

Administration and Inspection Activities for Noise Barrier Systems

(As Specified in OPSS 760)

760.01 SCOPE

This CAIS covers the construction administration and inspection requirements for Noise Barrier Systems as specified in OPSS 760, November ~~2014~~2025.

760.02 REFERENCES

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

Ontario Provincial Standard Specifications, Construction:

OPSS 760	Noise <u>206</u>	<u>Grading</u>
OPSS 501	<u>Compacting</u>	
OPSS 510	<u>Removal</u>	
OPSS 609	<u>Grounding</u>	
OPSS 740	<u>Concrete</u>	<u>Barrier Systems</u>
OPSS 902	<u>Excavating and Backfilling – Structures</u>	
OPSS 903	<u>Deep Foundations</u>	
OPSS 904	<u>Concrete Structures</u>	
OPSS 905	<u>Steel Reinforcement for Concrete</u>	
OPSS 906	<u>Structural Steel for Bridges</u>	

Ontario Provincial Standard Specifications, Material:

OPSS 1010	<u>Aggregate – Base, Subbase, Select Subgrade, and Backfill Material</u>
OPSS 1350	<u>Concrete - Materials and Production</u>
OPSS 1355	<u>Precast Concrete – Materials and Production</u>

Construction Administration and Inspection Specifications (CAIS):

CAIS 206	<u>Grading</u>
CAIS 501	<u>Compacting</u>
CAIS 510	<u>Removal</u>
CAIS 609	<u>Grounding</u>
CAIS 740	<u>Concrete Barrier</u>
CAIS 903	<u>Deep Foundations</u>
CAIS 904	<u>Concrete Structures</u>
CAIS 906	<u>Structural Steel for Bridges</u>
CAIS 1350	<u>Concrete - Materials and Production</u>
CAIS 1440	<u>Steel Reinforcement for</u> <u>1355</u> <u>Precast</u> Concrete <u>– Materials and Production</u>

760.03 DEFINITIONS

For the ~~purpose~~purposes of this CAIS, the definitions shall be as specified in OPSS 760.

760.04 DESIGN AND SUBMISSION REQUIREMENTS

760.04.01 Design Requirements

Administrative Activities:

1	M-	Receive three copies of Working Drawings for the noise barrier system at least 4 weeks prior to the commencement of construction and verify that it meets the Contract requirements and that it has been sealed and signed by an Engineer. Check that design requirements are as specified in OPSS 760.	100% =
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760.04.02 Submission Requirements

Administrative Activities:

<u>1</u>	<u>M</u>	<u>Receive the Working Drawings for the noise barrier system at least 4 weeks prior to the commencement of the construction and verify that they meet the requirements specified in OPSS 760 and that the Working Drawings have been signed and sealed by a design Engineer and a design-checking Engineer.</u>	<u>=</u>
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760.05 MATERIALS

~~760.05.01~~ ~~General~~

~~Inspection~~Administrative Activities:

1	M	Check all the delivered material to verify that it is being supplied from the approved <u>DSM list of the system</u> that was submitted by the Contractor at the commencement of the Contract.	50% =
<u>2</u>	<u>=</u>	<u>Check that materials are as specified in OPSS 760.</u>	<u>=</u>
<u>3</u>	<u>=</u>	<u>Check that precast concrete component of the noise barrier system, including traffic barrier, bottom panels and reflective panels are as specified in OPSS 1355 in its entirety. For precast concrete, additional inspection and administrative activities shall be as specified in CAIS 1355.</u>	<u>=</u>
<u>4</u>	<u>=</u>	<u>Check that traffic barrier used as part of the noise barrier system is as specified in OPSS 740 in its entirety. Additional inspection and administrative activities shall be as specified in CAIS 740.</u>	<u>=</u>

<u>5</u>	=	<u>Check that concrete for footings and all other cast-in-place components of noise barrier systems is according to OPSS 1350 in its entirety. For cast-in-place concrete, additional inspection and administrative activities shall be as specified in CAIS 1350.</u>	=
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760.05.02 ~~Granular Materials~~

Inspection Activities:

<u>4</u>	M	Check all the granular material shall be as specified in the Contract Documents.	10%
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760.05.03 ~~Footings~~

<u>4</u>	M	Check cast-in-place concrete in footings are according to CAIS 1350.	100%
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760.05.04 ~~Steel Reinforcement~~

<u>4</u>	M	Check steel reinforcement for the footings are according to CAIS 1440.	100%
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760.06 **EQUIPMENT - Not Used**

760.07 **CONSTRUCTION**

760.07.01 **General**

Inspection Activities:

<u>1</u>	-	Check <u>that</u> noise barrier system are installed according to manufacturer's specifications and at locations specified in the Contract Documents.	100%
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760.07.02 ~~Site Grading and Preparation~~Connection to Existing Fence

Inspection Activities:

<u>1</u>	=	<u>Check that all side fences are reconnected in accordance with the requirements of the Contract Documents.</u>	<u>50%</u>
<u>2</u>	=	<u>Administer the removal of any fence in accordance with CAIS 510.</u>	<u>25%</u>

760.07.03 Underground Utility and Drainage Crossings

Inspection Activities:

<u>1</u>	=	<u>Check that all underground utility and drainage crossings requirements have been implemented.</u>	<u>100%</u>
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760.07.04 Existing Overhead High Voltage Lines

Inspection Activities:

<u>1</u>	=	<u>Check if potential of arcing exists due to the close proximity of existing overhead high voltage lines, steel noise barrier panels and posts are protected according to Contract Documents.</u>	<u>100%</u>
<u>2</u>	=	<u>Check that grounding of any steel components is according to OPSS 609 and administration and inspection is according to CAIS 609.</u>	<u>50%</u>

760.07.05 Grading

Inspection Activities:

1	M	Check that grading and berm construction is completed <u>and</u> conforms with the requirements of the Contract Documents prior to the footing construction.	50%
2	M	Check that barrier for tree protection is in place as specified in the Contract Documents, prior to commencement of the Work.	100%
3	M	Check that tree pruning and removal is carried out correctly and kept to a minimum. Issue approval prior to commencement of any pruning or removal.	25%
<u>4</u>	<u>M</u>	<u>Check that there are no visible gaps between any barrier panels or beneath the bottom panels after completion of the barrier.</u>	<u>50%</u>
<u>54</u>	M	Check <u>that</u> all grading <u>are</u> <u>is as specified in OPSS 206 and administration and inspection is</u> according to CAIS 206.	50%
<u>65</u>	M	Check <u>that</u> earth and granular materials are compacted according to <u>OPSS 501 and administration and inspection is according to</u> CAIS 501.	100%

760.07.0306 Footings

Inspection Activities:

<u>1</u>	<u>M</u>	<u>Check that all loose material is removed from the bottom of the postholes or is compacted prior to post installation.</u>	<u>25%</u>
<u>2</u>	<u>M</u>	<u>Check the alignment and elevation of the anchorage assemblies if applicable.</u>	<u>25%</u>
<u>3</u>	<u>M</u>	<u>Check concrete for drilled footings are casted entirely against undisturbed soil.</u>	<u>25%</u>
<u>4</u>	<u>M</u>	<u>Check concrete are according to CAIS 904.</u>	<u>100%</u>
<u>5</u>	<u>M</u>	<u>Check backfilled material are compacted at least 95% standard Proctor maximum dry density.</u>	<u>25%</u>

6	M	Check if required, the top of all footings are shaped to provide for full horizontal seating of panels and the remaining surface area are sloped away from the post to shed water. Check stepped footings if constructed to suit grade changes.	25%
7	M	Check concrete in the footings are cured to meet design strength as specified by the Engineer prior to the installation of noise barrier panels.	25%
8	M	Check excavations into rock are backfilled entirely with concrete. Check excavation above the top of rock are formed to the required dimensions and the remainder of the excavation backfilled with granular material.	25%

~~760.07.04~~ ~~Posts~~

~~Inspection Activities:~~

1	M	Check steel posts and components are hot dip galvanized after fabrication and check if galvanized surfaces are abraded must be cleaned and painted according to Contract Documents.	10%
2	M	Check structural steel posts are according to CAIS 906.	100%
3	M	Check that posts are installed to the proper alignment and depth.	25%
4	M	Check the alignment and elevation of the anchorage assembly's if applicable.	25%
5	M	Check the top of footing and underside of post base plate are filled with non shrink grout according to the manufacturer's specifications.	25%
6	M	Check that the installation of the noise barrier footings and posts have been constructed in conformance with the Contract Documents.	25%

~~760.07.05~~ ~~Panels~~

~~Administrative Activities:~~

1	M	Issue a Notice to Proceed, in a timely manner, after receiving the Request to Proceed and prior to the installation of the noise barrier panels.	=
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Inspection Activities:

<u>1</u>	<u>M</u>	<u>Check that concrete for cast-in-place footings is according to OPSS 904 in its entirety and that administration and inspection is according to CAIS 904.</u>	<u>100%</u>
<u>2</u>	<u>M</u>	<u>Check that steel reinforcement for cast-in-place footings is according to OPSS 905 in its entirety and that administration and inspection is according to CAIS 905.</u>	<u>100%</u>
<u>3</u>	<u>M</u>	<u>Receive and Review test reports for early strength. Check that concrete in the footings has reached the specified 28-Day compressive strength prior to the installation of panels.</u>	<u>25%</u>

<u>4</u>	<u>M</u>	<u>Check that construction of footings is as specified in OPSS 760.</u>	<u>25%</u>
<u>5</u>	<u>M</u>	<u>Check that all loose material is removed from the bottom of the postholes or is compacted prior to post installation.</u>	<u>25%</u>
<u>6</u>	<u>M</u>	<u>Check the alignment and elevation of the anchorage assemblies if applicable.</u>	<u>25%</u>
<u>7</u>	<u>M</u>	<u>Check that granular material around the footing is compacted to at least 95% standard proctor maximum dry density.</u>	<u>25%</u>
<u>48</u>	<u>M</u>	<u>Receive and check a Request to Proceed from the Contractor after the construction of the noise barrier footings and posts and prior to the installation of the noise barrier panels. Check that the top of all footings are shaped to provide for full horizontal seating of panels and the remaining surface area is sloped away from the post to shed water. Check that stepped footings are constructed to suit grade changes.</u>	<u>10025%</u>
<u>9</u>	<u>M</u>	<u>Check that excavations into rock are backfilled entirely with concrete according to OPSS 904. Check that excavation above the top of rock is formed to the required dimensions and the remainder of the excavation is backfilled with granular material according to OPSS 902.</u>	<u>25%</u>

760.07.07 Caisson Piles

Inspection Activities:

<u>1</u>	<u>-</u>	<u>Check that caisson piles are as specified in OPSS 760 and OPSS 903. Additional inspection and administrative activities shall be as specified in CAIS 903.</u>	<u>100%</u>
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760.07.08 Posts

Inspection Activities:

<u>1</u>	<u>M</u>	<u>Check that structural steel post are according to OPSS 906 and administration and inspection is as specified in CAIS 906.</u>	<u>100%</u>
<u>2</u>	<u>M</u>	<u>Check that posts are installed to the proper alignment and depth.</u>	<u>25%</u>
<u>3</u>	<u>M</u>	<u>Check the alignment and elevation of the anchorage assemblies if applicable.</u>	<u>25%</u>
<u>4</u>	<u>M</u>	<u>Check the top of footing and underside of post base plate are filled with mortar according to the manufacturer's specifications.</u>	<u>25%</u>
<u>5</u>	<u>M</u>	<u>Check that the installation of the noise barrier footings and posts have been constructed in conformance with the Contract Documents.</u>	<u>25%</u>

760.07.09 Installation

Inspection Activities:

<u>1</u>	<u>M</u>	<u>Receive and Check a Request to Proceed from the Contractor after the construction of the noise barrier footings and posts and prior to the installation of the noise barrier panels.</u>	<u>100%</u>
2	-	Check that installed panels are free of any oils, dirt and debris and are installed in accordance with the requirements of the Contract Documents and are in their proper location in the noise barrier system.	50%
3	M	Check bottom panels to make sure that no voids are visible underneath the panel. If required, make sure that minor grading is carried out so the installation matches the ground profile.	50%
<u>4</u>	<u>M</u>	<u>Check that there are no visible gaps between any barrier panels or beneath the bottom panels after completion of the installation.</u>	<u>50%</u>

Administrative Activities:

<u>1</u>	<u>M</u>	<u>Issue a Notice to Proceed, in a timely manner, after receiving the Request to Proceed and prior to the installation of the noise barrier panels.</u>	=
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760.07.10 Noise Barrier Access Openings

Inspection Activities:

<u>1</u>	<u>M</u>	<u>Check that openings, frames, doors, and hardware for noise barrier access are supplied and installed according to the manufacturer's Working Drawings and installation instructions at the locations and of the types specified in the Contract Documents.</u>	<u>25%</u>
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Administrative Activities:

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<u>1</u>	<u>M</u>	<u>Receive Working Drawings for the openings, frames, doors, and hardware for the noise barrier access.</u>	=
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760.07.11 Noise Barriers on Structures

Inspection Activities:

1	M	Check that noise barriers on structures are attached according to the requirements of the Contract Documents.	100%
2	-	Check the testing of the mounting bolts when attached to retaining walls to determine <u>Determine</u> that specified torque has been applied.	25%

~~760.07.07~~ ~~Precast Noise and Traffic Barriers~~

~~Inspection Activities:~~

4	M	Check that the noise, or traffic barrier units, or both, are constructed within the tolerances of the lines and grades as specified in the Contract Documents.	25%
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~~760.07.08~~ ~~Noise Barrier Access Openings~~

~~Inspection Activities:~~

4	M	Check that openings, frames, doors, and hardware for noise barrier access are supplied and installed in accordance with the manufacturer's Working Drawings and installation instructions at the locations and of the types specified in the Contract Documents.	25%
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~~Administrative Activities:~~

4	M	Receive Working Drawings for the openings, frames, doors, and hardware for the noise barrier access.	100%
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~~760.07.09~~ ~~Connection to Existing Fence~~

~~Inspection Activities:~~

4	-	Check that all side fences are reconnected in accordance to the requirements of the Contract Documents.	50%
2	=	Administer the removal of any fence in accordance with CAIS 510.	25%

~~760.07.10~~ ~~Underground Utility and Drainage Crossings~~

~~Inspection Activities:~~

4	=	Check that all underground utility and drainage crossings requirements have been implemented.	100%
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~~760.07.11~~ ~~Existing Overhead High Voltage Lines~~

~~Inspection Activities:~~

4	=	Check if potential of arcing exists due to the close proximity of existing overhead high voltage lines, steel noise barrier panels and posts are protected according to Contract Documents.	100%
2	-	Check grounding of any steel components are according to CAIS 609.	50%

760.07.12 ~~Markings~~ Marking

Inspection Activities:

1	M	Check that the manufacturer's identification plates contain the proper information <u>specified in OPSS 760</u> and that they are attached to the completed noise barrier system according to the requirements of the Contract Documents.	50%
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760.07.13 Quality Control

~~760.07.13.01~~ Interim Inspection of Footings and Posts

Inspection Activities:

1	M	Check that the noise barrier material is visually uniform in appearance in terms of colour, pattern, and texture from a distance of 15 m from noise barrier system. Noise barrier panels shall visibly match adjacent panels.	25%
2	M	Receive Certificate of Conformance from the Contractor upon completion of the installation of the noise barrier system.	100%

760.07.14 Sampling of Steel Reinforcement

Inspection Activities:

<u>1</u>	<u>M</u>	<u>Check with MTO's Quality Assurance Section whether sampling of steel reinforcement for cast-in-place components of the noise barrier system is required.</u>	<u>25%</u>
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760.07.15 Site Restoration

Inspection Activities:

1	M	Check after noise barrier system installation that the site is cleaned and trimmed and the ground restored to a neat condition.	25%
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760.07.~~15~~16 Management of Excess Material

Inspection Activities:

1	M	Check that <u>management of</u> excess material is managed according to CAIS 501 <u>as specified in the Contract Documents.</u>	25%
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760.08 QUALITY ASSURANCE

Inspection Activities:

1	-	Check if noise barrier components damaged in transit or during placement are replaced by the Contractor at no cost to the Owner.	100%
2	-	Check final inspection after complete installation according to the Working Drawings and Contract Documents.	50%
<u>3</u>	<u>M</u>	<u>Check that the noise, or traffic barrier units, or both, are constructed within the tolerances of the lines and grades as specified in the Contract Documents.</u>	<u>25%</u>
<u>4</u>	<u>M</u>	<u>For precast concrete components of the noise barrier system, inspect the elements for defects or deficiencies as specified in OPSS 1355. Additional inspection activities shall be as specified in CAIS 1355.</u>	<u>100%</u>
<u>5</u>	<u>-</u>	<u>For traffic barrier used as part of the noise barrier system, inspect the elements according to OPSS 740. Additional inspection activities shall be as specified in CAIS 740.</u>	
<u>6</u>	<u>M</u>	<u>For cast-in-place concrete components of the noise barrier system, additional inspection activities shall be as specified in CAIS 904 and CAIS 1350.</u>	<u>100%</u>

Administrative Activities:

<u>1</u>	<u>M</u>	<u>Check that quality assurance and acceptance is as specified in OPSS 760.</u>	<u>-</u>
<u>2</u>	<u>M</u>	<u>For precast concrete components of noise barrier systems, Check that quality assurance and acceptance is as specified in OPSS 1355. Check that precast concrete meets the quality assurance requirement as specified in OPSS 1355, including acceptable 28-Day compressive strength, air void system parameters, and rapid chloride permeability. For precast concrete components of noise barrier systems, additional administrative activities shall be as specified in CAIS 1355.</u>	<u>-</u>
<u>3</u>	<u>-</u>	<u>For traffic barrier used as part of the noise barrier system, check that quality assurance and acceptance is as specified in OPSS 740. Additional inspection activities shall be as specified in CAIS 740.</u>	<u>-</u>
<u>4</u>	<u>M</u>	<u>For cast-in-place concrete components of the noise barrier system, including footings, Check that quality assurance and acceptance is as specified in OPSS 904 and OPSS 1350. For cast-in-place concrete components of the noise barrier system, additional administration activities shall be as specified in CAIS 904 and CAIS 1350.</u>	<u>-</u>
<u>5</u>	<u>M</u>	<u>Notify MTO's Quality Assurance Section for any noise barrier system that fails to meet the acceptance requirements. Provide written notification to the Contractor, after consultation with MTO, for rejectable work.</u>	<u>-</u>

760.09 MEASUREMENT FOR PAYMENT

Administrative Activities:

1	-	Measurement for payment shall be as specified.	-
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760.10 BASIS OF PAYMENT

Administrative Activities:

1	-	Basis of payment shall be as specified.	-
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~~WARRANT: Always with OPSS 760, Construction Specification for Noise Barrier Systems.~~