



2025 Surface Penetration Guidelines

Toronto Pearson 

Surface Penetration Guidelines

Current Edition: 2025 r1

The GTAA reserves the right to amend the content of the “Surface Penetration Guidelines” on an as-required basis.

All correspondence concerning or requesting clarification of any information contained in this document can be directed to:

Construction Compliance & Permits Office

Greater Toronto Airports Authority

3111 Convair Drive,

Toronto Pearson Airport, P.O. Box 6031

Toronto AMF, Ontario, Canada L5P 1B2

Email: constructioncompliance@gtaa.com

PDF copies of all the current FAP Process forms, checklists, guides, and the Airport Construction Code are available on-line using this link:

[Pearson Airport Construction Approvals | Pearson Airport \(torontopearson.com\)](https://torontopearson.com/airport-construction-approvals)

Version Control

Version	Effective Date	Changes	Issued by
2025 r1	May 2025	New requirements for Slab-On-Grade Penetrations & Excavation & updated Entuitive Contact Info	Sam Adile
2025	November 2024	Minor Revisions & Re-Branding	Sam Adile
2024 r1	March 2024	Updated DSE Contact Information	Sam Adile
2024	November 2023	Issued "Surface Penetration Guidelines"	Sam Adile
2023	October 2022	Issued "Surface Penetration Guidelines"	Sam Adile
2019	August 2019	Issued "Surface Penetration Guidelines"	Sam Adile
2017	May 2017	Issued "Surface Penetration Guidelines"	Sam Adile
2013	August 2013	Issued "Core Drilling Guidelines at Toronto Pearson"	Jonathan Lock

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1. Guidelines Purpose & Application

The purpose of these Guidelines is to ensure that the structural integrity of GTAA buildings and facilities is being maintained and to assist contractors in their planning and execution of construction activities requiring surface penetration of concrete floors slabs, walls, or structural members with a focus on safe, responsible, and consistent procedures. Note that these Guidelines apply regardless of the penetration size or depth and subject to CCPO/GTAA Engineering discretion.

Also note that with the assessments & signoffs required for these surface penetrations, these activities must go through the FAP process.

These guidelines **shall** be used to:

- ensure that project design & execution aligns with GTAA's requirements for maintaining building and facilities structural integrity and all applicable reviews & assessments are completed, documented and the required signoffs are obtained prior to any surface penetrations commencing,
- locate embedded reinforcement and services within or installed underneath the concrete slabs where surface penetrations are required,
- obtain GTAA Engineering review & signoff for proposed surface penetrations when applicable,
- safely execute surface penetrations involving concrete coring, drilling, chipping, cutting, etc. within any GTAA buildings and facilities on Airport Lands,
- ensure that accurate building As-Built records are obtained prior to commencing any surface penetration activities & any discrepancies found between the As-Builts and actual site conditions should be reported to the Project Owner, CCPO & GTAA Engineering to help address any issues before proceeding with any activities.

These guidelines are **not** intended to:

- replace any existing GTAA processes in place for construction. A valid Facilities Alteration Permit (FAP), and/or Terminal Work Permit (TWP) must be in place prior to any construction work at the Airport commences; or
- provide direction regarding firestopping requirements. All firestopping will be reviewed separately by GTAA's Independent Code Compliance Consultant (ICCC) as a part of the FAP process.

2. Roles and Responsibilities

- a. **Project Owner (PO)** – is the company who initiated the work at Toronto Pearson being undertaken by a Contractor. The PO shall ensure that:
 - the project Design Consultants and Contractor are made aware of these guidelines through the project specifications and the construction contracts to facilitate compliance with these guidelines.
 - all concrete surface penetrations i.e., coring, drilling, chipping, cutting, etc., are carried out in compliance with the requirements of these guidelines and are subject to GTAA Engineering review and signoff.

- the project Design Consultants and Contractor are provided the As-Built record drawings of the project area for their review and assessment of existing services penetrations which should be first utilized to minimize the need for new surface penetrations.
 - where large numbers of new surface penetrations are required, a full structural analysis will be required by the project design team to establish that the structural integrity of the base building components are being maintained. If the structural integrity of the base building structural components cannot be maintained, a redesign may be required as determined by GTAA Engineering.
- b. **Contractor** - is the company who has taken responsibility for all aspects of construction activities for the specific project. The Contractor shall ensure that:
- all applicable employees, sub-contractors, etc., are made aware of all requirements of these guidelines to facilitate full compliance.
 - work area As-Built record drawings are requested and provided by the Project Owner and are made available to their workers and subtrades.
 - arrange with a reputable **scanning services sub-contractor** to scan and mark the locations on site of all proposed surface penetrations through concrete floor slabs, walls or structural members and surrounding obstructions for review & signoff by the **Structural Engineer (SE)** &/or the **Designated Structural Engineer (DSE)** as applicable.
 - arrange with the project or an independent **Structural Engineer (SE)** in good standing to review the proposed locations of the penetrations and based on the available base building structural data, scanning data, etc., help the contractor ensure that each surface penetration avoids any reinforcement or obstructions that are embedded/surface mounted. Further, the SE should assess and confirm in their signoff report that the integrity of the associated base building structural components is not affected by the location or number of surface penetrations within a specific area. When issues or concerns persist, the SE can refer to the **Designated Structural Engineer (DSE)** as listed in Appendix A or can refer the issue to CCPO/GTAA Engineering.
 - arrange with the **Independent Safety Compliance Consultant (ISCC)** based on their availability, to conduct an on-site safety review & provide their signoff prior to commencing any surface penetrations.
 - all surface penetrations through concrete floor slabs, walls or structural members i.e., coring, drilling, chipping, cutting, etc., are completed safely and in compliance with the contractor's reviewed Project Specific Safety Plan and these guidelines.
 - all applicable documentation including: the surface penetration location(s) record drawings, structural engineer's reports and all scans completed, etc., are submitted to the Construction Compliance & Permits Office (CCPO) as part of the FAP closeout process.
- c. **Structural Engineer (SE)** - is part of the project consultant group or an independent consultant in good standing who has been retained by the Project Owner/Contractor to fulfill the requirements for the project design and/or construction overview as required by the Airport Construction Code (ACC). The SE must:
- review the proposed locations of the penetrations and based on the available base building structural data, scanning data, etc., help the contractor locate each surface penetration to avoid slab reinforcement or obstructions that are embedded/surface mounted. Further, the SE should assess and confirm in their signoff report that the integrity of the associated base building structural components are not affected by the location or number of surface penetrations within a specific area. When issues or concerns persist, the SE can refer to the **Designated Structural Engineer (DSE)** as listed in Appendix A for assistance and must notify CCPO/GTAA Engineering.

- based on the available documentation, site reviews and assessment, provide a sealed & signed report with any applicable comments for each penetration location.
- d. **Designated Structural Engineers (DSE)** – includes consultants who have an in-depth understanding of the base building structural components of GTAA Facilities. The DSE will:
 - provide assistance upon receiving a request from the SE or the Contractor to help with the SE's requirements noted above.
 - ensure that the structural integrity of the base building structural components is being maintained and if this is not possible, the coring should not proceed and CCPO should be notified.
- e. **Independent Safety Compliance Consultant (ISCC)** – CCPO's consultant who is responsible for the review of all Project Specific Safety Plans submitted for FAP applications and for ensuring that all work on Airport Lands is completed safely. The ISCC will:
 - review the contractor's Project Specific Safety Plan.
 - conduct a site safety review with the Contractor prior to any surface penetrations [through concrete floor slabs, walls or structural members](#) being commenced and if all appropriate safety measures are in place, sign the Contractor's 'Surface Penetration Checklist & Signoff form'.
- f. **GTAA Engineering** – responsible for ensuring that the structural integrity of all GTAA buildings & structures is maintained.
 - review applicable surface penetration structural review reports, scanning reports & documentation requiring GTAA Engineering's signoff.
 - based on documentation submitted confirm that they are in agreement that the structural integrity of the base building is being maintained and provide their signoff for the surface penetrations to proceed.
- g. **Construction Compliance & Permits Office (CCPO)** – AHJ for monitoring all construction activities carried out on Airport property.
 - Receive copies of all structural review reports, scanning reports & as-builts documentation as applicable for any surface penetrations.
 - Maintain the AHJ official project records of all documentation & correspondence for project consultants' design & contractors' execution activities.

3. General Guidelines

The following general guidelines shall be followed when executing the process outlined below:

1. Surface penetrations [through concrete floor slabs, walls or structural members](#) shall be kept to a minimum and shall be planned in accordance with this document and other associated building-specific guidelines regarding coring, drilling, chipping, cutting, etc. **Where possible, installations shall use existing penetrations.** New surface penetration layouts shall be reviewed & signed off by the applicable parties noted above prior to any surface penetrations commencing.
2. [Prior to commencing their design](#), Project designers shall review the project site area and utilize the existing layout of services (plumbing, electrical, communications, etc.) and establish their [final](#) design to minimize the need for new surface penetrations. Where large numbers of new surface penetrations are required, a full structural analysis (seal & signed report) will be crucial to establish that the structural integrity of the base building components is being maintained which will be required for CCPO/GTAA Engineering signoff before any surface penetrations can commence.
3. The Contractor shall include in their Project Specific Safety Plan (PSSP) submitted to the Construction Compliance & Permits Office (CCPO) with the FAP application, all control measures and work safe

procedures for any surface penetrations including all necessary precautions to prevent and capture any water or debris that may fall through any openings during the surface penetration(s).

4. Prior to commencing any surface penetrations, the Contractor shall arrange an onsite review by the Independent Safety Compliance Consultant (ISCC) to review the control measures that have been put in place in compliance with the Contractor's PSSP previously submitted to CCPO.
5. The **Contractor** shall submit all required terminal work permits and/or shut-down requests and must have received confirmation that the requests are approved prior to any work commencing.
6. The Contractor shall erect barricades and bilingual warning signage identifying the hazards around all work areas, including the floor area below where the surface penetration is going through the entire slab depth to ensure that only those involved with the work have access.
7. Additionally, in any location where the public or Airport employees are present, the Contractor shall position an adequate number of spotters to direct persons away from the area during the surface penetration. Effective communication must be maintained between the spotter(s) and those executing the surface penetration(s) at all times.

4. Process

1.0 Locating Hidden Obstructions

1. The Contractor must request As-Built records for all utilities in the work area from GTAA Engineering Data. These records must be fully reviewed and be available at the work site before any surface penetrations commence.
2. The Contractor shall provide the scanning company with the as-built records (if available) as well as arrange access to any required services rooms (elect., mech., comm., etc.) or applicable building areas.
3. The Contractor shall scan the floor slabs and/or walls at all proposed surface penetration locations for obstructions that are embedded/surface mounted. If any obstructions are found, then the proposed penetration must be reassessed.
4. Where scanning results for structural obstructions are inconclusive, in consultation with the Structural Engineer, the Contractor must determine whether to proceed with the penetration(s) with the understanding that they will be held responsible for all damages incurred.
5. Located obstructions must be clearly marked and maintained on the floor slabs and/or walls for reference and further review as may be required and until all surface penetration activities are completed. Building gridline reference points must be used when referencing penetration locations on as-built documentation.

2.0 Additional Requirements for Surface Penetrations in any Concrete Slabs-on-Grade

1. In addition to the requirements for locating hidden obstructions noted above, surface penetration of slabs-on-grade that require below slab excavation will require a Ground Penetrating Radar (GPR) scan and utility locates carried out by a reputable service provider before the grade is excavated to any depth. This will require the services of a scanning and private locating company with the applicable equipment and expertise to be able to detect any buried utilities.
2. The locator must verify all buried utilities and accurately mark the locations. Any disturbances to the site area will require that the locates be rechecked & remarked.

3. In case of any conflicts or discrepancies in the locates results, work must cease and the PM and CCPO should be notified immediately. The contractor should also provide a documented risk assessment for excavation in these areas.
4. Any changes in the design, scope of work or alterations that might affect the buried utilities must be communicated immediately to the PM, CCPO and all relevant parties for a reassessment & approval. New locates must then be performed prior to continuing work.
5. The Contractor shall provide the scanning and private locating company with the As-Built records (if available) as well as arrange access to any required service rooms (elect., mech., etc.) or building areas.
6. For interior excavation, Contractors shall only use non-destructive methods (i.e., hand digging or hydrovac) with care and control within the areas of any buried utilities that have been identified and/or located. The Contractor shall complete the sub-base removal following the allowed depth/limits noted by the private locating company. Refer to the Ontario Regional Common Ground Alliance (ORCGA)/Canadian Common Ground Alliance (CCGA) Best Practices for Underground Infrastructure Damage Prevention.
7. Copies of the locates must be provided to the Project Owner (Project Manager or Contract Administrator), CCPO and GTAA Engineering as applicable and included as part of the FAP closeout documentation required for the Occupancy/Use and the FAP Closeout.

3.0 Structural Review & Signoff

1. Once the slab reinforcement & any obstructions have been located, the Contractor shall contact the Structural Engineer to conduct a site review & assessment of each proposed penetration location for their sign-off.
2. Upon completion of the site review, the Structural Engineer will issue a sealed & signed Structural Review Report to the Contractor as a record of the review. A copy of the report must be sent to CCPO/GTAA Engineering for review & sign-off prior to commencing any work.
3. If scanning results are inconclusive and/or the Structural Engineer cannot signoff on any of the locations, the Designated Structural Engineer (refer to Appendix A) may be requested for assistance and the CCPO/GTAA Engineering must be immediately notified.

4.0 Executing Approved Surface Penetrations

1. The Contractor shall arrange an onsite review with GTAA's Independent Safety Compliance Consultant (ISCC) upon receipt of the Structural Engineer's Review Report & sign-off to confirm that all safety control measures are in place in compliance with the Contractor's PSSP
2. Once the site has been reviewed and the ISCC is satisfied with all the required control measures in place, they will then sign the 'Surface Penetrations Request Form'. The Contractor may only then proceed with the surface penetrations as planned.
3. Upon completion, the Contractor shall submit to the Construction Compliance & Permits Office, copies of the completed & signed 'Surface Penetrations Checklist & Signoff Form'; the Sealed & Signed Structural Review Reports; the Scanning Reports; Locates, & the As-builts Documentation of all penetration locations that indicate the size of each hole and their distance in relation to the building grid line reference points.

Appendix A: Designated Structural Engineers (DSE) & ISCC Contact Information

Building	Company	Primary Contacts	Secondary Contacts
Designated Structural Engineers (DSE)			
Terminal 1	Entuitive	Tom Jennings T: 416.272.1075 tom.jennings@entuitive.com	Nicholas Greven T: 416-906-7796 nicholas.greven@entuitive.com
Terminal 3	MTE Consultants Inc. (Formerly Milman & Associates)	Jeff Mitchell, P.Eng. T: 416-489-7888 x218 JMitchell@mte85.com	Hunt Zhong, P.Eng. T: 416-489-7888 x219 HZhong@mte85.com
Terminal 1 Parking Garage	EXP Services Inc.	Weimin Liang P.Eng. C: 416-877-2686 T: 905-695-3217 x 63734 weimin.liang@exp.com	Gordon Ho P.Eng. C: 416-873-0284 T: 905-695-3217 x 63726 Gordon.Ho@exp.com
Independent Safety Compliance Consultant (ISCC)			
All GTAA Facilities	TRH Group	Jack Papadopoulos M: 416-705-0234 E: Jack.Papadopoulos@gtaa.com	John Tomkow M: 416-705-0256 E: John.Tomkow@gtaa.com Emily Thompson M: 416-705-0257 E: emily.thompson@gtaa.com

CCPO's expectations are that these DSE's respond to calls or emails for each request for surface penetration reviews within 24 hours to make arrangements for the site review & 5 business days to complete their assessment & report to signoff the required surface penetration activities planned by the contractor.

Note: services provided by the Designated Structural Engineers (DSE) are independent of the GTAA and their inclusion on this list **does not constitute a mandatory requirement that they be utilized**. These DSEs are included on this list based on their extensive knowledge/experience with the applicable buildings noted however, **contractors carrying out surface penetration activities can also utilize any reputable Structural Engineer/Consultant they wish** to help them comply with the GTAA Surface Penetration Guideline requirements which are mandatory.