

This specification outlines the requirements for constructing Portland cement concrete walks, curbs and gutters, along with the installation of catch basin frames and grates that lie within the flow lines of the curb and gutter system, to lines, grades, dimensions and typical cross-sections or as directed.

PART 1 REFERENCES

This specification refers to the following standards, specifications, or publications:

ASTM International

A1064/A1064M	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
<u>C171</u>	<u>Standard Specification for Sheet Materials for Curing Concrete</u>
C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete, Type 2 Class
D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ³ (600 kN·m/m ³), <u>Method D</u>)
D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

CSA Group

A23.1/A23.2	Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete
<u>B651</u>	<u>Accessible Design for the Built Environment</u>

[Canadian General Standards Board \(CGSB\)](#)

[1.2-98 Boiled Linseed Oil](#)

Government of Newfoundland and Labrador, Department of Transportation and Infrastructure (TI), Highway Design and Construction Division, Highway Specifications Book:

Section 904.04.08 Concrete Structures: Contraction Joints

International Organization for Standardization (ISO)

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Raw, Refined and Boiled Linseed Oil for Paints and
Varnishes — Specifications and Methods of Test

PART 2 GENERAL

2.1 SUBMITTALS

- .1 Submittals in accordance with 01340.
- .2 Inform Owner of proposed source of materials and provide access for sampling minimum four (4) weeks prior to commencing work.

2.2 TESTING

- .1 Testing of concrete to CAN A23.1/A23.2 and requirements of Section 03300 – Cast-in-Place Concrete.

2.3 ENVIRONMENTAL CONDITIONS

- .1 If temperature is below 5 °C or if Owner anticipates a temperature drop below this value within the next 24 hours, take all necessary measures to protect concrete from freezing.
- .2 Do not place concrete on frozen base.

PART 3 PRODUCTS

3.1 MATERIALS

- .1 Concrete mixes and materials: in accordance with Section 03300 – Cast-in-Place Concrete unless specified otherwise.
- .2 Concrete mix design to produce 32 MPa minimum compressive strength at 28 calendar days and containing 192 mm maximum size, 6 mm minimum size coarse aggregate with water/cement ratio and aAir entrainment Category in accordance with CSA A23.1/A23.2, Table 8 for Class "C-2" exposure and 80 mm slump at time and point of deposit, or as otherwise indicated. Air Entrainment in accordance with CSA A23.1/A23.2, Table 10.
- .3 Reinforcing steel: In accordance with Sections 03200 – Concrete Reinforcement and 02223 – Excavating, Trenching and Backfilling.
- .4 Joint filler: in accordance with Section 03300 – Cast-in-Place Concrete, T1, Highway Specifications Book, Section 904.04.08, or equivalent.

- .5 Granular sub-base Class "B" in accordance with Section 02233 – Selected Granular Base & Subbase.
- .3.6 Fill material to Section 02226 – Aggregates for Earthwork and 02223 – Excavating, Trenching and Backfilling.
- .4.7 Curing compound in accordance with ASTM C309, Type 2 Class.
- .5.8 Boiled linseed oil in accordance with ISO 150 CAN/GSBC 1.2-98.
- .6.9 Non-staining mineral type form release agent: chemically active release agents containing compounds that react with free lime to provide water soluble soap.
 - .1 Acceptable product: Noxcrete by Bird-Goodco, Formshield by W.R. Grace.
- .10 FiberExpansion joint filler: Meadows Sealtight Fiber Expansion Joint Filler in accordance with ASTM D1751, or equivalent.
- .11 Clear, polyethylene film to ASTM C171, minimum thickness 0.10mm or as indicated.
- .7.12 Tactile Walking Surface Indicators: Cast reinforced fiberglass with truncated domes to CSA B651.
Wire mesh: ASTM A1064/A1064M.

PART 4 EXECUTION

4.1 GRADE PREPARATION CONCRETE

- .1 Do grade preparation work in accordance with Section 02223 - Excavating, Trenching and Backfilling.
- .1.2 Excavate to lines, depths and widths indicated or directed.
- .2.3 Construct embankments using excavated material free from organic matter or other objectionable materials. Provide for minimum 0.5 m shoulders, where applicable, outside of neat lines of concrete.
- .4 Provide borrow material for fill when a deficiency of excavated material exists and compact to minimum 95 % of maximum dry density to ASTM D698.
- .5 Compact granular base Place fill in maximum 150 mm layers and compact to at least 100 % of maximum dry density in accordance with ASTM D698, Method D.
- .3.6 Ensure that Subgrade, Granular Subbase and Granular Base preparation has been inspected and approved by Owner before commencing work.

4.2 GRANULAR BASE

- .1 Obtain Owner's approval of sub-grade before placing granular base.
- .2 Place granular base material to lines, widths, and depths indicated or directed.
- .2.3 Compact granular base in maximum 150 mm layers to at least 100 % of maximum dry density in accordance with ASTM D698, Method D.

4.3 CONCRETE

- .1 Obtain Owner's approval of granular base and reinforcing steel prior to placing concrete.
- .2 Do concrete work in accordance with Section 03300 – Cast-in-Place Concrete and as specified herein.
- .3 Immediately after floating, give sidewalk surface uniform finish, free of open texturing and exposed aggregate. Produce regular corrugations not exceeding 2 mm deep, by drawing broom in direction normal to centre line to provide a non-skid texture.
- .4 Round edges, including edges of joints, with 10 mm radius edging tool.
- .5 Do not work more mortar to surface than required. Do not use neat cement as a drier to facilitate finishing. Broom finish surface to provide non-skid texture.
- .3.6 Tolerance: Finish surfaces to within 3 mm in 3 m from line, level or grade, as measured with a straightedge placed on surface. Finish exposed surfaces to a smooth uniform finish, free of open texturing and exposed aggregate.

4.4 FORMING

- .1 Form vertical surfaces to full depth using forming material that will not deform under loading by plastic concrete.
- .2 Securely position forms to required lines and grades.
- .3 Coat forms with form release agent.
- .4 Obtain approval of forms before placing concrete.
- .5 Install metal fabrication as required.
- .3.6 Install transitions from full curb to drop curb, 450 mm long where indicated or directed.

.4.7 Slip forming may be approved subject to evaluation of mechanical equipment proposed for use. For evaluation by Owner place 50 m~~etre~~ trial section for Owner's approval.

4.5 EXPANSION AND CONTRACTION JOINTS

- .1 Install tooled transverse contraction joints after floating, when concrete is stiff but still plastic, at approximately the width of the sidewalk but not more than 1.5 times sidewalk width or 3 metres (30 times slab thickness) in concrete walk as indicated or directed at intervals of:
 - .1 Transverse contraction joints at approximately the width of the sidewalk but not more than 1.5 times sidewalk width or 3 metres (30 times slab thickness).
 - .3 When sidewalk is adjacent to curb, make joints of curb, gutters and sidewalk coincide. When concrete curb and gutter is constructed adjacent to concrete pavement, the contraction joint spacing of the curb and gutter shall coincide with that of the concrete pavement. When concrete curb and gutter is constructed adjacent to asphalt pavement, transverse joints shall have a uniform spacing not exceeding 4.5 m.
 - .3.4 Install joint filler in expansion joints as indicated.
- .2 Install e~~Expansion~~ joints, at maximum internals of 6 m or in accordance with subsection 4.5.3 of this specification or as otherwise directed.

4.6 ISOLATION JOINTS

- .1 Install expansion~~(isolation)~~ joints around maintenance holes and catch basins and along length adjacent to concrete curbs, catch basins, buildings, or permanent structure, and also before and after curve sections and at intersections of sidewalk and/or curb, to full depth of concrete.
- .2 Install joint filler in isolation joints as indicated.
- .3 Seal joints with Owner approved sealant.
- .4 Install transverse contraction~~isolation~~ joints 25 mm deep either by oiled steel separators, which are removed after concrete has set sufficiently, or by sawing the set concrete.
- .5 Combined curb and sidewalk to be provided with a continuous dummy joint 150 mm from the face of the curb. This joint to be similar to the transverse contraction~~isolation~~ joint and to be 25 mm deep.
- .6 Contraction~~-~~isolation joint spacing shall vary to coincide with the centreline of maintenance holes, hydrants, poles or other box outs.

4.7 TACTILE WALKING SURFACE INDICATORS

- .1 Install tactile walking surface indicators at curb ramp edges, where indicated on drawings and in accordance with local municipal by-laws.

4.8 CURING

- .1 Cure and protect concrete by adding moisture continuously in accordance with CSA A23.1/A23.2 to exposed finished surfaces for minimum of 1 day after placing, or sealing moisture in by curing compound.
- .2 Alternatively, apply curing compound- evenly to finished surface within one hour of placing to form continuous film, in accordance with at-a-rate recommended by manufacturer's requirements.
- .3 Where polyethylene sheets are used for moist curing, place polyethylene over sufficiently hardened concrete to prevent drainage. Overlap adjacent edges 150 mm and tightly seal with sand or wood planks. Weigh sheets down to maintain close contact with concrete during the entire curing period.
- .4 Where burlap is used for moist curing, place two prewetted layers on concrete surface and keep continuously wet during curing period.

If corrosion protection for de-icing salts is specified, use water cure method.

4.64.9 BACKFILL

- .1 Allow concrete to cure for 7 calendar days prior to backfilling.
- .2 Backfill to designated elevations with suitable material, compact and shape to required contours as indicated or directed by the Owner.

4.74.10 CORROSION PREVENTION

- .1 Apply when specified or directed by the Owner for protection against de-icing salts. Apply with spray method only, two coats of one to one mixture of boiled linseed oil and kerosene.
- .2 Ensure concrete surfaces are dry, free of dirt or dust, and at least 14 calendar days old before applying coating. Apply each coat at a rate of 0.1 litres per square metre.
- .3 Dry first coat thoroughly before further application.
- .4 Protect adjacent surfaces from spray.

4.11 LINSEED OIL TREATMENT

- .1 When concrete is being placed late in the season when 30 days air drying is not obtained:
 - .1 Apply two coats of linseed oil mixture uniformly to surfaces of curbs, walks and gutters, after concrete has cured for specified curing time and when surface of concrete clean and dry.
 - .2 Linseed oil mixture to consist of 50% boiled linseed oil and 50% mineral spirits by volume.
 - .3 Apply treatment when air temperature above 10 degrees C.
 - .4 Apply first coat at 135 mL/m².
 - .5 Apply second coat at 90 mL/m² when first coat has dried.

4.12 CLEANING

- .1 Proceed in accordance with Section 01710 – Reinstatement and Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

PART 5 PAYMENT

5.1 MEASUREMENT FOR PAYMENT

- .1 Granular base Class "A" and sub base "Class "B": will be measured in cubic metres within the areas and to the thicknesses indicated on the contract drawings, unless otherwise specified. Limit for granulars bedding will be 300 mm each side of the concrete structure.
- .2 Concrete walks, combined curb and sidewalk, curb and gutter, and concrete curb will be measured in metres to dimensions specified and shown on the contract drawings. The unit of measurement includes low backs, pedestrian ramps, bull noses and any other modifications inherent in the system. Driveway ramps will be measured separately in metres along the sidewalk to the dimensions specified and as shown on the contract drawings.
- .3 Tactile Walking Surface Indicators will be paid for by the each installed.

5.2 BASIS OF PAYMENT

- .1 All costs associated with work as outlined in this specification shall be deemed to be included in the appropriate unit and lump sum price quoted as outlined in the Measurement for Payment subsection of this section and included in the MERX Schedule of Quantities and Prices.

- .2 **Mass eExcavation backfill:** will be measured in accordance with Section 02224 – Roadway Embankment. Limit for excavation shall be 300 mm each side of the concrete structure.
- .2.3 **Borrow backfill will be measured in accordance with Section 02224 – Roadway Embankment.**

Not For Construction