SIGN TYPE 6:

WASHROOM FOR SECONDARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND
  STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 6

DRAWN: CH DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1:2	DWG No. 8	REV 00

REV	DATE	DESCRIPTION	BY	CHKD

SIGN TYPE 7:

BARRIER FREE WASHROOM FOR SECONDARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND
  STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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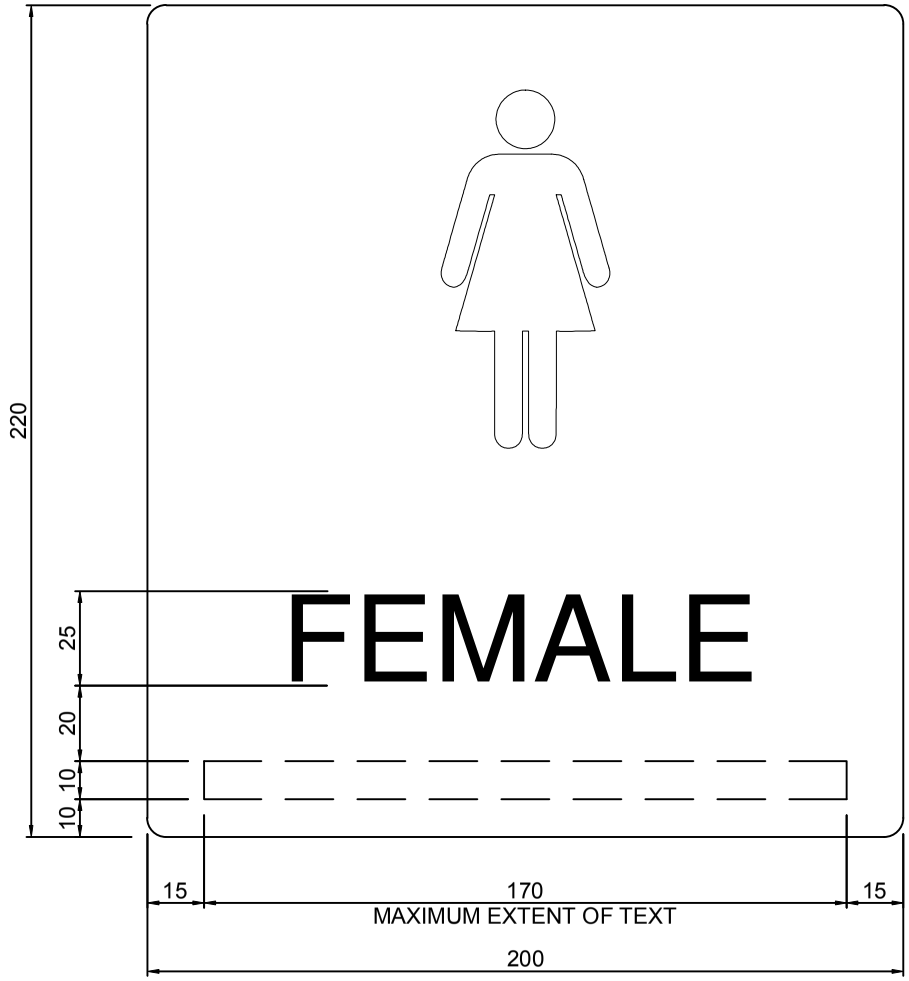
SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 7

DRAWN CH DATE MAY 2017	CHKD - DATE -	APPVD - DATE -
SCALE 1:2	DWG No. 9	REV 00

REV	DATE	DESCRIPTION	BY	CHKD



SIGN TYPE 8:

FEMALE STUDENT WASHROOM FOR SECONDARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND

STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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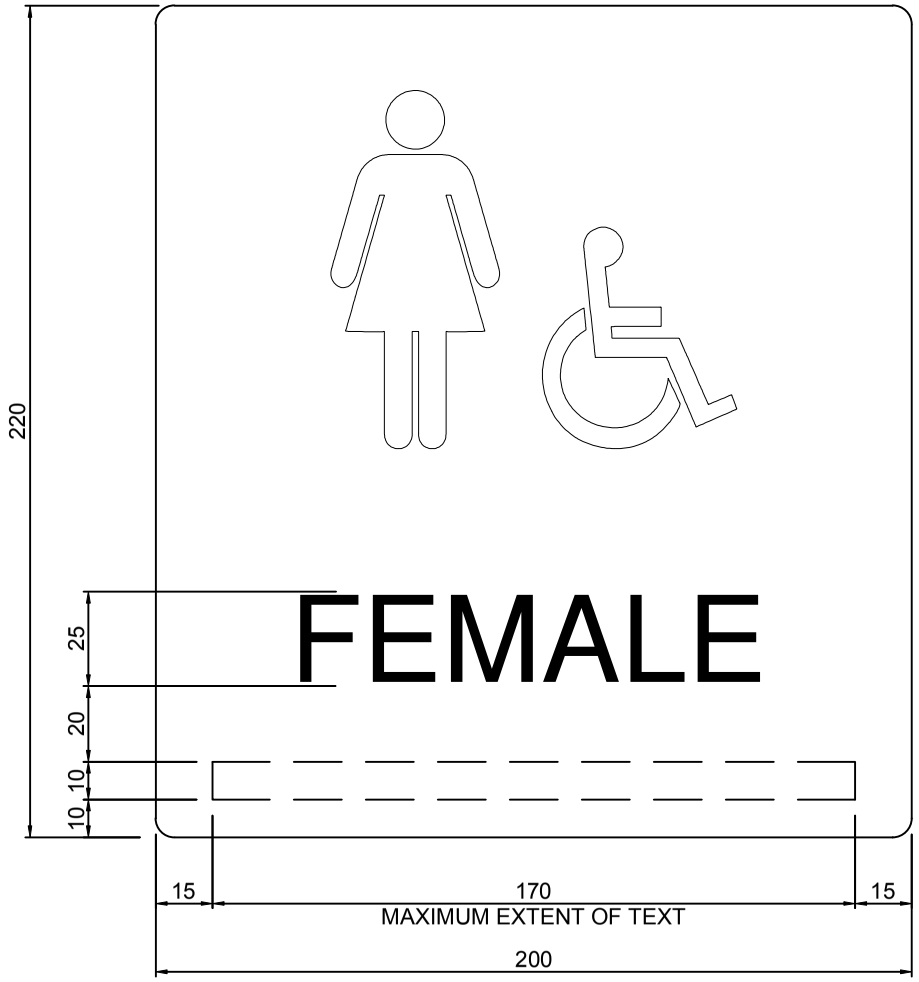
SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 8

DRAWN: CN DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1:2	DWG No. 10	REV 00

REV	DATE	DESCRIPTION	BY	CHKD



SIGN TYPE 9:

BARRIER FREE FEMALE STUDENT WASHROOM FOR SECONDARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND

STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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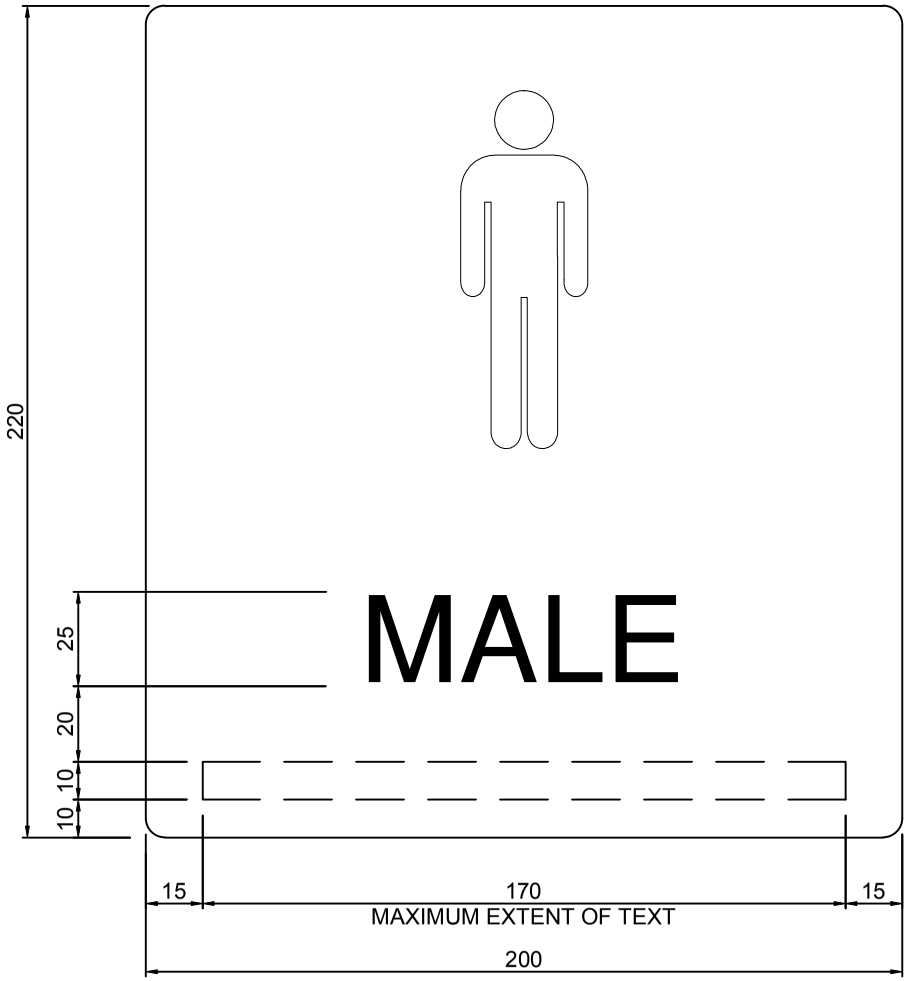
SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 9

DRAWN: CH DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1:2	DWG No. 11	REV 00

REV	DATE	DESCRIPTION	BY	CHKD



SIGN TYPE 10:

MALE STUDENT WASHROOM FOR SECONDARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND

STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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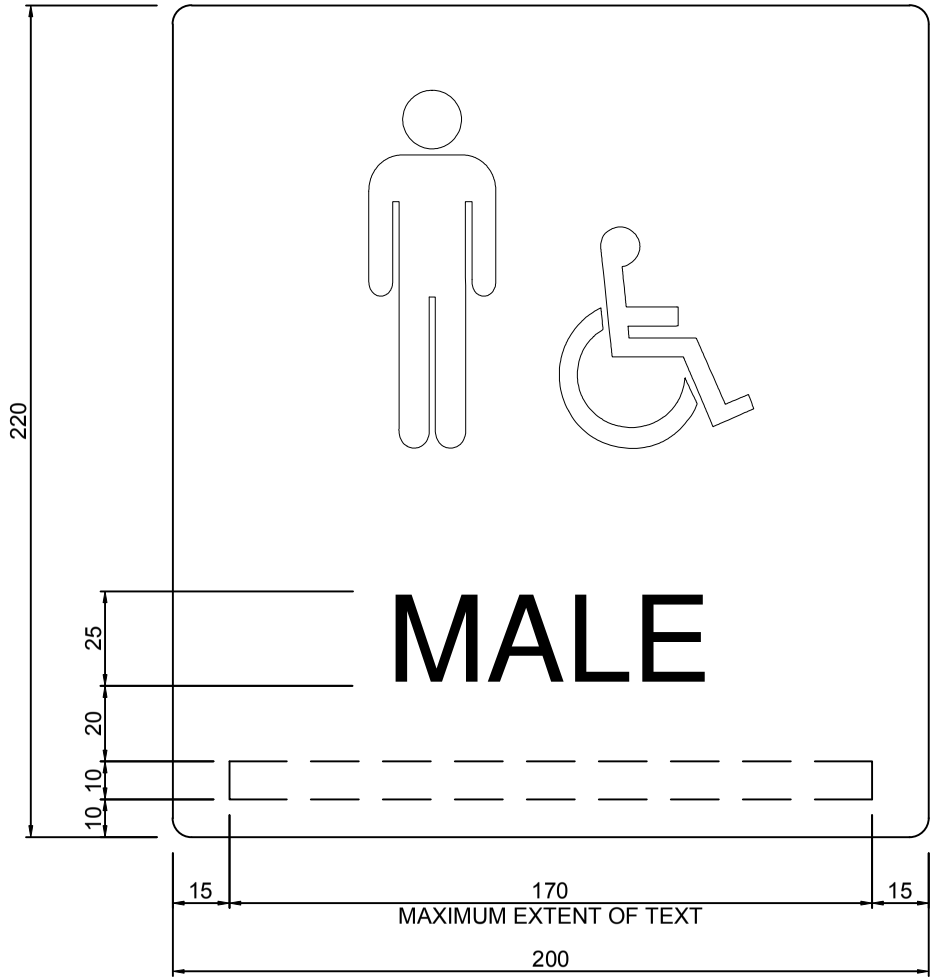
SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 10

DRAWN: CN DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1:2	DWG No. 12	REV 00

REV.	DATE	DESCRIPTION	BY	CHKD



SIGN TYPE 11:

BARRIER FREE MALE STUDENT WASHROOM FOR SECONDARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND

STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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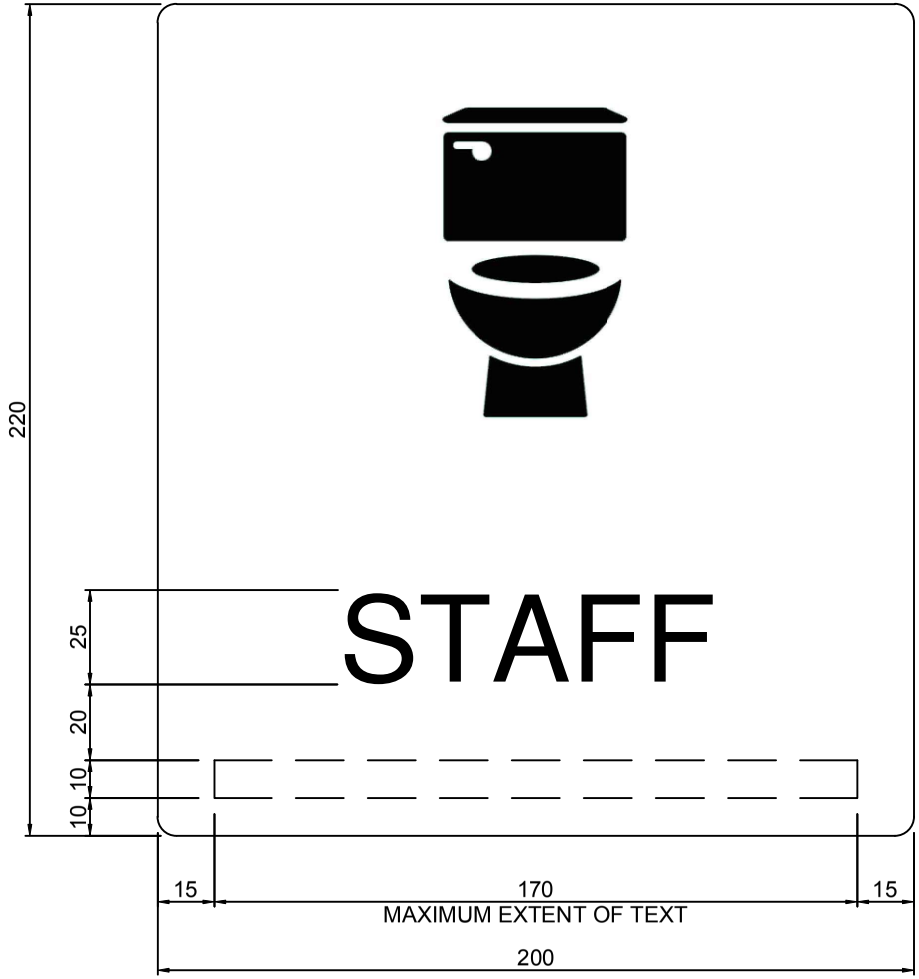
SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 11

DRAWN: CH DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1:2	DWG No. 13	REV 00

REV	DATE	DESCRIPTION	BY	CHKD



SIGN TYPE 12:

STAFF WASHROOM FOR SECONDARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND
  STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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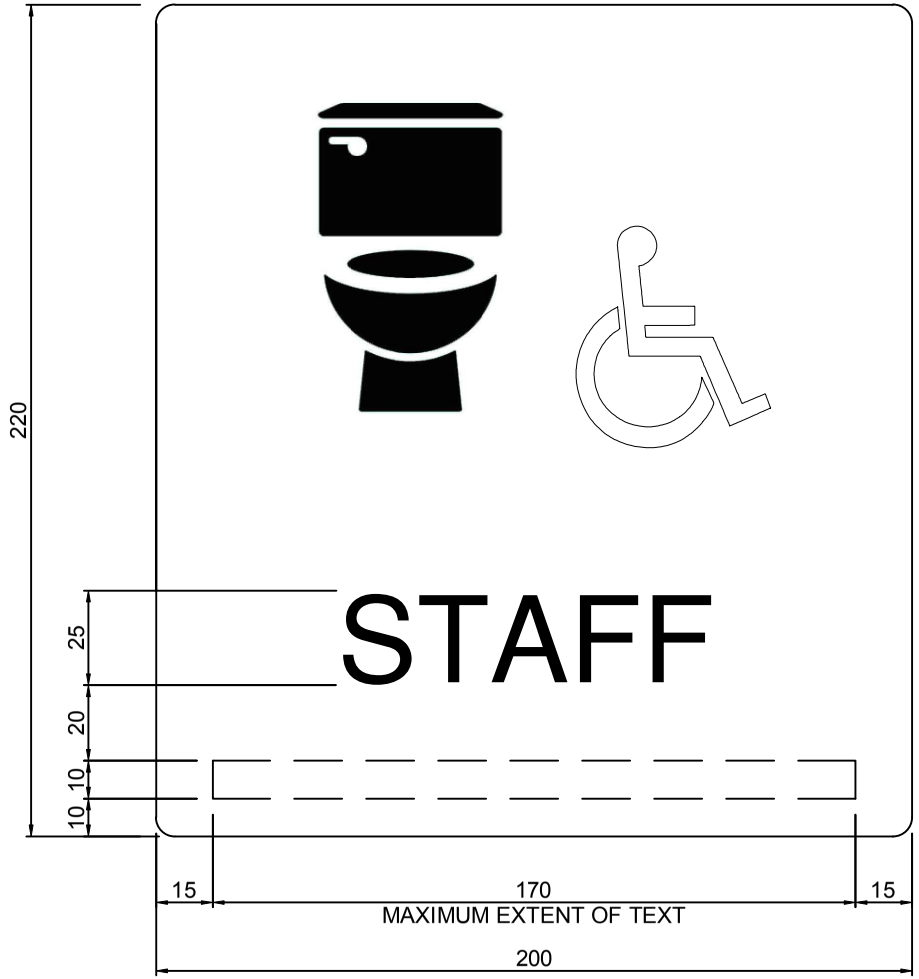
SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 12

DRAWN: CH DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1:2	DWG No. 14	REV 00

REV	DATE	DESCRIPTION	BY	CHKD



SIGN TYPE 13:

BARRIER FREE STAFF WASHROOM FOR SECONDARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND

STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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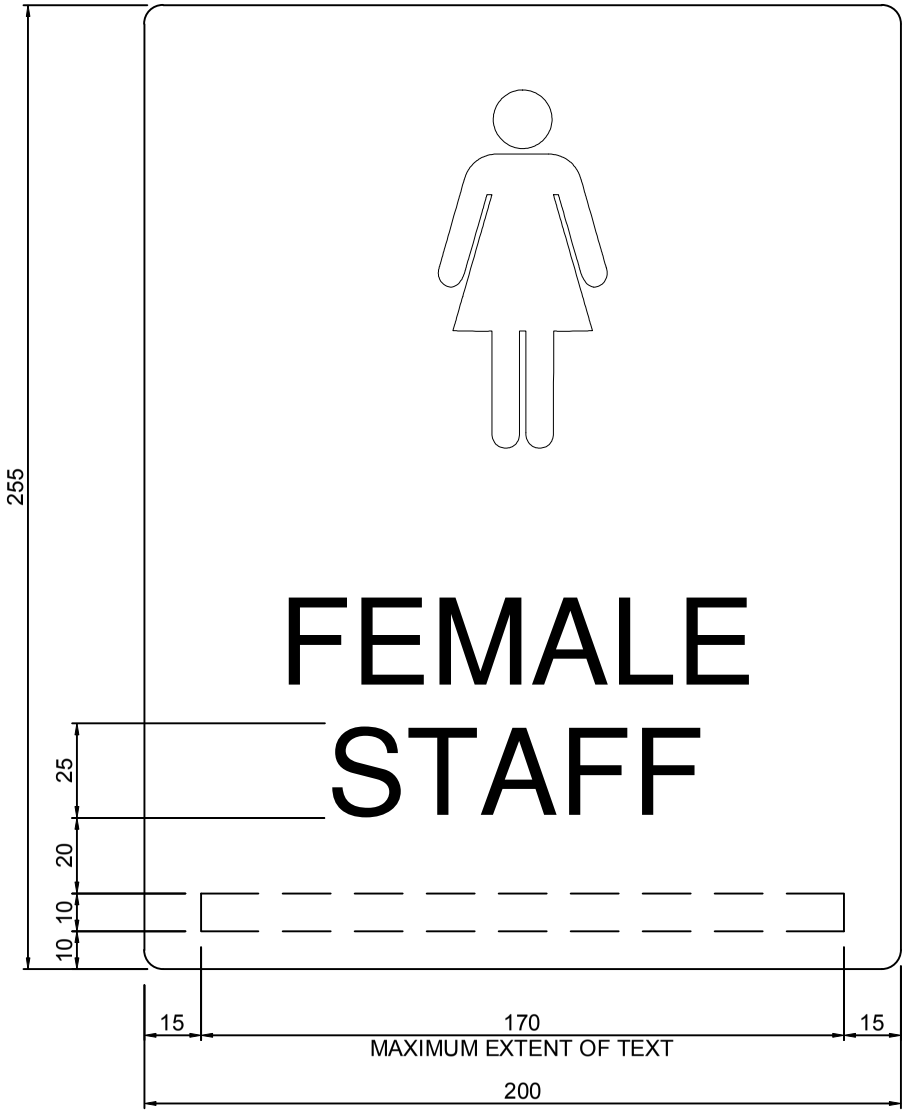
SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 13

DRAWN: CN DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1= 2	DWG No. 15	REV 00

REV	DATE	DESCRIPTION	BY	CHKD



SIGN TYPE 14:

FEMALE STAFF WASHROOM FOR SECONDARY AND ELEMENTARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND
  STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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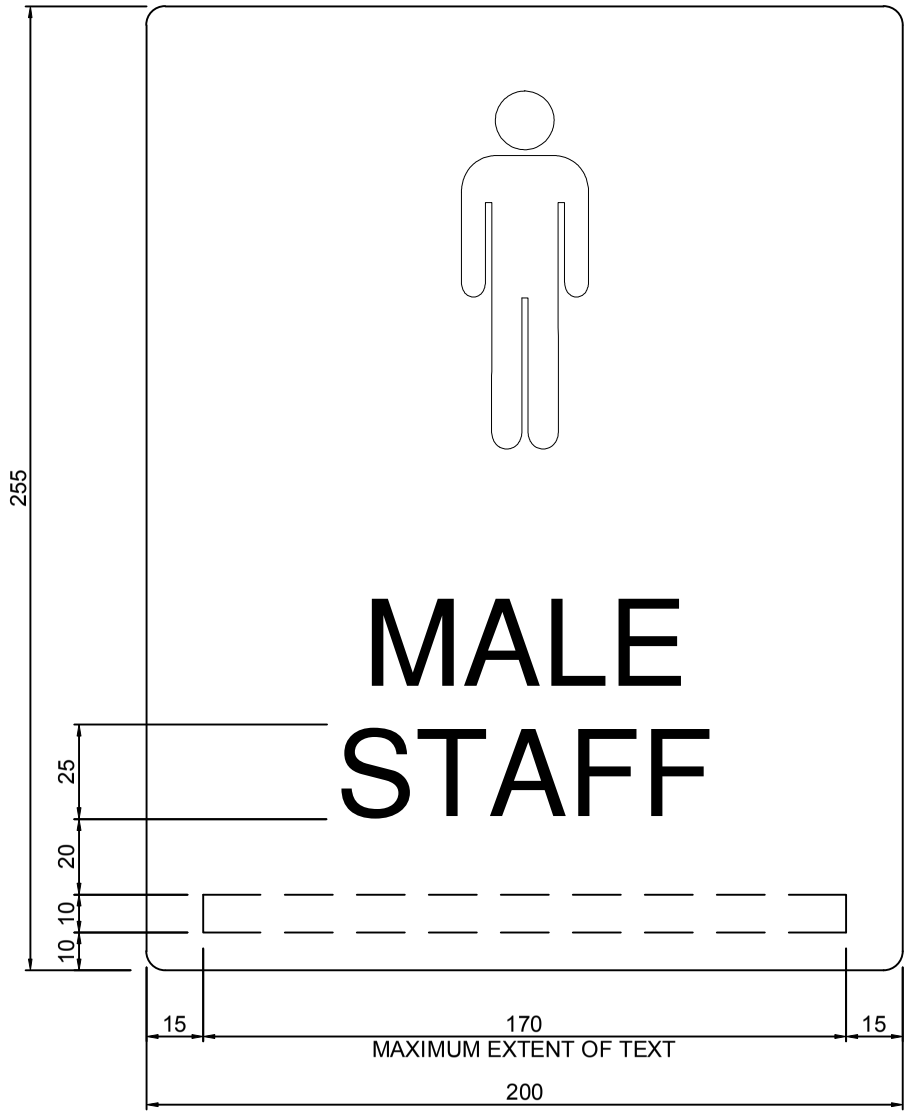
SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 14

DRAWN: CN DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1:2	DWG No. 16	REV 00

REV.	DATE	DESCRIPTION	BY	CHKD



SIGN TYPE 15:

MALE STAFF WASHROOM FOR SECONDARY AND ELEMENTARY SCHOOL LEVEL

SIGNAGE NOTES:

REVERSE PAINTED 3mm P95 LASER CUT ACRYLIC SIGN.
SIGN CHARACTERS TO BE FINISHED WITH A MATTE/ GLARE-FREE SURFACE.
SIGN TO BE ADHERED WITH PL PREMIUM CONTRACTORS ADHESIVE.

ALL CHARACTERS ARE REQUIRED TO BE TACTILE, WITH THE PROPERTIES BELOW:

- RAISED MINIMUM 0.8mm ABOVE SIGN SURFACE
- UPPERCASE LETTERING WITH HEIGHT BETWEEN 16mm TO 50mm
- SMOOTH AT THE CHARACTER EDGES
- ACCOMPANIED BY CONTRACTED GRADE 2 BRAILLE
- BRAILLE DOT HEIGHT MUST BE BETWEEN 0.6mm - 0.9mm
- HAVE A TONAL CONTRAST OF 70% MINIMUM WITH SIGN BACKGROUND
  STANDARD: BLACK LETTERING ON WHITE SIGN BACKGROUND (SEE NOTE 3.4)

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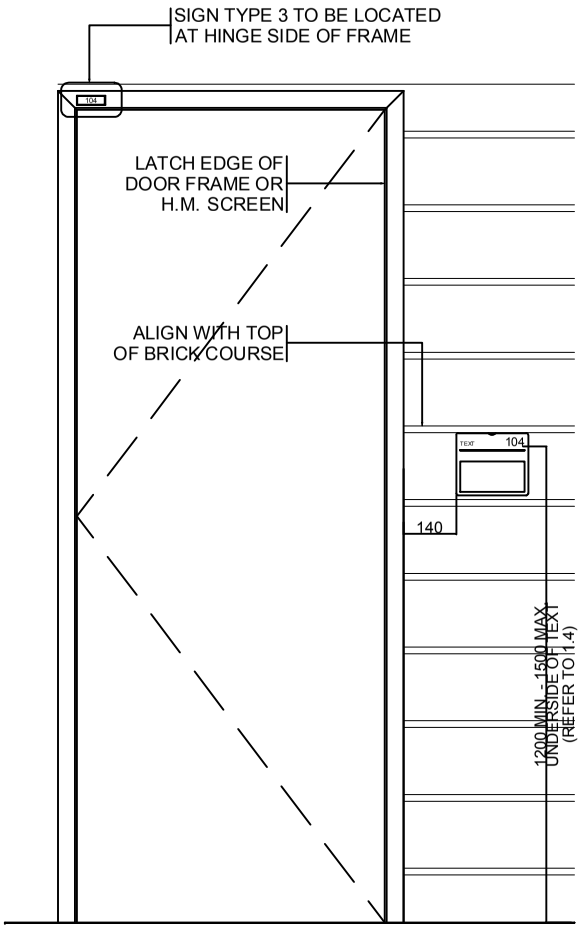
SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: INTERIOR SIGN TYPE 15

DRAWN: CN DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1:2	DWG No. 17	REV 00

REV.	DATE	DESCRIPTION	BY	CHKD



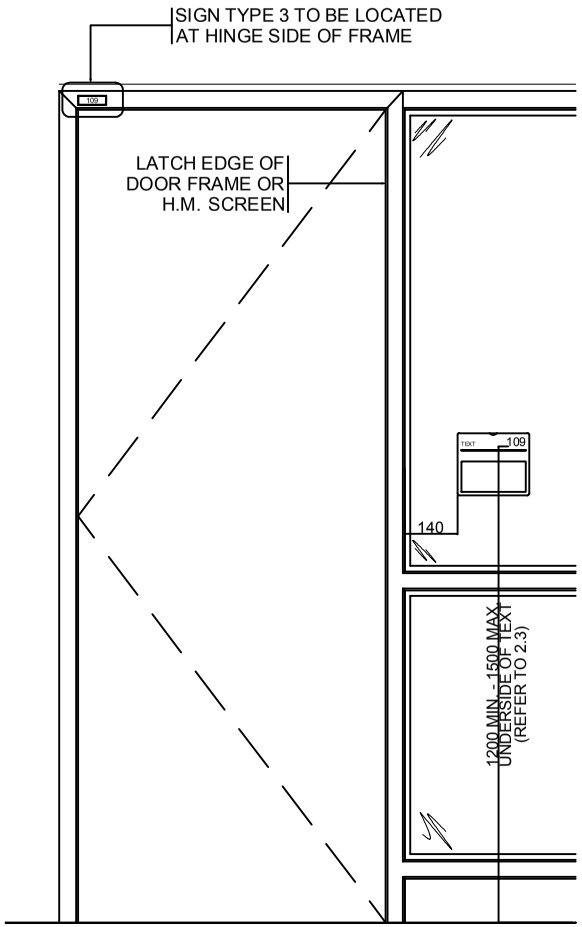
(A) WALL MOUNTED SIGN

1.1 SIGN IS TO BE LOCATED ON WALL ADJACENT TO LATCH SIDE OF DOOR.

1.2 WHERE THERE IS NO WALL SPACE ADJACENT TO THE LATCH SIDE OF THE DOOR, SIGN TO BE LOCATED ON NEAREST ADJACENT WALL.

1.3 IN THE CASE OF DOUBLE DOORS, THE SIGN SHOULD BE MOUNTED TO THE INACTIVE DOOR. IF BOTH DOORS OPEN, THE SIGN SHOULD BE MOUNTED TO THE RIGHT OF THE RIGHT HAND IF THERE IS NO ROOM TO THE RIGHT, THE SIGN CAN BE MOUNTED ON THE NEAREST ADJACENT WALL.

1.4 BASELINES OF RAISED CHARACTERS SHALL BE LOCATED BETWEEN 1200mm AND 1500mm ABOVE FINISHED FLOOR.



(B) GLASS MOUNTED SIGN

2.1 SIGN IS TO BE LOCATED AS SHOWN ON GLAZED SIDELIGHT, WHEN NOTED IN DOOR SCHEDULE, WHERE NO ADJACENT WALL IS AVAILABLE.

2.2 WHERE THIS IS REQUIRED, PROVIDE BACKING PANEL FOR OPPOSITE SIDE OF GLASS. BACKING PANEL TO BE FINISHED TO MATCH SIGN MATERIAL.

2.3 BASELINES OF RAISED CHARACTERS SHALL BE LOCATED BETWEEN 1200mm AND 1500mm ABOVE FINISHED FLOOR.

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SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE: MOUNTING DETAILS

DRAWN: CN DATE: MAY 2017	CHKD: - DATE: -	APPVD: - DATE: -
SCALE: 1:20	DWG No. 19	REV 00

REV	DATE	DESCRIPTION	BY	CHKD

3.0 SUMMARY OF TYPOGRAPHY FOR TACTILE SIGNS:

3.1 HEIGHT FOR TACTILE INFORMATION:

- MINIMUM HEIGHT REQUIREMENT OF 16 mm
- MAXIMUM HEIGHT REQUIREMENT OF 50 mm

3.2 ACCEPTABLE TACTILE FONTS:

- TACTILE SHOULD BE ALL UPPERCASE
- RAISED MINIMUM OF 0.8 mm ABOVE THE SIGN SURFACE
- CHARACTERS SHOULD NOT BE ITALIC, OBLIQUE, SCRIPT OR HIGHLY DECORATIVE
- CHARACTERS SHOULD HAVE A FONT STYLE OF SANS SERIF

3.3 SPACING FOR MULTI-LINE TEXT:

- SPACING BETWEEN LINES OF TEXT SHOULD BE NO LESS THAN 135% OF THE CORRESPONDING TEXT HEIGHT (MEASURED FROM BASELINE TO BASELINE)
- SPACING BETWEEN LINES OF TEXT SHOULD BE NO GREATER THAN 170% OF THE CORRESPONDING TEXT HEIGHT (MEASURED FROM BASELINE TO BASELINE)

3.4 COLOUR SCHEME STANDARD:

- BLACK LETTERING ON A WHITE SIGN BACKGROUND

4.0 SUMMARY OF BRAILLE SPECIFICATIONS:

- MUST BE GRADE II WITH CONTRACTIONS
- SHAPE OF BRAILLE CHARACTERS MUST ALWAYS BE ROUNDED
- BRAILLE MUST BE PLACED DIRECTLY BELOW CORRESPONDING RAISED CHARACTERS
- BRAILLE IS TO BE PLACED BELOW ALL TEXT, IF MULTI-LINED, AND SEPARATED 10 mm FROM ANY OTHER TACTILE CHARACTERS
- SHOULD BE SEPARATED 10 mm MINIMUM FROM RAISED BOARDERS AND DECORATIVE ELEMENTS
- MUST ALWAYS BE LOWERCASE
- UPPERCASE CHARACTERS SHOULD ONLY BE USED FOR THE FIRST WORD AT THE BEGINNING OF A SENTENCE, NAMES, PROPER NOUNS, INITIALS, ACRONYMS, AND INDIVIDUAL LETTERS OF THE ALPHABET

5.0 SUMMARY OF LOCATION OF PERMANENT ROOM SIGNS:

5.1 MOUNTING AREA:

- MOST OFTEN, SIGN SHOULD BE MOUNTED ON THE STRIKE SIDE OF THE DOOR
- IF THERE IS NO ROOM, SIGN CAN BE PLACED ON THE NEAREST ADJACENT WALL

5.2 DOOR MOUNTING:

- SIGN CAN ONLY BE DOOR MOUNTED IF THERE IS NO ROOM ON ADJACENT WALLS RELATIVE TO THE DOOR
- WHERE THIS IS REQUIRED, PROVIDE BACKING PANEL FOR OPPOSITE SIDE OF GLASS. BACKING PANEL TO BE FINISHED TO MATCH SIGN MATERIAL.
- IN THE CASE OF DOUBLE DOORS, THE SIGN SHOULD BE MOUNTED TO THE INACTIVE DOOR.
- IF BOTH DOORS OPEN, THE SIGN SHOULD BE MOUNTED TO THE RIGHT OF THE RIGHT HAND DOOR
- IF THERE IS NO ROOM TO THE RIGHT, THE SIGN CAN BE MOUNTED ON THE NEAREST ADJACENT WALL.
- SIGN TO BE MOUNTED CENTERED HORIZONTALLY ON THE DOOR.
- BASELINES OF RAISED CHARACTERS SHALL BE LOCATED BETWEEN 1200mm AND 1500mm ABOVE FINISHED FLOOR.

5.3 MOUNTING HEIGHT:

- BASELINE OF CHARACTERS MUST BE LOCATED BETWEEN 1200 mm AND 1500 mm ABOVE FINISHED FLOOR

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SECONDARY SCHOOL
INTERIOR SIGNAGE STANDARD

TITLE
INTERIOR SIGN NOTES

DRAWN CM DATE MAY 2017	CHKD - DATE -	APPVD - DATE -
SCALE 1:2	DWG No. 20	REV 00

REV	DATE	DESCRIPTION	BY	CHKD

1 General

1.1 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Section 01 33 00.

.2 Shop Drawings: Project-specific drawings, illustrating materials, shelving layouts, dimensions, component sizes, anchorage and installation details.

1.2 MANUFACTURER'S INSTRUCTIONS

.1 Submit manufacturer's instructions as specified in Section 01 78 00.

.2 Manufacturer's Instructions: Manufacturer's standard assembly and installation instructions, complete with parts listings; sufficient quantity for inclusion in operation and maintenance manual.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Metalware Metal Shelving.

.2 Substitution Procedures: Refer to Section 01 25 00.

2.2 DESCRIPTION

.1 Metal Storage Shelving: Modular, bolt-less design; 457 mm deep, 1 067 mm wide, 1 930 mm high; complete with metal adjustable shelves, 4 steel post uprights, metal side and back bracing bars, and manufacturer's add-on package; Metalware Metal Shelving Model No. MWS1842FB, as distributed by atWork Office Furniture.

2.3 COMPONENTS

.1 Metal Shelves: 1.2 mm thick cold-rolled steel, with double folded corners, pre-punched to accept bin dividers; 457 x 1 067 mm size.

.2 Post Uprights: 1.5 mm thick hot-rolled steel, pre-punched, roll-formed, welded and cut to length.

.3 Bracing Bars: Manufacturer's standard side and back metal bracing bars.

.4 Add-On Package: Second column of shelves; Metalware Metal Shelving Model No. MWS 1842FB-ADD.

2.4 FINISHES

.1 Baked Enamel Coating on Metal Components: Electrostatically sprayed and baked-on alkyd enamel finish; manufacturer's standard colour.

3 Execution

3.1 EXAMINATION

.1 Refer to Section 01 71 00.

.2 Verify site dimensions prior to fabrication.

3.2 INSTALLATION

.1 Install Products true to dimensions, straight, square, plumb and level, to a rigid structure.

.2 Conform to accepted Shop Drawings.

.3 Accurately fit members with hairline joints, properly secured.

.4 Construct shelving units free from distortion and defects detrimental to appearances and performance.

.5 Secure shelving units to wall to prevent tipping.

3.3 ADJUSTING

.1 Touch-up damaged surfaces with one coat of spray touch-up paint matching factory-applied finish.

END OF SECTION

1 General

1.1 PRODUCT DATA

.1 Submit Product data as specified in Section 01 33 00.

.2 Product Data: Manufacturer's standard data sheets, indicating materials, available sizes and configurations, power requirements, and available finishes.

1.2 MANUFACTURER'S INSTRUCTIONS

.1 Submit manufacturer's instructions as specified in Section 01 33 00.

.2 Manufacturer's Instructions: Manufacturer's printed installation instructions, and templates required for installation.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Refer to Section 01 60 00.

.2 Package, crate and brace Products to prevent distortion in shipment and handling.

.3 Protect Products with sturdy wrappings.

.4 Label packages and crates with manufacturer's name, model number, quantity, and shipment date.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Da-Lite Screens Inc.
.2 Draper.

.2 Substitution Procedures: Refer to Section 01 25 00.

2.2 MANUFACTURED UNITS

.1 Motor-Operated Projection Screen:
.1 Screen: 3 200 x 4 200 mm size viewing surface, heavy duty matte white; 1 000 mm black top skirt, black masking borders; 10 mm OD tubular steel bottom slat, with baked enamel finish and plastic end caps.
.2 Enclosure: Sealed and fire retardant design for use in plenum spaces, flat back design, rectangular steel case, baked enamel finish; with fully automatic ceiling closure doors, and in-the-roller motor mounting system; one required for each screen.
.3 Power Supply: 110V AC, single phase, 60 Hz.
.4 Motors: Dual motors, one motor operating the closure door and the second motor operating the projection screen; capacities as recommended by screen manufacturer.
.5 Remote Control System: Dual motor low voltage control system with three-button wireless radio frequency remote receiver and transmitter; separate UP, DOWN and STOP commands, complete with control module, 3-button keyed wall switch, box, cover plate, and 3-button control radio frequency transmitter with receiver; one unit required for each screen.

3 Execution

3.1 INSTALLATION

.1 Install Products for long life under hard use.

.2 Install Products level, true, and tightly fitted to adjacent surfaces.

.3 Connect power-operated components to designated power source. Coordinate with appropriate facility service Subcontractor.

3.2 ADJUSTING

.1 Verify installed Products function properly and smoothly.

.2 Adjust equipment to ensure proper and smooth operation.

.3 Make Good damaged and defective Products so that no variation in surface appearance is discernible.

.4 Refinish Products at the Place of the Work only when approved by Consultant.

3.3 DEMONSTRATION

.1 Refer to Section 01 79 00.

.2 Demonstrate operation and maintenance of equipment.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 05 50 00 - Metal Fabrications.

.2 Section 06 10 00 - Rough Carpentry.

1.2 REFERENCES

.1 ASTM A1008/A1008M-23e1: Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable.

.2 ASTM B221M-21: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

.3 NFPA 701-2004: Methods of Fire Tests for Flame Propogation of Textiles and Films.

.4 CAN/ULC-S109-14 (R2019): Standard Method for Flame Tests of Flame-Resistant Fabrics and Films.

1.3 SAMPLES

.1 Submit samples as specified in Section 01 33 00.

.2 Selection Samples: Duplicate 300 x 300 mm size samples of curtain fabric, illustrating weight, knap and available colours.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Refer to Section 01 60 00.

.2 Package, crate and brace products to prevent distortion in shipment and handling.

.3 Protect products with sturdy wrappings.

.4 Label packages and crates with manufacturer's name, model number, quantity and shipment date.

2 Products

2.1 REGULATORY REQUIREMENTS

.1 Fabric: Flame-proof and fire-retardant when tested to NFPA 701 and CAN/ULC-S109.

.2 Drapery Panels: Provide on each panel a sewn label next to flame test swatches, clearly indicating:
.1 Manufacturer’s Name.
.2 Material Used.
.3 Material Colour.
.4 Fabrication Date.
.5 Flame Resistance Compliance.
.6 Finished Panel Size.

.3 Each drapery panel shall have minimum six 40 mm wide x 130 mm long flame test swatches sewn to an offstage, bottom corner, made from same fabric used to construct drape and used for flame testing purposes.

2.2 MATERIALS

.1 Curtain Fabric: 543 g/m^2 100 percent cotton velour; colour as selected by Consultant.

.2 Extruded Aluminum: To ASTM B221, 6061 alloy, T5 temper.

.3 Sheet Steel: To ASTM A1008/A1008M, Commercial Steel (CS) Types A, B, and C; cold-rolled sheet steel.

2.3 COMPONENTS

.1 Proscenium Drapery: Two main drape panels, coloured curtain fabric, sewn with 150 percent fullness; heading to have flat fold pleat reinforced with minimum 75 mm jute webbing; #2 Black Brass grommets installed 25 mm in from each end with additional grommets equally spaced at 300 mm OC; 150 mm lead hem and 25 mm double side hem sewn with upholstery thread to match fabric colour; panels sewn together with 5 thread heavy duty surger; half and full panels only, with no horizontal seams; 125 mm double stitched hem, with continuous jack chain.

.2 Proscenium Valance: One valance panel; coloured curtain fabric, sewn with 150 percent fullness; heading to have 3 fold pinch pleat; panels sewn together with serger; bottom hem 75 mm double stitched; pin on hooks inserted in top of drapery 38 mm from top of valance.

.3 Stage Leg Curtains: Coloured curtain fabric, sewn with 150 percent fullness; heading to have 3 fold pinch pleat; panels sewn together with serger; bottom hem 75 mm double stitched; pin on hooks inserted in top of drapery.

.4 Proscenium Drapery Track: 1.9 mm thick galvanized steel, entirely enclosed except for slot in bottom, each half to be in one continuous piece except where splicing clamps are required.

.5 Drapery Carriers: Plated steel construction, with two nylon wheels held to block by corrosion-resistant nickel-plated rivet, each wheel rolling on two separate parallel threads; free moving plated swivel complete with trim chain attached to accommodate curtain S-hook. Provide two master carriers complete with trim chains; end stops for placement at each track end; end pulleys equipped with ball bearing wheels; adjustable floor pulley, 6 mm OD fiberglass reinforced, stretch resistant operating cord.

3 Execution

3.1 INSTALLATION

.1 Install Products level, true, and tightly fitted to adjacent surfaces; for long life under hard use.

.2 Suspend drapery track to rear face of proscenium opening using L-shaped brackets spaced at 800 mm OC.

.3 Install drapery panels on track carriers using S-hooks.

.4 Install drapery panels to hang between 5 mm and 25 mm from stage floor when in playing position. Use trim chain with S-hooks on carriers as required.

.5 Install proscenium valance to wooden header using velcro-style fastening strips.

3.2 ADJUSTING

.1 Verify installed Products function properly and smoothly.

.2 Adjust equipment to ensure satisfactory operation.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 22 00 - Concrete Unit Masonry.

.2 Section 09 65 66 - Resilient Athletic Flooring.

.3 Section 09 90 00 - Painting and Coating.

.4 Section 11 66 53 - Gymnasium Dividers.

.5 Section 11 68 23.13 - Exterior Basketball Equipment.

1.2 PRODUCT DATA

.1 Submit Product data as specified in Section 01 33 00.

.2 Product Data: Manufacturer's standard data sheets, indicating materials, components, component sizes and features, size and shape of backboards and available finishes.

1.3 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Section 01 33 00.

.2 Shop Drawings: Project-specific drawings, illustrating materials, dimensions, locations, attachment heights and methods, loads and other miscellaneous details.

.3 Shop Drawings for backstops are to be stamped, signed and dated by manufacturer's design engineer.

1.4 FIELD QUALITY CONTROL SUBMITTALS

.1 Submit field quality control submittals as specified in Section 01 40 00.

.2 Manufacturer Report: A written report issued by manufacturer's design engineer certifying completed installation is structurally safe and conforms to accepted Shop Drawings.

1.5 CLOSEOUT SUBMITTALS

.1 Submit closeout submittals as specified in Section 01 78 00.

.2 Special Tools: Two removable winch handles for manually-operated backstops.

1.6 QUALIFICATIONS

.1 Manufacturer's Design Engineer: A professional structural engineer experienced in designing, fabricating and installing gymnasium equipment, licensed to practice at Place of the Work.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Forum Athletic Products.
.2 Gymnasium & Health Equipment Limited.
.3 Lolimpin Gym Equipment.
.4 Porter Athletic, Inc.

.2 Substitution Procedures: Refer to Section 01 25 00.

2.2 MANUFACTURED UNITS

.1 Basketball Backstop: Wall-mounted, side-swing design, manual crank operation; height adjustable; and as follows:
  .1 Steel Frame: 3.2 mm thick steel tubing, 51 x 51 mm size, extension as indicated on Drawings; complete with safety cable supports; baked enamel finish; eg. BB-10RG by Gymnasium & Health Equipment Ltd.
  .2 Height Adjustable Adapter Framing: Two 38 mm square steel tubing guide rails extending 114 mm in front of backstop framing, complete with height adjuster crank handle; capable of adjusting net height from 2 440 mm to 3 100 mm above finished floor; baked enamel finish; eg. BB-3 by Gymnasium & Health Equipment Ltd.
  .3 Backboard: 1 067 x 1 829 mm size; 13 mm thick tempered glass set in extruded aluminum frame; official border and target area fired into glass; eg. BB-29-RG2 by Gymnasium & Health Equipment Ltd.
  .4 Cushion Edge Padding: Pre-moulded urethane foam, purpose made to fit along lower edge of glass backboard, complete with fixing hardware; colour as selected by Consultant; eg. BB-44 by Gymnasium & Health Equipment Ltd.
  .5 Goal: 457 mm OD, front-mounted shock absorber goal, with completely enclosed positive locking mechanism; baked enamel finish; eg: BB-33B by Gymnasium & Health Equipment Ltd.
  .6 Net: 120 count nylon, hourglass design, official anti-whip net; eg. BB-41 by Gymnasium & Health Equipment Ltd.
  .7 Winch Handle: Manufacturer's standard removable type.

.2 Floor Socket: 60 mm ID brass floor socket and flush socket lid; eg. Model FS-2 by Gymnasium & Health Equipment Ltd.

.3 Adapter Bushing: 48 mm ID heavy duty plated steel socket; eg. Model AD-93BAB Adapter Bushing by Gymnasium & Health Equipment Ltd.

.4 Padded Wall Mat: 1 220 x 1 830 mm size, 50 mm thick; comprised of 3 equal panels; high density polyurethane foam with 610 g/m^2 fire-retardant PVC vinyl cover; complete with 50 mm wide velcro strips on 4 sides; eg. WP-2004 by Gymnasium & Health Equipment Ltd., Royal Blue colour.

.5 Volleyball Post: 60 mm OD steel tube combination posts, pre-drilled for ratchet attachment; refer to Drawings for quantities; baked enamel finish; types as follows:
  .1 VP-1: Complete with eye hooks; eg. Model VB-92 by Gymnasium & Health Equipment Ltd.
  .2 VP-2: Complete with pulleys; eg. Model VB-92P by Gymnasium & Health Equipment Ltd.

.6 Volleyball Post Padding: Vinyl-covered ethafoam padding, designed to cover all braces and posts; refer to Drawings for quantities; eg. Model VB-755SP End Post Safety Padding by Gymnasium & Health Equipment Ltd.

.7 Badminton Post: 38 mm OD steel tube end post; baked enamel finish; refer to Drawings for quantities; eg. Model BN-93B by Gymnasium & Health Equipment Ltd.

.8 Handle Ratchet: Standard safety volleyball and badminton ratchet with fold-away handle; refer to Drawings for quantities; Model WN-150 by Gymnasium & Health Equipment Ltd.

.9 Volleyball Net: 3 mm braided nylon netting, 9 144 mm long; Olympic Model; refer to Drawings for quantities; eg. Model VBN-750/30 by Gymnasium & Health Equipment Ltd.

.10 Badminton Net: 800 x 6 100 mm size, knotless heavy black nylon netting; fully taped; with cable top; refer to Drawings for quantities; eg. Model BN-250 by Gymnasium & Health Equipment Ltd.

2.3 ACCESSORIES

.1 Hoisting Cable: 6 mm OD, 7 x 19 aircraft hoisting cable.

.2 Cable Clip: To Fed. Spec. FF-C-450, Type 1, Class 1.

.3 Swivel Pulley and Beam Clamp: With Proof of Load Testing at 4 090 kg each.

.4 Velcro Strip: 3 050 mm long extruded aluminum wall hanger, complete with velcro strip insert; eg. VEL-69A Velcro Strip Complete by Gymnasium & Health Equipment Ltd.

.5 Fasteners: Grade 5 bolts.

.6 Anchors: Expanding, epoxy type.

2.4 FABRICATION

.1 Conform to OASBO Health and Safety Committee recommendations.

.2 Use only closed type connectors. S-hooks, J-bolts and other open-style connectors will be rejected.

.3 Provide stop clamps and markings on hoisting cables, indicating when to stop.

.4 Terminate hinge points with 13 mm bolts, complete with cotter pins.

.5 Do not use secondary chains.

.6 Fabricate pulleys from machined steel complete with oil impregnated bearings.

2.5 FINISHES

.1 Baked Enamel Coating on Metal Components: Primer and two coats of factory-applied baked enamel, colour as selected by Consultant.

3 Execution

3.1 PREPARATION

.1 Supply floor inserts for placement by concrete Subcontractor.

.2 Supply through wall anchors for placement by Section 04 22 00.

.3 Provide supplementary structural support for installation above bottom chord of roof joists.

3.2 INSTALLATION

.1 Install Products rigidly in place, straight, level and plumb.

.2 Install backstop supports with welded or bolted connections to form a rigid structure.

.3 Suspend ceiling-mounted backstops from supplementary structural supports, clear of light fixtures.

.4 Mount backstops and rings square and true to required court locations.

.5 Locate manual winches to one side.

.6 Install winches, motors, transmitters and other related equipment.

.7 Coordinate connection of motors, winches, transmitters, controls and other electrically-operated equipment with appropriate facility service Subcontractor.

.8 Install wall-mounted key switches 1 350 mm above finished floor.

.9 Install velcro strip wall hangers where indicated on Drawings, aligned with top of wall-mounted mats at 2 200 mm above finished floor.

3.3 MANUFACTURER SERVICES

.1 Arrange for manufacturer's design engineer to periodically inspect installation to ensure compliance with manufacturer's installation guidelines and accepted Shop Drawings.

.2 Prepare manufacturer's report, confirming completed installation conforms to accepted Shop Drawings.

3.4 DEMONSTRATION

.1 Refer to Section 01 79 00.

.2 Demonstrate operation and maintenance of basketball backstops.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 11 66 23 - Gymnasium Equipment.

1.2 REFERENCES

.1 ANSI/CAN/UL 325-2017: Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.

.2 CAN/ULC-S102.2-2018 (REV1): Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.

.3 CAN/ULC-S109-14 (R2019): Standard Method for Flame Tests of Flame-Resistant Fabrics and Films.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Section 01 33 00.

.2 Product Data: Manufacturer's standard data sheets, indicating materials, thicknesses, components, component sizes, power requirements, and available colours and finishes.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Section 01 33 00.

.2 Shop Drawings: Project-specific drawings, illustrating materials, dimensions, configurations, attachment heights and methods, power requirements, loads and other miscellaneous details.

.3 Shop Drawings are to be stamped, signed and dated by manufacturer's design engineer.

1.5 FIELD QUALITY CONTROL SUBMITTALS

.1 Submit field quality control submittals as specified in Section 01 40 00.

.2 Manufacturer's Report: A written field review report issued by manufacturer's design engineer certifying completed installation is structurally safe and conforms to accepted Shop Drawings.

1.6 CLOSEOUT SUBMITTALS

.1 Submit closeout submittals as specified in Section 01 78 00.

.2 Operation and Maintenance Data: Manufacturer's standard operating instructions, and maintenance and cleaning guidelines; sufficient quantities for inclusion in operation and maintenance manual.

.3 Special Tools: Six keys for controlling divider curtain.

1.7 QUALIFICATIONS

.1 Manufacturer's Design Engineer: A professional structural engineer experienced in designing, fabricating and installing gymnasium dividers, and licensed to practice at Place of the Work.

1.8 WARRANTY

.1 Submit extended warranty in accordance with General Conditions of the Contract.

.2 Extended Warranty: For a period of 5 years, covering against failure of curtain divider to operate smoothly and fully within design parameters, and against damage to curtain and netting fabric.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Forum Athletic Products.
.2 Gymnasium & Health Equipment Limited.
.3 Lolimpin Gym Equipment.
.4 Porter Athletic, Inc.

.2 Substitution Procedures: Refer to Section 01 25 00.

2.2 REGULATORY REQUIREMENTS

.1 Seismic Requirements: Provide seismic restraint as required by applicable regulatory requirements.

2.3 EQUIPMENT

.1 Divider Curtain: Vertically-acting, center-rolling gymnasium divider curtain; as follows:
.1 Weight: 610 g/m^2 polyester reinforced vinyl on bottom 3.0 metres with 373 g/m^2 vinyl coated polyester mesh on upper section;
.2 ULC labelled according to CAN/ULC-S109 and CAN/ULC-S102.2; and having a maximum flame spread index of 75.
.3 Roll Rate: 6.4 metres per minute.
.4 Drive Tube: 85 mm OD extruded aluminum tubing.
.5 Bottom Batten: 41 mm OD steel pipe.
.6 Motor: To ANSI/CAN/UL 325; twin synchronized internal tubular motors for long curtains, and single internal tubular motor for short curtains; compatible with 120V AC, single phase, 60 cycle power supply; permanently lubricated; and with built-in thermal overload protection.
.7 Winch: Complete with limit switches to control upper and lower limit of curtain travel; externally located at end of drive tube.
.8 Emergency Safety Brake: Self-activating to avoid free-fall of curtain in case of equipment failure.
.9 Control Station: Key lock, three-position momentary contact wall switch, with safety delay, and fit in a general purpose masonry-style switch box and polished stainless steel wall plate.
.10 Curtain Colour: As selected by Consultant.
.11 Product and Manufacturer: eg. Model F3500 Centre Drive Divider Curtain by Forum Athletic Products.

3 Execution

3.1 INSTALLATION

.1 Install supports with welded or bolted connections to form a rigid structure.

.2 Install Products for long life under hard use.

.3 Coordinate connection of motors, controls, winches and other electrically-operated equipment to power supply with appropriate facility service Subcontractor.

3.2 MANUFACTURER SERVICES

.1 Arrange for manufacturer's design engineer to periodically inspect installation to ensure compliance with manufacturer's installation guidelines, and accepted Shop Drawings.

.2 Prepare manufacturer's field review report, confirming completed installation conforms to accepted Shop Drawings.

3.3 DEMONSTRATION

.1 Refer to Section 01 79 00.

.2 Demonstrate maintenance of gymnasium divider curtains.

.3 Demonstrate operation of divider curtain, illustrating Open and Closing operations.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 21 00 - Clay Unit Masonry.

.2 Section 09 90 00 - Painting and Coating.

.3 Section 11 66 23 - Gymnasium Equipment.

1.2 REFERENCES

.1 ASTM A123/A123M-17: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A153/A153M-23: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

.3 ASTM A780/A780M-09(2015): Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

.4 ASTM B209/B209M-21a: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.5 CSA G40.20-13 (R2018): General Requirements for Rolled or Welded Structural Quality Steel.

.6 CSA G40.21-13 (R2018): Structural Quality Steel.

.7 CSA W47.1:19: Certification of Companies for Fusion Welding of Steel.

.8 CSA W47.2-11 (R2020): Certification of Companies for Fusion Welding of Aluminum.

.9 CSA W55.3-08 (R2018): Certification of Companies for Resistance Welding of Steel and Aluminum.

.10 CSA W59-18: Welded Steel Construction (Metal Arc Welding).

.11 CSA W59.2-M1991 (R2018): Welded Aluminum Construction.

1.3 PRODUCT DATA

.1 Submit Product data sheets as specified in Section 01 33 00.

.2 Product Data: Manufacturer's standard data sheets, indicating sizes, details of construction, profiles, jointing, fastening and other related details.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Section 01 33 00.

.2 Shop Drawings: Project-specific drawings, illustrating sizes, reinforcement, embedded anchorages, and special details.

1.5 QUALIFICATIONS

.1 Fabricator and Installer: A firm specializing in fabricating and installing exterior basketball equipment, having minimum 3 years documented experience.

.2 Welders: Workers certified by CWB to CSA W47.1, CSA W47.2 and CSA W55.3.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Forum Athletic Products.
.2 Gymnasium & Health Equipment Limited.
.3 Lolimpin Gym Equipment.
.4 Porter Athletic, Inc.

.2 Substitution Procedures: Refer to Section 01 25 00.

2.2 MATERIALS

.1 Steel Tubing: To CSA G40.20, galvanized; sizes as specified below.

.2 Sheet Aluminum: To ASTM B209/B209M, 5005 alloy, H14 temper.

.3 Welding Materials: To CSA W59 and CSA W59.2-M.

.4 Wall Anchors: Corrosion-resistant masonry anchors, adequate size and type for safe securement of basketball equipment to wall assembly.

.5 Touch-Up Primer for Galvanized Metal Surfaces: Zinc-rich paint type.

2.3 EQUIPMENT

.1 Exterior Basketball Backstops: Wall-mounted, fixed design; as follows:
.1 Frame and Brackets: 3.2 mm thick steel tubing, 51 x 51 mm size, 152 mm extension; galvanized finish; eg. BB-1-O-6 by Gymnasium & Health Equipment Ltd.
.2 Backboard: 1 372 x 889 mm size; fan-shaped aluminum with smooth rounded corners; eg. BB-23B by Gymnasium & Health Equipment Ltd.
.3 Goal: 457 mm OD, rear-mounted double-ring goal complete with nylon net; eg. BB-30-S by Gymnasium & Health Equipment Ltd.

2.4 FABRICATION

.1 Fabricate components to CSA S136, and CAN/CSA-S157.

.2 Fit and shop assemble in largest practical sections, for delivery to Place of the Work.

.3 Weld components to CSA W59 and CSA W59.2-M as applicable.

.4 Grind exposed welds flush and smooth with adjacent finish surface.

.5 Make exposed joints butt tight, flush, and hairline.

2.5 FINISHES

.1 Shop Priming:
.1 Do not prime surfaces designated to come into direct contact with concrete, or where field welding is required.
.2 Prime components using minimum two coats.

.2 Galvanized Coating on Steel Components: To ASTM A123/A123M, Coating Grade 55; hot dipped zinc alloy coating.

.3 Galvanized Coating on Steel Hardware: To ASTM A153/A153M, Classes B3, C or D; hot dipped zinc alloy coating.

3 Execution

3.1 INSTALLATION

.1 Install backboards and goals for long life under hard use.

.2 After erection, prime welds, abrasions and surfaces not yet shop primed or galvanized.

.3 Make Good damaged or defective galvanized coatings to ASTM A780/A780M.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 31 23 10 - Excavation, Trenching, Backfilling.

.2 Section 32 13 13 - Concrete Paving.

1.2 PRODUCT DATA

.1 Submit Product data as specified in Section 01 33 00.

.2 Product Data: Manufacturer's standard data sheets, including descriptions and sizes of components, installation guidelines, operating instructions and maintenance data.

1.3 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Section 01 33 00.

.2 Shop Drawings: Project-specific drawings, illustrating layouts, locations, dimensions, concrete ballast, anchoring system, granular fill and other pertinent design information.

2 Products

2.1 MANUFACTURERS

.1 Substitution Procedures: Refer to Section 01 25 00.

2.2 MATERIALS

.1 Fine Granular Fill: As specified in Section 31 23 10.

.2 Concrete Ballast and Pad: As specified in Section 32 13 13.

2.3 MANUFACTURED UNITS

.1 Solid Waste Collection Bins: In-ground waste collection bin, polyethylene construction with steel frame; as follows:
.1 Configuration: Rectangular container above ground, round rotatable container below ground.
.2 Capacity: 5 000 L.
.3 Waste Feed Doors: Two per container, lockable.
.4 Waste Feed Openings: 480 x 610 mm.
.5 Lid Colours: Two colours as selected by Consultant.
.6 Locks: Two automatic gravity latches on main service lid.
.7 Manufacturer and Product Name: Model EB500 by EarthBin.

2.4 FABRICATION

.1 Fabricate Products completely in shop, ready for transport and installation at Place of the Work.

3 Execution

3.1 PREPARATION

.1 Excavate suitably sized pit.

.2 Install bin sleeve and anchoring system embedded in concrete ballast. Pour concrete ballast to thickness indicated on accepted Shop Drawings.

.3 Backfill around sleeve prior to pouring concrete pad. Compact fill to 95 percent Standard Proctor maximum dry density.

.4 Provide concrete pad over compacted fill as specified in Section 32 13 13. Allow to cure.

3.2 INSTALLATION

.1 Install solid waste collection bins level on cured concrete pad.

.2 Loosely set unit plumb inside bin sleeve. Rotate unit for desired alignment as indicated on Drawings.

3.3 DEMONSTRATION

.1 Refer to Section 01 79 00.

.2 Demonstration: Instruct Owner's personnel on suitable types of waste, depositing methods and emptying of waste from units.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 22 00 - Concrete Unit Masonry.

.2 Section 12 24 13.16 - Manual Roller Window Shades.

1.2 REFERENCES

.1 AAMA 611-20: Voluntary Specification for Anodized Architectural Aluminum.

.2 ASTM B209/B209M-21a: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.3 ASTM B221M-21: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

.4 NFPA 701-2004: Methods of Fire Tests for Flame Propogation of Textiles and Films.

.5 CAN/ULC-S109-14 (R2019): Standard Method for Flame Tests of Flame-Resistant Fabrics and Films.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Section 01 33 00.

.2 Product Data: Manufacturer's standard data sheets, indicating materials, components and accessories, component sizes, available fabrics and finishes, and installation instructions.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Section 01 33 00.

.2 Shop Drawings: Project-specific drawings, illustrating wall opening dimensions, shade sizes and shapes, operator details, top rail, anchorage details, joint locations, hardware and accessory details, conditions between adjacent units, corner conditions, required clearances, and electrical operating mechanisms and connections.

1.5 SAMPLES

.1 Submit samples as specified in Section 01 33 00.

.2 Verification Samples: Duplicate samples of the following:
.1 Shade Fabric: 200 x 200 mm size samples of each specified fabric.
.2 Visually-Exposed Components: 300 mm long samples of each visually-exposed component, illustrating material, colour, surface texture and sheen.
.3 Metal Finish: 50 x 100 mm size samples, illustrating specified finish.

1.6 SOURCE QUALITY CONTROL SUBMITTALS

.1 Submit source quality control submittals as specified in Section 01 33 00.

.2 Fire Test Reports: Manufacturer's standard fire test reports, prepared by independent testing agency deemed acceptable by authorities having jurisdiction, indicating fire hazard classification of shade fabric meets regulatory requirements.

1.7 CLOSEOUT SUBMITTALS

.1 Submit closeout submittals as specified in Section 01 78 00.

.2 Operation and Maintenance Data: Manufacturer's standard operating instructions, and maintenance and cleaning guidelines; sufficient quantity for inclusion in operation and maintenance manual.

1.8 QUALIFICATIONS

.1 Supplier: A manufacturer-certified firm, approved to supply specified Products, and to honour warranty claims.

.2 Installer: A manufacturer-certified firm, trained and experienced in installing specified Products.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Refer to Section 01 60 00.

.2 Protect Products with suitable heavy weight wrapping before delivery to Place of the Work.

.3 Store Products at Place of the Work in a designated area, allowing for natural ventilation over finished surfaces.

1.10 WARRANTY

.1 Submit extended warranty in accordance with General Conditions of the Contract.

.2 Extended Warranty: For a period of 10 years, covering complete replacement cost of defective Product, including removal and disposal of defective assembly, and installation of replacement Product. Covered defects to include the following:
.1 Fading of shade fabric colour,
.2 Shrinkage of shade fabric,
.3 Loss of flame-retardant properties of shade fabric,
.4 Punctures, rips or tears in shade fabric, and
.5 Mechanical failure of operating mechanisms.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Altex Decorations Ltee.
.2 Concord Shading Systems Inc.
.3 Elite Shades.
.4 Hunter Douglas Architectural.
.5 Legrand Canada.
.6 MechoShade Systems, Inc.
.7 Sun Glow Window Covering Products of Canada Ltd.

.2 Substitution Procedures: Refer to Section 01 25 00.

2.2 DESCRIPTION

.1 Roller Window Shades (RWS-1): Motor-operated single roller shade, rectangular-shaped, completely concealed from view when retracted; each unit consisting of two end brackets, motorized roller tube, cable guide system and side channels, cassette fascia, concealed hembar, and sun control fabric; with switched operation; sizes as indicated on Drawings.

2.3 PERFORMANCE CRITERIA

.1 Fire Classification of Fabrics: Flame-retardant and fire-resistant to CAN/ULC-S109 and NFPA 701.

2.4 MATERIALS

.1 Extruded Aluminum: To ASTM B221M, 6063 alloy, T5 temper; unless specified otherwise.

.2 Sheet Aluminum: To ASTM B209/B209M, 3003 alloy, H14 temper.

.3 Sun Control Fabric: Vinyl-coated polyester yarn, consisting of 79 percent vinyl and 21 percent dernier polyester core yarn; one percent openness factor; complete with antimicrobial coating; tensioned prior to heat setting; Gray colour.

.4 Bituminous Coating: Fibrous asphalt emulsion.

.5 Screw Fasteners: Non-corrosive type, size as recommended by shade manufacturer.

2.5 COMPONENTS

.1 Motors: Asynchronous capacitor start and run, 120V AC, single phase, 60 Hz; planetary type gears, solenoid activated disc brakes and built-in limit switch units; thermally protected, tubular in shape and totally enclosed within roller tube; rated at 38 RPM; UL recognized and CSA certified for safe operation.

.2 Motorized Roller Tube: 62 mm OD, 1.6 mm thick grooved 6005-T5 alloy extruded aluminum; apply a double-sided adhesive strip for exact and firm mounting of fabric. Ensure minimum one turn of fabric will be placed on roller before working section of fabric starts.

.3 Motorized Idle End Cap: Injection molded polymer plug with a spring-loaded bearing shaft that will allow easy but positive locking of roller tube into idle end bracket.

.4 Cassette: Two-piece interlocking 1.9 mm thick extruded aluminum housing, rectangular profile.

.5 Fascia Mounting Brackets: For motor and idler end, stainless steel. Provide decorative endcaps in matching finish for outside mount applications.

.6 Fascia: 1.7 mm thick extruded aluminum complete with three continuous screw flute.

.7 Side Channels: 25 x 38 mm size, 1.6 mm thick extruded aluminum, U-shaped.

.8 Cable Guide System: Polymer coated steel cable, attached at top to shade bracket and at bottom to independent brackets; tension adjusted at bottom bracket.

.9 Hem Bar: 3 x 32 mm size flat extruded aluminum bar; length to suit shade width.

.10 Operating Switches: Manufacturer's standard switch assembly, colour as selected by Consultant.

2.6 FINISHES

.1 Anodized Coating on Aluminum: To AAMA 611, AA-M10C21A31, Class II Clear Anodic Oxide coating No. 17.

3 Execution

3.1 EXAMINATION

.1 Refer to Section 01 71 00.

.2 Verify wall openings and power supply are ready to receive installation.

3.2 PREPARATION

.1 Apply heavy coat of bituminous paint on surfaces of aluminum placed in contact with concrete, mortar, plaster, or dissimilar metals.

.2 Provide fastenings and anchors required to be built in to adjacent work to other Sections.

3.3 INSTALLATION

.1 Install Products in window openings level, plumb, and square, and parallel with window plane.

.2 Ensure Products are rigidly coupled and adequately anchored.

.3 Maintain uniform clearances, and accurate alignment levels.

.4 Provide electrical control equipment, shades and accessories for a complete installation and single source responsibility.

.5 Install hembar in fabric hem pocket and secure to avoid displacement.

3.4 TOLERANCES

.1 Gap Variation Along Perimeter: $\leq$ 6 mm per 2 440 mm of shade height.

.2 Offset from Level: $\leq$ 3 mm.

.3 Conform to manufacturer's edge clearance requirements for shades exceeding a 1:3 width-to-height ratio.

3.5 ADJUSTING

.1 Adjust Products to ensure smooth and trouble free operation without binding.

.2 Adjust shade and fabric to hang flat without buckling or distortion.

3.6 CLEANING

.1 Refer to Section 01 74 00.

.2 Clean exposed surfaces using recommended non-abrasive materials and methods.

3.7 DEMONSTRATION

.1 Refer to Section 01 79 00.

.2 Demonstrate proper operation and maintenance of roller shades.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 04 22 00 - Concrete Unit Masonry.

.2 Section 12 24 13.13 - Motorized Roller Window Shades.

1.2 REFERENCES

.1 AAMA 611-20: Voluntary Specification for Anodized Architectural Aluminum.

.2 ASTM B209/B209M-21a: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.3 ASTM B221M-21: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).

.4 NFPA 701-2004: Methods of Fire Tests for Flame Propogation of Textiles and Films.

.5 CAN/ULC-S109-14 (R2019): Standard Method for Flame Tests of Flame-Resistant Fabrics and Films.

.6 ANSI/WCMA A100.1-2018: American National Standard for Safety of Corded Window Covering Products.

1.3 PRODUCT DATA

.1 Submit Product data as specified in Section 01 33 00.

.2 Product Data: Manufacturer's standard data sheets, indicating materials, components and accessories, component sizes, available fabrics and finishes, and installation instructions.

1.4 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Section 01 33 00.

.2 Shop Drawings: Project-specific drawings, illustrating wall opening dimensions, shade sizes, operator details, top rail, anchorage details, joint locations, hardware and accessory details, conditions between adjacent units, corner conditions and required clearances.

1.5 SAMPLES

.1 Submit samples as specified in Section 01 33 00.

.2 Verification Samples: Duplicate samples of the following:
.1 Shade Fabric: 200 x 200 mm size samples of each specified fabric.
.2 Visually-Exposed Components: 300 mm long samples of each visually-exposed component, illustrating material, colour, surface texture and sheen.
.3 Metal Finish: 50 x 100 mm size samples, illustrating specified finish.

1.6 SOURCE QUALITY CONTROL SUBMITTALS

.1 Submit source quality control submittals as specified in Section 01 33 00.

.2 Fire Test Reports: Manufacturer's standard fire test reports, prepared by independent testing agency deemed acceptable by authorities having jurisdiction, indicating fire hazard classification of shade fabric meets regulatory requirements.

1.7 CLOSEOUT SUBMITTALS

.1 Submit closeout submittals as specified in Section 01 78 00.

.2 Operation and Maintenance Data: Manufacturer's standard operating instructions, and maintenance and cleaning guidelines; sufficient quantity for inclusion in operation and maintenance manual.

1.8 QUALIFICATIONS

.1 Supplier: A manufacturer-certified firm, approved to supply specified Products and to honour warranty claims.

.2 Installer: A manufacturer-certified firm, trained and experienced in installing specified Products.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Refer to Section 01 60 00.

.2 Protect Products with suitable heavy weight wrapping before delivery to Place of the Work.

.3 Store Products at Place of the Work in a designated area, allowing for natural ventilation over finished surfaces.

1.10 WARRANTY

.1 Submit extended warranty in accordance with General Conditions of the Contract.

.2 Extended Warranty: For a period of 10 years, covering complete replacement cost of defective Product, including removal and disposal of defective assembly, and installation of replacement Product. Covered defects to include the following:
.1 Fading of shade fabric colour,
.2 Shrinkage of shade fabric,
.3 Loss of flame-retardant properties of shade fabric,
.4 Punctures, rips or tears in shade fabric, and
.5 Mechanical failure of operating mechanisms.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Altex Decorations Ltee.
.2 Concord Shading Systems Inc.
.3 Elite Shades.
.4 Hunter Douglas Architectural.
.5 Legrand Canada.
.6 MechoShade Systems, Inc.
.7 Sun Glow Window Covering Products of Canada Ltd.

.2 Substitution Procedures: Refer to Section 01 25 00.

2.2 DESCRIPTION

.1 Roller Window Shades (RWS-2): Manual pull-down, spring-activated retracting operation, single sprocket roller shade, rectangular-shaped, with infinite positioning; each unit consisting of two end brackets, shade roller tube, cassette fascia, exposed hembar, and sun control fabric; sizes as indicated on Drawings.

2.3 DESIGN CRITERIA

.1 Design manual roller window shades to operate without any exposed cords or chains, in accordance with ANSI/WCMA A100.1.

2.4 PERFORMANCE CRITERIA

.1 Fire Classification of Fabrics: Flame-retardant and fire-resistant to CAN/ULC-S109 and NFPA 701.

2.5 MATERIALS

.1 Extruded Aluminum: To ASTM B221M, 6063 alloy, T5 temper; unless specified otherwise.

.2 Sheet Aluminum: To ASTM B209/B209M, 3003 alloy, H14 temper.

.3 Plastic: ABS type.

.4 Sun Control Fabric: Vinyl-coated polyester yarn, consisting of 79 percent vinyl and 21 percent dernier polyester core yarn; one percent openess factor, complete with antimicrobial coating; tensioned prior to heat setting; Grey colour.

.5 Bituminous Coating: Fibrous asphalt emulsion.

.6 Screw Fasteners: Non-corrosive type, size as recommended by shade manufacturer.

2.6 COMPONENTS

.1 End Bracket: 77 x 96 mm, two-piece moulded ABS construction; 64 mm OD nylon drive sprocket; finish to match fascia colour.

.2 Shade Roller Tube: 1.52 mm thick extruded aluminum with 3 internal 4.82 mm high continuous fins spaced 120 degrees apart.

.3 Cassette: Two-piece interlocking 1.9 mm thick extruded aluminum housing, rectangular profile.

.4 Fascia: 1.7 mm thick extruded aluminum complete with three continuous screw flute.

.5 Drive Assembly: Factory set for size and travel of shades, field adjustable; complete with built-in shock absorber.

.6 Hem Bar: 32 x 19 mm size, extruded aluminum, with upper groove to secure shading fabric; complete with high-impact nylon plugs inserted into each end.

2.7 FINISHES

.1 Anodized Coating on Aluminum: To AAMA 611, AA-M10C21A31, Class II Clear Anodic Oxide coating No. 17.

3 Execution

3.1 PREPARATION

.1 Apply heavy coat of bituminous paint on aluminum surfaces placed in direct contact with concrete, mortar, plaster, or dissimilar metals.

.2 Provide fastenings and anchors required to be built in to adjacent work to other Sections.

3.2 INSTALLATION

.1 Install Products in window openings level, plumb, square, rigidly coupled and adequately anchored, maintaining uniform clearances, accurate alignment levels and parallel with window plane.

.2 Conform to manufacturer’s Product data and accepted Shop Drawings.

.3 Conceal brackets and rollers with closure panels for full width of opening.

3.3 TOLERANCES

.1 Gap Variation Along Perimeter: ≤ 6 mm per 2 440 mm of shade height.

.2 Offset from Level: ≤ 3 mm.

.3 Conform to manufacturer's edge clearance requirements for shades exceeding 1:3 width-to-height ratio.

3.4 ADJUSTING

.1 Adjust Products to ensure smooth and trouble free operation without binding.

.2 Adjust shade and fabric to hang flat without buckling or distortion.

3.5 CLEANING

.1 Refer to Section 01 74 00.

.2 Clean exposed surfaces using recommended non-abrasive materials and methods.

3.6 DEMONSTRATION

.1 Refer to Section 01 79 00.

.2 Demonstrate proper operation and maintenance of roller shades.

END OF SECTION

1 General

1.1 REFERENCES

.1 AAMA 2604-22: Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (With Coil Coating Appendix).

.2 CSA B355-15: Lifts for Persons with Physical Disabilities.

.3 CSA W59-18: Welded Steel Construction (Metal Arc Welding).

1.2 PRODUCT DATA

.1 Submit Product data as specified in Section 01 33 00.

.2 Product Data: Manufacturer's standard data sheets, indicating dimensions, method of anchorage, and details of construction.

1.3 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Section 01 33 00.

.2 Shop Drawings: Project-specific drawings, illustrating the following information:
.1 Dimensions of required clearances.
.2 Arrangement of mechanisms, pumps and motors, operating station, showing names of manufacturers, type or style designations, part numbers, and HP and RPM of motor.
.3 Factory test data of operating system, containing complete information covering test.
.4 Details of electrical equipment.

.3 Shop Drawing must be stamped, dated and signed by manufacturer's design engineer.

1.4 CLOSEOUT SUBMITTALS

.1 Submit closeout submittals as specified in Section 01 78 00.

.2 Operation and Maintenance Data: Manufacturer's standard operating and maintenance instructions, sufficient quantity for inclusion in operation and maintenance manual; and including the following information:
.1 Complete description and sequence of operation, together with wiring diagrams showing electrical connections,
.2 Maintenance instructions, complete with parts catalogue giving complete list of repair and replacement parts, with cuts and identifying numbers,
.3 Dimensioned as-built drawing of installed vertical platform lift, and
.4 One copy of TSSA registered design submission.

1.5 QUALIFICATIONS

.1 Manufacturer's Design Engineer: A professional engineer experienced in designing vertical platform lifts, licensed to practice at Place of the Work.

.2 Installer: A firm specializing in installing vertical platform lifts, approved by manufacturer.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers having Product considered acceptable for use:
.1 Cambridge Elevating Inc.
.2 Garaventa.
.3 Savaria Concord Lifts, Inc.

.2 Substitution Procedures: Refer to Section 01 25 00.

2.2 DESIGN AND PERFORMANCE CRITERIA

.1 Vertical Wheelchair Lift: To CSA B355, and as follows:
.1 Platform Size: 915 x 1 370 mm.
.2 Capacity: 340 kg.
.3 Travel Distance: ≤ 1 220 mm.
.4 Travel Speed: 0.04 m/s.
.5 Levels Serviced: Two.
.6 Daily Cycle: Normal duty (10), with maximum 10 starts in one hour.
.7 Side Guards: 1 070 mm high panels mounted on platform.
.8 Cab Access: 90 degrees.
.9 Drive: Acme screw and back-up nut system.
.10 Noise Level: Maximum 66 dBA in UP direction, and 65 dBA in DOWN direction.
.11 Motor: 1.0 HP, 110V AC.
.12 Power Supply: 120V AC, 20 A, 60 Hz, single phase dedicated power source.
.13 Control System: Electronic-free relay logic controller.
.14 Features: Call/Send stations at landings, continuous-pressure type buttons, operating control buttons on platform, emergency manual lowering/raising device, low-voltage controls, underpan sensors, non-skid platform surface, automatic 610 mm field-reversible access ramp, and emergency STOP button.

2.3 MANUFACTURED ITEMS

.1 Vertical Platform Lift: eg. Multilift Public Vertical Platform Lift by Savaria Concord Lifts, Inc.

2.4 FABRICATION

.1 Fabricate Products to CSA B355, in strict accordance with accepted Shop Drawings.

.2 Perform shop welding to CSA W59.

2.5 FINISHES

.1 Shop Priming:
.1 Do not prime surfaces in direct contact with concrete or where field welding is required.
.2 Prime components with minimum two coats primer.

.2 Powder Coated Finish on Metal Components: To AAMA 2604; electrostatically sprayed polymer powder, factory-applied to 0.05 mm dry film thickness; Almond Beige colour.

3 Execution

3.1 EXAMINATION

.1 Refer to Section 01 71 00.

.2 Verify rough-in opening is acceptable.

.3 Verify anchor placement is acceptable.

3.2 PREPARATION

.1 Provide integral anchors for placement in concrete by appropriate Subcontractor.

3.3 INSTALLATION

.1 Install Products to CSA B355.

.2 Set components plumb, square and properly aligned as indicated on accepted Shop Drawings.

.3 Anchor units securely to structural building components.

.4 Install electrical motors, controller units, pushbutton stations, relays and other electrical equipment required for proper operation.

3.4 ADJUSTING

.1 Touch up shop primer to bolts, welds and burned or scratched surfaces at completion of installation.

.2 Adjust components to ensure smooth operation.

3.5 DEMONSTRATION

.1 Demonstrate operation and maintenance of equipment as specified in Section 01 79 00.

.2 Conduct operating tests for approval of Owner, including:
.1 Operation to maximum limits in "UP", and "DOWN" directions.
.2 Demonstration of loading capacity.
.3 Any other test required by Consultant to ensure full compliance with specified requirements.

3.6 MAINTENANCE

.1 Conduct adjustment and maintenance services throughout warranty period.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 31 23 10 - Excavation, Trenching, Backfilling.

.2 Section 32 11 23 - Aggregate Base Courses.

.3 Section 32 91 21 - Topsoil and Fine Grading.

1.2 REFERENCES

.1 ASTM D6461/D6461M-18: Standard Specification for Silt Fence Materials.

.2 OPSS.MUNI 206 (April 2019): Construction Specifications for Grading.

.3 OPSS.MUNI 805 (Nov. 2021): Construction Specification for Temporary Erosion and Sediment Control Measures.

1.3 EXISTING CONDITIONS

.1 Protect trees, shrubs, lawns and other features remaining as portion of final landscaping.

.2 Protect bench marks, existing structures, fences, roads, sidewalks, paving and curbs.

2 Products

2.1 MATERIALS

.1 Subsoil: Native stripped and excavated soil or similar imported soil; graded free of lumps larger than 150 mm OD, rocks larger than 75 mm OD and debris.

.2 Erosion Control Blanket: To OPSS.MUNI 805.

.3 Silt and Sediment Fence: To ASTM D6461/D6461M; 915 mm high, woven polypropylene fibre geotextile fabric secured to support posts; having 67 percent filter efficiency; eg. Terrafence by Terrafix Geosynthetics Inc.

3 Execution

3.1 PREPARATION

.1 Identify required lines, levels, contours and datum.

.2 Identify known below grade utilities. Stake and flag locations. Notify utility company to remove and relocate utilities.

.3 Provide temporary erosion and sediment control measures to OPSS.MUNI 805.

.4 Provide silt and sediment fencing as indicated on Drawings. Space support posts at 2 440 mm OC.

3.2 ROUGH GRADING

.1 Conform to OPSS.MUNI 206.

.2 Cut and fill to levels required.

.3 Establish and maintain line and grade stakes for duration of grading operations.

.4 Conform to grades indicated on Drawings.

.5 Unless otherwise noted, uniformly slope grades between elevations indicated.

.6 Do not exceed slopes of 4:1 unless indicated otherwise on Drawings.

.7 Contour lines indicated on Drawings are approximate only and may require minor adjustments at Place of the Work.

.8 Smoothly contour tops and toes of slopes and banks.

.9 Establish contours parallel to finished grades.

.10 Shape contours to ensure adequate drainage.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 Materials, applications, installation and verification for excavating, trenching and backfilling.

.2 Related Sections:

.1 Section 31 05 17 - Aggregate Materials.

.3 Measurement Procedures:

.1 Not Used.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C117-03, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-01, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-632002, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft 3) (600 kN-m/m 3).

.5 ASTM D1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft 3) (2,700 kN-m/m 3).

.6 ASTM D4318-00, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.1 CSA-A3001-03, Cementitious Materials for Use in Concrete.

.2 CAN/CSA-A23.1/A23.2-00(August 2001), Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

.4 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 DEFINITIONS

.1 Excavation classes: one class of excavation will be recognized; common excavation.

.1 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.3 Topsoil:

.1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters 1 inch in any dimension.

.4 Waste material: excavated material unsuitable for use in work or surplus to requirements.

.5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.7 Unsuitable materials:

.1 Weak, chemically unstable, and compressible materials.

.2 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136 : Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.

.2 Table:
Sieve Designation % Passing
2.00 mm 100
0.10 mm 45 - 100

0.02 mm 10 - 80
0.005 mm 0 - 45

.3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

.8 Unshrinkable fill: very weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 SUBMITTALS

.1 Make submittals in accordance with HWDSB and project General Requirements as per section 01 33 00.

.2 Preconstruction Submittals:

.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.

.2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field clearance record from utility authority location plan of relocated and abandoned services, as required

.3 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Inform Owner’s Representative at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.

1.5 QUALITY ASSURANCE

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Where Owner’s Representative is employee of Contractor, submit proof that Work by Owner’s Representative is included in Contractor's insurance coverage.

.3 Submit design and supporting data at least 2 weeks prior to beginning Work.

.4 Keep design and supporting data on site.

.5 Do not use soil material until written report of soil test results are reviewed and approved by Owner’s Representative.

.6 Health and Safety Requirements:

.1 As per HWSDB Requirements.

.7 Sustainable Requirements:

.1 Not Used.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Storage and Protection:

.1 Protect existing features in accordance with applicable local regulations.

.2 Existing buried utilities and structures:

.1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.2 Prior to beginning excavation Work, notify applicable authorities having jurisdiction to establish location and state of use of buried utilities and structures. Authorities having jurisdiction are to clearly mark such locations to prevent disturbance during Work.

.3 Confirm locations of buried utilities by careful test excavations.

.4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.

.5 Where utility lines or structures exist in area of excavation, obtain direction of Owner's Representative before removing or re-routing. Costs for such Work to be paid by Contractor.

.6 Record location of maintained, re-routed and abandoned underground lines.

.7 Confirm locations of recent excavations adjacent to area of excavation.

.3 Existing buildings and surface features:

.1 Conduct condition survey of existing buildings, adjacent site, trees and other plants, lawns, fencing, furniture, service poles, wires, rail tracks, pavement, survey benchmarks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repairs as directed by Owner's Representative.

.3 Where required for excavation, cut roots or branches as directed by Owner's Representative in accordance with Section 32 01 91 - Tree and Shrub Preservation.

.2 Construction/Demolition Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Region of Niagara.

.2 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Region of Niagara requirements.

.3 Place materials defined as hazardous or toxic in designated containers.

.4 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, and Regional regulations.

.5 Ensure emptied containers are sealed and stored safely.

.6 Divert excess aggregate materials from landfill to local recycling facility for reuse.

.7 Divert excess aggregate materials from landfill to local recycling facility for reuse as directed by Owner's Representative and per Ontario O. Reg. 406/19: On-Site and Excess Soil Management

PART 2 PRODUCTS

2.1 MATERIALS

.1 Type 1 and Type 2 fill: properties to Section 31 05 17 - Aggregate Materials and the following requirements:

.1 Crushed, pit run or screened stone, gravel or sand.

.2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1 and CAN/CGSB-8.2.

.3 Table:

Sieve Designation	% Passing	
	Type 1	Type 2
75 mm	-	100
50 mm	-	-
37.5 mm	-	-
25 mm	100	-
19 mm	75-100	-
12.5 mm	-	-
9.5 mm	50-100	-
4.75 mm	30-70	22-85
2.00 mm	20-45	-
0.425 mm	10-25	5-30
0.180 mm	-	-
0.075 mm	3-8	0-10

.2 Type 3 fill: selected material from excavation or other sources, approved by Owner's Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

.3 Unshrinkable fill: proportioned and mixed to provide:

.1 Maximum compressive strength of 0.4 MPa at 28 days.
.2 Maximum Portland cement content of 25 kg/m 3: to CSA-A3001, Type 10.
.3 Minimum strength of 0.07 MPa at 24 h.
.4 Concrete aggregates: to CAN/CSA-A23.1.
.5 Portland cement: Type 10.
.6 Slump: 160 to 200 mm.

.4 Shearmat: honeycomb type bio-degradable cardboard 100 mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.

PART 3 EXECUTION

3.1 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 STRIPPING OF TOPSOIL

.1 Begin topsoil stripping of areas as indicated after area has been cleared of brush, weeds and grasses and removed from site.

.2 Strip topsoil to depths as indicated. Do not mix topsoil with subsoil.

.3 Stockpile in locations as directed by Owner’s Representative. Stockpile height not to exceed 2.0 m and should be protected from erosion.

.4 Cover and protect topsoil from weed growth.

.5 Dispose of unused topsoil at an approved facility off site, per O. Reg. 406/19.

3.3 SCREENING

.1 All topsoil whether existing or imported topsoil for use under sodded areas shall be screened topsoil having passed through a 25mm size screen and ensure that it is free from:

.1 Debris and stones over 25 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

3.4 STOCKPILING

.1 Stockpile fill materials in areas designated by Owner’s Representative and HWDSB. Stockpile granular materials in a contained fashion and prevent from mixing with fill materials.

.2 It is the Contractor's responsibility to prevent stockpiled fill or topsoil materials from contamination by other site materials. If stockpiled materials become cross-contaminated they will be removed from the site and replaced at the Contractor's expense.

.3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

.1 Not Used.

3.6 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.
Submit for Owner's Representative's review and approval of details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.

.2 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.3 Protect open excavations against flooding and damage due to surface run-off.

.4 Dispose of water to approved collection or runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction.

.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.7 EXCAVATION

.1 Advise Owner's Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions as indicated as directed by Owner's Representative.

.3 Remove concrete, masonry, paving, walks, demolished foundations and rubble and other obstructions encountered during excavation in accordance with Section 02 41 13 - Selective Site Demolition.

.4 Excavation must not interfere with bearing capacity of adjacent foundations.

.5 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.6 For trench excavation, unless otherwise authorized by Owner's Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.

.7 Keep excavated and stockpiled materials safe distance away from edge of trench as

directed by Owner's Representative.

.8 Restrict vehicle operations directly adjacent to open trenches.

.9 Dispose of surplus and unsuitable excavated material in approved location on site off site.

.10 Do not obstruct flow of surface drainage or natural watercourses.

.11 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.12 Notify Owner's Representative when bottom of excavation is reached.

.13 Obtain Owner's Representative approval of completed excavation.

.14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Owner's Representative.

.15 Hand trim, make firm and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.2 Clean out rock seams and fill with concrete mortar or grout to approval of Owner's Representative.

3.8 FILL TYPES AND COMPACTION

.1 Use types of fill as indicated.

3.9 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Not Used.

3.10 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:

.1 Owner's Representative has inspected and approved installations.

.2 Owner's Representative has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.4 Removal of concrete formwork.

.5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

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

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

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

.5 Backfilling around installations.

.1 Place bedding and surround material as specified elsewhere.

.2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.

.3 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:

.1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Owner’s Representative or:
.2 If approved by Owner’s Representative, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Owner’s Representative.

3.11 RESTORATION

.1 Upon completion of Work, remove and dispose of waste materials and debris, trim slopes, and correct defects as directed by Owner’s Representative.

.2 Replace topsoil as directed by Owner’s Representative and drawings. It is the Contractor's responsibility to ensure all roots, rock and other debris are removed from topsoil prior to seeding or sodding. It is the Contractor's responsibility to ensure that stockpiled topsoil is not contaminated by other site materials.

.3 Reinstate lawns to elevation which existed before excavation with sod, as noted on drawings.

.4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.

.5 Clean and reinstate areas affected by Work as directed by Owner’s Representative.

.6 Protect newly graded areas from traffic and erosion and maintain them free of trash or debris.

3.12 FIELD QUALITY CONTROL

.1 Not Used

END OF SECTION 31 23 10

1 General

1.1 RELATED SECTIONS

.1 Section 07 26 16 - Below-Grade Vapour Retarders.

.2 Section 31 23 10 - Excavation, Trenching, Backfilling.

.3 Section 32 12 16 - Asphalt Paving.

.4 Section 32 13 13 - Concrete Paving.

.5 Section 32 16 13 - Concrete Curbs and Gutters.

1.2 REFERENCES

.1 ASTM D698-12(2021): Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 OPSS.MUNI 501 (Nov. 2017): Construction Specification for Compacting.

.3 OPSS.MUNI 1004 (Nov. 2021): Material Specification for Aggregates - Miscellaneous.

.4 OPSS.MUNI 1010 (Nov. 2013): Material Specification for Aggregates - Base, Subbase, Select Subgrade and Backfill Material.

.5 Geotechnical Investigation Report: As described in Section 00 31 00.

1.3 SAMPLES

.1 Submit samples as specified in Section 01 40 00.

.2 Verification Samples: One 4.5 kg sample of each type of fill, delivered to testing laboratory in air-tight containers.

1.4 SOURCE QUALITY CONTROL SUBMITTALS

.1 Submit source quality control reports as specified in Section 01 40 00.

.2 Source Quality Control Reports: Include moisture content, suitability and other required standards for aggregates.

1.5 FIELD QUALITY CONTROL SUBMITTALS

.1 Submit field quality control reports as specified in Section 01 40 00.

.2 Field Quality Control Reports: Include specified and actual results for compaction, moisture content and other required standards for aggregate base courses.

2 Products

2.1 MATERIALS

.1 Fine Aggregate Fill: To OPSS.MUNI 1010, Granular Class A; moisture content within plus or minus two percent of requirements in ASTM D698.

.2 Fine Crushed Stone Fill: To OPSS.MUNI 1004, Open Graded 19.0 mm Crushed Rock.

.3 Coarse Aggregate Fill: To OPSS.MUNI 1010, Granular Class B, Type II; moisture content within plus or minus two percent of requirements in ASTM D698.

.4 Coarse Crushed Stone Fill: Pit run, washed natural limestone; free of shale, clay, friable material, sand, debris; graded as follows:
.1 Minimum Size: 38 mm.
.2 Maximum Size: 50 mm.

.5 Sand: Natural river or bank sand; washed; free of silt, clay, loam, friable or soluble materials, or organic matter.

.6 Pea Gravel: Natural stone; washed, free of clay, shale, organic matter; graded as follows:
.1 Minimum Size: 6 mm.
.2 Maximum Size: 16 mm.

3 Execution

3.1 PREPARATION

.1 Generally, compact subgrade to density requirements for subsequent backfill materials.

.2 Cut out soft areas of subgrade not capable of insitu compaction and compact.

.3 Proof roll subgrade prior to placement of backfill in presence of Owner's geotechnical engineer.

.4 Correct soft areas and obtain geotechnical engineer's acceptance of existing conditions prior to placing aggregate base courses.

3.2 PLACEMENT

.1 Provide aggregate sub-base and base courses to compacted thicknesses and in locations as indicated on Drawings, including below:
.1 Concrete slabs-on-fill.
.2 Asphalt paving.
.3 Reinforced concrete paving.
.4 Concrete sidewalks, curbs and gutters.

.2 Where sub-base and base course thicknesses are not identified on Drawings, conform to recommendations of geotechnical investigation report.

.3 Backfill areas to contours and elevations with unfrozen materials.

.4 Systematically backfill to allow maximum time for natural settlement.

.5 Do not backfill over porous, wet, frozen or spongy subgrade surfaces.

.6 Place and compact materials in continuous layers not exceeding 150 mm compacted depth.

.7 Employ placement method that does not disturb or damage adjacent Work.

.8 Make grade changes gradual. Blend slope into level areas.

.9 Compact aggregate sub-base and base courses to OPSS.MUNI 501; at compaction rates recommended by geotechnical investigation report.

3.3 FIELD QUALITY CONTROL

.1 Perform field inspection and testing as specified in Section 01 40 00.

.2 Conduct tests and analysis of fill to ASTM D698.

.3 If tests indicate completed installation does not meet specified requirements, remove non-compliant fill, replace with new compacted fill, and re-test at no additional cost to Owner.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 02 41 19 - Selective Demolition.

.2 Section 32 11 23 - Aggregate Base Courses.

.3 Section 32 17 23 - Pavement Markings.

1.2 REFERENCES

.1 ASTM D698-12(2021): Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 OPSS.MUNI 310 (Nov. 2017): Construction Specification for Hot Mix Asphalt.

.3 OPSS.MUNI 312 (Nov. 2018): Construction Specification for Asphalt Curb and Asphalt Gutter Systems.

.4 OPSS.MUNI 341 (Nov. 2021): Construction Specification for Routing and Sealing Cracks in Hot Mix Asphalt Pavement.

.5 OPSS.MUNI 1003 (Nov. 2013): Material Specification for Aggregates - Hot Mix Asphalt.

.6 OPSS.MUNI 1101 (Nov. 2016): Material Specification for Performance Graded Asphalt Cement.

.7 OPSS.MUNI 1103 (Nov. 2019): Material Specification for Emulsified Asphalt.

.8 OPSS.MUNI 1150 (Nov. 2020): Material Specification for Hot Mix Asphalt.

.9 OPSS.MUNI 1212 (Nov. 2022): Material Specification for Hot Poured Rubberized Asphalt Joint Sealing Compound.

.10 Geotechnical Investigation Report: As described in Section 00 31 00.

1.3 FIELD QUALITY CONTROL SUBMITTALS

.1 Submit field quality control reports as specified in Section 01 40 00.

.2 Field Quality Control Reports: Include specified and actual results for compaction, suitability and other required standards for asphaltic material.

1.4 AMBIENT CONDITIONS

.1 Conform to OPSS.MUNI 310.

.2 Do not install Products during rainy or inclement weather.

2 Products

2.1 MATERIALS

.1 Asphalt Cement: To OPSS.MUNI 1101.

.2 Aggregate for Asphaltic Concrete Mix: To OPSS.MUNI 1003; graded as follows:
.1 Binder Course Mix: 100 percent passing a 26.5 mm sieve.
.2 Surface Course Mix: 100 percent passing a 16 mm sieve.

.3 Primer, Tack and Sealer Coats: To OPSS.MUNI 1103; SS-1 asphaltic emulsion.

.4 Patching Compound: Asphalt-based mix, maximum 10 mm OD aggregate size, Elsro Road Repair #1170 by W. R. Meadows of Canada Ltd.

.5 Crack Sealant: To OPSS.MUNI 1212; hot poured rubberized asphalt sealant.

2.2 MIXES

.1 Asphaltic Concrete Mixes: To OPSS.MUNI 1150; ready-mixed, hot laid asphaltic concrete, as follows:
.1 Binder Course: Type HL 8.
.2 Surface Course: Type HL 3.

3 Execution

3.1 EXAMINATION

.1 Refer to Section 01 71 00.

.2 Verify aggregate base course is compacted, dry and ready to support paving and imposed loads.

.3 Verify aggregate base course gradients and elevations are correct.

3.2 PREPARATION

.1 Shape finished subgrade parallel to proposed finished grades.

.2 Proof roll subgrade to 100 percent Standard Proctor maximum dry density.

.3 Where existing asphalt pavements are designated to be removed, replaced or extended, saw cut existing edges to form a neat joint between existing and new construction. Remove and dispose of abandoned materials as specified in Section 02 41 19.

3.3 PLACEMENT

.1 Lay asphalt paving to OPSS.MUNI 310, rolled to firm compaction.

.2 Apply asphalt courses to compacted thicknesses as indicated on Drawings. In the absence of such information, conform to recommendations of geotechnical investigation report.

.3 Lay mixture on dry aggregate base course, free of standing water.

.4 Spread mixture with mechanical self-propelled power spreader capable of spreading mixture to a line and grade.

.5 Before roller compaction is started, check surface for inequalities and flat spots, and adjust.

.6 Finished Surface: Smooth and true to established crown, free from depressions.

.7 Provide asphalt curbs and gutters to OPSS.MUNI 312.

.8 Make Good designated areas of damaged asphalt pavement using patching compound.

.9 Route and seal cracks in asphalt pavement to OPSS.MUNI 341.

3.4 FIELD QUALITY CONTROL

.1 Perform field inspection and testing as specified in Section 01 40 00.

.2 Conduct tests and analysis to ASTM D698.

.3 If tests indicate completed installation does not meet specified requirements, remove defective Products, replace with new Products and re-test at no cost to Owner.

3.5 ADJUSTING

.1 Repair low or defective areas by cutting out affected course and replace it with fresh, hot mixture. Immediately compact to conform to surrounding area.

.2 Ensure 100 percent bond to existing adjacent paving.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 02 41 19 - Selective Demolition.

.2 Section 32 11 23 - Aggregate Base Courses.

.3 Section 32 16 13 - Concrete Curbs and Gutters.

.4 Section 32 17 23 - Pavement Markings.

1.2 REFERENCES

.1 ASTM A1064/A1064M-22: Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

.2 ASTM C309-19: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM D1751-18: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.4 CSA A23.1:19: Concrete Materials and Methods of Concrete Construction.

.5 CSA A23.2:19: Test Methods and Standard Practices for Concrete.

.6 CSA G30.18-09 (R2014): Carbon Steel Bars for Concrete Reinforcement.

.7 OPSS.MUNI 350 (Nov. 2021): Construction Specification for Concrete Pavement and Concrete Base.

.8 OPSS.MUNI 351 (Nov. 2021): Construction Specification for Concrete Sidewalk.

.9 OPSS.MUNI 1350 (Nov. 2023): Material Specification for Concrete - Materials and Production.

1.3 SHOP DRAWINGS

.1 Submit Shop Drawings as specified in Section 01 33 00.

.2 Shop Drawings: Project-specific drawings, illustrating reinforcing steel design, as follows:
.1 Prepared according to RSIC Manual of Standard Practice.
.2 Clearly indicate bar sizes, spacings, location and quantities of reinforcement, welded wire fabric, chairs spacers and hangers with identifying code marks to permit correct placement without reference to Drawings.
.3 Prepare details to show placement of reinforcing where special conditions occur.
.4 Shop Drawings will not contain reproductions of Contract Documents.

.3 Mill Tests: Submit upon request one certified copy of mill tests for reinforcing steel, showing physical and chemical analysis.

1.4 FIELD QUALITY CONTROL SUBMITTALS

.1 Submit field quality control reports as specified in Section 01 40 00.

.2 Field Quality Control Reports: Include specified and actual results for slump at point of placement, compressive strength, cement content, water-to-cement ratio, air entrainment and other required standards for concrete material.

1.5 QUALIFICATIONS

.1 Applicator: A firm specializing in commercial-quality concrete paving, having minimum 10 years documented experience.

1.6 AMBIENT CONDITIONS

.1 Place Products only when ambient conditions are to CSA A23.1.

.2 Ensure temporary heating is provided for cold weather work.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers of tactile walking surface indicators having Product considered acceptable for use:
.1 ADA Solutions, Inc.
.2 Kinesik Engineered Products Inc.

.2 Substitution Procedures: Refer to Section 01 25 00.

2.2 MATERIALS

.1 Concrete: To OPSS.MUNI 1350; as follows:
.1 Compressive Strength: 32 MPa at 28 days;
.2 Water-to-Cement Ratio: 0.40;
.3 Air Entrainment: 7 to 10 percent.

.2 Formwork: SPF species; NLGA Light Framing classification, Utility Grade; with grade stamp clearly visible.

.3 Release Agent: Non-staining oil-based material, which will not impair natural bonding or colour characteristics of coating intended for use on concrete; eg. Duoguard ECO-Coat by W. R. Meadows of Canada Limited.

.4 Reinforcing Steel: To CSA G30.18, Grade 400R; high bond deformed bars made from new billet steel, sizes as indicated on Drawings.

.5 Welded Wire Reinforcement: To ASTM A1064/A1064M; flat sheets; 152 x 152 MW 18.7 X MW 18.7 size.

.6 Tie Wire: To ASTM A1064/A1064M; minimum 3 mm OD, annealed type.

.7 Chairs, Bolsters, Bar Supports and Spacers: Adequate for strength and support of reinforcing construction conditions.

.8 Expansion Joint Filler: To ASTM D1751; 10 mm thick, preformed asphalt-impregnated fibre board.

.9 Curing and Sealing Compound: To ASTM C309, Type 1, Class B; transparent, non-yellowing; eg. CS-309 by W. R. Meadows of Canada Limited.

.10 Concrete Sealer: eg. Sealtight HIAC acrylic concrete sealer by W. R. Meadows of Canada Limited.

.11 Below-Grade Insulation: Extruded polystyrene rigid board insulation, Type INS-RB-1 as specified in Section 07 21 00.

.12 Tactile Walking Surface Indicators - Cast-in-Place (TWSI-CIP): 610 x 915 mm rectangular units, two-piece polymeric assembly consisting of 32 mm deep cast-in-place base pan with hexagonal nylon anchors, and 5 mm thick cover tile complete with 5 mm high, 23 mm OD truncated domes, spaced at 61 mm OC and aligned in an in-line pattern; bevelled edges; eg. Replaceable Cast in Place Access Tiles as distributed by Kinesik Engineered Products Inc., colour as selected by Consultant.

.13 TWSI Adhesive/Sealant: eg. Access Tile Tactile Bond & Seal as distributed by Kinesik Engineered Products Inc.

.14 TWSI Fasteners: Stainless steel screw type fasteners, size and length as recommended by manufacturer.

.15 Non-Slip Strips: 50 mm wide carborundum grit tape strip inserts, colours as selected by Consultant and in accordance with barrier free requirements.

.16 Joint Sealer and Saw Cut Filler: Lithoreal Joint Sealant by L. M. Scofield Company, multiple colours required, to match adjacent surfaces.

2.3 MIXING

.1 Mix concrete to OPSS.MUNI 1350 and CSA A23.1.

3 Execution

3.1 EXAMINATION

.1 Refer to Section 01 71 00.

.2 Verify subgrade elevations.

3.2 PREPARATION

.1 Shape finished subgrade parallel to proposed finished grades.

.2 Proof roll subgrade to 95 percent Standard Proctor maximum dry density.

.3 Where existing concrete pavements are designated to be removed, replaced or extended, saw cut existing edges to form a neat joint between existing and new construction. Remove and dispose of abandoned materials as specified in Section 02 41 19.

3.3 PLACEMENT

.1 Place below grade insulation where noted on Drawings.

.2 Construct concrete pavements to OPSS.MUNI 350.

.3 Construct concrete sidewalks to OPSS.MUNI 351.

.4 Place reinforcement, supported on concrete chairs at mid-thickness of concrete slabs. Do not continue reinforcement through expansion joints.

.5 Place concrete to thicknesses indicated on Drawings and vibrate to CSA A23.1.

.6 Broom finish surface to a slight crown to shed water.

.7 Provide tooled edge and mark into panels not more than 1 525 mm in size.

.8 Saw cut concrete surfaces and fill with saw cut filler as indicated on Drawings.

.9 Provide asphalt-impregnated board expansion joint at maximum 7 500 mm OC.

.10 Cure and seal concrete pavements subject to action of salt with curing and sealing compound.

.11 Apply concrete sealer to concrete that has cured for minimum 7 days.

.12 Apply non-slip strips to concrete surfaces to barrier free ramp in pattern as indicated on Drawings. Ensure concrete surfaces are properly cured, smooth, dry, clean and free of foreign materials such as dust, paint, grease, and oils. Roll non-slip strips with J-hand roller to ensure proper bond with substrate.

.13 Provide tapered concrete sidewalks in conjunction with drop curbs, with maximum 1:12 slope. Finish to sandblast texture.

3.4 TACTILE WALKING SURFACE INDICATORS

.1 Install tactile walking surface indicators where indicated on Drawings.

.2 Embed TWSI assembly in freshly poured concrete, tamping to correct level.

.3 Create 6 mm wide joint around TWSI assembly and float concrete surface around assembly perimeter.

.4 Clean and seal perimeter with TWSI adhesive/sealant.

3.5 FIELD QUALITY CONTROL

.1 Perform field inspection and testing as specified in Section 01 40 00.

.2 Conduct tests and analysis of concrete to CSA A23.2.

.3 If tests indicate completed installation does not meet specified requirements, remove non-compliant Products, replace with new Products, and re-test at no additional cost to Owner.

3.6 PROTECTION

.1 Protect concrete from harmful effects of sunshine, drying winds and cold running of surface water for minimum 5 days.

.2 Remove temporary protective covering from tactile walking surface indicator surfaces after concrete has cured.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 02 41 19 - Selective Demolition.

.2 Section 32 11 23 - Aggregate Base Courses.

.3 Section 32 13 13 - Concrete Paving.

.4 Section 32 17 23 - Pavement Markings.

1.2 REFERENCES

.1 ASTM A1064/A1064M-22: Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

.2 ASTM D1751-18: Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.3 CSA A23.1:19: Concrete Materials and Methods of Concrete Construction.

.4 CSA A23.2:19: Test Methods and Standard Practices for Concrete.

.5 CSA G30.18-09 (R2014): Carbon Steel Bars for Concrete Reinforcement.

.6 OPSS.MUNI 353 (Nov. 2021): Construction Specification for Concrete Curb and Gutter Systems.

.7 OPSS.MUNI 1350 (Nov. 2023): Material Specification for Concrete - Materials and Production.

1.3 FIELD QUALITY CONTROL SUBMITTALS

.1 Submit field quality control reports as specified in Section 01 40 00.

.2 Field Quality Control Reports: Include specified and actual results for slump at point of placement, compressive strength, cement content, water-to-cement ratio, air entrainment and other required standards for concrete.

2 Products

2.1 MATERIALS

.1 Concrete: To OPSS.MUNI 1350; as follows:
.1 Compressive Strength: 35 MPa at 28 days;
.2 Water-to-Cement Ratio: 0.40;
.3 Air Entrainment: 7 to 10 percent.

.2 Formwork: Wooden forms, as specified in Section 32 13 13.

.3 Release Agent: As specified in Section 32 13 13.

.4 Reinforcing Steel: To CSA G30.18, Grade 400R; high bond deformed bars made from new billet steel, sizes as indicated on Drawings.

.5 Welded Wire Reinforcement: To ASTM A1064/A1064M; flat sheets; 152 x 152 MW 18.7 X MW 18.7 size.

.6 Tie Wire: To ASTM A1064/A1064M; minimum 3 mm OD, annealed type.

.7 Chairs, Bolsters, Bar Supports and Spacers: Adequate for strength and support of reinforcing construction conditions.

.8 Expansion Joint Filler: To ASTM D1751; 10 mm preformed asphalt impregnated fibre board.

.9 Curing and Sealing Compound: eg. CS-309 by W. R. Meadows of Canada Limited.

.10 Concrete Sealer: eg. Sealtight HIAC acrylic concrete sealer by W. R. Meadows of Canada Limited.

2.2 EQUIPMENT

.1 Concrete Curb Extruder: Proprietary concrete extruder, designed to form profile of concrete curb automatically by extrusion process.

2.3 MIXING

.1 Mix concrete to OPSS.MUNI 1350 and CSA A23.1.

3 Execution

3.1 EXAMINATION

.1 Refer to Section 01 71 00.

.2 Verify subgrade elevations.

3.2 PREPARATION

.1 Proof roll base to 95 percent Standard Proctor maximum dry density.

.2 Where existing concrete curbs and gutters are designated to be removed, replaced, or extended, saw cut existing edges to form a neat joint between existing and new construction. Remove and dispose of abandoned materials as specified in Section 02 41 19.

3.3 PLACEMENT

.1 Erect formwork as specified in Section 32 13 13.

.2 Construct concrete curbs and gutters to OPSS.MUNI 353.

.3 Place reinforcement, supported on concrete chairs at mid-thickness of concrete curbs. Do not continue reinforcement through expansion joints.

.4 Place concrete to scheduled thickness and vibrate to CSA A23.1.

.5 A concrete curb extruder may be used for non-reinforced curbs.

.6 Provide asphalt-impregnated board expansion joint at maximum 7 500 mm OC.

.7 Cure and seal concrete with curing and sealing compound.

.8 Apply concrete sealer to concrete that has cured for minimum 7 days.

.9 Provide drop curbs in conjunction with tapered sidewalks, as indicated on Drawings.

3.4 FIELD QUALITY CONTROL

.1 Perform field inspection and testing as specified in Section 01 40 00.

.2 Conduct tests and analysis of concrete to CSA A23.2.

.3 If tests indicate completed installation does not meet specified requirements, remove defective Products, replace with new Products and re-test at no cost to Owner.

3.5 ADJUSTING

.1 Remove formwork no sooner than 24 hours after pouring.

3.6 PROTECTION

.1 Refer to Section 01 76 00.

.2 Protect concrete from harmful effects of sunshine, drying winds and cold running of surface water for 5 days.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 32 12 16 - Asphalt Paving.

.2 Section 32 13 13 - Concrete Paving.

.3 Section 32 16 13 - Concrete Curbs and Gutters.

1.2 REFERENCES

.1 OPSS.MUNI 710 (Nov. 2021): Construction Specification for Pavement Marking.

.2 OPSS.MUNI 1716 (Nov. 2021): Material Specifications for Water-Borne Traffic Paint.

1.3 CLOSEOUT SUBMITTALS

.1 Submit closeout submittals as specified in Section 01 78 00.

.2 Stencils: Submit stencils to Owner upon completion of pavement marking application.

1.4 AMBIENT CONDITIONS

.1 Conform to OPSS.MUNI 710.

.2 Do not install Products during rainy or inclement weather.

.3 Apply pavement markings only when ambient conditions are as follows:
.1 Air Temperature: > 10 degrees C.
.2 Wind Speed: < 60 kph.
.3 Precipitation: None forecasted for the next 48 hours.

2 Products

2.1 MATERIALS

.1 Traffic Paint: To OPSS.MUNI 1716; ready-mixed, homogeneous, water-borne traffic paint of uniform consistency, Flat gloss level; colours as follows:
.1 Existing Linework Designated to be Abandoned: Black.
.2 Depressed Sidewalks and Drop Curbs: White.
.3 Crosswalks: White.
.4 Barrier Free Parking Symbol: Yellow border, Blue field, Yellow symbol.
.5 Electric Vehicle Parking Symbol: White border, Green field, White symbol.
.6 Play Area Game Lines: White.
.7 All Other Pavement Markings: Yellow.

2.2 EQUIPMENT

.1 Stencils: Re-usable stencils, 3 mm thick heavy duty plastic; lettering and symbols as indicated on Drawings, by U-Line.

3 Execution

3.1 APPLICATION

.1 Lay out pavement markings as indicated on Drawings.

.2 Apply pavement markings to OPSS.MUNI 710.

.3 Apply traffic paint evenly at rate of 3 L/m^2.

.4 Do not thin paint.

.5 Provide symbols and lines as indicated, using stencils specified above.

.6 Provide lines of uniform colour and density, with sharp edges.

.7 Thoroughly clean distributor tank before refilling with paint of different colour.

.8 Paint markings to be within plus or minus 12 mm of dimensions indicated.

.9 Make Good incorrect markings.

.10 Protect pavement markings until dry.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 03 11 00 – Concrete Forming

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM), latest editions at time of tender

.1 ASTM A53/A53M-02, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A90/A90M-01, Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.

.3 ASTM A121-99, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.

.4 A653/A653M-03, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or
Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM C618-03, Standard Specification for Coal Fly Ash and Raw or Calcined Natural
Pozzolan for Use as a Mineral Admixture in Concrete.

.6 ASTM F1664-01, Standard Specification for Poly Coated Steel
Tension Wire Used with Chain-Link Fence.

.2 Canadian General Standards Board (CGSB), latest editions at time of tender

.1 CAN/CGSB-138.1 Fabric for Chain Link Fence.

.2 CAN/CGSB-138.2 Steel Framework for Chain Link Fence.

.3 CAN/CGSB-138.3 Installation of Chain Link Fence.

.4 CAN/CGSB-138.4 Gates for Chain Link Fence.

.5 CAN/CGSB-1.181 Ready-Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International), latest editions at time of tender

.1 CAN/CSA-A23.1/A23.2-00, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

.2 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CAN/CSA-A30008, Cementitious Materials Compendium. Includes:

.1 CAN/CSA-A23.5, Supplementary Cementing Materials

.4 Department of Justice Canada, latest editions at time of tender:

.1 Canadian Environmental Protection Act (CEPA), c. 33.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.6 The Master Painters Institute (MPI) - Architectural Painting Specification Manual.

.1 MPI # 18, Organic Zinc Rich Primer.

.7 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act (TDGA), c. 34.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Concrete mixes and materials: in accordance with Section 03 11 00

.2 Chain-link fence fabric: to CAN/CGSB-138.1; and as indicated on drawings; and

.1 All mesh to be new and hot dipped galvanized before fabrication. Top and bottom selvage to have a knuckled finish. Galvanized fabric to have a minimum of 488 g/sq.m of zinc on surface area. Fabric shall be installed to the full width indicated on drawings without overlap.

.2 Mesh to be 6-gauge, 38 x 38 mm diamond.

.3 Fabric with galvanized burrs will not be accepted.

.3 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe; and as indicated on drawings.

.4 Top and bottom tension wire: to CAN/CGSB-138.2; and as indicated on drawings.

.5 Tie wire fasteners securely for long term durability: steel wire aluminum wire, aluminum alloy wire, black vinyl coated; and ss indicated on drawings

.6 Tension bar: to ASTM A653/A653M, 5 x 19mm minimum galvanized steel; and as indicated on drawings.

.7 Fittings and hardware: to CAN/CGSB-138.2 galvanized steel.

.1 Tension bar bands: 3 x 19 mm minimum galvanized steel or 5 x 20 mm minimum aluminum.

.2 Post caps to provide waterproof fit, to fasten securely over posts and to carry top rail.

.3 Turnbuckles to be drop forged.

.8 Organic zinc rich coating: to CAN/CGSB-1.181 MPI #18.

2.2 FINISHES

.1 Galvanizing:

.1 For chain link fabric: to CAN/CGSB-138.1 Grade2.

.2 For pipe: 550 g/m2 minimum to ASTM A90.

.3 For other fittings: to CAN/CSA-G164.

.2 Black Vinyl coating: to ASTM F1664.

.1 0.045 mm dry film thickness minimum.

Part 3 EXECUTION

3.1 GRADING

.1 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.

.1 Provide clearance between bottom of fence and ground surface of 30 mm to 50 mm.

3.2 ERECTION OF FENCE

.1 All vertical and horizontal structural members to be welded except as otherwise noted on drawings.

.2 Erect fence along lines as indicated and to CAN/CGSB-138.3.

.3 Excavate post holes to dimensions indicated.

.4 Space posts as indicated and confirm spacing with Owner’s Representative prior to installation.

.5 Install corner post where change in alignment exceeds 10 degrees.

.6 Install end posts at end of fence.

.7 Place concrete in post holes then embed posts into concrete to depths indicated on drawings

.1 Brace to hold posts in plumb position and true to alignment and elevation until concrete has set.

.8 Do not install asphalt until concrete has cured a minimum of 7 days.

.9 Install asphalt over concrete footings and around posts per details and drawings. Ensure adequate installation and compaction of asphalt per Section 32 12 17 Asphalt Paving.

.10 Do not install fence fabric until concrete has cured a minimum of 7 days.

.11 Install brace between end posts and nearest line post, placed in centre of panel and parallel to ground surface as indicated.

.12 Install overhang tops and caps.

.13 Install top rail between posts and fasten securely to posts and secure waterproof caps and overhang tops.

.14 Install bottom tension wire, stretch tightly and fasten securely to end, corner, gate and straining
posts with turnbuckles and tension bar bands.

.15 Lay out fence fabric. Stretch tightly to tension recommended by manufacturer and fasten to end, corner, gate and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals.

.1 Knuckled selvedge at bottom.
.2 Knuckled selvedge at top.

.16 Secure fabric to top rails, line posts and bottom tension wire with tie wires at 450 mm intervals.

.1 Give tie wires minimum three twists and ensure long term durability of ties .

.17 Install grounding rods as indicated.

3.3 TOUCH UP

.1 Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of organic zinc-rich paint to damaged area.

.1Pre-treat damaged surfaces according to manufacturers' instructions for zinc-rich paint.

.2 Replace any areas where black vinyl coating has been removed or damaged to the satisfaction of the Owner’s Representative.

.3 Protect all surrounding areas of the site from damage during all welding and touch-up work.

END OF SECTION 32 31 13

PART 1 GENERAL

1.1 SUMMARY

.1 The work in this section includes, but is not limited to, the following:

.1 Grading of stockpiled topsoil on-site for seeding.

.2 References:

.1 The following references and standards used herein and shall mean:

.2 Agriculture and Agri-Food Canada
a. The Canadian System of Soil Classification, Third Edition, 1998.

.3 NMS (National Master Specification) Section 32 91 19.13 Topsoil Placement and Grading

.4 Canadian Landscape Standard, Second Edition
.1 Section 4: Grading and Drainage
.2 Section 5: Growing Medium

1.2 TESTING.

.1 Not used.

PART 2 PRODUCTS

2.1 EXISTING STOCKPILED TOPSOIL

.1 All topsoil used to be supplied from stockpiles of stripped site topsoil.

PART 3 EXECUTION

3.1 SITE EXAMINATION

.1 Examine the surface grades and soil conditions for any circumstances that might be detrimental to soil drainage, such as uneven sub grades and waterproofing that may hold or pond water, deposits of construction-related waste or soil contamination, storage of material or equipment, soil compaction or poor drainage.

.2 Examine the grading, verify all elevations. Confirm that all other work in the area of planting mix installation is completed. Notify the Owner’s Representative in writing of any unsatisfactory conditions.

3.2 COORDINATION WITH PROJECT WORK

.1 The Contractor shall coordinate with all other work that may impact the completion of the work. Protect installed topsoil from compaction by other trades.

.2 Assure that all sediment control required by the project documents is in place during the installation of topsoil. Provide additional sediment control to retain topsoil within the project limits as needed.

.3 It is the sole responsibility of the Contractor to ensure that topsoil stockpiled on site remains uncontaminated for the duration of the project. If site stockpiled topsoil becomes contaminated, it will be the responsibility of the Contractor to remove it from the site and replace with clean, screened topsoil at their expense.

3.3 GRADE AND ELEVATION CONTROL

.1 Provide grade and elevation control during installation of topsoil. Utilize grade stakes, surveying equipment and other means and methods to assure that grades and contours conform to the grades indicated on the plans.

.2 Grade stakes are to be maintained until grades have been viewed by the Owner's Representative and concrete and asphalt works have been installed.

3.4 SOIL MIX PREPARATION

.1 Not used.

3.5 SCREENING TOPSOIL

.1 All topsoil whether existing or imported topsoil for use under sodded areas shall be screened topsoil having passed through a 25mm size screen and ensure that it is free from:

.1 Debris and stones over 25 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

3.6 SPREADING OF TOPSOIL

.1 Spread topsoil after Owner's Representative has inspected and approved the subgrade.

.2 Place appropriate soil to the following depths:

.1 Seed restoration areas: 100 mm

.2 Sod restoration areas: 100mm

.3 Planting beds 400mm min.

.3 Spread 50% of approved soil on an unfrozen, aerated sub-grade, completed drainage course and drain tile tree pits. This soil should be mixed with the existing sub-grade soil, followed by the addition of the remaining 50%. Ensure that all debris Including sticks and stones are removed from soil after spreading.

.4 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.7 FINISH GRADING

.1 Fine grade and loosen topsoil. Eliminate rough spots and low areas, foot prints and tire tracks to ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Roll to 680kg pressure per square meter, to consolidate topsoil for areas to be seeded leaving surface smooth, uniform, firm enough to prevent deep footprints, and with a fine loose texture that has been approved by the Consultant.

.3 In areas of drainage corridors, ditches and swales compact topsoil to 90% Standard Proctor dry density and level to ensure positive flow of water.

3.8 CLEAN-UP

.1 During installation, keep pavements clean and work area in an orderly condition.

.2 Keep the site free of garbage at all times. Immediately dispose of wrappings or waste materials associated with products necessary for the completion of the work.

.3 All garbage shall be kept in a central collection container. Do not bury garbage in backfill.

.4 Once installation is complete, remove any excess soil from pavements or embedded fixtures.

3.9 PROTECTION DURING CONSTRUCTION

.1 The Contractor shall protect landscape work and materials from damage due to landscape operations, operations by other Contractors or trespassers. Maintain protection during installation until acceptance. Treat, repair or replace damaged topsoil installation work immediately.

.2 Till compacted topsoil and replace topsoil that has become contaminated as determined by the Owner’s Representative. Topsoil shall be tilled or replaced by the Contractor at no expense to the Owner.

3.10 REPAIR OF SETTLED GROWING MEDIUM

.1 At the end of the twelve months warranty period, inspect the site and restore any areas where the grades have settled beyond the elevations shown on the drawings by an amount greater than 5% of the soil depth.

.1 In seeded areas where the settlement is 75mm or less, top dress the area with the specified topsoil and re-seed.

.2 In all ground cover areas and shrub planting areas where the settlement is greater than 75mm, remove the turf, add the necessary topsoil, replace with sod and water appropriately to establish turf. Repair must be done with sod. Seed repair is unacceptable.

END OF SECTION 32 91 21

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 32 91 21 – Topsoil and Fine Grading.

1.2 SUBMITTALS

.1 Samples.

.1 Submit source in accordance with Section 01 33 00 - Submittal Procedures.

.2 Obtain approval of proposed source by Owner's Representative.

1.3 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

1.4 SCHEDULING

.1 Schedule sod laying to coincide with preparation of soil surface.

.2 Schedule sod installation when frost is not present in ground.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials.

.2 Divert unused fertilizer from landfill to official hazardous material collections site approved by Owner's Representative.

.3 Do not dispose of unused fertilizer into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop.

.1 Turf Grass Nursery Sod types:

.1 Number One Kentucky Bluegrass Sod: Nursery Sod grown solely from seed of cultivars of Kentucky Bluegrass, containing not less than 50% Kentucky Bluegrass cultivars.

.2 Number One Kentucky Bluegrass Sod - Fescue Sod: Nursery Sod grown solely from seed mixture of cultivars of Kentucky Bluegrass and Chewing Fescue or Creeping Red Fescue, containing not less than 40% Kentucky Bluegrass cultivars and 30% Chewing Fescue or Creeping Red Fescue cultivar[s].

.3 Number One Named Cultivars: Nursery Sod grown from certified seed.

.2 Turf Grass Nursery Sod quality:

.1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 35 to 65 mm.

.4 Soil portion of sod: 6 to 15 mm in thickness.

.2 Water:

.1 Supplied by Contractor.

.3 Fertilizer:

.1 To Canada "Fertilizers Act" and "Fertilizers Regulations".

.2 Complete, synthetic, slow release with 25-5-5 NPK ratio.

2.2 SOURCE QUALITY CONTROL

.1 Obtain approval from Owner's Representative of sod at source.

.2 When proposed source of sod is approved, use no other source without written authorization.

Part 3 Execution

3.1 PREPARATION

.1 Verify that grades are correct and prepared in accordance with Section 32 91 21 - Topsoil Placement and Grading. If discrepancies occur, notify Owner's Representative and do not commence work until instructed by Owner's Representative.

.2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.

.3 Fine grade surface free of humps and hollows to smooth, even grade, to contours and elevations indicated, to tolerance of plus or minus 10 mm, for Turf Grass Nursery Sod and plus or minus 10 mm for Commercial Grade Turf Grass Nursery, surface to drain naturally.

.4 Remove and dispose of weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site in location as directed by Owner's Representative.

3.2 SOD PLACEMENT

.1 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.2 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.3 Roll sod as directed by Owner's Representative. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.3 FERTILIZING PROGRAM

.1 Fertilize during establishment and warranty periods as required.

3.4 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of installation until acceptance.

.2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 100mm until accepted. Daily watering may be required for initial establishment if installed between June 1 and October 1.

.3 Cut grass to 65 mm when or prior to it reaching height of 100mm. Remove clippings which will smother grassed areas as directed by Owner's Representative.

.4 Maintain sodded areas weed free 95%.

.5 Fertilize areas in accordance with fertilizing program. Spread half of required amount of slow-release fertilizer in one direction and remainder at right angles and water in well.

3.5 ACCEPTANCE

.1 Turf Grass Nursery Sod areas will be accepted by Owner's Representative provided that:

.1 Sodded areas are properly established.

.2 Sod is free of bare and dead spots.

.3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 65mm.

.4 Sodded areas have been cut minimum 3 times prior to acceptance.

.2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

3.6 MAINTENANCE DURING WARRANTY PERIOD

.1 Following approval and acceptance, maintenance will be carried out by the Owner.

3.7 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION 32 92 23

PART 1 GENERAL

1.1 SUMMARY

.1 Supply and installation of all Trees, grasses, perennials and shrubs.

.2 Supply and installation of all planting accessories including mulch, tree support, and maintenance for the duration of the warranty period.

1.2 RELATED DOCUMENTS AND REFERENCES

.1 Canadian Nursery Landscape Association (CNLA).

.1 Canadian Standards for Nursery Stock-2006.

1.3 SUBMITTALS

.1 Make submittals in accordance with the General Conditions.

.2 Material Certificates: Submit material certificates for all natural and bulk material indicating that the material meets the requirements of the specification to the Owner's Representative for approval. Provide submittal four weeks before the installation of plant material.

1.4 SEQUENCING AND SCHEDULING

.1 Do not schedule installation of plant material in areas that require additional access for other work.

.2 Anticipated schedule suggests that trees, shrubs and groundcovers should be planted in Fall 2023. For turf areas, seed and sod should be installed in Fall 2023. Upon award of contract, Contractor responsible for securing stock, confirming and ensuring coordination of both digging and planting schedule with Owner’s Representative, supplier and associated trades in accordance with construction schedule.

1.5 SELECTION AND QUALITY ASSURANCE

.1 Acceptance:

.1 The contractor is responsible for selecting and securing plant material. Owner’s Representative will review material at source with contractor prior to delivery to site. Owner’s representative will also inspect material on site prior to planting. Any material which does not meet the requirements as stipulated will be rejected and shall be replaced at the contractor’s cost.

.2 Material should be gathered, grouped and flagged at source for Owner's Representative to review. Owner's Representative **will not** select and flag material at source. It will be the contractor’s responsibility to ensure tagged material is what is delivered to site.

.3 Acceptance of plant material by the Owner's Representative shall be for general conformance to specified size, character and quality and not relieve the Contractor of responsibility for full conformance to the contract documents, including correct species.

.4 The Contractor is responsible for the condition and quality of work and materials during construction, and until Substantial Performance. Contractor shall bear the total cost of replacing any and all plant material until this time.

.5 Any material shipped to site without Owner's Representative approval at source will be rejected.

.2 Warranty:

.1 Submit for the Owner's documentation. Furnish written warranty in form stipulated by the Owner's Representative, signed by the contractor and the installer, agreeing to replace defective Work, which has failed as a result of defects in the growth or health of the plant materials. Defective plant materials are defined as plant materials that are dead or not in a healthy, attractive condition as defined below. If necessary, Owner's Representative may request replacement for plant material that has failed to meet these standards.

.2 All trees, shrubs and ground covers; two-year warranty.

.1 During the warranty period, failure to replace material within four (4) weeks of notification by Owner's Representative will result in forfeiture of holdback. A new two-year warranty will begin for any replacement work beginning at the time of planting.

.3 Final Acceptance:

.1 At the end of the warranty period, the Owner's Representative shall inspect all warranted work, upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date for final inspection.

.2 Final Acceptance will be given only when all the requirements of this specification have been met.

.4 Contractor's Quality Assurance Responsibilities: Contractor is solely responsible for quality control of the Work.

.5 Qualified Installer: the installer shall be a firm having at least 5 years of successful experience of a scope similar to that required for the Work, including the handling and planting of large specimen trees in urban areas.

.6 Regulatory requirements: Comply with applicable requirements of the laws, codes, ordinances and regulations of federal, Provincial and municipal authorities having jurisdiction. Obtain necessary approvals from all such authorities.

1.6 REJECTION OF PLANT MATERIALS

.1 The Owner's Representative has the right to reject any and all plant material that does not conform to the requirements of this specification at any time regardless of any previous approval.

.2 When a plant has been rejected, remove it from the area of the Work within 24 hours and replace it with a plant of the required species, size and quality at the earliest planting period consistent with these specifications.

.3 Acceptance shall not be given for the planting Work until all plants rejected during the course of the Work are replaced.

1.7 SITE CONDITIONS

.1 It is the responsibility of the Contractor to be aware of all surface and sub-surface conditions, and to report any circumstances that would negatively impact the health of plantings. Do not proceed with work until unsatisfactory conditions have been corrected.

.2 Do not install plant materials into saturated or frozen soils. Do not install plant materials during inclement weather, such as rain or snow or during extremely hot, cold or windy conditions.

1.8 PLANTING AROUND UTILITIES

.1 Contractor shall carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging.

.2 Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until parties concerned mutually agree upon removal.

PART 2 PRODUCTS

2.1 BALLED AND BURLAPPED PLANT MATERIAL

.1 Provide field grown, quality plant material of height or caliper scheduled or shown and with branching configurations and spread characteristics.

.2 Trees: quality single-stem balled and burlapped (B&B) deciduous trees. Container trees shall not be accepted, unless specified or approved by the Owner’s Representative. Trees that are multi-stemmed (unless specified in Contract) or that lack a strong central leader will not be accepted.

.1 Trees (general) shall be with straight trunks, well and characteristically branched for species. Container grown trees shall not be permitted for planting, unless approved by the Owner’s Representative prior to purchase. Contractor to advise nurseries that trunk flare must be exposed above root ball before arrival on site. Trees that fail to meet this requirement shall be rejected by the Owner’s Representative.

.3 Shrubs: Provide quality single-stem or caned balled and burlapped (B&B) deciduous shrubs, except where special forms are shown or listed.

2.2 CONTAINER GROWN PLANT MATERIAL

.1 Provide plants established and well rooted in removable containers or integral peat pots and

with not less than the minimum number and length of runners required by Canadian Standards for Nursery Stock-2001 for the pot size listed in the planting schedule.

.2 Container-grown stock shall have been grown in a container long enough for the root system to have developed sufficiently to hold its soil together but not so long as to have developed a girdling root mat around the edge of the container.

2.3 MULCH

.1 Mulch shall be double shredded pine bark free from roots, leaves, twigs, debris, stones, fungus, crabgrass rhizomes, or any material detrimental to plant growth. Material shall be mulching grade, uniform in size and foreign matter. Wood content shall not exceed 15% by volume. Mulch shall be composted to the point where all wood has turned dark brown within the interior of the fragment. Mulch that has become saturated with water and presents an anaerobic odor shall be rejected. Submit manufactures material certificate that product meets the requirements and an 8-liter sample packaged in two 4-liter bags for approval.

2.4 ANTI-DESICCANT

.1 Do not use anti-desiccant.

2.5 TREE STAKING AND GUYING MATERIAL

.1 Secure stakes to tree with V-Straps (Treestop), per manufacturer’s specifications. Tighten only enough to prevent slipping and to allow for trunk movement. Strap shall be long enough to accommodate 35mm (1.5”) growth. Buffer all branches from the strap.

.2 Stakes to be 50 x 50mm wooden stakes aligned parallel with the direction of prevailing winds and firmly planted into stable subgrade outside of tree root ball area.

.3 Contractor to remove stakes and straps at the end of warranty period, or longer as directed by Owner’s Representative.

2.6 TREE WRAPPING

.1 Remove all tree wrapping after installation.

2.7 CHEMICAL AND BIOLOGICAL ADDITIVES

.1 Chemical and Biological Additives: All material shall be delivered to the site in unopened containers and stored in a dry enclosed space suitable for the material and meeting all environmental regulations. Biological additives shall be protected from extreme cold and heat. All products shall be freshly manufactured and dated for the season in which the products are to be used.

.1 Fertilizer: Fertilizer for planting shall be organic fertilizer, part of the elements of which from organic sources. Fertilizer selections shall be based on the recommendations of the soil test. Specialty fertilizers and additives noted below shall be used where required by the specifications prior to the use of any additional fertilizer. Submit manufacturers product data for approval.

.2 Lime: Agricultural limestone complying with ASTM C602 containing minimum of 85

percent carbonates. Minimum gradation: 100 percent passing a No. 10 mesh sieve; 98 percent through a No. 20 mesh sieve; 55 percent through a No. 60 mesh sieve; and 40 percent through a No. 100 mesh sieve. Submit manufacturers product data for approval.

.3 Mycorrhizal Stimulant: MychorrizaROOTS, manufactured by Novozymes Biologicals, Inc – ROOTS Plant Care Group, Phone: 800-342-6173. Mycorrhizal Stimulant shall be used according to manufacturer's recommendations. Submit manufacturers product data for approval.

.4 Bone Meal: Commercial, raw, finely ground; 4 percent nitrogen, and 20 percent phosphoric acid. Bone meal shall be Bulb Tone manufactured by Espoma Company, Millville NJ 856 825 0542. Submit manufacturers product data for approval.

PART 3 EXECUTION

3.1 SITE EXAMINATION

.1 Examine the surface grades, subsurface condition, and soil conditions for any circumstances that might be detrimental to plant growth, such as deposits of construction-related waste or soil contamination, storage of material or equipment, soil compaction or poor drainage. Examine the grading, verify all elevations, and notify the Owner's Representative in writing of any unsatisfactory conditions.

3.2 STORAGE AND PROTECTION

.1 Immediately store and protect plant material, which will not be installed within 1 hour after arrival at site in storage location, approved by Owner's Representative. Material left on site longer than 48 hours will be rejected.

.2 Protect stored plant material from frost, excessive heat, wind and sun following delivery and as follows:

.1 For pots and containers, maintain moisture level in containers.

.2 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

.3 Unprotected plant material exceeding 1 hour of exposure to frost, excessive heat, wind or sun, shall be rejected, removed from site and replaced at Contractor's expense.

3.3 COORDINATION WITH PROJECT WORK

.1 The Contractor shall coordinate with all other work that may impact the completion of the work.

3.4 LAYOUT AND PLANTING SEQUENCE

.1 When applicable, plant trees before adjacent shrubs, groundcovers, vines and other plants are in place. Where spacing dimensions or locations are not clear, notify the Owner's Representative before installation.

.2 Notify the Owner's Representative, minimum 48 hours prior to layout for approval. Stake out all tree and large shrub locations for review and approval by Owner's Representative prior to planting. **Planting must not occur until tree and shrub locations have been reviewed by the Owner's Representative.**

.3 It is understood that plants are not precise objects and that minor adjustments in the layout will be required as the planting plan is constructed. These adjustments may not be apparent until some or all of the plants are installed. Make adjustments as required by Owner's Representative, including relocating previously installed plants.

3.5 INSTALLATION OF BALLED AND BURLAPPED TREES AND SHRUBS

.1 Inspect each plant after delivery and prior to installation for damage of other characteristics that may cause rejection of the plant. Notify the Owner's Representative of any condition observed.

.2 Excavate pits, beds, and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify the Owner's Representative before planting. Dispose of subsoil removed from planting excavations. Do not mix with planting soil or use as backfill. Plants to be planted in prepared planting soil may utilize the soil removed from the planting hole as backfill around the root ball.

.3 For plants to be planted in prepared planting soil, tamp the soil under the root ball using a motorized jumping jack tamper, to assure a firm bedding for the root ball. Assure the compaction under and around the root ball meets the requirements of the planting mix installation to the depths and profiles indicated on the drawings and in the specifications.

.4 When set, brace root ball by tamping backfilled soil around the lower portion of the root ball. Place additional backfill around base and sides of ball in 150mm lifts. Work each lift to settle backfill and eliminate voids and air pockets. When excavation is approximately two-thirds full, water thoroughly before placing remainder of backfill. Ropes or strings on top of ball shall be cut and shall be pulled back. Burlap or cloth wrapping shall be cut and removed from the top of the root ball. The top horizontal ring of support wire baskets shall be cut in four places and the top half of the wire basket folded down into the soil.

.5 Repeat watering until no more is absorbed. Water again after placing final layer of backfill.

.6 All evergreen plant material shall have anti-desiccant applied to it for Fall installations.

.7 Remove trunk protection just prior to substantial completion or at the time trunk-wrapping material is applied.

3.6 INSTALLATION OF CONTAINER GROWN PLANTS

.1 Remove plastic, paper or fiber pots from containerized plant material. Inspect the root system. Plants that have girdling roots including circling roots from smaller nursery containers used during the propagation and production process that cannot be removed without severely stressing the plant shall be rejected. Notify the Owner's Representative of any plants with circling or girdling roots. The Owner's Representative may request that random containerized

plants be dug up after planting to inspect the roots for compliance with these specifications.

.2 Pull roots out of the root mat. Cut any circling roots or girdling roots and circling or girdling roots in the interior of the root ball that are the result of smaller nursery containers used during the propagation and production process when these roots cannot be pulled out of the root mat. Cut roots with a sharp knife. Loosen the potting medium and shake away from the root mat. Remove any roots above the main structural roots including fibrous roots that form when potting mix is placed on top of earlier, smaller rootballs during the plant production process.

.3 Dig holes large enough to allow for spreading of roots and backfill with planting soil. Do not dig the hole too deep such that the plant will settle. Normally the depth of the plant root ball will be half the depth of the container after shaking out the potting mix and pulling out the roots. Work soil around roots to eliminate air pockets. Pack planting mix with fingers around the exposed roots while planting. Leave a slight saucer indentation around plants to hold water. Water thoroughly after planting, taking care not to cover crowns of plants with wet soil.

.4 Install the plant such that the top of the root ball is at the finish grade of the surrounding soil.

.5 Water each plant on the day of installation to saturate the soil around the roots and wash the soil into the root zone. After the soil has drained, reset any settled plants or grades around the plant, adding soil if required.

.6 The Owner's Representative may request that random containerized plants be dug up after planting to inspect the roots for compliance with these specifications.

3.7 INSTALLATION OF GROUND COVER, PERENNIAL, ANNUAL, AND BULB PLANTINGS

.1 Ground cover plantings and bulb holes shall be dug with a hand trowel, bulb planter, or hoe. If beds have been mulched prior to planting, remove all mulch around the hole before digging so that each plant and bulb is planted in the plant mix. Do not mix mulch into the plant mix.

.2 Before planting, biodegradable pots shall be crushed and non-biodegradable pots shall be removed. Root systems of all potted plants shall be split or crumbled to eliminate circling roots.

.3 Each plant shall be planted so that the roots of the plants are surrounded by soil below the mulch. Potted plants shall be set so that the top of the pot is even with existing grade. Bare root plants shall be covered up to the crown of the plant or soil level. minimum amount of soil covering the top of the bulb equal to three times the diameter of the bulb.

.4 Add bone meal to the bottom of each bulb hole as recommended by the manufacturer.

.5 Set all plants and bulbs at an equal distance apart as shown.

.6 Place mulch in the bed such that the entire bed is covered in mulch. Lift leaves and stems of plants out of the mulch when covered.

.7 Thoroughly water all beds immediately after planting.

3.8 TREE STAKING AND GUYING

.1 Secure stakes to tree with V-Straps (Treestop), per manufacturer's specifications. Tighten only enough to prevent slipping and to allow for trunk movement. Strap shall be long enough to accommodate 35mm (1.5") growth. Buffer all branches from the strap.

.2 Stakes to be 50 x 50mm wooden stakes aligned parallel with the direction of prevailing winds and firmly planted into stable subgrade outside of tree root ball area.

.3 Contractor to remove stakes and straps at the end of warranty period, or longer as directed by Owner's Representative.

3.9 TREE WRAP

.1 Wrap the trunks of any deciduous trees with thin bark prior to shipping, handling and installing. Carefully remove after installation to avoid damage to tree trunk.

3.10 STRAIGHTENING TREES AND SHRUBS

.1 Maintain all trees and shrubs in a plumb position throughout the warranty period. Straighten all trees including those not staked. Plants to be straightened shall be excavated and the root ball moved to a plumb position, and then re-backfilled.

.2 Do not straighten plants by applying force to trunk at any location above the rootball.

3.11 INSTALLATION OF FERTILIZER AND OTHER CHEMICAL ADDITIVES

.1 Do not apply any fertilizer to plantings during the first year after transplanting. Unless required by the Owner's Representative.

.2 Fertilizers shall be applied according to the manufacturer's instructions and standard horticultural practices. Do not apply fertilizers after August 1 of the calendar year.

3.12 PRUNING OF TREES AND SHRUBS

.1 Prune plants as directed by the Owner's Representative at the time of planting and in order to preserve the natural character of the plant. Pruning shall follow recommendations in "An Illustrated Guide to Pruning, Second Edition" by Ed Gillman and ANSI A 300 - 1995.

.2 An arborist certified by the International Society of Arboriculture shall perform all pruning. Submit arborist's proof of ISA certification in Form of Tender.

.3 Remove and replace excessively pruned or malformed stock resulting from improper pruning.

3.13 MULCHING OF PLANT MATERIAL

.1 Mulch top of root balls and planting beds, covering the entire planting bed area. Provide the following thickness of mulch. Top of mulch shall be smooth and even in all directions. Tree and shrub planting areas: 100mm thickness continuous from plant to plant; Groundcover and vine planting areas: 25mm minimum thickness

.2 In no case shall mulch come in contact with any part of trunk, root flare, leaves or low hanging stems.

.3 Apply mulch after all plants have been installed and approved by the Owner's Representative.

.4 Excess mulch shall be removed and disposed of off-site. Contractor shall not over-mulch planting beds with excess mulch.

3.14 WATERING

.1 The Contractor shall be fully responsible to ensure that adequate water is provided to all plants from the point of installation until the end of the warranty period.

.2 Hand water root balls of all plants to assure that the root balls have adequate moisture. Test the moisture content in each root ball to determine the water content.

3.15 CLEAN-UP

.1 During installation, keep pavements clean and work area in an orderly condition.

.2 Keep the site free of garbage at all times. Immediately dispose of wrappings or waste materials associated with products necessary for the completion of the work.

.3 All garbage shall be kept in a central collection container. Do not bury garbage in backfill.

3.16 PLANT MAINTENANCE

.1 Maintenance during the period prior to Acceptance shall consist of pruning, watering, cultivating, weeding, mulching, removal of dead material, repairing and replacing of tree stakes, tightening and repairing of guys, repairing and replacing of damaged tree wrap material, resetting plants to proper grades and upright position, and furnishing and applying such sprays as are necessary to keep plantings free of insects and disease, and in healthy growing condition. Planting areas shall be kept free of weeds, grass, and other undesirable vegetative growth.

.2 Plants in poor or dead condition will be deemed the Contractor’s responsibility to replace during warranty period.

3.17 APPROVAL FOR PAYMENT

.1 Installed plants will be inspected by Owner’s Representative to confirm installation per details. If there are deficiencies in staking, ties, mulch application or depth of mulch, tree pit formation, final grade of plants, condition of specimen etc. these must be rectified immediately. No payment will be approved for plant material that is incorrectly installed.

3.18 MAINTENANCE DURING THE WARRANTY PERIOD

.1 Following Substantial Performance, HWDSB will carry out maintenance.

END OF SECTION - 32 92 10