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2.3 Design for durability

2.3.5 Materials

2.3.5.5 Backfill material

Add the following paragraphs and Table:

Backfill for structures shall be Bridge End Fill (BEF) meeting the material, placement and compaction requirements of SS 201.40. In addition to SS 202.04.02, where Bridge End Fill is used for MSE Wall structural fill, primary quality testing shall also include all additional testing as required to confirm that the material meets the electrochemical criteria for the wall system. Bridge End Fill shall extend a minimum of 8 m (perpendicular) from the abutment for the full width of the roadway for bridges, as recommended by the designers for conventional retaining walls and for the full reinforced soil area of MSE walls unless otherwise Consented to by the Ministry.

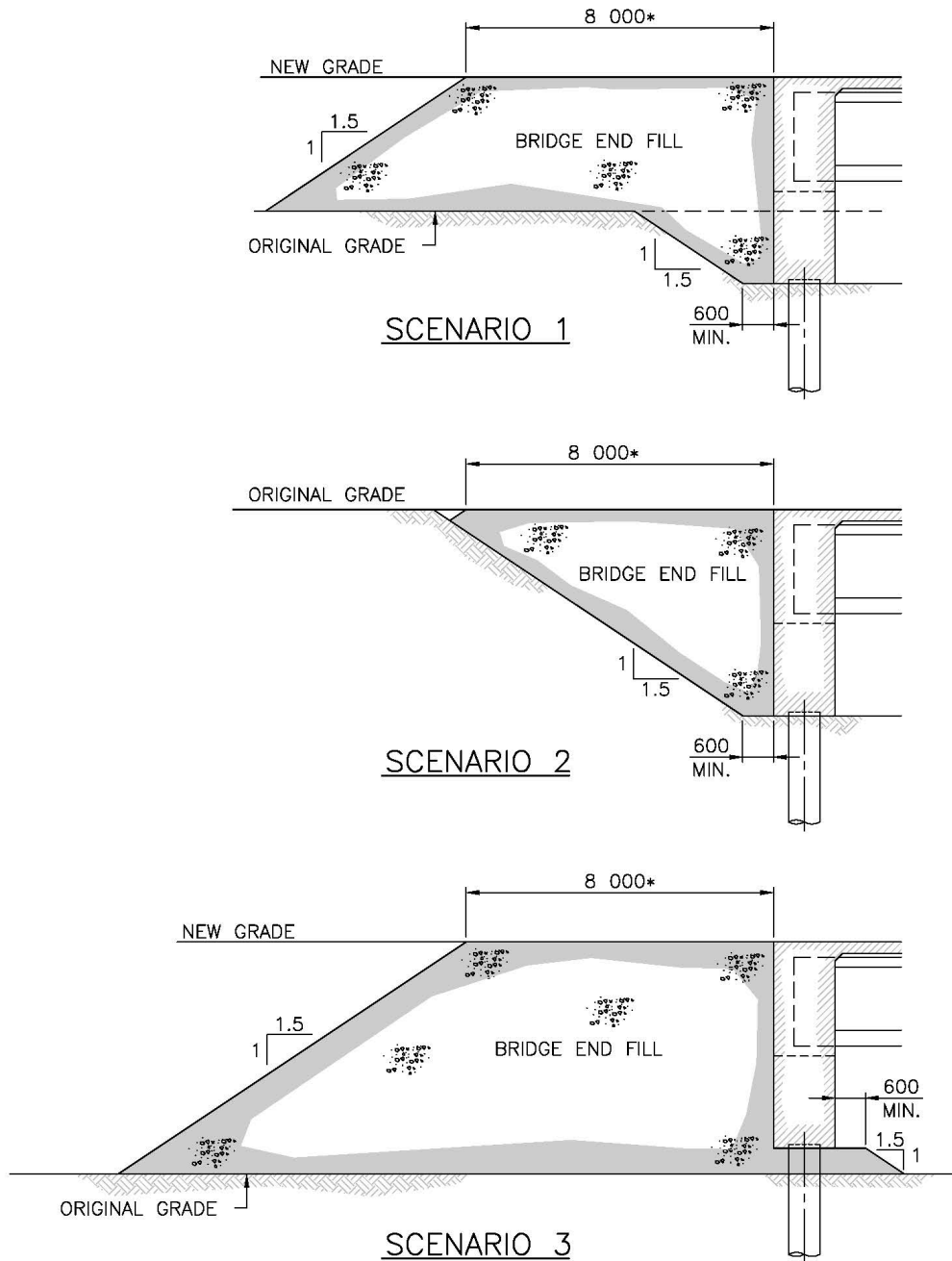
An aggregate drainage course shall be provided along the backside of all foundation and retaining walls located in cut areas with positive drainage.

The gradation of drainage course aggregate shall be as follows:

Sieve Size (mm)	Passing Per Nominal Maximum Size
40	100
20	0 - 100
10	0

Commentary: Typical BEF envelopes are shown in the sketches below in Figure 2.3.5.5. An envelope shorter than 8 m is generally acceptable on LVR structures and for shorter simple span structures. In some situations, the use of supplementary dimpled drainage board may be warranted to facilitate rapid drainage to the drain course or to protect the membrane between superstructure and substructure. When considered adjustments to the BEF envelope, the designer should consider: the length and details of an approach slab (if used), construction methodology, deck finishing requirements and equipment set up, approach fill settlement, drainage etc.

Figure 2.3.5.5
Bridge End Fill Envelopes



* DISTANCE MAY BE REDUCED FOR LOW VOLUME ROAD BRIDGES OR FOR SHORT SPAN BRIDGES.

BRIDGE END FILL EXAMPLES

2.3.5.6 Other materials

Add the following paragraph:

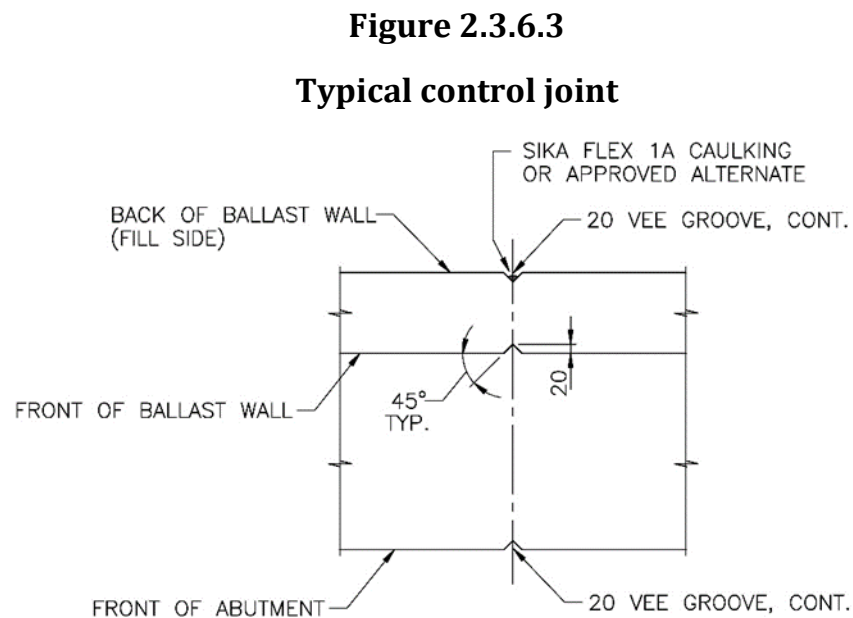
An acceptable pre-molded joint filler for structures consists of a minimum 25 thick Evazote 50 or alternate as Consented to by the Ministry. Application shall be in accordance with the manufacturer's instructions.

2.3.6 Structural details

2.3.6.3 Joints in abutments, retaining walls, and buried structures

Add the following and Figure 2.3.6.3 after the first paragraph:

Typical details for concrete control joints are shown in Figure 2.3.6.3.



NOTES:

1. ABUTMENT/BALLAST WALL SHOWN OTHER WALLS SIMILAR.
2. MAXIMUM SPACING OF CONTROL JOINTS = 3.0m
3. JOINTS TO BE LOCATED AT HORIZONTAL DRAINS THRU WALL AND AT ABRUPT ABUTMENT OR WALL SECTION CHANGES. INTERMEDIATE JOINTS TO BE LOCATED TO MEET MAX. SPACING OF 3.0m
4. CONTROL JOINTS (AND HORIZONTAL DRAINS) ARE TO BE LOCATED TO AVOID BEARING SEATS.
5. LOCATIONS OF CONTROL JOINTS ARE TO BE SHOWN ON ABUTMENT OR WALL ELEVATION.

2.3.6.4 Expansion and/or fixed joints in decks

Delete the first sentence and replace with:

Wherever practical, expansion and/or fixed joints in decks shall be avoided or placed in the approach pavements. Where expansion joints cannot be avoided, and are Consented to by the Ministry, they shall be detailed to prevent damage to components of the structure from water, de-icing salts, chemicals, and roadway debris. Joints shall be designed such that they can be easily accessed for flushing, maintenance, inspection, seal replacement and repair.

Commentary: *Joint seals shall be assessed for serviceability throughout the full temperature range at the site.*

2.3.6.5 Drainage

Amend the second sentence in the second paragraph as follows:

Downspouts shall extend a minimum of 500 mm below adjacent members, except where prohibited by vertical clearance requirements.

2.3.6.9 Waterproofing membranes

Add the following paragraphs after the first paragraph:

Requirements for membranes are identified in Section 8.

The Ministry's Recognized Products List shall be used as a reference to identify potential products for bridge deck waterproofing systems which are accepted by the Ministry. The link is as follows:

<https://www2.gov.bc.ca/gov/content/transportation/transportation-infrastructure/engineering-standards-guidelines/recognized-products-list>

2.3.6.10 Soil and rock anchors

Replace the second sentence with :

Unless otherwise Consented to by the Ministry, soil and rock anchors shall be a PTI - Class 1, Double Corrosion Protection (DCP) system.

Commentary: *Rock bolts other than DCP may be used for the purposes of rock slope design per SS and DBSS 206 and T- 04/17 Geotechnical Design Criteria when not integral to the stability of a structure:*

2.3.6.13 Utilities

Add the following paragraph:

The Ministry's "Utility Policy Manual" shall be followed for procedures and guidelines regarding the installation of utilities on or near bridges.

Commentary: The Ministry's Utility Policy Manual can be found at the following link:

https://www2.gov.bc.ca/assets/gov/driving-and-transportation/funding-engagement-permits/highway-permits/utility_policy_manual.pdf

2.8 Climate and exposure considerations

Add the following paragraph:

The designer shall follow the requirements of Technical Circular T-04/19 - Resilient Infrastructure Engineering Design - Adaptation to the Impacts of Climate Change and Weather Extremes.

Commentary: Guidance can also be found in the Engineers and Geoscientists British Columbia Professional Practice Guidelines, Civil and Transportation Infrastructure - Developing Climate Change-Resilient Designs for Highway Infrastructure in British Columbia, at the following link:

<https://www.eqbc.ca/getmedia/b60921fc-a820-41be-868f-02f0d3d92892/EGBC-BCMOTI-Climate-Resilient-Design-Highway-V2-0.pdf.aspx>