM A563.
6. ALL REHABILITATED BEARINGS SHALL BE MOUNTED TO STRUCTURAL STEEL USING H.S. TURNED BOLTS (OR TURNED STUDS). ALL REHABILITATED BEARINGS AND THEIR STRUCTURAL SUPPORTS SHALL BE DRILLED AND REAMED IN THE FIELD AFTER FINAL ALIGNMENT OF THE MACHINERY. NEW TURNED BOLTS SHALL BE PROVIDED WITH A CLASS LC6 FIT WITH THE BEARING BASE, SHIMS AND STRUCTURAL SUPPORT. NUTS FOR TURNED BOLTS SHALL BE BROUGHT TIGHT AND SECURED WITH LOCK WASHERS.
7. PROVIDE ALL NEW STAINLESS STEEL SHIM PACKS FOR LEVELING AND ALIGNING OF ALL MACHINERY COMPONENTS. SHIM PACKS SHALL BE 1/2" NOMINAL THICKNESS, UNLESS OTHERWISE SPECIFIED, WITH ADJUSTMENT VARIATIONS AS DESCRIBED IN THE SPECIFICATION.
8. FITS AND FINISHES FOR THE MACHINERY SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:

SURFACE	FIT (ANSI)	FINISH (MICROINCHES)
MACHINERY BASE ON STEEL	-	250
MACHINERY PARTS IN FIXED CONTACT	-	125
SHAFTS (EXPOSED SURFACES)	-	63
SHAFTS (JOURNAL SURFACES)	RC6	8
BUSHINGS (JOURNAL SURFACES)	RC6	16
SPLIT BUSHING IN BASE	LC1	125
SOLID BUSHING IN BASE (TO 1/4" WALL)	FN1	63
SOLID BUSHING IN BASE (OVER 1/4" WALL)	FN2	63
HUBS ON SHAFTS (TO 2" BORE)	FN2	32
HUBS ON SHAFTS (OVER 2" BORE)	FN2	63
TURNED BOLTS IN FINISHED HOLES	LC6	63
SLIDING BEARINGS	RC6	32
KEYS AND KEYSEATS	CL. 2	63
TEETH OF OPEN GEARING	-	125

9. FITS FOR CYLINDRICAL PARTS SHOWN ABOVE SHALL ALSO APPLY TO THE MAJOR DIMENSIONS OF NON-CYLINDRICAL PARTS.

10. CLEANING, PAINTING AND, AS APPLICABLE, LUBRICATING SHALL BE INCLUDED UNDER EACH MACHINERY ITEM.

GENERAL MACHINERY NOTES (CONTINUED):

11. MODEL NUMBERS AND DETAILS FOR MOTORS, COUPLINGS, BEARINGS AND OTHER STANDARD COMPONENTS ARE BASED ON MANUFACTURERS CATALOG DATA CURRENT AT THE TIME THE PLANS WERE PREPARED. EQUIVALENT MODELS FROM OTHER MANUFACTURERS MAY BE SUBSTITUTED AT THE OPTION OF THE CONTRACTOR AND WITH THE APPROVAL OF THE ENGINEER. ALL RELATED STRUCTURAL, MECHANICAL, ARCHITECTURAL AND ELECTRICAL DETAILS SHALL BE REVISED BY THE CONTRACTOR TO SUIT THE CERTIFIED DIMENSIONS OF THE COMPONENTS ACTUALLY FURNISHED AT NO ADDITIONAL COST.
12. ALL EXISTING MOUNTING SURFACES USED TO SUPPORT MACHINERY COMPONENTS SHALL BE VERIFIED AS BEING FLAT. FLAT SHALL BE DEFINED AS MEASURING WITHIN 0.010 OF AN INCH ACROSS THE LENGTH AND WIDTH OF THE SURFACE. REPAIR DETERIORATED MOUNTING SURFACES AND/OR SUPPORTING STEEL AS ORDERED BY THE ENGINEER.
13. THE EXTENT OF MACHINERY COMPONENT REHABILITATION AND REPLACEMENT CALLED FOR IN THE CONTRACT IS THAT WHICH WAS ANTICIPATED AT THE TIME THESE PLANS WERE DEVELOPED AS DETERMINED BY FIELD INSPECTION AND OBSERVATION OF THE MACHINERY DURING OPERATION. THE ENGINEER WILL PERFORM AN ADDITIONAL INSPECTION OF ALL MACHINERY COMPONENTS DURING THE CONTRACTORS REHABILITATION WORK. ADDITIONAL REPAIRS AND/OR REPLACEMENT OF COMPONENTS MAY BE REQUIRED AS A RESULT OF THESE SHOP AND FIELD INSPECTIONS, AND SHALL BE MADE BY THE CONTRACTOR AS ORDERED BY THE ENGINEER IN ACCORDANCE WITH NCDOT SPECIFICATION 104 - SCOPE OF WORK.
14. WHERE PERMANENT MACHINERY REMOVAL OR CLEANING/REHABILITATION IS REQUIRED, ALL ITEMS TO BE DISCARDED SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH ALL ENVIRONMENTAL REGULATIONS AND LOCAL AND STATE LAW. THESE ITEMS SHALL INCLUDE BUT NOT BE LIMITED TO COMPONENTS CONTAINING LEAD PAINT, ASBESTOS, LUBRICANTS, BRAKE THRUSTER OIL AND ANY OTHER ENVIRONMENTALLY SENSITIVE MATERIAL.

15. ELECTRICAL ITEMS SUCH AS MOTORS AND BRAKES ARE TO BE FURNISHED UNDER THE ELECTRICAL WORK ITEM, HOWEVER THESE ITEMS ARE TO BE INSTALLED AND ALIGNED AS PART OF THE MACHINERY WORK.

SHOP DRAWINGS AND SUBMITTALS:

16. THE CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS AND FIELD ASSEMBLY DRAWINGS. IN GENERAL, SHOP DRAWING DETAILS FOR IN-KIND REPLACEMENT AND IN-KIND REHABILITATION OF ORIGINAL COMPONENTS SHALL BE BASED ON ORIGINAL SHOP DRAWINGS. SHOP DRAWING DETAILS FOR NEW COMPONENTS SHALL BE BASED ON THESE CONTRACT PLANS AND SPECIFICATIONS.

17. PRIOR TO SUBMITTING SHOP DRAWINGS AND FIELD ASSEMBLY DRAWINGS, THE CONTRACTOR SHALL VERIFY ALL CRITICAL DIMENSIONS IN THE FIELD. PRIOR TO MANUFACTURING NEW PARTS, THE CONTRACTOR SHALL SUBMIT, FOR REVIEW AND APPROVAL BY THE ENGINEER, SHOP AND ASSEMBLY DRAWING DETAILS INDICATING ALL DIMENSIONS AND DETAILS THAT HAVE BEEN FIELD VERIFIED.

18. IT WILL BE THE CONTRACTORS RESPONSIBILITY TO DETAIL, COORDINATE AND VERIFY THE RELATIONSHIP AND ASSEMBLY OF ALL PARTS FOR A COMPLETE WORKING SYSTEM. ALL REQUIRED MACHINING, RIGGING, ASSEMBLY, SPECIAL SHIMMING, PAINTING, LUBRICATING AND TESTING SHALL BE CONSIDERED PART OF THE WORK.

19. THE CONTRACTOR SHALL PROVIDE AND SUBMIT PROPOSED CONSTRUCTION METHODS/PROCEDURES, SCHEDULE, INSPECTION PLAN, TESTING PLAN AND QUALITY CONTROL/QUALITY ASSURANCE PLAN TO THE ENGINEER FOR REVIEW PRIOR TO STARTING SHOP AND FIELD WORK. (SEE SPECIFICATIONS)

20. TEMPORARY MEANS NEEDED TO COMPLETE MACHINERY ITEMS, INCLUDING BUT NOT LIMITED TO TEMPORARY END WEDGES AND CENTER WEDGES, SHALL BE DEVELOPED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR REVIEW. SUBMITTALS SHALL INCLUDE ALL NECESSARY INFORMATION TO ILLUSTRATE AND CONFIRM SAFE OPERATION AND SUPPORT OF THE MACHINERY AND/OR SWING SPAN. SUBMITTALS SHALL INCLUDE SHOP AND WORKING DRAWINGS, INSTALLATION AND ERECTION DRAWINGS, CATALOG AND SPECIFICATION SHEETS, AND CHECKED CALCULATIONS. SUBMITTAL SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE APPROPRIATE DISCIPLINE BY THE STATE OF NORTH CAROLINA.

GENERAL MACHINERY NOTES (CONTINUED):

FABRICATION:

21. THE EDGES AND CORNERS OF ALL MACHINERY PARTS SHALL BE DETAILED AND MACHINED WITH SUITABLE FILLETS AND CHAMFERS. IN GENERAL THE MINIMUM EDGE OR CORNER RADIUS OR CHAMFER SHALL BE 1/4" IF THE PART THICKNESS IS GREATER THAN 1" AND 1/8" IF EQUAL TO OR LESS THAN 1", UNLESS OTHERWISE NOTED. IN THE CASE OF MATING PARTS, ALLOWANCE SHALL BE MADE FOR THE PROPER FIT AND ASSEMBLY. SUCH DETAILS SHALL BE SHOWN ON SHOP DRAWINGS. 22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPILING CERTIFICATIONS AND TEST DATA, AND SHALL VERIFY AND DOCUMENT THAT ALL MACHINERY MEETS THE CONTRACT REQUIREMENTS. MATERIAL CERTIFICATIONS AND TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO SHIPMENT.

23. ALL NEW BEARING BUSHINGS SHALL BE PROVIDED WITH DOUBLE OVAL GREASE GROOVES, UNLESS OTHERWISE NOTED. INSTALLATION OF NEW BUSHINGS SHALL INCLUDE NEW ADAPTERS, PIPING AND GREASE FITTINGS, AS NECESSARY, TO FACILITATE PROPER MAINTENANCE.

24. NEW BRASS/BRONZE BEARING LINERS (SHIMS) SHALL BE PROVIDED FOR ALL SPLIT BEARINGS. DETAILS SHALL MATCH EXISTING FOR REPLACEMENT PARTS.

25. ALL SURFACES OF NEW FORGINGS AND BRONZE CASTINGS SHALL BE MACHINED, UNLESS OTHERWISE NOTED.

26. ALL TRANSITIONS OF SURFACES OF MACHINERY PARTS SHALL BE BLENDED IN SMOOTH.

27. THE GENERAL DIMENSIONAL TOLERANCE IS +/- 1/64 INCH, UNLESS OTHERWISE NOTED.

FIELD WORK:

28. THE CONTRACTOR SHALL SCHEDULE ALL WORK TO MINIMIZE IMPACT ON HIGHWAY AND MARINE TRAFFIC. ALL HIGHWAY AND MARINE TRAFFIC CLOSURES NEED TO BE COORDINATED WITH AND APPROVED BY THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION AND UNITED STATES COAST GUARD. A BRIDGE OPERATIONAL CLOSURE PERIOD WILL BE REQUIRED TO PERFORM PART OF THE WORK.

29. THE CONTRACTOR SHALL PERFORM A COORDINATED JACKING EFFORT AT THE END WEDGE SEATS (4 TOTAL LOCATIONS) TO MEASURE THE AVERAGE POSITIVE REACTION AT EACH CORNER WITH THE SWING SPAN ENDS ALIGNED WITH THE APPROACH STRUCTURE. THE JACKING PROCEDURE SHALL MIMIC HOW THE END WEDGE MACHINERY RAISES THE ENDS OF THE SWING SPAN. AS PART OF THIS EFFORT, THE CONTRACTOR SHALL ALSO INCLUDE RAISING EACH CORNER OF THE SWING SPAN IN A SIMILAR MANNER TO ACHIEVE 12 KIPS +/- AT EACH CORNER AND NOTING THE DIFFERENCE IN ELEVATION BETWEEN THE SWING SPAN ENDS AND THE APPROACH STRUCTURE. THE JACKING EFFORT SHALL OCCUR PRIOR TO SUNRISE OR WHEN IT IS CONFIRMED THAT THE MAIN GIRDERS HAVE UNIFORM TEMPERATURE READINGS FROM THEIR TOP TO BOTTOM FLANGES. THE RESULTS OF THE JACKING EFFORT SHALL BE SUBMITTED TO THE ENGINEER AND WILL BE USED AS THE BASIS FOR DEFINING THE CORRECTIVE SHIM THICKNESS TO BE INSTALLED/REMOVED BETWEEN THE CENTER PIVOT TOP AND PIVOT GIRDER. THE CORRECTIVE SHIM THICKNESS WILL DEFINE THE FINAL ELEVATION OF THE SWING SPAN. THE POSSIBILITY EXISTS THAT THIS EFFORT WILL BE AN ITERATIVE PROCESS.

30. ALL REQUIRED TEMPORARY REMOVAL OF COVERS AND TEMPORARY DISASSEMBLY OF STRUCTURAL, MECHANICAL & ELECTRICAL COMPONENTS TO PERFORM THE WORK FOR THIS PROJECT SHALL BE INCLUDED AS PART OF THE WORK.

31. ALL MACHINERY COMPONENTS SHALL BE MATCH MARKED PRIOR TO DISASSEMBLY TO ENSURE REINSTALLATION AT THE SAME LOCATION FROM AND ORIENTATION IN WHICH THEY WERE REMOVED. THE CONTRACTOR SHALL SUBMIT A KEY DIAGRAM IDENTIFYING THE MATCH MARKING SYSTEM, ELEVATION AND LOCATION OF ALL SHAFT CENTERLINES TO THE ENGINEER FOR APPROVAL PRIOR TO DISASSEMBLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING AND/OR REINSTALLING ALL NEW AND/OR REHABILITATED MACHINERY AND MACHINERY SUPPORTS IN THEIR PROPER LOCATION AND ALIGNMENT.

GENERAL MACHINERY NOTES (CONTINUED):

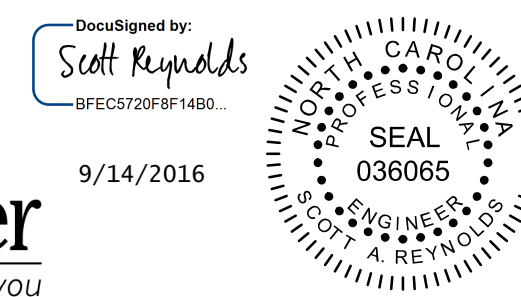
32. ALL REASSEMBLY OF ANY ITEM THAT NEEDED TO BE TEMPORARILY DISASSEMBLED DURING/FOR THE COURSE OF THE WORK FOR THIS PROJECT SHALL BE INCLUDED AS PART OF THE WORK. REASSEMBLY OF ITEMS TO BE TO A CONDITION EQUAL TO OR BETTER THAN THAT PRIOR TO DISASSEMBLY.

PROJECT NO. B-5936
TYRRELL COUNTY
BRIDGE NO: 7

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

**MACHINERY
GENERAL NOTES**

**ALLIGATOR RIVER
SWING SPAN**



DRAWN BY: JAG/MS DATE: 8/8/2016
CHECKED BY: GAF/RH DATE: 8/8/2016
DESIGN ENGINEER OF RECORD: JAG/MS DATE: 8/8/2016

DWG NUMBER			TOTAL DWGS			DOCUMENT NOT CONSIDERED UNLESS ALL SIGNATURES COMPLETED		
68			90			1	3	4

REVISIONS						SHEET NO.	
NO	BY:	DATE:	NO	BY:	DATE:	M-1	
1			3			TOTAL SHEETS	
2			4			23	

