

STRUCTURAL STEEL NOTES

1. ALL NEW STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50 OR GRADE 36 PAINTED EXCEPT AS SHOWN OTHERWISE. NEW STRUCTURAL STEEL FOR THE TRUSS FLOOR SYSTEM, STRINGERS, CONNECTION ANGLES, SCUPPERS AND DOWNSPOUTS SHALL MEET THE REQUIREMENTS OF ITEM 506, STRUCTURAL STEEL.
2. MEMBERS OR COMPONENTS OF MEMBERS DESIGNATED IN THE DRAWINGS AS FRACTURE CRITICAL MEMBERS (FCM) SHALL RECEIVE CHARPY V-NOTCH (CVN) TESTING.
3. STEEL DESIGNATIONS ARE AS FOLLOWS:
 FLOORBEAMS- AASHTO M270 GR 50 F2
 STRINGERS- AASHTO M270 GR 50 T2
 FLOORBEAM CONNECTION- AASHTO M270 GR 50 F2
 STRINGER CONNECTION- AASHTO M270 GR 50 T2
 TRUSS FRAMING- AASHTO M270 GR 50 T2
4. PAINTING OF NEW STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH ITEM 513.25 STRUCTURAL PAINTING, SHOP APPLIED. (2 COATS FINAL COAT APPLIED IN FIELD)
5. ALL EXISTING STEEL RETAINED AFTER WIDENING OF THE STRUCTURE SHALL BE CLEANED TO BARE METAL AND REPAINTED. WHERE NEW STEEL IS TO BE CONNECTED TO EXISTING STEEL, THE SURFACE OF THE EXISTING STEEL SHALL BE CLEANED TO BARE METAL, REMOVING ALL RUST, AND PRIMED BEFORE ATTACHING NEW STEEL. ALL CLEANING OF EXISTING STEEL SHALL BE IN ACCORDANCE WITH ITEM 513.41 SURFACE PREPARATION (FIELD). PAINTING OF EXISTING STEEL SHALL BE IN ACCORDANCE WITH ITEM 513.30, STRUCTURAL PAINTING FIELD APPLIED. THE COLOR OF THE FINAL COAT OF PAINT SHALL BE "GREEN" IN ACCORDANCE WITH SUBSECTION 708.03. COMPATIBILITY BETWEEN SHOP AND FIELD PAINT SYSTEMS SHALL BE COORDINATED.
6. THE EXISTING STRUCTURAL STEEL IS PAINTED WITH A MATERIAL THAT CONTAINS LEAD. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE REGULATIONS WHEN WORKING WITH THIS STEEL.
7. ALL FIELD CONNECTIONS SHALL BE MADE USING HIGH STRENGTH BOLTS MEETING AASHTO M164, TYPE 1. (UON)

CONNECTION INSTALLATION METHODS

1. FIELD DRILLING NEW STEEL:
 WHEN BOLT HOLES IN NEW REPAIR MATERIAL ARE REQUIRED TO MATCH EXISTING RIVET/BOLT PATTERN. THEY SHALL BE PREPARED USING ONE OF THE FOLLOWING METHODS.
 - A) THE CONTRACTOR SHALL BRING NEW REPAIR STEEL OUT TO THE FIELD BLANK (WITHOUT PRE-DRILLING HOLES). AFTER ASSEMBLY AND ALIGNMENT, HOLES IN THE EXISTING STEEL SHALL BE USED AS A ONE TIME TEMPLATE TO FIELD DRILL FULL SIZE HOLES IN THE NEW STEEL.
 - B) THE CONTRACTOR SHALL CREATE AN APPROXIMATE PATTERN OF EXISTING RIVET HOLES USING FIELD MEASUREMENTS AND EXISTING CONTRACT PLANS. THIS PATTERN SHALL BE USED TO DRILL 1/4" SUBSIZE HOLES IN THE NEW STEEL IN THE SHOP. THEREAFTER, THESE HOLES SHALL BE (RTA) REAMED TO FULL SIZE IN THE FIELD, USING THE EXISTING STEEL COMPONENT AND ITS ASSOCIATED HOLES AS A ONE TIME TEMPLATE.
2. FIELD DRILLING EXISTING STEEL:
 WHEN NEW BOLT HOLES ARE REQUIRED IN EXISTING MATERIAL, THEY SHALL BE PREPARED USING ONE OF THE FOLLOWING METHODS.
 - A) FULL SIZE HOLES SHALL BE DRILLED USING HOLES IN NEW MATERIAL AS A ONE TIME TEMPLATE. (CNC-MDT)
 - B) FULL SIZE HOLES SHALL BE DRILLED USING A STEEL TEMPLATE WITH HARDENED BUSHINGS. (DT)
3. FIELD REAMING AND DRIFTING OF HOLES:
 FIELD REAMING AND DRIFTING OF HOLES SHALL BE REQUIRED WHEN HOLES IN THE EXISTING PLIES DO NOT LINE UP.

 AFTER REAMING, HOLES SHALL BE PERPENDICULAR TO THE FAYING SURFACE AND 75% OF THE GROUP OF HOLES SHALL NOT BE ELONGATED GREATER THAN 1/32 INCH. THE REMAINING 25% OF THE GROUP SHALL NOT BE ELONGATED GREATER THAN 1/16 INCH. IF ANY BOLT HOLE, AFTER REAMING, IS MORE THAN 1/8 INCH LARGER THAN THE NOMINAL SIZE OF THE BOLT INDICATED ON THE DRAWINGS, THE NEXT SIZE BOLT SHALL BE USED.

 SHOULD OVERSIZE BOLTS BE REQUIRED, THE ENGINEER SHALL BE NOTIFIED FOR APPROVAL.
4. HOLE PREPARATION
 HOLES IN PRIMARY MATERIAL SPLICES SHALL BE:
 RA,DA,DTOR CNC-MDT. PREPARATION TYPE WILL BE IDENTIFIED IN STEEL FABRICATION DRAWINGS.
5. ALL BOLTED CONNECTIONS ARE DESIGNED AS SLIP-CRITICAL CONNECTIONS UNLESS OTHERWISE DESIGNATED ON THE PLANS. THE LENGTH OF THE BOLTS SHALL BE SUCH THAT TWO OR THREE THREADS ARE SHOWING ABOVE THE FACE OF THE NUT WHEN COMPLETELY INSTALLED. SUFFICIENT THREAD MUST BE PROVIDED TO PREVENT THE NUT FROM ENCOUNTERING THE THREAD RUN-OUT. BOLTED CONNECTIONS SHALL BE ASSEMBLED WITH A HARDENED WASHER UNDER THE TURNED ELEMENT. WHEN OVERSIZE HOLES ARE PERMITTED, A HARDENED WASHER SHALL BE INSTALLED OVER EACH OVERSIZE HOLE IN AN OUTER PLY. WASHERS SHALL BE USED UNDER BOTH THE HEAD AND THE NUT WHEN BOLTS ARE USED IN CONNECTIONS IN ANY OF THE FOLLOWING CONDITIONS:
 - A) REPLACEMENT OF EXISTING BOLTS OR RIVETS.
 - B) CONNECTIONS WHICH ARE PREPARED BY DRILLING IN THE FIELD.
 - C) CONNECTIONS BETWEEN NEW STEEL AND EXISTING STEEL.
6. BOLTS SHALL BE INSTALLED WITH THE NUTS PROTECTED FROM THE WEATHER OR OTHER CORROSIVE ELEMENTS UNLESS CLEARANCE RESTRICTIONS DICTATE OTHERWISE. BOLTS INSTALLED WITH THE STEM VERTICAL SHALL HAVE THE HEADS UP. BOLTS INSTALLED WITH THE STEM HORIZONTAL SHALL HAVE THE HEADS OUT TOWARD THE WEATHER.
7. BOLTS SHALL BE TIGHTENED TO THE MINIMUM REQUIRED TENSION DESCRIBED IN SECTION 506 BY THE TURN-OF- THE- NUT METHOD. ENOUGH BOLTS SHALL BE INSTALLED AND BROUGHT TO A SNUG TIGHT CONDITION TO ENSURE THAT THE PARTS OF THE JOINT ARE BROUGHT INTO FULL CONTACT WITH EACH OTHER. SNUG TIGHT IS DEFINED AS THE TIGHTNESS ATTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A PERSON USING AN ORDINARY SPUD WRENCH. THIS REPRESENTS APPROXIMATELY 150 FOOT POUNDS FOR BOLTS 7/8 INCH IN DIAMETER AND LARGER. FOLLOWING THIS INITIAL OPERATION, BOLTS SHALL BE PLACED IN ANY REMAINING HOLES IN THE CONNECTION AND BROUGHT TO SNUG TIGHTNESS. ALL BOLTS IN THE JOINT SHALL THEN BE TIGHTENED ADDITIONALLY BY THE APPLICABLE AMOUNT OF NUT OR HEAD ROTATION SPECIFIED IN SECTION 506. DURING THIS OPERATION, THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH.
8. WHEN REAMING TO A TEMPLATE IS PERMITTED, THE TEMPLATES SHALL BE STEEL, 1/4" MINIMUM THICKNESS, WITH HARDENED STEEL BUSHINGS.

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