

SCOPE OF WORK

1. STANDARDS

ALL WORK SHALL CONFORM TO THE MOST CURRENT VERSIONS OF THE FOLLOWING STANDARDS:

- A. AASHTO AMERICAN ASSOCIATION OF STATE HIGHWAY TRANSPORTATION OFFICIALS STANDARD SPECIFICATIONS FOR MOVABLE HIGHWAY BRIDGES, PUBLISHED BY AASHTO
- B. NEC NATIONAL FIRE PROTECTION ASSOCIATION 70 NATIONAL ELECTRIC CODE
- C. NFPA 101 NATIONAL FIRE PROTECTION ASSOCIATION 101 LIFE SAFETY CODE
- D. OSHA OCCUPATIONAL SAFETY AND HEALTH ASSOCIATION
- E. IEEE INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
- F. IPCEA INSULATED POWER CABLE ENGINEERS ASSOCIATION
- G. NEMA NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
- H. UL UNDERWRITERS LABORATORY
- I. ANSI AMERICAN NATIONAL STANDARDS INSTITUTE
- J. ASTM AMERICAN SOCIETY FOR TESTING AND MATERIAL

2. FIELD MEASURING AND VERIFICATION

THE CONTRACTOR SHALL PERFORM A FIELD SURVEY TO DETERMINE ALL EXISTING DIMENSIONS OF THE CONTROL HOUSE, THE PIVOT PIER, AND THE APPROACH TO LOCATE AND INSTALL THE NEW EQUIPMENT. THE CONTRACTOR SHALL PERFORM A FIELD SURVEY TO VERIFY THE EXISTING WIRING TO VERIFY THE WIRE TAGS, AS-BUILT DOCUMENTATION, AND CONTRACT PLANS.

3. UTILITY SERVICE, AERIAL CABLES, AND MEDIUM VOLTAGE TRANSFORMER

THE EXISTING SERVICE IS A 2400V MEDIUM VOLTAGE DELTA SERVICE. THE CONTRACTOR SHALL UPGRADE THIS SERVICE. THE CONTRACTOR SHALL FURNISH AND INSTALL A POLE MOUNTED DISCONNECT SWITCH TO FACILITATE MAINTENANCE OF THE SERVICE FEEDERS. THE CONTRACTOR SHALL FURNISH AND INSTALL NEW AERIAL CABLES AND SUPPORTS. THE NEW AERIAL CABLES SHALL BE ROUTED UNDER THE ROADWAY TO THE CONTROL HOUSE AS SHOWN ON THE PLANS. ON THE CONTROL HOUSE PATIO, FURNISH AND INSTALL A NEW SERVICE DISCONNECT SWITCH AND A NEW STEP DOWN 2400V DELTA/480-277V WYE CONNECTED TRANSFORMER. FURNISH AND INSTALL NEW COPPER CLAD GROUND ROD AND CONNECTION AT SERVICE AND BOND THE STRUCTURAL STEEL TO THE GROUND SYSTEM.

4. STANDBY GENERATOR AND ATS

THE CONTRACTOR SHALL FURNISH AND INSTALL A NEW DIESEL GENERATOR RATED AT 480VAC AND AN AUTOMATIC TRANSFER SWITCH TO TRANSFER POWER FROM THE NORMAL UTILITY SOURCE TO THE STANDBY GENERATOR POWER SOURCE. THE RATING SHALL BE AS SHOWN ON THE PLANS. THE NEW GENERATOR SHALL BE LOCATED ON THE UPPER PLATFORM WHERE THE EXISTING GENERATOR IS LOCATED AND SHALL BE FULLY OUTDOOR RATED WITH A TANK LOCATED IN THE GENERATOR ENCLOSURE.

5. MOTOR CONTROL CENTER AND MOTOR DRIVES

FURNISH AND INSTALL A NEW MOTOR CONTROL CENTER (MCC) TO DISTRIBUTE POWER TO ALL EQUIPMENT AND MOTORS. THE MCC SHALL BE LOCATED IN THE CONTROL HOUSE AS SHOWN ON THE PLANS. THE MCC SHALL BE OF MODULAR CONSTRUCTION AND RATED NEMA-12. THE MCC SHALL HOUSE THE MOTOR DRIVES FOR THE SPAN MOTOR. ALL DRIVES, CONTACTORS, AND MOTOR STARTERS SHALL BE PROVIDED ETHERNET COMMUNICATION CAPABILITIES AND SHALL BE PART OF THE PLC SUPERVISORY CONTROL AND DATA ACQUISITION. EACH MOTOR STARTER AND DRIVE SHALL BE EQUIPPED WITH A HUMAN MACHINE INTERFACE (HMI) TO ALLOW THE EQUIPMENT TO BE CONTROLLED IF THE PLC IS OUT OF SERVICE.

6. STEP DOWN TRANSFORMER AND SERVICE LIGHTING PANEL

FURNISH AND INSTALL ONE (1) NEMA-3R STEP DOWN 480V/208-120 VAC CONNECTED TRANSFORMER IN THE CONTROL HOUSE TO POWER THE BRIDGE SERVICE EQUIPMENT. FURNISH AND INSTALL ONE (1) NEW NEMA-12 BRIDGE LIGHTING PANEL TO DISTRIBUTE POWER TO THE SERVICE EQUIPMENT.

7. SPAN MOTOR

REMOVE AND DISPOSE THE EXISTING SPAN MOTOR. FURNISH AND INSTALL ONE (1) NEW 25HP, 480VAC, 900 RPM, INVERTER DUTY, TENV MOTOR. THE MOTOR SHALL BE EQUIPPED WITH AN INTERNAL HEATER AND AN ENCODER TO PROVIDE MOTOR SPEED FEEDBACK TO THE ASSOCIATED DRIVE. FURNISH AND INSTALL IN-SIGHT, NEMA-4X STAINLESS STEEL DISCONNECT SWITCH FOR THE MOTOR.

8. WEDGE MOTOR

REMOVE AND DISPOSE THE EXISTING WEDGE MOTOR. FURNISH AND INSTALL ONE (1) NEW 7.5HP, 480VAC, TENV MOTOR TO REPLACE THE EXISTING WEDGE MOTOR. FURNISH AND INSTALL ONE (1) IN-SIGHT, NEMA-4X STAINLESS STEEL DISCONNECT SWITCH FOR THE WEDGE MOTOR.

9. MOTOR AND MACHINERY BRAKES

REMOVE AND DISPOSE THE EXISTING SPAN AND MACHINERY BRAKES. FURNISH AND INSTALL ONE (1) NEW 480VAC MOTOR BRAKE AND TWO (2) NEW 480VAC MACHINERY BRAKES. EACH BRAKE SHALL BE EQUIPPED WITH A HAND RELEASE MECHANISM AND LIMIT SWITCHES TO INDICATE SET, RELEASED, AND HAND RELEASED POSITIONS. FURNISH AND INSTALL THREE (3) IN-SIGHT, NEMA-4X STAINLESS STEEL DISCONNECT SWITCHES, ONE FOR EACH BRAKE.

10. PLC CONTROL SYSTEM

FURNISH AND INSTALL A NEW PROGRAMMABLE LOGIC CONTROLLER (PLC) BASED CONTROL SYSTEM. THIS WILL INCLUDE A MAIN PLC PANEL LOCATED IN THE CONTROL HOUSE, A NEW CONTROL DESK IN THE CONTROL HOUSE, AND A NEW REMOTE I/O PANEL IN THE CENTER PIVOT PIER. THE EQUIPMENT ENCLOSURES LOCATED IN THE CONTROL HOUSE SHALL BE RATED NEMA-12 AND THE PANEL IN THE PIVOT PIER SHALL BE RATED NEMA-4X STAINLESS STEEL. THE PANELS SHALL USE ROCKWELL AUTOMATION: ALLEN-BRADLEY (AB) CONTROLLOGIX PLC WITH AN ETHERNET COMMUNICATION NETWORK TO COMMUNICATE BETWEEN THE CONTROL DESK, THE MAIN PLC PANEL, THE MCC, AND THE REMOTE I/O RACK IN THE PIVOT PIER. ALL REQUIRED PROGRAMMING SHALL BE PROVIDED BY THE CONTRACTOR.

11. LIMIT SWITCHES AND CONTROL DEVICES

INTEGRATE THE EXISTING SPAN POSITION ROTARY CAM LIMIT SWITCH INTO THE NEW CONTROL SYSTEM. FURNISH AND INSTALL NEW WEDGE ROTARY CAM LIMIT SWITCH. INTEGRATE THE CAM LIMIT SWITCH AND SPAN POSITION TRANSMITTER INTO THE NEW CONTROL SYSTEM. INTEGRATE THE NEW BRAKE LIMIT SWITCHES (ITEM 9 ABOVE) INTO THE NEW CONTROL SYSTEM. FURNISH AND INSTALL NEW MAGNETIC PROXIMITY LIMIT SWITCHES ON THE NEAR PIER AND PIVOT PIER TO PROVIDE SPAN FULL CLOSED, OPEN, AND SPAN OVERTRAVEL POSITION INFORMATION. FURNISH AND INSTALL NEW FLOAT SWITCH IN THE WASTE WATER HOLDING TANK.

ALL LIMIT SWITCHES SHOWN IN THE WIRING DIAGRAMS ARE SHOWN IN THE CONFIGURATION CORRESPONDING TO THE ROADWAY OPEN TO VEHICULAR TRAFFIC: SPAN FULLY CLOSED, ALL BRAKES SET AND NOT HAND RELEASED, WEDGES FULLY DRIVEN, ALL GATES FULLY RAISED, AND ALL DISCONNECT SWITCHES IN THE NOT DISCONNECTED POSITION.

12. REFURBISH WARNING GATES

RECONNECT ALL GATE MOTORS TO OPERATE AT 480VAC. CLEAN AND LUBRICATE THE GATE EQUIPMENT. INTEGRATE THE GATES INTO THE NEW CONTROL SYSTEM. FURNISH AND INSTALL NEW 120V SERVICE FOR HEATER, RECEPTACLE, FLASHING LIGHTS AND FLASHER UNIT INSIDE THE WARNING GATES ENCLOSURES.

13. REFURBISH BARRIER GATES

REMOVE AND DISPOSE THE EXISTING BARRIER GATE MOTORS AND SOFT STARTS. FURNISH AND INSTALL NEW DRIVES AND MOTORS TO OPERATE AT 480VAC. CLEAN AND LUBRICATE THE GATE EQUIPMENT. INTEGRATE THE GATES INTO THE NEW CONTROL SYSTEM. FURNISH AND INSTALL NEW 120V SERVICE FOR HEATER AND RECEPTACLE INSIDE BARRIER GATE ENCLOSURES. REPLACE THE DRIVE ROLLER CHAINS, DRIVE SPROCKET, DRIVE WHEEL SPROCKET, AND DRIVE WHEELS ON EACH GATE WITH NEW B&B APPROVED EQUIPMENT. PROVIDE TWO SETS OF SPARE DRIVE ROLLER CHAINS, DRIVE SPROCKET, DRIVE WHEEL SPROCKET, AND DRIVE WHEELS.

14. REFURBISH TRAFFIC EQUIPMENT

INCORPORATE THE EXISTING TRAFFIC CONTROL EQUIPMENT (TRAFFIC SIGNALS AND FLASHING LIGHTS) INTO THE NEW CONTROL SYSTEM.

15. SUBMARINE CABLES TO PIVOT PIER

FURNISH AND INSTALL A NEW SUBMARINE CABLE BETWEEN THE CONTROL HOUSE TO THE PIVOT PIER. THIS SHALL PROVIDE POWER AND CONTROL TO ALL EQUIPMENT IN THE PIVOT PIER FOR SPAN OPERATION.

FURNISH AND INSTALL NEW DRAG CABLES BETWEEN THE FIXED PIVOT PIER SUBMARINE CABINET AND THE MOVABLE PIVOT PIER TERMINATION CABINET TO ACCOMMODATE 180° ROTATION.

16. CONDUIT AND WIRE

FURNISH AND INSTALL ALL CONDUIT, BOXES, AND WIRE AS REQUIRED TO FULLY CONNECT ALL EXISTING AND NEW EQUIPMENT TO THE ELECTRICAL SYSTEM.

ALL NEW CONDUIT SHALL BE RIGID GALVANIZED STEEL CONDUIT, EXCEPT FOR FINAL CONNECTIONS TO LIMIT SWITCHES AND MOTORS WHICH SHALL BE LIQUIDTIGHT FLEXIBLE CONDUITS. NO CONDUIT USED SHALL BE SMALLER THAN 3/4".

ALL NEW WIRING SHALL BE XHHW AND INSTALLED IN CONDUIT. THE MINIMUM WIRE SIZE FOR CONTROL WIRES INSIDE ENCLOSURES SHALL BE #14 AWG AND THE MINIMUM SIZE FOR POWER WIRES SHALL BE #12AWG FOR ALL NEW WIRING IN ACCORDANCE WITH AASHTO.

THE EXISTING SUBMARINE CABLES BETWEEN THE CONTROL HOUSE AND THE FAR SIDE ACROSS BOTH CHANNELS SHALL BE REUSED AND INTEGRATED INTO THE POWER DISTRIBUTION SYSTEM AND THE CONTROL SYSTEM.

THE CONTRACTOR SHALL FURNISH AND INSTALL A MAIN TERMINAL PANEL IN THE CONTROL HOUSE TO PROVIDE THE TRANSITION POINT BETWEEN THE NEW POWER DISTRIBUTION SYSTEM AND THE NEW CONTROL SYSTEM AND THE EXISTING WIRING AND EQUIPMENT TO REMAIN. THE CONTRACTOR SHALL FIELD VERIFY ALL CONDUCTORS, TRACE THE WIRING, AND PROVIDE WIRE TAGS ON ALL EXISTING WIRING. THIS INFORMATION SHALL BE INCLUDED ON THE AS-BUILT DRAWINGS FOR EASE OF FUTURE MAINTENANCE.

17. SIREN

FURNISH AND INSTALL A NEW SIREN AND MOUNT ON THE CONTROL HOUSE. PROVIDE A DOUBLE PROJECTOR AIR HORN TO SERVE AS THE SIREN. PROVIDE ONE PROJECTOR UP RIVER AND ONE PROJECTOR DOWN RIVER.

18. HVAC, SERVICE LIGHTING AND RECEPTACLES

REMOVE AND DISPOSE EXISTING HVAC, SERVICE LIGHTING, AND RECEPTACLES IN THE CONTROL HOUSE AND PIVOT PIER. PROVIDE POWER AND INTEGRATE THE NEW CONTROL HOUSE HVAC INTO THE POWER SYSTEM. FURNISH AND INSTALL NEW LIGHTING AND RECEPTACLES IN THE CONTROL HOUSE AND THE PIVOT PIER.

19. DEMOLITION

REMOVE AND DISPOSE FROM SITE THE CONTROL DESK, DRIVES, MOTOR CONTROLLER PANELS, GENERATOR, ATS, AERIAL SERVICE CABLES, BRAKES, WEDGE MOTOR, SPAN MOTOR, WEDGE LIMIT SWITCHES, LIGHTS, RECEPTACLES, AND ASSOCIATED CONDUIT, BOXES, AND WIRE. ALL EQUIPMENT TO REMAIN IN SERVICE SHALL BE PROTECTED AT ALL TIMES.

THE CONTRACTOR SHALL REMOVE AND STORE THE EXISTING CCTV, ANEMOMETER AND ALL ASSOCIATED EQUIPMENT LOCATED IN AND ON TOP OF THE CONTROL HOUSE. ONCE ALL CONTROL HOUSE WORK IS COMPLETE THE CONTRACTOR SHALL RE-INSTALL AT THE DIRECTION OF NCDOT.

20. TEMPORARY BRIDGE OPERATION

THE CONTRACTOR SHALL KEEP THE SPAN OPERATIONAL AT ALL TIMES, IN ACCORDANCE WITH THE COAST GUARD APPROVALS. THE CONTRACTOR SHALL PROVIDE A TEMPORARY POWER AND CONTROL SYSTEM TO OPERATE THE SPAN, WEDGES, AND ASSOCIATED EQUIPMENT SAFELY DURING CONSTRUCTION. ANY REQUIREMENTS TO TAKE THE SPAN OUT OF SERVICE SHALL BE APPROVED BY THE COAST GUARD.

21. OPERATION AND MAINTENANCE MANUALS, TRAINING, AND AS-BUILT DOCUMENTATION

THE CONTRACTOR SHALL FURNISH COMPLETE MAINTENANCE MANUALS WITH ACCURATE AS-BUILT DOCUMENTATION FOR ALL WORK. THESE MANUALS SHALL BE COMPLETED PRIOR TO COMMISSIONING THE SPAN AND USED AS PART OF THE COMMISSIONING PROCESS TO VERIFY THE MANUAL ACCURACY. THE MANUALS SHALL BE USED AS PART OF THE TRAINING OF THE BRIDGE OPERATORS AND TECHNICIANS ON THE SAFE OPERATION AND MAINTENANCE OF THE BRIDGE.

22. COMMISSIONING

THE CONTRACTOR SHALL COMPLETELY COMMISSION THE BRIDGE CONTROL SYSTEM IN A FACTORY TEST AND THEN AN ONSITE COMMISSIONING TO SHOW THE EQUIPMENT IS INSTALLED ACCURATELY AND SAFELY IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ALL EQUIPMENT SHALL BE OPERATED TO THE SATISFACTION OF THE ENGINEER AND A TESTING PROCEDURE TO RECORD THE TESTING OF ALL EQUIPMENT.

DRAWN BY: _QIV DATE: 8/8/2016
 CHECKED BY: _MJT DATE: 8/8/2016
 DESIGN ENGINEER OF RECORD: _CHS DATE: 8/8/2016



DocuSigned by:
 Scott Reynolds
 BFECC072098F1480
 1/11/2017



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

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL NOTES					
ALLIGATOR RIVER SWING SPAN					
REVISIONS					SHEET NO.
NO	BY:	DATE:	NO	BY:	DATE:
1			3		
2			4		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					E-3 TOTAL SHEETS 51

DWG NUMBER 19	TOTAL DWGS 90
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