



**CONSTRUCTION SPECIFICATION FOR ROCK REMOVAL
BY MANUAL SCALING, MACHINE SCALING, TRIM BLASTING,
OR CONTROLLED BLASTING**

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202.01 SCOPE

This specification covers the requirements for removing rock by manual scaling, machine scaling, trim blasting, or controlled blasting.

202.01.01 Specification Significance and Use

This specification is written as a provincial-oriented specification. Provincial-oriented specifications are developed to reflect the administration, testing, and payment policies, procedures, and practices of the Ontario Ministry of Transportation.

Use of this specification or any other specification shall be according to the Contract Documents.

202.01.02 Appendices Significance and Use

Appendices are not for use in provincial contracts as they are developed for municipal use, and then, only when invoked by the Owner.

Appendices are developed for the Owner's use only.

Inclusion of an appendix as part of the Contract Documents is solely at the discretion of the Owner. Appendices are not a mandatory part of this specification and only become part of the Contract Documents as the Owner invokes them.

Invoking a particular appendix does not obligate an Owner to use all available appendices. Only invoked appendices form part of the Contract Documents.

The decision to use any appendix is determined by an Owner after considering their contract requirements and their administrative, payment, and testing procedures, policies, and practices. Depending on these considerations, an Owner may not wish to invoke some or any of the available appendices.

202.02 REFERENCES

When the Contract Documents indicate that provincial-oriented specifications are to be used and there is a provincial-oriented specification of the same number as those listed below, references within this specification to an OPSS shall be deemed to mean OPSS.PROV, unless use of a municipal-oriented specification is specified in the Contract Documents. When there is not a corresponding provincial-oriented specification, the references below shall be considered to be to the OPSS listed, unless use of a municipal-oriented specification is specified in the Contract Documents.

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

Ontario Provincial Standard Specifications, Construction

OPSS 206 Grading

202.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

Controlled Blasting means cushion blasting, line drilling, and pre-shearing as defined in OPSS 206.

Grubbing means as defined in OPSS 206.

Mucking means as defined in OPSS 206.

Rock Cut Sounding means any non-destructive method using mechanical or electronic devices to acoustically determine areas where rock is partially or completely detached from the main rock mass.

Rock Face means as defined in OPSS 206.

Scaling means as defined in OPSS 206.

Trim Blasting means a blasting technique involving the drilling of a single row of closely-spaced holes along the excavation limits, loading them with light, well-distributed charges, completely stemmed, and simultaneously firing the charges.

Wall Control Blasting means as defined in OPSS 206.

202.04 DESIGN AND SUBMISSION REQUIREMENTS

202.04.02 Submission Requirements

A minimum of 5 Business Days prior to beginning the Work, the name and contact number of the on-site person that is responsible for the Work being carried out (i.e., foreman) and a written statement showing that the person has had at least 5 years of related work experience, including dates, and has taken all appropriate safety training shall be submitted to the Contract Administrator.

202.06 EQUIPMENT

202.06.01 Lifting Equipment

Lifting equipment shall consist of a two-person aerial lift, crane, or other equipment suitable to access the Work.

202.06.02 Drilling Equipment

Drilling equipment shall consist of a hydraulic track drill or other suitable drilling equipment acceptable to the Contract Administrator and capable of producing holes accurately and uniformly across the top of a rock cut to the depth specified in the Contract Documents.

202.06.03 Backhoe Excavator

Backhoe excavators shall have a minimum operating weight of 30,000 kg and shall be capable of operating to a minimum height of 10 m.

202.06.04 Hoe-Ram Excavator

A backhoe excavator shall be equipped with a minimum 5,200 Joule hydraulic impact hammer.

202.07 CONSTRUCTION

202.07.01 General

The work of the removal of rock by scaling or blasting or both shall include the following:

1. All equipment, including any lifting equipment, materials, and labour that is:
 - a) necessary to gain access to the rock removal locations specified in the Contract Documents.
 - b) required by the Owner to obtain access to any areas where:
 - i. the Work is being inspected;
 - ii. quantities are to be measured; or
 - iii. quality assurance and acceptance procedures are being conducted.

2. All associated mucking, hauling, and management of rock material.

Removal of rock shall always be carried out in such a manner as to minimize fracturing and all other disturbance to the surrounding rock beyond the removal limits specified in the Contract Documents.

All blasting, including the use of explosives, shall be as specified in the Contract Documents.

202.07.02 Scaling

202.07.02.01 General

Scaling shall consist of the complete removal of all loose and partially-detached rock at the locations and heights specified in the Contract Documents.

Scaling shall begin at the top of the rock cut and progress to lower elevations as the work proceeds. As the scaling progresses, care shall be taken to avoid undercutting the upper sections of the scaled rock cut.

The scaling crew shall be in continuous full-time radio contact with the foreman to permit direct and immediate control.

Each day, the scaling crew shall inspect the rock cut:

- a) prior to the start of work and remove any identified loose or visually unstable rock that may endanger workers.
- b) prior to shutdown and remove any identified loose or visually unstable rock that may endanger the traveling public.

202.07.02.02 Manual Scaling

The work of manual scaling shall consist of the complete removal of all loose and partially-detached rock at the locations and heights specified in the Contract Documents by the manual scaling work unit and in addition to all of the other items specified in the Contract Documents, shall also include the following:

- a) Rock cut sounding.
- b) Scaling of the rock cut with hand tools and hand-held machine tools.

Manual scaling may include blasting with small quantities of explosives, but only when specified as an option in the Contract Documents.

As a minimum, the manual scaling work unit shall consist of the following:

- a) Two labourers that are experienced in doing scaling work at the heights required in the Contract and have taken the appropriate safety training.
- b) All tools and materials required for the performance of the work.

202.07.02.03 Machine Scaling

The work of machine scaling shall consist of the complete removal of all loose rock and partially-detached rock at the locations and heights specified in the Contract Documents by the machine scaling work unit and in addition to all of the other items specified in the Contract Documents, shall also include the following:

- a) Grubbing.
- b) Rock cut sounding.
- c) Scaling of the rock cut.

As a minimum, the machine scaling work unit shall consist of the following:

- a) Either a:
 - i) Backhoe excavator equipped with a narrow scaling/ditching bucket and hydraulic thumbs; or
 - ii) Hoe-ram excavator.
- b) Backhoe and hoe-ram excavator operators with experience in machine scaling work.
- c) All tools and materials required for the performance of the work.

202.07.03 Trim Blasting or Controlled Blasting

202.07.03.01 General

The work of trim blasting or controlled blasting shall consist of drilling and blasting to remove the rock specified for removal in the Contract Documents, while minimizing damage to the surrounding rock.

Any loosened or partially-detached rock shall be properly scaled, as specified in the Scaling subsection.

202.07.03.02 Trim Blasting

In addition to all of the other items specified in the Contract Documents, the work of trim blasting shall also include locating and drilling 50 mm diameter vertical holes along the perimeter of the specified trim at a maximum spacing of 750 mm or at a spacing approved by the Contract Administrator.

202.07.03.03 Controlled Blasting

In addition to all of the other items specified in the Contract Documents, the work of controlled blasting shall also include the appropriate wall control blasting techniques, as specified for rock face in OPSS 206.

202.07.04 Management of Excess Material

Management of excess material shall be as specified in the Contract Documents.

When possible, excess rock material shall be managed within the right-of-way by slope flattening at locations approved by the Contract Administrator or as specified in the Contract Documents.

202.09 MEASUREMENT FOR PAYMENT

202.09.01 Actual Measurement

202.09.01.01 Rock Excavation, Manual Scaling

Measurement of rock excavation by manual scaling shall be by time in hours that the scaling crew is in effective operation.

Effective operation shall not include the time taken for the management and disposal of the materials generated by the scaling operation.

202.09.01.02 Rock Excavation, Machine Scaling

Measurement of rock excavation by machine scaling shall be the cumulative sum of the time in hours that each individual scaling unit is working on the site in effective operation.

Effective operation shall not include the time taken for the management and disposal of all materials generated by the scaling operation or for the construction of any associated ramps.

202.09.01.03 Rock Excavation, Trim Blasting

Measurement of rock excavation by trim blasting shall be by vertical length in metres of drilling required.

202.09.01.04 Rock Excavation, Controlled Blasting

Measurement of rock excavation by controlled blasting shall be by volume in cubic metres of rock measured in-place.

202.09.02 Plan Quantity Measurement

When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clauses under Actual Measurement.

202.10 BASIS OF PAYMENT

- 202.10.01 Rock Excavation, Manual Scaling - Item**
- Rock Excavation, Machine Scaling - Item**
- Rock Excavation, Trim Blasting - Item**
- Rock Excavation, Controlled Blasting - Item**

Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment, and Material to do the work.

**Appendix 202-A, November 2013
FOR USE WHILE DESIGNING MUNICIPAL CONTRACTS**

Note: This is a non-mandatory Commentary Appendix intended to provide information to a designer, during the design stage of a contract, on the use of the OPS specification in a municipal contract. This appendix does not form part of the standard specification. Actions and considerations discussed in this appendix are for information purposes only and do not supersede an Owner's design decisions and methodology.

Designer Action/Considerations

No information provided here.

Related Ontario Provincial Standard Drawings

No information provided here.