4600501 STRUCTURAL STEEL AND MISCELLANEOUS METALS
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Comments: (11-28-11)
As proposed –

460-5.1 General: Use *bolts as follows:*

1. Use galvanized ASTM A 325 *Type 1* bolts in all bolted structural steel connections *that are primed before installation of the bolts.*

2. Use either black or galvanized ASTM A 325 Type 1 bolts in all bolted structural steel connections that are to be primed after installation of the bolts.

3. Use black ASTM 325 Type 3 bolts in all bolted structural steel connections for weathering steel that is to remain unpainted.

4. Use the bolts as specified for~~, unless the~~ connected assemblies or parts *that* are designated as miscellaneous components ~~and~~*where* the fastener ~~assembly~~*type* is specified elsewhere in the Contract Documents.

~~-~~Tighten ASTM A 325 bolts in accordance with the procedures specified below for turn-of-nut or direct-tension-indicator (DTI) tightening.

Lubricate and maintain consistency in lubrication of fastener assembly during Rotational Capacity (RC) testing and installation. Assemblies that exhibit a loss of lubrication, as determined by the Engineer, may be relubricated and retested prior to installation.

Use ASTM A 490 bolts only with the approval of the Engineer. Provide procedures in accordance with for the handling, lubrication, installation, tightening and testing of ASTM A 490 bolts. Do not install ASTM A 490 bolts without prior approval of the procedures by the Engineer.

When the Engineer approves ASTM A 307 bolts for use in miscellaneous components, tighten them such that the plies of the joint are in firm contact. Use three to five impacts of an impact wrench or the full effort of a person using an ordinary spud wrench to obtain a snug connection.

Fasten aluminum, other materials or assemblies of dissimilar materials in accordance with the Contract Documents.

Install ordinary rough or machine bolts and nuts in accordance with the Contract Documents.

1. If the field bolts are to be galvanized, some consideration and stipulation should be made as to whether they should be hot-dipped or mechanical galvanized. The latter is usually preferred due to a more uniform coating thickness and fewer thread fit issues.

Response: Mechanical galvanizing is required for A 325 Type 1 bolts per Section 962. No changes made.

2. If the galvanized bolts are to be painted, should they be stipulated as “no quenching”? Does that not enhance the bonding of the paint to the galvanizing?

Response: Mechanically galvanized bolts are not normally quenched. The hot dip galvanization process often utilizes a water quench to reduce the temperature of the finished product prior to storage. No changes made.

3. If the galvanized bolts are to be painted, what is the required preparation prior to painting? Solvent wipe? Pressure wash? Brush blasted? Is a profile required? Does this change between quenched or non-quenched? If so how?

Response: Section 560 is being revised to specify solvent cleaning of field installed galvanized fasteners to SSPC SP1 cleanliness. After they are properly cleaned, mechanically galvanized fasteners are suitable for coating with all our QPL intermediate coatings and finish coats. The surfaces of shop installed galvanized fasteners will be prepared in the same manner as the adjacent steel.

4. If the galvanized bolts are not to be painted, some rusting will occur, since the installation process, and tightening of the bolts, will result in removal of some of the zinc galvanizing at the edges of the bolt faces. Will some rusting be acceptible? How much? How will that be measured? If not acceptible, then how should it be repaired? With a brushed coat of mastic?

Response: The galvanized bolts will be painted along with the rest of the structural steel that is painted in the shop. Field installed bolts may or may not be painted depending on the type of paint treatment used for the structural steel. Slight damage to the paint at the galvanized bolts will not be large enough to cause the large cathode / small anode effect. If the galvanizing on the bolts is also damaged, the zinc on the bolts should protect the damaged areas. However, significant damage can cause the bolts to corrode and thus will need to be repaired just as it would currently.

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D4

Comments: (12-20-11)
460-5.1 General:

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We recommend against the use of galvanized bolts due the problems with bolt tightening vs the galvanizing on the threaded parts. This is why I thought we went back to black bolts (and paint) several years ago.

Response: The referenced past problems with bolt tightening were the result of the zinc-coating, overtapping, lubrication, and rotational capacity testing of the bolts, nuts and washers as a system not being in accordance with ASTM A 563 as referenced by ASTM A 325, Section 3.2.3. When the specification requirements are followed, galvanized bolts can be installed successfully. No changes made.

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D3

Jennifer Williams
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Comments: (12-22-11)
District Three staff has reviewed the subject document and we have the following comment to offer.
There have been cases of galvanized bolts giving erroneous torque measurements due to the threads being fouled by the galvanization. Was there any consideration given to requiring direct-tension-indicator (DTI's) when galvanized bolts are used?

Response: Please see response to D4 comment.

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