

BID NO.: T11PJ19727

CONTRACT TITLE: Sheppard Station
Station Managers Office and Zone Hub

This Addendum forms part of the Bid Documents dated May, 2019, and amends the original Bid Documents as described below.

This Addendum will be issued in the form of the complete replacement of the entire affected Section(s), which is to be inserted in the Bid Documents, discarding the replaced Section(s).

For further instructions on Addenda, refer to Section 00 21 00 - Instructions to Bidders.

1 PROCUREMENT AND CONTRACTING REQUIREMENTS

- 1.1 Revised Procurement and Contracting Section pages listed below accompany and form part of this Addendum. Each page is marked at the bottom with the number of this Addendum. Only those pages which include wording that is bold italicized are listed below.

Section	Title	Page Number
00 01 15	List of Drawings	7

2 SPECIFICATIONS

- 2.1 Revised Specification Sections' pages listed below accompany and form part of this Addendum. Each page is marked at the bottom with the number of this Addendum. Only those pages which include wording that is bold italicized are listed below.

Section	Title	Page Number
08 71 00	Finish Hardware	3
09 30 00	Tiling	1, 3, 4, 5

3 DRAWINGS

- 3.1 The following revised Drawings marked as being issued for Addendum 1, accompany and form part of this Addendum:

Sheet No.	Drawing Number	Title
001	SH35-8-G001	Drawing List
023	SH35-8-A900	Schedules Door & Room Finishes
046	SH35-8-E003	Key Plan Concourse Level
056A	SH35-8-E602	Telephone & Data Plan Concourse Level (Switchboard Room)

4 REFERENCE DRAWINGS

4.1 The following new reference drawings marked as being issued for Addendum 1, accompany and form part of this Addendum:

Sheet No.	Drawing No.	Reference No.	Title
			SHEPPARD SUBWAY YONGE STATION AND RELATED STRUCTURES
097	SH-51-11-E-165	SH35-8-REF-37	Yonge Line N/Fan Room Power 16+510 to 16+549
098	SH-51-11-E-185	SH35-8-REF-38	Systems
099	SH-51-11-E-731	SH35-8-REF-39	Distribution Panel Schedule DP-3G & SP-13H

END OF SECTION

CONTRACT DRAWINGS

SHEET NO.	DRAWING NO.	TITLE
		SHEPPARD STATION STATION MANAGERS OFFICE AND ZONE HUB
000	Drawing Cover Sheet	
001	SH35-8-G001	Drawing List
002	SH35-8-G002	Abbreviations
003	SH35-8-G003	Legend, Symbols & General Notes
004	SH35-8-G004	Wall Types Schedule
005	SH35-8-G005	Building Code Matrix
006	NOT USED	
007	SH35-8-A150	Key Plan Street Level
008	SH35-8-A151	Key Plan Concourse Level
009	SH35-8-A152	Key Plan Concourse/Platform Level
010	SH35-8-AS01	Hoarding and Staging Plan Concourse Level
011	SH35-8-AD01	Demolition Floor Plan Concourse Level
012	SH35-8-AD02	Reflected Ceiling Demolition Plan Concourse Level
013	SH35-8-AF01	Fire Separation Plan Concourse Level
014	SH35-8-AF02	Exit Routing Concourse Level
015	SH35-8-A200	Floor Plan Concourse Level

ADDENDUM 1

SHEET NO.	DRAWING NO.	TITLE
016	SH35-8-A300	Reflected Ceiling Plan Concourse Level
017	SH35-8-A301	Floor Finish Plan Concourse Level
018	SH35-8-A400	Interior Elevations
019	NOT USED	
020	SH35-8-A500	Section
021	SH35-8-A800	Plan Details
022	SH35-8-A801	Section Details
022A	SH35-8-A802	Miscellaneous Details
023	SH35-8-A900	Schedules Door & Room Finishes
024	SH35-8-S001	General Notes
025	SH35-8-S002	Typical Details
026	SH35-8-S200	Floor Plan Concourse /Platform Level
027	SH35-8-S500	Sections & Details 01
027A	SH35-8-S501	Sections & Details 02
028	SH35-8-M001	Mechanical Services Legend & Symbols
028A	SH35-8-M002	Mechanical Services Platform Key Plan
028B	SH35-8-M003	Mechanical Services Concourse /Platform Level Key Plan
029	SH35-8-M120	Mechanical Services Piping Details
030	NOT USED	
031	SH35-8-M201	Drainage Piping - Demolition & Removal Concourse Level Floor Plan

SHEET NO.	DRAWING NO.	TITLE
032	SH35-8-M202	Drainage Piping Concourse Level Floor Plan
033	SH35-8-M203	Drainage Piping - Demolition & Removal Platform Level Floor Plan
034	SH35-8-M204	Drainage Piping Platform Level Floor Plan
035	NOT USED	
036	NOT USED	
037	SH35-8-M303	Fire Protection Concourse Level Floor Plan
038	NOT USED	
039	SH35-8-M501	H.V.A.C. - Demolition & Removal Concourse Level Floor Plan
040	SH35-8-M502	H.V.A.C. Concourse Level Floor Plans
041	SH35-8-M510	H.V.A.C. Section & Detail
042	SH35-8-M520	H.V.A.C. Details
043	SH35-8-M560	H.V.A.C. Schedules
044	SH35-8-E001	Legend & Symbols Sheet 1 of 2
045	SH35-8-E002	Legend & Symbols Sheet 2 of 2
046	SH35-8-E003	Key Plan Concourse Level
047	SH35-8-E100	Power Single Line Diagram
048	SH35-8-E101	Power Demolition Plan Concourse Level

SHEET NO.	DRAWING NO.	TITLE
049	SH35-8-E102	Power Plan Concourse Level
050	SH35-8-E103	Power Plan Concourse Level (Switchboard Room)
051	SH35-8-E200	Lighting Demolition Plan Concourse Level
052	SH35-8-E201	Lighting Plan Concourse Level
053	SH35-8-E500	Fire Alarm Demolition Plan Concourse Level
054	SH35-8-E501	Fire Alarm Plan Concourse Level
055	SH35-8-E600	Telephone & Data Demolition Plan Concourse Level
056	SH35-8-E601	Telephone & Data Plan Concourse Level
056A	SH35-8-E602	Telephone & Data Plan Concourse Level (Switchboard Room)
057	SH35-8-E650	PA & CCTV Demolition Plan Concourse Level
058	SH35-8-E651	PA & CCTV Plan Concourse Level
059	SH35-8-E800	Electrical Details Power & Data /Outlets
060	SH35-8-E900	Schedules Electrical Panel & Lighting Fixtures

REFERENCE DRAWINGS

Reference drawings listed below are provided for information and convenience. TTC accepts no liability or responsibility for completeness or accuracy of reference drawings. Reference drawings are not to scale.

SHEET NO.	DRAWING NO.	REFERENCE NO.	TITLE
			SHEPPARD SUBWAY YONGE STREET AND RELATED STRUCTURES
061	SH-51-11-A-055	SH35-8-REF-1	Yonge Line Existing N/Concourse North Plan
062	SH-51-11-A-064	SH35-8-REF-2	Yonge Line Existing N/Concourse Plan / Details
063	SH-51-11-A-072	SH35-8-REF-3	Yonge Line Existing N/Concourse North Reflected Ceiling Plan
064	SH-51-11-A-137	SH35-8-REF-4	Yonge Line Existing N/Concourse North Floor Pattern
065	SH-51-11-A-291	SH35-8-REF-5	Std Details/Schedules/Misc North Concourse Collector's Booth
066	SH-51-11-KA-009	SH35-8-REF-6	Legends/Symbols/Wall Types
067	SH-51-11-A-140	SH35-8-REF-7	Yonge N/C & Sheppard W/C Floor Pattern Plan Details
068	SH-51-11-FA-003	SH35-8-REF-8	Fire Separations Yonge Line Existing N/Concourse N/Tunnel
069	SH-51-11-A-174	SH35-8-REF-9	Yonge Line Existing N/S Section Looking West
070	SH-51-11-A-278	SH35-8-REF-10	Std Details/Schedules/Misc Fare Collection/Barriers/Booths
071	SH-51-11-A-293	SH35-8-REF-11	Std Details/Schedules/Misc Collector's Booth
072	SH-51-11-A-294	SH35-8-REF-12	Std Details/Schedules/Misc Collector's Booth
073	SH-51-11-A-295	SH35-8-REF-13	Std Details/Schedules/Misc Collector's Booth

SHEET NO.	DRAWING NO.	REFERENCE NO.	TITLE
074	SH-51-11-SC-012	SH35-8-REF-14	Invert Slab Yonge Sta. 16+510 to 16+549
075	SH-51-11-SC-023	SH35-8-REF-15	North Concourse Framing Plan North Portion
076	SH-51-11-SC-124	SH35-8-REF-16	North Concourse Roof Framing Plan Units Y5420 and Y5426
077	SH-51-11-SC-211	SH35-8-REF-17	Yonge Profile Elevation Sta.16+510 to 16+548
078	SH-51-11-M-021	SH35-8-REF-18	Yonge Line North Fan Room Plumbing and Drainage
079	SH-51-11-M-028	SH35-8-REF-19	Yonge Line North Concourse, North Plumbing and Drainage
080	SH-51-11-M-045	SH35-8-REF-20	Yonge Line North Concourse, South Fire Protection
081	SH-51-11-M-046	SH35-8-REF-21	Yonge Line North Concourse, North Fire Protection
082	SH-51-11-M-048	SH35-8-REF-22	Sheppard Line West Concourse Fan Room Fire Protection
083	SH-51-11-M-058	SH35-8-REF-23	Yonge Line North Concourse, North Heating, Ventilation and Air Conditioning
084	SH-51-11-M-071	SH35-8-REF-24	Mechanical Schedules
085	SH-51-11-M-077	SH35-8-REF-25	Sheppard Line North Concourse Part Plan Plumbing and Drainage
086	SH-51-11-E-174	SH35-8-REF-26	Yonge Line N/Concourse South Power
087	SH-51-11-E-175	SH35-8-REF-27	Yonge Line N/Concourse North Power
088	SH-51-11-E-189	SH35-8-REF-28	Yonge Line N/Concourse North Systems
089	SH-51-11-E-160	SH35-8-REF-29	Yonge Line N/Concourse North Lighting

SHEET NO.	DRAWING NO.	REFERENCE NO.	TITLE
090	SH-51-10-E-217	SH35-8-REF-30	Yonge Line Retail Distribution 120 / 208 V, 3 PH, 4 W
091	SH-51-11-E-733	SH35-8-REF-31	Distribution Schedules DP-E & DP-H
			SHEPPARD SUBWAY HVAC EQUIPMENT RELOCATION SHEPPARD-YONGE STATION
092	SH35-1-M515	SH35-8-REF-32	Concourse Level HVAC Demolition
093	SH35-1-M535	SH35-8-REF-33	Concourse Level New HVAC
			YONGE SUBWAY NORTHERN EXTENSION SHEPPARD STATION
094	Y7-S-255	SH35-8-REF-34	Unit Y5426 Mezzanine Level Plan
095	Y7-S-256	SH35-8-REF-35	Unit Y5426 Longitudinal Sections
096	Y7-S-257	SH35-8-REF-36	Unit Y5426 Sections
			SHEPPARD SUBWAY YONGE STATION AND RELATED STRUCTURES
097	SH-51-11-E-165	SH35-8-REF-37	Yonge Line N/Fan Room Power 16+510 to 16+549
098	SH-51-11-E-185	SH35-8-REF-38	Systems
099	SH-51-11-E-731	SH35-8-REF-39	Distribution Panel Schedule DP-3G & SP-13H

END OF SECTION

- 1 General
- 1.1 SECTION INCLUDES**
 - 1.1.1 Labour, Products, equipment, and services necessary for finish hardware Work in accordance with Contract Documents.
- 1.2 REFERENCES**
 - 1.2.1 ANSI/BHMA A156.18, Materials and Finishes.
 - 1.2.2 NFPA 80, Fire Doors and Windows.
- 1.3 HARDWARE GROUP REQUIREMENTS**
 - 1.3.1 Refer to attachment 08 71 00.01 for hardware requirements for quantity and type of hardware for each hardware group.
- 1.4 SUBMITTALS**
 - 1.4.1 Submit in accordance with Sections 01 33 00 and 01 33 23.
 - 1.4.2 Shop Drawings:**
 - 1.4.2.1 Submit the following:
 - 1.4.2.1.1 Manufacturer's Product name and catalogue number, type of finish, quantities required.
 - 1.4.2.1.2 Photographs and Drawings showing elevations, plans, and critical dimensions.
 - 1.4.2.1.3 Compliance with reference standards, and fire ratings.
 - 1.4.2.1.4 Features, functions, and technical data.
 - 1.4.2.1.5 Locations and mounting heights of each type of hardware.
 - 1.4.2.1.6 Transportation and installation requirements.
 - 1.4.2.1.7 Supply door templates and required information to door and frame manufacturer to enable accurate sizes, locations of cut-outs, and reinforcement for hardware.
 - 1.4.2.1.8 Submit templates and installation instructions to required trade to arrange for provisions for accurate setting and fitting of hardware.
 - 1.4.2.1.9 Submit Door Hardware Schedule. Indicate Product, type, manufacturer, model number, base material, function, size, and finish information.
 - 1.4.3 Quality Assurance Submittal:**
 - 1.4.3.1 Submit ULC or WH-ETL certification for hardware in fire separation and exit doors prior to Product delivery.
 - 1.4.4 Closeout Submittals:**
 - 1.4.4.1 Submit the following for incorporation into Operation and Maintenance Manuals in accordance with Section 01 78 23:
 - 1.4.4.1.1 Inspection reports.
 - 1.4.4.1.2 Maintenance, adjustment, and repair instructions.
 - 1.4.4.1.3 Warranty information.

1.5 QUALITY ASSURANCE

1.5.1 Door hardware manufacturers:

1.5.1.1 Companies registered with BHMA.

1.5.2 For hardware in fire separation and exit doors:

1.5.2.1 ULC or WH-ETL certification.

1.5.3 Inspection report:

1.5.3.1 Retain hardware consultant to prepare report. Hardware consultant to inspect completed installation, and verify hardware supplied and installed in accordance with manufacturer's recommendations.

1.5.4 Maintenance, adjustment, and repair instructions:

1.5.4.1 Correct care of hardware, including information on lubrication of locksets, adjustments, and repairs of door closers, and general maintenance.

1.6 DELIVERY, STORAGE AND HANDLING

1.6.1 Package hardware on set by set basis with complete set of screws, bolts, and fastenings necessary for complete installation.

1.6.2 Label packages legibly, indicating manufacturer's name, hardware name and model number, function, size, metal (type, thickness and finish) opening direction, (if applicable) and scheduled installation location. Cross reference to hardware groups.

1.6.3 Include packing slip complete with list of parts, name of manufacturer, and installation door number.

1.6.4 Protect prefinished surfaces with wrapping and strippable coating as required to prevent scratches, nicks, and blemishes.

1.6.5 Replace defective or damaged hardware with new.

1.6.6 Deliver hardware to Site in original factory packaging in accordance with Section 01 62 00.

1.6.7 Store hardware indoors, in secure dry, clean, well-ventilated area, and in accordance with manufacturer's recommendations.

1.7 SPECIAL TOOLS AND EXTRA STOCK MATERIALS

1.7.1 Supply in accordance with Section 01 78 43:

1.7.1.1 Cleaning solution for stainless steel frames.

1.7.1.2 Two (2) sets of wrenches for fire exit hardware.

2 Products

2.1 GENERAL

2.1.1 Ensure each hardware item of same type, design, and manufacturer.

2.1.2 Ensure selected hardware functions are correct and in accordance with Contract requirements and authorities having jurisdiction.

2.1.3 Verify each door handing corresponds to direction of door opening indicated on the Contract Drawings.

- 2.1.4 Verify cylindrical lockset compatible with TTC key in lever (KIL) Medeco KIL 20 200, request information from TTC.
- 2.1.5 Inform TTC of discrepancies in the Contract Documents regarding quality, quantity, operation or function of hardware selected.
- 2.1.6 Fire rated hardware:
- 2.1.6.1 Selected and installed in accordance with applicable codes and regulations, NFPA 80, and to approval of authorities having jurisdiction.
- 2.1.6.2 ULC labelled.
- 2.1.7 Locksets and latch sets on fire rated doors: Minimum 19 mm throw.
- 2.2 HARDWARE MANUFACTURE GROUP**
- 2.2.1 Select hardware entirely from one of manufacturers indicated in Article 2.3. Avoid mixing Products from different manufacturers unless otherwise indicated.
- 2.3 MATERIALS**
- 2.3.1 Hardware types and manufacturers:

Hardware Types	Manufacturer's Parts and Products			Finish
	DORMA + KABA GROUP	ALLEGION GROUP	ASSA ABLOY GROUP	
Standard weight butt hinge	PBB CB51 - 4 1/2" x 4" x NRP	IVES 3CB1 - 4 1/2" x 4" x NRP	McKinney TA314 - 4 1/2" x 4" x NRP	630
Deadbolt	Dorma - D800 Series	Schlage - B600 Series	Sargent - 480 Series	626
Cylindrical storeroom lockset	Dorma C800 SERIES ("LR Lever) Prepare with 20200V1(S) core	Schlage ND SERIES (Rhodes Lever with Vandlguard Feature) Prepare with 2020073(S) core	Arrow QL SERIES with 20200H1(S) core	626
Surface door closer (with metal cover)	Dorma - 8900 Series	LCN - 4041XP Series	Sargent - 351 Series	689
Electric strike for lock	Rutherford Controls F2164	Von Duprin 6400	HES 1006	630
Power supply for electric strike	Rutherford Controls 10 Series	Schlage PS900 Series	Securitron BPS	N/A
Manufacturer	CBH	ALLEGION GROUP	ASSA ABLOY GROUP	
Kickplate	CBH 903 x SIZE x 3M TAPE	Standard Metal K10A - SIZE x 3M Tape	Rockwood K1050 x SIZE x SA	630
Floor stop	CBH -CBH 110 or 100	IVES - FS13 or FS17	Rockwood - 438 or 439	626
Wall stop	CBH - CBH 140	IVES - WS406CVX	Rockwood - 406	626

Manufacturer	K.N. CROWDER MFG. INC.	PEMKO	NATIONAL GUARD PRODUCTS	
Weatherstripping	W-14	312_R	134NA	AL
Door Sweep	W-13S	315_N	200NSS	AL
Threshold	CT-9	170A	424	AL

2.4 FASTENINGS

- 2.4.1 Provide fastening devices required for satisfactory installation and operation of hardware.
- 2.4.2 Attach items to masonry or concrete with expandable shields, lag screws, bolts or other fastening devices as required.
- 2.4.3 Fasteners to be stainless steel, with Phillips or Robertson heads, unless indicated otherwise in hardware schedule. Exposed fastenings to match existing hardware.

2.5 FINISHES

- 2.5.1 Metal finishes: Free from defects, clean, unstained, and of uniform colour for each type of finish required.
- 2.5.2 Finishes and categories: In accordance with ANSI/BHMA A156.18.

626	Satin chromium plated over nickel; base material brass/bronze; Category "A" brushed chrome.
628	Satin aluminum, clear anodized; base material aluminum; Category "A".
630	Satin stainless steel, base material STS 300 Series; Category "A".
689	Aluminum painted; base material any; Category "E" silver sprayed.

2.6 KEYING

- 2.6.1 During construction, supply temporary cylinders keyed alike, and compatible with locks.
- 2.6.2 Supply cylinders with cam/tail pieces suitable for specified lock function. Supply compression rings, trim collars, and blocking rings to suit.

3 Execution

3.1 EXAMINATION

- 3.1.1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects and discrepancies to TTC.
- 3.1.2 Replace and pay for defective hardware, including incorrectly selected hardware, remedial, and installation costs.
- 3.1.3 Commencement of Work means acceptance of existing Site conditions.

- | | | |
|---------|--|--|
| 3.2.1 | Install hardware in accordance with manufacturer's installation instructions and applicable codes and regulations. | |
| 3.2.2 | Mount hardware measured from finished floor to centre of hardware, unless indicated otherwise: | |
| 3.2.2.1 | Top hinge: | 250 mm from head of door to top of hinge. |
| 3.2.2.2 | Bottom hinge: | 265 mm from finished floor to bottom of hinge. |
| 3.2.2.3 | Intermediate hinge: | Centred between top and bottom hinge. |
| 3.2.2.4 | Locksets, latchsets: | 1000 mm. |

3.3 FIELD QUALITY CONTROL

- 3.3.1 Adjust door hardware for smooth operation, and weather-tightness.
- 3.3.2 Ensure hardware supplied is correctly installed and correct for Work as constructed.

END OF SECTION

1 General

1.1 SECTION INCLUDES

1.1.1 Labour, Products, equipment, and services necessary for tiling Work in accordance with the Contract Documents.

1.2 REFERENCES

1.2.1 ANSI A108/A118/A136.1, American National Standard Specification for the Installation of Ceramic Tile. This publication is a compilation of voluntary standards for the installation of ceramic tile. American National Standard Specifications A108.01, .02, .1A, .1B, .1C, .4, .5, .6, .8, .9, .10, .11, .12, .13, .14, .15, .16 and .17 define installation of ceramic tile. A118.1, .3, .4, .5, .6, .7, .8, .9, .10, .11, .12, .13, .15 and A136 define test methods and physical properties for ceramic tile installation materials.

1.2.2 ANSI A137.1, American National Standards Specifications for Ceramic Tile.

1.2.3 ASTM C144, Standard Specification for Aggregate for Masonry Mortar.

1.2.4 ASTM C373, Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products, Ceramic Tiles, and Glass Tiles.

1.2.5 ***ASTM C627, Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson Type Floor Tester.***

1.2.6 ASTM C920, Standard Specification for Elastomeric Joint Sealants.

1.2.7 CSA A3000, Cementitious Materials Compendium.

1.2.8 DCOF, Dynamic Coefficient of Friction.

1.2.9 ISO 13006, Ceramic Tiles -- Definitions, Classification, Characteristics and Marking.

1.2.10 ISO 13007, Ceramic Tiles -- Grouts and Adhesives.

1.2.11 TTMAC, Terrazzo, Tile and Marble Association of Canada, Specification Guide 09 30 00 Tile Installation Manual.

1.2.12 TTMAC, Terrazzo, Tile and Marble Association of Canada, Hard Surface Maintenance Guide.

1.3 SUBMITTALS

1.3.1 Submit in accordance with Section 01 33 00.

1.3.2 Product Data, Shop Drawings, and Documents Package:

1.3.2.1 Product Data:

1.3.2.1.1 Submit manufacturer's Product data including:

1.3.2.1.1.1 Cut sheets.

1.3.2.1.1.2 Technical data.

1.3.2.1.1.3 Manufacturer's installation and instruction guidelines.

1.3.2.1.1.4 Design data and test report.

1.3.2.1.1.5 Requirements for transportation, storage, and handling of Products and materials.

1.3.2.2 Shop Drawings:

1.3.2.2.1 Submit Shop Drawings in accordance with Section 01 33 23 indicating:

1.3.2.2.1.1 Tile layout, patterns, colour arrangement, and control joint locations.

1.3.2.2.1.2 Perimeter conditions, junctions with dissimilar materials.

1.3.2.2.1.3 Setting details.

1.3.2.3 Documentation:

1.3.2.3.1 Submit installer's proof of membership in good standing with TTMAC.

1.3.2.3.2 Submit certification for each type of floor tile that dynamic coefficient of friction (DCOF) is minimum 0.42 tested in accordance with ANSI A137.1.

1.3.3 Samples:

1.3.3.1 Submit duplicate sample panels of each type, class, finish, colour, texture, size, and pattern of tile.

1.4 SITE CONDITIONS

1.4.1 Do not install Work of this Section outside of the following environmental ranges without TTC and Product manufacturer's written acceptance:

1.4.1.1 Ambient air and surface temperature: 12°C to 38°C.

1.4.1.2 Install epoxy mortar and grout between 18°C and 35°C in accordance with manufacturer's recommendations.

1.4.1.3 Curing time: Maintain temperature range for 48 hours before, during, and after installation.

1.4.1.4 Install temporary protection and facilities to maintain Product manufacturer's specified environmental requirements for 7 Days before, during, and 7 Days after installation.

1.4.1.5 Ventilation: Provide and maintain adequate ventilation or supplemental equipment where Work of this Section may generate volatile gases or where there is risk of raising relative humidity levels that could damage building finishes and assemblies.

1.5 MAINTENANCE MATERIALS

1.5.1 Submit maintenance materials to TTC, 5% of gross area covered.

1.5.2 Allow proportionately for each pattern and type of tile specified and part of same Production run as installed Products.

1.5.3 Store maintenance Products as directed by TTC.

1.5.3.1 Store packaged or bundled Products in original and undamaged condition.

1.5.3.2 Retain original manufacturer's seals and labels intact. Do not remove from packaging or bundling until required for repairs or maintenance.

1.5.3.3 Provide estimated storage area requirements.

2 Products

2.1 PERFORMANCE REQUIREMENTS

- 2.1.1 Slip resistance: Provide materials having minimum DCOF 0.42 dry/wet in accordance with ANSI A137.1, when tested to BOT 3000 Digital Tribometer.
- 2.1.2 Floor level tolerances: Provide materials to attain floor level tolerances required by this Section. Calculate quantity of materials based on difference between specified tolerance and initial tolerance in accordance with Section 03 30 00. Make measurements in same manner as used in Section 03 30 00.

2.2 FLOOR TILES

2.2.1 Porcelain Tile (CT 2) and (CT-2A):

- 2.2.1.1 In accordance with ANSI A137.1.
- 2.2.1.1.1 Surface hardness: MOHS minimum 7.
- 2.2.1.1.2 Dimensional variation:
- 2.2.1.1.2.1 Length or width: $\pm 0.6\%$.
- 2.2.1.1.2.2 Edge straightness: $\pm 0.6\%$.
- 2.2.1.1.2.3 Evenness: $\pm 0.5\%$.
- 2.2.1.1.2.4 Thickness: $\pm 5.0\%$.
- 2.2.1.1.3 Dimensions: as per Drawings.
- 2.2.1.1.4 Cove base (CT2A): 300 mm x 200 mm high, bevelled top edge, colour to match tile.
- 2.2.1.1.5 Finish: **Unglazed**.
- 2.2.1.1.6 Accessories: Available accessory trim pieces as required to complete installation.
- 2.2.1.1.7 Mortar: Epoxy adhesive **or Thinset Mortar**.
- 2.2.1.1.8 Grout: **Epoxy**.
- 2.2.1.1.9 Grout joint width: 6 mm.
- 2.2.1.1.10 Colour: to be selected by Consultant.
- 2.2.1.1.11 Edges: Square.
- 2.2.1.1.12 Tile and manufacturer:
- 2.2.1.1.12.1 ***Omnia series as distributed by Olympia Tile International Inc. or approved equivalent by OSI Hard Surfaces.***

2.3 WALL TILES

2.3.1 Porcelain Tile (CT-1A):

- 2.3.1.1 In accordance with ANSI A137.1.
- 2.3.1.1.1 Dimensional variation:
- 2.3.1.1.1.1 Length or width: $\pm 0.6\%$.
- 2.3.1.1.1.2 Edge straightness: $\pm 0.6\%$.
- 2.3.1.1.1.3 Evenness: $\pm 0.5\%$.
- 2.3.1.1.1.4 Thickness: $\pm 5.0\%$.

- 2.3.1.1.2 Dimensions: 300 mm x 300 mm.
- 2.3.1.1.3 Tile colour: to be selected by Consultant.
- 2.3.1.1.4 Finish: ***to be selected by Consultant.***
- 2.3.1.1.5 Mortar: Thinset mortar.
- 2.3.1.1.6 Grout: Sanded.
- 2.3.1.1.7 Grout joint width: 3 mm.
- 2.3.1.1.8 Grout colour: to match tile.
- 2.3.1.1.9 Accessories: Available accessory trim pieces as required to complete installation.
- 2.3.1.1.10 Tile and manufacturer:
- 2.3.1.1.10.1 ***Unicolour series as distributed by Olympia Tile International Inc. or approved equivalent by OSI Hard Surfaces.***

2.3.2 Porcelain Tile (CT-1B):

- 2.3.2.1 In accordance with ANSI A137.1.
- 2.3.2.1.1 Dimensional variation:
 - 2.3.2.1.1.1 Length or width: $\pm 0.6\%$.
 - 2.3.2.1.1.2 Edge straightness: $\pm 0.6\%$.
 - 2.3.2.1.1.3 Evenness: $\pm 0.5\%$.
 - 2.3.2.1.1.4 Thickness: $\pm 5.0\%$.
- 2.3.2.1.2 Dimensions: 300 mm x 300 mm.
- 2.3.2.1.3 Tile colour: to be selected by Consultant.
- 2.3.2.1.4 Finish: ***to be selected by Consultant.***
- 2.3.2.1.5 Mortar: Thinset mortar.
- 2.3.2.1.6 Grout: Sanded.
- 2.3.2.1.7 Grout joint width: 3 mm.
- 2.3.2.1.8 Grout colour: to match tile.
- 2.3.2.1.9 Accessories: Available accessory trim pieces as required to complete installation.
- 2.3.2.1.10 Tile and manufacturer:
- 2.3.2.1.10.1 ***Unicolour series as distributed by Olympia Tile International Inc. or approved equivalent by OSI Hard Surfaces.***

2.3.3 Porcelain Tile (CT-1C):

- 2.3.3.1 In accordance with ANSI A137.1.
- 2.3.3.1.1 Dimensional variation:
 - 2.3.3.1.1.1 Length or width: $\pm 0.6\%$.
 - 2.3.3.1.1.2 Edge straightness: $\pm 0.6\%$.
 - 2.3.3.1.1.3 Evenness: $\pm 0.5\%$.
 - 2.3.3.1.1.4 Thickness: $\pm 5.0\%$.

- 2.3.3.1.2 Dimensions: 300 mm x 300 mm.
- 2.3.3.1.3 Tile colour: to be selected by Consultant.
- 2.3.3.1.4 Finish: ***to be selected by Consultant.***
- 2.3.3.1.5 Mortar: Thinset mortar.
- 2.3.3.1.6 Grout: Sanded.
- 2.3.3.1.7 Grout joint width: 3 mm.
- 2.3.3.1.8 Grout colour: to match tile.
- 2.3.3.1.9 Accessories: Available accessory trim pieces as required to complete installation.
- 2.3.3.1.10 Tile and manufacturer:
- 2.3.3.1.10.1 ***Unicolour series as distributed by Olympia Tile International Inc. or approved equivalent by OSI Hard Surfaces.***

2.4 SETTING MATERIALS

2.4.1 Mortar Systems:

2.4.1.1 Epoxy Adhesive:

- 2.4.1.1.1 In accordance with ANSI A118.3 and ISO 13007 R2, chemical resistant, 100% solids epoxy with high temperature resistance, and meeting the following minimum physical requirements:
 - 2.4.1.1.1.1 Compressive strength: >34.4 MPa.
 - 2.4.1.1.1.2 Shear bond strength: >8.6 MPa.
 - 2.4.1.1.1.3 Thermal shock resistance: >4.1 MPa.
 - 2.4.1.1.1.4 Tensile strength: >9.6 MPa.
 - 2.4.1.1.1.5 Shrinkage: 0-0.1%.
 - 2.4.1.1.1.6 Total VOC content: <0.05 mg/m³.
 - 2.4.1.1.1.7 ISO 13007: R2.
 - 2.4.1.1.1.8 Manufacturer's Product(s):
 - 2.4.1.1.1.8.1 Latapoxy 300 by Laticrete International Inc.
 - 2.4.1.1.1.8.2 Kerapoxy by Mapei Inc.
 - 2.4.1.1.1.8.3 TA-440 AccuColor EFX by TEC Inc.
 - 2.4.1.1.1.8.4 100 Flex Epoxy Grout by Flextile Ltd.

2.4.1.2 Latex or Polymer Modified, Thinset Mortar:

- 2.4.1.2.1 Location: Dry and moderate traffic interiors tile size 300 mm x 300 mm or less.
- 2.4.1.2.2 In accordance with ANSI A118.4, ANSI A118.11, and ISO 13007 C2ES1P2.
- 2.4.1.2.3 Manufacturer's Product(s):
 - 2.4.1.2.3.1 #52 Versatile by Flextile Ltd.
 - 2.4.1.2.3.2 Ultraflex 3 by Mapei Inc.
 - 2.4.1.2.3.3 TA-392 (Gray)/TA-393 (White) SuperFlex Mortar by TEC Inc.

2.4.1.2.3.4 4-XLT Medium/Thin-set Mortar by Laticrete International Inc.

2.5 CRACK SUPPRESSION MEMBRANE

- 2.5.1 Crack suppression membrane: Thin, cold applied, single-component liquid, and load bearing.
- 2.5.2 Reinforcing fabric: Non-woven and rot-proof, specifically intended for crack suppression.
- 2.5.3 Materials: Non-toxic, non-flammable, and non-hazardous during storage, mixing, application, and when cured.
- 2.5.4 Physical requirements in accordance with the following:
 - 2.5.4.1 Elongation @ break (in accordance with ASTM D751): 20 - 30%.
 - 2.5.4.2 System crack resistance (in accordance with ANSI A118.12): Pass (High).
 - 2.5.4.3 Seven Day tensile strength (in accordance with ANSI A118.10): 1.8 MPa – 2.0 MPa.
 - 2.5.4.4 Seven Day shear bond strength (in accordance with ANSI A118.10): 1.4 MPa - 1.9 MPa.
 - 2.5.4.5 Twenty-eight Day shear bond strength (in accordance with ANSI A118.4): >1.48 MPa - 2.4 MPa.
 - 2.5.4.6 Service rating (in accordance with ASTM C627): Extra heavy.
 - 2.5.4.7 Total VOC content: <0.05 mg/m³.
 - 2.5.4.8 Manufacturer's Product(s):
 - 2.5.4.8.1 Hydroban by Laticrete International Inc.
 - 2.5.4.8.2 1000 Flexilastic Crack Isolation by Flextile Ltd.
 - 2.5.4.8.3 Mapeguard 2 by Mapei Inc.
 - 2.5.4.8.4 TA-324 Triple Flex - Waterproofing Crack Isolation Membrane by TEC Inc.

2.6 GROUTS AND SEALANTS

2.6.1 Grout, Sanded (Floors and Bases):

- 2.6.1.1 Joint width: 5 mm to 10 mm in accordance with ANSI A118.7.
- 2.6.1.2 Manufacturer's Product(s):
 - 2.6.1.2.1 600 Polymer Modified Sanded Floor Grout by Flextile Ltd.
 - 2.6.1.2.2 Sanded Ker-200 Dry-Polymer Modified Floor Grout by Mapei Inc.
 - 2.6.1.2.3 TA-650 AccuColor Premium Sanded Grout with TA-869 Acrylic Grout Additive by TEC Inc.
 - 2.6.1.2.4 Permacolor Grout 2500 Series by Laticrete International Inc.

2.6.2 Cement Grout, Sanded (Walls):

- 2.6.2.1 Joint width: Over 3 mm in accordance with ANSI A118.6 and ISO 13007 CG2W.
- 2.6.2.2 Manufacturer's Product(s):
 - 2.6.2.2.1 Keracolor S by Mapei Inc.
 - 2.6.2.2.2 TEC TA 650, Accucolor Premium Sanded Grout with TA 869 Acrylic Grout Additive by TEC Inc.

2.6.2.2.3 Permacolor Grout 2500 Series by Laticrete International Inc.

2.6.2.2.4 Flextile 600 by Flextile Ltd.

2.6.3 Grout Colour:

2.6.3.1 To match tiles from manufacturer's full colour range.

2.6.4 Sealants:

2.6.4.1 Joint Backing: Refer to Section 07 92 00.

2.7 CEMENT LEVELLING BED

2.7.1 Mix:

2.7.1.1 One part Portland cement.

2.7.1.2 Four parts sand.

2.7.1.3 One part water (including polymer additive), adjusted for water volume depending on moisture content of sand.

2.7.1.4 Include polymer additive where required by the TTMAC detail.

2.7.1.5 Manufacturer's Product(s):

2.7.1.5.1 4 to 1 mix by Mapei Inc.

2.7.1.5.2 Flextile 44 by Flextile Ltd.

2.7.1.5.3 Laticrete levelling bed: 3701 Fortified Mortar Bed by Laticrete International Inc. mixed with water only and in accordance with manufacturer's instructions.

2.8 PENETRATING SEALER

2.8.1 Clear, water based, non-visible after application.

2.8.1.1 Manufacturer's Product(s):

2.8.1.1.1 511H₂O Plus by Miracle Sealants Company.

2.8.1.1.2 Ultracare Penetrating Plus by Mapei Inc.

2.9 ACCESSORIES:

2.9.1 Divider strips for floor and base: Refer to Section 09 66 13.

3 Execution

3.1 EXAMINATION

3.1.1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to TTC.

3.1.2 Commencement of Work means acceptance of existing conditions.

3.2 SURFACE PREPARATION

3.2.1 Shot blast existing concrete surface floors.

3.2.2 Clean and dry surfaces thoroughly.

3.2.3 Neutralize trace of strong acids or alkali from substrate.

3.2.4 On masonry walls and concrete wall curbs where tiles and bases are required, apply levelling coat prior to application of thinset mortar.

- 3.2.5 Concrete slabs where existing flooring finishes are demolished and where new tile Work is required, apply levelling coat as required to ensure level substrate prior to mortar application.
- 3.2.6 Carefully plan layout of tile Work to provide symmetrical pattern and so that no tile is less than half full size. Minimize cutting.
- 3.2.7 Thoroughly clean back of tiles immediately prior to installation.
- 3.3 CRACK ISOLATION MEMBRANE**
- 3.3.1 Over cracks, in concrete floor slab install layer of crack suppression membrane in accordance with manufacturer's recommendation.
- 3.4 LEVELLING BED**
- 3.4.1 Install levelling bed on uneven substrate surfaces, level, and plumb substrates in accordance with following tolerances:
- 3.4.1.1 Vertical surfaces: Maximum 3 mm in 2.4 m.
- 3.4.1.2 Horizontal surfaces: 6 mm in 3 m from finished levels of surface, or better. On platform level, slope 2% with crown at centre line of double sided platform.
- 3.4.2 Clean structural substrate control joints and blow-clean with compressed air. Grout fill control joints flush to slab with levelling bed.
- 3.5 INSTALLATION**
- 3.5.1 Lay out tile Work in accordance with reviewed Shop Drawings.
- 3.5.2 Lay out Work to produce symmetrical pattern with minimum amount of cutting. Ensure cut tile at room perimeter minimum 1/2 of full size.
- 3.5.3 Do not start Work until Work of other trades, which goes through or is in space behind tile or tile backing walls, has been completed.
- 3.5.4 Install tiles in accordance with manufacturer's recommendation and TTMAC, Tile Installation Manual. If conflict occurs, manufacturer's installation recommendations govern over TTMAC Tile Installation Manual.
- 3.5.5 Mix and install mortar bed, adhesive and grout components in accordance with manufacturer's recommended proportions and methods, to achieve maximum bond strength.
- 3.5.6 Apply mortar bed and tile Work to non-frozen, frost-free surface.
- 3.5.7 Place as large area as can be covered with tile before mortar or adhesive has reached its initial set in one operation. When more mortar or adhesive has been spread than can be properly covered within setting period, cut back unfinished portion to clean, bevelled edge and remove.
- 3.5.8 If necessary, back butter tiles to ensure minimum 95% coverage between tile, setting material, and substrate. Twist and slide tiles into position.
- 3.5.9 Lay out individual tiles to straight edge at regular intervals. Install tiles to pattern layouts as indicated.
- 3.5.10 Set tiles in place and rap or beat with beating block as necessary to ensure proper bond and to level surface of tile.

- 3.5.11 At locations where tiles of different thickness are required on same elevation, provide thicker setting bed for thinner tiles to ensure tiles faces are installed flush.
- 3.5.12 Align tile for uniform joints and allow to set until firm.
- 3.5.13 Adjust joints between tiles to be uniform, plumb, straight, even, and true with adjacent tiles flush. Align grout joints in both directions unless indicated otherwise.
- 3.5.14 Align floor, base, and wall tile grout joints where tile lengths are same.
- 3.5.15 Install tile accessory fittings for complete and fully coordinated tile assembly.
- 3.5.16 Install wall tile full height of wall unless indicated otherwise.
- 3.5.17 Make necessary adjustments and drill, cut, and fit to suit adjacent Work of other trades.
- 3.5.18 Cut and fit tile units around corners, fixtures, drains, and other built-in objects to maintain uniform joint appearance. Make cut edges smooth, even, and free from chipping. Chipped and broken edges and edges resulting from splitting not permitted. Cut units to suit required dimensions, installation, and Site conditions.
- 3.5.19 Extend tile behind fitments and other wall mounted units.
- 3.5.20 Form intersections, corners, returns, and bases accurately.
- 3.5.21 Make joints watertight without voids, cracks, excess mortar or grout.
- 3.5.22 Make internal angles square, external angles bullnosed. Use bullnose edged tiles for bullnose effect.
- 3.5.23 Use bullnose edged tiles where edges of tiles at terminations are left exposed.
- 3.5.24 Clean excess mortar from surface of tile with wet cloth or sponge while mortar fresh.
- 3.5.25 Allow minimum 4 hours after installation of tiles with fastset mortar to cure before grouting.
- 3.5.26 Allow minimum 36 hours after installation of tiles with regular (not fastset) mortar before grouting.
- 3.5.27 Apply grout in accordance with grout manufacturer's recommendation to produce watertight, filled joints without voids, cracks, and excess grout. Thoroughly compact and tool floor grout.
- 3.5.28 Except for control joints and around projections through tile Work, fill joints solid with grout. Fill bevelled and cushion edge tiles joints to depth of bevel and cushion. Fill square edged tile joints flush with surface of tiles.
- 3.5.29 Remove excess grout by wiping diagonally across joints with damp, clean sponge. Change water with clean water often.
- 3.5.30 Thoroughly clean installed tile surfaces after installation and grouting has cured, and immediately prior to applying sealer.
- 3.5.31 Ensure completed Work is free from broken, damaged, and other faulty tiles.
- 3.5.32 Ensure top surface of installed tiles are flush with each adjacent tile and that entire surface of installed tiles are plumb, level and even throughout.
- 3.5.33 If existing tiles, those to remain, are damaged during demolition and removal Work, provide new tiles to match existing tiles. Prepare substrate and install new tiles as specified for new Work of this Section.

3.5.34 Provide adequate protection of completed tiled surfaces to prevent damage by other trades until final completion of the Work.

3.5.35 Protect exposed edges of floor tile with same thickness as tile until adjoining floor finish installed.

3.6 CONTROL JOINTS

3.6.1 Continue control, construction and cold joints in structural substrate up through tile finish, and align with mortar joints where possible. Review joint locations on Site with TTC.

3.6.2 Install joint widths to match grout joint widths except where minimum width is indicated.

3.6.3 Follow control joint width for interior areas in accordance with TTMAC recommendations.

3.6.4 Install control joints in the following typical locations:

3.6.4.1 Aligned over structural beams.

3.6.4.2 At restraining perimeters such as walls and columns.

3.6.4.3 In accordance with reviewed Shop Drawings.

3.6.5 Seal control joints in accordance with Section 07 92 00.

3.7 JOINT BACKING AND TILE SEALANT

3.7.1 Provide caulking required for tile Work in accordance with sealant manufacturer's recommendation.

3.7.2 Install joint backing under sealant as necessary.

3.7.3 Caulk around piping, fittings, and other items extending through tiled surfaces.

3.7.4 Seal internal tile to tile junctions. Tool to smooth, flush surface, free from air bubbles, and contamination.

3.8 FIELD QUALITY CONTROL

3.8.1 Field testing: Conduct slip resistance testing in accordance with ANSI A137.1.

3.8.2 Prepare inspection report to TTC.

3.9 CLEANING

3.9.1 Clean and polish floor and wall tile after grout has cured in accordance with TTMAC recommendations in Hard Surface Maintenance Guide. Do not use acid for cleaning.

3.9.2 Repoint joints after cleaning as required to eliminate imperfections, repeat cleaning as required. Avoid scratching tile surfaces.

3.10 PROTECTION

3.10.1 Prevent traffic over tiled areas and protect tiled assemblies from weather, freezing, and water immersion for minimum 48 hours after final installation.

3.10.2 Prevent direct impact, vibration, and heavy hammering on adjacent and opposite walls for minimum 24 hours after final installation.

END OF SECTION