Metrolinx Overbuild Development Guidelines GO Transit Heavy Rail Corridors

Third Party Projects Review (TPPR)

Version 1.0 - December 2022

METROLINX

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1.0 Introduction

1.1 Context

As growth intensifies in the Greater Toronto and Hamilton Area, Developers are seeking new and creative ways to deliver in-demand development projects. This is particularly true for dense urban centres, such as downtown Toronto where the combination of limited availability of land and increasing property values has led some Developers to identify the airspace over Rail Corridors as the next frontier for development activity. Private developments that have been or are being considered over Rail Corridors ("Overbuild Developments" or "Overbuilds") support different land-uses including parks/open space, private buildings (commercial and residential), private pedestrian connections, stations and ancillary uses.

An Overbuild Development requires careful planning, management, and coordination with Metrolinx throughout the Overbuild Life Cycle to ensure that rail safety is maintained, railway infrastructure is protected, rail operations are not unduly impacted, or constrained, and compatible developments are delivered for the unencumbered enjoyment of a variety of users.

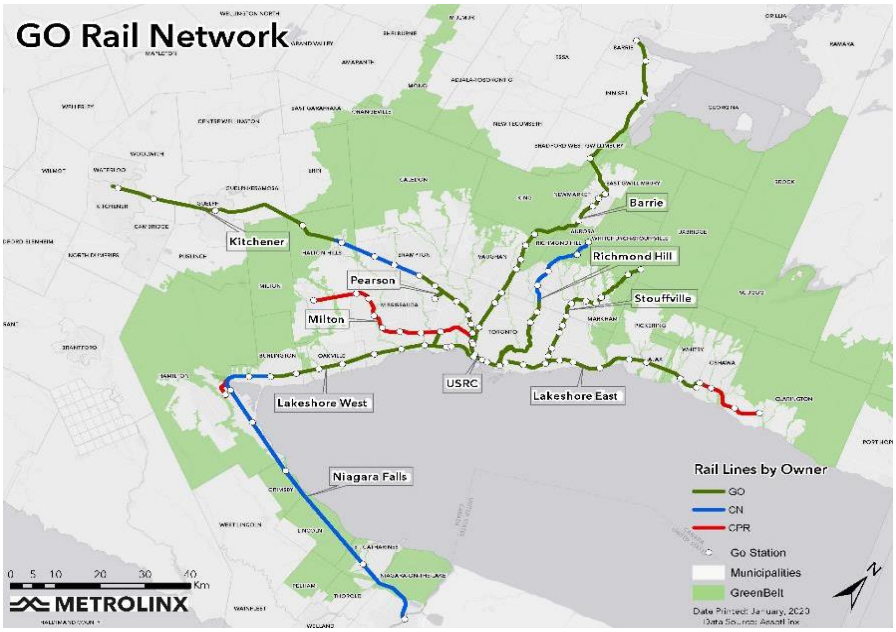
1.2 Guideline Purpose and Scope

These Guidelines are intended for Developers who are contemplating or pursuing construction of infrastructure over a Rail Corridor. Authorization of development activities and approval of new infrastructure that has the potential to impact the Rail Corridor is required from Metrolinx and appropriate Authorities Having Jurisdiction, through a design-review and approval process; outside of the Rail Corridor, private development and associated public obligations are governed by municipality requirements.

This document identifies key procedural, operational, and technical considerations applicable to Overbuild Developments. It should be noted the design and functional aspects of each Overbuild Project, as well as the prevailing and future characteristics of the Rail Corridor, will vary by location and must be determined on a case-by-case basis. This document is provided for guidance purposes only and should be considered as a starting point for related discussions, in combination with other applicable guidelines and standards, such as the Metrolinx Adjacent Development Guidelines. Parties interested in pursuing an Overbuild Development are encouraged to review these materials and engage with Metrolinx representatives at the earliest opportunity.

1.3 Geographic Scope

Metrolinx operates heavy rail service on eight Rail Corridors that extend across the Greater Toronto and Hamilton area, as illustrated in Figure 1.1. Overbuild Development can be considered anywhere on the network, although project viability is particularly enhanced in the vicinity of stations and in dense urban centres.



In downtown Toronto, several Overbuild Projects have been contemplated above the Union Station Rail Corridor (USRC – illustrated in Figure 1.2) – which is the epicentre of Metrolinx operations, the location of the main passenger hub - Union Station, and the busiest Rail Corridor in Canada. While there are benefits offered by this location in relation to project viability, it is a complex environment, with a high level of train activity supported by a complicated array of infrastructure in a constrained space and may present technical challenges beyond what may be encountered at other main line locations. These Guidelines contemplate the breadth of conditions that may be encountered – within the USRC or elsewhere.

Figure 1.1 Metrolinx Rail Network

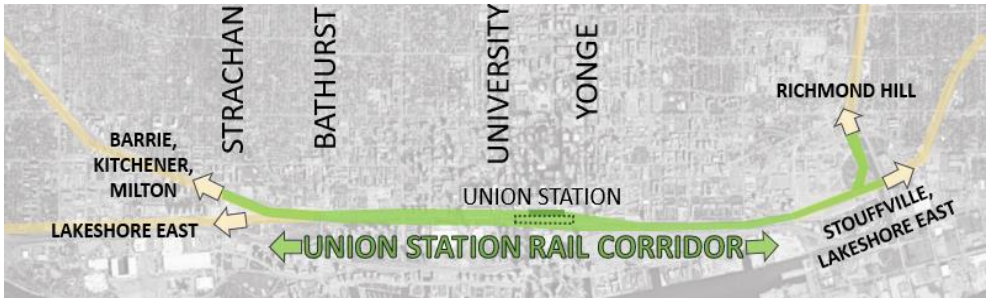


Figure 1.2 Union Station Rail Corridor

Parts of the Rail Corridors used by Metrolinx are also comprised of lands - or airspace - owned by other rail-oriented entities such as Canadian National Railway, Canadian Pacific Railway or Toronto Terminal Railways. In this context these Guidelines may be considered in addition to any other guidelines and requirements set by the railway landowner and any other agency with jurisdiction. The Developer should seek advice from all landowners impacted by their proposed Overbuild Development, including CN, CP and/or TTR to obtain relevant approvals/easements/air-rights.

It should be noted these Guidelines do not specifically consider requirements for Overbuild Projects above Light Rail (LRT) and Subway corridors - although many of the same general principles would apply.

2.0 Overbuild Project Process

2.1 Overbuild Life Cycle

The Overbuild Life Cycle encompasses all work from early planning, design, procurement, construction, operations, maintenance, and decommissioning.

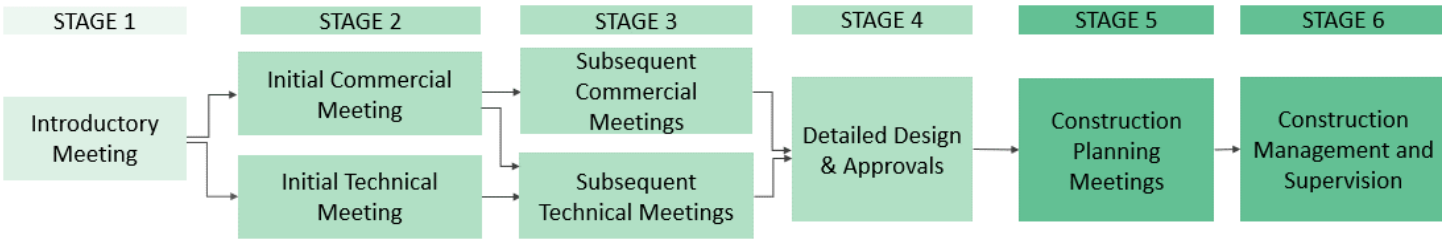
Experience has shown the most successful project outcomes arise when Developers and Metrolinx representatives work together collaboratively. Metrolinx is committed to working as a trusted partner to ensure external parties obtain the information necessary to promote safe and healthy communities while also reducing and removing potential conflicts with Metrolinx infrastructure and services.

It is the Developer's responsibility to demonstrate to Metrolinx that rail-oriented impacts will be suitably mitigated, and railway assets, operations and future expansion plans will be protected through the entire Overbuild Life Cycle including construction, operation, and even future decommissioning of the proposed development.

Activities required during an Overbuild Life Cycle, such as initial design, construction, major rehabilitation works, decommissioning, require Metrolinx involvement and approvals through the Overbuild Review Process.

2.2 Overbuild Review Process and Fee Structure

The following flow-chart identifies each stage of the Overbuild Review Process (ORP) and outlines best practice for engagement between the Developer and Metrolinx. The Overbuild Project Checklist in Appendix B is provided to consider additional information, documents, field investigations and reports that may be required at any given stage in support of obtaining the required Metrolinx approval(s).



STAGE 1 – INTRODUCTORY MEETING

The Developer may request an introductory meeting with Metrolinx to discuss a proposed Overbuild Project at no cost. At this meeting, the logistics for signing Non-Disclosure Agreements and exchange of information can be arranged, as required, prior to proceeding to Stage 2.

STAGE 2 – INITIAL COMMERCIAL AND TECHNICAL MEETING(S)

Metrolinx will engage the appropriate Metrolinx Subject Matter Experts (SMEs) and technical advisors who will advise on major constraints and key requirements related to the specific railway location and Overbuild Development proposal and will assist the Developer to create an initial document checklist to inform planning for future work. Subsequent stages will commence upon agreement between Metrolinx and the Developer on the required scope of services and fees.

STAGE 3 – FEASIBILITY (SUBSEQUENT COMMERCIAL AND TECHNICAL MEETINGS)

Metrolinx will review the Overbuild Project documentation provided by the Developer, and schedule subsequent technical and commercial meetings to achieve general agreement with the Developer on the feasibility of the Overbuild Development, meeting of key requirements and obligations, required next steps, and the level of Metrolinx support required during detailed design approval and construction. This stage will continue until a Letter of Intent (LOI) is signed.

STAGE 4 – DETAILED DESIGN AND APPROVALS

Metrolinx will review and comment on the Overbuild Development design regarding conformance to Metrolinx standards and requirements, and verify assumptions agreed to in the LOI. This stage will continue until Metrolinx approval is provided on the Overbuild Development Construction Drawings, construction schedule, and key contract documents.

STAGE 5 – CONSTRUCTION PLANNING MEETINGS

Metrolinx will review and approve construction plans provided by the Developer, confirm Rail Corridor access needs and flagging requirements, and agree on the details for construction supervision by Metrolinx staff.

STAGE 6 – CONSTRUCTION MANAGEMENT AND SUPERVISION

Metrolinx will review and approve all detailed work plans, permits and Rail Corridor access required to build the Overbuild Development, confirm provisions, and process requests of flagging resources, provide onsite construction supervision, attend regular site meetings, and perform construction inspections as necessary.

STAGE 7, STAGE 8 (FUTURE CONSIDERATIONS) – MAINTENANCE AND REHABILITATION, DECOMMISSIONING

The Developer will provide Metrolinx with an Asset Management Plan for the Overbuild Project, that details the life-cycle requirements for the development, including scheduled inspections, repair and maintenance, and future upgrades and/or decommissioning, as a possible outcome.

2.3 Pre-Construction Technical Review and Work Permit Issuance

Overbuild Projects that are above or involve infrastructure that is within or immediately adjacent to the Rail Corridor will be subject to further technical review and will conclude with execution of applicable agreements and issuance of a Metrolinx Work Permit. No construction within 10 metres (30 feet) of active rail may proceed without a Metrolinx Work Permit. Notwithstanding, it is recommended that proponents also confirm associated requirements with Metrolinx for work that is located outside of the 10-metre limit.

2.3.1 Technical Review Process

Project-related construction activities that are located within or immediately adjacent to the Metrolinx Rail Corridor will be subject to a technical review process that examines the detailed design and Work Plan for each of the proposed Works. The focus of the technical review is to confirm compliance with applicable requirements in order to mitigate, and ideally eliminate, any potential impacts on the Metrolinx Rail Corridor. The Developer shall be responsible for submission of all associated plans, reports and other materials required to support the subject review.

Metrolinx will oversee the technical review process and will engage internal stakeholders to review submissions and provide feedback as required. Subject matter that extends outside of internal expertise will require more advanced technical review by the Metrolinx Third Party TA. The TA will provide feedback to the Developer regarding technical considerations within fifteen (15) business days per individual submission unless otherwise specified, and the review period will re-start with each subsequent revision. All fees associated with this process are the responsibility of the proponent and will be identified in a "Level of Effort" quote to be provided by the TA at commencement of the process. Receipt of payment must be confirmed prior to initiation of the review. The quote shall include the facilitation of access for work within the Metrolinx Rail Corridor, as well as ongoing coordination, support, and construction oversight in accordance with conditions set out in the Metrolinx Work Permit.

The Technical Review will be conducted with reference to applicable policies, standards and protocols. The Technical Review must be fully completed prior to the issuance of a Work Permit. Where the subject Project proposes to physically integrate with public facing transit facilities, this guideline will not apply, and rather, the proponent shall follow the Metrolinx Asset Protection Package (MAPP) process accordingly.

2.3.2 Work Permit Issuance

Upon successful completion of the technical review process as identified in section 2.3.1, Metrolinx shall determine if conditions have been satisfied to support Work Permit issuance. A Work Permit is a document that identifies proponent roles and responsibilities with respect to the subject work and allows the Developer to proceed with their construction, subject to satisfaction of certain conditions/obligations that are to be confirmed by Metrolinx.

Beyond the technical review, the Work Permit shall not be issued until the Developer confirms satisfaction of other conditions including:

- ✓ Railway utility locates (Metrolinx and CN) have been obtained
- ✓ Railway flagging protection arrangements have been confirmed
- ✓ Rail Corridor Access parameters such as workblocks are understood and arrangements are confirmed
- ✓ Appropriate insurance has been obtained
- ✓ WSIB requirements have been satisfied
- ✓ Appropriate personnel have completed Personal Track Safety (PTS) training

Additional information regarding these matters is documented in the Work Permit and Metrolinx will provide advice and assistance as required. It should be noted that some of these requirements (such as Rail Corridor Access permissions) have long lead times and it is prudent to initiate related discussions during the municipal planning review stage.

Upon issuance of the Work Permit, the Developer and their contractors shall be obligated to satisfy all applicable requirements as set out in the Work Permit document. The issuance of a Work Permit by Metrolinx does not exempt the Developer from other applicable codes, standards, by-laws, statutes, regulations, or any other conditions required by Metrolinx or other entities involved in the development review and approval process.

2.4 Project Agreements

Depending on the Project circumstances, development agreements may be required to specify requirements, roles and responsibilities. Some agreements may be required at the outset of the project, while others may need to make reference to final Project plans (with content depending on the nature of the agreement) so finalization will occur in the latter stages of the Project planning process. Metrolinx has developed and refined (based on Subject Matter Expert feedback) template agreements that can be provided to the Project team for reference in the early stages of engagement. Review and refinement of associated details can begin at any time, although it should be noted that modifications to the standard templates are discouraged.

A list of typical agreements is provided below. Other agreements may also be required depending upon the Developer's proposal.

2.4.1 Non-Disclosure Agreement

Metrolinx may require a Developer to enter into a Non-Disclosure Agreement to protect sensitive and confidential information such as documents, working papers, design documents, and other materials pertaining to Metrolinx.

2.4.2 Letter of Intent (LOI)

An LOI is a document expressing an intention for the Developer to enter into a contract with Metrolinx at a future date, however, creates no contractual relationship. The LOI would be in effect until a future, more detailed contract has been finalized.

2.4.3 Memorandum of Understanding (MOU)

An MOU is a non-legal binding agreement between the Developer and Metrolinx that describes a broad outline of scope and terms that have been mutually accepted by both parties – prepared on the basis that a binding contract such as a Development Agreement will be prepared in the future.

2.4.4 Land Transfer or Exchange Agreements

Metrolinx may require a Developer to enter into a Land Transfer Agreement when land within the development site is or has a likelihood of being required for a Metrolinx Priority Transit Project or where Metrolinx lands are required by the Developer to accommodate the development.

2.4.5 Development Construction Agreement

A Construction Agreement is established between the Developer and Metrolinx to set out the specific requirements and parameters of the construction of the development and may include restrictions on the timing and duration of construction activity by the Developer. This agreement must be executed prior to the release of the first municipal building permit and start of any excavation and shoring work. In some circumstances this agreement may be required prior to demolition works on the site.

2.4.6 Long-Term Maintenance Agreement

A Long-Term Maintenance Agreement defines the obligations of both parties to allow for ongoing maintenance and repairs of both Metrolinx and Developer's infrastructure to the extent that one impacts the other.

2.4.7 Entrance Connection Agreement

An Entrance Connection Agreement is required for developments which propose direct pedestrian connections to a Metrolinx station. The Entrance Connection Agreement will deal with all aspects of a transit connection, including the design, construction, supply and installation of fare collection equipment, electrical services, stairs, elevators, escalators, security features, wayfinding and signage, fire / life safety and other elements or components of an Entrance Connection as applicable.

2.5 Project Close-Out

The Developer shall advise Metrolinx in writing once all engineering, interfacing and project construction impacting Metrolinx is complete and to confirm that all Developer obligations have been satisfied. Where the Project includes permanent change/modification to Metrolinx infrastructure, the Developer is to provide As-Built Drawings as directed by and in a form acceptable to Metrolinx. Metrolinx, in turn, will issue a closeout letter to the Developer representing technical, fiscal and administrative closeout of the Project.

3.0 Building Over A Metrolinx Rail Corridor

Overbuild Developments are categorized based on their impact to the Rail Corridor. Various Overbuild design configurations are illustrated in below Figure 3.1, 3.2 and 3.3, in order of increasing impact to Metrolinx rail operations. It is Metrolinx's strong preference to avoid Overbuild Developments with infrastructure such as piers/columns within the Rail Corridor, as this presents safety and operational challenges.

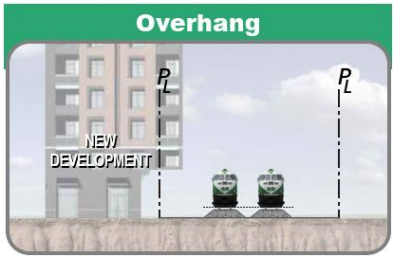


Figure 3.1

- Substructure outside the Rail Corridor
- Superstructure inside the Rail Corridor

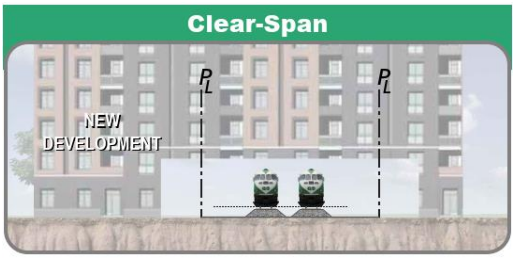


Figure 3.2

- Substructure outside the Rail Corridor
- Superstructure inside the Rail Corridor

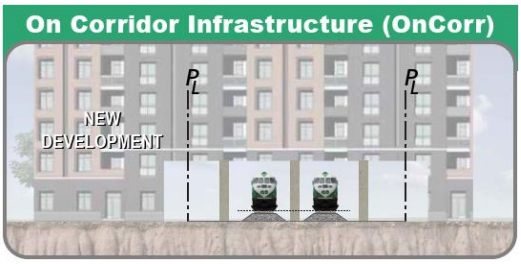


Figure 3.3

- Substructure and Superstructure inside the Rail Corridor – Discouraged by Metrolinx
- Not preferred.

For Overbuild Developments proposed to be integrated into an existing or new Metrolinx station, as illustrated in Figures 3.4 and 3.5, technical considerations and best practices outlined in this document should be considered, but additional technical and commercial requirements will also be required beyond the documentation and processes outlined in these Guidelines.

Figure 3.4

Figure 3.5

Certain spatial and design factors must be considered when building over a Metrolinx Rail Corridor to ensure the continued safe and efficient operations within the Rail Corridor. To assist with understanding these requirements, the area in and around a potential Overbuild Development can be organized into three (3) Zones, each of which involving different planning and operational considerations that may be assessed individually, but which may also interrelate and influence one another. The Zones are described as follows, and illustrated in Figure 3.6 below:

- Zone 1, The Rail Corridor: The area located below the Overbuild structure where rail operations occur.
- Zone 2, The Overbuild Structure: The physical structure to be constructed above the Rail Corridor.

- Zone 3, The Overbuild Development: The Development on top of the Overbuild Structure.

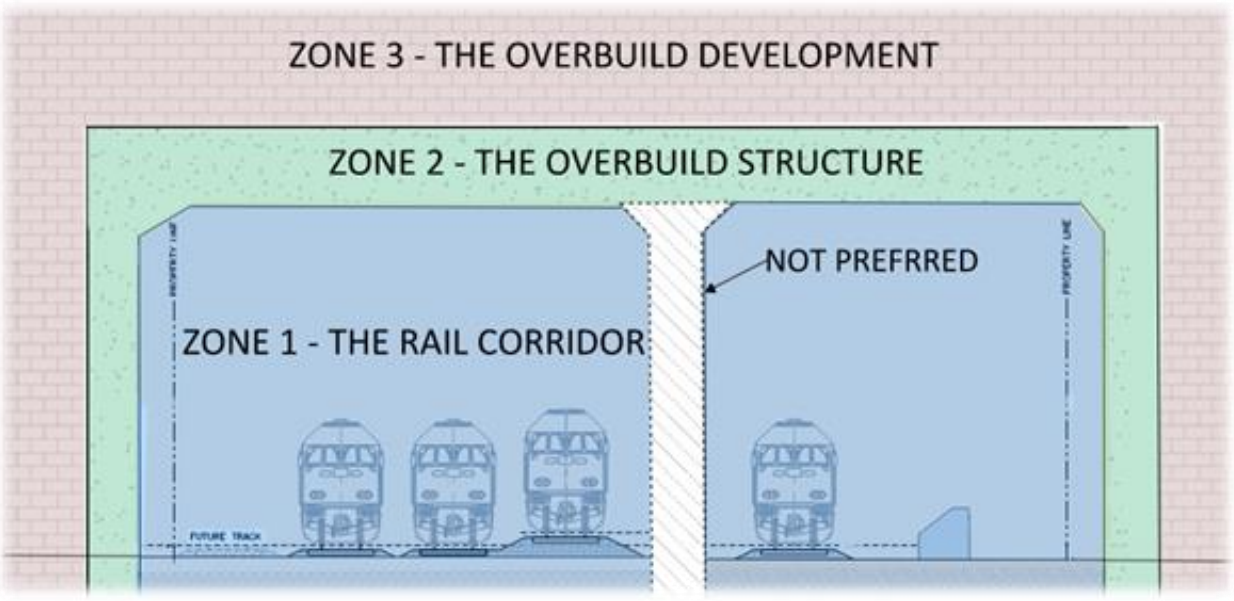


Figure 3.6 Conceptual Overbuild Development, Affected Rail Corridor and Zone 1, 2, 3

With reference to the Figure 3.6, it is the intent of the Overbuild Review Process to ensure:

- Activities in Zone 1 can effectively continue as if there is no change within the airspace above;
- The structure that comprises Zone 2 should be designed so it does not negatively impact Zone 1 while also suitably supporting the activities in Zone 3; and
- The development in Zone 3 must be compatible with (not impact or be impacted by) the operations in Zone1.

The following sections present an overview of development considerations for each of the zones. An Overbuild Project Checklist is also provided in Appendix B, which identifies project documents for each design discipline, and explains the purpose of each document, and at what Stage during design and construction of the project documents are required in accordance with the Metrolinx approval process. Additional information pertaining to key design and construction considerations set out in Appendix C.

3.1 Zone 1 – The Rail Corridor

Zone 1 encompasses the rail operational Right-of-Way (ROW) and immediate surroundings, including the areas adjacent to the tracks, above the tracks to the limits of the underside of the Overbuild structure, and the subsurface area below the tracks and along the ROW. Infrastructure elements within Zone I are controlled by Metrolinx, and require Metrolinx authorization to access and maintain, along with design and construction approval for installation. The following sections highlight elements and key considerations when planning access, design, construction, and maintenance within Zone 1.

3.1.1 Clearances

Clearances represent the allotted minimum horizontal (H) and vertical (V) spatial requirements along the Rail Corridor and are based on considerations such as: rail operations and maintenance requirements, current and future planned railway infrastructure such as tracks, signals, and electrification, the future placement of ventilation equipment and any fire life safety infrastructure. Each location on the rail network has a unique combination of current and future requirements: for example, a reduced clearance in effect in one location may be undesirable nor feasible at another location. Figure 3.7-A and 3.7-B illustrate some of the conceptual Horizontal and Vertical Clearances to consider during an Overbuild Project.

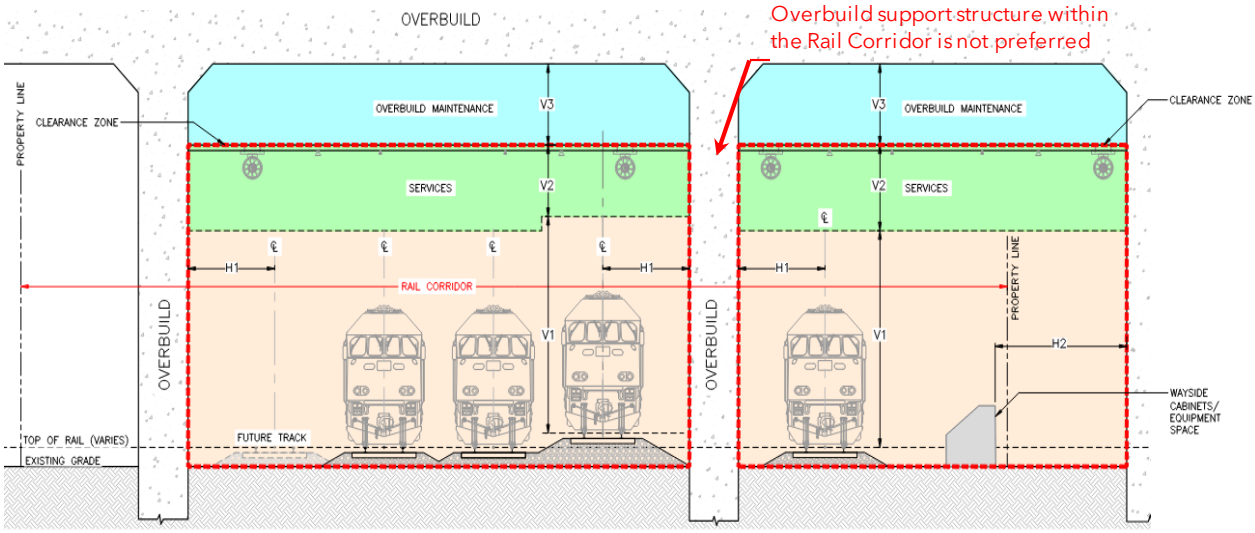


Figure 3.7-A Conceptual Overbuild Horizontal and Vertical Clearances

V1	7.6 m	*Electrification Clearance – clearance required above top of rail for existing and future tracks to accommodate rail vehicle and electrification equipment, for protection against electrical arcing from Metrolinx equipment.*
V2	Varies	*Railway Equipment Clearance – additional clearance above V1 to accommodate existing or future equipment including signal masts/bridges and future alignment changes such as track lifts for grade separations, including access for maintenance of all railway equipment.*
V3	Varies	*Maintenance Clearance – Additional clearance required above V1+V2 to permit maintenance activities to underside of Overbuild Structure and should be determined in consideration of minimum impact to railway operations.*
H1	7.6 m	*Track with adjacent maintenance road*
	5.5 m	*Track without maintenance road*
	2.55 m	*Track without maintenance road, walkway, or emergency egress route*
H2	3.0 m	*Switch Machine*
	3.0 m	*OCS pole or signal mast (clearance based on Electrical clearance required for 25kva OCS system)*
	3.0 m	*Wayside cabinet*
	2.0 m	*Troughing and buried cables (daylighting within 1.0m)*

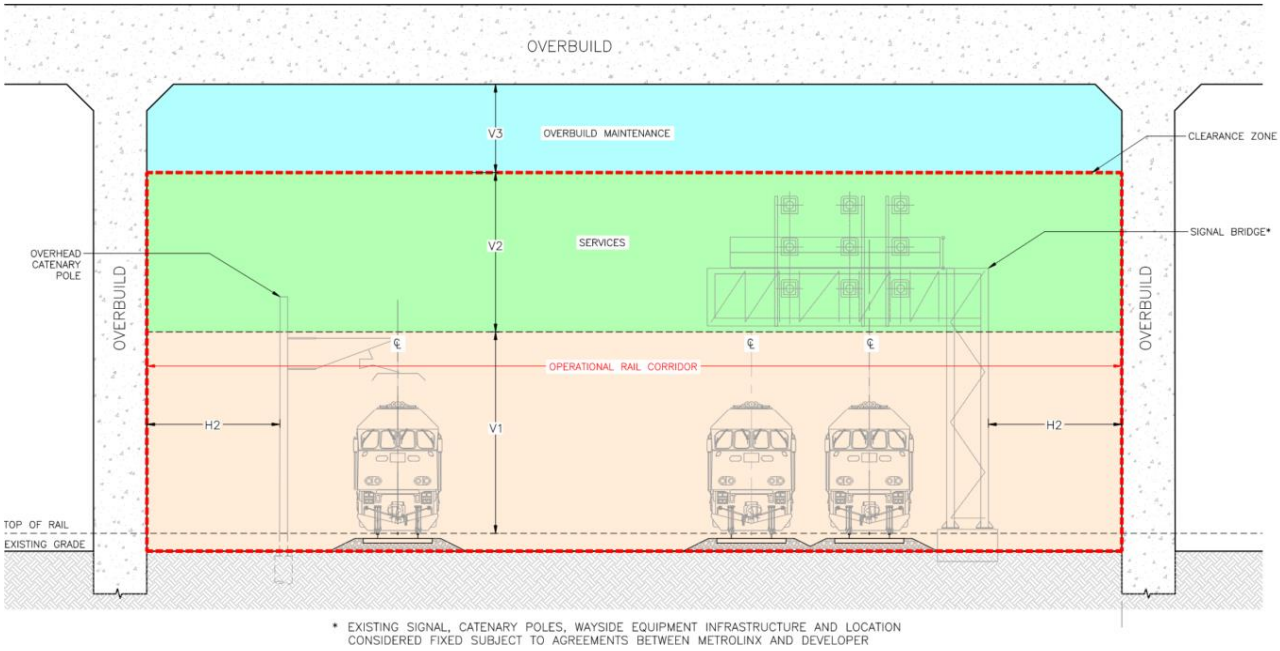


Figure 3.7-B Conceptual Overbuild Horizontal and Vertical Clearances

3.1.2 Metrolinx Rail Corridor Access

Accessing the Metrolinx Rail Corridor around an Overbuild Project requires permission and worker protection (Flagging) for the various stages of a Project such as: investigation, planning, design, construction, long-term maintenance, and decommissioning. Any work within, over, or adjacent to the Rail Corridor requires Metrolinx approval through review of detailed work plans and permits.

3.1.3 Scheduling of Working Hours

Hours for working on or over the Rail Corridor are limited to non-service hours (overnight); overnight hours can be further reduced by (un)planned train activity, required maintenance, and weather emergencies. Full track closures may be possible however, not guaranteed, and priority will always be given to works supporting Metrolinx operations. Metrolinx often has planned track closures throughout the rail network for maintenance purposes that may also accommodate the Overbuild construction. Developer proposed track closures or diversions for Overbuild construction are funded by the Developer and will need to be secured months/seasons in advance of the construction phase of a project.

3.1.4 Personal Track Safety (PTS) and Worker Protection

All personnel requiring access to the Rail Corridor must be certified by Metrolinx. Training is organized in advance and paid for by the Developer. Worker protection is required for work within the Rail Corridor, and costs to Development can be significant depending on the location and duration of a project. Flagging resources are limited, therefore a project must notify Metrolinx well in advance to secure flagging needs. A minimum of 6 months' notice must be provided to Metrolinx ahead of any construction activities, and up to 12 months' notice to Metrolinx is required if flaggers will be needed full-time during the Overbuild construction.

3.1.5 Construction Coordination

Access points onto the Rail Corridor are limited, especially within the USRC. Access requests need to be communicated well in advance so that Metrolinx can coordinate the requirements of different projects. Construction staging and laydown areas within the Rail Corridor are restricted; Overbuild Development should secure land adjacent to a project site outside the limits of the Rail Corridor. Monitoring of construction activities (including noise and vibration) within the Rail Corridor is required to prevent damage to Metrolinx infrastructure, prevent local disturbances, and ensure the safe operation of the Rail Corridor.

3.1.6 Overbuild Rail Corridor Risk Assessment

The Developer is required to submit an Overbuild Rail Corridor Risk Assessment Report that identifies potential risks to the safe operation of the railway as well as the material impacts of the Overbuild Development on Metrolinx infrastructure and operations at any time during the Overbuild Development Life Cycle (from construction through decommissioning), addressing safety risks posed to Metrolinx passengers, staff, contractors, and neighbours, and outlines mitigation measures such as:

- Disruptions to rail operations and passenger service levels;
- Disruption to maintenance and construction activities undertaken by Metrolinx or its' contractors;
- Impact on existing Metrolinx infrastructure;
- Impact to maintenance or operation costs related for new rail infrastructure required due to Overbuild; and
- Constraints(s) on Metrolinx future expansion plans within current Metrolinx Rail Corridor.

This report differs from a Rail Risk Assessment or Rail Safety Report as required by municipalities, which focuses on risks a Rail Corridor may impart on adjacent development.

3.1.7 Overbuild Support Structures Within the Rail Corridor

Metrolinx discourages Overbuild supporting structures and foundations within the Rail Corridor, and preferers clear spans, to avoid safety and operational challenges, and potential impacts to existing and future Metrolinx infrastructure. Alternatives may be considered by Metrolinx if clear span constraints prohibit effectual designs however, an assessment of impacts and mitigations by the Developer will be required. In addition, any impacts to existing Metrolinx infrastructure because of the placement of Overbuild supporting structures within the Rail Corridor, may create cascading impacts to Metrolinx infrastructure well outside the immediate Project limits, and will be the responsibility of the Developer to mitigate.

3.1.8 Track and Signals

Rail Corridor infrastructure such as tracks and signals, are key components to the safe and efficient operation of the Rail Corridor. Damage to these components or any other Rail Corridor infrastructure as result of an Overbuild Project will require the shutdown of rail operations until repairs have been made; all associated costs are the responsibility of the Developer. Overbuild Projects will be required to adhere to and maintain a comprehensive track level monitoring and inspection program as part of the Project.

3.1.9 Buried Metrolinx Infrastructure

The Metrolinx Rail Corridor contains visible infrastructure at track level as well as buried infrastructure, below and adjacent to the tracks. Buried power and signal lines, cable trays, and other utilities can impact an Overbuild Project's ability to access the Rail Corridor, store equipment and materials, and limit construction loading. Metrolinx record

drawings of any buried infrastructure on Metrolinx property may be made available to Overbuild Development for review to help identify conflicts. The Developer is responsible in undertaking any subsurface investigations to confirm buried utilities and obstructions, any required protection of existing utilities, and for any utility relocations if necessary.

3.1.10 Current and Future Metrolinx Projects

Future projects and expansion plans are always possible at any location on any Metrolinx Rail Corridor. As part of initial meetings with the Developer, Metrolinx will advise on plans that may influence the viability or configuration of the Overbuild Development.

3.2 Zone 2 – The Overbuild Structure

Zone 2 is comprised of elements forming part of the Overbuild Development supporting structure and may include surrounding elements with the potential to impact Zone 1, necessitated by design and/or construction of the Overbuild Development which are ultimately approved and authorized by Metrolinx. The following sections highlight elements and key considerations when planning access, design, construction, and maintenance within Zone 2.

3.2.1 Overbuild Superstructure

The Overbuild superstructure (deck) supports the Overbuild Development and must be designed in accordance with applicable codes and standards, Rail Corridor clearances as outlined in this document, and as required by Metrolinx. Metrolinx General Guidelines for Design of Railway Bridges and Structures specifies that structures must have a service life of 100 years. The Overbuild structure must also preserve existing (and future) access to Metrolinx infrastructure for maintenance purposes and must not adversely impact emergency egress locations.

3.2.2 Piers/Columns, Retaining/Crash Wall, and Foundations

Metrolinx discourages Overbuild Developments with infrastructure such as piers/columns within the Rail Corridor and administers strict requirements in the design and construction of adjacent retaining/crash walls and other foundation elements. If the placement of Overbuild supporting infrastructure within the Rail Corridor is unavoidable, then the considerations outlined in Zone 1 shall apply, along with additional design and construction requirements as identified by Metrolinx.

3.2.3 Future Electrification

Overbuild Developments are to account for future Rail Corridor electrification in the design and construction of their Overbuild structure, which includes allowing sufficient space per required clearances for Rail Corridor overhead contact system (OCS) or allowing for the attachment of rail infrastructure components to the underside of the Overbuild superstructure (deck) to support such lines. In addition, Overbuild Developments are to allow for the future installation of a barrier system as required by Metrolinx Electrification Standards to preclude access to rail corroder overhead electric lines within Zone 1.

3.2.4 Storm Water Management and Waterproofing

Construction of a structure above the Rail Corridor will act to shield the area below against the elements and thus protect rail infrastructure. It is important to ensure the Overbuild structure is sealed against leakage and fitted with appropriate drainage infrastructure to transport runoff outside of the rail right of way. If not, stormwater may pass through the structure, causing internal corrosion as well as potential damage to tracks and equipment below.

Furthermore, such leaks would have the potential to create icicles during winter months, which would pose a significant risk for passing trains and people.

3.2.5 Fireproofing

Like buildings, structures above the Metrolinx Rail Corridor and supporting the Overbuild Development are to be designed to mitigate the impacts of fire emanating from the Rail Corridor or the effects from a fire within the Overbuild Development, which may impact the Rail Corridor below. Required fire ratings of an Overbuild structure shall be in accordance with applicable codes and standards.

3.2.6 Ventilation and Fire/Life Safety

Ventilation and fire/life safety requirements are dictated by applicable codes and standards and based on the current and future overall length of the enclosed Rail Corridor. The determination of applicability of the requirements will be made by the Authority Having Jurisdiction and Metrolinx in consideration of current, future, and adjacent Overbuild sections. Equipment such as ventilation fans, emergency egress routes and lighting may be required due to the proposed Overbuild and in combination with existing and future Overbuilds. Responsibility for design, construction, maintenance, and operations costs of the new railway equipment will be subject to commercial discussions and agreements between the Developer and Metrolinx.

3.2.7 Maintenance

During the planning and design process it is important to protect for maintenance access since on-going maintenance will include visual inspections of the Overbuild structure every year, with detailed inspections every five years; including the Overbuild structure underside, Overbuild portals (the ends of the Overbuild structure), and the facade structure of the above Overbuild Development (Zone 3). Maintenance and repair should be performed regularly to ensure no deterioration from the structure can impact the Rail Corridor. Deteriorated structure components are the responsibility of the Overbuild Development to repair/replace.

3.2.8 Life Cycle and Long-Term Considerations

Overbuild Development projects are to consider, through an Asset Management Plan, the life cycle of a project., Overbuild infrastructure components are to be designed to allow for: minimal construction impacts to the Rail Corridor during a project's erection; long-term maintenance considerations such as inspection and replacement of Overbuild-deck components, fireproofing, utilities, and façade elements above the Rail Corridor; potential Overbuild expansion; and decommissioning of the Overbuild Development with minimal impacts to existing infrastructure and the Rail Corridor.

3.2.9 Integration with Adjacent Overbuild Developments (Existing or Future)

New Overbuild Development projects connecting to an existing or future planned Overbuild superstructure (deck) will effectively extend the total length of the Overbuild Development – and the cumulative impacts of such a configuration should be suitably understood, with applicable mitigative measures (including those factors referenced in the sections above) adjusted accordingly.

3.3 Zone 3 – The Overbuild Development

Zone 3 includes elements of and considerations for the Overbuild Development with the potential to impact Zone 2 and Zone 1. Zone 3 is controlled by the Overbuild Development; however certain aspects will need to be approved and authorized by Metrolinx.

The following sections highlight elements and key considerations when planning/designing, constructing, and operating within Zone 3.

3.3.1 Setbacks and Structural Integrity

The Overbuild superstructure will effectively shield the development from many of the rail corridor impacts that would otherwise be relevant for adjacent development. Since the structure is supporting the development, however, structural integrity is an important consideration – including as influenced by a fire within the rail corridor below. Sensitive uses within the development should be setback to be outside of the fire safety zone of influence. Furthermore, the structure should be designed with redundancy to ensure that integrity will not be compromised in the event of damage to supporting infrastructure.

3.3.2 Noise and Vibration

Where residents or occupants of the Developer's Project or neighboring developments are expected to be impacted by noise and/or vibration from Rail Corridor operations, the Developer is to complete and submit a noise impact study to demonstrate, through an analysis of the surrounding environment, that suitable measures will be incorporated into the Development provided to mitigate rail-oriented noise and vibration.

3.3.3 Ventilation

The design of an Overbuild Development must suitably consider the placement of rail corridor ventilation infrastructure (air intake and exhaust) to ensure that public areas and buildings are not unduly impacted.

3.3.4 Microclimate (wind/snow accumulation/solar exposure)

Overbuild Developments are to consider the negative environmental impacts to Rail Corridor operations and Metrolinx infrastructure that may arise as a result of the siting and configuration (built form) of the Overbuild Project through a microclimate study, which outlines wind, snow accumulation, and solar exposure impacts. Appropriate microclimate mitigation measures must be integrated into the project as applicable.

Appendix A – Key Definitions & Railway Terminology

Term	Abbreviation	Definition
Airspace		The area extending above the upper limit of the operating Rail Corridor that may be owned by Metrolinx or another entity. Use of this area is subject to specific air-rights that are typically specified in an agreement.
As-Built Drawings		Has the meaning given by the Professional Engineers of Ontario as those drawings prepared and sealed by the reviewing engineer after verifying in detail the actual conditions of the completed project.
Authority Having Jurisdiction		Any federal, provincial, territorial, regional, municipal, or local governmental authority, quasi-governmental authority, or other agency having legal jurisdiction and that has or performs legislative, judicial, regulatory, administrative, or other functions within its jurisdiction.
Cable Trough or Duct Bank		Enclosed, accessible trenches within the Rail Corridor and along the tracks, carrying rail signal, power, and fiberoptic cables.
Crossover		A track or two turnouts connection two generally parallel adjacent tracks, which allow rail vehicles to cross from one track to another, (GO Transit Track Standards)
Developer		Owners of development and infrastructure Projects adjacent to the Rail Corridor lands. Any landowner who plans work adjacent to the Rail Corridor lands is also considered a Developer in this guideline. A proponent as defined in Bill 171 (as in the Consolidated Hearings Act), is also a Developer in this guideline.
Flagging		Safe system of work put in place to protect workers on or near the Rail Corridor
Metrolinx Asset Protection Package	MAPP	Metrolinx process that governs projects where private development and Metrolinx infrastructure (e.g., stations) are integrated.
Guideway		A channel, track, or structure along which a transit vehicle moves.
Overbuild or Overbuild Development (also see Overbuild Project)		A private development or third party (non-Metrolinx) infrastructure that exists in the airspace over a Rail Corridor. May tie into adjacent existing or future private/public developments and/or Metrolinx stations.
Overbuild Life Cycle		The stages through which an Overbuild Development will pass from planning, design, procurement, construction, commissioning, operations & maintenance, and decommissioning.
Overbuild Project		A project in which Metrolinx has been engaged by a Developer in capacity as an advisor, partner or approver related to a proposed or existing Overbuild Development. The Overbuild Project may involve any one or more stages of the Overbuild Life Cycle. Also referred to as an Overbuild or Overbuild Development.

Appendix A – Key Definitions & Railway Terminology

Overbuild Review Process		The recommended sequence of steps for engaging Metrolinx to achieve approvals and agreements for an Overbuild. Refer to section 2.2 for details.
Overhead Contact System	OCS	One or more electrified wires (or rails, particularly in tunnels) situated over a transit ROW that transmit power to trains via pantograph, a current collector mounted on the roof of an electric vehicle. Metro OCS is supported by hollow poles placed between tracks or on the outer edge of parallel tracks
Personal Track Safety	PTS	Certification required for any person including Developer and their representatives to access a Rail Corridor for any purpose including but not limited to site visit, survey, construction.
Rail Corridor		Metrolinx owned property for the exclusive operation, maintenance, and construction of Metrolinx railway services – in this case pertaining to GO Transit.
Right-Of-Way	RoW	The area bound by the property limits, owned by the railway owner (e.g. Metrolinx, CP, CN or TTR).
Setback		The horizontal or combined horizontal and vertical distance between the railway and the sensitive use portion of a development. Refer to Metrolinx Adjacent Development Guideline.
Sightlines		Sightlines are measured from a point 1.05 m above the road surface to a point 1.2m above top of lowest rail. (TC)
Signal		A device that indicates the condition of the line ahead to the driver of a train
Switch		A device used to route equipment or a track unit from one track to another.
Top of Rail Elevation		An elevation measured at the top of the track as provided by the Railway Company to be used in measuring Vertical Clearances.
Turnout		A track structure by means of which vehicles are diverted from one track to another. (GO Transit Track Standards)
Vertical Clearance		Measured above the top of the rail. It is the required clearance to accommodate rail vehicles, overhead equipment (including signals and signal structures, overhead power lines and supporting structures for future electrification), access and maintenance to the overhead equipment. Note that the rail elevation can be different on adjacent tracks.
Wayfinding		Signs, maps, and other graphic or audible methods used to convey location and directions to travelers.
Wayside		The area adjacent to rail tracks
Work		The activities associated with provision of the Developer Infrastructure and Third Party infrastructure required in connection with the Project.
Work Permit		Permit granted by Metrolinx to perform work on or within close proximity to the Rail Corridor.

Appendix A – Key Definitions & Railway Terminology

Work Plan		Project management document outlining the definition of work tasks, choice of technology, estimation of required resources and duration of individual tasks, and identification of interactions among the different work tasks.
Zone of Influence	ZOI	The limit of the area under considered under pressure from the live load of track vehicles/equipment and is measured from the point starting 450mm (18in) away from the edge of the track ballast with downward slope of two (2) horizontal to one (1) vertical [2H to 1V], as defined in the Metrolinx General Guidelines for Design of Rail bridges and Structures.

Appendix B – Overbuild Project Checklist

Document Type	Title	Discipline	Purpose	Initial Technical Meetings (ORP Stage 2)	Subsequent Technical Meetings (ORP Stage 3)	Detailed Design (ORP Stage 4)	Construction (ORP Stage 5, Stage 6)
Report	Basis of Design	Structural	Identifying design assumptions for structural components of Overbuild Projects; indicating design codes, loading, and preliminary calculations for design viability.	N	Y	N	N
Report/Plans	Condition Surveys	Multidiscipline	Documenting of pre/post project conditions; further detailed condition assessments of existing infrastructure may be required.	N	Y	N	Y
Report/Plans	Storm Water Management	Civil	Identifying and confirming that Overbuild Developments are not creating an adverse flood risk to the Rail Corridor.	N	Y	N	N
Report/Plans	Fire/Life Safety, and Code Compliance	Civil, Electrical, Fire Protection, Mechanical	Comprehensive Fire/Life Safety/Code compliance analysis including: Ventilation, Lighting, Standpipe, emergency communication, fire alarm, SCADA, and emergency egress.	N	Y	Y	N
Report/Plans	Accessibility & Egress	Architecture	Identifying capacity and space requirements that inform design strategies and egress requirements.	N	Y	Y	N
Report	Noise & Vibration	Noise & Vibration	Modeling of noise and vibration impacts of Overbuild Projects during construction; plan for Mitigation of adverse impacts.	N	N	N	Y
Report	Stray Current	Electrical/Power	Identifying and mitigating the effect of corrosion on metal infrastructure components by stray Rail Corridor existing/proposed electric currents; cathodic protection.	N	N	Y	N
Report	Air Quality - Construction	Environmental	Ensuring that airborne contaminants are not discharged or dispersed near Metrolinx facilities and be potentially harmful to employees/clients.	N	N	N	Y
Report	Microclimate	Civil	Investigating potential negative effects of Overbuild and adjacent development projects on the Rail Corridor from climate: wind, snow accumulation, shadow, and solar exposure.	N	Y	N	N
Report	Rail Safety and Mitigation	Track	Identifying and mitigating Rail Corridor operational requirements that will impact Overbuild Project's temporary and permanent works within and adjacent to the Rail Corridor.	N	Y	N	N
Plans	Site/Property, Civil, Utility, Architectural, Structural, Fire Protection, Plumbing, Mechanical, and Electrical	Multidiscipline	Contract drawings documenting: existing infrastructure, identifying any relocations, protections, and necessary mitigation measures; proposed infrastructure in accordance with the Basis of Design and all applicable codes and standards.	N	Y	Y	N
Plans	Construction Management	Multidiscipline	Identifying a plan for working in an around the Rail Corridor given existing corridor constraints and operational restrictions.	N	N	Y	Y
Plans	Rail Corridor Construction	Multidiscipline	Documenting construction aspects specific to working adjacent to and within the Rail Corridor and may include plans outlined in the Construction Considerations Section in Appendix.	N	N	Y	Y

Appendix C –Design and Construction Requirements

Overbuild Developers should consider certain design and construction requirements when building above an active Metrolinx Rail Corridor. The following sections outline these requirements, to be considered from Project inception through to ultimate decommissioning. Basic Design Requirements will always apply; Advanced Design Requirements may apply depending on the scope of the Overbuild Project. Construction Requirements will apply in any scenario. It should be noted that infrastructure integrating with Metrolinx assets will require a Metrolinx Asset Protection Package (MAPP) Agreement and further discussion with respect to Project design and construction.

C-1 Basic Design Requirements

Structural Design

- Load cases for structural design are to include temporary loads from construction staging;
- Permanent or temporary structures, including all appurtenances, are not to impede operations or maintenance of Metrolinx systems, or encroach upon track clearances (see Zone 1, Clearances).
- Exiting Metrolinx infrastructure is not to be utilized for new temporary or permanent infrastructure vertical or lateral support;
- Calculated maximum deflection of overhead-structures are to be considered in determining clearances. In the maximum deflected state, the overhead structure is not to foul overhead clearances (including those for future electrification). See Zone 1, Clearances.
- Redundancy of the overhead-structural system must be considered to ensure that if a supporting column is damaged due to a derailment that the structure is still stable and that resulting deflections do not foul overhead clearances.
- Columns, shear walls and associated foundations are not to encroach upon track clearances, nor disturb the soils supporting Metrolinx infrastructure (see Figure C1).
- New foundations are not to transfer loads to any existing rail infrastructure or associated foundations.

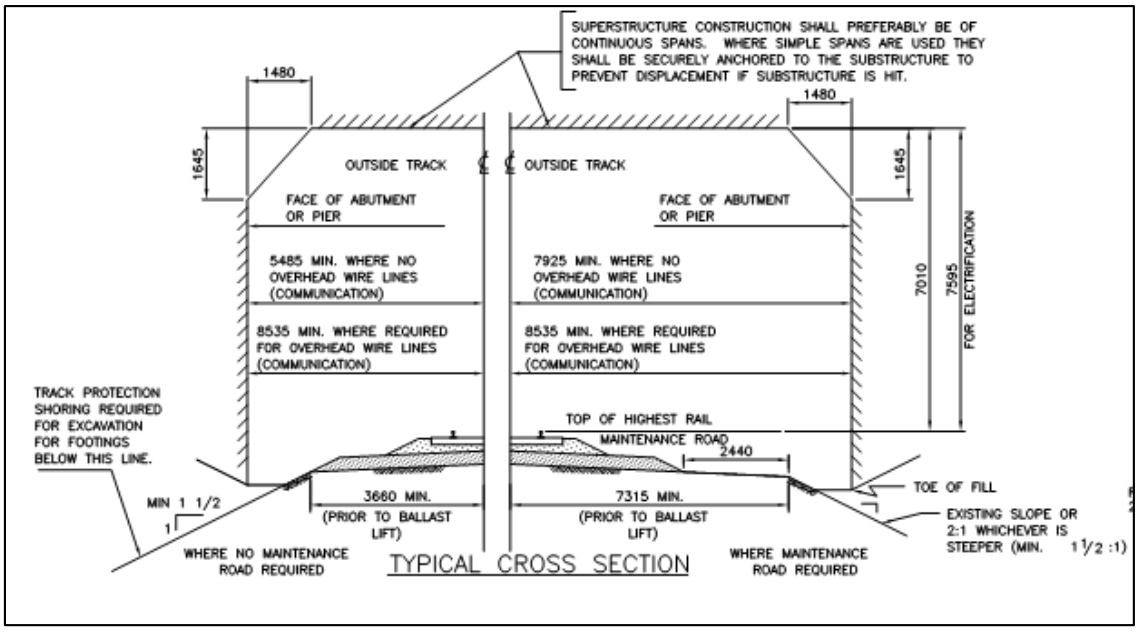


Figure C1 – Metrolinx typical Cross Section details Drawing K1U-10.2m

Retaining Walls and Foundations

- Retaining walls, foundations, and excavations in proximity to tracks must not undermine the track structure as this would impact railway operations;
- Existing buried utilities are to be considered when excavating or working on new or existing foundations; designers are to perform utility-locates within the project area to ensure no existing utility interferences exist;
- Foundations within the Rail Corridor are to be installed so as not to preclude future lowering of tracks;
- Approvals are required for retaining walls proposed within the Zone of Influence.
- Temporary Support of Excavations (SOE) must not adversely affect the track structure;
- Structural and SOE drawings must be submitted for approval prior to construction;
- Tiebacks that encroach into the Mx ROW from another property may require a tie back easement or license;
- A monitoring program will be agreed upon by Metrolinx prior to construction activities and will identify monitoring requirements and maximum tolerances for horizontal and vertical displacements during temporary shoring works, including groundwater dewatering operations.

Crash Walls

- A crash wall (a type of Safety Barrier, sometimes referred to as deflection wall) may be required to absorb impacts of possible derailments and provide physical protection for adjacent structures;
- Overbuild supporting-structures such as piers, columns or shear walls that are within - or in proximity to[1] - the Rail Corridor must be designed with protection (crash wall) to withstand the impact of a derailed train ('derailments');
- It is recommended that a crash wall be isolated from Overbuild structural support walls/columns;
- Where space constraints dictate, the crash wall and supporting wall(s) for the Overbuild may be the same structure, in which case it must be proven through engineering calculations that in the event of a train derailment the structure can absorb the impact from the crash without compromising the structural integrity of the structural system supporting the Overbuild

Future Electrification

The design of the Overbuild Development is to allow adequate clearances and accommodations for future electrification of the Rail Corridor, and necessary protection measures in accordance with Metrolinx Electrification Standards.

Accessibility

Overbuild Developments are to maintain existing access, and provide:

- Accessibility for operations, maintenance, and railway corridor users;
- Emergency egress and evacuation (from the Rail Corridor).

For Overbuild Development infrastructure to be utilized by Metrolinx customers, additional requirements may apply relating to:

- Level of Service, pedestrian flow, and traffic assessments to guide circulation and exiting strategies;
- Universal Access Design, improved connectivity and integration to amenities that enhance user experience for a diverse clientele through different design features (ramps, delineated pedestrian routes, tactile markings);
- Continuity Elements in design such as wayfinding, branding, street furniture, lighting, etc.;

[1] Metrolinx Adjacent Development Guidelines address requirements for structures in proximity to the railway.

Fireproofing (Overbuild-Deck)

- Overbuilds are to meet fire ratings as required by NFPA 130 and demonstrate how Level-1 floor / tunnel roof and deck assemblies will achieve this rating.
- Spray fireproofing above the rail tracks is not recommended, as it is subjected to diesel-train exhaust and weathering conditions.
- Spray fireproofing products, if used by the Overbuild Development, are to be inspected and repaired by the Overbuild Development as required by manufacturer to meet a 75-year design life.
- Spray fireproofing products are to be removed and replaced by the Overbuild Development at the end of their service life or as determined by the manufacturer.

Track

Overbuild infrastructure and construction activities must not damage rail tracks, switches, and associated corridor equipment. Damage of sensitive and safety critical equipment can cause unsafe and/or impaired railway operations, resulting in the shutdown of the corridor for remediation. Where tracks are considered to be at risk of impact from construction activities, a program of rigorous monitoring and inspection must be prepared and implemented.

- A Track Monitoring Plan will be prepared that will provide a detailed outline of all work activities (e.g., excavation) within Zone of Influence. This must be approved by Metrolinx prior to the proposed construction activities. Track monitoring to be implemented by a qualified provider upon Metrolinx approval.
- Track Monitoring Equipment must be protected during construction and regularly inspected.
- Track Monitoring Reports must be submitted on to confirm the integrity of the track structure and allow construction activities to continue.
- A Track Inspection Plan to be prepared with details on inspection frequency and methodology for approval by Metrolinx prior to any construction activities that may impact adjacent tracks.
- Track Inspections to be carried out by Certified Track Inspector upon Metrolinx approval.
- Track Inspection Reports to be prepared and submitted to Metrolinx on time. Any damages on rails, turnouts, switch, and signal equipment due to construction works to be fully inspected and reported to Metrolinx in an urgent manner.

If the Overbuild features any component (such as a column, or a stair well for emergency egress) to be built within the railway corridor and/or Overbuild construction activities to take place at track level, additional requirements/considerations may apply as follows: Consider the location of planned future rail alignments as well as existing alignments and all associated infrastructure (rail tracks, track turnouts and crossovers, switch equipment, signal equipment, snow clearing equipment, signal and communication underground lines):

- Avoid construction equipment crossings at existing turnouts, switches, and other track appliances.
- Avoid the requirement for realignment and/or modification of existing track, turnouts, crossovers, and any associated equipment including signal and communication equipment and underground lines. Modification of any railway infrastructure can be complex, costly and time consuming.

Maintain minimum 4 feet clear space to any existing surface features such as signals, switch equipment and snow clearing equipment at all times during construction

Signals

Extra precaution and mitigation measures must be implemented when working in the vicinity of wayside signal infrastructure such as signals, power switch machines, snow clearing devices, housings, junction boxes, cable troughing and all associated buried infrastructure.

- If inspections or tests will interfere with the safe operations of trains, ensure that positive protection is applied in accordance with GI-301(i) Protecting Train Operations During Signal System Interruption.
- Consideration for the design, construct, test, and commission for the temporary structures to facilitate construction and construction staging of the Works, as required. Protection of Existing Adjacent Structures and Utilities as required.
- The Overbuild must not impact the existing (and future planned) signal sightlines such that visibility for the train driver will meet the train operational requirements

Storm Water Management and Water Proofing

Overbuild Developments are to maintain existing storm water management infrastructure and provide:

- New Overbuild drainage infrastructure oriented to drain excess runoff away from and discharged outside of the railway ROW, not fouling the tracks, or causing damage or impacts to the corridor below;
- Overflows or failure modes of private storm water management measures, located above or on adjacent property, directed away from the railway corridor;
- Drainage infrastructure suitable to remove, at a minimum, all runoff from 1 in 100-year design storm event;
- A design that will demonstrate provisions to prevent leakage onto the operational railway;
- New Overbuild drainage infrastructure that includes failure-mode mechanisms to prevent impacts to the railway right-of-way (ROW), including track and signal infrastructure;
- Waterproofing of structures over the corridor to ensure that all joints and potential water pathways are thoroughly sealed against leakage.

Ventilation (Smoke Dispersion)

Where the Overbuild Development encloses the space above an operating Rail Corridor, a Smoke Dispersion Analysis shall be completed. When the Developer's building is located within 50 metres of a planned ventilation grate, a study shall be undertaken in accordance with the Metrolinx Smoke Dispersion Analysis (SDA) Requirements for New Development in the Vicinity of Stations and Ventilation Shafts, to demonstrate the following:

- The concentration of smoke discharged from the ventilation shafts and drawn into Developer building entrances (including operable windows and doors) or air intake shafts is sufficiently diluted; and
- The Developer has an effective smoke management system and emergency response and evacuation plan to minimize the smoke ingress into or any issues arising from the smoke ingress into the Developer's building.

Noise and Vibration

Where residents or occupants of the Developer's Project or neighboring developments are expected to be impacted by noise and/or vibration from Rail Corridor operations, the Developer shall complete and share with Metrolinx a noise impact study, completed in accordance with municipal and MECP NPC-300 requirements, and demonstrate through an analysis of the surrounding environment, that suitable measures are to be integrated into the Development to mitigate rail oriented noise and vibration. The following provides an overview of noise and vibration study requirements and conditions:

- Acoustical analysis is required for residential uses and recommended for other non-residential uses where there may be sensitivity to noise (e.g., day care centers, offices with sensitive equipment etc.);
- Other measures (e.g. provision of air conditioning, enhanced windows and building materials, etc.) may also be recommended by a qualified acoustical consultant;

- Warning Clauses are required for residential units within 30 metres of the Rail Corridor and may suitably address noise concerns for other non-residential forms of development;
- Special considerations may apply at locations where trains are stored and/or operate at reduced speed/idle, as well as in areas with unique operating characteristics (e.g. use of snow blowers, specialized machinery, etc.).
- Isolation measures will be required where vibration levels exceed the established standards.

Developer Owned Infrastructure - Asset Management

The approach to and strategy for the Overbuild infrastructure Asset Management Plan is to be based upon the International Institute of Asset Management (IIAM) definition of a Standard of Service (SoS) that describes how an asset will perform in objective and measurable terms. The SoS to include the definition of a "minimum condition grade", which is established by considering the consequences of a failure of the infrastructure asset.

In the asset management strategy for the Overbuild, the following issues, which also influence the lifecycle costs to be considered:

i. site conditions, including accessibility for repairs and maintenance
ii. historic performance of materials,
iii. effective condition and performance monitoring techniques,
iv. appropriate intervention strategies.

The key components of an Infrastructure Asset Management strategy for a Rail Corridor Overbuild structure are considered to include:

i. Identification of the designed performance conditions
ii. Definition of a Standard of Service (SoS)
iii. Establishment of measurable specifications of how the asset should perform
iv. Establishment of a minimum condition grade based on observable and measurable conditions
v. Establishment of a whole life approach to managing the condition of the asset
vi. Elaboration of an Asset Management Plan

Metrolinx expects that initial development of the Infrastructure Asset Management strategy for a Rail Corridor Overbuild structure will occur at the completion of the final design for the Overbuild and adjacent project and be provided by the Developer for Metrolinx review and approval. Metrolinx will reserve the right to investigate the Developer's implementation of the Infrastructure Asset Management Plan by audit and or by independent condition inspection of the Overbuild structure.

C-2 Advanced Design Requirements

Fire and Life Safety

- Project to comply with OBC, and NFPA 130-2020 requirements.
- If the Overbuild Project is longer than 305m, or if the Overbuild Project will extend the total length of interconnected connected overbuilt segment (existing and current segments) longer than 305m, a Mechanical ventilation system to be designed and provided for the whole segment as per NFPA 130 (2020) chapter 7.
- If the Overbuild Project is less than 305m in meter but longer than 61m, or if the Overbuild Project will extend the total length of interconnected connected overbuilt segment (existing and current segments) less than 305m but longer than 61m, a comprehensive analysis to be performed to indicate if a Mechanical ventilation system may be designed and provided for the entire segment as per NFPA 130 (2020) chapter 7.
- If the overall length of the overbuilt segment (existing plus current) exceeds 762m, egress facilities as required by NFPA 130-2020 section 6.3 to be provided.

- Emergency requirements for the Overbuild Project to be designed in accordance with Chapter 6 of NFPA 130-2020.
- If an open concept existing train station falls in the vicinity of the Overbuild Project, and as result the nature of the station is changed to enclosed train station, requirements of chapter 5 of NFPA 130-2020 to be adhered to."
- Developer to provide a fire life safety code compliance report and fire life safety plan for the project.
- Fire life safety plan to include required signage and communication elements to assure the safety of users in the event of an emergency.

Mechanical and Plumbing

- Positive pressure is to be maintained in electrical and communication rooms to avoid ingress of dust from tracks and be provided with a heat pump with variable compressor speeds, low ambient cooling kits and remote supplemental electric heaters. No water/heating piping to be routed in these rooms. Provide stainless steel pan routed under condensate piping draining to nearest funnel floor drain.
- MRL Elevator shaft to be provided with split AC cooling unit at the top of the shaft to offset heat gain from elevator motor and exterior glass enclosure (if applicable), and electric heater in the elevator pit.
- Provide condensing boilers for radiant floor heating system (main heating source for all station buildings), and near condensing boilers for snow melting system. Refer to Go Specification 23 21 12 and 23 21 18 for detailed design requirements.
- Generator flue exhaust location and Generator room sound attenuation to meet MOE requirements. Duplex fuel oil pumps to be on emergency backup power.
- Battery charging rooms to be provided with hydrogen detection system.
- Building Automation System (BAS) to be open protocol, non-proprietary direct digital control (DDC)-based and BACnet IP with latest technology available. BAS to monitor/control mechanical equipment, electrical and communication systems.
- Register fuel oil system and refrigeration piping system (as applicable) with TSSA.
- Clean agent fire suppression system (NOVEC 1230) to be provided for communication, electrical and computer and telephone rooms.
- Provide sprinklers and standpipe systems and fire pumps (as applicable) in accordance with NFPA standards.
- Rooms with Clean agent fire suppression system to be provided with emergency ventilation for clean agent evacuation.
- Plumbing and drainage piping to not be embedded in concrete.
- Elevator pits to be provided with scupper drain with back water valve.
- Backflow preventer to be provided at incoming city water and fire protection main and at equipment including but not limited to humidifiers and boilers.
- Provide grease interceptors for drainage from tenant retail kitchens.
- Cold water and storm pipes in unheated areas to be provided with electric heat tracing.
- Submersible sump pumps to be duplex, each sized for 100% flow rate with emergency backup power. Provide Grinder type pumps for sanitary drainage. Provide capped cam-lock connection with check and isolation valves on discharge pipe for connection to emergency portable pump.
- Provide meters at incoming city water and natural gas supply, monitored by BAS.
- Provide sub-meters at tenant water and natural gas supply, monitored by BAS.
- Developer to provide a track drainage system throughout Overbuild structural to collect water from all underground track sections utilising a gravity flow system, including (but not limited to) tunnel invert slab drainage troughs, catch basins, maintenance holes, and drainage pipework as required.
- Where track drainage troughs are used, Developer to ensure that the design flow is be contained within the drainage trough without overflow.

- Developer to design the track drainage system to identify the location of any flow blockages and have sufficient access to remove any blockages.
- Developer to design the track drainage system to convey all water entering the rail tunnel, from sources including (but not limited to):
    i. rainwater entering the tunnels from the portals;
    ii. water discharged during fire-fighting operations within the tunnel;
    iii. water discharged during tunnel wash-down;
    iv. ground water leaking into the tunnel;
    v. surface water conveyed form the Rail Corridor;
    vi. any other sources resulting in water entering the rail tunnel.
- Developer to provide a manual dry Class I standpipe system throughout the rail tunnel, in accordance with the requirements of all relevant Governmental Authority standards and guidelines, including (but not limited to) OBC, NFPA 14 and NFPA 130.
- Developer to provide fire standpipe system including follows:
    i. fire department connections at designated access points for applicable Emergency Service Providers;
    ii. Class I standpipe with 2 ½" fire hose valve positioned to discharge perpendicular to the Guideway.
    iii. the fire valves to be located at maximum 60 m intervals along the tunnel.
    iv. the standpipe system to incorporate manual drain valves.
- Developer to locate fire department connections to the standpipe systems not more than 45 m, and unobstructed, such that there is sufficient area adjacent to the fire department connections to facilitate unimpeded access to such connections by applicable Emergency Service Providers
- Developer may provide a single fire department connection to the dry standpipe, provided that all associated requirements of NFPA 130 are satisfied.

Electrical

General Electrical Requirements

- Developer's design and construction to comply with the criteria contained in the Chapter 4, and in all standards, regulations, policies, Applicable Law, guidelines, or practices applicable to the Project.
- Developer to Provide all electrical systems required for the operation of the New Metrolinx Infrastructure, including the following:
- Toronto Hydro utility connection dedicated to New Metrolinx Infrastructure
- Power distribution system dedicated to New Metrolinx Infrastructure and not shared with any other party's distribution system
- Standby power system, including diesel generators, automatic transfer switches, and uninterruptable power supplies
- Grounding system, including grounding for future electrification system
- Lightning protection system;
- Lighting and lighting control system

Provision for Future Electrical System Expansion

- Developer to make provision for future growth in the electrical system in accordance with the Metrolinx Standards and including:
- Electrical service to have a minimum 50% spare capacity and all major electrical equipment and main service feeders to be sized to suit;
- Primary transformer to have a minimum of 50% spare capacity;
- Duct banks and conduit runs to include a minimum of 30% of spare conduits;

- Spare conduit is defined as empty conduit, so in the case of one conduit run, this standard requires an extra spare conduit as well,
- Cable trays sized based on conductor weight plus a minimum of 50% spare capacity;
- Electrical rooms to have a minimum of 25% usable spare wall space for future use;
- Standby diesel generator to have a minimum of 50% spare capacity;
- UPS system to have a minimum of 50% spare capacity; and
- Breaker panels to have a minimum of 25% spare breakers and 25% spare spaces.

Electrical Systems Studies

- Developer to Provide Electrical System Studies to Metrolinx for review and to prepare, maintain and update the Electrical System Studies and submit the updated studies to Metrolinx prior to Substantial Completion. The studies to include:
- Load Flow Study – Developer to complete load flow studies for normal power condition and for emergency power condition. For each condition, Developer to determine connected load and the demand load;
- Short Circuit Study – Developer to complete a short circuit study for the entire Metrolinx power distribution system;
- Protection Device Coordination Study – Developer to Provide coordination studies completed for normal power and emergency power conditions;
- Arc Flash Study – Developer to perform a study that meets the latest requirements of OBC, Workplace Electrical Safety CSA Z462 and Standard for Electrical Safety in the Workplace NFPA 70E;
- Station Grounding System Study - Developer to Provide a Station Grounding System Study including lightning protection;
- Motor starting Study – Developer to Provide a motor starting study for Tunnel Ventilation Systems, Elevators and Pumps.

Electrical Design Basis

- Developer to Provide electrical system in compliance with applicable codes and standards, and the following:
- Normal power distribution systems (fed from the local hydro) to include loads which, if de-energized, would have no effect on passenger safety or adverse effect to facility systems.
- Essential power distribution system (fed from local hydro but backed up by a diesel generator or a dual electrical system fed from two separate utility sources) to include loads that can tolerate momentary interruptions and require a reliable power source.
- Emergency/critical power distribution system (fed from an uninterruptible power supply [UPS] system) to include loads that can tolerate neither prolonged nor momentary interruptions.
- Emergency Power Supply System Level 1 loads as defined by NFPA 110 for all Tunnel ventilation systems, flood control pumps, Fire Alarm System, and all life safety equipment and warning systems.
- All Medium Voltage Switchgear must meet ANSI/IEEE C37.20.2
- All low voltage electrical equipment rated 600V or less in excess of 400A must be free standing and either LV switchgear as per ANSI/IEEE C37.20.1, LV switchboard as per UL 891 or Motor Control Centers as per UL 845.
- All electrical conduit within the OCLZ must be non-metallic.
- All electrical cables and conduit must meet UL 1685 requirements for low smoke release, with all cables with the designations LS on the cable jackets.
- All electrical equipment must be rated for the environment.
- All electrical equipment and devices not located within conditioned spaces must be rated minus 40 DegC to plus 40 DegC.

Electric Utility Coordination

- Coordinate with local hydro utility;
- Apply for the new connection;
- If required provide an electrical service room for the utility, this room must meet the requirements of the utility company and must be accessible to the utility 24/7.
- Pay for all fees associated with the new power service including connection of new utility transformer and cables as required;
- Submit design documentation as required by the local hydro authority;
- Ensure that the spare capacity at the main breaker is co- ordinated with the hydro utility so the transformer is sized appropriately for future growth;
- Provide civil work for transformer foundations and electrical raceway system in compliance with local hydro authority requirements and standards; and
- Complete electrical connection work at demarcation points defined by local hydro authority.

Electrification

- Developer to Provide a fully coordinated and integrated grounding system including electrical building grounding, electrical system grounding, electrification system grounding, communication system grounding, and lightning protection grounding for the overbuilt.
- The building grounding system must be adequate to cater for any future lightning protection system installed above the Overbuild.
- Developer to Provide a clean ground grounding system with single point ground to main electrical system ground for communication equipment grounding to minimize AC power line frequency interference.
- Developer to conduct and submit to the Metrolinx an electrical short circuit study, and electrical hazard analysis, step and touch potential hazard analysis for traction power faults generated by the overhead traction power system, based on the available traction power faults from the 2x25kV traction power system within the Overhead Contact Line Zones.

Lighting

New Rail Corridor lighting is to be provided by development along the limits of their project and is to be comprised of:

- Developer to Provide lighting, luminaires, and a lighting control system in compliance with Metrolinx Standards and IESNA Illuminating Engineering Society of North America.
- Developer to Provide new poles complete with new LED luminaires complete with drivers suitable for proposed lighting control system. All external luminaires to have backlight-up light-glare protection and be sealed from habitation by insects. The external light to not trespass to neighbouring properties.
- Developer to Provide lighting fixtures from one manufacturer and one model for each type of light required per area; and
- Developer to Provide hinged type poles on the rail platform in accordance with Metrolinx Standards.
- Developer to include the following in lighting design:
    vii. Recessed LED luminaires with lenses in lunchroom, corridors, and in washrooms as applicable.
    viii. 4’ industrial LED luminaires in service rooms, telecommunications and electrical rooms.
    ix. LED luminaires for down lighting in common areas.
    x. Lighting incorporated with landscape and plantings.
- Developer to Provide lighting as follows:
    i. Provide service access features that are secure and protected from unauthorized access and vandalism;
    ii. Lighting to be even and diffused throughout.

iii. Where up lights are used to highlight architectural features, light output to be contained by structure, to avoid light pollution.
iv. Daylight responsive controls to be Provided to switch, or dim, electric lights in response to the presence or absence of daylight illumination in the space.
v. Station identification names to be additionally lit to a light level equivalent to the level of light on-board trains or Metrolinx Standards, whichever is greater. This may be achieved through localized accent lighting
vi. Light placement and intensity to not interfere with sight and sight lines of train crews.
vii. Lighting to not be directed towards oncoming rail traffic or towards adjacent neighbours;
viii. Lighting hot spots and glare to be prevented:

- Glare control to be implemented to avoid high-contrast lighting environments that may affect visual acuity of both passengers and train drivers.
- Developer to Provide lighting control as follows:
  i. The platform lighting control system to be an extension of the entire lighting control system for the Metrolinx Station.
  ii. Developer to implement photocells for lighting control.
  iii. Developer to Provide the lighting control system to satisfy the following design requirements:
- A lighting system complete with occupancy sensors and daylight levels in the public areas.
- Dimming operation of lighting fixtures in public areas through lighting control system so the minimum average illuminance levels with corresponding uniformities laid out in Metrolinx Standards at the lowest possible energy consumption while not affecting CCTV coverage. Developer to Provide override switches to override this operation.
- All programming, testing, balancing, and training to Metrolinx personnel to ensure the dimming operations described above are implemented and that Metrolinx personnel can maintain and control this operation and change the programming as desired through the BAS without needing a manufacturer's representative. Developer to Provide photometric lighting calculations showing the non-dimmed and dimmed conditions.
- Dimming operation without instant rapid increase in lighting levels that could impact vision of customers.
- All spaces that require a control device for lighting to be manual-on or automatic- on to 50% or less.
- Exterior lighting to be turned off during daylight hours, controlled during the night to reduce lighting levels and manually overridden to turn on for site maintenance activities. All external lighting fixtures to be compatible with proposed wireless lighting control system.
- The system to be network-ready, standalone system connected to Metrolinx infrastructure network. The system to be capable to work offline. Infrastructure network requirements to be coordinated with Metrolinx.
  i. Developer to Provide lighting controls to be integrated into building automation system. There to be override stations, 1 outside, 1 in each electrical room and 1 in the Ambassador Office as a minimum.
  ii. Developer to use the following lighting controls:
- Where daylight exists, photocells to be Provided.
- Occupancy motion sensors to be used for selected areas such as washrooms, storage rooms, Pedestrian Tunnels, covered bridges, stairwells, and service rooms.

Communications

- CN, CP, VIA, and Metrolinx trains all use an "Operations" Analog radio system using the Association of American Railroad VHF radio channelization plan in the 161 MHz. range. CPR uses both analog and digital modes.
- VHF radio (as above) is used where communication with the CN and CP railroad Dispatchers is necessary for coordination with all rail equipment, including freight trains, VIA, GO/Mx. and Maintenance of Way vehicles, track gangs etc. while on CN and CP tracks.

- Metrolinx trains also use a 420 MHz. UHF P25 digital trunking radio for their own "private operations" in addition to the VHF above when on CP and CN tracks.
- Metropolitan Toronto first responders (Police, Fire and Ambulance) use VHF, UHF and 800 MHz radio.
- We also would expect passengers on the GO and VIA trains to want to use their cellular radios when waiting onboard both VIA and GO trains, travelling through the area.
- When additional buildings and especially concrete slab covered areas are placed into the existing radio served areas, the ability to communicate by radio changes.
- The previously acceptable radio system coverage is changed, often resulting in greatly reduced radio coverage.
- Where there are a large group of high-rise buildings built around the tracks, there are a many radio "dead spots" produced by the structures. Quality and reliability of radio communications are degraded and often not possible.
- In the case where a reinforced concrete slab coves the right of way tracks and a long-covered tunnel is created, then even greater disruption is caused or there is no radio coverage at all once the train enters the tunnel.
- However, there are Communication Engineering solutions to these problems which can be used by the Developer
- For tunnels and covered areas, the Developer can bring "donor site" radio traffic into the tunnel areas and distribute this two-way traffic using fibre optic cables, bi-directional amplifiers, radiating cables as well as distributed antennas (DAS) in some selected areas.
- For the hi-rise case where radio signals are not completely blocked as in a tunnel, the Developer can also work with the user to establish additional radio sites to improve radio coverage and eliminate dead spots caused by the new buildings.
- Both CPR and CNR have existing radio coverage measurements made for all existing track areas. An Engineering determination can be made with the Developer as to what effect the new construction will produce. Then propose solutions and make system changes as necessary.
- For the first responders and in particular the safety and medical service provided to others by responders, the Developer must make an Engineering determination what radio coverage first responders currently have and will require, during the construction period. As this group may also have to respond to construction site injuries, a workable solution during construction must be in place and part of the Safety Plan.
- The Developer must work with major cellular telephone providers to provide suitable cellular radio coverage in tunnel areas, for GO and VIA train passengers and others to be able to use their cellular radios when waiting onboard trains or travelling by rail through the new covered area.

C-3 Construction Requirements

Pre/Post-Construction Condition Survey

A survey report is to be provided by the development project, comprised of plans and photographs that document baseline conditions of existing Metrolinx infrastructure prior to the start of an Overbuild Project and at the conclusion of the project; survey limits: to 30-metres beyond proposed project limits.

Construction Management Plan

A Construction Management Plan is required, and is to identify the proposed Developer Project scope of work in and adjacent to the Rail Corridor and include: type of construction activity; Rail Corridor access; work zone locations and extent; expected daily work hours; positioning of construction machinery and equipment including stationary and movable cranes; protective barriers/fencing; locations of hoarding; and locations of stockpiling of materials and laydown areas; in-corridor systems impact/relocation requirements; anticipated track closures to enable work; and a draft construction schedule.

Demolition Work Plan

A Demolition Work Plan is required for any proposed demolition of structures within or adjacent to the Rail Corridor, and is to include: a detailed narrative describing the demolition procedure and protection of Metrolinx infrastructure and the public from dust and debris; a ground Instrumentation monitoring plan; crane/equipment/machinery swing/location plans with supporting documentation; hoarding locations; material stockpiling locations; and structural calculations supporting proposed demolition works signed and sealed by a Professional Engineer in the jurisdiction of the proposed Developer Project.

Hoarding and Stockpiling of Materials Plan

Developer is to ensure that hoarding and stockpiling of construction site materials or works within the Rail Corridor meet certain requirements including that: works and protective coverings be secured; equipment and materials not block Metrolinx access roads or any part of the Metrolinx Corridor unless prior written consent from Metrolinx is obtained; within Rail Corridor and Metrolinx corridors, track components including support structure is to be protected where there is a potential for debris falling onto the tracks including trees, rocks, and vegetation; and materials on site be contained in secure areas within the construction site.

Utility Coordination

Construction has the potential to interrupt utilities necessary for safe operations and maintenance within the Rail Corridor, including gas mains and service pipes, water piping, potable/fire water mains, and storm and sanitary sewer lines, electrical/telecommunication services, and signal circuitry. The Developer to address temporary and permanent utility impacts and relocation near Metrolinx facilities during project design and engineering to avoid conflicts during construction.

Contractors are to protect existing aboveground and underground utilities during construction and coordinate with Metrolinx and utility companies to obtain written approval for any utilities that may be verified, daylit, used, interrupted, or disturbed. When electrical power outages or support functions are required, the approval must be obtained through Metrolinx and TTR.

Excavations, Shoring, and Tie-Back Plan

Detailed excavation, shoring, tieback plans, and specifications are required for any temporary support of excavation structural systems utilized by proposed Developer Projects within or adjacent to the Rail Corridor, and include detailed plans, specifications and structural calculations signed and sealed by a Professional Engineer in the jurisdiction of the proposed Project.

Site Maintenance and Environmental Management During Construction Plan

Site maintenance and environmental management is required to control erosion, sediments, dust, debris, and tracking of mud due to Developer construction of the Overbuild Project within the Rail Corridor. A site maintenance and environmental management plan is required and is to identify control measures and frequencies of machinery/vehicle cleaning, site upkeep, and protective measures that the Developer will implement to avoid negative impacts to Metrolinx infrastructure due to the Developer's construction.

Ground Instrumentation and Monitoring Plan (GIMP)

Ground Instrumentation and Monitoring Plans are required for the implementation of a construction monitoring program for the Developer Projects within the Rail Corridor, and include plans and specifications for all instrumentation and monitoring work, including established monitoring thresholds/limiting values, procedures to ascertain and monitor potential movement of existing Metrolinx Infrastructure through monitoring reports, and contingency measures listing the immediate remedial action to be taken in the event movement reaches the established threshold limits and/or damage is observed, which includes stopping Developer Works.

Instrumentation and monitoring of Metrolinx Infrastructure is required to ensure that structural or functional inadequacy does not develop because of the Developer's construction. In addition, monitoring will be required to ensure the Developer's construction support of excavation system is functioning as designed and the loads on Metrolinx Infrastructure remain within design limits. If changes are observed/exceeded, a Stop-Work-Order can be issued by Metrolinx, and the frequency of monitoring will be increased, and contingency measures will be implemented by the proposed Developer. Monitoring stages are to consist of:

Stage 1 - Initial Pre-Construction Monitoring: Conduct survey of existing conditions within the Metrolinx Infrastructure, obtaining baseline readings at established monitoring points;

Stage 2 - Project Monitoring: Monitoring during demolition, excavation, and construction, and will be performed at an agreed upon Metrolinx-frequency intervals. The monitoring frequency will be increased as necessary during critical work such as blasting, tunneling, or as requested by Metrolinx.

Stage 3 - Post-Construction Monitoring: Conduct final survey monitoring, performed after substantial construction completion of the Developer Works to determine changes to initial conditions, document the post-construction condition, and provide photographic records. In addition to structural monitoring, a final alignment survey of the rail/tracks (if present) will be required for comparison with the initial survey data.

Selection, design, installation, monitoring, reading, and documentation of the monitoring program are to be conducted by a licensed Land Surveyor or a Professional Engineer registered in the jurisdiction of the Developer Project. The Developer is to provide monitoring reports to Metrolinx during the Developer's construction and at an interval as indicated in the Permit conditions.

Crane Swing Plan

Any cranes being utilized, including mobile and stationary cranes, as part of a Developer Project within the Rail Corridor, is required to enter into a Crane Swing Agreement prior to crane arrival and erection on site. The Crane Swing Agreement provides easement rights and safety parameters for the use of a crane and is to outline the necessary requirements needed for the use of a crane on-site. The following is to be submitted to Metrolinx for review and approval as part of the Agreement: Scope of Work – Purpose of Work, Hours of Operations, Location; Crane Swing Plan – Swing Radius, Existing Infrastructure, Metrolinx Infrastructure, Corridor Control Lands and Outriggers; Specifications of the Crane – Load Charts, Size of Counterweight, Maximum Expected Boom Radius, Maximum Expected Boom Length, Maximum Expected Pick Weight with Factor of Safety of 1.5; Copy of Operator's Valid Driver's License, Hoisting License, Medical Certificate; most recent Annual Developer Inspection/Certification; within last 12 Calendar months; and Insurance Certificate.

Construction Barriers and Barricades Plan

Construction barriers and barricades are to comply with Applicable Codes and Standards, local by-laws, and governing regulations, and is to barricade all work area(s) or close excavations and openings in floors, walls, and other parts of Developer Infrastructure while openings are not protected full-time, ensuring positive measures in preventing unauthorized entry into Metrolinx Infrastructure or Metrolinx Rail Corridor. The design and field installation is to be certified in writing by a registered professional engineer registered in the jurisdiction of the Developer's Project.

Overhead Protection Plan

Overhead protection for Metrolinx Infrastructure, Rail Corridor, and the public is required whenever there is a possibility of overhead fall hazards from construction material or debris from the Developer's Project. The design and field installation is to be certified in writing by a registered professional engineer registered in the jurisdiction of the Developer's Project.

Construction Equipment Orientation/Shielding Plan

Proper construction equipment orientation/shielding by Developer Projects, is to ensure that construction equipment used for sheeting, shoring operations, and temporary protective shields or barriers be positioned and operated so that the equipment is precluded from overturning and falling onto or affecting Metrolinx Infrastructure and Rail Corridor. Auguring or pile driving equipment is to be oriented parallel to the Metrolinx Corridor/alignment, to prevent piles or equipment from falling or affecting the Rail Corridor. The design and field installation is to be certified in writing by a registered professional engineer registered in Ontario.

Safety, Quality, and Risk Assessment Plans

Metrolinx is committed to safety and implementing the highest safety standards. The prevention of accidents while completing any Overbuild construction project is of primary importance to everyone connected to Metrolinx, as such, Metrolinx is authorized to stop all Developer Works within the Rail Corridor that creates an unsafe condition. Prior to carrying out any work in the Rail Corridor, the Developer is to submit to Metrolinx, Safety, Quality and Risk Assessment work plans for carrying out specified scope of either intrusive or non-intrusive investigative works that includes a task-specific safety, quality, and risk assessment for each task. The level of detail of these plans will depend on the scale, complexity and expected impact on the Rail Corridor and Metrolinx infrastructure. Metrolinx may, in its sole discretion, conduct its own task-specific safety, quality and risk assessment in respect of any work plan submitted if Metrolinx is not satisfied with the Developer's task-specific assessments. The level of detail required for each of these work plans is to be scaled to the level of complexity of the Developer's Project.

Site Reviews, Construction Monitoring, and Communications Plans

Metrolinx is entitled to meet with Developer representatives, request information, obtain construction schedules, review construction submissions that have the potential to impact the Rail Corridor, and review construction as the work progresses to ensure the Project is being constructed in accordance with the construction management plan and terms and conditions of Metrolinx Agreements.

Construction Noise and Vibration

The Developer to include within their construction noise and vibration control plan a communication protocol that clearly identifies to the public that Overbuild construction noise and vibration is the responsibility of the Developer. The plan to implement a method for the public to submit and resolve noise and vibration complaints due to the Overbuild construction.

Construction Ventilation and Air Quality

- Developer to submit and share an Air Quality Management Plan, listing all relevant mitigations measures used and communicated to Metrolinx before start of construction work. The plan should include, but is not limited to:
    i. Identification of the nearest Metrolinx sensitive areas and receptors regarding air quality.
    ii. Identification and quantification of construction activities that generates contaminants and have a significant impact on air quality.
    iii. Predict concentrations of air contaminants that were identified as having a significant impact on air quality with the means of an air dispersion study.
    iv. Identify and provide options and methods to mitigate and possibly monitor air contaminants from construction activities.
- Developer to require consent for work that involves dust, odours, fumes, or generation of any toxic gas that could escape the worksite and affect operations or people.
- Hot or foul air, fumes, smoke, and steam from adjacent facilities must not be discharged within 15 m of existing Metrolinx facilities, including but not limited to: trackside buildings, ventilation system intake shafts or station entrances. Should fumes be discharged within 15 m of Metrolinx intake shafts, a protection panel around each shaft to be required.

- Developer to develop and share its construction community complaint protocol and communication plan. The communication plan to address how Metrolinx is to direct any complaints received by them concerning the Developer's construction activities. The plan to address how the Developer will communicate its responsibility for construction noise and vibration to the surrounding community.
- Developer to consider providing a rail/tunnel ventilation system for the track area covered by the Overbuild to keep air pollutants inside the tunnel under regulated concentrations.
- Developer to share its Air Quality Impact Study used for the City's Official Plan Amendment. The study to include but is not limited to:

    i. Air dispersion study to be conducted as per ECP ADM Guideline (could include scenarios such as existing conditions, future with and without project, mobile and stationary sources).
    ii. Prediction of air pollutants concentrations before and after the project at nearest sensitive areas (Metrolinx's and neighborhood).
    iii. Demonstrate compliance of the predictions to all applicable regulations (i.e.: MOECP, CCME). For non-compliance, elaborate mitigation measures to reduce contaminant at compliance level or an acceptable level.

Appendix D – List of Applicable Standards

When planning and designing an Overbuild Development, the most current edition of applicable Metrolinx, federal, provincial, municipal, and industry codes, standards, and guidelines shall be referenced.

Metrolinx Standards may include (but are not limited to) the following:

a) Adjacent Development Guidelines

b) Asset Lifecycle Management Standards

c) Bridges and Structures Standards

d) Business Technology Standards

e) Construction Safety Management Program (CSMP)

f) Design Requirements Manual

g) Electrification Standards

h) Personnel Protective Equipment and Beacon Standards

i) Rail Corridor Access - Network Access Planning Tool (NAPT)

j) Rail Corridor Access Standards

k) Rail Corridors Infrastructure Handover Protocols

l) Signal and Communication Standards

m) Standards Deviation Process

n) Station Services Standards

o) Systems Engineering Assurance Standards

p) Track Standards

q) Track Worker Safety Instructions (TWSI)

r) Trenchless Utility Works Design and Construction Guidelines

s) Tunnels and Underground Structures Standards

t) Work Plan Methodology Template and User Guide

Further information on Metrolinx Standards may be found at http://www.gosite.ca/engineering_public/

External standards may include (but are not limited to) the following:

a) Accessibility for Ontarians with Disabilities Act (AODA)

b) American Railway Engineering and Maintenance-of-Way Association (AREMA) - Manual for Railway Engineering

c) Canada Transportation Act

d) Canadian National Railway Standards

e) Canadian Railway Operating Rules (CROR)

f) Canadian Standards Association (CSA) – various construction and infrastructure standards

g) Electrical Safety Authority (ESA) – Ontario Electrical Safety Code

h) National Fire Protection Association (NFPA) – various standards/codes pertaining to fire safety

i) Ontario Environmental Protection Act

j) Ontario Ministry of Labour Guidelines

k) Ontario Occupational Health and Safety Act (OHSA)

l) Ontario Planning Act

m) Ontario Planning and Development Act

n) Railway Association of Canada (RAC) / Federation of Canadian Municipalities (FCM) – Guidelines for New Development in Proximity to Railway Operations

o) Railway Safety Act

p) Transport Canada – Standards Respecting Railway Clearance

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