



CODES CANADA
Build on expertise

Canadian National Master Construction Specification (NMS)

User's Guide



National Research
Council Canada

Conseil national de
recherches Canada

Canada

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1 Preface

1.1 Foreword

The Canadian National Master Construction Specification (NMS) is a resource and reference tool for specification writers. Over the last 35 years, it has developed into an extensive database of master specifications. It is the culmination of contributions from many professionals and industry specialists who are well recognized in their fields.

1.2 Copyright notice

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Intended use by end-users means that a user may reproduce NMS sections for use in preparing office-specific master specification sections and for producing their project specifications as derivative work. Any other usage is restricted under international Copyright laws.

1.3 Disclaimer

NMS is supplied "as is". The NRC disclaims any warranties, expressed, implied, or statutory, of any kind or nature with respect to NMS, including without limitation any warranty of merchantability or fitness for a particular purpose. The NRC shall not be liable in any event for any damages, whether direct or indirect, special or general, consequential or incidental, arising from the use of NMS. NRC does: (1) not assume any legal liability or responsibility for the accuracy, completeness, or usefulness of NMS, (2) not warrant that NMS is error-free or that any errors will be corrected.

1.4 Limitations of Use

NMS is not a substitute for the Project Manual or the Contract specifications. The appropriate NMS sections must be edited and adapted to suit the requirements of individual construction projects. The responsibility for determining the suitability of NMS sections for use in a particular project and for the selection of options rests with the NMS user.

NMS is based on the requirements of the National Model Construction Codes and does not include all possible regional and municipal variations concerning materials, systems, assemblies, accessories, their availability and their method of construction. It may not list or describe every material, system, assembly or accessory required for an individual project. It may not describe the entire execution of the required Work in detail.

1.5 National Research Council of Canada

The NRC is the Government of Canada's premier organization for research and development (R&D). The NRC partners with Canadian industry to take research results from the lab to the marketplace, where the public can experience the benefits. With its market-driven focus, the NRC is responsive, creative, and uniquely placed to partner with Canadian industry and to invest in strategic R&D programming that will address critical issues for the future.

As the custodian of NMS, the NRC facilitates the development and updating of NMS sections to provide the most comprehensive master specification in Canada, which serves as an easy-to-use framework for writing construction project specifications.

1.6 Contact information

For enquiries related to NMS, refer to www.nrc-cnrc.gc.ca/nms.

2 Executive summary

NMS is managed and maintained by the NRC. NMS is continually reviewed and updated by industry specialists from across Canada in both the public and private sectors.

NMS has adopted a philosophy of environmental responsibility and encourages sustainable construction practices. However, specification writers, consultants, and other NMS users must understand that NMS is neither intended as a design tool nor as an educational tool. NMS users are assumed to be, for the most part, experienced specification writers capable of making the appropriate design and product decisions required to meet specific project requirements. This Guide is intended to assist the specification writer in using NMS and in making appropriate choices through the use of tools built into the NMS system.

This Guide gives the specification writer basic information about NMS and its use by:

- providing an overview of and background information on NMS
- describing the organizational structure of NMS
- explaining the application and use of tools built into NMS

3 Overview and background

3.1 Introduction

NMS is an extensive library of construction specification sections, which are used by government and the private sector. Available in English and French, NMS is a resource tool designed for the Canadian building construction industry, containing more than 780 specification sections and comprising about 7000 pages in each language.

NMS is supported by major construction industry associations and is updated regularly by industry specialists to incorporate changes in:

- technology
- environmentally responsible options for materials, products and systems
- installation requirements and methods
- current industry practices

NMS is a resource tool and reference document. It is a delete master that provides bracketed optional text and blank spaces requiring selection and editing by the project specification writer.

Reference to materials and methods in NMS does not necessarily preclude the use of other suitable materials and methods.

NMS is divided into divisions and sections in accordance with MasterFormat™ and UniFormat™, which are standard master lists of titles and numbers for the construction industry. Both MasterFormat™ and UniFormat™ are jointly produced by Construction Specifications Canada (CSC) and the Construction Specifications Institute (CSI).

NMS prescriptive sections are formatted in accordance with SectionFormat™, which is a recommended three-Part format for construction specifications that is jointly produced by CSC/CSI.

NMS performance sections are formatted following some of the recommendations outlined in CSI's PPDFormat™ (PPD stands for Preliminary Project Description). This format was then adapted to allow for broader project information, to better capture information available at later stages of the project.

NMS is available in various electronic formats through authorized publishers. Each publisher produces software applications that enhance the ease of use of NMS.

3.2 NMS development

The NRC's Construction Research Centre is responsible for ensuring that NMS is current, concise, and practical. To this end, the NMS Technical Team manages and maintains NMS by:

- developing work plans for the maintenance and updating of NMS database
- administering the NMS technical review process
- maintaining the integrity, style, and format of NMS

The NRC co-ordinates the continuing development, maintenance, and updating of:

- general construction specification sections
- sections on historic structures and conservation for Parks Canada, Canadian Heritage, and Environment and Climate Change Canada
- specialty sections for Public Services and Procurement Canada, National Defence, and the private sector
- a list of reference standards

3.2.1 NMS update process

NMS is reviewed and updated on an ongoing basis, and new updates are published every 3 months (in January, April, July, and October). In producing these updates, NMS Task Groups are in charge of developing and updating a group of sections related to a particular subject, which are generally part of the same MasterFormat™ division or linked UniFormat™ elements. The NMS Technical Team then standardizes, processes, and translates these sections before sending them to the publishers of NMS. Each publisher makes NMS available for purchase as Rich Text Format (RTF) files for use with word processing software or as files for use with the publisher's proprietary software.

3.2.2 NMS National Advisory Board

The NMS National Advisory Board is responsible for providing overall direction to the NMS Technical Team by establishing goals and priorities for NMS.

3.2.3 NMS National Technical Committee

The NMS National Technical Committee comprises representatives from industry and professional associations, who advise on the technical content of NMS.

3.2.4 NMS Task Groups

NMS Task Groups comprise specialists from a range of stakeholder groups, including private-sector professional, trade, and manufacturer associations. The task groups are responsible for the technical integrity, content, and relevancy of the sections that they review.

3.3 Use of NMS

3.3.1 Use in the federal public sector

It is the policy of the Real Property Branch (RPB) of Public Services and Procurement Canada to use the performance-based NMS for the preparation of specifications for the construction, renovation, restoration, and repair of federal government architectural, landscape, marine, structural, and heavy civil engineering facilities, whether designed in-house, by private consultants, or as projects done through the department's Alternate Forms of Delivery service provider. For further details, refer to the RPB "Policy on the Use of the National Master Specification (NMS)." National Defence and Defence Construction Canada each have a similar policy of using NMS for their projects.

3.3.2 Use in the provincial, territorial, and municipal public sectors

Provincial, territorial, and municipal governments often mandate the use of NMS for the preparation of construction and demolition procurement documents. It is deemed important to use a non-restrictive approach for the preparation of project specifications for Contracts when expenditures are made against the public purse and to avoid any perception of favouritism in these specifications through naming or single sourcing without extensive research. Most provincial, territorial, and municipal governments expect project-specific requirements to be incorporated in specifications where such information is missing or incomplete in NMS.

3.3.3 Use in the private sector

For decades, NMS has been used as the basis for most private sector specifications. Many design professionals and commercial corporations use the content and layout of NMS as a framework to build in-house specifications. NMS can be modified to include proprietary descriptions of acceptable products (where a variety of products can be used) or basis of design products (where single-source products are used, as is common practice for replicated construction projects and renovations that require a predictable source of construction components).

3.4 Types of specifications

In NMS, two types of specifications are used:

- Prescriptive specifications: these require expert input and product knowledge from many contributors. Prescriptive specifications can present a higher risk to the consultant and tend to limit the Contractor's freedom to create innovative solutions. Nevertheless, prescriptive specifications provide the Owner with a known set of requirements, allowing a more accurate bid price to be established and reducing the Contractor's risk.
- Performance specifications: these require that the Contractor use their experience to interpret the project deliverables. Performance specifications can present a higher risk to the Contractor if the consultant or specification writer does not provide sufficient detail on expected performance. Nevertheless, performance specifications can provide the Owner with a more innovative construction solution.

The use of both prescriptive and performance specifications in NMS provides the specification writer with a more efficient approach to project documentation and allows each risk to be allocated to the party best suited to manage that risk.

Manufacturer names, product numbers, and trade names may be added to NMS content by the Specification writer to designate products demonstrating the performance described by performance-based requirements, on the basis of other projects, private or public sector usage, or project manager direction.

4 NMS content

4.1 Specification structure and conventions

NMS follows the recommendations of:

- CSC for the textual improvement of construction specifications, including their language and style
- CSC/CSI MasterFormat™ and UniFormat™ for the numbering and naming of prescriptive specification and performance specification sections, respectively
- CSC/CSI SectionFormat™ for the organization of information within prescriptive sections according to a structure of three Parts containing consistently named Articles in a specific order
- CSI PPDFormat™ for part of the organization of information within performance sections

In addition, NMS facilitates the use of PageFormat™ for page layout by the publisher.

4.1.1 CSC/CSI MasterFormat™ and UniFormat™

The structure of NMS offers considerable flexibility through its expandable and contractible number of sections within the rigid framework of the 50 Divisions of MasterFormat™ and the 9 main groups of level 1 elements of UniFormat™.

The structure of NMS enables a consistent arrangement of information and facilitates cross-referencing, which is necessary to fully describe certain Work Results.

Each MasterFormat Division is composed of multiple related sections. The designations these sections start with are a 2-digit number corresponding to the appropriate Division, which are followed by a 4- or 6-digit number, depending on the scope of information or the recommendations of MasterFormat™.

MasterFormat™ sections are subdivided into three Parts with a simple and logical sequence of information arranged according to SectionFormat™.

The designations of UniFormat™ sections start with a letter corresponding to the appropriate level 1 element, which is followed by a 2-, 4- or 6-digit number, depending on the level of detail.

4.1.2 Language and style

In writing construction specifications, effective communication is achieved by keeping the reader in mind at all times and by following five fundamental principles (the 5 C's of Specification Writing):

- **Clear:** Organize sentence structure for readability, use correct grammar, and choose words that convey exact meaning.
- **Concise:** Write short sentences when possible and eliminate unnecessary words without compromising clarity.
- **Complete:** Give comprehensive and detailed information.
- **Correct:** Verify accuracy of information and make no assumptions.
- **Consistent:** Maintain consistent spelling, language and format throughout the document.

The NMS style and format have been developed to assist the specification writer in fulfilling these basic principles of effective specification writing.

4.2 SPEC NOTES: Notes to the Specification Writer

SPEC NOTES are notes located throughout NMS to provide specification writers with additional information and guidance. They are not meant for inclusion in the Project Manual.

There are several types of Spec Notes, including:

- **SPEC NOTE: DESCRIPTION:** This type of Spec Note, located at the top of the first page of a section, serves to introduce the section and to provide a brief overview of its content and recommended usage. It also advises the specification writer of items that are not in the section but that the section title may lead them to believe would be included.
- **SPEC NOTE: SUPPORT:** This type of Spec Note acknowledges organizations that have assisted in the review or development of the section. When included, these acknowledgements are located at the top of the first page of the section, directly below the SPEC NOTE: DESCRIPTION.
- **SPEC NOTE: ENVIRONMENTAL:** This type of Spec Note is found at the top of the first page of certain sections to notify the specification writer that the section specifies environmentally responsible choices of materials, products and systems. It can also be found at other locations in a section, where it is intended to assist the specification writer in making environmentally responsible selections and decisions.
- **SPEC NOTE:** This general type of Spec Note introduces certain Articles and paragraphs, and provides specification writers with related information or with instructions on the actions required on their part (for example, choices to be made).

4.3 Reference Standards

NMS references standards to establish levels of quality for both materials and work practices. These reference standards are issued by standards development organizations (SDOs), such as the Bureau de normalisation du Québec (BNQ), the Canadian General Standards Board (CGSB), CSA Group, ASTM International, the American National Standards Institute (ANSI), ULC Standards, the International Organization for Standardization (ISO), and professional, trade, and manufacturers' associations. Most of the reference standards are consensus standards.

Although Canadian standards are referenced whenever possible, many American and international standards are referenced as well. The number of ISO standards referenced is increasing as a result of the harmonization of Canadian, American, and international standards.

Reference standards are specific to the NMS section in which they appear and may contain references to other standards. It is incumbent on the NMS user to gain a thorough understanding of these nested standards and to make choices appropriate for the project on the basis of this understanding.

4.3.1 Standards in prescriptive sections

Standards referenced in the text of a section are listed in the REFERENCE STANDARDS Article in Part 1 under a paragraph identifying the SDO. The specification writer must delete any listed standards that are not referenced in the section. The specification writer can also add standards to the REFERENCE STANDARDS Article (for example, when a new standard provides clearer direction on a specific performance requirement applicable to the project in question). Nested standards are not listed in the REFERENCE STANDARDS Article of the NMS section.

In the REFERENCE STANDARDS Article in Part 1, the standards are identified by SDO (acronym or initials), number, date, and title. The date and title are not included when referencing a standard in the section's text. For instance, while the REFERENCE STANDARDS Article would include the full description "ASTM D448-[12], Standard Classification for Sizes of Aggregate for Road and Bridge Construction," subsequent references in the body of the section would read "ASTM D448."

As standards are continually being reviewed and updated, specification writers must determine which edition of a reference standard applies to their project by verifying which edition is currently enforced by local authorities and industry associations. When updating a reference standard to a new edition, the specification writer should also review the new edition of the standard to evaluate its impact on the technical content of the section.

4.3.2 Consensus Standards

Consensus standards describe compliance criteria for specific materials, testing procedures, and processes, which are developed and accepted by a recognized public or private SDO through a consensus-based mechanism, often with public input.

4.4 Project Options

Project options (for example, material, component, and assembly selections) are provided throughout the text of a section to assist the specification writer in the development of the project specification. These options, which are presented in a drop-down list or square brackets, are retained or deleted by the specification writer according to the needs of the project.

Where several options are presented, the order in which they are listed should not be assumed to be an order of preference.

Blank fields or square brackets enclosing blank spaces indicate that the specification writer must fill in additional information. They are immediately preceded or followed by symbols, such as units of measurement, or explanations to guide the specification writer.

4.5 Related Requirements

The RELATED REQUIREMENTS Article contains cross-references to documents and sections with specific information on items that require co-ordination. It lists other documents or sections in the Project Manual that are related to, that are dependent on, or that have a direct effect on the Work Result of the section.

Cross-referencing facilitates the co-ordination of information on assemblies and systems whose components span multiple sections to ensure that the assembly or system as a whole meets the necessary performance requirements. For example, if hardware for aluminum entrances is specified in a section on aluminum entrances, a cross-reference to this section would be appropriate in the section on finish hardware.

At the moment, the RELATED REQUIREMENTS Article is usually left blank for the specification writer to fill in. In future NMS updates, a list of directly related or closely associated documents and sections may be provided in the RELATED REQUIREMENTS Article.

4.6 References to MasterFormat™ Division 01

Division 01 sections are unique in that their content interrelates directly with the content of all other technical specification sections.

Division 01 sections are not listed in the RELATED REQUIREMENTS Article of a section because Division 01 applies equally to all technical specification sections. However, it is common practice to include the numbers and titles of Division 01 sections within the body of a section as a reminder that Division 01 applies to all Work Results.

5 Regulatory Requirements

NMS is based on the national model construction codes.

While federal projects must comply with the national model construction codes, provincial, territorial, municipal, and private projects must comply with the applicable codes for the jurisdiction where the work will be carried out.

In Canada, provincial, and territorial governments have the authority to enact legislation that regulates building design and construction within their jurisdictions. This legislation may include the adoption of the National Model Construction Codes without change or with modifications to suit local needs, and the enactment of other laws and regulations regarding building design and construction. The provinces and territories, in turn, delegate a rigidly controlled portion of this authority to municipalities. Therefore, the specification writer must refer to provincial or territorial and municipal regulations to ensure that the project specification complies with the governing legislation.

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