



# **Fencing and Anti-Trespassing Requirements**

RC-0401-06

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Date: July 2022

## Fencing and Anti-Trespassing Requirements

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# Preface

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This is the first revision of Metrolinx Fencing and Anti-Trespassing Requirements, formerly the Metrolinx - GO Transit Fencing Guidelines which was originally approved in 2013. This version:

- has repurposed the guideline document into a Metrolinx standard with prescriptive language and requirements;
- adds anti-trespassing requirements and broadens the scope of fencing requirements for heavy rail;
- introduces the Abloy High Security Lock product for use at corridor access locations; and
- introduces the following appendices:
  - Appendix A: Sample Contract Specifications for Fencing and Gates;
  - Appendix B: Sample Contract Specifications for Anti-Trespass Panels;
  - Appendix C: Anti-Trespass Panel Standard Drawing; and
  - Appendix D: Rail Corridor Signage.

The purpose of the Fencing and Anti-Trespassing Requirements is to ensure a universal approach is taken during planning, design, construction, and maintenance to secure the Metrolinx managed Rail Corridors with controlled access.

The installation and maintenance of heavy rail fencing systems is a key component of the larger safety strategy aimed at prevention of trespassing and related issues (vandalism and graffiti) on Metrolinx managed Rail Corridors. Compliance with these requirements will ensure that Work performed aligns with the holistic approach for Metrolinx managed Rail Corridor security elsewhere in the network and appropriately maintains Rail Corridor controlled access and security.

The Fencing and Anti-Trespassing Requirements is available for external users to download via the Metrolinx public download site at [http://www.gosite.ca/engineering\\_public/](http://www.gosite.ca/engineering_public/).

Suggestions for revision or improvements including a description of the proposed change along with information on the background of the application and any other useful rationale or justification can be sent to the Metrolinx Track Engineering Office, Attention: Director Track Engineering. The Director of Track Engineering ultimately authorizes the changes. Proposals for revisions or improvements to include your name, company affiliation (if applicable), e-mail address, and phone number.

July 2022

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# 1. Scope

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## 1.1 Overview

- 1.1.1 This standard sets out the criteria to embed the fencing and anti-trespassing requirements during planning, design, construction, and maintenance to preserve access security to Metrolinx managed Rail Corridors in a holistic manner.
- 1.1.2 The installation and maintenance of heavy rail fencing systems is a key component of the larger safety strategy aimed at prevention of trespassing and related issues (vandalism and graffiti) on Metrolinx managed Rail Corridors.
- 1.1.3 This standard does not provide electrification specific fencing/ protective measures.

## 1.2 Purpose

- 1.2.1 The key objective of this standard is to maintain Metrolinx managed Rail Corridor security and controlled access by establishing requirements to uphold heavy rail fencing and anti-trespassing requirements.
- 1.2.2 Compliance with this standard during planning, design, construction, and maintenance will ensure that Work performed aligns with the holistic approach for Rail Corridor security elsewhere in the network and appropriately maintains Rail Corridor controlled access and security.
- 1.2.3 The Contracted Party shall perform all Work in accordance with the requirements of this standard and shall support the Metrolinx commitment to always take safety seriously.
- 1.2.4 The Fencing and Anti-Trespassing Requirements identifies the requirements for:
  - a) identification and evaluation of trespassing issues;
  - b) fencing type evaluation;
  - c) fencing and anti-trespassing systems on Rail Corridors including:
    - 1) property line fence types;
    - 2) fencing between station platforms tracks;
    - 3) access control gates;
    - 4) access control signage;
    - 5) urban form barriers;
    - 6) Abloy high security lock;
    - 7) anti-trespass panels; and
    - 8) grounding and bonding; and

- d) progression of fencing systems.

## 2. Definitions, abbreviations, interpretation, codes and standards

### 2.1 Definitions

- 2.1.1 Capitalized terms used in this standard shall have the meanings prescribed in Table 1.

**Table 1: List of definitions**

Term	Definition
"CARE Model"	Has the meaning given in Section 3.3.2.
"Community Trespass Prevention Program" or "CTP Program"	Has the meaning given in Section 3.3.1.
"Contracted Party"	Means the party responsible for the performance of the Work of the project assignment and under contract or agreement with Metrolinx (e.g. Consultant, Contractor, Designer, Design-Builder, Project Co, Technical Advisor, or Developer). Within this standard, wherever the term Contracted Party is used, but there is no Contracted Party, the same item shall apply directly to Metrolinx.
"CPTED Surveys"	Has the meaning given in Section 3.2.1.
"GO Station"	Means any GO Transit station.
"Metrolinx"	Means Metrolinx, a non-share capital corporation continued under the <i>Metrolinx Act</i> , S.O. 2006, c.16 and a Crown Agency in accordance with the <i>Crown Agency Act</i> , R.S.O. 1990, c.48 and includes all operating divisions.
"Metrolinx Corridor Maintenance"	Means the division within Metrolinx that is accountable for the performance of operations and maintenance services for Metrolinx Rail Corridors.
"Metrolinx Electric Traction Standards"	Means the electrifications standards developed by Metrolinx and available on the GO Site ( <a href="http://www.gosite.ca/engineering_public/">http://www.gosite.ca/engineering_public/</a> ).
"Metrolinx Standards"	Means standards developed by Metrolinx as defined in Section 2.4.1.
"Metrolinx Track Infrastructure"	Means the division within Metrolinx that is accountable for the performance of operations and maintenance services for Metrolinx track.
"Operation Lifesaver"	Means the partnership initiative of the Railway Association of Canada and Transport Canada which works in cooperation with the rail industry, government, police, unions, and many public organizations and

Term	Definition
	community groups to advocate for railway safety and, among other things, prevent trespassing incidents that lead to serious injury or death.
"Rail Corridor(s)"	Means each of the Union Station, Lakeshore East, Lakeshore West, Milton, Barrie, Kitchener, Richmond Hill, and Stouffville rail corridors.
"Transit Safety"	Means the division within Metrolinx that is accountable for the enforcement of the Trespass to Property Act.
"Trespass to Property Act"	Means the Trespass to Property Act, R.S.O. 1990, c. T.21, or as amended from time to time.
"Vegetation Management and Graffiti Removal Plan"	Has the meaning given in Section 4.6.6.
"Weston Subdivision"	Means the portion of the Kitchener Rail Corridor characterized by the Canadian Transportation Agency as "Weston Subdivision" extending from Mile 1.9 Strachan Ave. to Mile 16.8 Halwest.
"Work"	Means the design, construction, maintenance, installation, testing, commissioning, and completion of the scope of the project assignment.

## 2.2 Abbreviations

2.2.1 The abbreviations used in this standard shall have the meaning prescribed in Table 2.

**Table 2: List of abbreviations**

Abbreviation	Definition
ATP	Means "anti-trespass panels"
CARE	Means "Community, Analysis, Response and Evaluation"
CGSB	Means "Canadian General Standards Board"
CPTED	Means "Crime Prevention Through Environmental Design"
CTP	Means "Community Trespass Prevention"
CSA	Means "Canadian Standards Association"
OPSD	Means "Ontario Provincial Standard Drawings"
OPSS	Means "Ontario Provincial Standard Specifications"
NRCC	Means "National Research Council of Canada"

## 2.3 Interpretation

2.3.1 This standard shall be interpreted according to the following provisions, unless the context requires a different meaning:

- a) unless the context specifically states otherwise, all obligations included herein are the responsibility of the Contracted Party to undertake;



- b) wherever used herein the plural includes the singular, the singular includes the plural, and each of the masculine, feminine and neutral genders include all other genders;
- c) references to persons shall include their successors and permitted assigns. References to a public organization shall include their successors and assigns, and if a public organization ceases to exist or ceases to perform its functions without a successor or assign, references to such public organization shall be deemed to include a reference to any public organization or any organization or entity which has taken over either or both the functions and responsibilities of such public organization; and
- d) references containing terms such as “includes” and “including”, whether or not used with the words “without limitation” or “but not limited to”, shall not be deemed limited by the specific enumeration of items but shall, in all cases, be deemed to be without limitation and construed and interpreted to mean “includes without limitation” and “including without limitation”.

## 2.4 Codes and standards

2.4.1 All systems, equipment and materials required for Work relating to this standard, shall be provided in accordance with the most current edition of applicable federal, provincial, municipal, and industry codes, standards, and guidelines including:

- a) Metrolinx/GO Transit standards and guidelines (the “Metrolinx Standards”) including:
  - 1) all latest version document on the GO Site including amendments and bulletins ([http://www.gosite.ca/engineering\\_public/](http://www.gosite.ca/engineering_public/)); and
  - 2) Metrolinx Grade Crossing Guidelines;
- b) National Building Code of Canada (NRCC 51690), latest version;
- c) Ontario Provincial Standard Specifications (OPSS), latest version:
  - 1) OPSS.PROV 1541, “Construction Specification for Chain Link Fence”;
  - 2) OPSS 1601 - “Material Specifications for Wood, Preservative Treatment and Shop Fabrication”; and
  - 3) OPSS.PROV 1540 - “Material Specifications for Standard Highway Fence Components”;
- d) Ontario Provincial Standard Drawings (OPSD), latest version:
  - 1) OPSD 972.101, “Fence, Chain Link Component - Barbed Wire”;
  - 2) OPSD 972.130, “Fence, Chain Link Installation - Roadway”; and
  - 3) OPSD 991.1320, “Expanded Metal Anti-Glare Screen, Installation - Chain Link Fence”;

- e) Canadian General Standards Board (CGSB), latest version:
  - 1) CAN/CGSB - 1.181, "Ready-Mixed Organic Zinc-Rich Coating";
  - 2) CAN/CGSB - 138.1, "Fabric for Chain Link Fence";
  - 3) CAN/CGSB - 138.2, "Steel Framework for Chain Link Fence"; and
  - 4) CAN/CGSB - 138.4, "Gate for Chain Link Fence"; and
- f) Canadian Standards Association (CSA), latest version:
  - 1) CAN/CSA G164-M92 (R2003), "Hot Dip Galvanizing of Irregularly Shaped Articles";
  - 2) CAN/CSA-A23.1, "Concrete Materials and Methods of Concrete Construction"; and
  - 3) CAN/CSA - A23.5-98, "Supplementary Cementing Materials".

## 3. Strategies to identify, evaluate and address trespassing issues

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### 3.1 Inspection and maintenance of existing systems

- 3.1.1 Fencing shall be inspected on an annual basis during the project term for integrity, functionality and signs of damage.
- 3.1.2 Metrolinx shall advise the Contracted Party completing any design or installations at any problem areas identified from the Metrolinx Track Infrastructure group, Transit Safety officers' patrols, CPTED Surveys, CTP Program initiatives and fencing inquiries from corridor neighbours, local authorities, and political representatives.
- 3.1.3 The Contracted Party shall include mitigation measures as part of the fencing evaluation and selection of fencing management systems. The Contracted Party shall install remediation measures within 14 days from the time of identification of defect.
  - 3.1.3.1 Where repairs required involve the request of utility locates, repairs may be completed within 14 days of receiving the locate package. Locates must be requested within 7 days from time of identification of defect.

### 3.2 Crime Prevention Through Environmental Design Surveys

- 3.2.1 Metrolinx Corridor Maintenance and Transit Safety staff will initiate, for selected problem locations, Crime Prevention Through Environmental Design (CPTED) surveys to inventory and address changes in community-built form/land uses and surrounding environment ("CPTED Surveys").

3.2.2 CPTED Surveys provide opportunities to work closely with community stakeholders to identify and implement broader strategies and responses targeted at the root causes of trespassing. The Contracted Party shall use the CPTED Survey to inform the identification of trespassing issues and as part of the evaluation for enhancements that can be employed as crime prevention or other security measures.

### 3.3 Community Trespass Prevention Program

3.3.1 Other approaches to evaluate and address trespassing includes the Community Trespass Prevention Program (the “Community Trespass Prevention Program” or “CTP Program”). This program is an important community-based outreach initiative developed by Operation Lifesaver aimed at reducing railway trespassing and crossing incidents and related injuries.

3.3.2 The goal of the CTP Program is to develop trespassing prevention strategies through community problem-solving partnerships to identify and implement broader strategies and responses targeted at the root causes of trespassing. The Community, Analysis, Response and Evaluation Model (the “CARE Model”) provides a four-step process for the identification, analysis, and areas of response for addressing trespassing issues in a community:

- a) Community: identify the trespassing problem in the community in general terms and identify potential community stakeholders that may be able to assist in the responding to the issue(s);
- b) Analysis: collect detailed information about the trespassing problem and determine underlying causes (e.g. review of pedestrian desire line, local attractors);
- c) Response: identify and implement response(s) targeted at the root causes of trespassing. Identify the most effective and feasible response(s):
  - 1) Education (e.g., school presentations, media, web-based);
  - 2) Engineering or CPTED (e.g., fences, signs, crossing);
  - 3) Enforcement (e.g., targeted/tickets); and
  - 4) Other strategy (e.g., ditching, grease application);
- d) Evaluation: determine if response was effective. Evaluate the effectiveness of your response over the immediate and longer term based on measures identified in the analysis step. (e.g., Was the issue displaced, reduced, unchanged or eliminated?)

3.3.3 The Contracted Party shall use the CTP Program and CARE Model evaluations to inform the identification of trespassing issues and as part of the evaluation for enhancements that can be employed as crime prevention or other security measures.

## 3.4 Threat Risk Vulnerability Assessment

- 3.4.1 A Threat Risk and Vulnerability Assessment is not required if fencing type is selected based on the requirements of Table 3.
- 3.4.2 If an alternate fencing type is selected, the Contracted Party shall consult with Metrolinx Track Infrastructure team to determine if any mitigation measures are necessary and include remediation measures as part of the fencing evaluation and selection of fencing management systems.

## 3.5 Fence type evaluation

- 3.5.1 The Contracted Party shall evaluate the adjacent land uses and population density to identify pedestrian desire lines e.g. from schools/commercial uses that cross the Rail Corridor to inform the determination of the height, application, and type of fencing management system selected.
- 3.5.2 The Contracted Party shall review adjacent parks or trails (formal and informal), open spaces, community centers, and schools as part of this evaluation which typically correspond with increased trespassing and the need to continually repair fences and initiate a progression of the applicable fencing systems. The Contracted Party shall review trespasser crossing opportunities and consider the enhanced level of the trespasser desire line if there are no public crossings in the immediate area. The Contracted Party shall also consider in the evaluation for the fencing management system selection that the trespasser desire line increases as the urban form along the Rail Corridor becomes denser and the variation of land uses increase. As the trespasser desire line increases across the Rail Corridor, the progression of fencing types and applications to be considered to mitigate trespassing and protect railway infrastructure and assets also increases.
- 3.5.3 The Contracted Party shall also evaluate population density, train volume, train types (freight /commuter and inter-regional rail), speed, and other operational issues in the selection of fencing management systems.
- 3.5.4 The Contracted Party shall select the appropriate fencing system in accordance with Table 3 below based on the general risk area/typical land use categories and the anticipated level of trespasser desire (line) to cross the Rail Corridor. The Contracted Party shall submit details of the evaluation to Metrolinx for review including identification of adjacent land uses and the fencing selection. The Contracted Party is permitted to install a combination of systems at the same location, complementing each system's individual benefits.
  - a) Metrolinx, at their discretion, may mandate a specific type of fencing for the Contracted Party to use.

**Table 3: Pedestrian desire line and fencing type evaluation guide**

General risk area	Typical land use categories	Minimum fencing type
Urban core	Critical infrastructure (signal system, control buildings, etc.)	High security
	High trespass and security concerns	High security
	Institutional - schools, hospitals, community centers, libraries	High security
	Parks and open spaces	High security
	Residential - high and medium density	Chain link <sup>2</sup>
	Commercial - office and retail	Chain link <sup>2</sup>
	Industrial - warehouses, factories, etc	Chain link <sup>2</sup>
Outer urban core	Established trespass locations	Expanded metal mesh <sup>1</sup> or high security
	Residential - high and medium density	Expanded metal mesh <sup>1</sup> or Chain link <sup>2</sup>
	Commercial - office and retail	Chain link <sup>2</sup>
	Institutional - schools, hospitals, community centers, libraries	Expanded metal mesh <sup>1</sup> ; or high security
	Parks and open spaces	Expanded metal mesh <sup>1</sup> ; or high security
Suburban	Established trespass locations	Expanded metal mesh <sup>1</sup> ; or high security
	Residential - high and medium density	Expanded metal mesh <sup>1</sup> or Chain link <sup>2</sup>
	Residential - low density	Chain link
	Commercial - office and retail	Chain link
	Institutional - schools, hospitals, community centers, libraries	Chain link <sup>2</sup>
	Parks and open spaces	Chain link <sup>2</sup>
Rural	Residential - low density	Chain link <sup>2</sup>
	Commercial - office and retail	Post and wire
	Institutional - schools, hospitals, community centers, libraries	Chain link
	Parks	Chain link
	Open spaces and farmland	Post and wire
<b>Notes:</b> <ol style="list-style-type: none"> <li>Expanded metal mesh shall only be permitted for retrofit installations and is not permitted for new fencing installations.</li> <li>High Security fence will be required where there is an increased probability of public trespassing. (e.g. Where a commercial or publicly accessible road or trail terminates or runs parallel to the property line, or near schools.) Secured private property with limited to no access to the public can use chain link</li> <li>Where high security fencing is insufficient to deter trespassing, the Contracted Party is to discuss further escalation options with the Metrolinx Track Infrastructure team.</li> </ol>		

## 4. Fencing and anti-trespassing systems

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### 4.1 Fencing management priorities

4.1.1 The Contracted Party for maintenance shall maintain fencing and anti-trespassing management systems in accordance with the following requirements:

- a) repair existing Metrolinx owned fencing that has been damaged including damage due to vandalism or storms;
- b) repair existing Metrolinx owned anti-trespass management systems that have been damaged including damage due to vandalism, unintended use, or storms;

4.1.2 The Contracted Party shall install fencing and anti-trespassing management systems in accordance with the following requirements:

- a) install upgraded or new fencing in areas identified from the evaluation in accordance with Section 3 of this standard or identified in the contract documents as areas of high trespass and vandalism, for example, where fencing progression is required by Metrolinx in urban and suburban conditions;
- b) install fencing in areas of no existing fencing with high trespassing locations identified from the evaluation in accordance with Section 3 of this standard or in the contract documents;
- c) install fencing to divide adjacent property development from the Metrolinx managed Rail Corridor. Metrolinx will assess the areas and fill in the large gaps between the developer's fence and the rail line if deemed necessary; and

4.1.3 The Contracted Party shall install fencing types in accordance with the fence type evaluation as required in Section 3 and in accordance with the requirements of this Section 4.

4.1.4 The Contracted Party shall remove any installed signage advertising the Contracted Party prior to final completion of the installation program.

### 4.2 Fence types

4.2.1 General:

4.2.1.1 The Contracted Party shall install property line fencing in accordance with the following requirements:

- a) fencing shall be installed on the property line unless otherwise accepted by the Metrolinx Corridor Maintenance;
- b) height shall be 1.8 m unless an increase in height is required; and

- c) height shall be increased to 2.4 m in locations identified by Metrolinx or as required for fencing progression in accordance with the evaluation in Section 3 of this standard to deter trespassing and illegal dumping.
  - d) High security fencing shall be 2.4 m in height.
- 4.2.2 In embankment locations, the Contracted Party shall locate the fence at the top of the embankment or on the property line, subject to acceptance by Metrolinx Corridor Maintenance, and adjust the fence height to maintain height differential in accordance with Section 4.2.1.1 to prohibit access.
- 4.2.3 Within the sightline proximity of private, farm, and other crossings that do not have gates, fencing shall not be installed within the regulatory sightline triangles.
- 4.2.4 Metrolinx sample specification requirements are included in Appendix A - Sample Contract Specifications for Fencing and Gates.
- 4.2.5 Post and wire:
- 4.2.5.1 The Contracted Party shall only be permitted to use post and wire fencing in new applications where there is minimal trespassing risk as defined by the evaluation in accordance with Section 3. All other applications for new fencing shall be chain link or more secure.
  - 4.2.5.2 Notwithstanding Section 4.2.5.1 above:
    - a) the Contracted Party shall install post and wire fencing as the minimum standard, in rural areas or along the side of highways since these areas generally have the lowest risk of trespassing and vandalism; and
    - b) the Contracted Party shall install post and wire fencing to define property lines and as a deterrent to keep farm animals from the Rail Corridor right-of-way.
  - 4.2.5.3 The Contracted Party shall ensure fence posts and woven wire are in accordance with OPSS 1601 and OPSS 1540. Fencing shall be seven wires type.
  - 4.2.5.4 The Contracted Party shall install fencing in accordance with the most current GO Transit Track Standard Plan, GTS-2211.
- 4.2.6 Chain link:
- 4.2.6.1 The Contracted Party shall ensure fence wire is in accordance with CAN/CGSB-138.1 and as follows:
    - a) heavy gauge, Type 1 Steel Fabric 3.5 mm diameter steel wire with Style 2 medium steel wire in suburban areas;
    - b) medium gauge, Type 1 Steel Fabric 3.5 mm diameter steel wire with Style 2 medium steel wire in rural areas;
    - c) hot dip galvanized after weaving with a diamond pattern size of 50 mm;
    - d) diameter of the bottom tension wire shall be 5.0 mm;

- e) tie wire fasteners in accordance with CAN/CGSB - 138.1, single strand, galvanized steel;
  - f) tension bar in accordance with ASTM A525M, 5 x 20 mm minimum galvanized steel;
  - g) organic rich zinc coating in accordance with CAN/CGSB - 1.181;
  - h) all mechanical fasteners to be sealed with loctite as a means of vandal proofing the fastening system; and
  - i) concrete mixes and materials in accordance with CAN/CSA-A23.1.
- 4.2.6.2 The Contracted Party shall install chain link fencing in accordance with OPSS 541 and OPSD 972.130.
- 4.2.6.3 If anti-climb fencing is requested by Metrolinx, the Contracted Party shall install a three-layer barbed wire on top of the fence for additional trespasser mitigation for sensitive areas e.g., in and around layover yards, equipment storage yards.
- 4.2.6.3.1 Any use of barbed wire will require the Contracted Party to conduct a risk assessment with Metrolinx stakeholders and obtain approval through this process prior to installation.
- 4.2.6.4 The Contracted Party shall provide drawings stamped by a professional engineer licenced in Ontario that demonstrate that connections to concrete walls or other structures can withstand applied load.
- 4.2.7 Expanded metal mesh:
- 4.2.7.1 The Contracted Party shall not use expanded metal mesh for new fencing installations.
- 4.2.7.2 Where upgrade of existing chain link fencing is permitted by Metrolinx, the Contracted Party shall weld or bolted expanded metal mesh as a retrofit onto the existing chain link fence posts in areas that are subject to higher levels of trespassing and vandalism. Retrofit installations shall be in accordance with OPSD 991.132 and the manufacturers recommendations.
- 4.2.7.3 The Contracted Party shall use expanded metal mesh in accordance the following requirements:
- a) fabric shall be gauge 9, 25.4 mm mesh size, raised mesh (not flat), hot dip galvanized steel; and
  - b) fittings shall be galvanized clamps and bands and are as recommended and supplied by the manufacturer.
- 4.2.7.4 The Contracted Party shall use expanded metal mesh products from the following Metrolinx approved products:
- a) AMICO Secure fence system; or
  - b) an equivalent vendor product meeting the requirements of this standard and accepted in writing by Metrolinx Corridor Maintenance.



- 4.2.7.5 All bolts and clamps will be secured with Lok-Tite or equivalent material to prevent removal.
- 4.2.8 High security:
- 4.2.8.1 The Contracted Party shall install high security fencing for urban settings that are subject to the highest rates of trespassing (urban, and dense suburban environments), vandalism or to secure high value Metrolinx owned assets.
- 4.2.8.2 The Contracted Party shall use high security fencing in accordance with the following requirements:
- a) panel mesh shall consist of a minimum 4 mm diameter high tensile wire, with aperture sizes (openings) 76.2 mm x 12.7 mm on centre or smaller;
  - b) mechanical fasteners shall be tamper-proof, and factory galvanized;
  - c) panel mesh, posts, clamps, and associated hardware shall be galvanized with an exterior finish coating capable of withstanding repeat climate variances within Southern Ontario; and
  - d) 2.4 m height
- 4.2.8.3 The Contracted Party shall install high security fencing in accordance with the following requirements:
- a) panel mesh shall be fastened to suitable posts that allow for a minimum foundation depth of 1.2 m. The fence panels shall be strengthened with factory formed undulations or additional reinforcing integrated within each mesh panel; and
  - b) fastening hardware shall be concealed from the face of each panel and post.
- 4.2.8.4 The Contracted Party shall select and install high security fencing products from the following Metrolinx approved products:
- a) Bear Mountain - Bear Securi Mesh Barrier;
  - b) BetaFence - Securifor 3D;
  - c) CLD - Securus Profiled;
  - d) Cochrane - ClearVu 22;
  - e) Wallace Perimeter Fence - Rampart 354; or
  - f) an equivalent vendor product meeting the requirements of this standard and accepted in writing by Metrolinx Corridor Maintenance.
- 4.2.8.5 Where traditional high security fencing is not effective, the Contracted Party shall select and install further progressions on high security fencing products from the following Metrolinx approved products:
- a) Cochrane - ClearVu 44; or

- b) an equivalent vendor product meeting the requirements of this standard and accepted in writing by Metrolinx Corridor Maintenance.
- 4.2.8.6 The Metrolinx Track Infrastructure team can be consulted for further progressions for high security fencing which may include:
- a) Use of an unsharpened tangle coil on the inside face of the fencing
  - b) Greasing the fence fabric
  - c) Urban form barrier application.
  - d) Mitigations through vegetation applications
- 4.2.8.7 The Contracted Party shall provide drawings stamped by a professional engineer licenced in Ontario that demonstrate that connections to concrete walls or other structures can withstand applied load.
- 4.2.9 Transition fencing
- 4.2.9.1 Where fencing types are transitioned from one form to another, the Contracted Party shall extend the higher security fence by 50 m into where the lower security fence is required.
- 4.2.9.2 The Contracted Party shall safeguard these transition points from trespass by ensuring the outer edge is seamless. The fencing transition point shall not have any hardware that facilitates use as a handhold or foothold.

## 4.3 Fencing within the Rail Corridor

- 4.3.1 The Contracted Party shall install chain link fencing between tracks at GO Station platforms to prevent the public from crossing tracks at grade in accordance with the most current GO Transit Track Standard Plan, GTS-3005. This fencing is to be extended a minimum of 6 m beyond the ends of the platforms to further prevent people from trying to walk around at station ends.
- a) The Contracted Party shall restrict the fencing height to between platform tracks to no higher than 1.2 m above the top of rail for both tracks based on a plane defined by the plane between both rails on each track. For clarity, this means, where a platform is located in a curve, the fencing height has to be adjusted to accommodate the tilt of the train.
  - b) The minimum height of fence shall be 1 m above top of rail.
  - c) There shall be a 0.3 m gap at the bottom of the fence from the top of ballast
- 4.3.2 For fencing requirement at GO facilities, layovers, and train yards, refer to the Metrolinx DRM.
- 4.3.3 The Contracted Party shall ensure this fencing does not encroach on the train clearance envelope.

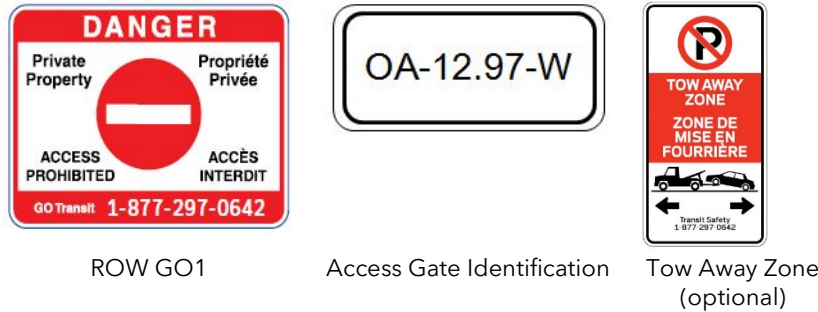
## 4.4 Access control gates

- 4.4.1 The Contracted Party shall select the gate type (swing, slide, horizontal, vertical, electronic etc.) based on the availability of space within the Metrolinx property and adjacent land and in accordance with the following requirements:
- a) swing gates shall only be installed where there is no possibility of the gate opening within the clearance envelope of the nearest track; and
  - b) electronic gates shall only be installed where regular high-volume access is required.
    - 1) electronic gates into the rail corridor shall be operated by the same standard Metrolinx lock keyway identified in Section 4.7
- 4.4.2 The Contracted Party shall install gates into the corridor as close a reasonably possible to all whole mile locations, and locations of mileboards. There shall be a vehicle gate installed at all controlled locations (signal plant locations).
- 4.4.3 The Contracted Party shall incorporate measures to prevent hinges from being removed (e.g., peen bolts or loop and crimp wire rope around gate and fencing post) into all Rail Corridor access control gate installations.
- 4.4.4 The Contracted Party shall install access control signage on all access gates in accordance with Section 4.5.3.
- 4.4.5 If a new gate is required in an existing fence, the Contracted Party shall install such a gate of the same type of fencing as is present and include all necessary signage. All other requirements of Section 4.4 shall also be met.
- a) The Contracted Party shall procure a standard Metrolinx lock as per Section 4.7 and pass on this information for Metrolinx to program.
  - b) The Contracted Party shall notify the Metrolinx Track Infrastructure team of the new gate location and type.
- 4.4.6 Where gates are installed for means of providing an emergency egress, a push bar style mechanism shall be installed to allow immediate exit. This type of system will be protected to prevent operation from outside of the corridor.

## 4.5 Access control signage

- 4.5.1 The Contracted Party shall install access control signage in accordance with the requirements of this section and Appendix D - Rail Corridor Signage to increase awareness and give due notice that railway rights-of-way are private property to deter pedestrians trespassing on railway property. These access control signs shall also provide a contact number to help promptly report illegal activity or potentially unsafe conditions to Metrolinx.
- 4.5.2 The Contracted Party shall install signs in clear view to avoid concealment and signs shall be posted or attached to the fencing system materials at uniform intervals to deter accidental or inadvertent trespass.

4.5.3 The Contracted Party shall install the signs shown in Figure 1 on all access gates. The Tow Away Zone sign shall be installed as requested by Metrolinx:

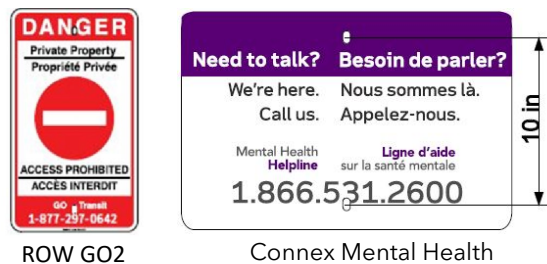


**Figure 1: Access control signage**

4.5.4 The Contracted Party shall install the ROW GO1 signs (as shown in Figure 1) on the outside face of the fencing at a maximum spacing of 30 m.

4.5.5 The Contracted Party shall install the ROW GO2 and Connex Mental Health signs at all quadrants of all grade crossings as shown in Figure 2 and in accordance with the following requirements:

- a) signs shall be installed perpendicular, facing towards the road;
- b) signs shall be installed into the ground on a 3 m metal u-post;
- c) signs shall be at pedestrian eye level height;
- d) the top edge of the signs shall be in alignment, with the top edge no greater than 2.4 m from the ground;
- e) signs shall be located 3 m from the nearest rail; and
- f) signs shall be located a minimum of 1.5 m from the edge of roadway to a maximum of 5 m.
- g) signs shall not be located within the regulatory sightline triangle at ungated crossings



**Figure 2: Grade crossing signage**

4.5.6 The Contracted Party shall install the Connex Mental Health signs (as shown in Figure 2) at the following additional locations:

- a) hot spot locations identified by Metrolinx;
- b) at either end of all GO Station platforms; and

- c) every 10 m along the fencing between tracks at GO Station platforms facing the associated platform track.
- 4.5.7 The Contracted Party shall install the Connex Mental Health sign
- 4.5.8 The Contracted Party shall install additional signage at grade crossings in accordance with the requirements of Section 4.8 and Appendix D - Rail Corridor Signage.
- 4.5.9 By November 2023, all access locations shall also include signage for line speed, immediate hazards, nearest track ID to access point (North/East/T1/T2, etc.), name of Sub and exact Mileage and the emergency number(s). Space must be left on the sign for future Electrification information (Isolation mileages, etc.)

## 4.6 Urban form barriers

- 4.6.1 In the most urbanized areas of the Metrolinx rail network, for example along the Union Station Rail Corridor and the Weston Subdivision, the Contracted Party shall be permitted to use urban form barriers (noise attenuation and crash barriers) where required by contract documents to limit access to the Rail Corridor as an acceptable substitute for standard fencing installations.
- 4.6.2 Metrolinx does not accept living barrier fencing or green walls unless an agreement for municipal maintenance is in place. In cases where such an agreement is in place, the inclusion of living barrier fencing, or green walls shall be subject to acceptance in writing by Metrolinx Corridor Maintenance.
- 4.6.3 Where the Contracted Party installs noise walls, an agreement for the graffiti maintenance must be in place between the municipality and Metrolinx prior to installation for the outside face of the noise wall to be maintained by the municipality, where practicable.
- a) Metrolinx does not maintain the exterior face of the noise walls with respect to graffiti removal
- 4.6.4 Urban form barriers shall have the same access gate requirements as identified in Section 4.4.
- 4.6.5 The Contracted Party shall install additional fencing in locations with direct exposure to the Rail Corridor and as required by Metrolinx.
- 4.6.6 The Contracted Party shall provide noise walls in accordance with the requirements of the contract documents. Noise walls shall be placed such that the outer fall of the wall is on the property line unless otherwise accepted by the Metrolinx Corridor Maintenance. Where placement is offset from the property line, a Vegetation Management and Graffiti Removal Plan (the "Vegetation Management and Graffiti Removal Plan") shall be submitted to Metrolinx Corridor Maintenance Office for review. The Vegetation Management and Graffiti Removal Plan shall include:
- a) work plans for vegetation management and graffiti removal including corridor access locations;

- b) details of any hazards or conditions present that will not be easily visible; and
  - c) information on any agreements with adjacent landowners and easements that are in place to facilitate the work.
- 4.6.7 The Contracted Party shall pave the land between the property line and the noise wall to limit the need for vegetation management unless otherwise accepted by Metrolinx Corridor Maintenance or permitted in the contract documents.
- 4.6.8 For all new developments adjacent to the Rail Corridor, the Contracted Party shall install an appropriate fencing type along the boundary line.
  - a) Where noise walls are installed, the Contracted Party is responsible for the application of anti-graffiti spray
- 4.6.9 For clarity, in the case of private fencing (residential, commercial, industrial, institutional etc. - installed by the adjacent land-owner), the adjacent landowner is responsible for the continued maintenance and upkeep of fencing systems along the mutual property line, including all applicable costs. Metrolinx does not maintain private fencing.
  - a) This includes graffiti removal and application of anti-graffiti spray if applicable.

## 4.7 Corridor Access Locks

- 4.7.1 The Contracted Party shall use the Abloy Protec 2 High Security Lock system at corridor access locations including the Abloy CLIQ Remote. No other types of locks, including private contractor / construction locks will be permitted for the securement of a Rail Corridor access gate.
- 4.7.2 At facility and layover locations, other access controls will be in place. The Contracted Party will be provided this information on a contract specific basis.

## 4.8 Anti-trespass panels - grade/level crossing access control

- 4.8.1 The Contracted Party shall install anti-trespass panel's (ATPs), shown in Fig 3, along with the additional fencing at grade level crossings, stations platforms and other areas where trespassing is identified as a risk, in accordance with the typical layout illustrated in the Metrolinx Grade Crossing Guideline, Appendix C - Anti-Trespass Panel Standard Drawing, and the following requirements:
  - a) the ATPs shall provide a visual and physical deterrent to persons attempting to gain illegal access into the corridor where fencing is not physically possible;
  - b) the ATPs shall be installed on the ground at grade crossings with the addition of 9-gauge chain link fence, or better, at each quadrant and two access gates, one on each side of the crossing; and

- c) the physical characteristics of the ATPs shall provide a difficult surface for those attempting to trespass.
  - d) ATPs shall be installed per the manufacturer’s recommended installation procedures.
- 4.8.2 ATPs shall have a minimum lifespan of 25 years and be made of 100% recycled rubber and plastic.
- 4.8.3 To adequately fit into different sections of an ATP layout, three variations of ATPs are illustrated in Figure 4.
- 4.8.4 Metrolinx sample specification requirements are included in Appendix B - Sample Contract Specifications for Anti-Trespass Panels.

**Figure 3: Metrolinx Anti-Trespass Panels (ATPs)**



**Figure 4: Rosehill Rail Anti-Trespass Panels (ATPs)**



- 4.8.5 Fixing kits for installation are delivered with each panel, comprising of:
- a) Two ‘planks’ made of 100% recycled plastic;
  - b) Eight cadmium plated and rust resistant fixing screws; and

c) Washers to enable immediate mobilization

- 4.8.6 The type and size of ATPs to be fitted on track varies based on the number of tracks present, track spacing and the right-of-way area at grade crossings. Double flange standard panels fit between the rails of each track, with single flange panels on the field face of both rails.
- 4.8.7 Figure 4 depicts the addition of flangeless flat panels between single flange panels for multiple tracks, at lengths based on track spacing.
- 4.8.8 To ensure the continuity of anti-trespass measures, any distance between the end of single flange panels and any existing fence, barrier, or wall, shall be covered by the applicable width of panels and cut to fit as per manufacturer specifications.
- 4.8.9 Where the distance from outer rail to an existing fence is greater than 4.5 m, a new chain link fence shall be placed at this distance to limit the use of numerous panels.
- 4.8.10 At Station locations, fencing shall be extended to ensure pedestrians cannot bypass the ATPs using the corridor or other pathways.
- 4.8.11 ATPs shall be located at least 10 feet (3.0m) clear of the edge of the roadway surface.
- 4.8.12 Measures shall be implemented to ensure that the installation of ATPs does not impede drainage, including the installation of culverts if necessary.

## **4.9 Grounding and Bonding**

- 4.9.1 The Contracted Party shall properly ground, and bond metallic fencing as required by the Ontario Electrical Safety Code.
- 4.9.2 For electrified territory requirements please refer to Electrification Enabling Works Standards and Related Traction Power Standards and Specifications.

# **5. Progression of fencing and anti-trespassing systems**

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## **5.1 Progression of fencing and anti-trespassing systems**

- 5.1.1 The Contracted Party shall review Metrolinx Track Infrastructure staff inspection reports/memos to identify frequency, location and ongoing areas of concern within the project limits and evaluate these concerns in the selection of the type, style or components of the fencing design in accordance with Section 3 of this standard.



- 5.1.1.1 The Contracted Party shall restore fencing where there is evidence of damage by accident, storms, occasional vandalism, or other circumstances in accordance with the following requirements:
- a) post and wire and chain link fencing systems fencing shall be restored to their original condition; and
  - b) in the case of private fencing installations, where the adjacent landowner is unwilling to restore the integrity of the original fencing, the Contracted Party shall replace private fences with chain link fence or applicable fencing type.
- 5.1.2 In other areas where there are consistent trespassing issues, community complaints and deliberate acts of vandalism to the existing fencing system, the Contracted Party shall evaluate a series of progressive measure to address the integrity and advancement of the fencing system:
- a) in areas where chain link fencing is consistently being damaged and there are continued issues, the fencing type will progress (step-up) to expanded metal mesh in accordance with Section 4.2.7 with anti-climb fencing if requested by a Metrolinx risk assessment. The integrity of the expanded metal mesh will continue to be monitored by the Contracted Party and Metrolinx to evaluate its success in deterring trespassers at that particular location;
  - b) at locations where expanded metal mesh fencing is proving ineffective, or in areas of new urban installations, the fencing system shall be progressed, and the Contracted Party shall install high security fencing in addition to other measures and treatments based on site considerations including anti-climb fencing, increased fencing height, change in panel type; and
- 5.1.3 where high security fencing proves ineffective, the Contracted Party shall consult the manufacturer of the high security fencing for a site-specific solution for installation, or Metrolinx for recommendations on next level progressions. The Contracted Party shall evaluate other measures required in the immediate term, and shall compliment fencing based on site location and topology with additional measures including:
- 1) brush clearing;
  - 2) ditching adjacent to the fence line to impede or dissuade entry onto the Rail Corridor; and
  - 3) application of graphite-based grease coating on the fence.

## **6. Handover and commissioning**

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### **6.1 Handover and commissioning**

- 6.1.1 Final handover of all new assets to Metrolinx shall follow the Rail Corridor Infrastructure Handover Protocol.

6.1.2 All equipment and appurtenances shall be clean prior to final handover.

# Appendix A - Sample contract specification for fencing and gates

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# Fencing and Gates Specification

Section 32 31 19

Revision 0  
Date: July 2022

# Fencing and Gates Specification

Section 32 31 19

Publication Date: July 2022

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Amendment Record Sheet

Amendment in Clause No.	Date of Amendment	Description of Changes

# FENCING AND GATES

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**1. GENERAL**

**1.1. DESCRIPTION OF WORK**

1.1.1. This Section 32 31 19 - Fencing and Gates, specifies the Contractor requirements for fencing, gates and associated fittings and hardware for the Work.

**1.2. RELATED SECTIONS**

1.2.1. Division 1 - General Requirements Section 01 11 00 - 01  
91 13

**1.3. REFERENCE DOCUMENTS**

1.3.1. The Contractor shall perform Work in accordance with GO Transit, Design Requirements Manual (DRM), latest version.

1.3.2. The Contractor shall perform Work in accordance with Metrolinx Fencing and Anti-Trespassing Requirements, latest version.

1.3.3. The Contractor shall perform Work in accordance with National Building Code of Canada (NRCC 51690), latest edition.

1.3.4. The Contractor shall perform Work in accordance with Canadian Standards Association (CSA), latest version including:

- a) CAN/CSA G164-M92 (R2003), latest revision, Hot Dip Galvanizing of Irregularly Shaped Articles;
- b) CAN/CSA - A23.1, latest revision, Concrete Materials and Methods of Concrete Construction; and
- c) CAN/CSA - A23.5-98, latest revision, Supplementary Cementing Materials.

1.3.5. The Contractor shall perform Work in accordance with Ontario Provincial Standard Specification (OPSS), latest version including:

- a) OPSS.PROV 772, latest revision, Material Specifications for Chain-Link Fence Components;
- b) OPSS.PROV 1540, latest revision, Material Specifications for Standard Highway Fence Components;
- c) OPSS.PROV 1541, latest revision, Construction Specification for Chain Link Fence Components; and



## FENCING AND GATES

- d) OPSS 1601, latest revision, Material Specifications for Wood, Preservative Treatment and Shop Fabrication.
- 1.3.6. The Contractor shall perform Work in accordance with Ontario Provincial Standard Drawing (OPSD):
- a) OPSD 900.03, latest revision, Fence, Chain link Component - Gate;
  - b) OPSD 972.101, latest revision, Fence, Chain Link Component - Barbed Wire;
  - c) OPSD 972.101, latest revision, Fence, Chain Link Component - Roadway; and
  - d) OPSD 991.1320, latest revision, Expanded Metal Anti-Glare Screen, Installation - Chain Link Fence.
- 1.3.7. The Contractor shall perform Work in accordance with Canadian General Standards Board (CGSB) specifications:
- a) CGSB - 1.181, latest version, Ready-Mixed Organic Zinc-Rich Coating
  - b) CGSB-138.1-96, latest revision, Fabric for Chain Link Fence;
  - c) CGSB-138.2-96, latest revision, Steel Framework for Chain Link Fence; and
  - d) CGSB-138.4-96, latest revision, Gate for Chain Link Fence.

### **1.4. QUALITY CONTROL**

- 1.4.1. The Contractor shall conduct Work of this Section 32 31 19 - Fencing and Gates in accordance with Section 01 45 00 - Quality Control.
- 1.4.2. The Contractor shall ensure the Manufacturer is responsible to plan, establish, implement and maintain their own quality control program to ensure all materials and products meet the requirements of the specifications.
- 1.4.3. The Contractor shall ensure the Manufacturer meets the applicable requirements of the Contract Conditions and has a minimum of five years of experience manufacturing decorative metal fences and gates of the type specified. The Contractor shall ensure the Manufacturer provides test reports showing compliance with specified performance characteristics, and on-Site technical representation to advise on installation.
- 1.4.4. The Contractor shall ensure that the installer has past experience in performing the Work of this Section 32 31 19 - Fencing and Gates and is specialized in installations of a similar size and nature. The Contractor shall submit to Metrolinx, the installer's current certificate of approval by the Manufacturer as proof of compliance.

- 1.4.5. The Contractor shall arrange with the Manufacturer's representative, installer's representative, and the Consultant to inspect substrates, and to review installation procedures two Business Days in advance of installation.
- 1.4.6. The Contractor shall ensure fencing layout is completed by a surveyor, registered and licensed to practice in the Province of Ontario.
- 1.4.7. The Contractor shall keep records of inspection work by the Manufacturer and shall make records available to Metrolinx during the performance of the Contract.

### **1.5. SUBMITTALS**

- 1.5.1. The following submittals are in addition to the requirements of Section 01 33 00 - Submittal Procedures.
- 1.5.2. The Contractor shall submit copies of the Manufacturer's product data for Metrolinx review in accordance with Section 01 33 00 - Submittal Procedures indicating:
  - a) performance criteria, compliance with appropriate reference standard, characteristics, limitations; and
  - b) product transportation, storage, handling and installation requirements.
- 1.5.3. The Contractor shall submit Shop Drawings for Metrolinx review in accordance with Section 01 33 00 - Submittal Procedures indicating:
  - a) layout for the fence to suit the finished grade along the rail corridor;
  - b) transition panels to be utilized at the locations where the grade differences exist;
  - c) adjacent construction, elevations and details, dimensions gauges, finishes and relationship to adjacent construction;
  - d) profile drawings showing the fence elevation;
  - e) fence fabric details;
  - f) foundation design for posts demonstrating that foundations are located in a manner to minimize impacts and conflicts with existing surface features and underground / overhead utilities; both during the installation and permanent conditions;
  - g) methods of fastenings, accessory items required, gate details, structural header design and design computations, isolation details and other pertinent data and information; and

- h) for custom fences and gates, guide rails, and appurtenances, indicating lateral strength, anchoring details to concrete foundation, dimensions, gauges, tensile and yield strength of members and welds, post settings and picket interspaces.

1.5.4. The Contractor shall ensure Shop Drawings are stamped and signed by a professional engineer licensed to practice in the Province of Ontario, having experience in design of fence and gates specified in this Section 32 31 19 - Fencing and Gates. The Contractor shall confirm experience on the Shop Drawings.

1.5.5. The Contractor shall submit the following samples upon request by Metrolinx for review in accordance with Section 01 33 00 - Submittal Procedures:

- a) mock-up - one sample size typical panel complete with posts and exclusion fence; to demonstrate the fence finish and joint details.

## **2. PRODUCTS**

### **2.1. GENERAL**

2.1.1. The Contractor shall ensure detailed fencing specifications are in accordance with Metrolinx Fencing and Anti-Trespassing Requirements and shall comply with the Drawings.

2.1.2. The Contractor shall ensure custom metal fences, gates, guide rails, appurtenances, and their foundations are designed and certified by a professional engineer licensed to practice in the Province of Ontario to resist lateral loads of 2.2 kN/m and vertical loads of 1.5 kN/m.

2.1.3. The Contractor shall submit the Manufacturer's information in support of the manufacturing process and test results upon request by Metrolinx.

### **2.2. POST AND WIRE FENCING**

2.2.1. The Contractor shall provide post and wire fencing in accordance with Metrolinx Fencing and Anti-Trespassing Requirements and as shown on the Drawings.

### **2.3. CHAIN LINK FENCE**

2.3.1. The Contractor shall provide chain link fence and fence fabric in accordance with Metrolinx Fencing and Anti-Trespassing Requirements and as shown on the Drawings.

2.3.2. The Contractor shall ensure all new fences are fitted with a top rail.

## FENCING AND GATES

- 2.3.3. The Contractor shall ensure the grounding rod is 16 mm diameter copperwell rod, 3.0 metres long.
- 2.3.4. The Contractor shall ensure the posts, braces and rails conform to CAN/CGSB-138.2, black vinyl coated galvanized steel pipe.
- 2.3.5. The Contractor shall use concrete for footing construction as designated on the Drawings.
- 2.3.6. The Contractor shall ensure fittings and hardware conform to the following criteria:
- a) fittings and hardware shall be galvanized steel;
  - b) all mechanical fasteners to be sealed with thread-locking fluid as a means of vandal proofing the fastening system;
  - c) post caps to provide waterproof fit, to fasten securely over posts and to carry top rail;
  - d) overhang tops to provide waterproof fit, to hold top rails and an outward projection to hold; barbed wire overhang; and
  - e) turnbuckles are drop forged and the overall length of turnbuckles is approximately 300 mm, with ends in the closed position. The Contractor shall ensure bolt diameter is approximately 10 mm and capable of taking up a minimum of 150 mm slack.
- 2.3.7. Where anti-climb fencing is requested by Metrolinx, the Contractor shall provide projection with clips or recesses to hold three strands of barbed wire spaced 100 mm apart. The Contractor shall ensure projection of approximately 300 mm long to project from fence at 45° above horizontal.
- 2.3.8. The Contractor shall ensure finishes are as follows:
- a) colour is Jet Black (RAL9005);
  - b) post is hot dip galvanized, marine fusion bond coated; and
  - c) mesh is pre-galvanized, marine fusion bond coated with "alugalv" coating for extra protection coated.
- 2.3.9. The Contractor shall ensure finishes of vinyl coated chain link fences are as follows:
- a) finish on fabric, and ties to be factory applied vinyl coating, industrial grade, black in colour; and

## FENCING AND GATES

- b) finish on pipe components, hardware and fittings to be black polyester powder coating or black jacket extruded polyethylene coated, industrial grade.

2.3.10. Where indicated by Metrolinx the Contractor shall install additional chain link fabric on existing chain link fencing to form a double layer of fabric on either side of the fence posts. The Contractor shall ensure:

- 1) a uniform 1 ½" diamond pattern is used for this fabric; and
- 2) all other material specifications are as per OPSS 772.

### **2.4. EXPANDED METAL MESH (SECURITY MESH)**

2.4.1. The Contractor shall provide expanded metal mesh fencing in accordance with Metrolinx Fencing and Anti-Trespassing Requirements and as shown on the Drawings.

2.4.2. The Contractor shall ensure the top line of the expanded metal mesh retrofit does not exceed 1" in elevation from the top cross member of the existing fence.

### **2.5. GATES**

2.5.1. The Contractor shall supply gates in accordance with Metrolinx Fencing and Anti-Trespassing Requirements and as shown on the Drawings and matching the fencing material and colour of the adjacent fence.

2.5.2. The Contractor shall ensure gates meet the most current version of OPSS 541 and OPSD 900.03. The following gate types will be required as directed by Metrolinx:

- a) Pedestrian gate - Chain Link and High Security (1.0 metre);
- b) Single Swing gate - Chain Link and High Security (4.5metre);
- c) Double Swing gate - Chain Link and High Security (9.0 metre);
- d) Single Sliding gate - Chain Link and High Security (4.5 metre); and
- e) Double Sliding gate - Chain Link and High Security (9.0 metre).

2.5.3. The Contractor shall ensure material standards for chain link fence and gates are per OPSS 772.

2.5.4. The Contractor shall construct gates from galvanized steel pipe frames and braces.

2.5.5. The Contractor shall supply all gates with galvanized malleable iron hinges, latch and latch catch, and shall ensure the gates are capable of opening approximately

180 degrees. Gate latches shall be suitable for the use of Abloy Protec 2 High Security Lock system.

- 2.5.6. The Contractor shall ensure gates are supplied completely assembled, including the fabric. Gate fabrics shall be similar to the adjacent fence fabric.

### **2.6. HIGH SECURITY FENCING**

- 2.6.1. The Contractor shall provide high security fencing in accordance with Metrolinx Fencing and Anti-Trespassing Requirements and as shown on the Drawings.

- 2.6.2. Contractor shall ensure high security fencing is in accordance with the following:

- a) mesh shall be galvanized with an exterior finish coating capable of withstanding typical climate variances within Southern Ontario:
  - 1) colour is Jet Black (RAL9005); and
  - 2) fences greater than 305 metres in length shall be divided into maximum 305 metre sections with insulated inserts.

### **2.7. HIGH SECURITY GATES**

- 2.7.1. The Contractor shall provide gates of type matching high security fencing system in accordance with the following:

- a) 1000 mm wide pedestrian swing gate mesh a minimum 4 mm diameter high tensile wire, with aperture sizes (openings) 76.2 x 12.7 mm centers or smaller. Gate heights shall match fence heights as shown on Drawings;
- b) two at 3000 mm wide vehicular double swing gate, a minimum 4 mm diameter high tensile wire, with aperture sizes (openings) 76.2 x 12.7 mm centers or smaller - swinging away from corridor and designed to prevent accidental movement of the gate towards the corridor;
- c) provide non-lift barrel type hinges to permit gate to fully open and close, mechanical drop latch locking device, and automatic heavy-duty hydraulic gate closer as recommended by security gate Manufacturer; and
- d) mesh to be galvanized with an exterior finish coating capable of withstanding typical climate variances within Southern Ontario:
  - 1) colour is Jet Black (RAL9005).

**3. EXECUTION**

**3.1. GRADING**

- 3.1.1. The Contractor shall remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.
- 3.1.2. The Contractor shall provide clearance between bottom of fence and ground surface of 30 mm to 50 mm.
- 3.1.3. The Contractor shall restore grade to as appropriate to match existing or design condition and ensure there are consistent clearances not exceeding 50 mm below bottom of fence.
- 3.1.4. The Contractor shall ensure drainage is not altered.
- 3.1.5. The Contractor shall ensure access gate locations have grading on both sides of the gate, to allow for easy access (no grade difference between Metrolinx property and adjacent property).

**3.2. LINE POST AND TERMINAL POST INSTALLATION**

- 3.2.1. The Contractor shall install line posts and terminal posts as shown on the Drawings and in conformance with OPSD 972.130.
- 3.2.2. The Contractor shall maintain equal horizontal distances for posts. All posts shall be placed in a vertical position and set accurately in accordance with the Drawings.
- 3.2.3. The Contractor shall cut posts to the required height above the ground to present a smooth and uniform profile.

**3.3. CHAIN LINK FENCE INSTALLATION**

- 3.3.1. The Contractor shall erect metal fencing in accordance with locations and details indicated on the Shop Drawings including:
  - a) fence posts, rails and pickets;
  - b) gates;
  - c) metal posts to be anchored to concrete base wall;
  - d) overhang tops and caps;
  - e) anchors; and

## FENCING AND GATES

- f) all fabrication of fence panels and attachment to metal posts.
- 3.3.2. The Contractor shall ensure concrete mixes and materials are in accordance CAN/CSA-A23.1 and adhere to the following:
  - a) nominal coarse aggregate size: 20 mm;
  - b) compressive strength: 20 MPA at minimum 28 days; and
  - c) air entrained (5 - 8 %).
- 3.3.3. The Contractor shall provide terminal posts, bracing, and other required elements where existing adjacent property fences tie-in and abut to new fences.
- 3.3.4. The Contractor shall space line posts 3.0 metres apart, measured parallel to ground surface.
- 3.3.5. The Contractor shall space straining posts at equal intervals of 20 metres if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade is greater than 40 metres.
- 3.3.6. The Contractor shall install corner post where change in alignment exceeds 10°.
- 3.3.7. The Contractor shall install end posts at end of fence and at buildings.
- 3.3.8. The Contractor shall install gate posts on both sides of gate openings.
- 3.3.9. The Contractor shall embed posts into concrete to a minimum depth of 1370 mm, extend concrete 50 mm above ground level and slope to drain away from posts. The Contractor shall brace to hold posts in plumb position and true to alignment and elevation until concrete has set.
- 3.3.10. The Contractor shall install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.
- 3.3.11. The Contractor shall install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining posts with turnbuckles and tension bar bands.

### **3.4. HIGH SECURITY FENCE INSTALLATION**

- 3.4.1. The Contractor shall utilize installation methods in accordance with the Manufacturer's recommendations and the Shop Drawings.
- 3.4.2. The Contractor shall install fence posts in accordance with locations and details indicated on the Shop Drawings.



- 3.4.3. The Contractor shall install posts anchored to concrete bases in accordance with the Shop Drawings.
- 3.4.4. The Contractor shall ensure posts are plumb within a tolerance of 6 mm in 3.0 metres.
- 3.4.5. The Contractor shall install fence panels, including, anchorage, in accordance with the Shop Drawings.
- 3.4.6. The Contractor shall provide terminal posts, bracing, and other required elements in accordance with the Shop Drawings where existing adjacent property fences tie-in and abut to new fences.

### **3.5. FENCE FABRICS**

- 3.5.1. The Contractor shall not install fence fabric until the footings have cured for a minimum period of seven calendar days.
- 3.5.2. The Contractor shall ensure fence fabric is stretched tight to tension recommended by Manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals. The Contractor shall install the knuckled selvedge at bottom and twisted selvedge. The Contractor shall ensure longitudinal axis of the diamond configuration shall be perpendicular to the slope of the pipe rail.
- 3.5.3. The Contractor shall place the fabric on the side of the post nearest the railway, with the barbed edge at the top.
- 3.5.4. The Contractor shall secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals. The Contractor shall give tie wires a minimum of two twists.

### **3.6. BRACING**

- 3.6.1. The Contractor shall install brace between end and gate posts and nearest line post, placed diagonally. The Contractor shall install braces on both sides of fence corner and straining posts in similar manner.
- 3.6.2. The Contractor shall secure the end fittings for pipe braces by a 6 mm bolt placed through the brace and fitting at both ends.

### **3.7. GROUNDING**

- 3.7.1. The Contractor shall install grounding rods as indicated on the Drawings and in accordance with Metrolinx Fencing and Anti-Trespassing Requirements.

3.7.2. For electrified territory requirements please refer to Electrification Enabling Works Standards and Related Traction Power Standards and Specifications.

### **3.8. INSTALLATION OF GATES**

3.8.1. The Contractor shall utilize installation methods in accordance with the Manufacturer's recommendations and the Shop Drawings.

3.8.2. The Contractor shall install gates in accordance with the following requirements:

- a) install gates in locations as indicated on the Drawings and in accordance with Metrolinx Fencing and Anti-Trespassing Requirements;
- b) level ground between gate posts and set gate bottom approximately 100 mm above ground surface; and
- c) determine position of steel gate track:
  - 1) cast steel gate track in concrete as directed by Metrolinx; and
  - 2) dome concrete above ground level to shed water.

3.8.3. The Contractor shall install posts anchored to concrete bases in accordance with the Shop Drawings.

3.8.4. plumb within a tolerance of 6 mm in 3.0 metres.

3.8.5. The Contractor shall install gate panels, including, anchorage, in accordance with the Shop Drawings.

3.8.6. The Contractor shall ensure all gates to swing in the opposite direction of the railway tracks, or as directed by Metrolinx. The Contractor shall install gate stops where the gate has the potential to swing within the train envelope.

3.8.7. The Contractor shall ensure swing gates meet the following requirements:

- a) all connections and joints shall be welded to form rigid frames or assembled with corner fittings; and
- b) hinges shall not twist or turn under the action of the gate, shall be so arranged that a closed gate cannot be lifted off the hinges to obtain entry.

### **3.9. TOUCH UP**

3.9.1. The Contractor shall lightly sand the surface to remove all rust and loose material.

## FENCING AND GATES

- 3.9.2. The Contractor shall clean the surface with a solvent such as paint thinner to remove any remaining contaminants which might hinder proper paint adhesion.
- 3.9.3. The Contractor shall apply one coat of exterior metal primer and three topcoats with exterior grade enamel paint of type compatible with existing coating.
- 3.9.4. The Contractor shall ensure colour matches existing.

### **3.10. AS-BUILT DRAWINGS**

- 3.10.1. Upon completion of the Work, the Contractor shall perform a topographical survey for all fences, confirming the location, length and elevations. The Contractor shall provide CAD files for the topographical survey to Metrolinx.
- 3.10.2. The Contractor shall prepare As-Built Drawings based on the topographical survey.

**END OF SECTION**

# Appendix B - Sample contract specification for Anti-Trespass Panel

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# **Anti-Trespass Panels Specification**

Section 34 72 19

Revision 0  
Date: July 2022

# Anti-Trespass Panels Specification

Section 34 72 19

Publication Date: July 2022

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Amendment Record Sheet

Amendment in Clause No.	Date of Amendment	Description of Changes

ANTI-TRESPASS PANELS

LIST OF CONTENT

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1.2. RELATED SECTIONS ..... 2

1.3. QUALITY CONTROL..... 2

1.4. SUBMITTALS..... 2

**2. PRODUCTS.....3**

2.1. GENERAL ..... 3

**3. EXECUTION .....4**

3.1. PREPARATION ..... 4

3.2. ANTI-TRESPASS PANEL INSTALLATION ..... 4





## ANTI-TRESPASS PANELS

- b) product transportation, storage, handling and installation requirements.
- 1.4.2. The Contractor shall submit the Manufacturer's information in support of the manufacturing process and test results upon request by Metrolinx.
- 1.4.3. The Contractor shall submit Shop Drawings for Metrolinx review in accordance with Section 01 33 00 - Submittal Procedures for all ATPs.
- 1.4.4. The Contractor shall ensure Shop Drawings are stamped and signed by a professional engineer licensed to practice in the Province of Ontario, having experience in design of fence and gates specified in this Section 34 72 19 - Anti-Trespass Panels. The Contractor shall confirm experience on the Shop Drawings.

## 2. PRODUCTS

### 2.1. GENERAL

- 2.1.1. The Contractor shall use ATPs from the following Metrolinx approved products:
  - a) Rosehill Rail authorized distributor:
    - 1) Mike Yared, Canadian Regional Sales Manager, Rail Business Division  
L.B. Foster Rail Technologies Canada Ltd.  
350 Blvd Industriel, St. Jean sur Richelieu, Québec, QC  
J3B 4S6  
Tel: 514-426-6257  
Email: myared@lbfoster.com; or
    - b) an equivalent vendor product meeting the Metrolinx-tested and approved specifications of Rosehill Rail, the requirements of this standard and accepted in writing by Metrolinx Corridor Maintenance. The Contractor shall ensure any proposed equivalent products meet the following criteria:
      - 1) have a minimum lifespan of 25 years (subject to no mechanical damage being sustained); and
      - 2) ATP mats are made out of 100% recycled rubber with plastic components of the mats made from recycled plastic/plastic bottles.
- 2.1.2. The Contractor shall use ATPs from the following Metrolinx approved formats:
  - a) Double Flange Standard Panel (Rosehill Rail product code: RCP ANTI TRESPASS);
  - b) Single Flange Panel (Rosehill Rail product code: RCP ANTI TRESPASS/1);

- c) Flangeless/Flat Panel (Rosehill Rail product code: RCP ANTI TRESPASS/0); or
- d) an equivalent vendor product accepted in writing by Metrolinx Corridor Maintenance.

2.1.3. The Contractor shall use ATP installation kits from the following Metrolinx approved products:

- a) Rosehill Rail Fixing Kits (RCP AT FIXING KIT) comprising of:
  - 1) 2 plastic 'planks'; and
  - 2) 8 cadmium plated and rust resistant screw fixings and washers; or
- b) an equivalent vendor product accepted in writing by Metrolinx Corridor Maintenance.

### 3. EXECUTION

#### 3.1. PREPARATION

3.1.1. Prior to ATP installations, the Contractor shall:

- a) ensure the grade is sufficient and shall positively drain away from the tracks, platform and right-of-way (ROW);
- b) ensure that any ties being covered by the ATP are in good condition;
- c) ensure tie assessment is provided by Metrolinx prior to installation;
- d) ensure that the ATP will not cover any signaling conduits or cables; and
- e) ensure that the proposed area is free from bumps or potential lifting points that may limit the fastening capabilities of the ATP. The Contractor is responsible for creating a 'bump free' area and for redistributing and adding any material required to ensure a uniform base.

#### 3.2. ANTI-TRESPASS PANEL INSTALLATION

3.2.1. The Contractor is responsible for installing the Anti-Trespass mats as per the Manufacturer's instructions.

3.2.2. Where fixings vary as a result of the surface in which the anti-trespass mats are being installed, the Contractor shall select fixings that are the most appropriate for the Site condition surface as per the Manufacturer's recommendation.

## ANTI-TRESPASS PANELS

- 3.2.3. The Contractor shall ensure the panels are correctly positioned and supported and that all fixings are secured in place with each installation.
- 3.2.4. The Contractor is responsible to coordinate the removal of all excess material and appropriately dispose or recycle any waste.
- 3.2.5. The Contractor is responsible to cut the ATP as necessary to fit into the locations identified by Metrolinx.

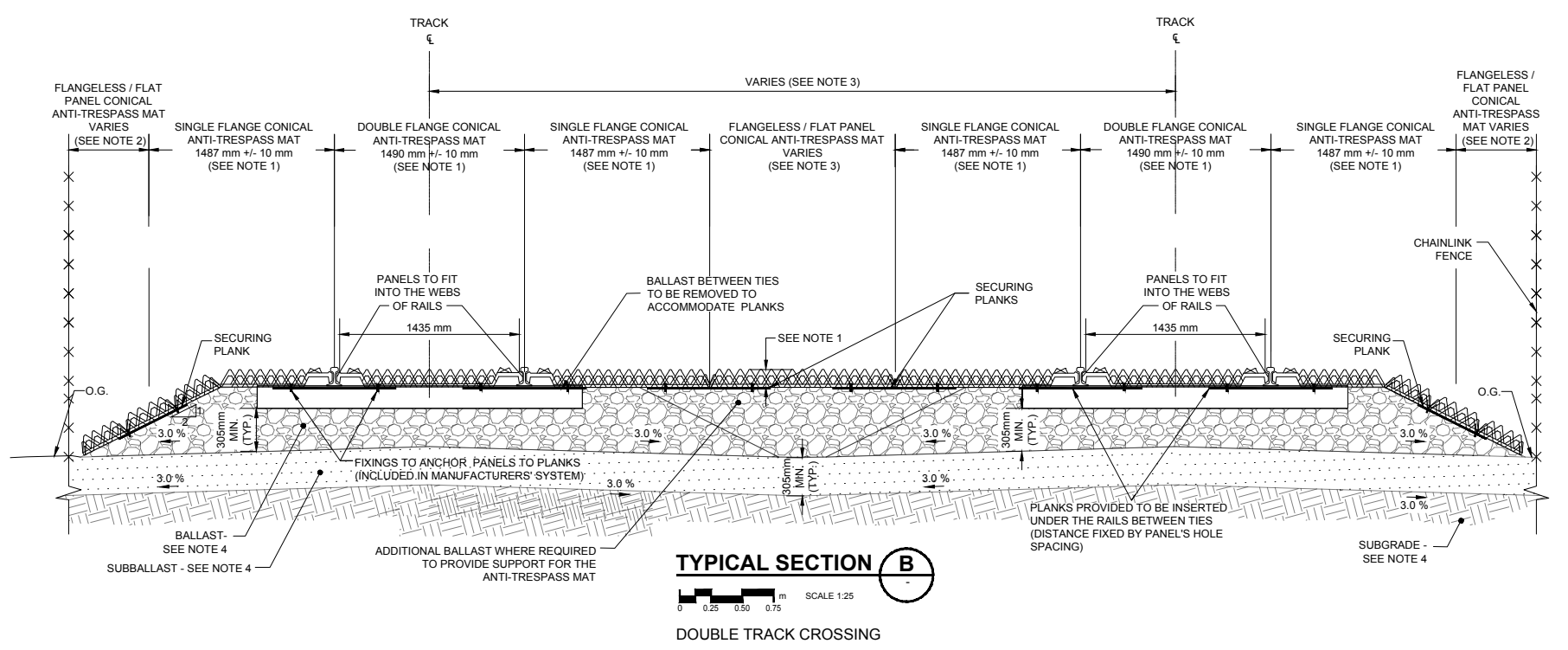
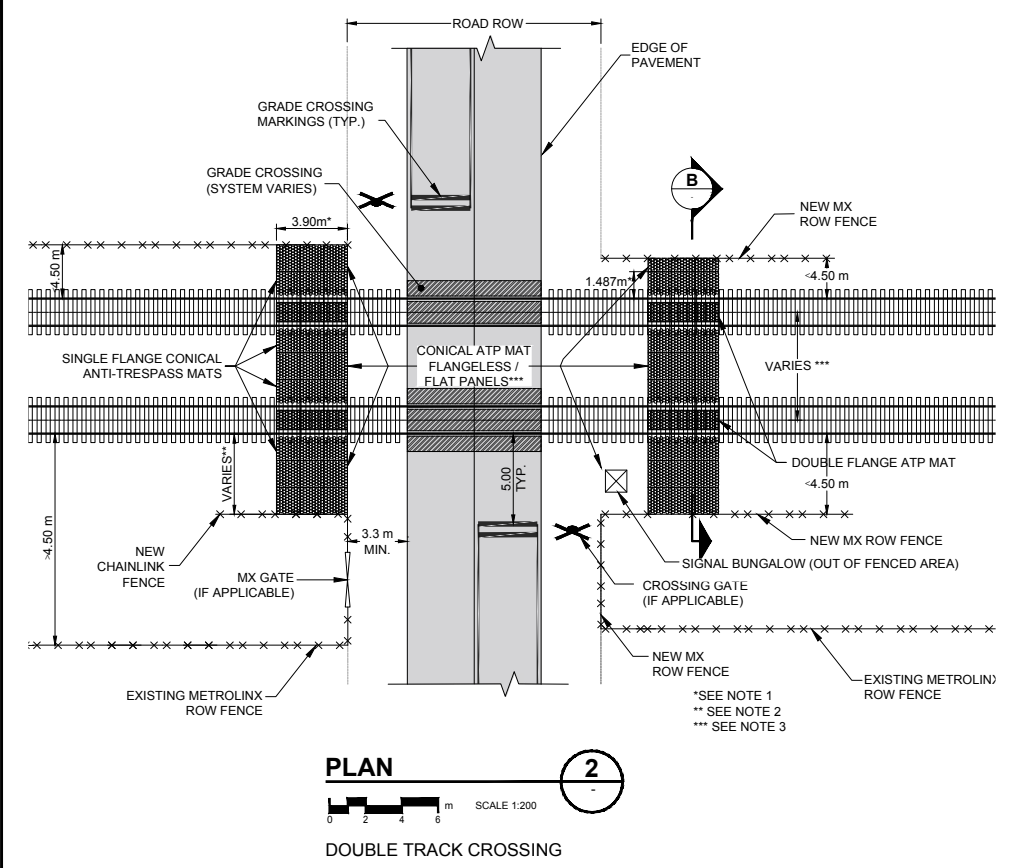
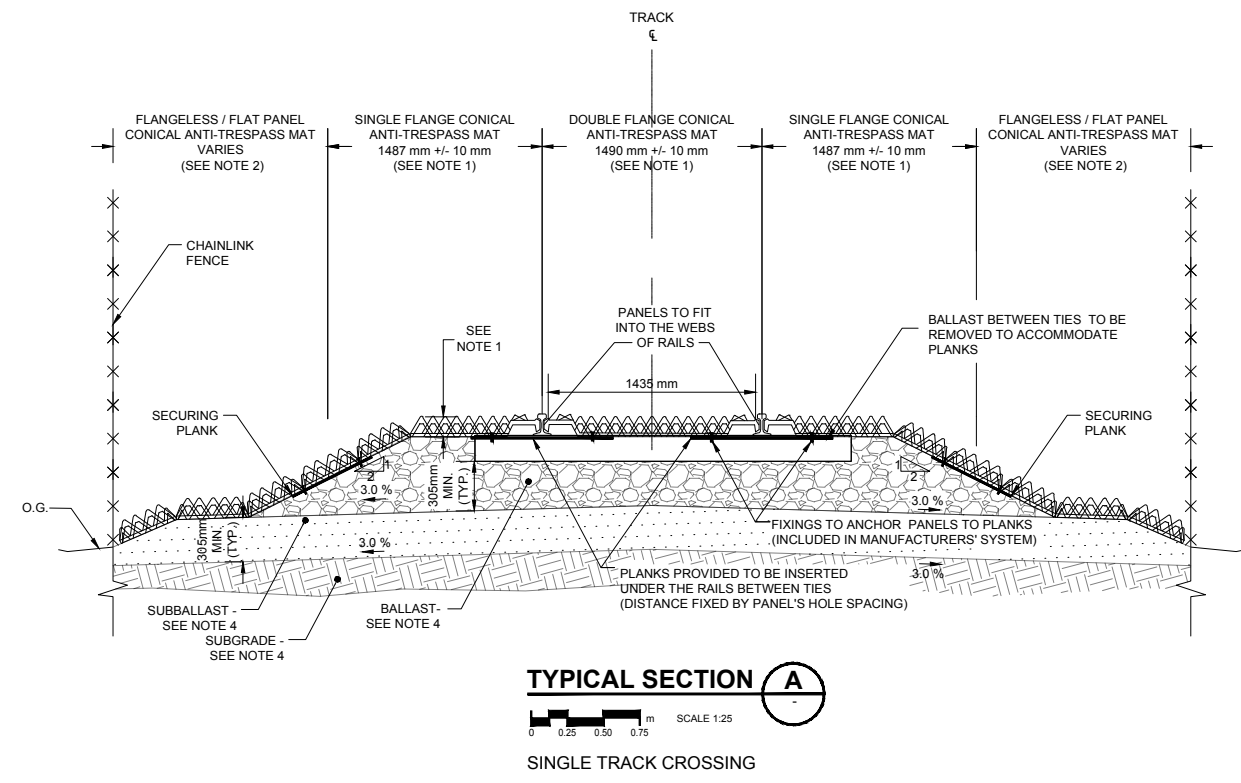
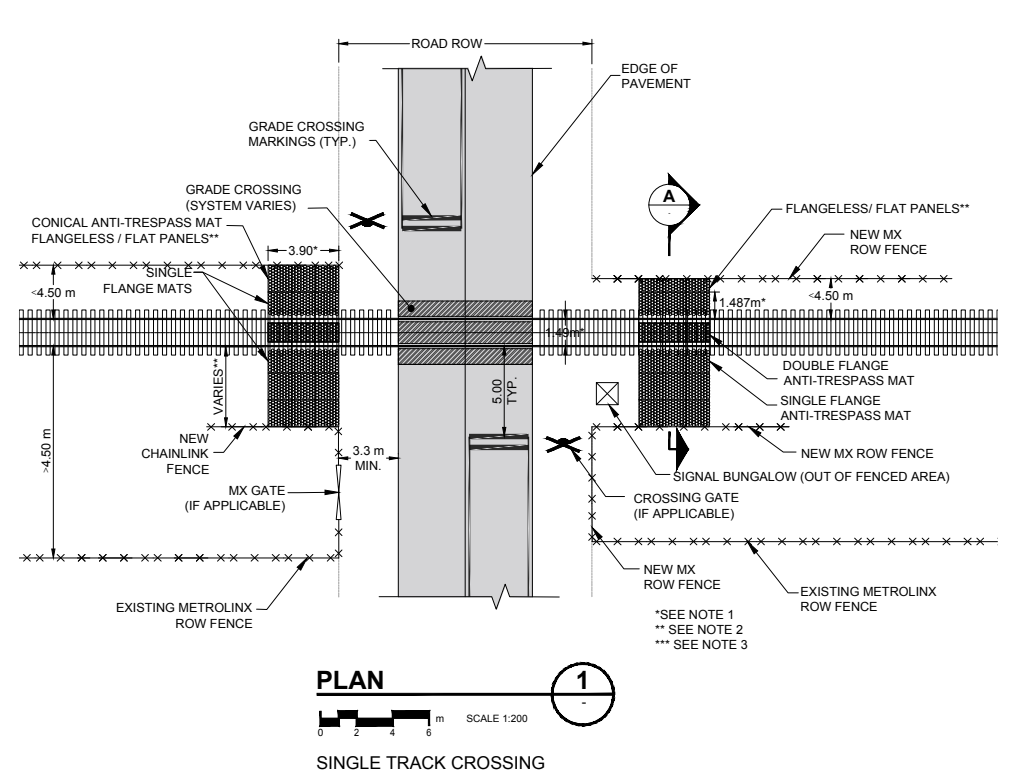
**END OF SECTION**

# Appendix C - Anti-Trespass Panel standard drawing

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METRIC  
ALL DIMENSIONS SHOWN ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE NOTED.

- NOTES:**
- DIMENSIONS SHOWN OF PANELS LENGTH AND WIDTH, PLANKS & FIXING SIZES AS WELL AS DETAILS OF THE CONICAL ELEVATION ARE INDICATIVE ONLY AND BASED ON MANUFACTURER'S SPECIFICATIONS.  
  
ALL MEASUREMENTS TO ENSURE TIE SPACING, RAIL CONDITION AND ADJACENT GRADE CROSSING ARE ADEQUATE FOR THE ANTI-TRESPASS MATS INSTALLATION TO BE CHECKED AGAINST MANUFACTURER'S REQUIREMENTS AND SITE VERIFIED.
  - IN ORDER TO ENSURE CONTINUITY OF THE ANTI-TRESPASS MEASURES, ANY DISTANCE BETWEEN THE END OF THE SINGLE FLANGE MAT AND ANY EXISTING FENCE, BARRIER OR WALL, SHOULD BE COVERED BY THE APPLICABLE WIDTH OF FLAT PANELS, FIXED TO THE SINGLE FLANGE END AND CUT TO FIT AS PER MANUFACTURER'S SPECIFICATIONS.
  - WHERE DISTANCE FROM OUTER RAIL TO EXISTING ROW FENCE IS ABOVE 4.5m, A NEW CHAINLINK FENCE SHALL BE PLACED AT THIS DISTANCE, TO AVOID USING MORE THAN 3 NO. PANELS, AS SHOWN IN PLANS 1 & 2.
  - TYPE AND SIZE OF ANTI-TRESPASS MATS TO BE FITTED BETWEEN TRACKS VARIES UPON TRACK SPACING.  
A SINGLE FLANGE CONICAL MAT IS REQUIRED TO BE FIXED TO THE INNER RAILS, AND BASED ON THE AVAILABLE DISTANCE, THE PANELS CAN BE CUT.
  - IF TRACK SPACING IS LARGER THAN THAT COVERED BY TWO SINGLE FLANGED MATS, A FLANGELESS / FLAT PANEL CAN BE INSERTED BETWEEN THEM AND FIXED TO THESE TO COVER THE AREA.
  - TRACKBED DIMENSIONS AND EXTENTS INDICATIVE ONLY. RAIL GEOMETRY, BALLAST AND SUBBALLAST THICKNESS ARE NOT RELATED AND SHOULD NOT BE MODIFIED DUE TO THE ANTI-TRESPASS MAT SYSTEM.
  - PRIOR TO INSTALLATION, ANY BALLAST ON THE TIE SURFACE TO BE REMOVED.
  - PANEL FLEXIBILITY CAN ACCOMMODATE ORIGINAL GROUND BALLAST SURFACE IRREGULARITIES. HOWEVER, IT IS RECOMMENDED THAT THE ORIGINAL GROUND IS LEVELED OFF PRIOR TO INSTALLATION TO FACILITATE FIXING BETWEEN PANELS.
  - SUFFICIENT CLEARANCE AROUND SIGNAL BUNGALOW SHALL BE ENSURED AS PER METROLINX REQUIREMENTS



REFERENCE DRAWINGS		ISSUE		REVISIONS		DRAWN BY: JOM	DESIGNED BY: JOM	<b>METROLINX</b>	ANTI - TRESPASS MAT			
						CHECKED BY: AS	APPROVED BY: LB		STANDARD DRAWING			
						SCALE: AS SHOWN FULL SIZE ONLY						
DWG. NO.	TITLE	REV.	DATE	ISSUED FOR	REV.	DATE			CONTRACT NO. XX-XXXX-XX-XXX	DWG. NO. X-XXX	REV. 0	SHEET

METROLINX PROJECT NO. XXXXXX

# Appendix D - Rail corridor signage

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# **Rail Corridor Signage**



# Grade Crossing Signage



Figure B-1. Number of Tracks Sign

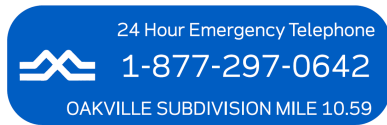


Figure B-3. Emergency Notification Sign (ENS)

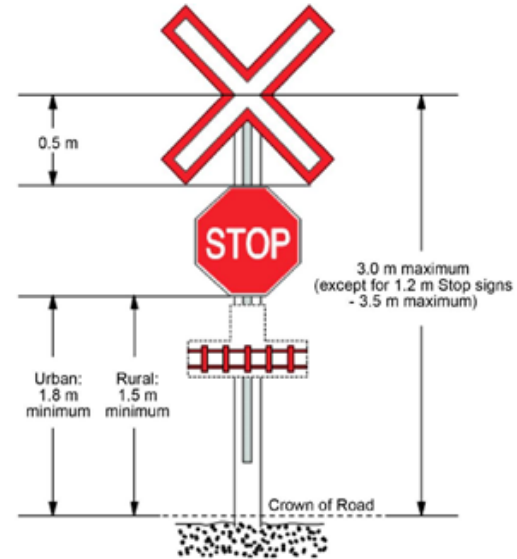


Figure B-2. Stop Sign Placement (Transport Canada, 2019)

**Note:** For more Rail Corridor Signage information contact the ROW Officer in the Rail Corridor Maintenance Office.



Figure B-4. Private Property Signs



Figure B-5. Tow Away Zone Sign



Figure B-6. Stuck on Tracks Sign



Figure B-7. Connex Mental Health Sign



Figure B-8. Dismount and Walk Sign (Ontario Traffic Manual - Book 18, Rb-70)

*Note: For more Rail Corridor Signage information contact the ROW Officer in the Rail Corridor Maintenance Office.*

Signs providing advanced warning ahead of all grade crossings are required by applicable standards in the *Grade Crossing Handbook*. A Railway Crossing Ahead Sign, Advisory Speed Tab Sign, and Stop Ahead Sign shown below shall be installed and manufactured according to specifications in Articles 8.2 and 8.3 of the *GCH* by the governing road authority. Where a new crossing is being constructed or modified from an existing configuration, advance warning signs shall be installed or modified accordingly by the party completing the work.



Figure B-9. Grade Crossing Advance Warning Signs

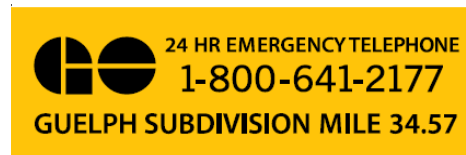


Figure B-10. Emergency Notification Sign Decal for Private Crossing (sample)

**Note:** For more Rail Corridor Signage information contact the ROW Officer in the Rail Corridor Maintenance Office.