



STRUCTURAL ADDENDUM No. 03

Project No: MRK-23004289-A0

Date: 2024-11-06

Project: UHN TWH - Seniors Emergency Medicine Centre
399 Bathurst Street, Toronto, ON M5T 2S8
UHN Project No.: SAP #110022016

This Addendum forms part of the Contract Documents and amends the original Drawings, Specifications, Schedules and Details dated 2024-10-11.

1. Specifications

- 1.1. Section 31 23 00 Excavation and Backfill
 - 1.1.1. Refer to revised specification section dated 2024-11-06.
 - 1.1.2. All revisions are highlighted yellow.

2. Drawings

None

3. Clarifications

None

- End of Addendum -

1 General

1.1 SUMMARY

- 1.1.1 General Conditions and Division 1, General Requirements, shall govern the *Work* of this Section.
- 1.1.2 Section includes excavation and backfilling for work related to new corridor building, patient transfer canopy, and for work within existing East Wing basement.

1.2 DESCRIPTION

1.2.1 Related Work Specified in Other Sections

03 30 00: Cast-In-Place Concrete: Granular underbed below slab-on-grade.
31 60 20: Soldier Pile and Lagging Shoring
33 41 13: Foundation Drainage.

1.3 QUALITY ASSURANCE

1.3.1 Reference Standards

The following Reference Standards shall govern *Work* of this Section, except where they are in conflict with requirements imposed by this Specification in which case the latter shall govern. Standards referenced by following Standards apply but are not necessarily repeated in following list.

- .1 ASTM D698-12 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³)).
- .2 CAN/CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .3 OPSS.MUNI 1010, Material Specification for Aggregates – Base, Subbase, Select Subgrade and Backfill Material.
- .4 OPSS.MUNI 1359, Material Specification for Unshrinkable Backfill
- .5 OPSS.MUNI 517, Construction Specification for Dewatering for Excavations
- .6 Ontario Regulation 406.19 On-Site and Excess Soil Management

1.3.2 Source Quality Control

- .1 Field quality control including verification of materials, placement and degree of compaction will be performed by an Inspection and Testing Company appointed by *Consultant*.
- .2 Review provided by Inspection and Testing Company does not relieve *Contractor* of his sole responsibility for quality control over *Work*. Performance or non-performance of Inspection and Testing Company shall not limit, reduce, or relieve *Contractor* of his responsibilities in complying with the requirements of the Specification.
- .3 Inspection and Testing Company and its laboratory shall be certified under CCIL/CSA A283.
- .4 Payment for specified *Work* performed by Inspection and Testing Company will be made from cash allowance specified in Section 01 21 00.
- .5 Payment for additional tests required by changes of materials requested by *Contractor*, and failure of completed *Work* to meet specified requirements, shall be made at *Contractor's* expense.
- .6 Perform *Work* at source quality control in accordance with relevant CSA or OPSS standards to include:
 - .1 verification of specified degree of compaction.

- .2 evaluation of material placement.
- .3 sampling, inspection and testing of materials as required.

1.4 SUBMITTALS

1.4.1 Samples

- .1 Imported Granular Fill: If requested, submit inspection reports, laboratory test results and samples of materials.

1.4.2 Field Inspection and Testing Reports

Inspection and Testing Company shall:

- .1 Submit laboratory test reports.
- .2 Submit written reports of field inspection and test results after each inspection.
- .3 Distribute reports as follows:
 - 2 copies to *Consultant*;
 - 1 copy to Consulting Structural Engineer;
 - 1 copy to *Contractor*.
- .4 On compaction test reports, include:
 - .1 Moisture contents, and wet/dry density of material.
 - .2 Archived degree of compaction.
 - .3 Type of material
 - .4 Location and depth of testing

- 1.4.3 Submit dewatering methods 30 days in advance for review by *Consultant*. If well point system is required, such system shall be designed by professional engineer.

- 1.4.4 Submit to *Consultant* details of locations where surplus soils and other materials are to be disposed of or reused. Include each disposal/reuse Site, operator's name and business address, type of license under which Site operates, and criteria used by Site to access suitability of surplus material for disposal.

- 1.4.5 Submit to *Consultant*, within 48 hours of a load of surplus soil or other material leaving the Site, a daily register recording the time and place of disposal/reuse of each load signed by a representative of the disposal site accompanied by corresponding Hauling Records in accordance with O. Reg 406/19 s.18. Such documentation must be submitted before payment for excavation will be made.

- 1.4.6 Submit to *Owner* an Excess Soil Management plan, prepared by a Qualified Person (QP) in accordance with O. Reg 406/19. Obtain *Owner's* written consent prior to proceeding with earthworks and the implementation of the plan.

1.5 JOB CONDITIONS

1.5.1 East Wing Crawl Space

- .1 This is a unique situation, and the Contractor must take care to account for all premium costs that are associated with the execution of this work. Specialized means and methods will be required for excavation below the existing East Wing Level 1 slab. Access is restricted and will require working in confined space. Refer to available geotechnical reports for descriptions of soil physical and environmental properties.

1.5.2 New Corridor Building and Stair Tunnel

- .1 The footprint of this new structure overlaps the site of a previously demolished building, known as the Edith Cavel Wing. It is believed that portions of original foundations and

footings have been abandoned in place. The Contractor must plan for demolition, removal, cutting and coring through these elements as required to complete the new construction. Additionally, an existing caisson wall from the excavation shoring system for the original construction of the Fell Pavilion building is believed to exist along gridline FL. Demolition of part of this caisson wall, including walers and tie backs, will be required to complete the tunnel excavation and new construction. Refer to available geotechnical reports for descriptions of soil physical and environmental properties.

1.5.3 Geotechnical Conditions

- .1 For information on subsurface soil and groundwater conditions at the Site, refer to geotechnical reports:
 - For the East Wing Crawl Space:
 - "Soil Sampling and Analytical Program, 399 Bathurst Street, Toronto, Ontario", prepared by Toronto Inspections Limited, dated August 30, 2024. Project No.: 6636-24-EA. Report No.: 01.
 - "Report on Geotechnical Investigation, 399 Bathurst Street, Toronto, Ontario", prepared by Toronto Inspections Limited, dated October 10, 2024. Project No.: 6636-24-GB (Interior).
 - For the New Corridor and Site Works:
 - "Soil Sampling and Analytical Program, 399 Bathurst Street, Toronto, Ontario", prepared by Toronto Inspections Limited, dated September 30, 2024. Project No.: 6636-24-EA. Report No.: 02.
 - "Report on Geotechnical Investigation, 399 Bathurst Street, Toronto, Ontario", prepared by Toronto Inspections Limited, dated October 11, 2024. Project No.: 6636-24-GC (Exterior).

1.5.4 Protection

- .1 Existing underground utilities:
 - .1 Size, depth and location of known existing utilities and structures are indicated for guidance only. Completeness and accuracy is not guaranteed.
 - .2 Prior to commencing any excavation *Work*, have authorities stake out utility locations to prevent disturbance during *Work*.
 - .3 Confirm locations of buried utilities by careful test excavations. Hand dig test excavations as necessary.
 - .4 When such utilities are encountered notify the *Owner* of the affected utility immediately and protect, brace and support them. Where such utilities require repairs, adjustment, relocation or abandonment provide such *Work* to the satisfaction of the *Owner* of the affected utility. Record location of maintained, rerouted and abandoned underground utilities.
- .2 Existing buildings and surface features:
 - Conduct with *Consultant*, a condition survey of existing buildings and structures, trees and other plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by *Work*.
 - Protect existing buildings, structures and surface features which may be affected by *Work* from damage while *Work* is in progress and repair damage resulting from *Work*.
 - Where excavation necessitates root or branch cutting, perform *Work* in accordance with *Owner* and *Consultant*.
 - Confirm with *Consultant*, condition Survey of buildings and structures undertaken by *Consultant*.
- .3 Temporarily cover local existing catch basins and maintenance holes to prevent entry of earth or debris. Ensure adequate surface drainage in affected area is maintained.

- .4 Protect excavations against flooding and damage and install and maintain appropriate warning devices during construction and during time when *Work* is closed down for any cause.
- .5 Protect bottom of excavations that will support foundations, floor slabs, pavements etc. from precipitation, frost or freezing.
- .6 Stockpiles of soils or construction materials shall be kept at least 3 m away from the edge of excavation slope. No stockpiles of soils or construction materials shall be placed within 10 m of the crest of existing slope south of Life Saving Drive or on the slope surface. Any water discharge onto the excavation and existing slope are not permitted.
- .7 Keep access roads, sidewalks, pathways and roadways clear of debris and dirt resulting from *Work* of this Section to acceptance of *Owner* and *Consultant*.
- .8 Trench support and shoring, in addition to requirements of local authorities, shall be carried out in accordance with requirements of The Occupational Health and Safety Act, specified herein for Construction Projects, and other applicable regulation of Ontario Ministry of Labour.

2 Products

2.1 MATERIALS

2.1.1 Granular A:

Granular materials produced by crushing bedrocks, or, sand, gravel, cobbles and boulders from naturally formed deposits sourced from a Pit or Quarry governed under the Aggregate Resource Act. Use of recycled aggregates is not permitted without prior approval from *Consultant*. The physical properties shall meet the requirements of OPSS.MUNI.1010 Granular A.

2.1.2 Granular B Type I:

Granular materials produced by crushing bedrocks, or, sand, gravel, cobbles and boulders from naturally formed deposits sourced from a Pit or Quarry governed under the Aggregate Resource Act. Use of recycled aggregates is not permitted without prior approval from *Consultant*. The physical properties shall meet the requirements of OPSS.MUNI.1010 Granular B Type I.

2.1.3 Granular B Type II:

Granular materials produced by crushing bedrocks only sourced from a Pit or Quarry governed under the Aggregate Resource Act. The physical properties shall meet the requirements of OPSS.MUNI.1010 Granular B Type II.

2.1.4 Backfill and Fill Materials for Work of Mechanical and Electrical divisions:

- .1 Earth Trenches to 600 mm [2"] Above Mechanical Pipe *Work*: Clean, natural unwashed gravel or sand, ranging in size from medium gravel to medium sand, 100 percent passing 25 mm [1"] sieve and 95 percent to 100 percent retained on 250 um [#60 sieve].
- .2 Earth Trenches – 100 mm [4"] Envelope Surrounding Electrical Raceways and Wiring: Fine aggregate [sand] for concrete, graded, CAN/CSA-A23.1.
- .3 Top Portion of Earth Trenches Specified Above, Concrete Trenches and Other Mechanical Electrical *Work* in Areas not to Receive Floor Slabs: As specified in Site Services, Section 02 53 00.
- .4 Top Portion of Earth Trenches Specified Above, Concrete Trenches and Other Mechanical and Electrical *Work* in Areas to Receive Floor Slabs: As specified in paragraph 2.1.1

2.1.5 Prior to the import of excess soil to the Project Area the Owner should be provided with a certification letter from the Contractor QP confirming that the material meets the applicable Excess Soil Quality Standards for the Site for review and approval. Formal written consent from the Owner must be provided to the Reuse Site Owner/Operator in accordance with O. Reg

406/19 prior to the shipment of excess soil to the Project Area. All soil transport must be carried out in accordance with the requirements in O. Reg 406/19 and the Owner must be provided a completed Hauling Record to account for each imported load.

2.1.6 Concrete Backfill:
Concrete backfill, minimum 5 MPa compressive strength at 28 days unless higher strength is required to equal strength of area adjacent to over-excavated area.

2.1.7 Unshrinkable Backfill:
Maximum 0.4 MPa compressive strength at 28 days cement stabilized backfill conforming to requirements of CAN/CSA A23.1-14/A23.2-14 and OPSS.MUNI 1359, Material Specification for Unshrinkable Backfill.

3 Execution

3.1 PREPARATION

3.1.1 Clearing: Clear and remove obstructions to excavating. Remove trees and stumps not required to be retained, as indicated on Drawings.

3.1.2 Stripping: Strip area of Site to be excavated or graded free of sod and topsoil and stockpile separately on Site where directed. Avoid mixing topsoil with subsoil. Remove surplus sod and topsoil, if any, from Site.

3.1.3 Lines and Levels: Establish accurate lines and levels as required and supply batter boards, line stakes and templates and establish permanent reference lines and bench marks required.

3.2 SHEETING, SHORING AND BRACING

3.2.1 Engage a professional engineer registered in the Province of Ontario and fully qualified in this line of Work to design, approve, and assume responsibility for lagging, sheeting, shoring and bracing.

3.2.2 Submit detailed shop drawings of shoring and bracing to authorities having jurisdiction. Submit shop drawings to *Consultant* for review before commencing Work. Shop drawings to bear the seal and signature of a professional engineer registered in the Province of Ontario.

3.2.3 Provide lagging, sheeting, shoring, bracing necessary to support sides of excavations. Maintain shoring and bracing in position until footings, foundation walls and other foundations are in place and are strong enough to withstand the backfilling pressures.

3.2.4 Provide lagging, sheeting, shoring and bracing of sufficient strength to protect the adjacent structures and excavations against damage which may be caused by earth slippage, land slides, heavy rainfalls and vehicular traffic.

3.2.5 Report any movement of shoring to *Owner* and *Consultant* immediately.

3.2.6 Position lagging, sheeting, shoring and bracing to minimize interference with the building Work.

3.3 TEMPORARY DEWATERING

3.3.1 The design, operation and removal of temporary dewatering system shall conform to OPSS.MUNI 517 Construction Specification for Dewatering for Excavations

- 3.3.2 Lower groundwater level and maintain at depth below lowest point of excavation to ensure a dry stable surface. Provide dewatering equipment of sufficient capacity and maintain until such time as permanent drainage system is installed. Take necessary measures to prevent flow of surface water into excavation.
- 3.3.3 Dewater to prevent loss of soil and maintain stability of sides and bottom of excavation and of adjacent existing buildings and structures.
- 3.3.4 Dispose of water in conformance with applicable by-laws and in a manner not detrimental to public and private property, or portion of *Work* completed or under construction.
- 3.3.5 Supply and install treatment facilities to remove suspended solids or other materials before discharging to sewers in accordance with authorities having jurisdiction at no cost to *Owner*. Perform testing on discharge to confirm that effluent meets Toronto Municipal Code Chapter 681 sewer bylaw requirements.
- 3.3.6 Should method of dewatering fail to achieve conditions specified above, *Consultant* reserves right to revise methods and procedures at no cost to *Owner*.

3.4 EXCAVATION – GENERAL

- 3.4.1 Excavation shall include all strata including rocks, boulders, paving, rubbles, frozen materials and other obstructions encountered during excavation *Work*.
- 3.4.2 Do not disturb soil within drip line of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw in a manner acceptable to authorities having jurisdiction.
- 3.4.3 Where excavation is required to extend below the level of footings of adjacent existing building and within angle of repose of local soil as drawn from bottom of footing, then such excavation design shall be by professional engineer.
- 3.4.4 Excavate to extent, elevations and depth required for completion of *Work*, leaving sufficient space to permit inspection, removal of formwork, application of waterproofing, installation of foundation drains and shoring where required.
- 3.4.5 Slope earth adjacent to foundations to trenches or sumps at an incline not exceeding a ratio of 7 vertical to 10 horizontal.
- 3.4.6 Protect bottom and side of excavations and trenches from freezing and from exposure to wet weather to prevent cave-ins and softening of bearing soils.

3.5 FOUNDATION BEARING CAPACITY

- 3.5.1 Carry out excavation of foundations to undisturbed native soil having the design bearing capacity and to depths shown on the Drawings, and as required to safely support the structure within acceptable limits of settlement.
- 3.5.2 Hand trim the bottom of excavations for foundations. The bearing surface shall be properly cleaned and free of loose soils, standing water or any other unsuitable materials.

- 3.5.3 After completion of excavation, notify Inspection and Testing Company to inspect exposed bearing surfaces. All bearing surfaces shall be verified and approved prior to concrete placement. Do not proceed without authorization.
- 3.5.4 If upon excavating to the elevations shown it is found that required bearing capacities are not achieved, or that they are achieved at higher elevations, the footings shall be lowered or raised accordingly, but only with the written permission of *Consultant* and Consulting Structural Engineer. In no case shall footing excavations be raised such that less than the minimum frost protection is provided to footings.
- 3.5.5 Wherever excavations for foundations are carried out to greater depths than what are shown on the Drawings or authorized by *Consultant* and Consulting Structural Engineer, backfill to the correct level with concrete backfill as specified in paragraph 2.1.5.
- 3.5.6 Keep a record of founding elevations of all footings. Obtain approval of these records before claims for extras will be considered.

3.6 TRENCH EXCAVATION FOR MECHANICAL AND ELECTRICAL WORK

- 3.6.1 Include all types of strata in *Contract* Sum for trench excavation.
- 3.6.2 Excavation for mechanical and electrical *Work* shall be carried out in accordance with requirements specified herein. Such *Work* shall be laid out under supervision of mechanical and electrical Sections. Coordinate mechanical and electrical *Work* with respective Section before commencement.
- 3.6.3 Commence excavating of service trenches at low point: evenly pitch trenches and maintain trenches in dry condition. Excavate with suitable machinery or by hand as may be necessary to depth and dimensions required for *Work*. Excavate trenches to depth sufficient to provide minimum frost cover of 1500 mm [59"] over pipe when laid.
- 3.6.4 Cut and trim sides of trenches evenly and as near vertical as possible and shore as required to prevent cave-in.
- 3.6.5 Keep bottom of trenches clean and clear of loose material and slope or grade as required. Hand trim last 100 mm [4"] of trench excavation to ensure minimum disturbance to load bearing value of trench bottoms.

3.7 EXCESS MATERIAL

- 3.7.1 Excess soil generated from the Project Area must be managed in accordance with the requirements outlined in O. Reg 406/19, the MECP document entitled, "Rules for Soil Management and Excess Soil Quality Standards," and the procedures outlined in the approved project Excess Soil Management Plan.
- 3.7.2 Prior to the export of any excess soil from the Project Area, the Contractor QP should prepare an Excess Soil Destination Assessment Report, confirming that the excess soil is of suitable quality for the intended destination site. Formal written consent to accept the excess soil from each destination site must be provided to the Owner for review and approval prior to the export from the Project Area.
- 3.7.3 Obtain all necessary permits, licenses, registrations and manifests required to transport and dispose materials from Site to the approved destination site(s).

- 3.7.4 Each load of excess soil transported to or exported from the Project Area must be accompanied by a Hauling Record in accordance with the requirements in O. Reg 406/19 s.18. The Owner must be provided a copy of each completed hauling record for each transported load.
- 3.7.5 The Contractor is responsible for retaining a Qualified Person (QP) to prepare an Excess Soil Management Plan in accordance with O.Reg. 406/19, to be implemented during the Project execution to ensure compliance with the applicable laws and regulations. The QP shall review documents provided by the Owner and provide the following upon contract execution:
- Quality assurance sampling plan
 - List of receiver sites
 - Written consent for each reuse site
 - Excess Soil Destination Assessment Report
 - Soil Transport Contingency Plan (should the intended destination site not be available for whatever reason)
- 3.7.6 The Contractor and their QP shall be responsible for the review of the reports, understanding the site conditions, and soil quality. The Contractor shall make its own determination of the soil quality which will require removal for the Work based on the Contractor's proposed methodology for the required work at the Project Area and the applicable soil quality standards at the intended reuse sites.
- 3.7.7 The Contractor is responsible for all costs associated with any required additional soil sampling and reporting that is required to adhere to requirements of O. Reg 406/19 or that may be required by the intended destination site(s).
- 3.7.8 The Contractor and Contractor QP shall provide the Owner with all documentation related to the management and transport of excess soil from the Project Area.

3.8 **BACKFILLING**

- 3.8.1 Proceed promptly with backfilling as building progresses.
- 3.8.2 Do not backfill over frozen ground, frozen snow, or ice-covered ground. Do not backfill until the subgrade, footings, foundation walls, sub-drainage systems and waterproofing have been inspected and approved.
- 3.8.3 Where possible, place fill material against both sides of walls, catch basins, and pits simultaneously and evenly. If it is not practical to carry out backfilling in this manner, brace the walls adequately to prevent damage to the walls.
- 3.8.4 Where walls are to be backfilled on one side only, commence backfilling only when the ground and basement floors structural members are in place or adequate bracing is provided for top and bottom of foundation walls.
- 3.8.5 Ensure that areas behind temporary shoring to be left in place are properly backfilled.
- 3.8.6 Properly place, compact or otherwise consolidate each layer of backfill in place. Maintain fill within 2% of its optimum moisture content. Dampen dry fill with water and aerate wet fill to obtain the water content required. Excessively wet materials shall not be used as backfill.

3.8.7 Prior to backfilling or placing concrete on exposed soil subgrade, proof roll subgrade to identify soft or loose areas. Any soft or loose areas identified shall be sub-excavated and replaced with compacted granular fill such as Granular A or Granular B Type II. Proceed with placing backfill or concrete only after inconsistencies identified by above procedure have been reworked and compacted or excavated, backfilled with approved material as required to eliminate such conditions to acceptance of *Consultant*.

3.8.8 Spread fill in thin lifts not exceeding 200 mm per lift. Carry out fill operations systematically. Prevent segregation of particle sizes. Compact each layer to the required degree of compaction before placing succeeding layers.

3.8.9 Granular Fill Under Concrete Slabs:

- .1 Immediately after foundation walls are completed to floor level and backfill over mechanical and electrical services is completed, place and compact fill as required to bring level up to elevation of underside of granular underbed provided under Section 03 30 00, Cast-In-Place Concrete. The granular fill shall comprise compacted Granular A as per paragraph 2.1.1.
- .2 Inspect moisture content of fill prior to placing. Limited addition of water only to extent required to provide optimum moisture content for compaction. Puddling or flooding with water to compact fill is not permitted.
- .3 Deposit fill in layers so equipment being used for compacting can produce specified density. If lumps are present in material each layer shall be continuously disked in order to ensure proper compaction.
- .4 During and immediately after leveling and diking, compact each layer of fill using approved mechanical equipment until required compaction and level is reached. Carry out compaction within 1 m [3'-4"] of walls, where grade difference is 0.5 m [1'-8"] or more on other side of wall by hand tamping.
- .5 Make good any subsequent settlement.

3.8.10 Mechanical and Electrical Work:

- .1 Excavate, backfill and rough trade as required for mechanical, electrical and site services.
- .2 Cooperate with Mechanical and Electrical Divisions and carry out *Work* promptly, avoiding disruption of their *Work* sequence.

3.8.11 Compaction Density

- .1 The specified degrees of compaction in terms of percent Standard Proctor Maximum Dry Density (SPMDD) as per ASTM D698-12 are as below:

Location	Densities Required
Fill both sides of foundation walls	98% SPMDD or above
Under floor slabs	100% SPMDD
Under pavements	98% SPMDD or above
Under sodding and all other areas	98% SPMDD or as otherwise approved

3.9 **RAMPS**

3.9.1 Construct and maintain temporary access roads and ramps as required leading into each excavated area.

3.9.2 Design ramps of sufficient size to provide stability and to support movement of haulage vehicles, construction equipment and concrete trucks. Construct such ramps and roads from site excavated material where available, provided they meet design requirements and construction schedule.

3.9.3 Remove temporary ramps and other access roads to suit construction schedule. Hand excavated areas clean for *Work* to progress as required.

3.10 **DEFECTIVE WORK**

3.10.1 Material which does not meet specification or which does not meet specified compaction level will be considered defective *Work* performed by this Section.

3.10.2 Recompect or replace and compact backfill material that does not meet required compaction levels.

3.10.3 **Testing and replacement of deficient backfill material**

- .1 *Contractor* shall pay for additional testing, design and related expenses if *Work* has proven to be deficient.
- .2 *Contractor* shall pay for all testing and related expenses for recomacted or replaced *Work* until approved by *Consultant*.

3.11 **CLEANING UP**

3.11.1 Remove from building site excess and waste materials and debris resulting from *Work* of this Section. Leave site in a condition acceptable to *Consultant* before completion of *Work*.

-- End of Section --