



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

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202.01 SCOPE

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

202.01.01 Specification Significance and Use

This specification is written as a municipal-oriented specification. Municipal-oriented specifications are developed to reflect the administration, testing, and payment policies, procedures, and practices of many municipalities in Ontario.

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

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

Ontario Provincial Standard Specifications, Construction

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| OPSS 201 | Clearing, Close Cut Clearing, Grubbing, and Removal of Surface and Piled Boulders |
| OPSS 206 | Grading |

202.03 DEFINITIONS

For the purpose of this specification, the definitions in OPSS 201 and OPSS 206 and the following definitions apply:

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.

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.

202.04 DESIGN AND SUBMISSION REQUIREMENTS

202.04.01 Submission Requirements

A minimum of 5 Business Days prior to beginning the manual scaling work, the following shall be submitted to the Contract Administrator, for information purposes only:

- a) Name and contact number of the on-site person that is responsible for the work being carried out (i.e., foreperson), and a written statement showing that they have had at least 5 years of related work experience, including dates, and has taken all appropriate safety training.
- b) Proof of training certification for all staff performing the manual scaling work.
- c) A safety plan which may include the assignment of additional equipment and personnel or the use of special work methods and procedures, including site-specific communication and rescue procedures, to ensure that in the event of an incident, the recovery of an injured worker suspended at height or any other member of the work unit can be undertaken in a timely manner.

A copy of the safety plan shall be kept on site both prior to and during the manual scaling work.

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 as specified in the Contract Documents.

202.06.03 Excavator

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

An excavator shall be equipped with a minimum 5,200 J hydraulic impact hammer.

202.07 CONSTRUCTION

202.07.01 General

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 as 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 as 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 as 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 foreperson 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

Manual scaling shall consist of the complete removal of all loose and partially-detached rock at the locations and heights as specified in the Contract Documents by the manual scaling work unit and shall also include the following:

- a) Rock cut sounding.
- b) Scaling of the rock cut with hand tools and hand-held machine tools.
- c) Grubbing as required to complete the manual scaling.

Manual scaling may include blasting with small quantities of explosives when specified 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.
- b) All tools and materials required for the performance of the work.

202.07.02.03 Machine Scaling

Machine scaling shall consist of the complete removal of all loose rock and partially-detached rock at the locations and heights as specified in the Contract Documents and shall also include the following:

- a) Rock cut sounding.
- b) Scaling of the rock cut.
- c) Grubbing as required to complete the machine scaling.

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) All tools and materials required for the performance of the work.

202.07.03 Trim Blasting

202.07.03.01 General

Trim blasting shall consist of drilling and blasting to remove the rock as specified 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

Trim blasting shall include locating and drilling a minimum 50 mm diameter vertical or battered holes along the perimeter of the specified trim at a maximum spacing of 750 mm or at a spacing approved by the Contract Administrator.

202.07.04 Management of Excess Material

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 actively and necessarily engaged on the work.

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 actively and necessarily engaged on the work.

202.09.01.03 Rock Excavation, Trim Blasting

Measurement of rock excavation by trim blasting shall be by length in metres of drilling required or volume in cubic metres as specified in the Contract Documents.

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**

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

202.10.02 Disposal, Earth and Rock

Payment for the disposal of earth and rock materials generated from manual scaling and machine scaling shall be according to OPSS 206.

Appendix 202-A, November 2022 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

The designer should specify the following in the Contract Documents:

- Depth of rock removal. (202.06.02)
- Locations necessary to gain access to the rock removal. (202.07.01)
- Removal limits. (202.07.01)
- All blasting, including the use of explosives. (202.07.01)
- Locations and height of removal of scaling. (202.07.02.01)
- Where and when small quantities of explosives are required with manual scaling. (202.07.02.02)
- Rock that shall be removed by trim blasting. (202.07.03.01)
- Whether excess rock material is to be managed within the right-of-way by slope flattening or other locations. (202.07.04)
- Whether payment for rock excavation by trim blasting shall be by length in metres of drilling required or by volume in cubic metres. (202.09.01.03)

If rock excavation is required for reasons other than manual scaling, machine scaling, or trim blasting, the Designer should include a separate item under Rock Excavation according to OPSS.MUNI 206.

The designer should ensure that the General Conditions of Contract and the 100 Series General Specifications are included in the Contract Documents.

Related Ontario Provincial Standard Drawings

No information provided here.