

This Addendum forms part of the contract documents for the above noted project, and the revisions and additions noted herein and any attachments shall read in conjunction with all other documents. This Addendum shall take precedence over all previously issued tender documents where differences occur.

TENDER DOCUMENTS

SPECIFICATIONS

- .1 Section 32 14 13 Precast Concrete Unit Paving
 - .1 Delete Section 2.2.2 Precast Maintenance Edge and replace with the following;
 - .2 *Concrete Maintenance Edge: Umbriano*
 - .1 *Size: 300 (w) x 600 (L) x 70(D)mm*
 - .2 *Colour: Winter Marvel*

ATTACHMENTS TO THIS ADDENDUM

SPECIFICATIONS

Section 32 14 13

Precast Concrete Unit Paving

END OF LANDSCAPE ADDENDUM 1

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 32 91 19 Topsoil and Fine Grading

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C136-[13] , Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .2 ASTM C140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
 - .3 ASTM C936, Standard Specification for Solid Concrete Interlocking Paving Units.
 - .4 ASTM C979/C979M-[10] , Standard Specification for Pigments for Integrally Colored Concrete.
 - .5 ASTM C1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units
- .2 CSA Group
 - .1 CSA A23.1/A23.2-[09] , Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A179-[04(R2009)] , Mortar and Grout for Unit Masonry.
 - .3 CSA A231.1/A231.2-[06(R2010)] , Precast Concrete Paving Slabs/Precast Concrete Pavers.
 - .4 CSA A283-[06(R2011)] , Qualification Code for Concrete Testing Laboratories.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for precast concrete unit paving and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit full size samples of each paver type, thickness, colour and finish that indicate the range of colour variation and texture expected upon project completion for consultant approval.
 - .2 Accepted samples become the standard of acceptance for the product produced.
- .4 Test and Evaluation Reports:
 - .1 Submit following sampling and testing data:
 - .1 Sieve analysis for gradation of bedding and joint material.
 - .2 Unit paver sampling and testing.
 - .3 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Installer: company or person specializing in precast concrete paver installations of similar complexity, size and material with 5 documented years of experience.
- .2 Mock-ups:
 - .1 Construct 3 x 3 m area mock-up.
 - .2 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, operation of equipment and material application.
 - .2 To determine surcharge of bedding layer, joint sizes, lines, laying patterns, colours, texture and levelness.
 - .3 Locate mock-up where directed by Consultant.
 - .4 Allow 48 hours for inspection of mock-up before proceeding with work.
 - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect materials free from mud, dirt, and other foreign materials.
 - .3 Store and protect precast concrete units from nicks, scratches, and blemishes.
 - .4 Replace defective or damaged materials with new.
- .4 Coordinate delivery and paving schedule to minimize interference with normal use of streets and sidewalks adjacent to paver installation.
- .5 Prevent joint and sand setting bed sand from exposure to rainfall, or removal by wind with secure, waterproof covering.

1.6 PROJECT / SITE CONDITIONS

- .1 Environmental Requirements:
 - .1 Install pavers only on unfrozen setting bed aggregate materials
 - .2 Install pavers only on unfrozen base or sub-base aggregate materials
 - .3 Install base or subbase only over unfrozen subgrade
 - .4 Install setting bed sand or pavers only when there is no heavy rain or snowfall.

1.7 CONCRETE PAVER OVERAGE AND ATTIC STOCK

- .1 Provide a minimum of 5% additional material for overage to be used during construction.
- .2 Contractor to provide a minimum of 10 sq. m of each product and size used to owner for maintenance and repair. Furnish pavers from the same production run as installed materials.

Part 2 Products

2.1 CONCRETE PAVERS

- .1 Concrete pavers to be manufactured by Techo-Bloc Inc.
 - .1 Contact: Jada Blackwood, jada.blackwood@techo-bloc.com
- .2 Concrete Paver Type 1: Aquastorm Commercial
 - .1 Size: 225 (w) x 510(L) x 100(D)mm
 - .2 Colour: Grey
 - .3 Finish: Smooth
- .3 Pavers shall meet the minimum material and physical properties set forth in ASTM C936.
 - .1 Average compressive strength 8000psi (55 MPa) with no individual unit under 7,200 psi (50 MPa)
 - .2 Average absorption of 5% with no greater than 7% when tested according to ASTM C140.
 - .3 Conforming to ASTM C 1645 when tested for freeze-thaw requirements.
 - .4 Height tolerances +/- 3.2mm.
- .4 Pigment in concrete pavers: to ASTM C979/C979M.
- .5 Maximum allowable breakage of product is 5%.

2.2 PRECAST MAINTENANCE EDGE

- .1 Concrete pavers to be manufactured by Unilock.
 - .1 Contact: Philip Clark, T: 416-646-9000.
- .2 Concrete Maintenance Edge: Umbriano
 - .1 Size: 300 (w) x 600 (L) x 70(D)mm
 - .2 Colour: Winter Marvel

2.3 JOINT MATERIAL

- .1 Turfstone pavers to receive topsoil and sod plugs in voids. Refer to Section 32 91 19 Topsoil and Fine Grade and drawing details.

2.4 SETTING BED

- .1 Unit Paving Setting Bed Sand
 - .1 Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.
 - .2 Do not use limestone screenings, stone dust, or sand material that does not conform to the grading requirements of ASTM C 33.

- .3 Do not use mason sand or sand conforming to ASTM C 144.
- .4 Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.
- .5 Conform to the grading requirements of ASTM C 33 with modifications as shown in Table below:

Table – Setting Bed Sand Gradation Requirements for Setting Bed Sand	
ASTM C 33	
Sieve Size	Percent Passing
3/8 in (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No. 8 (2.36 mm)	85 to 100
No. 16 (1.18 mm)	50 to 85
No. 30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075)	0 to 1

2.5 BASE AGGREGATE

- .1 Unit Paving Base Aggregate
 - .1 Provide Base Aggregate materials conforming to ASTM D 2940 and gradation requirements as presented in Table below:

Table – Base Aggregate Gradation Requirements	
ASTM D 2940	
Sieve Size	Percent Passing
2 in (50 mm)	100
1-1/2 in (37.5 mm)	95 to 100
3/4 in (19 mm)	70 to 92
3/8 in (9.5 mm)	50 to 70
No. 4 (4.75 mm)	35 to 55
No. 30 (600 µm)	12 to 25
No. 200 (75 µm)	0 to 8

2.6 EDGE RESTRAINTS

- .1 Edge restraints shall be concrete. Refer to Civil.

2.7 CLEANING COMPOUND

- .1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete pavers of contamination encountered.
- .2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on pavers.

2.8 SEALING COMPOUND

- .1 Sealing compound to be used only as recommended by manufacturer where applicable.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for precast concrete unit paving installation in accordance with manufacturer's written instructions and requirements for installation tolerances and other conditions affecting performance prior to placing concrete pavers.
 - .1 Unit Paving on Aggregate Base:
 - .1 Verify that the Base and Sub-base aggregate materials, thickness, compacted density, surface tolerances and elevations conform to specified requirements.
 - .2 Provide written density test results for soil subgrade, base and subbase aggregate to Owner and Consultant.
 - .3 Verify location, type, and elevations of edge restraints, concrete curbs, concrete collars around utility structures and drainage inlets.
 - .2 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.
 - .1 Beginning Paver installation signifies acceptance of base and edge restraint conditions.

3.2 INSTALLATION OF EDGE RESTRAINTS

- .1 Install restraints true to grade, in accordance with manufacturer's recommendations and as shown on drawing details.

3.3 BASE AND SUBBASE AGGREGATES

- .1 Unit Paving Base:
 - .1 Provide the Base Aggregate material in uniform lifts not exceeding 6 in. (150 mm) over the compacted Subbase Aggregate (or Subgrade) material and compact to at least 100 percent Standard Proctor Density as per ASTM D 698.
 - .2 Compact the Base Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the roller.
 - .3 Tolerance: Do not exceed the specified surface grade of the compacted Base Aggregate material more than $\pm 3/8$ in. (10 mm) over a 10 ft. (3 m) long straightedge laid in any direction.
 - .4 Compact and grade the upper surface of the base sufficiently to prevent infiltration of the bedding sand into the base both during construction and

throughout its service life. Blend segregated areas of the granular base by the application of crushed fines that have been watered and compacted into the surface.

3.4 SETTING BED

- .1 Unit Paving:
 - .1 Provide, spread and screed Setting Bed Sand evenly over the compacted Base Aggregate course.
 - .1 Protect screeded Setting Bed Sand from being disturbed by either pedestrian or vehicular traffic.
 - .2 Screed only the area which can be covered by pavers in one day.
 - .3 Do not use Setting Bed Sand material to fill depressions in the aggregate base surface.
 - .2 Keep moisture content constant and density loose and constant until Concrete Pavers are set and compacted.
 - .3 Screed Setting Bed Sand using either an approved mechanical spreader (e.g.: an asphalt paver) or by the use of screed rails and boards. Maintain in a loose condition slightly ahead of the paving units and fully protect against incidental compaction following screeding. Loosen compacted sand by rain or screeded sand left overnight before further paving units are placed.
 - .4 Inspect the Setting Bed Sand course prior to commencing the placement of the Concrete Pavers. Acceptance of the Setting Bed Sand occurs with the initiation of Concrete Paver placement.

3.5 INSTALLATION OF CONCRETE PAVERS

- .1 Replace Concrete Pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.
- .2 Mix Concrete Pavers from a minimum of three (3) bundles simultaneously drawing the paver vertically rather than horizontally, as they are placed, to produce uniform blend of colors and textures.
- .3 Exercise care in handling face mix concrete pavers to prevent surfaces from contacting backs or edges of other units.
- .4 Provide Concrete Pavers using laying pattern as indicated. Adjust laying pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.
- .5 Use string lines or chalk lines on Setting Bed to hold all pattern lines true.
- .6 Set surface elevation of pavers 1/8 in. (3 mm) above adjacent drainage inlets, concrete collars or channels.
- .7 Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight.
 - .1 When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.
- .8 Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.
- .9 Prevent joint (bond) lines from shifting more than $\pm 1/2$ in. (± 13 mm) over 50 ft. (15 m) from string lines.

- .10 Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.
- .11 Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.
- .12 Prevent all traffic on installed Concrete Pavers until joint material has been vibrated into joints. Keep skid steer and forklift equipment off newly laid Concrete Pavers that have not received initial compaction and Joint material.
- .13 Vibrate Concrete Pavers into leveling course with a low-amplitude plate vibrator capable of a to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:
 - .1 After edge pavers are installed and there is a completed surface or before surface is exposed to rain.
 - .2 Compact installed Concrete Pavers to within 6 feet (1.8 meters) of the laying face before ending each day's work. Cover Concrete Pavers that have not been compacted and leveling course on which pavers have not been placed, with nonstaining plastic sheets to prevent Setting Bed from becoming disturbed.
- .14 Protect face mix Concrete Paver surface from scuffing during compaction by utilizing a urethane pad.

3.6 INSTALLATION OF JOINT MATERIAL

- .1 Remove any cracked or structurally damaged Concrete Pavers and replace with new units prior to installing Joint material.
- .2 Provide, spread and sweep topsoil material into joints immediately after vibrating pavers into Setting Bed course until full. Compact topsoil to 70% SPD Joint material until voids are completely filled, 25mm below top of paver to ensure sod installation sits flush with top of paver.
- .3 Remove excess topsoil material broom clean from surface when installation is complete.
- .4 Cleanly cut sod to fit in paver voids snugly. Roll surface to ensure proper knitting with topsoil.

3.7 FIELD QUALITY CONTROL

- .1 Verify final elevations for conformance to the drawings after sweeping the surface clean.
 - .1 Prevent final Concrete Paver finished grade elevations from deviating more than $\pm 3/8$ in. (± 10 mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.
- .2 Paver-to-Paver Lippage:
 - .1 No greater than 3 mm (1/8 inch) difference in height between adjacent pavers.

3.8 REPAIRING, CLEANING AND SEALING

- .1 Remove and replace unit pavers that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Provide new units to match adjoining units and install in same manner as original units, with same joint treatment and with no evidence of replacement.

- .2 Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.
- .1 Clean Concrete Pavers in accordance with the manufacturer's written recommendations.

3.9 PROTECTION

- .1 Protect completed work from damage due to subsequent construction activity on the site.

END OF SECTION