	NC DEPARTMENT OF TRANSF DIVISION OF HIGHWAYS BRIDGE MANAGEMENT UNIT	ORTATION	ATTENTION	(	06-09-2016			
E TANDING	BRIDGE I				EPORT			
COUNTY	INSPECTION TYPE: 065	ELECTRICA BRIDGE NU	MBER 0013	077783333777788	ION CYCLE 2 YRS			
		-	0013	-				
ROUTE	065 US017	ACROSS	CAPE FEAR R	IVER	М.Р.			
PRIMARY DRIVE		for / Drive		TAND-ALO	NE EMERGENCY DRIVES			
LONGITUDE	77°57'07.3"W		LATITUDE		34°13'39.1"N			
PRESENT CON	DITION FAIR		TRAFFIC	CAMERAS	8 ROADWAY - 5 MAINTENANCE			
INSPECTIO	N DATE 06-09-2016		TRAF	FIC GATES	4 B&B ROADWAY			
NUMBER OF M	OTORS 4 MAIN - 2 AUX	(	ROADW	AY LIGHTS	41			
NUMBER OF E	BRAKES 6 MAIN - 2 AUX	(	BRIDGE S	CHEDULE_	ON DEMAND			
BRIDG	E TYPE VERTICAL LIFT	SPAN	PAN YEARLY OPENINGS 180					
YEAR CONSTR	RUCTED 1969		YEAR OF	LAST REHA	AB 2008			



LOOKING NORTH

AASHTO Inspection Manual Sections & Scope of Work		Condition at Inspection			AASHTO Inspection Frequency		
Section	AASHTO Movable Bridge Electrical Inspection - General	Good	Poor but operable	Needs repair	Routine (2 yr)	In Depth (6 yr)	Comments
2.5.9	Emergency and Manual Drives	Х			Х		
2.5.9.1	Emergency Drive Motors / Engines	Х			Х		
	Brake Operation (if applicable)	Х			Х		
	Brake Wheel Condition (if applicable)		Х		Х		SOME SURFACE RUST
	Clutch Operation	Х			Х		
	Drive Operates as Intended	Х			Х		
2.5.9.2	Manual Drives (if applicable)				Х		N/A
	Operates as Intended				Х		N/A
2.8	Electrical components	Х			Х		
2.8.4	Motors	Х			Х		
2.8.4.1	Traffic Gate Motors	Х			Х		
	Bearings quiet	Х			Х		
	No excessive vibration	Х			Х		
	No excessive heat	Х			Х		
	All components tight	Х			Х		
	Lock/Wedge Motors	Х			Х		
	Bearings quiet	Х			Х		
	No excessive vibration	Х			Х		
	No excessive heat	Х			Х		
	All components tight	Х			Х		
	Brake Motors	Х			Х		
	Bearings quiet	Х			Х		
	No excessive vibration	Х			Х		
	No excessive heat	Х			Х		
	All components tight	Х			Х		

AASHTC	AASHTO Inspection Manual Sections & Scope of Work		Condition at Inspection			nspection uency	
Section	AASHTO Movable Bridge Electrical Inspection - Bascule	Good	Poor but operable	Needs repair	Routine (2 yr)	In Depth (6 yr)	Comments
2.8.4.1	Main Drive Motors	Х			Х		
	Bearings quiet	Х			Х		
	No excessive vibration	Х			Х		
	No excessive heat	Х			Х		
	Motor heaters operable (if applicable)	Х			Х		
	Conduit connections secure	Х			Х		
	Brushes - adequate length	Х				Х	
	Brushes - freedom in holder	Х				Х	
	Rings in good condition	Х				Х	
	No oil or grease contamination		Х		Х		SIGNS OF OVER GREASING
	External resistors (if applicable)	Х			Х		
	Megger testing values (attach results)					Х	SEE ATTACHED RESULTS
2.8.5	Motor Controls & MCC	Х			Х		
	No rust or corrosion on cabinet	Х			Х		
	Loose wiring on starters	Х			Х		
	Burned coil or wire insulation	Х			Х		
	Contacts worn or pitted	Х				Х	
	Dust or debris present	Х			Х		
	Unusual noise during operation	Х			Х		

AASHTO Inspection Manual Sections & Scope of Work		Cond	Condition at Inspection			nspection uency	
Section	AASHTO Movable Bridge Electrical Inspection - Bascule	Good	Poor but operable	Needs repair	Routine (2 yr)	In Depth (6 yr)	Comments
2.8.6	Brakes	Х			Х		
	Shoe clearance 1/8 " or less	Х			Х		
	Shoes dragging	Х			Х		
	Shoes glazed	Х			Х		
	Shoes excessively worn	Х			Х		
	Drum surface condition		Х		Х		SOME SURFACE RUST
	Fluid levels (thrusters)	Х			Х		
	Coil condition (solenoids)	Х			Х		
2.8.7	Electric Cables	Х			Х		
	Submarine Cables (if applicable)				Х		N/A
	Proper support				Х		N/A
	No damage to exterior insulation				Х		N/A
	Megger testing values (attach results)					Note 1	
2.8.7	Electric Cables	Х					
	Aerial Cables (if applicable)				Х	Note 2	INSPECTION IN SEPT. 2016
	Proper support				Х		
	No damage to exterior insulation				Х		
	Megger testing values (attach results)					Note 1	
2.8.7.2	Terminal Connections (Wires & Cables)			Х	Х	Note 4	See notes 4 and 5
	Connections tight	Х			Х		
	Condition of insulation	Х			Х		
2.8.8.1	Incoming Power	Х			Х		
	No oil leakage from transformers	Х			Х		
	No blown fuse jacks	Х			Х		
	No loose hardware or supports	Х			Х		

AASHTO	AASHTO Inspection Manual Sections & Scope of Work		Condition at Inspection			nspection uency	
Section	AASHTO Movable Bridge Electrical Inspection - Bascule	Good	Poor but operable	Needs repair	Routine (2 yr)	In Depth (6 yr)	Comments
2.8.8.2.1	Standby Generator	Х			Х		
	Start up / run as intended	Х			Х		
	Voltage within tolerance	Х			Х		
2.8.8.3	Transformers (if applicable)	Х			Х		
	No excessive rust / corrosion	Х			Х		
	No oil leakage (if applicable)	Х			Х		
	Primary disconnect connections	Х			Х		
2.8.9	Circuit Breakers	Х			Х		
	Connection points indicate overheating	Х			Х		
	Proper trip settings / values	Х			Х		
	Arc damage on contacts (if applicable)	Х			Х		
2.8.10	Traffic Control	Х			Х		
2.8.10.1	Drawbridge Ahead Signal (if applicable)				Х		N/A
2.8.10.2	Traffic Signal Installation	Х			Х		
2.8.10.3	Traffic / Barrier Gates	Х			Х		
	Smooth operation	Х			Х		
	Gate arm installed correctly	Х			Х		
	Flashing lights functioning	Х			Х		
	Electrical connections tight	Х			Х		
	Limit switchs operate as intended	Х			Х		
2.8.11	Navigational Lighting	Х			Х		
	All lights present / burning	Х			Х		
	Proper orientation of fixtures	Х			Х		
	Proper configuration of fixtures	Х			Х		

AASHTC	) Inspection Manual Sections & Scope of Work	Condition at Inspection			AASHTO Inspection Frequency		
Section	AASHTO Movable Bridge Electrical Inspection - Bascule	Good	Poor but operable	Needs repair	Routine (2 yr)	In Depth (6 yr)	Comments
2.8.12	Lightning Protection (if applicable)	Х			Х		
	Continuity - air terminals to ground	Х			Х		
	Conductors free of rust / corrosion	Х			Х		
	Connections tight	Х			Х		
2.9.2	Bridge Operating Sequence	Х			Х		
2.9.3.1	Limit Switches	Х			Х		
	Rotary span limits	Х			Х		
	Lock / wedge limits	Х			Х		
	Seating plunger switch (if applicable)				Х		N/A
	Seating proximities (if applicable)		Х		Х	Note 3	DAMAGE FROM PAINT PROJECT - NEED REPLACING
2.9.3.2	Selsyn Transmitters (if applicable)				Х		N/A
2.9.3.3	Resolvers & Encoders (if applicable)	Х			Х		
2.9.4	Control Console	Х			Х		
	Controls operate as intended	Х			Х		
	All indicating lamps operable	Х			Х		
	Bypass switches sealed or locked	Х			Х		
	Voltmeters & ammeters functioning	Х			Х		
	Position indication functioning	Х			Х		
	Cleanliness of enclosure	Х			Х		
	Neatness of wiring	Х			Х		
2.9.4.4.1	Control Interlocking Tests	Х			Х		
2.9.5	PLC's (if applicable)	Х			Х		
	Air filters clean	Х			Х		
	Wiring connections tight	Х			Х		

AASHTO	AASHTO Inspection Manual Sections & Scope of Work		Condition at Inspection			nspection uency	
Section	AASHTO Movable Bridge Electrical Inspection - General	Good	Poor but operable	Needs repair	Routine (2 yr)	In Depth (6 yr)	Comments
2.9.6.1	Drum Controllers (if applicable)				Х		N/A
	Operates as intended				Х		N/A
	Contacts clean and connections tight					Х	N/A
2.9.6.2	Relay Logic Controller (if applicable)	Х			Х		
	Overloads not tripped	Х			Х		
	Dashpot fluid levels (if applicable)					Х	N/A
2.9.7.1	AC Manual Control (if applicable)	Х			Х		
	Resistor bank connections	Х				Х	
	Signs of resistor bank overheating	Х			Х		
2.9.7.3	Thyristor Controller (if applicable)				Х		N/A
	Operates as intended				Х		N/A
	Connections on SCRs tight				Х		N/A
	No visible cracks or damage on SCRs				Х		N/A
2.9.8	Surge Protection (if applicable)	Х			Х		
	Grounds bonded together	Х			Х		
	Neutral bonded to ground at service	Х			Х		
	No neutral bonding at sub panels	Х			Х		
	Surge protector (if applicable)	Х			Х		

Section	Discrepancies Noted	Details and Comments
2.8.7	Deviation from recommended schedule	Note 1 - Obtaining proper megger values for conductors in a submarine or aerial cable involves
		removing each conductor from the terminal strip. For safety considerations, power should be
		removed which necessitates periods of bridge inoperability. Also, terminal strips of questionable
		condition may require replacement to accommodate such testing. NCDOT will conduct megger
		testing of submarine and aerial cables ONLY if troubleshooting efforts indicate that megging is
		warranted. Megger testing of motors will remain on the recommended schedule.
2.8.7	Aerial cable inspection	Note 2 - Aerial cables are inspected after Labor Day every year. Any discrepencies noted are
		repaired during the inspection and not carried over for any length of time.
2.9.3.1	Seating proximities damaged	Note 3 - All four seating proximity switches show signs of damage or deterioration due to the
		sand blasting and/or painting of the bridge structure. Recommend replacing all switches.
2.8.7.2	Light fixtures need replacing	Note 4 - Several light fixtures in stairwell are in need of replacement.
2.8.7.2	Abandoned wiring needs removal	Note 5 - Abandoned wiring gives appearance of a safety issue. Recommend removal of wiring
		and/or conduit or installation of junc box and termination of wiring inside.
		The bridge is in overall very good electrical condition after a major refurbishment in 2008

## Bridge Cape Fear Memorial

## Megger Testing Report

Motor Group\_\_\_\_\_

Testing Date <u>6-09-2016</u>

NUMBER	CYCLES	TO PHASE "B"	Phase "A" TO Phase "C"	PHASE "B" TO PHASE "C"	PHASE "A" TO NEUTRAL	PHASE "B" TO NEUTRAL	PHASE "C" TO NEUTRAL	PHASE "A" TO GROUND CONDUCTOR	PHASE "B" TO GROUND CONDUCTOR	PHASE "C" TO GROUND CONDUCTOR
	480/3/60	0	0	0	N/A	N/A	N/A	>500M	>500M	>500M
	480/3/60	0	0	0	N/A	N/A	N/A	>500M	>500M	>500M
	480/3/60	0	0	0	N/A	N/A	N/A	>500M	>500M	>500M
	480/3/60	0	0	0	N/A	N/A	N/A	>500M	>500M	>500M
		480/3/60	480/3/60 0	480/3/60 0 0	480/3/60 0 0 0	480/3/60 0 0 0 N/A	480/3/60 0 0 0 N/A N/A	480/3/60 0 0 0 N/A N/A N/A	480/3/60 0 0 0 0 N/A N/A N/A >500M	480/3/60 0 0 0 N/A N/A N/A >500M >500M

\_\_\_\_\_









