

FORM 480



GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Transportation and Works
Highway Design Division

SECTION 480

INSTALLATION OF CONCRETE CURB AND GUTTER

INDEX

480.01 SCOPE

480.02 MATERIALS

480.03 PREPARATION WORK

480.04 FORMWORK

480.05 PLACING THE CONCRETE

480.06 JOINTS

480.07 CURING THE CONCRETE

480.08 TRIMMING

480.09 PROTECTION OF CURB AND GUTTER FROM TRAFFIC AND PEDESTRIANS

480.10 MEASUREMENT FOR PAYMENT

480.11 BASIS OF PAYMENT

480.01 SCOPE

This specification covers the requirements for the construction of various types of concrete curb and gutter on a prepared bed of granular base course. Curb and gutter of the type as stipulated in the Unit Price Table will include the provision of drop curbs, paraplegic ramps, and tapered ends together with the incorporation of catch basins and manhole gratings as staked by the Engineer.

480.02 MATERIALS

Concrete for use in constructing curb and gutter shall conform to the following specific requirements:

CLASS OF CONCRETE	40MPa AT 28 DAYS
AGGREGATE	20mm MAXIMUM SIZE
AIR CONTENT	6% ± 1%
SLUMP	60mm ± 20mm

All concrete shall conform with Section 904 "Concrete Structures".

Material for forming isolation joints shall be 12 mm thick bituminous fibre material.

Material for forming control joints shall be 12 mm thick bituminous fibre material for the set-in-place type, or a bituminous filler material for the groove or saw-cut type.

All materials including formwork, shall be supplied by the Contractor.

480.03 PREPARATION WORK

Should excavation be required prior to placing the bed for the curb and gutter, then such work shall be carried out and paid for in accordance with Section 206 "Grading of Cuts" or Section 403 "Excavation for Foundations".

FORM 480

When fill is required prior to placing the bed for the curb and gutter, then this work shall be carried out in accordance with Section 204 "Grading of Fill".

After the site has been graded, as described above, a bed shall be laid composed of granular base course Class "B", or Class "A" should the Engineer so require. The bed shall be laid to the lines and grades as staked by the Engineer.

The compacted depth of the bed should not be less than 100 mm. The bed shall be compacted to not less than 95% of the Standard Proctor Density (ASTM D698-78).

480.04 FORMWORK

Formwork shall conform to the requirements of Section 907 "Formwork and Falsework".

Forms shall be set to provide curb and gutter of the required type, to the grades and lines as staked by the Engineer.

Curb and gutter shall be of Types "C", "D", "G", or "H" as shown in the drawing in Section 1275 "Concrete Curbs, Types C, D, G & H" or of other types shown on the drawings.

At those places where a drop curb or a tapered end is required, the forms shall be set so as to obtain a finished concrete surface as shown in the drawings in Section 1276 "Typical Drop Curb With Sidewalk Layout" or Section 1277 "Typical Curb and Gutter Tapered End Treatment", Section 1278, "Paraplegic Ramps" as the case may be.

480.05 PLACING THE CONCRETE

Concrete shall be placed in accordance with the requirements of Section 904 "Concrete Structures".

The curb and gutter shall be laid so as to incorporate catch basin, and manhole frames and grates which lie on the line of the curb and gutter.

The concrete on the upper surfaces shall be floated to a smooth uniform finish of the required cross section, free of open textured aggregate and local projections. No deviation of greater than 3 mm in a 3 m straight edge shall be tolerated.

Care shall be taken to avoid over finishing or working more mortar to the surface than is actually required.

Back edges shall be rounded by use of a 6 mm radius edging tool.

Neat cement shall not be used as a drier to facilitate finishing.

Any honeycombed areas occurring along the formed surfaces shall be filled with mortar composed of one part Portland Cement and two parts sand.

The provisions of this specification may be modified by the Engineer at the Contractor's request to suit construction by extrusion methods if the Contractor can demonstrate to the Engineer's satisfaction that by such methods a quality will be achieved at least equal to that produced by standard methods. Notwithstanding approval of such modifications, the Engineer may, at any time, require the Contractor to revert to standard methods if, in his opinion, the required results are not being obtained.

480.06 JOINTS

When concrete curb and gutter is constructed immediately adjacent to another structure such as concrete pavement, concrete sidewalk, catch basin frame or gutter outlets, then the Contractor shall construct a full depth isolation joint between the structure and the curb and gutter. Isolation joints shall also be constructed at points of curvature for short radius curves.

FORM 480

Isolation joints shall consist of a 12 mm thick bituminous fibre panel cut to such size so as to provide a full depth joint extending for the full width. The bituminous fibre panels shall be set vertical in the forms before the concrete is poured.

Panels shall be pre-cut to the shape of the joint so as to provide a 6 mm recess on the exposed surfaces. The Contractor has the option of either providing a 6 mm deep, 12 mm wide cap strip, to be removed after the concrete has hardened and not edging the joints, or carefully removing all concrete immediately above the filler material to form a 6 mm deep, 12 mm wide recess then finishing both edges of each joint to 6 mm radius with a suitable short edging tool.

When concrete curb and gutter is constructed adjacent to asphalt pavement, control joints shall be spaced at intervals not exceeding 6 metres. However, when concrete curb and gutter is constructed adjacent to concrete pavement, control joints shall coincide with joints in the pavement. Control joints may be formed using a 12 mm thick bituminous fibre panel cut to such size so as to provide a joint extending not less than one quarter the depth of the curb and gutter for the full width. The bituminous fibre panel control joints shall be set vertical in the forms before the concrete is poured.

Panels shall be pre-cut to the shape of the joint so as to provide a 6 mm recess on the exposed surfaces. The methods of obtaining these 6 mm recesses shall be as previously stipulated for isolation joints.

Alternatively control joints may be formed by the use of a "guillotine" knife in fresh concrete or saw cutting the hardened concrete within a sufficient time of placing to prevent uncontrolled cracking. Groove or saw-cut control joints shall be of thickness between 3 and 5 mm, depth not less than one quarter the depth of the curb and gutter and width the full width of the curb and gutter. When the concrete is dry, the control joints shall be completely filled with a bituminous filler material. Immediately prior to the filling, the joint shall be thoroughly cleansed of all dust, and particles of foreign matter.

Construction joints shall be built at convenient stopping places in the placement of the concrete. They may be either butt type or isolation joints and they shall be the full depth and width of the curb and gutter. They shall be built at the end of each day's construction or when there is a delay in the supply of concrete and cold joints might develop.

480.07 CURING THE CONCRETE

Concrete shall be cured in accordance with the requirements of Section 904 "Concrete Structures". Consideration will be given to the use of white pigmented curing compound applied according to the manufacturer's recommendations.

480.08 TRIMMING

Trimming of adjacent materials shall be carried out behind the curb and gutter which is to remain in isolation without abutting a sidewalk.

After the removal of the forms and after the initial curing of the concrete, the Contractor shall grade and tamp adjacent granular materials against the rear of the curb and gutter to form shoulders to the sidewalk. These shoulders shall be made trim to slightly proportions.

480.09 PROTECTION OF CURB AND GUTTER FROM TRAFFIC AND PEDESTRIANS

The Contractor shall by barricades, security, or other means, protect all curb and gutter from harm by traffic or pedestrians, until the Engineer authorizes the curb and gutter open to those who wish to cross over the curb and gutter.

The Contractor shall at all times prior to the opening to traffic provide suitable bridging or other means of access to adjacent properties.

480.10 MEASUREMENT FOR PAYMENT

Measurement for payment for the installation of curb and gutter of a particular type of curb and gutter shall be the length in metres, rounded to one decimal place, as measured along the exposed face of the

FORM 480

curb of the type in question. Such measurements will include the space occupied by gutter outlets and frames and grates.

Curb and gutter installed outside of the lines and grades as staked by the Engineer will not be measured for payment.

480.11 BASIS OF PAYMENT

Payment at the contract price for curb and gutter for the type in question shall be full compensation for labour, materials and equipment-use to supply and place formwork and concrete, to provide tapered ends and drop curbs as required, to incorporate any catch basin frames into the curb and gutter, to construct joints, to provide and place joint filler, to cure the concrete, to protect the curb and gutter from traffic, to remove the forms, to shoulder the back of the curb with adjacent material, and to tamp the shoulders behind the curb.

Granular base course for providing the bed shall be paid for in accordance with the contract unit price for Granular "B" or Granular "A", as appropriate, but any additional labour required to place this bed as specified shall be considered compensated for in the contract price for curb and gutter.

480.12 Concrete Acceptance and Reduced Payment Criteria on Concrete Located in Curbs and Gutter

Concrete on a project for a specified Type of curb and gutter, and also as defined by its specified strength at 28 days, must have an average tested strength at 28 days equal to or greater than that specified for payment at the bid price.

Concrete for a certain Type of Curb and Gutter having an average strength of less than that specified will be accepted into the job at a reduced payment, provided the difference between specified strength and tested strength is no greater than 5MPa. If the average of tests in a particular predefined portion of curb and gutter is less than that specified by more than 5MPa then that concrete shall be rejected.

When concrete is rejected, those provisions outlined in CSA-A23.1-94 shall be followed to determine whether or not the concrete may remain in the work. Such work will be done at the Contractors cost. Notwithstanding the above, should the concrete remain in the work it will be subject to a reduction, as outlined below, for having a strength less than that specified.

Concrete of a specific Type of Curb and Gutter and otherwise acceptable but having an average strength deficiency as tested of less than 5 MPa compared with that specified, will be accepted but the bid price for all concrete in the predefined portion will be reduced according to the following procedure:

For concrete work where the Unit Price Table states the unit to be linear metres the adjusted price shall be calculated as follows:

$$\frac{\$(\text{Adjusted Concrete Price})}{\$(\text{Bid Concrete Unit Price})} = \left(\frac{\text{Tested Strength}}{\text{Specified Strength}} \right) \times$$

Division of the curb and gutter into predefined portions will be done by the Engineer as the concrete placement is carried out. A predefined portion shall generally be established as that concrete placed within one operation.

There will be no bonus payment under the contract when the average strength is in excess of the specified strength.