# Amendment to Section 3, Foundation Piles, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Cold Weather Conditions

Subsection 3.4.3.4, Cold Weather Conditions, shall be replaced in its entirety with the following:

*3.4.3.4 Cold Weather Conditions*

*When the ground temperature against which pile concrete is placed is below -5°C, the pile hole shall be hoarded and heated until the ground temperature is warmer than 10°C or oversized by 100 mm. Immediately after placing and finishing the pile concrete, the top exposed surface shall be protected with insulated tarps or other means to adequately cure the concrete for a period of 7 days. For concrete supplied with Type HSL, Type HSLb, or Type HSe containing hydraulic Portland-limestone cement, the curing period shall be extended from 7 days to 14 days. Piles that extend above the ground surface shall be protected in accordance with Section 4.21, Concreting in Cold Weather.*

# Amendment to Section 4, Cast-In-Place Concrete, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Hydraulic Cement

Subsection 4.2.1, Hydraulic Cement, shall be replaced in its entirety with the following:

*4.2.1 Hydraulic Cement*

*Hydraulic cement shall be hydraulic Portland cement or* *hydraulic Portland-limestone cement, and shall conform to the requirements of CSA A3000-18. Concrete supplied with hydraulic Portland-limestone cement shall include supplementary cementitious materials of the type and quantity specified. Hydraulic Portland-limestone cement as the sole cementitious material will not be permitted.*

*4.2.1.1 Hydraulic Portland Cement*

*Hydraulic Portland cement shall be Type GU, Type GUb, Type HS, or Type HSb.*

*4.2.1.2 Hydraulic Portland-Limestone Cement*

*Hydraulic Portland-limestone cement shall be Type GUL, Type GULb,* *Type HSL, or Type HSLb.*

*The proportion of limestone shall not exceed 15%.*

*The sulphate resistance expansion of hydraulic Portland-limestone cement Type HSL and Type HSLb shall be a maximum of 0.045% at 6 months or a maximum of 0.100% at 12 months measured in accordance with CSA A3004-18-C8. Sulphate resistance test results measured in accordance with CSA A3004-18-C6 will not be considered.*

*4.2.1.3 Hydraulic Cement Material Test Reports*

*Hydraulic cement material test reports shall be in accordance with CSA A3000-18.*

*Hydraulic Portland-limestone cement material test reports shall include the proportion and reference standard limit of limestone, limestone calcium carbonate (CaCO3), methylene blue values, and total equivalent alkali (NA2Oeq).*

*Sulphate resistance expansion testing shall be completed by an independent laboratory certified to CSA A283. Sulphate resistance expansion test reporting for Type HS, Type HSb, Type HSL, and Type HSLb hydraulic cement shall be to three decimal places and include the date of testing, age of test specimen at time of testing, and reference testing standard.*

*4.2.1.4 High Sulphate Equivalency / Type HSe*

*Where a combination of supplementary cementitious materials and Type GU/GUb or Type GUL/GULb hydraulic cement (Type HSe) is proposed to be supplied as an alternative to Type HS/HSb or Type HSL/HSLb hydraulic cement, current representative independent sulphate resistance expansion test results shall be submitted with the concrete mix design letter for the review and acceptance of the Consultant.*

*The sulphate resistance expansion of Type HSe containing hydraulic Portland cement and supplementary cementitious materials shall be a maximum of 0.050% at 6 months or a maximum of 0.100% at 12 months measured in accordance with CSA A3004-18-C8.*

*The sulphate resistance expansion of Type HSe containing hydraulic Portland-limestone cement and supplementary cementitious materials shall be a maximum of 0.045% at 6 months or a maximum of 0.100% at 12 months measured in accordance with CSA A3004‑18-C8.*

*Sulphate resistance expansion testing shall be completed by an independent laboratory certified to CSA A283. Sulphate resistance expansion test reporting shall be to three decimal places and include the date of testing, age of test specimen at time of testing, and reference testing standard.*

# Amendment to Section 4, Cast-In-Place Concrete, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Class and Composition of Concrete

Note (3) of Table 4-1, Classes of Concrete, in Subsection 4.4.1, Class of Concrete, shall be replaced in its entirety with the following:

(3) *Class HPC concrete shall be used for all decks, deck overlays with internal reinforcement, curbs, barriers, medians, roof slabs, deck joint blockouts, approach slabs and MSE wall copings. Deck overlay concrete shall be Class HPC with steel fibres when no internal reinforcement exists. Class HPC and Class HPC with steel fibres will not be permitted for elements specified to have sulphate resistance.*

Note (4) of Table 4-1, Classes of Concrete, in Subsection 4.4.1, Class of Concrete, shall be replaced in its entirety with the following:

(4) *Fly ash shall not exceed 30% by mass of cementitious materials. For concrete supplied with Type GUL or Type HSL hydraulic Portland-limestone cement the minimum amount of supplementary cementitious materials shall be 25% by mass of cementitious materials. For concrete supplied with Type GULb or Type HSLb hydraulic Portland-limestone cement the minimum amount of supplementary cementitious materials shall be 20% by mass of cementitious materials.*

Note (9) of Table 4-1, Classes of Concrete, in Subsection 4.4.1, Class of Concrete, shall be replaced in its entirety with the following:

(9) *Class C, Class S, and Class Pile concrete shall be supplied with Type HS, Type HSb, Type HSL, or Type HSLb hydraulic cement unless otherwise specified on the Drawings and/or Special Provisions of the Contract.*

The following Note shall be added to Table 4-1, Classes of Concrete, in Subsection 4.4.1, Class of Concrete:

*(11) Hydraulic Portland-limestone cement will not be permitted for use in prestressed and/or post-tensioned concrete.*

# Amendment to Section 4, Cast-In-Place Concrete, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Class HPC and Class HPC with Steel Fibres

The fourth bullet of the first paragraph of Subsection 4.4.1.1, Class HPC and Class HPC with Steel Fibres, shall be replaced in its entirety with the following:

* *Minimum hydraulic cement content (excluding supplementary cementitious materials) shall be 335 kg/m3. The C3A content of hydraulic cement (excluding supplementary cementitious materials) shall be greater than or equal to 4.5%;*

# Amendment to Section 4, Cast-In-Place Concrete, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Concrete Mix Design Submission Requirements

The twelfth and thirteenth paragraphs of Subsection 4.4.3, Concrete Mix Design Submission Requirements, shall be replaced in their entirety with the following:

*The potential for deleterious alkali-aggregate reactivity and the measures to avoid deleterious expansion in concrete shall be assessed in accordance with CSA A23.2-27A. Test data less than 24 months after date of sampling shall be used to evaluate the potential alkali-silica reactivity of aggregates tested in accordance with CSA A23.2-14A or CSA A23.2-25A. Testing in accordance with CSA A23.2-28A to demonstrate the effectiveness of supplementary cementitious materials may be utilized as part of the alkali-aggregate reactivity assessment. In the absence of test data, the aggregate shall be presumed to be highly reactive. The level of risk for alkali-aggregate reactivity assessment shall be for concrete exposed to humid air and the design service life shall be greater than or equal to 75 years (St4).*

*When assessing alkali-aggregate reactivity mitigation in accordance with CSA A23.2-27A, Type F fly ash with a maximum CaO content of 15% shall be used. Expansion limits for aggregate testing in accordance with CSA A23.2-14A shall only apply for concrete supplied with hydraulic Portland cement. Aggregates for concrete supplied with hydraulic Portland-limestone cement shall be considered highly reactive.*

# Amendment to Section 4, Cast-In-Place Concrete, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Sulphate Testing

The following subsection shall be added to Subsection 4.9, Inspection and Testing:

*4.9.9 Sulphate Testing*

*For each class of concrete supplied with Type HSL, Type HSLb, or Type HSe containing hydraulic Portland-limestone cement, a sulphate resistance test shall be completed in accordance with CSA A3004-18-C8 using the combined cementitious materials of the reviewed and accepted concrete mix design. Sampling of the combined cementitious materials shall be at the source of concrete production (batch plant) as determined by the Consultant. Sulphate resistance expansion testing shall be completed by an independent laboratory certified to CSA A283.*

# Amendment to Section 4, Cast-In-Place Concrete, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Concreting in Cold Weather

The third bullet of the first paragraph of Subsection 4.21, Concreting in Cold Weather, shall be replaced in its entirety with the following:

* *The Contractor shall enclose the structure in such a way that the formwork, concrete and air within the enclosure can be kept at or above 15°C for a protection period of 7 days after placing the concrete. For concrete supplied with Type HSL, Type HSLb, or Type HSe containing hydraulic Portland-limestone cement, the protection period shall be extended from 7 days to 14 days. Enclosures shall be constructed with a minimum of 300 mm clearance between the enclosure and the concrete;*

# Amendment to Section 4, Cast-In-Place Concrete, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Tremie Concrete

Note (2) of Table 4-3, Tremie Concrete, in Subsection 4.22.1, Concrete Mix Design, shall be replaced in its entirety with the following:

(2) *The fly ash content shall be determined by the concrete mix design review professional engineer. For concrete supplied with Type GUL or Type HSL hydraulic Portland-limestone cement the minimum amount of supplementary cementitious materials shall be 25% by mass of cementitious materials. For concrete supplied with Type GULb or Type HSLb hydraulic Portland-limestone cement the minimum amount of supplementary cementitious materials shall be 20% by mass of cementitious materials.*

Note (6) of Table 4-3, Tremie Concrete, in Subsection 4.22.1, Concrete Mix Design, shall be replaced in its entirety with the following:

(6) *Class Tremie concrete shall be supplied with Type HS, Type HSb, Type HSL or Type HSLb hydraulic cement, unless otherwise specified on the Drawings and/or Special Provisions of the Contract.*

# Amendment to Section 4, Cast-In-Place Concrete, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Curing

The second paragraph of Subsection 4.23.1, General, shall be replaced in its entirety with the following:

*The curing period for Class C and D concrete shall be 3 days. For concrete supplied with Type HSL, Type HSLb, or Type HSe containing hydraulic Portland-limestone cement, the curing period shall be extended from 3 days to 7 days.*

*All concrete surfaces consisting of Class C and D concrete shall be wet cured. The Contractor shall cover the concrete surface(s) with curing blankets as soon as the surface will not be marred by so doing. Curing blankets shall be UltraCure DOT or an equivalent acceptable to the Consultant. The curing blankets and concrete surfaces shall be saturated with water during curing blanket installation. The curing blankets shall be installed in full contact with the concrete surfaces without folds, wrinkles or air pockets. Curing blankets and concrete surfaces shall be kept continuously wet for the duration of the curing period. Where formwork is left in place for the duration of the curing period, no additional curing will be required.*

*Curing compounds will not be permitted except as specified for concrete slope protection in Subsection 4.23.2, Curing Requirements for Concrete Slope Protection.*

# Amendment to Section 7, Precast Concrete Units, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Hydraulic Cement for Precast concrete Units

The first paragraph of Subsection 7.2.4.1, Hydraulic Cement, shall be replaced in its entirety with the following:

*Hydraulic cement shall be hydraulic Portland cement in accordance with Subsection 4.2.1, Hydraulic Cement. The C3A content of hydraulic Portland cement shall be greater than or equal to 4.5%.*

*Hydraulic Portland-limestone cement will not be permitted.*

# Amendment to Section 20, Deck Overlays and Rehabilitation of Concrete Components, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Hydraulic Cement for Cement/Silica Fume Slurry Grout

The first sentence of the third paragraph of Subsection 20.5.4, Cement/Silica Fume Slurry Grout, shall be replaced in its entirety with the following:

*Slurry grout shall consist of 4% silica fume, 46% hydraulic cement with a minimum C3A content of 4.5%, and 50% sand (maximum 2.5 mm aggregate size) by weight, mixed with sufficient water to form a slurry.*

# Amendment to Section 24, Overhead Sign Structures and Panels, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Foundation Concrete

The second paragraph of Subsection 24.2.1, Foundations, shall be replaced in its entirety with the following:

*Concrete shall be Class Tremie in accordance with Section 4, Cast-In-Place Concrete, and supplied with Type HS, Type HSb, Type HSL, or Type HSLb hydraulic cement unless otherwise specified on the Drawings and/or Special Provisions of the Contract.*

*For concrete supplied with Type HSL hydraulic Portland-limestone cement the minimum amount of supplementary cementitious materials shall be 25% by mass of cementitious materials. For concrete supplied with Type HSLb hydraulic Portland-limestone cement the minimum amount of supplementary cementitious materials shall be 20% by mass of cementitious materials.*

# Amendment to Section 26, RCP and PBC Structures, of the 2020 Standard Specifications for Bridge Construction Edition 17, Re: Hydraulic Cement

Subsection 26.2.6.1, Hydraulic Cement, shall be replaced in its entirety with the following:

*26.2.6.1 Hydraulic Cement*

*Hydraulic cement used in the fabrication of RCP and PBC structures shall be Type HS, Type HSb, Type HSL or Type HSLb in accordance with Section 4, Cast-In-Place Concrete, unless otherwise specified on the Drawings and/or Special Provisions of the Contract.*

*For concrete supplied with Type HSL hydraulic Portland-limestone cement the minimum amount of supplementary cementitious materials shall be 25% by mass of cementitious materials. For concrete supplied with Type HSLb hydraulic Portland-limestone cement the minimum amount of supplementary cementitious materials shall be 20% by mass of cementitious materials.*

# END