

FORM 450



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

SECTION 450

CONCRETE FOOTINGS FOR STRUCTURAL PLATE ARCHES

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450.01 SCOPE

This specification covers the Department's requirement for the construction of concrete footings for structural plate arches, and long span structural plate arches. The footings incorporating a galvanized channel, reinforcing steel, and dowels if required, shall be as shown on the drawings, or as directed by the Engineer.

Dowels where required, shall be a separate contract item.

450.02 MATERIALS

450.02.01 Galvanized Channel

The Contractor will supply the galvanized channel sections. Galvanized channel is supplied and paid for under Section 424 of the Specifications Book, "Supply and Installation of Structural Plate Arch".

450.02.02 Concrete

Concrete for use in constructing the footings shall be supplied by the Contractor and shall meet the specifications for "Substructure" concrete with a compressive strength at 28 days of 40MPa as per Section 904 "Concrete Structures". The cement used shall be a blended Portland, fly ash, silica fume cement, Type GUbF/SF. Contractors are advised that the minimum proportion by mass of the total cementing materials for silica fume shall be 6% and a maximum of 8%. Contractors are advised that the maximum proportion by mass of the total cementing materials for fly ash is 25%.

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450.02.03 Joints

Joint materials shall be supplied by the Contractor. 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 saw-cut type.

450.02.04 Reinforcing Steel

Reinforcing steel shall be of the sizes shown in the drawings.

Reinforcing steel shall conform with the requirements of Section 905 "Concrete Reinforcement".

450.03 EXCAVATION

The Contractor shall excavate a foundation within the limits and to the grades as staked by the Engineer.

The excavation shall be carried out and paid for in accordance with Section 403 "Excavation For Foundations".

450.04 FORMWORK

Before placing formwork, the Contractor shall have drilled the required holes removed any dirt and debris that may be in the holes with compressed air or other acceptable means, inserted the required dowels, free of oil, grease, excessive rust and scale, and grouted them securely in place where the contract documents indicate that dowels are required. Holes to be drilled into the rock for the insertion of dowels shall have a maximum size of 1½-2 times the dowel diameter.

Formwork shall be supplied by the Contractor, and shall conform to the requirements of Section 907 "Formwork and Falsework".

450.05 PLACING OF REINFORCING STEEL

Reinforcing steel shall be placed in accordance with the requirements of Section 905 "Concrete Reinforcement".

450.06 PLACING CONCRETE AND CHANNEL

The Contractor shall load the channel sections at the point of supply and transport them to the installation site.

The lugs on the channels shall be bent down and twisted into the correct position.

The channel sections shall be cut to lengths such that when placed the channel will not be continuous through any of the joints.

The channels shall be placed in the footings to the lines and grades as staked by the Engineer and such that there will be a small gap between pieces of channel at all joints, at both the set-in-place type and at any future saw-cut control joints.

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

As soon as the concrete has been placed and consolidated, it shall be struck off true to grade on each side of the imbedded channel.

The surface shall then be floated with a wooden float until the mortar flushes to the top, and the entire surface, on each side of the channel, presents a tight and compact appearance.

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450.07 JOINTS

The configuration and spacing of joints shall be as shown on the drawings, or as required by the Engineer.

Isolation joints shall extend the full width and depth of the footing. The 12 mm thick bituminous fibre panels comprising the joint shall be set in the forms before the concrete is poured.

Control joints shall extend over at least one quarter the least dimension, and be of length equal to the full length of the dimension perpendicular to the least dimension.

Control joints may be formed using a 12 mm thick bituminous fibre panel cut to size and placed in the forms before the concrete is poured. Alternatively, control joints may be formed by saw-cutting the hardened concrete with a sufficient time of placing to prevent uncontrolled cracking. Saw-cut control joints shall be of thickness between 3 and 5 mm. Saw-cut joints shall be thoroughly cleansed of all dust and particles of foreign matter and then completely filled with a bituminous filler material.

450.08 CURING THE CONCRETE

Concrete shall be cured in conformity with the requirements of Section 904 "Concrete Structures".

450.09 TRIMMING

After the removal of the forms and after the initial curing of the concrete, the Contractor shall backfill adjacent material into any foundation trenches which may occur at the ends and at the stream sides of the footings. The ground next to the ends and the stream sides of the footings shall be made trim to sightly proportions.

450.10 MEASUREMENT FOR PAYMENT

Measurement for payment for Concrete Footings for Structural Plate Arches shall be calculated from the dimensions of the footings as laid out according to the instructions of the Engineer and such measurements will be computed to obtain the volume in cubic metres, rounded to two decimal places.

450.11 BASIS OF PAYMENT

Payment at the contract price for Concrete Footings for Structural Plate Arches shall be full compensation for all labour, materials, and equipment use: to supply and place formwork, to supply reinforcing steel, to protect and clean the reinforcing steel as required, to bend, cut and weld the reinforcing steel, to place the reinforcing steel in the work, to support the reinforcing steel during the placing, to supply and place concrete, to construct joints, to provide and place joint filler, to cut and place channel sections, to cure the concrete, to remove the forms and to trim the adjacent ground; together with labour, materials, and equipment use to provide such unwatering provisions that may be necessary in order to carry out the work according to these specifications.

It should be clearly understood, that the supply of the reinforcing steel is included in the basis of payment for Concrete Footings For Structural Plate Arches.

Dowels where required, shall be compensated for in a separate contract item.

450.12 CONCRETE ACCEPTANCE AND REDUCED PAYMENT CRITERIA ON CONCRETE FOOTINGS AND HEADWALLS FOR STRUCTURAL PLATE ARCHES

Concrete footings and headwalls, as defined by the contract item and the required 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 of a lower strength will have section 904.11.03 Concrete Acceptance and Reduced Payment Criteria on Concrete Located in New Structures of the specifications apply for adjustment of the unit price applicable or judgement of the acceptability of the concrete placed for this item.