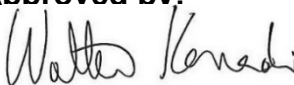




Title:	500 MPa Steel Reinforcement - Structural Implementation
Division:	Transportation Infrastructure Management (TIM)
Branch:	Standards and Contracts Branch (SCB)
Office:	Structures Office
Date:	2022/05/04
Theme(s):	Design
Distribution:	<input type="checkbox"/> Internal Only <input checked="" type="checkbox"/> Approved for External Distribution All Manager, Highway Design Office Head, Standards Management Section
Memo #:	SCB-SO-2022-01
Approved by:	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  Walter Kenedi, Manager Structures Office </div> <div style="text-align: center;">  Steven McInnis, Director Design & Engineering Branch </div> <div style="text-align: center;">  Alain Beaulieu, Director Standards & Contracts Branch </div> </div>

Implementation

This memorandum is effective as of the date of issue.

Background

In July 2021, MTO made the decision to move from traditional 400 MPa to 500 MPa steel reinforcement, and this policy initiative was conveyed in Policy Memo SCB-SO-2021-03. This was done to optimize steel usage, reduce congestion and allow for easier concrete placement.

The initial stage of the transition involves simply changing the steel grade on Structural Standard Drawings. Structures Office has reviewed the various Structural Standard Drawings (SSDs) and confirmed there is no detrimental effect of using 500 MPa reinforcement on the drawings as currently designed. The drawings will be updated to include design according to 500 MPa reinforcement in the near future. The existing practice of only using weldable grade of reinforcing steel for structural applications will be retained, with only Grade 500W being permitted. This memo provides guidance for designers to implement the policy on the structural portion of the design during the transition period (approximately Spring 2022 to 2024) until OPSS 1440 is updated and 500W reinforcement is fully adopted.

Policy

1. Projects shall use CSA G30.18 Grade 500W steel reinforcement, as determined by the Structural Section, using the guidance of Policy Memo SCB-SO-2021-03.
2. Where 500W reinforcement is used, designers shall consider the higher yield strength of 500 MPa in proportioning the size and spacing of reinforcement of all components of their design. Where designers are updating a completed design, they shall review the impacts, including potential detrimental effects of higher strength (e.g. sections that may become over-reinforced, sections providing capacity protection to other elements, etc.).
3. For SSD's associated with the specific bridge that fully indicate the design requirements (e.g. barriers, approach slabs, etc.), the designer shall change the Grade of rebar from 400W to 500W in the notes of the SSD to match that of the remainder of the bridge, with the size and spacing of reinforcement not requiring changes. The SSD shall be marked as "Modified"; this modification of reinforcement grade in itself does not constitute a major change and this does not necessitate the need for the drawing to have a second engineering seal as per Section 1.1.8 of the Structural Manual.
4. The designer shall change any OPSD or MTOD drawing directly related to the bridge from grade 400W to 500W. Since these types of drawings cannot be modified, they must be replicated in the structural design drawings with the revised steel grade.
5. A Special Provision modifying OPSS 1440 will automatically be included in the Contract to allow for the use of 500W steel, when specified directly on the Contract Drawings.