

THE STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
Signature Sheet

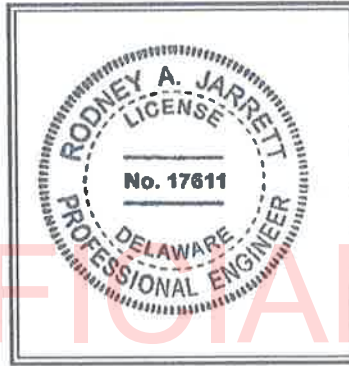
Contract No.: T201707005

F.A.P. No.: EBHOS-2018(36)

P3E No.: 17-07005

Title: Statewide Movable Bridge Preventative Maintenance
Location: Bridges 1-687, 1-688, 1-693, 2-021A, 3-151, 3-153, 3-154, 3-164
County: Statewide

PREPARED BY




AECOM Project Manager
Date: 08/31/2018

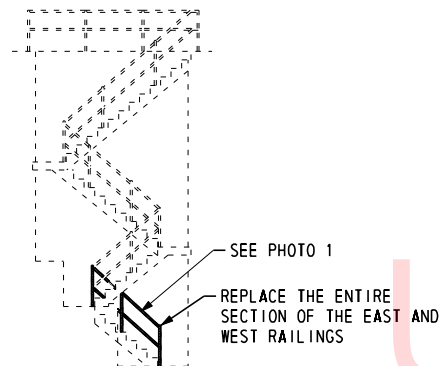

Hardesty & Hanover Project Manager
Date: 08-28-2018

APPROVED for ADVERTISEMENT


Director, Maintenance & Operations
Date: 9/4/2018

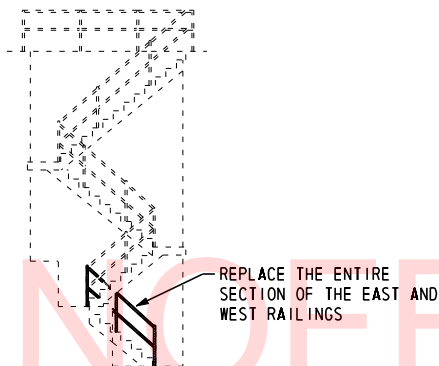
Bridge 1-687

UNOFFICIAL
WEBSITE
COPY



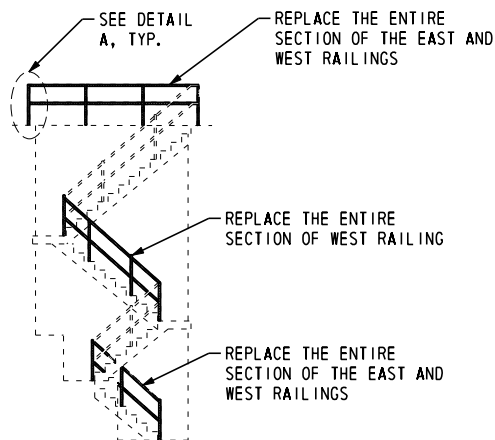
**NORTH PIT
EAST STAIRS**

SCALE: NTS



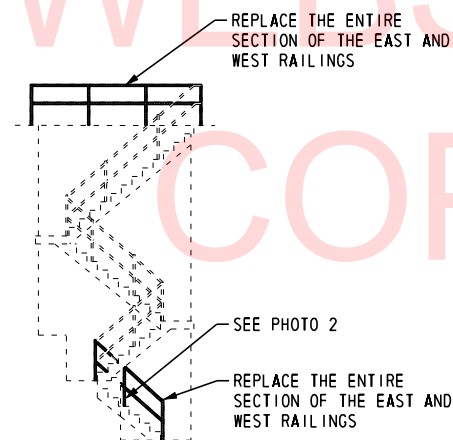
**NORTH PIT
WEST STAIRS**

SCALE: NTS



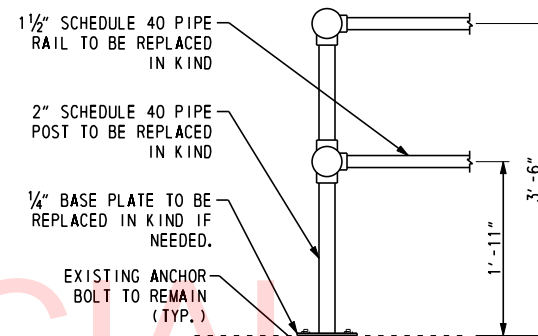
**SOUTH PIT
EAST STAIRS**

SCALE: NTS



**SOUTH PIT
WEST STAIRS**

SCALE: NTS



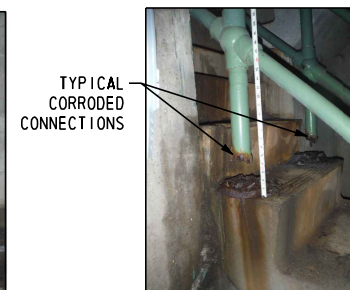
DETAIL A

SCALE: 1/2" = 1'-0"



TYPICAL RAILING
SECTION TO BE
REPLACED

**TYPICAL RAILING
SECTION**



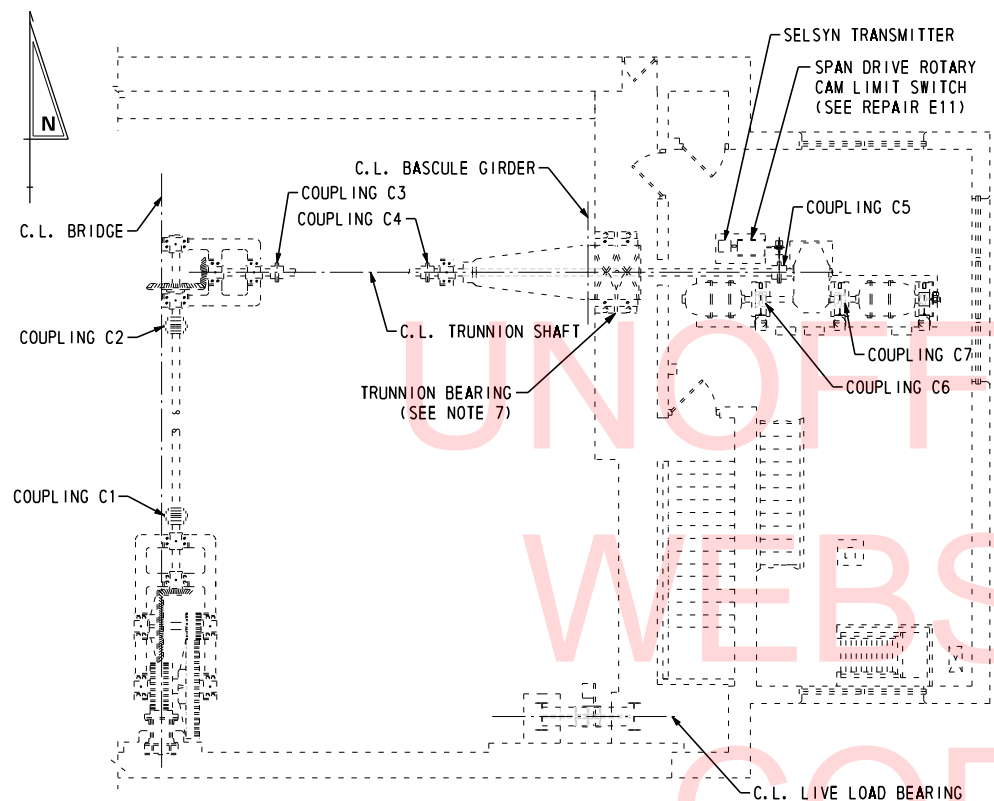
TYPICAL
CORRODED
CONNECTIONS

**TYPICAL FAILED
CONNECTION**

NOTES:

1. ALL ITEMS ON THIS DRAWINGS SHALL BE PAID UNDER 615600 - "INITIAL REPAIRS AT BRIDGE 1-687."
2. REFER TO THE SPECIAL PROVISION "615600 - INITIAL REPAIRS AT BRIDGE 1-687" FOR REQUIREMENTS.
3. APPROXIMATE TOTAL LENGTH OF RAILING TO BE REPLACED = 131 LF
4. WHERE RAILING POSTS ARE REPLACED, REPLACE ANY BASE PLATES THAT HAVE SECTION LOSS. FIELD DRILL HOLES TO MATCH EXISTING ANCHOR LOCATIONS.

T201707005	WALNUT STREET
615600 - INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR S1	



SPAN DRIVE MACHINERY - PLAN

SCALE: NTS
 NOTES: SOUTH LEAF SHOWN, NORTH LEAF SIMILAR.
 TRUNNION BEARINGS AND LIVE LOAD BEARINGS ARE SYMMETRICAL ABOUT CENTERLINE OF BRIDGE
 (ONLY ONE OF EACH SHOWN).
 WALKWAYS INSIDE THE BASCULE PIER NOT SHOWN FOR CLARITY.

REPAIRS

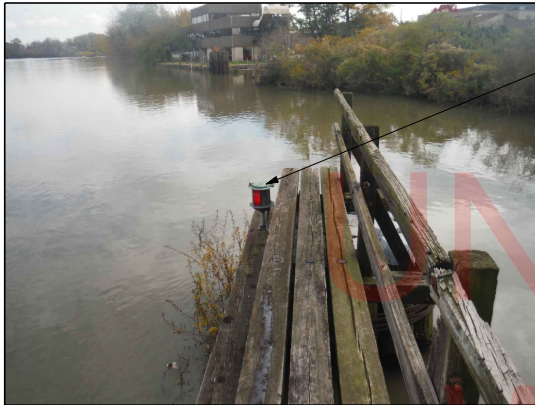
- M1 REPLACE SPAN DRIVE MACHINERY COUPLING SEALS. (SEE TABLE FOR DETAILS)
- M2 CLEAN ACCUMULATION OF DEBRIS FROM ALL TRUNNION BEARING ASSEMBLIES. (BOTH LEAFS)

EXISTING COUPLING INFORMATION				
COUPLING I.D.	MANUFACTURER	MODEL (SEE NOTE 3)	LOCATIONS TO REPLACE SEALS	QTY. (BRIDGE TOTAL)
C1	WALDRON	GEAR COUPLING SINGLE ENGAGEMENT SIZE 6A	NORTH AND SOUTH LEAFS	2
C2	WALDRON	GEAR COUPLING SINGLE ENGAGEMENT SIZE 6A	SOUTH LEAF	1
C3	WALDRON	GEAR COUPLING SINGLE ENGAGEMENT SIZE 5A	NORTH AND SOUTH LEAFS	2
C4	WALDRON	GEAR COUPLING SINGLE ENGAGEMENT SIZE 5A	NORTH LEAF	1
C5	WALDRON	GEAR COUPLING SINGLE ENGAGEMENT SIZE 5A	NORTH AND SOUTH LEAFS	2
C6	FALK	BRAKEWHEEL COUPLING 14" DIA. MODEL 12BW	NORTH LEAF	1
C7	FALK	BRAKEWHEEL COUPLING 14" DIA. MODEL 12BW	NORTH AND SOUTH LEAFS	2

NOTES:

- ALL ITEMS ON THIS DRAWING SHALL BE PAID UNDER SECTION 615600 "INITIAL REPAIRS AT BRIDGE 1-687".
- REFER TO THE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
- THE CONTRACTOR SHALL FIELD VERIFY EXISTING COUPLING MANUFACTURER AND MODELS PRIOR TO PURCHASING NEW SEAL, GASKET, AND BOLT KITS RECOMMENDED BY THE MANUFACTURER.
- PRIOR TO DISASSEMBLING ANY COUPLING, THE CONTRACTOR SHALL LOCK OUT THE SPAN DRIVE MOTORS AND TEMPORARILY HAND RELEASE THE BRAKES TO REMOVE ANY RESIDUAL TORQUE WITHIN THE SPAN DRIVE MACHINERY. MANUALLY SET THE BRAKES AFTER THE RESIDUAL TORQUE HAS BEEN REMOVED.
- TEMPORARILY SUPPORT SHAFTS WHENEVER ANY COUPLING IS DISASSEMBLED.
- WHILE COUPLINGS ARE DISASSEMBLED, CLEAN OLD GREASE FROM THE COMPONENTS AND MANUALLY APPLY FRESH GREASE TO THE COUPLING TEETH. FINISH FILLING COUPLINGS WITH GREASE USING A GREASE GUN AFTER THE COUPLINGS HAVE BEEN REASSEMBLED (SEE O&M MANUAL FOR LUBRICATION PROCEDURES AND WARNINGS).
- THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL BIRD WASTE AND DEBRIS AT THE TRUNNION BEARINGS. THE CONTRACTOR SHALL UTILIZE PROPER PPE AND REMOVAL METHODS WHEN CLEANING THE WASTE. BIRD WASTE SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

T201707005	WALNUT STREET
615600 - INITIAL REPAIRS AT BRIDGE 1-687	
REPAIRS M1 & M2	



ADJUST AND ROTATE
EXISTING PIER
LIGHTS TO MEET
USCG REQUIREMENTS
33 CFR 118.65

**FENDER NAVIGATION LIGHTS NOT
ALIGNED WITH THE CHANNEL**

QTY: 6 FENDER LIGHTS

NOTES:

1. POSITIONING OF LIGHTS SHALL BE IN ACCORDANCE WITH USCG 33 CFR 118.65.
2. FURNISH AND INSTALL NEW NEMA 4X S.S. BOX TO REPLACE CONDUIT BODY AT THE DAMAGED CONDUIT TEE (NOT SHOWN IN THIS DRAWING) AND SPLICE EXISTING CONDUCTORS INSIDE THE ENCLOSURE.
3. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E1	



FURNISH AND INSTALL MISSING
HARDWARE FOR SPAN MOTOR
ACCESS COVER (4 MOTORS)

TYPICAL SPAN MOTOR WITH MISSING
HARDWARE ON ACCESS COVER

TOTAL: 8 FASTENERS REQUIRED



INSTALL EXISTING COVER
AND FURNISH WITH NEW
HARDWARE FOR TACHOMETER
AND OVERSPEED ENCLOSURE

TYPICAL TACHOMETER AND OVERSPEED
ENCLOSURE WITH UNSECURED COVER (2 TOTAL)

TOTAL: 24 FASTENERS REQUIRED

NOTES:

1. ALL HARDWARE SHALL BE TYPE 316 S.S.
2. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.
3. TIGHTEN THE LOOSE MOUNTING FASTENERS AT THE NORTHWEST WARNING GATE REDUCER (NOT SHOWN ON THIS DRAWING).
4. THE WARNING GATE REDUCER BOLTS SHALL BE TORQUED AS RECOMMENDED BY THE WARNING GATE MANUFACTURER. THE EXISTING WARNING GATES ARE B&B ROADWAY MODEL VW-4.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E2	



FURNISH AND INSTALL GROUND
LUG IN EACH ENCLOSURE AND
BOND NEW GROUND CONDUCTOR

FURNISH AND INSTALL GROUND
CONDUCTOR IN EXISTING CONDUIT

TYPICAL SPAN MOTOR DISCONNECT SWITCH WITHOUT A GROUND CONDUCTOR

TOTAL: 4 LOCATIONS

NOTES:

1. PROVIDE PULLING LUBRICANT AND MAKE OTHER NECESSARY PRECAUTIONS NOT TO DAMAGE THE MOTOR FEEDER CONDUCTORS DURING INSTALLATION OF NEW CABLES.
2. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.
3. MEASURE INSULATION RESISTANCE OF DISCONNECTED CABLES BEFORE AND AFTER GROUND INSTALLATION AND SUBMIT THE RESULTS FOR REVIEW.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E3	



TYPICAL MOTOR DISCONNECT SWITCHES,
CONDUIT AND FITTINGS WITH CORROSION

TOTAL: 2 LOCATIONS

CLEAN ALL SIDES OF CONDUIT AND
ENCLOSURES, SCRAPE WITH WIRE
BRUSH AND PAINT AS SPECIFIED



TYPICAL TERMINATION ENCLOSURES,
CONDUIT AND PULL BOXES EXHIBITING PEELING PAINT

TOTAL: 2 LOCATIONS

NOTES:

1. DO NOT PAINT FLEXIBLE CONDUIT, PVC OR S.S. EQUIPMENT.
2. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E4 (1 OF 2)	



**TYPICAL CONTROL ENCLOSURE
WITH CORROSION AT THE BASE**

TOTAL: 8 CABINETS



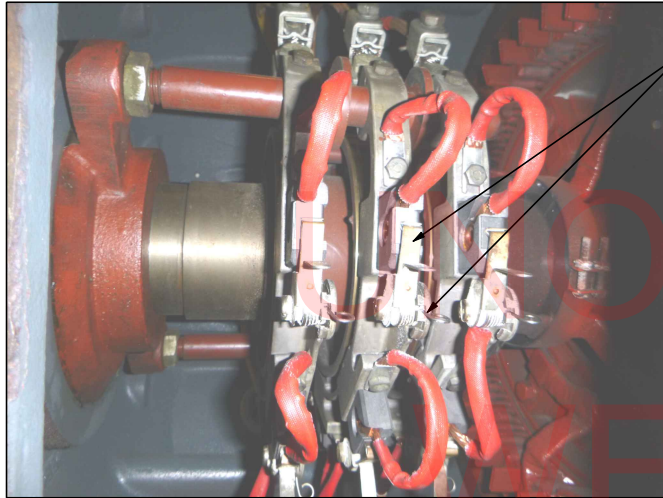
**TYPICAL CONDUIT IN BASCULE PIER
WITH PEELING PAINT AND CORROSION**

TOTAL: LOCATIONS VARY

NOTES:

1. DO NOT PAINT FLEXIBLE CONDUIT, PVC OR S.S. EQUIPMENT.
2. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E4 (2 of 2)	



ADJUST BRUSH HOLDERS
AND SPRINGS TO ACHIEVE 90%
CONTACT (MINIMUM). REPLACE
COMPONENTS AS NEEDED

BRUSHES WITH POOR
CONTACT

TYPICAL SPAN MOTOR BRUSHES, SPRINGS,
HOLDERS AND SLIP RINGS WITH POOR ALIGNMENT

QTY: 4 SPAN MOTORS



TYPICAL MOTOR BRUSHES WITH
POOR CONTACT WITH SLIP RINGS

QTY: 4 SPAN MOTORS

NOTES:

1. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E5	



SELSYN POSITON
TRANSMITTER

FURNISH AND INSTALL NEW
NEMA 4X S.S. ROTARY CAM
LIMIT SWITCH WITH REDUCER
AS SPECIFIED

FURNISH AND INSTALL NEW
LIMIT SWITCH COUPLINGS (SEE
SPECIAL PROVISIONS FOR
COUPLING AND KEY DETAILS)

FURNISH AND INSTALL NEW
S.S. SHIM PACKS.

**TYPICAL SPAN POSITION ROTARY CAM
LIMIT SWITCH**

QTY: 2 LOCATIONS

NOTES:

1. ADJUST LIMIT SWITCH PER AS-BUILT DRAWINGS AND EXISTING LIMIT SWITCH SETTINGS.
2. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E6	



SWITCH CONNECTIONS AT PHASE A
AND C ON THE LOAD SIDE AND
CHANGE PHASE CONNECTIONS WITHIN
THE MOTOR JUNCTION BOX FOR
CORRECT MOTOR ROTATION.

**IMPROPER COLOR CODING INSIDE
THE MOTOR DISCONNECT SWITCH**

QTY: 4 LOCATIONS

NOTES:

1. MOTOR ROTATION SHALL BE VERIFIED WITH MOTOR COUPLING UNCOUPLED PRIOR TO PERFORMING ANY TEST OPENINGS.
2. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.
3. COORDINATE COUPLING DISASSEMBLY WITH REPAIR M1 WORK.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E7	



CLEAN ALL SIDES OF CONDUIT
SCRAPE WITH WIRE BRUSH
AND PAINT

PEELING PAINT AND CORROSION
ON CONDUIT INSTALLED THROUGH THE NORTH
MACHINERY ROOM FLOOR NEAR SPAN MOTOR
DISCONNECT SWITCHES

QTY: 1 LOCATION

NOTES:

1. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E8	



CLEAN ALL SIDES OF CONDUIT AND ENCLOSURES, SCRAPE WITH WIRE BRUSH AND PAINT

FURNISH AND INSTALL HEAVY DUTY S.S PIGEON SPIKES IN AREAS OF SUSPECTED PIGEON NESTING

BIRD WASTE AND PEELING PAINT
ON CONDUIT NEAR DROOP CABLE JUNCTION BOX
IN THE BASCULE PIER

QTY: 2 LOCATIONS

NOTE:

1. REFER TO THE SPECIAL PROVISIONS FOR REQUIREMENTS.

T201707005	WALNUT STREET
615600 – INITIAL REPAIRS AT BRIDGE 1-687	
REPAIR E9	