

SECTION 403

EXCAVATION FOR FOUNDATION

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403.01 SCOPE

This work shall include labour, equipment and materials required to carry out excavation such as that required to obtain a foundation for such structures as bin-walls, culverts, footings, and gabions, and shall include hauling up to 1 kilometre, handling and incorporation of all suitable materials into fill construction in accordance with Section 204, and shall include the hauling up to 1 kilometre, and handling of the unsuitable materials and the trimming of such unsuitable materials along embankment slopes or elsewhere, all to the satisfaction of the Owner's Representative.

The Work shall also include excavation required prior to disposal or salvage of culvert or pipe.

The Work shall not include the excavation of those materials which the Contractor had previously placed, as their own choice as a temporary measure, and is required to excavate to facilitate the placing of, for example, select granulars. Any such excavation of materials which were placed as a temporary measure by choice of the Contractor, shall be at the Contractor's expense.

Where the quantity of excavation exceeds that required in the backfilling operation or to construct the fills, and if acceptable to the Owner's Representative, the surplus material shall be used to widen the fills, otherwise the Contractor shall dispose of the excess material to the satisfaction of the Owner's Representative. Any excavated material deemed unsuitable by the Owner's Representative shall be removed and disposed of by the Contractor at their expense.

403.02 ENVIRONMENTAL AND SAFETY REQUIREMENTS

The Contractor shall be aware of Division 8. Where unwatering is required, it shall be carried out as specified in Section 180.

The Contractor is advised that all excavation work shall be in accordance with the requirements of Section 190.

403.03 EXCAVATION FOR FOUNDATION

The Contractor shall excavate along the lines, to the width and to the grade required by the Owner's Representative.

403.03.01 Excavation for Foundation for Culverts Installed in All Places Other than Across Existing Roads

In the particular case of excavation for foundation for culverts installed in all places except across existing roads, the Contractor will normally be required to excavate for a width equal to the nominal diameter of the pipe, or the nominal span of the arch in the case of pipe arches, plus a distance of 300 millimetres on each side of the culvert, unless required otherwise by the Owner's Representative. The depth of the excavation shall be as shown on Form 1236, Form 1231, or Form 1232, as appropriate, or as directed by the Owner's Representative.

Excavation beyond the limits as described above shall be considered incidental to the Work.

403.03.02 Excavation for Foundation for Culverts Installed Across an Existing Road in a Low Fill

In the particular case of excavation for foundation for culverts installed across an existing road where the excavation is 1.22 metres deep, or less, the Contractor will be required to excavate for a width equal to the nominal diameter of the pipe, plus 0.3 metres on each side.

The depth of excavation shall be as shown on Form 1236, or as directed by the Owner's Representative.

Excavation beyond the limits as described above, shall be considered incidental to the Work.

403.03.03 Excavation for Foundation for Culverts Installed Across an Existing Road in a High Fill

In the particular case of excavation for foundation for culverts installed across an existing road where the excavation is deeper than 1.22 metres, the Contractor will be required to excavate for a width at the bottom of the trench, equal to the nominal diameter of the pipe, plus 0.3 metres on each side. However, at the top of the trench, the width shall be equal to the bottom width plus two times the depth of the trench.

For culverts where the depth of excavation is greater than 5.0 metres, calculated nominal excavation volumes will include the provision of a bench of nominal width 4.0 metres. The bench is intended to assist in the operation of removing the old culvert and installing the new one. The location of the bench will be such that there will be 5.0 metres from the

bottom of the culvert to the bench or another configuration that is to the satisfaction of the Owner's Representative.

The depth of excavation shall be as shown on Form 1236, Form 1231, Form 1232, or Form 1226, as appropriate, or as directed by the Owner's Representative. Excavation beyond the limits as described above, shall be considered incidental to the Work.

403.03.04 Excavation for Foundation for Gabions

In the case of excavation for foundations for gabions, the excavation pay lines shall be the length of the footing plus 300 millimetres on each end times the width of the footing plus 300 millimetres on each side times the depth between original ground line and foundation elevation or to the satisfaction of the Owner's Representative.

Excavation beyond the limits as described above shall be considered incidental to the Work.

403.03.05 Excavation for Foundation for Footings

In the case of excavation for concrete footings for structural plate arches, the excavation pay lines shall be the length of the footing plus 300 millimetres on each end times the width of the footing plus 300 millimetres on each side times the depth between original ground line and foundation elevation or to the satisfaction of the Owner's Representative. All excavation in addition to the above will be considered incidental to the Work.

When a footing is to rest on an excavated surface other than rock, special care shall be taken not to disturb the bottom of the excavation. In soft or wet conditions, the final removal of material to foundation level shall not be made until the Contractor is ready to proceed with the construction of the footing. When material at the founding elevation is Other Material and has been over excavated, the elevation shall be re-established by replacing with suitable material and compacting it to the bearing capacity of the original material to the satisfaction of the Owner's Representative. When the founding material is Solid Rock and has been over excavated, the foundation elevation shall be re-established to the original elevation with mass concrete. First, all loose and compressible material shall be removed from the excavation to the satisfaction of the Owner's Representative. Next, concrete shall be placed to the foundation elevation and shall fill the entire volume of the over excavation. Concrete shall be of a quality compatible with that used in the footing. No compensation will be provided for the cost of remedial measures required by the Owner's Representative as a result of over excavation by the Contractor.

403.03.06 Excavation for Foundation for Bin-Type Retaining Wall

In the case of excavation for bin-type retaining wall, the excavation lines shall be the length of the structure plus 1.0 metre on each end times the width of the structure plus 1.0 metre on each side times the actual depth from original ground to the base elevation or 200 millimetres below the base elevation where an unyielding or rock foundation exists. When the foundation is soft or has non-uniform bearing capacity, the lines for the excavation shall be as directed by Owner's Representative.

Excavation beyond the limits as described above shall be considered incidental to the Work.

403.03.07 Excavation for Foundation for Welded Wire Retaining Wall

In the case of excavation for welded wire retaining wall, the excavation lines shall be the length of the structure plus 0.3 metres on each end times the width of the structure plus 0.3 metres on each side times the actual depth from original ground to the base elevation or 200 millimetres below the base elevation where an unyielding or rock foundation exists. When the foundation is soft or has non-uniform bearing capacity, the lines for the excavation shall be as directed by the Owner's Representative.

Excavation beyond the limits as described above shall be considered incidental to the Work.

403.03.08 Backfill Material

Materials excavated as excavation for foundations will be used for backfill if the material is deemed suitable by the Owner's Representative.

If there should be insufficient backfill material available from the excavations, where possible the Owner's Representative will direct that material from a cut or from a borrow area will be used to complete the backfilling.

Should additional backfill materials be required to complete backfilling, then, these materials shall be paid for in accordance with Section 204, 206 or Section 207 as appropriate, but the additional requirements for backfilling as stipulated in this specification shall be considered compensated for in the contract price in Excavation for Foundation.

Frozen materials shall not be acceptable as backfill material.

403.04 CLASSIFICATION

Excavated materials will be classified as either "Solid Rock" or "Other Material" in accordance with Section 205.

403.05 MEASUREMENT FOR PAYMENT

Volumes of all classes of excavation described in Section 403.04 will be measured in excavation and computed in cubic metres rounded to the nearest whole number.

During excavation operations whenever the character of material changes from one type to another, as classified in Section 205, the Contractor shall strip the area, within the limits, of all overlying material and notify the Owner's Representative in order that proper measurements or cross sections may be made. No allowance will be made for material excavated before such measurements or cross sections have been made.

For boulders present in Other Material; the three maximum rectilinear dimensions of boulders, actually excavated, will be measured and the volume of each so determined. Volumes of the boulders which are equal to, or greater than, 0.5 cubic metres will be included for payment as Excavation for Foundation Solid Rock.

Where excavation for foundation is carried out during existing pipe removal operations, the cross-sectional area of the pipe to be removed shall be determined, and deducted for excavation end areas used in volume of excavation determinations.

403.05.01 Measurement for Payment for Excavation for Foundation for Culverts Installed in All Places Other than Across Existing Roads

Measurement for payment for Excavation for Foundation for culverts installed in all places other than across existing roads shall be by means of the nominal volume of excavation.

The quantity to be measured shall be the number of cubic metres of excavated material as shown between the position of the ground lines as cross sectioned after grubbing operations have been completed (or when excavation for foundation is to be carried out in a cut, after grading of cut or excavation of muskeg or bog operations have been completed, as appropriate), and the completed and accepted excavation lines. Material excavated outside of the required limits will not be included in measurement for payment. Nominal volume of excavation shall be computed by an adaption of the Average End Area method of volume computation, in which end areas are calculated as the product of the required depth of excavation, times the nominal width of excavation.

The nominal width of excavation shall be taken as either: 1.0 metre or the nominal diameter of the culvert plus 0.6 metres, whichever is greater.

403.05.02 Measurement for Payment for Excavation for Foundation for Culverts Installed Across an Existing Road in a Low Fill

Measurement for payment for Excavation for Foundation for culverts installed across an existing road where all the excavation is 1.22 metres deep, or less, shall be by means of the nominal volume of excavation.

Nominal volume of excavation shall be computed by an adaption of the Average End Area method of volume computation, in which end areas are calculated as the product of the required nominal depth of excavation, times the nominal width of excavation. The nominal depth of excavation shall be defined as the depth of the excavation on the centerline of the culvert at original ground to the bottom of the trench as specified by the Owner's Representative. The nominal width of excavation shall be taken as either: 1.0 metre or the nominal diameter of the culvert plus 0.6 metres, whichever is greater.

403.05.03 Measurement for Payment for Excavation for Foundation for Culverts Installed Across an Existing Road in a High Fill

Measurement for payment for Excavation for Foundation for culverts installed across an existing road where the excavation is more than 1.22 metre depth, shall be by means of the nominal volume of excavation.

Nominal volume of excavation shall be computed by an adaption of the Average End Area method of volume computation, in which the end areas used in the calculations are nominal end areas. For each culvert, the volume shall be calculated using the excavation nominal end area: at the inlet, at the edge of the road shoulder, at the road center line, at the edge of the other shoulder, at the outlet and at any other significant inflection point within the cross-section of the culvert. These individual nominal end areas shall each be calculated in accordance with the typical cross section shown on Form 1226.

403.05.04 Measurement for Payment for Excavation for Foundation for Items Other than Culverts

Measurements shall be of the actual amount of material moved from within the limits required by the Owner's Representative.

The quantity to be measured shall be the number of cubic metres of excavated material as shown between the position of the ground lines as cross sectioned after grubbing operations have been completed (or when excavation for foundation is to be carried out

in a cut, after grading of cut or excavation of muskeg or bog operations have been completed as the case may be), and the completed and accepted excavation lines. Material excavated outside of the required limits will not be included in measurement for payment. The volume of the excavation to be computed by the average end area method of computation or as wedges or pyramids, as the case may be, when terminating at grade points.

403.06 BASIS OF PAYMENT

Payment shall be at the Contract Unit Price per cubic metre for Excavation for Foundation, Solid Rock or Other Material, as appropriate, hauled 1 kilometre or under and the backfilling of the same in accordance with the plans or to the satisfaction of the Owner's Representative. Such payment shall be full compensation for all work herein described together with the labour, materials, and equipment use required for excavating, handling, hauling up to 1 kilometre, placing, and compacting in a fill as described in Section 204 or stockpiling and reuse of the materials excavated as excavation for foundations for backfill of the excavation if the material is deemed suitable by the Owner's Representative or disposing over slopes, removing and disposing, or otherwise directed by the Owner's Representative.

Where the Owner's Representative requires that Excavation for Foundation material be hauled in excess of 1 kilometre, additional payment for overhaul will be made in accordance with Section 215.