

Ministry of Transportation

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MEMORANDUM

DATE: April 2, 2009

TO: • Distribution List (Attached)

FROM: Bala Tharmabala
Manager, Bridge Office

RE: **Bridge Office Design Bulletin**
Use of Type XM-28 Stainless Steel Reinforcing

Purpose

To inform the availability of a new type of stainless steel reinforcing and to provide guidance on the method of including this material in current and future contracts.

Background

The ministry currently specifies stainless steel reinforcing for use in the bridge components that are most vulnerable to corrosion damage. From 1998 until the present, two types of stainless steel have been specified for use and they are Type 316LN and Type 2205 Duplex. The use of these two stainless steel types was based on accelerated laboratory tests carried out by the US Federal Highway Administration and the ministry's corrosion protection policy review carried out in 1998.

Although the life-cycle costs of structures built with stainless steel reinforcement are predicted to be significantly lower than using black reinforcement material, the high cost of installed stainless steel reinforcement in MTO work has limited the extent of its use.

Recently a new stainless steel, commonly called Type XM-28 (and alternatively identified as AISI XM-28 or UNS S24100) has become available, with corrosion resistance similar to that of Type 316LN and Type Duplex 2205 but with a different chemical composition. This steel has a high-manganese, low-nickel, low-molybdenum austenitic stainless steel composition, and has higher yield strength than 316LN. The material was tested for the ministry by an independent laboratory and corrosion resistance was found to be comparable to 316LN. ASTM Standard A 955/A 955M-07 - Standard Specification for Deformed and Plain Stainless-steel Bars for Concrete Reinforcement now includes XM-28 as one of the recommended types of stainless steel along with 316LN and 2205 Duplex.

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Ministry specifications are being changed to allow the use of XM-28 steel where stainless steel is specified. The types of stainless steel permitted for use in MTO contracts are specified in SP 905S04 and the acceptable sources of stainless steel reinforcement are listed on the Ministry's Designated Sources for Material (DSM) List # 9.65.76.

Recommendations

In future projects when stainless steel is specified, the ministry will permit the use of XM-28, 316LN and 2205 Duplex. We anticipate that sources of XM-28 stainless steel will be added to the DSM by May 2009.

For contracts where XM-28 was not included in SP 905S04, the contractor may submit a change proposal to request its use; however, acceptance of the change proposal should be based on proof that the material satisfies the requirements of ASTM A 955/A 955M and its use results in significant cost savings (a minimum of 20% of the installed cost is recommended) to the ministry.

For contracts where XM-28 is included in SP 905S04 and the DSM list is not yet updated with the source list for XM-28 steel, as an interim the material supplied shall be used with written confirmation that the material supplied satisfies the requirements of ASTM A 955/A 955M.

For contracts that come into effect after XM-28 is included in SP 905S04 and the DSM has been updated with the list of suppliers for XM-28 steel, XM-28 steel can be used as an alternative to Type 316 LN or Type Duplex 2205.

These recommendations shall be effective immediately for all future projects.

Sincerely,

J. Tharmabala

Bala Tharmabala

c: G. Chaput
A. Tardif