STEEL PACK RUST REPAIR DETAILS:

DESCRIPTION:

THIS WORK SHALL CONSIST OF REPAIRING BUILT-UP STEEL MEMBERS THAT HAVE BEEN DEFORMED BY PACK RUST (RUST BUILD-UP) AT LOCATIONS INDICATED ON THE CONTRACT PLANS AND OTHER LOCATIONS DIRECTED BY THE FIELD ENGINEER IN ACCORDANCE WITH THE REPAIR PROCEDURES DESCRIBED BELOW.

MATERIALS:

MATERIALS FOR THIS WORK SHALL CONFORM TO THE FOLLOWING:

1. TERMARUST 2000 SERIES HIGH RATIO CALCIUM SULFONATE SYSTEM BY TERMARUST TECHNOLOGIES, MONTREAL CANADA OR AN APPROVED EQUAL:

GENERAL PACK RUST REPAIR PROCEDURES:

1. THE FIELD ENGINEER SHALL DETERMINE THE AREAS REQUIRING REPAIR. THE FIELD ENGINEER WILL IDENTIFY THE LOCATIONS AND LIMITS AND SHALL INCLUDE ALL AREAS SHOWN ON THE CONTRACT PLANS AND OTHER LOCATIONS WHERE BUILT-UP STEEL PLATE SECTIONS ARE DEFORMED OVER 3/8" AND, WHICH IN THE OPINION OF THE FIELD ENGINEER REQUIRE REPAIR.
2. REMOVE THE EXISTING PAINT A MINIMUM OF 6" ON EITHER SIDE OF THE REPAIR AREA AND IN ACCORDANCE WITH THE PARAMETERS OF TDOT SPEC 603.05B.
3. RIVETS THAT INTERFERE WITH THE WORK OR ARE DETERIORATED, DEFORMED, OR FAILED SHALL BE REMOVED AS DETERMINED BY THE FIELD ENGINEER. REMOVAL OF RIVETS ALONG A GAGE LINE SHALL BE STAGGERED SUCH THAT TWO ADJACENT RIVETS ARE NOT REMOVED AT THE SAME TIME. RIVETS SHALL BE REMOVED BY ONE OF THE FOLLOWING METHODS: (1) SHEAR RIVET HEAD USING A PNEUMATIC RIVET BREAKER (HELLDOG), AND DRIVE OUT RIVET SHANK WITH A PNEUMATIC PUNCH OR (2) FLAME CUT RIVET HEAD ABOVE THE BASE METAL USING A RIVET SCARFING TIP WITHOUT DAMAGING THE BASE METAL, AND DRIVE OUT THE SHANK USING A PNEUMATIC PUNCH. IF PUNCHING WILL DAMAGE THE BASE METAL, THE SHANK SHALL BE REMOVED BY DRILLING. ANY DAMAGE TO THE BASE METAL SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE CITY.
4. REMOVE PACK RUST BASED ON THE UNIQUE CONDITIONS FOUND AT EACH SPECIFICALLY IDENTIFIED REPAIR LOCATIONS BY ONE OF THE FOLLOWING REMOVAL TECHNIQUES TO BE DETERMINED BY THE FIELD ENGINEER. THE TECHNIQUE SELECTION SHOULD BE THE BEST VALUE SOLUTION TAKING INTO CONSIDERATION THE FOLLOWING PARAMETERS SUCH AS STRUCTURAL COMPONENT AND SYSTEM STABILITY, ABILITY TO PERFORM THE WORK IN THE FIELD, AND REMOVAL OF THE MAXIMUM AMOUNT OF PACK RUST AS FEASIBLY POSSIBLE.

PACK RUST REMOVAL TECHNIQUE 1 - "PARTIAL DISASSEMBLY TECHNIQUE"
PARTIALLY DISASSEMBLE COMPONENT PIECES ADJACENT TO PACK RUST BUILD-UP TO THE EXTENT REQUIRED TO COMPLETELY REMOVE ALL THE PACK RUST BY MEANS OF POWER TOOL CLEANING.
ONLY TO BE USED IN CASES WHERE STABILITY IS NOT A CONCERN AND WHERE COMPLETED DISASSEMBLY OF THE COMPONENT OR STRUCTURAL SYSTEM IS NOT REQUIRED. (I.E. BATON PLATES OR LATTICE OF BUILT-UP MEMBERS.)

PACK RUST REMOVAL TECHNIQUE 2 - "TRADITIONAL TECHNIQUE"
PACK RUST IN THE DEFORMED AREA SHALL BE REMOVED BY POWER TOOL CLEANING TO THE DEPTH OF SEPARATION BETWEEN THE PLIES. BUT NOT LESS THAN A MINIMUM DEPTH OF ONE INCH. THE FIELD ENGINEER MAY SPECIFY A DEPTH OF LESS THAN ONE INCH, BUT IN NO CASE SHALL THE REMOVAL DEPTH BE LESS THAN ONE-HALF INCH.

PACK RUST REMOVAL TECHNIQUE 3 - "HEAT AND HAMMER TECHNIQUE"
HEAT A SMALL AREA OF AN ACCESSIBLE STEEL PLY OF THE BUILT-UP MEMBER ADJACENT TO THE PACK RUST USING AN OXYGEN FUEL TORCH FITTED WITH A ROSEBUD TIP. THE STEEL SHOULD BE HEATED TO A TEMPERATURE IN THE RANGE OF 800°F TO 1000°F.
IN ORDER TO AVOID DISTORTION OF THE STEEL BY CONCENTRATING TOO MUCH HEAT IN ONE AREA, ONLY PERFORM THIS OPERATION IN 1 SQ. FT. SECTIONS.
PLACE A BUFFER PLATE DIRECTLY ON TOP THE HEATED PLY. THE BUFFER PLATE NEEDS A HANDLE TO ALLOW A WORKER TO HOLD THE PLATE IN PLACE TO ENSURE THAT IT DOES NOT MOVE DURING HAMMERING OPERATIONS.
USING A RIVET HAMMER WITH A MODIFIED SNAP, PERFORM A HAMMERING ACTION ON THE BUFFER PLATE TO DRIVE OUT THE PACK RUST AND FLATTEN THE BUCKLED PLY SECTION BELOW THE BUFFER PLATE.
MOVE TO A NEW AREA AND REPEAT THE PROCESS.
DEMONSTRATION OF THIS PROCESS CAN BE OBSERVED BY VIDEO AT THE FOLLOWING LINK: HTTP://NCPTT.NPS.GOV/WP-CONTENT/UPLOADS/2010-04.PDF

THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OSHA WORKER PROTECTION REQUIREMENTS.

ANY STABILITY CALCULATIONS AND/OR TEMPORARY SHORING DESIGNS REQUIRED FOR THE REPAIRS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND CALCULATIONS AND PLANS SEALED BY A LICENSED PROFESSIONAL ENGINEER SHALL BE SUBMITTED TO THE FIELD ENGINEER FOR REVIEW AND APPROVAL. PRIOR TO START OF WORK.

5. NOTE DELETED AND REMOVED FROM CONSIDERATION. (1)
6. WITH THE PACK RUST REMOVED, THE REPAIR AREAS SHALL BE DRIED BY APPLYING ARTIFICIAL HEAT UNTIL THE SURFACE TEMPERATURE REACHES 250°F. THE METHOD OF APPLYING ARTIFICIAL HEAT SHALL BE APPROVED BY THE FIELD ENGINEER. IF TORCHES ARE USED THE CONTRACTOR SHALL DEMONSTRATE TO THE FIELD ENGINEER THAT THE AREA CAN BE DRIED WITHOUT DAMAGING THE STEEL, OR COATING THAT IS TO REMAIN.
7. IMMEDIATELY AFTER THE SURFACE HAS BEEN DRIED, APPLY THE TERMARUST 2000 SYSTEM PENETRANT/SEALER. THE PACK RUST TREATMENT SYSTEM SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER S INSTRUCTIONS.
8. AFTER THE SEALER HAS DRIED, THE EMPTY RIVET HOLES SHALL BE FILLED ASTM A325 HIGH STRENGTH BOLTS. ALL HIGH STRENGTH BOLTS SHALL BE THE SAME DIAMETER AS THE RIVETS THEY REPLACE. HIGH STRENGTH BOLTS SHALL BE INSTALLED AFTER THE NICKS, BURRS AND FOREIGN SUBSTANCES THAT MIGHT INTERFERE WITH SEATING OF THE BOLT HEAD AND NUT WASHERS ARE REMOVED. LIGHT GRINDING MAY BE REQUIRED. INSTALLATION AND INSPECTION OF HIGH STRENGTH BOLTS SHALL BE PERFORMED IN ACCORDANCE WITH THE STEEL CONSTRUCTION MANUAL. IF IT BECOMES NECESSARY TO DISCONNECT, OR ADJUST, STEEL REMAINING AS PART OF THE STRUCTURE TO COMPLETE THE WORK, THE CONTRACTOR SHALL OBTAIN THE FIELD ENGINEERS APPROVAL PRIOR TO PERFORMING DISCONNECTIONS OR ADJUSTMENTS. IF THE BOLT WILL NOT FIT THE RIVET HOLE, THE HOLE MAY BE REAMED SUFFICIENTLY TO ACCOMMODATE THE BOLT. THE TORQUEING AND SEQUENCING OF BOLT INSTALLATIONS SHALL BE PERFORMED IN SUCH A MANNER THAT SEPARATED AND DEFORMED PLIES OF PLATE MAY BE SEQUENTIALLY DRAWN TOGETHER.
9. AFTER THE BOLTING HAS BEEN COMPLETED THE TERMARUST 2000 TOPCOAT MATERIAL SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THE AREAS TO BE SEALED SHALL BE FREE OF DIRT, DUST, RUST OR LOOSE PAINT, AND OTHER MATERIAL THAT WOULD INTERFERE WITH THE ADHESION OF THE SEALANT. SEALED AREAS OF PACK RUST REPAIR SHALL BE FILLED FLUSH WITH THE VERTICAL EDGES OF STEEL FLANGES AND WITHOUT VOIDS OR AIR POCKETS.

STEEL SECTION LOSS REPAIR DETAILS USING PAD WELDING:

DESCRIPTION:

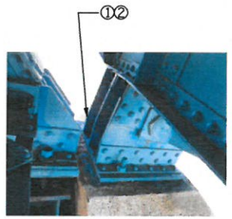
THIS WORK SHALL CONSIST OF REPAIRING STEEL MEMBERS THAT HAVE EXPERIENCED PITTING OR MINOR SECTION LOSS AT LOCATIONS INDICATED ON THE CONTRACT PLANS AND OTHER LOCATIONS DIRECTED BY THE FIELD ENGINEER IN ACCORDANCE WITH THE REPAIR PROCEDURES DESCRIBED BELOW.

MATERIALS:
MATERIALS FOR THIS WORK SHALL CONFORM TO THE FOLLOWING:

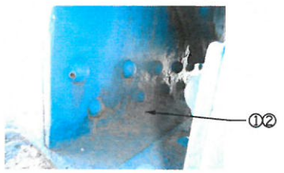
1. AWS SMAW LOW HYDROGEN ELECTRODE E7018 WELD.

GENERAL PACK RUST REPAIR PROCEDURES:

1. THE FIELD ENGINEER SHALL DETERMINE THE AREAS REQUIRING REPAIR. THE FIELD ENGINEER WILL IDENTIFY THE LOCATIONS AND LIMITS AND SHALL INCLUDE ALL AREAS SHOWN ON THE CONTRACT PLANS AND OTHER LOCATIONS OF STEEL COMPONENTS WITH PITTING OR MINOR SECTION LOSS, WHICH IN THE OPINION OF THE FIELD ENGINEER REQUIRE REPAIR.
2. REMOVE THE EXISTING PAINT A MINIMUM OF 6" ON EITHER SIDE OF THE REPAIR AREA AND IN ACCORDANCE WITH THE PARAMETERS OF TDOT SPEC 603.05B.
3. RIVETS THAT INTERFERE WITH THE WORK OR ARE DETERIORATED, DEFORMED, OR FAILED SHALL BE REMOVED AS DETERMINED BY THE FIELD ENGINEER. REMOVAL OF RIVETS ALONG A GAGE LINE SHALL BE STAGGERED SUCH THAT TWO ADJACENT RIVETS ARE NOT REMOVED AT THE SAME TIME. RIVETS SHALL BE REMOVED BY ONE OF THE FOLLOWING METHODS: (1) SHEAR RIVET HEAD USING A PNEUMATIC RIVET BREAKER (HELLDOG), AND DRIVE OUT RIVET SHANK WITH A PNEUMATIC PUNCH OR (2) FLAME CUT RIVET HEAD ABOVE THE BASE METAL USING A RIVET SCARFING TIP WITHOUT DAMAGING THE BASE METAL, AND DRIVE OUT THE SHANK USING A PNEUMATIC PUNCH. IF PUNCHING WILL DAMAGE THE BASE METAL, THE SHANK SHALL BE REMOVED BY DRILLING. ANY DAMAGE TO THE BASE METAL SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE CITY.
4. PREPARE THE SURFACE AREA USING A HAND HELD POWER WIRE BRUSH TO CLEAN THE AREA OF ALL CORROSION.
5. REPAIR ALL PITTING AND SECTION LOSS BY FILLING THE DETERIORATED AREAS WITH PADDING WELDS BACK TO THE ORIGINAL LIMITS OF THE COMPONENT USING AN AWS SMAW LOW HYDROGEN ELECTRODE E7018 WELD.
6. USING A HAND HELD POWER GRINDER, SMOOTH OUT THE WELDED SURFACE. ALWAYS GRIND IN ONE DIRECTION PERPENDICULAR TO THE WELD.
7. DEMONSTRATION OF THIS PROCESS CAN BE OBSERVED BY VIDEO AT THE FOLLOWING LINK: HTTP://WWW.LCC.EDU/MANUFACTURING/WELDING/VIDEOS/PAD_WELDING.ASPX
8. REPAINT THE REPAIRED SECTION AREA IN ACCORDANCE WITH TDOT SPECIFICATIONS 603.



GENERAL BEARING OVERVIEW



BEARING SECTION LOSS DETAIL

TRUSS BEARING REPAIR

NOTES:
1. SECTION LOSS IS AT BASE OF EXTERIOR VERTICAL BEARING PLATES.
2. REPAIR USING PAD WELDING DETAILS.

CITY OF CHATTANOOGA SEAL

CITY OF CHATTANOOGA
DEPARTMENT OF TRANSPORTATION
CONTRACT #E-13-002-201
WALNUT STREET PEDESTRIAN BRIDGE
BRIDGE REPAIRS - PHASE I
JUSTIN C. HOLLAND, ADMINISTRATOR
WILLIAM C. PAYNE, P.E., CITY ENGINEER

STEEL REPAIR DETAIL (4)

NO.	REVISION	DATE	SIG.
1	REV. NOTE	6/16	ASD

SCALE NO SCALE
DRAWN C. DIXON
DESIGN A. DAVIDSON
CHECKED T. MONTIEL

VOLKERT

ADAM S. DAVIDSON REGISTERED ENGINEER No. 119436 STATE OF TENNESSEE

APPROVED

JOB NO. 457001.17
DATE 2/29/16
SHEET 37
FILE NO.

01-JUN-2016 12:25
457000_Walnut Street Bridge\457001.17_Walnut Repair Plans 2016\DGN\Bridge\037_SteelRepair Detail(4).dgn