# GENERAL

## Summary

### This Section covers the work for excavation, backfill and grading for structures, including:

#### Dewatering;

#### Excavating;

#### Subgrade preparation and protection;

#### Sheathing, shoring and bracing;

#### Fill and backfill;

#### Rough grading; and

#### Disposal of material.

## Related Sections

#### Section 01561 – Environmental Protection

#### Section 01710 – Pre-Construction Structural Survey

#### Section 02200 – Site Preparation

#### Section 02240 – Dewatering- General

#### Section 02243 – Operate and Maintain Dewatering System,

#### Section 02244 – Retain Specialty Contractor to Monitor Existing Groundwater Levels and Discharge Water Quality in Accordance with PTTW

#### Section 02310 – Grading

#### Section 02701 – Aggregates-General

#### Section 02911 – Topsoil and Finish Grading

#### Section 03300 – Cast-in-Place Concrete.

## References, Codes and Standards

### Ontario Provincial Standard Specifications (OPSS):

#### OPSS.MUNI 539 (Nov 2014) Temporary Protection Systems

#### OPSS 902 (Nov. 2010) Excavation and Backfilling - Structures

## General

### OPSS 902 shall be amended as follows:

902.04.02 Submission Requirements is amended by the addition of the following:

###### Submit to the Consultant, 20 working days prior to commencement of the Work, the following:

Design calculations and drawings and all supporting data for the sheathing, shoring, bracing and underpinning systems, all stamped and signed by the Contractor’s design engineer.

#### 902.04.02.1 Preconstruction Survey is amended by the addition of the following:

###### Conduct pre-construction survey in a manner specified in Section 01710 – Pre-Construction Structural Survey.

## Measurement and Payment

### All costs associated with the work of this Section shall be included in the price for Item No. A2.01 in the Bid Form.

# PRODUCTS

## General

### OPSS 902shall be amended as follows:

#### 902.05.01 **Granular** is to be deleted and replaced with:

## Granular material to be used for backfill, bedding, and frost tapers shall be according to Section 02701 Aggregates –General.

# EXECUTION

## OPSS Amendments

### OPSS 902 shall be amended as follows:

902.07.03 -Protection Systems is amended by the addition of the following:

##### Protect existing and new works and undertake construction Work in the manner necessary to protect the surrounding area which is not part of the Work.

##### Where Work is to proceed, the Contractor shall:

###### Review drawings of the existing work to ensure that the construction team understands the anticipated existing conditions.

###### Have the sump water pumping (dewatering) and excavation Work planned and executed under the direct control of Professional Engineer(s); and

###### Plan dewatering and excavation work to prevent detrimental effects on existing conditions.

##### Should damage of any kind, including settlement or lateral movement of adjacent structures, utilities or surface features occur as a result of the Work, such conditions and any resultant damage shall be immediately rectified to the satisfaction of the Consultant at the Contractor’s own expense.

##### Sheathing, Shoring and Bracing

###### Provide necessary sheathing, shoring and bracing to prevent caving in of banks and excavations. Place shoring so as to be independent of footings, and keep in position until forms have been removed, waterproofing completed, drains are in place and authorization has been given by the Consultant to proceed with backfilling.

###### Remove sheathing and bracing, as excavation is backfilled, in such a manner as to avoid caving in of the Work. Carefully fill voids left by the withdrawal of sheathing by ramming, or as otherwise directed by the Consultant.

###### Where removal of sheathing and shoring is not necessary from an engineering requirement, the Consultant will consider written requests to leave sheathing and shoring in place. Make written request and obtain the Consultant’s consent before commencing backfilling. No addition to the Contract Price will be allowed for sheathing and shoring left in place by the Contractor's preference.

###### Where the sheathing and shoring cannot be removed without injury to the Work or to the adjoining structures, leave the sheathing and shoring in place. Cut off sheathing to such lengths as approved by the Consultant.

##### Protection of Structures and Utilities

###### Protect existing and new works and undertake construction Work in the manner necessary to protect the surrounding area which is not part of the Work.

###### Where Work is to proceed the Contractor shall:

Review drawings of the existing work to ensure that the construction team understands the anticipated existing conditions.

Have the sump water pumping (dewatering) and excavation Work planned and executed under the direct control of Professional Engineer(s) ; and

Plan dewatering and excavation Work to prevent detrimental effects on existing conditions.

###### Should damage of any kind, including settlement or lateral movement of adjacent structures, utilities or surface features occur as a result of the Work, such conditions and any resultant damage shall be immediately rectified to the satisfaction of the Consultant at the Contractor’s own expense.

### 902.07.04 Dewatering Structure Excavation

### The second sentence of 902.07.04 Dewatering Structure Excavation is to be deleted and replaced with the following:

###### Control of water shall be according to Section 01561 – Environmental Protection and Section 02240 – Dewatering General, 02243 – Operate and Maintain Dewatering System, 02244 – Retain Specialty Contractor to Monitor Existing Groundwater Levels and Discharge Water Quality in accordance with City of Vaughan and TRCA requirements.

### **902.07.04 Dewatering Structure Excavation** is further amended by the addition of the following:

###### Keep all excavations free of water while the Work is in progress and protect open excavations against flooding and damage due to surface runoff.

### **902.07.05 Excavation**

#### **902.07.05.01 General** is amended by the addition of the following:

##### Strip topsoil after the area has been cleared. Do not mix topsoil with subsoil.

##### Do not stockpile topsoil on Site. Manage topsoil in accordance with Section 02200 - Site Preparation.

##### Pre-clear areas of proposed excavation to ensure that no existing piping or buried utilities are present.

##### Relocate piping and buried utilities prior to excavation.

##### Excavate in accordance with the Drawings to the appropriate depth.

##### Excavate and remove materials by mechanical means. Blasting is not permitted.

##### Excavate clean, and level. Remove loose material.

##### Do not place granular or concrete before examination of the excavation has occurred and the acceptance of the Consultant have been obtained.

##### Construct each structure on stable ground where structures at different elevations occur adjacent to each other.

##### Stockpile excavated materials required for use as fill or backfill so as not to interfere with construction. Do not place excavated material so as to cause pressure on newly placed structures, or where it may cause soil slippage.

##### Dispose of excess and unsuitable material off the Site.

##### Over-excavation beneath structures, where such over-excavation was not authorized by the Consultant, shall be backfilled with unshrinkable fill, or other suitable material as approved by the Consultant at the Contractor’s own expense.

##### All uncovered excavations must be secured by fencing at the end of each work day. Plating, where used to cover excavations, must be recessed to match existing grade and shall not protrude or form a lip on any surface.

##### Have sub-grades inspected prior to proceeding with construction. Notify the Consultant a minimum of one working day prior to when sub-grades will be ready for inspection, so that the inspection can be arranged.

##### Moisten or dry, if necessary, when the sub-grade below foundations and slabs on grade is not rock. Scarify and compact to 100 percent Standard Proctor Density before placing the granular base, foundations or slabs.

##### Protect sub-grades from the deleterious effects of the weather and adverse construction activities.

##### Restore or repair any damage.

##### Provide necessary means for thawing frozen ground and for snow removal when required.

##### Maintain sub-grade to a temperature of at least 10oC prior to placing concrete.

### **902.07.06 Backfilling**

#### **902.07.06.01 General** is amended by the addition of the following:

##### Do not proceed with backfilling operations until the Consultant has inspected and approved installations.

##### Areas to be backfilled must be free from debris, snow, ice, water and frozen ground.

##### Do not use backfill material which is frozen or contains ice, snow or debris.

##### Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

##### Place unshrinkable fill or fill concrete in areas as indicated on the Contract Drawings. Consolidate and level unshrinkable fill with internal vibrators:

###### Place bedding and surround material as specified on the Contract Drawings.

###### Place layers simultaneously on both sides of installed Work to equalize loading.

### **902.07.06.02 Compaction** is amended by the addition of the following:

#### Compaction Tests

##### Where compaction of sub-grade, backfill or fill is specified, the Consultant may order compaction tests by an independent testing company. Tests will be arranged for by the Consultant and paid for by the Region:

###### If the compacting Work does not meet the specified requirements, the Contractor shall perform further compacting Work until the specified requirements are met and pay the cost of further testing to establish proof of the specified compaction.

###### For fill or backfill compaction, tests will be made at every 450mm maximum depth, after three 150mm lifts have been placed.

###### Co-operate with the Consultant and testing company by scheduling the placing and compacting of fill and backfill so tests can be progressively taken.

#### Rough Grading

##### Rough grade, compact and grade the Site, in accordance with the Drawings, to within a tolerance of 50 mm, to receive finish grading. Remove soft areas in the sub-grade and replace with suitable material as directed by the Consultant. Provide additional suitable material if necessary.

##### Grade and maintain rough grades, including slopes and ditches, to provide proper drainage.

#### Restoration

##### Upon completion of Work, remove excavated waste materials and debris, trim slopes, and correct defects as directed by the Consultant.

##### Clean and reinstate areas affected by Work and restore as indicated on the Contract Drawings.

##### Reinstate pavement and sidewalks to elevation that existed before excavation or as indicated on the Contract Drawings.

##### Use temporary plating to support traffic loads over unshrinkable fill for the initial 24 hour curing period.

### **902.07.09 Management of Excess Material** is amended by the addition of the following:

#### Disposal of excess material from the Site shall meet the requirements of Section 01561 - Environmental Protection.

**END OF SECTION**