ONTARIO PROVINCIAL STANDARDS

FOR

ROADS AND PUBLIC WORKS

OPS USER GUIDE

January 2023

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PREFACE

This Guide has been written by the Standards Management Section of the Standards and Contracts Branch, Highway Design Office, of the Transportation Infrastructure Management Division of the Ministry of Transportation. The Ontario Provincial Standards (OPS) User Guide is written to help users and writers of OPS specifications and drawings understand the history and administration of the OPS, how standards are created and updated, and to provide guidance on some common obstacles and issues (e.g., formatting, style, and font).

This publication of the OPS User Guide is a consolidation and subsequent update of the 2016 OPS User Guide and the 2010 OPS Style and Format Guide.

This document provides guidance and direction to users and writers on processes used in the OPS: it is for reference only and is meant to be a living document as processes and policies evolve. Although some sections of this Guide may be helpful for individualized information, the reader is encouraged to read and utilize the entire Guide. Much like OPS Specifications, if a user only references a certain part of the Guide, there is a risk that incredibly important information will be missed.

1.0 OPS OVERVIEW

1.1 OPS History

In the 1970s, municipal engineers and other infrastructure professionals began discussing the creation of a standard set of technical specifications and drawings and in response the Municipal Engineers Association (MEA) compiled a set of standards and drawings, called the "Yellow Book", which lay the initial seed for Ontario Provincial Standards (OPS). Combining the different versions of specifications and drawings was an excellent solution to reduce redundancies and confusion, and the resulting cost savings were significant across the board - ultimately benefiting the taxpayer of Ontario.

Prior to 1984, various specifications and drawings existed in silos in municipalities across Ontario, with little harmony between one another. This was an inefficient and unfavourable situation for contractors, suppliers, and infrastructure owners. At this time, the Ministry of Transportation and Communications (MTC), now Ministry of Transportation (MTO), also produced and maintained its own set of documentation and became aware of the issues related to multiple sets of standards.

To further harmonize specifications and eliminate duplication of effort, a goal was set to create a standardized set of specifications and drawings that would be suitable for use throughout the entire province of Ontario by both municipalities and the MTC. In response to a recommendation of the Municipal Project Liaison Committee Report the following three agencies came together in 1977 to create the Ontario Provincial Standards (OPS):

- Ministry of Transportation and Communications (MTC), now Ministry of Transportation (MTO);
- Municipal Engineers Association (MEA); and
- Ministry of the Environment (MOE), now Ministry of the Environment, Conservation and Parks (MECP)

The initial specifications published in January of 1984 were based mainly on MEA's Yellow Book and many of the initial OPS drawings were based on the ministry's Highway Engineering Standard Drawings for Roads, Barriers and Drainage.

In a brief period, the OPS started to improve the administration and cost-effectiveness of road building and other municipal services such as sewers and watermains. Today, the OPS is unique in providing free and sustainable construction and material standards to all of Ontario - a service not found elsewhere in the world.

1.2 Partners

OPS standards are primarily developed and reviewed by OPS Specialty Committees comprised of representatives from the following partners:

- Municipal Engineers Association (MEA)
- Ministry of Transportation (MTO)
- Good Roads, formerly Ontario Good Roads Association - OGRA
- Ontario Road Builders' Association (ORBA)
- Association of Consulting Engineering Companies Ontario (ACEC-Ontario)
- Ontario Sewer and Watermain Construction Association (OSWCA)
- City of Toronto
- Electrical Contractors Association of Ontario (ECAO)
- Electrical Safety Authority (ESA)
- International Municipal Signal Association (IMSA)
- Ministry of the Environment, Conservation and Parks (MECP)
- Ontario Water Works Association (OWWA)
- Heavy Construction Association of Toronto (HCAT)
- Concrete Ontario (CO)

Other supporting organizations that contribute expertise on an ad-hoc basis, and attend committee meetings upon the request of the OPS Chair include:

- Canadian Institute of Steel Construction (CISC)
- Cement Association of Canada (CAC)
- Canadian Concrete Pipe & Precast Association (CCPPA)
- Canadian Precast/Prestressed Concrete Institute (CPCI)
- Centre for Advancement of Trenchless Technologies (CATT)
- Corrugated Polyethylene Pipe Association (CPPA)
- Corrugated Steel Pipe Institute (CSPI)
- Electrical Distributors Association (EDA)
- Ontario Clean Water Agency (OCWA)
- Ontario Public Buyers Association (OPBA)
- Ontario Public Works Association (OPWA)
- Ontario Stone Sand and Gravel Association (OSSGA)
- Ready Mixed Concrete Association of Ontario (RMCAO)

1.3 OPS Funding

The OPS funding partners, MTO and MEA, share the financial responsibilities of the OPS. MTO funds the administration and operation of the OPS, while both MTO and MEA fund special initiatives, such as the update of the OPS website. Funding can be provided through various partnerships, where appropriate.

1.4 OPS Mandate and Objectives

The mandate of the OPS organization is to develop and maintain consistent and cost-effective methods to improve the construction of municipal and provincial roads and public works in Ontario by providing a comprehensive set of standards for use by road and public works owners, contractors, and consultants in Ontario.

The objectives of the OPS are to:

- Develop and improve the administration, safety and environmental aspects, and cost effectiveness of the design and construction of roads, structures, sewers, watermains and electrical services.
- Review and publish updated standards on a five-year renewal cycle to ensure they meet the needs of users and are current with the technology, material, and methods, employed by the engineering and construction industry.
- Promote the use of OPS standards on a province-wide basis.

1.5 OPS Milestones

1977 Ontario Provincial Standards for Road and Municipal Services initiated as the result of a recommendation in the Municipal Project Liaison Committee Report; Joint Committee and four subcommittees begin work on developing OPS standards.

1984 Initial set of OPS specifications and drawings are issued; nine specialty committees formed; OPS adopted by MTC.

1985 Ministry of the Environment adopts OPS; OPS Electrical Drawing Manual published.

1990 Toronto adopts OPS; and OPS General Conditions of Contract published.

1992 MTO adopts OPS General Conditions of Contract; OPS User's Guide published.

1994 Ontario Clean Water Agency and Ministry of Natural Resources join the OPS as contributors; Management study carried out by private consultant on the OPS organization.

1995 Ronen Publishing House becomes the official publisher for MTO including OPS.

1996 MTO initiated management study of OPS Administration Unit; OPS Advisory Board formed; OPS Products Management Committee formed.

1997 MTO concludes study; Joint Committee renamed OPS Standards Management Committee, official name changed to Ontario Provincial Standards for Roads and Public Works.

1998 Heavy Construction Association of Toronto joins OPS system as contributor.

1999 Product Information Management Agreement signed between Good Roads (formerly OGRA) and MTO.

2000 Electrical Safety Authority and City of Toronto join the OPS as contributors; official OPS website goes live at www.ops.on.ca

2003 OPWA joins the OPS system as a contributor.

2005 New method initiated for publishing and distributing OPS standards free of charge via the MTO Technical Publications website: OPS Advisory Board sanctions Ontario Infrastructure Business Code (OIBC) Committee as an OPS specialty committee. Hard copies of standards are no longer published by Ronen Publishing House.

2006 OIBC released; revised OPS review process accepted by MTO and MEA.

2007 First provincial- and municipal-oriented specifications published.

2008 Custodianship of OIBC is transferred to Good Roads (formerly OGRA).

2010 Reallocation of Divisions and Relocation (Renumbering) of Specifications in OPS Volumes. OPS Style and Format Guide published.

2013 OPS Review conducted, new Mission Statement and various recommendations presented.

2016 OPS Review Recommendations implemented; OPS Products Management Committee transferred to Good Roads (formerly OGRA); updated OPS User Guide published.

2022 Updated OPS User Guide is an incorporation and subsequent update of the 2016 OPS User Guide and the 2010 OPS Style and Format Guide.

2.0 USE OF ONTARIO PROVINCIAL STANDARDS

2.1 Purpose of Ontario Provincial Standards

2.1.1 Specifications

A specification defines each item in a Contract that the Contractor bases their bid price on and agrees to construct. The specifications form a part of the Contract Documents and, as such, are considered legal documents. They can best fulfill their primary purpose if specifications contain reference to, or a description of the essential parts or characteristics of the item and establish requirements or attributes and measurable properties for payment. In some cases, where properties are unknown or not measurable, it is necessary to define the desired result by comparison with satisfactory materials or construction or by describing the method of accomplishment.

In addition, the specifications should:

- Provide the Contractor with a definite basis for preparing a bid.
- Inform all parties of the obligations of the Contractor. Owners are expected to provide directions to their own staff and representatives by other means.
- Describe equipment requirements and contractual procedures.
- State the basis for acceptance or rejection of the completed work, including sampling and testing methods.
- Provide rules for decision on matters referred to the Contract Administrator.
- Define the requirements and timelines for submissions by the Contractor and, where applicable, the timeline for an Owner response.
- Specify how the work will be measured for payment and the basis for payment including any payment adjustment.

2.1.2 Drawings

The purpose of a drawing is to illustrate the facilities to be constructed, the required result of using a manufactured product, or the method to be followed when constructing according to a specification. Ontario Provincial Standard Drawings (OPSD), in most circumstances, do not stand-alone in providing direction to the Contractor.

2.2 Benefits of Using Ontario Provincial Standards

Benefits of using Ontario Provincial Standards include:

- Consistent and cost effective for Owners and Contractors.
- Easy to read and understand; clear and concise.
- Reduce contract preparation time.
- Maximizes return on infrastructure investment.
- Library of quality standards.

- Updated by practitioners and experts.
- Predictable bid prices.

The specifications and drawings in the OPS manuals are intended for use as pre-printed components of a construction contract. The OPS manuals are not intended to serve as design aids or as manuals of design procedures, and they will not adequately serve those purposes.

The use of the Ontario Provincial Standards by the province or municipalities is not mandatory. Each infrastructure Owner is responsible for determining implementation dates and directions for use of the Ontario Provincial Standards. For example, Ontario Provincial Standards are not immediately implemented by MTO. Manual holders are cautioned about immediately discarding superseded and cancelled standards, as there might be legal implication to existing or carry over contracts.

2.3 Types of Ontario Provincial Standards

OPS specifications are separated into two main categories:

- Provincial (PROV) specifications are intended for MTO use.
- Municipal (MUNI) specifications are intended for Municipal use.

The process of development and vetting of Provincial versus Municipal specifications is different (see Sections 6.3 and 6.4). Municipal specifications are entirely developed and vetted through OPS Committees (see Sections 3.2 and 3.3). Provincial specifications are informed by OPS Specialty Committees and other research and following internal reviews posted for public comment on MTO's Technical Consultation Portal prior to being published.

OPS specifications and drawings are published in an eight-volume arrangement. The volumes are currently laid out as specified below. Common specifications are no longer active, however common drawings still exist and are intended for use by both MTO and municipal users.

Volume	Category		
	COMM	**PROV**	**MUNI**
Volume 1 – General and Construction Specifications	Contains a Notice to Users for each Common specification that has been converted, which are phased out after 3 years.		
Volume 2 – Material Specifications	Contains a Notice to Users for each Common specification that has been converted, which are phased out after 3 years.		
Volume 3 – Drawings for Roads, Barriers, Drainage, Sanitary Sewers, Watermains and Structures	✓		
Volume 4 – Drawings for Electrical Work	✓		
Volume 5 – MTO General Conditions of Contract and General and Construction Specifications		✓	
Volume 6 – Material Specifications		✓	
Volume 7 – OPS General Conditions of Contract and General and Construction Specifications			✓
Volume 8 – Material Specifications			✓

OPS volumes and their associated content can be found in Section 12, Example 1.

3.0 GOVERNANCE

Members participate on OPS Committees to represent the interests of the OPS founder, partner or supporting organization that appointed them to the OPS Committee; not themselves or their individual office, municipality, or company.

3.1 Advisory Board (AB)

Oversight of the OPS organization is provided by the Advisory Board (AB). The role of the AB is to:

- Manage the overall administration of OPS, monitor Committee membership, review and approve budgets for OPS activities and initiatives.
- Promote the use of Ontario Provincial Standards to Owners, Consultants, Contractors, Developers, and other ministries and government agencies.
- Set OPS policies and perform strategic planning to determine what OPS should produce, now and in the future, with due consideration of the decisions being made by the Provincial and Municipal governments, and changes in design and construction procedures for public works in Ontario.
- Review and approve the organizational representation on OPS Committees.
- Review and improve the delivery and approval mechanisms for the Ontario Provincial Standards.

Wherever possible, all decisions by the AB shall be by consensus achieved at regular meetings. Where decisions have financial implications, funding partners MTO and MEA may override those decisions due to funding constraints.

The AB meets four (4) times per year at a location mutually agreed to, or via a virtual meeting platform. The Chair of the AB rotates every two years between MEA and MTO. The following organizations sit on the AB. The voting rights designation is intended to differentiate members from guests and non-member attendees:

Organization	Number of Seats	Voting Rights
Ministry of Transportation (MTO)	1	Yes
Municipal Engineers Association (MEA)	1	Yes
Ontario Provincial Standards (OPS) • Manager of Highway Design Office • Head of Standards Management Section	 1 1	 Yes No
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Good Roads (formerly OGRA)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
Ontario Sewer and Watermain Construction Association (OSWCA)	1	Yes
City of Toronto	1	Yes
Good Roads/MEA Coordinator	1	No
Standards Management Committee (SMC) Chair	1	No
OPS Coordinator	1	No

3.2 Standards Management Committee (SMC)

Under the general direction of the AB, the role of the SMC is to:

- Promote knowledge, acceptance, and use of the OPS standards throughout the province, and encourage increased use of standard specifications to minimize the need for contract special provisions.
- Liaise with organizations and groups who provide input and request revisions to OPS standards to ensure OPS standards meet the needs of users and reflect current technology, materials, and construction practices.
- Comment on OPS activities, address general issues related to the OPS, formulate, and recommend policy to the AB, and implement policies approved by the AB.
- Provide direction, coordinate activities, and review minutes of the Specialty Committees (SCs).
- Review and approve municipal specifications and drawings prepared by the SCs.

The AB appoints representatives to SMC who serve on the committee for a minimum two-year term with eligibility for reappointment. As much as practicable, the AB shall stagger

appointments so that in any given year, no more than half of the SMC representatives are replaced.

SMC should meet once a month or at other intervals as required by work volume or at the call of the Chair. The Chair of the SMC shall attend all AB meetings and report on the activities of the SMC and SCs.

Wherever possible, all decisions by the SMC shall be by consensus achieved at regular meetings.

The following organizations and associations have representation on SMC:

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO) • Standards Engineer of Standards Management Section	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Good Roads (formerly OGRA)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
Ontario Sewer and Watermain Construction Association (OSWCA)	1	Yes
Ontario Provincial Standards (OPS) • Head of Standards Management Section	1	Yes
OPS Coordinator	1	No

3.3 Specialty Committees (SCs)

Under the general direction of the SMC, the role of the SCs is to:

- Support the terms of reference of the SMC.
- Ensure standards meet the needs of users and reflect current technology, materials, and construction practices.
- Solicit input from other SCs, outside agencies, interest groups, and individuals and incorporate appropriate changes into the standards.
- Provide technical expertise for the development of construction and material specifications, and drawings within the specialty division with a focus on municipal (MUNI) specifications.

- Develop and maintain a work plan for the review, revision and development of standards and provide SMC with a prioritized list in March of each year, with a goal of reviewing standards on a five-year cyclical basis.
- Specification work should be concurrent with the review, revision, and development of related drawings.
- Prepare standards along with a Publication Request form for submission to, and comment from, members of SCs and SMC, and review comments received.
- Support SMC in the promotion, knowledge, acceptance, and use of OPS.

Changes to the organizations represented on SCs shall be recommended to the Head, MTO Standards Management Section ("Head"). The recommendation shall include voting rights and will proceed to SMC for endorsement and AB for approval.

SCs should meet once a month or at other intervals as required by work volume or at the call of the Chair. Wherever possible, all decisions by the SCs shall be by consensus achieved at regular meetings.

Upon recommendation from SMC, the AB may, at its discretion, establish new Specialty Committees. The SCs currently established are as follows:

Drainage Committee is responsible for standards related to drainage such as: sewer and culvert pipes; drainage structures (e.g., maintenance holes); jacking and boring; tunnelling; rip-rap; and gabions. There is some overlap with the standards and responsibilities of the Watermains Committee.

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Ministry of the Environment, Conservation and Parks (MECP)	1	Yes
Ontario Sewer and Watermain Construction Association (OSWCA)	1	Yes
OPS Coordinator	1	No

Electrical Committee is responsible for standards related to electrical work such as: electrical chambers, ducts, cables, grounding, luminaires, poles, traffic signals, vehicle detection, power supply equipment, and removal of electrical equipment.

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO)	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Electrical Safety Authority (ESA)	1	Yes
Electrical Contractors Association of Ontario (ECAO) / Ontario Road Builders Association (ORBA)	1	Yes
International Municipal Signal Association	1	Yes
OPS Coordinator	1	No

Environmental Committee is responsible for standards related to the environment such as: management of excess materials, waterbody and fisheries protection, dewatering, tree protection, planting, topsoil, sodding, seed and cover, and temporary erosion and sediment control measures.

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO)	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
Ontario Sewer and Watermain Construction Association (OSWCA)	1	Yes
OPS Coordinator	1	No

General Conditions Committee is responsible for reviewing and revising the General Conditions of Contract, the standardization of Forms of Agreement, the format and content of information to tenderers and form of tender and other related documents.

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO)	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
Ontario Sewer and Watermain Association (OSWCA)	1	Yes
Good Roads (formerly OGRA)	1	Yes
OPS Coordinator	1	No

Grading Committee is responsible for standards related to grading such as: earth and rock excavation, removal of boulders, embankments over swamp, borrow material, granular sealant, dust suppressants, compaction, removals, utility location, entrances, and geotextiles.

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO)	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
OPS Coordinator	1	No

Pavement Committee is responsible for standards related to pavement such as: granular base and sub-base, surface treatment, asphalt, concrete and composite pavements, subdrains, sidewalk, curb and gutter, and weighing of materials.

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO)	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
Concrete Ontario (CO)	1	Yes
OPS Coordinator	1	No

Structures Committee is responsible for standards related to structures such as: concrete structures, earth retaining structures, structural steel, pre-stressed concrete, structure rehabilitation, sign support structures, temporary modular bridges, anchorage systems for foundations, structural wood systems, and precast concrete box culverts.

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO)	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
Concrete Ontario (CO)	1	Yes
Heavy Construction Association of Toronto (HCAT)	1	Yes
OPS Coordinator	1	No

Traffic Safety Committee is responsible for standards related to traffic safety such as: attenuators, delineation, pavement markings, roadside barriers, noise barriers, end treatments, crash cushions, arrestors, anti-glare screens, traffic control signing, fencing, and winter salting and sanding.

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO)	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
OPS Coordinator	1	No

Watermains Committee is responsible for standards related to watermains and forcemains such as: site preparation and restoration, excavation, backfill, and compaction for all pipelines and maintenance holes, catch basins, ditch inlets, and valve chambers; cathodic protection; thrust blocks; support systems; water services; and hydrants. There is some overlap with the standards and responsibilities of the Drainage Committee.

Organization	Number of Representatives	Voting Rights
Municipal Engineers Association (MEA)	3	Yes
Ministry of Transportation of Ontario (MTO)	1	Yes
Ontario Road Builders Association (ORBA)	1	Yes
Association of Consulting Engineering Companies Ontario (ACEC-Ontario)	1	Yes
Ontario Sewer and Watermain Construction Association (OSWCA)	1	Yes
Ontario Water Works Association (OWWA)	1	Yes
Ministry of the Environment, Conservation and Parks (MECP)	1	Yes
OPS Coordinator	1	No

3.4 OPS Administration

OPS Administration is provided by MTO under the general supervision of the Head, Standards Management Section (“Head”) within the Highway Design Office.

General responsibility for the day-to-day operation and maintenance of the OPS organization and the Ontario Provincial Standards are provided by a team of three coordinators.

OPS Administration is responsible for Division 1 – Abbreviations, of the Ontario Provincial Standard Drawings.

4.0 MEMBER RESPONSIBILITIES

4.1 Responsibilities

General meeting decorum should be adhered to ensure a productive meeting. Avoid distracting or disruptive actions.

Additional responsibilities of partner organizations, chairs, coordinators, and representatives are as follows:

a) Partner Organizations

- Ensure active participation on committees.
- Assign representatives to committees as required.
- Facilitate two-way communication between committees and the organization they are representing.
- Develop and institute recognition and appreciation measures for committee representatives.

b) AB, SMC, and SC Chairs

- Develop meeting agendas, call meetings, and approve requests for guest attendance at committee meetings.
- Ensure the proper, relevant conduct of meetings, and encourage and promote the efficient operation of the committee.
- Ensure a balanced perspective from all representatives on the committee.
- Ensure that inquiries to the committees are dealt with in a timely manner.
- Ensure the development of an annual work plan identifying OPSDs and MUNI specifications which should be reviewed by the committee based on the goal of having a five-year renewal cycle.
- Monitor membership of the committee with respect to areas of expertise and advise the Coordinator when a modification is required. SMC Chair to attend the AB meetings as a non-voting representative and report on the activities of SMC and the SCs.
- In the absence of the Chair, the Vice-chair shall fulfil the duties of the Chair.

c) Coordinators

- Organize meetings for the Committee; prepare and distribute meeting notices, agendas, minutes, and materials to be reviewed; record decisions and relevant comments.
- Table those parts/items of the minutes of other committees that require action.
- Communicate to all absent committee members and external stakeholders any action items requiring their attention.
- Provide advice on standards formatting issues and administrative matters.
- Liaise and communicate decisions to the Coordinators of the other SCs as guided or directed by the committee.

- SMC coordinator to organize the biennial OPS SC Chairs meeting; prepare and distribute meeting notices and agendas, record decisions and relevant comments, and prepare and distribute minutes.
- Monitor the committee and advise the Head when there is a vacancy or the SC Chair when it is apparent that a representative does not attend meetings on a regular basis.
- Receive and respond to correspondence directed to the Committee.
- Report to the Head for the purpose of fulfilling day to day operational duties.
- Facilitate elections for the Chair and Vice-Chair of SMC and SCs.

d) Representatives

- Represent the interests of municipalities and the organization that appointed and approved their membership on the Committee.
- Attend scheduled meetings and review material provided prior to the meeting.
- Fulfil the terms of reference through active participation at the meeting.
- MTO representatives will focus on knowledge transfer and information related to ongoing work within MTO on PROV specifications and special provisions, provide technical expertise, and when relevant, rationale and background on MTO specification development.
- Identify potential new and/or revisions to specifications, which may be addressed by the committee.
- Perform tasks assigned by the Chair.
- Vice-chair to act as Chair when specifically requested on an as-needed basis.

4.2 Conflict of Interest

Principles

As a result of the involvement as either an “OPS Committee Member or alternate member” (Member), OPS committee members shall not influence the specifications in such a way that they derive unfair personal advantage, financial gain for their relatives, or unfair advantage or financial gain for their employers.

Each Member has the duty to disclose to the Chair any situation of actual or perceived conflict of interest, or any situation that has the potential to become a case of actual or perceived conflict of interest.

Definitions

Conflict of Interest: means a conflict between a Member’s personal or business interests or both and their official duties as a Member.

Actual Conflict: means a conflict that is clear and current, in that the Member is actively engaged in a situation that conflicts with their duties as a Member, either directly or indirectly.

Direct Conflict: means an actual conflict where the Member is personally linked to the situation.

Indirect Conflict: means an actual conflict where the personal or business interest of a Member's spouse or relative is linked to the situation.

Perceived Conflict: means a conflict-of-interest situation that may exist even if it has not actually occurred, in that it gives the appearance of conflict in the eyes of others.

Potential Conflict: means a situation that may result in a conflict of interest in the future.

Procedure

a) If a Member believes they are directly or indirectly in an actual, perceived, or potential conflict of interest situation, they have a duty to declare a conflict of interest to the Chair before actions or discussions take place on an Ontario Provincial Standard or item that will result in the conflict of interest.

b) The Member declaring the conflict should not be involved in the discussions or the determination of committee action to be taken regarding the item that had led to the declaration of the conflict of interest. If the input of the organization for which the Member in conflict represents is necessary, then discussions and action on the item should be suspended until arrangements can be made to have an alternate representative present to take part in the discussions and decision-making process.

c) The Coordinator should record that a conflict of interest has been declared in the meeting minutes along with the actions that occurred after the declaration has been made. At the soonest possible time after the meeting, the Coordinator should discuss with the Head the declaration and subsequent actions taken by the Chair and the Member.

d) The Head or Coordinator should contact the organization that the Member represents and inform them of the declaration and actions taken. Consideration should be given to providing an alternate representative while the Committee works on the item that has caused the conflict of interest.

e) If a Member or an OPS Administration staff member identifies a possible conflict of interest before a meeting, that person should discuss the matter with the Head to determine the action to be taken.

5.0 COMMITTEE PROCEDURES

5.1 Committee Meetings

Note: This section applies to the SCs that are responsible for developing and maintaining the Ontario Provincial Standards. Aside from subject matter discussions, all committee meetings are generally the same.

5.1.1 Purpose of Meetings

Meetings are an important aspect of the development and maintenance of the Ontario Provincial Standards. Meetings act to foster and encourage open dialogue between Committee members, thereby leading to better OPS standards. The Committees meet on a regular basis to plan for and organize, review, revise, and develop the standards for which they are responsible. To accomplish this, members:

a) Conduct the business of the committee.

b) Develop and maintain an annual work plan for their review, revision, and development of standards.

c) As much as possible, review and revise Ontario Provincial Standards on a cyclical basis of preferably five years, but not more than ten years.

d) Develop new Ontario Provincial Standards.

e) Provide technical expertise for the development of construction and material specifications and drawings by the Committee.

f) Solicit input from OPS owner and partner organizations, other committees, outside agencies, interested groups, and individuals and incorporate appropriate changes into the standards.

g) Prepare standards for circulation to and solicit comments from identified interested individuals and organizations and then review and evaluate comments received.

h) Prepare commentaries for all construction and material specifications.

i) Prepare standards that meet the needs of users and are current with technology, materials, and construction practices.

j) Ensure the standards that are revised or developed are consistent with and support the appropriate standards currently contained in the OPS library.

k) Review standards from other Committees that may impact on the work of their committee.

5.2 The Committee Meeting

Successful Committee meetings are the result of the Chair and Coordinator working collaboratively with the goal of making the meeting effective, efficient, and a good use of members' time. To ensure a successful meeting, below are some of the responsibilities of the Coordinator.

5.2.1 Prior to the Committee Meeting

a) For an in-person meeting, ensure that a meeting location has been arranged. For a remote or hybrid meeting, confirm the platform for videoconferencing. A teleconference option should also be available whether meeting in-person or videoconferencing. Coordinate lunch if appropriate.

b) Set a meeting date and time.

c) Ask members for agenda items.

d) Prepare a Notice of Meeting, which includes an agenda, and send it out in advance of the meeting.

e) Ensure that the minutes of the previous meeting and a Notice of Meeting have been distributed.

f) Review all correspondence and other OPS committee minutes received since the previous committee meeting, and determine which information is relevant to the Committee and needs to be reported to the members.

g) Prepare copies of all documents the members will need during the meeting and email these to the members at least 2 days before the meeting or as agreed to by the Committee. This includes the latest draft copies of the specifications and drawings under review. If comments have been received regarding the standards under review, ensure they are also available to the members.

h) Review previous meeting minutes to determine outstanding action items. Complete action items that have been assigned to the Coordinator. If there is a need, contact members to ensure they will have a report on their action items for the meeting.

i) Contact and arrange attendance for any guests the committee members wish to have attend a meeting to provide information or presentations. These guests may have the expertise to help in committee discussions on a given standard. Confirm the guest's attendance about a week before the committee meeting.

j) Be organized and ready for questions that may arise from previous meetings.

5.2.2 During the Committee Meeting

a) For an in-person meeting, arrive about a half hour early to set up the room and confirm if any sponsored refreshment order has arrived. Set up the room for good interaction between the committee members. For a videoconference or teleconference, test the

platform connection about a half hour in advance and keep the call open at least 15 minutes before the meeting starts.

b) Ensure that the meeting starts on time and begins on a positive note.

c) Committee meetings should be conducted in an informal manner. Decisions are made by consensus. Where voting is needed on contentious items the vote will be recorded [See 5.4 for more information].

d) The Coordinator supports the efforts of the Chair.

e) Adhere to the agenda. Ensure that all members are working from the same documents and on the same topic. Allow time for breaks.

f) Take notes during the meeting for preparation of the meeting minutes. Record discussions in general terms–not word for word [See 5.3.2 for more information.]

g) Generally:

   i. Be familiar with the topics on the agenda.

   ii. Avoid being critical of others.

   iii. Listen carefully to the people and consider their points of view and encourage others to do the same thing.

   iv. Provide supporting examples to reinforce your statements.

   v. Show respect and remember that other people have good ideas too.

h) Provide direction and advice to the Committee on the format of Ontario Provincial Standards.

i) Before the end of the meeting, work with the members to set the meeting date and location for the next meeting. If the Committee can set several dates at one time; it is helpful to the Coordinator in order to schedule the work of the Committee.

j) Ensure that the meeting finishes on time and ends on a positive note. Thank members for attending the meeting.

5.2.3 After the Committee Meeting

a) From time to time, request feedback on how members felt about the previous meeting (e.g., was it informative, did it drag or seem boring, or was it a good use of time). Always ask for ideas, topics, and presentations for future meetings.

b) Prepare minutes of the meeting and distribute them to members within 2 weeks of the meeting. The meeting items in the minutes should be the same as the agenda's items (i.e., same title and item number). Any revised material can be sent out with the minutes as long as the preparation of such material does not delay the distribution of the minutes.

c) Prepare the Notice of Meeting for the next meeting. This should be completed in consultation with the Committee Chair, if they desire. The Notice of Meeting can be

distributed with the minutes but should go out not less than 10 days prior to the meeting for which it was prepared.

d) As soon as a date has been determined for a meeting, arrange for a meeting location or videoconference platform, guests, meeting refreshments, and sponsored lunch, as required. Meeting location reservations should be made by the Coordinator or, when a member is hosting the meeting, by a member.

e) Follow up on tasks given by the members to the Coordinator or other members. Follow up on any requests made of the Coordinator for information.

f) Update specifications and drawings discussed at the meeting. Decide whether members need the revisions before the next meeting and, if so, distribute them for their review prior to the meeting. If they do not need them, make copies to distribute at the meeting if the meeting is in person. If revised standards cannot be prepared in time for the next meeting, prepare other material for the committee members to discuss.

g) Discuss any contentious issues with the Head.

5.3 Meeting Documentation

5.3.1 Notice of Meeting/Agenda

[Section 12, Example 2]

The purpose of the Notice of Meeting is to inform the Committee members and meeting guests of a pending meeting. It notifies these people of the meeting date, time, location, and agenda. This notice also informs other OPS members and committees of the issues or standards being reviewed and discussed by the Committee. The Notice of Meeting is divided into five distinct areas, each with a prescribed purpose.

a) The **TO** area lists the names of individuals who are expected to attend the meeting as either a member, who takes part in the entire meeting, or a guest, who attends the meeting for a particular portion of the meeting to give a presentation or provide expert information to the Committee. Alternates that attend meetings on a regular basis are also listed here.

b) The **SUBJECT** area informs the attendees which meeting they are asked to attend. The meeting number and the name of the Committee are shown here.

c) The **AGENDA** area informs the attendees of the topics being discussed during the meeting so that they may prepare for the discussions or read material to be reviewed (e.g., previous minutes or standards).

d) The **MEETING INFO** area informs the attendees of the date, time, length, and location of the meeting. Location information should be complete enough that attendees can find the meeting location. If necessary, a map should be attached as a second page of the Notice of Meeting.

e) The **CONTACT** area informs the attendee who is responsible for meeting arrangements. This is the person who can be contacted with questions about the meeting, to add

agenda items, send regrets for not being able to attend the meeting, or to make specific requests.

Agendas are the road maps for meetings. They inform meeting attendees of the topics that will be discussed and which topics, by their absence from the agenda, will not be discussed. Also, agenda item numbers are shown for reference purposes. The item number shows the meeting number and the actual number of the item (e.g., item 190.6 informs the reader what issue is to be discussed as the sixth item of meeting 190).

Optionally, three additional pieces of information can be added to the agenda. Some agendas contain a column showing the time of day an item will be discussed or the length of discussion time that has been assigned to a particular item. The second optional piece of information is contained in another column, and it identifies who is responsible for that particular item (i.e., who is to provide information or a presentation or lead a discussion on the item). Thirdly, agendas may contain notes for attendees such as reminders to review certain material (e.g., minutes or standards before the meeting or to bring material that was distributed at a previous meeting).

There are certain topics or items that should be included on every agenda, those being: Adoption of Minutes of the Previous Meeting, Review of Previous Minutes - Issue Tracking, Report on Correspondence, Report on Minutes of Other OPS Committees, Other Business, Review of Standards, and Future Meetings. Each of these items will be discussed in more detail in the OPS Committee Minutes clause.

5.3.2 Committee Minutes

[Section 12, Example 3]

Meeting minutes are a report that document a meeting in a clear, concise, informative manner. The items reported in the minutes should be the same as the items listed on the agenda with the same numbers and titles. Even if the items listed on the agenda were discussed out of order, when approved by the Committee Chair, the numbering and reporting order remains the same. As with the agenda numbering, readers expect to find consistency in reporting from meeting to meeting.

In general, committee minutes should report on:

a) Action items and who is responsible to complete a task.

b) Decisions made with rationale.

c) Attendance at meeting, including guests.

d) Any issues and questions that need to be researched.

e) Issues that are to be sent to other OPS committees.

f) Other business.

g) Voting information, if a vote is necessary [See 5.4 for more information].

The following is a detailed description of the parts of the minutes:

a) The first page of the minutes provides the reader with general information regarding:

   i. OPS information: the address and phone number.

   ii. Meeting information: committee name; meeting number; and meeting date, location, and time.

   iii. Committee membership information: person's status on the committee (i.e., Chair, Vice-Chair, or Coordinator), telephone number, email address, and organization they represent on the committee.

   iv. Meeting attendance information: whether a committee member was present or absent, whether an alternate was present for absent members, and guests who attended.

   v. Minute distribution information: all individuals or organizations other than the meeting attendees who receive a copy of the minutes are listed under the 'Email Copy To' section. This includes members of the next senior committee, corresponding members, all Committee Chairs, the Chair of MTO's Contract Documentation Committee, and other interested individuals or organizations. The SMC minutes are also distributed to each member of AB, and the AB minutes are distributed to all members of the SMC.

   vi. Finally, the committee members are reminded to check the Issue Tracking page for any action for which they may be responsible.

b) **General Meeting Notes:** These notes are at the top of the second page and report items that happened during the meeting that do not fit into any other item (e.g., new member and leaving member announcements, members' regrets for not attending the meeting, extend congratulations, and thank an organization for hosting the meeting. All of these deserve to be noted to others and should be at the start of the minutes and not buried in the minutes.

c) **Adoption of Minutes of Previous Meetings:** This item reports whether the members adopt the previous minutes as written or with amendments due to errors or omissions. If an error or omission is identified, the correct or missing information should be shown here identifying the portion of the minutes where the information was incorrectly reported or omitted.

d) **Report on Minutes of Other OPS Committees:** This item reports on activities of or information or action requests from other SCs or the AB or SMC that impact on the committee.

e) **Report on Correspondence:** This item reports on written communications (i.e., faxes, memos, letters, and emails) and may be extended to include verbal communications (i.e., telephone conversations that have been received by the Coordinator or other members). These communications may be requests for information or action; suggestions on the work or reviews of the Committee; provide information that impacts

on or requires action by the Committee; or requests, direction, information, or policy changes from the AB or SMC.

f) **Other Business:** This is a catch-all item for business that arose from previous meetings or new business raised at the meeting for which the minutes reflect. Each issue under this item should have its own item number and title. Again, the Coordinator should capture the essence of the business clearly and concisely.

g) **Review of Issues from Previous Minutes - Issue Tracking:** This item is a short, quick update on issues that required action from previous meetings. These issues are taken from the issue tracking list found at the end of the last meeting minutes.

   i. Any action taken that completes an issue is marked as completed.

   ii. If no action has been taken, the issue is marked as pending.

   iii. If there is an update on an action item but the action is not complete, the update should be shown under Other Business, with its own item number and title, and the Coordinator should mark the old issue as pending. If the action changes, the previous action item should be shown as complete and a new action item is added to the Issue Tracking page at the end of the minutes.

h) **Between Issue Tracking and Future Meetings** is the reporting of topics as shown on the meeting agenda. As with all other topics, the idea is to capture the essence of the committee discussions, the action items and who is responsible for the action, and all decisions and rationale for making the decision. Examples of topics are review of standards, developing work plans, or presentations made to the committee. As with other topics, the action for these topics is shown by stating the action required and the person responsible for the action. If the committee receives suggestions, had short discussions on ideas for work the Committee wishes to work on in the future, or wishes to table work on an item or issue, it is captured here and noted as a Reminder. Action items and reminders are added to the Issue Tracking list at the end of the minutes. Items of which other committees or OPS Administration staff should be made aware of shall be noted in the minutes (e.g., John Smith Please Note).

i) **Future Meetings:** This item informs the reader of upcoming meeting dates and locations as decided by the committee members.

j) The last page of the minutes is usually **Issue Tracking** and provides the reader with a quick overview of outstanding issues in the committee. Items on this list reflect action items by the item number for the meeting where the action item originated, a brief description of the issue, and the person responsible for the action. Another purpose for this list is to keep track of items, on which the committee has done some work or had some discussions, but they have deferred them to a later date as a Reminder showing the meeting and item when the topic was first reported in the minutes.

   When an action has been completed or additional information has been received before the minutes are circulated, this fact may be noted as a Post Meeting Note at the end of the appropriate item or just after the description of the action and the Action By note.

5.4 Voting on Contentious Issues

It is desirable that matters affecting OPS be decided by consensus for all Committees (i.e., AB, SMC and SCs). Voting is to be used to break an impasse in a contentious issue and only after all attempts to resolve the impasse have been exhausted.

All OPS owner and partner organizations have voting privileges. Representatives of ad hoc organizations and Coordinators do not have voting privileges. The privilege to vote on behalf of an organization is exercised by its members or their alternate on the OPS Committee. Proxy votes are not permitted.

a) Any member of an OPS Committee may request that the Chair call for a vote when they believe an impasse has been reached. The Chair may choose to call for a vote, if they agree that an impasse has been reached. A brief description of the impasse that led to the vote is to be recorded in the minutes of the meeting.

b) A meeting quorum must be present before a vote can be taken. Meeting quorum refers to the number of voting committee members present, not to the number of members voting. A meeting quorum shall exist when a minimum of 60% of the total voting committee membership is present at the meeting. The following table indicates the number of members required to constitute a meeting quorum:

Total Voting Committee Members	6-7	8-9	10	11-12	13-14	15	16
Meeting Quorum	4	5	6	7	8	9	10

c) Items being voted on need a two-thirds vote to pass. A two-thirds vote means two-thirds of the votes cast, ignoring blanks which should never be counted.

d) Voting shall be by “Yeas and Nays.” The Coordinator shall record the roll of the entire Committee and each member shall response with either “yes” or “no,” or “abstain” if they do not wish to vote.

e) The vote shall be entered into the minutes by recording:

   i. The motion duly made and seconded on which the vote is being held.

   ii. The presence of a meeting quorum at the time of voting.

   iii. The response of each member.

   iv. The number of votes for and against the motion.

   v. Whether the motion was passed or defeated.

5.4.1 Appeal Process

Note: The appeal process pertains to the development of standards by the SCs only.

Each member or their organization has the right to enter an appeal to the SMC in case of a dispute over decisions regarding standards made by voting. The appeal process shall be as follows:

a) The appeal is to be in writing and sent to the Head with copies sent the SC Chair and Coordinator.

b) The Head shall acknowledge receipt of the appeal in writing to its author with copies sent the SC Chair and Coordinator.

c) The Head shall forward the appeal to the SMC for review, discussion, and action at the next scheduled SMC meeting after the appeal has been received by the Head.

d) In a timely manner the SMC members shall:

   i. Review the appeal.

   ii. If necessary, seek information from the SC Chair and Coordinator.

   iii. Render a decision to the author of the appeal with copies sent to the Head and SC Chair and Coordinator.

5.5 Development and Approval of Annual Committee Work Plans

[Section 12, Example 4]

SMC and SCs are required to develop work plans that coincide with the fiscal year of MTO (i.e., April 1 to March 31). The OPS organization uses the same fiscal year as MTO due to financial considerations.

Work plans are to indicate both on-going and future projects with anticipated completion dates provided for each.

SC work plans are to be finalized and given to the Head by mid-January. Work plans are presented to the SMC at their January meeting for review and approval at their February meeting.

5.5.1 Purpose and Benefits of Work Plans

Outlines work that the committee plans to undertake.

- Keeps committee members focused on process, committee goals, and progress in obtaining those goals.
- Keeps members aware of planned work so they can prepare for future reviews and development of Ontario Provincial Standards.
- Provides timelines for the start and completion of reviews and development of standards.
- Tracks and reports on progress of SC to the SMC.
- Provides a tool for SMC to approve the intended work of the SCs.
- Tracks standards that have been reaffirmed.

5.6 Vacancies

The process for filling a committee membership vacancy is as follows:

a) Once a Coordinator knows of a vacancy the Head shall be advised of the need to fill that specific vacancy.

b) The Head contacts the organizations leadership to request a proposed candidate be selected.

c) Organization leadership then responds to the Head with the proposed candidate.

d) The Head will then advise the candidate and the committee Chair/Coordinator of this decision.

e) Coordinator should then provide the new member with a welcoming email to the committee as a full voting/participating member with information regarding meeting logistics etc.

The Head provides a vacancy table to SMC and AB for each meeting.

5.6.1 Membership Requirements

Members on all Committees must:

- Be appointed and approved by the organization they represent.
- Have a willingness to contribute time and expertise.
- Have a willingness to seek input from and circulate draft standards within the organizations they represent for comment during development.
- Have knowledge of municipal and/or ministry contract engineering practices.
- Have a commitment to the use of OPS.

5.6.2 Commencement and Cessation of Membership

When a person becomes a member on a Committee, the Coordinator formally welcomes them to the Committee with a letter (Section 12, Example 5), as well as providing some background information on OPS to orientate them to their new role.

When a person leaves a Committee, the Coordinator sends a thank you letter (Section 12, Example 6) in which the SMC Chair acknowledges the contribution of the exiting member. The Coordinator also informs the Head that a person has resigned from the Committee, which triggers the recruitment process to find a new member and the updating of OPS records.

When a Coordinator is leaving a Committee, the exiting Coordinator shall inform each Committee of their impending absence, as well as any plans and timelines for a new Coordinator to be assigned. Whenever possible, the exiting Coordinator should leave instructions and an overview of standard reviews currently in progress for the new Coordinator, in order to have as little interruption to the Committee's workplan.

5.7 Meeting Attendance

The Coordinator monitors members' attendance at meetings to ensure each organization with membership on the Committee is being represented on a continual basis.

Attendance by all members at scheduled committee meetings is especially important to the accomplishment of work by the Committee. Acceptance of membership on a Committee implies recognition of the value of its work and a person's commitment to make every effort to attend committee meetings. Failure to attend three consecutive meetings will be construed as an indication of an inability to participate fully in the work of the committee and this may become the basis for the consideration of a replacement.

If a committee member misses more than three consecutive meetings, without sending an alternate approved by their organization, they are to be contacted by the Committee Chair to determine why they have not attended and if they plan to continue to serve on the Committee in the future. If they wish to continue serving on the Committee, they are to be reminded of the importance of attending meetings on a regular basis. If they fail to attend meetings regularly, the Committee Chair is to contact the Head who will contact the OPS owner or partner organization for a replacement.

5.8 Committee Elections

Elections in the organization shall be held in January every odd numbered year or when the position of Chair or Vice-Chair is vacated during the term of office. The term of office begins April 1st following the election and ends on March 31st at the conclusion of the two-year term.

For SMC and the SCs, the Chairs and Vice-Chairs are elected by all voting members of the SC. Only MEA members may act as Chairs.

The following procedures for SMC and SC elections shall be followed:

a) The Coordinator shall include an item to hold elections on the Committee's January meeting agenda when the need for an election is required due to the end of a two-year term.

b) When a position has been vacated during the term of office, an item for the election shall be added to the agenda of the next Committee meeting following the resignation of the person from the position. The person elected shall fill the position for the remainder of the original two-year term.

c) Coordinators are responsible for facilitating the election. Separate elections are to be held for each position as follows:

    i. The Coordinator requests nominations for the position of Chair.

    ii. When nominations are completed, the Coordinator shall ask each nominee if they will accept the nomination.

    iii. If there is more than one nomination, nominees shall leave the room until the election is completed.

iv. In turn, the Coordinator shall ask for a show of hands for each nominee. Election to a position shall be by a majority show of hands.

v. When there is only one nominee agreeing to stand for election, the Coordinator shall acclaim the person to the position.

vi. The procedure is then repeated for the position of Vice-Chair.

d) Results of the election shall be recorded in the minutes.

When a committee member is a Chair or Vice-Chair and resigns from the committee, the position is not transferred to the person's replacement. An election shall be held to fill the vacated position.

For the AB, the Chair shall be either an MTO or MEA representative. Whichever organization is the Chair, the Vice-Chair shall be the other OPS owner. For the positions of Chair and Vice-Chair of the AB, elections are not required at the end of a two-year term. The positions of Chair and Vice-chair of the AB shall automatically rotate every two years between the MTO and MEA representatives.

5.9 Appreciation

The OPS organization feels it is important to recognize its members periodically and therefore provides tangible forms of recognition to thank members for attending meetings and for contributing to the efforts of OPS.

Once a representative has completed five years of service on a committee, they receive an OPS Certificate of Appreciation. If they leave or retire from the committee after five years, they receive on OPS Service Recognition Certificate and acknowledgement from the Chair.

6.0 REVISING AND DEVELOPING ONTARIO PROVINCIAL STANDARDS

6.1 General

Standards are revised or developed based on:

- An SCs cyclical review work plan.
- A request from an OPS user.

Related construction and material specifications and drawings should be reviewed and published at the same time.

If revision or development of a standard is the result of a request from an OPS user and the SC agrees with the request, the SC decides if the review is to begin immediately or at a future date. The review is put on the SCs work plan for the next year, if the review is for a future date.

6.2 Revision and Development Responsibilities

The responsibilities of SC members and Coordinators are as follows:

a) SC Members

- Contribute their expertise to the review.
- Circulate standards to others in their organization for review and comment, if the member determines that input from their organization would be helpful during the review process.
- Gather and bring comments received or solicited from their organization to the Committee. Ideally, comments should be obtained prior to the start of the review.
- Research and provide technical information as required.

b) Coordinator

- Before a specification is sent to the SC members, the Coordinator:

    i. Reviews their files to determine if they are any new issues since the last review of the standard for inclusion in the current review.

    ii. Reviews the *OPS Cross Reference List* to determine which standards may be affected by changes being considered during the review of the standard. This is particularly important when a standard is being considered for cancellation or renumbering. Standards should not be cancelled or renumbered until all references to it have been removed from or revised in other Ontario Provincial Standards.

    iii. Reviews the *OPS Cross Reference List* to determine if other committees may have a vested interest.

    iv. Reviews external publications and standards referenced in the OPS to determine if any changes have been made to the external publication since the OPSS or

OPSD was developed or last revised. If there are any differences, the Coordinator will prepare a summary of findings for the SC members to review.

- Generally, during the review of standards, the Coordinator is responsible for:

  i. Spelling, grammar, and word usage.

  ii. Advising on OPS format and style.

  iii. Checking and updating the references to standards that are shown.

  iv. Providing draft copies of the standard to the members.

  v. Researching technical information, when required.

  vi. Liaise with other individuals and associations not represented by SC members to obtain information.

  vii. In the case of a material specification, circulate the standard to manufacturers and suppliers, when appropriate.

  viii. Circulate the final draft of specifications, comparison documents, and Confirmation of Review sheets to SCs that have a vested interest in the content of the standards. Obtain their comments and Confirmation of Review sheet signed by the other SC Chair and Coordinator. [Section 12, Example 7]

  ix. Discuss any contentious issues with the Head.

6.3 Revising and Developing Municipal OPS Specifications by Committee (OPSS.MUNIs)

The Coordinator will revise the OPSS.MUNI to reflect the current OPS style. These changes should be made before the specification is distributed to the SC members for review. There is no need to present tracked style and format changes to the SC as the Coordinator is obligated to make these changes. The revised OPSS.MUNI becomes the first draft revision of the specification.

The first and subsequent drafts of a specification being revised or developed should be identified as a draft specification. The following changes should be made to the specification as part of the first draft:

a) The file name should clearly indicate the OPSS number and draft date e.g., OPSS.MUNI ### (Draft YYYY-MM-DD).

b) Remove the OPS logo from the top of the first page of the specification and add the specification designation and draft date. ‘DRAFT’ is also added to the footer. [Section 12, Example 8]

c) To help ensure a smooth review and revision of specifications and error-free conversion from MS Word to PDF, navigate to File > Options > Proofing > AutoCorrect Options and select the appropriate Auto Correct settings. [Section 12, Example 9]

6.3.1 Revising Existing Municipal OPS Specifications (OPSS.MUNIs)

The following outlines the process for revising existing OPSSs by the SC, based on the SCs cyclical review work plan.

Before the specification is sent to the SC members, the Coordinator:

a) Reviews the existing OPSS.

b) Adds any MTO and submitted municipal Special Provisions (SPs) to the specification. The members will determine the appropriateness of the SPs during their review. Added SPs are to be clearly indicated and include its source.

c) Checks the *OPS Cross Reference List* to determine both if other standards refer to the specification and if other committees have a vested interest.

When the specification has been prepared with SPs, reformatted, and distributed to SC members and all relevant material has been gathered, the specification is ready to be reviewed by the members as an entire committee.

It is suggested that the Coordinator distributes the specification to the SC in advance of its review. SC members should review the specification and any other information received from the Coordinator before it is to be reviewed by the entire SC and come to the review meeting prepared to discuss the standard.

To ensure a comprehensive review, consideration for the distribution of standards during the review by the SC should be as follows:

a) Standards are only distributed to organizations represented on the SC if the organization has instructed their representatives to do so or if individual members wish to gather additional comments from their organization in order to make changes to the standard. In order to facilitate the distribution, the Coordinator provides an electronic copy of the OPSS in draft format. When distributing the specification, a request for comments should accompany the specification.

b) Each SC member is responsible for circulating the specification to other organization members and gathering comments that result from the circulation. Members are to bring gathered comments to the SC meeting where the specification is reviewed by the entire SC and present them as a revision to the specification.

c) The Coordinator is responsible for circulating the standards to any individual or organization not represented on the SC, only if the SC members feel there is a benefit in doing so. The Coordinator brings comments received from this type of circulation to the SC.

SC review of the standard:

a) Review begins as scheduled and, at the appropriate time during the review, members discuss comments they may have and comments they have received from other members of their organization.

b) The SC agrees or disagrees with the comments, comments are added, and information originally in the specifications is deleted or updated according to the discussions.

   i. The Coordinator records the decisions of the SC.

   ii. The Coordinator keeps a list of SPs added to the specification along with a list of reasons the SC did not add a part or all of any other SPs.

   iii. If there are any impacts on other Ontario Provincial Standards, they must be resolved before information is deleted or revised.

Based on discussions, the Coordinator revises the specification after each meeting.

a) When the entire specification has been reviewed and all changes have been made, the Coordinator presents the specification to SC members for confirmation of their decisions or to make additional changes as identified.

b) SC members may decide to circulate the specification again to individuals who provided comments during the initial circulation for comments, if it is felt a better product will result from a second circulation. If the specification has undergone major changes, a second circulation could be used to get acceptance by those who made comments on the initial circulation.

c) If the specification is to be recirculated, it is circulated as discussed previously. The Coordinator will also provide a comparison document with the revised specification.

d) Comments received from the second circulation are discussed and the specification revised accordingly to produce the final draft.

e) The SC members and the Coordinator prepare a draft commentary appendix [Section 12, Example 10] and the Coordinator attaches it to the specification.

f) The Coordinator reviews the references to external standards and publications again, discusses any changes with the SC and revises the specification accordingly.

g) The Coordinator reviews the OPSS Cross References List to identify if other SCs may have a vested interest in the content of the specification. The Coordinator sends the final draft of the specification, the comparison document, and a Confirmation of Review Prior to Publication form [Section 12, Example 7] to those SCs for comment and to have the form signed by the other SCs Chair and Coordinator. A summary of the major changes may also be provided, if applicable.

h) If there are any comments from the other SCs, they are reviewed and revised accordingly by the SC responsible for the specification.

i) Once the review is complete, the Coordinator prepares the specification for submission to the SMC for permission to publish. The Coordinator produces a Publication Request form [Section 12, Example 11] and forwards it with a copy of the specification to the Head [see 7.0 for more information].

6.3.2 Developing New Municipal OPS Specifications (OPSS.MUNIs)

New specifications are developed when an interested party makes a request to the SMC for the development of a new specification or when the SC believes that a specification is required to cover construction or material requirements.

a) If the SC decides that a new specification is needed:

   i. The SC determines if another standards development organization (e.g., CSA or ASTM) has a standard that can be referenced.

   ii. If there is not, the Committee solicits specifications from municipalities or other sources from which information can be used to develop a new OPSS.

   iii. Committee members bring specifications from their jurisdictions for consideration.

   iv. Through discussions the Committee develops its specifications.

b) When an interested party requests a new specification and the SMC has decided to include it in the OPS, a draft specification is developed by the sponsor for the interested party [see 6.6 for more information]. The submitted specification is revised by the Coordinator to reflect the OPS style and format. The revised OPSS becomes the first draft revision of the specification and should be labelled as such.

   Whether the new specification comes from an outside source through the SMC or from the SC, the process for developing the specification is the same.

c) The Coordinator distributes the new OPSS to the SC members for their review prior to the entire committee reviewing and discussing it.

d) The review starts as scheduled and the SC members discuss and revise the new OPSS. The Coordinator records the decisions of the SC and revises the specification accordingly.

e) When the entire specification has been reviewed and all changes have been made, the Coordinator presents the specification to SC members for confirmation of their decisions or to make additional changes as identified.

f) The SC members and the Coordinator prepare a draft commentary appendix [Section 12, Example 10] and the Coordinator attaches it to the specification.

g) The Coordinator reviews the references to external standards and publications and revises the specification accordingly.

h) Once the review is complete, the Coordinator prepares the specification for submission to the SMC for permission to publish. The Coordinator produces a Publication Request form [Section 12, Example 11] and forwards it with a copy of the specification to the Head [see 7.0 for more information].

6.4 Revising and Developing Provincial OPS Specifications (OPSS.PROVs)

The process for revising and developing PROV specifications is detailed in the MTOs Contract Design, Estimating and Documentation (CDED) Manual available on the MTO Technical Publications website.

6.5 Revising and Developing OPS Drawings (OPSDs)

Once it is determined that changes are required to a drawing it is placed in a draft format and remains in this format until permitted for publication [Section 12, Examples 12 and 13].

Each time the OPSD is revised, the date of the drawing should be changed to reflect the date the revision was made by the Coordinator, as in the case of the first draft, or the SC in subsequent revisions.

6.5.1 Revising Existing OPS Drawings (OPSDs)

Before the drawing is sent to the SC members, the Coordinator:

a) Reviews the existing OPSD.

b) Checks the *OPSD Cross Reference List*, to determine if other OPSDs refer to the drawing and if other SCs have a vested interest.

c) OPS format for the drawing designation is to include three numbers after the decimal. Drawings with two numbers after the decimals should be revised to three. Any references to the drawing in other OPSD must be revised to match.

d) Gathers any MTODs or submitted municipal drawings similar to the subject matter of the drawing. The SC members determine the appropriateness of information on the other drawings during their review.

e) Supplies the SC members with a PDF copy of the drawing, if members wish to circulate the draft OPSD to other members of their organization, similar to circulating a specification.

f) Gathers comments and suggestions received from other sources for the committee to review.

g) Packages all of the material gathered and distributes it to the SC members before the OPSD is to be reviewed.

h) SC members review the material individually in preparation for the review and discussions of the SC.

i) SC review begins as scheduled and members discuss comments they may have and comments they have received from other members of their organization.

j) SC agrees or disagrees with the comments, comments are added, and information originally on the drawing is deleted or revised according to the discussions.

    i. The Coordinator records the decisions of the SC.

ii. If there are any impacts on other Ontario Provincial Standards, they must be resolved before information is deleted or revised.

k) When the entire drawing has been reviewed and all changes have been made, the Coordinator presents the drawing for SC members to confirm their decisions or make changes.

l) If necessary, SC members may decide to circulate the drawing again to individuals who provided comments during the initial circulation, if it is felt a better product will result from a second circulation.

m) If the drawing is to be recirculated, it is circulated as discussed previously.

n) Comments received from each circulation are discussed and the drawing revised accordingly to produce the final draft.

o) The Coordinator reviews the references to external standards and publications again and revises the drawing accordingly.

p) As other SCs may have a vested interest in the content of the drawing, the Coordinator sends the final draft of the drawing and a Confirmation of Review Prior to Publication form [Section 12, Example 7] to those SCs for comment and to have the confirmation form signed by the other SC's chair and coordinator.

q) If there are any comments from the other SCs, they are reviewed and addressed by the SC responsible for the drawing.

r) Once the review is complete, the Coordinator prepares the drawing for submission to the SMC for permission to publish. The Coordinator produces a Publication Request form [Section 12, Example 11] and forwards it with a copy of the drawing to the Head [see 7.0 for more information].

6.5.2 Developing New OPS Drawings (OPSDs)

New drawings are developed when an interested party makes a request to the SMC for the development of a new drawing or when the SC determines that a drawing is needed to cover construction or material requirements.

a) If the SC determines that a drawing is needed:

i. The SC solicits drawings from municipalities or other sources from which information can be used to develop a new OPSD.

ii. SC members bring drawings from their jurisdictions for consideration.

iii. Through discussions the SC develops its drawing.

b) When an interested party requests a new drawing, the request should include a copy of the drawing developed by the interested party. The SMC forwards the request and drawing to the Coordinator along with its comments to the appropriate SC for consideration [see 6.6 for more information].

i. When a drawing is received from the SMC, the SC members review the submission to determine if a new OPSD is necessary and should be developed.

ii. If the SC agrees with the submission, the submitted drawing is prepared by the Coordinator to reflect OPS style and format. The revised OPSD becomes the first draft revision of the drawing and is labelled as such.

Whether the new drawing comes from an outside source through the SMC or from the SC, the process for developing the drawing is the same.

c) The Coordinator may distribute the new OPSD to the SC members for their review prior to the entire SC reviewing and discussing it.

d) The review starts as scheduled and the SC members discuss and revise the new OPSD. The Coordinator records the decisions of the SC and revises the drawing accordingly.

e) When the entire drawing has been reviewed and all changes have been made, the Coordinator presents the drawing to SC members for confirmation of their decisions or to make additional changes as identified.

f) The Coordinator reviews the references to external standards and publications and revises the specification accordingly.

g) Once the review is complete, the Coordinator prepares the drawing for submission to the SMC for permission to publish. The Coordinator produces a Publication Request form [Section 12, Example 11] and forwards it with a copy of the drawing to the Head [see 7.0 for more information].

6.6 Sponsorship Submissions for New or Revised OPS Standards

A Sponsorship Submission is a request made to OPS for the revision of an existing standard or development of a new standard, by a non-member. All such requests shall adhere to the procedures outlined in this section.

Standardization will only be considered by OPS when one of the following apply:

- The new or revised standard is sponsored by MTO or an Ontario municipality, including for a new service or technical solution developed by a company or proponent.
- A service or technical solution incorporated into the new or revised standard has been successfully used on multiple Ontario projects.
- The effectiveness of a service or technical solution incorporated into the new or revised standard has been demonstrated for a minimum period of 5 years or as deemed appropriate by the OPS Committee.

A proprietary service or technical solution will generally not be incorporated into OPS standards, except when standardization can be generic without specific reference to proprietary products.

All Sponsorship Submissions for the inclusion of a new or revised standard in the OPS shall be made to the Head at ontario.prov.standards@ontario.ca or at the following address:

Standards Management Section
Ontario Ministry of Transportation
Garden City Tower, 2nd Floor North
301 St. Paul Street
St. Catharines, ON L2R 7R4

The following procedures are applicable to all Sponsorship Submissions:

a) Only MTO or an Ontario municipality can be a sponsor. As part of the Sponsorship Submission, the sponsor shall provide the following information:

   i. Clear benefits of the new or revised standard to the Owner, for example, cost, safety, and durability. The standard must be recognized by ANSI, ASME, ASTM, AASHTO, CSA, NSF, UL or others.

   ii. There must be a verifiable history in the Province of Ontario by OPS users. For each instance contact names, email and telephone numbers are required. The submitter shall also identify the location, the roadway classification and traffic pattern, and the length of time the standard has been used.

   iii. Letters of reference, including reference name, email, and telephone number, from other users should provide endorsement while identifying where the standard has or is currently being used.

   iv. The Submission shall be signed by a Professional Engineer licensed by Professional Engineers Ontario to practice in the Province of Ontario, and the Engineer shall have overseeing responsibilities for the infrastructure that the new or revised standard is being used in. OPS may contact these individuals for comments and their experience with the use of the new or revised standard.

   v. Results of testing and evaluation, if applicable.

   vi. If the submitter has any concerns or questions regarding the above requirements or the submission process, they should contact the Head for further clarification.

b) The Head shall review the Submission to ensure it is complete and then forward it to the SMC for review.

c) The SMC shall forward Submissions, along with any comments they may have, to the appropriate SC for their review to determine whether the inclusion of the standard in the OPS would be of benefit.

d) The SC shall review the information provided and make a decision whether the inclusion of the standard is beneficial to the OPS and municipalities as a whole, not individual municipalities or organizations. During the SCs review of the Submission, the sponsor of the standard may be requested to provide additional information to the SC.

e) The SC upon completion of the review shall make a recommendation to SMC.

f) If SMC approves the SC's recommendation to include the standard in the OPS, the SMC Coordinator will advise the SC Coordinator.

g) The Coordinator shall notify the submitter of the decision.

h) If the standard is found to be beneficial, the following shall then apply:

   i. The sponsor shall develop and supply a draft specification to the SC for their review. The specification does not need to be in exact OPS format, but it must contain the appropriate sections as found in other current OPS specifications.

   ii. When a standard drawing is being developed, the manufacturer or service provider shall develop and supply draft standard drawings produced in AutoCAD according to MTO's Integrated Engineering Standards (IES) for CAD to the Committee for their review.

If the Sponsorship submitter has any concerns or questions regarding the above requirements for a draft specification or a draft drawing, they should contact Head for further clarification.

6.7 Cancelled Ontario Provincial Standards

As part of a review of a standard by a SC, the SC may decide to cancel a standard for several reasons (e.g., the standard has low usage or is no longer used, the standard is out of date, or references old technology). If a standard is to be cancelled, the Coordinator prepares the standard for submission to the SMC for permission to cancel. The Coordinator produces a Publication Request form [Section 12, Example 11], including the rationale for cancelling the standard, and forwards it with a copy of the standard to be cancelled to the Head.

There is a difference between a standard that has been cancelled and one that has been superseded. A standard is considered cancelled when the information in the standard is deleted and not found anywhere else in the Ontario Provincial Standards. A standard is superseded when the information in it is still available in a current Ontario Provincial Standard, either in a different OPS or the revised version of the standard.

6.8 Reaffirmed Ontario Provincial Standards

The process for reaffirming standards shall be as follows:

a) The Committee begins the review process. The Coordinator provides a copy of the standard to the SC for review. If the Committee does not recommend any changes, the most recently published version of the standard is submitted for reaffirmation with no technical or administrative changes.

   i) If any changes are recommended by the SC, then the standard will go through the normal process of being drafted.

   ii) If no changes are recommended by the SC and the standard is reaffirmed, then no drafting is required and only page one of the Publication Request form is completed.

b) The Coordinator will send the standard and the Publication Request form to the Head requesting processing to SMC.

c) SMC will review the standard as a recommended reaffirmation.

d) If SMC concurs with the reaffirmation, then a reaffirmation date to added to the OPS Index and the Coordinator adds the reaffirmation date in the SCs work plan under the column titled “Date Last Reaffirmed”. This will allow for future tracking of standard status.

e) If SMC comments on the standard, then the standard will be sent to the Coordinator for further committee discussion

7.0 SUBMISSION FOR PERMISSION TO PUBLISH OR CANCEL ONTARIO PROVINCIAL STANDARDS

7.1 General

SCs are to spread their submissions for OPSS.MUNI specifications and OPSDs for permission to publish or cancel over the entire year.

7.2 Submission Timelines

The Head and SMC require adequate time to review standards after submission. There are no guarantees that standards will be published or cancelled in the year they are submitted for review. There are several factors affecting the review of submissions (e.g., workload and priorities of the Head and SMC, and a lack of lead-time to allow for a thorough review).

Rather than set deadlines for submissions for review by SMC, the SMC provides guidelines to the committees to help them plan their reviews and submissions. However, the last meetings the SMC approves standards for publishing or cancelling are March for April publishing and October for November publishing. Standards not approved before or at these meetings will not be published or cancelled until the following publication.

During the months of April and November, OPS Administration prepares the standards and associated documents for publishing.

The following schedule applies to the standards developed and reviewed by the SCs:

a) **December 31st and July 31st** - Standards from the SCs received by the Head after these dates stand a high likelihood of not being published or cancelled by the April or November publishing date, respectively. This does not mean that the SMC will not review these specifications or drawings after December or July, it only means that they stand a greater chance of not being published or cancelled than those received by these dates.

b) **February and September SMC Meeting** – These are the last meetings for specifications and drawings to be distributed to the SMC after being reviewed by the Head if SCs are seeking permission to publish or cancel in the subsequent April or November.

c) **March and October SMC Meeting** – These are the last meetings for giving permission to publish or cancel standards in the subsequent April or November.

d) **April and November** - The Head, the Coordinators and the SCs work to address SMC comments where permission is given to publish or cancel a standard.

e) **April or November** - Electronic versions of the Ontario Provincial Standards are published on MTO's Technical Publications website on the last business day of the month.

7.3 Review of Submitted Standards

After the Coordinator has prepared a standard for submission, it is submitted to the Head with a copy of the completed Publication Request. If a specification is being submitted, a comparison document between the draft and the most recently published version of the specification shall be included in the submission package. If a drawing is being submitted, the most recently published version of the drawing shall be included in the submission package. Each submission is reviewed by the Head prior to the SMC review.

a) The Head receives the standard and its supporting documentation and enters pertinent information into the Publication Cycle Standards Tracker. This document is used by OPS Administration to track a standard's progress through the Head and SMC reviews to publication. The tracker is updated at each review and step in the process.

b) Head reviews the standard for OPS format and style, spelling and grammar, readability, and ambiguity. The standard is marked up accordingly.

c) All submitted documents are returned to the submitting Coordinator for action. In some cases, the Head and Coordinator discuss the rationale for some of the markups.

d) Any markups for OPS format and style, spelling, and grammar are made by the Coordinator. Markups dealing with readability and ambiguity are taken to the SC by the Coordinator for review and action by the SC.

e) The Coordinator makes all the necessary changes and returns the standard to the Head.

f) The Head reviews the resubmission and, if necessary, marks up areas of concern and returns it to the Coordinator for action.

g) Once all issues have been addressed between the Head and SC, the Head signs the Publication Request form to indicate the standard has been approved for SMC review. The Head then forwards the submission package to the SMC coordinator.

h) The SMC coordinator distributes copies of the revised and currently published standard, Publication Request, and comparison document to all members of the SMC. The package is sent to members 2 weeks before the meeting at which the SMC will review the standard as an entire committee.

i) SMC members review the standard prior to the meeting at which it is to be reviewed and discussed.

j) At the SMC meeting, the SMC reviews the standard, makes comments, and:

    i. Gives permission to publish or cancel.

    ii. Gives permission to publish or cancel when SMC comments are addressed.

    iii. Does not give permission to publish or cancel.

k) The SMC coordinator notes all comments and questions and the SMC decision on a copy of the documents and returns the marked-up documents to the SC Coordinator after the meeting.

l) If permission to publish is given, the documents are marked to indicate that the Coordinator is to prepare the standard in final format.

m) If permission to publish is given after SMC comments are addressed, any markups for OPS format and style, spelling, and grammar are made by the Coordinator. Markups dealing with comments and questions from the SMC are taken to the SC by the Coordinator for review and action by the SC. When all comments are addressed, the Coordinator submits the revised standard and Publication Request form to the Head for approval on behalf of SMC.

n) If permission to publish was not given, the SC is to make the necessary changes and the standard is to be resubmitted to go through the review process as a new submission.

o) The Coordinator takes the appropriate actions and, once all issues are resolved, the standard is prepared in final format and electronically filed for publishing [see 8.0 for more information].

8.0 PUBLISHING ONTARIO PROVINCIAL STANDARDS

8.1 Publishing Schedule

OPS standards are updated twice yearly on the last Business Day of April and November. Publishing of new and revised standards, cancellation of existing standards and correction of errors in recently published standards can occur at either of these publications.

OPS Administration will prepare and compile all information for publishing.

The following information is available from the MTO Technical Publications website:

- Current versions of the published standards.
- Archived versions of the previously published standards.
- Indexes for each OPS volume.
- Revision Information Sheets for current and previously published standards.
- Revision Information Packages for recently published standards.
- Complete OPS Volumes.

SMC and MTO retain the prerogative to publish a standard immediately, if they determine the need to do so. This is the exception to the rule rather than the norm. The decision to publish a standard is at the discretion of the SMC or MTO. Coordinators should discuss the need to publish standards with the Head as soon as the need has been identified.

Publishing of Ontario Provincial Standards is managed by OPS Administration. Standards are no longer published in hard-copy format, instead they are now available exclusively online at no cost, in electronic PDF format, from the MTO Technical Publications website.

9.0 STRUCTURE OF OPS SPECIFICATIONS

9.1 Types of OPS Specifications

9.1.1 General Specification

General specifications are 100 series numbered and apply to all work. General specifications do not contain tender items. References to the 100 Series OPS General Specifications and the General Conditions of Contract are not to be made in specifications. These specifications apply to all work and must be adhered to by the Contractor.

The General Conditions of Contract is a special form of general specification with a unique structure and formatting that is not covered in this Guide. The General Conditions of Contract covers the administrative and legal aspects of the relationship between the Owner and the Contractor. Construction and material specifications are intended to cover the technical details of the work to be done. It is beneficial to rely to the maximum extent on the General Conditions of Contract, for consistency in the administration of the Contract.

9.1.2 Construction Specification

Construction specifications are numbered between 200 and 999, specify the construction work required by tender items, and may or may not contain tender items. Construction specifications without tender items can only be invoked when referenced by other specifications with tender items.

9.1.3 Material Specification

Material specifications are numbered 1000 or higher and specify the requirements of material. Material specifications do not contain tender items. These specifications are generally invoked when referenced by construction specifications with a handful of exceptions.

9.2 Sections of an OPS Specification

9.2.1 General

[Section 12, Examples 14 and 15]

The standard sections found in specifications and a description of the general content found in each are shown below. The explanations provide the purpose and format of the individual sections but are not necessarily limited to the details discussed.

9.2.2 Table of Contents

[Section 12, Examples 16 and 17]

Each specification has a table of contents that lists all the sections that may be found in an OPS specification. If a section is not used in a particular specification, the section number and title are shown along with the words "-**Not Used**".

The Table of Contents also shows which appendices are attached to the specification.

9.2.3 Section 1.0 – Scope

[Section 12, Examples 18 and 19]

Explains in brief and concise terms the purpose and extent of the specification. This section also describes the significance and use of the specification and the appendices attached to the specification.

9.2.4 Section 2.0 – References

[Section 12, Example 20]

A list of all standards and publications referenced in the body of the specification is given in this section.

The year of issue for these documents is a requirement for this section except for the OPS specifications, as it is assumed that all users have an up-to-date set of OPS specifications. Year of issue for the documents is only shown in this section and not in the body of the specification.

All standards, specifications, and publications referenced within the specification are listed in the References section by number and title. Forms referenced in OPSSs that are developed by an organization other than OPS and are published by the organization on its website or in electronic or hard-copy format are considered to be publications.

Reference Format

a) The phrase "this specification refers to the following standards, specifications, or publications:" is the wording that is to be used to introduce the section.

b) The year of issue or version number for each referenced document in a specification is shown in this section, except in the case where OPS specifications or MTO publications are being referenced, as it is assumed that all users have an up-to-date set of these documents. The date of the standard or publication informs the reader of the version consulted for the reference in the OPSS. Year of issue is not shown anywhere in the specification except in the Reference section.

c) When several standards from the same standards organization are shown in the same sentence (e.g., W47.1, W47.2, and W59.2) indicate the designation prefix or standard organization's name each time (e.g., CSA W47.1, CSA W47.2, and CSA W59.2).

d) Some metric standards are indicated with an "**M**" as part of the standard designation. The "**M**" is shown in the Reference section (e.g., ASTM A240/A240M-00) and is not shown in the body of the OPS specification (e.g., ASTM A240).

e) Standards, specifications, and publications are referenced in alphanumeric order under the name of the organization responsible for their existence. If there is no particular organization or there are miscellaneous publications, they are shown under the title "**Others**". References in OPSSs are listed in a specific order, as appropriate:

   i. Ontario Provincial Standard Specifications, Construction

   ii. Ontario Provincial Standard Specifications, Material

   iii. Ontario Ministry of Transportation Publications

   iv. CSA Standards

   v. ASTM International

   vi. Standards from other standard development organizations listed in alphabetical order

   vii. Others - includes references to miscellaneous standards, publications, etc.

f) Forms are referenced in the section under the title of the organization responsible for the form, and they are the last entry under that title after all other publications of the organization. Forms are to be referenced in the Reference section by the form owner, number, and title. In the body of the specification, forms are only referenced by the form owner and number (e.g., MTO form PH-CC-449a). OPSFs are not referenced in Section 2.

g) The General Conditions of Contract (GCs) and OPS general specifications are not referenced in Section 2 or the body of the OPSS. References are not required to the GCs as it is understood that the requirements set out in the GCs apply to the Contract as part of the Contract Documents.

h) References to the MTO Designated Sources for Material (DSM) are different in MUNI and PROV specifications. The MTO General Conditions of Contract defines the "DSM" acronym and specifies the supply of material from the DSM. The MUNI General Conditions of Contract does not contain any language related to the MTO DSM.

   i. In PROV, the DSM is not listed in the References section. Any references to the DSM in other sections of PROV specifications need only refer to "…. The MTO DSM".

   ii. Any MUNI specifications relying on MTO's DSM must reference the MTO Designated Sources for Material (DSM) under "Ontario Ministry of Transportation Publications". Other sections of MUNI specifications should refer to "the MTO DSM".

9.2.5 Section 3.0 – Definitions

[Section 12, Example 21]

The definitions apply specifically to the specification in which they are given. Definitions are required for words or phrases:

a) To improve the understanding or reduce the ambiguity of the word or phase when the dictionary has several meanings or different senses for the word.

b) When a word in the specification is intended to have a meaning different from the Canadian Oxford dictionary.

c) When their meaning differs from the meaning found in the GCs. Definitions in the General Conditions of Contract (OPSS.MUNI 100, OPSS.PROV 100), which apply to the entire Contract and are not repeated within individual specifications. Words that are defined in the OPS General Conditions are capitalized within the standards if the meaning of the word in the standard is the same as the meaning in the OPS GCs.

Definition Format

a) The phrase "For the purpose of this specification, the following definitions apply" is the standard wording for the introduction of the section. The phrase is always in the plural form, even if there is only one definition.

b) Definitions are arranged in alphabetical order.

c) The word or phrase being defined is capitalized and bolded. Definitions start with the word "**means**" after the word being defined, even if the word is singular.

d) If a word or phrase is used in another specification or document and has the same definition as that word or phrase, then the definition should not be rewritten, but the definition in the other source should be referenced (e.g., …means as defined in…). If one or more definitions from the same specification is referenced, that specification can be included in the introduction of the section (e.g., "For the purpose of this specification, the definitions in OPSS 406 and the following definitions apply").

9.2.6 Section 4.0 – Design and Submission Requirements

[Section 12, Examples 22 and 23]

This section is generally divided into two subsections: Design Requirements and Submission Requirements.

Design Requirements

This subsection explains the design information required by the Contractor for the design of temporary or permanent works. In the Material Specifications, it gives the design criteria for the material/product.

Submission Requirements

This subsection explains any submissions that are required (e.g., notices, test results, and working drawings), and the submission timeline before the Contractor can commence work covered by the required submission (applicable construction operation). These working drawings may show the design of temporary works, such as falsework. Information as to which working drawings are to be submitted, how many copies are required, when submissions are to

be made, and whether the seal and signature of a licenced professional or professionals is required, should be included in this subsection. Submissions are not limited to drawings but may include submission requirements for such items as materials, design calculations, work procedures, etc.

Submissions required after the commencement of construction operations are specified in the Construction section.

Design and Submission Requirements Format

a) If both subsections are used in a specification, design requirements precede submission requirements.

b) Any requirements or statements for a Certificate of Conformance to be issued so the Contractor can proceed with work after an interim inspection are to be shown in the Submission Requirements subsection.

c) Any requirements or statements for a Certificate of Conformance to be issued after work is completed are not shown in Section 4. This requirement belongs in the Construction section.

9.2.7 Section 5.0 – Materials

[Section 12, Examples 24 to 26]

This section details the necessary quality requirements of the material to be used in the work and will typically refer to OPS material specifications or material standards published by other standards organizations (e.g., CSA). Sometimes storage and handling requirements for materials may be specified.

Materials Format

a) References may be made to OPS material specifications or material standards published by other standards developing organizations.

b) The section could state the actual requirements rather than referencing another standard or set the limits to or modify information found in another standard.

c) References to other standards should include the standard and, when appropriate, a particular type/grade of material in the standards.

d) Materials are listed in alphabetical order.

e) The material name used in this section must be used consistently and in full throughout the specification to avoid ambiguity, i.e., if the name used in this section is “high strength bolts”, the term “high strength bolts” and not “bolts” must be used throughout the rest of the specification.

9.2.8 Section 6.0 - Equipment

[Section 5, Examples 27 and 28]

This section details only the mandatory requirements of the equipment to be used in the work. It is normal not to detail equipment that is considered standard equipment to complete an operation (e.g., not listing the asphalt paver and compaction equipment traditionally used to place hot mix pavement). The intention is to minimize the detailing of equipment, thereby providing the Contractor with the necessary encouragement to use the latest equipment and technology available.

The Ontario Provincial Standards are not written to prescribe equipment unless a particular piece of equipment is necessary to complete work that is specialized in nature as long as it fulfills the requirements of the specification. The onus is on the Contractor to complete the work as described in the specification.

Equipment requirements, certification, and capabilities are some of the items included in the section. Equipment is listed in alphabetical order.

9.2.9 Section 7.0 - Construction (Construction Specifications) or Production (Material Specifications)

In OPS specification specifications, the section is titled "**Construction"** and in the OPS material specifications it is titled **"Production"**. This section details the necessary requirements for the construction or production phases of the work to be carried out by the Contractor and may include tolerances and operational constraints. It may also include the quality control requirements which the Contractor or manufacturer is required to perform.

Construction Section Format (Construction Specification) and Production Section Format (Material Specification)

[Section 12, Examples 29 and 30]

a) Where there are several operations to complete in the specification, the operations (i.e., steps) should be detailed in the order the operations must be completed before the next step is undertaken.

b) As with all sections of OPS specifications, subsections start the discussion for a new operation. Related clauses are shown under the appropriate subsection.

c) General subsections or clauses are used when the work pertains to several parts of the subsection or clause. When "**General**" is the title of a subsection, the information in that subsection pertains to the entire section. When "**General**" is the title of a clause, the information in that clause pertains to the entire subsection. Similarly, when "**General**" is the title of a sixth or seventh-level division, the information in that division pertains to the entire next larger division.

d) If there are any operational constraints, they are the first subsection after the general subsection in the construction section and are titled "**Operational Constraints**".

e) The subsection “**Management of Excess Material**” should always the last subsection in the construction section.

9.2.10 Section 8.0 - Quality Assurance

[Section 12, Examples 31 to 36]

This section details those quality assurance requirements that may affect the Contractor’s bid and work planning, such as sampling and testing frequency, acceptance thresholds, and the time required for testing. Statements in the ***Quality Assurance*** section are not instructions to Owners or Contractor; they are information for the Contractor/manufacturer to make them aware of what actions the Owner may take that may impact on their work schedule. In OPS specifications, Quality Assurance is assumed to be an Owner responsibility.

The section details those quality assurance requirements that may affect the Contractor / manufacturer’s work or the Contractor’s bid, such as:

a) Action required by the Contractor in order for the Owner to complete quality assurance.

b) Testing and measurements of the work and the time required for these activities.

c) Those tests and measurements on which the quality of the work will be accepted (i.e., acceptance criteria).

d) Consequences of unacceptable test /measurement results.

e) Provision for Contractor request for review or referee testing or other form of appeal, as appropriate

Quality assurance statements may vary depending on which quality assurance confirmation is required.

9.2.11 Section 9.0 - Measurement for Payment (Construction Specifications)

[Section 12, Examples 37 to 39]

In construction specifications this section details units of measurement and such further details as slope or horizontal measurement. This section is divided into two subsections: "**Actual Measurement**" (i.e., field measurement), and "**Plan Quantity Measurement**" (i.e., pay quantity as shown in the contract).

Measurement for Payment Format

a) When there is more than one method of measuring quantities, all methods are to be included in the section (e.g., mass in tonnes and volume in cubic metres). When there is more than one method to calculate a quantity (e.g., volume: end area or by truck box method), each calculation method should be explained under its own title. When one of the methods of measurement is lump sum (e.g., concrete appurtenances: volume in cubic metres or lump sum) the volume measurement is explained and the lump sum measurement is given as an alternative (i.e., Alternatively, concrete appurtenances may be a lump sum item.)

b) When payment is only by Lump Sum, no measurement of payment is shown.

c) When writing measurement statements, describe fully how the measurement is to be made by indicating such information as: where measurements are taken; measured along the horizontal, slope, or contour; deductions or no deductions; and the unit of measurement.

d) When payment is by each, the standard measurement for payment statement is, "**For measurement purposes, a count shall be made of the number of**" then what is to be counted is indicated (e.g., maintenance holes passing the leakage test and structures installed).

e) The standard plan quantity measurement statement is "When measurement is by Plan Quantity, such measurement shall be based on the units shown in the clauses under Actual Measurement". This statement is always in the plural form (i.e., units and clauses). Plan quantity measurement is used by MTO for a number of tender items as identified in their Contracts. There is no need to refer to adjustment since it is covered by the MTO General Conditions of Contract.

f) Sample measurement for payment statements:

   i. Measurement of sidewalk shall be by area in square metres . . .

   ii. Measurement of concrete appurtenances shall be by volume in cubic metres . . .

   iii. Measurement of pipe culvert shall be by length in metres horizontally along the centreline . . .

   iv. Measurement of hot mix asphalt shall be by mass in kilograms . . .

   v. Measurement of borrow shall be by mass or by volume as specified in the Contract Documents.

   vi. For measurement purposes, a count shall be made of the number of high-voltage splices and terminations completed, regardless of the type, size, or rating.

   vii. For measurement purposes, a count shall be made of the number of service connection appurtenance sets installed.

   viii. Measurement of steel reinforcement shall be by mass in tonnes for the steel reinforcement placed. Alternatively, steel reinforcement may be a lump sum item.

9.2.12 Section 9.0 - Owner Purchase of Material (Material Specifications)

[Section 12, Examples 40 to 42]

The section exists to standardize the process of material purchases by Owners within the industry. The Owners themselves may use the material specifications to purchase material for supply to a Contractor or for maintenance purposes. This section standardizes the basis on which the products are purchased in these situations. The section is not for contract payment to the Contractor as material supplied by the Contractor is included as part of the contract price to do the work.

Owner Purchase of Material Format

a) The section should indicate how the measurement of the product is made and that payment includes supply and delivery.

b) Use a Measurement and Payment subsection in material specifications not the Measurement for Payment or Basis of Payment subsections found in construction specifications.

c) The following statements are standard wording, except the underlined wording is to be revised to the appropriate material:

"Payment at the price specified in the purchasing order shall be for the supply of fence fabric, posts and rails, diagonal wire braces, top and bottom wires, gates, fittings and accessories, turnbuckles, and barbed wires delivered to the destination on the date and time specified."

"The cost of all testing, except that performed in the Owner's laboratory, shall be included in the price."

9.2.13 Section 10.0 - Basis of Payment

Construction Specifications

[Section 12, Examples 43 to 47]

The section exists in the construction specifications only. It details the basis of payment. All payment statements or statements affecting payment should appear in the section. The phrase "**to do the work**" means the work described in the specification, including references to other documents.

Basis of Payment Format

a) Items that are paid as part of the specification have a standard basis of payment statement (i.e., Payment at the Contract price for the above tender items shall be full compensation for all labour, Equipment, and Material to do the work.). The list of items associated with the specification change, but the statement never changes. Items in the list of items that are paid as part of the specification are followed by:" - **Item**".

b) If any of the work discussed in the specification is included in the payment for the tender item of another specification, there needs to be a statement made to this fact.

c) If any of the work discussed in the specification is paid according to the specification, except when there is a separate item that covers the work in the specification, there needs to be a statement to this fact.

d) Other basis of payment statements may be necessary to indicate any work that is to be paid as a Change in the Work.

e) When payment is adjusted based on material testing results or other information, the method of calculating the adjustment, complete with formulae if required, must be fully defined.

f) When payment of a lump sum tender item is to be paid in on a percentage basis depending on milestones (e.g., installation 70%, removal 30%).

g) The MTO and MUNI General Conditions of Contract both allocate responsibility between the Owner and the Contractor for the repair or replacement of defective or damaged work.

Existing specifications may contain statements that specify that repairs and replacements are at no extra cost (or no additional cost) to the Owner. In the interest of consistency in the interpretation and administration of the Contract, when specifications are reviewed these statements should be examined in the context of the General Conditions of Contract and deleted if not required. The General Conditions of Contract language is clear and may be relied on for general instances of work not conforming to the Contract (i.e., defective) or work damaged by the Contractor's operations.

There are other cases where the responsibility for the cost of some aspect of the work may not be clear. In such cases, either a "no additional cost to the Owner" statement, or conversely, an "administered as a Change in the Work" statement, depending on which party is to be responsible, may be included in the Basis of Payment section to provide clarity.

Sample statements:

i. Site visits by a technical expert to restore the PTTS to full operation shall be at no additional cost to the Owner.

ii. Lane closures required for the placement or removal of reflectors, or the collection of static GPS coordinates shall be administered as a Change in the Work.

iii. Replacement of carbide cutter or diamond saw blades to achieve the specified dimensions and shape of the routed groove to the satisfaction of the Contract Administrator shall be at no additional cost to the Owner.

iv. The management of catch basin cleanout material found to be contaminated by a pollutant shall be administered as a Change in the Work.

v. The backfill and compaction of over excavated areas with granular material according to OPSS 1010 shall be at no additional cost the Owner.

Material Specifications

Since 1999, section 10 no longer exists as part of the format of material specifications. The section was titled Designated Sources Requirements in the material specifications. As the older material specifications are being revised, Section 10 is being removed.

9.3 Possible Supplementary Additions to Specifications

9.3.1 Tables

[Section 12, Examples 48 and 49]

Tables referenced in the body of the OPSS are placed immediately after the last section of the specification in the order they are referenced in the body of the OPSS and are a part of the specification.

Table Format

a) For ease of reading and clarity, OPS practice is to keep tables limited to one page, including notes, as much as possible. For information in a table to be legible, tables that are too large for one page may break across pages, as long as there is a note at the bottom of the table at each break stating, "**Continued on Next Page**", and as long as the top of table on the subsequent page contains the table number and title, the column headings, and a note stating, "**Continued From Previous Page**".

b) All tables are to have a title that concisely describes the contents/subject of the table.

c) All tables are normally numbered according to their order of reference in the specification (i.e., the first reference to a table in the specification is Table 1; the next reference to a different table is Table 2, and so on).

d) Parentheses are used around note references (e.g., (Note 1)) and terms that are better known by another name (e.g., polyvinylchloride (PVC)), if not already shown elsewhere in the specification.

e) No parentheses around units of measurement.

f) Title and number of the table and header rows at the top of each column are bolded. Nothing else in the table is bolded.

g) Notes for the table are normally in the last row of the table.

   i. Numeric notes are listed first and refer to a particular part of the table.

   ii. Alphabetic notes are listed second and refer to the table in general terms.

   iii. Parts of a table that require numbered notes are ordered starting in the upper left cell of the table, proceeding right across the row, then down to the left side of the next row moving right proceeding down the table until all numbered notes of the table are identified.

   iv. Both the numeric and alphabetic notes have a period after the number or letter (e.g., 1. and A.)

h) Border of the table and cells are single lines, except as noted.

9.3.2 Figures

[Section 12, Example 50]

Figures are used in specifications to illustrate and clarify something in a specification that may be too confusing to describe in only words. They do not take the place of OPSDs. Their purpose is to add to the readers understanding of the specification.

Figure Format

a) Notes for figures are similar to notes for tables, except numeric notes should be identified on the figure starting at the upper left side of the figure and proceed in a clockwise direction around the figure.

b) Figures are to have a bolded number and title placed below the actual figure.

c) Figure numbering follows the same convention as tables follow.

d) Figures should be provided in AutoCAD format to OPS Administration for inclusion into the specification. Alternatively, provide OPS Administration with a hand-drawn sketch of the figure, including all necessary data to produce an AutoCAD drawing.

9.3.3 Forms

Forms that are developed within OPS for use with an OPSS, or developed by another organization that is suitable and not subject to copyright protection, may be handled in different ways within OPS:

a) If a form is referenced in a specification as being one that is mandatory for the Contractor to complete, it is provided as a part of the specification on a new page, located after the Basis of Payment Section, prior to the Commentary Appendix. [Section 12, Example 51] If an Owner uses their own form, wording in the Commentary Appendix will be added requiring that the contract documentation be changed.

b) If OPS develops a form and it is an option for Owners to use as part of the Contract requirements for the Contractor to complete, it is added to the specification as an extra information appendix and instructions to the designer for use of the form is added to the commentary appendix. When this is the case, the designer needs to invoke the appendix containing the form by referencing it in the Contract Documents.
[Section 12, Example 52]

c) If a form is to be completed during the design of a Contract and referenced in the specification as being part of the Contract requirements, the uncompleted form is provided as part of the commentary appendix for the designers use. An example of the completed form should also be provided as part of the commentary appendix to provide guidance on its use. [Section 12, Example 53]

Forms Format

a) Forms are numbered using the specification number and a sequential number for the form (e.g., if two forms are developed for specification OPSS.MUNI XXX, the forms would be numbered OPSF XXX-1 and OPSF XXX-2).
b) Forms are numbered according to their order of reference within the body of the specification.

c) The form number is shown in bold at the outside bottom left corner of the form, along with the date the specification was published.

9.4 Appendices in OPS Specifications

[Section 12, Examples 54 and 55]

OPS specifications (OPSSs) published since 2000 have at least one appendix. As the older OPSSs are reviewed, appendices will be added to them. Appendices are attached to the OPSSs for ease of access to the Owner and are written for use by the Owner.

Appendices are not automatically part of the OPSS or the Contract Documents. This is the default condition. Before an appendix becomes part of the Contract Documents, the Owner/designer must invoke it by reference in the Contract Documents. Each Owner is responsible for determining which appendices will be used in their Contracts.

Each appendix has an introduction. The introduction includes the appendix designation and date. There is also a standard worded note for each type of appendix.

There are three types of appendices in OPSSs:

1) **Commentary** - this type of appendix provides designers with information on the use of a specification in a Contract. A commentary is required for all construction and material specifications. Owners may have their own Contract preparation documentation that supersedes this type of appendix. Commentary appendices are notes to designers so will never be invoked in a Contract and they are only information to the designer.

Commentary Appendices Format

a) Each commentary is divided into two sections: Designer Action/Considerations and Related Ontario Provincial Standards Drawings.

b) List the type of information that a designer should add to the Contract Documents to complete the specification for all instances that the phrase “as specified in the Contract Documents” is used in the specification.

c) List the type of information that a designer should consider whether or not to add to the Contract Documents to complete the specification for all instances that the phrase “when specified in the Contract Documents” is used in the specification.

d) The statement “The designer should ensure that the General Conditions of Contract and the 100 Series General Specifications are included in the Contract Documents”

shall be included in all commentary appendices in common and municipal-oriented OPSSs.

2) **Additional Information** - this type of appendix includes information that can be used as supplementary information to the specification or supplementary requirements to modify a specification. They are written in mandatory language to allow Owners to invoke the additional information option in a Contract without revising the appendix.

The additional information is data that was not included in the specification as it does not represent standard practice in most jurisdictions, but some Owners may wish to apply it to their Contracts. Over time, this additional information may become part of the specification as it becomes more widely used and accepted. Examples of additional information are referee testing, retesting procedures, and gradation tables.

3) **End-Result Specification (ERS)** - this type of appendix provides ERS information written in mandatory language to allow Owners to invoke the ERS option in their Contracts by reference in the Contract Documents. The entire appendix must be invoked to make the specification end-result oriented.

10.0 WRITING OPS SPECIFICATIONS

10.1 General

Specifications apply after a Contract has been awarded and signed. When writing specifications, the specification should be written to provide the Contractor and Owner's representatives with the Owner's expectations, how payment will be made, materials to use, etc. From this information the Contractor is able to provide a bid for the work. For this reason, specifications should not contain instructions that indicate work or payment or both that will be determined once the Contract starts.

Ontario Provincial Standard specifications are written for the Contractor's information and the Owner's protection. As such, the specifications should be complete, yet concise, containing all pertinent information necessary for construction or production, and should adhere to the following principles:

a) **Avoid Ambiguity**: A specification should be written to avoid ambiguity. The intentions of the Owner will then not be subject to misunderstanding or misinterpretation by the Contractor.

b) **Avoid Repetition**: Once specified, a requirement of the work to be carried out should not be repeated within the specification since a restatement of a requirement, regardless of how carefully worded, may be interpreted differently.

c) **Write Practicality**: Specification requirements regarding construction or production processes must be practical; it is pointless to specify a process or result that cannot reasonably be accomplished. However, specifications should not preclude technological advancements that may make a process practical and economical.

d) **Avoid Referencing Laws**: Ontario Provincial Standards generally do not repeat federal, provincial, or municipal laws, bylaws, or statutes as requirements, since the Contractor is bound by the laws of the land. A reference to any laws or bylaws may raise unwarranted and undesirable precedence in the mind of the Contractor.

e) **Referencing**: Rather than copying information from other sources, a reference should be made to the source where the data can be found.

   i. External: OPS supports the referencing of Canadian standards in its specifications. If there is a Canadian standard and a standard from another country, the preference is to reference the Canadian standard, if it is appropriate and fulfils the requirements being conveyed in the OPS specification.

   ii. Internal: OPSSs do not reference OPSDs and vice versa. This sort of referencing can lead to errors and misinformation if a specification is revised but not the corresponding drawings or if a drawing is cancelled or a new drawing is developed the specification will require updating also. In some cases, there are several drawings depicting different methods that designers could choose to complete a particular operation. Designers should be the ones who decide which drawing they wish to include in their contract package.

OPSSs may be referenced in another OPSS and OPSDs may reference other OPSDs. To avoid ambiguity, individuals revising or developing standards should ensure that all referencing of other standards is complete, accurate, and suits the purpose for which the reference is intended.

References to sections, subsections, and clauses should be made to the title rather than to the number of the information being referenced. This is to avoid any misinterpretation should the section/subsection/clause number be changed and the reference to the number was missed during the review of the specification (i.e., the reference may be to a number that has information that does not pertain).

OPSSs are revised and developed in MS Word and converted into PDF for publishing on MTO's Technical Publications website.

10.2 OPS Specification Style

10.2.1 OPS Specification Outline

OPSSs are limited to a maximum eight levels of division.

The OPS logo is located at the top left-hand corned of the first page of a specification. The number and year of the specification are located parallel to the OPS logo at the top right-hand corner of the specification. The logo and the title of the specification are separated by triple line spacing, and the title of the specification and the table of contents are separated by a single line spacing.

Each section of the Table of Contents is separated by single line spacing, with double line spacing before Appendices, and triple line spacing after Commentary.

Within the body of the specification, there is double line spacing between sections and single line spacing in all other divisions, except between seventh and eighth level divisions where there is no line spacing [Examples 14 and 15]. Formatting conventions are:

a) The title of a specification is bolded, upper case, and centred at the beginning of the specification.

b) Specifications are divided into sections, subsections, and clauses. The number of sections is ten in construction OPSSs and nine in material OPSSs. Sections are not limited in the number of subsections they contain, but each subsection is limited to three levels of clauses. Section, subsection, and clause numbers are bolded and flush with the left margin while their bolded titles are indented to 37 mm. Section titles are bolded in upper case while subsection and clause titles are bolded in title case.

c) For major partitions within a subsection that does not contain clauses or within a clause, use lower case letters with a single closing parenthesis. The major partition letter is flush with the left margin while the text is indented to 6 mm. Major partitions normally do not have a title. If a major partition has a title, it is in title case but not bolded.

d) For subdividing major partitions, use lower case Roman numerals with a period after the numeral. The Roman numeral is indented to 6 mm while its text is indented to 12 mm.

10.2.2 Referencing OPS Specifications Within Another OPS Specification

To avoid ambiguity, people revising, or developing standards should ensure that all referencing of other standards is complete, accurate, and suits the purpose for which the reference was intended.

a) In the Basis of Payment section of OPS construction specifications is the phrase “shall be full compensation for all labour, Equipment, and Materials to do the work”. Generally, the work is interpreted to mean the work described in the specification and work described in referenced standards. This has been the intent of the phrase since its inception.

b) The work in the Construction section of an OPSS requires all the other sections in the specification in order to be completed. Therefore, you cannot reference one section without invoking the entire specification.

c) When a reference to an OPSS is made by another OPSS to cover work requirements, the entire referenced specification is invoked.

When a reference is needed to invoke another OPS construction specification, the reference should be made in the Construction section of the referencing specification. An example would be, to cover the work required for the installation of deck joints and joint materials in a structure, the following is included in OPSS 904:

904.07	**CONSTRUCTION**
904.07.0	**Deck Joint Assemblies and Joint**
Deck joint assemblies, joint fillers, joint seals, joint sealing compounds, and external waterstops shall be according to OPSS 920.	

d) When a reference to an OPSS is made by another OPSS to cover material requirements, the reference is made in Section 5, Materials. This reference invokes the entire referenced OPS material specification, as the entire specification is a material specification that describes nothing but the requirements for a product/material. All the other sections in the referenced specification are required in order for a product/material to be completed.

e) If there is ever a need to invoke a portion of a specification without invoking all of the specification, then specific references need to be made (e.g., if the statement “Testing for early strength of concrete shall be according to the Testing for Early Strength clause in OPSS 904**”** is made in OPSS 920, then only that clause is invoked.).

f) If there is conflict in the information between the referenced OPSS and the referencing OPSS, then the information in the referencing OPSS supersedes the referenced specification. (e.g., where OPSS 920 references OPSS 904, the concrete subsection in OPSS.MUNI 920 supersedes the concrete subsection in OPSS 904.).

To ensure that there is no confusion understanding what requirement applies to a particular operation, references should be made to the correct specification and any exceptions, or contrary or additional information should be clearly noted in the referencing specification.

g) When work can be paid in more than one way, then payment statements need to be clear as to how the contractor is paid to do the work in a given situation. For example: Deck joints are paid as part of the concrete tender item in which the deck joint assemblies are incorporated when the deck joints are installed as part of new construction under OPSS 904 and deck joints can also be paid as a separate item under OPSS 920.

In OPSS 904, the reader is told that:

904.10.0	**Deck Joint Assemblies, Bearings, and Deck**
When the Contract does not contain a separate tender items for deck joint assemblies, bearings, and deck drains, the Contract price for the concrete tender items in which the deck joint assemblies, bearings, and deck drains are incorporated shall include full compensation for all labour, Equipment, and Material required to place the deck joint assemblies, bearings, and deck drains.	

The reader looks in the tender to determine if there is a separate tender item for deck joints. If there is no item, then the deck joints are paid as part of OPSS 904 tender items. If there is an item for deck joints, then the joints are paid under the item as described in OPSS 920.

920.10.0	**Deck Joint Assemblies, Installation - Item Deck Joint Assemblies, Modification - 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.	

h) Ensure that all required work is covered by a reference to another specification if the specification being revised or developed does not describe the required work itself. (e.g., OPSS 904 correctly does not describe the work relating to deck joints. This work is described in OPSS 920.).

i) Specifications being revised or developed should provide a clear description of the work required and how payment for the work will be made. It is imperative that the authors of any revision or development of standards are familiar with what is stated in all related/referenced specifications to clearly describe the work and payment without duplicating requirements.

10.3 OPS Writing Style

10.3.1 Format

a) Paper size is 8.5 x 11 inches oriented normally to portrait; landscape for wide tables.

b) Margins are set to 25 mm (1”) all around the page.

c) OPS specifications are produced in a single column format.

d) Tabs for the document are set from the left margin at 6, 12, 18, 24, 37, and 101 mm (0.24, 0.47, 0.71, 0.95, 1.46, and 4.0 inches).

e) Text is justified.

f) The order that information is presented in an OPSS is standard:

   i. Specification technical information by section

   ii. Tables referenced in the specification

   iii. Figures referenced in the specification

   iv. Forms referenced in the specification

   v. Appendices

      - commentary appendix

      - additional information appendices

      - end-result appendices

g) Tables, figures, and forms (OPSFs) that are referenced in the specification are placed at the end of the specification. Tables, figures, and OPSFs all start on a separate page; several tables call be placed on one page depending on table size as can figures; and each OPSF is on a separate page.

h) Appendices are to be placed after the last page of the specification whether the end of the specification is a section, table, figure, or OPSF.

10.3.2 Spelling

Canadian spelling is used in OPS. Where there are variant spellings or forms of a word, the most common Canadian usage, as provided in a Canadian dictionary, is to be used. If applicable, spelling from MTO glossary lists or Ontario government official spelling is to be used and shall take precedence.

Definitions and spelling are according to the latest edition of the following, consulted in the order listed:

a) Oxford Canadian Dictionary

b) Canadian Oxford Spelling Dictionary

c) Collins Gage Canadian Dictionary

d) Merriam-Webster's Collegiate Dictionary

e) Other sources.

10.3.3 Grammar, English Usage, and Punctuation

Except as outlined below, English usage and style are according to the latest edition of the following, consulted in the order listed:

a) Oxford Guide to Canadian English Usage

b) The Gregg Reference Manual, Canadian Edition

c) The Canadian Press Stylebook

d) McGraw-Hill Handbook of English

e) Other sources.

Parentheses ( ) are used:

a) To enclose abbreviations or acronyms that will be used again throughout the specification.

b) When they are a part of the title of a standard or publication being quoted in OPS.

c) In formulas and equations and in statements defining a term in a formula or equation.

d) Alternate terms (e.g., natural polyisoprene (natural rubber) and polychloroprene (neoprene)).

e) To enclose references to notes in tables (e.g., (Note 1)).

f) When e.g. and i.e. are used (e.g., (e.g., standards) or (i.e., without movement)).

Brackets [ ] and braces { } are used:

a) In formulas or equations.

b) When they are a part of the title of a standard or publication being quoted in OPS.

As there are differing opinions on how some punctuation is applied, OPS uses the following punctuation preferences:

a) Comma after the item immediately preceding a conjunction in a series of three or more items (e.g., red, white, and blue).

b) Periods and commas inside the closing quotation mark; exclamation and question marks outside the closing quotation mark unless the mark is part of the quote.

c) Semi-colons are used to separate items in a series of three or more when there is other punctuation in the series (e.g., You can have bacon, ham, or sausage; toast or English muffin; two eggs; coffee, tea, or juice; and home fries.).

d) When using e.g. for the abbreviation of "**for example**" or i.e. for "**that is to say**", the abbreviations and the term or phrase used with it are placed in parentheses and the abbreviation is punctuated with periods and a comma, that being: (e.g., . . .) or (i.e., . . .).

10.3.4 Font

The font used in OPSSs is Arial and formatted as follows:

a) Ontario Provincial Standards, beside the logo - 11 pt. bold

b) Specification designation, top right corner - 12 pt. bold

c) Specification title - 12 pt. bold

d) Table of contents - 10 pt. bold

e) Body of the specification - 10 pt. regular, bold for titles

f) Tables and figures:

   i. Table and figure numbers and titles - 10 pt. bold

   ii. Body and notes - normally 10 pt. regular; smaller to 8 pt. regular to fit table on one page; bold font for column headings

   iii. Appendices

   iv. Introductory note - 9 pt. bold

   v. Title and body – 10 pt. regular, bold for title and headings

Enable the embed fonts feature in MS Word. This feature stores the fonts used in the document with the document file. Others who open the document will be able to view and print it with the fonts used to create it, even if those fonts are not installed on their computers. To enable this feature, in current versions of MS Word, navigate to File > Options > Save and toggle "Embed fonts in the file".

10.3.5 Symbols

The use of words instead of symbols is recommended within the body of the specification, particularly for less than or equal to, or greater than or equal to. For tables, use the MS Word symbols from the subsets listed below, when using symbols in an OPS document. They are available in MS Word on the Insert menu, click Symbol, and then click the Symbols tab; in the Font box click (normal text) and the subset you require, or you can use the shortcut keys listed below. The number keypad must be used for the shortcut keys.

The following symbols are from within the Basic Latin subset:

< - less than	Shortcut key: < key on keyboard
> - greater than	Shortcut key: > key on keyboard
± - plus or minus	Shortcut key: Alt+0177
µ - micro	Shortcut key: Alt+0181
° - degree	Shortcut key: Alt+0176
· - middle dot (as in N·m)	Shortcut key: Alt+0183

The following symbols are from within the Mathematical Operators subset:

≤ - less than or equal to	Shortcut key: 2264 Alt+X
≥ - greater than or equal to	Shortcut key: 2265 Alt+X
× - multiply	Shortcut key: Alt+0215
² - squared	Shortcut key: Alt+0178
³ - cubed	Shortcut key: Alt+0179

Most symbols necessary to make a formula are found in the Basic Greek subset.

10.3.6 OPS Preferences

a) Use words for single-digit numbers, unless before a unit of measure (e.g., metres, grams, days, years). Figures can be used for numbers ten and greater. This only applies to whole numbers.

b) If a sentence begins with a number, the number is to be spelt out, regardless of whether it is referring to a unit of measurement or not.

c) When writing numbers that indicate there is a range, numerals shall be used. (e.g., 3 to 12 poles) include the unit of measurement after the last number only. (e.g., 25 to 30 mm not 25 mm to 30 mm, 30 to 40% not 30% to 40%, 10 to 50 °C not 10 °C to 50 °C).

d) Use a nonbreaking space to avoid having part of a number orphaned on a separate line. Avoid awkward breaks that orphan a number at the end of a line of text, (e.g., 7 mm), and the unit at the beginning of the next line as in this example by using a nonbreaking space between all numbers and units. This shall also be done for specification numbers (e.g., OPSS.MUNI 182).

e) A space is inserted between a number and a unit of measure, with the exception of percentages (e.g., 70%).

f) When writing numbers to indicate tolerances, indicate the unit of measurement after each number. For example:

25% ± 1.25% not 25 ± 1.25% or 25% ± 1.25

12 mm ± 2 mm not 12 ± 2 mm or 12 mm ± 2

g) When writing numbers to indicate slope ratios, use numerals and indicate the horizontal and vertical numbers with an H or V, starting with the horizontal number first. (e.g., 1H:2V not 1:2, 3H:1V not 3:1)

h) Standard words and phrases that are standard for Ontario Provincial Standards are listed in Attachment 10-A.

i) Standard wording format is shown in Attachment 10-B.

j) Discussion regarding some terms used in OPSSs are shown in Attachment 10-C.

k) Terms not to be used in OPS are shown in Attachment 10-D.

l) The auto numbering/bullets option in MS Word is not used.

m) Time is shown in a 24-hour time format (e.g., 09:00 to 18:30 rather than 9:00 am to 6:30 pm).

n) Do not use "**will**" anywhere in the specification. Use such terms as "**shall**", "**may**", "**is**", or "**are**", as may be appropriate. [See discussion in Attachment 10-C]

o) Gender neutral wording shall be used at all times in OPS standards and documentation. Any gendered wording used in past versions of standards shall be replaced in subsequent updates. This includes terms such as 'his' and 'hers', but also terms such as 'manhole', which is to be replaced with 'maintenance hole'.

p) When referencing standards other than OPSSs in the Reference section, do not show the prefix of the standard number, but do show the prefix in the body of the specification (e.g., S6:19 under the CSA title in the Reference section is shown as CSA S6 [without the date] in the body of the specification.)

q) Abbreviations are used throughout the standards.

   i. When an abbreviation is to be used, the first time the entire word or phrase is used, include the abbreviation in parenthesis after the word or phrase.

   ii. Spell out the entire abbreviated word or phrase in section, subsection, and clause titles.

   iii. When a word or phrase has been abbreviated, use the abbreviation, except as noted in point ii. above, or when use of the word or phrase adds to the clarity of what is being discussed.

r) Use of phrases such as "**the Contractor shall"** is not necessary in specifications as specifications are instructions to Contractors and it is redundant to repeat such phrases. Sentences are to be rewritten to avoid use of these phrases. The only exception to its use would be in Section 8, Quality Assurance, which is stating work that is carried out by the Owner that could affect the Contractors work, and clarity is necessary to avoid ambiguity. The use of the word Contractor in Section 8 should be minimized and in most cases will not be required.

Attachment 10-A

Standard Words and Phrases for Specifications

RATHER THAN:	USE:
1.5m minimum to 3.0m maximum	1.5 - 3.0m (OPSD)
15 radius or 15m or R=15	15R or 15mR
1 week, 2 weeks	7 Days, 14 Days
21 Days, 28 Days, etc. (except 28-Day)	3 weeks, 4 weeks, etc.
24 hours a day 7 Days a week	24/7
3:1	3H:1V
and/or	xxx and xxx, xxx or xxx, xxx or xxx or both
bimonthly	every two months
bimonthly	twice a month or twice monthly
biweekly	every two weeks
biweekly	twice a week or twice weekly
biyearly	biannual or twice a year
biyearly	biennial or every two years or lasting two years
cadweld or cad weld	thermite weld
cast in place	cast-in-place
catchbasin	catch basin
cold in place	cold-in-place
conform, conformance, accordance, conformity	shall be according to
cross section	cross-section
date of (e.g., manufacture) equivalent to	date (i.e., yyyy-mm-dd) of (e.g., manufacture) equal to
granular A	Granular A
labour, equipment, and material	labour, Equipment, and Material
LS–xxx, xxx, and xxx	LS-xxx, LS-xxx, and LS-xxx
ml, Ml, or ML for millilitres	mL
mold	mould
None	No information provided here. (in appendix A)
OPSS NNN and NNN OPSD NNNN and OPSD NNNN	OPSS NNN and OPSS NNN OPSD NNNN and NNNN (opposite of OPSS)
percent	per cent
prequalified	pre-qualified
required to do the work	to do the work (in section 10)
right of way	right-of-way
rip rap or riprap	rip-rap
sawcut or saw-cut	saw cut
set back	setback
specified, specified in the Contract, specified in the Contract Drawings, specified in the Contract Documents	As specified in the Contract Documents (OPSS), as specified (OPSD)
styrofoam or, more accurately, Styrofoam	expanded styrene
the above item	the above tender item
utilize	use
will, must	shall, may, is, or are, as appropriate
he or his, her or she	they or them
manhole	maintenance hole
flagman	traffic control person
foreman	supervisor

Attachment 10-B

Standard Format, Wording, and Phrases

Note: Words and phrases *italicized*/double underlined in some examples are for illustration purposes and may be changed as appropriate to reflect the intent of the required documentation.

Working Drawings - Engineer's Seal and Signature

The following formats shall be used as standard wording when a specification or special provision requires documents to be sealed and signed by a professional Engineer. Similar language may be adopted for documents signed by other professionals.

The second sentence in the first paragraph of each example (i.e., with or without a design element) informs the Engineer of the purpose of the affixed seal and signature. The second paragraph provides for any cases where Working Drawings may contain engineering expertise from more than one discipline. The entire wording format is to be used in all instances where Working Drawings require an Engineer's seal and signature. The second paragraph of the wording format may be deleted for documentation other than Working Drawings, as appropriate.

Documentation without a Design Element:

The Contractor shall submit 4 sets of Working Drawings to the Contract Administrator at least 14 Days prior to the commencement of fabrication, for information purposes only. Prior to making a submission, an Engineer's seal and signature shall be affixed on the Working Drawings verifying that the drawings are consistent with the Contract Documents.

Where multi-discipline engineering work is depicted on the same Working Drawing and a single Engineer is unable to seal and sign the Working Drawing for all aspects of the work, the drawing shall be sealed and signed by as many additional Engineers as necessary.

Documentation with a Design Element:

The Contractor shall submit three sets of falsework Working Drawings to the Contract Administrator at least 1 Day prior to commencement of erection of falsework, for information purposes only. Prior to making a submission, the seals and signatures of a design Engineer and a design-checking Engineer shall be affixed on the Working Drawings verifying that the drawings are consistent with the Contract Documents.

Where multi-discipline engineering work is depicted on the same Working Drawing and the design or design-checking Engineer or both are unable to seal and sign the Working Drawing for all aspects of the work, the drawing shall be sealed and signed by as many additional design and design-checking Engineers as necessary.

Attachment 10-C

Discussion on Some of the Words and Phrases Used in OPS Specifications

. . .shall be according to. . . This phrase indicates that work, products, or materials are to meet the requirements of another standard or publication. For consistency, as specifications and drawings are being revised or when new standards are being developed, this phrase shall replace or be used rather than phrases such as "**shall be in conformity**", "**shall be in conformance with**", or "**shall be in accordance with**".

shall, may, should, and will: "**Shall**" is used to convey a mandatory obligation. "**May**" is used to convey there is a choice. "**Should**" is used to convey a recommendation that is not a mandatory obligation. While a common usage of "**will**" for most people, but not all people, would indicate a mandatory obligation, "**shall**" is used in the Ontario Provincial Standards. "**Will**" may still be found in some of the older Ontario Provincial Standards and, in such cases, it is to convey a mandatory obligation. For consistency and to remove all potential speculation of the meaning of "**will**", as specifications and drawings are being revised or when new standards are being developed "**will**" is being replaced.

. . . as specified in the Contract Documents This phrase is used to indicate to the Contractor that the Owner has requirements supplemental to the standard that can be found in other parts of the Contract Documents. Some older specifications use the phrases "**specified in the Contract**" or "**as specified**". For consistency and to remove all potential speculation of the meaning of these phrases, as specifications are being revised or when new standards are being developed, they are being replaced by "**as specified in the Contract Documents**". Due to space concerns, the phrase "**as specified**" will be used on the OPS drawings to mean "**as specified in the Contract Documents**".

Contract Administrator: Term used when referring to the Owner's representative.

Engineer: This term is used when something needs to be reviewed, approved, supervised, or acted upon by a professional engineer and is defined in both the MUNI General Conditions of Contract and the MTO General Conditions of Contract. The definition in older specifications should be deleted as they are revised.

When the term Engineer is used in a specification to mean as defined, treat Engineer as a proper name and capitalize the E to remove any ambiguity of the word's meaning. The preferred phrase for stating approval by an Engineer is "**bearing the seal and signature of an Engineer**".

Day, Working Day, and Business Day: These terms are defined in the General Conditions of Contract. The term "**Day**" is used rather than "**calendar day**". "**Working Day**" is used when describing the timing of an operation is to be completed based on the controlling operation of the contract. "**Business Day**" is used when describing the timing based on Monday to Friday.

Material: Use the singular form of the collective noun material in the Basis of Payment paragraph.

that and which: Use "**that**" with restrictive clauses and "**which**" with non-restrictive clauses. A restrictive clause is one that is essential to the meaning of the word it is modifying (e.g., The book that Michael lent me is informative.). A non-restrictive clause is one that adds information that is not essential to the meaning of the sentence (e.g., The standards manual, which Michael lent me, is informative.). Non-restrictive clauses are preceded with and followed by a comma.

Attachment 10-D

Discussion on Some of the Words and Phrases Not To Be Used in OPS Specifications

Superfluous phrases should be avoided in specifications and every effort should be made to detect and eliminate them. The following phrases, and phrases similar to them, should not be used:

a) "**The Contractor is hereby notified**" or "**the Contractor's attention is drawn to the fact that**": All the Contract Documents are written to the Contractor, so these types of phrases are superfluous.

b) "**At the contract price per cubic yard**": The term contract price means the accepted price bid by the Contractor per unit of work as indicated on the tender form, therefore, per cubic yard is superfluous.

c) **"In accordance with the contract drawings"** and **"as herein described"**: Use "as specified in the Contract Documents".

d) "**As directed by the Contract Administrator**": The General Conditions of Contract already indicate the Contract Administrator's authority to direct.

e) "**Unless otherwise specified**": Anything in an Ontario Provincial Standard can be modified by an Owner, so we do not need to tell them this fact. A prospective Contractor is not able to bid on what might be directed. The Ontario Provincial Standards are written as the standard. If an Owner does not agree with the standard, they can revise it by writing a special provision.

11.0 DEVELOPING OPS DRAWINGS

Volume 3 of the OPS manuals contains the standard drawings for roads, barriers, drainage, sanitary sewers, watermains, and structures and the abbreviations and symbols used in this volume. The drawings are divided into twelve series. Each series contains individual drawings related to the series title.

Volume 4 of the OPS manuals contains the standard drawings for electrical work and the abbreviations and symbols used in this volume. This volume is divided into seven series. Each series contains individual electrical drawings related to the series title.

11.1 General Requirements

The detail of direction conveyed by a drawing greatly improves acceptance and understanding by all users. Therefore, standard drawings should exhibit requirements that:

a) Do not repeat, in note form, the directions or conditions stated elsewhere in the Contract Documents.

b) Do not conflict with or weaken Contract directions and conditions.

c) Enhance, where necessary, the directions and conditions described in the specifications, but with obvious limits.

d) Accurately and adequately describe, in graphical form, the full range of choice or alternatives allowed in the specification.

11.2 OPS Drawing Format

Draft Format

[Section 12, Example 12]

Whether a drawing is being revised or a new drawing is being developed, the drawing is to be reviewed in draft form. The idea is to make every effort possible to ensure that a drawing in progress is not taken as being a final drawing and used in a Contract.

In draft format, there is nothing to identify the drawing as an Ontario Provincial Standard except as noted below. The amended title box indicates:

a) Drawing number and title.

b) Drawing is in draft form.

c) Revision number.

d) Draft date.

e) Drawing is not for use in contracts.

The drawing number and title correspond to the final drawing number and title. Revision numbers change incrementally, beginning at zero, with each published change to the drawing.

The draft date is the date when the drawing was last revised by the SC or the Committee Coordinator.

Final Format

[Section 12, Example 13]

After a drawing has been revised or developed and is ready for publishing, the drawing is placed into the final format.

In final format, the drawing contains the OPS logo and the phrase "**ONTARIO PROVINCIAL STANDARD DRAWING**". The title block also indicates:

a) Drawing number and title.

b) Publication date.

c) Revision number.

OPS users are not encouraged to modify OPSDs but, if it becomes necessary to do so, a space has been provided in the title block for a user to indicate:

a) "**Modified**".

b) Modification date.

c) Contract or work project number for which the drawing was modified.

11.3 OPS Drawing Style

Note: The format and style discussed in Section 10 of this Guide apply to the OPS drawings, except where the style and format described in Section 11 differs from Section 10, in which case, Section 11 shall apply as appropriate.

General

a) OPSDs are revised and developed in AutoCAD and converted into PDF for publishing on MTO's Technical Publications website.

b) OPS uses MTO's Integrated Engineering System Computer Aided Design (IESCAD) productivity tool for standardized and automated design and drafting processing.

c) OPSDs are contained in two volumes: Volume 3 is drawings for roads, barriers, drainage, sanitary sewers, watermains, and structures; and Volume 4 is for electrical drawings.

d) Standard drawings show dimensioned illustrations of components for roads, public works, and construction requirements along with notes that are intended to clarify the illustration.

e) If the IESCAD customization menu has a symbol depicting a particular feature/situation (e.g., welding and arrow symbols), use the IESCAD symbol rather than creating a new symbol.

Font

[Section 12, Example 56]

The font used in OPSDs are romans.shx (regular text) and romand.shx (bold text) in MTO's IESCAD and formatted as follows.

Note: Before changing font sizes because of space issues, try compressing width factor in AutoCAD by 10% maximum before using the standard smaller size text described below. As a last resource, if space is still an issue after compressing the width factor and using the smaller text, there is a layer in OPS IESCAD to use that is based on TEXT15, Red as its standard. Again, this layer is a last resource to use before breaking the drawing into multiple drawings, and only if breaking the drawing into multiple drawings is not an option.

Font information located on Border Layer of OPSDs in IESCAD.

a) In title block, draft format:

   i. THIS DRAFT STANDARD IS NOT FOR USE IN CONTRACTS - uppercase, TEXT25, White.

   ii. DRAFT and date - uppercase, TEXT50B, Blue.

   iii. Revision number - bottom right section, TEXT25, White.

   iv. Drawing designation line - uppercase, TEXT45B, Cyan.

   v. Drawing title - text style as shown in [Section 12, Example 56].

b) In the title block, final format:

   i. ONTARIO PROVINCIAL STANDARD DRAWING - uppercase, TEXT30, Green.

   ii. Date - first three letters of the month (e.g., Nov) and the year, TEXT25, White.

   iii. Revision Number - TEXT25, White.

   iv. Drawing designation - TEXT45B, Cyan.

   v. Drawing title - text style as shown in [Section 12, Example 56].

c) Drawing area:

   i. Detail labels - sentence case, TEXT25, White, where space is an issue: TEXT20, Yellow.

   ii. Detail titles - uppercase, main titles TEXT30B Green, subtitles TEXT25B White.

   iii. Tables - TEXT25, White, where space is an issue: TEXT20, Yellow.

   iv. NOTES and LEGEND titles - uppercase, TEXT30, Green.

   v. Notes - TEXT25, White, where space is an issue: TEXT20, Yellow.

   vi. Dimensions - TEXT20, White.

   Note: Main titles as those for sections, views, and details. Other titles are subtitles.

Symbols and Abbreviations and Lines, Templates, and Pens

Symbols and abbreviations used throughout the OPSDs are standardized and recorded in the OPSD 100 Series in Volume 3 and OPSD 2000 Series in Volume 4.

Line work, template sizes, and pen sizes are standardized in IESCAD and are the responsibility of OPS Administration.

Spelling, Grammar, and English Usage

Guidelines written in the Ontario Provincial Standard Specification Format subsection apply to the OPSDs [see 10.1 for more information].

Format

a) Paper size is 8.5 x 11" orientated to portrait or landscape.

b) Margins are set at 6 mm for left, right, and bottom and 20 mm for top.

c) Drawing information is contained in the title block in the lower right corner of the drawing, whether the drawing is in draft or final form.

Style

[Section 12, Example 57]

a) Notes on OPSDs:

   i. Notes on OPSDs are indicated by letter or number. Numbered notes precede lettered notes under the heading **NOTES**. Numbered notes apply to a specific characteristic identified on the drawing while lettered notes apply to the drawing in general with no specific reference to a detail on the drawing.

   ii. Notes are written as instructions to the Contractor.

   iii. When referencing another OPSD in the Notes, use the phrase, "This OPSD to be read in conjunction with OPSD 111.110 and 111.112."

   iv. The last lettered note on a drawing should indicate the most common unit of measurement used on the drawing. If there are no dimensions on the OPSD, this note is not included. All other units of measurement are to be shown after the dimension whether or not the dimension is used in a phrase.

   v. Use the phrase "**as specified**" on all drawings rather than "**as specified in the Contract Documents**" due to space constraints on the drawings.

b) Standard wording for Notes:

   i. This OPSD is to be read in conjunction with OPSD XXX.XXX.

   ii. All dimensions are in millimetres unless otherwise shown. (millimetres may be metres as appropriate)

iii. For _____ details, see OPSD XXX.XXX.

iv. _____ shall be according to OPSD XXX.XXX.

c) Units of measurement are not shown on the drawing dimensions except when the dimension is part of a phrase (i.e., when the dimension stands alone, there is no unit of measurement shown) and if the unit is different than the unit shown in the last lettered note on the drawing. If the dimension is part of a phrase, abbreviated units of measurement are shown following the dimension without a space between them (e.g., 250mm on centre).

d) Use of letters for dimensioning and describing drawing features:

i. When indicating a varying dimension on a particular portion of a drawing that is taken from a table of dimensions, use an italicised lower-case letter (e.g., *a*, *b*, *c*, etc.).

ii. When describing a particular feature on a drawing that is described elsewhere on the drawing, say in a legend, use an italicised upper-case letter (e.g., *A*, *B*, *C*, etc.).

iii. When describing a particular feature on a drawing and the letter is also a dimension, use an italicised upper-case letter (e.g., *A*, *B*, *C*, etc.).

e) Sections should begin at A-A on each drawing and proceed through the alphabet for as many sections are necessary to completely illustrate the shape or features being depicted on a drawing.

f) Use of Typ (typical):

i. Typ is used to indicate information on a drawing that is repeated on a drawing.

ii. Use a comma after the text or number immediately before Typ when it is on the same line as the text or number (e.g., . . . 55 mm, Typ). A comma is not used when Typ and the text or number are on different lines.

iii. Typ is used when a feature of a view has a label, dimension, description, etc. and the feature is shown again elsewhere on the same view or on another view, and it is clear that it is the same feature.

iv. If there is any possibility of confusion to a user of the drawing when Typ may be used, do not use Typ. Repeat the label, dimension, description, etc. where the feature is shown each time.

g) OPSDs should show only the information that is the subject of the drawing and not the details of features that are covered by other OPSDs. For example, an OPSD for roadway widening for the installation of a guide rail system should only show the widening details as they relate to the roadway and the system; system details and layout should not be shown as they are covered by the system OPSDs.

h) When an OPSD for one purpose contains an item detailed on another OPSD (e.g., a cable guide rail installation OPSD shows turn buckle assembly that has its own OPSD),

the turn buckle should be labelled on the installation drawing as "**Turn buckle assembly, OPSD XXX.XXX**" [not "**see OPSD**"].

OPSD Numbering

a) The numbering is based on the decimal system in order to accommodate additional drawings within a series without altering the numbers already in place.

b) Each drawing within a given series is numbered and should be grouped with other standard drawings of the same subject. Every effort is to be made to keep like drawings together without leaving large gaps in the numbering system that can lead to a shortage of chronological numbers and reduces the ease of searching for a particular OPSD.

c) OPS drawing numbering format is either three or four numbers before the decimal and three numbers after the decimal. Drawings with two numbers after the decimal should be revised to three numbers after the decimal. Use three-digit numbers after the decimal on all NEW standard drawings.

d) If a drawing is cancelled, the cancelled drawing number is not to be used for at least five years, although OPS preference is that drawing numbers are never reused after cancellation.

e) The revision number is changed each time the drawing is revised, and the drawing number does not change. If a drawing is revised and the number changes or a new drawing is developed, then the revision number of the drawing is zero, subsequent publications increase by 1. If the revision number is zero, place a zero in the space provided on the drawing for the revision number. When a drawing is revised or developed, the new revision number is to be added to the draft drawing frame as soon as work starts on the drawing.

Example 1 – OPS Volumes and Content

Volumes 1, 5, and 7	MTO General Conditions of Contract – Volume 5 only MUNI General Conditions of Contract – Volume 7 only
General Conditions of Contract	Division 1 – General Specifications
General Specifications	Division 2 – Grading Division 3 – Pavement
Construction Specifications	Division 4 – Drainage, Watermain, and Utility Division 5 – Miscellaneous Division 6 – Electrical Division Division 7 – Traffic Safety Division 8 – Environmental and Landscape Division 9 – Structural
Volumes 2, 6, and 8	Division 10 – Aggregates Division 11 – Bitumens
Material Specifications	Division 12 – Seals, Bearings, Waterstops Division 13 – Cement and Concrete Division 14 – Metal Division 15 – Safety Related Division 16 – Wood and Plastics Division 17 – Coatings Division 18 – Pipes and Associated Drainage Items Division 19 – Environmental Division 20 – Signs and Sign Support Division 21 – Clothing, Cloth and the Like Division 22 – Miscellaneous Division 23 – Unassigned Division 24 – Electrical Division 25 – Chemicals
Volume 3	Series 100 – Abbreviations Series 200 – Grading Sections
Drawings for Roads, Barriers, Drainage, Sanitary Sewers, Watermains, and Structures	Series 300 – Entrances Series 400 – Frames and Grates Series 500 – Paving Series 600 – Curbs and Gutters Series 700 – Catch Basins and Maintenance Holes Series 800 – Culverts and Drains Series 900 – Fencing, Guide Rails Series 1000 – Sanitary Sewers Series 1100 – Watermains Series 3000 – Structures
Volume 4	Series 2000 – Abbreviations Series 2100 – Underground Work
Drawings for Electrical Work	Series 2200 – Foundations Series 2300 – Work on Structures Series 2400 – Purchasing Standards Series 2500 – Traffic Signals Series 2600 – Sign Lighting Series 2900 – Advanced Traffic Management System

Example 2 – Notice of Meeting and Agenda

NOTICE OF MEETING				
TO	Robert Fazio Duncan Kung	Marko Kasunic Brad Porter	Kenneth Shannon Edward Chiu	Anna Visconti
SUBJECT	Meeting No. **318**	**OPS TRAFFIC SAFETY COMMITTEE** Ontario Provincial Standards for Roads & Public Works		
AGENDA	ITEM			
	318.1 Adoption of Minutes of the Previous Meeting 318.2 Review of Issues from Previous Minutes – Issue Tracking 318.3 Report on Minutes of Other OPS Committees 318.4 Report on Correspondence 318.5 Other Business 318.6 Review of Standards .1 OPSS.MUNI 741 Temporary Concrete Barriers .2 OPSS 753 and OPSDs 923.201, 923.202, 923.204, 923.242, 923.244, 923.245, and 984.205 Connecticut Impact Attenuation System .3 OPSS 1503 Cable Guide Rail .4 OPSS 707 Modified Overhead Signboards .5 OPSS.MUNI 723 Energy Attenuators OPSDs 923.196, 923.197, 923.198, and 923.199 Quadguard M10 System OPSDs 923.007 and 923.141 Quadguard M10 Wide System OPSDs 923.008, 923.501, and 923.502 Hercules System OPSDs 924.132, 924.133, and 911.236 ABSORB-M System 318.7 Future Meetings – Anne changed **Please advise the coordinator if you are unable to attend the meeting.**			
MEETING INFO	Date: **February 11, 2021**	Time: **9:00 a.m. – 12:00 noon**	Duration: **3 hrs.**	
	Location: **Microsoft Teams Meeting**			
CONTACT	Name: Duncan Kung	Phone: 905-704-2240	Date: January 19, 2021	

ONTARIO PROVINCIAL STANDARDS FOR ROADS AND PUBLIC WORKS

Ontario Ministry of Transportation
Highway Design Office
2nd Floor North
301 St. Paul Street
St. Catharines ON L2R 7R4

Tel: 905-704-2240

MINUTES OF MEETING NO. 318

OPS TRAFFIC SAFETY COMMITTEE

Date: 2021-02-11 **Location:** Microsoft Teams Meeting

Time: 9:00 a.m. to 12:00 noon

Attending	Org	Telephone	Email
Robert Fazio, Chair	MEA	416-395-6306	robert.fazio@toronto.ca
Anna Visconti, Vice-Chair	ORBA	905-727-2518	avisconti@powell.ca
Duncan Kung, Coordinator	OPS	905-704-2240	duncan.kung@ontario.ca
Kenneth Shannon	MTO	905-704-3106	kenneth.shannon@ontario.ca
Brad Porter	ACEC-Ontario	905-381-5438	brad.porter@stantec.com
Absent			
Edward Chiu	MEA	877-464-9675 Ext 75908	edward.chiu@york.ca
Marko Kasunic	MEA	519-741-2600 Ext 4192	marko.kasunic@kitchener.ca

Email Copy to: **Corresponding Members:** Dan Cozzi Bryan Hocking

OPS Standards Management Committee Chair: Alan Korell

OPS Specialty Committee Chairs: Don Kudo Adam Kiley David Shelsted
Eva Pulnicki Tim Marotta John Stephenson
Mohan Toor Paul Nause

OPS Administration: L Maria Vaz Anne Allore Fahad Shuja

Contract Documentation Committee Chair: Aimee Rose Tupaz

Please Check the Issue Tracking Page for Your Name

General Meeting Notes:

.1 Marko and Edward sent their regrets for not being able to attend the meeting today.

318.1 Adoption of Minutes of the Previous Meeting

The minutes of meeting TS317 were adopted as written.

318.2 Review of Issues From Previous Minutes – Issue Tracking

Issue No.	Description	Action By
	OPSS.MUNI 741, MTODs 911.610 and 924.130 Moveable Temporary Concrete Barriers	
287.6.5	- Review MASH version when MTO completes their review.	Reminder
	OPSS.MUNI 741 and OPSDs 911.143, 911.150, 911.151, 911.160, 911.162, 911.163,911.164, 911.167, 911.168, 911.170, 911.171, 911.172, 911.173, 911.174, 911.180, 911.181, 911.190, 911.191, 911.192, 911.193, 911.194, 911.195, 911.196, 911.197, 911.198, 911.199, 911.200, 911.232, 911.610, and 924.130 Temporary Concrete Barriers	
314.5.1	- Provide update regarding drainage gap. - Pending.	Kenneth
314.5.1	- Publish drawings when OPSS.MUNI 741 is completed.	Reminder
	OPSDs 923.280, 923,281, 923.282, and 923.283 TRACC System	
315.6.4	- Submit to the SMC for permission to cancel after the review of OPSS.MUNI 723 has been completed.	Reminder
	OPSDs 923.380 - 923.395 TAU-II	
315.6.5	- OPSDs 923.380, 923.381, 923.382, and 923.383; submit to the SMC for permission to cancel after the review of OPSS.MUNI 723 has been completed.	Reminder
315.6.5	- OPSDs 923.384, 923.385, 923.386, 923.387, 923.388, 923.389, 923.390, 923.391, 923.392, 923.393, 923.394, and 923.395; submit to the SMC for permission to reaffirm after the review of OPSS.MUNI 723 has been completed.	Reminder
	OPSS.MUNI 723 Energy Attenuators	
317.6.2	- Revise specification as discussed. - Completed.	Duncan
	OPSDs 923.180, 923.181, 923.182, 923.183, 923.184, 923.185, and 923.186 Quadguard System	
317.6.2	- Submit to the SMC for permission to cancel after the review of OPSS.MUNI 723 has been completed.	Reminder
	MTODs 923.396, 923.397, 923.398, and 923.399 Tau-M System	
317.6.2	- Convert into OPSDs. - Completed.	Duncan
	MTODs 923.196, 923.197, 923.198, and 923.199 Quadguard M10 System	
317.6.2	- Convert into OPSDs and revise as discussed. - Completed.	Duncan

MTODs 923.007 and 923.141 Quadguard M10 Wide System

317.6.2 - Convert into OPSDs and revise as discussed. Duncan
- Completed.

MTODs 923.008, 923.501 and 923.502 Hercules System

317.6.2 - Convert into OPSDs and revise as discussed. Duncan
- Completed.

MTODs 924.132 and 924.133 ABSORB-M System

317.6.2 - Convert into OPSDs and revise as discussed. Duncan
- Completed.

317.6.2 - Determine overall dimensions of the system. Kenneth
- Completed.

MTOD 911.236 Temporary Concrete Barrier and Energy Attenuator – Installation, Temporary

317.6.2 - Convert into OPSD and revise as discussed. Duncan
- Completed.

317.6.2 - Check the title of the drawing. Kenneth
- Completed.

318.3 Report on Minutes of Other OPS Committees

The most recent OPS committee meeting minutes reviewed by the committee coordinator include:

Advisory Board	62	Standards Management	365
Drainage	294	Grading	244
Electrical	281	Pavement	323
Environmental	226	Structures	257
General Conditions	63	Watermains	270

The following new issues from the noted minutes pertain to this committee:

.1 OPS Advisory Board Meeting No. 62

In light of COVID-19, all OPS Specialty Committees will meet remotely for the remainder of 2021.

.2 OPS Standards Management Committee Meeting No. 367

The SMC reviewed and gave permission to publish OPSS.MUNIs 704 and 2001.

The SMC reviewed and gave permission to reaffirm OPSDs 923.530, 923.531, 984.101, and 984.105.

The SMC reviewed and gave permission to cancel OPSDs 991.130 and 991.131.

The SMC reviewed and gave permission to publish OPSS.MUNIs 705 and 791 and OPSD 991.132, when comments have been addressed.

318.4 Report on Correspondence

.1 An email from Anne Allore was received on Jan. 26, 2021, forwarding a Confirmation of Review for OPSS.MUNI 1601 Material Specification for Wood, Preservative Treatment, and Shop Fabrication. The request was forwarded to the OPS Traffic Safety Committee for review.

318.5 Other Business

.1 OPSS.MUNI 1601 Material Specification for Wood, Preservative Treatment, and Shop Fabrication

As requested by the OPS Structures Committee, the committee reviewed the draft and had no comments. The completed Confirmation of Review for OPSS.MUNI 1601 is to be forwarded to Anne Allore. **Action by Duncan**

.2 OPSS.MUNI 705 Flexible Delineator Posts
OPSS.MUNI 791 Expanded Metal Anti-Glare Screen
OPSD 991.132 Expanded Metal Anti-Glare Screen, Installation – Chain-Link Fence

The committee reviewed SMC comments and the following was discussed:

- OPSS.MUNI 705, revise as discussed and resubmit to OPS Head. **Action by Duncan**

- OPSS.MUNI 791 and OPSD 991.132, leave as is and provide the rationale to OPS Head. **Action by Duncan**

.3 MEA Membership Confirmation

Robert advised the committee that MEA has a new process for confirming that its members wishes to stay on the committee for another year. Robert will contact MEA members by email.

318.6 Review of Standards

.1 OPSS.MUNI 741 Temporary Concrete Barriers

OPSS.MUNI 741 (Draft 2020-01-09) was not reviewed due to pending drainage gap issue.

.2 OPSS 753 and OPSDs 923.201, 923.202, 923.204, 923.242, 923.244, 923.245, and 984.205 Connecticut Impact Attenuation System

The review of OPSS 753 was initiated as a result of MTO's goal/desire to complete the cancellation of all COMMON specifications as of November 2021. The committee reviewed the above noted standards and the following was discussed:

- OPSS 753 and OPSDs 923.244 and 923.245, revise as discussed and submit to the SMC for permission to publish. **Action by Duncan**

- OPSDs 923.201, 923.202, 923.204, 923.242, and 984.205; submit to the SMC for permission to reaffirm. **Action by Duncan**

.3 OPSS 1503 Cable Guide Rail

The review of OPSS 1503 was initiated as a result of MTO's goal/desire to complete the cancellation of all COMMON specifications as of November 2021. The committee reviewed the above noted specification and made revisions. The specification is to be revised as discussed and submitted to the SMC for permission to publish. **Action by Duncan**

.4 OPSS 707 Modified Overhead Signboards

The review of OPSS 707 was initiated as a result of MTO's goal/desire to complete the cancellation of all COMMON specifications as of November 2021. The committee reviewed the above noted specification and made revisions. The specification is to be revised as discussed and submitted to the SMC for permission to publish. **Action by Duncan**

.5 OPSS.MUNI 723 Energy Attenuators
OPSDs 923.196, 923.197, 923.198, and 923.199 Quadguard M10 System
OPSDs 923.007 and 923.141 Quadguard M10 Wide System
OPSDs 923.008, 923.501, and 923.502 Hercules System
OPSDs 924.132, 924.133, and 911.236 ABSORB-M System

The above noted standards were not reviewed due to time constraints.

318.7 Future Meeting

The next OPS Traffic Safety Committee meeting has been scheduled as follows:

Date: March 11, 2021
Time: 9:00 a.m. to 12:00 noon
Location: Microsoft Teams Meeting

The dates and locations of future scheduled meetings are as follows:

April 8, 2021	Microsoft Teams Meeting
May 13, 2021	Microsoft Teams Meeting
June 10, 2021	Microsoft Teams Meeting
September 9, 2021	Microsoft Teams Meeting
October 14, 2021	Microsoft Teams Meeting
November 4, 2021	Microsoft Teams Meeting
December 9, 2021	Microsoft Teams Meeting

Notes:

1. Please advise the committee coordinator if you are unable to attend a meeting.
2. Please review the minutes for errors and omissions prior to the next meeting.

Duncan Kung

Standards Coordinator
OPS Specialty Committee on Traffic Safety

OPS Traffic Safety Committee Issue Tracking

Issue No.	Description	Action By
	OPSS.MUNI 741, MTODs 911.610 and 924.130 Moveable Temporary Concrete Barriers	
287.6.5	- Review MASH version when MTO completes their review.	Reminder
	OPSS.MUNI 741 and OPSDs 911.143, 911.150, 911.151, 911.160, 911.162, 911.163, 911.164, 911.167, 911.168, 911.170, 911.171, 911.172, 911.173, 911.174, 911.180, 911.181, 911.190, 911.191, 911.192, 911.193, 911.194, 911.195, 911.196, 911.197, 911.198, 911.199, 911.200, 911.232, 911.610, and 924.130 Temporary Concrete Barriers	
314.5.1	- Provide update regarding drainage gap.	Kenneth
314.5.1	- Publish drawings when OPSS.MUNI 741 is completed.	Reminder
	OPSDs 923.280, 923,281, 923.282, and 923.283 TRACC System	
315.6.4	- Submit to the SMC for permission to cancel after the review of OPSS.MUNI 723 has been completed.	Reminder
	OPSDs 923.380 - 923.395 TAU-II	
315.6.5	- OPSDs 923.380, 923.381, 923.382, and 923.383; submit to the SMC for permission to cancel after the review of OPSS.MUNI 723 has been completed.	Reminder
315.6.5	- OPSDs 923.384, 923.385, 923.386, 923.387, 923.388, 923.389, 923.390, 923.391, 923.392, 923.393, 923.394, and 923.395; submit to the SMC for permission to reaffirm after the review of OPSS.MUNI 723 has been completed.	Reminder
	OPSDs 923.180, 923.181, 923.182, 923.183, 923.184, 923.185, and 923.186 Quadguard System	
317.6.2	- Submit to the SMC for permission to cancel after the review of OPSS.MUNI 723 has been completed.	Reminder
	OPSDs 923.396, 923.397, 923.398, and 923.399 Tau-M System	
317.6.2	- Submit to the SMC for permission to publish after the review of OPSS.MUNI 723 has been completed.	Reminder
	OPSS.MUNI 1601 Material Specification for Wood, Preservative Treatment, and Shop Fabrication	
318.5.1	- Forward Confirmation of Review to Anne Allore.	Duncan
	OPSS.MUNI 705 Flexible Delineator Posts	
318.5.2	- Revise as discussed and resubmit to OPS Head.	Duncan
	OPSS.MUNI 791 Expanded Metal Anti-Glare Screen OPSD 991.132 Expanded Metal Anti-Glare Screen, Installation – Chain-Link Fence	
318.5.2	- Forward committee response to SMC comments to OPS Head.	Duncan
	OPSS.MUNI 753 and OPSDs 923.201, 923.202, 923.204, 923.242, 923.244, 923.245, and 984.205 Connecticut Impact Attenuation System	
318.6.2	- OPSS 753 and OPSDs 923.244 and 923.245, revise as discussed and submit to the SMC for permission to publish.	Duncan
318.6.2	- OPSDs 923.201, 923.202, 923.204, 923.242, and 984.205; submit to the SMC for permission to reaffirm.	Duncan
	OPSS.MUNI 1503 Cable Guide Rail	
318.6.3	- Revise as discussed and submit to the SMC for permission to publish.	Duncan

PERPETUAL WORK PLAN **OPS GRADING COMMITTEE**

REVIEW GROUP (Note 1)	STANDARD (Note 2) VOL	STANDARD (Note 2) DESIGNATION	STANDARD TITLE	DATE LAST PUBLISHED	DATE REAFFIRMED	PLANNED REVIEW (Note 3) START	PLANNED REVIEW (Note 3) END	ACTUAL REVIEW (Note 4) START	ACTUAL REVIEW (Note 4) END	TARGET YEAR TO PUBLISH	COMMENTS
27	7	220.MUNI	Wick Drain Installation	2014 11		2019 08	2019 09	2021 02	2021 05	2022	Submitted for publication Nov 2021 – SMC comments not addressed by Committee in time. Resubmitted to be published April 2022.
5	7	305.MUNI	Granular Sealing	2016 11		2021 02	2021 03	2021 03		2022	On hold until OPS Pavement Committee updates OPSS.MUNI 314 and MTO updates OPSS.PROV 305
5	3	210.070	Granular Sealing	2016 11		2021 02	2021 02	2021 03		2022	" "
8	5	202.MUNI	Rock Removal by Manual Scaling, Machine Scaling, Trim Blasting, or Controlled Blasting	2016 11		2021 02	2021 03	2021 03		2022	Submitting for publication for April 2022
9	3	205.010	Transition Treatment, Earth Cut to Earth Fill	2016 11		2021 02	2021 02	2021 10	2021 10	2022	Submitted for publication for April 2022
9	3	205.020	Transition Treatment, Rock Cut to Rock Fill	2016 11		2021 02	2021 03	2021 10	2021 10	2022	" "
9	3	205.030	Transition Treatment, Rock Cut to Earth Fill	2016 11		2021 02	2021 03	2021 10	2021 10	2022	" "
9	3	205.040	Transition Treatment, Earth Fill to Rock Fill and Earth Fill to Granular Fill	2016 11		2021 02	2021 02	2021 10	2021 10	2022	" "
9	3	205.050	Transition Treatment, Rock Cut to Earth Cut	2016 11		2021 02	2021 03	2021 10	2021 10	2022	" "
14	3	202.032	Roadway Widening for Steel Beam Energy Attenuating Terminal Leaving End and Constrained Approach End	2016 11		2022 01	2022 02			2022	
14	3	202.033	Roadway Widening, Single Sided Energy Attenuating Terminals, Approach End	2016 11		2022 01	2022 02			2022	
13	3	209.020	Widening Existing Rock Cut with Grade Rise	2016 11		2022 01	2022 02			2022	
25	3	203.010	Embankments Over Swamp New Construction	2017 11		2022 01	2022 02			2022	

Note:
1) Standards with the same Review Grouping number will be reviewed by the committee as a package.
2) Construction (1) specifications are three digit numbers without decimals; Material (2) specifications are four digit numbers without decimals; Drawings (3 or 4) are three or four digit numbers with decimals.
3) Date that committee plans to start and end the review of the standard. Reviews may start or end earlier or later than planned.
4) Actual start and end dates are dependent on committee's workload, OPS priorities, and member commitments.

Ontario Provincial Standards for Roads and Public Works Page 1 of 3 Revised: 2021-12-23

PERPETUAL WORK PLAN **OPS GRADING COMMITTEE**

REVIEW GROUP (Note 1)	STANDARD (Note 2) VOL	STANDARD (Note 2) DESIGNATION	STANDARD TITLE	DATE LAST PUBLISHED	DATE REAFFIRMED	PLANNED REVIEW (Note 3) START	PLANNED REVIEW (Note 3) END	ACTUAL REVIEW (Note 4) START	ACTUAL REVIEW (Note 4) END	TARGET YEAR TO PUBLISH	COMMENTS
25	3	203.020	Embankments Over Swamp Existing Slope Excavated to 1H:1V	2017 11		2022 01	2022 02			2022	
25	3	203.030	Embankments Over Swamp Existing Slopes Maintained	2017 11		2022 01	2022 02			2022	
25	3	203.040	Embankments Over Swamp At Pipe Culverts ≤ 1500 Mm	2017 11		2022 01	2022 02			2022	
12	7	501.MUNI	Compacting	2017 11		2022 02	2022 05			2022	
21	7	506.MUNI	Dust Suppressants	2017 11		2022 03	2022 05			2022	
21	8	2503.MUNI	Magnesium Chloride Flake and Magnesium Chloride Solution	2017 11		2022 05	2022 10			2023	
6	8	1860.MUNI	Geotextiles	2018 11		2022 10	2023 02			2023	
19	7	510.MUNI	Removal	2018 11		2023 01	2023 04			2023	
17	3	300.010	Side Road Intersection, Fill	2018 11						2023	
17	3	300.020	Side Road Intersection, Cut	2018 11						2023	
	7	206.MUNI	Grading	2019 04						2024	
	3	208.010	Benching of Earth Slopes	2019 04						2024	
	3	710.010	Capping Existing Structures Maximum 4.0 m Cover	2019 04						2024	
24	7	201.MUNI	Clearing, Close Cut Clearing, Grubbing, and Removal of Surface Boulders	2019 04						2024	
11	3	204.010	Boulder Treatment Cut Sections, Subgrade	2015 11	2019 11					2024	
	7	203.MUNI	Rock Stabilization	2019 11						2024	
9	3	205.060	Frost Heave Treatment	2019 11						2024	
	7	212.MUNI	Borrow	2019 11						2024	

Note:
1) Standards with the same Review Grouping number will be reviewed by the committee as a package.
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PERPETUAL WORK PLAN **OPS GRADING COMMITTEE**

REVIEW GROUP (Note 1)	STANDARD (Note 2) VOL	STANDARD (Note 2) DESIGNATION	STANDARD TITLE	DATE LAST PUBLISHED	DATE REAFFIRMED	PLANNED REVIEW (Note 3) START	PLANNED REVIEW (Note 3) END	ACTUAL REVIEW (Note 4) START	ACTUAL REVIEW (Note 4) END	TARGET YEAR TO PUBLISH	COMMENTS
	7	120.MUNI	The Use of Explosives	2019 11						2024	
21	8	2501.MUNI	Calcium Chloride Flake and Calcium Chloride Solution	2021 11						2026	
14	3	202.010	Slope Flattening Using Surplus Excavated Material on Earth or Rock Embankment	2016 11	2021 11					2026	
14	3	202.031	Roadway Widening for Steel Beam Energy Attenuating Terminal Approach End	2016 11	2021 11					2026	
20	8	2510.MUNI	Tall Oil Pitch Emulsion	2021 11						2026	
7	3	200.010	Earth/Shale Grading, Undivided Rural	2009 11		TBD	TBD			TBD	Roadside Manual has been updated, and slope requirements have changed significantly. This is difficult to address and the Committee has elected to wait for the MTODs (in process) before updating.
7	3	200.020	Earth/Shale Grading, Divided Rural	2009 11		TBD	TBD			TBD	Waiting for MTOD
8	3	201.010	Rock Grading, Undivided Highway	2009 11		TBD	TBD			TBD	Waiting for MTOD
8	3	201.020	Rock Grading, Divided Highway	2009 11		TBD	TBD			TBD	Waiting for MTOD
18	3	301.010	Rural Entrances to Roads on Fill	2010 11		TBD	TBD			TBD	Waiting for MTOD
18	3	301.020	Rural Entrances to Roads in Earth Cut With Culvert Installation	2010 11		TBD	TBD			TBD	Waiting for MTOD
18	3	301.030	Rural Entrance, Rock Cut	2010 11		TBD	TBD			TBD	Waiting for MTOD
22	3	217.050	Access to Hydrant Across Ditch	2011 11		TBD	TBD			TBD	Waiting for MTOD
23	3	217.060	Utility Pole Setting Depth At Ditch Locations	2011 11		TBD	TBD			TBD	Waiting for MTOD
	3	202.020	Drainage Gap for Slope Flattening on Rock or Granular Embankment	2013 11		TBD	TBD			TBD	Waiting for MTOD

Note:
1) Standards with the same Review Grouping number will be reviewed by the committee as a package.
2) Construction (1) specifications are three digit numbers without decimals; Material (2) specifications are four digit numbers without decimals; Drawings (3 or 4) are three or four digit numbers with decimals.
3) Date that committee plans to start and end the review of the standard. Reviews may start or end earlier or later than planned.
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Ontario Provincial Standards for Roads and Public Works Page 3 of 3 Revised: 2021-12-23

Example 5 – Welcome Letter

Dear [new member name]:

Subject: **Commencement of Membership on the OPS [XYZ] Committee**

On behalf of the OPS [XYZ] Committee, I welcome you as a [organization] representative.

For your information, I have enclosed a copy of the minutes from the committee's previous meeting and the agenda for the next committee meeting.

I have attached the OPS User Guide to this email for your reference. It provides information on Committee member responsibilities and the processes followed in the OPS. The Guide also contains instructions regarding formatting and preferred wording for OPS specifications and drawings that will be helpful during the review process. As your Coordinator, I am happy to provide additional assistance with any questions you have, or you can visit the OPS website (www.ops.on.ca).

[Optional to include:
- Committee member information.
- Any information on contentious issues or standards that the new Committee member could benefit from.]

Thank you for accepting the responsibilities of membership on this OPS committee. I wish you all the best for the duration of your involvement with OPS. Other involved individuals have found the time and effort spent in OPS interesting and satisfying. I trust the same will be true for you.

I look forward to seeing you at the next OPS [XYZ] Committee meeting on [next Committee meeting date], which I will be forwarding an invitation for shortly

Yours sincerely

[Coordinator name and contact information]

Cc: Committee Chair

Example 6 – Thank You Letter

Dear [member name]:

Subject: **Cessation of Membership in the OPS [XYZ] Committee**

Please accept the sincere thanks of the members of the OPS Standards Management Committee and the members of the OPS [XYZ] Committee for the effort you have expended in serving this committee since your first meeting in [first meeting date]. Your contribution has been much appreciated, particularly when it is realized that you also had your everyday responsibilities at [employer].

Keeping our standards current, practical, and economical is an ongoing task to which we are all committed. Your [years of service] of participation in this objective has been of great help, and I hope that it has given you some satisfaction.

Thanks again for your service to the Ontario Provincial Standards for Roads and Public Works organization and I wish you all the best in future endeavours.

Yours sincerely,

Alan Korell, P.Eng.
Chairperson
OPS Standards Management Committee

Cc: Standards Management Committee
[XYZ] Committee Chair

Example 7 - Confirmation of Review Prior to Publication Form

Ontario Provincial Standards for Roads and Public Works (OPS)

Confirmation of Review Prior to Publication

Custodial Committee

a) Delete checks as appropriate.
b) Each reviewing committee receives a separate copy of this form along with the standard and summary of revision.

STANDARD DESIGNATION		NEW STANDARD ✓	STANDARD TITLE
DRAFT DATE	REVISION NUMBER	REVISED STANDARD ✓	

CUSTODIAL COMMITTEE

COMMITTEES FROM WHICH CONFIRMATION IS REQUIRED

✓ OPS Drainage Committee	✓ OPS Electrical Committee	✓ OPS Environmental Committee
✓ OPS General Conditions Committee	✓ OPS Grading Committee	✓ OPS Pavement Committee
✓ OPS Structures Committee	✓ OPS Traffic Safety Committee	✓ OPS Watermains Committee

NOTES TO REVIEWING COMMITTEES FROM CUSTODIAL COMMITTEE — RETURN COMMENTS BY

CUSTODIAL COMMITTEE COORDINATOR — DATE

Reviewing Committee

a) Reviewing committee completes the remainder of the form.
b) When completed, this form is to be returned to the custodial committee coordinator.

REVIEW COMMENTS

The above standard has been reviewed and found to meet the requirements of the reviewing committee.

CHAIRPERSON — DATE

COMMITTEE COORDINATOR — DATE

Form Date: 2009-04-07

ONTARIO PROVINCIAL STANDARD SPECIFICATION

OPSS.MUNI nnn
NOVEMBER 2021

Draft Date 2021-06-08

CONSTRUCTION SPECIFICATION FOR *ADD TITLE HERE*

TABLE OF CONTENTS

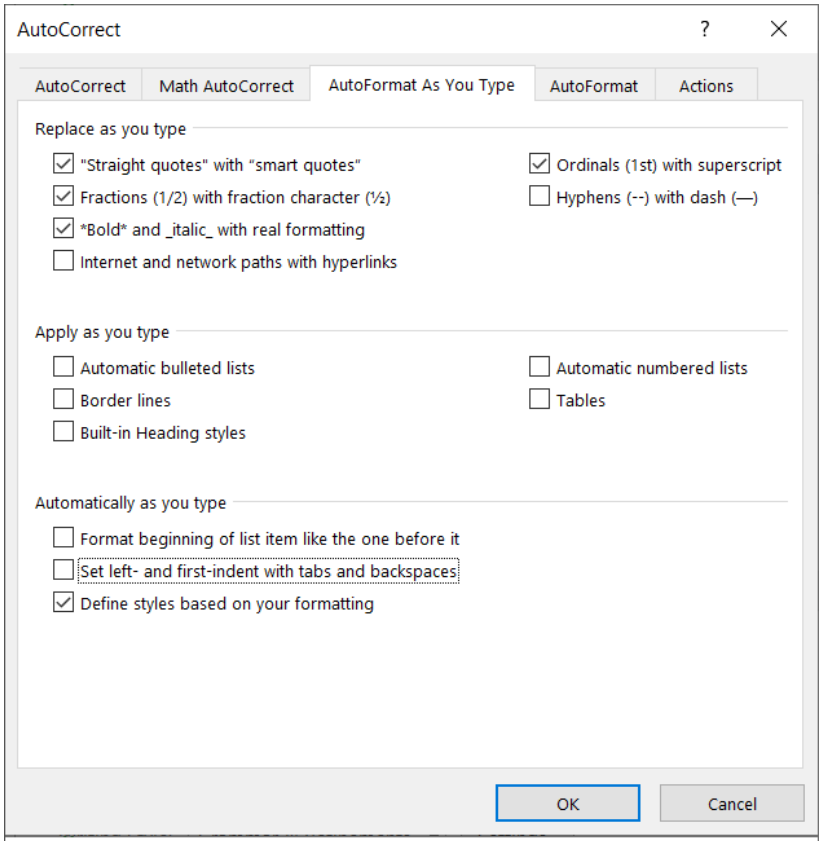
nnn.01 SCOPE

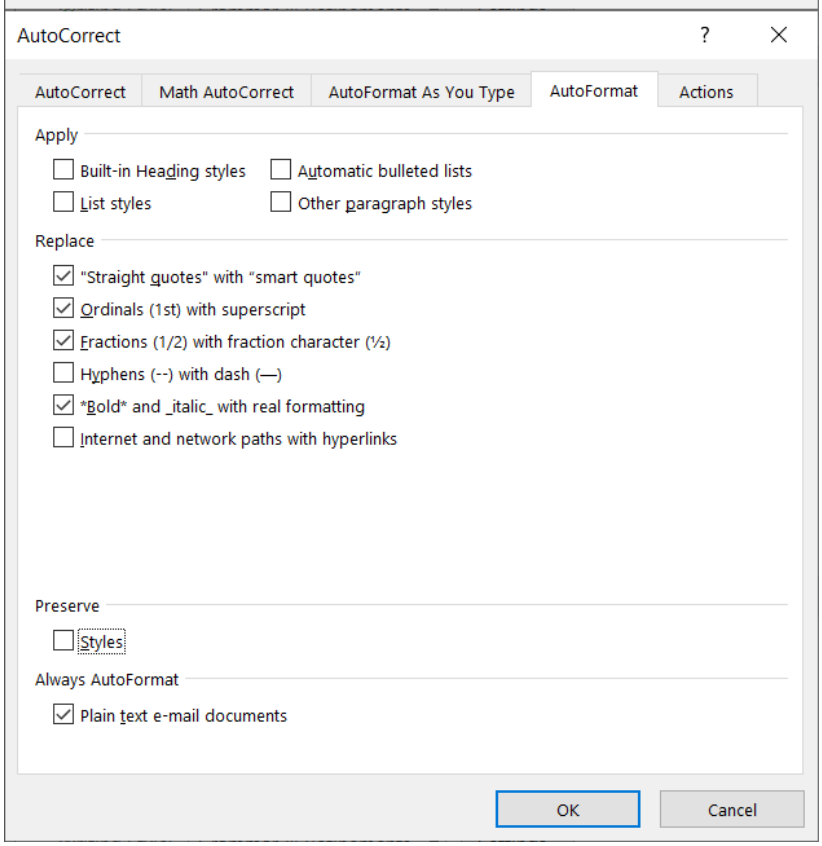
This specification covers the requirements for xxxxxx

nnn.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

Example 9 – Microsoft Word Format Configuration





Appendix 220-A, November 2007

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:

- Requirements for excavation and backfill of unsuitable material. (220.07.03)
- Limits and grade of the granular blanket. (220.07.03)
- Depth of installation of wick drains. (220.07.05)
- Location and spacing requirements for wick drains. (220.07.05.02)

When there is significant variance in embedment depth, the designer should consider having more than one pay item based on depth.

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.

Example 11 – Publication Request

ONTARIO PROVINCIAL STANDARDS **PUBLICATION REQUEST**	PERMISSION TO PUBLISH ☐ CANCEL ☐	PUBLICATION CYCLE YEAR 2021 NOV ☐ APRIL ☐	SMC CLEARANCE NUMBER

STANDARD DETAILS

STANDARD TITLE	Construction Specification for XYZ				
STANDARD DESIGNATION	OPSS. # # #	LAST PUBLISHED	2016-11	REVIEW COMPLETED	2021-02
SUBMITTED BY	OPS XYZ COMMITTEE	MTO OFFICE: CONTACT NAME:	XYZ XYZ	MEA Executive ☐	
SUBMITTED	2021-03-28	FILE	5007 - 2 - # # #		
☐ Standard Reaffirmed ☐ See Summary of Revisions		Rationale for Cancelling			

BACKGROUND FOR INITIATING REVIEW

The standard was reviewed as part of its cyclic review program.

STANDARD REVIEW

HEAD REVIEWED STANDARD AND APPROVED FOR PROCESSING TO SMC ☐ DATE

SMC REVIEW	
	PERMISSION GIVEN ☐
	PERMISSION GIVEN, WHEN COMMENTS ARE ADDRESSED Comments on the standard or below ☐
DATE	PERMISSION NOT GIVEN Rationale below ☐

RATIONALE FOR NOT GIVING PERMISSION OR COMMENTS TO COMMITTEE

IF PERMISSION GIVEN WITH COMMENT, COMMENTS HAVE BEEN FORWARDED TO COMMITTEE ☐

COMMENTS ADDRESSED BY COMMITTEE AND REVIEWED AND APPROVED BY HEAD ☐

SIGNED BY HEAD ON BEHALF OF THE SMC DATE

Example 11 – Publication Request

NOTES TO OPS SPECIALTY COMMITTEE COORDINATOR	
FINALIZE ☐	FILE COPY ☐

DIRECTIONS

PUBLISH	OPSS	OPSS.PROV	OPSS.MUNI	OPSD – REV#	DATE
					Nov 2020
Title	Construction Specification for XYZ				
SUPERSEDE	OPSS	OPSS.PROV	OPSS.MUNI	OPSD – REV#	DATE
					Nov 2003
Title	Construction Specification for XYZ				
CANCEL	OPSS	OPSS.PROV	OPSS.MUNI	OPSD – REV#	DATE
Title					

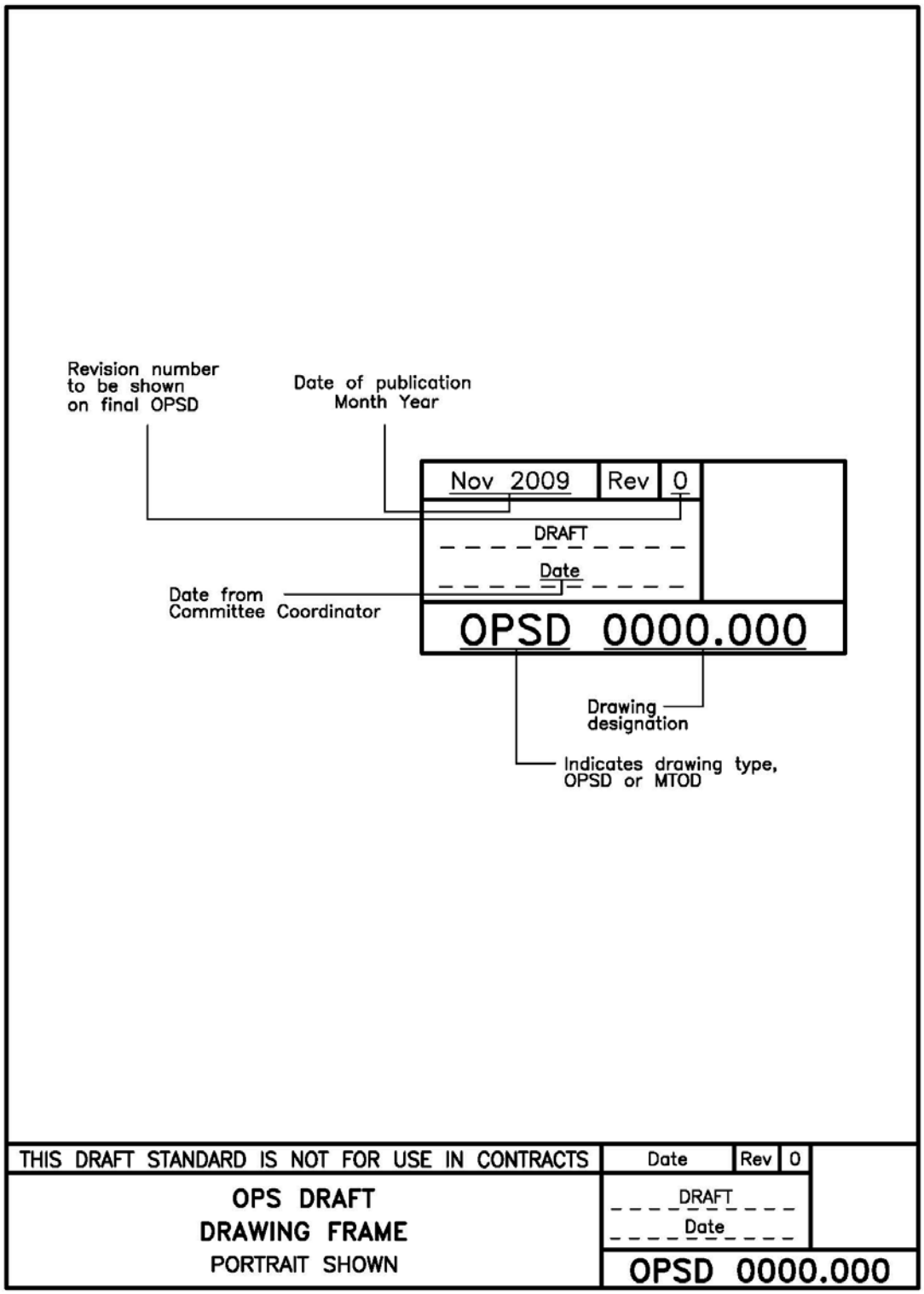
SUMMARY OF REVISIONS

OPSS. MUNI 539

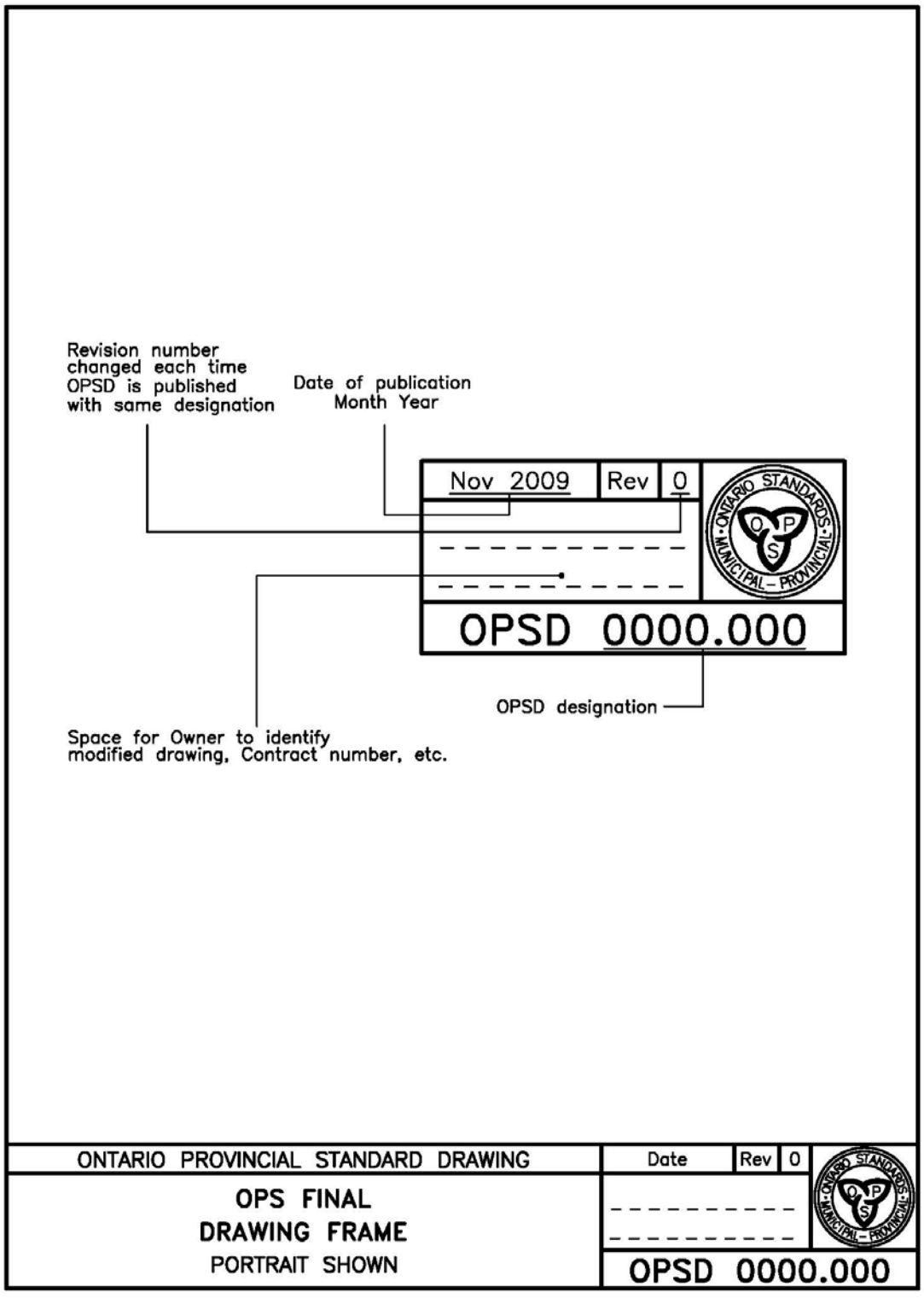
Construction Specification for Temporary Protection Systems

- Section 539.02 References: CSA S6 and AASHTO Guide Design Specification updated. Structural Manual removed.
- Section 539.03 Definitions: Certificate of Conformance updated. Engineer, Quality Verification Engineer, and Top of Shoring Wall removed.
- Clause 539.04.02.05: Removed.
- Clause 539.04.02.05.01: Removed.
- Clause 539.07.03.03.02: Amended to add a requirement that the Contractor's Engineer or an assigned delegate shall inspect the installation and removal of the protection system. Note: These are the same requirements that were removed from Clause 539.04.02.05.01.
- Clause 539.07.03.03.03: Amended to add a requirement that the Contractor's Engineer or an assigned delegate shall inspect the layout and extent, piling, installation, and removal of protection system. Note: These are the same requirements that were removed from Clause 539.04.02.05.02.
- Clause 539.07.03.04: Title updated.
- Clause 539.07.03.04.01: Amended to require the Contractor's Engineer or an assigned delegate to inspect and verify a protection system was installed, monitored, and subsequently removed according to the Contract Documents. Clause also amended to require a Certificate of Conformance be submitted to the Contract Administrator upon completion of the installation and removal of the protection system.
- OPSF 539-1 Certificate of Conformance: Added.
- Appendix 539-B Supplemental Requirements for Using OPSS 539 in Municipal Contracts: Appendix has been removed and integrated into the body of the specification.

Example 12 - Draft Drawing Frame, Landscape Shown



Example 13 - Final Drawing Frame, Portrait Shown



Example 14 - OPS Specification Numbering Outline

TITLE OF SPECIFICATION

nnn.06	**TITLE OF SECTION**	First division (section)
nnn.07	**TITLE OF SECTION**	First division (section)
nnn.07.01	**Title of Subsection**	Second division (subsection with clauses)
nnn.7.01.01	**Title of 1st Level Clause**	Third division (1st level clause)
nnn.7.01.01.01	**Title of 2nd Level Clause**	Fourth division (2nd level clause)
nnn.7.01.01.01.01	**Title of 3rd Level Clause**	Fifth division (3rd level clause)
nnn.7.01.01.01.02	**Title of 3rd Level Clause**	Fifth division (3rd level clause)

a) Sixth division — Major partition of a clause

- i. Seventh division — Subdivided major partition of a subsection with clauses
- ii. Seventh division — Subdivided major partition of a subsection with clauses

b) Sixth division — Major partition of a clause

- i. Seventh division — Subdivided major partition of a subsection with clauses
- ii. Seventh division — Subdivided major partition of a subsection with clauses
  - (A) Eighth division — Subdivided seventh division of subsection with clauses
  - (B) Eighth division — Subdivided seventh division of subsection with clauses

c) Sixth division — Major partition of a clause

nnn.07.02	**Title of Subsection**	Second division (subsection without clauses)

a) First division — Major partition of subsection without clauses

- i. Second division — Subdivided major partition of subsection without clauses
- ii. Second division — Subdivided major partition of subsection without clauses

b) First division — Major partition of subsection without clauses

- i. Second division — Subdivided major partition of subsection without clauses
- ii. Second division — Subdivided major partition of subsection without clauses
  - (A) Third division — Subdivided second division of subsection without clauses
  - (B) Third division — Subdivided second division of subsection without clauses

c) First division — Major partition of subsection without clauses

Notes: Maximum three levels of clauses per subsection
Do not use automatic numbering

180.07.06 Conditions on Management by Stockpiling

Management of excess material by stockpiling within the Owner's property and on other property designated in the Contract Documents shall be as specified in the Contract Documents.

Stockpiling shall otherwise be outside the Owner's property.

Stockpiles of bituminous pavement, concrete, and masonry shall be separated according to Table 2 unless either of the following occurs:

a) Stockpiles are located within a road right-of-way or on property with a boundary common to a right-of-way, both within the Contract limits for a period not exceeding 120 Days.

b) Stockpiles are located within a provincial or municipal works yard or in a commercially licensed pit or quarry.

For all other excess materials, where Table 1 indicates that stockpiling is subject to management conditions in Table 2, such management conditions shall only apply to stockpiles that are to be in place for a period exceeding 120 Days.

180.07.07 Conditions on Management by Disposal as Subject Waste

When an excess material is identified as a dangerous goods waste, or a subject waste specified in the Contract Documents, management shall be as follows:

a) Subject waste shipments shall be manifested and transported directly to a certified waste disposal site.

b) When the subject waste is also a dangerous good as defined in the Transportation of Dangerous Goods Act (TDGA), the carrier shall provide all necessary TDGA labels and placards.

Example 16 - Table of Contents, Construction Specification

TABLE OF CONTENTS

Example 17 - Table of Contents, Material Specification

TABLE OF CONTENTS

Example 18 - Scope Section Format, MUNI OPSS

nnn.01 SCOPE

This specification covers the requirements for ....

nnn.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.

nnn.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.

Example 19 - Scope Section Format, PROV OPSS

nnn.01 SCOPE

This specification covers the requirements for ...

nnn.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.

*[**Note:** The above paragraph is not used in PROV OPSS]*

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

Ontario Provincial Standard Specifications, Construction

OPSS 920	Deck Joint Assemblies, Preformed Seals, Joint Fillers, Joint Seals, Joint Sealing Compounds, and Waterstops - Structures
OPSS 922	Installation of Bearings

Ontario Provincial Standard Specifications, Material

OPSS 1202	Bearings - Elastomeric and Plain Steel Laminated
OPSS 1203	Bearings - Rotational and Sliding Surface

Ontario Ministry of Transportation Publications

MTO Laboratory Testing Manual:

LS-200	Penetration of Bituminous Materials
LS-202	Kinematic Viscosity of Asphalt
LS-602	Sieve Analysis of Aggregates

Ontario Traffic Manual (OTM):
Book 6 - Warning Signs

Structural Manual

MTO Field Guide, for the Acceptance of Hot Mix and Bridge Deck Waterproofing

MTO Forms:

PH-CC-449a	Aggregate Test Data – Hot Mix Asphalt – Physical Properties, Fine Aggregate

CSA Standards

G30.18-M92(R1998)	Billet - Steel Bars for Concrete Reinforcement
G40.20/G40.21-M98	General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels
G164-M92	Hot Dip Galvanizing of Irregularly Shaped Articles
G189-1966 (R1998)	Sprayed Metal Coatings for Atmospheric Corrosion Protection
S6-00	Canadian Highway Bridge Design Code
W59-M1989	Welded Steel Construction (Metal Arc Welding)
W186-M1990	Welding of Reinforcing Bars in Reinforced Concrete Construction

ASTM International

A167-99	Specification for Stainless and Heat-Resisting Chromium Steel Plate, Sheet and Strip
A240/A240M-00	Heat-Resisting Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels
D471-98	Test Method for Rubber Property - Affects of Liquids
D573-99	Test Method for Rubber Deterioration in an Air Oven
D2240-97	Test Method for Rubber Property - Durometer Hardness
F835-03	Specification for Alloy Steel Socket Button and Flat Countersunk Head Cap Screws

International Slurry Surfacing Association (ISSA)

TB 106-90	Measurement of Slurry Seal Consistency
TB 115-90	Determination of Slurry System Compatibility

Society of Automotive Engineers (SAE)

J403	Chemical Compositions of SAE Carbon Steels

Others

Ontario Ministry of the Environment:
Letter of Agreement
Certificate or Provisional Certificate of Approval for a Dust Suppression Waste Management System

U.S. Military Specification:
MIL-A-907D-93 Antiseize Thread Compound, High Temperature

nnn.03 DEFINITIONS

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

Associated Appurtenances mean structures, devices, and appliances, other than pipe and conduit, that are used in connection with a water distribution system, such as valves, hydrants, corporation cocks, services, and thrust restraints.

Backfilling means the operation of filling the trench with bedding, cover, and backfill material, or embedment and backfill material.

Bentonite means a commercial term applied to clay deposits containing sodium montmorillonite as the essential mineral.

Clay means a fine textured (i.e., grain size smaller than 0.002 mm) sedimentary or residual deposit consisting of hydrated silicates of aluminum mixed with various impurities but no organics. It is a cohesive soil and plastic within a wide range of water content.

Excavation, Earth and Rock means the excavation classified as earth and rock according to OPSS 206.

Fittings mean connections, appliances, and adjuncts designed to be used in connection with pipes; examples are elbows and bends to alter the direction of a pipe, tees and crosses to connect a branch with a main, plugs and caps to close an end, and bushings, diminishers, or reducers to couple two pipes of different diameters.

Independent Laboratory means as defined in OPSS 313.

Service Connection means the system used to supply water from the watermain to the property line.

Service Connection Appurtenance Set means the main stop, curb stop, couplings, service box, service box support, and service saddle used in the installation of a service connection.

Watermain means an installation designed for the conveyance of water under pressure using circular pipe.

Example 22 - Design and Submission Requirements Section, Construction Specification

120.04 DESIGN AND SUBMISSION REQUIREMENTS

120.04.01 Design Requirements

A blast design shall be prepared by an individual or firm with a minimum 5 years experience and be certified by an Engineer. The blast design shall include, at a minimum, the following:

a) Design PPV and design peak sound pressure level at 100 m radius or nearest Utility, residence, structure, or facility.

b) Number, pattern, orientation, spacing, size, and depth of drill holes.

c) Collar and toe load, number and time of delays, and mass and type of charge per delay.

d) Setback distances to affected waterbodies.

e) The explosive products to be used.

f) The designated blast area.

120.04.02 Submission Requirements

The following shall be submitted to the Contract Administrator:

a) A minimum of 14 Days prior to the use of explosives:

   i. The name and statement of experience of the firm carrying out the blasting.
   ii. The name of the blaster including a record of experience and safety training.
   iii. The name of the individual or firm responsible for the blast design, including a record of experience and statement of qualifications.
   iv. A letter from an Engineer certifying the design.
   v. The name of the blast monitoring consultant, including a record of experience, a record of qualifications, and safety training.
   vi. A certificate of insurance indemnifying the Owner from all claims and damages arising from the use of explosives.

b) A minimum of 48 hours prior to the use of explosives:

   i. A letter signed by the Engineer certifying the blast design indicating the areas for which the blast design has been completed.
   ii. A letter signed by the blaster indicating receipt of the blast design and agreement that the blasting shall be according to the design.
   iii. A letter signed by the Contractor certifying that a pre-blast survey has been carried out in accordance with the Pre-Blast Survey subsection. A copy of the pre-blast survey shall be provided to the Contract Administrator upon request.
   iv. A copy of the blast design.
   v. The designated blast area.
   vi. A blasting schedule.
   vii. A list of all locations to be monitored.

c) Upon request, any blasting permits, approvals, and agreements required for the use of explosives or to carry out blasting operations.

2476.04 DESIGN AND SUBMISSION REQUIREMENTS

2476.04.01 Design Requirements

Raising and lowering equipment for high mast lighting poles shall be designed such that under all conditions the load on the winch cable shall never exceed 25% of the minimum breaking strength of the winch cable.

Raising and lowering equipment for high mast lighting poles shall be designed such that under all conditions the load on each support cable shall never exceed 25% of the minimum breaking strength of each support cable.

2476.04.02 Submission Requirements

2476.04.02.01 Working Drawings

Working Drawings shall be prepared for the fabrication of raising and lowering equipment for high mast lighting poles.

Three sets of Working Drawings shall be submitted to the Contract Administrator at least 14 Days prior to the commencement of the raising and lowering equipment for high mast lighting fabrication, for information purposes only. Prior to making a submission, an Engineer's seal and signature shall be affixed on the Working Drawings verifying that the drawings are consistent with the Contract Documents.

Where multi-discipline engineering work is depicted on the same Working Drawing and a single Engineer is unable to seal and sign the Working Drawing for all aspects of the work, the drawing shall be signed and sealed by as many additional Engineers as necessary.

A copy of the Working Drawings shall be retained at the fabricator's plant during and after pole fabrication.

Working Drawings shall include the following:

a) Detailed dimensioned layouts, including plans, elevations, and sections to clearly indicate the following:

   i. Luminaire support rings and arms
   ii. Luminaire mounting arrangements
   iii. Counter-balancing arrangements
   iv. Head assembly balancing arrangements
   v. Motor mounting arrangements
   vi. Winch mounting arrangements
   vii. Electrical breaker box mounting arrangements
   viii. Junction box details and mounting arrangements
   ix. Electrical control enclosure mounting arrangements

b) Detailed wiring diagrams for the internal drive luminaire raising and lowering equipment.

c) Detailed wiring diagrams for the portable power units.

Example 24 – Materials Section, Construction Specification

551.05 MATERIALS

551.05.01 Steel Box Beam Guide Rail and Median Barrier

Components and associated hardware shall be according to OPSS 1510.

551.05.02 Emulsified Asphalt

RS-1K emulsion shall be according to OPSS 1103.

RS-2K emulsion shall be according to CGSB-16.4M.

551.05.03 Concrete Anchor Blocks

Concrete in anchor blocks shall be according to OPSS 1350 with a nominal minimum 28-Day compressive strength of 20MPa. Blocks may be either cast-in-place or precast.

Example 25 – Materials Section, Material Specification

1205.05 MATERIALS

1205.05.01 General

Material used for clay seals shall lie within the hatched area shown in Figure 1 and shall be natural clay or clay mixture.

The coefficient of permeability as determined in the flexible wall permeameter according to ASTM D 5084 shall not exceed 1×10^{-5} cm/s.

1205.05.02 Natural Clay

Clay material for clay seal shall be according to the following:

a) Liquid limit shall be > 40%.

b) Plasticity index shall be > 0.73 x (Liquid Limit - 20%).

1205.05.03 Clay Mixture

Alternatively, material for clay seal may be made of the following mixture by volume:

a) 1 part Bentonite powder

b) 3.5 parts Granular A

The mixing of the material shall be carried out in an approved mechanical mixer.

At placement, the moisture content of the mixture shall be maintained to within ± 1% of the optimum moisture content.

1205.05.04 Granular A

Granular A shall be according to OPSS 1010.

1301.05 MATERIALS

1301.05.01 Physical and Chemical Requirements

Cementing materials shall be according to the physical and chemical requirements of CSA A3000. Fly ash, slag, and silica fume shall also be according to the optional requirements of CSA A3000, with the exception of the requirements for Control of Expansion Due to Alkali-Silica Reactivity.

The cementing material shall be free of undue lumps or partially hydrated material.

At the time of delivery to the concrete producer and at the time of use, the temperature of cementing material shall not exceed 65°C.

Where Portland cement is required to be certified as being free from early stiffening tendencies, the penetration shall be 50% or greater when determined according to CSA A3000, Annex A.

Example 27 – Equipment Section, Construction Specification

302.06 EQUIPMENT

302.06.01 Pressure Distributor

The pressure distributor shall be designed and manufactured to spray primer uniformly on the road surface. The pressure distributor shall be capable of applying primer at the specified rates and in a continuous and uniform manner both longitudinally and transversely for a full lane width.

302.06.02 Mechanical Aggregate Spreader

The mechanical aggregate spreader shall be designed and manufactured to be self-propelled and capable of continuously and uniformly distributing aggregate on the primed granular base at the specified application rate.

302.06.03 Pilot Vehicle

The pilot vehicle shall be equipped according to the requirements of the OTM, Book 7.

302.06.04 Rollers

Rollers shall be according to OPSS 304.

Example 28 - Equipment Section, Material Specification

1350.06 EQUIPMENT

1350.06.01 Batching Plant

The batching plant and equipment shall be certified by the RMCAO prior to producing concrete for the work, including concrete for any trial batches, and shall meet the requirements for certification throughout the production of concrete.

1350.06.02 Delivery Equipment

Delivery equipment shall be truck mixers, agitator trucks, or non-agitating equipment. Use of non-agitating equipment shall be restricted to delivery for placement of concrete base or concrete pavement.

Truck mixers shall consist of concrete mixers mounted on a truck or other vehicle used for the complete mixing of concrete ingredients after they have been batched at the plant. Effective April 1, 2008, all truck mixers shall be certified by RMCAO and shall display certification stickers.

Agitator trucks shall consist of drums or containers mounted on trucks or other vehicles in which completely mixed concrete is kept sufficiently agitated during delivery to prevent segregation.

Non-agitating equipment shall consist of containers mounted on trucks for delivering completely mixed concrete. The body of the container shall be smooth, watertight, made of steel, and equipped with gates that shall permit control of the discharge of the concrete.

511.07 CONSTRUCTION

511.07.01 Excavation

Prior to placing any material the area shall be excavated to the lines and dimensions specified in the Contract Documents and fine graded to a uniform even surface. Depressions shall be filled and compacted with acceptable material.

511.07.02 Placing Material

511.07.02.01 General

Material shall be placed to the lines and dimensions specified in the Contract Documents.

On slopes where rip-rap or rock protection is being placed, the rock shall commence at the toe of the slope and progress up the slope.

When geotextile is specified in the Contract Documents, rip-rap, rock protection, and granular sheeting shall be placed in a manner as not to tear or damage the geotextile.

511.07.02.02 Rip-Rap

Rip-rap shall be placed in a set and stable manner, flat on the slope with the largest dimension parallel to the slope contours. The larger pieces of rip-rap shall be placed in the bottom courses. The rip-rap shall be laid closely such that a reasonable semblance of courses is achieved. Smaller pieces of rip-rap shall be used to fill the voids.

511.07.02.03 Rock Protection

Rock protection shall be placed in a random but stable manner.

511.07.02.04 Granular Sheeting

Granular sheeting operations shall follow earth excavation operations as closely as practical and possible.

Compaction of granular sheeting material is not required.

511.07.02.05 Geotextile

Geotextile shall be free of folds, tears, and wrinkles. The geotextile shall be joined so that the material laps a minimum of 500mm and shall be pinned together. Alternatively, the geotextile shall be joined to conform to the seam requirements of OPSS 1860.

Geotextiles shall be fixed to prevent movement during installation. Geotextile shall be wrapped down into the ground a minimum 300mm at termination points.

511.07.03 Management of Excess Material

Management of excess material shall be according to the Contract Documents.

1601.07 PRODUCTION

1601.07.01 Preservative Treatment

Preservative treatment shall be according to CSA O80 Series.

All wood for permanent applications shall be pressure preservative treated except Eastern White Cedar for cable guide rail posts, guide posts, delineator posts, and highway fence posts and Western Red Cedar for sign posts.

All wood, except cedar posts, in temporary structures with an intended service life exceeding 1 year shall be pressure preservative treated.

Wood treated using oil borne preservatives shall be subjected to a vacuum expansion bath at a treatment plant according to CSA O80 Series to produce a material that is free of excessive surface oil. Wood treated using water borne preservatives shall have an average moisture content not exceeding 25% at 25mm depth below the surface prior to preservative treatment.

1601.07.02 Shop Fabrication

Cutting, framing, drilling, and grooving of wood shall be performed prior to preservative treatment.

1601.07.03 Handling, Storage and Care of Wood

Handling and storage of wood shall be according to CSA O80 Series.

Wood shall be kept free of dirt and stored in a location that will not create an excessive increase in temperature through the green house effect resulting in rapid drying of the material. Wood shall be stored in a manner that will prevent ponding or trapping of excess moisture between surfaces where it cannot dry readily.

When oil treatment is used, the wood shall be given three coats of creosote oil to repair all cuts, abrasions, and holes made after the initial pressure preservative treatment. Each coat shall be dry before the next coat is applied.

Repair of cuts, abrasions, and holes in material treated with water-borne preservatives shall be according to CSA O80 Series.

1601.07.04 Quality Control - Wood Preservation

The wood preserving plant shall use quality control procedures according to CSA O80 Series.

1601.07.05 Tolerances

1601.07.05.01 Dimensions

The following tolerances shall apply:

Diameter of round wooden posts for highway fence, cable guide rail, and delineator posts	± 10mm
Diameter of other round wooden posts	± 6mm
Dressed cross-sectional dimensions	± 2mm
Length	± 10mm

Example 31 – Quality Assurance Section, Construction Specification

212.08 QUALITY ASSURANCE

212.08.01 Earth Borrow Source

The earth borrow source shall be accepted provided the quality control test results submitted by the Contractor meet the requirements of this specification.

The Contract Administrator will take and test a minimum of one sample per source to verify the material meets the requirements of this specification. Additional quality assurance samples may be taken at anytime.

212.08.02 Excavation and Placement of Earth Borrow

The Contract Administrator reserves the right to identify on a visual basis, localized soft spots which result from excessive wet, silty or organic borrow materials. Removal and replacement of these areas shall be the responsibility of the Contractor at no additional cost to the Owner.

212.08.03 Rock Borrow

The Contract Administrator reserves the right to visually inspect rock borrow to ensure the material conforms to the requirements of OPSS 206.

Example 32 - Quality Assurance Section, Material Specification

1510.08 QUALITY ASSURANCE

1510.08.01 Producer Certification

A copy of the producer's certificates shall be included with the shipping documents for each of the mechanical, chemical, and impact tests completed according to Section 16 of CSA G40.20. The fabricator shall certify that all of the materials provided are from the materials identified by the producer as being represented by the copies of the producer's certificate by a letter attached to the copy of the producer's certificate. The fabricator shall certify all of the materials provided are according to CSA G40.20 and shall supply a copy of the mill certificate from the producer.

Example 33 – Quality Assurance Section, Material Specification

1601.08 QUALITY ASSURANCE

1601.08.01 Inspection

The quality of all materials and finished products shall be subject to inspection and approval by the Owner. The manufacturer shall afford the Owner all reasonable facilities and access to ensure that the wood products furnished are in accordance with this specification.

Example 34 - Quality Assurance Section, Material Specification

1853.08 QUALITY ASSURANCE

Upon request, the manufacturer shall provide the test results for the rubber adjustment units supplied.

Example 35 – Quality Assurance Section, Material Specification

1601.08 QUALITY ASSURANCE

1601.08.01 Inspection

The quality of all materials and finished products shall be subject to inspection and approval by the Owner. The manufacturer shall afford the Owner all reasonable facilities and access to ensure that the wood products furnished are in accordance with this specification.

Example 36 - Quality Assurance Section, Material Specification

2501.08 QUALITY ASSURANCE

2501.08.01 Sampling and Testing

Calcium chloride flake and calcium chloride solution may be subject to sampling and testing for conformity to the specified requirements. All materials that fail to meet the specified requirements shall be rejected by the Owner.

2501.08.02 Sampling Calcium Chloride Flake

Not less than three bags shall be selected by the Owner at random from the shipment. The contents of each bag shall be sampled by the Owner by scraping aside the top layer of material to a depth of approximately 25mm and taking a 0.5kg representative sample by means of a sampling tube or other method. Precautions shall be taken during the sampling operation to avoid exposing the sample unduly to atmospheric moisture. The individual samples shall be mixed thoroughly and immediately to form a composite sample of material and shall be stored in a sealed glass or suitable plastic container.

212.09 MEASUREMENT FOR PAYMENT

212.09.01 Actual Measurement

212.09.01.01 Earth Borrow and Rock Borrow

Measurement of earth borrow and rock borrow shall be by mass in tonnes or by volume in cubic metres as specified in the Contract Documents.

When earth borrow and rock borrow is measured by volume, one of the following methods, as specified in the Contract Documents, shall be used to calculate the volume of the material:

a) End Area Method

i. At Source
(A) Material shall be measured at the source in its original location by the method of average end areas.
(B) Cross-sections shall be taken after the source has been cleared, grubbed, and stripped of all unsuitable surface material.
(C)The volume of boulders removed from borrow pits that cannot be accommodated in embankments shall be deducted.

ii. In Place
(A) The material shall be measured in place with no allowance for shrinkage by the method of average end areas.

b) Truck Box Method

i. The material shall be measured loose by predetermined truck box capacities and an appropriate bulking factor as determined by the Contract Administrator. The predetermined capacity of each truck shall be that computed from its box dimensions.
ii. Each truck shall be uniquely and readily identifiable.

506.09 MEASUREMENT FOR PAYMENT

506.09.01 Water for Dust Suppression

Measurement of water for dust suppression shall be by volume in cubic metres by one of the following methods for that quantity used in the work:

a) The mass of the water shall be determined by weighing according to the Contract Documents and shall be the difference between the mass of the empty water tank and carrying vehicle and the mass of the full tank and carrying vehicle. The mass of the water shall be converted to cubic metres using a factor of 1,000kg to $1m^3$.

b) The water tank shall be measured and its volume computed in cubic metres.

c) The water shall be measured through a water meter acceptable to the Contract Administrator.

506.09.02 Calcium Chloride Flake and Magnesium Chloride Flake

Measurement of calcium chloride flake and magnesium chloride flake shall be by mass in kilograms.

506.09.03 Calcium Chloride Solution

Measurement of calcium chloride solution shall be by mass in tonnes and the mass of calcium chloride solution converted to a mass of equivalent calcium chloride flake using a conversion factor of 1 tonne of calcium chloride solution to 455kg of calcium chloride flake. The mass and volumetric measurement of calcium chloride solution shall be according to
OPSS 2501.

506.09.04 Magnesium Chloride Solution

Measurement of magnesium chloride solution shall be by mass in tonnes and the mass of magnesium chloride solution converted to a mass of equivalent magnesium chloride flake using a conversion factor of 1 tonne of magnesium chloride solution to 638kg of magnesium chloride flake. The mass and volumetric measurement of magnesium chloride solution shall be according to OPSS 2503.

Example 39 - Measurement for Payment Section, Construction Specification

558.09 MEASUREMENT FOR PAYMENT

558.09.01 Actual Measurement

558.09.01.01 Crash-Cushion Attenuating Terminal System

For measurement purposes, a count shall be made of the number of each complete Crash-Cushion Attenuating Terminal system installed.

558.09.01.02 Crash-Cushion Attenuating Terminal System, Temporary

For measurement purposes, a count shall be made of the number of each Crash-Cushion Attenuating Terminal system installed and removed, up to the maximum number of Crash-Cushion Attenuating Terminal systems required to be placed at any one time during the Contract.

558.09.01.03 Crash-Cushion Attenuating Terminal System, Relocation

For measurement purposes, a count shall be made of the number of each Crash-Cushion Attenuating Terminal system relocated. Crash-Cushion Attenuating Terminal systems that are temporarily surplus but are required for future stages shall be paid for as one relocation for the combined moves into and out of storage, including any off-site storage required due to on-site restrictions.

558.09.02 Plan Quantity Measurement

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

Example 40 - Owner Purchase of Material Section, Material Specification

1430.09 OWNER PURCHASE OF MATERIAL

1430.09.01 Measurement and Payment

Payment at the price specified in the purchasing order for the number of units of each type and size of gabion basket or gabion mat shall be full compensation for the supply of the gabion baskets or gabion mats, including the dividers, diaphragms, connecting wire, and lacing wire or fasteners, delivered to the destination on the date and time specified.

The cost of all testing, except that performed in the Owner's laboratory, shall be included in the price.

Example 41 - Owner Purchase of Material Section, Material Specification

1540.09 OWNER PURCHASE OF MATERIAL

1540.09.01 Measurement and Payment

Highway fence fabric shall be measured in metres.

For measurement purposes, a count shall be made of the number of steel fence posts delivered and accepted.

Staples shall be measured by mass in kilograms, delivered and accepted. Staples shall be delivered in units weighing 50kg or less.

Brace wire shall be measured by mass in kilograms, delivered and accepted. Brace wire shall be delivered in coils weighing 25kg or less.

For measurement purposes, a count shall be made of the number of gates, including hardware, delivered and accepted, regardless of the size and type of gate. Double gates shall be counted as one gate.

Payment at the price specified in the purchasing order shall be for the supply of fence fabric, steel fence posts, staples, brace wires, or gates, delivered to the destination on the date and time specified.

The cost of all testing, except that performed in the Owner’s laboratory, shall be included in the price.

Example 42 - Owner Purchase of Material Section, Material Specification

1802.09 OWNER PURCHASE OF MATERIAL

1802.09.01 Measurement and Payment

Measurement of smooth wall steel pipe shall be by length in metres along the centreline of the pipe.

Payment at the price specified in the purchasing order shall be for supply of the pipe and jointing devices delivered to the destination on the date and time specified.

The cost of all testing, except that performed in the Owner's laboratory, shall be included in the price.

Example 43 - Basis of Payment Section, Construction Specification

407.10 BASIS OF PAYMENT

407.10.01 Maintenance Holes, “type, size” - Item
Catch Basins “type, size” - Item
Ditch Inlets “size” - Item Valve Chambers “size” - Item
Maintenance Hole Leakage Testing – 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.

When the Owner raises or lowers a pipe invert in a maintenance hole by up to and including 150mm, it shall not constitute a Change in the Work and no adjustment shall be made to the payment. Where a pipe invert in a maintenance hole is raised or lowered by more than 150mm, then this shall constitute a Change in the Work for the full extent of the change from the original grade.

Example 44 - Basis of Payment Section, Construction Specification

504.10 BASIS OF PAYMENT

Payment at the Contract price for the appropriate tender items for the installation of sanitary and storm pipe sewers, pipe culverts and end sections, forcemains and associated appurtenances, watermains and associated appurtenances, and other underground Utilities; maintenance holes, catch basins, ditch inlets or valve chambers; and any other specified subsurface construction, shall be full compensation for all labour, Equipment, and Material to do the work of the preservation, protection, or reconstruction of existing facilities.

When the Contract contains separate items for work required by this specification, payment shall be at the Contract prices and according to the specifications for such work.

Example 45 - Basis of Payment Section, Construction Specification

539.10 BASIS OF PAYMENT

539.10.01 Protection System – Item

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

When the Contract does not contain a separate item for protection systems, the Contract price for the items directly associated with the protection system shall include full compensation for all labour, Equipment, and Materials required to do the work described in this specification.

Example 46 - Basis of Payment Section, Construction Specification

732.10 BASIS OF PAYMENT

732.10.01 Steel Beam Energy Attenuating Terminal System - 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.

Costs associated with any required removals and replacement or repairs of defective work and materials shall be the Contractor’s responsibility at no additional cost to the Owner.

Example 47 - Basis of Payment Section, Construction Specification

514.10 BASIS OF PAYMENT

514.10.01 Trenching, Backfilling, and Compacting

Payment at the Contract price for the appropriate tender items for the installation of sanitary and storm pipe sewers, pipe culverts and end sections, subdrains, forcemains and associated appurtenances, watermains and associated appurtenances, and other underground Utilities shall be full compensation for all labour, Equipment, and Material to do the work.

When the Contract contains separate items for work required by this specification, payment shall be at the Contract prices and according to the specifications for such work.

Any expenses for remedial work resulting from unauthorized over-excavation of the trench width and depth shall be borne by the Contractor.

When native material is deemed unsuitable for backfill for reasons other than those attributed to the Contractor's mode of operation, any additional work done to provide acceptable backfill beyond the work herein specified shall be paid for as Extra Work.

514.10.02 Additional Trenching, Backfilling, and Compacting - Item

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

514.10.03 Rock Excavation for Trenches

Payment for rock excavation for trenches shall be according to OPSS 515.

TABLE 1
Unacceptable CRM Mix and Required Repairs

Deficiency Type	Severity	Required Repair
Ravelling / Coarse Aggregate Loss (Note 1)	Very Slight to Slight	No action required.
	Moderate to Severe	Mill 50mm and replace with same HMA to be used on surface course or an acceptable HMA as specified in the Contract Documents.
	Very Severe	Remove all CRM material and replace with same HMA to be used on surface course or an acceptable HMA as specified in the Contract Documents.
Segregation (Note 2)	Slight to Medium	No action required.
	Severe	Mill 50mm and replace with same HMA to be used on surface course or an acceptable HMA as specified in the Contract Documents.
Moisture content could not be achieved as per the Acceptance Criteria for Moisture Content subsection.	N/A	Remove all CRM material in the sublot represented by the test and replace with CRM or the same HMA to be used on surface course or an acceptable HMA as specified in the Contract Documents.
Compaction could not be achieved as per the Acceptance Criteria for Compaction subsection.	N/A	Remove all CRM material in the sublot represented by the test and replace with CRM or the same HMA to be used on surface course or an acceptable HMA as specified in the Contract Documents.

Notes:

1. Deficiency and severity definitions according to SP-024.

2. Deficiency and severity definitions according to Field Guide for the Acceptance of Hot Mix and Bridge Deck Waterproofing.

A. The HMA shall be placed in compacted lift thicknesses between 40 and 75mm.

TABLE 9
Gradation Requirements for Winter Sand

Sieve Size	Gradation (LS-602), Percent Passing
9.5 mm	100.0 (Note 1)
6.7 mm	97 - 100
4.75 mm	90 - 100
2.36 mm	50 - 95
1.18 mm	20 - 90
600 μm	0 - 70
300 μm	0 - 35
150 μm	0 - 15
75 μm	0 - 5.0

Notes:

1. In addition to LS-602, to be confirmed by visual inspection of the stockpile.

A. The minimum size of the test sample shall be 5kg. Following oven drying, the sample shall be sieved on the 9.5mm, 6.7mm, and 4.75mm sieves. Material passing the 4.75mm sieve shall be split to an appropriate size according to LS-602 for subsequent washing and fine sieving. The final grading shall be calculated according to LS-602 as the percentage of material passing each sieve based on the total mass of the oven dried sample.

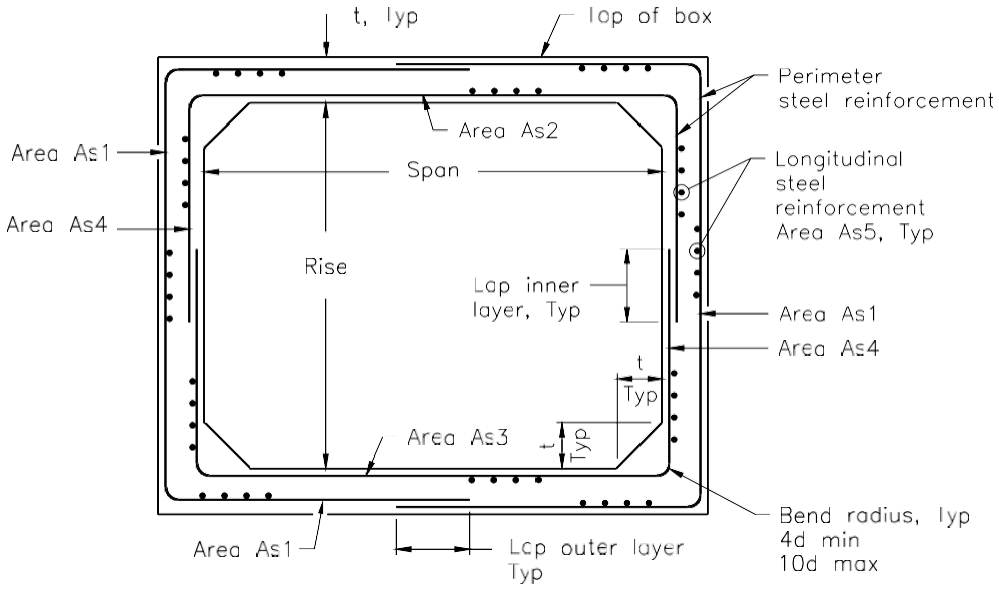


Figure 1
Box Unit Cross-Section

Notes:

A. Figure 1 to be used in conjunction with Table 1 and only applies to box units reinforced with WWR.
B. As1 to As4 refer to minimum reinforcement areas required at indicated faces.
C. t = thickness of walls and slabs.
D. d = diameter of perimeter steel reinforcement.

206.07.06.01.01 Submission of Grade Checks

The Contractor shall submit all grade checks relating to horizontal and vertical grading tolerances, including all non-compliances, to the Contract Administrator within 2 Business Days following completion of the grade.

When a digital terrain model is available, the Contractor has the option to provide the grade checks in the same format accompanied with a signed cover letter certifying that the components of the work indicated on the digital terrain model have been correctly constructed to the specified line and grade tolerances.

Alternatively when grading templates are available, the Contractor shall sign and certify on the grading template that the components of the work indicated on that template have been correctly constructed to the specified line and grade tolerances.

If a digital terrain model or template is not available, then the Contractor shall complete, sign, and submit the attached form OPSF 206-1 to the Contract Administrator.

CERTIFICATION OF GRADE ELEVATION / CROSSFALL

CONTRACT _____ **LOCATION** _____

COMPONENTS _____ **LOCATION** _____

In compliance with the contract, I hereby certify that the following component of the work has been correctly constructed to the specified line and grade tolerances.

FROM STATION	TO STATION	TYPE OF GRADE (base, subbase, earth, rock, culvert etc.)	DATE	SIGNATURE

OPSF 206-1, November 2021

Appendix 1010-D, November 2013
FOR USE IN MUNICIPAL CONTRACTS, WHEN REFERENCED IN THE CONTRACT DOCUMENTS

Note: This is a non-mandatory Additional Information Appendix intended to provide supplementary requirements for the OPS specification in a municipal contract, when the appendix is invoked by the Owner. It is written in mandatory language to permit invoking it by reference in the Contract Documents. If the appendix has not been invoked by reference in the Contract Documents, it does not apply.

OPSS 1010 - Aggregate Test Data - Granulars
Physical Properties

Contract No.:	Contractor:	Contract Location:	
Name of Testing Laboratory:		Telephone No.:	Fax No.:
Sampled by (Print Name):		Date Sampled (YY/MM/DD):	Date Tested (YY/MM/DD):
Granular Type:		Quantity (tonnes) :	
Source Name/Location:		Aggregate Inventory Number (AIN) :	

Laboratory Test and Number	Requirements								Test Results		
	A	B Type I	B Type II	B Type III	M	O	S	SSM	Reference Material	Sample	Meets Requirements (Y/N)
Crushed Particles, % minimum, LS-607	60	--	100	--	60	100	50	--			
Unconfined Freeze-Thaw, % maximum loss, LS-614	--	--	--	--	--	15	--	--			
2 or more Crushed Faces, % minimum, LS-617	--	--	--	--	--	85 (Note 1)	--	--			
Micro-Deval Abrasion, Coarse Aggregate % maximum loss, LS-618	25	30 (Note 2)	30	30 (Note 2)	25	21	25	30 (Note 2)			
Micro-Deval Abrasion, Fine Aggregate % maximum loss, LS-619	30	35	35	35	30	25	30	--			
Asphalt Coated Particles, % maximum, LS-621	30	30	0	30	30	0	30	0			
Amount of Contamination, LS-630	**(Note 3)**										
Plasticity Index, maximum, LS-703/704	**0**										
Determination of Permeability, *k,* LS-709	**(Note 4)**										

Notes:
1. When Granular O is produced from boulders, cobbles, or gravel retained on the 50mm sieve.
2. The coarse aggregate Micro-Deval abrasion loss test requirement shall be waived if the material has more than 80% passing the 4.75mm sieve.
3. Granular A, B Type I, B Type III, or M may contain up to 15 percent by mass crushed glass or ceramic materials. Granular A, B Type III, M, O, and S shall not contain more than 1.0 percent by mass of wood, clay brick and/or gypsum and/or gypsum wall board or plaster. Granular B Type II and SSM shall not contain more than 0.1 percent by mass of wood.
4. For materials north of the French/Mattawa Rivers only, the coefficient of permeability, *k*, shall be greater than 1.0×10^{-4} cm/s or field experience has demonstrated satisfactory performance. Prior data demonstrating compliance with this requirement for *k*, shall be acceptable provided that such testing has been done within 5 years of the material being used and field performance has continually been shown to be satisfactory.

OPSF 1010-1, November 2013

I hereby certify that testing has been carried out by a properly qualified/certified test technician:

Issued by: _____ _____ _____
PRINT NAME | TESTING LABORATORY REPRESENTATIVE SIGNATURE | DATE

Received by: _____ _____ _____
PRINT NAME | CONTRACT ADMINISTRATOR REPRESENTATIVE SIGNATURE | DATE

Copies to: x Contract Administrator x Project Manager

Example 53 – OPSS Forms, Form Completed During Design to Specify a Contract Requirement

Appendix 182-A, November 2012
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

OPSS 182 and Ontario Provincial Form (OPSF) 182-1 may be required whenever work is proposed in waterbodies and on waterbody banks.

OPSS 182 and OPSF 182-1 should not be included in the Contract, unless necessary authorizations, approvals, and permits can be obtained from the appropriate regulating agencies.

The Owner should complete OPSF 182-1 with the necessary environmental protection information, in consultation with the appropriate regulatory agencies. The completed OPSF 182-1 is to be included in the Contract Documents.

The completed form should reflect the requirements of any formal approvals, permits or authorizations obtained, or the requirements that avoid the need for such authorization. In some cases OPSF 182-1 should refer to the actual authorization attached to the Contract. A blank copy of OPSF 182-1 is attached along with an example of information required to complete the form.

It may be necessary to augment the completed OPSF 182-1 with project-specific Contract Drawings.

Use of the OPSDs listed below are subject to the same conditions and approvals as OPSF 182-1.

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

Significant Clauses

The requirements of subsection 182.07.01 are intended to avoid unauthorized destruction of fish habitat by the Contractor and thereby minimize the potential for charges being laid against the Owner and Contractor. For this section to be effective, the Owner must ensure that all waterbodies, including seasonally dry fish habitat, within the Contract limits are identified in the Contract Documents.

Related Ontario Provincial Standard Drawings

OPSD 221.010	Temporary Water Passage System, Culvert in Watercourse
OPSD 221.020	Temporary Water Passage System, Pumping and Piping
OPSD 221.030	Temporary Water Passage System, Temporary Channel or Culvert Outside Watercourse
OPSD 221.040	Temporary Waterbody Crossing, Fill and Culvert
OPSD 221.050	Temporary Waterbody Crossing, Ford

Appendix 182-A

PERMITTED WORK IN WATERBODIES, ON WATERBODY BANKS AND ADJACENT TO WATERBODIES

Waterbody and Location	Permitted Protection Measures and Work		Design and Construction Details Including Site Restoration	Timing Constraints (see note)
For each waterbody and location within the Contract limits, specify: 1. waterbody name/location 2. stations and offsets pertinent to the work permitted and the fisheries and protection measures selected.	Temporary Water Passage	Culvert (OPSD 221.010)	Specify # of culverts, culvert dimensions; invert elevations; bedding material; dam material/details; scour protection.	
		Piping and Pumping (OPSD 221.020)	Specify capacity/end points; dam material/details; scour protection.	
		Channel (OPSD 221.030)	Specify end points; channel dimensions; channel lining; flow control device; dam material/details, culvert details as listed below under culvert, if required.	
	Temporary Waterbody Crossing	Fill and Culvert (OPSD 221.040)	Specify # of culverts, culvert dimensions; maximum fill base width; maximum fill elevation; scour protection; waterbody bank protection.	
		Ford (OPSD 221.050)	Specify equipment restrictions; crossings per day; maximum fill base width.	
		Bridge	Specify type of structure; opening dimensions; pier setback; waterbody bank protection.	
	Cofferdam, Dam, Turbidity Curtain		Specify end points; channel dimensions or maximum penetration; maximum dam base width; maximum dam elevation; dam material/details.	
	Isolation of work area from Waterbody and Waterbody Bank.		Specify temporary barricade, identification of area in which any entry is prohibited, etc.	
	Other work in waterbodies and on waterbody banks.		Specify details of permitted work.	

OPSF 182-1, November 2021

To be completed by the Owner in consultation with regulatory agencies, and is to be used in conjunction with OPSS 182 and shall form part of the Contract Documents. A separate form is required for each work area in waterbodies and on waterbody banks.

Note:

For each protection measure and for any other work, specify one or a combination of:

1. Dates between which protection measure installation is permitted and dates between which protection measure removal is permitted.

2. Dates between which protection measure can be in place; or

3. Maximum period (e.g., # of days) that protection measure can be in place.

4. A separate form is required for each work area in waterbodies and on waterbody banks.

Appendix 182-A

PERMITTED WORK IN WATERBODIES, ON WATERBODY BANKS AND ADJACENT TO WATERBODIES

Waterbody and Location	Permitted Protection Measures and Work		Design and Construction Details Including Site Restoration	Timing Constraints (see note)
	Temporary Water Passage	Culvert (OPSD 221.010)		
		Piping and Pumping (OPSD 221.020)		
		Channel (OPSD 221.030)		
	Temporary Waterbody Crossing	Fill and Culvert (OPSD 221.040)		
		Ford (OPSD 221.050)		
		Bridge		
	Cofferdam, Dam, Turbidity Curtain			
	Isolation of work area from Waterbody and Waterbody Bank.			
	Other work in waterbodies and on waterbody banks.			

To be completed by the Owner in consultation with regulatory agencies, and is to be used in conjunction with OPSS 182 and shall form part of the Contract Documents. A separate form is required for each work area in waterbodies and on waterbody banks.

OPSF 182-1, November 2021

Appendix 405-A, November 2008
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:

- Pipe size, metal thickness, corrugation profile, and coating requirements of corrugated steel pipe. (405.05.02)

- Pipe size, type, and stiffness requirements of polyethylene and polyvinyl chloride pipe products. (405.05.03 and 405.05.04)

- The width, grade, and alignment of trench excavation. (405.07.02)

- Bedding depth. (405.07.05)

The designer should determine if the following is required and, if so, it should be specified in the Contract Documents:

- Type, Class, and Filtration Opening Size (FOS) of geotextile trench wrap. (405.05.05)

- Whether the subdrain trench and outlet are to be wrapped with geotextile. (405.07.04)

- Installation details of the geotextile trench wrap. (405.07.04)

- Material type(s) for embedment and backfill of subdrain and outlet pipes. (405.05.07 and 405.07.07)

- Tender item for the inspection of subdrain and outlet pipes by CCTV. (405.07.08 and 405.10.02)

In specifying material types for embedment material, the designer should be aware that certain granulars may have lower permeability and may not be suitable as a drainage medium.

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

OPSD 206.050 Subdrain Pipe Connections and Outlet Details - Rural
OPSD 207.044 Subdrain Pipe Connections and Outlets for Open Graded Drainage Layer
OPSD 216.021 Subdrain Pipe Connections and Outlet Details - Urban

Example 55 - Appendices, Supplementary Information to be Completed by Contractor

Reference in Appendix 1010-A:
The designer should determine if the forms in Appendices 1010-B and 1010-C are to be used for submission purposes. If so, they need to be invoked by reference in the Contract Documents.

Appendix 1010-B, April 2004
FOR USE IN MUNICIPAL CONTRACTS, WHEN REFERENCED IN THE CONTRACT DOCUMENTS

Note: This is a non-mandatory Additional Information Appendix intended to provide supplementary requirements for the OPS specification in a municipal contract, when the appendix is invoked by the Owner. It is written in mandatory language to permit invoking it by reference in the Contract Documents. If the appendix has not been invoked by reference in the Contract Documents, it does not apply.

OPSS 1010 - FINE AGGREGATE TEST DATA
Granular A, B, M, O, S, and Select Subgrade Material (SSM)

Contract No:	**Contractor:**	**Contract Location:**
Name of Testing Laboratory:		
Telephone No:	**Fax No:**	**Date Tested:**

Material Type (check one)						
Granular						**[ ] SSM**
[ ] A	**[ ] B Type I**	**[ ] B Type II**	**[ ] M**	**[ ] O**	**[ ] S**	
Date Sampled (YY/MM/DD):		**Sampled by (Print Name):**			**Material Source:**	

Laboratory Test Number	**Acceptance Requirements**							**Test Results**	
	Granular						**SSM**		
	A	**B Type I**	**B Type II**	**M**	**O**	**S**		**Reference Material**	**Sample**
Petrographic Requirement, LS-616	For materials north of the French and Mattawa Rivers: maximum 10% mica (retained on the 75 μm sieve).							N/A	
Micro-Deval Abrasion Loss, % maximum, LS-619	30	35	35	30	25	30	N/A		
Plasticity Index, % maximum, LS-704	0	0	0	0	0	0	0	N/A	

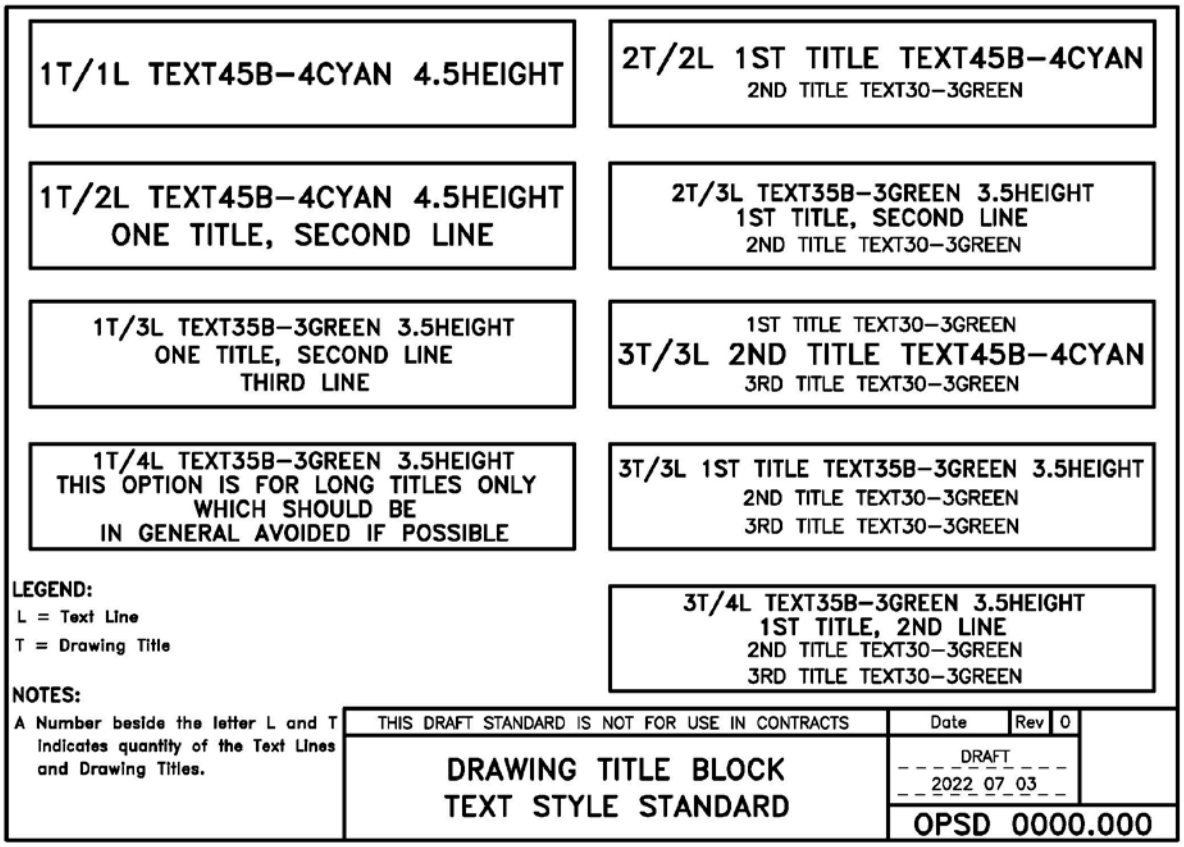
Issued by Testing Laboratory Representative:

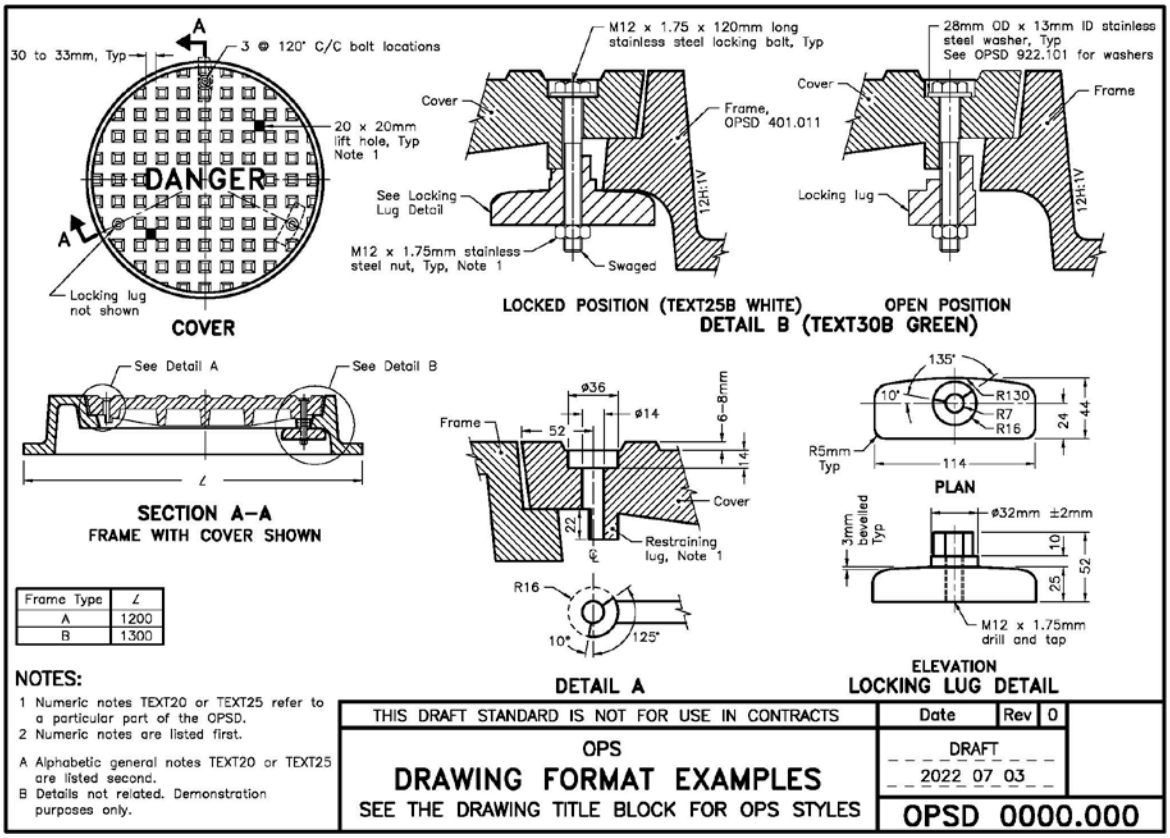
PRINT NAME SIGNATURE DATE

Received By Contract Administrator Representative:

PRINT NAME SIGNATURE DATE

Example 56 – Drawing Title Block, Font




30 to 33mm, Typ
3 @ 120° C/C bolt locations
20 x 20mm lift hole, Typ Note 1
DANGER
Locking lug not shown
COVER
M12 x 1.75 x 120mm long stainless steel locking bolt, Typ
Cover
Frame, OPSD 401.011
See Locking Lug Detail
M12 x 1.75mm stainless steel nut, Typ, Note 1
Swaged
12H:1V
28mm OD x 13mm ID stainless steel washer, Typ See OPSD 922.101 for washers
Locking lug
LOCKED POSITION (TEXT25B WHITE)
OPEN POSITION
DETAIL B (TEXT30B GREEN)
See Detail A
See Detail B
SECTION A–A
FRAME WITH COVER SHOWN
Frame Type | ℄
A | 1200
B | 1300
ø36
ø14
52
6–8mm
14
22
Restraining lug, Note 1
R16
10°
125°
DETAIL A
135°
R130
R7
R16
10°
24
44
R5mm Typ
114
PLAN
3mm bevelled Typ
ø32mm ±2mm
10
25
52
M12 x 1.75mm drill and tap
ELEVATION
LOCKING LUG DETAIL
NOTES:
1 Numeric notes TEXT20 or TEXT25 refer to a particular part of the OPSD.
2 Numeric notes are listed first.
A Alphabetic general notes TEXT20 or TEXT25 are listed second.
B Details not related. Demonstration purposes only.
THIS DRAFT STANDARD IS NOT FOR USE IN CONTRACTS
Date
Rev 0
OPS
DRAWING FORMAT EXAMPLES
SEE THE DRAWING TITLE BLOCK FOR OPS STYLES
DRAFT
2022 07 03
OPSD 0000.000