FACILITIES CIVIL ENGINEERING AND BUILDING ENVELOPE STANDARD - GENERAL

MX-FAE-STD-C001

Facilities Architecture & Engineering
Revision 00
October 2025

METROLINX

Facilities Civil Engineering and Building Envelope Standard – General

MX-FAE-STD-C001

Publication Date: October 2025
COPYRIGHT © 2025

Metrolinx,

an Agency of the Government of Ontario

The contents of this publication may be used solely as required for services performed on behalf of Metrolinx or for and during preparing a response to a Metrolinx procurement request. Otherwise, this publication or any part thereof shall not be reproduced, redistributed, stored in an electronic database or transmitted in any form by any means, electronic, photocopying or otherwise, without written permission of the copyright holder. In no event shall this publication or any part thereof be sold or used for commercial purposes.

The information contained herein or otherwise provided or made available ancillary hereto is provided "as is" without warranty or guarantee of any kind as to the accuracy, completeness, fitness for use, purpose, non-infringement of third-party rights or any other warranty, express or implied. Metrolinx is not responsible and has no liability for any damages, losses, expenses, or claims arising or purporting to arise from the use of or reliance on the information contained herein.

Preface

This is the first edition of the Facilities Civil Engineering and Building Envelope Standard – General (MX-FAE-STD-C001). This standard is to establish a framework for the Facilities Civil Engineering (FCE) Standards, providing overarching principles, guidance on their use, and their role in supporting consistency, quality, and maintainability across Metrolinx-owned station and facility assets. It serves as an introduction to the suite of technical standards, ensuring users understand their intent, structure, and application.

This standard is to be followed by Engineering and Design Consultants working on Metrolinx projects and internal Metrolinx staff.

The content within the Facilities Civil Engineering and Building Envelope Standard – General (MX-FAE-STD-C001) was developed by the Metrolinx Facilities, Architecture, and Engineering's Civil Engineering Team within the Asset Management and Maintenance Division, which includes specialized subject matter experts.

This Standard is available for external users to download via the Metrolinx public download site at https://www.metrolinx.com/en/metrolinx-technical-standards

Suggestions for revision or improvements can be sent to Metrolinx Facilities, Architecture, and Engineering (FAE) Civil Engineering Team, Attention: Senior Manager, FAE Civil Engineering, who will introduce the proposed changes to Metrolinx FAE Civil Engineering. The Senior Manager, FAE Civil Engineering, ultimately authorizes the changes. A description of the proposed change shall be included along with information on the background of the application and any other useful rationale or justification. Proposals for revisions or improvements shall include your name, company affiliation (if applicable), email address, and phone number.

October 2025

Contents:

Preface iii

1. General 1

1.1 Purpose 1

1.2 Scope 1

1.3 Using The Facilities Civil Engineering and Building Envelope (FCE) Standards 2

2. Definitions & Abbreviations 5

2.1 Definitions 5

2.2 Abbreviations 6

List of Tables:

Table 1: FCE Standard Topics 2

Table 2: List of Definitions 5

Table 3: List of Abbreviations 6

1. General

1.1 Purpose

1.1.1 The Metrolinx Facilities Civil Engineering and Building Envelope (FCE) standards are designed to ensure consistency, quality, and ease of maintenance across all civil infrastructure projects related to stations and facilities. Standardization helps in achieving reliable and predictable outcomes, minimizes operational disruptions, and enhances the safety and sustainability of our transit facilities.

1.1.2 The purpose of this suite of standards is to provide minimum requirements and design guidance to designers for Metrolinx-owned assets. They are not a substitute for good judgment or sound engineering practice, nor are they intended to hinder innovative solutions or design outcomes that improve durability, maintainability, or overall system performance.

1.1.3 The Designers of Record retain ultimate responsibility for their designs and shall comply with all applicable laws, codes, and regulations relevant to the specific project site. This framework ensures consistent design practices, regulatory compliance, and civil infrastructure that is durable, maintainable, and suited for long-term service, while allowing the Designers of Record to exercise their professional judgment.

1.2 Scope

1.2.1 This set of standards applies to all Metrolinx-owned station and facility assets across multiple transit modes, including but not limited to: GO Stations, Bus Terminals, Light Rail Transit (LRT), Bus Rapid Transit (BRT), and Subway lines. Station and facility assets include buildings, structures, pedestrian bridges, subsurface utilities, and surface-level transportation facilities, primarily associated with bus and train platforms within the project site but outside the rail corridor or transit guideways.

1.2.2 Temporary assets required to support Metrolinx operations during transitions between construction projects, including those constructed within a singular project to enable phasing, may not need to comply with these standards, provided it can be demonstrated on a case-by-case basis that full compliance is not feasible. In such instances, a safety risk assessment and detailed technical justification shall be submitted to the Owner of the Standard for review and approval, as applicable to the respective discipline. Examples of temporary civil assets include but are not limited to temporary boarding platforms (e.g., mini-platforms) and temporary pedestrian bridges.

1.2.3 The standards address civil and building envelope requirements relating to station buildings and site infrastructure. They are managed and maintained by the Owner of this Standard to ensure they remain up-to-date and aligned with industry best practices. While the document primarily applies to new construction, it includes limited provisions for rehabilitation projects.

1.2.4 The following Table 1 lists the current FCE standard topics:

Table 1: FCE Standard Topics

Standard Number and Name		Publication Date
SITE CIVIL		
MX-FAE-STD-C002	Wastewater Systems	October 2025
MX-FAE-STD-C003	Water Supply Systems	October 2025
MX-FAE-STD-C004	Stormwater Systems	October 2025
MX-FAE-STD-C005	Pavement Structures	October 2025
MX-FAE-STD-C006	Site Elements	October 2025
TRAFFIC		
MX-FAE-STD-C007	Pavement Markings	October 2025
MX-FAE-STD-C008	Swept Path Analysis	October 2025
BUILDING ENVELOPE		
MX-FAE-STD-C009	Waterproofing	October 2025
MX-FAE-STD-C010	Enclosed Pedestrian Bridges	October 2025
MX-FAE-STD-C011	Low-Slope Roofing	October 2025

1.3 Using The Facilities Civil Engineering and Building Envelope (FCE) Standards

1.3.1 Codes and Regulations

1.3.1.1 Comply with industry best practices and latest editions of most stringent codes and standards of Authorities Having Jurisdiction (AHJ), including but not limited to those listed in the FCE standards. Generally, Ontario-mandated codes and standards legally govern unless the Project Specific Output Specification or Project Agreement specifically states that a more stringent code or standard applies.

1.3.1.2 Where duplicate codes or standards exist, the more stringent governs. OBC governs where conflicts arise unless otherwise stated.

1.3.1.3 Any reference to engineers within the FCE standards shall be understood as referring to Professional Engineers licensed to practice in the Province of Ontario, as required by the Professional Engineers Act.

1.3.2 Organizational Structure

1.3.2.1 To ensure clarity, consistency, and a logical progression from high-level concepts to detailed requirements, each FCE standard follows a structured format. While the exact layout may vary depending on the specific standard, they typically include the following sections:

a) Asset Overview: Provides a general description and scope of the asset covered by the standard;

b) Design Requirements: Detailed criteria for the design, which take into account environmental, long-term performance, ease of maintenance, and

durability considerations. These requirements are supplemental to local codes and standards and aim to provide a clear understanding of Metrolinx preferences for the various options available in meeting these codes and standards;

c) Construction Considerations: Guidelines for specifying construction practices and recommended installation procedures. These considerations assist designers in preparing specifications and drawings that comment on execution, ensuring alignment with Metrolinx standards; and

d) Quality Assurance and Quality Control: Protocols to ensure that all design materials and systems meet the specified standards. This includes requirements for testing, commissioning, independent third-party verification, and necessary documentation submissions, such as certificates or reports, at handover to ensure compliance with Metrolinx standards.

1.3.3 Limitations of Use

1.3.3.1 FCE standards provide minimum requirements. Reference to materials and methods in the FCE standards does not necessarily preclude the use of other materials or methods suitable for the intended purpose.

1.3.3.2 FCE standards may periodically be updated or revised.

1.3.3.3 Refer to the FCE standards' latest version, including interim updates and revisions, in developing specific design and contract documents.

1.3.3.4 Report FCE standards errors, omissions, and contradictions to the Owner of this Standard for review and response.

1.3.4 Engineering Exceptions Process

1.3.4.1 The Engineering Exceptions Process provides a streamlined way for designers to address site-specific conditions that require consultation with the "Owner of this Standard" as outlined in the FCE standards. Unlike formal deviations, which require proposing entirely new solutions, this process allows designers to request exceptions by submitting relevant documents through Civil Engineering Exception Form. Submissions will be reviewed by the applicable Subject Matter Expert (SME) to determine if the exception is approved. This approach ensures efficient resolution of site-specific challenges while maintaining compliance with the standards.

1.3.5 Core Principles

1.3.5.1 The FCE standards are established on core principles such as durability and maintenance, innovation and best practices, performance, public safety, and value engineering. There is an emphasis for the use of materials and methods that enhance the longevity of Metrolinx assets, incorporate progressive technologies and practices, and prioritize the safety and comfort of the public and staff using our stations and facilities. Additionally, this approach focuses on value engineering to ensure the delivery of the best value for customers while maintaining high standards of quality and performance.

a) Durability and Maintenance: Ensuring long-lasting infrastructure with minimal maintenance, thereby reducing lifecycle costs and increasing asset reliability.

b) Innovation and Best Practices: Incorporating the latest methodologies to enhance efficiency, sustainability, and resilience in our infrastructure projects.

c) Performance: Achieving high standards of operational efficiency to ensure our facilities meet and exceed functional requirements and provide seamless service to our customers.

d) Public Safety: Prioritizing the safety of our station customers and staff through rigorous design and construction standards that mitigate risks and enhance the overall security of our facilities.

e) Value Engineering: Applying value engineering principles to optimize project costs and deliver the best value for our customers. This involves assessing various design options and selecting those that provide the highest benefits in terms of performance, durability, and cost-effectiveness, ensuring efficient use of resources and achieving optimal project outcomes.

1.3.6 Coordination with Other Metrolinx Standards

1.3.6.1 The FCE standards are intended to be used in conjunction with other Metrolinx design standards (e.g., architectural, structural, and others). Where scopes overlap, the respective discipline-specific standard generally governs. Designers are responsible for coordinating across standards to ensure consistency and compliance, and shall consult the Owner of the Standard for clarification when conflicts arise.

1.3.7 Design Submission Timing

1.3.7.1 Design documentation shall be submitted to the Owner of this Standard early enough in the design process to allow for technical review and implementation of comments. Submissions provided after the design has progressed beyond a stage where revisions can reasonably be accommodated may be deemed non-conforming with this Standard.

2. Definitions & Abbreviations

2.1 Definitions

2.1.1 The capitalized terms used in this standard shall have the meaning prescribed in Table 2.

Table 2: List of Definitions

Term	Definition
Authorities Having Jurisdiction	Regulatory bodies that enforce applicable codes and standards, such as municipal building departments or provincial authorities.
Engineering Exceptions Process	Procedure for requesting case-by-case exceptions from FCE standards, subject to SME approval.
Owner of the Standard	Metrolinx representative group responsible for maintaining and updating the FCE standards.
Project Specific Output Specifications	Contractual documentation outlining the specific requirements for a given project.

2.2 Abbreviations

2.2.1 The abbreviations used in this standard shall have the meaning prescribed in Table 3.

Table 3: List of Abbreviations

Abbreviation	Definition
AHJ	Authority Having Jurisdiction
FCE	Facilities Civil Engineering
PSOS	Project Specific Output Specifications
SME	Subject Matter Expert