APPENDIX A

TECHNICAL SPECIFICATIONS FOR :

PROJECT: MAYFIELD WEST No. 2 PUBLIC SCHOOL

CLIENT: peel District School Board

PROJECT No.: 24112

TENDER No.: RFT MA26-5334

DATE: JULY 2026

BINDER: A ARCHITECTURAL & STRUCTURAL



ARCHITECT & CONSULTANTS:

HOSSACK ARCHITECTURE
105-1939 IRONOAK WAY
OAKVILLE, ONTARIO L6H 3V8
Tel (905) 815-8284

Salas O'Brien

rybka Ellard Willson

MGM CONSULTING INC

FRP inc. landscape.architects
1877 Davenport Road
Toronto, M6N 1B9
www.frpinc.ca

PROJECT NAME

Board Tender Number: RFTMA26-5334
Mayfield West #2 Public School
29 Tweedhill Ave., (corner of Petch Ave & Tweedhill Ave)
Caledon, ON

PROJECT OWNER

PEEL DISTRICT SCHOOL BOARD
5650 Hurontario Street
Mississauga, ON L5R 1C6

CONSULTANTS

Architect
HOSSACK ARCHITECTURE
105 – 1939 Ironoak Way
Oakville, ON L6H 3V8
Tel.: (905) 815-8284

Mechanical, & Electrical Engineers
Rybka ELLARD WILLSON
260 Town Centre Boulevard, Suite 202
Markham, ON L3R 8H8
Tel.: 1 (905) 940-3100

Structural Engineer
Salas O'Brien STEPHENSON ENGINEERING
2235 Sheppard Ave. E, Suite 1100
Toronto, ON M2J 5B5
Tel.: (416) 635 9970

Site Services (Civil) Engineer
MGM CONSULTING INC.
400 Bronte Street South, Suite 201,
Milton, ON L9T OH7
Tel.: (905) 567-8678

Landscape Architect
FRP INC.
1877 Davenport Road
Toronto, ON M6N 1B9
Tel.: (416) 533-4990

END OF SECTION

No. of Pages

SPECIFICATIONS BINDER "A"

THE BID DOCUMENTS

RFT **PDSB Invitation to Tender**

INTRODUCTORY INFORMATION

00 00 05	Consultants	1
00 00 10	Table of Contents	7
00 22 00	Supplementary Information Form	8
21 00 00	Mechanical Supplementary Information Form	(in Binder B)
26 00 01	Electrical Supplementary Information Form	(in Binder B)

DIVISION 1- General Requirements

01 11 00	Summary of Work	27
01 11 10	Buy Ontario Act	3
01 22 00	Meetings and Progress Reports	3
01 33 00	Submittal Procedures	5
01 35 23	Site Safety Protocol for Occupied Buildings	8
01 35 30	Health and Safety Requirements	4
01 35 43	Environmental Procedures	2
01 45 00	Quality Control	4
01 51 00	Temporary Utilities	3
01 52 00	Construction Facilities	3
01 56 00	Temporary Barriers and Enclosures	3
01 73 03	Execution Requirements	4
01 74 11	Cleaning	2
01 77 00	Closeout Procedures	2
01 78 00	Closeout Submittals	7
01 78 10	Sample Guarantee/Warranty form	2
01 91 00	Building Envelope Quality Control	3

DIVISION 2- Existing Conditions
No items

		No. of Pages
DIVISION 3- Concrete		
03 30 53	Cast-In-Place Concrete	22
03 35 05	Concrete Floor Hardeners	3
03 41 13	PC Concrete Hollow Core Planks	7
DIVISION 4- Masonry		
04 05 12	Mortar	3
04 21 13	Concrete and Clay Brick Unit Masonry Veneer	7
04 22 00	Concrete Unit Masonry	10
DIVISION 5- Metals		
05 12 43	Structural Steel & Open Web Steel Joist	12
05 31 00	Steel Roof Decking	6
05 50 00	Metal Fabrications	7
DIVISION 6- Wood, Plastics and Composites		
06 10 11	Rough Carpentry	6
06 40 00	Architectural Woodwork	9
06 47 00	Plastic Laminates	3
DIVISION 7- Thermal and Moisture Protection		
07 11 13	Bituminous Waterproofing	8
07 21 13	Board Insulation	4
07 21 19	Foamed-In-Place Insulation	5
07 27 10	Air Barriers	4
07 44 56	Cementitious Composite Panels	5
07 46 13	Metal Siding and Soffit	5
07 51 12	Built-Up Asphalt Roofing and Waterproofing	22
07 62 00	Sheet Metal Flashing and Trim	4
07 81 00	Applied Fireproofing	3
07 84 00	Fire Stopping	4
07 92 10	Joint Sealing	7

No. of Pages

DIVISION 8- Openings

08 11 14	Steel Doors and Frames	15
08 11 15	Door Schedule	1+11
08 14 10	Flush Wood Doors	3
08 36 13	Sectional Overhead Doors	6
08 44 13	Glazed Aluminum Curtain Walls & Doors	10
08 50 50	Aluminum Windows	9
08 71 10	Finish Hardware – General	16
08 71 15	Finishing Hardware Schedule	1+44
08 80 50	Glazing	6
08 92 00	Louvres & Sunshades	4

DIVISION 9-Finishes

09 21 16	Gypsum Board Assemblies	8
09 22 16	Non-Structural Metal Framing	3
09 30 13	Ceramic Tiling	9
09 51 13	Acoustical Panel Ceilings	4
09 65 16	Resilient Sheet Flooring	4
09 65 19	Resilient Tile Flooring	5
09 68 00	Carpeting	2
09 84 10	Acoustical Wall Treatment	5
09 91 22	Painting	8
09 91 27	Finishes and Colour Notes	2
09 91 30	Room Finish Schedule	1+10
09 97 24	Concrete Floor Sealer System	4

DIVISION 10- Specialties

10 11 25	Manufactured Specialties	6
10 14 10	Exterior Signage	6
10 21 14	Metal Toilet Compartments	4
10 21 20	Laminated Plastic Toilet Partitions	4
10 22 27	Folding Panel Partitions	4
10 28 10	Washroom Accessories	6
10 43 70	Exterior Manual & Electronic Reader Board	3
10 44 00	Concrete Storage Unit	3

DIVISION 11- Equipment

11 52 00	Gymnasium Equipment	5
11 62 00	STAC ROOM Equipment	3

No. of Pages

DIVISION 12- Furnishings

12 21 16	Window Coverings	4
12 21 18	Stage Rigging and Drapery	12

DIVISION 13- Special Construction

No items

DIVISION 14- Conveying Systems

14 21 23	Hydraulic Passenger Elevators	10

DIVISION 21, 22, 23, 25 Mechanical

Refer to Specification Binder 'B'

DIVISION 26 Electrical

Refer to Specification Binder 'B'

DIVISION 31- Earthwork

31 09 15	Geotechnical Information	1
	Geotechnical Investigation Report	Binder C
31 14 10	Site Preparation	2
31 22 00	Landscape Grading	3
31 23 10	Excavating, Trenching and Backfilling	12
31 23 13	Rough Grading	4
31 25 00	Erosion and Sedimentation Control	2

DIVISION 32- Exterior Improvements

32 01 90	Tree Preservation	3
32 12 17	Asphalt Paving	5
32 13 01	Landscape Concrete Forming and Accessories	2
32 13 02	Landscape Cast-in-Place Concrete	2
32 13 13	Concrete Paving and Edges	2
32 13 14	Detectable Warning Panels	1
32 14 13	Precast Concrete Unit Paving	2
32 15 40	Crushed Stone Surfacing	2
32 18 13	Synthetic Grass Surfacing	2
32 31 13	Fences and Gates	5
32 33 00	Site Furnishings	4
32 80 00	Irrigation	8
32 90 00	Landscape Maintenance (Separate Price)	5
32 91 19	Topsoil and Finish Grading	4

		No. of Pages
32 92 23	Sodding	5
32 93 10	Trees, Shrubs and Groundcover Planting	6
32 94 13	Landscape Eding	4
32 94 20	Landscape Boulders	2
32 96 43	Tree Transplanting	4

DIVISION 33- Utilities

33 05 14	Manholes and Catch Basin	3
33 11 17	Water Systems	4
33 31 13	Sanitary Sewers	3
33 44 00	Storm Sewers	4
33 44 01	Subdrains	2
33 46 00	Landscape Subdrainage	3
33 46 20	Foundation and Underslab Drainage	4

SPECIFICATIONS BINDER "B"

DIVISION 21, 22, 23, and 25 Mechanical
Refer to Specifications Binder 'B'

DIVISION 26 Electrical
Refer to Specifications Binder 'B'

SPECIFICATIONS BINDER "C"

ARCHITECTURAL DETAILS

Detail No.	Title
PMP-101	Pavement Marking and Signage Plan (West Parking Lot)
PMP-101	Pavement Marking and Signage Plan (East Parking Lot)
PMP-201	Pavement Marking and Signage Plan (PXO)
PMP-202	Pavement Marking and Signage Plan (Traffic Calming)
PMP-203	Pavement Marking and Signage Plan (Traffic Calming)
PMP-204	Pavement Marking and Signage Plan (Traffic Calming)
PMP-205	Pavement Marking and Signage Plan (Traffic Calming)
AD 100	Building Weeping Tile Location Plan
AD 208	Concrete Storage Unit Concrete Pad
AD 215	Job Site Sign
AD 255	Gas Meter Cage
AD 256A	Site Signage
AD 256B	Site Signage
AD 257A	Job Site Signage
AD 257B	Job Site Signage
AD 400	Firestopping Detail at Cavity Wall
AD 401	Exterior Cavity Wall Control Joint Detail

No. of Pages

AD 411 Wall Control Joint Details Interior Side
AD 412 Brick Vent Details
AD 413A Date Stone
AD 413B Date Stone and Time Capsule

AD 502 Bench Detail M5
AD 503 Drinking Fountains Mounting Heights
AD 517 Roof Access Ladder
AD 518 Millwork Bulkhead Details
AD 519 Gym Storage Room Shelving M4
AD 523 Gym Vertical Pole Storage Rack
AD 525 Gym Divider Curtain
AD 530 Section at Stage
AD 531 Stage Rigging
AD 534 Main Drape Bracket 'B' Detail
AD 536 Channel Pipe Hanger
AD 538 Channel Wall Attachment
AD 539 300 Hanger
AD 550 Roof Top Unit Screen

AD 600A Modular Control Panel
AD 600B Modular Control Panel Sections
AD 601 Cabinet Type B1
AD 602 Cabinet Type B2
AD 603A Cabinet Type B3A
AD 603B Cabinet Type B3B
AD 604 Cabinet Type B4
AD 605A Cabinet Type B5
AD 605B Cabinet Type B5 Sections
AD 606 Cabinet Type B6 S.M.T Room
AD 607 Cabinet Type B7
AD 608 Cabinet Type B8
AD 609 Cabinet Type B9
AD 610 Cabinet Type B10
AD 611 Cabinet Type B11
AD 612 Barrier-Free Counter with Double Sink - Type B12
AD 614 Cabinet Type B14
AD 615 Computer Desk Type B15
AD 616 Stainless Steel Dishwasher surround for childcare kitchen Type B16
AD 621 Cabinet Type U1
AD 622 Cabinet Type U2
AD 623 Cabinet Type U3
AD 624 Cabinet Type U4
AD 625A Cabinet Type U5-A
AD 625B Cabinet Type U5-B
AD 626 Cabinet Type U6
AD 631 Kindergarten Closet & Drawers Type K1
AD 632 Kindergarten Storage Unit Type K2
AD 633 Kindergarten Bench & Coat Rack Details Type K3
AD 634 Kindergarten Toy Cart Storge Type K4
AD 635 Kindergarten Toy Cart and Storage Type K5
AD 638 Kindergarten Cabinet Type K8

No. of Pages

AD 639 Kindergarten Cabinet Type K9
AD 640 Kindergarten Cabinet Type K10
AD 641A Child Care Cubbies, Bench & Coat Rack Details Type K11 – Section and Plan Details
AD 641B Child Care Cubbies, Bench & Coat Rack Details Type K11 - Elevation
AD 642A Triple Sink Cabinet Type K12
AD 642B Triple Sink Cabinet Type K12
AD 643 Kitchen Counter for Trolleys Type K13
AD 647 Corridor Break-Out Space Bench
AD 648A Feature Wall Bench & Display Case - Elevation
AD 648B Feature Wall Bench & Display Case - Details
AD 648C Feature Wall Bench & Display Case - Details
AD 651 Cabinet Type C1
AD 652 Cabinet Type C2
AD 653 Cabinet Type C3
AD 654 Cabinet Type C4 – Mail Slot
AD 655 Health Washroom New Millwork Type C5
AD 670 Typical Details for Cabinets with 38mm Doors
AD 685 Electrical Panel Surround – M6

AD 724 Bottom Beam Flange Spray Fireproofing Detail
AD 725 Top of Wall Construction at Fire Separation Assembly
AD 726 Top of Wall Construction at Non-rated Assembly

AD 800 Door Types
AD 801A Hollow Metal Frames & Screens
AD 801B Hollow Metal Frames & Screens
AD 801C Hollow Metal Frames & Screens
AD 801D Hollow Metal Frames & Screens
AD 810 Door Jamb Sections

AD 900 Radiant Panel Detail
AD 905 Locker Base Detail

AD 1000 Washroom Fixture Mounting Heights

AD 2001AR Pylon Sign Construction Details
AD 2001BR Pylon Sign Construction Details
AD 2001CR Pylon Sign Construction Details
AD 2001DR Pylon Sign Construction Details

Section 31 09 15 Geotechnical Investigation by Forward Engineering 1
Geohydrology Report 79 Report
Soil Chemical Testing Report 16 Report

No. of Pages

DRAWING SET

ARCHITECTURAL, CIVIL, LANDSCAPE

SV TOPOGRAPHIC SURVEY (OLS)
SP1 SITE PLAN
SP2 SITE PLAN DETAILS

TP100 TREE INVENTORY & PRESERVATION PLAN
TP101 TREE INVENTORY & PRESERVATION NOTES & DETAILS
L100 LANDSCAPE PLAN
L101 LANDSCAPE PLAN NOTES
L102 SUBDRAINAGE PLAN
L110 LANDSCAPE ENLARGEMENTS PLAN
L120 SCHEMATIC IRRIGATION PLAN
L131 SCHEMATIC IRRIGATION DETAILS
L200 PLANTING PLAN
L201 SOIL VOLUME PLAN
L300 PLANTING DETAILS
L301 LANDSCAPE DETAILS
L302 LANDSCAPE DETAILS

CV-1 EROSION & SEDIMENT CONTROL PLAN
CV-2 GRADING PLAN
CV-3 SERVICING PLAN

A01 FIRE SEPARATIONS & OBC MATRIX
A02 GROUND FLOOR PLAN
A03 SECOND FLOOR PLAN
A04 ROOF PLAN
A05 GROUND FLOOR REFLECTED CEILING PLAN
A06 SECOND FLOOR REFLECTED CEILING PLAN
A07 EXTERIOR ELEVATIONS
A08 BUILDING SECTIONS 1
A09 BUILDING SECTIONS 2

A10 WALL SECTIONS AND DETAILS
A11 WALL SECTIONS AND DETAILS
A12 WALL SECTIONS AND DETAILS
A13 WALL SECTIONS AND DETAILS
A14 WALL SECTIONS AND DETAILS
A15 SECTION & PLAN DETAILS
A16 INTERIOR ELEVATIONS
A17 INTERIOR ELEVATIONS
A18 INTERIOR ELEVATIONS
A19 INTERIOR ELEVATIONS
A20 ENLARGED WASHROOM PLANS & INTERIOR ELEVATIONS
A21 GYMNASIUM LAYOUT AND DETAILS
A22 STAIR PLANS AND DETAILS
A23 STAIR PLANS AND DETAILS
A24 CURTAIN WALLS & WINDOWS SCHEDULE
A25 FLOOR PATTERN PLANS AND DETAILS

No. of Pages

STRUCTURAL

S00 COVER PAGE
S0-01 DESIGN CRITERIA NOTES
S0-02 PLAN NOTES, MISC SCHEDULES AND DETAILS
S1-01 FOUNDATION PLAN
S1-02 SECOND FLR / LOW ROOF FRAMING PLAN
S1-03 ROOF FRAMING PLAN
S1-04 MECHANICAL PENTHOUSE ROOF FRAMING PLAN
S2-01 COLUMN SCHEDULE
S3-01 FOUNDATION SECTIONS
S3-02 ELEVATOR SECTIONS
S4-01 FLOOR SECTIONS
S4-02 FLOOR SECTIONS
S5-01 ROOF SECTIONS
S5-02 ROOF SECTIONS
S5-03 ROOF SECTIONS
S6-01 GENERAL NOTES AND TYPICAL DETAILS
S6-02 TYPICAL DETIALS
S6-03 TYPICAL DETAILS
S6-04 TYPICAL DETAILS
S6-05 TYPICAL DETAILS
S6-06 TYPICAL DETAILS

HVAC

M1 HVAC - GROUND FLOOR PLAN
M2 HVAC - SECOND FLOOR PLAN
M3 HVAC - MECHANICAL ROOM PLANS & SECTIONS
M4 HVAC - ROOF PLAN & DUST COLLECTION
M5 HVAC - FLOW DIAGRAM
M6 HVAC - SCHEDULES
M7 HVAC - DETAILS (1)
M8 HVAC - DETAILS (2)

PLUMBING & SPRINKLER

PD1 PLUMBING & DRAINAGE GROUND FLR PLAN
PD2 PLUMBING & DRAINAGE SECOND FLR PLAN
PD3 PLUMBING & DRAINAGE PART PLANS
PD4 PLUMBING & DRAINAGE DETAILS & LEGEND
SPK1 SPRINKLER PROTECTION GROUND FLOOR PLAN
SPK2 SPRINKLER PROTECTION SECOND FLOOR PLAN
SPK3 SPRINKLER PROTECTION DETAILS & LEGEND

ELECTRICAL

E1 ELECTRICAL SITE PLAN AND DETAILS
E2 ELECTRICAL LEGEND OF SYMBOLS & DETAILS
E3 ELECTRICAL DETAILS
E4 ELECTRICAL NOTES AND DETAILS

No. of Pages

E5 ELEC GROUND FLR LIGHTING LAYOUT
E6 ELEC GROUND FLR POWER LAYOUT
E7 ELEC SECOND FLR LIGHTING LAYOUT
E8 ELEC SECOND FLR POWER LAYOUT
E9 ELECTRICAL GROUND FLOOR FIRE ALARM & SECURITY LAYOUT AND DETAILS
E10 ELECTRICAL SECOND FLOOR FIRE ALARM & SECURITY LAYOUT
E11 ELECTRICAL ROOF PLAN
E12 ELEC. FIRE ALARM SYSTEM RISER DIAGRAM
E13 ELEC. SECURITY RISER AND LOCKDOWN DETAILS
E14 ELEC. AUDIO/ VIDEO SYSTEM RISER DIAGRAM
E15 ELECTRICAL POWER RISER DIAGRAM
E16 ELECTRICAL PANEL SCHEDULE
E17 ELECTRICAL DETAILS
E18 ELECTRICAL DETAILS

End of Table of Contents

Part 1 General

1.1 SUPPLEMENTARY INFORMATION SUBMISSION

.1 Refer to the *Peel District School Board's Request to Tender (RFT)* for Submission Requirements the Supplementary Information Submission.

.2 The completed Supplementary Information Submission must be submitted by the low three bidders to the office of the Architect by email to admin@hossackarch.com , within 24 hours (or the next business day if a statutory holiday or weekend) of close of General Tenders, if so requested.

.3 All parts of the *Supplementary Information Form* and its accompanying documents shall be completed. Failure to complete all aspects of the documents may result in the entire Bid being rejected outright as an incomplete bid.

.4 General Contractors are responsible to ensure that all required documents accompany the Supplementary Information Submission including Mechanical and Electrical Supplementary Information Forms and Mechanical and Electrical Agreements to Bond, if so required. Refer to *Section 0 21 13 - Instructions to Bidders.*

.5 Notwithstanding the information above, this Supplementary Information Form shall be accompanied by:

.1 completed **Mechanical Supplementary Information Forms** –"*Section 15001*" including Agreement to Bond from the Mechanical Contractor.

.2 completed **Electrical Supplementary Information Forms** – "*Section 16001*" including Agreement to Bond from the Electrical Contractor.

1.2 SUPPLEMENTARY ALTERNATE PRICES

.1 On a separate sheet to be included with this *Supplementary Information Form*, the Contractor may offer *Supplementary Alternate Prices* to the specified Work and acknowledge that they have been provided in accordance with the instructions in the *Instructions to Bidders*.

.2 Contractors submitting Alternate Prices for Mechanical and Electrical Products other than Base Bid shall do so in this manner, on a separate sheet individually listing and detailing each Alternate Product or system

1.3 WORK DIVISON

.1 The division of Work among the subcontractors and suppliers/installers is our responsibility and we, the bidder, covenant that neither the Consultants nor the Board, will be requested to act as an arbiter to establish subcontract limits between Sections or Division of Work.

1.4 TENDER PRICE BREAKDOWN

.1 For the accounting and information purposes of the Owner and for basic project contract administration, contractors must submit the following cost breakdown. This information shall be completed in its entirety as applicable to projects bid.

.2 "Site Work" costs listed below shall include all new and remedial site work including but not limited to: temporary access, mud mat, site signage, temporary fencing and hoarding, site preparation, rough grading, importing and disposal of fill, removal of existing and new asphalt and concrete paving, site drainage, sewers, waterlines, fencing, landscaping and top soil, and all exterior equipment such as garbage enclosures, bicycle racks, etc.

.3 **PROJECT COST BREAKDOWN**:

.1 **Cash Allowance**

.1 The value of the Cash Allowance included in the Tender Amount:

$ **750,000.00** _____ (***excluding*** **H.S.T**.)

.2 **Contingency Allowance**

.1 The value of the Contingency Allowances included in the Tender Amount:

$ **500,000.00** _____ (***excluding*** **H.S.T**.)

.3 **Building Construction:**

.1 The building construction including all of the Work of all trades, the supply and installation of all specified equipment, base bid supply and installation, but excludes the cost of Mechanical, Electrical and Site Work identified. below.

$ _____ (***excluding*** **H.S.T**.)

.4 **Site Services:**

.1 Cost of all Mechanical and Electrical Site services; i.e. site drainage, sewers, water mains, and underground Mechanical & Electrical services outside the Building.

$ _____ (***excluding*** **H.S.T**.)

.5 **Site Work:**

.1 Cost of all Site Work excluding Site Services referenced in 1.4.2 above; i.e. rough and finish grading, landscaping, asphalt and concrete paving, , including temporary and permanent fencing and hoarding.

$ _____ (***excluding*** **H.S.T**.)

.6 **Mechanical Bid** (Includes "Controls" but excludes Site Services included in Site Services above)

.1 Name of Mechanical Sub-Contractor: _____

$ _____ (***excluding*** **H.S.T**.)

.7 Electrical Bid (excludes exterior underground electrical site services included in Site Services above)

.1 Name of Electrical Sub-Contractor: _____

$ _____ (***excluding* H.S.T**.)

.4 The total of items 1.4.3.1 through 1.4.3.7. shall equal the total Tender Amount.

1.5 ITEMIZED PRICES

.1 The Itemized Prices shall be completed in full and are required as part of a Complete Tender submission. Itemized Prices are requested for Owner's Information only. However, accuracy of completeness and accuracy pricing is required and the successful bidder may be required to show a further breakdown of the itemized price if requested by the Board for its cost analysis purposes. Itemized Prices represent the itemized cost of supply and install of materials or products that are INCLUDED in the *Tender Amount*. Itemized Prices do not include HST.

.2 There are no Itemized Prices required for this project.

1.6 IN LIEU OF PRICES

.1 The In Lieu of Prices shall be completed in full and are required as part of a Complete Tender submission. In Lieu of Prices represent the extra or credit for substitutions to Base Bid materials or products, if so requested by the Consultant. In lieu of Prices do NOT represent items that are included in the Tender Amount. These In Lieu of Prices do not include HST.

.2 **In Lieu of Price No. 1: Spray Urethane Foam Insulation to Cavity Walls**: "The total amount to be added to or deducted from the Tendered Amount to substitute Spray Urethane Foam insulation to all cavity walls,(complete with specified Blueskin Air/Vapour Barrier as transition membrane) and including mineral wool horizontal and vertical fire stopping to perimeter of the building cavity as required by OBC Division B, all in lieu of the specified Rigid Board Insulation system. Spray insulation is to include a 450mm high band of the specified rigid board insulation at the base of the wall cavity below the foamed in place insulation":

Add: $_____ Deduct: $_____

1.7 SEPARATE PRICES

.1 The Separate Prices shall be completed in full and are required as part of a Complete Tender submission. Separate Prices represent the amount for additional work to Base Bid materials or products, as described below, if so requested by the Consultant. Separate Prices do NOT represent items that are included in the Tender Amount. These Separate Prices do not include HST.

.2 There are no Separate Prices required for this project.

1.8 DECLARATION AND SIGNATURE OF SUPPLEMENTARY INFORMATION FORM

.1 We hereby declare that, notwithstanding those *alternative* products or systems identified on this Supplementary Information Form, we have included in our Tender Price all base bid products or systems specified

.2 We are submitting this *Supplementary Information Form* under a Corporate Seal as a Limited Company, or witnessed as an individual or partnership and in accordance with ***Instructions to Bidders.***

NAME OF BIDDER _____

PRINT NAME OF SIGNING OFFICER _____

PRINT TITLE OF SIGNING OFFICER _____

SIGNATURE OF AUTHORIZED SIGNING OFFICER _____

DATED AT_____ THIS _____ DAY OF _____2026

1.9 BIDDERS CHECKLIST – ENVELOPE SUBMISSION

1.9.1 We declare the following items are required in accordance with the Bid Documents for the Supplementary Information Form Submission, as follows:

☐ Project Cost Breakdown	☐ Alternate Prices if required
☐ Separate Prices if required	☐ Itemized Prices if required
☐ Mechanical Supplementary Information Form	☐ Mechanical Agreement to Bond
☐ Electrical Supplementary Information Form	☐ Electrical Agreement to Bond

END OF SUPPLEMENTARY INFORMATION FORM

Part 1 General

1.0 SECTION INCLUDES

1.1 Precedence
1.2 Contract
1.3 Relations of Trades
1.4 Additional Drawings
1.5 Existing Site Conditions
1.6 Temporary Construction Fencing
1.7 Construction Phasing and Sequencing
1.8 Contractor Parking
1.9 Bylaws, Permits and Approvals
1.10 Organization
1.11 Canadian Products and Local Labour
1.12 Materials and Workmanship
1.13 Quality Control
1.14 Overtime
1.15 Protection of Other Work
1.16 Fastenings
1.17 Supply and Install
1.18 Occupation Before Completion
1.19 General Requirements
1.20 Coordination
1.21 Access to the Project
1.22 Subtrade Awards
1.23 Safety Data Sheets
1.24 Regulating Documents
1.25 General Contractor's Responsibilities
1.26 Manufacturers' Instructions
1.27 Air and Vapour Seal
1.28 Fire Safety
1.29 Construction Safety
1.30 Independent Tests and Inspections
1.31 Periodic Cleaning
1.32 Temporary Protection
1.33 Completion
1.34 Guarantees
1.35 Contingency Allowance
1.36 Cash Allowances
1.37 Allowances Carried in Divisions 15 and 16
1.38 Schedule of Allowances
1.39 Polychlorinated Biphenyl (PCB)
1.40 Use of Consultant's Digital Drawings
1.41 Building Dimensions
1.42 Setting of the Work & Required Surveys
1.43 Layout of Work
1.44 Documents Required: Start, During & Close Out.

1.1 PRECEDENCE

.1 This Section contains Articles prepared which represent the Board standards and policies. In all cases this Section is intended to be read in conjunction with and to coordinate with

all other Sections. In the case of discrepancy between this Section and other Sections to more stringent Articles of any applicable Section shall apply.

1.2 CONTRACT

.1 Construct the Work under a single, lump sum, Stipulated Contract. The form of Contract is the *Stipulated Price Contract, Standard Document PDSB-2011 Rev. April 2020* attached to these specifications referred to in these specifications as the '*Contract*').

.2 Contract includes the construction of a new two storey school, plus site work, plus coordination. Location of the work is at the corner of Petch Ave. & Tweedhill Ave. in Caledon, Ontario.

.3 Project Occupancy Requirements

.1 It is the requirement of this Contract that the school and site work, which is to be contracted and completed under the terms of this contract, be completed as follows:

a) Have the building (s) "Fit for Occupancy by: **July 1, 2028**
b) Have the building(s) and site work completed by: **September 1, 2028**
c) Have the contract completed in its entirety by: **October 1, 2028**

.4 Cautionary Note

.1 Bidders, both General Contractors and Subcontractors, are cautioned that they should not submit bids or tenders if they are unsure of their ability to comply with the above stated construction/occupancy schedule and requirements, provide overtime work as necessary and/or are unwilling to be bound by the schedule and Provisions described in these documents.

1.3 RELATIONS OF TRADES

.1 The Contract Specifications have been generally divided into trade sections for the purpose of ready reference.

.2 The Contractor is responsible for coordinating all trades. He is solely responsible for determining the lines of demarcation between Contractor and/or trades. Neither the Consultant nor the Board, assume any responsibility for any such determination or for any dispute arising concerning it. No extras will be considered due to any such dispute concerning either labour or materials.

.3 Specifications and drawings form an integral part of the Contract Documents. Any subject or item omitted from one, but which is mentioned or reasonably implied in the other, shall be considered as properly and sufficiently specified and will be part of the Work.

1.4 ADDITIONAL DRAWINGS

.1 Consultant may furnish additional drawings to assist proper execution of the Work. These drawings will be issued for clarification only. Such drawings, however, shall have the same meaning and intent as if they were included with plans referred to in the Contract Documents.

1.5 EXISTING SITE CONDITIONS & RELOCATION OF STREET LIGHTING

.1 Refer to geotechnical report, grading drawings, survey and site plans and note requirements for additional grading, removals, new driveways and service connections and reinstatement for areas beyond property lines and coordinate requirements for Permits, fees, deposits, etc. with Owners ITT documents.

.2 At the outset of the contract and before any other work begins, the contractor shall review grades on site to confirm compliance with the contract documents. Contractor to provide to the Owner a formal written letter of acceptance or otherwise of the site condition & grade elevations prior to commencement of any work. This letter format may be provided by the Owner or Consultant. Failure to do so at this initial stage shall eliminate the contractor's right to make claim regarding incorrect grades or site surface conditions at any later stage for the work.

.3 Contractor is responsible to quantify all on-site material to achieve design grades and is responsible for the importation or exportation of material from the site as required.

.4 Ascertaining the specific site and building conditions as they relate to the project is the responsibility of the contractor. Notwithstanding this overriding responsibility the consultant has made every effort to properly represent existing site conditions as they are evident at the time of tender.

.5 The Contractor shall assume the work site based on the existing conditions as shown on the drawings and visible on the job site at the time of the closing of the tender. All excavation, stockpiling, removal, importing and/or grading of soils is to be included in the work of this Contract. Refer to site plan drawings. The contractor shall also refer to the recommendations of the soils investigation records which are included for information, and report any discrepancies to the consultant prior to submitting a tender.

.6 Inspection of the site during the tender period is mandatory for all Contractors. In addition, refer to Section 00 21 13 Instructions to Bidders for the time of a *conducted* contractors' site tour.

.7 Minor adjustments to the level of sodded areas, berms, etc., may be permitted, to the prior approval of the Consultant and owner. It must be stressed that it will be the contractor's responsibility to negotiate and obtain approval for any such changes with the Authorities having Jurisdiction over lot grading approvals for this project. Completion delays due to such approvals shall not be entertained.

.8 While undergoing construction of the new driveway entrance, the contractor shall ensure the existing underground street lighting system is located at least 1 metre below the road base of the new driveway. The City's street lighting inspector shall be contacted prior to the installation of the driveway to review the site conditions with the contractor. If the street lighting system is required to be lowered, the contractor shall hire one of the City's Pre-Qualified Electrical Contractors. This Contractor will be responsible to expose the existing conductors and sheave a 50 mm PVC conduit around these conductors. This repositioning shall extend to 1 metre beyond the driveway surface and/or curb.

1.6 TEMPORARY CONSTRUCTION FENCING

.1 For the sake of safety to the neighbours and users of the school in which this project is being constructed, the Board insists that fencing and hoarding be provided for every construction project, as described below.

.2 At the locations shown on drawings, provide temporary, 6'-0" (1.8 m) high chain link fencing complete with main and truck gates around entire perimeter of site, except where an existing min. 1.8m high fence exists. Gates shall be locked when no work is in progress, and located as shown on the Site Servicing drawings, unless approved by the consultant.

.3 The Board requires that the installation of this construction fencing be accomplished as the first task of the General Contractor when he moves onto the site.

.4 Ensure for the duration of the contract that surrounding the work site, the construction fencing, siltation fencing and man and truck gates, are provided and maintained. This fence shall be locked when no work is in progress, and located as shown on the site plan drawing.

.5 In addition, should the sodded play areas not be completed by one month prior to school start, the contractor shall be responsible for the erection and maintenance of a temporary, leased, perimeter "Mod-U-Lock" fence around the sod that is installed in the spring until the consultant has approved removal or a date agreed upon with the Owner, at no additional cost to the owner. Refer also to Section 01 56 00 and Section 32 92 23.

.6 For any work that continues into the occupied school period, maintain safe, unobstructed pedestrian access and egress that is not in conflict with regular or construction traffic. Scheduling of Flag-men and exact positions of hoarding will be reviewed with Consultants and school staff at the outset of the Project.

.7 For any work that continues into the occupied school period, the Contractor shall allow for the requirement of full time flagmen at all construction entrances and, any areas where staff or students must cross through construction areas. Flagmen shall be posted and active at any time construction traffic uses these access points. In addition, and regardless of construction activity, the full time flag men shall be posted ½ hour before and ½ hour after each school day from the start of construction period to 9:00 a.m. and from 2:30 to 4:30 p.m., including all lunch periods. This is mandatory to ensure the safe coordination of pedestrians and vehicles accessing the various entry points to the school.

.8 Costs of full time flagmen for the conditions stated above shall be included in the Tender Amount.

.9 Fire routes must be maintained open and unobstructed throughout the duration of construction regardless of whether the building is occupied or not.

1.7 CONSTRUCTION PHASING & SEQUENCING

.1 A detailed sequencing strategy shall be coordinated on site for deployment of both labour and materials, will be worked out jointly between the owner, consultants and contractor.

.2 Note that for any work that may continue after the occupied school year, cconstruction activities during the school year will be subject to noise and odour restrictions, "after hours work only" and if any work is deemed approved during occupied hours, requirements for full time flagmen will apply.

.3 Coordinate sequencing with all trades and advise sub-trades of these sequencing requirements prior to the close of Tenders.

.4 Bidders shall include for overtime costs, flagmen etc. in the base Tender Price.

1.8 CONTRACTOR PARKING

.1 Refer to section 01 52 00 Construction Facilities.

1.9 BYLAWS, PERMITS AND APPROVALS

.1 Nothing indicated on the Drawings or Specifications is intended to be in conflict with any law, by-law or regulation of Municipal, Provincial, or similar Authority Having Jurisdiction.

.2 Work of this Contract must conform with such laws, by-laws and/or regulations. Any required variation to, or deviation from, the drawings and specifications, shall be performed in accordance with the Contract contained in these specifications.

.3 Furnish inspection certificates and/or permits as may be applicable as evidence that the installed Work conforms with laws, by-laws and regulations of Authorities Having Jurisdiction.

.4 Each subtrade shall obtain and pay for all permits and licenses required by Municipal, Provincial, or other authorities having Jurisdiction, particular to their trade.

.5 It is the final responsibility of the General Contractor to obtain all the required approvals and permits and include in his Total Stipulated Price, the cost of such approvals, permits and fees. **The only exception is the Building Permit, which has been already issued and paid for by the Board**. It is the contractor's responsibility include in the base tender amount any additional permit or connection fees not specifically identified in the Cash Allowance, and to provide any deposits or securities required by Authorities Having Jurisdiction.

.6 Haul Permit is required by the Town of Caledon. Contractor to apply at: https://forms.caledon.ca/do.aspx

.7 Any revisions or deviations to Contract Documents required by any Authorities Having Jurisdiction must be reviewed by the Consultants before implementation.

1.10 Laws, Notices, Workplace Safety and Insurance, WHMIS, Safety Regulations, COVID-19 Guidelines

.1 Comply with all applicable laws, by-laws and regulations as applicable.

.2 Comply with the most current versions of all applicable government and association regulations, rules, notices of best practices and guidelines, including but not limited to those referred to in:

.1 Directives from the Chief Public Health Officer of Canada, the Chief Medical Officer of Health of the Province of Ontario, the Medical Officer of Health for the local municipality and Region.

.2 Government of Ontario: Construction Site Health and Safety During COVID-19: https://www.ontario.ca/page/construction-site-health-and-safety-during-covid-19

.3 Infrastructure Health & Safety Association (IHSA) COVID-19 Construction Resources Links & Resources: https://www.ihsa.ca/Urgent-Notices/COVID-19-Links-Resources.aspx#construction-resources

.4 Canadian Construction Association (CCA) Guidelines: COVID-19 – Standardized Protocols for All Canadian Construction Sites: https://www.cca-acc.com/wp-content/uploads/2020/04/CCA-COVID-19-Standardized-Protocols-for-All-Canadian-Construction-Sites-04-16-20.pdf.

.3 Post warning and notice signs and posters on site as required and as described in the above listed resources.

.4 If there are differing requirements in the regulations, best practices and guidelines noted above, comply with the requirements that are more stringent in maintaining and protecting the health and safety of people working at the Construction site.

.5 Comply with all aspects of the Workplace Hazardous Materials Information System (WHMIS) as it pertains to material handling and application.

.6 Provide evidence of compliance with all requirements of the Workplace Safety and Insurance Board, including all payments.

.7 In keeping with updated requirements from the Province of Ontario, the Peel District School Board (PDSB) requires all Contractor personnel and sub-trades visiting their schools or requiring access to their schools and the property where construction is occurring, to fill out the Ontario Schools online Covid-19 screening form. The online form is required to be completed by all workers every day prior to entering the site and the school building. The COVID form can be completed online at the following link: https://covid-19.ontario.ca/school-screening/

.8 The Contractor must provide PDSB with a "Health and Safety Plan". The Health and Safety Plan must outline the workplace strategies the Contractor will implement to address the health and safety impacts of the COVID-19 pandemic on the work site. Such strategies should include, but are not limited to, practices such as physical distancing and on-site sanitation, as well as any other practices recommended by the entities referred to in 3.2.2 above. The Health and Safety Plan must also address how such workplace strategies will be used to protect the health and safety of the employees and other personnel of the Contractor, its subcontractors and suppliers, PDSB, PDSB's Consultant, as well as the general public.

.9 The Contractor acknowledges and agrees that the submission of the aforementioned Health and Safety Plan to PDSB shall not constitute acceptance or approval thereof, in whole or in part, by PDSB. Further, the Contractor acknowledges and agrees that PDSB may require revisions to the Health and Safety Plan from time to time, including, but not limited to, by reason of recommendations made by the government of Ontario, the government of Canada, the local municipal government, and their respective ministries, agencies, and departments, including any modifications to such recommendations as issued by those entities from time to time. The submission of a Health and Safety Plan to PDSB does not absolve the Contractor of its responsibility for complying with the requisite health and safety legislation and regulations, including, but not limited to, the Occupational Health and Safety Act, R.S.O. 1990, c. O.1, and any associated regulations

and/or public health directives. PDSB shall not be held liable to the Contractor, its subcontractors and/or suppliers, the PDSB's Consultant, and/or any employees or personnel of the foregoing entities or of PDSB itself, as well as the general public, on account of its having received the Health and Safety Plan from the Contractor, and/or having required any modifications thereto. Further, the Contractor hereby agrees to indemnify and defend PDSB, its directors, officers, elected officials, employees and agents and hold them absolutely harmless in the event that there is a claim or finding that any of them is liable to any party on account of PDSB having received the Health and Safety Plan, and/or having required any modifications thereto.

.10 Upon award, the successful vendor will be provided by the Plant representative with the Board's Pandemic Protocol and Policy that will need to be followed in order to access and work on Board premises.

1.10 ORGANIZATION

.1 Organize the Work of each section as required for satisfactory and expeditious completion of the Work. Take field dimensions required for the Work. Fabricate and install work to suit field dimensions and conditions.

.2 If applicable, take into account existing work to ensure best arrangements of components in available space. Contact the Consultant prior to commencing Work in critical locations and interface with other Contractors' Work.

.3 Provide all forms, templates, anchors, sleeves, inserts and accessories required to be installed in the Work. Set in place, or instruct the applicable subtrade as to their location. Pay costs of extra work, if required, as a result of a failure to comply with these requirements at the proper time.

.4 Before starting his work and from time to time as the work progresses, each Subcontractor shall examine the work and materials installed by the other Subcontractors insofar as it effects his own work, and the General Contractor shall promptly notify the Consultant IN WRITING, if any condition exists that will prevent any Subcontractor from giving a satisfactory result in his own work.

.5 Should any Subcontractor start his own work without such notification, it shall be construed as an acceptance by him of all preceding work and as a waiver of all claims or questions as to its suitability for receiving his work.

1.11 CANADIAN PRODUCTS AND LOCAL LABOUR

.1 To the extent that the same are available and consistent with the proper economy and expeditious completion of the Contract, Canadian equipment, materials, products and other such applicable items are preferred by the Board to be used in the Work, wherever possible and practical.

1.12 MATERIALS AND WORKMANSHIP

.1 All materials shall be new and the best of their respective kinds, where a specific grade or brand is not indicated. Pre-packaged materials shall be delivered and stored in unopened containers.

.2 All work performed under this Contract shall be done by mechanics skilled in their respective trades. They shall make use of such templates, jigs or special tools as may be required for the operation involved.

.3 The acceptance of any materials or workmanship shall not be a bar to their subsequent rejection, if found defective.

.4 Adequate, dry storage facilities shall be provided and all stored materials shall be protected from damage and theft.

.5 All Contractors will do Work in accordance with the best industry practice of the type of work specified, unless the Contract Documents stipulate more precise requirements, in which case, the more precise requirements shall govern.

.6 Do Work in a neat, plumb & square manner. Ensure that various work components are properly installed, forming tight joints and appropriately aligned junctions, edges and surfaces, free of warps, twists, waves, or other such irregularities.

.7 Wherever indicated on the drawings or specifications, or in the manufacturers' / suppliers' written instructions, arrange to have manufacturers' / installer's representatives inspect the Work which incorporates their materials, products or items.

.8 Do not permit materials to come in contact with other materials such conditions may result in corrosion, staining, discolouration or deterioration of the completed Work. Provide compatible, durable separators where such contact is unavoidable.

.9 The design of the Work is based on the full interaction of its component parts. No provisions have been made for conditions occurring during construction. Ensure that no part of the Work is subjected to a load which will endanger its safety or which might cause permanent deformation.

.10 Conceal pipes, ducts, conduit, wiring and other such items requiring concealment preferably in, wall or ceiling construction of all finished areas. If in doubt as to method of concealment, or intent of the Contract Documents in this regard, request clarification from the Consultant before proceeding with the Work.

.11 Lay out mechanical and electrical work well in advance of concrete placement and furring installation to allow for proper concealment. Test and inspect Work before applying pipe covering and before it is concealed.

.12 Provide and maintain control lines and levels required for the Work. Lay out the Work in accordance with these lines and levels and dimensions indicated on the drawings.

.13 Verify lines, levels and dimensions and report any errors or inconsistencies on the drawings to the Consultants.

.14 Final responsibility of satisfactory completion of all the Work, however, lies with the General Contractor.

1.13 QUALITY CONTROL

.1 Refer also to Section 01 45 00.

.2 The Consultants and authorized Board staff shall have access to all areas of the Work, including any off site construction facilities.

.3 The General Contractor shall give timely notice requesting inspection if Work is designated for special tests, inspections, or approvals by the Consultants, or any other authorized Board staff or testing and Inspection Company.

.4 If the General Contract covers, or permits to be covered Work that has been designated as outlined above, he shall uncover such work, have the inspections and tests satisfactorily completed and make good such work at no additional cost to the Board.

.5 The Consultants or the authorized Board Staff may order any part of the Work to be examined, if such Work is suspected not to be according to the Contract Documents. If, upon examination, such work is found not to be in accordance with the Contract Documents, then the General Contractor shall correct such Work and pay for cost of examinations and correction. If such Work is found to be in full accordance with the Contract Documents, the Board shall pay for the cost of examination and making good.

.6 If defects are revealed during inspection and/or testing, the appointed agency may request additional inspection and/or testing to ascertain the full degree of defects. The General Contractor shall correct the defects and irregularities as reported by the inspection and/or testing agency, at no additional cost to the Board and the General Contractor shall pay all associated costs for retesting and reinspection.

.7 The General Contractor shall provide any tools, materials or equipment that may be required by the inspection and/or testing agencies in retesting the Work (*e.g.* Video camera rental to reinspect incorrectly installed sewer lines.)

.8 The employment of inspection and/or testing agencies does not, in any way, affect the General Contractor's responsibility to perform the Work in strict accordance with the Contract Documents.

.9 The General Contractor shall remove all defective work, whether the result of poor workmanship by him or his subtrades, use of defective or damaged products, whether or not incorporated into the Work and any Work that has been rejected by the Consultants or authorized Board Staff as failing to conform to the Contract Documents. Replacement and execution of the affected Work shall be done in full accordance with the Contract Documents, making good other trades' work damaged by such removals or replacements at no additional charge to the Board.

.10 If, in the opinion of the Consultant and/or the authorized Board Staff, it is not expeditious to correct the defective Work, or Work not performed in accordance with the Contract Documents, the Board, may, at its sole discretion, deduct from the Contract Price, the difference in value between the work performed and that required by the Contract Documents, the amounts of which shall be determined by the Consultant.

.1 The notable exception to the above item is a faulty installation of base and asphalt paving. If, the inspection agency, after performing random test holes to determine compaction and thickness of sub base, base and asphalt, determines that either one or both, are not according to what was specified in the Contract Documents, the Board will not accept credits for such inconsistencies but rather, demand that any such installation be removed and redone in its entirety, at the

pleasure and convenience of the Board, but within the first year of the warranty period.

1.14 OVERTIME AND OVERTIME SCHEDULING

.1 The General Contractor must include in his Total Stipulated Tender Price, all costs for overtime work which may be necessary to complete the various portions of the Work, in accordance with the Completion Dates specified in the *Stipulated Price Bid Form.* The Board shall not entertain requests for any payments in connection with overtime work that may be required by the General Contractor, or any of his subtrades, in order to comply with the above referenced dates.

.2 Similarly, it is the Contractor's responsibility to ensure, prior to the close of tenders that all subtrades will meet the requirements for overtime, as required, with no additional costs to the owner, in order to meet the Completion Dates specified in the Form of Tender.

.3 The contractor shall recognize the critical importance that the schedule for full occupancy must be met by the dates stated in the *Stipulated Price Bid Form*. Note that local by-laws may be enforced restricting morning and evening and Sunday work hours.

.4 Note that at no time will the Board entertain additional charges or claims from the General Contractor or his subcontractors for premium, overtime or after–hours work.

.5 Only claims for scope changes or conditions beyond the control of the Contractor may be submitted for review by the Consultants and must be submitted and accepted in advance of the work taking place and at the outset of the condition or scope change arising. No claims additional charges or delays will be accepted if not reviewed and formally accepted in advance.

.6 Notwithstanding sentence 5 above, for any work that remains incomplete after school occupancy by staff or students, all access and work shall be restricted to after hours only: i.e.: after 4:00 p.m. and before 7:00 a.m.. No additional costs for overtime or after hours work shall apply.

1.15 PROTECTION OF OTHER WORK

.1 Each trade shall avoid damage to other trades and shall take all measures necessary and provide all masking and materials necessary, to provide adequate protection.

.2 Each Subcontractor shall be held responsible for all damage to work installed by others that is caused by this work or by anyone employed by him.

.3 Patching and repairing of damaged work shall be done by the Contractor who installed the work, as directed by the Consultant, but the cost of same, shall be paid for by the Contractor who is responsible for the damage.

1.16 FASTENINGS

.1 All fastenings must be permanent, of same metal, or compatible with any metals with which they are in contact, of adequate size and spacing, to ensure permanent anchorage against load or shear.

.2 Exposed fastenings must be evenly spaced, neatly laid out and must not mar surfaces of prefinished materials.

.3 No ram-setting or similar techniques will be permitted, without prior written approval of the Consultant.

1.17 SUPPLY AND INSTALL

.1 Unless specifically noted, "*supply only*", any reference to supply intends the **supply and installation** of material or item so noted.

1.18 OCCUPATION BEFORE COMPLETION

.1 If the General Contractor, for any reason, does not have the Project completed by the specified completion date and the Board, of necessity, is forced to occupy any part of the building before the whole of the Work is completed, the Contractor will not be entitled to any indemnity for interference with his operation.

1.19 GENERAL REQUIREMENTS

.1 All Contractors shall examine carefully all drawings and specifications to inform themselves fully of all conditions and limitations pertaining to the work of the contract.

.2 All Contractors shall co-operate and co-ordinate their work for the proper completion of the work, including co-ordination of delivery dates and commencement of subtrades work.

.3 The responsibility and costs for all work, including temporary structures, shoring, shoring design (if applicable) and erection shall at all times rest with the General Contractor and his Subcontractors. The Consultant will review construction methods and shop drawings for general arrangements only. The method of obtaining the results contemplated by the Contract Documents shall be determined by the General Contractor.

.4 The undertaking of period site review by the Consultant or Board Representative shall not be construed as supervision of actual construction, nor make them responsible for providing a safe place for work, visit, use, access, travel, or occupancy of the Consultant's or Board's employees or agents.

.5 The General Contractor shall be fully responsible for coordinating and expediting the work of all Subcontractors and shall employ the necessary and qualified personnel to provide the required quality of labour and materials and to prevent delays in the progress of the project. Each trade shall be afforded all reasonable opportunities for the installation of its work and for the storage and handling of its materials.

1.20 COORDINATION

.1 The General Contractor shall coordinate all work and preparation on which subsequent work depends to facilitate mutual progress, and to prevent any conflict.

.2 The General Contractor shall ensure that each trade makes known, for the information of the General Contractor and other trades, the environmental and surface conditions

required for the execution of its work; and that each trade makes known the sequence of others' work required for installation of its work.

.3 The General Contractor shall ensure that each trade, before commencing work, knows the requirements for subsequent work and that each trade is assisted in the execution of its preparatory work by trades whose work depends upon it.

.4 The General Contractor shall ensure that shop and layout drawings, templates, and all information necessary for the location and installation of materials, openings, inserts, anchors, accessories, fastenings, connections and access panels are provided by each trade whose work requires cooperative location and installation by other trades and that such information is communicated to the applicable installer.

.5 The General Contractor shall ensure that delivery of materials supplied by one trade to be installed by another is well before the installation begins.

.6 The General Contractor shall inform all trades that giving installation information in error, or too late to incorporate in the work, shall be responsible for any extra work caused thereby, unless impractical and where required, cutting shall be done by each respective trade, and patching shall be done by the general contractor.

1.21 ACCESS TO THE PROJECT

.1 The General Contractor for this Work shall, at all times allow the Consultants, the Board, or any other Board commissioned contractor or their employees, access into the building or around the premises, undisturbed, whether union or non-union, as may be required in the execution of other portions of the building work and installation of equipment, etc.

.2 The General Contractor shall cooperate fully with any and all Board commissioned Contractors.

1.22 SUBTRADE AWARDS

.1 The Contractor shall, on notice of award of the contract, obtain the Consultants approval of a complete list of all persons or firms to which he proposes to sublet any part of the work, the trades or divisions of work which are to be sublet to each, and the amount of each trade. The General Contractor shall provide to the Consultant a financial breakdown showing all divisions of the work amounting to the full sum of the contract. Mechanical and Electrical trades shall be further broken down as specified in Divisions 26 and 33.

1.23 SAFETY DATA SHEETS

.1 The General Contractor shall ensure that the following material and safety data sheets are submitted prior to commencing installation and application of at least the following:

.1 Lead-free solder
.2 Resilient flooring
.3 Painting and finishing
.4 Fertilizers
.5 Glues and adhesives
.6 Pesticides

.7 Herbicides

.8 Any other product which may give off air borne particles after installation.

.9 Sealants and caulking

.2 The General Contractor and all of his Subcontractors must note that specifically, Asbestos and Asbestos containing materials solder for piping containing lead, and Painting & Coatings containing lead and/or mercury must be excluded from any part of the Work.

.3 Contractor The General must submit Certificates of Compliance, prior to the application for Substantial performance, for each of the following items:

.1 An affidavit relative to the use of Lead-free solder for all domestic water lines, regardless of location.

.2 Products for which Material Safety Data Sheets have been submitted and accepted.

.3 Other Work/Products identified in the Contract Documents as requiring a Certificate of Compliance.

.4 Each Certificate of Compliance must indicate names and addresses of the project, the Board, the date of Issue, produce description including name, number, manufacturer, with a statement verifying that the Work/Product installed meets specified requirements and, if applicable, complies with the submitted and accepted Material Safety Data Sheets.

.5 Each Certificate of Compliance must be issued on the trade's letterhead, properly executed, under whose work the respective Work/Product has been provided.

.6 Each Certificate of Compliance must be endorsed by the General Contractor with his authorized stamp/signature.

.7 The Completion Security Account will not be paid to the Contractor without submission of all required affidavits and requested material and safety data sheets.

1.24 REGULATING DOCUMENTS

.1 The General Contractor and all of his Subcontractors, Suppliers/Installers etc., must conform to the latest editions in force at the time of tender of each and all of the following: Ontario Building Code, Canadian Electrical Code (CEC), The Occupational Health and Safety Act, Ontario, the National Fire Code, the local Municipal Fire Code, and all other applicable Codes and Building By-Laws. All must also conform to the requirements of the Authorities Having Jurisdiction, such as Public Utilities. Where required under the Occupational Health and Safety Act, engage a Professional Engineer to design hoarding, scaffolding and shoring, formwork and falsework for concrete.

.2 Contract forms, codes, standards and manuals referred to in these specifications are the latest published editions at the date of close of tenders. The General Contractor and all of his Subcontractors, Suppliers/Installers must meet or exceed the requirements of specified standards.

.3 Provide, on site, copies of documents referred to in the Specification for joint use of Contractor and Consultant.

1.25 GENERAL CONTRACTOR'S RESPONSIBILITIES

.1 The list of General Contractor's responsibilities identified below is by no means comprehensive, nor is it in any priority or critical order. It is here, merely to identify the most often forgotten or ignored responsibilities of the General Contractor and is reproduced only as a reminder. The Consultants and the Board advise the General Contractor that it is he who is responsible for all aspects and facets of the Project, from start to completion, from compliance with Occupational Health and Safety regulations to compliance with all codes and statutes.

.1 The General Contractor will be responsible to take all necessary steps to protect personnel (workers, visitors, general public, etc.) and property from any harm during the course of the contract.

.2 All equipment shall be in safe operating condition and appropriate to the task.

.3 Only competent personnel will be permitted on site. During the site introduction, *only the Consultant* will determine who is competent. The General Contractor will cause to remove from the site any persons not observing or complying with safety requirements.

.4 The General Contractor shall comply with, and shall ensure that all of his Subcontractors, Suppliers, Installers etc., comply with all Federal, Provincial and Municipal Safety Codes and Regulations and the Occupational Health and Safety Act.

.5 The General Contractor shall supply competent personnel to implement his safety program and ensure that all Subcontractors comply with the Board's standards, and those of the Occupational Health and Safety Act.

.6 The Board will provide periodic monitoring to ensure that safety requirements are met, and that safety records are properly kept and maintained. Continued disregard for safety standards can cause the Contract to be canceled and the General Contractor removed from the site.

.7 The Board may hire Commissioners to perform inspections of building systems at the closing stages of the work of this contract. If so contracted and identified in the *Instructions to Bidders*, the General Contractor shall cooperate with and coordinate the work of the Board's Commissioners on site.

.8 The General Contractor will report to the Board and Jurisdictional Authorities any accident or incident involving personnel and/or property of the Contractor, Board, or Public, arising from the General Contractor's or any of his Subcontractors' execution of the work.

.9 The General Contractor will include all provisions of this contract in any agreement with Subcontractors, and hold them equally responsible for safe work performance.

.10 If the General Contractor is responsible for a delay in the progress of the work due to an infraction of legislation or Board Health and Safety requirements, the Contractor will, without additional cost to the Board, work such overtime, and acquire and use for the execution of the work such additional labour and equipment as to be necessary in the sole opinion of the Board's Representative and Consultant, to avoid delay in the final completion of the work or any operations thereof.

1.26 MANUFACTURERS' INSTRUCTIONS

.1 Unless otherwise specified, the General Contractor and all his Subcontractors shall comply with manufacturer's latest printed instructions for materials and installation methods.

.2 The General Contractor shall notify the Consultant in writing of any conflict between the Specifications and Manufacturer's Instructions and have same clarified.

1.27 AIR AND VAPOUR SEAL

.1 The General Contractor shall ensure that exterior walls, windows, floor and roof surfaces provide an air-tight and vapour-tight membrane to prevent problems due to building vapour migration.

.2 In general, the air/vapour barrier must be achieved on the interior side of the thermal insulation.

1.28 FIRE SAFETY

.1 The General Contractor and all of his Subcontractors must comply with requirements of standard for Building Construction Operations FC No. 301-1982, issued by the Fire Commissioner of Canada.

.2 The appropriate clauses of the Ontario Building Code relating to fire protection shall be strictly followed.

.3 The General Contractor shall provide and maintain free access to temporary or permanent fire hydrants acceptable to local fire department.

1.29 CONSTRUCTION SAFETY

.1 The General Contractor and all his trades must observe and enforce construction safety measures required by Canadian Construction Safety Code, Workplace Safety & Insurance Board, and Municipal statutes. In particular, the Ontario Construction Safety Act, the regulations of the Ontario Department of Labour and Ontario Hydro Safety Requirements shall be strictly enforced. In event of conflict between any provisions of above authorities the most stringent provisions will apply.

.2 The General Contractor is reminded, once again, that it is he who is responsible for Occupational Health and Safety on this Project. The items listed below are only guidelines of the Board's expectations in this regard and not to be construed to be comprehensive or total in nature.

.3 The Board will take every reasonable precaution to prevent injury or illness to students, employees and the public, participating in Board activities, or performing their duties. This shall be accomplished by providing and maintaining a safe, health working environment by providing the education necessary to perform these activities or duties safely.

.4 The Board is vitally interested in the health and safety of all Contractors and their workers performing work for the Board. Cooperation and support of the General

Contractor in the protection of workers from injury or occupational disease is a major, continuing object of the Board. To achieve these goals, the Board, in concert with the Contractors, will endeavor to make every effort to ensure that the Contractors provide a work site which is a safe and healthy work environment. The Board insists that all Contractors and their workers are dedicated to the continuing objective of reducing risk and injury.

.5 The General Contractor covenants and agrees to comply with all statutory and other obligations, including, without limitation, the provisions of the Occupational Health and Safety Act (Ontario) and all Regulations thereto, and all amending and successor legislation, including without limitation, Bill 208 (the "Act") in connection with all work performed by either the Contractor, Subcontractors, or any Other Contractor on, or in connection with, the Project.

.6 Without limiting the foregoing, for the purposes of this Contract, the General Contractor agrees that **he** shall be the "constructor" of the Project within the meaning of the Act, and as such, shall assume all the obligations and responsibilities, and observe all construction safety requirements and procedures, and duties of inspection imposed by the Act on the "constructor", as therein defined, for all work and services performed by the General Contractor, Subcontractors and Other Contractors on or in connection with the Project.

.7 The General Contractor further covenants and agrees that the Board and its existing and former officers, trustees, employees and agents, and their respective heirs, executors, administrators, successors and assigns (hereinafter collectively referred to as the "Board") shall be released from any obligations or liabilities otherwise imposed on the Board, or on any of them, pursuant to the Act in connection with the Project, and that the General Contractor shall assume all liability and responsibility in connection with same.

.8 The General Contractor agrees to save harmless and indemnify the Board from any losses, damages, costs and expenses of any kind, or nature whatsoever, including all legal expenses, and all defense costs and related expert or consulting fees, incurred by the Board, or any of them, arising in connection with the failure, default, or inability of the General Contractor of the Board, or any of them, to comply with any of the aforementioned statutory, or other legal requirements, or arising in connection with any breach by the General Contractor of any of its covenants, agreements and obligations under this Contract.

.9 The General Contractor shall inform and instruct Other Contractors that they, while performing work on this project, are under the authority of the Contractor. Other Contractors are to discuss and co-ordinate with, and follow instructions from, the General Contractor on all matters of site access, vehicles, deliveries, storage, temporary facilities, coordination with the work of other subcontractors, work methods, scheduling, labour conditions, construction safety, environmental protection, security and all other matters which relate to the safe and proper execution of construction work.

.10 The General Contractor shall ensure that all supervisory personnel on job site are fully aware of the procedures and requirements outlined above and comply with all requirements specified.

.11 All Contractors are responsible to ensure that all machinery and/or equipment are/is safe and that the workers perform their tasks in compliance with established safe work

practices or procedures. Workers must receive adequate training in their specific work tasks to protect their health and safety.

.12 The General Contractor shall be responsible for all persons and companies performing work, including Other Contractors, on this project, at all times, up to and including, the date of Substantial Performance of the Work. Authority for coordination and instructions relating to all matters which relate to the safe and proper execution of construction work shall rest with the General Contractor. The Contract Price must include the General Contractor's fees for the coordination and supervision of the work of all Other Contractors.

.13 In addition to the responsibility of all contractors as outlined above, Subcontractors will be held accountable for the health and safety of workers under their supervision.

.14 Every worker must protect his/her own health and safety by working in compliance with the law and with safe work practices and procedures established by the authorities having jurisdiction.

.15 All sections of the Occupational Health and Safety Act for Industrial Establishments, latest edition, and the Occupational Health and Safety Act for Construction projects, latest edition, shall be enforced, by the General Contractor, in their entirety, throughout the duration of the construction project.

.16 The General Contractor shall provide the Consultant with the telephone number where the General Contractor or his representative can be reached at any time, day or night, for the duration of the contract.

.17 Where an accident, explosion, or fire causes a person injury at the work place, and the worker is disabled from performing the usual task, the General Contractor shall prepare a written notice and shall forward same to the Ministry of Labour within four days of the occurrence with a copy to the Board's Representative, who shall copy and inform the Board's Supervisor of Health and Safety and/or the Board's Joint Health and Safety Committee, containing such information and particulars as may be described.

.18 Where a person is killed or critically injured from any cause at the work place, the General Contractor shall immediately call the Ministry of Labour. A written notice from the General Contractor shall be given to the Ministry of Labour within forty-eight hours after the occurrence, containing such information and particulars as may be prescribed, with copies to the Architect and the Board's Representative.

.19 The General Contractor is advised that the accident scene is under the jurisdiction of the Ministry of Labour and no wreckage, articles, etc., shall be interfered with, disturbed, destroyed, altered or carried away at the scene, or connected with the occurrence, until the Ministry of Labour has given permission.

1.30 INDEPENDENT TESTS AND INSPECTIONS

.1 The Contractor shall appoint inspection firms as directed by the Consultant and make payments from the cash allowances specified in Division noted, except for the following, which shall be included in the contract:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Testing, adjustment and balancing of mechanical and electrical equipment and systems.

.4 Mill tests and certificates of compliance.

.5 Re-testing as already described in *Quality Control* of this Section.

.2 The Consultant will authorize payment of inspection services from specified cash allowances.

.3 The General Contractor shall furnish labour and facilities to:

.1 Provide access to work to be inspected and tested.

.2 Facilitate inspections and tests.

.3 Make good work disturbed by inspection and test.

.4 Pour concrete test cylinders and store as directed by Inspection Firm.

.4 The General Contractor shall notify Inspection Firms sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.5 Where materials are specified to be tested, the General Contractor shall deliver representative samples in required quantity to testing laboratory.

1.31 PERIODIC CLEANING

.1 Refer also to Section 01 74 11.

.2 As part of the Tender, the General Contractor shall provide all necessary garbage bins through the duration of the project. The General Contractor shall ensure that the following is accomplished:

.1 Keep all areas of the Work clean and orderly, free from accumulation of dirt, debris, garbage, oily rags, excess material, or such other trash items. Remove such items for all areas of the Work on a daily basis.

.2 Vacuum and/or broom interior building areas when ready to receive painting and other finishes. Continue cleaning on an "as needed" basis until the building is ready for inspection and takeover.

.3 Schedule cleaning operations so that resulting dust and other contaminants do not affect wet, newly painted surfaces.

.4 In preparation for Substantial Performance and Occupancy, conduct inspections of all exposed interior and exterior surfaces.

.5 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all exposed interior and exterior finishes, including glass and other polished surfaces.

.6 Remove all protective film from switch plates and hardware, particular kick plates.

.7 Clean lighting reflectors, lenses and other lighting surfaces.

.8 Broom clean paved surfaces and rake clean other disturbed surfaces in the area of the Work, to remove site debris caused by the Work of this Contract. Inspect for damages and make good.

.9 Remove debris and surplus materials from the roof areas and accessible concealed spaces.

.10 Replace heating, ventilation and/or air conditioning filters through the entire building to the extent that they supply or return from the work areas, whether or not, the units were operated during construction operations.

.11 Refer to "cleaning" sections of the specifications for additional specific periodic and final clean up requirements.

.3 The General Contractor must note the Board insists that tiled (VCT) and sheet good floors (vinyl or linoleum) be broom swept only. Wet mopping and waxing/polishing will be completed by the Contractor.

.4 Do not provide sealants and waxes on terrazzo, ceramic and other hard surfaced floors without reviewing products and methods of application with the Board's Caretaking Staff. Failure to comply with this requirement will result in the contractor stripping these floors in their entirety.

.5 The contractor shall also ensure that the appropriate measures including a stone mud mat are installed and maintained at all construction entrances, to avoid contamination of City roads and sewers. It is the Contractor's responsibility and not the Board's to ensure that site entrances and roadways in front of the site are maintained in clean condition acceptable to the municipality or Subdivision Engineer.

1.32 TEMPORARY PROTECTION

.1 Refer also to Articles 1.6, in this Section.

.2 The General Contractor to provide temporary barricades, screens or barriers as directed by the Consultant and/or authorized Board Representative, for the safety of persons, or for dividing the Work from portion or portions of the building or site that may be required for use by the school, or others.

.3 Properly protect the Work from any damage by the elements. In cold weather cover all exterior openings in the work areas likely to cause water damage.

.4 During off hours and/or stages of suspended operations for whatever reasons, the General Contractor must assume all responsibility for protection against the elements, theft and/or vandalism. This applies to all work in progress and to any materials, products, tools, equipment, or other such items left at the work site.

.5 Properly protect floors and roofs from any damage. Take special precautions when moving heavy loads or equipment over floors and roofs.

.6 The General Contractor must keep floors free of oils, grease or other such materials likely to discolour them and/or affect bonding of applied surfaces.

.7 The General Contractor must ensure that no part of the Work is loaded greater than it was designed for, when completed. Make any temporary support as strong as the permanent

support. Place no load on concrete structure until it has sufficient strength to safely bear such load.

.8 Protect glass and other finishes against heat, slab and weld splatters, using appropriate protective shields and covers.

.9 The General Contractor must provide and maintain, in good working order, appropriately labeled ULC fire extinguishers, to the approval of Authorities Having Jurisdiction.

.10 The General Contractor must provide a minimum of two safety helmets on site at all times for the use of the Consultant and any other Board authorized visitors to the site. It is the General Contractor's responsibility to make certain that any such visitors wear the protective headgear and any other safety gear which may be necessary at that particular time of construction.

1.33 COMPLETION

.1 Upon completion of the Work, all protection erected shall be removed, all damage to the Work and adjoining Work due to the lack or failure of such protection shall be made good and all debris, surplus materials tools equipment shall be removed from the work areas and the site, and the Project shall be left clean and tidy to the full and complete satisfaction of the Consultant and Board Staff. The General Contractor shall give written notice to the Consultant, requesting final inspection of the completed Project.

.2 Refer to the pertinent sections of the Specifications for requirements with respect to submission of *Record Documents, Maintenance Materials, Special Tools* and *Spare Parts.*

1.34 GUARANTEES

.1 The following is a summary of the guarantees (in number of years) required by the contract. Refer to individual specifications sections for additional information on warrantees. In the event an extended warranty is listed in the specific Section, that section will have precedence over this list. If no extended warranty is listed, this list will govern:

.1	Entire Building, General Contract	1
.2	Paving	2
.3	Finish Carpentry	2
.4	Sprayed-In-Place Urethane Insulation	2
.5	Precast Structural Concrete	5
.6	Caulking	2
.7	Composite Panels	5
.8	Aluminum Windows & Window Walls (manufacturer's)	5
.9	Glazed Sealed Units	10
.10	Finish Hardware	3
.11	Panic Devices and Door Closers	5
.12	Acoustic Ceilings	2
.13	Built Up Roofing (installation)	2+3
.14	Built Up Roofing (manufacturer's)	20

.15	Sheet Metal Flashing and Siding	5
.16	Concrete Floors	3
.17	Ceramic Tile	5
.18	Millwork (AWMAC)	2
.19	Resilient Tile	3

.2 The guarantee period shall start on the date of issue of the Certificate of Substantial Performance of the Contract by the Consultant.

1.35 CONTINGENCY ALLOWANCE

.1 Include in the Tender Amount a Contingency Allowance in the amount described in the PDSB Invitation to Tender (ITT) Document herein.

.2 Expend Contingency Allowance as directed by the Consultant, in writing, in accordance with the Contract

.3 Contractor's charges for expenses and profit on Contingency Allowance expenditure shall not be included in Contract Price. Refer to the Contract and Supplementary Conditions for percentages of mark-ups.

.4 Such charges shall be added to the net trade cost of each expenditure from the Contingency Allowance at the percentage rates noted in the Stipulated Price Contract, Standard Document PDSB-2011.

.5 *Changes to the Work shall be added to, or deducted from, the Contingency Allowance. The Contract shall be adjusted by Board approval, only once - at the end of the Project.* Credit the Contract with any unused portion of the Contingency Allowance only in the final payment statement.

1.36 CASH ALLOWANCE

.1 Cash Allowance: Include in the Contract Price, a Cash Allowance in the amount described in the PDSB Invitation to Tender (ITT) Document herein.

.2 Cash Allowances, unless otherwise specified, cover the net cost to the General Contractor of services, products, construction, machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing the Work.

.3 The Base Contract Price, *and not the Cash Allowance*, includes the General Contractor's profit and coordination costs in connection with all Cash Allowance expenditures.

.4 The Contract Price will be adjusted by written order by the Consultant to provide for an excess or deficit to each Cash Allowance. Any unused portions of these allowances shall be returned to the Board on the conclusion of the Contract.

.5 A schedule shall be prepared jointly by the Consultant and the General Contractor to show when items called for under Cash Allowances, so that the progress of the Work is not delayed.

.6 Exclusive of Deposits, which are the contractor's sole responsibility to provide as required of Authorities Having Jurisdiction, the following is a summary of the scope Cash Allowances to be included in the contract:

.7 Expend both Cash Allowances as directed by the Consultant in writing. Allowances will be adjusted to actual cost with no adjustment to Contractor's charges. Cash expenditure must identify the H.S.T. separately.

.9 **Cash Allowance** Breakdown of Items

.1 Testing and Inspections (requested by Consultant, Owner or imposed by Authorities)
.2 Air and Water Balancing/Testing
.3 Incoming Gas Service
.4 Hydro Service Connection Fees
.5 Street light standard(s) and utility box relocations within the municipal right of way boulevards. *(Contractor to contact Con-Elco Ltd., Concord, Frank Rotino frotino@con-elco.com)*
.6 Permit fees if any Lot Grading Certificate (not deposits)
.7 Erosion and Sediment Control Permit Fees (not deposit)
.8 Consultant fees for application to MOE for Emergency Generator Exhaust approval
.9 Interior signage (supply and install)
.10 Exterior school name, address and school board logo signage (supply and install)
.11 Detailed school logo in gym floor and wall mural.
.12 Gym electronic scoreboard
.13 Manually operated Window coverings. (*Electric operated roller shades are included in contract*)
.14 Storm Water Quality Contribution
.15 PA/Telephone System Components (cables, jack, telephones, clocks, speakers and Aiphone system, etc…)
.16 Computer Components System (data wiring, jacks, patch panels etc…)
.17 Foundation Survey by OLS (upon completion of foundations)
.18 Completion Site Survey by OLS
.19 Storm System Video Inspection upon completion
.20 Preparation of digital as-built drawings (if completed by the Consultants)

1.37 ALLOWANCES CARRIED IN DIVISIONS 15 AND 16

.1 No Additional Cash Allowances are included in the work of Divisions 15 and 16.

1.38 SCHEDULE OF ALLOWANCES

.1 Material Allowances shall include the following:

.1 Net cost of Material
.2 Applicable taxes and duties

.3 Delivery to site

.2 For Material Allowance, the contract shall include:

.1 Handling at site, including unloading, uncrating, storage and hoisting
.2 Protection from elements, from damage
.3 Labour, installation and finishing
.4 Other expenses required to do cash allowance work (i.e. contract co-ordination)
.5 Overhead and profit

.3 Material and Installation Allowances shall include the following:

.1 Net cost of material
.2 Applicable taxes and duties
.3 Deliver to site
.4 Handling at site, including unloading, uncrating, storage and hoisting
.5 Labour, installation and finishing

1.39 POLYCHLORINATED BIPHENYL (PCB)

.1 Conform to the Environmental Protection Act and Regulations, Ontario Regulation 11/82 as amended.

1.40 USE OF CONSULTANTS'S DIGITAL DRAWINGS

.1 Where a contractor wishes to obtain a digital copy of consultant drawings for shop drawings or survey purposes, the consultant may elect to provide this drawing for a nominal fee. As this is the consultants' option, the contractor shall not anticipate provision of these digital drawings to meet the contract schedule.

1.41 BUILDING DIMENSIONS

.1 Ensure that all necessary job dimensions are taken and all trades are co-coordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for co-ordination.

.2 Verify that all work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by requirements of the drawings, and ensure that work installed in error is rectified before construction resumes.

.3 Check and verify all dimensions referring to the work and the interfacing of all services. Verify all dimensions, with the trade concerned when pertaining to the work of other trades. Be responsible to see that Subcontractors for various trades co-operate for the proper performance of the Work.

.4 Avoid scaling directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Be responsible for any change through the disregarding of this clause.

.5 All details and measurements of any work which is to fit or to conform with work installed shall be taken at the building.

.6 Advise Consultant of discrepancies and if there are omissions on drawings, including layout of items which affect aesthetics, or which interfere with services, equipment or surfaces. DO NOT PROCEED without direction from the Consultant.

.7 Prepare interference drawings AND SUBMIT AS SHOP DRAWINGS IN ADVANCE OF PRODUCTION to properly co-ordinate the work in all ceiling spaces and where necessary. Coordinate these drawings with all Divisions. Refer also to Section 013300.

1.42 SETTING OF WORK AND REQUIRED SURVEYS

.1 As part of the base tender amount, provide and pay for the services of a Land Surveyor acceptable to the Consultant, registered in the Province of Ontario to establish the property boundaries and the location of the building addition.

.2 Lay out building lines for the work and provide substantial stakes, batterboards or monuments to preserve lines and levels.

.3 Verify on the site all grades, lines, levels, dimensions and location of hydrants, existing structures, manholes, overhead and buried utilities, existing trees, roadways, sidewalks and the like, shown on the drawings, and report omissions, errors, or inconsistencies, before commencing work.

.4 Upon completion of layout work and before commencement of any excavation, give ample notification to allow for inspection of lines and levels. Such inspection does not in any way mitigate the Contractor's responsibility for accuracy of layout.

.5 Provide the consultant with a Surveyor’s Certificate describing the location of all perimeter foundation walls relative to property lines before construction proceeds on those walls.

1.43 LAYOUT OF WORK

.1 Layout work with respect to the work of all trades. Arrange mechanical and electrical work such as piping, ducts, conduits, panels, equipment and the like to suit the architectural and structural details.

.2 Alterations necessary due to conflict and interference between trades, to be executed at no cost to the Owner unless notification is given in writing before Tender Closing Date.

1.44 DOCUMENTS REQUIRED AT START, DURING & CLOSE-OUT OF CONSTRUCTION

.1 At Commencement of Contract

.1 Supply Performance Bond and Labour and Material Bond, in accordance with the front-end specification documents.

.2 Supply Public Liability and Property Damage Insurance Certificates, also Builder’s Risk and Boiler Insurance as required of the Contract.

.3 Supply Certificates of good standing from WSIB for the General Contractor and all Subcontractors.

.4 Supply a complete Contract Sum Breakdown of all subtrades or parts of work and general expense items for approval by all consultants. Include Mechanical and Electrical Breakdowns for review and acceptance by Consultants.

.5 Supply a competent detailed Construction Schedule that has been reviewed and approved by major subtrades. Identify critical milestone dates.

.6 Supply Cash Flow schedule of monthly progress payments in coordination with the Construction Schedule and plot as 'S' curve chart.

.7 Supply Schedule of Shop Drawing Submissions and identify list of long-lead items.

.8 Apply for and post and supply a copy of Notice of Project.

.9 Supply a copy of Health & Safety policy as well as post at the job site.

.10 Apply for and pay all security deposits in conjunction with Temporary Road Occupancy Permit and Site Alteration Permit.

.11 Haul Permit is required by the Town of Caledon. Contractor to apply at: https://forms.caledon.ca/do.aspx

.12 Supply Shoring Designs of all load bearing areas if any required of the construction sequence or if required by the Structural Engineer.

.13 Supply interference drawings for all areas requested by the Architect, Mechanical Engineer or Electrical Engineer.

.2 During Construction

.1 Maintain as-built record drawings in clean condition.

.2 Organize regular Trade Coordination meetings.

.3 Organize separate, regular Owner and Consultant Job Meetings in accordance with Section 012200.

.4 Maintain a copy of up to date records on site including, but not limited to Permit Sets, Contract Documents updated with all addenda, all Changes and Supplementary Instructions issued by Consultants.

.3 Monthly with Each Progress Payment Application

.1 Supply Monthly Progress Reports and Construction Schedule in accordance with Section 012200.

.2 Adjust Allowances, as required.

.3 Current WSIB Form

.4 Confirm that payments are being made to subcontractors and suppliers by submission of original copies of the current versions of Statutory Declarations with the second and subsequent Progress Payment Application. Include both Statutory Declarations Form CCDC-9A for the General Contractor and CCDC-9B from subcontractors with each monthly Progress Payment Application. No payment will be made for unincorporated material on the site, unless Bill of Sale in proper format is provided.

.4 Prior to Substantial Completion

.1 Provide detailed Completion Schedule a minimum of 90 days prior to Substantial Completion. Schedule to illustrate all trades and sequences required for completion and legal occupancy. Issue to Consultants and upon acceptance, to all trades.

.2 Coordinate Completion Schedule with Building Commissioner at least 60 days prior to substantial completion or as directed by Consultant.

.3 Prior and as a requirement of owner acceptance of Substantial Completion of the work the following to be observed, executed and submitted:

.1 DEFICIENCIES ARE LISTED: prior to Substantial Completion, the contractor shall prepare a room by room deficiency list in electronic format on an MS Excel spreadsheet provided by the Consultant. Contractor shall print and review on site with consultants at a site meeting and post on each room or area. Contractor shall reissue back to Consultant, when updated, in Excel electronic format. This list will be acted upon by all trades and coordinated and updated weekly as a minimum by the General Contractor to ensure all deficiencies are addressed by the date required for Total Performance. Confirm in writing to the Architect when and on what dates each deficiency has been completed in a satisfactory manner. The Consultant's site review will be final approval.

.2 Acceptable preliminary submissions of all Mechanical and Electrical Operations and Maintenance Manuals have been reviewed by Consultants.

.3 Acceptable preliminary submissions of all Warranty and Shop Drawing Records have been reviewed by Consultants.

.4 All final clean-up to have been executed, as specified in Section 01 74 11.

.5 Complete preliminary balancing and provide preliminary Balancing Reports.

.4 Failure to comply with these requirements shall have amounts withheld on Progress Payments and delay issuance of Certificate of Substantial Completion.

.5 Note that Prior to the Release of Holdback, a similar Progress Claim is required, and must include current Statutory Declaration Forms CCDC-9A for the General Contractor and CCDC-9B from subcontractors updated to refer to the Previous Certificate of Payment.

.5 Upon Completion (Refer also to 01 78 00 Close-Out Submittals)

.1 Upon completion of work before the Final Certificate of Payment is issued, the following to be observed, executed and submitted:

.2 DEFICIENCIES ARE COMPLETE. Confirm in writing to the Architect when and on what dates each deficiency has been completed in a satisfactory manner. The Consultant's site review will be final approval.

.3 Finishing Hardware, Inspection and Verification. Note requirements for qualified installation and inspection in Section 08 71 10- Door Hardware. Inspection only is paid for from Cash Allowances.

.4 Organize a Final Inspection tour at which to be present: the Owner's authorized representative; the Architectural, Structural, Mechanical and Electrical Consultants, and their supervisory personnel, if any; the Contractor and his superintendent.

.5 Where the above procedure is impossible or where any deficiencies remain outstanding, the Owner's representative and the Consultant concerned, to inspect and accept the affected work and/or material upon notification by the Contractor, that all deficiencies involving this Consultant have been made good.

.6 A complete release of all liens arising out of this Contract, other than his own. If a subcontractor or supplier refuses to furnish a release of such a lien, furnish a

bond satisfactory to the Owner to indemnify him against any claim under such a lien.

.7 Certificates of good standing from the WSIB, for the General Contractor and all Subcontractors.

.8 All reference records, as specified, under Section 01 78 00.

.9 Certificate of Inspection from Mechanical and Electrical Engineers.

.10 Copies of all Lists of Deficiencies with each Deficiency verified when complete by only this project's job Superintendent. The Final List of Deficiencies to be signed, completed by all concerned, if accepted.

.11 Statement of Completion from General Contractor.

.12 Final adjustment of all Allowances.

.13 Certificates required by Provincial, Municipal and other authorities having jurisdiction. Including signed Building Permit.

.14 Final Balancing Reports showing completed adjustments

.15 Digital copy of Site Services, Architectural, Structural, Mechanical and Electrical and 2 sets As-Built Drawings – paid from Cash Allowance.

.16 As-Built Survey by O.L.S. (2 copies and diskette) – paid from Cash Allowance. Survey to include detailed spot elevations and include elevations at tops of all CB's & MH's, all invert elevations (engage private locate firm as required), elevations at bottoms of curbs, elevations at all corners of building.

.17 Final copies of all Maintenance Manuals.

.18 Entire Maintenance Manuals of all items listed above to be provided as a (1) digital CD copy.

.19 Building Permit set (digital PDF format on a separate CD).

.20 Site Meeting Reports (digital PDF format on a separate CD).

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.0 ONTARIO AND CANADIAN GOODS AND SERVICES

.1 It is the intent of this project design, tender and construction to comply with the 'Buy Ontario Procurement Directive'. The objective is to maximize the use of Ontario-Made and Canadian-Made Goods and Ontario Services, while maintaining value for money and the timely delivery of infrastructure projects. This includes construction, fixtures, furniture and equipment that are included in and incidental to this construction project, and as required to support the school's operational readiness immediately following completion of construction.

.2 Efforts have been made to specify Ontario and Canadian made goods in the drawings and specifications. In instances where goods and services have been specified that are not Ontario or Canadian made, if there are alternates that are Ontario and Canadian produced, meet the performance of the specified items and that are available within the project construction schedule, they will be allowed to be supplied as part of this project upon review and approval by the consulting team.

.3 As the School Board is governed under, and considered to be a Broader Public Sector (BPS) entity, they are required by the 'Buy Ontario Procurement Directive' to exclude U.S. businesses from procurements, however, procuring from U.S. businesses is allowed if any of the following circumstances apply:

- .1 A U.S. business is the only viable source for the good/service, and the procurement cannot be delayed.
- .2 For procurements for services, the U.S. business commits to having at least 90 percent of the required staff to deliver the contracted services located in Canada.
- .4 For any goods or services from a U.S. business, regardless of the value, approval must be obtained from the appropriate governing entity to procure.

.4 To understand the procedure, forms and information required for approval of any goods or services, visit https://www.ontario.ca/page/buy-ontario-procurement-directive.

1.1 DOMESTIC SUPPLY CHAIN PLAN (DSCP) – DECLARATION OF GOODS & SERVICES

.1 A Domestic Supply Chain Plan (DSCP) will be formed by the consultant from the information provided by contractors in the 'Stipulated Price Subcontract Bid' forms submitted at the time of tender, in compliance with the requirements of the *Buy Ontario Procurement Directive,* which outlines the origin and sourcing strategy for major goods and services required for the construction of the proposed work.

Contractors shall not substitute goods or services with those that do not comply with the Buy Ontario Act. Any substitutions shall be subject to the Consultants' and Board's approval.

.2 Objectives: Maximize procurement of goods manufactured in Ontario and Canada

- .1 Support local and regional suppliers, trades, and workforce.
- .2 Ensure transparency in sourcing of major construction materials and services.
- .3 Provide traceability and documentation to demonstrate compliance.

.3 Definitions:

.1 Ontario Supplier: A business with a physical presence in Ontario that manufactures, assembles, or distributes goods, or provides services.

.2 Domestic Content: Goods that are manufactured or substantially transformed within Ontario or Canada.

.3 Ontario-Sourced: Goods manufactured or substantially transformed in Ontario.

.4 Canadian-Sourced: Goods manufactured or substantially transformed in Canada.

.5 Non-Domestic: Goods sourced outside Canada.

.6 Major goods: means durable materials, systems or components that are essential to ensuring the operational readiness or performance of the deliverable, and include:

.1 Structural materials: concrete, steel and other metals, lumber, stone, aggregates;

.2 Building envelope components: windows, glass, roofing systems, bricks;

.3 Mechanical and electrical systems: HVAC units, generators, elevators;

.4 Specialty items: prefabricated panels, major fixtures;

.5 Fixtures, furniture and equipment; and,

.6 Transit fleet vehicles.

.7 Ontario Service: A service wholly provided by individuals (natural persons) located in Ontario

.8 Ontario-Made Good: A good that meets any one of the following criteria:

.1 It is wholly manufactured or originating in Ontario, or

.2 At least 51% of the total direct costs of producing or manufacturing the good have been incurred in Ontario.

.9 Canadian-Made Good: A good that meets any one of the following criteria:

.1 Is wholly manufactured or originating in Canada,

.2 At least 51% of the total direct costs of producing or manufacturing the good have been incurred in Canada, or

.3 Is labelled as “Made in Canada” or “Product of Canada”.

.10 Canadian Service: A service wholly provided by individuals (natural persons) located in Canada.

1.2 SUPPLY CHAIN STRATEGY

.1 Contractors and Subcontractors must:

.1 Prioritize Ontario-based suppliers and subcontractors.

.2 Engaging local labour and trades wherever possible.

.3 Ensuring transparency in sourcing decisions.

.4 Maintaining documentation to verify origin of goods and services.

.5 Mitigating supply chain risks through diversified domestic sourcing.

.6 Identify specified materials that do not comply with the directive and provide alternates that meet the requirements of the specification and mandate within the tender/contract price, where required.

.2 Contractors, Subcontractor and Vendor Engagement:

.1 All subcontractors will be required to provide the following during construction:

.1 Disclose the origin of major goods, materials and components.

.2 Demonstrate efforts to source from Ontario suppliers.

.3 Provide supporting documentation upon request.

.3 Monitoring and Reporting

.1 The General Contractor commits to:

.1 Track the origin of the goods and services (Ontario, Canadian or Non-Domestic) throughout the project.

.2 Provide reports to the Owner in compliance with the Directive (with monthly progress billing) including:

.1 Confirmation that actual suppliers used match those identified in the DSCP.

.2 Any deviations from the DSCP are documented with justification.

.3 Supplier certifications with Province/Country-of-origin declarations.

.3 Notify the Owner in advance of any material changes to supply sources, especially where:

.1 A domestic supplier is replaced with a non-domestic supplier (subject to the approval of the Owner where needed).

.2 Availability or cost issues impact compliance.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 PROJECT MEETINGS FOR COORDINATION

.1 In consultation with the Consultant not later than the second week of construction, arrange for site meetings weekly or every 2 weeks as appropriate to the stage of construction, for project coordination. Such meetings shall fall at the same time each week the meeting is scheduled.

.2 Responsible representatives of the Contractor's and Subcontractor's office and field forces and suppliers shall be obliged to attend.

.3 Inform the Owner, Consultant, and those others whose attendance is obligatory, of the date of each meeting, in sufficient time to ensure their attendance.

.4 Provide physical space for meetings, prepare an agenda, chair and record the minutes of each meeting. Relevant information must be made available to all concerned, in order that problems to be discussed may be expeditiously resolved. Identify "action by: _____".

.5 Within three days after each meeting, distribute two copies of the minutes to each invited person and regular distribution list to be issued by the consultant.

1.2 PRECONSTRUCTION MEETING

.1 Within 5 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Include in the agenda the following:

.1 Appointment of official representative of participants in the Work.
.2 Site Safety and Security
.3 Scheduling of Work. Schedule to include a detailed breakdown of mechanical and electrical works.
.4 Interference with ongoing business.
.5 Work by other Contractors.
.6 Schedule of submission of shop drawings and samples.
.7 Requirements for temporary facilities, site sign, offices, storage sheds utilities.
.8 Delivery schedule of specified equipment and identification of long-lead or other critical items.
.9 Site security.
.10 Procedures for Contemplated change notices, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
.11 Record drawings.
.12 Maintenance manuals.
.13 Take-over procedures, acceptance, warranties.
.14 Monthly progress claims, administrative procedures, photographs, holdbacks.
.15 Appointments of inspection and testing agencies or firms.
.16 Insurances, transcript of policies.

.17 Schedule for progress meetings.

1.3 PROJECT MEETINGS FOR PROGRESS OF WORK

.1 Conduct progress meetings in accordance with the schedule and/or decisions made at Preconstruction meeting.

.2 Inform the Owner, Consultant, project consultants, Subcontractors and suppliers and those whose attendance is obligatory, of the date of the meeting, in sufficient time to ensure their attendance.

.3 Include in the agenda the following:

.1 Site Safety and security record or incidents.
.2 Review, approval of minutes of previous meeting.
.3 Review of Work progress since previous meeting.
.4 Field observations, problems, conflicts.
.5 Problems which impede construction schedule.
.6 Review of off-site fabrication delivery schedules.
.7 Corrective measures and procedures to regain projected schedule.
.8 Revisions to construction schedule.
.9 Progress during succeeding work period as a “two-week look ahead”.
.10 Review submittal schedules: expedite as required.
.11 Maintenance of quality standards.
.12 Pending changes and substitutions.
.13 Review proposed changes for effect on construction schedule and on completion date.
.14 Other business.

1.4 PROGRESS RECORDS

.1 Maintain a permanent written record on the site of the progress of the work using standard OGCA form. This record shall be available to the Consultant at the site, and a copy shall be furnished to same on request. The record shall contain:

.1 Daily weather conditions, including maximum and minimum temperatures.
.2 Dates of the commencement and completion of stage or portion of the work of each trade in each area of the project.
.3 Conditions encountered during excavation.
.4 Dates of erection and removal of formwork, in each area of the project.
.5 Dates of pouring the concrete in each area of the project, with quantity and Particulars of the concrete.
.6 Work force on project daily per trade and active hours.
.7 Visits to site by personnel of Consultant, Jurisdictional Authorities and testing companies.

1.5 PROGRESS REPORTS

.1 Submit to the Consultant, Monthly Progress Reports consisting of a concise narrative and a marked-up summary schedule showing physical percentage complete by item and in total. These progress calculations must agree with the Progress Payment Claims. masonry; mechanical, finishing trades and the like. Include with this submission the digital schedule referenced below

1.6 DIGITAL PROJECT SCHEDULES

.1 At the outset of the project, General Contractor to provide and maintain a digital project schedule including Milestone Dates and listing all trades.

.2 Update and issue to Consultant in hard copy and electronic copy not less than monthly and at each Progress Draw. To be issued in format compatible with Microsoft Project program.

.3 At 70% completion, or 16 weeks prior to Substantial Completion, whichever comes first, Project develop a detailed Completion Schedule outlining final coordination and sequences to completion.

1.7 DOCUMENTS REQUIRED AT PROJECT START, DURING CONSTRYCTION AND CLOSE OUT

.1 Refer to Section 01 11 00 – Summary of Work, article 1.44.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Shop drawings and product data.

.2 Samples and mock ups.

1.2 SHOP DRAWINGS

.1 Submit to Architect, for review, shop drawings, product data and samples specified.

.2 Until submission is reviewed, work involving relevant product must not proceed.

1.3 RELATED SECTIONS

.1 Section 13 05 41 - Seismic Restraint for Non-structural Components.

1.4 REFERENCES

.1 PDSB 1998 Stipulated Price Contract.

1.5 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate Sections.

.3 Identify details by reference to sheet and detail numbers shown on Contract Drawings.

.4 Maximum sheet size 606 x 909 mm.

.5 Reproductions for submissions: opaque diazo prints.

1.6 PROJECT DATA

.1 Certain specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.

.2 Above will only be accepted if they conform to following:

.1 Delete information which is not applicable to project.

.2 Supplement standard information to provide additional information applicable to project.

.3 Show dimensions and clearances required.

□

.4 Show performance characteristics and capacities.

.5 Show wiring diagrams (when requested) and controls.

1.7 COORDINATION OF SUBMISSIONS

.1 Review shop drawings, product data and samples prior to submission.

.2 Verify:

.1 Field measurements.

.2 Field construction criteria.

.3 Catalogue numbers and similar data.

.3 Co-ordinate each submission with requirement of work and Contract documents. Individual shop drawings will not be reviewed until all related drawings are available.

.4 Contractor's responsibility for errors and omissions in submission is not relieved by Architect's review of submittals.

.5 Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Architect's review of submission, unless Architect gives written acceptance of specified deviations.

.6 Notify Architect, in writing at time of submission, of deviations from requirements of Contract documents.

.7 After Architect's review, distribute copies.

1.8 SUBMISSION REQUIREMENTS

.1 Schedule submissions at least fourteen (14) days before dates that reviewed submissions will be required to be returned.

.2 Submit one reproducible transparency, plus six (6) opaque diazo copies of shop drawings, product data to Architect for review.

.3 Accompany submissions with transmittal letter, in duplicate, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Number of each shop drawing, product data and sample submitted.

.5 Other pertinent data.

.4 Submissions must include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name of:

.1 Contractor.

□

.2 Subcontractor.

.3 Supplier.

.4 Manufacturer.

.5 Separate detailer when pertinent.

.5 Identification of product or material:

.1 Relation to adjacent structure or materials.

.2 Field dimensions, clearly identified as such.

.3 Specification Section number.

.4 Applicable standards, such as CSA or CGSB numbers.

.5 Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract documents

1.9 INTERFERENCE DRAWINGS

.1 Prepare interference drawings for all work in confined space: all typical ceiling space conditions and atypical conditions. Coordinate with all trades.

.2 Submit as shop drawings in advance of fabrication or installation of components. Site conditions requiring corrections, due to failure to provide interference drawings as required will be corrected at no additional cost to the owner.

.3 Ceiling heights and bulkheads will not be revised during construction due to failure to prepare interference drawings.

1.10 SHORING DESIGN DRAWINGS

.1 If required as part of this project, or due to construction sequence, it is the contractor’s responsibility to provide in advance of any work requiring shoring, detailed Shoring design drawings bearing the seal of a Professional engineer registered in the Province of Ontario and also a Method Statement describing the work sequence.

.2 Submit to the Consultants as shop drawings in advance of the work.

1.11 SHOP DRAWINGS BEARING THE SEAL OF A PROFESSIONAL ENGINEERS

.1 In addition to any the similar requirements for shop drawings of any mechanical or electrical systems, Shop Drawings for all structural components or components required to perform in conjunction with other structural or building envelope components, cladding and the like shall bear the seal of a professional engineer licensed in the Province of Ontario.

.2 In addition, all components to be attached to or suspended from the walls and ceiling areas shall also bear the seal of a professional engineer licensed in the Province of Ontario. This shall include but not be limited to the following:

.1 Stage drapery and rigging

.2 Stage lighting system

.3 Gymnasium equipment such as basketball backstops

□

.4 Projection screen supports

.5 Exterior building signage

.6 Exterior pylon sign

.7 Gym curtain structural connections

1.12 LIST OF SAMPLE OR MOCK-UP SUBMITALS

.1 At the outset of the project the contractor shall prepare a comprehensive list of all shop drawings, sample submissions and mock ups required.

.2 For assistance only, the following samples and mock up items to be provided are included but not limited to the list following (note this is not exclusive of data sheets and shop drawings):

.1	04 21 13	Concrete and Brick Masonry	samples, mock-up (2m x 2m)
.2	04 21 13	Masonry Accessories	samples
.3	04 22 00	Concrete Masonry	samples
.4	06 40 00	Architectural Woodwork	samples (300mm x 300mm)
.5	06 47 00	Plastic Laminates	samples
.6	07 11 13	Bituminous Waterproofing	mock-up (3m x 2m)
.7	07 18 00	Traffic Coatings	samples
.8	07 21 13	Board Insulation	samples
.9	07 27 10	Air Barriers	samples
.10	07 41 43	Aluminum Composite Panels	samples, mock-up (3m x 2m)
.11	07 81 00	Applied Fireproofing	samples (300mm x 300mm)
.12	07 84 00	Firestopping	samples (300mm x 300mm)
.13	07 92 10	Joint Sealing	samples and mock up
.14	08 44 13	Glazed Aluminum Curtain Walls	samples, mock-up
.15	08 71 10	Finish Hardware	samples
.16	08 80 50	Glazing	samples (300 x 300)
.17	09 30 13	Ceramic Tiling	samples
.18	09 51 13	Acoustical Panel Ceilings	samples (300 x 300)
.19	09 65 19	Resilient Tile Flooring	samples
.20	09 68 00	Carpeting	samples (225 x 225)
.21	09 84 10	Acoustic Wall Treatment	samples (300 x 300)
.22	09 91 22	Painting	draw downs, mock-up
.23	10 11 25	Manufacturer Specialties	samples
.24	10 14 10	Exterior Building Panel Signage	samples
.25	10 14 15	Interior Signage	mock up
.26	10 21 20	Laminated Plastic Toilet Partitions	samples
.27	10 22 27	Folding Panel Partitions	samples
.28	31 23 10	Excavating, Trenching and Backfilling	samples
.29	32 12 17	Asphalt Paving	samples
.30	32 13 10	Unit Paving on Sand Bed	samples
.31	32 31 13	Chain Link Fences and Gates	samples
.32	32 91 21	Imported Topsoil	test reports and samples

□

1.13 SUBMISSIONS TO INSPECTION AGENCIES

.1 Note that Millwork shop drawings are to be submitted to AWMAC as part of the Guarantee Inspection program.

.2 Note that Paint formulations specified are to be submitted to the OPCA with set up documentation upon award of Contract.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

□

Part 1 General

1.1 DESCRIPTION

.1 This Section is issued FOR INFORMATION AND REFERENCE to outline the parameters required for any work that may be carried later than building occupancy.

.2 This section outlines the mandatory minimum Health and Safety protocols for school construction Projects where all or a portion of the existing school building remains occupied and in use.

.3 These Health and Safety protocols are mandatory minimum requirements, procedures and standards that the Peel District School Board insists are fully complied with by all parties involved with Peel District School Board Projects.

1.2 RELATED SECTIONS

.1 These specifications apply to all Divisions of this Project specification. It is the responsibility of the Contractor to apply these provisions wherever practical within specification limits to all products and services used on this Project.

.2 The requirements of this Section supersede those of all other specification Sections and Drawings. Where conflicts exist in procedures, methods or materials, they shall immediately be brought to the attention of the Consultant and Board Project Manager. Where clarification is not immediately available, the Contractor shall assume the specifications contained in this Section are a minimum standard and the more stringent specification shall apply.

.3 The Contractor must receive approval from Board Project Manager for any deviations from this specification Section.

.4 The General Contractor shall recognize that it is *he* who is the Constructor of the Project. The General Contractor shall also recognize that he is solely responsible for site safety at the Place of the Work and compliance with the requirements of this Section does not limit or remove his total responsibility for site safety as Constructor of the Project.

1.3 REFERENCES

.1 Applicable related regulations, standards and laws related to safety include but are not limited to:

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Ontario

1. Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. [1990 June 2002].

1.4 COMPLIANCE SPECIFICATION

.1 Notwithstanding the requirements of this Section, the Contractor must comply with all applicable health, safety and environmental regulations and statutes.

1.5 BEYOND COMPLIANCE SPECIFICATION

.1 These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Board's intention to develop a specification which provides the safest practical procedures and policies for construction project sites that are occupied and in use by staff, students and visitors during the execution of the Construction Contract.

.2 Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore, these specifications cover both material and methods.

.3 These provisions apply to both indoor and outdoor applications equally.

Part 2 Products

2.1 NOT USED

Part 3 Execution and Compliance Requirements

3.1 APPLICATION OF COMPLIANCE REQUIREMENTS

.1 The articles setout herein are to be applied together as a set of related policies and procedures to achieve a comprehensive Health and Safety working protocol.

.2 The Contractor shall execute all of the procedures and meet all of the requirements set out herein and apply these protocols from the outset of the Construction Phase.

.3 These procedures or requirements are to be maintained for the duration of the Construction Phase. The Contractor shall not discontinue any of the individual procedures or requirements without the prior approval of the Board Project Manager.

3.2 SITE SUPERVISOR (SITE SUPERINTENDENT)

.1 A full-time Site Supervisor (Site Superintendent) is required on site, regardless of the number of active workers on site.

.2 Site Superintendent shall have as a minimum:

.1 Recent, previous experience with renovation or addition projects involving occupied buildings including (but not limited to) school construction, sites with students, tenants, employees, retail customers, pedestrian and vehicular traffic.

.2 Successful completion of a multi-session Supervisor's training course conducted by a recognised Construction Association in Ontario.

.3 Site Superintendent must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded and accessed during all non-work hours including weekends and holidays.

.4 Site Superintendent must have means of live phone or walkie-talkie communication with the site Flagman during all work hours.

.5 Site Superintendent shall not be changed throughout project unless confirmed and approved by the Board Project Manager.

3.3 ONTARIO OCCUPATIONAL HEALTH & SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS

.1 General Contractor to comply with the Ontario Occupational Health & Safety Act and Regulations for Construction Projects, latest edition– including all amendments.

.2 Beyond compliance in item .1 above, regardless of the number of labourers active on the Project, the General Contractor shall form a contractors' Health & Safety Committee at the outset of construction. This Committee shall then follow the standard requirements for such a Committee as set out in the *Occupational Health & Safety Act and Regulations for Construction Projects.*

3.4 ON-SITE COMMUNICATIONS

.1 At the outset of the project the General Contractor shall provide to the Board Project Manager all relevant contact information for the Site Superintendent, GC Project Manager and key sub-contractors including names and cell phone numbers.

.2 The General Contractor shall provide at least one "emergency contact" telephone number at which the Contractor's representative can be reached directly during all work hours and have the ability to have voicemail recorded during all non-work hours including weekends and holidays. As outlined below, this may be designated to the Site Superintendent's cell phone number.

.3 Regardless of compliance method for the emergency contact telephone number stated above, the Site Superintendent must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded during all non-work hours including weekends and holidays.

.4 Site Superintendent must have means of live phone or walkie-talkie communication with the site Flagman during all work hours.

.5 The Contractor is to ensure that the Board Project Manager is immediately apprised of any safety issues as each arises and the related request and/or resolution. The Board Project Manager is responsible for any decisions that have an effect on the contract execution.

.6 Notwithstanding the reporting to the Project Manager noted above the Site Superintendent shall liaise with school principal or designate on all safety related matters as required on a daily basis.

.7 In the event of a safety issue requiring contractual clarification or action (i.e. Change Notice, etc.), the contractor shall ensure that, where applicable, the action is followed up with appropriate documentation.

3.5 FULL-TIME ON-SITE FLAGMEN

.1 A full-time, designated Flagman is required at all vehicular construction entrances. Refer to drawings for the scope and locations.

.2 In the event there is more than one entrance to the hoarded/fenced construction area, there must be a separate Flagman for each entrance.

.3 Flagman may not be same person as Site Superintendent or other construction worker.

.4 Flagman shall not be changed throughout the Project unless confirmed and approved by the Board Project Manager.

.5 Flagman must have means of phone communication with Site Superintendent (phone or walkie-talkie).

.6 The Flagman shall not be designated for any other duties than to act as a Flagman for safety purposes as described herein.

.7 The Flagman shall meet and escort any construction traffic from the site **entrance** into and out of the hoarded/fenced construction area (including through open site areas until entrances to hoarding.

.8 The Flagman shall only open hoarded areas when construction traffic moves through and immediately re-close gates.

.9 The Flagman shall control construction parking at the school site (including vehicles parking or traveling in unauthorized areas).

.10 The location of the Flagman shall be set to ensure the safe guarding of staff, student, and pedestrian traffic.

.11 If not designated on the Contract Documents, the location of the Flagman shall be confirmed with the Board Project Manager and Consultant at the outset of the project and before the placement of hoarding and fencing.

.12 Where the Contractor deems it necessary, in order for the Flagman to carry out the required full-time duties, the cost of a temporary shelter shall be included in the Tender Price.

.13 The Flagman shall be properly attired to carry out his duties, including the use of safety equipment (e.g. wear reflective vest, have appropriate traffic hand-held "Stop" sign and have a visible identification tag).

3.6 SITE SAFETY SIGNAGE

.1 Standardised Safety Signage is required at all construction entrances.

.2 If not designated on the Contract Documents, the location of the Safety Signage shall be confirmed with the Board Project Manager and Consultant at the outset of the Project and before the placement of hoarding and fencing.

.3 Safety Signage is to be posted at all street entrances to school site and at each entrance to hoarded/fenced construction area.

.4 Total surface area of signage is to avoid exceeding municipal standards that would require a separate signage permit.

.5 Access signage text shall include cell phone contact number for Site Superintendent.

.6 Signage posted at gates shall state restrictions on hours of entry and egress as described in the Contract Documents and under no circumstances shall construction traffic be allowed within 30 minutes prior to school start, during recess, lunch break, and 30 minutes after dismissal periods.

3.7 ACCESS/EGRESS CONTROLS

.1 At the outset of the Contract, the General Contractor shall advise all suppliers and subcontractors of the protocols listed herein and of the requirement to contact the Site Superintendent by Cell phone prior to entering the site.

.2 The drivers of all construction vehicles entering the site, including delivery vehicle drivers, are to contact site Superintendent by cell phone prior to entering site; the Site Superintendent shall, in turn, give notice to the Flagman to be aware of the traffic and authorize the Flagman to allow entry of that vehicle.

.3 Vehicular Gates are only for entry and exit of for construction purposes such as construction personnel, Authorities performing inspections, Board representative, delivery personnel, and disposal pickup and ONLY under escort by the Flagman. As such vehicular gates must remain closed and locked at all times and only opened for access/egress under escort by the Flagman, then closed and locked again.

.4 Gates are to be lockable swing gates for vehicles and man gates at all access points to the hoarded/fenced construction area.

3.8 CONTRACTOR PARKING

.1 Contractor parking shall be restricted to hoarded areas or designated parking areas only where pre-approved by Board Project Manager and Principal.

.2 Contractor parking is restricted from all off-site street areas that interfere with site specific parent drop-off and parking areas.

3.9 REQUIRED PRE-CONSTRUCTION MEETINGS

.1 As applicable for this phase during occupancy:

.2 Meeting 1: Contractor shall receive approval from the Architect and the Board Project Manager for parking, vehicular movement, access/egress strategies at a Pre-construction meeting taking place in advance of mobilizing on site.

.3 Meeting 2: Once hoarding and fencing is erected BEFORE site construction is fully active and vehicles or equipment is mobilized on site, an initial site meeting shall take place at which time the layout of trailers and staging, deliveries, storage of materials, parking areas and vehicular movement to be reviewed and approved by the Board Project Manager.

.4 See article *3.12- 'Site Meetings'* following.

3.10 CONSTRUCTION FENCING AND HOARDING

.1 Construction hoarding requirements shall be a site based decision to be determined by the Architect and the Board Project Manager at the design stage and shown on Contract Documents.

.2 No fencing or hoarding shall be less than a continuous 1800 mm high.

.3 In portions of the site where chain link is approved, it shall be continuous 1800 mm high chain link fencing, wire-tied to staked iron 'tees' at 1800 mm on centre - OR - leased, modular 'quick fencing' if staked down and wire tied together.

.4 All fenced and hoarded areas to be gated with lockable vehicular and man gates-minimum construction to be steel rail and chain link construction.

.5 Plastic snow fencing is NOT permitted.

.6 All hoarding and fencing shall be maintained in a stable condition, for duration of construction period as part of the base contract price and to include Superintendent's inspection at the beginning and end of each work day.

.7 All Fire Routes to be outside all fenced and hoarded areas and maintained clear at all times.

.8 'Covered way' protection shall be provided when accesses or pathways are in proximity to construction, in accordance with Ministry of Labour *Occupational Health & Safety Act* Regulations.

3.11 PEEL DISTRICT SCHOOL BOARD HEALTH, WELLNESS & SAFETY DEPARTMENT REPRESENTATIVE

.1 A representative of the Board's Health, Wellness & Safety Dept. ('Environment, Health and Safety Officer') may visit site at any anytime throughout the duration of the Contract to review the site, as it relates to the safety of the occupied areas of the site. Such site review shall neither constitute an inspection or approval for the Contractor.

.2 Concerns or issues identified by the representative from the Board's Health, Wellness & Safety Dept. shall be communicated through the Board Project Manager and the school Principal for corrective action.

.3 Contractor shall ensure full access to all site areas, at all times, for the Board's Health, Wellness & Safety Department Representative.

3.12 SITE MEETINGS

.1 Coordinate the requirements of this Section with *Section 01 22 00 – 'Meetings and Progress Reports'*.

.2 Initial site meeting to take place after erecting fencing and hoarding but prior to the mobilisation of any vehicles, equipment or start of Work.

.3 Contractor shall ensure that the Board Project Manager, School Principal and a representative of the Board's Health, Wellness & Safety Department and the School Principal attend the initial site meeting.

.4 The initial meeting shall review and approve a standardised agenda for all site meetings and a thorough review of the Site Safety Protocol.

.5 The standardised agenda shall include a Checklist and Report of Health and Safety items at the beginning of the agenda. This Checklist shall be included and each item reviewed at all site meetings for the duration of the project.

.6 The Checklist of Site Safety items shall include but not be limited to:

.1 Contractor's report of site safety record and report of recent site activities, precautions or actions.

.2 Review any visits to the site and actions required by Ministry of Labour or Board Health, Wellness & Safety representatives or other Authorities Having Jurisdiction.

.3 Contractor's Health & Safety policy manual posted in site trailer.

.4 Copy of Ministry of Labour *Occupational Health & Safety Act and Regulations for Construction Projects* in site trailer.

.5 Name of General Contractor H&S representative.

.6 Continuing compliance with Safety Signage.

.7 Hoarding & fencing layout and condition.

.8 Access and egress measures and any breaches of requirements.

.9 Confirmation of communications link between Site Superintendent & Flagman.

.10 Work that may produce any noxious odours and the containment measures, (*i.e.*: schedule, type, approvals required therefore).

.11 Copies of Material Safety Data sheets in site trailer.

.12 Complete meeting minutes including details of Safety Checklist shall be copied to Architect, Board Project Manager and Principal.

.7 Contractor to produce record of written Memorandum to all subtrades and suppliers detailing but not limited to: hours of delivery; site access procedures and restrictions; use of existing facilities.

.8 Contractor to prepare detailed and accurate written record of all meetings to be kept and issued to all parties.

3.13 CONTRACTOR'S HEALTH AND SAFETY COMMITTEE MEETINGS

.1 As required in item 3.1.2, the Contractor shall form a Health and Safety Committee, hold meetings and record minutes of meetings for the duration of the Contract.

.2 Contractor to maintain a copy of Health & Safety Committee minutes on site for review by Ministry of Labour or Board representative(s).

END OF SECTION

.1 SPEC NOTE DESCRIPTION: Use this section on all Public Works and Government Services Canada (PWGSC) projects. This section includes health and safety considerations required to ensure that PWGSC shows due diligence towards health and safety on construction sites, and meets the requirements laid out in PWGSC/RPB Departmental Policy DP 073 - Occupational Health and Safety - Construction.

Part 2 General

2.1 SECTION INCLUDES

.1 Health and safety considerations required to ensure due diligence towards health and safety on construction sites, and meets the requirements laid out Occupational Health and Safety - Construction.

2.2 RELATED SECTIONS

.1 These specifications apply to all divisions of this project specification. It is the responsibility of the Contractor to apply these provisions wherever practical within specification limits to all products and services used on this project.

.2 Recognized that currently specified materials and methods may conflict with the basic intention of this section. Where reasonable alternate materials and methods exist that are not specified here, and that do not compromise quality or create additional cost for the Owner, notify the Consultant of such alternate materials or methods. Do not proceed to use alternate materials or methods to those specified without the express approval of the Consultant.

.3 Elsewhere, apply the provisions of this section to all work. Exceptions can only be made when signed off by the Consultant. Suitability of all products used is the responsibility of the Contractor.

2.3 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

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

.1 Material Safety Data Sheets (MSDS).

.3 Province of Ontario

.1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. [1990 June 2002].

2.4 COMPLIANCE SPECIFICATION

.1 The Contractor must comply with all applicable health, safety and environmental regulations.

2.5 BEYOND COMPLIANCE SPECIFICATION

.1 These specifications apply in addition to all applicable health, safety and environmental compliance regulations. They are incorporated here to reflect the Owner’s intention to develop a specification which maximizes environmentally “friendly” materials and methods wherever possible within current technical and budget limitations.

.2 Beyond compliance specifications recognize that performance well beyond the minimum regulatory standard is often desirable, possible and affordable, often with no cost or low cost options. It also recognizes that application methods or protocols may be as important as the material specified. Therefore these specifications cover both material and methods.

.3 The primary goal of beyond compliance specification is to reduce the use of products or methods which have negative health and environmental impacts both during and after construction. These considerations may include full life cycle impacts, associated with raw materials, manufacturing, transport, deconstruction and their eventual fate.

.4 These specifications will specifically address primary categories of readily identifiable products, ingredients and methods.

.5 These provisions apply to both indoor and outdoor applications equally.

2.6 EXCEPTIONS

.1 These specifications recognize that not all substitutes are equal and therefore exceptions can be made based on substantive evidence of necessary and superior performance. Special considerations may be given to restricted substances when secondary provisions are made such as sealed in place (contained) applications. All such exceptions must be approved in writing by the Consultant.

2.7 PRODUCTS OR SUBSTANCES TO BE AVOIDED OR LIMITED IN USE

.1 No product containing the following substances may be used on this project when an equivalent product without or with a lower concentration of this substance is suitable and available. All products containing substances which are known to cause health effects including but not limited to cancer, mutagenic, neurological, or behavioral effects should be avoided if suitable substitutes not containing or containing lower concentrations are available. This provision shall be limited to information contained on Material Safety Data Sheets, therefore MSDS sheets must be reviewed for all products for which such sheets are required. Applications for exceptions must be accompanied by related MSDS and product application and performance sheets, clearly showing a need for the exception.

2.8 VOLATILE ORGANIC COMPOUNDS

.1 No product containing volatile organic compounds (in over simplified terms volatile petro chemical or similar plant derived solvents) may be used on this project when a suitable non VOC or failing that a low VOC substitute is available. Manufacturers may refer to the U.S. EPA definition of VOC's for guidance or alternatively use the low molecular weight organic compound descriptor.

.1 Example: Paints, Coatings, Primer, Adhesives, Chalks, Firestops, etc.

.2 Waterborne equivalents are available for most of the solvent borne products used in construction and in most cases would be the preferred alternative. Waterborne products may in some instances have high VOC contents; therefore the fact that a product is waterborne does not automatically make it acceptable.

2.9 CHLORINATED SUBSTANCES

.1 Poly Vinyl Chloride (vinyl) and other chlorinated products should be avoided if suitable substitutes are available.

2.10 PLASTICIZERS

.1 Plasticizers which off-gas (low molecular weight) should be avoided.

2.11 MAN MADE MINERAL FIBRES

.1 Products containing mineral fibres which can be emitted or abraded should be avoided.

.1 Examples: duct liner, mineral fibre ceiling tiles, etc.

2.12 RADIATION

.1 Products or methods which result in the lowest emission of Electro Magnetic Fields are preferred.

2.13 BIOCIDES

.1 Products containing biocides (pesticides, miticides, mildeweides. fungicides, rodenticides, etc.) are not to be used if suitable alternatives are available. Highly stable, low human toxicity biocides such as Portercept may be acceptable substitutes. Biocide formulas which break down, emit powders of offgass should be avoided.

2.14 HEAVY METALS

.1 Heavy metals such as lead, cadmium, mercury etc. should be avoided.

2.15 ALUMINUM

.1 Raw aluminum should be avoided, anodized or factory painted aluminum is acceptable. This is particularly applicable to surfaces which people can touch.

2.16 OZONE DEPLETING SUBSTANCES

.1 Products which contain or which use Ozone Depleting Substances such as Bromide, Chlorofluorocarbons (CFC) or Hydrofluorocarbons (HFC) etc. should be avoided if suitable substitutes are available.

2.17 GREENHOUSE GASES

.1 Products which contain, use or generate Greenhouse gasses such as CO2 should be avoided if suitable substitutes are available.

2.18 BITUMINOUS (Tar) PRODUCTS

.1 Products containing tar compounds should not be used if suitable substitutes are available.

2.19 CHEMICAL COMPOUNDS

.1 Products containing the following chemical compounds should not be used if suitable substitutes are available: Neoprene, Latex, Butyl, ABS, and Formaldehyde.

2.20 ADHESIVES

.1 Adhesives containing solvents or other non preferred ingredients should be avoided if suitable substitutes are available, including systems designs which do not need adhesives or can use mechanical etc. fastening alternatives

2.21 COMPOSITE PRODUCTS

.1 Some composite products contain adhesives such as formaldehyde which are not preferred, and some composites such as Fibre Reinforced Plastics are not practical for recycling. These products should be avoided if suitable substitutes are available.

2.22 CLEANERS AND SOLVENTS

.1 Products, equipment, and methods which require the use of cleaners and solvents are not preferred if suitable substitutes are available. Examples of preferred products would include No Wax floors, or primerless caulks and adhesives, or products not requiring caulks and adhesives.

Part 3 Products

3.1 NOT USED

.1 Not used.

Part 4 Execution

4.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 FIRES

.1 Fires and burning of rubbish on site not permitted.

1.2 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.3 DRAINAGE

.1 Refer also to Section 31 23 10.

.2 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.

.3 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.4 SITE CLEARING AND PLANT PROTECTION

.1 Protect trees and plants on site and adjacent properties where indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Restrict tree removal to areas indicated or designated by Engineer.

1.5 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under previous contract and to be provided new under this contract and as requested by local Municipal and Regional Authorities.

.2 Install, maintain, restore, replace sediment control fence as required by Municipal and Regional authorities. The fence shall be in accordance with Municipal standards.

3. Install, maintain, restore, replace roadside catchbasin sediment protection at all street catch basin in accordance with Municipal standards.

.3 Install, maintain, restore, replace catchbasin sediment barrier immediately after installation of catch basins on the property in accordance with Municipal Standards.

.4 A temporary mud mat has been installed under the previous grading contract and remains for removal under this contract. As part of this contract, include in the tender amount the supplementary stone required for maintenance and the removal of the mud mat consisting of 30m x 5m x 0.45m clear stone at any construction entrance. This is required whether or not such mud mat is shown on drawings or remains evident on site.

.5 Control emissions from equipment and plant to local authorities emission requirements.

.6 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

.7 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Inspection and testing, administrative and enforcement requirements.

.2 Tests and mix designs.

.3 Mock-ups.

.4 Mill tests.

.5 Equipment and system adjust and balance.

1.2 PRECEDENCE

.1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.3 RELATED SECTIONS

.1 Section 1 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

.3 Section 01 11 00, article 1.12 – Quality Control

1.4 REFERENCES

.1 PDSB 1998 Stipulated Price Contract.

1.5 INSPECTION

.1 General: Materials and workmanship shall be subject to inspection at any time. Cooperate in permitting access for inspection to all places where work is being done or stock is being stored.

.2 Owner's quality control inspection and testing is specified in the technical sections and will be paid from Cash Allowance except as otherwise specified. Contractor to be responsible to pay for inspections and retesting to verify acceptability of work requiring correction.

.3 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.4 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.

.5 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.6 Consultant may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in

accordance with Contract Documents, correct such Work and pay cost of examination and correction.

1.6 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.7 PROCEDURES

.1 Notify appropriate agency Consultant in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.8 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

1.9 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested.

.2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Consultant and may be authorized as recoverable.

.3 Allow sufficient time for testing, evaluation, alterations and retesting so as not to interrupt the Progress Schedule for the Project.

.4 The Consultant may require testing of connections and special prefabricated inserts, as part of the work of this Section.

1.10 MOCK-UPS

.1 Refer to partial list of mock ups in Section 01 33 00 - Submittal Procedures

.2 Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.

.3 Construct in all locations acceptable to Consultant.

.4 Prepare mock-ups for Consultant's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

.5 Failure to prepare mock-ups in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.6 If requested, Consultant will assist in preparing a schedule fixing dates for preparation.

.7 Remove mock-up at conclusion of Work or when acceptable to Consultant.

.8 Mock-ups may remain as part of Work only if previously agreed to by consultant and accepted as acceptable quality upon completion..

.9 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.11 MILL TESTS

.1 Submit mill test certificates as required of specification Sections.

1.12 EQUIPMENT AND SYSTEMS

.1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

1.13 SEALANTS

.1 Refer also to Section 07 92 10.

.2 Sealants used for the various building envelope assemblies shall be selected from those specified in the respective assembly Section, and shall be coordinated with the sealant being provided under other building envelope Sections. Preferably, one sealant by the same manufacturer shall be used throughout. If different sealants are selected, from those specified, it is the responsibility of the respective Section to ensure compatibility between selected sealant, substrates, and sealants of other Sections which come in contact with the selected sealant.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Date: July 2026

Project: Mayfield West #2 PS - PDSB

Project No: 20241729

Architect: Hossack Architecture

Consulting Structural Engineer: Stephenson Engineering Limited

PART 1 - INTRODUCTION

1.1 General

.1 The following are the terms of reference for the inspection and testing of items listed below:

Strip and Spread Footings
Cast-in-Place Concrete and Reinforcing Steel
Structural Steel
Steel Deck
Masonry and Masonry Reinforcement

.2 The inspection and testing is to be performed by one or more Independent Inspection and Testing Companies.

1.2 Objective

.1 The objective is to inspect, sample, and test a sufficient number of members, details and procedures, and a sufficient quantity of material, to determine if the structural work is proceeding generally in accordance with the contract documents.

1.3 Execution

.1 Carry out inspection, sampling, and testing in accordance with the Ontario Building Code and all applicable acts, standard procedures, and by-laws of any authority having jurisdiction.

.2 When standard procedures do not exist, submit, for review by the Engineer, well ahead of the time at which it will be required, a detailed procedure indicating inspection sampling and testing methods, acceptance criteria, and report format.

.3 Employ inspection and testing personnel fully qualified for such work, as per the Ontario Building Code and all applicable acts, standard procedures, and by-laws of any authority having jurisdiction.

.4 Items, which in our opinion require special attention, are listed in the Detailed Requirements, together with a recommended minimum degree of inspection. In general, inspect, sample, and test the first of each element, operation, and material quantity. Where elements, operations, and material repeat, inspect, sample, and test a percentage of each during the course of the work. Where minimum percentages are not specifically listed herein, inspect, sample, and test at least 10%.

.5 The detailed requirements of inspection and testing will be reviewed and refined jointly by the inspection company and the Engineer in close cooperation with the Prime Consultant and General Contractor at regular intervals to coordinate with the finally adopted fabrication and erection procedures, and the construction schedule.

.6 Regularly evaluate the extent of your inspection and testing to determine that it is achieving the objective. Report to the Engineer with a copy to the Prime Consultant and Owner if you deem further inspection and testing is necessary and make recommendations.

1.4 Defects and Deficiencies

.1 When defects or deficiencies are noted, inspect, sample, and test the remedial action and review successive similar elements, operations, and material until you are satisfied the defect or deficiency is not recurring; then progressively revert to the original percentage or frequency of review.

.2 Keep separate, accurate records of dates, time and expenses related to re-inspection, re-sampling, and re-testing of elements, material and procedures. When requested by the Prime or Sub-Consultants and/or the Owner prepare a report identifying such costs in detail.

1.5 Contractor's Quality Control

.1 This inspection and testing is not intended to serve as any part of the Contractor's quality control. The inspection and testing company is responsible to the Prime Consultant and the Owner and shall take instructions only from the Architect, or the Engineer.

.2 The specifications state that the cost of additional inspection and testing made necessary by repeated deficiencies or defects in the materials or work will be charged to the Contractor.

PART 2 - QUALIFICATIONS

2.1 Companies to be considered shall have the following qualifications where applicable:

.1 Certification to CSA A283 Qualification Code for Concrete Testing Laboratories, Category 2.

.2 Certification to CSA W178.1 and W178.2 with respect to company, personnel, equipment, and procedures for applicable requirements.

2.2 All technicians carrying out non-destructive testing shall be C.G.S.B. Level 2 certified.

2.3 All field technicians performing concrete testing must be certified under CSA A283.

2.4 Be in a position to assemble the necessary experienced staff to carry out the specified work as required by the fabrication and erection schedule.

2.5 Submit with your proposal the following data:

.1 Statements covering the qualification requirements for your firm and individuals assigned to this project.

.2 Set-up of organization as it pertains to this project.

.3 Names and experience of the key inspectors.

.4 A sample of the standard checklists used by your inspectors for shop and field inspection and testing of the applicable work.

PART 3 - PROPOSAL

3.1 Submit a proposal to the Owner with a copy to the Architect and Engineer containing the following:

.1 Schedule of rates.

.2 Estimate of manpower involvement and overall cost estimate based on these terms of reference.

.3 Unit rates for the following:

1.	Inspector time on site (includes review of contract documents and preparing hand-written report to be left on site)	$	/hr.
2.	Inspector travel time (not to be included in item 1)	$	/hr.
3.	Vehicle travel cost - firm price	$	/km $ /trip
4.	Written report - firm price (includes typing and issuance)	$	/report
5.	Concrete cylinder costs	$	/set of 3
6.	Any additional staff or activities applicable and respective rates		

PART 4 - DOCUMENTS

4.1 Contract Documents

.1 Obtain from the Architect the latest relevant contract documents including drawings and specifications.

.2 Thoroughly familiarize yourself with latest contract documents.

4.2 Geotechnical Investigation Reports

.1 Obtain from the Architect all relevant geotechnical reports, letters and the like, on which the final building design is based.

.2 Thoroughly review these reports, letters, etc.

.3 Include in the proposal, an amount for reviewing these reports, completed foundation drawings and related specification clauses, to ensure that recommendations made in the reports are consistent with the available geotechnical information (i.e., boreholes, tests, etc.). In addition, ensure that the geotechnical report recommendations have been properly interpreted and have been incorporated into the contract documents. NOTE: The successful geotechnical inspection and testing firm will be required to submit a written summary of their comments upon completion of the above noted contract document review. In addition, they will be required to submit a summary of any comments they may have on the contents and recommendations contained in the original geotechnical report.

4.3 Construction Information

.1 Obtain, prior to submitting your proposal, the following from the Contractor:

.2 Construction, fabrication and erection schedule.

.3 Material quantities.

.4 Obtain the following from the Contractor at appropriate times during the construction:

.5 A set of fabrication, setting and erection drawings identified as being a true copy of the drawings bearing the Stephenson Engineering "Reviewed" stamp.

.6 Mill test certificates.

.7 Erection procedures for major elements, including details of temporary shoring and guying of the structure.

PART 5 - GENERAL PROCEDURES

5.1 Examine the proposed construction schedule together with the Owner and Contractor and estimate the appropriate number of site visits accordingly.

5.2 Establish a procedure with the Contractor and Prime Consultant whereby you are notified in advance when fabrication and erection will commence. Maintain close contact with the Contractor to ensure that the inspection of designated items is not missed.

5.3 Conform to the attached Detailed Requirements. Base inspection and testing on the contract drawings and specifications and reviewed shop and erection drawings bearing the Stephenson Engineering stamp.

5.4 Except as herein noted otherwise, examine materials and procedures on a sampling basis to satisfy yourselves that the Contractor is, in general, complying with the contract requirements.

5.5 Reports

.1 Report immediately to the Architect and/or Structural Consultant by telephone, any deviation from the contract documents, giving any recommendations for further testing deemed necessary. No modifications are to be made or instructions given without prior approval of the Engineer.

.2 Issue written inspection reports addressed to the The Prime Consultant within five (5) working days of the inspection.

.3 Concrete test reports must be issued within five (5) working days of the test.

.4 Among the other routine data, state in the inspection report the exact gridline, location, level and marks of the members which were checked and all details regarding these members that were examined. It is suggested that a tabular system be used for summarizing the inspection.

.5 At the beginning of each report, state whether the contract requirements have been met, and list separately members or conditions not meeting requirements. State the seriousness of these infractions.

.6 Issue a final report, at the end of the applicable phases of work, summarizing previous intermediate reports and signifying that you have complied with these terms of reference and are satisfied that work has been completed in general conformity with the contract documents, applicable codes and standards and reviewed shop drawings.

.7 Keep the Contractor and Architect informed of the results of all inspections and tests.

5.6 Report Distribution

.1 Address reports to the Architect and distribute as follows:

FIRM	COPIES
[Owner]	
[Architect]	
[Chief Building Official]	
[Stephenson Engineering]	
[Contractor]	

5.7 Invoices

.1 Submit invoices monthly or as per agreed procedure between Inspection Company and the Owner.

.2 Submit the following with your monthly invoices:

.3 A detailed breakdown of all time spent, and costs incurred during the billing period. This breakdown should include the number of site/shop visits, the number of concrete cylinder tests performed, the number of hours spent reviewing reinforcement on site (if applicable) and the like.

.4 A recapitulation of the total costs incurred to date, related to the progress (percentage of work completed).

.5 Inform the Owner, Architect and the Engineer, in writing, as soon as possible, when expenditures have reached 50% and 85% of the estimate and/or if it appears that the costs of required testing and inspection may exceed the estimate.

.6 Do not exceed the cash allowance of $[ ]. Inform the Owner and the Engineer if it appears that the costs of required testing and inspection may exceed the cash allowance.

END OF SECTION 01 45 23

Part 1 General

1.1 SECTION INCLUDES

.1 Temporary utilities.

1.2 RELATED SECTIONS

.1 Section 01 52 00 - Construction Facilities.

.2 Section 01 56 00 – Temporary Barriers and Enclosures.

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.4 DEWATERING

.1 Refer also to Sections 31 23 10 and 01 35 43.

.2 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.5 WATER SUPPLY

.1 Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances. Provide for water as require whether available in the vicinity of the site or not.

1.6 TEMPORARY HEATING AND VENTILATION

.1 Pay for cost of temporary heat and ventilation used during construction, including costs of installation, fuel, operation, maintenance and removal of equipment. Use of direct-fired heaters discharging waste products into work areas will not be permitted unless prior approvals given by the Architect.

.2 Furnish and install temporary heat and ventilation in enclosed areas, as required to:

.1 Facilitate progress of work.

.2 Protect work and products against dampness and cold.

.3 Prevent moisture condensation on surfaces.

.4 Provide ambient temperatures and humidity for storage, installation, curing of materials.

.5 Provide adequate ventilation to meet health regulations for safe working environment.

.3 Maintain minimum temperature of 10 degrees C or higher where specified as soon as finishing work is commenced and maintained until acceptance of structure by Engineer.

.4 Ventilating:

.1 Prevent hazardous accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

.3 Dispose of exhaust materials in manner that will not result inharmful exposure to persons.

.4 Ventilate storage spaces containing hazardous or volatile materials.

.5 Ventilate temporary sanitary facilities.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.

.5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:

.1 Conform with applicable codes and standards.

.2 Enforce safe practices.

.3 Prevent abuse of services.

.4 Prevent damage to finishes.

.5 Vent direct -fired combustion units to outside.

.6 The Architect may permit the use of permanent system providing agreement can be reached on:

.1 Conditions of use, special equipment, protection and maintenance.

.2 Guarantees will not be affected.

.3 Approval of the Owner.

7. Refer to Section 011100, item 1.30. 'Periodic Cleaning' for replacement of filters at time of final acceptance of work.

1.7 TEMPORARY COMMUNICATION FACILITIES

.1 For duration of contract until final permanent lines are installed, provide and pay for temporary telephone and fax hook up, lines and equipment necessary for own use and use of Consultant.

.2 Immediately upon award of contract, arrange for temporary Bell telephone line to be connected to the site trailer for purposes of providing functional communication equipment listed above.

1.8 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by [insurance companies having jurisdiction] [and] governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

1.9 POWER

.1 During the tender period, determine if power will be available in the vicinity of the project site. If no power is deemed available, include costs for generation of power required to carry out the work for the duration required to complete the Project. Provide written clarification at the time of Tender of estimated costs included in the Tender Price.

The Board will not consider payment of generated power unless this written clarification is provided at the time of Tender. A separate sheet may be included with a written clarification, if required, and submitted along with the Supplementary Information Form submission.

.2 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.

.3 Install temporary facilities for power such as pole lines and underground cables to approval of local power supply authority.

.4 Electrical power and lighting systems installed under this Contract may be used for construction requirements with prior approval of Architect, provided that guarantees are not affected. Make good damage. Replace lamps which have been used over period of three (3) months.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Construction aids.

.2 Office and sheds.

.3 Parking.

.4 Project identification – refer to AD Drawings for jobsite sign.

1.2 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities.

.2 Section 01 56 00 - Temporary Barriers and Enclosures.

1.3 REFERENCES

.1 PDSB 1998 Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 1-GP-189M-84, Primer, Alkyd, Wood, Exterior.

.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.3 Canadian Standards Association (CSA International)

.1 CAN3-A23.1-/A23.2-94, Concrete Materials and Methods for Concrete Construction/Method of Test for Concrete.

.2 CSA-0121-M1978, Douglas Fir Plywood.

.3 CAN/CSA-Z321-96, Signs and Symbols for the Occupational Environment.

1.4 INSTALLATION AND REMOVAL

.1 Provide construction facilities in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.5 SCAFFOLDING

.1 All necessary scaffolding shall be provided and constructed according to all by-laws and safety regulations. It shall be removed promptly and completely when no longer required.

.2 As required by Ministry or Labour, design of scaffolding or hoarding shall be by a Professional Engineer.

1.6 ACCESS

.1 Provide and maintain adequate access to project site.

.2 The General Contractor for this Work shall, at all times allow the Consultants, the Board, or any other Board commissioned contractor or their employees, access into the building

or around the premises, undisturbed, whether union or non-union, as may be required in the execution of other portions of the building work and installation of equipment, etc.

.3 The General Contractor shall cooperate fully with any and all Board commissioned Contractors.

1.7 HOISTING

.1 Provide, operate and maintain hoists & cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.

.2 Hoists & cranes shall be operated by qualified operator.

1.8 ELEVATORS

.1 Permanent elevators may not be used by construction personnel for transporting of materials unless coordinated with the Architect or Structural Engineer.

.2 Provide protective coverings for finish surfaces of cars and entrances.

1.9 SITE STORAGE/LOADING

.1 Provide adequate weather tight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.

1.10 CONSTRUCTION PARKING

.1 Provide, on site, sufficient temporary parking.

1.11 OFFICES

.1 Provide office heated to 22 degrees Celsius, lighted 750 Lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing lay down table, telephone, and facsimile machine. Pay telephone not acceptable.

.2 Maintain in clean condition.

.3 Provide and maintain in clean condition: two separate plans layout tables, minimum 1200 x 1800 mm each. One table shall be used by the General Contractor and subcontractors at their discretion. The second shall be provided for use by subcontractors and by the consultant or Inspection and Testing Companies during site visits or project meetings.

1.12 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in a clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in a manner to cause least interference with work activities.

1.13 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take such precautions, as required, by local health authorities. Keep area and premises in sanitary condition.

.3 When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval or Architect.

1.14 JOBSITE SIGN

.1 Supply and erect a sign (W.P. Plywood Signboard) as shown on AD Detail Sheets

.2 Construct plumb and level in neat wood framework and securely anchored in ground by posts to withstand wind pressure of 160 km/h.

.3 Provide shop drawing of layout.

.4 Supply of painted sign only shall be paid from Cash Allowance. Contractor is responsible for supply and installation of support framing and foundation connection on the site.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Barriers.

.2 Traffic Controls.

.3 Fire Routes.

1.2 RELATED SECTIONS

.1 Section 01 51 00 - Temporary Utilities.

.2 Section 01 52 00 - Construction Facilities.

.3 Section 01 11 00 - Summary of Work.

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.189M- [84], Primer, Alkyd, Wood, Exterior.
.2 CGSB 1.59- [97], Alkyd Exterior Gloss Enamel.

.2 Canadian Standards Association (CSA International)

.1 CSA-O121- [M1978], Douglas Fir Plywood.

1.4 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.5 SITE ENCLOSURES

.1 Refer to Section 01 11 00- Summary of Work, article 1.6 ‘Construction Fencing’ for clarification of existing fence on site.’ Maintain fences in good repair.

2. Maintain siltation control fencing as part of site enclosure, as indicated in Section 01 35 43, and/or required Municipal or Regional authorities. Maintain/restore/replace siltation control fencing as directed throughout the construction period to ensure proper function.

1.6 WEATHER ENCLOSURES

.1 Provide temporary weathertight enclosures protection for exterior openings until permanently enclosed.

.2 Erect enclosures to allow access for installation of materials and working inside enclosure.

.3 Design enclosures to withstand wind pressure.

.4 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

1.7 DUST TIGHT SCREENS

.1 Provide dust tight screens or insulated partitions as required to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.8 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.9 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.10 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.11 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.12 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Consultant locations and installation schedule 5 days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

1.13 TEMPORARY FENCING TO SODDED AREAS

1. As specified in Section 32 92 23, if sodding is not completed at least 1 month prior to occupancy, supply and install temporary, leased Modular (Mod U Lok) 1800 high chain link fencing to be supplied and maintained after sod installation in the spring and until the consultant has deemed the sod roots have “knit” and is ready for student play activities, at no additional cost to the owner. Stake with iron “T’s” at minimum 2400 o.c. and maintain to date stipulated as part of this contract and sod is deemed established. Refer to Section 32 92 23 – Sodding and 01 11 00 – Summary of Work.

2. Remove fencing at end of required period.

3. Cost of this temporary fencing for this period to be included Tender Price if sod is not installed at least 1 month prior to occupancy.

4. If sodding is not completed at least 1 month prior to occupancy, Contractor shall be responsible to maintain fence on site after sod installation, at no additional cost to the owner, until the consultant has deemed the sod roots have “knit” and is ready for student play activities.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not Used

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Requirements and limitations for cutting and patching the Work.

.2 The responsibilities of this section includes but is not limited to the following item(s), including all related labour and materials necessary to successfully complete the installation of same as detailed on the Drawings.

.3 The cutting, removal and disposal and patching of masonry wall sections in locations of all new electrical panels and for all mechanical ducts passing through masonry walls or walls of any other construction not automatically accommodated in new work by the mason.

.4 The cutting, removal and patching of all penetrations required for mechanical and electrical services through floors, ceilings and walls.

.5 The supply and installation of a Portland cement based leveling skim coat as required to provide an acceptable surface for the installation of new VCT tile to any rooms as described on drawings to receive such flooring.

.6 All other work not listed in other Sections, but detailed on the Drawings.

1.2 RELATED SECTIONS

.1 Section 01 11 00 - Summary of Work.

.2 Section 04 21 13- Brick Masonry

.3 Section 01 33 00 - Submittal Procedures.

.4 Section 08 11 14- Metal Doors and Frames

.5 Section 08 71 15 – Finish Hardware

.6 Section 09 91 22- Painting

.7 Section 09 21 16- Gypsum Board Assemblies

.8 Section 09 51 13- Acoustic Panel Ceilings

.9 Section 10 11 25- Manufactured Specialties

.10 Mechanical and Electrical Sections.

.11 Individual product Sections: cutting and patching incidental to work of section. Advance notification to other sections required.

1.3 SUBMITTALS

.1 Submit written request in advance of cutting or alteration which affects:

.1 Structural integrity of any element of Project.

.2 Integrity of weather-exposed or moisture-resistant elements.

.3 Efficiency, maintenance, or safety of any operational element.

.4 Visual qualities of sight-exposed elements.

.5 Work of Owner or separate contractor.

.2 Include in request:

.1 Identification of Project.

.2 Location and description of affected Work.

.3 Statement on necessity for cutting or alteration.

.4 Description of proposed Work, and products to be used.

.5 Alternatives to cutting and patching.

.6 Effect on Work of Owner or separate contractor.

.7 Written permission of affected separate contractor.

.8 Date and time work will be executed.

1.4 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

.3 Concrete lintel block, reinforcing steel and concrete fill for openings if required at new penetrations in walls or steel lintels as may be permitted by consultant.

.4 Portland Cement based Concrete Patching Compound compatible with new slab, precast concrete slabs or other flooring to make good a smooth, suitable surface to accept the direct application of new VCT or resilient sheet flooring.

.5 Portland Cement based Concrete for new floor openings or floor leveling, or patching of floor openings.

.6 All other materials not listed in other Sections, but detailed on the Drawings.

1.5 EXECUTION

.1 The Trades requiring cuts, holes or sleeves for their work shall locate them.

.2 Do not cut, drill or sleeve load-bearing members without obtaining prior written approval from the Consultant for each condition.

.3 Cut holes carefully, leaving holes no longer than required, with clean, true and smooth edges.

.4 Fit items to the tolerances established by industry ‘Best Practice’ standard for applicable type of work.

.5 Make patches undetectable in the finished work. All other work not listed in other Sections, but detailed on the Drawings, is to be done in a professional manner and to the industry ‘Best Practice’ standard for the described work.

.6 Execute cutting, fitting, and patching including excavation and fill if required, to complete Work.

.7 Fit several parts together, to integrate with other Work.

.8 Uncover Work to install ill-timed Work.

.9 Remove and replace defective and non-conforming Work.

.10 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.11 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.12 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

.13 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.14 Restore work with new products in accordance with requirements of Contract Documents.

.15 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.16 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.

.17 Refinish surfaces to match adjacent finishes: For continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.

.18 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

General

.1 SECTION INCLUDES

.1 Progressive cleaning.

.2 Final cleaning.

.2 RELATED SECTION

.1 Section 01 77 00 - Closeout Procedures.

.2 Section 01 11 00 – Summary of Work.

.3 REFERENCE STANDARDS

.1 PDSB-2011 Stipulated Price Contract.

.4 GENERAL CLEANINESS DURING CONSTRUCTION

.1 Refer also to Section 01 11 10, item 1.30 ‘Periodic Cleaning’ and coordinate with this Section.

.2 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.3 Store volatile wastes in covered metal containers, and remove from premises daily.

.4 Prevent accumulation of wastes which create hazardous conditions.

.5 Provide adequate ventilation during use of volatile or noxious substances.

.6 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.7 Provide on-site dump containers for collection of waste materials, and rubbish.

.8 Remove waste materials, and rubbish from site.

.9 Vacuum clean interior building areas when ready to receive finish painting, and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.

.10 Schedule cleaning operations so that resulting dust and other contaminants will not fall on wet, newly painted surfaces.

.5 FINAL CLEANING

.1 At completion of Work, remove waste materials, rubbish, tools, equipment, machinery, and surplus materials, and clean all surfaces exposed to view; leave project clean and ready for occupancy.

.2 Employ experienced, professional cleaners, for final cleaning.

.3 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all sight-exposed interior and exterior finished surfaces; polish resilient and ceramic surfaces so designated to shine finish. Vacuum carpet.

.4 Clean and polish glass and mirrors.

.5 Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.

.6 Broom-clean paved surfaces; rake clean other surfaces of grounds.

.7 Clean exposed ductwork, and structure.

.8 Replace filters.

.9 Clean bulbs and lamps and replace those burned out.

.10 Clean diffusers and grilles.

.11 Clean sinks, faucets, and water closets and controls.

.12 Remove snow and ice from access to building, if applicable.

.13 Maintain cleaning until project, or portion thereof, is occupied by Owner.

.14 All tiled (VCT) floors to be broom swept and wet mopped by the Contractor. The Owner will seal & wax. Contractor to allow for application of three (3) coats of Owner-supplied sealer/waxes.

Products

.1 NOT USED

.1 Not Used.

Execution

.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Section 01 11 00 - Summary of Work, article 1.44.

.2 PDSB-2011 Stipulated Price Contract.

1.2 INSPECTION AND DECLARATION

.1 Refer to Section 01 11 00 – Summary of Work, article 1.44 for a detailed list of requirements.

.2 Contractor's Inspection: Contractor and Subcontractors: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.3 Consultant's Inspection: Consultant and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.

.4 Completion: submit written certificate that following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed.

.3 Equipment and systems have been tested, adjusted and balanced and are fully operational.

.4 Certificates required by Fire Commissioner and Utility companies have been submitted.

.5 Operation of systems has been demonstrated to Owner's personnel.

.6 Work is complete and ready for final inspection.

.5 Final Inspection: when items noted above are completed, request final inspection of Work by Owner, Consultant and Contractor If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request re-inspection.

.6 Declaration of Substantial Performance: when Owner and Consultant consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.

.7 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.8 Final Payment: when Owner and Consultant consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. If Work is deemed incomplete by Owner and Consultant, complete outstanding items and request re-inspection.

.9 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with the PDSB 1998 Stipulated Price Contract.

1.3 CLEANING

.1 In accordance with Section 01 74 11 – Cleaning.

.2 Remove waste and surplus materials, rubbish and construction facilities from the site immediately following completion of work and prior to final inspection.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 As-built, samples, and specifications.

.2 Equipment and systems.

.3 Product data, materials and finishes, and related information.

.4 Operation and maintenance data.

.5 Spare parts, special tools and maintenance materials.

.6 Warranties and bonds.

.7 Final site survey.

1.2 RELATED SECTIONS

.1 Section 01 45 00 - Quality Control.

.2 Section 01 77 00 - Closeout Procedures.

.3 Section 01 78 10 - Guarantee/Warrantee Form

.4 Section 01 91 00 - Commissioning.

.5 Mechanical Division: Commissioning

.6 Section 01 11 00 Summary of Work, article 1.43.

1.3 SUBMISSION

.1 Submit one digital copy of completed project operation and maintenance volumes and as-built drawings in final form 15 days prior to substantial performance. For equipment put into use with Owner's permission during construction, submit Operating and Maintenance Manuals within 10 days after start-up. For items of Work delayed materially beyond date of Substantial Performance, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

.2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.3 Copy will be returned after inspection with Consultant's comments.

.4 Revise content of documents as required prior to final submittal.

.5 Submit digital copy of revised volumes of data in final form within 10 days after final inspection.

.6 For contract drawings (architectural, site services, landscaping, structural, mechanical, and electrical), transfer neatly as-built notations onto digital PDF set and submit. Cost of only the transfer of these as-built sets into digital AutoCAD format is paid from Cash

Allowance. Completion of as-built drawings to the Consultant is a mandatory requirement of Total Completion of the Contract.

.7 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.8 If requested, furnish evidence as to type, source and quality of products provided.

.9 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.10 Pay costs of transportation.

1.4 FORMAT

.1 Organize data in the form of an instructional manual with table of contents and cover page on a CD.

.2 Arrange content in digital folders under Section numbers and sequence of Table of Contents.

1.5 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project;

.1 date of submission; names,

.2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties;

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

1.6 AS-BUILTS AND SAMPLES

.1 In addition to requirements in Sections 00 21 13 Instructions to Bidders, 01 11 00 Summary of Work and PDSB-2011 Stipulated Price Contract terms, maintain at the site for Owner one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Consultant.

1.7 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Consultant.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 References to related shop drawings and modifications.

.5 Specifications: legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, and field test records, required by individual specifications sections.

1.8 DIGITAL AS-BUILT DRAWINGS

.1 Retain the services of a CAD drafting company acceptable to the Consultant.

.2 Transfer to digital file all information recorded on As-Built drawings. Layering of information as per Consultant's instructions.

.3 The Consultant will provide CAD file of contract documents.

.4 The cost for preparing digital As-Built drawings will be deducted from the Cash Allowances.

1.9 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Mechanical Sections.

.15 Additional requirements: As specified in individual specification sections.

1.10 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.11 MAINTENANCE MATERIALS

.1 On completion of project, submit to Architect a digital copy of Operations Data and Maintenance Manual in English, made up as follows:

.1 Enclose title sheet, labeled "Operation Data and Maintenance Manual", project name, date and list of contents subdivided into digital folders.

.2 Organize contents into applicable sections of work to parallel project’s specification break-down.

.2 Include following information, plus data specified.

.1 Maintenance instruction for finished surface and materials.

.2 Copy of hardware and paint schedules.

.3 Description, operation and maintenance instructions for equipment and systems, including complete list of equipment and parts list. Indicate nameplate information such as make, size, capacity, serial number.

.4 Names, addresses and phone numbers of sub-contractors and suppliers.

.5 Guarantees, Warranties and bonds showing:

.1 Name and address of project.

.2 Guarantee commencement date (date of Final Certificate of Completion).

.3 Duration of guarantee.

.4 Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.

.5 Signature and seal of Contractor.

.6 Additional material used in project listed under various Sections showing name of manufacturer and source of supply.

.3 Neatly type lists and notes. Use clear drawings, diagrams or manufacturers' literature.

.4 Include one complete set of final shop drawings (bound separately) indicating corrections and changes made during fabrication and installation.

1.12 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged products at own expense and to satisfaction of Consultant.

1.13 WARRANTIES AND BONDS

.1 Refer to Section 00 21 13 ‘Instructions to Bidders’ for bonding requirements for this project, both at the time of tender submission and throughout the duration of the construction period.

.2 Refer to PDSB-2011 Stipulated Price Contract for Warranty requirements and conditions for the standard warranty which is required for the work of this contract.

.3 Extended warranties are required to be issued by manufacturers, fabricators, suppliers and/or installers, sometimes jointly, due to their unique position in the construction process and their ability to guarantee a particular section of work. Refer to individual requirements of extended warranties requested as well as Section 01 11 00 article 1.33.

.4 Unless specifically noted otherwise, all extended warranties shall commence on the date of Substantial Performance of the Work as certified by the Consultant.

.5 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

.6 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal. Use Guarantee/Warranty Form as provided in Section 017810 Sample Guarantee/Warranty Form, whenever standard preprinted trade or manufacturer’s Guarantee/Warranty forms are not available. Provide written form for each warranty specified in Section 01 11 00 Summary of Work, Article 1.33.

.7 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work.

.8 Date at beginning of time of warranty start shall be Date of Substantial Performance.

.9 Verify that documents are in proper form, contain full information, and are notarized.

.10 Co-execute submittals when required.

.11 Retain warranties and bonds until time specified for submittal.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1. GENERAL

1. To be made out on the letterhead of Guarantor or Warrantor which usually is a Subcontractor.

2. This format is to be used only when standard preprinted trade or manufacturer's forms are not available. Preprinted forms are to include all elements of information shown on this sample or as a minimum.

3. Comply with Requirements for Guarantee/Warranty as specified in Section 01 78 10, Closeout Submittals.

To: Peel District School Board

Date: _____

SECTION _____

TITLE _____

GUARANTEE/WARRANTY TO:

OWNER	The Peel District School Board
PROJECT	Mayfield West #2 Public School Caledon, Ontario
ARCHITECT	Hossack Architecture
REFERENCE	(to specifications or drawings)
TIME	Period of Guarantee/Warranty:_____ years
GUARANTEE/ WARRANTY	Starting Date: Substantial Performance as certified by Consultant Date: _____

(Description of Guarantee/Warranty)

_____

_____

_____

Upon written notification from the Owner or the Consultant that the above work is defective any repair or replacement work required shall be to the Consultant's satisfaction at no cost to the Owner.

This guarantee shall not apply to defects caused by the work of others, maltreatment of materials, negligence or Acts of God.

_____

SUBCONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer:

_____
(Name Printed)

_____
Title

Name of Firm: _____

Address: _____

Telephone Number _____

CONTRACTOR

_____ _____
Signature Date

Authorized Signing Officer:

_____ _____
(Name Printed)

_____
Title

Name of Firm: _____ SEAL

Address: _____

Telephone Number _____

END OF SECTION

Part 1 General

1.1 QUALITY ASSURANCE

.1 This Section includes parameters for the general design and performance for the work of Sections which comprise the building envelope including but not limited to, masonry cavity walls, metal cladding, soffits, windows, entrances and roofing.

.2 Performance of the building envelope shall be guaranteed by the Contractor.

1.2 DESIGN

.1 General: Design and engineer as required, fabricate, erect, and/or install building envelope in compliance with the Ontario Building Code, other regulations and requirements of authorities having jurisdiction.

.2 Take into account construction tolerance limitations, creepage, deflection and other movements of the structure.

.3 Accommodate, by means of expansion and contraction provisions, any movement in the building envelope assemblies themselves and between the assemblies and the building structure. Allow for expansion and contraction of components caused by ambient temperature range, surface temperature variation of components, wind, seismic forces, structural deflection and racking; without causing misalignment of joints, breakage of joints and air/vapour barriers, water and air penetration through the assembly, glass breakage, or other defects detrimental to appearance or performance.

.4 Method of attachment to the structure shall take into account site peculiarities so that site and air vibrations or normal temperature movements of the building do not loosen, weaken and/or fracture the connection between building envelope assembly components and the structure or between the components themselves.

.5 Reinforce building envelope assembly components, as required, so that the members can safely sustain design loads.

.6 Assemble and secure assemblies in manner which will keep stresses on sealants within the sealant manufacturer's recommended maximum performance levels.

.7 Rain Screen Principle: Except where detailed otherwise, construct building envelope assemblies based on the "Rain Screen" principle as advocated by the National Research Council of Canada. All voids between the assembly components as well as those between components and the structure shall have:

.1 Gaskets, baffles, overlaps, seals and compartmentalization as required providing a barrier "Rain Screen" to effectively prevent excessive rain water entry into any of the building envelope cavities but to allow pressure equalization of cavity air spaces.

.2 air barriers and seals are required to prevent entry of interior building air into building envelope cavities, and exterior air into the building. Air barriers and seals shall be able to withstand wind design pressures.

.3 such provisions in the form of openings between cavities and the building exterior of sufficient cross sections to provide adequate pressure equalization. All openings shall be effectively baffled against direct rain water entry. Air spaces

shall be baffled and compartmentalized to prevent chimney effect within the air spaces vertically and horizontally.

.4 Thermal separators, isolators and seals placed to eliminate contact between interior humid air and a cold surface or structural component to prevent condensation and ice build-up on such surfaces during cold weather.

1.3 WATER, VAPOUR AND MOISTURE

.1 Comply with the design and performance requirements specified in the building code, and as specified herein, including the following principles:

.2 Drain to the exterior face of the assembly, any water entering at joints and any condensation occurring within the building envelope assembly.

.3 Design, fabricate and install the assembly to be watertight to the interior under the interior and exterior design conditions in combination with movements occurring due to loads imposed.

.4 At design conditions no water penetration to the building interior side of the assembly shall occur.

.5 The requirements for an air barrier and a vapour barrier are intended to be provided at the same plane in the building envelope design unless otherwise indicated or specified. In such cases, the Drawings and Specifications refer to "air/vapour barrier". The definition of the air/vapour barrier for the purpose of these Specifications is "a continuous membrane including joints of membrane between components and to adjacent construction which prevents or retards penetration of moisture laden air and the diffusion of water vapour through it".

.6 The maximum water vapour transmission of all components forming the vapour barrier shall be (1.72 ng/Pa x s x sq.m.) (0.3 Imperial Perms) unless specified otherwise.

.7 At design conditions no condensation shall occur on room side surfaces.

.8 Sound: Provide completed installations free from vibrations, wind whistles and noise due to thermal and structural movement and wind pressure.

.9 Seismic: Fabricate and erect cladding assemblies to prevent damage due to earthquake forces as required by The Ontario Building Code.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 – GENERAL

1.1 General Requirements

.1 Also included in this section are clauses for the following items:

Architectural Quality Concrete
Concrete Forming and Accessories
Concrete Reinforcing
Concrete Toppings
Defective Concrete
Finishing of Formed Surfaces
Finishing Treatment of Slab Surfaces (Screeding and Trowelling)
Sealing and Curing
Slabs-on-Grade
Vapour Retarder Membrane for Slabs-on-Grade

.2 Make a thorough examination of the drawings, site, specification and geotechnical report, to determine the intent, extent, materials and conditions of interfacing with other work and to be fully cognizant of the requirements.

.3 Assume full responsibility for the design, for the adequacy and for the safety of all formwork and falsework.

.4 The Contractor shall ensure that no asbestos containing materials are used in connection with the work of this section.

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

.1 A23.1 ..... Concrete Materials and Methods of Concrete Construction.

.2 A23.2 ..... Test Methods and Standard Practices for Concrete.

.3 A23.3 ..... Design of Concrete Structures.

.4 A3000 ..... Cementitious Materials Compendium.

.5 G30.18 ..... Carbon Steel Bars for Concrete Reinforcement.

.6 S269.1 ..... Falsework and Formwork.

.7 W186 ..... Welding of Reinforcing Bars in Concrete Construction.

.4 Conform to the following ASTM Standards:

.1 C94/C94M ..... Standard Specification for Ready-Mixed Concrete.

.2 C309 ..... Standard Specification for Liquid Membrane Forming Compounds for Curing Concrete.

.3 C661 ..... Standard Test Method for Indention Hardness of Elastomeric-Type Sealants by Means of a Durometer.

.4 C1116/C1116M ..... Standard Specification for Fiber Reinforced Concrete.

.5 D1751 ..... Standard Specification for Preformed Expansion Joint Filler for Concrete paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.6 E1643 ..... Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

.7 E1745 ..... Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

.5 Conform to:

.1 ACI 214R ..... Guide to Evaluation of Strength Test Results of Concrete.

.2 ACI 303R ..... Guide to Cast-in-Place Architectural Concrete Practice.

.6 Conform to SP-66, ACI Detailing Manual and the RSIC Reinforcing Steel Manual of Standard Practice.

.7 In the event of conflict between reference standards, codes, drawings and specifications, the Contractor shall request clarification by the Consultant. The Consultant's decision as to which requirements govern shall be final and binding. Generally the more stringent provision shall govern. No extras to the contract will be approved due to such clarification.

.8 Conform to the Occupational Health and Safety Act, R.S.O. 1990, c. O.1, last amendment.

1.3 Shop Drawings

.1 Provide shop drawings (placing drawings and bar lists) showing dimensions and complete information necessary for fabrication and placing reinforcing steel and accessories.

.2 Submit shop drawings in accordance with directions.

.3 Allow ten (10) working days for the review of shop drawings and supply as many copies for review and distribution as directed. Shop drawings shall be checked in detail by the General Contractor before submission. Drawings which fail to meet this requirement shall be returned marked NOT REVIEWED.

.4 Review of the Shop Drawings is for general conformance with the design concept of the project and general compliance with the information given in the contract documents. The Contractor is responsible for confirming, correlating all quantities and dimensions, and is not relieved of the responsibility for compliance with the intent of the drawings and specifications.

.5 Only shop drawings bearing the review stamps, signed and dated shall be kept at site.

1.4 Source Quality Assurance

.1 Concrete supplied to this project shall meet the "Performance Based Specification" for concrete supply as adopted by the Ready Mix Concrete Association of Ontario.

.2 SUBMITTALS

Brand names, and when requested, manufacturer's data sheets, detail drawings or diagrams of all items which are proposed for use in the concrete mix, or which are to be cast in or attached to the concrete structure or will affect the concrete structure in any way, are to be submitted for review.

These shall include but not be limited to:

.1 A schedule of "Standardized mix designs" which indicates compliance with the Construction Documents. Schedule to include but not be limited to:

.1 Concrete mix for each exposure class and strength to be utilized in the project.

.2 Water/cementitious materials ratio (w/cm).

.3 Air entrainment %, if applicable.

.4 Include “Pump Mixes” if proposed for use.

.5 Brand name and dosage of synthetic fibres.

.6 Brand names of all admixtures to be incorporated into the mixes.

.2 Brand names and, if requested, manufacturers’ data sheet of proposed curing compound.

.3 If requested, provide a certified copy of a mill test report of the reinforcing supplied, and samples of reinforcing bars to be used on this project for testing by the appointed Inspection and Testing Company before delivery to the site.

.4 If requested, for unidentified reinforcing steel or reinforcing steel from non- Canadian mills, submit test data from an approved testing company verifying that each size and grade of reinforcing steel meets the Specification requirements. Pay for cost of such testing.

.5 Shop drawings of elevators, showing complete details of proposed connections to the structure, including pockets, inserts and loadings.

.6 Shop drawings of exterior walls panels showing complete details of proposed connections to the structure, including pockets, inserts and loadings.

.7 Shop drawings of steel and precast concrete stairs showing complete details of connections to the structure including pockets, inserts and loadings. Shop drawings to be stamped by a Licensed Professional Engineer.

.8 Cement finishing of floors shall be by a specialist sub-contractor thoroughly experienced in this type of work and a member in good standing with the Concrete Floor Contractors Association of Ontario (CFCAO). Submit references when requested.

.3 MATCH SAMPLE OF ARCHITECTURAL QUALITY CONCRETE.

.1 Provide a sample of “Architectural Concrete” including reveals, to the Architect’s approval. Repeat at no cost to the owner until approval has been given.

.2 All “Architectural Quality” concrete throughout the project shall match or exceed the quality level of the approved “Match” sample as to surface, cone tie pattern and other features as directed.

.3 Refer also to **Architectural Quality Concrete** later in this section.

.4 Pre-Construction meetings as specified in this section.

PART 2 - PRODUCTS

2.1 Materials

.1 FORMWORK

.1 Formwork lumber: Plywood and wood formwork materials are to conform to CSA A23.1.

.2 Plywood: Form plywood shall be exterior grade. Plywood shall be resin coated one side (in contact with concrete). Use sound undamaged plywood with clean true edges. Make-up or patching strips between panels shall be kept to a minimum.

.3 Falsework Materials: To conform to CSA S269.1. Materials shall bear grade marks or be accompanied with certificates, test reports or other proof of conformity.

.4 Formwork Release Agent: Shall be a proprietary material which will not stain the concrete or impair the natural bonding or color characteristics of coating intended for use on the concrete.

.5 Form Ties: Removable or "snap off" metal ties, fixed or adjustable lengths, free of devices leaving holes larger than 25 mm [1″] diameter in the concrete surface.

.6 Exposed Surfaces

.1 Form materials for concrete surfaces which require smooth and uniform surfaces for applied finishes or other purposes, shall consist of square edged smooth panels of plywood, metal or plastic. The panels shall be square and made in a true plane, clean, free of holes, surface markings and defects.

.2 Refer also to **Architectural Quality Concrete** later in this section.

.7 Circular (Tubular) Column Forms

.1 Internally treated with release material.

Acceptable Types:

SONOTUBE ..... by Sonoco
POLI-PERMAFORM..... by Atlas Construction Specialties
Other types subject to submission and acceptance.

.2 Where required by the Architectural drawings and finish schedules provide lined forms so that no spiral line is visible in the finished concrete surface.

.2 REINFORCING AND ACCESSORIES

.1 Reinforcing Bars:

.1 Shall be new deformed “Hi-Bond” bars conforming with CSA G30.18M with a minimum yield stress of 400 MPa [58 ksi]. All bars to have Typical Identification Patterns and standard identification requirements.

.2 Epoxy coating is to conform to the specified standard, applicator is to be certified by RSIC.

.2 Welded Wire Mesh: Unless otherwise approved shall be supplied in flat sheets only.

.3 Chairs, bolsters, bar supports, side wall spacers and bar spacers:

.1 Provide quantity for strength and support of the construction conditions, so that there is no possibility of displacement or deformation of the reinforcement during construction.

.2 Use plastic chairs and/or sidewall spacers for all concrete.

Acceptable Types as supplied by:

Drummond & Reeves
Acrow Richmond
Superior Concrete

.4 Tie Wires: Annealed wire 1.29 mm [0.05″] diameter (No.16 U.S. Standard Gauge), or heavier or an approved proprietary system.

.5 Provide all necessary support bars and spacers in accordance with recommendations of the RSIC Manual.

.3 READY MIX CONCRETE:

.1 Unless otherwise specified, concrete shall be premixed, quality controlled conforming to CSA A23.1 with minimum 28 day compressive strengths as noted on the drawings.

.2 Cement shall be Portland Cement of Canadian manufacture conforming to CSA A3000, Type GU (10).

.3 Supplementary Cementing Materials shall conform to the requirements of CSA A3000.

.4 Aggregates shall be clean, uncoated sand and coarse aggregates from approved sources conforming to CSA A23.1. Nominal size of coarse aggregate shall not exceed 20 mm [3/4″] unless otherwise stated on the structural drawings or specifications.

.5 Water shall be potable from a municipal supply.

.6 Chemical Admixtures, where permitted shall conform to the requirements of CSA A23.1.

.1 Provide an approved water-reducing agent in all concrete.
Acceptable Types:

EUCON WR ..... by Euclid
WRDA 82 ..... by Grace
PLASTOCRETE 161 ..... by Sika
MASTERSET R 100 ..... by BASF
MASTERPOZZOLITH 210 ..... by BASF

.2 High Range Water Reducing Admixture (Super P)
Acceptable Types:

EUCON 37 ..... by Euclid
WRDA 20 ..... by Grace
SIKAMENT 686 ..... by Sika
MASTERRHEOBUILD 1000 ..... by BASF
MASTERGLENIUM 51 ..... by BASF

.3 Mid-Range Water Reducing Additive where approved for use:
Acceptable Types:

MASTERPOLYHEED 1020 ..... by BASF
EUCON MR ..... by Euclid
DARACEM 55 ..... by Grace
SIKAMENT 500 ..... by Sika

.4 Air-Entraining Agent:
Acceptable Types:

EUCON AIR MAC6 ..... by Euclid
DARAX AEA ED ..... by Grace
SIKA AIR ..... by SIKA
MASTERAIR ..... by BASF

.7 Calcium chloride or chloride based admixtures **shall not** be used.

.8 Salt or other chemicals shall not be added to reduce the freezing point of concrete.

.9 All admixtures shall be used in strict accordance with the manufacturers' instructions.

.10 SYNTHETIC FIBRE REINFORCING

.1 Synthetic Fibre Reinforcing to control plastic shrinkage cracking: 100% virgin polypropylene fibres specifically manufactured for concrete reinforcement and containing no reprocessed materials. Fibres to be added at the concrete batching plant at the rate of 0.9 kg/m³ [1.52 lb/yd^3] of concrete for defibrillated fibres and 0.6 kg/m³ [1.01 lb/yd^3] for monofilament fibres, unless otherwise noted, in strict accordance with manufacturer's instructions.

Acceptable Types:

PSI FIBRESTRAND 150 ..... by Euclid
SIKAFIBER PPF-50 mm ..... by SIKA Canada Inc.
MICROFIBRE ..... by Grace
MASTERFIBER ..... by BASF

.11 Typical Concrete Mixes: See schedule on drawings.

.4 CONSTRUCTION GROUTS: Non-shrink grout unless otherwise noted shall be a premixed non-metallic, non-shrink grout.

Acceptable Types:

EUCO NS OR DRY PACK GROUT ..... by Euclid
M-BED STANDARD ..... by Sika
MASTERFLOW 555 ..... by BASF
CG-86 ..... by W.R. Meadows
CPD NON-SHRINK GROUT ..... by CPD

.5 CURING, SEALING AND/OR CURING/SEALING COMPOUND where approved for use shall conform to ASTM C309.

.1 Acceptable Types:

MASTERKURE CC 300 XS ..... by BASF
FLORSEAL WB 25 ..... by Sika
SUPER DIAMOND CLEAR 350 ..... by Euclid
CS-309-30 ..... by W.R. Meadows
ACRYLIC CURE & SEAL 30% ..... by CPD
Compounds must be compatible with applied finishes.

.2 Compound used for Coloured Surface Hardened Finishes shall be:

.1 SUPERDIAMOND (CLEAR) 350 FOR SURFLEX…by Euclid
.2 FLORSEAL WB25 (CLEAR) FOR COLORPLETE…by Sika
.3 MASTERKURE CC 300 XS ..... by BASF

.3 For LEED Projects, use:

EVERCLEAR VOX.....by Euclid
VOCOMP 25.....by W.R. Meadows

.4 Compounds applied at the rates as recommended by the manufacturers.

.6 BONDING AGENT:

ALBITOL CONCENTRATE.....by Sika
INTRALOK.....by W.R. Meadows
SBR LATEX .....by Euclid
CPD CONCENTRATED LATEX ADHESIVE .....by CPD
MASTEREMACO A 660 .....by BASF

.7 PRE-MOULDED JOINT FILLERS: Provide bituminous impregnated fibreboard conforming to ASTM D1751.

Acceptable types:

FIBRE EXPANSION JOINT FILLER .....by W.R. Meadows
CPD ASPHALT FIBRE EXPANSION JOINT FILLER.....by CPD

.8 JOINT FILLER FOR "SAW-CUT" CONTROL JOINTS: Two component self-leveling sealant, minimum Shore A Durometer hardness of 80 at 20°C [68°F] as conforming to ASTM C661.

Acceptable types:

MASTERSEAL CR 190 ..... by BASF
EUCO QWIKJOINT UVR..... by Euclid
LOAD FLEX POLYUREA..... by Sika
REZI-WELD FLEX ..... by W.R.Meadows
CIPADAM E-13..... by CPD

.9 VAPOUR RETARDER MEMBRANE FOR SLAB-ON-GRADE

.1 Provide a vapour retarder membrane cover over the prepared base material below slabs-on-grade where noted on the drawings.

.2 Membrane shall have the following properties:

.1 Performance as tested after conditioning (ASTM E1745)

.2 Strength minimum CLASS B (ASTM E1745)

.3 Minimum thickness 0.25 mm [0.01″]

.3 Lap joints minimum 150 mm [6″] and tape with material as recommended by membrane manufacturer.

.4 Acceptable membrane types as manufactured by:

FLORPRUFE 120 ..... by Grace
STEGO WRAP ..... by Stego Industries
PERMINATOR ..... by W.R.Meadows
MOISTOP ULTRA ..... by Fortifiber Building Systems

.10 Other materials or products which are not listed herein shall comply with the latest CSA, ASTM, CGSB, or ACI Standards appropriate to those materials.
Refer to **Source Quality Assurance** in **PART 1** of this section.

PART 3 – EXECUTION

3.1 Work by this Section as Supplied by Others

.1 Install anchors and other items to be cast into the concrete as supplied by others.

3.2 Formwork

.1 Formwork design, materials, and erection shall conform with CSA A23.1 including all falsework and ties.

.2 Column and wall footings and caps shall have plywood side forms. The placement of footings directly against neat cut excavations may be approved subject to review and acceptance by the Structural Consultant. Approval to proceed must be given in writing by the Structural Consultant before any concrete is placed.

3.3 Reinforcing Fabrication and Placement

.1 Conform to CSA A23.1.

3.4 Concrete

.1 Mixing, Transportation and placement to conform to CSA A23.1.

.2 Maximum time between adding mix water and complete discharge of concrete into forms shall be 120 minutes. Exemptions to this time frame shall only be permitted with approval by the Structural Consultant when previously approved chemical additives are used.

.3 Approved synthetic fibres to be added to the concrete for slabs where noted on drawings. Refer elsewhere in this section for dosage rates and superplasticizers.

3.5 Cold Weather Conditions

.1 When the air temperature is at or below 5°C [41°F] or when there is a probability of its falling to that limit within 24 hours of placing (as forecast by the nearest weather office).

Conform to the requirements of CSA A23.1 including, but not limited to the following:

.1 Job Preparation.

.2 Concrete Temperature.

.3 Concrete Placing.

.4 Protection Requirements and Methods:

.1 Heated Enclosures.
.2 Protective Covers and Insulation.

.5 Cooling after protection.

.6 Cold-Weather Curing.

.2 All materials and equipment needed for adequate protection and curing shall be on hand and ready for use before concrete placement has started.

3.6 Hot Weather Protection Requirements

.1 Conform to the requirements of CSA A23.1.

3.7 Finishing Treatment of Slab Surfaces (Screeding and Trowelling)

.1 Screeding, Bull Floating, Darbying, Trowelling.

.1 Conform with the requirements of Clause 7.6 of CSA A23.1 and as modified hereinafter.

.2 Bring tops of floors to even level or sloping surfaces as shown on the drawings.

.3 Slabs shall be finished only when bleed water on the slab surface has evaporated.

.4 Machine trowel all floor slabs, except as required by the drawings and/or specifications to Class A Conventional (Smooth) classification.

.5 Surfaces of exterior exposed steps and platforms shall be finished with a wood float and given a “fine broom” finish to the Consultant’s satisfaction. (Class A Conventional (Smooth) classification). Refer also to Architect’s “Finish Schedule”.

.6 Unless otherwise shown or specified, roof slabs shall be finished for waterproofing with a Steel Trowel Finish. (Class A Conventional (Smooth) Classification).

.7 Floors to receive separate finishes shall be screeded to proper elevation, and wood float finished. (Class A Conventional (Smooth) Classification).

.8 Class A Conventional (Smooth) Classification shall be as defined in CSA A23.1 Table 21 and shall be determined by F-number method as defined in Clause 7.6.1.1 unless otherwise directed.

.9 Finished surfaces not conforming to the specified tolerances shall be deemed as **Defective Concrete**. See later in this section.

.2 **Slab-On-Grade**

.1 VAPOUR RETARDER MEMBRANE FOR SLABS-ON-GRADE

.1 For areas specified to receive on under slab membrane:

.1 Ensure that the prepared subgrade is approved by the Geotechnical Consultant.

.2 Level, tamp and/or roll the subgrade as required.

.3 Install the membrane in accordance with manufacturer's instructions and to ASTM E1643.

.4 Unroll membrane with the longest dimension parallel to the direction of the concrete pour.

.5 Lap membrane over footings and seal to foundation walls, columns and column caps etc., and overlap joints 150 mm [6″].

.6 Seal all penetrations (including pipes) and seal as per manufacturer's directions.

.7 Repair damaged areas with membrane patches overlapping damaged areas by 150 mm [6″] and taping all four sides.

.2 READY MIX CONCRETE

.1 Refer to drawings and also to **Materials** in this section.

.2 Synthetic Fibres: Refer to READY MIX CONCRETE earlier in this section.

.3 Superplasticizer

.1 Where shown on the drawings and specifications as slabs to have superplasticizer added to the mix, the approved superplasticizing agent can be added at the site or at the plant subject to the appropriate mix design being submitted for review and approval issued by the consultant. NO WATER IS TO BE ADDED AT SITE.

.2 As an alternative, the specified Mid-Range Water Reducing additive, added at the batching plant, may be approved for use. Subject to the appropriate mix design being submitted for review and approval issued by the Consultant.

.4 Quantities and procedure for admixtures shall be determined and supervised with the assistance of the manufacturer's technical staff.

.3 EXECUTION

.1 Refer to **Field Quality Control** later in this section.

.2 Obtain Geotechnical Consultant's approval of the granular fill before placing the concrete slabs-on-grade.

.4 Provide screeds set to an engineer's level for leveling the surface of floor slabs-on-grade.

.5 Provide keys or dowels at construction joints as detailed on the drawings.

.6 CONTROL JOINTS

.1 Where shown on plans or on Typical Details, provide saw-cut control joints as indicated.

.2 Control joints in slabs-on-grade shall be cut using power driven abrasive or diamond tipped blades.

.3 Cutting shall begin as soon as the concrete surface has hardened sufficiently to resist raveling as the cut is made and before shrinkage cracks form in concrete. Generally, saw-cutting of slabs-on-grade shall be done within the first 24 hours after the slabs are placed. Alternatively, use the Soff-Cut method immediately after finishing the slab.

.4 The depth of control joints shall be one-third (1/3) of the thickness of the slab, with a minimum of 40 mm [1.5″] unless otherwise noted.

.5 Clear saw-cuts of all debris and ensure sides are clean and dry before proceeding.

.6 Mix saw-cut joint filler according to manufacturer's instructions.

.7 Pour filler into joints, flush with adjacent surfaces.

.3 **Surface Hardened Finishes**

.1 For slabs designated to be surface hardened, apply the specified surface hardener in strict accordance with the manufacturer's instructions at a rate of 5.0 kg/m² [1.00 lb/ft²].

3.8 Finishing of Formed Surfaces

.1 Conform to the requirements of CSA A23.1 Clause 7.9.

.2 Refer to Architectural Finish Schedules and Drawings.

.3 Refer to **Architectural Quality Concrete** later in this section.

3.9 Sealing and Curing

.1 Apply specified compounds in strict accordance with manufacturer's directions.

.2 All floor slabs and all EXPOSED concrete surfaces, such as walls, beams, columns, etc., are to receive a minimum of one coat of curing and sealing compound unless not compatible with architectural finishes.

.3 CURING

.1 Conform to the requirements of CSA A23.1 including but not limited to the following:

.1 Basic curing period.

.2 Additional curing for durability.

.3 Additional curing for structural safety.

.4 Methods for curing.

.5 Cold weather curing.

.6 Hot weather curing.

.7 Curing for Accelerated Strength Development.

.4 Refer also to **Cold Weather Conditions** and **Hot Weather Protection Requirements,** elsewhere in this section.

3.10 Protection of Slab Surfaces

.1 Fully protect exposed concrete finishes from damage and staining.

.2 Protect all exposed surfaces from dropping plaster, welding debris, paint, dirt or other marring agents, by heavy building paper, tarpaulins or other appropriate means. The surface must be perfectly dirt-free before this protection is placed.

.3 Do not allow any pipe threading or similar machines using oil or other permanently staining liquid on any concrete floor unless set up on large oil-tight and properly constructed metal pans. Plywood sheets or other absorbent materials will not be permitted as a substitute for pans.

3.11 Miscellaneous Items

.1 This section to provide and place concrete, formwork and reinforcing and/or grout fill for all concrete work shown on or implied by the drawings and specifications.

.2 DRY-PACK GROUT: Provide and install specified non-shrink grout as required, in accordance with manufacturer's directions.

.3 REINFORCED MASONRY LINTELS: Where required, provide reinforcing and place concrete in accordance with the Typical Notes and Details on the drawings.

.4 VERTICAL MASONRY WALL REINFORCING BARS: Provide, for installation by the Mason, bars as required by the drawings and typical details.

.5 MASONRY GROUT: Co-ordinate with the Mason for supply and installation of grout. Grout as specified on the drawings.

.6 BONDING AGENT: Provide and install specified agent as required in accordance with manufacturer's directions.

.7 CONCRETE FILL FOR PRECAST SLABS: *(Refer also to Section 03 41 13)*

Co-ordinate placement of forms, reinforcing and concrete as required by the precast hollow core slab supplier.

.8 DRILLED AND SET ANCHORS AND DOWELS:

Provide and install the specified products and materials as required in accordance with manufacturer's directions. Refer also to Post Installed Anchors Specification 05 05 19.

3.12 Toppings

.1 General

.1 Conform to CSA A23.1 and the requirements noted below, unless noted otherwise in the contract documents.

.2 Set screeds and bulkheads rigidly and accurately to prevent displacement during concreting.

.3 Special provisions for bonded and unbonded toppings:

.1 The maximum pour size for bonded and unbonded toppings is to be limited to [1000 m^2] 10000[ft^2].

.2 Maintain a one to one length to width aspect ratio for all pours, here extent and geometry of topping permits.

.3 Toppings are to be poured in a “checker board” pattern to minimize the effects of shrinkage. Adjacent sections of topping shall be poured no sooner than 3 days after the adjoining section was poured.

.4 Ensure temperature of base course is 10°C (50°F) minimum prior to pouring toppings.

.5 Provide hot and cold weather protection for toppings in accordance with CSA A23.1.

.2 Monolithic Toppings:

.1 Monolithic toppings are constructed by applying a concrete mixture to a “freshly” poured base course that has lost all slump and bleed water, prior to its final set. Alternatively, monolithic toppings can be poured with the main base course to a final thickness equal to the thickness of the base course plus the thickness of the topping.

.2 Where monolithic toppings are specified, place reinforcement and maintain cover requirements based on the thickness of the base slab only. Provide additional layer of reinforcement in monolithic toppings where noted on the contract documents.

.3 Bonded Toppings

.1 Bonded toppings are constructed by applying the topping mixture over a hardened concrete base to which the surface has been prepared to accept the concrete topping. By definition, bonded toppings are designed to bond to the concrete base or an existing concrete surface.

.2 Materials:

.1 Concrete: Refer to concrete mix schedule on the drawings. (Maximum coarse aggregate to be 10 mm [3/8″]).

.2 Shrinkage Reducing Additive: Use Eucon SRA or an approved equivalent at the rate of 2% by weight of cementitious materials.

.3 Base Course Finishing and Preparation

.1 Base Course Finishing and Preparation

.1 Base Courses Which Are To Receive Bonded Toppings Are To Be Finished By One Of Two Methods:

1. rough broom finish (very rough finish – amplitude ± 6mm/± ¼”).

2. Means of finish as per requirements of Pre Cast Hollow Core supplier to receive the topping. See also specification 03 41 13.

.2 The slab surface is to be cleaned by high-pressure water blasting to ensure all laitance, dirt, dust, construction debris and the like are removed prior to application of the topping.

.4 Placing and Finishing Toppings

.1 Place and finish toppings in accordance with CSA A23.1

.5 Curing

.1 Continuously wet cure bonded toppings for a minimum of seven days.

.4 Cracks in Toppings

.1 All cracks in concrete toppings must be repaired by the Contractor. Extent of repair and method of crack repair must meet the requirements of flooring installation contractor and the Owner.

3.13 Architectural Quality Concrete

Where concrete surfaces are denoted as Architectural Quality or Architectural Finished Concrete, comply with the following:

.1 Refer to MATCH SAMPLE FOR ARCHITECTURAL QUALITY CONCRETE earlier in this section.

.2 Use same formwork and joint sealing on final work as was used on “Match” sample.

.3 Conform with the requirements of CSA A23.1 Clause 8.3 and ACI 303.

.4 DESIGN

.1 The mix shall be designed by the Contractor so that it will achieve all the properties specified and in addition will achieve a high workability.

.2 Regardless of specified strength, architectural concrete exposed to weather shall have a maximum water cement ratio of 0.48 by mass.

.3 The maximum slump permitted is 90 mm [3.5″].

.4 Take care to reduce variation in mix proportions and particularly the quality of water used in various batches, in order to ensure reasonable colour uniformity of concrete.

.5 Architectural quality concrete shall meet the standards set out below when the forms are stripped, without further finishing work other than treatment of tie holes and clean-up:

.1 Dense, even concrete, uniform in colour and free of defects such as colour change, honeycombing, voids, loss of fines, flow lines, cold joint lines or other similar imperfections. Patching, unless it is required to only an insignificant extent, will not be permitted to repair these defects. Where patching is permitted, it must accurately match the colour and texture of the surrounding concrete to be acceptable. The judgement as to what constitutes insignificant defects which may be patched and the acceptance of the patch shall be made solely by the Architect.

.2 Concrete members of generally uniform colour.

.3 Concrete members with true, accurate definition at corner, arises, reglets and the like, generally free of chipped or spalled areas and within dimensional tolerances set out in ACI 303.

.4 Weathertight construction joints in members exposed to weather.

.5 Under no circumstances shall patches or repair to any architectural concrete be undertaken without the Architect’s written consent. Concrete members which are patched without the Architect’s consent will be classified as defective work and the Architect may require their removal and replacement.

.6 Colour and texture matching the sample panel designated by the Architect.

.6 FORMS

.1 Use approved cone type form ties, spaced as required by the Architect. Align vertical and horizontal form panel joints.

.2 Seal joints on exterior side between form panels with an approved joint seal and securely fasten 25 x 50 mm [1″ x 2″] wood battens over each joint seal.

.3 Provide formwork for reveals as detailed on the architectural drawings to the Architect's satisfaction.

.7 SANDBLAST FINISH: Where denoted.

.1 Sandblast the exposed surface of concrete members as required to a depth sufficient to at least remove the surface skin and expose the coarse aggregate and match the approved sample designated by the Architect.

.2 Sandblast individual concrete members at the same age to ensure reasonable colour uniformity. Protect adjacent surfaces not noted to be sandblasted.

.3 Do not proceed with sandblasting operations until the Architect has inspected and approved the surfaces to be sandblasted.

.8 When specified or shown on the drawings fill form tie holes with Mills gray concrete plugs in strict accordance with the manufacturer's recommendations.

3.14 Defective Concrete

.1 Concrete not meeting the requirements of the specifications and drawings shall be considered defective concrete.

.2 Defective concrete and concrete not conforming to lines, details, quality and grade specified or as shown on the Drawings shall be modified or replaced at no extra cost to the Owner, and to the satisfaction of the Architect.

.3 Finished lines, dimensions and surfaces shall be correct and true within tolerances specified.

.4 Non-exposed Surfaces: Honeycombing shall be cut out and filled and any fins which interfere with strapping, etc., shall be cut back. Holes left by form separators shall be filled.

.5 Crack Repair: After concrete has cured, examine concrete floor surfaces and repair all cracks. Route out cracks with mechanical router to a minimum depth of 13 mm [1/2″]. Then clean and fill cracks in same manner as control joints.

.6 Use approved curing/sealing compound in strict accordance with manufacturer's recommendations.

3.15 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

.4 Refer to **Source Quality Assurance** included in this section.

.5 If requested, provide a copy of the Concrete Suppliers Certificate confirming that the specified fibre reinforcement at the specified dosage was added to all required concrete delivered to the job site.

3.16 Notification

1. Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective. A minimum notification of 24 hours in advance of placing concrete is required.

3.17 Inspection and Testing

1. The General Contractor in agreement with the Dufferin Peel School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

2. The Inspection and Testing Company will conduct inspection and testing services per Specification Section 01 45 23 – *Testing and Inspection Services – General Requirements*

3. The following are responsibilities of the contractor regarding the Inspection and Testing Company:

   .1 Co-operate with the representatives of the Inspection and Testing Company.

   .2 Provide the Inspection and Testing Company with a set of construction documents to enable them to understand the scope of their services.

   .3 Provide an insulated storage box according to the specification and drawing supplied by the Inspection and Testing Company.

.4 Protect test cylinders.

.5 Keep a record set of drawings upon which shall be marked by the contractor's superintendent, the time and date of pouring of each section of concrete, the date of removal of forms and a daily record of the temperature.

3.18 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 03 30 53

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for concrete floor hardeners, slip resistant coatings, and sheet curing materials.

1.2 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 51 00 – Temporary Utilities

.3 Section 03 33 00 – Cast-in-Place Concrete

1.3 REFERENCES

.1 Health Canada - Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.2 CSA-A23.1-09: Concrete Materials and Methods of Concrete Construction

1.4 SUBMITTALS

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

.2 Submit WHMIS MSDS - Material Safety Data Sheets.

.1 WHMIS MSDS acceptable to Human Resources Development Canada-Labour and Health Canada for concrete floor hardeners.

.2 Indicate VOC content.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard, packaging material in appropriate on-site bins for recycling.

.3 Dispose of unused chemical additive materials at an official hazardous materials collections site approved by Consultant.

.4 Unused chemical additive materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.5 Fold up metal banding, flatten and place in designated area for recycling.

.6 Dispose of unused chemical additive materials at an official hazardous materials collections site approved by Consultant.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Temporary lighting:

.1 Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 m^2 of floor being finished.

.2 Electrical power:

.1 Sufficient electrical power to operate equipment normally used during construction.

.3 Work area:

.1 Water tight protection against rain and detrimental weather conditions.

.4 Temperature:

.1 Maintain ambient temperature of not less than 10 degrees Celsius or C^o from 7 days before installation to at least 48 hours after completion of Work and maintain relative humidity not higher than 40% during same period.

.2 Maintain substrate temperature at 10 C^o minimum.

.5 Moisture:

.1 Ensure concrete substrate is within moisture limits prescribed by flooring manufacturer.

.6 Safety:

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

.7 Ventilation:

.1 Ventilate area of work as directed by Consultant by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Provide continuous ventilation during and after coating application.

.4 Sufficient to prevent carbon monoxide or high levels of carbon dioxide and other injurious gases from affecting concrete.

1.7 SCOPE OF WORK

.1 Provide liquid hardener at all exposed concrete slab-on-grade areas, and where exposed concrete is indicated on architectural drawings or in room finish schedule.

Part 2 Products

2.1 FLOOR HARDENER

.1 Concrete floor sealer (SCONC): where concrete curing agent/sealer/hardener is required, provide Shur-Seal as manufactured by Paul M. Wolff Co. Inc. (714) 974-0630 or Sure Hard manufactured by Dayton Superior's Canada Limited.

Part 3 Execution

3.1 EXAMINATION

.1 Examine area and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work and which do not

conform to manufacturer's recommendations. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 On freshly poured concrete surfaces, no additional surface preparation will be required. All surfaces must be clean, sound and absorptive. Remove any concrete laitance and patch, fix all cracks and damaged areas. New concrete should be properly cured a minimum of seven (7) days, prior to placing the concrete floor hardener, in accordance with CSA A23.1 by one of the following methods: water, plastic sheeting or burlap.

.2 On areas where forms are recently removed, remove all form oil and breaking compound residue to assure penetration of the product into the surface.

.3 When applying near windows, mask the glass.

.4 Avoid contact with plant life, glass, aluminum, and other finished surfaces. Where contact occurs, immediately wipe with a damp cloth or flush with water.

.5 Avoid contact with asphaltic concrete.

.6 On previously sealed existing concrete floors, completely strip floor of sealers and contaminants prior to application. Apply as for freshly poured surfaces.

3.3 APPLICATION REQUIREMENTS

.1 Two applications are required. The first application at $5m^2$/litre followed by the second application at $10m^2$/litre as final coat in strict accordance with manufacturer’s specifications.

END OF SECTION

PART 1 – GENERAL

1.1 General Requirements

.1 Make a thorough examination of the drawings, site, specification and soil report, to determine the intent, extent, materials and conditions of interfacing with other work and to be fully cognizant of the requirements.

.2 Assume full responsibility for the design, for the adequacy and for the safety of all formwork and falsework.

.3 The Contractor shall ensure that no asbestos containing materials are used in connection with the work of this section.

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

.1	A23.1	Concrete Materials and Methods of Concrete Construction.
.2	A23.2	Test Methods and Standard Practices for Concrete.
.3	A23.3	Design of Concrete Structures.
.4	A23.4	Precast Concrete - Materials and Construction.
.5	A3000	Cementitious Material Compendium.
.6	G30.18	Carbon Steel Bars for Concrete Reinforcement.
.7	W48	Filler Metals and Allied Materials for Metal Arc Welding.
.8	W186	Welding of Reinforcing Bars in Reinforced Concrete Construction.

.4 In the event of conflict between reference standards, codes, drawings and specifications, the Contractor shall request clarification by the Consultant. The Consultant's decision as to which requirements govern shall be final and binding. Generally the more stringent provision shall govern. No extras to contract will be approved due to such clarification.

1.3 Shop Drawings

.1 Submit shop drawings and design calculations in accordance with directions. Each sheet submitted shall bear the stamp of a Professional Engineer licensed in Ontario.

.2 Submit erection drawings and details showing general arrangement, size, shape, unit identification marks and location of slabs and installation data, such as method and sequence of erection, connection methods, joint and grouting details, camber, apertures and other data necessary to any trade working on or adjacent to installed slabs and which is part of work of the manufacturer.

.3 Shop drawings shall show accommodation for all electrical services, sleeves, etc.

.4 Review of shop drawings shall not relieve the Contractor from the responsibility of seeing that the work is complete, accurate and in conformity with the Architectural and Structural drawings and the Specifications. Shop drawings shall be checked and initialed by the Contractor's staff before being submitted.

.5 Only shop drawings bearing the review stamps shall be kept at site.

1.4 Source Quality Assurance (refer to LEED Requirements earlier in this section)

.1 The manufacturer and erector shall have a minimum of five (5) years of experience on projects of similar size and scope. If requested, the manufacturer and erector shall provide documentation to references including contact names and phone numbers.

.2 Manufacturer and erector of precast elements shall comply with CSA A23.4.

.3 Upon request, provide Consultant with certified copies of quality control tests and inspection related to this project as specified in CSA A23.4.

.4 Upon request, provide Consultant with certified copy of mill test report of reinforcing strands supplied, showing physical and chemical analysis.

1.5 Warranty

.1 The Contractor hereby warrants that the precast elements will not spall or show visible evidence of cracking, except for normal hairline shrinkage cracks, in accordance with GC24, except for five (5) years after completion.

1.6 Design Criteria

.1 Design precast elements to CSA A23.3 and to carry handling stresses.

.2 Design loads in accordance with applicable codes for use and occupancy, wind, temperature and earthquake, and as shown on the structural drawings.

.3 Design precast planks to the thickness indicated on the drawings, with a maximum design camber under self-weight of 30 mm. Increase the plank thickness as required to achieve a maximum design camber under self-weight of 30 mm.

.4 Design precast slabs to meet a two (2) hour fire resistance rating.

.5 Consider vibration characteristics in accordance with the Ontario Building Code.

.6 If any aspect of the precast hollow core slab construction, proposed by the Contractor for use on this project and/or as required by the final design requirements of the precast hollow core slab system varies from that shown on the tender drawings and the variation requires the re-design of the base building elements and/or the revision to or addition of materials to accommodate such variance and the Owner, the Architect and the Structural Consultant are in agreement with the proposed variation, then the Contractor and/or the precast hollow core supplier requesting the variation shall pay for all costs, including re-design associated with the change.

PART 2 – PRODUCTS

2.1 Materials

.1 Cement aggregates, water, admixtures to conform to CSA A23.1 and CSA A23.4.

.2 Concrete shall have a minimum compressive strength of 30 MPa [4.35 ksi] at transfer, and 40 MPa [5.80 ksi] at 28 days.

.3 The prestress strands shall be uncoated 7-wire cable conforming to ASTM A416/A416M.

.4 Grout Mix: Cement grout of one (1) part type 10 Portland cement, 2 ½ parts sand, and sufficient water for placement and hydration or as specified by the Precast Manufacturer.

.5 Bearing Pads: 3 mm [0.12″] Masonite smooth one side.

.6 Reinforcing Steel shall conform to CSA G30.18.

.7 Anchorages and Couplings: To CSA A23.1.

.8 Embedded Steel: To CSA G40.20/G40.21.

.9 Welding Materials: To CSA W48.

PART 3 – EXECUTION

3.1 Fabrication and Erection

.1 All prestressed hollow core units shall be manufactured using machines castings techniques in a closely controlled manufacturing process.

.2 Erection shall be carried out by experienced precast erectors under supervision of the manufacturer.

.3 Bearing surfaces prepared by others shall be examined and approved by the manufacturer of the prestressed hollow core slabs.

.4 Commencement of erection implies acceptance of the work of other sections which affect the work of this section.

.5 No relief from contractual responsibility will be allowed unless such claim is made in writing prior to commencement of work.

.6 Install 3 mm [0.12″] Masonite pads, smooth side up on bearing ends of masonry.

.7 TOLERANCES

.1 Conform to tolerances specified in CSA A23.4 including but not limited to the following:

.1 Depth (thickness of slabs)

The maximum variation from the specified depth shall be …± 5mm [3/16″]

.2 Length (As shown on reviewed shop drawings)

The maximum variation from the required length shall be:

.1 Lengths up to and including 7.2 m [23′-8″] .....± 12mm (± ½″)

.2 Lengths greater than 7.2 m [23′-8″] .....± L/600

Regardless of the variation specified above, the length of bearings of the precast slabs on supporting elements shall not be reduced from the minimum shown on the construction documents.

.3 Squareness and Plumbness

.1 Variation from square or specified angle
at ends of precast slabs .....Max. 1 in 200

.4 Alignment of Longitudinal Edges

.1 The maximum variation in alignment between two adjacent slabs shall be L/600 or 5 mm [3/16″].

.5 Camber

.1 The maximum variation from design camber shall be L/1000, but not greater than 10 mm [3/8″].

.2 The maximum differential camber between adjacent slabs shall be L/1000 but not greater than 12 mm [½″].

.3 Refer to **Topping** paragraph later in this section.

.8 Slabs shall be grouted using a grout mixture as specified by the Precast Manufacturer.

.9 Due care shall be exercised to ensure that joints between the slabs are completely filled.

.10 Install insulation plugs in each cell at exterior conditions.

.11 Caulking of exposed ceiling joints shall be done using material as specified. Caulk joints between underside of the hollow core slabs and the top of the supporting elements, at both end and side conditions. Refer to Architectural Drawings for the locations. Caulking material to be compatible with applied finishes.

.12 The Contractor shall provide suitable surfaces as follows:

.1 A suitable top finish to accept direct application of finished flooring/roofing as specified on Architectural drawings.

.2 Where the undersides of the precast units are exposed and are designated to receive a painted finish, provide a surface which conforms to CSA A23.4. (Standard finish).

.3 The top surfaces to receive a bonded topping are to be scratched (roughened).

.13 Protection: Provide suitable temporary protection/coverings for cells which may be exposed to the elements during construction.

3.2 Topping

.1 Where concrete topping is specified to be provided, refer to Section 03 30 53 – Cast-in-Place Concrete. Topping is bonded and non-composite and shall be placed with top surface flat.

.2 If precast hollow core slab designer requires topping to perform with composite action, all details, including but not limited too reinforcing and top of slab finishes to suit the requirements of a bonded composite topping shall be designed and specified by the precast hollow core slab designer/supplier.

.3 Where no concrete topping is provided and the camber differential exceeds 10 mm [3/8″] the Precast Supplier shall provide a "feathering-out" topping underlayment between the slabs. This "feathering- out" shall be to the satisfaction of the Architect.

3.3 Relation to Other Trades

.1 Provide information to all trades required to fix or suspend ceilings, lighting fixtures, ducts, piping, windows, curtain walls, etc. to precast elements. Information shall show methods and locations acceptable to the precast manufacturer.

.2 Coordinate with trades that are required to run services horizontally in the cells of the precast units.

.3 Holes

.1 Field cutting for holes through precast elements shall be only done with the express approval of the Precast Manufacturer and the Consultant.

.2 Prior to field cutting or drilling of holes through precast slabs, a drawing shall be prepared by the Contractor showing locations and sizes of holes. This drawing is to be reviewed and approved by the Precast Supplier's Engineer. A copy of this Engineer's approval is to be submitted to the Architect and Structural Consultant for review and acceptance before field cutting proceeds.

.4 The precast hollow core supplier shall supply in fill cast-in-place concrete, including formwork, and reinforcing as required for installation by the concrete installer, (co-ordinate with the concrete sub-Contractor as required) or alternatively the precast supplier shall provide precast elements sized to suit the conditions.

3.4 Defective Work

.1 Precast concrete not meeting the requirements of the specifications and drawings shall be considered defective work.

.2 Defective work and work not conforming to lines, details, quality and grade specified as shown on the drawings shall be modified or replaced at no cost to the Owner, and to the satisfaction of the Architect.

.3 Finished lines, dimensions and surfaces shall be correct and true within tolerances specified.

.4 Testing from areas in question, as directed by the Structural Consultant and in accordance with CSA Standard A23.1 and/or load testing of the structural elements in accordance with the requirements of the Structural Consultant shall be done at no cost to the Owner.

.5 REPAIRS:

.1 COSMETIC REPAIRS

.1 Before any steps are taken to repair surface defects they shall first be inspected by the Architect who shall state whether or not repair treatment shall be undertaken.

.2 Should the Architect determine that the defects be too serious for repair, or should repairs prove unacceptable, the effected unit shall be removed from the site and replaced with a new unit at no cost to the Owner.

.2 STRUCTURAL REPAIRS

Repairs of a structural nature shall not be undertaken until the manufacturer's engineer has:

.1 Investigated the structural implications of the defect or damage.

.2 Established the cause of the defect or the damage.

.3 Received approval of the proposed repair procedures from the Structural Consultant.

3.5 Clean-Up

.1 Upon satisfactory completion of the work, clear away from the building and premises all tools, utensils, apparatus, excess or waste materials and debris resulting from the operations, and leave all complete and in a condition acceptable to the Architect.

3.6 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

.4 Refer to Section 03 30 53**.**

.5 Refer also to **Source Quality Assurance**, in this section.

.6 After completion of the precast slab installation, the precast supplier/engineer shall issue a report signed and sealed by a licensed Professional Engineer certifying that the project was designed, fabricated and installed according to the project contract documents and specifications and the precast shop drawings including **ALL** openings/holes through the slabs.

3.7 Notification

1. Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.8 Inspection and Testing

1. The General Contractor in agreement with the Dufferin Peel School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

2. Contractor to cooperate with the representative of the Inspection and Testing Company to facilitate the work.

3. The Inspection and Testing Company will conduct inspection and testing services per the following:

   .1 Specification Section 01 45 23 – *Testing and Inspection Services – General Requirements.*

3.9 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 03 41 13

Part 1 General

1.1 RELATED SECTIONS

.1 This Section specifies work which shall be performed by:
Section 04 22 00: Concrete Unit Masonry

1.2 QUALITY ASSURANCE

.1 Requirements of Regulatory Agencies:
Modify requirements of the Specifications only as jurisdictional authorities may direct.

1.3 REFERENCES

.1 ASTM C270-89: Standard Specification for Mortar for Unit Masonry.
.2 CSA A179-04 (R2009): Mortar and Grout for Unit Masonry.
.3 CSA A371-04 (R2009): Masonry Construction for Buildings.
.4 CSA S304.1-04: Masonry Design for Buildings (Limit States Design).

1.4 SUBMITTALS

.1 Affidavits:
Submit to Consultants affidavits of an inspection company that mortar and grout materials conform to requirements of the Specifications, if requested.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Handle and store cementitious materials protected against moisture.

.2 Handle and store all mortar materials to prevent contamination by foreign materials, and damage by freezing or excessively high temperatures.

1.6 SITE CONDITIONS

.1 Environmental Requirements:
When air temperature is less than 5^{o} C, mix mortar as specified in CSA A371.

Part 2 Products

2.1 MATERIALS

.1 Use materials only as specified in CSA Standard A179 referenced from CSA A371 and CSA S304.1 as applicable. Ensure that water and aggregate used in mortar, other than in walls buried in earth, will cause no efflorescence.

.2 Incorporate only materials from same source in mortar exposed to view.

.3 Water: Verify that water used contains no salts to cause efflorescence.

.4 Portland Cement: to CAN/CSA-A3001, Type GU; grey colour, unless indicated elsewhere.

.5 Masonry Cement: to CAN/CSA-A3002, Type S.

.6 Hydrated Lime: to ASTM C207, Type S-Special.

.7 Mortar Aggregate: natural sand, to CSA A179, standard masonry type; clean, dry, protected against dampness, freezing and foreign matter.

.8 Grout Coarse Aggregate: to CSA A179, maximum 10 mm size, 27 percent by volume.

.9 Grout Fine Aggregate: to CSA A179, clean well graded sharp sand; 54 percent by volume.

.10 Water: potable, clean and free of deleterious amounts of acids, alkalies or organic materials.

2.2 ADMIXTURES

.1 Plasticizer: water reducing type, reducing porosity and absorption to increase bond strength.

.2 Water Repellent: mixture of calcium carbonate and hydrous magnesium aluminum silicate powders.

.3 Colour: liquid manufactured or natural oxide pigment, colour and loading as selected by Consultant.

2.3 MIXES

.1 Mortar for Concrete Masonry Units: to CSA A179, Type S using the Proportion Specification Method c/w water repellent addition.

.2 Mortar for Calcium Silicate Masonry Units: to CSA 179, Proportion Specification Method, consisting of 1-1-6 mix of Portland cement, hydrated lime and aggregate, c/w integral colour.

.3 General: Ensure that water and aggregates used are all from same source and will meet required strengths. Batch mortar and grouts are acceptable provided source is approved prior to commencement of work.

.4 Mix mortars as specified in CSA A179. Use only dry aggregate. Test for bulking to determine accurate proportioning.

.5 Do not incorporate calcium chloride in mortar mix. In cold weather non-chloride accelerating admixtures may be utilised such as Accelguard 80 by Euclid Chemical Canada Inc., or equivalent meeting specified requirements of ASTM Specification C270.

.6 Dirt resistant additives: aluminum tristearate, calcium stearate or ammonium stearate.

.7 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.

.8 Colouring Additive: A mineral-oxide pigment, harmless to mortar set and strength, shall

be provided. Colour shall be one (1) colour per masonry unit type, as selected by the Consultant.

2.4 GROUT

.1 Grout in Reinforced Masonry Cores, Bond Beams and Lintels:
: 20 MPa strength at 28 days
: 175 – 200 mm slump, mixed to CSA – A179, fine grout.

Part 3 Execution

3.1 MIXING

.1 Mix mortar to consistency required for working.

.2 Mix grout to semi-fluid consistency.

.3 Incorporate colour and admixtures into mixes in accordance with manufacturer's instructions. Use clean mixer for coloured mortar.

.4 Prehydrate pointing mortar by mixing ingredients dry, then mix again adding just enough water to produce damp unworkable mix that will retain its form when pressed into ball. Allow to stand for not less than 1 hour nor more than 2 hour then remix with sufficient water to produce mortar of proper consistency for pointing.

3.2 INSTALLATION

.1 Grout fully all pockets in concrete foundation walls where structural components installed, under bearing plates at piers and elsewhere as noted on drawings.

.2 Grout solid all reinforcing installed in concrete block walls.

.3 Protect all mortar and grout installed from freezing or from excessive heat which will prevent bonding or decrease the required compressive strength.

3.3 PREPARATION

.1 Protection:
Provide waterproof protection over construction surfaces at mixing areas to prevent deposit on them of mortar and mortar materials.

3.4 MORTAR TYPES

.1 For laying concrete and brick unit masonry, use mortar type:
"S" in masonry walls in contact with earth.
"S" in masonry walls for all structural walls.
"N" in non-structural applications.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 This section to be read in conjunction with Section 04 22 00 for Execution Requirements

.2 Section 01 33 00 – Submittal Procedures

.3 Section 03 30 00 – Cast-in-Place Concrete

.4 Section 05 12 23 – Structural Steel for Buildings

.5 Section 03 41 00 – Plant- Precast Structural Concrete

.6 Section 04 22 00 – Concrete Unit Masonry

.7 Section 07 21 13 – Board Insulation

1.2 REFERENCES

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

.1 ASTM C126-99, Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.

.2 Brick Industry Association (BIA).

.1 Technical Note No. 20-2000, Cleaning Brick Masonry.

.3 Canadian Standards Association (CSA International).

.1 CAN/CSA A82-06: Fired Masonry Brick Made from Clay or Shale
.2 CAN/CSA-A165 SERIES-04 (R2009): Concrete Block Masonry Units
.3 CSA-A371-04 (R2009): Masonry Construction for Buildings
.4 CAN/CSA-A3001: Portland Cement
.5 CSA-A8-M88: Masonry Cement
.6 CSA S304.1-04: Design of Masonry Structures

1.3 SUBMITTALS

.1 Product Data.

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Manufacturer's Instructions.

.1 Submit manufacturer's installation instructions.

1.4 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 For clay units, in addition to requirements set out in referenced CSA and ASTM Standards include data indicating initial rate of absorption for units proposed for use.

1.5 PRODUCT DELIVERY STORAGE AND HANDLING

.1 Ensure that materials are delivered to job site in dry condition.

.2 Except where wetting of bricks is specified, keep materials dry until use.

.3 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.6 COLD WEATHER REQUIREMENTS

.1 Supplement Clause 5.15.2 of CSA A371 with the following

.1 Maintain temperature of mortar between 5°C and 50°C until used.

1.7 HOT WEATHER REQUIREMENTS

.1 As per Clause 6.7.4 of CSA A37.

1.8 PROTECTION

.1 Until completed and protected by flashings or other permanent construction, keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain. Use waterproof coverings draped 600 mm (min.) down each side of wall and securely anchored.

.2 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.

.3 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.

1.10 JOB MOCK UP

.1 Construct mock-up panel of exterior masonry wall construction, 2000 mm x 2000 mm, showing all masonry materials and colors, fixtures, jointing, coursing, mortar and workmanship.

Part 2 Products

2.1 MANUFACTURED UNITS

.1 Clay Brick Masonry Units:

.1 All units: **57 mm x 90 mm x 255 or 290 mm** (HxDxL) Metric Norman in a smooth finish:

.2 **Masonry Veneer "A"** (Colour **– Dark Grey**)**:**

.1 Brampton Brick 'Contemporary Series – Colour "RAVEN"

.2 Canada Brick 'Canada Architectural Series' - Colour IRONSTONE

.3 Permacon Melville Norman Brick – Colour ROCKLAND BLACK

.2 **Concrete Masonry Veneer Units:**

.1 All units**: 90 mm x 90 mm x 390 mm** (HxDxL) in a smooth finish:

.2 **Masonry Veneer "B"** (Colour **- Light Grey-White**)**:**

.1 Brampton Brick 'Finesse Series – Colour POLAR WHITE *(Suave)*

.2 Day & Campbell 'Modern Masonry Architectural' – Colour CAMEO WHITE #200 *(Honed)*

.3 Richvale York 'Cambridge Series' – Colour WELLINGTON *(Ground)*

.3 Clay and concrete veneer units:

.1 All brick to be manufactured from single continuous run to ensure minimum coulour and texture variations.

.2 Hollow core units may be used. Provide solid units where required for corners and edges.

.3 Install in a one-third lapped running bond pattern (typical).

.4 All units are to be manufactured from single continuous run to ensure minimum colour and texture variations.

.4 Portland Cement:

.1 To CAN/CSA-A3001.

.5 Masonry Cement:

.1 To CAN/CSA A8.

.6 Hydrated Lime:

.1 To ASTMC207-74.

.7 Aggregate:

.1 To CSA A82.56-M1976.

.8 Water:

.1 Ensure that water contains no salts which may cause efflorescence.

.9 Thru-wall Flashing and Air/Vapour Barrier Sheet Membrane Treatment**:** Self-adhering SBS modified bitumen membrane reinforced with non-woven fibrous glass. Acceptable materials: Blueskin TW by Bakor Inc., Mississauga or sheet air/vapour barrier membrane as specified as in Section 07 27 10 – Air Barriers.

.10 Bolts and Anchors: To CAN3-A370.

.11 Mortar:

.1 Generally: Use materials only as specified in CSA A179. Ensure that weather and aggregate used in mortar, other than in walls buried in earth, will not cause efflorescence.

.2 Bonding Agent**:** Acrylic latex type by Sternson Limited, W.R. Meadows or Thoro Building Products. Use for all mortar except brick.

.3 Mixes: Mix mortars as specified in CSA A179 using the Proportion Specification. Add bonding agent in accordance with manufacturer's instructions.

.4 Mortar Types:

.1 For masonry walls in contact with earth and bedding for bearing plates and lintels: Mortar Type "S".

.2 For load-bearing walls: Mortar Type "S".

.3 For brick: Mortar Type "N" (1:1:6) premixed "Betomix 1-1-6" Type "S" portland cement hydrated lime as supplied by Daubois Inc., Jiffy Mortar Systems. Mix on site with sand and water.

.4 For all other (non-structural) masonry walls, use regular Type "N" mortar.

.5 Grout: To CSA A179 Table 3.

.6 Colouring Additive: A mineral-oxide pigment, harmless to mortar set and strength, shall be provided. Colour shall be one (1) colour per masonry unit type, as selected by the Consultant.

.12 Mortar Dropping Control Device: "Mortar Net" manufactured by Mortar Net USA (Telephone: 1-800-664-6638).

.13 Weepholes**:** 90 mm x 90 mm x 10 mm purpose made PVC, designed to drain cavities and with mesh to prevent insects from entering. Colour to be chosen by Architect from manufacturer's full range.

.14 Date Stone: Date stone to be 390 x 390 x 90 deep solid limestone. Font: Technic Lite, 100mm high. Beveled edges. Polish finish. Location to be determined by Architect.

.15 Time Capsule Stone: Time capsule stone to be 390 x 390 x 90 deep solid limestone. Font: Technic Lite, 100mm high. Beveled edges. Polish finish. Location to be under display cabinet in Entrance Foyer. Confirm final location and exact beveled wording with Architect.

.16 Veneer Ties: Fero slotted block tie (Type II) c/w V-Tie manufactured from 4.76 mm diameter wire conforming to CSA Standard G30.3, hot dipped galvanized to ASTM A153.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 WORKMANSHIP

.1 Build masonry plumb, level, and true to line, with joints in proper alignment.

.2 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

3.3 TOLERANCES

.1 Clause 5.3 of CAN/CSA-A371 applies except as follows: Walls to receive thinset ceramic tile: plumb within 1:600.

3.4 EXPOSED MASONRY

.1 Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.

.2 Parging on the face of exposed masonry units will be rejected.

3.5 JOINTING

.1 Except where indicated otherwise on drawings or details or as below, make concave joints, allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, compressed, uniformly concave joints. Where joints are to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating, strike flush.

3.6 WEEPHOLES

.1 Provide 10 x 90 x 90 mm PVC weepers at regular intervals at both top and bottom of walls as indicated on Drawings. Ensure weepers are clear and not blocked by mortar or mortar droppings.

3.7 JOINING OF WORK

.1 Where necessary to temporarily stop horizontal runs of masonry, and in building corner, Step-back masonry diagonally to lowest course previously laid. Do not "tooth" new masonry. Fill in adjacent course before heights of stepped masonry reach 1200 mm.

3.8 CUTTING

.1 Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.

.2 Make cuts straight, clean, and free from uneven edges. Use masonry saw where necessary.

3.9 BUILDING-IN

.1 Build in items required to be built into masonry by other trades.

.2 Prevent displacement of built-in items during construction. Check for plumbness, alignment, and correctness of position, as work progresses.

.3 Brace door jambs to maintain plumbness. Fill door frame with concrete.

3.10 WETTING OF BRICKS

.1 Except during winter, wet clay brick having an initial rate of absorption exceeding 1g/min/100mm2; wet to uniform degree of saturation, to 24 hours before laying, and do not lay until surface is dry.

.2 Similarly, wet tops of walls built of bricks qualifying for wetting, when recommencing work on such walls.

3.11 SUPPORT OF LOADS

.1 Except where drawing requirements are more stringent, comply with Clause 6.3 of CSA S304.1.

.2 Where concrete fill is used in lieu of solid units, use minimum 25 MPa concrete to Section 03 30 00.

.3 Install building paper below voids to be filled with concrete; keep paper 25 mm back from faces of units.

3.12 PROVISION FOR MOVEMENT

.1 Leave 5 mm space below shelf angles.

.2 Leave 6 mm space and do not use wedges between tops of non-load bearing walls and partitions and structural elements.

3.13 LINTELS

.1 Install steel lintels above windows, doors and all mechanical and electrical as shown on structural drawings. Centre over opening width.

.2 Install loose steel lintels supplied by Section 05 12 23. Centre lintel over opening width. Minimum 150 mm solid bearing each end.

.3 Lintels over 2000 mm span to be complete with bearing plate and anchors each end.

.4 Bridge openings less than 450 mm wide with 6 mm thick mild steel plate lintels, bearing minimum 100 mm on each side of opening and set on dry pack grout. Width of plate to be equal to the wall thickness less 25 mm.

.5 Install precast concrete lintels supplied under Section 03 30 00.

3.14 CONTROL AND EXPANSION JOINTS

.1 Except as noted following, control joints required at maximum of 6000 mm o.c. in continuous walls having no openings, intersections or column locations. Refer to elevations for locations on exterior walls and advise Consultant of variances prior to executing the work. Control joints are not shown for clarity on the drawings for interior walls. If in doubt, request assistance from the Consultant.

.2 At doorway locations, unless indicated otherwise on elevation drawings, use one side of doorway beyond lintel. Use building paper to prevent that end of lintel to bond.

.3 Use standard block with concrete filled end core to form key. Line one side of core with building paper before filling core to prevent bonding. Complete vertical separation, full height and thickness of wall are required.

.4 Stop masonry reinforcing at each side of the joints. Caulking specified in Section 07 92 10 – Joint Sealers.

.5 At expansion joints in brick and veneer, install Rapid Expansion joint DA 2015, to leave vertical joint free of mortar to allow for horizontal expansion.

3.15 INSPECTION & TESTING

.1 Refer to Section 01 11 00 – Summary of Work, section 1.29.

3.16 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 On a weekly basis and at completion of work remove all debris, cut blocks and bricks, and mortar droppings.

.3 Power wash or brush exterior masonry surfaces at completion of work.

.1 Soft, clean cloths.

.4 Clean concrete brick masonry as work progresses.

.1 Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of brick and finally by brushing.

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 This section to be read in conjunction with Section 04 21 13 for Execution Requirements.

.2 Work performed by other Sections and which is related to this Section is specified in:
Section 03 10 00: Concrete Formwork: for dovetail anchor slots in concrete, concrete lintels.

.3 Supply of work which shall be installed by this Section is specified in:

Section 05 12 23: Structural Steel for Buildings: to furnish bearing plates, steel lintels

Section 05 31 00: Steel Decking: to furnish weld plates. Miscellaneous inserts and attachment devices to support the installations of other Sections, frames and miscellaneous metal work

.4 This Section shall include performance of work which is specified in:
Section 04 05 12: Mortar and Grout

1.2 SYSTEM DESCRIPTION

.1 Tolerances:
Lay masonry to tolerances specified in CSA A371 and:
.1 Level within 6 mm in any bay or 6 m maximum distance, and 13 mm in 12 m or more.
.2 Opening sizes within 6 mm of designated dimension.
.3 With joints to dimensions indicated, but in no case greater than 13 mm.

1.3 QUALITY ASSURANCE

.1 Requirements of Regulatory Agencies:
.1 Construct masonry as required by jurisdictional authorities.
.2 Before commencing masonry work, verify that site conditions will allow construction of masonry within required limitations for wall heights, wall thickness, openings, bond, anchorage, lateral support, and compressive strengths of masonry units and mortars.
.3 Construct masonry fire rated assemblies, which are validated by UDI, ULC, or NRC fire tests, in complete accordance with the test design specification. Fire rated assemblies constructed otherwise will be acceptable only on presentation of authorization by jurisdictional authorities.

1.4 REFERENCES

.1 CAN/CSA-A165 SERIES-04 (R2009): Concrete Block Masonry Units
CAN/CSA-A370-04 (R2009): Connectors for Masonry

CAN/CSA-A371-04 (R2009): Masonry Construction for Buildings

CSA S304.1-04: Design of Masonry Structures (Limit States Design)

.2 Reference standards quoted in Contract Documents refer to: ASTM A924/A924M-95, Specification for General Requirements for Steel Sheet Metallic Coated by the Hot-Dip Process.
CAN/CGSB-37.2-M88, Emulsified, Asphalt, Mineral Colloid Type, Unfilled, for Dampproofing and Waterproofing, and for Roof Coatings.

1.5 SUBMITTALS

.1 Samples:
Submit samples of unit masonry for review.

.2 Affidavits:
Submit affidavits by an approved independent testing laboratory stating that materials supplied are in accordance with the Specifications, if requested.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Isolate masonry units from contact with ground and other materials until laid, to prevent staining.

.2 Ensure that moisture content of concrete masonry units is maintained within specified limits from time of shipment from plant, to time of installation.

.3 Cover masonry unit stockpiles while stored to prevent exposure to weather. Keep water out of all holes and reglets in units during freezing weather.

.4 Handle and store masonry units to prevent soiling and chipping.

.5 Deliver products to the place on site as directed, and to meet installation schedule.

Part 2 Products

2.1 MATERIALS

.1 Meet specified requirements of CSA A370 and CSA A371 for materials unless specified otherwise.

.2 Asphalt Emulsion:
To meet specified requirements of CAN/CGSB-37.2.

.3 Joint Packing at Walls:
.1 Fire Separation Packing: at tops of fire rated walls and partitions: Thermafiber 200 degree glass fibre insulation by Canadian Gypsum Company, Limited, or Firebarrier fibre firestopping by AD Distributors Ltd.
.2 Expansion Joint Packing: Glass fibre insulation, rigid board, density of 48 kg/cu.m.; or Rodofoam by Sternson Limited, or closed cell neoprene DA2015 by Dur-O-Wal Ltd.

.4 Joint Reinforcement:

.1 Provide joint reinforcement in width to ensure that longitudinal rods at faces of wall have minimum mortar cover of 16 mm and that they are centred on shells of hollow core units.

.2 Horizontal joint reinforcing shall include longitudinal and cross rods, welded steel rod, Truss type extra heavy duty Blok-Lok BL-30 or 120 Truss-Mesh by Hohmann & Barnard Inc. Galvanizing as per Section 2.1.9.

.3 For Exterior single-wythe block wall horizontal joint reinforcement shall include cross ties hot dipped galvanized Truss type (Extra Heavy Duty). Spacing to be minimum everty 3rd course, U.N.O.

.4 For Interior Single Wythe Load-bearing Walls shall include 4.8mm cross ties mill galvanized Truss type (Extra Heavy Duty). Spacing to be as per drawings.

.5 For Interior Single Wythe Non-Load-bearing Walls provide 3.76 mm dia. longitudinal and cross rods, welded steel rod, galvanized, ladder design (Standard). Spacing shall be every second block course.

.6 All joint reinforcing to be galvanized as per 2.19 of this Section.

.5 Masonry Veneer Wall Tie (Steel Stud Back-up):

Adjustable, dual component slotted design; e.g. Fero Slotted Stud Tie (Type 1), comprised of:

.1 Slotted Stud Plate: 1.61 mm thick hot dipped galvanized steel plate to ASTM A153; length to suit air space dimension and stud width.

.2 V-Tie: 4.76 mm diameter hot dipped galvanized steel wire to ASTM A153; length to provide placement of tie legs at centerline of veneer.

.3 Fasteners: self-tapping sheet metal screws, hex washer head, suitable length to penetrate stud no less than 13 mm; minimum 2 screws per tie.

.4 Insulation Retaining Clip: purpose-made plastic, as recommended by tie manufacturer.

.6 Masonry Veneer Wall Tie (CMU Back-up):

Adjustable, dual component slotted design; e.g. Fero Slotted Block Tie (Type 1), comprised of:

.1 Slotted Block Plate: 1.61 mm thick hot dipped galvanized steel plate, to ASTM A153; length to suit air space and CMU width dimension, less 6 mm.

.2 V-Tie: 4.76 mm diameter hot dipped galvanized steel wire, to ASTM A153,; length to provide placement of tie legs at centerline of veneer.

.3 Insulation Retaining Clip: purpose-made plastic, as recommended by tie manufacturer.

.7 Wall Tie (Structural Steel Back-up):

Adjustable, dual component design; suitable for welded attachment; e.g. Blok Lok Flex o-lok ties BLT-9, hot dipped galvanized c/w V-Tie, 4.8 mm size; hot dipped galvanized, suitable length to provide placement of tie legs at central line of veneer.

.8 Strap Anchors: 6.35 mm thick steel plate, hot dipped galvanized; U-shaped and Z-shaped to suit application; e.g. BLT 11Z BY Blok-Lok.

.9 Galvanizing:

.1 For Joint Reinforcement, Bond Ties, Anchors, and Accessories in Exterior Walls: To meet specified requirements of ASTM Specification A153 , Class B, hot dip.

.2 For Joint Reinforcement, Anchors, and Accessories in Interior Walls: above

grade Manufacturer's standard mill galvanising.

.3 For Joint Reinforcement, Bond Ties, Anchors, and Accessories in interior walls below grade: To meet specified requirements of ASTM Specification A153, Class B, Hot Dip Gavanized.

.10 Reinforcing Steel:
For reinforced block lintels: to meet specified requirement of CSA Standard G30.18.

.11 Dovetail Anchor:
25 mm x 2mm formed sheet steel dovetail brick anchor galvanised, with end bent to form hook, to suit dovetail anchor slot specified for installation by formwork constructor.

.12 Weep Holes:
Plastic tube, 10mm OD x 100 mm long, or 10 mm x 38 mm x 90 mm long rectangular; or DA1069 Cell Vent by Dur-O-Wall Limited.

.13 Concrete Masonry Units:

.1 To meet specified requirements of CAN3-A165 Series – 04.

.2 Include all special shapes, such as end, bond, sash groove and lintel units, required for complete masonry installation indicated on Drawings. Use bullnose corner block at all door jambs, vertical external corners and where otherwise indicated on Drawings.

.3 Modular size units.

.4 Provide 100% solid units where required by jurisdictional authorities.

.5 Moisture controlled ("M") units acceptable to Consultant.

.6

.1 Normal Weight Units: For use in walls below ground floor elevation:
Hollow Units: H/15/A/O.
75% Solid Units: S/15/A/M.
Solid Units: Sc/15/A/O:

.2 Light Weight Units: For use in walls above ground floor elevation:
Hollow Units: H/15/C/M
75% Sold Units S/15/C/M
Solid Units: Sc/15/C/M

.7 Supply lintel blocks for fabrication of lintels by Section 03 30 00.

.14 Acoustical concrete blocks (Gym): CSA A165 Series, 'Acoustade' by Richvale York Block Inc. Type and size as shown on drawings, and approved by Consultant.

Part 3 Execution

3.1 PROTECTION

.1 Cover exposed tops of masonry walls when laying is not in progress and until protected by completed construction. Cover with non-staining waterproof material to overhang top edges of wall by 600 mm minimum and secured to prevent dislodgement.

.2 Protect exposed external corners of masonry with materials which will not damage or soil finished surfaces.

.3 Protect all finished surfaces from mortar droppings.

.4 Take particular care to protect faces of concrete unit masonry from mortar droppings and smears as laying proceeds.

.5 Turn over or cover scaffolds and mortar boards at completion of each day's work to avoid staining of finished surfaces by splashed rain.

3.2 LAYING MASONRY

.1 Lay masonry to meet specified requirements of CSA A370 and CSA A371, unless otherwise specified.

.2 Lay masonry to course as shown on Drawings and to minimise cutting of units.

.3 Coordinate coursing of dissimilar sized units only as approved by Consultant.

.4 Use only dry and unfrozen materials.

.5 Remove sections of masonry which have been frozen before laying of masonry continues.

.6 Lay masonry in running bond with vertical joints of alternate courses in line.

.7 Lay concrete unit masonry with thick ends of webs on top.

.8 Joints:

.1 Make joints of uniform thickness with vertical joints from course to course maintained plumb.

.2 Provide full bed and head joints for shear walls.

.3 When laying is resumed on walls previously laid with mortar either partially or totally set, remove loose units and mortar from top and adjoining surfaces. Remove mortar completely when masonry is removed and replaced with new.

.4 Form tooled concave joints wherever exposed to view, whether behind cabinets, fitments, and wall accessories, or not. When mortar has become "thumb-print" hard, tool joints and clean off burrs with trowel or burlap. Use a tool with a bearing surface of 550 mm minimum length on horizontal joints to avoid uneven depressions.

.5 Rake out joints to masonry exposed to view to provide for caulking
: at junction of interior and exterior walls with columns.
: at junction of interior with exterior walls.
: intersections of walls and partitions where joint reinforcement is installed.
: at caulked joints where indicated typically.

.9 Stop off horizontal runs of walls by racking back a half unit in each horizontal course: do not touch.

.10 Do not wet concrete units.

.11 Distribute masonry units of varying colours and textures to avoid spotty appearance over wall surfaces exposed to view. Do not use units which contrast too greatly with overall

range.

.12 Use chipped and blemished units only where concealed. Do not use defective or broken units. Do not lay concrete units with markedly smooth face that will appear slick where exposed to view, whether painted or not.

.13 Maintain bracing of walls and piers continuously during construction until structure provides support.

.14 Lintels:

.1 Build in Lintels supplied by Section 03 30 00 and 05 50 00. Set and level lintels on a bed of mortar.

.2 Build in precast concrete block lintels fabricated under work of Section 03 30 00.

.3 Provide means to prevent damage due to differential movement resulting form expansion or contraction and from deflection of lintel.

.4 Bridge openings not exceeding 450 mm in width with 6 mm mild steel plate lintels bearing 100 mm on each side of opening. Width of plate shall be wall thickness less 25 mm. Joint at lintel to be dry packed. Provide weep joints in mortar at 800 mm above lintels.

.15 Built-In Items:

.1 Verify that built-in items specified in other Sections are available for building in before laying of masonry commences. Co-operate in the setting and aligning of built-in items and provide for later installation of items which are installed by other Sections, to avoid cutting, fitting, and patching.

.2 Build masonry around pressed steel door frames supplied and set as specified in other sections. Ensure that anchors are well secured and that frames are true and plumb. Completely fill frames with mortar as each course is laid. Maintain protective frame covering and ensure that no mortar is left on frame faces.

.16 Cope, cut and split concrete masonry units with power-driven abrasive discs. Cut units wherever electrical outlets, grilles, and pipes occur. Allow 3.2 mm clearance around items which are incorporated in walls.

.17 Do not expose open cells, cores or frogs of masonry units to view.

.18 Coat faces of concrete covered with less than 200 mm of masonry veneer at exterior walls and parapets with prime coat and one dampproof coat of asphalt emulsion.

.19 Locate bearings and piers as indicated on Drawings; provide solid masonry units at bearings.

.20 Extend walls and partitions at top to deck, slab or structural members, as applicable, except where otherwise noted on Drawings. Incorporate both lateral support and deflection space at termination of walls as required by this Section. Where walls terminate at bottoms of steel joists, close space at joists to deck or slab with metal lath and plaster on one side of joist or with 16 mm thick fire rated, Type X. gypsum board secured to each side of joists, if infilling with masonry is impractical; and to meet specified requirements of Section 09 21 16. Ensure that construction at joists completely closes and seals space.

.21 Masonry Solid Wall Anchorage:

.1 Use dovetail anchors for slots at concrete construction.

.2 Keep masonry a minimum of 12.7 mm clear of faces of structural members or as indicated on Drawings, and fill space with glass fibre board, leaving space for caulking at joints exposed to view or the weather.

.3 Bed anchors solidly in mortar joints.

.4 Fill cores of hollow units solidly with mortar where anchors are embedded.

.5 Co-ordinate with Section 031 0 00 to ensure that dovetail anchor slots in concrete are located correctly. Assist in their installation if requested.

.6 Coodinate with Section 11 52 00 locations of all wall mounted Gymnasium equipment and fill blocks solid above, below, and within mounting locations.

.22 Joint Reinforcement:

1. Install joint reinforcement in single wythe masonry walls and partitions. Place reinforcement continuously in horizontal joints spaced as noted on structural drawings, beginning with course 400 mm above bearing, unless otherwise specified or indicated.
2. Place reinforcement additionally in courses 200 mm, 400 mm and 800 mm above and below openings, and extending 600 mm beyond jambs of openings.
3. Where changes in wall thickness occur, extend reinforcement of lesser width 450 mm beyond changes of width.
4. Lap reinforcement a minimum of 150 mm at splices.
5. Do not run reinforcement through control joints.
6. Wherever walls and partitions intersect one another, or each other, continue reinforcement through. Do not carry reinforcement through intersections where lateral support anchors are installed or at intersections of walls and partitions with solid piers.
7. Bond cavity walls together with cavity-wall ties staggered in alternate course and spaced not to exceed 800 mm horizontally and 600 mm vertically. Provide additional ties spaced not more than 400 mm apart within 200 mm of openings and on each side of control and expansion joints, except where wythes are bonded together with masonry returns or otherwise.
8. Install vertical reinforcing to size and spacing as shown on Drawings. Fill voids with minimum 10 MPa grout.
9. Properly position vertical bar reinforcement in concrete masonry pilasters, columns, and walls and secure against displacement.
10. Provide two 15M size reinforcing bars grouted vertically into masonry unit cores on both sides of masonry openings. One bar per cell.
11. Solidly fill block cores containing vertical reinforcement or anchor bolts with grout.
12. Lap splices 30-bar diameters minimum. Clear distance between vertical bars and masonry units shall be 15 mm.
13. Provide 20M size reinforcing bars full height, each cell, complete with 25MPa concrete as shown on drawings.

.23 Deflection Space:

.1 Incorporate a deflection space between tops of non-load-bearing walls and partitions and structure to prevent transference of structural loads to masonry.

.2 Fill deflection space with glass fibre board compressed to 50% of original thickness to completely seal space.

.3 Co-ordinate laying of masonry with installation of lateral support specified in this Section and as provided by Section 05 50 00.

.24 Penetrations of Masonry:

.1 Fill voids of masonry to within 19 mm of structural members, pipes, ducts and conduit that penetrate masonry walls and partitions, unless otherwise indicated.

.2 Keep masonry units similarly clear of such penetrations.

.3 Finish mortar smooth at face of masonry.

.4 Pack remainder of annular void surrounding penetrating item with fire separation packing to within 12.7 mm of face of masonry to allow for sealant.

.25 Shrinkage Control Joints:

.1 Incorporate vertical shrinkage control joints in walls of which concrete masonry units are a part.

.2 Install control joints at junctions of walls and columns, at intersections of unit concrete masonry load-bearing walls, and wherever indicated on Drawings, and otherwise in wall with no openings, at a maximum spacing of 6000 mm o/c. Carry joints full height of walls.

.3 Ensure complete vertical separation through walls incorporating control joints. Make control joints 9.5 mm wide, rake back 19 mm at junctures with concrete, and leave joints free and clear for caulking, as specified in Section 07 92 10.

.4 Construct control joints of standard block and fill void between block with 20 MPa concrete grout to form a continuous key full height of joint by installation of continuous building paper between concrete key and block on one side of joint.

.26 Expansion Joints:

.1 Incorporate expansion joints in walls where indicated on Drawings.

.2 Maintain expansion joints free of mortar with temporary filler when laying masonry. Pack joints full height with glass fibre board compressed to 50% of original thickness.

.3 Leave clean space in joints for caulking as specified in Section 07 92 10.

.27 Fire Separations:

.1 Construct fire separation walls tightly to construction at perimeter, and without openings or voids.

.2 Do not reduce the thickness of masonry fire separations to less than the thickness indicated for the required fire separation rating.

.3 All load bearing and non-load bearing partitions shall carry to the underside of structure above.

.4 All openings in partitions, even above ceilings shall be patched to maintain sound and fire separation.

.5 In partitions and walls not required to be fire separations, fill space between partitions and structural elements with rock wool compressible filler to maintain complete sound separation.

.6 In fire separations, spaces to be firestopped in accordance with Section 07 84 00 – Firestopping.

.7 Use U.L.C. labeled mortar for all patching in fire separations.

.28 Lateral Support Anchors:

.1 Vertical:

.1 At intersecting and abutting load bearing walls, use prefabricated corners and tees to match horizontal reinforcing.

.2 At intersection of non-load bearing walls with load bearing or non-load bearing walls, use corrugated galvanized ties.

.3 At wood parapet and similar conditions, use model BL404 with BLT9 ties, all by BlokLok. Ensure ties extend a minimum of 50 mm into the brick or block outer wythe.

.29 Bonding

.1 Walls of two or more widths: bond using metal ties in accordance with subsection 5.6 of CAN3-A371.

.2 Submit procedure and obtain approval by Architect.

.3 In cavity walls, keep all cavity spaces free of mortar and debris by placing a wood strip on the ties. Retain strip on a wire line and pull up level and clean off droppings prior to placing next course of ties. Install mortar control device at 300 mm o.c. horizontally, in a staggered pattern so as to overlap each other on each side. Install in every 2nd course above foundation and shelf angles.

.30 Thru-wall flashing and Thru-wall Building Paper at Control Joints

.1 Install thru-wall flashing at ground floor elevation in all walls on foundations.

.2 Leave 2” (50 mm) of thru-wall flashing or building paper hanging, projecting off all lintels and all required locations. Architect will review prior to cutting.

.3 Cutting protruding flashing: This procedure is to ensure that thru-wall flashing is installed where intended.

.31 Base Course Detail

.1 Provide square base block in areas of porcelain tile installation for porcelain cove base and fitted corners. Contractor to grind upper 50mm of block corner to match upper courses of bullnose block walls Refer to Details

.32 Cold Weather Protection

.1 Refer to the Ontario Masonry Contractor's Association's provision and publications. Include for tarped heated enclosures, heated mortar mixing pans - no non-freeze additives such as calcium will be tolerated on this project.

3.3 ADJUSTMENT AND CLEANING

.1 Patch damaged masonry in walls which have been rejected as unacceptable.

.2 Point all holes in mortar joints except weepholes.

.3 Point all voids in concrete unit masonry faces.

.4 Cut out defective mortar joints to a minimum depth of 13 mm and repoint.

.5 Clean concrete masonry units with dry brushes and as otherwise recommended by the supplier to remove mortar and stains.

.6 Do not use wire brushes for cleaning.

.7 Should specified cleaning methods be insufficient, proceed with other methods only with approval.

.8 Protect adjacent materials, construction and finished surfaces from damage while cleaning.

.9 Ensure that all efflorescence and mortar deposits are removed from surfaces to receive coating.

END OF SECTION

PART 1 – GENERAL

1.1 General Requirements

.1 When members are specifically designated as "Architecturally Exposed Structural Steel" or "AESS" in the Contract Documents, the requirements in this section shall apply in addition to Section 05 21 19.

.2 AESS members or components shall be fabricated and erected with the care and dimensional tolerances that are stipulated in this section.

.3 Refer to Architectural Drawings and/or specifications for showing requirements and/or locations and Categories of AESS finishes. All AESS members must also be identified by their Category on the Architectural Design Documents.

1.2 Definition Categories

.1 Categories are listed in the AESS Matrix shown in Table 1 where each Category is represented by a set of Characteristics. Refer to the CISC Code of Standard Practice Appendix I for additional information. The following Categories shall be used when referring to AESS:

AESS 1: **Basic Elements**
Suitable for "basic" elements which require enhanced workmanship.

AESS 2: **Feature Elements viewed at a Distance > 6 m**
Suitable for "feature" elements viewed at a distance greater than six meters. The process involves basically good fabrication practices with enhanced treatment of weld, connection and fabrication detail, tolerances for gaps, copes.

AESS 3: **Feature Elements viewed at a Distance ≤ 6 m**
Suitable for "feature" elements – where the designer is comfortable allowing the viewer to see the art of metalworking – welds are generally smooth but visible, some grind marks are acceptable. Tolerances are tighter than normal standards. The structure is normally viewed closer than six meters and is frequently subject to touch by the public.

AESS 4: **Showcase Elements**
Suitable for "showcase or dominant" elements – used where the designer is comfortable allowing the viewer to see the art of metalworking – welds are generally smooth but visible, some grind marks are acceptable. Tolerances are tighter than normal standards. The structure is normally viewed closer than six meters and is frequently subject to touch by the public.

AESS C: **Custom Elements**
Suitable for elements that require a different set of characteristics as specified in Categories AESS 1, 2, 3 or 4.

1.3 Related Documents

.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 "Specifications" Section, apply to this section.

.2 Related Sections: The following section contain requirements that may relate to this section:

.1 Division 1 "Quality Control" Section for independent testing agency procedures and administrative requirements.

.2 Division 5 "Steel Joist" Section.

.3 Division 5 "Metal Decking" Section for erection requirements relating to exposed steel decking and its connections.

.4 Division 9 "Painting" Section for finish coat requirements and coordination with primer and surface preparation specified in this section.

1.4 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code

.3 Refer to and comply with all standards referred to in Section 05 21 19 of this specification, and in addition conform to the following:

.1 ASTM A6/A6M ..... Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling.

.2 ASTM A780/A780M ..... Standard Practice for Repair of Damaged and Uncoated areas of Hot-Dip Galvanized Coatings.

1.5 Submittals

.1 Submit each item below according to the Conditions of the Contract and Division 1 "Specifications" Section.

.2 Shop Drawings detailing fabrication of AESS components:

.1 Provide erection drawings clearly indicating which members are considered as AESS members and identify by the Categories listed in Table 1.

.2 Include details that clearly identify all of the requirements listed in Sections 2.3 "Fabrication" and 3.3 "Erection" of this specification. Provide connections for AESS consistent with concepts, if shown on the Structural Design Documents.

.3 Indicate welds by standard CWB symbols, distinguishing between shop and field welds, and show size, length and type of each weld. Identify grinding, finish and profile of welds as defined herein.

.4 Indicate type, finish of bolts. Indicate which side of the connection bolt heads should be placed.

.5 Indicate any special tolerances and erection requirements;

.6 For Category AESS C, the AESS Matrix included in Table 1 shall be used to specify the required treatment of the element.

.7 Any variations from the AESS Categories listed must be clearly noted. These variations could include machined surfaces, locally abraded surfaces, and forgings. In addition:

.1 If distinction is to be made between different surfaces or parts of members the transition line/plane must be clearly identified/defined on the Shop detail, arrangement and erection drawings.

.2 Track welds, temporary braces, fixtures used in fabrication are to be indicated on shop drawings.

.3 All architecturally sensitive connection details will be submitted for approval by the Architect/Engineer prior to completion of shop detail drawings.

1.6 Quality Assurance

.1 FABRICATOR QUALIFICATIONS: In addition to those qualifications listed in other sections of Division 5 "Structural Steel and Open Web Steel Joist Framing" Section 05 21 19, engage a firm with a minimum 5 years of experience in fabricating AESS similar to that indicated for this Project and with sufficient production capacity to fabricate the AESS elements.

.2 ERECTOR QUALIFICATIONS: In addition to those qualifications listed in other sections of Division 5 "Structural Steel and Open Web Steel Joist Framing" Section 05 21 19, engage a competent Erector who has a minimum 5 years of experience carrying out comparable AESS work.

.3 Comply with applicable provisions of the following specifications and documents:

.1 CISC Code of Standard Practice, latest edition.

.4 Visual samples when specified may include any of the following:

.1 3-D rendering of specified element.

.2 Physical sample of surface preparation and welds.

.3 First off inspection: First element fabricated for use in finished structure subject to alterations for subsequent pieces.

.4 Mockups: As specified in Structural Design Document. Mockups are either scaled or full scale. Mockups are to demonstrate aesthetic effects as well as qualities of materials and execution:

.1 Mockups may have finished surface (including surface preparation and paint system).

.2 Architect's approval of mockups is required before starting fabrication of final units.

.3 Mockups are retained until project is completed.

.4 Approved full-scale mockups may become part of the completed work.

1.7 Delivery, Storage and Handling

.1 Ensure that all items are properly prepared, handled and/or package for storage and shipping to prevent damage to product.

.2 Erect finished pieces using softened slings or other methods such that they are not damaged. Provide padding as required to protect while rigging and aligning member's frames. Weld tabs for temporary bracing and safety cabling only at points concealed from view in the completed structure or where approved by the Architect.

PART 2 - PRODUCTS

2.1 Materials

.1 General: Meet requirements of sections of Division 5 "Structural Steel and Open Web Steel Joist Framing" Section 05 21 19.

.2 Specialty bolts must be specified.

2.2 Special Surface Preparation

.1 Primers: Primers must be specified.

2.3 Fabrication

.1 GENERAL FABRICATION

.1 For the special fabrication characteristics, see Table 1 – AESS Category Matrix.

.2 Fabricate and assemble AESS in the shop to the greatest extent possible. Locate field joints in AESS assemblies at concealed locations or as approved by the Architect.

.3 Fabricate AESS with surface quality consistent with the AESS Category and visual samples if applicable.

.4 The fabricator is to take special care in handling the steel to avoid marking or distorting the members, as follows:

.1 All slings will be nylon type or chains with softeners or wire rope with softeners.

.2 Care is also taken to minimized damage to any shop paint or coating.

.3 If temporary braces or fixtures are required during fabrication, during shipment, or to facilitate erection, care must be taken to avoid and/or repair any blemishes or unsightly surfaces resulting from the use or removal of such temporary elements.

.4 Tack welds are ground smooth.

.2 UNFINISHED, REUSED OR WEATHERING STEEL: Members fabricated of unfinished, reused or weathering steel that are to be AESS may still have erection marks, painted marks or other marks on surfaces in the completed structure. Special requirements shall be specified as Category AESS C.

.3 TOLERANCES FOR ROLLED SHAPES: The permissible tolerances for depth, width, and out of square, camber and sweep of rolled shapes shall be as specified in CSA G40.20/21 and ASTM A6. The following exceptions apply:

.1 For Categories AESS 3 and 4 and otherwise specified in the Contract Documents: The matching of abutting cross-sections shall be required.

.2 For Categories AESS 2, 3 and 4: The as-fabricated straightness tolerance of a member is one-half of the standard camber and sweep tolerance in CSA G40.20/21.

.4 TOLERANCES FOR BUILT-UP MEMBERS: The tolerance on overall profile dimensions of members made up from a series of plates, bars and shapes by welding is limited to the accumulation of permissible tolerances of the component parts as provided by CSA W59 and ASTM A6. For Categories AESS 2 and 3, use camber and sweep tolerances in CSA W59.

.5 JOINTS: For Categories AESS 3 and 4, all copes, miters and butt cuts in surfaces exposed to view are made with uniform gaps, if shown to be open joint, or in uniform contact if shown without gap.

.6 SURFACE APPEARANCE: For Categories AESS 1, 2 and 3, the quality surface as delivered by the mills should be acceptable. For Category AESS 4, the steel surface imperfections should be filled and sanded.

2.4 Shop Connections

.1 BOLTED CONNECTIONS: Make in accordance with Section 05 21 19. Provide bolt type and finish as specified and place bolt heads as indicated on the approved shop drawings.

.2 WELDED CONNECTIONS:

.1 Comply with CSA W59 and Section 05 21 19. Appearance and quality of welds shall be consistent with the Category and visual samples if applicable. Assemblies and weld built-up sections by methods that will maintain alignment of members to the tolerance of this section.

.2 For corrosive environments, all joints should be seal welded. In addition:

.1 For Categories AESS 1, 2 and 3, a smooth uniform weld will be acceptable. For AESS Category, the weld will be contoured and blended.

.2 For Categories AESS 1, 2, 3 and 4, all weld spatter is to be avoided/removed where exposed to view.

.3 For Categories AESS 1 and 2, weld projection up to 2 mm is acceptable for butt and plug welded joints. For Categories AESS 3 and 4, welds will be ground smooth/filled.

.3 WELD SHOW-THROUGH: It is recognized that the degree of weld show-through, which is any visual indication of the presence of a weld or welds on the opposite surface from the viewer, is a function of weld size and material thickness.

PART 3 – EXECUTION

3.1 Examination

.1 The erector shall check all AESS members upon delivery for twist, kinks, gouges or other imperfections, which might result in rejection of the appearance of the member. Coordinate remedial action with fabricator prior to erecting steel.

.2 STANDARD OF ACCEPTANCE: The standard for acceptance of delivered and erected member shall be equivalent to the standard employed at fabrication.

3.2 Preparation

.1 Provide connections for temporary shoring, bracing and supports only where noted on the approved shop erection drawings. Temporary connections shown shall be made at locations not exposed to view in the final structure or as approved by the Architect. Handle, lift and align pieces using padded slings and/or other protection required to maintain the appearance of the AESS through the process of erection.

3.3 Erection

.1 Set AESS accurately in locations and to elevations indicated, and according to CSA S16.

.2 The Erector must plan and execute all operations in such a manner that allows the architectural appearance of the structure to be maintained.

.3 In addition to the special care used to handle and erect AESS, employ the proper erection techniques to meet the requirements of the specified AESS Category:

.1 AESS Erection tolerances: Erection tolerances shall meet the requirements of standard frame tolerance for structural steel per CSA S16.

.2 All slings will be nylon strap or chains with softeners.

.3 If temporary braces or fixtures are required to facilitate erection, care must be taken to avoid and/or repair any blemishes or unsightly surfaces resulting from the use removal of such temporary elements.

.4 Removal of field connection aids: Run-out tabs, erection bolts and other steel members added to connections to allow for alignment, fit-up and welding in the field shall be removed from the structure. Welds at run-out tabs shall be removed to match adjacent surfaces and ground smooth. Holes for erection bolts shall be plug welded and ground smooth where specified. All backing bars will be removed and ground smooth.

.5 Filling of connection access holes: Filling shall be executed with proper procedures to match architectural profile, where specified.

.6 Bolt Head Replacement: All bolt heads shall be placed as indicated on the structural design document. Where not noted, the bolt heads in a given connection shall be on the same side, as specified, and consistent from one connection to another.

.7 Field Welding: Weld profile, quality, and finish shall be consistent with Category and visual samples, if applicable, approved prior to fabrication.

.8 Tack welds shall be ground smooth and holes shall be filled with weld metal or body filler and smoothed by grinding or filling to the standards applicable to the shop fabrication of the materials.

3.4 Erection Tolerances

.1 Unless otherwise specified in the Contract Documents, members and components are plumbed, leveled and aligned to a tolerance equal to the tolerance permitted for structural steel.

3.5 Field Connections

.1 BOLTED CONNECTIONS: Make in accordance with Section 05 21 19. Provide bolt type and finish as specified and place bolt heads as indicated on the approved shop drawings.

.2 WELDED CONNECTIONS:

.1 Comply with CSA W59 and Section 05 21 19. Appearance and quality of welds shall be consistent with the Category and visual samples if applicable. Assemble and weld built-up sections by methods that will maintain alignment of members to the tolerance of this section.

.2 Assemble and weld built-up sections by methods that will maintain alignment of axes. Verify that weld sizes, fabrication sequence, and equipment used for AESS will limit distortions to allowable tolerances.

3.6 Adjustable Connections

.1 Specifically designated more stringent erection tolerances for AESS require that the Owner's plans specify/allow adjustable connections between AESS adjoining structural elements, in order to provide the Erector with means for adjustment and/or specify the method to be used to achieve the desired dimensions. Any proposed adjustment details desired by the Erector shall be submitted to the Architect and Engineer for review.

3.7 Architectural Review

.1 The Architect shall review the AESS steel in place and determine acceptability based on the Category and visual samples (if applicable). The Fabricator/Erector will advise the consultant of the schedule of the AESS Work.

3.8 Protection

.1 In addition to requirements of Division 5 "Structural Steel and Open Web Steel Joist Framing" Section 05 21 19, protect AESS steel in accordance with table below.

Environment	Structural Member	Preparation	Protection	Remarks
Protected (Inside vapour barrier)	Structural Steel and Joists	SSPC-SP6 Commercial Blast Cleaning	CISC/CPMA 2-75	
Unprotected (outside vapour barrier) but **not** exposed to chlorides.	Structural Steel and joists	SSPC-SP6 Commercial Blast Cleaning	Inorganic zinc-rich primer (SSPC Paint 20, type I) and epoxy paint (SSPC Paint 22)	Provide topcoat SSPC Paint 36, Level 3, when exposed to sunlight
Unprotected (outside vapour barrier) exposed to chlorides.	Structural Steel and Joists	SSPC-SP10 Near White Blast Cleaning	Inorganic zinc-rich primer (SSPC Paint 20, type I) and epoxy paint (SSPC Paint 22)	Provide topcoat SSPC Paint 36, Level 3, when exposed to sunlight

Notes:

(a) Submit proposed coating system for approval of consultant prior to application.

3.9 Adjusting and Cleaning

.1 Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint shall be completed to blend with the adjacent surfaces of AESS. Such touch up work shall be done in accordance with manufacturer's instructions.

.2 Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

3.10 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

3.11 Notification

.1 Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.12 Inspection and Testing

.1 The General Contractor in agreement with the Dufferin Peel School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

.2 The Inspection and Testing Company will conduct inspection and testing services per the following:

.1 Specification Section 01 45 23 – Testing and Inspection Services – General Requirements.

3.13 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

Table 1 – AESS Category Matrix

	Category	**AESS C**	**AESS 4**	**AESS 3**	**AESS 2**	**AESS 1**	**SSS**
Id	**Characteristics**	Custom Elements	Showcase Elements	Feature Elements (Viewed at a Distance ≤ 6 m)	Feature Elements (Viewed at a Distance > 6 m)	Basic Elements	Standard Structural Steel (CSA S16)
1.1	Surface preparation to SSPC-SP 6		X	X	X	X	
1.2	Sharp edges ground smooth		X	X	X	X	
1.3	Continuous weld appearance		X	X	X	X	
1.4	Standard structural bolts		X	X	X	X	
1.5	Weld spatters removed		X	X	X	X	
2.1	Visual Samples		Optional	Optional	Optional		
2.2	One-half standard fabrication tolerances		X	X	X		
2.3	Fabrication marks not apparent		X	X	X		
2.4	Welds uniform and smooth		X	X	X		
3.1	Mill marks removed		X	X			
3.2	Butt and plug welds ground smooth and filled		X	X			
3.3	HSS weld seam oriented for reduced visibility		X	X			
3.4	Cross sectional abutting surface aligned		X	X			
3.5	Joint gap tolerances minimized		X	X			
3.6	All welded connections		Optional	Optional			
4.1	HSS seam not apparent		X				
4.2	Welds contoured and blended		X				
4.3	Surfaces filled and sanded		X				
4.4	Weld show-through minimized		X				
C.1			X				
C.2			X				
C.3			X				
C.4			X				

See Notes corresponding to Id (Next Page)

Notes to Table 1

1.1 Prior to blast cleaning, any deposits of grease or oil are to be removed by solvent cleaning, SSPC-SP 1.
1.2 Rough surfaces are to be deburred and ground smooth. Sharp edges resulting from flame cutting, grinding and especially shearing are to be softened.
1.3 Intermittent welds are made continuous, either with additional welding, caulking or body filler. For corrosive environments, all joints should be seal welded. Seams of hollow structural sections shall be acceptable as produced.
1.4 All bolt heads in connections shall be on the same side, as specified, and consistent from one connection to another.
1.5 Weld spatter, slivers, surface discontinuities are to be removed. Weld projection up to 2 mm [1/16″] is acceptable for butt and plug welded joints.
2.1 Visual samples are either a 3-D rendering, a physical sample, a first off inspection, a scaled mock-up or a full-scale mock-up, as specified in Contract Documents.
2.2 These tolerances are required to be one-half of those of standard structural steel as specified in CSA S16.
2.3 Members marked with specific numbers during the fabrication and erection processes are not to be visible.
2.4 The welds should be uniform and smooth indicating a higher level of quality control in the welding process.
3.1 All mill marks are not to be visible in the finished product.
3.2 Caulking or body filler is acceptable.
3.3 Seams shall be oriented away from view or as indicated in the Contract Documents.
3.4 The matching of abutting cross-sections shall be required.
3.5 This characteristic is similar to 2.2 above. A clear distance between abutting members of 3 mm [1/8″] is required.
3.6 Hidden bolts may be considered.
4.1 HSS seams shall be treated so they are not apparent.
4.2 In addition to a contoured and blended appearance, welded transitions between members are also required to be contoured and blended.
4.3 The steel surface imperfections should be filled and sanded.
4.4 The back face of the welded element caused by the welding process can be minimized by hand grinding the backside of the weld. The degree of weld-through is a function of weld size and material.
C. Additional characteristics may be added for custom elements.

END OF SECTION 05 12 13

PART 1 – GENERAL

1.1 General Requirements

.1 The Contractor shall ensure that no asbestos containing materials are used in connection with the work of this section.

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

.1	S16	Design of Steel Structures.
.2	W59	Welded Steel Construction (Metal Arc Welding).
.3	W47.1	Certification of Companies for Fusion Welding of Steel.
.4	G40.20/G40.21	General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.5	S136	North American Specification for the Design of Cold-Formed Steel Structural Members.

.4 Conform to the following ASTM Standards:

.1	A108	Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
.2	A123/A123M	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings for Iron and Steel Products.
.3	A563	Standard Specification for Carbon and Alloy Steel Nuts.

.4 F436/436M ..... Standard Specification for Hardened Steel Washers Inch and Metric Dimensions

.5 F1554 ..... Standard Specification for Anchor Bolts, Steel, 36, 44 and 105 ksi Yield Strength.

.6 F3125/F3125M ..... Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

.5 Conform to:

.1 CISC/CPMA 1-73a ..... A Quick-Drying One-Coat Paint for Use on Structural Steel.

.2 CISC/CPMA 2-75 ..... A Quick-Drying Primer for Use on Structural Steel.

.6 In the event of conflict between reference standards, codes, drawings and specifications, the Contractor shall request clarification by the Consultant. The Consultant's decision as to which requirements govern shall be final and binding. Generally the more stringent provision shall govern. No extras to the contract will be approved due to such clarification.

.7 Conform to the Occupational Health and Safety Act, R.S.O. 1990, c. O.1, latest amendment.

1.3 Architectural Exposed Structural Steel (AESS)

.1 Where finished surfaces of steel are designated as AESS on the drawings, refer to Section 05 12 13 [05121] "Architecturally Exposed Structural Steel" for additional requirements.

1.4 Source Quality Assurance

.1 The following is MANDATORY;

.1 The bidding Contractors are advised that their bids may be rejected unless documentation is submitted.

.2 Submission does not mean acceptance. Acceptance shall be in writing issued by the Consultant.

.3 The steel fabricator and erector shall have a minimum of five (5) years of experience on projects of similar size and scope. If requested, the fabricator and erector shall provide documentation with references including contact names and phone numbers.

.2 Submit two (2) certified copies of mill reports covering chemical and physical properties of steel used in this work.

1.5 Design of Details and Connections

.1 Design details, new connections and open web steel joists by a Licensed Professional Engineer, to requirements of CSA-S16 or CSA-S136 to resist forces, moments and shears indicated on or implied by the drawings.

.2 Unless otherwise noted, beam connections shall be designed for a minimum of 50% of the shear capacity of the beam.

.3 Conform to the Fire Rated Assembly Design specified for the project.

.4 Bolts in the following types of connections are to be **pretensioned** in accordance with the requirements of S16:

.1 Slip-critical connections.

.2 Connections governed by seismic requirements.

.3 Connections for all elements resisting crane loads.

.4 Connections for members directly supporting running machines or other live loads that produce impact or cyclic load.

.5 Connections where bolts are subject to tensile loads.

.6 Connections using oversized or slotted holes unless specifically designed to accommodate moment.

.5 The following types of connections are to be designed as **slip-critical connections**:

.1 Connections where slippage cannot be tolerated, including:

1. All moment connections (unless end plate type moment connections are used.

2. Connections where welds and bolts share in transmitting shear forces at a common faying surface.

.2 Connections that utilise oversized holes.

.3 Connections subject to fatigue or frequent load reversals.

.6 OPEN WEB STEEL JOISTS

.1 Design steel joists and bridging to carry loads indicated or implied by the drawings in accordance with CSA-S16 or CSA-S136. In addition, design joints for any concentrated loads resulting from piping which runs parallel with the joists. Bottom chords shall be designed for a minimum point load of 2 kN at any location, except for bottom chords of joists directly above mechanical, electrical or equipment areas which shall be designed for a minimum point load of 4 kN at any location.

.2 Design joists and anchorages for uplift forces as indicated.

.3 Ensure joists are manufactured to consider load effects due to fabrication, erection and handling.

.4 Limit floor joist deflection due to specified live load to 1/360 of span.

.5 Limit roof joist deflection due to specified live load to 1/300 of span.

.6 For joist spans adjacent to rigid supports (e.g. bearing walls, rigid beams or trusses, or intermediate columns), gradually increase the stiffness of the joists in the vicinity of the rigid support such that the differential live load deflection between adjacent joists spaced at a distance "S" is within 1/300 of 2*S, for roof joists.

.7 Joists which will be permanently exposed shall be neat and uniform in appearance to the approval of the Architect.

1.6 Submissions

.1 Refer also to **Source Quality Assurance**.

.2 Refer also to **Quality Control.**

.3 Prior to submission of SHOP DRAWINGS, submit calculations and sketches for review that bear the stamp and signature of the Licensed Professional Engineer responsible for the design. The following are MANDATORY REQUIREMENTS:

.1 TYPICAL MOMENT CONNECTIONS.

.2 VERTICAL BRACINGS.

.3 COLUMN TO BASE PLATE CONNECTIONS.

.4 BEAM TO COLUMN SHEAR CONNECTIONS.

.5 BEAM TO BEAM CONNECTIONS.

.6 COLUMN TO COLUMN "VERTICAL" AND "FUTURE" CONNECTIONS.

.7 NON-STANDARD CONNECTIONS.

.8 OPEN WEB STEEL JOISTS.

.4 Submitted Shop Drawings shall cross reference to reviewed and approved calculations and sketches.

.5 **Shop Drawings**

.1 Provide erection drawings having a scale no less than the structural framing plans and detail drawings of individual members and complete information necessary for fabrication and erection.

.2 Copies of Structural Framing Plans and Sections utilized as erection drawings are not permitted unless permission is first sought from and granted by the Structural Consultant.

.3 Submit shop drawings for review as directed.

.4 All shop drawings shall bear a Professional Seal and Signature.

.5 OPEN WEB STEEL JOISTS:

.1 Provide layout drawings showing location of open web steel joists, and design calculations for joists, covering each case of joist total loading.

.2 Drawings and calculations must be prepared using **METRIC** units. If both imperial and metric units are shown, only metric units will be reviewed in context of the rubber stamp placed on each drawing.

.3 All steel joists shall be designed by a Professional Engineer experienced in this type of design and all drawings and calculations shall bear a Professional Seal and Signature.

.4 OWSJ shop drawings and calculations submitted for review and **NOT BEARING** the stamp of the Professional Engineer responsible for the OWSJ design, and **NOT ACCOMPANIED** by stamped calculations, will **NOT BE REVIEWED** and will be returned to the Contractor.

.6 Fabrication shall not commence until shop drawings are reviewed.

.7 Allow ten (10) working days for the review of drawings and supply as many copies for review and distribution as directed. Shop drawings shall be checked in detail by the Contractor and shall bear the checker's initials before submission.

.8 Drawings which fail to meet these requirements shall be returned marked **NOT REVIEWED** and must be re-submitted after correction.

.9 The review of shop drawings shall not relieve the Contractor of the responsibility of seeing that this work is complete, accurate and in conformity with the drawings and this specification.

.10 Only shop drawings bearing the review stamps shall be kept at the site.

PART 2 – PRODUCTS

2.1 Materials

.1 MATERIALS

.1 Structural steel sections and plates and all connection angles and plates shall conform to CSA Standard G40.20/G40.21 as follows:

W shapes – Grade 350W.
S shapes – Grade 300W.
HSS Shapes – Grade 350W (Class C unless noted).
Channels, Angles – Grade 350W.
Plates and Rod – Grade 300W.

Note that ASTM A500 grade C HSS columns are NOT an acceptable direct substitution for CSA G40.21.

.2 Welding materials: to conform to CSA Standard W59.

.3 High Strength Fasteners: Bolts, Nuts, and Washers to conform to ASTM F3125/3125M, grade A325.

.4 Anchor Rods: to conform to to ASTM F1554, Grade 36, unless otherwise noted on the drawings

.5 Sag Rods: to conform to CSA G40.20/G40.21.

.6 Strap Anchors: to conform to CSA G40.20/G40.21.

.7 Shear Stud Connectors: to conform to ASTM A108, F_y = 345 MPa [50 ksi].

.8 PAINT:

.1 General Steel: Shop Primer and Field “touch-up” Paint to conform to SSPC-PAINT 20 (Type I).

.2 For exterior exposed steel where surfaces are to be primed provide a Corrosion Resistant and Field "touch-up" Primer as follows:

Acceptable product:

.1 CARBOZINC 11, (Solvent based inorganic zinc)

.2 Colour, 0300 (GREEN) or 0700 (GRAY)

.3 Steel Surface Preparation:
A minimum, non-immersion SSPC-SP6 and obtain a 25 to 75 micrometres [1 – 3 mils] Angular Blast Profile.

.4 Dry Film Thickness:
50 to 75 micrometres [2 – 3 mils] applied by spray (airless or conventional) with constant agitation.

.5 Field Touch-Up:
Areas less than 0.1 m^2 [1 ft^2]: clean (SSPC SP-1) , manually abrade (SSPC SP-2 or SP-3) and touch-up with Carbozinc 859 (organic zinc, SSPC Paint 20, type II).
Areas more than 0.1 m^2 [1 ft^2]: Tape, re-blast to SSPC SP-6 and spray apply Carbozinc 11 (Inorganic Zinc, SSPC Paint 20, Type I).

.3 Where an epoxy paint (SSPC Paint 20) is specified in combination with a zinc-rich primer, provide a compatible epoxy paint as follows:

Acceptable product:

1. CARBOGUARD 890 (Cycloaliphatic Amine Epoxy)

2. Dry Film thickness: 100 to 150 micrometres [4.0-6.0 mils]

.4 For field "touch-up" of galvanized surfaces provide same product as touch-up primer.

.9 GALVANIZING: For connections at all members specified to be galvanized, provide galvanized nuts, bolts, washers, clip angles and plates etc.

PART 3 – EXECUTION

3.1 Fabrication

.1 Fabricate structural steel and joists to CSA S16 and W59, and in accordance with reviewed shop drawings.

.2 Provide drain holes in closed HSS Sections to prevent moisture build-up within the member.

.3 SHEAR STUDS

.1 Install Shear Studs as specified in accordance with CSA W59.

.2 Failure of any studs during bending of the studs to an angle of 30 degrees (towards the nearest column for composite beams) will be cause of rejection of the stud welding, and may require further testing at the consultant's discretion and at the contractor's expense.

.3 A 10% or greater failure rata at the welds of the tested studs will be cause for rejection of all the studs installed by the welder.

.4 Replacement of failed or rejected studs shall be at the contractor's expense.

3.2 Protection

.1 Refer to Section 05 12 13 [05121] "Architecturally Exposed Structural Steel" for protection requirements of Architecturally Exposed Structural Steel.

.2 Cleaning Steel

.1 Clean structural steel and joists in accordance with the table below.

.2 Clean surfaces within 50 mm (2") of any field weld location of materials which would prevent proper welding or produce objectionable fumes while welding is being completed.

.3 Painting

.1 Shop paint or galvanize structural steel in accordance with the table below. Refer also **Galvanized Sections** for additional requirements.

.2 Apply coating under cover, on dry surfaces only and when surface and air temperatures are above 5°C [41°F].

.3 Maintain dry conditions and 5°C [41°F] minimum temperature until coating thoroughly dry.

.4 Joints which are to be field welded shall be kept free of primer or other coating that could be detrimental to achieving sound weldment.

.5 FIELD TOUCH-UP for welds, scrapes, etc.

.1 General Interior Surfaces: ..... With specified coating

.2 Exterior Exposed Surfaces: ..... With specified coating

.3 Galvanized Surfaces:..... GALVAFROID or approved equal

Environment	Structural Member	Preparation	Protection	Remarks
Dry enviroment with structural steel encased in concrete, or masonry, or covered in non-corrosive contact type fire proofing	Structural Steel and joists	SSPC-SP3 Power Tool Cleaning	Leave Unpainted	
Protected (Inside vapour barrier)	Structural Steel not exposed to view	SSPC-SP3 Power Tool Cleaning	CISC/CPMA 1-73a	
	Joists not exposed to view	SSPC-SP2 Hand Tool Cleaning	CISC/CPMA 1-73a or SSPC Paint 15	
	Structural Steel or Joists exposed to view, but not designated as AESS	SSPC-SP7 Brush-Off Blast Cleaning	CISC/CPMA 2-75	.
Unprotected (outside vapour barrier and/or unconditioned space) but **not** exposed to chlorides. *(See note (a)*)	Structural Steel	SSPC-SP7 Brush-Off Blast Cleaning + SSPC-SP8 Pickling	Hot Dip Galvanize	Note additional requirements for galvanizing in specification sections.
	Joists	SSPC-SP6 Commercial Blast Cleaning	Inorganic zinc-rich primer (SSPC Paint 20, type 1)	
Unprotected (outside vapour barrier and/or unconditioned space) exposed to chlorides.	Structural Steel and Joists	SSPC-SP10 Near White Blast Cleaning	Inorganic zinc-rich primer (SSPC Paint 20, type I) and epoxy paint (SSPC Paint 22)	Provide topcoat SSPC Paint 36, Level 3, when exposed to sunlight

Notes:

(a) This includes canopies, outdoor screens, exterior mechanical support framing, shelf angles (including supporting brackets) and lintels in exterior walls.

(b) Submit proposed coating system for approval of consultant prior to application.

3.3 Galvanized Sections

.1 Apply galvanizing to all steel members as noted in clause 3.2.

.2 Fabricate all framing prior to galvanizing providing all required vent holes and cap plates to ensure complete internal and external coverage is required.

.3 Galvanize in accordance with A123/A123M to minimum coating of 610 g/m² [2 oz/ft²].

.4 All bolts, nuts, washers, connector plates, clips, etc. at member connections shall be galvanized.

.5 Galvanize members after shop welding has been completed.

.6 When welding after galvanizing is in place, grind away galvanizing at areas to be welded and touch-up with two coats of coating complying with SSPC PAINT 20, type II.

.7 In cases where galvanized framing is in contact with plain carbon steel locally provide two coats of coating to the plain steel complying with SSPC PAINT 32 where members are in contact.

.8 Where the galvanizing process of members may cause distortion of the structural framing, submit procedures for review by the Consultant and make good to tolerances noted in the contract documents.

.9 For joists, a 25 mm spacing between chord members is recommended. Provide larger spacing as required to suit the specified surface preparation.

.10 Identify at time of tender any splices or additional fabrication requirements due to the size, length or weight constraints imposed by the galvanizing process.

.11 FINISH PAINTING

Where finish painting is specified for galvanized surfaces, the galvanizer is to eliminate any after-galvanizing treatment that would normally be applied to the coating that will adversely affect paint adhesion.

3.4 Joist Bridging & Bottom Chord Roof Bracing

.1 All bridging, bracing and anchorages to be as required by the drawings and CSA S16.

3.5 Joist Bearing Anchorage

.1 Conform to Specification, Typical Details and Notes on drawings unless specifically noted otherwise.

.2 Joists bearing on steel shall be anchored with welds as shown on drawings and typical details. Welds shown are minimum.

.3 Joists bearing on masonry shall be welded to Wall Plates as shown on drawings and typical details. Welds shown are minimum.

.4 It is anticipated, in order to accommodate the roof slopes, (refer to Architectural Plans and Details) that it will be necessary to modify OWSJ shoes and/or to provide steel shims to achieve level and sound bearings. The Contractor is to provide all necessary shims, plates etc. in order to maintain uniform slopes, and sound bearing and anchorage.

.5 Anchors in Masonry for Wall Plates:

.1 Unless otherwise shown provide a minimum:

.1 For Floor Joists:..... Refer to typical details on drawings.

.2 For Roof Joists: ..... Two (2) 20 mm [3/4″] diameter anchor rods by 600 mm [24″] long.

.2 Embed all anchors vertically and grout in solid.

3.6 Bearing/Wall Plates for Beams

.1 Provide a minimum of two (2) anchors, 12 mm [1/2″] diameter by 300 mm [12″] long with 50 mm [2″] hook, for all bearing plates on masonry shall be embedded vertically and grouted in solid unless specifically noted otherwise on the drawings.

.2 Weld beams to plates with a minimum of two (2) 3 mm x 25 mm [3/16″ x 1″] fillet welds unless noted otherwise.

3.7 Relation to Other Trades

.1 Give all necessary directions for setting anchor rods, bearing plates and other members required to be built in with the work of other trades.

.2 Verify the location and condition of all bearing surfaces placed by others. All such surfaces shall be at the elevations called for on the drawings and shall be truly level.

.3 Commencement of erection implies acceptance of the work of other sections which affect the work of this section.

.4 No claim for relief from contractual responsibility or for extras to the contract will be allowed unless such claim is made in writing prior to commencement of the work.

.5 Ensure the proper bearing surface and amount of bearing is available to support steel members including open web steel joists.

.6 Supply materials and all necessary directions for installation of all anchor rods and bearing plates, and also clips, angles and weld plates for steel deck if and as required. Co-ordinate with steel deck supplier for their actual requirements.

.7 Weld approved anchor slots at 600 mm [24″] on center for adjustable masonry anchors, on all steel surfaces to be built into masonry.

.8 Supply and install wall anchors, ceiling extensions, and header supports for trimming openings for all OWSJ.

.9 Provide and reinforce to the approval of the Consultant, openings through beams required by other trades. Obtain approval of the Consultant for location of the holes. The cost for this work shall be paid for by the trade requiring the openings. Reinforce openings to maintain required design strength.

.10 Provide at any time before the drawings are approved, punched holes from 11 mm to 27 mm [0.43″ to 1.1″] diameter for the convenience of other trades as requested by them. Holes shall be placed so as not to cause any appreciable reduction in the strength of such members.

.11 Co-ordinate with the Mechanical and Electrical Drawings and Trades to ensure that there is no interference between ductwork, suspended lighting fixtures and hangers, and the open web steel joists and bridging, or other structural steel members.

.12 Wherever items are suspended from OWSJ, the securement shall be from the top chords of the joists at panel points only. Unless specific permission is given by the Structural Consultant.

.13 Refer to drawings for CONCRETE FILLED COLUMNS.

3.8 Lintels

.1 Generally lintels will be supplied only by this section and be placed by the General Contractor.

.2 Lintels shall conform to the Lintel Schedules, Notes and Typical Details on the Structural drawings.

.3 While every effort has been made to show all lintels which occur in load bearing masonry walls, it is the Contractor’s responsibility to ensure that the correct size and quantity of lintels are provided.

.4 Lintels in non-load bearing walls and partitions are generally NOT SHOWN ON THE DRAWINGS. All such lintels shall be provided as required and shall conform to the Notes & Typical Details on the structural drawings.

.5 Refer also to **Galvanizing** earlier in this section.

3.9 Erection

.1 Commencement of erection implies acceptance of the work of other sections which affect the work of this section.

.2 No claim for relief from contractual responsibility or for extras to the contract will be allowed unless such claim is made in writing prior to commencement of the work.

.3 Conform to the requirements of CSA S16.

.4 Provide a competent and experienced supervisor.

.5 Provide all necessary temporary bracing to keep structure safe and plumb. Bracing on structural drawings is for the finished building only.

.6 Report all lack of fit to the Consultant before correction.

.7 Provide and install all necessary packing under open web steel joist shoes. Packing to be of steel so placed as to distribute the joist reaction uniformly on the bearing.

.8 Obtain written approval from the Consultant prior to field cutting or altering structural steel framing or open web steel joists or bridging.

.9 Touch-up shop primer to bolts, welds, burned or scraped surfaces at completion of erection.

.10 Provide proper coordination between the structural steel contractor, the mechanical and electrical contractors to ensure that all required openings through structural steel members or OWSJ are approved and are clearly detailed on the Shop Drawings before fabrication and erection. (Openings are to be reinforced to maintain the required design strengths.) The costs of such openings and/or for the provision of openings installed in the field, are to be borne by the Contractor or the trade requiring the opening, and are not extra to the Contract.

3.10 Tolerances

.1 Conform to CSA S16 and to the Typical Notes on the drawings.

3.11 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultants of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

.4 The structural steel fabricators shall be certified by the Canadian Welding Bureau to the requirements of CSA W47.1, division 1 or 2.

.5 Searching visual inspection aided by a magnifying glass shall be carried out regularly on all joints during the course of welding and after completion by the fabricators designated welding supervisor, and also by the inspection company's representative. Emphasis shall be placed upon visual inspection to establish correct "Fit-Up" and "Pre-heating".

.6 All welds are to be stamped with the operator's number or symbols and the fabricator's number assigned by the Canadian Welding bureau with the requirements of CSA Standard W59.

.7 Finished shop work must be inspected and approved before shipping to site and field work must be inspected and approved before the removal of erection equipment from the job.

3.12 Notification

Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective. Advise the Inspection and Testing Company at least twenty-four (24) hours in advance of each fabrication and/or erection sequence.

3.13 Inspection and Testing

1. The General Contractor in agreement with the Dufferin Peel School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

2. The Inspection and Testing Company will conduct inspection and testing services per the following:

   .1 Specification Section 01 45 23 – Testing and Inspection Services – General Requirements.

.3 The following are responsibilities of the contractor regarding the Inspection and Testing Company:

.1 Co-operate with the representatives of the Inspection and Testing Company.

.2 Provide the Inspection and Testing Company with a copy of Specification, Structural Drawings and reviewed copies of shop drawings.

.3 Co-ordinate a program of inspection and testing with the Inspection and Testing Company, and advise the Consultant accordingly.

3.14 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the[Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 05 21 19

PART 1 – GENERAL

1.1 General Requirements

.1 The Contractor shall ensure that no asbestos containing materials are used in connection with the work of this section.

1.2 Reference Standards

.1 Comply with The Building Code Act, as amended, the 2024 Ontario Building Code (OBC) as amended and Regulations and by-laws of other authorities having jurisdiction, including latest amendments thereto; all hereafter referred to as Building Code.

.2 All codes, standard specifications and by-laws referred to in this Specification shall be current editions including all latest revisions, addenda and supplements, unless otherwise noted in the Building Code.

.3 Conform to the following CSA Standards:

.1 S136 ..... North American Specification for the Design of Cold Formed Steel Structural Members.

.2 W47.1 ..... Certification of Companies for Fusion Welding of Steel.

.3 W59 ..... Welded Steel Construction (Metal Arc Welding).

.4 Conform to the following ASTM Standards:

.1 A653/A 653M ..... Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.

.5 Conform to the following Canadian Sheet Steel Building Institute Standards:

.1 CSSBI 10M ..... Standard for Steel Roof Deck.

.2 CSSBI B13 ..... Design of Steel Deck Diaphragms.

.6 Comply with any Fire Rated Assembly Design specified for the project.

.7 In the event of conflict between reference standards, codes, drawings and specifications, the Contractor shall request clarification by the Consultant. The Consultant's decision as to which requirements govern shall be final and binding. Generally the more stringent provision shall govern. No extras to the contract will be approved due to such clarification.

.8 Conform to the Occupational Health and Safety Act, R.S.O. 1990, c. O.1, last amendment.

1.3 Design Requirements

.1 Design steel deck using limit states design in accordance with CSA S136 and CSSBI 10M.

.2 Wherever structural framing permits, steel deck shall be designed and fabricated to span continuously over at least four (4) supports (3 spans).

.3 Provide an adequate increase in thickness of metal to compensate for continuity wherever fewer supports may occur.

.4 Steel deck and connections to steel framing to carry dead, live and other loads including lateral loads, diaphragm action, and uplift as indicated.

.5 Deflection of roof deck under specified live or snow load not to exceed 1/300 of span.

1.4 Shop Drawings

.1 Submit erection drawings in accordance with directions.

.2 Fabrication shall not commence until drawings are reviewed.

.3 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.

.4 Shop drawings are to bear the Seal and Signature of the Licensed Professional Engineer responsible for the design.

.5 When requested submit design calculations complete with Stamp and Signature of the responsible Professional Engineer.

.6 Allow ten (10) working days for the review of shop drawings and supply as many copies for review and distribution as directed. Shop drawings shall be checked in detail by the General Contractor before submission. Drawings which fail to meet this requirement shall be returned marked NOT REVIEWED.

.7 The review of such drawings shall not relieve the Contractor of the responsibility of seeing that this work is complete, accurate and in conformity with the drawings and the specification.

PART 2 – PRODUCTS

2.1 Materials

.1 STEEL SHEET to ASTM A653/A653M (Structural quality) minimum grade 275 MPa [40 ksi] with a base nominal thickness (BNT) as noted on the drawings.

.2 ZINC COATING

.1 Unless otherwise noted, provide a ZF75 (galvanneal) coating as designated by ASTM A653/A653M.

.2 Where specified on drawings as GALVANIZED DECK, provide a Z275 coating as designated by ASTM A653/A653M.

.3 Deck surfaces which are designated for finish painting (Refer to Architectural Drawings & Finish Schedules) shall not receive chemical treatment that will adversely affect paint application.

.3 TYPES OF DECKING:

.1 Roof deck: Shall be single fluted element with ribs of depth as shown on the drawings.

.2 Acoustic deck: shall be single fluted element with ribs of depths shown on the drawings and with perforations on the vertical faces of the flutes, complete with a sound absorbing strip (fiberglass density 17.6 kg/m^3 [1.1 lb. / ft^2]) supplied by the deck fabricator for installation by the roofing contractor.

.3 Pre-finished deck: where designated is to be pre-painted, provide:

.1 Colorite HMP
.2 10000 Series
.3 Metallic Series
.4 Barrier Series
.5 Weather X

Colour to be selected later by the Architect from the manufacturer's standard colour chart.

.4 Deck shall have interlocking side joints between panels.

.4 FASTENERS FOR PRE-FINISHED DECK:

.1 Unless otherwise noted, provide self-drilling or self-tapping corrosion resistant fasteners. Acceptable type: #14 TEK screws or an approved equivalent.

.5 CLOSURES:

.1 Provide cover plates, edge stiffeners, cell closures and flashings from sheet steel similar to decking with a base nominal thickness of 0.76 mm [0.03″] (22 gauge). (Refer to Architectural Drawings).

.2 Provide and install closures at the top of all walls. Type to match the profile and finish of selected decking.

.6 PRIMER: conform to CAN/CGSB-1.181

.1 Acceptable product: CARBOZINC II by Carboline.

.7 METAL UPSTANDS/CURBS:

.1 Where required by the Architectural Drawings provide and install 1.6 mm [0.063″] (16 gauge) galvanized metal upstands.

PART 3 – EXECUTION

3.1 Preparation

.1 Verify the location and condition of all bearing surfaces placed by others. All such surfaces shall be at the elevation called for on the drawings.

.2 Commencement of erection implies acceptance of the work of other sections, which affect the work of this section.

.3 No claim for relief from contractual responsibility or for extras to the contract will be allowed unless such claim is made in writing prior to commencement of the work.

.4 Protect steel deck during shipping and handling in accordance with CSSBI standards.

.5 The steel deck welder must be certified to CSA W47.1 for fusion welding of steel deck.

3.2 Fabrication & Erection

.1 Conform to CSA S136, CSA W59, CCSBI 10M.

.2 Erect steel decking as indicated to manufacturer’s direction and to reviewed shop drawings.

.3 No hangers or brackets supporting mechanical and electrical services, artwork, ceilings, bulkheads, lighting, etc. shall be hung directly from the floor or roof deck. All point loads must be applied directly to structural steel framing unless otherwise shown or approved by structural consultant.

.4 Accurately align the deck and lap at supports. Use 50 mm [2″] minimum lap.

.5 Supply and place steel packing as required to produce an even bearing pressure at supports.

.6 Any material which has been damaged shall be replaced at no expense to the owner.

.7 Provide for ribs to bear on beams parallel to flutes when tops of such beams are at same elevation as deck bearing.

.8 Provide reinforcing stiffeners for unsupported edges of metal deck.

.9 Install 50 x 50 x 6 mm [2″ x 2″ x ¼″] steel angles or formed channels perpendicular to flutes, welded to 2 flutes each side of opening for deck openings from 150 to 450 mm [6″ to 18″] in size. No reinforcement required for openings cut in the deck that are smaller than 150 mm [6″] square.

.10 For deck openings over 450 mm [18″] and for areas of concentrated load, reinforce in accordance with structural framing details.

.11 Install closures and upstands as shown on drawings and reviewed shop drawings.

.12 After alignment and levelling and unless otherwise noted on drawings, the minimum attachment of the deck to the bearing surfaces and the minimum side lap connections between deck units shall be:

.1 For 38 mm deck profiles, connect the first, third, fifth and seventh low corrugations (36/4 configuration), and each support parallel to flute direction at 300 mm [12″] maximum centers. Connections shall be made using either an arc spot weld with 20 mm [3/4″] nominal top diameter, or mechanically fastened using Hilti powder actuated fasteners (X-HSN24, HILTI X-ENP19, or equivalent).

.2 Side laps of adjacent nestable units shall be crimped together at 900 mm [36″] centres, or fastened with Hilti M HWH screws (SLCO1, SLC02, or equivalent) at 900mm [36”] on centre.

.13 Immediately after decking is permanently secured in place, where top and/or bottom surfaces have been burned by welding or where surface coating has been damaged during transit or in erection.

.1 Touch-up galvannealed surfaces with coating complying with SSPC-PAINT 20.

3.3 Quality Control

.1 Implement a system of quality control to ensure that the minimum standards specified herein are attained.

.2 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and give recommendations in writing.

.3 The Consultant 's general review during construction and inspection and testing by Independent Inspection and Testing Companies reporting to the Consultant are both undertaken to inform the Consultant of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve the Contractor of contractual responsibility. The contractor is solely responsible for quality control and shall implement its own supervisory and quality control procedures.

3.4 Notification

1. Prior to commencing significant segments of the work, give the Consultant and Independent Inspection and Testing Companies appropriate notification so as to afford them reasonable opportunity to review the work. Failure to meet this requirement may be cause for the Consultant to classify the work as defective.

3.5 Inspection and Testing

1. The General Contractor in agreement with the Dufferin Peel School Board and Prime Consultant will appoint an Independent Inspection and Testing Companies to make inspections or perform tests as the Consultant directs. The Independent Inspection and Testing Companies shall be responsible only to the Consultant, and shall make only such inspections or tests as the Consultant may direct. The representative of the Inspection and Testing Company shall NOT be required to supervise or instruct the Contractor.

2. The Inspection and Testing Company will conduct inspection and testing services per the following:

.1 Specification Section 01 45 23 – Testing and Inspection Services – General Requirements.

.3 The following are responsibilities of the contractor regarding the Inspection and Testing Company:

.1 Co-operate with the representatives of the Inspection and Testing Company.

.2 Provide the Inspection and Testing Company with a copy of Specification, Structural Drawings and reviewed copies of shop drawings.

3.6 Defective Materials and Work

.1 Where evidence exists that defective work has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, analytical calculations of structural strength, made and the like, in order to help determine whether the work must be corrected or replaced. Tests, inspections or surveys or calculations carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Consultant's opinion, the work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of The Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

.3 Materials or work which fail to meet specified requirements may be rejected by the Consultant whenever found at any time prior to final acceptance of the work regardless of previous inspection. If rejected, defective materials or work shall be promptly removed and replaced or repaired to the satisfaction of the Consultant, at no expense to the Owner.

END OF SECTION 05 31 23

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 03 30 00 – Cast-in-Place Concrete

.3 Section 04 21 13 – Masonry

.4 Section 05 12 23 – Structural Steel

.5 Section 05 21 00 – Steel Joist Framing

.6 Section 05 31 00 – Steel Deck

.7 Section 09 91 22 – Painting

1.2 REFERENCES

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

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

.2 ASTM A269-02, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service

.3 ASTM A307-02, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer

.2 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating

.3 CISC/CPMA 1 – 73B, Quick Drying, One-Coat Paint for Use on Structural Steel

.4 CISC/CPMA 2 – 75, Quick Drying, Primer for use on Structural Steel

.3 Canadian Standards Association (CSA International)

.1 G40.20-04: General Requirements for Rolled or Welded Structural Quality Steel

.2 G40.21-04 (R2009): Structural Quality Steel

.3 CAN/CSA G164-M92 (R2003): Hot Dip Galvanizing of Irregularly Shaped Articles

.4 CSA S16.1-09: Limit States Design of Steel Structures

.5 CAN/CSA – S136-07: North American Specification of the Design of Cold-formed Steel Structural Members

.6 CSA W47.1-09: Certification of Companies for Fusion Welding of Steel

.7 CSA W59-03 (R2008): Welded Steel Construction (Metal Arc Welding)

.8 CSA NSS.3-1965 (r2003): Resistance Welding Qualification Code for Fabricators of Structural Members in Buildings

.4 The Environmental Choice Program

.1 CCD-047a-98, Paints, Surface Coatings

.2 CCD-048-98, Surface Coatings - Recycled Water-borne

1.3 SUBMITTALS

.1 Shop Drawings

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

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Deliver, store, handle and protect materials in accordance with manufacturer recommendations.

.2 Storage and Protection:

.1 Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.

.2 Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Steel sections and plates: to CSA-G40.20/G40.21, Grade 350W for hollow structural sections Class H and Grade 300W for Plates and Flat Shapes.

.2 Welding materials: to CSA W59.

.3 Bolts and anchor bolts: to ASTM A307.

.4 Stainless steel tubing: to ASTM A269, Type 316 alloy, Seamless welded with AISI No. 4 finish.

.5 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.

2.2 PRIMERS, COATINGS AND SHOP PAINTING

.1 Interior Steel in Dry Areas: Quick drying oil alkyd conforming to CISC/CPMA 2.75.

.2 Exterior Steel, Interior Steel in Unheated Areas, Steel Embedded in Concrete**:** Hot dip galvanized conforming to CSA G164, minimum Z275 coating. Galvanizing of structural steel components and loose lintels: refer to Section 05 12 23.

.3 Galvanized Coating Touch-Up**:** W.R. Meadows “Galvafroid” or Kerry Industries “Z.R.C.” zinc rich coating or similar manufacturer containing minimum 90% zinc by weight.

.4 Apply two (2) shop coat(s) of primer or coating as indicated above and according to manufacturers recommendations. Do not prime aluminum, stainless steel or those components to be galvanized or encased in concrete.

.5 Use primer unadulterated, as provided by manufacturer. Paint on dry surfaces free from rust scale and grease. Do not paint when temperature is lower than 10 deg. Celsius and rising.

.6 Clean surfaces to be field welded; do not paint.

2.3 FASTENINGS

.1 Use nuts and bolts conforming to ASTM A307, A325, and A563 as applicable.

.1 For interior work, use cadmium-plated fastenings where other protection is not specified.

.2 For exterior work, use Type 300 or 400 stainless steel.

2.4 ANCHORS AND SHIMS

.1 For exposed anchorage of aluminum, if applicable, use stainless steel and otherwise to match metal anchored. For non-exposed work, anchors and shims may be galvanized steel.

2.5 PIPE

.1 To ASTM A53, extra strong steel pipe for bollards.

2.6 BITUMINOUS PAINT

.1 Alkali-resisting to meet specified requirements of CAN/CGSB-1.108, Type 2. Use to insulate contact between dissimilar metals.

2.7 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

.5 Weld all connections where possible, and bolt where not possible unless indicated otherwise on drawings.

.6 Weld all stainless steel by the Argon Arc Process. Grind smooth and polish joints, crence-free, and flush without seams.

2.8 LIST OF MISCELLANEOUS METAL FABRICATIONS

.1 This Section includes, but is not limited to the following list. Note: Galvanize all exterior items and other items noted. Prime paint all interior items.

.1 Anchors, Bolts, Inserts, Sleeves for work in this Section.
.2 Miscellaneous angles at edges of exposed ceilings to cover insulation in deck flutes.
.3 Bench Supports and Shelf Brackets (see ADs).
.4 Mechanical Room Steel Stairs, railings, handrails.
.5 Stairs and guardrails.
.6 Stainless Steel handrails.
.7 Perforated Steel Guardrail
.8 Fire route gate (see ADs).
.9 Access Stair & Ladder.
.10 Shelf Brackets and Hooks (see Drawings).
.11 Bollards (see ADs).
.12 Soccer Goal Posts (see ADs).
.13 Stage Rigging & Support Angles (also refer to Ads and specification section).
.14 Removable Stage Railing.
.15 HSS columns at Garbage Bin Enclosure (see ADs).
.16 Wrap Around Steel Door/Wall Jamb
.17 Gym Storage Fence and Gate.
.18 Threaded rod, turnbuckle and connections to structure for sliding door 117C
.19 Hangers and Supports (for work in this Section).
.20 Lintels (if not by Structural Steel).
.21 Gym Chair Dollies at Stage

Part 3 Execution

3.1 GENERAL

.1 Supply and install all miscellaneous metal work indicated on the Drawings and not indicated in work of other Sections in addition to items listed below.

3.2 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Consultant such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Provide components for building by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CSA-S16.1, or weld.

.7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.8 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.

.9 Touch-up galvanized surfaces with zinc rich primer where burned by field welding. Spray or brush apply a minimum of three (3) coats of zinc-rich paint to achieve a dry film thickness of 8 mils. Apply a finish coat of aluminum paint to provide a colour blend with the surround galvanizing.

3.3 WALL BENCHES AND UPPER SHELF

.1 Steel Angles, Steel Channel, Flat Bar Steel, Steel Rod as indicated on details.

.2 Use secure round head fasteners or countersink holes for flat head screws.

.3 Prime paint: Galvafroid.

.4 Chamfer cut ends of Rod 2 mm.

.5 Refer to AD drawings.

3.4 STEEL STAIRS

.1 Refer to Structural Drawing for Stair Construction Components. The sizes shown on structural drawings are minimum sizes. The stairs and its components shall be designed and certified by Fabricator's design Engineer licenced in the Province of Ontario.

.2 Refer to stair drawings for dimensions, location, and guardrail details.

.3 Note: install stairs, handrails, plumb, level, rigid and secure, as per details shown on Drawings.

.4 Provide shop drawings indicating profiles, sizes, connections, anchorage, etc. stamped and certified by a Professional Engineer (P. Eng.). The Engineer shall visit the site on periodic basis during construction, report in writing for each visit and upon completion of work and provide a certificate stating that the work was performed in general conformance with the drawings and specifications.

3.5 STAINLESS STEEL HANDRAILS

.1 Stainless steel tubing: to ASTM A269, Type 316 alloy, Seamless welded with AISI No. 4 finish.

.2 Locations: Stair A 112 and Stage 157 (removable)

3.6 PERFORATED STEEL GUARDRAILS

.1 Provide perforated steel guardrails at main central stair Foyer 111 to second level, as described on drawings.

.2 Perforated steel panels to be 10 gauge 304SS stainless steel, or 10 gauge steel panel with factory applied powder coat finish, all sides.

.3 Hole Size: 1/16" (0.063") dia. x 3/32" (.093") centres; 41% open area, with 60 degree stager, or similar stock material within 0.003" variation.

.4 Cut sheets to sizes indicated on drawings.

.5 Provide 400mm x 400mm sample of metal panel to architect for approval prior to fabrication.

.6 Design guards to have minimum design load of 2.2 kN/m horizontally and 1.5 kN/m vertically.

.7 Wellington Perforated Sheet & Plate Inc., Fergus ON 519-843-5280, Accurate Screen & Grating, Toronto 877 564-3381, Russel Metals, Ferrier Wire and Design Metals 888.769.5280, or other local supplier.

3.7 GATE

.1 Welded steel pipe construction, as shown on AD 218 drawing. Galvanize after fabrication.

.2 Provide post & wheel to vehicle gate to prevent sagging.

3.8 ACCESS STAIR & LADDER

.1 Fabricate interior and exterior roof access ladders as described on drawing 517. Typical Construction is detailed on Structural Drawings.

3.9 WALL BRACKETS AND HOOKS

.1 As shown on Drawings - prime paint.

3.10 BOLLARDS

.1 Supply and install galvanized steel bollards as shown on Drawings. Bollards shall be 150 mm diameter x 9.5 mm thick wall at 1200 mm high, seamless steel pipe. Install 1200 mm into a concrete foundation. Fill bollard with 25 MPa concrete and round top. Round top of footing also. For number of Bollards required - refer to Drawings.

.2 Refer to drawing AD 209.

3.11 SOCCER GOAL POSTS

.1 Refer to drawing AD 211 in Specification Binder C for information. Provide 1 moveable goalpost at each end of play field (2 in total).

.2 Goalposts can also be supplied by a gymnasium equipment supplier listed in Section 11 52 00. Moveable goalposts must meet the required size as described in AD 211.

3.12 STAGE RIGGING & SUPPORT ANGLES

.1 Refer to ADs for details.

3.13 REMOVABLE STAGE RAILING

.1 Refer to drawings.

3.14 GARBAGE BIN ENCLOSURE

.1 Refer to drawings AD 221 & AD 222 for details.

3.15 WRAP AROUND STEEL JAMBS

.1 Refer to drawings.

.2 Provide full heigh at opening of overhead door at Learning Commons 115.

3.16 GYM STORAGE FENCE AND GATE

.1 Wire Storage System:

.1 Welded wire mesh partition and swing doors as manufactured by Spinnaker.

.2 Provide a complete assembly, complete with hinges and locking hasps; for Gym Storage compartment.

3.17 DUST COLLECTOR GATE

.1 Provide a complete assembly as shown on drawings, complete with acoustic louvre (refer to specification Section 08 92 00 Louvres) hinges and locking hasps.

3.18 GALVANIZED STEEL

.1 Galvanize steel members, fabrications, and assemblies after fabrication by the hot dip process in accordance with CSA G164, minimum Z275 coating.

.2 Galvanize bolts, nuts and washers and iron and steel hardware components in accordance with CSA G164.

.3 Safeguard products against steel embrittlement in conformance with ASTM A143.

.4 Design features which may lead to difficulties during galvanizing shall be pointed out prior to dipping.

.5 The composition of metal in the galvanizing bath shall be not less than 98.0% zinc.

3.19 ERECTION

.1 Erect work in accordance with shop drawings and in coordination with trades whose work relates to this Section

.2 Erect work plumb, straight, square and accurately fitted with tight joints at intersections.

.3 Where possible install work in one continuous piece.

.4 Anchor all components to structure, walls, and floors as required with weld or other methods of anchorage approved by the Consultant.

3.20 TOUCH-UP AND REPLACEMENT

.1 Touch-up adjacent primed surfaces burned, scratched or otherwise damaged during erection with prime paint, to match shopcoat, or galvafroid for galvanized when erection is completed.

.2 Paint over bare areas on galvanized surfaces and welds with zinc rich paint.

.3 Replace damaged or unacceptable materials indicated by the Consultants.

3.21 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 10 00 – Concrete Forms and Accessories.

.2 Section 08 11 14- Steel Doors and Frames.

.3 Section 07 50 13 – Common Work Results for Roofing*

.4 Section 07 50 16 – Rough Carpentry for Roofing *coordinate responsibilities with this Section and Work Division Table in Section 07 50 13.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA B111-[1974(R1998)], Wire Nails, Spikes and Staples.

.2 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA O121-[M1978(R1998)], Douglas Fir Plywood.

.4 CAN/CSA-O141-[91(R1999)], Softwood Lumber.

.5 CSA O151-[M1978(R1998)], Canadian Softwood Plywood.

.6 CAN/CSA-O325.0-[92(R1998)], Construction Sheathing.

.7 CAN/CSA-086M-01(R2006), Engineering Design in Wood.

.2 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber [2000].

1.3 QUALITY ASSURANCE

.1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

.3 Plywood, OSB and wood based composite panel construction sheathing identification: by grademark in accordance with applicable CSA standards.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused wood materials from landfill to recycling, reuse, composting facility approved by Consultant.

.3 Do not dispose of preservative treated wood through incineration.

.4 Do not dispose of preservative treated wood with materials destined for recycling or reuse.

.5 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by Consultant.

.6 Dispose of unused wood preservative material at official hazardous material collections site approved by Consultant.

.7 Do not dispose of unused preservative material into sewer system, into streams, lakes, onto ground or in other locations where they will pose health or environmental hazard.

Part 2 Products

2.1 LUMBER MATERIAL

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:

.1 CAN/CSA-O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

.1 Douglas fir Graded 122-C, construction or No. 2 Pine, pressure treated in accordance with CSA 080M.

.2 Board sizes: "Standard" or better grade.

.3 Dimension sizes: "Standard" light framing or better grade.

.4 Post and timbers sizes: "Standard" or better grade.

.5 Fasteners: Proprietary fasteners toggle bolts, expansion shields and lag bolts, crews and lead or inorganic fire plugs, explosive actuated fastening devices, recommended for purpose by manufacture. Use stainless steel or galvanized to CSA G164-M1981 fasteners for all exterior fastening and for any damp or moist areas.

.6 Wood Preservatives: Surface-applied wood preservative: clear copper napthenate or 5% pentachlorophenol solution, water repellent preservative.

.7 Material shall be straight, sawn square, true, dressed four sides properly sized, shaped to correct dimensions from nominal sizes noted on Drawings.

2.2 PANEL MATERIALS

.1 Douglas fir plywood (DFP): to CSA O121, standard construction, good one side with waterproof adhesive.

2.3 ACCESSORIES

.1 Nails, spikes, staples, screws, bolts anchors lag screws, special fastening devices and supports required for erection of all carpentry components: to CSA B111. Use galvanized components where exposed to exterior atmosphere.

2.4 FINISHES

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work and interior highly humid areas.

Part 3 Execution

3.1 GENERAL

.1 Supply and install all other carpentry shown on drawings or as required for completion of work. Co-operate with other trades in installing items supplied by other sections, cut openings in woodwork when so required and make good disturbed surfaces.

3.2 PREPARATION

.1 Do all wood framing in accordance with the Ontario Building Code and Can3 086M 01 (2006).

.2 Machine dressed work shall be slow fed using sharp cutters and finished members shall be free from drag, feathers, slivers or roughness of any kind.

.3 Frame materials with tight joints rigidly held in place.

.4 Design construction methods for expansion and contraction of the materials.

.5 Erect work plumb, level, square and to required lines.

.6 Be responsible for methods of construction for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other trades.

3.3 FURRING AND BLOCKING

.1 Supply and install furring and blocking, required.

.2 Align and plumb faces of furring and blocking to tolerance of 1:600.

3.4 ROUGH BUCKS AND NAILERS

.1 Install wood bucks and nailers, as indicated, including wood bucks and linings around frames for doors and windows.

.2 Except where indicated, otherwise, use material at least 38 mm thick secured with 9 mm bolts located within 300 mm from ends of members and uniformly spaced at 1200 mm between.

.3 Countersink bolts where necessary to provide clearance for other work.

3.5 ROOF FASCIAS, CANTS, NAILERS CURBS

.1 Install wood cants, fascia backing, nailers, curbs and other wood supports for roofing, sheet metal fork, roof mounted equipment.

.2 Secure with galvanized 9 mm bolts, where indicated, galvanized nails elsewhere. Locate fastenings within 300 mm from ends and uniformly spaced between. Space bolts at 1200 mm and nails at 600 mm centres, except where indicated otherwise.

.3 Staple vapour retardant sheet strip to underside of nailers before installation. Apply strip continuous with 200 mm overlap at joints, free of wrinkles and tears, with at least 200 mm exposed for overlap on roof deck.

.4 Install wood nailers for roof hoppers, dressed, tapered and recessed slightly below top surface of roof insulation.

3.6 SUPPORTS FOR MECHANICAL UNITS

.1 Performed by Section 07 50 16. Refer to Section 07 50 13 for work division.

3.7 PRESSURE TREATED WOOD

.1 Use wood pressure treated in accordance with CSA 080M for all wood members in contact with exterior walls and roofs.

.2 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.8 GARBAGE ENCLOSURE DOORS

.1 Supply and install 38 mm x 140 mm pressure treated wood slats to front of garbage enclosure doors.

.2 Fasten each slat to steel frames with 2 screws at top, bottom and at diagonal bracing.

3.9 INSTALLATION OF HOLLOW METAL FRAMES

.1 Set frames plumb and square in their exact location and at correct elevation. Firmly block and brace to prevent shifting. Shim up where required to ensure proper alignment dimensions from finished floor to head of frame. Install temporary wood spreaders at mid-height.

.2 Where pressed steel frames are installed in concrete walls, secure frames to concrete using lead expansion shields and anchor bolts through pipe sleeves. Perform drilling of concrete as required. Fill recessed bolt heads flush to frame face with approved metal filler and sand smooth.

.3 Install fire rated door frames in accordance with requirements of National Fire Code Volume 4, produced by The National Fire Protection Association (NFPA 80).

3.10 GENERAL

.1 Supply and install all other carpentry shown on drawings or as required for completion of work. Co-operate with other trades in installing items supplied by other sections, cut openings in woodwork when so required and make good disturbed surfaces.

3.11 ERECTION

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other work.

3.12 INSTALLATION

.1 Lay out work carefully and to accommodate work of others. Cut and fit accurately. Erect in position indicated by drawings. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid bracing.

.2 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolthead and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of work.

.3 Co-operate with work of other Sections to ensure that unity of actions will ensure orderly progress to meet construction schedule.

.4 Provide anchors, bolts and inserts, required for attachment of the work of this Section, to those performing the work of other Sections and who are responsible for their installation.

.5 Work shall include rough hardware such as nails, bolts, nuts, washers, screws, clips, hangers, connectors, and strap iron required for installation of work and all operating hardware required on work of this Section for temporary use.

.6 Do no attach work by wood plugs or blocking in concrete or masonry. Use lead shields, expansion shields, concrete nails, or similar methods only as approved by the Architect.

.7 Do not regard grounds, blocking, furring, and such other fastening provisions as shown on Drawings as exact or complete. Provide required provisions for fastening, located and secured to suit site conditions, and adequate for intended support.

.8 Cut fastening work into lengths as long as practicable and with square ends. Erect work plumb, in true planes, and fastened rigidly in place.

.9 Grounds around openings in cavity wall systems, under sills and thresholds to provide continuous support shall be 50mm (2”) minimum thickness, preservative treated.

.10 Install supports and furring members as required to receive components of cabinetwork.

.11 Install blocking at roofs, as indicated on Drawings, secured permanently to structure, trimmed and levelled to accommodate roofing components, and to receive flashings.

.12 All members shall be accurately cut to length, angle and be true to line to assure tight joints.

.13 Correct alignment and plumb must be maintained until specified lateral bracing is installed. Cutting and altering of trusses is not permitted except by approval by the Engineer. Heavy concentrated loads must not be placed on top of trusses until permanent

bracing and decking have been installed. In any event, these temporary loads must not exceed the truss design loads.

3.13 SCHEDULES

.1 Provide electrical equipment backboards for mounting electrical equipment as indicated. Use 19mm thick plywood on 19 x 38 mm furring around spacing, perimeter and at maximum 300 mm intermediate

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 10 11 – Rough Carpentry.

.3 Section 06 47 00 – Plastic Laminates.

.4 Section 08 80 50 – Glazing.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)

- .1 ANSI A208.1-[99], Particleboard.
- .2 ANSI A208.2-[94], Medium Density Fiberboard (MDF).

.2 American Society for Testing and Materials (ASTM)

- .1 ASTM E1333-[96], Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
- .2 ASTM D2832-[92(R1999)], Standard Guide for Determining Volatile and Non-volatile Content of Paint and Related Coatings.
- .3 ASTM D5116-[97], Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.

.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC)

- .1 AWMAC Quality Standards for Architectural Woodwork.

.4 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.

.5 Canadian Standards Association (CSA)

- .1 CSA B111-[74(R1998)], Wire Nails, Spikes and Staples.
- .2 CSA O112.4-[M1977(R1999)], Standards for Wood Adhesives.
- .3 CSA O112.5-Series-M-[1977(R1999)], Urea Resin Adhesives for Wood (Room- and High-Temperature Curing).
- .4 CSA O112.7-Series M-[1977(R1999)], Resorcinol and Phenol-Resorcinol Resin Adhesives for Wood (Room- and Intermediate-Temperature Curing).
- .5 CSA O115-[M1982(R2001)], Hardwood and Decorative Plywood.
- .6 CSA O121-[M89(R1998)], Douglas Fir Plywood.
- .7 CAN/CSA O141-[91R1999], Softwood Lumber.
- .8 CSA O151-[M1978(R1998)], Softwood Plywood.
- .9 CSA O153-[M1980(R1998)], Poplar Plywood.
- .10 CSA Z760-[94], Life Cycle Assessment.

.6 Environmental Choice Program (EPC)

.1 ECP-44-[92], Adhesives.

.2 ECP-45-[92], Sealants and Caulking Compounds.

.3 ECP-76-[98], Surface Coatings.

.7 International Organization for Standardization (ISO)

.1 ISO 14040-[97], Environmental Management-Life Cycle Assessment - Principles and Framework.

.2 ISO 14041-[98], Environmental Management-Life Cycle Assessment - Goal and Scope Definition and Inventory Analysis.

.8 National Electrical Manufacturers Association (NEMA)

.1 NEMA LD-3-[95].

.9 National Hardwood Lumber Association (NHLA)

.1 Rules for the Measurement and Inspection of Hardwood and Cypress [, January 1996].

.10 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber [, 2000].

1.3 SHOP DRAWINGS

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

.2 Indicate details of construction, profiles, jointing, fastening and other related details.

.1 Scales: profiles full size, details 1/2 full size.

.3 Indicate materials, thicknesses, finishes and hardware.

1.4 SAMPLES

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

.2 Submit duplicate samples: sample size 300 x 300 mm samples of each type of paneling laminate, melamine and each type of solid wood or plywood to receive stain or natural finish.

.3 Submit a typical prototype unit representative of the work of this section.

1.5 QUALIFICATION

.1 Millwork manufacturer to have not less than 5 years proven first class experience in institutional millwork and provide a maintenance bond as specified below.

1.6 GUARANTEE

.1 This architectural woodworker shall furnish the owner with a two (2) year AWMAC Guarantee Certificate, or an equivalent maintenance bond, to the full value of the

architectural woodwork sub-contract, certifying that the architectural woodwork has been manufactured and/or installed in accordance with the standards incorporated in the AWMAC Quality Standards Manual, (edition in effect at time of tender). Those

providing the maintenance bond, instead of the Guarantee Certificate, to submit a letter from their insurer stating that they will provide the bond. A copy of this letter to be attached to their tenders. The Guarantee shall cover replacing and/or refinishing to make good any defects in architectural woodwork due to faulty workmanship or defective materials supplied by this architectural woodworker, which appear during a two (2) year period following the date of substantial completion of the project.

1.7 INSPECTION

.1 Architectural woodwork shall be manufactured and/or installed to the specified AWMAC Quality Standards and shall be subject to an inspection at the plant and site by an appointed inspector, approved by the AWMAC Chapter. Such inspection costs shall be paid from Cash Allowances. Shop drawings shall be submitted for review or approval before any work is commenced. Any work which does not meet AWMAC Quality Standards, as specified, shall be replaced by this architectural woodworker, at no additional cost to the owner and to the satisfaction of the consultant and the inspector.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Protect millwork against dampness and damage during and after delivery.

.2 Store millwork in ventilated areas, protected from extreme changes of temperature or humidity.

Part 2 Products

2.1 MATERIALS

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 10 % or less for interior work in accordance with following standards:

.1 CAN/CSA-O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.3 AWMAC premium grade, moisture content as specified.

.2 Hardwood lumber: moisture content 10% or less for interior work in accordance with following standards:

.1 National Hardwood Lumber Association (NHLA).

.2 AWMAC premium grade, moisture content as specified.

.3 Species: to be Maple unless otherwise noted.

.3 Hardwood plywood: to CSA O115, of thickness indicated, rotary cut face veneer, birch plywood, veneer core, No. 1 grade. Select veneers to provide book match veneer strips to be 240 mm wide minimum.

.1 Species: to be Birch, unless otherwise noted.

.4 Nails and staples: to CSA B111, galvanized for exterior work, interior high-humidity areas and for treated lumber; plain finish elsewhere. Use spiral thread nails except where specified elsewhere.

.5 Particle Board core: to CAN3-0188.1-M78, Grade R, 720 kg/m3 density in thicknesses indicated.

.6 Plywood core for shelving: to CSA 0120.

2.2 PLASTIC LAMINATE

.1 Refer to Section 06 47 00.

2.3 MELAMINE FACED PARTICLEBOARD

.1 To CAN3-0.188.1-M78, Grade "R" particleboard sanded faces, 13 mm, 16 mm, and 19 mm thickness, faced with laminated plastic. Melamine resin impregnated cover sheet with coloured and/or pattern paper inner layer. Thermally fuse to rigid particleboard substrate. Melamine faces shall be 8 mil thickness. Wood grain pattern to be chosen by Consultant from manufacturer's full range.

.1 Acceptable Material: Melamine faced particleboard as manufactured by Flakeboard, Formica or Arborite Division of Domtar Construction Materials Ltd., are of acceptable quality but colour/pattern requires approval prior to confirmation of full acceptance.

2.4 EDGE BANDING

.1 Solid polyvinyl chloride (PVC), 3 mm thickness x full width of panel edge, colour/pattern to match finished face of melamine panel or as selected by Consultant. All exposed edges of banding to be radiused to 2 mm radius after installation on panels. Submit sample of edge-banded panel with radiused edges to Consultant for approval prior to fabrication of architectural woodwork.

.1 Acceptable Material: Solid PVC edging as manufactured by "Woodtape" Edge-Banding.

.2 Acceptable Material: Solid PVC edging as manufactured by "Complast Inc."

2.5 CABINET HARDWARE

.1 Furnish and install all hardware to custom casework as follows:

.1 Cupboard Doors - 19 mm thick.:

.1	Hinges	200 Series 110° Salice
.2	Roller Catches	807N 2G (SgDr) Onward
.3	Elbow Catches	T03222 C15 (DhDr)
.4	Door Pulls	CBH235-3 1/2" C32D
.5	Cupboard Locks	8703/8704 14a National

.2 Drawers - 19 mm thick.:

.1	Drawer Slides	"Accuride Slide" 3832-2G full extension with ball bearing rollers, 100lb. capacity
.2	Drawer Pulls	CBH235-3 1/2" C32D
.3	Drawer Locks	8703 - 14a National

.3 Shelving:

.1	Plaster strips	KV255 Zinc Knape & Vogt

.2 Shelf Clips KV256 Zinc Knape & Vogt

.4 Cupboard Doors - 35 mm thick.:

.1 Hinges F179 76x76 Stanley C15

.2 Roller Catches 504N Onward C26

.3 Surface bolt 043-4 X Angle Strike C15

.4 Door Pulls CBH245-4 1/2" C32D

.5 Cupboard Locks supplied and installed under Section 08710

.5 Closet Rods and Flanges

.1 Rods: chrome finish, Ø 33 mm.

.2 Flanges: chrome finish, closed flanges at both ends of rods.

.6 Shelf and Rod Steel, white enamel, model No. 1797, manufactured by Hager.

.7 Display Case:

.1 Pilaster Strips: Brush Finish

.2 Shelf Brackets: Brush Finish

.3 Aluminum sliding track, top and bottom to accommodate sliding glass doors

.4 Lock sets and all required hardware for sliding glass door display system

.5 Glazing: 12mm tempered glass for shelves. 8mm tempered glass for sliding doors. Glazing to display cases to be provided by Section 08 80 50 and installed by this Section 06 40 00.

.8 Rubber Corner Guards:

.1 Provide and install purpose made rubber corner guards on the corners of the kindergarten carts as described in AD drawings.

.2 Model 06927 Corner Bumper by Colson Caster Corporation or others approved by consultant.

.9 Safety Release Coat Hook:

.1 Safety Release Coat Hooks to be supplied and installed under Section 10 11 25 Manufactured Specialties in Washrooms and Kindergarten Classrooms. Refer to Section 10 11 25 for information.

.10 Computer Desk Support Bracket

Hafele Hebgo Bracket, model no. 287-44-489, 150 kg capacity per pair, grey powder coat, refer to AD 611.

.11 Heavy Duty Lock Castors:

.1 Swivel Castors with brake, 2" x 2-1/2" (40kg): Part 00K21.21, as distributed by Lee Valley Tools, 1-800-267-8767, www.leevalley.com, or approved alternate.

.2 Quantity: Quantity and Location as described on AD drawings.

.12 Grommet:

.1 Cable grommets: round, one-piece chrome polished '429.94.258' by Hafele or approved alternative.

.2 Quantity: Quantity and Location as described on AD drawings.

.2 This section shall also include accessories such as rubber door silencers (2 per drawer or door), and other items necessary for the completion of the millwork.

.3 Cabinet Keying: Key all cabinet and drawer locks alike for the entire school, except teachers" closets.

.4 This section shall also include glazing where required in millwork. Receive glazing from to Section 08 80 50 - Glazing for glazing types and thicknesses.

2.6 MELAMINE CLAD CABINETWORK

.1 All cabinet frames whether for base, wall or tall floor standing cases, shall be fabricated so each is a self-contained module. Front side top and bottom, exterior and interior surfaces shall be finished allowing future relocation of any module, into any bench arrangement, without need of any additional finishing.

.2 Gables and panels shall be fabricated from 19 mm thick melamine surfaced panels with a P.V.C. edging applied to exposed edges.

.3 Bottoms shall be fabricated utilizing the same materials and edge finish as gables. Front edge will be edged with P.V.C. edging. All other edges will be thoroughly sealed and moisture proofed prior to attachment to gables.

.4 Rails shall be fabricated and machined to join the gables and form a rigid cabinet frame.

.5 Tops (applies to wall and tall units only) shall be fabricated utilizing the same material and edge finish as gables. Front edge will be edged with P.V.C. edging.

.6 Toe kick rail shall have a 100 mm x 19 mm section, machined to receive four screw nails for attachment to bottom front edge of gables. Cabinet base shall be plywood attached to melamine cabinet separately, insuring the melamine particle core gables do not come in contact with the floor.

.7 Backs in base cupboards shall be fabricated from a 6 mm hardboard.

.8 Backs in wall and tall cabinets shall be fabricated from 13 mm thick melamine surfaced panels securely glued and screw nailed into the check out provided in the backs of gables, tops, and bottoms.

.9 Shelves shall be fabricated from 19 mm birch plywood with solid birch edge and lacquer finish. All shelves shall be adjustable at 13 mm increments and each will be supported by a shelf support resting in four pilaster strips attached to the gables.

.10 Doors shall be fabricated from 19 mm thick melamine surfaced panels. All four edges shall be P.V.C. edging.

.11 Drawer fronts shall be fabricated utilizing the same material and edge finish as doors. All four edges shall P.V.C. edging. Fronts will be secured to drawer bodies with five screw nails through the front of the drawer body into the core of the drawer front.

.12 Drawer bodies shall consist of box construction fabricated from 13 mm birch plywood with solid birch edge, front, sides and back with a 6 mm hardboard bottom dadoed and glued into box members. Joint front, sides and back with carefully fitted glued and tenoned joints. Blum Metabox drawer bodies will <u>not</u> be accepted.

.13 35 mm thick doors shall be solid core with plastic laminate both sides and on all four edges, color and grain to match melamine.

.14 Solid hardwood glazed door fronts and frames shall receive lacquer finish. Refer to Section 08 80 50 for glazing types and thicknesses.

.15 Finish:

.1 Melamine surfaced panels shall be finished both sides in the same colours, patterns, and grain as selected by the Consultant.

.2 Solid hardwood glazed doors and drawer bodies shall be sanded, then sealer coated, and sanded with two finish coats of catalytic type acid resistant varnish.

2.7 SHOP FABRICATION

.1 Shop install cabinet hardware.

.2 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

.3 Shop assemble work for delivery to site in size easily handled and to insure passage through building openings.

2.8 BENCHES

.1 32 x 92 solid maple boards with 32 x 108 solid maple edges. Lengths, as indicated on Plans, secured to metal supports. Polyurethane finish, semigloss.

.2 Locations: Gymnasium Change Rooms and Kindergarten Classrooms.

2.9 PLASTIC LAMINATED TOPS

.1 Coordinate with Section 06 47 00.

.2 19 mm thick particle board core with post-forming grade plastic laminate finish bonded with resorginal formaldehyde resin glue to a particleboard core. All countertop front face to return vertically 35 mm ± . All front and backsplash edges to be rounded.

.3 Underside to receive a backing sheet, sanded one side and bonded same as surfacing material.

.4 Exposed edges to be finished with same material as used for the top.

.5 Drip grooves to be cut into underside of the top where exposed edges occur.

.6 Splash backs, curbs and curb shelves are to be of similar construction as the tops.

.7 Use acid resistant post-forming grade laminate, where indicated on drawings. Colour: black.

.8 At all wall termination, provide backsplash return.

2.10 MOULDING AND TRIMS

.1 Fabricate mouldings in maximum practical lengths to profile shown. Install with concealed fasteners.

.2 Note requirement for this Section to supply and install wood trim to **Acoustic panels in Music Room**. Refer to Drawings and interior elevations for locations and details.

2.11 FABRICATION

.1 Set nails and countersink screws apply wood filler to indentations, sand smooth and leave ready to receive finish.

.2 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.

.3 Shelving to cabinetwork to be adjustable unless otherwise noted.

.4 Provide cut-outs for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

.5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.

.6 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.

.7 Ensure adjacent parts of continuous laminate work match in colour and pattern.

.8 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.

.9 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.

.10 Apply laminate backing sheet to reverse side of core of plastic laminate work.

.11 Apply laminated plastic liner sheet where indicated.

2.12 SMT CLASSROOM UPPER CABINETS

.1 6 mm tempered Glazing to upper cabinet units in science classroom to be provided to Millworker by Section 08 80 50.

2.13 MODULAR CONTROL PANELS

.1 Modular control panels are to be fabricated and installed under this Section. Refer to AD 600A & AD 600B for description. Coordinate cut-outs and provisions with Div. 15, 16, 17 & 18.

.2 Modular control panels are to be installed minimum 600mm away from the edge of door frames.

2.14 DISPLAY CASES

.1 Display Cases: Provide and install appropriate hinges, keyed locks and wood/glass shelf supports required for all display cases as described on drawings. Glazing to be provided by section 08 80 50. Refer to Section 08 80 50.

.2 Display/Trophy Case Finish:

.1 Linseed oil, Forbo Tackboard surfacing to interior of all display cabinets and 'Feature Wall Bench AD 648A - AD648C' where felt or tackboard is indicated: supplied by Architectural School Products or equivalent product by other manufacturer approved by the Consultant. Colour to be selected by Architect.

2.15 STAGE CHAIR DOLLIES

.1 Stage Chair Dollies: Provide and install stage front fascia birch trim edging and wood chair dolly fronts as shown on Drawing 3/A23 as per Section 06 40 00, Item 2.1.3. 38mm thick c/w with two hand holes cut at top of front, typ. for all doors. Coordinate installation with misc metals fabricator at shop drawings. Approx. size is 800mm high x 1370mm wide (to be confirmed on site). Refer to Drawing A21 for number of doors required.

2.16 INSTALLATION

.1 Do architectural woodwork to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

.2 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.

.3 Set and secure all material and components in place, rigid, plumb and square.

.4 Provide heavy duty fixture attachments for wall mounted cabinets.

.5 Use draw bolts in countertop joints.

.6 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant.

.7 Apply water resistant building paper over wood framing members in contract with masonry or cementitious construction.

.8 After installation, fit and adjust operating hardware for wood and laminated plastic cabinet doors, drawers and shelves.

2.17 CLEANING

.1 Clean millwork, cabinet work, drawers and outside surfaces.

.2 Remove excess glue from surfaces.

2.18 PROTECTION

.1 Protect millwork and cabinet work from damage until final inspection.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 062000: Finish carpentry

.2 Section 064000:Architectural Woodwork

1.2 REFERENCES

.1 CAN/CGSB-71.20-M88 Adhesive, Contact, Brushable

.2 CAN3-A172-M79 High Pressure Paper Base, Decorative Laminates.

.3 CSA O112 Series-M1977(R2001) CSA Standards For Wood Adhesives.

.4 CSA O121-M1978(R2003) Douglas Fir Plywood.

.5 CSA O151-04 Canadian Softwood Plywood.

1.3 SAMPLES

.1 Submit duplicate samples of joints, edging, cutouts and postformed profiles in accordance with the General Conditions.

1.4 MAINTENCE DATA

.1 Provide maintenance data for laminated plastics work for incorporation into Operation and Maintenance Manual.

1.5 PRODUCT HANDLING

.1 Cover finished laminated plastic surfaces with heavy kraft paper or put in cartons during shipment. Protect installed laminated surfaces by approved means. Do not remove until immediately before final inspection.

.2 Do not store or install materials in areas where relative humidity is less than 25% or greater than 60% at 22 deg C.

Part 2 Products

2.1 GENERAL

.1 Products manufactured by one of the following companies are suggested for use on this project.

.1 Cyanamid Canada Inc., Montreal (Formica).
.2 Domtar Construction Materials, Arborite Division, LaSalle Quebec (Arborite).
.3 Wilsonart International, Temple, Texas (Wilsonart).

.4 Nevamar Corporation, Odenton Md.

.2 Allow for 8 colours of matte finish from manufacturer's full range. Final Selection of Plastic Laminate surface characteristics including colour, texture and pattern is to be made by the Consultant by means of a Colour Schedule to be issued at a later date. Use the following materials specifications as a base bid:

2.2 MATERIALS

.1 Notwithstanding laminates specified below, for laminate to SMT Classroom 214 countertops use Acid Resistant laminate; Colour: Black.

.2 Laminated plastic for flatwork: to CAN3-A172, Grade GP, Type SD, 1.25mm (0.050") thick; based on solid colour range with velour finish. Acceptable products:

.1 Formica Laminate Grade 10.

.2 Nevamar H-5 General Purpose Grade.

.3 Wilsonart General Purpose HGS Type 107.

.3 Laminated plastic for postforming work: to CAN3-A172, Grade PF, Type S, 1.07mm (0.042") thick, based on solid colour range with velour finish. Acceptable products:

.1 Formica Laminate Grade 12.

.2 Nevamar HF-5 Horizontal Post Forming Grade.

.3 Wilsonart Postforming Type 350.

.4 Laminated plastic backing sheet: supplied by same manufacturer as facing sheet; not less than 0.508 mm (0.02") thick and same colour as face laminate. Sanded one side. Acceptable products:

.1 Formica Laminate Grade 20.

.5 Laminated plastic cabinet liner sheet material or for MCP Board or Cladboard material: supplied by same manufacturer as facing sheet, not less than 0.760 mm (0.028") thick, white colour. Acceptable products:

.1 Formica Laminate Grade 20.

.2 VF-3 Vertical Post Forming Grade by Nevamar.

.3 Wilsonart Vertical Surface Type 335.

.6 Plywood core: Douglas Fir Plywood to CSA-O121 or Canadian Softwood Plywood to CSA-O151 solid two sides, 19 mm (¾") thick.

.7 Particleboard core: to CAN3-O188.1, Grade R, sanded faces, of thickness indicated.

.8 Adhesive for laminated plastic: to be CSA approved and one of the following types as selected by the laminate manufacturer as being suitable for the application:

.1 Urea resin adhesive to CSA O112 Series.

.2 Contact adhesive to CAN/CGSB-71.20.

.3 Resorcinol resin adhesive to CSA O112.

.4 Polyvinyl adhesive to CSA O112.

.5 Two component epoxy thermosetting adhesive.

.9 Sealer: water resistant sealer or glue acceptable to laminate manufacturer.

.10 Sealant: of a type recommended by the laminate manufacturer and in accordance with Section 079210 - Joint Sealers; colour to be selected by the Consultant.

.11 Draw bolts and splines: as recommended by fabricator.

.12 Apply laminate backing sheet to reverse side of core of plastic laminate work.

.13 Apply laminated plastic liner sheet to interior of cabinetry, including all exposed surfaces such as gable ends, doors and drawers, and where otherwise indicated.

Part 3 Execution

3.1 INSTALLATION

.1 Install work plumb, true and square, neatly scribed to adjoining surfaces.

.2 Make allowances around perimeter where fixed objects pass through or project into laminated plastic work to permit normal movement without restriction.

.3 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm (18") oc, 75 mm (3") from edge. Make flush hairline joints.

.4 Provide cutouts for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.

.5 At junction of laminated plastic counter back splash and adjacent wall finish, apply small bead of sealant.

.6 Where laminated plastic is site applied, adhere laminated plastic over entire surface. Make corners with hairline joints. Use full sized laminate sheets. Make joints only where indicated or approved. Slightly bevel arises. Cap exposed edges with anodized aluminum extrusions.

.7 For site application, offset joints in plastic laminate facing from joints in core.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for asphalt for use as waterproofing.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 51 00 - Temporary Utilities.

.3 Section 312310- Excavating, Trenching and Backfilling

.4 Section 033000- Cast- in-Place Concrete

.5 Section 042113- Masonry

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-37.2-[M88], Emulsified Asphalt, Mineral-Colloid Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.

.2 CAN/CGSB 37.3-[M89], Application of Emulsified Asphalts for Dampproofing or Waterproofing.

.3 CAN/CGSB 37.5-[M89], Cutback Asphalt Plastic Cement.

.4 CGSB 37-GP-6Ma-[83], Asphalt, Cutback, Unfilled, for Dampproofing.

.5 CGSB 37-GP-9Ma-[83], Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

.6 CGSB 37-GP-11M-[76(R1984)], Application of Cutback Asphalt Plastic Cement.

.7 CGSB 37-GP-12Ma-[84], Application of Unfilled Cutback Asphalt for Dampproofing.

.8 CGSB 37-GP-15M-[76(R1984)], Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.

.9 CAN/CGSB 37.16-[M89], Filled, Cutback, Asphalt for Dampproofing and Waterproofing.

.10 CAN/CGSB 37.28-[M89], Reinforced Mineral Colloid Type, Emulsified Asphalt for Roof Coatings and for Waterproofing.

.11 CGSB 37-GP-36M-[76], Application of Filled Cutback Asphalts for Dampproofing and Waterproofing.

.12 CGSB 37-GP-37M-[77], Application of Hot Asphalt for Dampproofing or Waterproofing.

.2 Canadian Standards Association (CSA International)

.1 CSA A123.4-[98], Bitumen for Use in Construction of Built-Up Roof Coverings and Dampproofing and Waterproofing Systems.

.3 Health Canada

.1 Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada (NRC)/Institute for Research in Construction (IRC)

.1 Canadian Construction Materials Centre (CCMC)

1.4 PRODUCT DATA

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

.2 Submit product data sheets for bituminous dampproofing products. Including:

.1 Product characteristics.

.2 Performance criteria.

.3 Application methods.

.4 Limitations.

.3 Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, and cleaning procedures.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Provide and maintain dry, off-ground weatherproof storage.

.2 Store materials on supports to prevent deformation.

.3 Remove only in quantities required for same day use.

.4 Store materials in accordance with manufacturer's written instructions.

.5 Store solvent base liquids away from excessive heat and open flame.

.6 Store emulsion liquids at above freezing temperatures, free from contact with cold or frozen surfaces.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Ensure emptied containers are sealed and stored safely.

.3 Fold up metal banding, flatten and place in designated area for recycling.

.4 Divert unused bituminous waterproofing, sealing compounds and asphalt primer materials from landfill to recycling facility approved by Consultant.

1.7 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS

.1 Temperature, relative humidity, moisture content.

.1 Apply waterproofing materials only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

.2 Do not proceed with Work when wind chill effect would tend to set bitumen before proper curing takes place.

.3 Maintain air temperature and substrate temperature at dampproofing installation area above 5 degrees C for 24 hours before, during and 24 hours after installation.

.4 Do not apply dampproofing in wet weather.

.2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

.3 Ventilation:

.1 Ventilate area of Work as directed by Consultant by use of approved portable supply and exhaust fans.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Provide continuous ventilation during and after waterproofing application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of waterproofing installation.

1.8 QUALIFICATIONS AND QUALITY ASSURANCE

.1 Waterproofing shall be carried out by applicators skilled and with previous similar experience in this work in strict accordance with manufacturer's printed instructions. Submit proof of experience upon Consultant’s request.

.2 Manufacturer’s representative shall be called by the applicator to inspect the substrate prior to commencement of work.

.3 Manufacturer’s representative shall be retained by installer to provide technical assistance on a as-needed basis during course of installation of membrane.

1.9 EXTENDED WARRANTY

.1 Contractor performing the work of this Section, shall provide a full materials and labour warranty for 5 years from the date of Substantial Performance of the Contract.

.2 Contractor hereby warrants that the waterproofing membrane will stay in place and remain leakproof in accordance with the Contract, but for 5 years.

.3 Waterproofing membrane manufacturer shall provide a written warranty that the waterproofing membrane will remain in a watertight condition and will not leak as a result of faulty materials for a period of ten years.

Part 2 Products

2.1 MATERIALS

.1 Locations: Walls below grade in elevator pits and all foundations adjacent to sodded and planted areas. Refer to Drawings for typical wall sections.

.2 Primary Waterproofing Membrane for Vertical Foundation Walls: Cold applied elastomeric asphalt emulsion waterproofing membrane in compliance with CGSB 37.2 shall be Aqua-Bloc 720-38 Elastomeric Asphalt Emulsion Waterproofing Membrane as manufactured by Bakor, a one component waterproofing compound compatible with sheet waterproofing membranes and substrates, having the following characteristics:

- .1 Elongation: 2000%,
- .2 Maximum VOC: 10 g/l
- .3 Water vapour permeance: 10 ng/Pa.m².s, ASTM E96,
- .4 Chemical resistance: Alkalis, calcium chloride, mild acid and salt solutions.
- .5 Approved alternate Mel-Rol LM by W.R. Meadows of Canada.

.3 Fabric Reinforcement for Cold Applied Waterproofing: Fabric reinforcement shall be 990-06 Yellow Jacket as supplied by Bakor, a glass reinforcement sheet capable of allowing the membrane to bleed through adequately to provide a monolithic reinforced membrane system.

.4 Prefabricated Drainage Board for Vertical Surfaces: Bakor DB 2000 Prefabricated Composite Drain Board, a polypropylene core board with polypropylene fabric attached, having the following physical properties:

- .1 Flow Rate: 223 L/min/m,
- .2 Compressive Strength: 11,000 psf,
- .3 Thickness: 10 mm

.5 Prefabricated Drainage Board Accessories

- .1 Securement Bars: Continuous 6mm x 20mm (1/4” x 3/4”) HDPE bar for screw attachment.
- .2 Moulding Strip: Continuous 90mm wide “Z” flashing strip to fit over exposed top edge of drain board.
- .3 Drain Board Plugs & Nails: HDPE pre-moulded washer to fit dimples c/w high strength, corrosion resistant concrete nails, UCAN AFH 37 or equal.
- .4 Termination Sealant: Polybitume 570-05 Polymer Modified Sealing Compound as manufactured by Bakor, a polymer modified sealing compound, compatible with sheet waterproofing membrane, substrate and insulation materials, complies with CGSB 37.29, remains flexible with ageing and chemically resistant to alkalis, calcium chloride, mild acid and salt solutions.

Part 3 Execution

3.1 WORKMANSHIP

.1 Keep hot asphalt:

.1 Below its flash point.

.2 At or below its final blowing temperature.

.3 Within its equiviscous temperature range at place of application.

3.2 PREPARATION

.1 Before applying waterproofing:

.1 Seal exterior joints between foundation walls and footings, joints between concrete floor slab and foundation and around penetrations through waterproofing with sealing compound.

.2 Before commencing work, ensure environmental and site conditions are suitable for installation of waterproofing membrane.

.3 The substrate shall be clean and dry, free from surface water, ice, snow or frost, dust, dirt, oil, grease, curing compounds or any other foreign matter detrimental to the adhesion of the waterproofing membrane.

.4 Can be applied to damp or new green concrete. Ensure concrete is smooth and free from voids and honeycombing prior to application of waterproofing membrane.

.5 Voids, cracks, holes and other damages to horizontal or vertical surfaces shall be repaired before application of the membrane.

.6 Notify Consultant and Contractor in writing of unsuitable surfaces and working conditions. Commencement of work shall imply acceptance of surfaces and working conditions.

3.3 MOCK UP

.1 Construct a 3 m x 2 m mock-up area for each separate job condition for inspection by the Consultant prior to proceeding with the work. Mock-up may be part of finished work.

.2 Notify Consultant and allow 24 hours for inspection by Consultant.

3.4 DECK TO VERTICAL JUNCTURES, FOOTINGS/FOUNDATION WALLS, CRACKS IN SLABS AND PROTRUSIONS

.1 Coat penetrations, such as brackets, clips, braces, etc. that are set into the concrete with a 2.3 mm (90 mil) coating of primary waterproofing membrane to the height of the wearing course and around projections to ensure a complete seal prior to coating the entire area.

.2 Penetrations subject to movement should be flashed with fabric reinforcement set into a minimum thickness of 2.3 mm (90 mil) of primary waterproofing membrane to required height on the wall and at least 100 mm (4”) on the slab, embed fabric reinforcement into wet coating followed by second coat.

.3 To all cracks and cold joints less than 3 mm (1/8") apply a coat of primary waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) and reinforce with fabric reinforcement.

.4 To all cracks greater than 3 mm (1/8"), prime area and install self-adhered flashing membrane. Overlap end joint of sheet a minimum 75 mm (3").

.5 At monolithic wall/slab junctures, apply primary waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) to required height on the wall and at least 100 mm (4") on the slab and embed fabric reinforcement into wet primary waterproofing membrane followed by a second coat.

.6 At non-monolithic wall/slab junctures, prime area, trowel-in fillet bead to inside corners and install self-adhered flashing membrane sheet to the required height on the wall and at least 100 mm (4") on the slab. Lap primary waterproofing membrane over a minimum of 50 mm (2").

.7 At footing to foundation wall junctions apply a coat of primary waterproofing membrane at a minimum thickness of 2.3 mm (90 mil) and reinforce with fabric reinforcement followed by second coat.

3.5 WATERPROOFING MEMBRANE VERTICAL APPLICATION

.1 Apply a full and continuous coat of primary waterproofing membrane at approximately 1.5 l/m^2 (3.6 gal. US/100ft^2) and embed fabric reinforcement into coating ensuring no fishmouths or wrinkles are created and allow to set.

.2 Apply second full and continuous coat of primary waterproofing membrane at 1.5 l/m^2 (3.6 gal./100$ft.^2$) and allow to cure.

3.6 WATERPROOFING MEMBRANE HORIZONTAL APPLICATION

.1 Apply a full and continuous coat of primary waterproofing membrane at approximately 1.5 l/m^2 (3.6 gal. US/100ft^2) and embed fabric reinforcement into coating ensuring no fishmouths or wrinkles are created and allow to set.

.2 Apply second full and continuous coat of primary waterproofing membrane at 1.5 l/m^2 (3.6 gal./100$ft.^2$) and allow to cure.

3.7 INSTALLATION OF PROTECTION BOARDS

.1 Protection Boards shall be installed over the waterproofing membrane to prevent damage from materials used in backfilling.

.2 Allow waterproofing to cure dry and apply protection board adhesive in 12mm wide strips spaced at 450 mm o/c to cure waterproofing membrane. Immediately embed protection board and press into adhesive to ensure full contact.

.3 Do not backfill until adhesive has cure dried. Do not use excessive levels of adhesive.

3.8 APPLICATION OF DRAINAGE BOARD VERTICAL

.1 Align and hang drainage up to foundation wall. Position bottom edge of drainage board to be in moderate contact with weeping tile system.

.2 Secure drainage board to foundation wall with nails and washers spaced 450 mm o/c horizontally. Install minimum of 2 rows staggered and spaced 150 mm apart and min 150 from top edge.

.3 Align and install termination strip along top edge with nails spaced 300 mm o/c and seal with termination sealant.

.4 Align and install moulding strip over completed top edge detail.

.5 Overlap end laps, pull back loose fabric to expose drain core and position core of second panel over the overlap flange of first panel.

.6 Bend drain board to create inside corners and cut board to create outside corners, provide 75 mm of extra fabric to wrap corner.

.7 Stagger or offset joints of drain board sheets.

.8 Place all subsequent sheets in an overlapping single fashion.

.9 Backfill bottom edge in conjunction with weeping tile system.

3.9 APPLICATION

.1 Do sealing work in accordance with CGSB 37-GP-11M except where specified otherwise.

.2 Do priming of surface in accordance with CGSB 37-GP-15M except where specified otherwise.

.3 Apply primer.

3.10 SCHEDULE

.1 Apply continuous, uniform coating to entire exterior faces of foundation walls from 50 mm below finished grade level to and including tops of foundation wall footings.

.2 Apply continuous, uniform coating to exterior side of foundation walls enclosing rooms below finished grade. Include exterior portion of interior walls where floors in adjacent rooms are at different elevations.

.3 Apply two additional coats of dampproofing to vertical corners and construction joints for a minimum width of 230 mm on each side, and all around and for 230 mm along pipes passing through walls.

3.11 CLEANING

.1 Promptly as the work proceeds and on completion clean up and remove from site all rubbish and surplus materials resulting from the foregoing work.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 04 21 13 – Masonry.

.3 Section 07 27 10 – Air Barriers.

.4 Section 07 55 00 – Roof insulation.

.5 Section 07 21 19 – Spray in Place Urethane Foam Insulation.

1.2 REFERENCES

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

.1 ASTM E96-[00e1], Test Methods for Water Vapour Transmission of Materials.

.2 Canadian General Standards Board (CGSB).

.1 CGSB 71-GP-24M-[77(R1983)], Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.

.3 Underwriters Laboratories of Canada (ULC).

.1 CAN/ULC-S604-[91], Type A Chimneys.

.2 CAN/ULC-S701-[01], Thermal Insulation, Polystrene, Boards and Pipe Coverings.

.4 Environmental Choice Program (EPC).

.1 CCD-016-[97], Thermal Insulation.

1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's insulation products and adhesives.

.2 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.4 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, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material [n appropriate on-site bins for recycling.

Part 2 Products

2.1 INSULATION

.1 Extruded polystyrene (XPS): to CAN/ULC-S701.

.1 RSI 2.65/R15.
.2 Thickness: **100 mm** or as indicated on drawings.
.3 Edges: ship-lapped.
.4 For use at typical cavity wall construction and at miscellaneous detail locations calling for rigid insulation.
.5 Acceptable Material: "**Styrofoam Cavity-Mate**" as manufactured by Dow Chemical Canada Inc.
.6 Acceptable Material: "**Foamular C200**" as manufactured by Celfortec Inc. (Owen Corning).
.7 or approved equal.

.2 Extruded polystyrene (XPS): to CAN/ULC-S701.

.1 RSI 2.65/R15.
.2 Thickness: **75 mm** or as indicated on drawings.
.3 Edges: Ship lapped.
.4 For use in cavity wall construction" below through-wall flashing below slab on grade as shown typical foundation details,
.5 Acceptable Material: "**Styrofoam SM**" as manufactured by Dow Chemical Canada Inc.
.6 Acceptable Material: "**Foamular C300**" as manufactured by Celfortec Inc. (Owen Corning).

.3 Batt insulation: CAN/ULC-S702, Type 1.

.1 Friction fit batt insulation.
.2 For use in steel studs as indicated.
.3 Acceptable Material: 'Mineral Wool' by Roxul

.4 Or approved equal.

2.2 ADHESIVE

.1 Adhesive (for polystyrene): to CGSB 71-GP-24.

.1 Bakor Air Bloc 21.

.2 Compatible with respective rigid insulation, air/vapour and waterproofing membranes and recommended by manufacturers of those products. Use Bakor

230-21 rigid insulation adhesive for rigid insulation in contact with Blueskin air vapour barrier.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 WORKMANSHIP

.1 Install insulation after building substrate materials are dry.

.2 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

.4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 [type B] [and] [L] vents.

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Offset both vertical and horizontal joints in multiple layer applications.

.7 Do not enclose insulation until it has been inspected and approved by Consultant.

3.3 EXAMINATION

.1 Examine substrates and immediately inform Consultant in writing of defects.

.2 Prior to commencement of work ensure:

.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.4 RIGID PERIMETER FOUNDATION INSULATION INSTALLATION

.1 Apply adhesive to polystyrene in accordance with manufacturer's recommendations.

.2 Apply adhesive to insulation board by spot method with daubs 40 mm diameter x 25 mm high at 200 mm o.c. each way

.3 Interior application: extend boards vertically below bottom of finish floor slab as indicated on drawings, installed on inside face of perimeter foundation walls.

.4 Exterior application: extend boards below finish grade as indicated on drawings. Install on exterior face of perimeter foundation wall with adhesive.

.5 Under slab application: extend boards as indicated on drawings. Lay boards on level compacted fill.

3.5 RIGID CAVITY WALL INSULATION INSTALLATION

.1 System Comprised of:

.1 Specified thickness of rigid ship-lapped insulation on Henry-Bakor Blueskin SA air/vapour barrier.

.2 Henry-Bakor Airbloc 21 adhesive to be applied to all sides of insulation and continuous layer to all insulation surfaces in contact with air/vapour barrier. Butter all sides and back to ensure full air barrier integrity. Apply adhesive to polystyrene in accordance with manufacturer's recommendations

.3 Butter Air Bloc 21 at all brick tie penetrations to ensure a complete seal

.4 Install plastic LOC-Wedges at masonry veneer ties to ensure securement to structural wythe or back up wall and in full contact with air/vapour barrier on wall surfaces.

3.6 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 04 21 13 - Masonry.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 51 00 - Temporary Utilities.

.4 Section 07 21 13 – Board Insulation.

.5 Section 07 55 00 – Protected Membrane Roofing.

.6 Section 07 62 00 – Sheet Metal Flashing & Trim.

.7 Section 07 27 10 – Air Barriers.

1.2 IN LIEU OF INFORMATION

.1 In relation to Cavity Wall Insulation only, this section is supplied for **INFORMATION ONLY for the purposes of providing the Alternate Price** required in Section 00 22 00 – 'Supplementary Bid Form'. Note that base cavity wall insulation is rigid board as specified in Section 07 21 13 and shown on drawings

.2 Notwithstanding this alternate price, other areas requiring spray foam insulation remain as part of this section.

1.3 REFERENCES

.1 Canadian Urethane Foam Contractors' Association Inc. (CUFCA)

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S101-[1989], Fire Endurance Tests of Building Construction and Materials.

.2 CAN/ULC-S102-[1988(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.

.3 CAN/ULC-S705.1-[01], Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Material Specification.

.4 CAN/ULC-S705.2-[02], Standard for Thermal Insulation Spray Applied Rigid Foam, Medium Density, Installer's Responsibilities-Specification.

1.4 TEST REPORTS

.1 Submit test reports, verifying qualities of insulation meet or exceed requirements of this specification, in accordance with Section 01 45 00 - Quality Control.

.2 Submit test reports in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

1.5 QUALITY ASSURANCE

.1 Applicators to conform to CUFCA Quality Assurance Program.

1.6 SAFETY REQUIREMENTS

.1 Protect workers as recommended by CAN/ULC-S705.2 and manufacturer's recommendations:

.1 Workers must wear [gloves] [respirators] [dust masks] [long sleeved clothing] [eye protection] [protective clothing] when applying foam insulation.

.2 Workers must not eat, drink or smoke while applying foam insulation.

1.7 PROTECTION

.1 Ventilate area in accordance with Section 01 51 00 - Temporary Utilities.

.2 Ventilate area to receive insulation by introducing fresh air and exhausting air continuously during and [24] hour after application to maintain non-toxic, unpolluted, safe working conditions.

.3 Provide temporary enclosures to prevent spray and noxious vapours from contaminating air beyond application area.

.4 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling.

.3 Fold up metal banding, flatten and place in designated area for recycling.

.4 Dispose of waste foam daily in location designated by Consultant and decontaminate empty drums in accordance with foam manufacturer's instructions and CAN/ULC-S705.2.

.5 Divert metal drums from landfill to metal recycling facility as approved by Consultant and to CAN/ULC-S705.2.

1.9 ENVIRONMENTAL REQUIREMENTS

.1 Apply insulation only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

Part 2 Products

2.1 MATERIALS

.1 Insulation: spray polyurethane to CAN/ULC-S705.1.

.1 Density: 30.4 kg/m3 (1.9 lb/ft3) minimum.

.2 Compressive Strength: >185 KPa (per ASTM D1622)

.3 Tensile Strength: > 330 KPa (per ASTM D1623)

.4 Air Barrier Classification:

.1 Type III (NRC) - permeance: 0.02 L/sec/m2 maximum at 75 Pa pressure differential.

.2 Air Barrier System Performance with leakage not exceeding 0.0054 l/m^2 @75 Pa pressure when tested in Accordance with CCMC Air Barrier System Requirements.

.3 All manufacturers/applicators shall submit test data reports prior to acceptance.

.5 Water Permeance: 125 ng/Pa.m2.s @25mm specimen thickness

.6 Submit manufacturer's Material Data Safety Sheets in accordance with and Sections 013300 – Submittal Procedures and 013530 – Health and Safety.

.7 Thickness: 100 mm

.8 Acceptable material: Products meeting these specifications by BASF Canada Inc: "Walltite CMO1". Installation shall only be by applicators specifically approved by the manufacturer/distributor.

.9 Acceptable material: Heatlok 0240, Heatlok Soya, Polar Foam 7300 and Polarfoam Soya, Elastochem Insulathane Extreme and Genyk Boreal Nature Elite.

.10 Acceptable materials: products meeting or exceeding these specifications by Certainteed Insulation Canada Inc. or other manufacturers meeting or exceeding these specifications as approved in writing by the Architect following specification, WMIS and test data submission including CertaSpray Closed Cell Foam by CertainTeed Canada and Icynene MDC200 spray foam insulation.

.11 Blowing agents must have a GWP of 150 or lower per Environment Canada Regulations effective January 1, 2021.

.2 Primers: in accordance with manufacturer's recommendations for surface conditions.

.3 Sheet Air/Vapour Barrier Transition Membrane and Thru-Wall Flashing:

.1 Self adhering SBS modified bitumen membrane reinforced with non-woven fibrous glass:

.1 Thickness: minimum 1.45 mm

.2 Water Vapour Permeance: 0.05 perms max value. (2.8 ng/Pa.m2.s)

.3 Air Permeance: less than 0.01 l/m2 at 75 Pa pressure differentials.

.4 Adhesion: 7 day min. Peel adhesion at 5 deg. C :

.1 to primed Concrete: > 20 N/cm

.2 to selfedge: > 20 N/cm

.3 to primed plywood: > 25 N/cm

.4 to metal: > 30 N/cm

.5 Submit manufacturer's Material Data Safety Sheets in accordance with and Sections 01333 – Submittal Procedures and 013520 – Health and Safety.

.6 Acceptable Material: Blueskin SA by Bakor and Blueskin TW as thru-wall transition at masonry locations.

.2 Overlap typically minimum 150 mm on all adjacent layers/materials or as detailed.

Part 3 Execution

3.1 APPLICATION

.1 Apply insulation to clean surfaces in accordance with CAN/ULC-S705.2 and manufacturer's printed instructions. Use primer where recommended by manufacturer.

.2 Apply sprayed foam insulation in thickness as indicated.

3.2 WORKMANSHIP

.1 Certification

.1 Installation is to be only by certified CUFCA/NECA applicators and manufacturer of the product being applied. Applicator shall provide proof of both approvals.

.2 Examination

.1 Install insulation after building substrata materials are dry, thoroughly clean and capable of providing a firm, uniform bonding surface and temperatures are within the range recommended by product manufacturers.

.2 Verify that surfaces and conditions are suitable to accept work required in this section.

.3 Report, in writing, defects in surfaces or conditions which may adversely affect the performance of products installed under this section to the Consultant; prior to commencement of work.

.4 Do not commence work until defects have been corrected.

.3 Preparation-Sprayed Insulation:

.1 Mask and cover adjacent areas to protect from overspray.

.2 Apply primers for special conditions as required by foam manufacturer.

.3 Clean work area prior to commencing spray operations.

.4 Preparation-Peel & Stick Membrane:

.1 Prime all surfaces using Blueskin Primer by Bakor or primer specifically approved by membrane manufacturer. Allow primer to dry. Apply primer only to areas to receive membrane within the same working day, or reprime surfaces.

.5 Application-Sprayed Insulation:

.1 Apply insulation to clean surfaces in accordance with CAN/CGSB 51-39-92 and manufacturer's printed instructions. Use primer where recommended by manufacturer. Ensure full adhesion to transition membrane.

.2 Completely fill jambs of all hollow metal frames with insulation and ensure continuous contact with sheet membrane used at head of frames.

.6 Application-Peel & Stick membrane:

.1 Ensure membrane widths capable of sealing to all door opens at heads of frames.

.2 Lap sides and ends a minimum of 100 mm or as per details. Ensure full adhesion as per details.

.3 Position membrane for alignment with release film in place. Roll back, remove release film and press firmly in place. Roll all areas and laps with a steel or polyurethane roller.

.4 Seal ends of membrane to substrate using Polybithume by Bakor. or product approved specifically by membrane manufacturer.

.7 Tolerance

.1 Maximum variation from required thickness for sprayed insulation: 6 mm.

.8 Firestopping

.1 Required in all cavity walls 25 mm air space or greater.

.2 Install firestopping at 20 m intervals maximum horizontally and 3 m maximum vertically, in accordance with OBC requirements and manufacturer's approved method of Roxul AFB and transition membrane protection.

.3 At wall extending more than 1 storey in height, install additional firestopping horizontally at intermediate floor elevation.

3.3 LOCATIONS

.1 Cavity Walls Above Grade: **as an alternate price to Rigid Cavity Installation** – see Section 01 11 00 - Supplementary Information Form. Spray insulation is to be applied to walls above a 450mm high band of the specified rigid board insulation (Section 07 21 13) applied at the base of the wall cavity (below the foamed-in-place insulation).

.2 On all structural steel in concealed locations exterior to insulation wall assemblies where steel penetrates through thermal barrier of wall forming a "cold bridge, whether shown on drawings or not.

.3 Concealed within Soffit Conditions: Refer to drawings.

.4 Jambs of Hollow Metal Frames: Refer to Section 081115 – Door Schedule.

.5 Behind Metal Siding/composite panels: Refer to Section 074143 – Aluminum Composite Panels.

.6 All other miscellaneous locations to ensure integrity of a continuous air/vapour barrier and insulation layer.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation methods providing [primary] air vapour barrier materials and assemblies.

.2 Air/vapour barrier materials to provide continuous seal between components of building envelope and building penetrations.

1.2 RELATED SECTIONS

.1 Section 04 21 13 - Concrete and Clay Brick Unit Masonry Veneer

.2 Section 07 21 13 – Rigid Board Insulation.

.3 Section 07 44 56 – Composite Panels

.4 Section 07 51 12 – Built-Up Bituminous (BUR) Roofing.

.5 Section 07 62 00 – Sheet Metal Flashing & Trim.

1.3 REFERENCES

.1 Canadian Construction Documents Committee

.1 CCDC 2 - Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13M-[M87], Sealing Compound, One Component, Elastomeric Chemical Curing.

.2 CAN/CGSB-19.18M-[M87], Sealing Compound, One Component, Silicone Base Solvent Curing.

.3 CAN/CGSB-19.24M-[M90], Multi-Component, Chemical Curing Sealing Compound.

.4 CGSB 19-GP-14M-[76], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.

.3 NBCC 1995; Part 5 - Environmental Separation

.4 Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.

1.4 SUBMITTALS

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

.2 Submit manufacturer’s product data sheets in accordance with Section 01 33 00 - Submittal Procedures.

.3 Submit manufacturer’s installation instructions in accordance with Section 01 33 00 - Submittal Procedures.

1.5 QUALITY ASSURANCE

.1 Applicators must be licensed or approved by membrane material manufacturers.

.2 Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.

.3 Maintain one copy of documents on site.

1.6 QUALIFICATIONS

.1 Applicator: Company specializing in performing work of this section with documented experience with installation of air/vapour barrier systems. Completed installation must be approved by the material manufacturer.
.

.2 Applicator: Company who is currently licensed by National Air Barrier Association or certifying organization must maintain their license throughout the duration of the project.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 33 00 – Submittal Procedures.

.2 Deliver, store and handle materials in accordance with manufacture’s written instructions.

.3 Avoid spillage. Immediately notify Consultant if spillage occurs and start clean up procedures.

.4 Clean spills and leave area as it was prior to spill.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Place materials defined as hazardous or toxic waste in designated containers.

.2 Ensure emptied containers are sealed and stored safely for disposal away from children.

1.9 PROJECT ENVIRONMENTAL REQUIREMENTS

.1 Do not install solvent curing sealants or vapour release adhesive materials in enclosed spaces without ventilation.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.3 Maintain temperature and humidity recommended by materials manufactures before, during and after installation.

1.10 SEQUENCING

.1 Sequence work to permit installation of materials in conjunction with related materials and seals.

Part 2 Products

2.1 SHEET MATERIALS

.1 Refer to technical data sheets for physical properties of product.

.2 Sheet Seal: Self-Adhesive bitumen laminated to high-density polyethylene film, nominal total thickness of 1 to 4 mm as indicated.

.1 Acceptable material: Bakor Blueskin AG, adhesive grade membrane, use 'peel and stick' Blueskin where Air-Bloc 21 not present or equal Blueskin SA or TG or Soprema 'Sopraseal Stick.' or Perm-A-Barrier by W.R. Grace or PQ 7190 A/VR by Permaquick or Sealtight Airshield by W.R. Meadows

.2 Sealant and Adhesive as recommended by Manufacturer.

.3 Transition membrane adhesive to be Bakor Air-Bloc 21.

.4 Air Barrier Membrane to be Bakor Air-Bloc 21.

2.2 SEALANTS

.1 Sealants in accordance with Section 07 92 10 - Joint Sealing.

.2 Primer: Recommended by sealant manufacturer and Appropriate to application.

.3 Substrate Cleaner: Non-corrosive type recommended by sealant manufacturer and compatible with adjacent materials.

2.3 ADHESIVES

.1 Adhesive to be 'Air-Bloc 21' by Bakor.

2.4 ACCESSORIES

.1 Thinner and cleaner for as recommended by sheet material manufacturer.

.2 Stick-Clips: Perforated Galvanized steel anchors.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that surfaces and conditions are ready to accept the Work of this section.

.2 Ensure all surfaces are clean, dry, sound, smooth, and continuous and comply with air barrier manufacturer□s requirements.

.3 Report any unsatisfactory conditions to the Consultant in writing.

.4 Do not start work until deficiencies have been corrected. Commencement of Work implies acceptance of conditions.

3.2 PREPARATION

.1 Remove loose or foreign matter which might impair adhesion of materials.

.2 Ensure all substrates are clean of oil or excess dust; all masonry joints struck flush, and open joints filled; and all concrete surfaces free of large voids, spalled areas or sharp protrusions.

.3 Ensure all substrates are free of surface moisture prior to application of self-adhesive membrane and primer.

.4 Ensure metal closures are free of sharp edges and burrs.

.5 Prime substrate surfaces to receive adhesive and sealants in accordance with manufacturer's instructions.

3.3 INSTALLATION

.1 Install materials strictly in accordance with manufacturer's instructions.

.2 Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

3.4 PROTECTION OF WORK

.1 Protect finished Work in accordance with Section 01 61 00 - Common Product Requirements.

.2 Do not permit adjacent work to damage work of this section.

.3 Ensure finished Work is protected from climatic conditions.

3.5 SCHEDULES

.1 Wall Air/Vapour Barrier Over Outer Surface of Inner Wythe of Masonry: Trowel seal Type F over masonry unit surface to a thickness of 6 mm, seal masonry anchor penetrations air tight.

.2 Wall Air/Vapour Barrier over Exterior Surface of Gypsum Sheathing: Place sheet seal Type G over sheathing surfaces with Adhesive Type E. Seal with Type Y sealant.

.3 Window Frame Perimeter: Lap sheet seal Type H from wall air seal surface with 75 mm of full contact over firm bearing to window frame with 25 mm of full contact. Edge seal with Type Z sealant.

.4 Wall and Roof Junction: Lap sheet seal Type J from wall seal material with 150 mm of contact over firm bearing to roof air seal membrane with 100 mm of full contact. Seal with Type X sealant.

.5 Roof System Air/Vapour Barrier Over Steel Deck: Gypsum sheathing, taped joints, apply membrane air seal Type K over sheathing surfaces with Adhesive Type D; edge seal membrane with Type Y sealant.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 78 00 – Closeout Submittals.

.3 Section 07 27 10 – Air Barriers.

.4 Section 07 21 13 – Thermal Insulation.

1.2 REFERENCES

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

.1 ASTM A653/A653M-09a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.

.2 Canadian Standards Association (CSA):

.1 CAN/CSA-G40.20/G40.21M-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.

1.3 DESIGN REQUIREMENTS

.1 Design exterior cementitious composite wall, soffit and canopy panels to withstand live, dead, lateral, wind, seismic, handling, transportation, and erection loads, imposed and other loads.

.2 Design soffit system to accommodate expansion and contraction of soffit elements without causing buckling, failure of joints, undue stress on fasteners or other effects detrimental to appearance or performance.

.3 Design cementitious composite panels in accordance with climatic design data for Oakville contained in the Ontario Building Code.

.4 Design cementitious composite panel system to prevent rattling and vibration of panels, overstressing of fasteners and clips, and other detrimental effects on the system.

.5 Design miscellaneous, additional structural framing members as required to complete composite panel system, where not indicated on Contract Drawings.

1.4 SUBMITTALS

.1 Product data:

.1 Submit copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:

.1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations.
.2 Product transportation, storage, handling and installation requirements.

.2 Shop drawings: Submit shop drawings in accordance with Section 01 33 00 indicating elevations, details, profiles, dimensions, thickness of materials, finishes, methods of joining, joint location, methods of anchoring, anchors, types of sealants, details of other pertinent components of the work, and compliance with design criteria and requirements of related work.

.3 Samples: Submit two 300 x 300 mm samples of panels in the selected colours and finish for approval.

.4 Closeout Submittals: Provide maintenance instructions for incorporation into Operation and Maintenance Manual, specified in section 01 78 00.

1.5 QUALITY ASSURANCE

.1 Retain a licensed Professional Engineer, registered in Province of Ontario, to perform following services for composite panel Work:
.1 Design of cementitious composite panel system.
.2 Review, stamp, and sign shop drawings.
.3 Conduct shop and field inspections and prepare and submit inspection reports.

.2 Installers qualifications: Perform Work of this Section by a company that has a minimum of ten years proven experience in the installation of composite building panel units of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator's current certificate of approval by the material manufacturer as proof of compliance.

.3 Mock-up:
.1 Fabricate, deliver, and erect a 1220 mm high x 3050 mm long mock-up panel of composite panel system in location acceptable to Consultant.
.2 Demonstrate finish, anchoring devices, air/vapour retarder sealing, and quality of workmanship.
.3 Mock-up may form part of final Work, if acceptable to Consultant. Remove and dispose of mock-ups which do not form part of Work.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Handle, transport, and store composite panel work as required by fabricator to prevent staining, soiling, and damage.

.2 Store composite panel work to clear ground or other bearing surfaces, to prevent overstress, warp, twist, accumulation of water and snow in depressions and holes, and to afford free movement of air on all sides of each unit.

1.7 EXTENDED WARRANTY

.1 Submit warranty for composite panel Work in accordance with General Conditions, except that warranty period is extended to 10 years.
  .1 Against leaking, warping, twisting, joint, and finish failure.
  .2 Coverage: Complete replacement including affected adjacent parts.

Part 2 Products

2.1 ACCEPTABLE PRODUCTS AND MANUFACTURERS

.1 'Cemfort S' by Arkea-Systems Inc. (1-877-929-2226)
.2 'Equitone (Natura)' by Engineered Assemblies Inc. (905 816-2218)
.3 'fibre C' by Sound Solutions (416 740-0303)
.4 'Cemval Matrix" by Cemtrade (416 789-1999 or 905 648-1881)
.5 'Polycon' – Rieger Architectural Projects (866)-385-8318 Ext 5
.6 or approved alternative.

2.2 MATERIALS

.1 Cementitious composite panels:
  .1 Smooth cement panels with composite core made of synthetic fibres, cement and active
  .2 Panel thickness: 8–12 mm thick.
  .3 Panel size: 1220 mm x 3050 mm.
  .4 Density: Minimum 1,500 kg/m3.
  .5 Finish and colour: Standard finish, in two colours as approved by the Consultant. Provide samples for the Consultant's approval.

.2 Structural shapes, plates, sag rods, and similar items: CAN/CSA-G40.20-G40.21-M, Grade 350W. Provide all additional structural supports not shown on Drawings as required.

.3 Thermally Broken Façade Structure (sub-girt):
  .1 Acceptable systems:
    .1 The Cascadia Clip® cladding support system
    .2 TClip™ & SYSTEM2 system by Engineered Assemblies
    .3 other thermally broken façade structures approved by the Consultant
  .2 Refer to drawings for required clip and support system depth.
  .3 Cavity behind panel to be at least 25 mm of unrestricted space and be designed as a rainscreen.
  .4 Provide engineered shop drawings indicating support structure, sealed by a structural engineer licenced to practice in Ontario.
  .4 Fasteners: Exposed tamperproof factory prefinished or stainless-steel fasteners as recommended by panel manufacturer.
  .5 Bottom joint to include PVC flat strip in colour as selected by the Consultant.
  .6 Sealants: Sealant as approved by panel manufacturer in colour matching the panel as closely as possible. Sealant colour to be approved by

Consultant.

4 Fasteners: Exposed tamperproof factory prefinished or stainless steel fasteners as recommended by panel manufacturer.

5 Bottom joint to include PVC flat strip in colour as selected by the Consultant.

6 Sealants: Sealant as approved by panel manufacturer in colour matching the panel as closely as possible. Sealant colour to be approved by Consultant.

2.3 FABRICATION

.1 Fabricate cementitious composite panels in accordance with reviewed shop drawings and manufacturer's written instructions.

.2 Fabricate panels in accordance with reviewed shop drawings, flat, true, free of marks, without visible distortion and with edges straight and true. Make all planes true, and corners square and bend of minimum radius.

.3 Form panels to dimensions indicated with tolerances to accommodate expansion and contraction between panels and structure members. Accurately form shaped panels.

Part 3 Execution

3.1 EXAMINATION

.1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

.2 Verify that backup construction is aligned for proper installation of wall panels before commencing erection.

.3 Protect metal surfaces in contact with concrete, masonry mortar, plaster or other cementitious surface with isolation coating.

3.2 INSTALLATION

.1 Supply and install miscellaneous, additional structural framing members, required to complete composite panel system, where not indicated on Contract Drawings.

.2 Install composite panels, supports, and related items to lines and elevations indicated and in strict accordance with reviewed shop/erection drawings and manufacturer's printed instructions. Carefully co-ordinate work with other Sections.

.3 Erect wall, soffit and canopy panel systems in accordance with manufacturer's instructions and under direct supervision of the manufacturer in straight lines, true, level, and plumb.

.4 Maximum deflection of the building including the frame to be within L/360.

.5 Finished work shall be securely anchored, free of distortion, free of surface imperfections and uniform in colour.

3.3 SEALANT

.1 Prepare substrate surface and mask as recommended by sealant manufacturer.

.2 Seal around all openings and all other locations indicated or required to provide weathertight and watertight seal.

3.4 REPAIR

.1 Remove damaged, defectively finished, or tool marked components and replace with new to Consultant's approval.

3.5 CLEANING

.1 Clean soiled panel surfaces in accordance with manufacturer's written instructions.

.2 Clean soiled panel surfaces and replace elements not acceptable to Consultant.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Requirements for the installation of preformed metal cladding/siding.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 06 10 11 – Rough Carpentry

.3 Section 04 21 13 – Masonry

.4 Section 07 21 19 – Sprayed in Place Urethane Foam Insulation

.5 Section 07 21 13 – Rigid Board Insulation

1.3 REFERENCES

.1 American National Standards Institute (ANSI).

.1 ANSI B18.6.4-[99], Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws.

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM D2369-[03], Test Method for Volatile Content of Coatings.

.2 ASTM D2832-[92(R1999)], Guide for Determining Volatile and Non-volatile Content of Paint and Related Coatings.

.3 ASTM D5116-[97], Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.

.3 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.

.2 CAN/CGSB-93.2-[M91], Prefinished Aluminium Siding, Soffits and Fascia, for Residential Use.

.3 CGSB 93.5-[92], Installation of Metal Residential Siding, Soffits and Fascia.

.4 Canadian Standards Association (CSA International).

.1 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.

.5 Environmental Choice Program (ECP).

.1 CCD-045-[95], Sealants and Caulking Compounds.

.6 Underwriters' Laboratories of Canada (ULC).

.1 CAN/ULC-S706-[02], Wood Fibre Thermal Insulation for Buildings.

1.4 SUBMITTALS

.1 Shop Drawings:

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

.2 Indicate arrangement of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural support members or support wall.

.3 Clearly detail and indicate locations of all Z clips, J-closures and edge trims.

.4 Describe in shop drawing details, suitable accommodation for the removal and joining of future cladding as described in 1.2.7 of this section and on drawings.

.2 Samples:

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

.2 Submit duplicate 300 x 300 mm samples of siding material, of colour and profile specified.

.3 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Divert used metal cut-offs from landfill by disposal [into the on-site metals recycling bin] [removed for disposal at the nearest metal recycling facility].

.2 Divert reusable materials for reuse at nearest used building materials facility.

.3 Divert unused caulking, sealants, and adhesive materials from landfill through disposal at hazardous material depot.

1.6 EXTENDED WARRANTY

.1 Submit a warranty for metal siding system, covering materials and labour and the repair or replacement of defective work in accordance with the Contract, but for five (5) years total.

Part 2 Products

2.1 METAL SIDING

.1 **Vertical Aluminum Siding**: prefinished **extruded aluminum** vertical siding (‘wood look’ / ‘wood effect’):

.1 Thickness: 11 gauge aluminum

.2 150mm (6”) wide ‘Channel’ siding & soffit profile x 7315mm long (24’)

.3 Location: Exterior and interior siding (various locations) and soffits. Refer to Exterior and Interior Elevations.

.4 Colour: To be selected from manufacturer’s full range of wood effect options.

.5 Approved manufacturers: Longboard (aluminum) by Mayne Coatings Corp., Knotwood extruded aluminum siding or Luxyclad.

.6 Vertical lengths to be single, continuous length (no seams).

.2 **Vertical Corrugated Siding:** prefinished steel siding (white)

.1 **Vicwest 7/8" Corrugated** steel siding by Vicwest or Agway Metals Inc.

.2 Location: Exterior siding. Refer to Exterior Elevations.

.3 Colour: White. Exact shade to be confirmed from full colour selection.

.4 Approved alternate with similar profile and colour.

.3 **Aluminum Batten** – prefinished extruded aluminum (wood effect):

.1 Knotwood – KEB20050, 50mm x 200mm (2"x8") extruded aluminum batten

.2 Location: Battens are referred to as "Pre-finished Wood Look Aluminum Fin" on drawings.

.3 Colour: to be selected by architect from wood grain selection

.4 Approved alternates: Longboard (aluminum) by Mayne Coatings Corp., Knotwood extruded aluminum siding or Luxyclad.

.4 For metal framing refer to Contract Drawings.

.5 Screws: to CSA B35.3-1962, any exposed fasteners to have head color same as exterior sheet finish, dished to CSA B35.3-1962.

.6 Powder actuated fasteners: galvanized, peened ballistic point, plastic cap of same color as exterior sheet.

.7 Sealants: in accordance with Section 079210- Joint Sealers, colour selected by Consultant. Allow for one (1) colour from manufacturers full range to match adjacent metal.

.8 Gaskets: soft pliable arctic grade vinyl, extruded profile.

.9 Touch-up paint: as recommended by panel manufacturer and Baycoat, compatible with prefinished coating.

.10 Provide purpose made material separators between dissimilar metal materials to avoid corrosion.

.11 Isolation coating: alkali resistant bituminous paint or epoxy resin solution.

.12 Insulation: As noted on Drawings and in Section 072113 – Board Insulation, and sections pertaining to Insulation and Sheet Air/Vapour Barrier transition membrane.

2.2 COMPONENTS

.1 Exterior sheet: factory preformed coated metal, to profiles and thicknesses as indicated.

.2 Exterior corners: of same profile, material and finish as adjacent siding material, shop cut and brake formed to required angle, concealed corner brace, hairline exposed joint, pop rivet connections with painted head to match siding.

.3 Exposed joint ends of siding sheet shop cut clean and square, backed with tight fitting filler lapping back if joint, exposed components color matched to siding.

.4 Accessories: cap flashings, drip flashings, internal corner flashings, copings and closures for head, jamb, eaves, soffits sill and corners, of same material and finish as exterior siding, brake formed to shape. Exposed cut edges of metal profiles will not be accepted.

.5 Thermally Broken Façade Structure (sub-girt):

.1 Acceptable systems:
.1 The Cascadia Clip® cladding support system
.2 TClip™ & SYSTEM2 system by Engineered Assemblies
.3 other thermally broken façade structures approved by the Consultant
.2 Refer to drawings for required clip and support system depth.
.3 Cavity behind panel to be at least 25 mm of unrestricted space and be designed as a rainscreen.
.4 Provide engineered shop drawings indicating support structure, sealed by a structural engineer licenced to practice in Ontario.
i) Fasteners: Exposed tamperproof factory prefinished or stainless-steel fasteners as recommended by panel manufacturer.
ii) Bottom joint to include PVC flat strip in colour as selected by the Consultant.
iii) Sealants: Sealant as approved by panel manufacturer in colour matching the panel as closely as possible. Sealant colour to be approved by Consultant.

2.3 FASTENERS

.1 Nails: CSA B111. Screws: ANSI B18.6.4.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 Install cladding in accordance with CGSB 93.5, and manufacturer's written instructions

.2 Install sub-girts to masonry walls prior to the installation of the Urethane foam insulation

.3 Install exterior finish siding to internal sub-girts with concealed fasteners.

.4 Provide notched and formed closures, sealed to arrest direct weather penetration at vertical profiles for exterior siding. Ensure continuity of "pressure equalization" of rain screen principle.

.5 Provide alignment bars, brackets, clips, inserts, shims as required to securely and permanently fasten wall system to building structure.

.6 Supply and install flashing at connection between roof and preformed metal siding.

3.3 CONTROL JOINTS

.1 Construct control joints, as indicated.

.2 Use cover sheets, of brake formed profile, of same material and finish as adjacent material.

.3 Use mechanical fasteners to secure sheet Expansion Joints materials.

.4 Assemble and secure wall system to structural frame so stresses on sealants are within manufacturer's recommended limits.

3.4 CLEANING

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

.2 Wash down exposed surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths.

.3 Remove excess sealant with recommended solvent.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM C 36-[97], Standard specification for Gypsum Board.
- .2 ASTM C 1002-[98], Specification for Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases.
- .3 ASTM D 1863-[86], Specification for Mineral Aggregate Used on Built-up Roofs.
- .4 ASTM D 2178-[97a], Specification for Asphalt Glass (Felt) Used in Roofing and Waterproofing.
- .5 ASTM D 4601-[97a], Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-37.5-[M89], Cutback Asphalt Plastic Cement.
- .2 CAN/CGSB-37.8-[M88], Asphalt, Cutback, Filled, for Roof Coating.
- .3 CGSB 37-GP-9Ma-[83], Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
- .4 CGSB 37-GP-15M-[84], Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.
- .5 CGSB 37-GP-19M-[76(R1985)]Cement, Plastic, Cutback Tar.
- .6 CGSB 37-GP-21M-[76(R1985)], Tar, Cutback, Fibrated, for Roof Coating.
- .7 CAN/CGSB-37.28-[M89], Reinforced Mineral Colloid Type, Emulsified Asphalt for Roof Coatings and Waterproofing.
- .8 CAN/CGSB-37.29-[M89], Rubber-Asphalt Sealing Compound.
- .9 CAN/CGSB-51.25-[M87], Thermal Insulation, Phenolic, Faced.
- .10 CAN/CGSB-51.26-[M86], Thermal Insulation, Urethane and Isocyanurate, Boards, Faced.
- .11 CAN/CGSB-51.33-[M89], Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.
- .12 CGSB 51-GP-38M-[76], Thermal Insulation, Cellular Glass, Pipe Covering, Block and Board.

.3 Canadian Standards Association (CSA)

- .1 CSA A123.2-[M1979(R1992)], Asphalt Coated Roofing Sheets.
- .2 CSA A123.3-[M1979(R1992)], Asphalt or Tar Saturated Roofing Felt.
- .3 CSA A123.4-[M1979(R1992)], Bitumen for Use in Construction of Built-Up Roof Coverings and Dampproofing and Waterproofing Systems.
- .4 CSA A231.1-[1972], Precast Concrete Paving Slabs.
- .5 CAN/CSA-A247-[M86(R1996)], Insulating Fibreboard.
- .6 CSA A284-[1976], Mineral Aggregate Thermal Roof Insulation.
- .7 CAN/CSA-ISO[9001] [9002] [9003], Requirements for Quality Assurance, Parts 1, 2 and 3.
- .8 CAN/CSA-ISO 14001-[96], Environmental Management Systems - Specifications with Guidance for Use.

.9 CSA O121-[M1978], Douglas Fir Plywood.

.10 CSA O151-[M1978], Canadian Softwood Plywood.

.4 Canadian Roofing Contractors= Association (CRCA)

.1 CRCA Specification.

.5 Underwriters= Laboratories of Canada (ULC)

.1 CAN/ULC-S701-[97], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.2 CAN/ULC-S702-[97], Standard for Mineral Fibre Thermal Insulation for Buildings.

.3 CAN/ULC-S704-[98], Thermal Insulation, Urethane and Isocyanurate, Boards, Faced.

.4 CAN/ULC-S706-[98], Insulated Fiberboard.

1.2 CO-ORDINATION

.1 Co-ordinate work of this Section with Related Work specified in other Sections to insure construction schedule is maintained and water tightness and protection of the building and finished work is maintained at all times.

.2 Co-ordinate work with other trades and provide materials and methods compatible with other materials and methods in order to maintain air/vapour barrier tightness of the building envelope.

.3 Co-ordinate supply and installation of air seals under all wood blocking with various trades. Also co-ordinate trades for tying in the air/vapour barrier of the roof/wall junction at all walls, perimeter eaves and parapets.

1.3 SUBMITTALS

.1 Submit to the Architect/ Consultant a list of all materials intended for use before they are ordered.

.2 Provide written declaration that all components and materials are compatible with each other and are covered under one common warranty.

.3 Submit samples of materials intended for use in accordance to Section 013300 – Submittal Procedures.

.4 Manufacturer’s Instructions: Provide to indicate special handling criteria, installation sequence, and cleaning procedures.

1.4 PRODUCT DATA

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

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, handle, store and protect materials of this section in accordance with Section 01 61 00 - Common Product Requirements.

.2 Provide and maintain dry, off-ground weatherproof storage.

.3 Store materials on supports to prevent deformation.

.4 Remove only in quantities required for same day use.

.5 Store materials in accordance with manufacturers written instructions.

.6 Store insulation protected from sunlight and weather and deleterious materials.

.7 Identification for delivery: indicate on containers or wrappings of and materials:

.1 Manufacturer's name and brand.
.2 Compliance with applicable standard.
.3 Mass where applicable.

.8 Deliver materials in original containers, sealed, with labels intact. Ensure that shelf life of materials has not expired.

.9 Keep material storage on roof to a minimum. Keep covered and protect stored materials from moisture and degrading effects of the sun. Elevate on raised platform minimum 100mm. Remove only those required for day's operation.

.10 Provide WHIMS Material Safety Data Sheets for materials supplied.

.11 At temperature below 5ºC, store membrane roofing, adhesive and sealants that will be affected by temperature in dry heated storage. Remove product immediately prior to installation.

.12 Protect edges of roll goods. Stand on end to prevent flattening.

.13 Deliver fasteners in boxes or kegs and keep in protective storage until used. Do not oil or grease fasteners.

.14 Remove damaged and/or rejected materials from site.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Place materials defined as hazardous or toxic waste in designated containers.

.2 Ensure emptied containers are sealed and stored safely for disposal away from children.

.3 Fold up metal banding, flatten and place in designated area for recycling.

.4 Plan and coordinate insulation work to minimize generation waste.

.5 Collect and separate plastic and/or paper packaging for recycling.

.6 Give preference to suppliers who take back mineral fibre insulation waste for reuse or recycling.

.7 Use the least toxic sealants and adhesives necessary to comply with requirements of this section.

.8 Close and seal, tightly, all partly used sealant and adhesive containers and store protected in well ventilated, fire-safe area at moderate temperature.

.9 Place used hazardous sealant tubes and adhesive containers in areas designated for hazardous materials.

.10 Collect, package and store partly used or unused containers of asphalt, sealing compounds, primers and roofing felts for recycling, and return to recycler.

1.7 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS

.1 Temperature, relative humidity, moisture content.

.1 Apply built-up bituminous membranes only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

.2 Do not install built-up bituminous membranes when air and substrate temperature remains below 5EC in accordance with manufacturer's recommendations or when wind chill gives equivalent cooling effect.

.3 Install built-up bituminous membranes on dry substrate, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into system.

.2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

.3 Ventilation:

.1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.

.2 Provide continuous ventilation during and after dampproofing application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for [7] days after completion of dampproofing installation.

1.8 QUALIFICATIONS

.1 Contractors must be experienced and approved for application of the materials and system being installed and have been responsible for satisfactory installation similar to that specified.

.2 By submitting this Tender the Contractor represents they have the special qualifications, training and experience for performing the work.

.3 Provide a competent foreman to supervise all work and act as the Contractors representative on site. Employ only experienced and qualified workers and ensure that workmanship conforms to best trade practices. Replace all work that results from inferior products or workership.

.4 Review contract documents with material manufacturer for products intended for use. Obtain mutual agreement and provide a letter co-signed by the manufacturer, that the details and specifications are appropriate and adequate for the construction and or renovations set out.

.5 In submitting their bid the Contractor reconfirms to be a member in good standing of the Canadian Roofing Contractors' Association and have been established as a roofing Contractor a minimum of five years and have adequate plant, equipment and skilled tradesmen to perform expeditiously and are known to have been responsible for satisfactory installations similar to that specified.

.6 In submitting their bid the Contractor confirms and represents to have the special qualifications for doing the work, and that the details and specifications are in their opinion appropriate and adequate for the construction described.

.7 In submitting their bid the Contractor acknowledges to be a trained and approved applicator for the materials and membrane systems specified.

1.9 SPECIAL PROTECTION

.1 Protect adjacent work, buildings, grounds and other property from damage during roofing operations. Locate garbage removal chutes and equipment away from locations where smoke and dust could be detrimental to the building or its occupants. Protect walls with tarpaulins in chute, hoisting and pumping areas.

.2 Proceed with caution. Use equipment that will not damage or impair the function of the deck.

.3 Do not overload the structure with materials or equipment.

.4 Remove all tools or equipment overnight that could be used to provide access to the building or used by persons intent on doing damage.

.5 Materials such as adhesives, solvents and thinners must be stored in well vented areas away from exists and air intake vents to avoid a build up of poisonous and caustic chemicals.

.6 Store solvent soaked cleaning rags in approved container, in a location to prevent a threat to fire safety or health of the building's occupants or workers. Dispose from site daily.

.7 Co-ordinate work to ensure that special protection against damage from traffic or work performed on top of completed roofing is provided.

.8 Protect roofing used as working platform by plywood sheets installed over work area including hoisting, pumping and traffic zones. Underlay platform with polyethylene when installed directly over bituminous membrane. Remove when not in use, otherwise weight down to prevent removal by wind.

.9 Remove and dispose asphalt mops from roof and site at end of working day. Storage arrangements shall provide free access of air to mops to minimize the possibility of spontaneous combustion. Mops to be stored in safe location to prevent the spread of fire should spontaneous combustion occur.

.10 Disconnect propane burners and torches from heating containers when not in use. Store heating fuel in protected area away from ignition sources and buildings.

.11 Fire Extinguishers: maintain one stored pressure rechargeable type with hose and shut-off nozzle, ULC labelled for A, B and C class protection. Size 10 kg on roof per torch applicator, within 10 m of torching operation.

.12 Maintain fire watch for 1.5 hours after each days roofing operations cease.

1.10 QUALITY CONTROL

.1 The roof inspection and testing shall in no way relieve the roofing contractor from his responsibility or obligation under the terms of the Contract.

.2 If the initial inspection and tests required to establish compliance with the Contract Documents indicate non-compliance with the Contract Documents, subsequent testing or re-inspection occasioned by non-compliance shall be performed. The cost of re-inspection and testing will be borne by the Contractor and deducted from the price of the Contract.

1.11 AIR TIGHTNESS

.1 Co-ordinate work with other trades and provide materials and methods compatible with other materials and methods in order to maintain air/vapour barrier tightness of the building envelope.

.2 Co-ordinate supply and installation of air seals under all wood blocking with various trades. Also co-ordinate trades for tying in the air/vapour barrier of the roof/wall junction at all walls, perimeter eaves and parapets.

1.12 WARRANTY

.1 Provide a written warranty signed and issued in the name of the Owner stating that the Contractor and Sub-Contractor jointly and severally warrant the complete roofing, and sheet metal flashing system against leakage, degradation of materials and thermal value, failure to stay in place, undue expansion, deformation, delamination, buckling, ridging, and splitting or loosening of seams, failure to adhere, deterioration, blistering, dislodged surfacing, and degradation of colour that detracts from performance or visual appearance and defective workmanship. All defects shall be repaired to restore the roof to good condition to the original Drawings and Specifications.

.2 Provide a 5 year performance warranty (2 year OIRCA roof warranty and a 3 year service warranty) and a 'NO-Dollar Limit Manufacturer's warranty' for twenty (20) years.

.3 The cost of the extended warrantee shall be included in the overall contract price. All roofing components must be supplied and/or pre-approved by the membrane manufacturer in order to comply with the acceptance criteria of the workmanship warranty.

1.13 SCHEMATIC ROOF DESIGNS

.1 Refer to Parts 2 and 3 for details on materials and installation procedures

.2 Refer to roof plan, wall section drawings and structural framing plans for locations of different types of roofs.

Roof Assemblies

R1	R2	R3	R4
Roofs with Steel or Acoustic Deck	**Canopy Roofs** *(102)*	**Roofs with Concrete Deck** *(101)*	**Sloped Roof 202** *(202)*
aggregate and bitumen surfacing	1 ply modified bitumen cap sheet	aggregate and bitumen surfacing	1 ply modified bitumen cap sheet
1 ply #15 felt and 4 plies type VI felt and asphalt roofing membrane	1 ply modified bitumen base sheet	1 ply #15 felt and 4 plies type VI felt and asphalt roofing membrane	1 ply modified bitumen base sheet
Fiberboard / tapered insulation	Tapered fibreboard	Fiberboard / tapered insulation	Fiberboard / tapered insulation
2 –layers of 75mm (1st layer mechanically fastened, mopped or adhesive, 2nd layer mopped or adhesive)		2 –layers of 75mm (1st layer mechanically fastened, mopped or adhesive, 2nd layer mopped or adhesive)	2 –layers of 75mm (1st layer mechanically fastened, mopped or adhesive, 2nd layer mopped or adhesive)
Self-adhered or 2-ply #15 vapour barrier			Self-adhered or 2-ply #15 vapour barrier
13mm Dens-Deck Prime sheathing (fastened or adhered)	13mm Dens-Deck Prime sheathing (fastened or adhered)	2-ply #15 organic felt and asphalt vapour barrier	13mm Dens-Deck Prime sheathing (fastened or adhered)
Steel deck or acoustic deck with flute insulation	Steel deck	Concrete deck	Steel deck or acoustic deck with flute insulation

Part 2 Products

2.1 COMPATIBILITY

.1 Compatibility between components of system and adjacent materials is essential. Provide written declaration to Consultant stating that materials and components, as assembled in system, meet this requirement.

2.2 VAPOUR RETARDER

.1 Self adhered or 2-ply #15 vapour barrier conforming to CAN/CGSB-51.33-M80, type 2 and ULC approved fire retardant adhesive as manufactured by IKO, Johns Manville or approved equal.

.2 For Concrete Decks – 2-ply #15 Organic Felt.

2.3 AIR SEAL

.1 Self-adhering Grade SBS Modified Bitumen minimum thickness 3.0mm, with minimum 180g/sq.m., polyester reinforcement, Type II, Class C, Grade 2 and conforming to CGSB 37-GP-56M as supplied by Bakor, IKO, Johns Manville, Siplast, or Soprema.

2.4 BASE POLYISOCYANURATE INSULATION (FIBRE GLASS FACED)

.1 Polyisocyanurate foam rigid insulation boards, 2 layers each 3" (75 mm) thick. Insulation boards to be Type 3, Class 2, manufactured with HC blowing agent (Pentane) bonded to fibre glass facers on top and bottom surfaces during the manufacturing process. Standard of acceptance to be E'NRG'Y3 AGF as manufactured by Johns Manville or 'Approved Alternate' by Atlas or IKO. Maximum board size: 1200 mm x 1200 mm for asphalt applications and 2440 x 2440 mm where mechanically secured. Insulation Boards to meet the following requirements:

.1 Approved and listed by Factory Mutual Global for Class 1-60, 1-75, and 1-90 windstorm classification and meeting FM4470 approval requirements for Class 1 fire as a component in roof deck construction.

.2 Meet the physical property requirements of ASTM C 1289 and CAN/ULC S-704.

.3 Dimensional stability change of less than 2% conforming to ASTM D 2126.

.4 Conformity to CAN/ULC S704 and Can/ULC S770 for Long Term Thermal Resistance in polyisocyanurate insulation.

.5 First layer mechanically fastened, mopped or adhesive. Second layer mopped or adhesive)

2.5 TAPERED FIBREBOARD

.1 Tapered high density fibreboard insulation min. 45 psi. meeting the requirements of CAN/CSA A-247-M86 and CAN/ULC-S706. Tapered insulation per the tapered layout.

.1 Acceptable Material: High Density Fibreboard insulation as supplied by Posi-Slope or Accuplane

2.6 OVERLAY FIBREBOARD

.1 Overlay insulation is to be a minimum 13 mm on flat areas. Insulation to be high density fibreboard insulation min. 45 psi. meeting the requirements of CAN/CSA A247-M86 and CAN/ULC-S706. Install overlay insulation as indicated on drawings.

.2 Overlay insulation at parapets and flashings to be torchable 13 mm recover board by Johns Manville or 13 mm Sopraboard by Soprema.

2.7 DECK SHEATHING

.1 Sheathing shall be Dens-Deck Prime, 13mm thick x 1220mm x 2440mm.

2.8 PRIMERS

.1 Asphalt primer: to CGSB 37-GP-9Ma.

.1 Acceptable material: as recommended by manufacturer.

.2 Zinc rich, ready mix to CAN/CGSB-1.181-92.

.1 Acceptable material: as recommended by manufacturer.

2.9 BUILT-UP MEMBRANE

.1 1 Ply #15 felt and 4 plies type VI glass fibre felts asphalt and felt built-up conventional membrane roof and waterproofing system.

2.10 BITUMEN

.1 Asphalt: to CSA A123.4, Type 2 and 3.

2.11 FELTS

.1 Saturated organic felts: to CSA A123.3 No.15, saturated asphalt.

.1 Acceptable material: Bakor, IKO, Johns Manville or Soprema.

.2 Saturated glass fibre felts: to ASTM D 2178, Type VI-ply sheet.

.1 Acceptable material: Bakor, IKO, Johns Manville or Soprema.

2.12 SEALERS

.1 Plastic cement: asphalt, to CAN/CGSB-37.5.

.1 Acceptable material: as recommended By manufacturer.

.2 Sealing compound: to CAN/CGSB-37.29, rubber asphalt type.

.1 Acceptable material: as recommended by manufacturer.

.3 Sealant: in accordance with Section 07 92 10 - Joint Sealing not contain total of volatile organic compounds in excess of [5] % by weight, asbestos-free sealant, compatible with systems materials, recommended by system manufacturer.

.4 Polyurethane Caulking: 1 part Polyurethane compound for concealed horizontal metal joints, and reglets and exterior uses to CAN/CGSB Standard 19.13-M87. “Dymonic” by Tremco Ltd. or approved equivalent. Use colour to match adjacent materials

.5 Caulking: Silicone to CAN/CGSB 19.18-M87.

2.13 CANT STRIPS

.1 Cut from 75 mm x 75 mm x 38 mm thick fibreboard material to measure 140 mm on slope.

2.14 MODIFIED BITUMEN MEMBRANE AND MEMBRANE FLASHING

.1 Base Sheet Flashing

.1 If base sheet and field membrane are being mopped, mop the base sheet flashing as well.

.2 Self-adhering Grade SBS Modified Bitumen minimum thickness 3.0mm, with minimum 180g/sq.m., polyester reinforcement, Type II, Class C, Grade 2 and conforming to CGSB 37-GP-56M as supplied by Bakor, IKO, Johns Manville, Siplast, or Soprema.

.2 Base Sheet Membrane

.1 Mopping Grade SBS Modified Bitumen minimum thickness 3.0mm, with minimum 180g/sq.m., polyester reinforcement, sanded underside and poly film surfacing for mop/torch application, Type II, Class C, Grade 2 and conforming to

CGSB 37-GP-56M as supplied by Bakor, IKO, Johns Manville, Siplast, or Soprema.

.3 Cap Sheet and Cap Sheet Flashing

.1 Torch Grade SBS Modified Bitumen minimum thickness 4mm, with minimum 250g/sq.m., non-woven polyester reinforcement, with light grey granule surfacing, Type 1, Class A, Grade 2, and conforming to CGSB 37-GP-56M as supplied by Bakor, IKO, Johns Manville, Siplast, or Soprema.

.4 Primer for Self Adhering Base Sheet

.1 Synthetic rubber based primer Elastocolle 500 by Soprema or equal.

2.15 FASTENERS

.1 All fasteners for steel, wood, concrete and specialty decks must meet factory mutual approvals.

.2 Use galvanized, copper, aluminum or stainless nails or screws as most compatible with materials being employed. Screws shall be minimum 38mm (1.5") #10 cadmium plated hex head with neoprene and steel washers by Atlas Bolt or approved equal. Rawl lead shields as required for anchoring. Use fasteners as most generally suitable to Consultant's approval.

.3 General Fasteners: #10 ardox nails of length to penetrate bases minimum 13mm (0.5"). Horizontal Membrane Fasteners: Use ardox 50mm (2.0") nails with minimum 25mm (1.0") solid caps for securing membrane to insulation stops.

.4 Vertical Flashing Fasteners: Nails, Tapgrip or Permagrip fasteners with 25mm (1.0") solid caps. Minimum length 38mm (1.5").

.5 Screws: Minimum 38mm (1.5") #10 cadmium plated hex head with neoprene and steel washers by Atlas Bolt or approved equal. Rawl lead shields as required for anchoring.

.6 Insulation to substrate: fasteners and plates must meet Factory Mutual 4470 Standard for wind uplift and corrosion resistance.

2.16 WHITE ROOF GRAVEL

.1 To be highly reflective aggregate such as Tremco #1 White Marble Roofing Aggregate or white calcite.

.2 10 mm x 16 mm, clean crushed stone, white colour.

2.17 CONCRETE PAVERS

.1 Paving slabs: to CSA A231.1, 600 mm x 600 mm x 38 mm, precast concrete paving slabs welded wire mesh reinforced concrete paver with 6% - 8% air entrainment and to 30 MPa. Install concrete pavers over 1” extruded polystyrene rigid insulation by Dow or equal.

2.18 PAVER PEDESTALS

.1 Pedestals and levelling plates made of high density polyethylene with integral spacer ribs on upper surface.

2.19 VENT STACK FLASHING

.1 SJ-24 pre-insulated spun aluminium with telescoping cap complete with stainless steel vandal proof cap by Thaler Metal Industries Inc. 80mm diameter, installation to conform to Local Plumbing Code. Confirm with Mechanical Section for size, number and location.

2.20 METAL SLEEVES

.1 Fabricate from one-piece 454 gms. (16.0 oz.) copper or 26 gauge stainless steel fabricated minimum 300mm (12.0") high above finished roof surface, with 125mm (5.0") flange as approved by the Consultant. All seams to be continuous and soldered.

2.21 SCUPPERS AND OVERFLOWS

.1 Size and materials as specified or shown, fabricated from 454 gms. (16.0 oz.) copper, 26 gauge stainless steel with minimum 125mm (5.0") roof flange and gravel guard to Consultant's approval. Make all seams continuous and watertight by soldering or heat welding.

2.22 LADDER SUPPORT

.1 ARS-500 access ladder support by Thaler Metal Industries.

2.23 BITUMINOUS METAL PAINT

.1 “Gilsonite Asphalt 410-02" by Monsey Bakor Inc. to CGSB1-GP-108 Type II.

2.24 B-VENT FLASHING

.1 MEF-4A by Thaler. Supplied by Mechanical Section and installed as approved by Roofing inspector.

2.25 SOURCE QUALITY CONTROL

.1 Submit laboratory test reports in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit laboratory test reports certifying compliance of bitumens and roofing felts with specification requirements.

Part 3 Execution

3.1 WORKMANSHIP

.1 Do work in accordance with applicable, standard in Canadian Roofing Contractors Association (CRCA)] Roofing Specifications Manual, except where specified otherwise.

.2 Do priming for asphalt in accordance with CGSB 37-GP-15M.

3.2 HEATING OF ASPHALT

.1 Asphalt to be heated in kettle or tanker sufficiently to provide correct EVT range at point of application.

.2 In cold weather insulate hauling equipment and re-circulation lines to minimize heat loss.

.3 Do not heat asphalt above its Final Blowing Temperature (FBT) in tanker.

.4 Heating asphalt above its FBT may be permissible in kettle as long as asphalt is used up within four hours.

.5 Equip kettle and tanker with working thermometers.

3.3 PLANT AND EQUIPMENT

.1 Do not use direct fired equipment.

.2 Use only kettles equipped with thermometers or gauges in good working order.

.3 Locate kettles in safe place outside of building or, if approved by Consultant, on noncombustible substrate at location to avoid danger of igniting combustible material below. When locating kettles, give consideration to direction of prevailing winds, building fans and air handling units to minimize possibility of smoke and fumes entering surrounding occupied buildings. If wind direction causes smoke and fume problems, relocate kettles on daily basis when directed by Consultant.

.4 Maintain supervision while kettles are in operation and provide metal covers for kettles to smother flames in case of fire. Provide suitable fire extinguishers.

.5 Maintain efficiency of kettles and equipment by frequent cleaning. Remove all carbonized bitumen.

.6 Use only fibreglass roofing mops.

3.4 PROTECTION AND SUBSTRATE EXAMINATION

.1 Review plans, specifications and drawings for the original and any subsequent alterations for the building's construction and interview those involved in the construction of the building. Investigate the location of services that may be installed under or in the deck, built into the structure on or within the assembly. These services are to include but are not limited to mechanical, electrical, communications, lightning protection, cable, security and fire alarms. Ensure that all services are located and protected from damage from work under this contract.

.2 Inspect the surface for soundness and notify the Architect/Consultant in writing of any surface unsound and unsuitable for roofing. Do not commence work until you have documented conditions and obtained a ruling from the Architect/Consultant on the acceptability of surfaces and/or corrective measures required. The cost for any delays due to postponement of work that results from investigating the site problem or obtaining a ruling will be at the Contractor's expense.

.3 Before proceeding with roofing application, ensure that:

.1 All surfaces are clean of debris and free of snow, frost and moisture.

.2 Surface is clean and sufficiently dry to ensure specified adhesion will be obtained.

.3 Surface is sound, constructed smooth in true planes and levels or sloped to drains, in conformity to design intent.

.4 Surfaces are free of cracks that are wider than bridging ability of roofing materials.

.5 Adjacent construction and installation of work of others incorporated when roof is completed.

.6 Preparations have been made for bases on which equipment will be installed.

.7 Existing fasteners are tight and deck irregularities and levels are corrected to provide a suitable surface for new roofing.

.8 Curbs have been built.

.9 Drains have been installed at proper elevations relative to finished roof surface.

.10 Plywood and lumber nailer plates have been installed to walls and parapets as indicated.

3.5 DECK SHEATHING

.1 Mechanically fasten sheathing to steel deck with screws spaced [400] mm oc each way.

.2 Place sheathing with long axis of each sheet transverse to steel deck ribs, with end joints staggered and fully supported on ribs.

3.6 ASPHALT APPLICATION

.1 Heat asphalt to obtain proper application temperature and viscosity at point of contact. The EVT temperature is the temperature when the asphalt attains a viscosity of 125 centistokes for hand mopping and 75 centistokes for mechanical application. To compensate for wind chill, ambient temperature and shading a tolerance of (±15º C) (±25ºF) is allowed. Keep asphalt in constant use to prevent distillation. If heating temperatures are not supplied on the containers or bills of lading for the asphalt on site heat to no more than 246ºC (475ºF) for Types II and III.

.2 In cold weather, insulate pump pipes and transport bitumen on roof in insulated carriers to minimize temperature fall back between kettle and point of application.

.3 Bitumen shall not be heated to flash point or held at final blowing temperature for more than 4 hours to prevent asphalt fallback.

.4 Unless otherwise specified by Manufacturer literature use the following E.V.T. temperatures.

	Mechanical Application	Mop Application
.2	Type II 400ºF (±25ºF)204ºC (±15ºC)	Type II 400 ºF (±25ºF)204ºC (±15ºC)
.3	Type III 450ºF (±25ºF)232ºC (±15ºC)	Type III 425 ºF (±25ºF)218ºC (±15ºC)

.5 Maintain constant supervision of tankers kettles to ensure that bitumen is not overheated. Check temperature of bitumen in kettle at a minimum of 30 minute intervals with an accurate thermometer. Maintain a record of bitumen temperatures.

.6 Do not place kettles on the roof without obtaining written permission from Owner and insurance underwriters. Where permission is granted, in addition to the requirements outlined in these documents, higher safety and insurance limits may be imposed. Any additional cost to meet these requirements will be at the Contractor's expense.

.7 Install all bitumen in a uniform continuous application insuring good adhesion is achieved. For #15 felts, apply at the rate of not less than 1.0 kgs./m^2 (20 lbs./100ft^2) per ply and for glass felts not less than 1.2 kgs./m^2 (25 lbs./100ft^2) per ply. Insure that bitumen bleeds out from both sides of the roll not less than 13mm (0.5").

.8 Use Type II for slopes up to 127mm/m (1.5"/ft.) (1:8).

.9 Use Type III for slopes greater than 127mm/m (1.5" to 3.0"/ft.) (1:8 to 1:4) and for felt flashings.

3.7 ACOUSTIC DECK INSULATION APPLICATION

.1 Where applicable install acoustic deck insulation in flutes of steel deck to manufacturers specified requirements. Supply by Steel Decking section.

3.8 PRIMER

.1 Prime masonry and concrete surfaces which will be in direct contact with asphalt at the rate of 0.15 L./m^2 (0.33 gal./100 ft^2) to CGSB 37-GP-15M. Ensure that surfaces are tack-free before proceeding.

.2 Limit quantity of primer at deck openings and points of termination to prevent bleedthrough to the building interior.

.3 Broom primer into surface.

.4 Re-prime all surfaces that become contaminated with dust or become marred due to their exposure to roof traffic or weather.

3.9 VAPOUR RETARDER

.1 Self adhered or 2-ply #15 vapour barrier conforming to CAN/CGSB-51.33-M80, type 2 and ULC approved fire retardant adhesive as manufactured by IKO, Johns Manville or approved equal.

.2 For Concrete Decks – 2-ply #15 Organic Felt.

.3 The vapour barrier shall be fully sealed at all overlaps and to adjacent surfaces with the adhesive.

.4 The vapour retarder is to overhang all edges and be carried up verticals a minimum 6" to allow for the formation of a water cut-off and enveloping the insulation.

3.10 VAPOUR RETARDER (CONCRETE DECK)

.1 Embed two piles of #15 organic felts in hot bitumen spread at rate of 1 kg/m^2 for organic asphalt or 1.2 for glass asphalt.

3.11 AIR SEALS

.1 Install self adhering modified Bitumen air seals under wood blocking, over metal upstands and all points shown on drawings. Overlap with air/vapour barrier of the roof/wall junctions at all wall perimeter eaves and parapets.

3.12 INSULATION

.1 The base insulation shall be 2 layers each 75 mm (150 mm total) of Polyisocyanurate insulation, with first layer mechanically secured to the steel deck with Trufast stainless or coated screws and plates to meet the requirements of FM 1-90. (5 fasteners per panel minimum or more as required by FM) At acoustic deck use prefinished screws to match deck color. Second layer to be mopped onto first layer. On concrete decks the polyisocyanurate insulation shall be applied in a mopping of type 3 asphalt at a rate of 25# per 100 sq. ft.

.2 Over top of the base insulation a layer of 13 mm high density fibreboard insulation is mopped in type 3 asphalt at a rate of 25# per 100 sq. ft.. At the parapet and flashing, the torchable recover board is to be mechanically secured to the back-up surface through the base layer of insulation.

.3 Insulation boards shall be installed with staggered joints so adjacent boards are butt together without gaps. Boards are to be cut at projections and perimeters to minimize heat loss at these locations. All joints in the 2 layers of insulation are to be off set a minimum of 6" (150 mm).

.4 At all drain locations, the base insulation shall be reduced by 1” (25 mm) in thickness to create an 8'x8' (2440x2440 mm) sump for positive drainage. Install tapered high density fiberboard sump from 1 ½” to ½” over 4’.

.5 Fasteners and plates used to secure the insulation to the roof deck must meet Factory Mutual 4470 Standard for wind uplift resistance I-90 and corrosion resistance. Trufast fasteners and metal plates and/or an equal pre-approved by the Consultant prior to the Tender Closing Date.

3.13 TAPERED INSULATION: APPLICATION

.1 For all locations of tapered insulation, provide shop drawings from tapered insulation Manufacturer for Consultant's review prior to installation.

.2 Where shown on roof plan, install width and thickness of tapered fibreboard insulation shown on drawings over base insulation set in a solid coat of Type III asphalt. Allow for wood blocking to compensate for additional insulation thickness.

.3 At all drain locations, provide tapered fibreboard insulation to form a sump each side of drain to promote positive drainage as shown on drawings.

.4 Ponding water will not be permitted.

3.14 CONVENTIONAL MEMBRANE APPLICATION

.1 Ensure all substrate surfaces are dried by artificial or natural means before installation of membrane.

.2 The roof membrane is to be constructed from 1 ply #15 felt and 4 plies type VI glass fibre felt with plies overlapping 698mm (27.5"). 3+1 or 2+2 applications are not acceptable.

.3 Roll and mop each ply into uniform solid layer of bitumen to obtain complete embedment.

.4 Install felts smooth, free of wrinkles, air pockets, fishmouths and tears. Coinciding end joints are not acceptable.

.5 All fishmouths in membrane are to be cut and worked into bitumen immediately while bitumen is still hot. Repair all fishmouths with an additional ply of glass felt extending minimum 150mm (6.0") in each direction of defect.

.6 Do not gang roll felts during application as this will result in the displacement of bitumen. Keep rolls minimum 2.0 metres (6.5 ft.) apart during application. Protect new membrane from wheel and foot traffic until bitumen is set.

.7 Install felts with the slope to prevent slippage of the roll due to gravitational forces starting at low point in continuous application to top of cants.

.8 Ensure that felts at inside and outside corners fit tight to all verticals without gaps. Seal membrane at top of cants with a continuous light coat of asphalt as work progresses. Cut membrane at all changes in plane to assure proper bond to surfaces.

.9 Extend felts to the top of cants at all vertical surfaces in a continuous operation to provide waterproof seal while bitumen is still hot. Secure membrane at 212mm (8.5") o.c. in center of insulation stop at the toe of the cant strip while bitumen is still hot prior to installing membrane flashings. Locate fasteners 38mm (1.5") from edge of overlapping plies. Glaze coat all felts with asphalt after securing membrane to insulation stops.

.10 Avoid coinciding end joints where possible. Terminating felts and cross strippings in ends is not acceptable. Use equipment and application techniques approved by Consultant.

.11 Install an additional two plies of fibreglass felt in solid bitumen to reinforce defects and lap joints where the membrane changes direction. Install an additional two plies of fibreglass felt in and 600mm (2'-0") beyond drainage sump and drainage channels.

.12 Install an additional 180gm/m^2 mop grade modified bitumen base sheet extending 200mm (8.0") beyond all areas where walkways, observation platforms or other apparatus are to be installed. Set base sheet in solid coating of Type III asphalt prior to gravelling area.

.13 At Canopy Roof locations the membrane application is to consist of one ply of modified bitumen base sheet applied with Type II hot asphalt and one ply of modified bitumen cap sheet membrane torch applied.

.1 Install membrane free of blisters, wrinkles and fishmouths in accordance with membrane manufacturer's instructions.

.2 Apply base sheet in hot asphalt applied at a rate of 1.25 kg/m^2 (25 lbs/100ft^2). Heat asphalt so that its mopping temperature is not below 240C (400F).

.3 Start all roofing applications at the lowest point or centre of the roof drain to ensure water runs over the laps of the membrane.

.4 Unroll membrane a maximum of 1.2 m (4') behind mopping application and carry 100 mm (4 inches) above the top of the cant.

.5 Lap base sheet 90 mm (3 1/2") on sides and 150 mm (6") on ends. Seam rollers are not recommended.

.6 Reinforce around all projections and drains using additional ply of base sheet as per manufacturers' instructions.

.7 Torch off the plastic film on the top surface of the base sheet with a propane torch before mopping in the base sheet flashing to the field of the base sheet.

.8 Apply a mopping of Type III asphalt or Easy Melt 200. Install the base sheet flashing membrane up the parapet walls. Apply membrane up and over parapets. Face nail with cap nails at 300 mm o.c. Seal the side laps with asphalt.

.9 TORCH APPLIED CAP SHEET MEMBRANE

.10 Apply cap sheet beginning at the low point of the roof or centre of drain. Allow membrane to relax according to manufacturer's recommendations.

.11 On the granular edge of the first course of membrane, chalk line a new 90 mm (3 ½") side lap. Heat with a propane torch and embed the granules before installing the next course of cap sheet membranes.

.12 Re-roll and torch apply to base sheet taking care not to burn membrane or its reinforcement and following manufacturers printed instructions.

.13 Extend membrane to top of vertical surface or to the top of cant strips as detailed or instructed.

.14 Lap sheets 90 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm minimum from base sheet.

.15 Embed surface granules on end laps by heating and using a round-nosed roofing trowel, prior to installation of following sheet.

.14 Flashing application.

.1 If base sheet and field membrane are being mopped, the base sheet flashing is to be mopped as well.

.2 Prior to installing the flashings, the roofing supervisor and foreman shall check, and approve the condition of the substrate. If required corrective action must be taken to rectify problem areas to the satisfaction of all parties. The start of work shall be deemed to constitute acceptance of the conditions governing the contract.

.3 Ensure substrate is dry before installation of membrane.

.4 At curbs, joints, parapets and verticals install base sheet flashing to points shown extending 150mm beyond the toe of the cant and extending up and over to points shown. Ensure that membrane achieves solid contact and is left free of wrinkles, air pockets, fishmouths and tears. Overlap all end joints and corners minimum 150mm and ensure a positive watertight seal. Install in one meter lengths, cut from across the roll.

.5 Install granular surfaced cap sheet flashing, extending 300mm beyond the toe of the cant, extending up and over to points shown. Leave finished product free of buckles, air pockets, fishmouths and tears.

.6 Prepare all overlaps with heat and trowel to fully embed the granules and obtain a continuous flow of bitumen.

.7 Overlap all end joints minimum 150mm. Install in 1 metre lengths cut from across the roll. Offset side laps of cap sheet roofing and cap sheet flashings by 50%.

.8 At inside and outside corners, carry first ply around onto opposite plane, minimum 150mm. Trim overlapping ply flush to corner. Fold over and secure cap sheet to outside faces and top of curbs with nails and caps at 225mm o.c. Secure the top of the membrane flashings at all vertical walls at 225mm o.c. with caps and fasteners most generally suitable. Seal the tops of all flashings and points of termination with modified sealant.

.15 Bituminous Surfacing

.1 Do not install bitumen and aggregate surface until membrane and membrane flashings are complete, inspected and accepted. Insure membrane and flashings asphalt have set prior to gravelling operation.

.2 Prior to installation of bituminous and aggregate surface carefully inspect and repair all defects and deficiencies in the membrane and flashings that was not corrected during the initial installation.

.3 Pour hot bitumen flood coat over entire surface without skips at a rate of not less than 3 kg./m^2 (60 lbs./100 ft^2). Apply full covering of gravel at the rate of not less than 24 kg./m^2 (500 lbs./100 ft^2). If skips are found, sweep back gravel and reflood area.

.4 Remove all loose gravel and embed a second full coat of bitumen and aggregate 5.0 metres (15'-0") at all outside corners of the building and 600mm (2'-0") back from all roof openings.

.5 Provide a double pour of asphalt and gravel at locations where ponding depth exceeds 6mm (0.25") to disburse water to nearest drain. Contractor is to include to repour 5% of the total roof area in the original bid.

.6 Repeat application of bitumen and aggregate over entire roof for total aggregate mass of 48 kg/m^2 (10.0 lbs./ft^2).

.7 Check areas with broom to ensure proper embedment of aggregate. Clean and repour all areas as required to obtain a minimum 40% of adhesion of aggregate into bitumen.

3.15 CANTS

.1 Install fibre cants over rigid insulation.

.2 Apply hot bitumen to receiving surface and embed cant firmly by hand.

.3 Angle cut cants to fit tightly on back and bottom where roof to wall angle varies from 90E.

3.16 ROOF DRAINS

.1 Ensure roof drains are properly secured and set to permit positive roof drainage. Lower or extend mechanical services required to conform to specified requirements and design intent.

.2 Coat drain flange to receive roofing solid with modified mastic and install 1 ply #15 felt in the sump as an underlay to the membrane laid with a solid coat of hot bitumen. Lay

membrane roofing including the cap sheet continuously through sump and over roof drain flange. Neatly trim felts to interior face and seal inside face with modified mastic.

.3 Set clamp ring in solid bed of modified asphalt sealant and secure clamp ring as dictated by drain design immediately after membrane is installed. Tighten bolts to ensure a permanent watertight seal. Install drain screen and gravel guards to details and manufacturer instructions.

3.17 PLUMBING VENTS, STACKS AND SLEEVES

.1 Inspect and clean soil pipes of debris to insure they are open. Make all roof penetrations air/water tight by installing a flexible membrane extending minimum 150mm beyond pipe onto overlay. Cut hole in membrane and pull over pipe to provide tight fit, tighten with clamp and seal with caulking. Alternatively at projections foam deck at pipes with polyurethane foam.

.2 Trim bitumen membrane 25mm from openings to prevent bitumen from dripping.

.3 Set metal flashings on top of completed membrane roofing.

.4 Set and cover flanges to receive roofing solid with modified sealant.

.5 Flash all flanges with three plies of felt laid solid with bitumen. Install first ply 25mm from upturn, and continue 150mm onto roof, second ply 225mm and third ply 300mm beyond flange.

.6 Coat finished surface of membrane immediately upon installation.

.7 Co-ordinate work with appropriate section to ensure that pipes are adjusted to flashing heights by either cutting down or extending pipes with matching materials attached with mechanical couplers. Ensure pipe is minimum 25mm higher than flashing sleeve. Insulate all sleeves, except unit heater stacks, with loosely packed glass fibre insulation. Seal openings between flashings and pipes with caulking sloped to shed water

.8 Install telescoping caps on soil pipes sealed solid with caulking to prevent condensation traps. Install vandal proof caps to manufacturer's requirements.

.9 Roofing Contractor to supply and install all sleeves, caps and rain collars on mechanical equipment. Unit heaters, etc. Design and fabricate collars to match material to which it is to be attached. Solder rain collars up to .559 mm and weld .711mm or heavier.

.10 Replace all damaged flashings and poorly fitting collars.

.11 Protect exposed surface during roofing operation and clean surfaces free of bitumen before leaving site.

3.18 CONCRETE PAVERS

.1 Install concrete pavers where shown to requirements of Summary of Work, drawings and details.

.2 Install paver on a 38mm (1.5") thick layer of extruded polystyrene insulation underscored in both directions at 150mm (6.0") o.c. to allow for drainage and venting. Cut insulation 38mm (1.5") smaller on all sides than paver so overhang protects insulation from direct sunlight. Build up gravel at edge of paver for additional protection to insulation.

.3 When bolting wood or equipment to pavers pre-drill holes through paver and install bolt from underside through to top and secure equipment with washers and nuts. Countersink bolt heads to protect membrane.

.4 Gas line supports including concrete paver bases shall be supplied by Division 15

.5 Quantity: as shown on drawings and to be site verified by the Consultant

3.19 ROOFING NEW TO EXISTING

.1 Make good existing roof, membrane flashing, and metal flashing. Scrape back existing roof surface minimum 18 inches (450 mm) along the entire perimeter involved, repair surface as required, due to scraping operations. Provide all cant strips, expansion joint filler, new roof membrane, membrane flashings, and provide new roof surfacing all as detailed and/or directed by authorized owner's representative.

.2 Materials for the reinstatement of existing roof must be compatible with existing materials.

.3 Make good existing roofing, flashing membrane and sheet metal counter flashings to the satisfaction of owner's authorized representative.

.4 Special job conditions are anticipated and will require full co-operation and co-ordination. Provide all miscellaneous materials and labour as directed.

3.20 FIELD QUALITY CONTROL

.1 Inspection and testing of BUR application will be carried out in accordance with Section 011100 – Summary of Work, section 1.43.

3.21 PROTECTION OF COMPLETED WORK

.1 Ensure membrane is undamaged before application of protection board.

.2 Apply protection board to cover membrane at locations as indicated.

3.22 CLEANING

.1 Keep the premises free from accumulation of waste materials or rubbish at all times. Stock piling of debris on the roof will not be permitted.

.2 Leave roof clean of debris and bitumen left by spills and machine tracking.

.3 Leave grounds and building free of debris and bitumen spread by pedestrian traffic where applicable. Rake out excessive piles of aggregate and trim to neat, even surface.

.4 Clean surfaces and penetrations of all contaminants and touch up to the satisfaction of the Owner. Include roof top equipment, curbs, soil stacks, sleeves, gas lines, vents, drains, ladders and walls.

.5 Check drains to ensure they are functional and where required remove all debris by vacuum.

.6 At the completion of the work remove all rubbish, tools, equipment and surplus materials.

.7 Be responsible to repair and pay all costs and fees required to rectify damage caused by work of this Contract with materials and finish to match original.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 10 11 – Rough Carpentry.

.3 Section 07 46 13 – Preformed Metal Siding.

.4 Section 07 51 12 – Built-Up Bituminous (BUR) Roofing.

.5 Section 07 21 19 – Spray in Place Urethane Foam Insulation.

.6 Section 07 46 13 – Preformed Metal Siding.

.7 Section 07 41 43 – Aluminium Composite Panels.

1.2 REFERENCES

.1 The Aluminium Association Inc. (AA)

- .1 Aluminium Sheet Metal Work in Building Construction-[2000].
- .2 AA DAF45-[97], Designation System for Aluminium Finishes.

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

- .1 ASTM A167-[99], Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- .2 ASTM A240/A240M-[02], Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- .3 ASTM A591/A591M-[98], Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating [Mass] Applications.
- .4 ASTM A606-[01], Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
- .5 ASTM A653/A653M-[01a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .6 ASTM A792/A792M-[02], Standard Specification for Steel Sheet, 55% Aluminium-Zinc Alloy-Coated by the Hot-Dip Process.
- .7 ASTM B32-[00], Standard Specification for Solder Metal.
- .8 ASTM B370-[98], Standard Specification for Copper Sheet and Strip for Building Construction.
- .9 ASTM D523-[89(1999)], Standard Test Method for Specular Gloss.
- .10 ASTM D822-[01], Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.3 Canadian Roofing Contractors Association (CRCA)

- .1 Roofing Specifications Manual [1997].

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-37.5-[M89], Cutback Asphalt Plastic Cement.

.2 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.

.3 CAN/CGSB-93.1-[M85], Sheet Aluminium Alloy, Prefinished, Residential.

.5 Canadian Standards Association (CSA International)

.1 CSA A123.3-[98], Asphalt Saturated Organic Roofing Felt.

.2 CSA-A440-[00]/A440.1-[00] - A440-[00], Windows / Special Publication A440.1-[00], User Selection Guide to CSA Standard A440-[00], Windows.

.3 CSA B111-[1974(R1998)], Wire Nails, Spikes and Staples.

1.3 QUALIFICATIONS

.1 Applicator to be of local recognized standing with proven record of satisfactory installations and to be approved by the Architect. Applicator must have, at least, five (5) years of proven experience in this work.

.2 Supply and install sheet metal flashings in accordance with, and to the standards of the CRCA FL Series details.

1.4 SAMPLES

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

.2 Submit 50 x 50 mm samples of each type of sheet metal material colour and finish.

1.5 SHOP DRAWINGS

.1 Submit Shop Drawings in accordance with Section 013330 – Submittal Procedures.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

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

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

.4 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

.5 Fold up metal banding, flatten and place in designated area for recycling.

1.7 EXTENDED WARRANTY

.1 Submit a warranty for metal flashing and trim, covering materials and labour and the repair or replacement of defective work in accordance with Section 01006 Stipulated Sum Contract, PBE - 1994, but for five (5) years total.

Part 2 Products

2.1 PREFINISHED STEEL SHEET

.1 Galvanized steel sheet with factory applied Stelco or Dofasco coating. Three colours to be used for this project:

- .1 Colours 1 – 3: three standard colours from full QC colour line.
- .2 Colour 4: custom colour to be exact match of colour selection for the composite panels.
- .3 All prefinished metal of same colour to be consistent and from same run.

.2 Metal thickness to be 24 gauge. Where exposed face of flat faced flashing and trim exceeds 250 mm, provide details to lap two layers providing on intermediate lock joint to achieve total depth required for exposed surface.

.3 Isolation coating to CGSB 1-GP-108C.

.4 Plastic cement to CGSB 37-GP-5M.

.5 Sealant compound of one (1) part polysulphide polymer base.

.6 Cleats of same material, and temper as sheet metal, minimum 50 mm wide, 45 mm thick.

.7 Fasteners: of same material as sheet metal to CSA B111-1974. Flat head roofing nails of length and thickness suitable for metal flashing application.

.8 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

Part 3 Execution

3.1 INSTALLATION

.1 Install sheet metal work to CRCA Specifications and complete as soon as possible following application of roof membrane.

.2 Use concealed fastenings except where approved before installation.

.3 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips, except where otherwise shown.

.4 Lock end joints and caulk with sealant.

.5 Flashings to be anchored into reglets or folded over continuous strips at maximum 300 mm centers.

.6 Supply and assist in the installation of reglets where required for metal flashings.

.7 Use isolation coating where galvanized metal is in contact with concrete, masonry or mortar.

.8 Form flashing over control and expansion joints to Architect's approval.

.9 Install plastic pans, where shown around items projecting through roof membrane to CRCA Specification FL-119. Fill pans with plastic cement.

.10 Install fasteners and cleats in sufficient numbers and proper size to prevent metal from lifting or tearing under 125 km/h winds.

.11 Contractor must inform roofing inspector 48 hours prior to start of any work. Roofing inspector has authority to reject incorrect procedure, inferior work and materials.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S101, 1989.

.2 CAN/ULC-S102, 1988.

1.2 TEST REPORTS

.1 Submit product data including certified copies of test reports verifying fireproofing applied to substrate as constructed on project will meet or exceed requirements of Specification.

.2 Submit test results in accordance with CAN/ULC-S101 for fire endurance and CAN/ULC-S102 for surface burning characteristics.

.3 For assemblies not tested and rated, submit proposals based on related designs using accepted fireproofing design criteria.

1.3 SAMPLES

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

.2 Submit duplicate 300 x 300 mm size sample of exposed fireproofing for approval of texture and colour.

1.4 PROTECTION

.1 At outdoor temperatures less than 5EC, ensure that a 5EC air and substrate temperature is maintained during and for 24 hours after application. Ensure that natural ventilation to properly dry the fireproofing during and subsequent to its application is provided. In enclosed areas lacking openings for natural ventilation, ensure that interior air is circulated and exhausted to the outside.

.2 Provide temporary enclosures to prevent spray from contaminating air beyond application area.

.3 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of fireproofing materials.

Part 2 Products

2.1 MATERIALS

.1 **Sprayed fireproofing**: ULC certified cementitious or fireproofing qualified for use in ULC Designs to provide 1 hour fire resistance rating to **all floor supporting structural steel members**. Contractor to state ULC Design compliance in data submissions in accordance with Section 01 33 00 – Submittals.

.1 Acceptable Material: “W.R. GRACE”, Type MK-6.

.2 Acceptable Material: “CAFCO/ISOLATEK INTERNATIONAL” Type LD-C/F or Type 300,5B OR 400.

.3 Acceptable Material: AD Fire Protection systems, AD Type 5.

.2 Curing compound: type recommended by fireproofing manufacturer, qualified for use in ULC Designs specified.

.3 Sealer: type recommended by fireproofing manufacturer, qualified for use in ULC Design specified.

.4 Intumescent Fireproofing to be applied to exposed columns, beams and members part of the floor supporting system, as indicated on drawings. Intumescent fireproofing system to provide a fire resistance rating of 1 hour in accordance with ULC listed on drawings.

.1 All faces of exposed structural steel columns indicated to receive fireproofing to be painted prior to the installation of abutting walls and bulkheads.

.2 Intumescent Fireproofing to be A/D Firefilm as manufactured by A/D Fire Protection Systems Inc., listed by Underwriters Laboratories and bearing ULC label on container, Carboline or approved equal.

.3 Provide decorative finish as approved by A/D Fire Protection Systems Inc.

.4 Primer: As recommended by AD Fire Protection Systems.

.5 Contractor to prepare a mock up of the AD Firefilm III on site. Architect and GC to review to determine if level of finish is acceptable.

Part 3 Execution

3.1 PREPARATION

.1 Discuss fireproofing methods and final product with principal building inspector prior to application to ensure that finished installation will be acceptable. Record in writing all materials and methods to be employed to achieve final approval of installation.

.2 Substrate shall be free of material, which would impair bond.

.3 Verify that painted substrate [s] are compatible and have suitable bonding characteristics to receive fireproofing.

.4 Remove incompatible materials.

.5 Ensure that items required to penetrate fireproofing are placed before installation of fireproofing.

.6 Ensure that ducts, piping, equipment, or other items which would interfere with application of fireproofing are not positioned until fireproofing work is completed.

3.2 APPLICATION

.1 Apply bonding adhesive or primer to substrate if recommended by manufacturer.

.2 Apply fireproofing to correspond with tested assemblies, or acceptable calculation procedures to provide following fire resistance ratings.

.3 Apply fireproofing over substrate, building up to required thickness to cover substrate with monolithic blanket of uniform density and texture.

3.3 INSPECTION AND SITE TESTS

.1 Inspection and testing of fireproofing will be carried out by Testing Laboratory designated by Consultant.

.2 Cost of testing will be paid from Cash Allowance specified in Section 011100 – Summary of Work, section 1.29.

.3 Arrange for final inspection of the work of this section by municipal building inspector.

3.4 PATCHING

.1 Patch damage to fireproofing caused by testing or by other trades before fireproofing is concealed, or if exposed, before final inspection.

3.5 LOCATIONS- SPRAYED FIREPROOFING

.1 Fireproofing is required on all structural steel supporting floor loads. Refer to structural drawings.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Fire stopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are specified in Division 26 and 33 respectively.

1.2 REFERENCES

.1 Underwriters Laboratories of Canada (ULC)

.1 ULC-S115-[1995], Fire Tests of Firestop Systems.

1.3 SAMPLES

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

.2 Submit duplicate 300 x 300 mm samples showing actual firestop material proposed for project.

1.4 PRODUCT DATA

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

.2 Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

1.6 SYSTEM DESCRIPTION

.1 Firestopping Materials: CAN4-S115M ASTM E814 to achieve a fire protection rating as noted on Drawings.

.2 It is the intent of this Section that in conjunction with Divisions 26 and 33 a competent, single source be responsible for the firestopping and smoke seals of the entire project.

1.7 QUALITY ASSURANCE

.1 Manufacturer: Company specializing in manufacturing products of this Section with minimum five years documented experience.

.2 Applicator: Approved, licensed and supervised by the manufacturer of firestopping materials. Company with minimum five years documented experience.

.3 Product: Manufactured under ULC Follow-up Program. Each container or package shall bear ULC label.

1.8 REGULATORY REQUIREMENTS

.1 Conform to applicable code for fire protection ratings.

.2 Provide certificate of compliance for authority having jurisdiction indicating approval.

1.9 DELIVERY, STORAGE AND HANDLING

.1 Deliver and store materials in a dry, protected area, off ground in original, undamaged, sealed containers with manufacturer's labels and seas intact.

1.10 PROJECT AND SITE CONDITIONS

.1 Application temperature and ventilation as per Manufacturer's instructions.

1.11 SEQUENCING AND SCHEDULING

.1 Sequence work to permit installation of firestopping and smoke seal materials to be installed after adjacent work is complete and before closure of spaces.

Part 2 Products

2.1 MATERIALS

.1 A/D Firebarrier Firestop Systems, by A/D Fire Protection Systems Inc., capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115 and not to exceed opening sizes for which they are intended.

.2 Mineral Wood Backing Insulation: ULC labeled, preformed non-combustible material (A/D Firebarrier Mineral Wool) by A/D Fire Protection Systems Inc.

.3 Retainers: Clips to support mineral wool.

.4 Firestopping Sealant: ULC labeled, single component silicone bases, A/D Silicone Firebarrier Sealant by A/D Fire Protection Systems Inc.

.5 Firestopping Seal: ULC labeled, single component water-base seal, A/D Firebarrier Seal by A/D Fire Protection Systems Inc.

.6 Firestopping Foam: ULC labeled, two components silicone foam, A/D Firebarrier RTV Foam by A/D Fire Protection Systems Inc.

.7 Firestopping Mortar: ULC labeled, non-combustible fibre reinforced, foamed cement mortar, A/D Firebarrier Mortar by A/D Fire Protection Systems Inc.

.8 Damming Material: In accordance with tested assembly being installed as applicable and as acceptable to authorities having jurisdiction.

Part 3 Execution

3.1 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

.5 Verify that openings are ready to receive the Work of this Section.

.6 Confirm compatibility of surfaces to receive firestopping and smoke seal materials.

.7 Beginning of installation means acceptance of existing surfaces and substrate.

3.2 INSTALLATION

.1 Install firestopping in wall cavities in accordance with the OBC 3.1.11., in cavities 25mm and greater, spaced 3.0m max. vertically and 20m max. horizontally.

.2 Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

.3 Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.4 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.5 Tool or trowel exposed surfaces to a neat finish.

.6 Remove excess compound promptly as work progresses and upon completion.

.7 Apply in sufficient thickness to achieve rating to uniform density and texture.

.8 Protect installed material until cured or set.

3.3 INSPECTION

.1 Notify Consultant when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.4 SCHEDULE

.1 Firestop and smoke seal at:

.1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.

.2 Top of fire-resistance rated masonry and gypsum board partitions.

.3 Intersection of fire-resistance rated masonry and gypsum board partitions.

.4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

.5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.

.6 Openings and sleeves installed for future use through fire separations.

.7 Around Mechanical and Electrical assemblies penetrating fire separations.

.8 Refer to Drawings for horizontal and vertical fire stop locations and for typical firestopping detail at cavity wall, for top of wall fire separation assembly and for fire separation locations.

3.5 CLEAN UP

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 07 62 00 – Sheet Metal Flashing and Trim.

.3 Section 08 11 14 – Steel Doors and Frames.

.4 Section 04 21 13 - Masonry.

.5 Section 07 46 13 – Preformed Metal Siding.

1.3 REFERENCES

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

.1 ASTM C919-[02], Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-[1984], Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).

.2 CAN/CGSB-19.13-[M87], Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CGSB 19-GP-14M-[1984], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).

.4 CAN/CGSB-19.17-[M90], One-Component Acrylic Emulsion Base Sealing Compound.

.5 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.

.3 Department of Justice Canada (Jus)

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

.4 General Services Administration (GSA) - Federal Specifications (FS)

.1 FS-SS-S-200-[E(2)1993], Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

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

.1 Material Safety Data Sheets (MSDS).

.6 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.4 SUBMITTALS

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

.2 Manufacturer's product to describe.

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.

.1 Instructions to include installation instructions for each product used.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal of paper, plastic, polystyrene, corrugated cardboard, or packaging material [in appropriate on-site bins] for recycling.

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

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

.5 Unused [sealant] material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.6 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Consultant.

.7 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.

.8 Fold up metal banding, flatten, and place in designated area for recycling.

1.7 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

1.9 WARRANTY

.1 Submit a warranty that caulking work will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces, in accordance the General Conditions of the Contract, but for two (2) years total. Contractor shall supply all labour, materials, tools and equipment to repair and/or replace any work judged to be defective by the Consultant and sealant manufacturer at no additional cost to the owner for a period of 2 years from the date of Substantial Completion.

.2 Submit a manufacturer’s warranty against defects in materials and workmanship covering the components of the sealant for a period of ten (10) years. The manufacturer shall supply a non-pro-rated warranty covering labour, materials, tools and equipment to repair and/or replace any materials defects at no additional cost, for a period of 10 years

Part 2 Products

2.1 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Primers: type recommended by sealant manufacturer.

.2 Joint Fillers:

.1 General: compatible with primers and sealants, outsized 30 to 50%.

.2 Polyethylene, urethane, neoprene or vinyl: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.

.3 Neoprene or butyl rubber: round solid rod, Shore A hardness 70.

.4 Polyvinyl chloride or neoprene: extruded tubing with 6 mm minimum thick walls.

.5 Bond breaker: pressure sensitive plastic tape which will not bond to sealants.

.6 Sealant Type A: One component, chemical curing, conforming to CAN2-19.13-M82, Class C-2-25-B-N; multi-component, chemical curing, conforming to CAN2-19.24-M80, Type 2, Class B.

.7 Sealant Type B: Multi-component, chemical curing mildew resistant conforming to CGSB 19-GP-22M.

.8 Sealant type C: Multi-component, acrylic emulsion base, conforming to CGSB 19-GP-17M.

.9 Sealant type D: One component, polyurethane base, chemical curing, conforming to CAN2-19.13-M82, Class C-1-25-B-N; or multi-component, chemical curing, conforming to CAN2-19.24-M80, type 1.

.10 For exterior aluminum to masonry, aluminum to wood and aluminum to metal joints: high performance, single component modified elastomeric joint sealant conforming to CAN2-19.24-M80. Acceptable Materials: Sonolastic Ultr***a*** by Degussa.

.11 For interior aluminum to masonry, aluminum to wood and aluminum to metal joints: high performance, single component low odour sealant conforming to CAN/CGSB-19.13-M87. Acceptable materials: Spectrem 2 by Tremco or Dow – CWS.

.3 Color of Sealants: to be selected by Consultant. Allow for a total of two (2) colours for Type A, two colours for Type B, two colours for Type C and one colour for Type D. Locations as directed on site by Consultant.

.4 Joint cleaner: xylol, methylethyl-ketone or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

.5 Vent tubing: 6 mm inside diameter extruded polyvinyl chloride tubing.

2.3 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

.2 Primer: as recommended by manufacturer.

Part 3 Execution

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

.1 New Work:

.1 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.

.2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.

.3 Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.

.4 Prepare concrete, masonry, glazed and vitreous surfaces to sealant manufacturer's instructions.

.5 Examine joint sizes and correct to achieve depth ratio 1/2 of joint width with minimum width and depth of 6 mm, maximum width 25 mm.

.6 Install joint filler to achieve correct joint depth.

.7 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.8 Apply bond breaker tape where required to manufacturer's instructions.

.9 Prime sides of joints to sealant manufacturer's instructions immediately prior to caulking.

.2 Sealant.

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.9 Apply sealant to joints between window or door frames to adjacent building components around perimeter of every external window or door opening, to control joints in masonry walls and where indicated. In masonry cavity construction, vent caulked joints from cavity to 3 mm beyond external face of wall by inserting vent tubing at bottom of each joint and maximum to 1500 mm o.c. vertically. Position tube to drain to exterior.

.10 Apply sealant to close gaps at all junctures of all interior walls meeting exposed ceilings. Provide required foam backer rods to ensure integrity of sealant bead when applied to juncture. Tool finish smooth to receive paint finish.

.11 Use sealants specified in the following locations:

.1 Type A: Joints between windows or door frames and adjacent building components; control and expansion joints and all other locations where sealing is required, except in locations designated for Type B, C and D. Ensure that sealant chosen (from the several specified under "MATERIALS") for each location is recommended by manufacturer for use on surfaces encountered.

.2 Type B: Joints between splash backs and walls.

.3 Type C: Joints between interior metal door frames and partitions.

.4 Type D: Joints in horizontal surfaces between concrete slabs.

.3 Curing.

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

.4 Cleanup.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

3.7 WORK INCLUDED

.1 Work shall include but not limited to the following areas:

.1 exterior and interior hollow metal frames and screens; both sides;

.2 exposed control and expansion joints in masonry walls, masonry corners, joints in front of steel lintels bearing on exterior brick jambs;

.3 joints at all washroom vanities, hair dryers, hand dryers, electrical panels, access doors and adjacent surfaces. (Use sanitary caulking.)

.4 joints between masonry and concrete surfaces.

.5 joints between gypsum board and masonry, or other materials.

.6 joints between louvres and other surfaces.

.7 exterior siding, prefinished metal fascia, flashing and trim.

.8 penetrations through roofs, floors and walls other than firestopping

.9 at all other locations on drawings, except as noted below.

.2 Sealing of joints to the underside of exposed precast slab to be by precast installer.

.3 Sealing of all joints at top of walls meeting exposed flat or sloped precast ceilings to be included in this section.

3.8 REQUIRED INSPECTION

.1 Contractor to engage exterior sealant manufacturer's representative to review in order to provide manufacturer's warranty. Manufacturer's representative shall review substrate conditions as prepared on site and prior to the application of the sealant. If requested, manufacturer to supply a written copy of this warranty.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 07 92 10 - Joint Sealing: Caulking of joints between frames and other building components.

.3 Section 08 71 10 - Door Hardware - General: Supply of finish hardware, including weatherstripping and mounting heights.

.4 Section 09 91 23 - Interior Painting.

.5 Section 09 91 13 - Exterior Painting.

1.2 REFERENCES

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

- .1 ASTM A653/A653M-[01a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM B29-[92(1997)], Specification for Refined Lead.
- .3 ASTM B749-[97], Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-1.181-[99], Ready-Mixed Organic Zinc-Rich Coating.
- .2 CGSB 41-GP-19Ma-[84], Rigid Vinyl Extrusions for Windows and Doors.

.3 Canadian Standards Association (CSA International)

- .1 G40.20/G40.21-[98], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CSA W59-[M1989(R2001)], Welded Steel Construction (Metal Arc Welding) (Metric Version).

.4 Canadian Steel Door Manufacturers' Association, (CSDMA).

- .1 CSDMA, Specifications for Commercial Steel Doors and Frames, [1990].
- .2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors, [1990].

.5 National Fire Protection Association (NFPA)

- .1 NFPA 80-[99], Standard for Fire Doors and Fire Windows.
- .2 NFPA 252-[99], Standard Methods of Fire Tests of Door Assemblies.

.6 Underwriters' Laboratories of Canada (ULC)

- .1 CAN4-S104-[80(R1985)], Fire Tests of Door Assemblies.
- .2 CAN4-S105-[85(R1992)], Fire Door Frames Meeting the Performance Required by CAN4-S104.

.7 CAN/ULC-S701-[01], Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.8 CAN/ULC-S702-[97], Thermal Insulation, Mineral Fibre, for Buildings.

.9 CAN/ULC-S704-[01], Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.3 DESIGN REQUIREMENTS

.1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.

.2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.4 WORK INCLUDED

.1 A single manufacturer shall fabricate products included within the scope of this Section.

.2 Manufacturer shall be a member in good standing of the Canadian Steel Door Manufacturers Association (CSDMA).

.3 Supply only of steel frame products including frames, transom frames, sidelight and window assemblies with provision for glazed, paneled or louvered openings, fire labeled and non-labeled, as scheduled or detailed by the Consultant.

.4 Supply only of flush steel doors with provision for glazed, paneled or louvered openings, insulated and un-insulated, fire labeled, with or without temperature rise ratings and non-labeled, as scheduled or detailed by the Consultant.

.5 Supply only of steel panels, similar in construction to steel doors, with flush or abetted bottoms for steel frames, transom frames, sidelight and window assemblies, fire labeled and non-labeled, as scheduled or detailed by the Consultant.

1.5 RELATED WORK

.1 Building-in of frame product into unit masonry, previously placed concrete, structural or steel or wood stud walls.

.2 Supply and installation of wood, plastic or composite core doors.

.3 Supply and installation of builders' hardware except as specified for acoustic assemblies.

.4 Drilling and tapping for surface mounted or non-templated builders' hardware.

.5 Caulking of joints between frame product and other building components.

.6 Supply and installation of gaskets or weather-strip.

.7 Supply and installation of louvers or vents.

.8 Supply and installation of glazing materials.

.9 Site touch-up and painting.

.10 Wiring for electronic or electric hardware.

.11 Field measurements.

.12 Fasteners for frame product in previously placed concrete, masonry or structural steel.

.13 Steel lintels, posts, columns or other load-bearing elements.

.14 Field welding.

1.6 SHOP DRAWINGS

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

.2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, or louvred, arrangement of hardware and fire rating and finishes.

.3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing and fire rating finishes.

.4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

.5 Submit test and engineering data, and installation instructions.

1.7 REQUIREMENTS

.1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M [NFPA 252] for ratings specified or indicated.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Divert unused paint and sealant materials from landfill to official hazardous material collections site approved by Consultant.

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

.4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.5 Damaged or broken glazing materials are not recyclable. These materials must not de disposed of with materials destined for recycling.

1.9 TESTING AND PERFORMANCE

.1 Door constructions covered by this specification shall be certified as meeting Level “A” (1,000,000 cycles) and Twist Test Acceptance Criteria (deflection not to exceed 6.4 mm /13.6kg force, total deflection at 136.1kg force not to exceed 63.5 mm and permanent deflection not to exceed 3.2 mm) when tested in strict conformance with ANSI-A250.4-

1994. Test shall be conducted by an independent nationally recognized accredited laboratory.

.2 Fire labeled product shall be provided for those openings requiring fire protection and temperature rise ratings, as determined and scheduled by the Architect. Doors, frames, transom frames and sidelight assemblies shall be tested in strict accordance with CAN4-S106. Product shall be listed by Underwriters Laboratories of Canada under an active Factory Inspection Program and shall be constructed as detailed in Follow-Up Service procedures issued to the manufacturer.

.3 Should any door or frame specified by the Architect to be fire rated, not qualify for labeling due to design, hardware, glazing or any other reason, the Consultant shall be so advised before manufacturing commences.

.4 Core materials for exterior doors shall attain a thermal resistance rating of RSI 1.06 (R6.0) when tested in accordance with ASTM C177 or ASTM C518.

.5 Product shall be manufactured by a firm experienced in the design and production of standard and custom commercial steel door and frame assemblies, the integration of builders' or electronic hardware and glazing materials and their impact on the scope of work.

.6 Manufacturer shall be assessed and registered as meeting the requirements of Quality Systems under ISO 9001.

.7 Product quality shall meet standards set by the Canadian Steel Door Manufacturers Association.

1.10 TEST REPORTS

.1 All alternates to this specification shall be submitted to the Architect for acceptance ten (10) days prior to bid date, complete with test reports from independent, nationally recognized testing authorities, certifying that:

.1 Steel door and frame assemblies furnished under this section meet the acceptance criteria of ANSI-A250.4-1994, Level "A".

.2 Insulated door cores furnished in exterior doors under this Section meet the specified thermal resistance rating.

.2 All reports shall include name of testing authority, date of test, location of test facility, descriptions of test specimens, procedures used in testing and indicate compliance with acceptance criteria of the test.

1.11 WARRANTY

.1 All steel door and frame product shall be warranted from defects in workmanship for a period of one (1) year from date of shipment.

.2 All steel door and frame product shall be warranted against rust perforation for a period of ten (10) years when the installed and finish painted with a commercial quality paint to the manufacturers recommendations.

.3 Finish paint adhesion on all door and frame product shall be warranted for a period of ten (10) years when the product has been properly cleaned and finish painted with a commercial quality paint applied as recommended by the paint manufacturer. This warranty shall not exceed that provided by the paint manufacturer.

Part 2 Products

2.1 MATERIALS

.1 Doors shall be fabricated from tension leveled steel to ASTM A924-M97, galvanized to ASTM A653-M97, Commercial Steel (CS), Type B, coating designation ZF75, known commercially as paintable Galvanneal.

1. Fleming Door Products
2. Trillium Steel Doors Ltd.
3. Baron Metal Door Industries Inc.
4. All Steel Doors 2000
5. All Can Doors and Hardware
6. Daybar Industries Ltd.
7. Shanahan's Limited
8. Vision Hollow Metal
9. Others meeting these exact specifications outlined in this section and accepted in writing during the tender period.

.2 Door Cores:

.1 Honeycomb:

.1 Structural small cell (25.4 mm maximum) kraft paper "honeycomb". Weight: 36.3 kg per ream (minimum), density: 16.5 kg/m^3 (minimum), sanded to the required thickness.

.2 Polystyrene:

.1 Rigid extruded, fire retardant, closed cell board, density 16kg/m^2, thermal values: RSI 1.06 minimum, conforming to ASTM C578.

.3 Temperature Rise Rated (TRR):

.1 Solid slab core of non-combustible, inorganic composite to limit temperature rise on the "unexposed" side of door to 250°C at 30 or 60 minutes, as required by governing building code requirements and determined and scheduled by the Architect.

.4 Adhesives:

.1 Honeycomb Cores and Steel Components: Heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement or ULC approved equivalent.

.5 Interlocking Edge Seams:

.1 Resin reinforced polychloroprene (RRPC), fire resistant, high viscosity, sealant/adhesive or UL approved equivalent.

.6 Polystyrene Cores:

.1 Heat resistant, epoxy based, low viscosity, contact cement.

.7 Primer:

.1 Rust inhibitive touch-up only.

.8 Exterior Top Caps:

.1 Rigid polyvinylchloride (PVC) extrusion.

2.2 DOOR FABRICATION

.1 This section is based on doors and frames as manufactured by Fleming. Doors and frames by other manufacturers are acceptable subject to be similar to the one specified and meeting the terms of this section.

.2 Doors shall be swinging, 44.4 mm thick of the types and sizes indicated on the Architect's schedules or drawings.

.3 Exterior doors shall be lock seam, flush.

.4 Face sheets for exterior doors shall be fabricated from (16) gauge steel.

.5 Longitudinal edges of exterior doors shall be fully welded, ground smooth with no visible seams.

.6 Face sheets of interior doors shall be fabricated from 18 gauge steel, except for heavy traffic doors (noted **HT** in Door Schedule) face sheet to be 16 gauge.

.7 Longitudinal edge of heavy traffic doors (noted **HT** in Door Schedule) shall be mechanically interlocked, fully welded, ground smooth with no visible seams. Do not fill seams.

.8 Interior doors shall be stiffened, insulated and sound deadened with honeycomb core laminated under pressure to each face sheet.

.9 Stiffened, insulated and sound deadened with Fleming's propriety core where Temperature Rise Rated (TRR) fire labeled doors are specified on the Architect's schedules.

.10 Longitudinal edges of interior doors shall be mechanically interlocked, adhesive assisted with edge seams and tack-welded every 150 mm and filled flush.

.11 Door faces of all steel doors shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles and waves.

.12 Formed edges shall be true and straight with a minimum radius for the thickness of steel used.

.13 Lock and hinge edges shall be beveled 3 mm in 50 mm unless builders' hardware or door swing dictates otherwise.

.14 Top and bottom of doors shall be provided with inverted, recessed, 16 gauge steel end channels, welded to each face sheet at 150 mm on center maximum.

.15 Exterior doors shall be provided with factory installed flush PVC top caps. Fire labeled exterior doors shall be provided with factory installed flush steel top caps.

.16 Unless ineligible due to design, size, hardware or glazing specified on the Architects' or hardware Suppliers' schedules or details, fire labeled doors shall be provided for those openings requiring fire protection ratings and temperature rise ratings, as determined and scheduled by the Architect.

.17 Exterior doors and high traffic doors shall be internally reinforced with 20 gauge continuous; interlocking steel stiffeners at 150mm O.C. max, with voids between stiffeners filled and insulated with 24kg/m3 density loose batt type fiberglass material to suit fully welded design.

.18 Doors shall be factory blanked, reinforced, drilled and tapped for fully templated mortised hardware only, in accordance with the final approved schedule and templates provided by the hardware supplier.

.19 Doors shall be factory blanked and reinforced only for mortised hardware that is not fully templated.

.20 Doors shall be factory reinforced only for surface mounted hardware.

.21 Templated holes 12.7mm diameter and larger shall be factory prepared, except mounting and through bolt holes, which shall be by the contractor responsible for installation on site, at the time of application. Templated holes less than 12.7mm diameter shall be factory prepared only when required for the function of the device (for knobs, levers, cylinders, thumb or turn pieces) or when these holes over-lap function holes.

.22 Drilling and tapping for surface mounted hardware or mortised hardware that is not fully templated shall be by the contractor responsible for installation on site, at the time of application.

.23 Hinge and pivot reinforcements shall be 10 gauge steel minimum high frequency type reinforcing.

.24 Hinge reinforcements for acoustic doors and doors in excess of 2450mm rabbet height shall be 10 gauge minimum with each cutout provided with 114.3mm heavy weight (4.6mm) high frequency type.

.25 Lock, strike and flush bolt reinforcements shall be 12 gauge steel minimum.

.26 Reinforcements for concealed closers and holders shall be 12 gauge steel minimum.

.27 For surface mounted hardware, reinforcements shall be 16 gauge steel minimum.

.28 All pairs of fire labeled doors shall be provided with 12 gauge steel surface mounted flat bar astragal, shipped loose for application on site, by the contractor responsible for installation.

.29 Pairs of doors up to 2450mm x 2450mm, to 1½ hour fire rating maximum shall be provided without astragals. Lock edge seam of such doors shall be tacked-welded and ground smooth. All other fire labeled pairs shall be provided with 12 gauge steel surface mounted flat bar astragal, shipped loose for application on site, by the contractor responsible for installation.

.30 Where electrically or electronically operated hardware is specified on the Architects' schedules or details of the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on the templates, shall be provided and interconnected with CSA Approved 12.7mm diameter conduit and connectors.

.31 Prepare doors to receive security door contacts – refer to electrical drawings for locations. Door contacts to be installed at 100 mm from the latch side door edge.

2.3 GLAZING

.1 Where 6mm thick glazing materials are specified on the Architects schedules or details, doors shall be provided with 20 gauge steel glazing trim and snap-in glazing stops.

.2 Where other that 6mm glazing is specified on the Architect's schedules or details, doors shall receive 20 gauge steel trim and screw fixed glazing stops. Screws shall be #6 x 32mm oval head scrulox (self-drilling) type at 300mm on center maximum.

.3 Glazing trim and stops shall be accurately fitted, butted at corners, with removable glazing stops located on the 'push' side of the door.

.4 Provide 27 mm "Pyrostop Glazing" for window screen type W-12, as distributed by Technical Glass Products 1-800-426-0279 to conform to 60 min. ULC rating.

2.4 LOUVER

.1 Where specified on the Architect's schedules or details, non-labeled doors shall be prepared on accordance with the louver manufacturer's details.

.2 Where specified on the Architect's schedules or details, fire labeled doors shall be prepared for UL listed sight-proof fusible link louvers in accordance with the louver manufacturer's details.

.3 Louvers shall be supplied and installed by others.

2.5 FINISHING

.1 Remove weld slag and splatter from exposed surfaces.

.2 All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth uniform surfaces.

.3 On exposed surfaces where zinc coating has been removed during fabrication, doors shall receive a factory applied touch-up primer.

.4 Primer shall be fully cured prior to shipment.

2.6 PANELS

.1 Panels shall be fabricated form the same materials, construction and finished in the same manner as doors as specified in Section 2.1.

2.7 PRIMER

.1 Touch-up prime CAN/CGSB-1.181.

2.8 PAINT

.1 Field paint steel doors and frames in accordance with Section[s] 09 91 22 – Painting. Protect weatherstrips from paint. Provide final finish shall be free of scratches or other blemishes.

2.9 FRAMES FABRICATION GENERAL

.1 Steel:

.1 Frame product shall be fabricated from tension leveled steel to ASTM A924-M97, galvanized to ASTM A653-M97, Commercial Steel (CS), Type B, coating designated ZF75, known commercially as paintable Galvanneal.

.2 Primer:

.1 Rust inhibitive touch up only.

.3 Miscellaneous:

.1 Door Silencers: GJ-64, Single Stud rubber/neoprene type

.2 Thermal Breaks: Rigid polyvinylchloride (PVC) extrusion

.3 Fiberglass: Loose batt type, density: 24kg/m^3 (minimum), conforming to ASTM C665.

.4 General:

.1 All steel frame product shall be as manufactured by Fleming of the types, sizes and profiles indicated on the Architects' schedules or details.

.2 Exterior frames shall be thermally broken, Fleming *Therma-Frame* Series, fabricated from 16 gauge steel.

.3 Exterior frame product shall be supplied profile welded (PW)

.4 Interior and exterior sections of thermally broken frames shall be separated by a continuous PVC thermal break.

.1 Thermally broken sections shall not be assembled by means of screws, grommets or other fasteners and welds shall not cause thermal transfers between interior and exterior surfaces of the frame sections.

.2 Closed sections (mullions and center rails) of thermally broken frames shall be factory insulated with 24kg/m^3 loose batt type fiberglass material.

.5 Insulation of open sections (jambs, heads and sills) on exterior frame product shall be provided and installed by the contractor responsible for installation.

.6 Interior frames shall be Fleming F-Series, fabricated from 16 gauge steel.

.7 Door 126A for ALE Room interior frame shall be Fleming F-Series, fabricated from 14 gauge steel.

.8 Interior frame product shall be supplied profile welded (PW)

.9 Knocked-down and knocked-down drywall frames shall not be acceptable.

.10 Jambs, heads, mullions, sills and center rails shall be straight and uniform throughout their lengths.

.11 Frame product shall be square, free of defects, wraps or buckles.

.12 Corner joints shall be profile welded (PW) (continuously welded on the inside of the profiles' faces, rabbets, returns and soffit intersections with exposed faces filled and ground to a smooth, uniform, seamless surface)"

.13 Joints at mullions, transom bars, sills or center rails shall be coped accurately, butted and tightly fitted, with faces securely welded, matching corner joint faces.

.14 All steel mullions will be fabricated from the same materials as specified for the steel frames. Steel mullions will be fabricated as a fully assembled three piece unit consisting of a front, back and full height one piece attachment clip as per Fleming F Series. The attachment clip will completely fill the stop area of the mullion on both sides and span the void between each side forming a grid channel like structure. Mullions used as hinge mullions or strike mullions between doors will be filled with grout by the general contractor either prior to or following installation of the frame. The head of the frame shall have an opening sufficient for the grout to be poured in to the mullion.

.15 Mullions shall be fabricated with continuous 20 gauge galvanneal steel internal reinforcing clips.

.16 Frame product shall be fabricated with integral door stops having a minimum height of 16mm.

.17 Glazing stops shall be formed 20 gauge steel, 16mm height channel, accurately fitted, butted at corners and fastened to frame sections with #6 x 32mm oval head scrulox (self-drilling) type screws at 300mm on center maximum.

.18 Where required due to site access, as indicated on the Architects' schedules or details, when advised by the contractor responsible for co-ordination or installation, or when shipping limitations so dictate, frame product shall be fabricated in sections for splicing in the field.

- .1 Field spliced jambs, heads and sills shall be provided with 16 gauge steel splice plates securely welded into one section, extending 100mm minimum each side of splice joint.
- .2 Field splices at closed sections (mullions or center rails) shall be 16 gauge steel splice angles securely welded to the abutting member. Face of splice angle shall extend 100mm minimum into closed sections when assembled.
- .3 Field splice joints shall be welded, filled and ground to present a smooth uniform surface by the contractor responsible for installation after assembly.

.19 Each door opening shall be provided with two (2) temporary steel jamb spreaders welded to the base of the jambs or mullions to maintain proper alignment during shipping and handling. Spreaders shall be removed by the contractor responsible for installation prior to anchoring of frame to floor.

.20 Each door opening shall be prepared for GJ-64 or equivalent, single stud door silencers, three (3) for single door openings, two (2) for double door openings. Silencers shall be shipped loose for installation by the contractor after finish painting.

.21 Unless ineligible due to design, size, hardware or glazing specified on the Architects' or Hardware Suppliers' schedules or details, fire labeled frame product shall be provided for those openings required fire protection ratings as determined and scheduled by the Architect.

.22 Hardware Preparations:

.1 Frame product shall be blanked, reinforced, drilled and tapped for fully templated mortised hardware only, in accordance with the final approved schedule and templated provided by the hardware supplier.

.2 Frame product shall be factory blanked and reinforced only for mortised hardware that is not fully templated.

.3 Frame product shall be reinforced only for surface mounted hardware.

.4 Drilling and tapping for surface mounted hardware or mortised hardware that is not fully templated shall be by the contractor responsible for installation on site, at the time of application.

.5 Frames shall be prepared for 114.3mm standard weight hinges (minimum).

.6 Hinge and pivot reinforcements shall be 10 gauge steel minimum reinforcing, high frequency type shall be provided.

.7 Hinge reinforcements for acoustic frames and frames in excess of 2450mm rabbet height shall be 10 gauge minimum with each cutout provided with 114.3mm heavy weight (4.6mm) high frequency type.

.8 Strike reinforcements shall be 16 gauge steel minimum.

.9 Reinforcements for surface mounted hardware, concealed closers and holders and flush bolts shall be 12 gauge steel minimum.

.10 Mortised cutouts shall be protected with 22 gauge steel minimum guard boxes.

.11 Where electrically or electronically operated hardware is specified on the Architects schedules or details or the final approved schedule and templates provided by the hardware supplier, hardware enclosures and/or junction boxes, where indicated on templates, shall be provided and inter-connected with CSA Approved 12.7mm diameter conduit and connectors.

.12 Prepare frames to receive security door contacts – refer to electrical drawings for locations. Door contacts to be installed at 100 mm from the latch side door edge.

.23 Anchorage:

.1 Frame product shall be provided with anchorage appropriate to floor, wall and frame construction.

.2 Each wall anchor shall be located immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb, except as indicated below.

.3 Frame product installed in unit masonry partitions shall be provided with 4.0mm diameter steel wire anchors, 18 gauge steel adjustable stirrup and strap or "T" type anchors as conditions dictate.

.4 Where frame product is installed prior to construction of the adjacent wall, each jamb shall be provided with 16 gauge steel floor anchors. Each anchor shall be provided with two (2) holes for mounting to the floor and shall be securely welded to the inside of the jamb.

.5 Floor anchors for thermally broken exterior frames shall be designed so as not to permit thermal transfers from exterior to interior surfaces of the frame sections.

.6 Frame product installed in drywall partitions shall be provided with 20 gauge steel snap-in or "Z" type stud type anchor.

.7 Jambs of frames in previously placed concrete, masonry or structural steel shall be punched and dimpled to accept machine bolt anchors, 6.4mm diameter, located not more than 150mm from the top and bottom of each jamb. Anchor preparations and guides shall also be located immediately above or below the intermediate hinge reinforcings and directly opposite on the strike jamb. Each preparation shall be provided with 16 gauge anchor bolt guides.

.8 Anchor bolts and expansion shell anchors for the above preparations shall be provided by the contractor responsible for installation.

.9 After sufficient tightening of the anchor bolts, the heads shall be welded do as to provide a non-removable application. Welded bolt head and dimple shall be filled and ground to present a smooth uniform surface by the contractor responsible for installation, prior to finish painting.

.10 Where indicated on the Architects' schedules or details, channel extensions shall be provided from the top of the frame assembly to the underside of the structure above. Extensions shall be fabricated from 12 gauge steel formed channel, mounting angles welded to inside of frame head and adjusting brackets. Formed channels, adjusting brackets and fasteners shall be shipped loose. Channels shall be mechanically connected to mounting angles and adjusting brackets with supplied fasteners, on site, by contractor responsible for installation.

.24 Finishing:

.1 Remove weld slag and spatter from exposed surfaces.

.2 All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth and uniform surfaces.

.3 On exposed surfaces where zinc has been removed during fabrication, frame product shall receive a factory applied touch-up primer.

.4 Primer shall be fully cured prior to shipment.

2.10 SIZES AND TOLERANCES

.1 All sizes and tolerances shall be in accordance with the Canadian Steel Door Manufacturers Association "Recommended Dimensional Standards for Commercial Steel Doors and Frames" as follows:

.1 Widths of door openings shall be measured from inside of frame jamb rabbet with a tolerance of +1.6mm, -0.8mm.

.2 Heights of door openings shall be measured from the finished floor (exclusive of floor coverings) to the head rabbet of the frame with a tolerance of $\pm$ 1.2mm.

.3 Unless builders' hardware dictates otherwise, doors shall be sized so as to fit the above openings and allow a 3mm clearance at jambs and head. A clearance of

19mm between the bottom of the door and the finished floor (exclusive of floor coverings) shall be provided. Tolerances on door sizes shall be ± 1.2mm.

.4 Manufacturing tolerances on formed frame profiles shall be ± 0.8mm for faces, door stop heights and jamb depths. Tolerances for throat openings and door rabbet shall be ± 1.6mm and ± 0.4mm respectively. Hardware cutout dimensions shall be as per template dimensions, +0.4mm, -0.

2.11 HARDWARE LOCATIONS

.1 Hardware preparations in frame product shall be as noted below and locations on doors shall be adjusted for clearances specified in 2.4.

.2 Top of upper hinge preparation for 114.3mm hinges shall be located 180mm down from head, transom mullion or panel as appropriate. The top of the bottom hinge preparation for 114.3mm hinges shall be located 310mm from finished floor as defined in 2.4.3. Intermediate hinge preparations shall be spaced equally between top and bottom cutouts. For dutch door frames, top and bottom hinge locations shall be as above, with the tops of intermediate hinges located at 930mm and 1403mm from finished floor.

.3 Strike preparations for unit, integral, cylindrical and mortise locks and roller latches shall be centered 950mm from finished floor. Strikes for deadlocks shall be centered at 1200mm from finished floor. Strikes for panic or fire exit hardware shall be located as per device manufacturer's templates.

.4 Push and/or pulls on doors shall be centered 950mm from finished floor.

.5 Preparations not noted above shall be as per hardware manufacturer's templates.

.6 Hardware preparation tolerances shall comply with the ANSI A115 series standards.

Part 3 Execution

3.1 SITE AND PROTECTION OF MATERIALS

.1 The contractor responsible for installation shall remove wraps or covers from door and frame product upon delivery at building site.

.2 All materials shall be thoroughly inspected upon receipt and all discrepancies, deficiencies and/or damages shall be immediately reported in writing to the supplier, All damage shall be noted on the carriers' Bill of Landing.

.3 Contractor responsible for installation shall ensure all materials are properly stored on planks or dunnage in a dry location. Product shall be stored in a vertical position, spaced with blocking to permit air circulation between them. Materials shall be covered to protect them from damage from any cause.

.4 Contractor shall notify the supplier in writing of any errors or deficiencies in the product itself before initiating any corrective work.

3.2 INSTALLATION GENERAL

.1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

.2 Install doors and frames to CSDMA Installation Guide.

.3 Install doors and frames in accordance with the Door and Hardware Institute "Installation guide for doors and hardware".

.4 Set frame product plumb, square, aligned, without twist at correct elevation.

.5 Frame Product Installation Tolerances:

.1 Plumbness tolerance, measured through a line from the intersecting corner of vertical members and the head to the floor, shall be $\pm$ 1.6mm.

.2 Squareness tolerance, measured through a line 90^0 from one jamb at the upper corner of the product, to the opposite jamb, shall be $\pm$ 1.6mm.

.3 Alignment tolerance, measured on jambs, through a horizontal line parallel to the plane of the wall, shall be $\pm$ 1.6mm.

.4 Twist tolerance, measured at face corners of jambs, on parallel lines perpendicular to the plane of the wall, shall be $\pm$ 1.6mm.

.6 Fire labeled product shall be installed in accordance with NFPA-80.

.7 Secure anchorages and connections to adjacent construction.

.8 Brace frame product rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at mid points of frame rabbet height and at floor level to maintain frame widths. Provide vertical support at center of head for openings exceeding 1250mm in width. Remove wood spreaders after product has been built-in.

.9 Frame product in unit masonry shall be fully grouted in place.

.10 Install doors maintaining clearances outlined in Section 2.4.

.11 Install louvers and vents.

.12 Adjust operable parts for correct clearances and function.

.13 Steel surfaces shall be kept free of grout, tar or other bonding materials or sealers.

.14 Any grout or other bonding material shall be cleaned from products immediately following installation.

.15 Exposed field welds shall be finished to present a smooth uniform surface and shall be touched-up with a rust inhibitive primer.

.16 Exposed surfaces that have been scratched or otherwise marred during shipment, installation or handling shall be touched-up with a rust inhibitive primer.

.17 Finish paint in accordance with Section 099116 and 099123.

.18 Install glazing materials and door silencers.

3.3 INSPECTION

.1 In accordance with Section 011100- Summary of Work, upon assignment of an inspection agency the following inspections shall be performed for hollow metal frames, screens and doors:

.1 review of shop drawings for compliance with specification

.2 shop inspection during production. Should inspection notification not be given suitable to review fabrication, destructive testing of one or more doors will be undertaken either in the shop or on site at no additional cost to the owner. Doors destroyed for invasive inspection shall be replaced as part of the contract price.

.2 Upon notification of initial door installation, contractor shall notify inspector to witness installation practice and at periodic points for duration of installation period.

.3 Scope of inspections shall include shop inspection during fabrication & installation and operation of hardware at site.

3.4 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.5 GLAZING

.1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.

END OF SECTION

Part 1 General

1.1 GENERAL NOTES

.1 Find the Door Schedule on the following pages.

.2 This schedule MUST be read in conjunction with a complete set of drawings and a complete Hardware Schedule.

.3 Refer to the 800 series of AD Drawings for door and frame types and details.

1.2 ABBREVIATIONS CODE

.1 1. The following abbreviations are used in the Door Schedule.

	Code	Reference
.3	DC	Door Contact (security)
.4	P	Paint
.5	HM	Hollow Metal
.6	FRG	Fire Rated Glazing
.7	TP	Tempered Glass
.8	45 MIN	45 minute fire rating
.9	HT	Heavy Traffic – see spec for welded seams, special reinforcing.
.10	B/F	Barrier-Free
.11	WD	Laminate Faced Wood Door
.12	P.LAM	Plastic Laminate Finish on Wood Door
.13	ALUM.	Aluminum
.14	ANNO.	Anodized Finish

1.3 DOOR SCHEDULE

.1 Door Schedule designation “DC” refers to “Door Contacts” used in the security system. Refer to Electrical Drawings and Division 16 Specifications for locations, zoning and description of system.

END OF SECTION

DOOR #	DOOR								FRAME					REMARKS
	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
GROUND FLOOR														
101 A	2X1000	2150	-	HT	B	ALUM	ANNO	TP	CW1	ALUM	ANNO	DC	TP	B/F DOOR OPERATOR, INSULATED EXTERIOR DOOR & FRAME, ELECTRIC SECURITY STRIKE TO OFFICE. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. COORD WITH ELEC FOR VIDEO INTERCOM SYSTEM / CARD READER. CONTINUOUS HINGES
101 B	2X1000	2150	-	HT	B	HM	P	TP	6	HM	P	-	TP	B/F DOOR OPERATOR
102 A	1000	2150	20MIN	-	D	HM	P	FRG	7	HM	P	-	FRG	B/F DOOR OPERATOR
102 B	2x825	2200*			G	WD	PLAN	-	*CLOSET DOOR SLIDING TOP AND BOTTOM TRACK AND HARDWARE					BY-PASS WOOD DOORS
103 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
104 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
105 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
106 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
108 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
109 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
110 A	950	2150	20MIN	-	C	HM	P	FRG	1	HM	P	-	-	
110 B	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
111 A	2X1100	2150	20MIN	HT	D	HM	P	FRG	3 SIM	HM	P	-	-	ELECTROMAGNETIC HOLDER. NO MID-MULLION. PROVIDE CONCEALED VERTICAL RODS

DOOR #	DOOR								FRAME					REMARKS
	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
113 A	950	2150	45MIN	-	C	HM	P	FRG	1	HM	P	-	-	
113 B	950	2150	45MIN	-	D	HM	P	FRG	1	HM	P	-	-	
113 C	2x1050	2200*			G	WD	PLAN	-	*CLOSET DOOR SLIDING TOP AND BOTTOM TRACK AND HARDWARE					BY-PASS WOOD DOORS
114 A	950	2150	-	-	B	HM	P	TP	4	HM	P	-	TP	
115 A	2X1000	2150	-	HT	B	HM	P	TP	8	HM	P	-	TP	B/F DOOR OPERATOR
115 B	2X1000	2150	-	HT	B	HM	P	TP	9	HM	P	-	TP	180 DEGREE SWING BOTH LEAFS
116 A	2X1000	2150	20MIN	HT	D	HM	P	FRG	10	HM	P	-	FRG	ELECTROMAGNETIC HOLDER IN CLOSER & AT WALL
116 B	2X1000	2150	20MIN	HT	D	HM	P	FRG	11	HM	P	-	FRG	ELECTROMAGNETIC HOLDER IN CLOSER & AT WALL
117 A	950	2150	20MIN	-	C	HM	P	FRG	1	HM	P	-	-	
117 B	950	2150	-	-	C	HM	P	TP	1	HM	P	-	TP	
117 C	SLIDING GLASS DOOR ASSEMBLY - REFER TO SPECS													
118 A	2X1000	2150	-	HT	B	ALUM	ANNO	TP	CW6	ALUM	ANNO	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. CONTINUOUS HINGES. B/F DOOR OPERATOR
118 B	2X1000	2150	45MIN	HT	D	HM	P	FRG	2	HM	P	-	-	180 DEGREE SWING (ONE LEAF). ROUGH-IN FOR ELECTROMAGNETIC HOLD OPEN DEVICE AT WALL BOTH SIDES OF DOOR. REF. ELEC. DWGS. B/F DOOR OPERATOR
119 A	1000	2150	-	-	C	HM	P	TP	1	HM	P	-	-	

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
119 B	1000	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
119 AA	1000	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
119 AB	1000	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
120 A	1000	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
121 A	1000	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
122 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
123 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
124 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
125 A	1100	2150	-	-	A	HM	P	-	1	HM	P	-	-	B/F OPERATOR
126 A	950	2150	-	HT	F	HM	P	FRG	1	HM	P	-	-	SPECIALTY HARDWARE, REF. HARDWARE SCHEDULE, DOOR TO BE 16ga. STEEL DOOR COMPLETE WITH MORTAR FILLED HEAD AND JAMB ON 14 ga. FRAME AND 4 HEAVY DUTY HINGES.
127 A	950	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	
128 A	1100	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	
128 B	1100	2150	-	-	A	HM	P	-	1	HM	P	-	-	INSULATED DOOR & FRAME, EXTERIOR DOOR.

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
130 A	2X1000	2150	-	HT	B	ALUM	ANNO	TP	CW12	ALUM	ANNO	DC	TP	B/F OPERATOR, INSULATED DOOR & FRAME, EXTERIOR DOOR. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. CONTINUOUS HINGES. REMOVABLE MID-MULLION
130 B	2X1000	2150	45MIN	HT	D	HM	P	FRG	2	HM	P	-	-	REMOVABLE MID-MULLION, BF OPERATOR, 180 DEGREE SWING (ONE LEAF). ROUGH-IN FOR ELECTROMAGNETIC HOLD OPEN DEVICE AT WALL BOTH SIDES OF DOOR. REF. ELEC. DWGS.
131 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
131 B	1000	2150	-	HT	B	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS. B/F DOOR OPERATOR
132 A	1000	2150	-	HT	B	HM	P	TP	12	HM	P	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR. B/F DOOR OPERATOR
132 B	1000	2150	-	HT	B	HM	P	TP	12	HM	P	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR
133 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	25mm UNDERCUT DOOR. B/F DOOR OPERATOR
134 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	25mm UNDERCUT DOOR
135 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
135 B	1000	2150	-	HT	B	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
137 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
137 B	1000	2150	-	HT	B	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS. B/F DOOR OPERATOR
138 A	1000	2150	-	HT	B	HM	P	TP	12	HM	P	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR. B/F DOOR OPERATOR

DOOR #	DOOR								FRAME					REMARKS
	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
138 B	1000	2150	-	HT	B	HM	P	TP	12	HM	P	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR
139 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	25mm UNDERCUT DOOR. B/F DOOR OPERATOR
140 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	25mm UNDERCUT DOOR
141 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
141 B	1000	2150	-	HT	B	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
142 A	2X1000	2150	-	HT	B	ALUM	ANNO	TP	CW13	ALUM	ANNO	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. CONTINUOUS HINGES. B/F DOOR OPERATOR
142 B	2X1000	2150	45MIN	HT	D	HM	P	FRG	2	HM	P	-	-	180 DEGREE SWING ONE LEAF. ROUGH-IN FOR ELECTROMAGNETIC HOLD OPEN DEVICE AT WALL BOTH SIDES OF DOOR. REF. ELEC. DWGS. B/F DOOR OPERATOR
143 A	1100	2150	-	-	A	HM	P	-	1	HM	P	DC	-	INSULATED DOOR & FRAME, EXTERIOR DOOR
143 B	1100	2150	1.5 HR	-	A	HM	P	-	1	HM	P	-	-	
144 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
144 B	1000	2150	-	HT	B	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
145 A	1000	2150	-	HT	B	HM	P	TP	12	HM	P	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR
145 B	1000	2150	-	HT	B	HM	P	TP	12	HM	P	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR. B/F DOOR OPERATOR
146 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	25mm UNDERCUT DOOR

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
147 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	25mm UNDERCUT DOOR. B/F DOOR OPERATOR
149 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
149 B	1000	2150	-	HT	B	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS. B/F DOOR OPERATOR
150 A	950	2150	20MIN	-	C	HM	P	FRG	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
150 B	1000	2150	-	HT	B	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
151 A	1000	2150	-	HT	B	HM	P	TP	12	HM	P	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR
151 B	1000	2150	-	HT	B	HM	P	TP	12	HM	P	DC	TP	INSULATED DOOR & FRAME, EXTERIOR DOOR. B/F DOOR OPERATOR
152 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	25mm UNDERCUT DOOR
153 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	25mm UNDERCUT DOOR. B/F DOOR OPERATOR
154 A	950	2150	20MIN	-	C	HM	P	FRG	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
154 B	1000	2150	-	HT	B	HM	P	TP	1	HM	P	-	-	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS. B/F DOOR OPERATOR
155 A	2X1000	2150	-	HT	B	HM	P	TP	2	HM	P	-	-	180 DEGREE SWING BOTH LEAFS. B/F DOOR OPERATOR
155 B	2X1000	2150	20MIN	HT	D	HM	P	FRG	3	HM	P	-	-	REMOVABLE MID-MULLION
159 A	2X700	2150	-	-	A	HM	P	-	5	HM	P	-	-	SPECIAL DOOR FRAME (NO TOP FRAME) NO BLOCK ABOVE. REF. INTERIOR ELEVATIONS. PROVIDE 90 DEGREE CUT FRAME EDGES, FINISH WELDED

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
160 A	1000	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
160 B	1000	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
161 A	950	2150	20MIN	-	D	HM	P	FRG	13	HM	P	-	FRG	
161 B	950	2150	-	-	B	HM	P	TP	13	HM	P	-	TP	
162 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
163 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
167 A	950	2150	20MIN	-	A	HM	P	-	1	HM	P	-	-	
167 B	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
168 A	950	2150	20MIN	-	A	HM	P	-	1	HM	P	-	-	
169 A	950	2150	-	-	B	HM	P	-	1	HM	P	-	-	
170 A	950	2150	20MIN	-	A	HM	P	-	1	HM	P	-	-	
170 B	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
171 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
172 A	2x1000	2150	-	-	A	HM	P	-	16sim	HM	P	-	-	

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
173 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
174 A	1100	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
175 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
176 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
179 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
180 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
TEACHER'S CLOSET LOCKSET (1ST FLOOR) - REFER TO FLOOR PLANS FOR QUANTITY (DOUBLE HANDLES, LEVER TYPE)														
GROUND FLOOR - CHILDCARE														
301 A	1100	2150	-	HT	B	ALUM	ANNO	TP	CW11	ALUM	ANNO	DC	TP	B/F DOOR OPERATOR, INSULATED DOOR & FRAME, ELECTRIC SECURITY STRIKE TO OFFICE. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. COORD WITH ELEC FOR VIDEO INTERCOM SYSTEM / CARD READER, CONTINUOUS HINGES. B/F OPERATOR IN CURTAIN WALL FRAMING. COORD WITH ELEC TO RUN CONDUIT IN FRAME SYSTEM
301 B	1100	2150	-	HT	B	HM	P	TP	14	HM	P	-	TP	B/F OPERATOR
302 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
305 A	1000	2150	45MIN	-	D	HM	P	TP	1	HM	P	-	-	
306 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	B/F OPERATOR

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
307 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
308 A	950	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	
310 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
312 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
314 A	970	1000	-	-	E	WD	PLAM	-	15	WD	PLAM	-	-	HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS
315 A	950	2150	-	-	B	HM	P	TP	4	HM	P	-	TP	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
316 A	2X800	2150	-	-	A	HM	P	-	16	HM	P	-	-	
317 A	2X800	2150	-	-	A	HM	P	-	16	HM	P	-	-	
318 A	970	1000	-	-	E	WD	PLAM	-	15	WD	PLAM	-	-	HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS 25mm UNDERCUT DOOR
319 A	950	2150	-	-	B	HM	P	TP	4	HM	P	-	TP	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
320 A	970	1000	-	-	E	WD	PLAM	-	15	WD	PLAM	-	-	HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS
322 A	1100	2150	-	HT	B	HM	P	TP	17	HM	P	-	TP	B/F OPERATOR, INSULATED DOOR & FRAME, EXTERIOR DOOR.
322 B	1100	2150	-	HT	B	HM	P	TP	17	HM	P	-	TP	B/F DOOR OPERATOR
323 A	970	1000	-	-	E	WD	PLAM	-	15	WD	PLAM	-	-	HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS

DOOR #	DOOR								FRAME					REMARKS
	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
324 A	950	2150	-	-	B	HM	P	TP	4	HM	P	-	TP	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
325 A	2X800	2150	-	-	A	HM	P	-	16	HM	P	-	-	
327 A	950	2150	-	-	B	HM	P	TP	4	HM	P	-	TP	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.
328 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	25mm UNDERCUT DOOR
TEACHER'S CLOSET LOCKSET (1ST FLOOR) - REFER TO FLOOR PLANS FOR QUANTITY (DOUBLE HANDLES, LEVER TYPE)														
SECOND FLOOR														
201 A	2X1000	2150	45MIN	HT	D	HM	P	FRG	CW15	ALUM	ANNO	-	TP	180 DEGREE SWING ONE LEAF, ELECTROMAGNETIC HOLD OPENS IN CLOSER. FIRE RATED DOOR. REMAINDER OF ASSEMBLY FIRE PROTECTED WITH WINDOW SPRINKLERS. REF. MECH. DWGS. ALUMINUM FRAME ASSEMBLY WITH 45min. FRR DOORS WITH FIRE-RATED HARDWARE MID-MULLION.
203 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
204 A	950	2150	-	-	D	HM	P	TP	4	HM	P	-	TP	
204 B	950	2150	-	-	A	HM	P	TP	1	HM	P	-	-	
205 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
207 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
207 AA	950	2150	-	-	B	HM	P	TP	1	HM	P	-	-	

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
208 A	2X1000	2150	45MIN	HT	D	HM	P	TP	2	HM	P	-	-	180 DEGREE SWING, ELECTROMAGNETIC HOLD OPENS
209 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
210 A	1000	2150	45MIN	-	D	HM	P	TP	1	HM	P	-	-	
211 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
212 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
212 AA	1000	2150	-	-	A	HM	P	-	1	HM	P	-	-	
213 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
213 B	950	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
213 C	950	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
214 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
215 A	950	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
217 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
218 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
219 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
220 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
221 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
222 A	2X1000	2150	45MIN	HT	D	HM	P	TP	2	HM	P	-	-	180 DEGREE SWING, ELECTROMAGNETIC HOLD OPENS
223 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
224 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
226 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
227 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
228 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
229 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
230 A	2X1000	2150	45MIN	HT	D	HM	P	TP	2	HM	P	-	-	180 DEGREE SWING, ELECTROMAGNETIC HOLD OPENS
231 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
232 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
233 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
235 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
236 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
238 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
239 A	950	2150	-	-	C	HM	P	TP	1	HM	P	-	-	
240 A	950	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
241 A	950	2150	-	-	B	HM	P	TP	1	HM	P	-	-	
242A A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
242B A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
243 A	1100	2150	-	-	A	HM	P	-	1	HM	P	-	-	
244 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
247 A	1100	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	
247 B	1100	2150	-	-	A	HM	P	-	1	HM	P	-	-	INSULATED EXTERIOR DOOR AT ROOF
248 A	1100	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	
248 B	1100	2150	-	-	A	HM	P	-	1	HM	P	-	-	
251 A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	

DOOR	DOOR								FRAME					REMARKS
#	WIDTH	HEIGHT	FIRE	H.T.	TYPE	MAT'L	FIN	GLASS	TYPE	MAT'L	FIN	DC	GLASS	
252 A	1100	2150	-	-	A	HM	P	-	1	HM	P	-	-	
253A A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
253B A	950	2150	-	-	A	HM	P	-	1	HM	P	-	-	
254 A	950	2150	45MIN	-	A	HM	P	-	1	HM	P	-	-	

TEACHER'S CLOSET LOCKSET (2ND FLOOR) - REFER TO FLOOR PLANS FOR QUANTITY (DOUBLE HANDLES, LEVER TYPE)

Part 1 General

1.1 RELATED SECTIONS

1. Section 08 71 10 – Door Hardware
2. Section 10 11 25 – Manufactured Specialties Item 2.1.14

1.2 REQUIRMENTS OF REGULATORY AGENCIES

1. Fabricate and install all doors to the following standards. AWMAC Quality Standards for Architectural Woodwork, latest edition
2. CAN/CSA-0132.2 Series-90, Wood Flush Doors
3. CAN4-S104-M80, fire tests of door assemblies
4. CAN4-S105-M85, Fire Door Frames
5. NFPA-80, Fire doors and Windows, latest edition.

1.3 SAMPLES

1. Submit samples in accordance with Section 01 33 00
2. Submit one 12” x 12” corner sample of each type of door
3. Show door construction, core, glazing details and faces.

1.4 SHOP DRAWINGS

1. Submit shop drawings in accordance with Section 01300 Submittals.

1.5 GUARANTEE

1. All doors shall be fully guaranteed for a period of three (3) years against manufacturing defects, core ghosting and warping, delamination of veneer, after Substantial Completion.

Part 2 General

2.1 MATERIALS

1. Acceptable door manufacturers:
   - .1 Algoma
   - .2 Cambridge
   - .3 Dormond
   - .4 Lambton

.5 Marshfield

2. Doors shall be of the sizes, thickness and type as shown on the drawings.

3. Solid core doors shall be constructed with urea-formaldehyde free particle board to ANSI A208.1, lD2. For Fire rated doors provide core in accordance with fire test requirements..

4. Doors shall be provided with vision panels as called for on the Door Schedules and supplied complete with wood glazing stops for 20 minute rated doors and ULC approved metal glazing stops for 45 minute or 60 minute rated doors.

5. Doors shall be complete with labels indicating approved fire resistance rated as required.

6. Undercut or rebate bottom rails as required.

7. Crossband – 3 ply hardwood plywood not less than 1/8" thick before sanding

8. Vertical and horizontal edges, including top, stops and beads for glass and grilles to match face veneer. Edges shall be minimum 1 ½" wide by thickness of door.

9. Stiles and rails to be low density softwood staved type minimum 1 ½" wide with ¾" thick hardwood edge banding. Moisture content shall not exceed 8%.

10. Glazing beads to be flush type front edge recessed 1/8" at bottom. Mitre cut and fil all corners to form tight flush joints.

11. Face veneer shall be plastic laminate from Nevamar Plastic Laminate ARP surface distributed by McFaddens. Approved alternates by Wisonart, Formica or Arborite. Allow for maximum of 2 colours from full range, including solids and wood grains as chosen by Consultant.

12. Colours to later selection by Consultant as specified in Plastic Laminates.

2.2 FABRICATION

1. Door cores unframed, solid laminated wood stave core construction, comprising narrow pieces of kiln dried wood, grain running vertically and end joints well staggered, solid, (no voids) and electronically glue bonded. Floating core construction will not be accepted. Sand door cores boths sides prior to application of faces.

2. If particle board core or fire rated cores used, frame with 1 1/8" minimum wood stiles and 2 ¾" minimum wood rails; edge stiles with birch ¾" wide minimum, full length piece. Glue tiles and rails to core and apply face veneer and machine flush with door edges.

3. Seal tope and bottom edges with two coats urethane finish or lacquer applied to door manufacturer's plant.

4. Attach ULC labels to fire doors and frames as required

5. Preparation of doors shall include provision for extra hinges, heavy weight butts and mortised or cylinder locksets as required of hardware tender documents.

6. Preparation of doors and frames shall make appropriate provision for sound seals as indicated on Door Schedule.

7. Prepare glazing stops to receive insulated, sealed glazing as required on Door Schedule.

Part 3 Execution

3.1 FITTING AND HANGING DOORS

1. Doors shall be delivered to site, protected in transit from any damage from weather or handlying and similarly stored in a protected area until hung in place.

2. Doors shall be hung by skilled carpenters.

3. Any planning of edges required for proper installation shall be sanded smooth prior to final installation.

4. Neatly and accurately fit required finishing hardware. Refer to section 08 71 10 - Finishing Hardware.

5. The completed installation required all doors to fit accurately in their frames, swing easily without binding and close slugly without movement when latch is engaged.

3.2 HARDWARE INSTALLATION

.1 Receive hardware from Section 08 71 10.

.2 Installation of the hardware is the responsibility of the General Contactor.

.3 Adjust for correct function.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 Submittal Procedures.

.2 Section 01 78 00 Closeout Submittals.

.3 Section 05 50 00 Metal Fabrications.

.4 Section 07 92 10 Joint Sealants.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM International)
- .1 ASTM A653/A653M-09a, Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot Dip Process.

.2 Canadian Standards Association (CSA)
- .1 CSA C22.1-09, Canadian Electrical Code, Part 1, Safety Standards for Electrical Installations.
- .2 CAN/CSA-G40.20/G40.21-M-04, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.
- .3 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 CSA S136-M-07, North American Specification for the Design of Cold Formed Steel Structural Members.

1.3 DESIGN REQUIREMENTS

.1 Provide a 45 mm thermally broken insulated flush overhead door, electrically operated complete with safety edge.

.2 Design door assembly to withstand wind loads in closed position of 1 kPa positive 0.6 kPa negative, with operators to function against 0.4 kPa wind load. Maximum deflection under full design load to be 1/240 of opening width.

.3 Calculate properties of steel sections and allowable stresses used in determination of structural performance in accordance with CSA S136-M.

.4 Design door assembly to withstand minimum 100,000 cycles per annum, and 20 years total life cycle. Design door panel assemblies with thermal insulation factor 2.84 RSI.

.5 Design electrical components for doors in accordance with CSA C22.1 and the Ontario Hydro Electrical Safety Code.

1.4 SUBMITTALS

.1 Product data:
- .1 Submit duplicate copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:
  - .1 Performance criteria, compliance with appropriate reference standards, characteristics, limitations, and trouble shooting protocol.
  - .2 Product transportation, storage, handling and installation requirements.

.2 Shop drawings:
- .1 Submit shop drawings in accordance with Section 01 33 00 indicating:
  - .1 Elevations, materials, sections and details, operating components, dimensions, gauges, glazing, hardware, accessories, finishes, and service rating.
  - .2 Complete electrical wiring diagrams including electrical schematics and sequence of operation.
  - .3 Complete engineering design data to confirm that door meets design criteria specified.

.3 Closeout submittals:
- .1 Submit following for each Product for incorporation into Operations and Maintenance Manuals in accordance with Section 01 78 00:
  - .1 Identification: Manufacturing name, type, year, and serial number.
  - .2 Performance criteria and maintenance data.
  - .3 Operating instructions and precautions.
  - .4 Safety precautions.
  - .5 Component parts availability including names and addresses of spare part suppliers.
  - .6 Lubrication schedule indicating lubrication points and type of lubricant recommended.

1.5 EXTENDED WARRANTY

.1 Submit a warranty for Work of this Section in accordance with General Conditions, except that warranty period is extended to 3 years.
- .1 Warrant against failure to meet design criteria and specified requirements.
- .2 Coverage: Complete replacement including affected adjacent Work.

Part 2 Products

2.1 ACCEPTABLE PRODUCTS AND MANUFACTURERS

.1 Model ‘Aluminum Glass Doors – Model 8800’ motorized by Wayne-Dalton Corp. or approved alternative.

.2 For use in Learning Commons. Door to be sized approximately 5485 x 2745 (18' x 9'). Confirm dimensions.

2.2 MATERIALS

.1 All materials under Work of this Section, including but not limited to, paints are to have low VOC content limits.

.2 Frame to be Clear anodized finish.

.3 Glass to be sound insulated tempered safety glass, clear.

2.3 HARDWARE

.1 Track: standard lift hardware with 75 mm size minimum 2.3 mm core thickness galvanized steel track.

.2 Track Supports: Continuous galvanized steel angle track supports.

.3 Spring counter balance: heavy duty oil tempered torsion spring with manufacturers standard brackets.
- .1 Drum: Die cast aluminum; size as recommended by door manufacturer to suit intended application.
- .2 Shaft: Solid steel; size as recommended by door manufacturer to suit intended application.

.4 Top roller carrier: galvanized steel minimum 2.3 mm thick, adjustable.

.5 Rollers: full floating, grease packed hardened steel, ball bearing minimum 75 mm diameter, stamped tire.

.6 Roller brackets: adjustable, galvanized steel, minimum 2.5 mm thick.

.7 Hinges: standard duty industrial 2.3 mm thick galvanized steel.

.8 Cable: Multi-strand galvanized steel aircraft cable with a safety factor of 8:1.

2.4 ELECTRICAL

.1 Electrical jack shaft side mounted type operator. Operator to include motors, speed reducers with all gears running in oil, sheaves, racks, levers, cables and brake, disconnect switches, reversing starters, controls, and all conduit and wiring to make all connections required to complete the Work.

.2 Provide operator with floor level disconnect device to allow for manual operation in event of power failure. Equip operator with electrical interlock switch to disconnect power to operator when in manual operation and Built-in chain hoist for manual operation in event of power failure.

.3 Electrical motors, controller units, remote pushbutton stations, relays and other electrical components: to CSA approval with CSA enclosure type 1.

.4 Power supply: 600 V, 3 phase, 60 Hz.

.5 Motor: Minimum 0.375 kW to maximum 0.560 kW to suit design.

.6 Operation: Remote pushbutton stations, surface mounted, in location shown, with "OPEN-STOP-CLOSE" designations on pushbuttons in English.

.7 Safety switch: combination roll rubber with limit switches for full length of bottom rail of bottom section of door, to reverse door to open position when coming in contact with object on closing cycle.

.8 Door speed: 300 mm per second.

.9 Control transformer: for 24 V AC control voltage.

2.5 FABRICATION

.1 Verify dimensions of existing Work before commencing fabrications and report discrepancies to Consultant.

.2 Fabricate Work in accordance with Contract Drawings and reviewed shop drawings. Fabricate, fit and assemble Work in shop where possible. Provide three vision panels.

.3 Fabricate Work free from defects impairing function, appearance, strength and durability.

.4 Fabricate panel frames in a continuous box frame with vertical stiffeners at 600 mm centres.

.5 Fabricate doors from prepainted steel stock.

2.6 FINISHES

.1 Prefinish sheet steel: Galvanized finish with baked-on polyester primer and polyester finish coat in colour as selected by the Consultant.

.2 Steel: Hot dip galvanized in accordance with CAN/CSA G164-M.

Part 3 Execution

3.1 INSTALLATION

.1 Install doors in accordance with reviewed shop drawings and manufacturer's written instructions.

.2 Use anchorage devices to securely fasten unit assembly to wall construction and building and building framing without distortion or stress.

.3 Fit and align assembly including hardware; level and plumb, to provide smooth operation. Install door to fit tight at all edges of jambs and heads of frames.

.4 Install operator including electrical motors, controller units, pushbutton stations, relays and other electrical equipment required for door operation in accordance with CSA C22.1 and Ontario Hydro Electrical Safety Code.

.5 Lubricate and adjust door operating components to ensure smooth opening and closing of doors.

.6 Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 92 10.

.7 Touch-up steel doors with primer where galvanized finish damaged during fabrication.

.8 Adjust weatherstripping to form a weathertight seal.

3.2 ERECTION TOLERANCES

.1 Maintain dimensional tolerances and alignment with adjacent work.

.2 Maximum Variation and alignment From Plum: 1.5 mm

.3 Maximum Variation From Level: 1.5 mm

.4 Longitudinal or Diagonal Warp: Plus or minus 3 mm per 3 m straight edge.

3.3 FIELD QUALITY CONTROL

.1 Testing: Test operate door and demonstrate the operation of same to the satisfaction of the Consultant.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 61 00 - Common Product Requirements.

.3 Section 01 78 00 - Closeout Submittals.

.4 Section 05 50 00 - Metal Fabrications: Metal fabricated framed openings, structural support framing for sloped glazing.

.5 Section 07 27 10 - Air Barriers - Descriptive or Proprietary.

.6 Section 07 84 00 - Firestopping: Fire safing between floor edge and curtain wall system.

.7 Section 07 92 10 - Joint Sealing: System perimeter sealant and back-up materials.

.8 Section 08 80 50 - Glazing.

.9 Section 09 91 23 - Interior Painting: Field painting of interior surface of infill.

1.2 REFERENCES

.1 Aluminum Association Designation System For Aluminum Finishes (AA)-[1997].

.1 DAF 45 [2003], Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).

.1 AAMA CW-DG-1-[96], Aluminum Curtain Wall Design Guide Manual.

.2 AAMA CW-10-[97], Care and Handling of Architectural Aluminum From Shop to Site.

.3 AAMA CW-11-[85], Design Wind Loads for Buildings and Boundary Layer Wind Tunnel Testing.

.4 AAMA T1R-A1-[02], Sound Control for Fenestration Products.

.5 AAMA 501-[94], Methods of Test for Exterior Walls.

.6 AAMA 503-[92], Voluntary Specification for Field Testing of Metal Storefronts, Curtain Wall and Sloped Glazing Systems.

.7 AAMA 611-[98], Voluntary Specifications for Anodized Finishes Architectural Aluminum.

.8 AAMA 612-[02], Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum.

.9 AAMA 2603-[02], Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.10 AAMA 2604-[02], Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.3 American Society for Testing and Materials International, (ASTM).

.1 ASTM A36/A36M-[103a], Specification for Carbon Structural Steel.

.2 ASTM A123/A123M-[02], Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.3 ASTM A167-[99], Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

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

.5 ASTM B209-[02a], Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.6 ASTM B221-[02], Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.7 ASTM E283-[91(1999)], Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.8 ASTM E330-[02], Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.

.9 ASTM E331-[00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.10 ASTM E413-[87(1999)], Classification for Rating Sound Insulation.

.11 ASTM E1105-[00], Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.4 Canadian General Standards Board (CGSB).

.1 CAN/CGSB 1.108-[M89], Bituminous Solvent Type Paint.

.2 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.

.5 Canadian Standards Association (CSA International).

.1 CSA-G40.20/G40.21-[98(R2003)], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.

.2 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA-S136-[01], North American Specification for the Design of Cold-Formed Steel Structural Members.

.4 CAN3-S157-[M83(R2002)], Strength Design in Aluminum.

.5 CSA W59.2-[M1991(R2003)], Welded Aluminum Construction.

.6 Environmental Choice Program (ECP).

.1 CCD-45-[95], Sealants and Caulking Compounds.

.2 CCD-47-[1998], Surface Coatings.

.3 CCD-48-[95], Recycled Water-Borne Surface Coatings.

.7 Society for Protective Coatings (SSPC).

.1 SSPC - Paint 20 Zinc Rich Coating.

.2 SSPC - Paint 25 Alkyd, Zinc Oxide Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.

1.3 SYSTEM DESCRIPTION

.1 Work included: Furnish labour, materials and other services to complete the fabrication and installation of the framing, including all materials and fitments required for the operation of any entrance units included, in the manner, direction and performance shown on the shop drawings and specified herein. Work not included: Structural support of framing, interior trims. Related work specified elsewhere.

1.4 QUALITY ASSURANCE

.1 Installation crews engaged or provided by the approved supplier shall have proven experience specifically trained and qualified in this work (written proof of minimum of five (5) years employment or service with the window manufacturer or similar manufacturer). Individuals are to be either employees of the manufacturer and/or workers approved by the manufacturer.

.2 Provide one (1) thoroughly experienced. reliable, qualified and competent foreman in charge of the work to be on site at all times when work is taking place. Individual to be designated in charge from start of activities on site until final deficiencies are complete. Foreman may only be changed by written approval *or request* of the Consultant or owner.

.3 Window supplier is to have adequate plant and skilled tradesmen and is known to have manufactured and installed similar windows for a minimum of five (5) years in the Province of Ontario.

1.5 PERFORMANCE REQUIREMENTS

.1 Structural performance shall be based on CSA standard CAN3-S157 "Strength Design in Aluminum" and a maximum deflection of 1/175 of the span.

.2 Air infiltration shall not exceed 0.06 cfm/ft2 (0.0003 m3/s-m2) when tested in accordance with ASTM E283 at a pressure differential of6.24p.s.f. (300 Pa.)

.3 There shall be no water infiltration when tested in accordance with ASTM E331 with a pressure differential of 15.0 p.s.f. (720 Pa.) Thermally, the grid members shall have a condensation resistance equal to or better than the area along the bottom of a 1" sealed glass unit with standard metal spacer edge construction.

.4 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.

.5 Provide system to accommodate, without damage to components or deterioration of seals:

.1 Movement within system.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.5 Shortening of building concrete structural columns.

.6 Creep of concrete structural members.

.6 Vapour seal with interior atmospheric pressure of 25 mm sp, 22 degrees C, 40% RH: No failure.

.7 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

.8 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

1.6 PRODUCT DATA

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

.2 Provide component dimensions; describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details and water flow diagrams.

1.7 SHOP DRAWINGS

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

.2 Indicate system dimensions, framed opening requirements and tolerances, internal million reinforcement, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required.

.3 Curtain wall shop drawings are to be approved for structural integrity by a Professional Engineer licensed to design structures in the Province of Ontario. Shop drawings are to bear Engineer's seal of approval.

1.8 SAMPLES

.1 Drawings and specifications for work of this section are based upon Thermawall 2600 series Curtain Wall system by Alumicor. For all approved products and acceptable alternatives, submit supporting technical literature, samples, drawings and performance data to meet or exceed these specifications.

.2 Submit two samples 800 x 800 mm in size illustrating prefinished aluminum surface, finish, colour, texture, specified glass units, insulated infill panels, glazing materials illustrating edge and corner.

1.9 DESIGN DATA

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

.2 Provide framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

1.10 TEST REPORTS

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

.2 Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and supportive data.

1.11 REGULATORY REQUIREMENTS

.1 Conform to applicable code for acoustic attenuation, and sound transmission.

.2 Use the following paragraph for assessing full sized erected assemblies for review of construction, coordination of work of several sections, testing, or observation of operation. A mock-up may also be used for assessing field applied finishes.

1.12 MOCK-UP

.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

.2 Locate where directed.

.3 Allow 24 hours for inspection of mock-up Consultant before proceeding with work.

.4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may not remain as part of finished work.

1.13 PRE-INSTALLATION MEETING

.1 Convene one week before starting work of this section.

1.14 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store, handle and protect materials in accordance with Division 1 requirements.

.2 Handle work of this section in accordance with AAMA CW-10.

.3 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.15 ENVIRONMENTAL REQUIREMENTS

.1 Do not install sealants when ambient and surface temperature is less than 5 degrees C.

.2 Maintain this minimum temperature during and after installation of sealants.

1.16 SEQUENCING

.1 Coordinate work of this section with installation of fire stopping, air barrier placement, vapour retarder placement, flashing placement, installing ductwork to rear of louvers.

1.17 WARRANTY

.1 Submit a manufacturer's warranty against defects in materials and workmanship covering the components of the window system for a period of ten (10) years. The manufacturer shall supply a non-pro-rated warranty covering labour, materials, tools and equipment to repair and/or replace any materials defects at no additional cost, for a period of ten (10) years including defects or failures due to poor workmanship and installation.

.2 The supplier shall also submit a warrantee, in accordance with Section 088050-Glazing, for 10 years warranting the sealed units against defects.

1.18 MAINTENANCE DOCUMENTS AND MATERIALS

.1 Provide 2 copies of data for maintenance and routine cleaning.

.2 Provide 2 copies of final record reviewed shop drawings for owner's records.

.3 Contractor shall supply all accessories as may be required for the operation and performance of the windows system.

1.19 EXTRA MATERIALS

.1 Provide extra materials of glass units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide protected and packaged in wood crates suitable for storage. Clearly identify each crate.

.3 Deliver Consultant, upon completion of the work of this section.

.4 Store where directed by Consultant.

1.20 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

Part 2 Products

2.1 MATERIALS

.1 **Exterior Curtain Walls** – Alumicor Thermawall 2600 or Kawneer 1600UT, Ultra Thermal Performance curtain wall, (63.5 mm x 190.5mm – incl. glazing & cap).

.1 Must be designed to withstand a wind load of min. 30 psf.

.2 Provide high thermal performance gaskets.

.3 Fixed (non opening) thermally broken anodized aluminum curtain wall system, glazed with tempered, insulating vision glass and tempered spandrel glass.

.4 Standard pressure cap for most locations.

.5 Deep Pressure Cap: Provide 150mm extended pressure cap where noted on drawings.

.6 Provide double width mullion where required (near main entrance).

.7 Provide Structural Silicone Mullion (SSG) where noted on drawings. Back section depth to match capped assembly where noted in drawings.

.8 Provide operable 'phantom vent 5000' where indicated on drawings.

.9 Provide insect screens to operable vents at Learning Commons and Art Classrooms.

.2 **Interior Curtain Walls** - Drawings and Details are based on Alumicor Versawall 2500 (non-thermal) curtain wall, (63.5 mm x 153mm – incl. glazing & cap).

.1 Fixed (non opening) anodized aluminum curtain wall system, glazed with tempered, vision glass and tempered spandrel glass.

.3 **Aluminum Doors**

.1 Interior:
- .1 '400A Series' by Alumicor Limited.
- .2 '350 Swing Doors' by Kawneer Company Canada Limited.
- .3 Or doors meeting these specifications by manufacturers listed below.

.2 Exterior:
- .1 'T400A ThermaPorte 7700 Series by Alumicor Limited.
- .3 Or doors meeting these specifications by manufacturers listed below.

.4 Acceptable Materials : Curtain wall systems meeting or exceeding these specifications manufactured by:

.1 Alumicor
.2 Aerloc Industries
.3 Alwind Industries
.4 Kawneer Company of Canada
.5 Windspec Inc.
.6 Sherwood Windows

.5 Extrusions shall be 6063 T54 alloy and temper.

.6 Formed aluminum components shall be sheet of alloy and temper suitable for their purpose and finish. Fasteners shall be 300 series stainless steel or 400 series stainless steel cadmium plated and of sufficient size and quantity to perform their intended function. Weathering and glazing gaskets shall be extruded, black, closed cell or dense elastomer of durometer appropriate to the function.

.7 Provide glazed and aluminum spandrel sections where indicated on drawings.

.8 Provide structural silicone mullions where described on drawings.

.9 Refer to Section 08 80 50 – Glazing for information on tinted glazing sections. Refer to drawings for locations of tinted glazing.

.10 Manufacturer / Installer to determine if mullions require internal reinforcement to achieve specified load resistance.

2.2 FINISHES

.1 CLEAR ANODIZED.

.1 Exposed aluminum sections shall be given an anodic oxide treatment in accordance with Aluminum Association specification AA-M12C22A31: “Clear anodized”.

2.3 SLIDING GLASS DOOR – Learning Commons

.1 DIRTT glass wall system includes full-height double sliding barn doors measuring 2000 mm in height and 3050 mm in overall width, providing a clear opening of 2681 mm.

.2 The track system is equipped with integrated soft-open and soft-close mechanisms for smooth operation.

.3 Location: (Door 117C between Learning Commons 115 and Classroom 117)

.1 Provide a factory-fabricated, demountable glass wall system with full-height double sliding barn doors.

.2 System shall include aluminum framing, sliding track hardware, glazing, blocking requirements, and structural support components as specified.

.3 Double sliding barn door configuration, 2000 mm height × 3050 mm overall width, with a minimum clear opening of 2681 mm.

.4 Aluminum door frames with 4-inch stile profile.

.5 Doors to be glazed with 6 mm tempered glass.

.6 Door Hardware to be provided by DIRTT. Must be lockable from both sides.

.7 Frame finish: Clear anodized aluminum.

.8 Sliding track system shall be supported from adjacent aluminum-framed glazed wall sections; no floor track permitted.

.9 Track hardware shall include integrated soft-open and soft-close mechanisms.

.10 Door manufacturer shall provide a header lift kit centered above the door opening for connection to structural support components.

.2 Structural Support Requirements: General Contractor shall provide and install a threaded rod with turnbuckle located centrally within the header cavity above the door opening.

.1 Header lift kit shall connect to the turnbuckle to provide vertical support and future adjustment capability for the door assembly.

.2 Provide access to the turnbuckle through a removable access hatch located in the bulkhead on one side of the opening. Preferred location is on the room side to avoid corridor visibility.

.3 Provide ½-inch wood blocking within bulkhead and at vertical wall locations behind drywall.

.3 Glazed Wall System: Sidelight glazing to be 6 mm tempered glass.

.1 Glass sidelights shall be fully floor-bearing.

.2 System shall provide vertical adjustability up to 1 ½ inches to accommodate floor height variations.

.3 Frame finish: Clear anodized aluminum.

2.4 FABRICATION

.1 Fabricate aluminum work in accordance with reviewed shop drawings and manufacturer's written instructions.

.2 Fabricate framing from extrusions of size and shape shown on shop drawings.

.3 Vertical and horizontal members shall be tubular extrusions designed for shear block comer construction.

.4 All joints shall be accurately machined, assembled and sealed to provide neat weather tight joints. Shielded drainage and pressure equalization vents shall be provided where required. AH horizontal members shall be sealed to vertical members to provide individual compartments within the system in accordance with the rain screen principle.

.5 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

.6 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.7 Prepare components to receive anchor devices. Install anchors.

.8 Arrange fasteners and attachments to ensure concealment from view.

.9 Reinforce framing members for external imposed loads.

.10 Visible manufacturer's identification labels not permitted.

.11 Break shapes must be approved by the Consultant prior to use.

.12 At all curtain wall spandrel panels exposed on interior of building, curtain wall spandral panels shall be laminated w/ aluminum panel of same pre-finish as mullions with bent edges.

.13 Provide spandrel panels at locations of exterior light fixtures as shown on elevations. Coordinate with Div. 16 for lighting location and size of openings.

.14 All perimeter sections to be tubular/closed back sections for continuous adhesion and continuity of building envelope membrane.

.15 Spandrel panels:

.1 Fabricate insulated spandrel panel inner facing of 20 gauge aluminum sheet. Wrap edges with aluminum sheet, enabling installation and minor movement of perimeter seal.

.2 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.3 Place insulation within panel, adhered to exterior face of interior panel sheet over entire area of sheet with impale fasteners.

.4 Provide integral reinforcing and stiffeners as required to reinforce panel against deflection caused by wind and suction loads.

.5 Provide non-metallic spacers as necessary to separate dissimilar metals.

.6 Ventilate and pressure equalize the air space outside the exterior surface of the insulation, to the exterior.

.7 Arrange fasteners and attachments to ensure concealment from view.

.8 Glass panels: Consists of spandrel glass in accordance with Section 08 80 00 to the exterior with insulated backpan to the inside. Interior face of panel to be finished with a pre-finished aluminum sheet of the same grade as the exterior, colour matching the exterior. Insulation thickness shall be as indicated, retained with stick clips. Seal all joints in shop with high grade butyl sealant, including perimeter seal at backpan. Colour to later selection by Consultant.

.9 Metal panels: Consists of an exterior prefinished flush aluminum panel with panel stiffeners as required, to match colour of window framing, with insulation

core thickness as indicated and galvanized sheet back-pan. Interior face of panel to be finished with a pre-finished aluminum sheet of the same grade as the exterior, colour matching the exterior.

Part 3 Execution

3.1 EXAMINATION

.1 Verify dimensions, tolerances, and method of attachment with other work.

.2 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2 INSTALLATION

.1 Framing shall be installed, glazed and adjusted by experienced personnel in accordance with the manufacturer's instructions and approved shop drawings. All items in this section shall be set in their correct location and shall be set level, square, plumb and at proper elevations and in alignment with other work.

.2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

.3 Provide alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.

.4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

.5 Provide thermal isolation where components penetrate or disrupt building insulation.

.6 Co-ordinate attachment and seal of perimeter air barrier and vapour retarder materials.

.7 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.8 Install fire-safing in areas as indicated.

3.3 FIELD QUALITY CONTROL

.1 Inspection will monitor quality of installation and glazing.

.2 Test to ASTM E1105, and AAMA 501.

.3 Evaluate installed system by thermo-photographic scan.

3.4 ADJUSTING

.1 Adjust operating sash for smooth operation.

3.5 CLEANING

.1 Remove protective material from prefinished aluminum surfaces.

.2 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.3 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.6 PROTECTION

.1 Protect finished Work from damage.

.2 Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint."

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 11 – Final Cleaning.

.3 Section 08 80 50 – Glazing.

.4 Section 07 92 10 - Joint Sealing.

1.2 REFERENCES

.1 American Architectural Manufacturers Association (AAMA).

.1 AAMA 611-98, Voluntary Specifications for Anodized Finishes Architectural Aluminum.

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM B209-07, Specification for Aluminum and Aluminum Alloy Sheet and Plate.

.2 ASTMB221-08, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.3 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.

.4 Canadian Standards Association (CSA) International

.1 CSA-A440-00/A440.1-00 (R2005), A440-00 (R2005), Windows / Special Publication A440.1-00 (R2005), User Selection Guide to CSA Standard A440-00 (R2005), Windows.

1.3 DESIGN REQUIREMENTS AND PREQUALIFIED WINDOW SUPPLIERS

.1 Base performance standard: Products to be supplied from the list of acceptable manufacturers listed below shall meet or exceed the following performance standard product upon which this specification is largely based: 970 Series with 1350 Series Vents as manufactured by Alumicor Ltd.

.2 Acceptable Manufacturers/Suppliers: Aluminum Windows meeting this specification for this project shall be supplied by one of the following pre-approved suppliers:

.1 Aerloc Industries; (905) 628-6061

.2 Alumicor Ltd.; (416) 745-4222

.3 Alwind Industries; (905) 738-4266

.4 Kawneer Company of Canada; (416) 755-7751

.5 Windspec Inc.; (905) 738-8311

.6 Sherwood Windows Ltd.

.7 Aluminum Window Designs Ltd.

Note: All window frames have been drawn to a std. framing depth of 5 1/4". Larger format windows in selected areas have a 6" depth.

All curtain wall framing has been drawn to match windows so that curtain wall framing is inset 67 mm from the veneer face. Provide data at drawn sizes to design loads required.

.3 Design framing and glazing to withstand design loads as per Ontario Building Code with a maximum reflection of 1/200th of clear span.

.4 Work of this Section must be designed by and bear stamp of a Professional Engineer licensed to design structures in the Province of Ontario certifying their strength and safety.

.5 By submitting a price for supply and install, the Contractor, for Work to this Section, shall guarantee that he has carried products and pricing from one of the above approved manufacturers.

1.4 PERFORMANCE

.1 The overall thermal transmittance of fenestration assemblies shall be less than 0.81 Btu. Thermal transmittance for the fenestration shall be determined using ASHRAE 90.1 calculation procedures and shall include the effect of sash, frame, edge effect and spacer for multiple-glazed units.

.2 Fenestration shall meet CAN/CSA – A440 windows:

.1 Air Leakage: A3

.2 Water Leakage: B7

.3 Wind Load Resistance: C5

.4 Condensation Resistance Factor: fixed frame: 60 minimum

.5 Glass: 59 minimum

.3 Window shall also meet the requirements for blocked operation, ease of operation, sash strength, stiffness and resistance to forced entry.

.4 Submit manufacturer's certificate, certifying compliance with the above-noted requirements.

1.5 QUALITY ASSURANCE

.1 Installation crews engaged or provided by the approved supplier shall have proven experience specifically trained and qualified in this work (written proof of minimum of five (5) years employment or service with the window manufacturer or similar manufacturer). Individuals are to be either employees of the manufacturer and/or workers approved by the manufacturer.

.2 Provide one (1) thoroughly experienced. reliable, qualified and competent foreman in charge of the work to be on site at all times when work is taking place. Individual to be designated in charge from start of activities on site until final deficiencies are complete. Foreman may only be changed by written approval *or request* of the Consultant or owner.

.3 Window supplier is to have adequate plant and skilled tradesmen and is known to have manufactured and installed similar windows for a minimum of five (5) years in the Province of Ontario.

.4 Mock-up: Construct a window mock-up in accordance with Section 01 45 00 – Quality Control. Allow 24 hours for inspection of mock-up by Consultant before proceeding with the Work. When accepted, mock-up will demonstrate minimum standard for this Work. Mock-up may not remain as part of finished Work.

1.6 SUBMITTALS

.1 Submittals:

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

.2 Clearly indicate on shop drawings all materials and large scale details for head, jamb and sill as they will be installed in contact with building components for this project, profiles of components, elevations of unit, anchorage details, location of isolation coating, location of insulation to jambs head and sill, drainage locations, description of related components and exposed finishes and fasteners.

.3 Show paths of interior drainage and venting.

.2 Samples:

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

.2 Submit samples of each window hardware item for Consultant’s approval of type, finish and material.

.3 Certificates: Submit manufacturer's certificate, and test performance data certifying compliance with specification requirements, for:

.1 windows

.2 finishes.

.3 infiltration/exfiltration rates.

.4 thermal transfer resistance of frames.

.5 locking hardware

.6 vandal resistance

.4 Closeout submittals:

.1 Submit closeout submittals in accordance with Section 01 78 00.

.2 Provide 2 copies of data for maintenance and routine cleaning.

.3 Provide 2 copies of final record reviewed shop drawings for owner’s records.

.4 Contractor shall supply all accessories as may be required for the operation and performance of the windows system.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal recyclable packaging materials in appropriate on-site for recycling.

.3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.4 Divert unused or damaged wood materials from landfill to recycling facility approved by Consultant.

.5 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.6 Divert unused caulking material from landfill to official hazardous material collections site approved by Consultant.

.7 Plastic caulking tubes are not recyclable and must not be diverted for recycling with other plastic materials.

1.8 WARRANTY

.1 Submit a manufacturer's warranty against defects in materials and workmanship covering the components of the window system for a period of ten (10) years. The manufacturer shall supply a non-pro-rated warranty covering labour, materials, tools and equipment to repair and/or replace any materials defects at no additional cost, for a period of ten (10) years including defects or failures due to poor workmanship and installation.

.2 The supplier shall also submit a warrantee, in accordance with Section 088050-Glazing, for 10 years warranting the sealed units against defects.

Part 2 Products

2.1 SYSTEMS AND MANUFACTURERS

.1 Drawings and Details are based on 970 Series with 1350 Series Vents as manufactured by Alumicor Ltd. (416) 745-4222.

.2 Approved exterior window systems meeting or exceeding these specifications by the following manufacturers will be considered:

.1 Alumicor
.2 Aerloc Industries
.3 Alwind Industries
.4 Kawneer Company of Canada
.5 Windspec Inc.

2.2 MATERIALS

.1 Extrusions shall conform to ASTM B221 and be AA6063 T54 alloy and temper for framing.

.2 Formed aluminum sheet and plate components shall be AA1100-H14 alloy and temper suitable for their purpose and finish.

.3 Exposed anodized sheet and plate shall conform to ASTM B209, to AA5005-H14 alloy and temper or AA1100-H14 alloy and temper (anodizing quality, 1.6 mm thickness).

.4 Non-exposed sheet and plate to AA3003-H14 alloy and temper, mill finish.

.5 Fasteners shall be 300 series stainless steel or 400 series stainless steel cadmium plated and of sufficient size and quantity to perform their intended function.

.6 Weathering and glazing gaskets shall be extruded, black, closed cell or dense elastomer of durometer appropriate to the function.

.7 Glass and glazing materials: In accordance with Section 08 80 50 – Glazing.

.8 Glazing tapes shall be preformed polyisobutylene-butyl glazing tape with integral shim strip, 10-15 durometer, hardness, paper release, black color. Acceptable materials: Tremco Polyshim II by Tremco Ltd.

.9 Exterior Sills: extruded aluminum, minimum 3 mm thick, complete with joint covers, complete with jamb drip deflectors on both sides of each sill (refer also to drawings for type), chairs, anchors, anchoring devices. All corners shall be ground or rounded to eliminate burrs and sharp edges. Submit details with shop drawings. Sills to be one continuous piece along sill of window.

.10 Sealants: ASTM C920, Type S, Grade NS, Class 100; One-part, Moisture -curing silicone, '790 Silicone Building Sealant' by Dow Corning Corporation or Spectrum 1 by Tremco. Colour: As selected by Consultant.

.11 Foam Backer Rod: to be extruded, closed cell foam, round polyethylene rope, minimum 25% wider than width of joint cavity to be caulked. To be compatible with primers and sealants.

.12 Void filler foam: one part expanding polyurethane closed cell foam by BASF, Hilti or approved alternate specifically designed for window applications. To be compatible with primers and sealers

.13 Bedding Compound: to CGSB 19-GP-14M.

.14 Isolation Coating: alkali resistant bituminous paint.

.15 All perimeter sections to be tubular/closed back sections for continuous adhesion and continuity of building envelope membrane.

.16 Window supplier / installer to provide and install continuous angles or clips as required for fastening windows to building structure.

2.3 FABRICATION

.1 Fabricate aluminum windows in accordance with reviewed shop drawings and manufacturer's written instructions.

.2 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:

.3 Fabricate framing from extrusions of size and shape shown on shop drawings. Interior and exterior extruded aluminum framing sections shall be integrated with a glass reinforced nylon thermal break to form a rigid composite assembly without the use of fasteners or other thermal bridging elements.

.4 Composite frame assembly shall have a minimum of 1100 lbf/4 in. (4815N/ 100 mm) resistance to shear between the aluminum and the thermal break materials.

.5 Dry shrinkage of the thermal break shall not exceed 0.1% of the framing member length.

.6 All framing joints shall be accurately machined, assembled, and sealed to provide neat weather tight connections. Coupling mullions shall be designed to provide a functional split to permit modular construction and allow for thermal expansion. Glass stops shall be lock-in screwless type.

.7 Elastomeric air seal gasket shall be installed around the full perimeter of glass and sealed at corners wit silicone sealant. Air seal gasket must provide adhesion with silicone sealant.

2.4 ALUMINUM FINISHES

.1 Exposed aluminum sections and infill panels or interior column covers, if any, shown on drawings be given an anodic oxide treatment in accordance with Aluminum Association specification AA-M12C22A31. and CAN/CSA-A440 clear anodized Class II, 10μm (.0004 inch.) in accordance with AAMA 611.

.2 For exterior spandrel panels –if required on the project, to be a clear anodized infill panel to match windows finish complete with solid support substrate and insulation layer, clear anodized aluminum smooth or textured finish to Consultant selection.

.3 If Colour finish other than anodized is indicated on drawings or required to match existing, enamel finish shall be PPG Duranar finish (minimum 8000 series) or approved alternate.

.4 Final approval of finish and colour to be made by Consultant.

2.5 HARDWARE

.1 Provide heavy duty cam-action locks (double lever) hardware for operation of windows (not rotary style) in conjunction with friction arms, aluminum hinges and all required additional components. Cam Handles by Truth Hardware, bar hinges by Anderberg 4 bar hinges, or approved alternates. Provide samples for Consultant's approval.

.2 Limiting stops: All operable windows within reach of occupants to have limiting stops to each hinge to restrict the opening to a maximum of 225mm.

.3 Operating pole: Provide one varnish finished hardwood pole with blunt end hook suitable for spring catch latch, for each room in which operating hardware is more than 1800 mm from floor.

.4 Verify all site conditions regarding location and exact assembly requirements.

2.6 INSECT SCREENS

.1 Not required.

2.7 ISOLATION COATING

.1 Isolate aluminum from following components, by means of isolation coating:

.1 Dissimilar metals except stainless steel, zinc, or white bronze or small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.8 GLAZING

.1 Prepare windows to receive 25 mm thick double glazed insulating glass specified under Section 088050 – Glazing. Glaze windows in accordance with CSA-A440/A440.1.

2.9 THRU-WALL FLASHING

.1 Sub-sill flashings to be Blueskin SA by Bakor in locations shown on drawings. Adhere to substrate using primer approved by manufacturer. Ensure clean-up of excess primer and no visible edges of flashing upon completion of the work.

2.10 EXTRUDED SILLS

.1 Sills are to be a minimum of 7 degree (7°) downward slope and integral drip which extends a minimum of 25 mm from the face of the wall cladding.

.2 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Break form shapes are not permitted.

2.11 ALUMINUM PANNING

.1 Panning to be extruded aluminum minimum 1.6 mm thick with pre-coated finish to be identical process and match to aluminum frames and sills. Break form shapes are not permitted.

.2 Submit samples of panning along with samples of other extrusions and materials.

.3 Metal panning to be designed to lock into new window frames and have true flat planes with no twists, buckles dents, “oil canning” or other similar visual defects caused by manufacturing or handling.

Part 3 Execution

3.1 PREPARATION

.1 Protect adjacent surfaces from damage resulting from work under this specification.

3.2 WINDOW INSTALLATION

.1 Install in accordance with CSA-A440/A440.1, reviewed shop drawings and manufacturer's written instructions.

.2 Coordinate with Section 08 80 50 as required for installation of glass and glazing materials.

.3 Arrange components to prevent abrupt variation in colour.

.4 Install the windows in accordance with the manufacturer's instructions. Install the windows plumb, level and true relative to building structure. Do not exceed 3mm in 3050 mm (1/8" in 10'0") variation from plumb and level. Foam insulate between the frame members and the window opening using a single component polyurethane foam, insulating sealant.

3.3 SILL INSTALLATION

.1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Ensure integral end caps are secured with no burrs or exposed sharp edges and do not require excessive caulking due to profiles at jamb. Break form shapes are not permitted.

3.4 CAULKING

.1 Seal joints between frame members and other non-operating components with sealant to provide weathertight seal at outside.

.2 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip reflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.

.3 Apply sealant in accordance with manufacturer's written instructions and additional requirements as outlined in Section 07 92 10 - Joint Sealing. Conceal sealant within window units except where exposed use is permitted by Consultant.

.4 Interior trims and sealant not to be applied until installed window has been inspected and approved by the Consultant.

3.5 ADJUSTING

.1 Adjust operable units to move smoothly, with proper tension, throughout their full range of motion and to fit tightly when closed and locked.

.2 Lubricate hardware in accordance with manufacturer's instructions.

.3 Ensure that weatherstripping makes weathertight contact and does not cause binding to affect closing and locking.

3.6 CLEAN UP

.1 Clean glass at the factory. For final cleaning of glass to remove job site soiling refer to Section 088050 - Glazing. Leave all surfaces clean, free from sealants, caulking or other

foreign material. Remove all surplus materials and debris resulting from the work of this Trade.

.2 Refer to other sections for requirements to make good all finishes.

3.7 PROTECTION

.1 Aluminum shall be isolated from concrete, mortar, plaster or dissimilar metals with bituminous paint or epoxy solution. Framing shall be protected from other building materials during and after installation until acceptance.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Division 1

.2 Section 06 40 00 – Architectural Woodwork.

.3 Section 08 11 14 – Metal Steel Doors and Frames.

.4 Section 10 22 27 – Folding Partitions.

.5 Section 26: Electrical wiring for magnetic strikes, electric releases and electric locks.

1.2 SECTION INCLUDES

.1 For continuity and ready reference, this section includes hardware Supply, Installation and Inspection which in total will involve more than one contractor, as described following. The General Contractor will ensure in submitting his tender that specific roles and scope delineations are clear.

.2 Hardware Supply: It is the intention of this Section that Installation is by a specialist hardware supplier as prequalified herein for the following scope:

.1 Supply only of door hardware for exterior steel doors.
.2 Supply only of door hardware for interior steel doors.
.3 Supply of locksets for millwork units.
.4 Supervision of door hardware installation (Hardware Consultant).
.5 Supply and installation of automatic operators.

.3 Hardware Installation: It is the intention of this section that Installation is by the General Contractor if so qualified or qualified personnel appointed by the General Contractor for all systems and methods described herein.

.1 Scope: Installation of door hardware for all interior and exterior steel doors, locksets to teachers closets and coordination of installation of automatic operators with Division 26.

.4 Hardware Inspection: It is the intention of this section that Installation is by the General Contractor for all systems and methods described herein.

.1 Scope: inspection of installation of door hardware.

1.3 REFERENCES

.1 CAN/CGSB-69.17-M86 – Bored and Pre-assembled Locks and Latches

.2 CAN/CGSB-69.18-M90/ANSI/BHMA-A156.1-1981 – Butts & Hinges

.3 CAN/CGSB-69.19-M93/ANSI/BHMA-A156-3-1989 – Exit Devices

.4 CAN/CGSB-69.20-M90/ANSI/BHMA-A156-4-1986 – Door Controls (Closers)

.5 CAN/CGSB-69.29-93/ANSI/BHMA-A156-13-1930 – Mortise Locks & Latches

.6 CAN/CGSB-69.34-93/ANSI/BHMA-A156.18-1987 – Materials & Finishes

.7 Canadian Steel Door & Frame Manufacturers Association (CSDFMA),

.8 Canadian Metric Guide for Steel Doors & Frames (Modular Construction)

.9 NFPA 80-1995 – Fire Doors and Fire Windows

1.4 REQUIREMENTS FOR REQULATORY AGENCIES

.1 Hardware for doors in fire separations and exit doors shall be certified by a Canadian Certification Organization accredited by the Standards Council of Canada.

1.5 SUBMITTALS

.1 Samples:

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

.1 Butt hinges

.2 Continuous hinges

.3 Door closers

.4 Exit devices

.5 Overhead stops

.6 Storeroom set with lever trim

.2 Identify each sample by a label indicating location for installation, applicable specification paragraph number, brand name and number, finish, and hardware package number.

.3 Samples will be retained by the Consultant during the initial review period, but not exceeding one month. Samples will be returned at that time and, if acceptable, they may be incorporated into the Work.

.4 Substitute new samples for those rejected by the Consultant.

.5 Do not supply door hardware to the site until all samples are approved by the Consultant.

.2 Hardware List:

.1 Submit contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit six copies of a detailed final door hardware list prepared by a qualified Architectural Hardware Consultant.

.3 List all items to be furnished and delivered under this section.

.4 Indicate door hardware proposed, identifying each item by manufacturer name, manufacturer's catalogue model number, material, function, finish, location, and other pertinent information.

.5 The list shall be in the same format as the door hardware list bound in this project manual.

.6 Approval of the Final Door Hardware List by the Consultant and the Owner shall not relieve the Contractor from responsibility for providing all required door hardware.

.3 Template:

.1 Within ten working days of being requested by the Consultant or the Contractor, submit templates for door and frame preparations and mounting of door hardware items.

.2 Identify each template by label indicating applicable specification paragraph number, brand name and number, door number, and hardware package number.

.3 Submit manufacturer's specifications, catalogue cuts, and other data required to identify individual components listed and to demonstrate compliance with specified requirements for items contained in the final door hardware list. Submission of manufacturer's full line brochures is not acceptable.

.4 Best Factory Order:

.1 Within 2 days of submitting the order for Best cylinders or locks, send one (1) copy of the order c/w the Approved hardware list to the Peel District School Board, Attention: Bob Thorpe, Maintenance Services – 933 Central Parkway West, Mississauga, ON L5C 2T9 (Fax:905-279-0859.)

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.2 Storage and Protection:

.1 Store finishing hardware in locked, clean and dry area.

1.7 WASTE DISPOSAL AND MANAGEMENT

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Dispose of [corrugated cardboard] [polystyrene] [plastic] packaging material in appropriate on-site bin for recycling.

1.8 MAINTENANCE DATA

.1 Provide parts list, manufacturers' instructions, and operation and maintenance data for each type of door hardware for incorporation into maintenance manual specified in Section 017800 – Closeout Submittals.

.2 Brief the Owner's maintenance staff regarding proper care, cleaning, and general maintenance of door hardware.

1.9 MAINTENANCE MATERIALS

.1 Supply four sets of wrenches for door closers, locksets, latchsets, and exit devices.

.2 Supply four sets of other special parts or tools required for proper maintenance and adjustment of door hardware (excluding tools required for keying.)

1.10 WARRANTY

.1 Submit a warranty for door hardware on a form approved by the Owner and in accordance with the General Conditions, but for a period of three (3) years unless specified otherwise. Where a manufacturer's standard warranty period exceeds three years it shall prevail.

.2 The warranty for both fire exit devices and power door operators shall be for a period of five (5) years.

.3 The warranty for door closers shall be for a period of ten (10) years.

.4 Provide a lifetime warranty for all mortise hinges.

.5 Door hardware warranties shall cover all defects in material and workmanship that become apparent during the warranty period and such defects shall be made good or the defective product shall be replaced, to the satisfaction of the Owner and at no cost to the Owner.

Part 2 Products

2.1 HARDWARE ITEMS

.1 Use one manufacturer's products only for similar items.

2.2 DOOR HARDWARE

.1 The hardware supplier shall thoroughly review the door hardware list included with this project manual, the architectural door and hardware schedules, and the drawings prior to preparing the final door hardware list.

.2 The base bid shall be based on the manufacturers and products specified and listed in the attached Door Hardware List and Article 2.02 below.

.3 Use one manufacturer's products only for all similar items.

.4 Ensure that the hardware specified is suitable in both dimension and function for the intended purpose and complies with building code requirements. Advise the Consultant of discrepancies or omissions.

.5 APPROVED HARDWARE SUPPLIERS – Door hardware shall be supplied ONLY by a Best approved dealer and is not limited to the list below:

.1 Commercial Doors & Hardware, Toronto 416 749-7231
.2 Upper Canada Hardware, East York, 416 696-8358
.3 Great Lakes Architectural Hardware, Hamilton 905 383-3334
.4 Regional Doors & Hardware, St. Catharines, 905 684-8161

.6 KEY CONTROL CABINET:

.1 Enamel finish steel cabinet
.2 Three-way cross reference index card system
.3 Provide all accessories to accommodate all keys

.4 Size cabinet to allow for 25% expansion

.7 KEYING:

.1 All locks shall be 7-Pin removable core by Best Locks.

.2 As part of the cost of this Section, the door hardware Subcontractor shall obtain brass construction cores for all locks from Best Locks.

.3 As part of the cost of this Section, all locks and cylinders are to include Best permanent cores great-grand master keyed to the Owner's requirements.

.8 STRIKES: ANSI with lip, except deadlock strikes which shall be ANSI without lip.

2.3 ACCEPTABLE MANUFACTURERS AND PRODUCTS

.1 The following tables list acceptable door hardware manufacturers and products.

.2 The tables may list acceptable equivalent products.

.1 Equivalent products are considered equal and may be substituted for the products listed in the attached Door Hardware List without further approval from the Owner.

.2 Where equivalent products are not listed, provide the named base bid products only.

.3 No other door hardware items other than those listed below will be accepted unless formal approval of an alternative is granted in writing by the Owner prior to the close of the Bid period.

.4 FINISH: Take special care to co-ordinate all of the various manufactured items furnished under this Section to ensure an acceptably uniform finish.

.5 HARDWARE FINISH CODES AND DESCRIPTIONS: Note: Not all of the codes listed in this table are necessarily used in the Work. Refer to the attached Door Hardware List for final finishes.

BHMA CODE	CANADIAN CODE	U.S. CODE	DESCRIPTION
600	CP	USP	Primed for paint (steel)
619	C15	US15	Satin nickel plated (brass bronze)
626	C26D	US28	Satin chromium plated (brass bronze)
628	C28	US32D	Satin aluminum, clear anodized
630	C23D, AL	-	Satin stainless steel
689	SB, AL	-	Aluminum plated
B	-	-	Brush
NEO	-	-	Neoprene
P	-	-	Pile
V	-	-	Vinyl

.3 MANUFACTURERS NAMES ABBREVIATIONS:

ABBREVIATION	MANUFACTURER NAME
BEST	Best Locks
CBH	Canadian Builders Hardware Mfg.Inc.
CORBIN	Corbin-Russwin Architectural Hardware (Yale-Corbin Canada)
DB	Dominion Brass
DORMA	Dorma Door Controls
GSH	Gallery Specialty Hardware
GJ	Glynn-Johnson (Ingersoll-Rand Architectural Hardware)
HAGER	Hager Hinge (Canada) Ltd.
KNC	K.N. Crowder Mfg. Inc.
LCN	LCN Closers (Ingersoll-Rand Architectural Hardware)
MARKAR	Markar Products Inc.
NORTON	Yale/Rixson Firemark Canada Ltd.
PEMKO	Pemko Mfg. Co.
RIXSON	Yale/Rixson Firemark Canada Ltd.
SARGENT	Sargent of Canada Ltd.
SCHLAGE	Schlage Lock Company (Ingersoll-Rand Architectural Hardware)
STANLEY	Stanley Hardware Canada
THOMAS	K.M. Thomas
VON-DUPRIN	Von-Duprin Inc. (Ingersoll-Rand Architectural Hardware)
YALE	Yale/Rixson Firemark Canada Ltd.
ZERO	Zero International Inc.

.4 HARDWARE LIST ABBREVIATIONS

ABBREVIATIONS	TERM
B/S	Back Set
CIF	Channel Iron frame
CTB	Counter-sunk Through Bolts
D/A	Double Acting
D/E	Double Egress
HMD	Hollow Metal Door
HMF	Hollow Metal Frame
H/O	Hold Open
LH	Left Hand
LHR	Left Hand Reverse

LS	Lead Shields
MFR	Minutes of Fire-Rating
MS	Machine Screws
NRP	Non Removable Pin
O/H	Over Head
O/S	Opposite Swing
PR.DRS	Pair of Doors
PSF	Pressed Steel frames
RH	Right Hand
RHR	Right Hand Reverse
SGL.DR.	Single Door
STS	Self-tapping Screws
TB	Through Bolts
TMS	Template Machine Screws
U/C	Undercut
WD	Wood Door
WDF	Wood Frame
WS	Wood Screws

.5 BUTT HINGES – FULL MORTISE:

ACCEPTABLE MANUFACTURERS	**ITEM**	**ITEM**	**ITEM**
HAGER	BB1168	BB1199	BB1279
STANLEY	FB 168	FBB199	FBB179

.1 Interior: 626 finish

.2 Exterior: 630 finish

.3 Non-removable pins at out-swinging exterior doors and all vestibule doors.

.4 Where doors are required to swing 180 degrees, furnish hinges of sufficient throw to clear trim.

.5 All full mortise hinges shall be ball bearing, standard duty or heavy duty as required.

.6 CONTINUOUS HINGES:

ACCEPTABLE MAUFACTURER	**ITEM**	**ITEM**
MARKAR	FM300	FM200

GSH	CH-951	CH0941

.1 Interior: 600 finish

.2 Exterior: 630 finish

.7 LOCKSETS: 630 FINISH

ACCEPTABLE MANUFACTURERS	ITEM	ITEM	ITEM	KNOB STYLE
BEST	35H7J	35H7EW	L-15-H	4A
SARGENT	8237	8204	LNL	LB
SCHLAGE	L9070	L9080	06B	42B

.1 Where lever handles are listed, they shall be solid, not hollow.

.2 All lever handles listed must be 630 finish. 626 finish will not be accepted.

.8 LATCHSETS: 630 FINISH

ACCEPTABLE MANUFACTURERS	ITEM	ITEM	ITEM
BEST	35H-N	35H-LF	L-15-H
SARGENT	8215	8265	LNL
SCHLAGE	L9010	L9040	06B

.1 Where lever handles are listed, they shall be solid, not hollow.

.2 All lever handles listed must be 630 finish. 626 finish will not be accepted.

.9 CYLINDERS AND 7-PIN REMOVABLE CORES & TEACHER'S CLOSET LOCKS: 626 FINISH

ACCEPTABLE MANUFACTURERS		ITEM	ITEM
BASE BID	**BEST**	1E74	1E72
NO EQUIVALENTS	NO ALTERNATES	---	---

	BEST	63K 7R 4C S3 X 626	---

.1 Removable and interchangeable 7-pin core design.

.2 Within 2 days of submitting the order for Best cylinders and locks, send one (1) copy of the order c/w the approved hardware list to Peel District School Board, Attention: Bob Thorpe, Maintenance Services- 933 Central Parkway West, Mississauga, ON L5C 2T9 (Fax 905-279-0859).

.10 DOOR PULLS: 630 FINISH

ACCEPTABLE MANUFACTURERS	**ITEM**
CBH	7009-1
GSH	1181-2
HAGAR	HA 12L

.1 All exterior doors requiring door pulls shall be supplied with 32 mm diameter solid stainless steel door pulls.

.2 All interior doors requiring door pulls shall be supplied with 25 mm diameter solid stainless steel door pulls.

.3 Offset door pulls shall be supplied on exterior doors equipped with night latch function exit devices to accommodate rim cylinders. Ensure that interior push pull doors are equipped with identical offset pulls to match.

.11 EXIT DEVICES- RIM TYPE: 626/630 FINISH

ACCEPTABLE MANUFACTURES	**ITEM**	**ITEM**
SARGENT	8810-F OR G	8804-F OR G
VON-DUPRIN	98EO	98NL-OP
YALE	7100-width	7100-width-521

.1 Use hex key and cylinder dogging at power operated doors only.

.2 Use hex bolts or through-bolts complete with sleeves for exit devices on mineral core doors.

.3 All exit device trim must be free-wheeling design.

.12 DOOR CLOSURE: 689 FINISH

ACCEPTABLE MANUFACTURERS	ITEM	ITEM
DORMA	4600	6600
LCN	1460	4110
NORTON	8501BF	7500
SARGENT	1430	350

.1 Where required, out swinging doors and interior doors shall have closures with parallel arms.
.2 Back checking feature shall be of a proper size to operate the door efficiently.
.3 All closures shall be complete with full cover of same design and manufacturer.
.4 All interior closers shall be reduced-force type.
.5 All interior doors for barrier-free use shall be delayed action and reduced-force type, meeting OBC requirements.
.6 Mount closures on interior room side of doors.
.7 All door closures shall be mounted with through-bolts.

.13 KICKPLATES: 630 FINISH

ACCEPTABLE MANUFACTURERS	SIZE (MM)	SIZE (MM)
CBH	200 X Length Listed	400 x Length Listed
DB	200 X Length Listed	400 x Length Listed
GSH	200 X Length Listed	400 x Length Listed

.1 Confirm kick plate sizes prior to ordering.
.2 Minimum thickness: 1.3 mm.
.3 Stainless steel: Type 304, No. 4 Finish-free from rough or sharp edges.
.4 Corners and edges shall be slightly rounded.

.5 Drill plates for countersunk fixing with stainless steel flathead screws flush with finished surface.

.14 PUSH PLATES: 630 FINISH

ACCEPTABLE MANUFACTURERS	ITEM
CBH	127 X Length Listed
DB	127 X Length Listed
GSH	127 X Length Listed

.1 Confirm kick plate sizes prior to ordering.
.2 Minimum thickness: 1.3 mm.
.3 Stainless steel: Type 304, No. 4 Finish-free from rough or sharp edges.
.4 Corners and edges shall be slightly rounded.
.5 Drill plates for countersunk fixing with stainless steel flathead screws flush with finished surface.

.15 OVERHEAD STOPS/HOLDERS: 626 FINISH

ACCEPTABLE MANUFACTURERS	ITEM	ITEM
GJ	104S	454S
RIXSON	1-336/436	10-336/446
SARGENT	693	1543

.1 Use appropriate overhead door stop & holder where wall stops cannot be used.
.2 Do not use floor stops.

.16 WALL STOPS: 626 FINISH

ACCEPTABLE MANUFACTURERS	ITEM
GSH	GSH 240

CBH	CBH 145

.1 Do not use floor stops.

.2 Do not use wall stops on non-masonry walls.

.17 WEATHERSTRIPPING: 628P FINISH

ACCEPTABLE MANUFACTURERS	ITEM	ITEM
KNC	W16P	W20P
PEMKO	309AP x Height	2891AP x Width
ZERO	98A x Height	---

.1 Install head weather-stripping uncut in one continuous length prior to installation of door closures or other hardware to the head of the door frame.

.2 Install jamb weather-stripping uncut in one continuous length, except that it may be cut at the strike location of surface mounted fire exit hardware.

.18 DOOR SWEEPS: 628NEO FINISH

ACCEPTABLE MANUFACTURERS	ITEM
KNC	W13S x Length
PEMKO	315CN x Length
ZERO	39A x Length

.19 THRESHOLDS: 628 FINISH

ACCEPTABLE MANUFACTURERS	ITEM	ITEM
HAGER	412SA	---
KNC	CT10	CT32
PEMKO	171A	---

.1 Confirm threshold sizes prior to ordering.

.20 POWER DOOR OPERATORS:

ACCEPTABLE MANUFACTURERS		**ITEM**	**ITEM**
BASE BID	HORTON	4100	4100
NO EQUIVALENTS &	NO ALTERNATES	---	---

.21 HOLD OPEN DEVICES:

ACCEPTABLE MANUFACTURERS		**ITEM**	**ITEM**
BASE BID	YALE-CORBIN	FM998 x Tri-volt	FM998 x Tri-volt
NO EQUILALANTS &	NO ALTERNATES	---	---

2.4 FASTENINGS

.1 Supply screws, bolts, expansion shields and other fastening devices required for the satisfactory installation and operation of hardware, and as recommended by the hardware manufacturers for long life under hard use.

.2 Exposed screws for installing hardware shall have Phillips or Robertson heads.

.3 Exposed fastening devices shall match the finish and material of hardware.

.4 Where a pull is scheduled on one side of a door and a push plate on the other side, supply fastening devices, and install so the pull can be secured through the door from the reverse side. Install the push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

.6 All door closers shall be through-bolt mounted.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Furnish door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware. Advise door and frame manufacturers to be aware that strike heights as listed in the table below are required for this project.

.2 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

.1 ALL DOORS, FRAMES, AND FINISHING HARDWARE SHALL BE INSTALLED BASED ON DHI INSTALLATION GUIDE FOR DOORS AND HARDWARE (ANSI/DHI A115.1G-1994 – Approved 8/19/94)

.2 Door hardware shall be installed by an approved Hardware Installer selected by the Hardware Supplier.

.3 Power door operators, complete with hook-up to power rough-in, low voltage control wiring, and exit device release, shall be installed by the manufacturers' recommended installer.

.4 Power door operators and **emergency assist devices** to be installed by hardware supplier. Low voltage control wiring to push button locations, exit device release, and 4" x 4" back boxes to be completed by Division 26 (Electrical Contractor.). **The low voltage wiring to be supplied by the Hardware Supplier to the Electrical Contractor for installation**.

.5 ARCHITECTURAL HARDWARE CONSULTANT:

.1 The hardware supplier shall have in its employ an Architectural Hardware Consultant who is a current member of the American Society of Hardware Consultants, and who shall be made available for consultation during the course of construction at no additional cost to the Owner.

.2 The Architectural Hardware Consultant must supervise hardware installation, provide assistance to the Hardware Installer, and carry out inspection and provide written certification of the finished door hardware installation.

.3 Allow for a minimum of three inspections during the course of hardware installation and one final inspection.

.4 Ten percent (10%) of this subtrade's contact will be considered as fair value for supervision and inspection with regard to progress certificates.

.5 Locate and mount hardware at standard location dimensions in accordance with CSDFMA, Canadian Metric Guide for Steel Doors and Frames (Modular Construction), and as indicated in the following table:

HARDWARE MOUNTING HEIGHTS	
HARDWARE ITEM	**DIMENSION ABOVE FINISHED FLOOR**
LOCKSET or LATCHSET	950 mm to Centreline of Strike
DEADLOCK	1200 mm to Centreline of Strike
EXIT DEVICE	950 mm to Centreline of Strike

PUSH PLATE/DOOR PULLS	900 mm to Centreline of Strike

.6 HARDWARE MOUNTING HEIGHTS

.1 The Hardware Installer shall carefully check manufacturer's installation instructions supplied with hardware products for conflicts with the above noted dimensions.

.2 The Hardware Installer shall use manual or "Yankee" screw drivers to turn screws into pre-drilled pilot holes for installation of hinges on mineral core fire protection rated doors. Please note that other methods of installation may void the door manufacturer's warranty.

.3 The recommended mounting heights shall be considered a general guide unless conditions such as intermediate rails and lines of glass dictate otherwise.

.4 Locate door stops to contact doors 75mm from latch edge.

.5 Install hardware and trim square and plumb to doors.

.6 Install mullion stabilizers at centre mullions at double doors and intermediate mullions on multiple door arrangements.

.7 Supply locksets to Section 064000 – Architectural Woodwork for 35mm and 45mm thick doors where such doors are a part of millwork units. Keying shall be in accordance with the building keying system for

3.3 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Ensure doors with closers close firmly and against wind and building air pressure, and can be opened readily as suitable for installation.

.3 Inspection:

.1 The Hardware Supplier shall have in his employ an Architectural Hardware Consultant who is a current member of the American Society of Hardware Consultants, and who shall be made available for consultation during the course of construction at no additional cost to the Board.

.2 In addition to this available consultant, a Hardware Inspector shall be engaged upon recommendation to the Board by the Consultants and costs for inspection paid for from Cash Allowances.

.3 The Consultant shall advise the Contractor that Hardware Inspector shall be assigned to supervise the hardware installation, provide assistance to the Hardware Installer, and carry out inspection and provide written certification of the finished door hardware installation. Costs for this inspection shall be paid from the Cash Allowance. The Contractor shall notify the Hardware Inspector at least 72 hours prior to commencing the installation and cooperate with the advice of the inspector.

.4 Upon completion of door hardware installation, the Architectural Hardware Inspector shall conduct an inspection of all door hardware as installed, accompanied by the Consultant, the Owner's representative, and the Contractor.

.5 If requested by the Consultant, the manufacturer's technical representative for each make of the hardware used in the Work shall be in attendance during the hardware inspection.

.6 During the inspection, the Architectural Hardware Inspector shall note all unsatisfactory installations and products and re-inspect these items after re-adjustment or replacement to ensure all hardware is in optimum working condition and specified function.

.4 Upon completion of door hardware installation, the Hardware Supplier shall submit a written certificate that all hardware has been correctly supplied and installed in accordance with the drawings, specifications, schedules, and approved final door hardware list, for type, function, and location, and that door hardware has been checked and adjusted.

.5 Clean hardware after installation following the hardware supplier's recommendations.

.6 At project completion all items of door hardware shall be clean and free from disfigurement. The Contractor shall repair or replace hardware found to be defective.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.

.3 Remove protective material from hardware items where present.

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

END OF SECTION

PART 1 - GENERAL

1.1 This hardware schedule has been prepared by:

Commercial Doors & Hardware.

Division of L.H. Ruprecht Limited
43 Millwick Drive
Weston, Ontario
M9L 1Y4
Phone: (416) 749-7231 Fax: (416) 749-0683

CONSULTANT
Ross Ruprecht, B.A., A.H.C.

PART 2 - FINISHING HARDWARE SCHEDULE

Refer to the Finishing Hardware List on the following pages.

Finishing Hardware Schedule

MAYFIELD WEST #2 PS 2026

Architect
HOSSACK ARCHITECTURE
105-1939 IRONOAKWAY , OAKVILLE

Detailer: **Austin Baril**
Consultant: **Ross Ruprecht B.A., A.H.C.**

Plans Dated: **JAN 2026**
Submittal Date: **FEB 2/26**

Manufacturers & Finishes

Manufacturers

Architectural Builders Hardware (Pg 63)
Baron Metal
BEST
Camden
Camden Door Controls (Pgs 80-90)
CBH
Crowder
Door Mftg.
Gallery
GYRO-TECH
HES
K.N. Crowder
LCN
MISC
Norton Rixson
Precision
Rixson
Sargent
Standard Metal
Stanley
Von Duprin
Zero

Finishes

600 - Primed for painting
622 - Flat black coated
626 - Satin chromium plated over nickel
628 - Satin aluminum, clear anodized
630 - Satin stainless steel
652 - Satin chromium plated over nickel
689 - Aluminum painted
US26D - Satin chromium plated over nickel
US28 - Satin aluminum, clear anodized
US32 - Bright stainless steel
US32D - Satin stainless steel
USP - Primed for painting

Openings Schedule

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
101A	1	<Aluminum>	EXTERIOR	FROM	VESTIBULE	1000, 1000	2150	51	LHRA/RHRA		90°	ALUM ENT OP BEST	"B/F DOOR OPERATOR, INSULATED EXTERIOR DOOR & FRAME, ELECTRIC SECURITY STRIKE TO OFFICE. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. COORD WITH ELEC FOR VIDEO INTERCOM SYSTEM / CARD READER, CONTINUOUS HINGES"	1
101B	1	<Hollow Metal>	VESTIBULE	FROM	CORRIDOR	1000, 1000	2150	45	LHRA/RHRA		90°	M101B	B/F DOOR OPERATOR	2
102A	1	<Hollow Metal>	CORRIDOR	TO	GENERAL OFFICE	1000	2150	45	LH	20MIN	90°	OFFICE BEST 102A	B/F DOOR OPERATOR	3
102B	1	<Wood>	CLOSET			825, 825	2200	45	BYPASS			BYPASS	BY-PASS WOOD DOORS	4
103A	1	<Hollow Metal>	GENERAL OFFICE	TO	PRINCIPLE OFFICE	950	2150	45	LH		90°	Office BEST REV		5
104A	1	<Hollow Metal>	GENERAL OFFICE	TO	VP OFFICE	950	2150	45	LH		90°	Office BEST REV		5
105A	1	<Hollow Metal>	GENERAL OFFICE	TO	VP OFFICE	950	2150	45	RH		90°	Office BEST REV		5
106A	1	<Hollow Metal>	GENERAL OFFICE	TO	GUIDANCE	950	2150	45	RH		90°	Office BEST REV		5
108A	1	<Hollow Metal>	STAFF ROOM	TO	OSR	950	2150	45	LH		90°	Office BEST REV		5
109A	1	<Hollow Metal>	HEALTH	TO	HEALTH WASHROOM	950	2150	45	RH		90°	WR WS		6
110A	1	<Hollow Metal>	CORRIDOR	TO	STAFF ROOM	950	2150	45	RH	20MIN	90°	CLASS RM CL COHS BEST 110B		7
110B	1	<Hollow Metal>	GENERAL OFFICE	TO	STAFF ROOM	950	2150	45	RH		90°	CLASS RM CL COHS BEST 110B		8
111A	1	<Hollow Metal>	CORRIDOR	FROM	CORRIDOR	1100, 1100	2150	45	L-LHR	20MIN	130°	CORR DE BEST	ELECTROMAGNETIC HOLDER. NO MID-MULLION. PROVIDE CONCEALED VERTICAL RODS	9
113A	1	<Hollow Metal>	CORRIDOR	TO	STAFF LOUNGE	950	2150	45	RH	45MIN	90°	CLASS RM ,CL,WS BEST		10
113B	1	<Hollow Metal>	GENERAL OFFICE	TO	STAFF LOUNGE	950	2150	45	RH	45MIN	90°	CLASS RM CL COHS BEST 110B		11
113C	1	<Wood>	CLOSET			825, 825	2200	45	BYPASS			BYPASS	BY-PASS WOOD DOORS	4
114A	1	<Hollow Metal>	LEARNING COMMONS	TO	LEARNING COMM WORK ROOM	950	2150	45	LH		90°	CLASS RM ,CL,WS BEST		12
115A	1	<Hollow Metal>	CORRIDOR	FROM	LEARNING COMMONS	1000, 1000	2150	45	RHR/LHR		90°	LEARNING COMMONS BEST	B/F DOOR OPERATOR	13
115B	1	<Hollow Metal>	CORRIDOR	TO	LEARNING COMMONS	1000, 1000	2150	45	LHA/RHA		180°	M115B	180 DEGREE SWING BOTH LEAFS	14
116A	1	<Hollow Metal>	CORRIDOR	FROM	STUDENT FORUM	1000, 1000	2150	45	LHRA/RHRA	20MIN	180°	VEST PR 950,COHS BEST	ELECTROMAGNETIC HOLDER IN CLOSER & AT WALL	15
116B	1	<Hollow Metal>	CORRIDOR	FROM	STUDENT FORUM	1000, 1000	2150	45	LHRA/RHRA	20MIN	180°	VEST PR 950,COHS BEST	ELECTROMAGNETIC HOLDER IN CLOSER & AT WALL	15
117A	1	<Hollow Metal>	CORRIDOR	FROM	CLASSROOM	950	2150	45	RHR	20MIN	90°	CLASS RM CL COHS BEST 110B		7
117B	1	<Hollow Metal>	LEARNING COMMONS	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM CL COHS BEST 117B		16
117C	1	<None>	LEARNING COMMONS	TO	CLASSROOM			45				GLASS	SLIDING GLASS DOOR ASSEMBLY - REFER TO SPECS	17

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
118A	1	<Aluminum>	EXTERIOR	FROM	STAIR D	1000, 1000	2150	51	LHRA/RHRA		100°,100°	EXT STAIR ALUM OP FM	INSULATED DOOR & FRAME, EXTERIOR DOOR. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. CONTINUOUS HINGES. B/F DOOR OPERATOR	18
118B	1	<Hollow Metal>	STAIR D	FROM	CORRIDOR	1000, 1000	2150	45	LHRA/RHRA	45MIN	90°,180°	VEST PR ULC OP EMHO	180 DEGREE SWING (ONE LEAF). ROUGH-IN FOR ELECTROMAGNETIC HOLD OPEN DEVICE AT WALL BOTH SIDES OF DOOR. REF. ELEC. DWGS. B/F DOOR OPERATOR	19
119A	1	<Hollow Metal>	CORRIDOR	TO	INST MUSIC CLASSROOM	1000	2150	45	LH		90°	CLASS RM SS		20
119B	1	<Hollow Metal>	VOCAL MUSIC CLASSROOM	TO	INST MUSIC CLASSROOM	1000	2150	45	LH		90°	CLASS RM SS		20
119AA	1	<Hollow Metal>	INST MUSIC CLASSROOM	TO	VESTIBULE	1000	2150	45	LH		90°	PRACTICE RM BEST WS		21
119AB	1	<Hollow Metal>	VOCAL MUSIC CLASSROOM	TO	VESTIBULE	1000	2150	45	RH		90°	PRACTICE RM BEST WS		21
120A	1	<Hollow Metal>	VESTIBULE	TO	PRACTICE ROOM	1000	2150	45	RH		90°	PRACTICE RM BEST		22
121A	1	<Hollow Metal>	VESTIBULE	TO	PRACTICE ROOM	1000	2150	45	RH		90°	PRACTICE RM BEST		22
122A	1	<Hollow Metal>	CORRIDOR	TO	VOCAL MUSIC CLASSROOM	950	2150	45	LH		90°	CLASS RM SS		23
123A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	LR		90°	CLASS RM WS		24
124A	1	<Hollow Metal>	CLASSROOM	TO	SPECIAL ED	950	2150	45	LH		90°	CLASS RM WS		24
125A	1	<Hollow Metal>	CORRIDOR	FROM	UNIV WASHROOM	1100	2150	45	LHR		90°	WR OP PUSH PDSB W SGL ANNUN	B/F OPERATOR	25
126A	1	<Hollow Metal>	SPECIAL ED	FROM	ALE	950	2150	45	RHR		90°	ALE BEST	SPECIALTY HARDWARE, REF. HARDWARE SCHEDULE, DOOR TO BE 16ga. STEEL DOOR COMPLETE WITH MORTAR FILLED HEAD AND JAMB ON 14 ga. FRAME AND 4 HEAVY DUTY HINGES.	26
127A	1	<Hollow Metal>	ELEC ROOM	FROM	SPRINKLER ROOM	950	2150	45	RHR	45MIN	110°	SPRINKLER BEST REV		27
128A	1	<Hollow Metal>	CORRIDOR	TO	ELEC ROOM	1100	2150	45	RH	45MIN	90°	ELECTRICAL INT BEST 1100		28
128B	1	<Hollow Metal>	EXTERIOR	FROM	ELEC ROOM	1100	2150	45	RHR		90°	EXT STORAGE 1100	INSULATED DOOR & FRAME, EXTERIOR DOOR.	29
130A	1	<Aluminum>	EXTERIOR	FROM	STAIR	1000, 1000	2150	51	LHA/RHA		90°	EXT STAIR ALUM OP	B/F OPERATOR, INSULATED DOOR & FRAME, EXTERIOR DOOR. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. CONTINUOUS HINGES. REMOVABLE MID-MULLION	30
130B	1	<Hollow Metal>	STAIR	FROM	CORRIDOR	1000, 1000	2150	45	LHRA/RHRA	45MIN	90°,180°	M130B	REMOVABLE MID-MULLION, BF OPERATOR, 180 DEGREE SWING (ONE LEAF). ROUGH-IN FOR ELECTROMAGNETIC HOLD OPEN DEVICE AT WALL BOTH SIDES OF DOOR. REF. ELEC. DWGS.	31
131A	1	<Hollow Metal>	CORRIDOR	TO	KINDERGARTEN	950	2150	45	LH		90°	CLASS RM OH DC BUZZ	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	32
131B	1	<Hollow Metal>	VESTIBULE	FROM	BENCH & COAT	1000	2150	45	LHR		90°	VEST SGL OP BEST	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS. B/F DOOR OPERATOR	33
132A	1	<Hollow Metal>	EXTERIOR	FROM	VESTIBULE	1000	2150	45	LHR		90°	EXT SGL OP	INSULATED DOOR & FRAME, EXTERIOR DOOR. B/F DOOR OPERATOR	34
132B	1	<Hollow Metal>	EXTERIOR	FROM	VESTIBULE	1000	2150	45	RHR		90°	EXT SGL HM	INSULATED DOOR & FRAME, EXTERIOR DOOR	35
133A	1	<Hollow Metal>	KINDERGARTEN	TO	WASHROOM	950	2150	45	RH		90°	WR KINDER OP	25mm UNDERCUT DOOR. B/F DOOR OPERATOR	36
134A	1	<Hollow Metal>	KINDERGARTEN	TO	WASHROOM	950	2150	45	LH		90°	VEST KINDER	25mm UNDERCUT DOOR	37
135A	1	<Hollow Metal>	CORRIDOR	TO	KINDERGARTEN	950	2150	45	RH		90°	CLASS RM OH DC BUZZ	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	32
135B	1	<Hollow Metal>	VESTIBULE	FROM	BENCH & COAT	1000	2150	45	RHR		90°	VEST KINDER	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	38

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
137A	1	<Hollow Metal>	CORRIDOR	TO	KINDERGARTEN	950	2150	45	LH		90°	CLASS RM OH DC BUZZ	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	32
137B	1	<Hollow Metal>	VESTIBULE	FROM	BENCH & COAT	1000	2150	45	LHR		90°	VEST SGL OP BEST	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS. B/F DOOR OPERATOR	33
138A	1	<Hollow Metal>	EXTERIOR	FROM	VESTIBULE	1000	2150	45	LHR		90°	EXT SGL OP	INSULATED DOOR & FRAME, EXTERIOR DOOR. B/F DOOR OPERATOR	34
138B	1	<Hollow Metal>	EXTERIOR	FROM	VESTIBULE	1000	2150	45	RHR		90°	EXT SGL HM	INSULATED DOOR & FRAME, EXTERIOR DOOR	35
139A	1	<Hollow Metal>	KINDERGARTEN	TO	WASHROOM	950	2150	45	RH		90°	WR KINDER OP	25mm UNDERCUT DOOR. B/F DOOR OPERATOR	36
140A	1	<Hollow Metal>	KINDERGARTEN	TO	WASHROOM	950	2150	45	LH		90°	W/R KINDER	25mm UNDERCUT DOOR	39
141A	1	<Hollow Metal>	CORRIDOR	TO	KINDERGARTEN	950	2150	45	RH		90°	CLASS RM OH DC BUZZ	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	32
141B	1	<Hollow Metal>	VESTIBULE	FROM	BENCH & COAT	1000	2150	45	RHR		90°	VEST KINDER	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	38
142A	1	<Aluminum>	EXTERIOR	FROM	STAIR	1000, 1000	2150	51	LHA/RHA		90°	EXT STAIR ALUM OP FM	INSULATED DOOR & FRAME, EXTERIOR DOOR. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. CONTINUOUS HINGES. B/F DOOR OPERATOR	18
142B	1	<Hollow Metal>	STAIR	FROM	CORRIDOR	1000, 1000	2150	45	LHA/RHA	45MIN	90°,180°	VEST PR ULC OP EMHO	180 DEGREE SWING ONE LEAF. ROUGH-IN FOR ELECTROMAGNETIC HOLD OPEN DEVICE AT WALL BOTH SIDES OF DOOR. REF. ELEC. DWGS. B/F DOOR OPERATOR	19
143A	1	<Hollow Metal>	EXTERIOR	FROM	UTILITY STORAGE	1100	2150	45	RHR		90°	EXT STORAGE 1100	INSULATED DOOR & FRAME, EXTERIOR DOOR	29
143B	1	<Hollow Metal>	UTILITY STORAGE	FROM	CORRIDOR	1100	2150	45	RHR	90MIN	90°	STORAGE 1100		40
144A	1	<Hollow Metal>	CORRIDOR	TO	KINDERGARTEN	950	2150	45	LH		90°	CLASS RM OH DC BUZZ	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	32
144B	1	<Hollow Metal>	VESTIBULE	FROM	BENCH & COAT	1000	2150	45	LHR		90°	VEST KINDER	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	38
145A	1	<Hollow Metal>	EXTERIOR	FROM	VESTIBULE	1000	2150	45	LHR		90°	EXT SGL HM	INSULATED DOOR & FRAME, EXTERIOR DOOR	35
145B	1	<Hollow Metal>	EXTERIOR	FROM	VESTIBULE	1000	2150	45	RHR		90°	EXT SGL OP	INSULATED DOOR & FRAME, EXTERIOR DOOR. B/F DOOR OPERATOR	34
146A	1	<Hollow Metal>	KINDERGARTEN	TO	WASHROOM	950	2150	45	RH		90°	VEST KINDER	25mm UNDERCUT DOOR	37
147A	1	<Hollow Metal>	KINDERGARTEN	TO	WASHROOM	950	2150	45	LH		90°	WR KINDER OP	25mm UNDERCUT DOOR. B/F DOOR OPERATOR	36
149A	1	<Hollow Metal>	CORRIDOR	TO	KINDERGARTEN	950	2150	45	RH		90°	CLASS RM OH DC BUZZ	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	32
149B	1	<Hollow Metal>	VESTIBULE	FROM	BENCH & COAT	1000	2150	45	RHR		90°	VEST SGL OP BEST	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS. B/F DOOR OPERATOR	33
150A	1	<Hollow Metal>	CORRIDOR	TO	KINDERGARTEN	950	2150	45	LH	20MIN	90°	CLASS RM OH DC BUZZ	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	41
150B	1	<Hollow Metal>	VESTIBULE	FROM	BENCH & COAT	1000	2150	45	LHR		90°	VEST KINDER	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	38
151A	1	<Hollow Metal>	EXTERIOR	FROM	VESTIBULE	1000	2150	45	LHR		90°	EXT SGL HM	INSULATED DOOR & FRAME, EXTERIOR DOOR	35
151B	1	<Hollow Metal>	EXTERIOR	FROM	VESTIBULE	1000	2150	45	RHR		90°	EXT SGL OP	INSULATED DOOR & FRAME, EXTERIOR DOOR. B/F DOOR OPERATOR	34
152A	1	<Hollow Metal>	KINDERGARTEN	TO	WASHROOM	950	2150	45	RH		90°	VEST KINDER	25mm UNDERCUT DOOR	37
153A	1	<Hollow Metal>	KINDERGARTEN	TO	WASHROOM	950	2150	45	LH		90°	WR KINDER OP	25mm UNDERCUT DOOR. B/F DOOR OPERATOR	36
154A	1	<Hollow Metal>	CORRIDOR	TO	KINDERGARTEN	950	2150	45	RH	20MIN	90°	CLASS RM OH DC BUZZ	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	41
154B	1	<Hollow Metal>	VESTIBULE	FROM	BENCH & COAT	1000	2150	45	RHR		90°	VEST SGL OP BEST	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS. B/F DOOR OPERATOR	33
155A	1	<Hollow Metal>	CORRIDOR	FROM	GYM	1000, 1000	2150	45	LHRA/RHRA		180°	GYM PR OP	180 DEGREE SWING BOTH LEAFS. B/F DOOR OPERATOR	42

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
155B	1	<Hollow Metal>	CORRIDOR	FROM	GYM	1000, 1000	2150	45	LHRA/RHRA	20MIN	90°	GYM PAIR F/R BEST 155B	REMOVABLE MID-MULLION	43
159A	1	<Hollow Metal>	STAGE	FROM	STORAGE	700, 700	2150	45	RHRA		90°	STAGE PAIR STORAGE BEST	SPECIAL DOOR FRAME (NO TOP FRAME) NO BLOCK ABOVE. REF. INTERIOR ELEVATIONS. PROVIDE 90 DEGREE CUT FRAME EDGES, FINISH WELDED	44
160A	1	<Hollow Metal>	STUDENT FORUM	FROM	CORRIDOR	1000	2150	45	RHR		90°	GYM SGL, EXIT		45
160B	1	<Hollow Metal>	CORRIDOR	FROM	GYM	1000	2150	45	RHR		90°	GYM SGL, EXIT		45
161A	1	<Hollow Metal>	STUDENT FORUM	TO	SEMINAR ROOM	950	2150	45	LH	20MIN	90°	CLASS RM ,CL,WS BEST		46
161B	1	<Hollow Metal>	CORRIDOR	TO	STUDENT FORUM	950	2150	45	RH		90°	CLASS RM ,CL,WS BEST		12
162A	1	<Hollow Metal>	CORRIDOR	TO	LAN	950	2150	45	LH		90°	STORAGE,915 ,WS		47
163A	1	<Hollow Metal>	CORRIDOR	TO	STAFF WR	950	2150	45	LH		90°	W/R, WS BEST		48
167A	1	<Hollow Metal>	CORRIDOR	TO	CHANGE ROOM	950	2150	45	RH	20MIN	90°	chg rm ulc		49
167B	1	<Hollow Metal>	GYM	To	CHG RM	950	2150	45	RHR		90°	CHG RM,DL Best		50
168A	1	<Hollow Metal>	CORRIDOR	TO	ACAD STORAGE	950	2150	45	LH	20MIN	90°	ACADEMIC STORAGE BEST REG		51
169A	1	<Hollow Metal>	GYM	TO	INSTRUCTOR ROOM	950	2150	45	RH		90°	INSTRUCTOR GYM BEST		52
170A	1	<Hollow Metal>	CORRIDOR	TO	CHANGE ROOM	950	2150	45	LH	20MIN	90°	chg rm ulc		49
170B	1	<Hollow Metal>	GYM	To	CHG RM	950	2150	45	LHR		90°	CHG RM,DL Best		50
171A	1	<Hollow Metal>	CORRIDOR	TO	SEMINAR ROOM	950	2150	45	LH		90°	CLASS RM WS		24
172A	1	<Hollow Metal>	GYM	TO	GYM STORAGE	1000, 1000	2150	45	RHA		90°	GYM STORAGE PR, BEST		53
173A	1	<Hollow Metal>	CORRIDOR	TO	RESOURCE ROOM	950	2150	45	RH		90°	CLASS RM WS		24
174A	1	<Hollow Metal>	CORRIDOR	FROM	CUSTODIAN OFFICE	1100	2150	45	LHR		110°	STORAGE 1100 CLP		54
175A	1	<Hollow Metal>	CORRIDOR	TO	ELEC ROOM	950	2150	45	LH		90°	LAN BEST		55
176A	1	<Hollow Metal>	CORRIDOR	TO	LAN ROOM	950	2150	45	LH		90°	LAN BEST		55
179A	1	<Hollow Metal>	CORRIDOR	TO	STAFF WR	950	2150	45	RH		90°	W/R, WS BEST		48
180A	1	<Hollow Metal>	CORRIDOR	TO	STAFF WR	950	2150	45	LH		90°	W/R, WS BEST		48
301A	1	<Aluminum>	EXTERIOR	FROM	VESTIBULE	1100	2150	51	RHR		90°	EXTERIOR SGL VEST 301A	B/F DOOR OPERATOR, INSULATED DOOR & FRAME, ELECTRIC SECURITY STRIKE TO OFFICE. COORDINATE DOOR WIDTH WITH CURTAIN WALL MANUFACTURER. COORD WITH ELEC FOR VIDEO INTERCOM SYSTEM / CARD READER, CONTINUOUS HINGES. B/F OPERATOR IN CURTAIN WALL FRAMING. COORD WITH ELEC TO RUN CONDUIT IN FRAME SYSTEM	56
301B	1	<Hollow Metal>	VESTIBULE	FROM	CORRIDOR	1100	2150	45	RHR		90°	VEST KINDER,FG 301B	B/F OPERATOR	57
302A	1	<Hollow Metal>	CORRIDOR	TO	OFFICE	950	2150	45	RH		90°	OFFICE INFANTS 302A, 303A		58
305A	1	<Hollow Metal>	CORRIDOR	TO	KITCHEN	1000	2150	45	LH	45MIN	90°	M312A		59
306A	1	<Hollow Metal>	CORRIDOR	TO	WASHROOM	950	2150	45	RH		90°	WR OP,FG 306A	B/F OPERATOR	60
307A	1	<Hollow Metal>	CORRIDOR	TO	LAUNDRY	950	2150	45	RH		90°	PRESCHOOL ENT		61

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
308A	1	<Hollow Metal>	CORRIDOR	FROM	ELEC ROOM	950	2150	45	RHR	45MIN	90°	ELECT PRESCHOOL BEST		62
310A	1	<Hollow Metal>	CORRIDOR	TO	STORAGE	950	2150	45	RH		90°	STORAGE PRESCHOOL BEST		63
312A	1	<Hollow Metal>	CUBBIE AREA	TO	STAFF ROOM	950	2150	45	RH		90°	STAFF FG		64
314A	1	<Wood>	PRE SCHOOL CLASS	TO	WASHROOM	970	1000	45	LH		90°	WR 1/2 DR BEST	HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS	65
315A	1	<Hollow Metal>	CUBBIE AREA	TO	PRE SCHOOL CLASS	950	2150	45	RH		90°	PRESCHOOL ENT	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	61
316A	1	<Hollow Metal>	PRE SCHOOL CLASS	FROM	COT STORAGE	800, 800	2150	45	LHRA/RHRA		90°	COT STORAGE BEST		66
317A	1	<Hollow Metal>	PRE SCHOOL CLASS	FROM	COT STORAGE	800, 800	2150	45	LHRA/RHRA		90°	COT STORAGE BEST		66
318A	1	<Wood>	PRE SCHOOL CLASS	TO	WASHROOM	970	1000	45	RH		90°	WR 1/2 DR BEST	"HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS 25mm UNDERCUT DOOR"	65
319A	1	<Hollow Metal>	CUBBIE AREA	TO	PRE SCHOOL CLASS	950	2150	45	LH		90°	PRESCHOOL ENT	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	61
320A	1	<Wood>	PRE SCHOOL CLASS	TO	WASHROOM	970	1000	45	RH			WR 1/2 DR BEST	HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS	65
322A	1	<Hollow Metal>	EXTERIOR	FROM	VESTIBULE	1100	2150	45	RHR		90°	EXT SGL OP FG	B/F OPERATOR, INSULATED DOOR & FRAME, EXTERIOR DOOR.	67
322B	1	<Hollow Metal>	VESTIBULE	FROM	CORRIDOR	1100	2150	45	RHR		90°	VEST KINDER, FG 322B	B/F DOOR OPERATOR	68
323A	1	<Wood>	TODDLER	TO	WASHROOM	970	1000	45	LH		90°	WR 1/2 DR BEST	HALF DOOR, COORD. WIDTH WITH WOOD JAMB. REF. AD DETAILS	65
324A	1	<Hollow Metal>	CORRIDOR	TO	TODDLER ROOM	950	2150	45	LH		90°	PRESCHOOL ENT	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	61
325A	1	<Hollow Metal>	TODDLER ROOM	FROM	COT STORAGE	800, 800	2150	45	LHRA/RHRA		90°	COT STORAGE BEST		66
327A	1	<Hollow Metal>	CORRIDOR	TO	INFANTS	950	2150	45	LH		90°	PRESCHOOL ENT	DOOR CONTACT FOR AUDIBLE BUZZER, COORD. W/ ELECT. DWGS.	61
328A	1	<Hollow Metal>	INFANTS	FROM	WASHROOM	950	2150	45	LHR		90°	WR KINDER FG BEST	25mm UNDERCUT DOOR	69
201A	1	<Hollow Metal>	CORRIDOR	TO	STAIRS	1000, 1000	2150	45	LHRA/RHRA	45MIN	180°,90°	M201	180 DEGREE SWING ONE LEAF, ELECTROMAGNETIC HOLD OPENS IN CLOSER. FIRE RATED DOOR. REMAINDER OF ASSEMBLY FIRE PROTECTED WITH WINDOW SPRINKLERS. REF. MECH. DWGS. ALUMINUM FRAME ASSEMBLY WITH 45min. FRR DOORS WITH FIRE-RATED HARDWARE MID-MULLION.	72
203A	1	<Hollow Metal>	CO-LAB ZONE	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
204A	1	<Hollow Metal>	CO-LAB ZONE	FROM	CLASSROOM	950	2150	45	RHR		90°	CLASS RM OH 2FL		74
204B	1	<Hollow Metal>	CLASSROOM	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS		24
205A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
207A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
207AA	1	<Hollow Metal>	CORRIDOR	TO	SEMINAR	950	2150	45	LH		90°	CLASS RM WS 2FL		73
208A	1	<Hollow Metal>	STAIR	FROM	CORRIDOR	1000, 1000	2150	45	LHRA/RHRA	45MIN	110°,180°	VEST PR ULC EMHO	180 DEGREE SWING, ELECTROMAGNETIC HOLD OPENS	75
209A	1	<Hollow Metal>	CORRIDOR	TO	ART CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
210A	1	<Hollow Metal>	ART CLASSROOM	TO	ART PREP ROOM	1000	2150	45	RH	45MIN	90°	CLASSRM CL WS 1000		76
211A	1	<Hollow Metal>	CORRIDOR	TO	SEMINAR	950	2150	45	RH		90°	CLASS RM WS 2FL		73
212A	1	<Hollow Metal>	CORRIDOR	TO	STAC CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
212AA	1	<Hollow Metal>	STAC CLASSROOM	FROM	DUST EXTRACTOR	1000	2150	45	LHR		90°	STORAGE 1000 CLP		77
213A	1	<Hollow Metal>	CORRIDOR	TO	SMT PREP ROOM	950	2150	45	RH		90°	CLASS RM OH 2FL		74
213B	1	<Hollow Metal>	STAC CLASSROOM	TO	SMT PREP ROOM	950	2150	45	RH		90°	CLASS RM OH 2FL		74
213C	1	<Hollow Metal>	SMT CLASSROOM	TO	SMT PREP ROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
214A	1	<Hollow Metal>	CORRIDOR	TO	SMT CLASSROOM	950	2150	45	LH		90°	CLASS RM OH 2FL		74
215A	1	<Hollow Metal>	CORRIDOR	TO	RESOURCE ROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
217A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
218A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
219A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
220A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
221A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
222A	1	<Hollow Metal>	CORRIDOR	FROM	STAIR	1000, 1000	2150	45	LHRA/RHRA	45MIN	180°,110°	VEST PR ULC EMHO	180 DEGREE SWING, ELECTROMAGNETIC HOLD OPENS	75
223A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
224A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
226A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
227A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
228A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
229A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
230A	1	<Hollow Metal>	CORRIDOR	FROM	STAIR	1000, 1000	2150	45	LHRA/RHRA	45MIN	90°,180°	VEST PR ULC EMHO	180 DEGREE SWING, ELECTROMAGNETIC HOLD OPENS	75
231A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
232A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
233A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
235A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
236A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
238A	1	<Hollow Metal>	CORRIDOR	TO	CLASSROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
239A	1	<Hollow Metal>	CORRIDOR	TO	RESOURCE ROOM	950	2150	45	RH		90°	CLASS RM WS 2FL		73
240A	1	<Hollow Metal>	CORRIDOR	TO	SEMINAR ROOM	950	2150	45	LH		90°	CLASS RM WS 2FL		73
241A	1	<Hollow Metal>	CORRIDOR	TO	ACADEMIC STORAGE	950	2150	45	LH		90°	STORAGE,915 ,WS		47
242AA	1	<Hollow Metal>	CORRIDOR	TO	ELEC ROOM	950	2150	45	RH		90°	STORAGE,915 ,WS		47
242BA	1	<Hollow Metal>	ELEC ROOM	TO	LAN	950	2150	45	RH		90°	STORAGE,915 ,WS		47
243A	1	<Hollow Metal>	CORRIDOR	TO	CUSTODIAN	1100	2150	45	RH		90°	STORAGE 1100		78

Opening Number(s)	Qty	Door Catalog	Location 1	To/ From	Location 2	Nominal Width	Nominal Height	Door Thickness	Hand	Label	Degree of Opening	Hardware Group	Remarks	Heading Num.
244A	1	<Hollow Metal>	CORRIDOR	TO	STAFF WASHROOM	950	2150	45	RH		90°	W/R, WS BEST		48
247A	1	<Hollow Metal>	CORRIDOR	TO	MECHANICAL ROOM	1100	2150	45	LH	45MIN	90°	MECH RM ,1100 BEST		79
247B	1	<Hollow Metal>	ROOF			1100	2150	45				ROOF BEST	INSULATED EXTERIOR DOOR AT ROOF	80
248A	1	<Hollow Metal>	CORRIDOR	TO	BOILER ROOM	1100	2150	45	LH	45MIN	90°	MECH RM ,1100 BEST		79
248B	1	<Hollow Metal>	BOILER ROOM	TO	STAIR	1100	2150	45	LH		90°	M248B		81
251A	1	<Hollow Metal>	CORRIDOR	TO	STAFF WASHROOM	950	2150	45	LH		90°	W/R, WS BEST		48
252A	1	<Hollow Metal>	CORRIDOR	TO	CUSTODIAN	1100	2150	45	RH		90°	STORAGE 1100		78
253AA	1	<Hollow Metal>	CORRIDOR	TO	ELEC ROOM	950	2150	45	RH		90°	STORAGE,915 ,WS		47
253BA	1	<Hollow Metal>	ELEC ROOM	TO	LAN ROOM	950	2150	45	RH		90°	STORAGE,915 ,WS		47
254A	1	<Hollow Metal>	CORRIDOR	TO	ELEV MECH ROOM	950	2150	45	RH	45MIN	90°	MECH. RMS, CL,WS		82
TC-CLOSET	1	<Wood>						35				TEACHERS CLOSETS BEST		83
OFFICE	1											OFFICE OPS		84
MISC	1											MISC-BEST		85

GENERAL NOTES

-HARDWARE SUPPLIER SECTION 08710 TO SUPPLY & INSTALL AUTO DOOR OPERATORS.
-1 WARRANTY FOR ALL FINISHING HARDWARE AND AUTO DOOR OPERATORS IS BY THE HARDWARE SUPPLIER.

Hardware Schedule

Heading #1 (Group: ALUM ENT OP BEST)

Item #1 — 1 Pair of doors 101A, EXTERIOR FROM VESTIBULE — 90° LHRA/RHRA

1000, 1000 x 2150 x 51 - AL DR x AL FR

MULLION BY FRAME SUPPLIER

2	Continuous Hinge	Stanley 661 HD UL 83" AL	AL
1	Exit Device	Stanley 3RO2401 x x 630 x x 2150 x 51 DOOR	630
1	Exit Device	BEST 3RO2403 x RIM CYL x 630 x 51 DOOR	630
1	Cylinder	Best 1E72S2RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
1	Electric Strike	HES 9600-630- 2005M3	630
2	Door Pull	Gallery 1180-2 TB 2" THICK DR. C32D	USC32D
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Mounting Bracket	Stanley DROP PLATE DP80-BS 689	
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
2	Kick Plate	Gallery GSH 80 C32D (150 X 950)	US32D
2	Overhead Door Holder	Rixson 1-436 630	630
2	Accessory	Von Duprin (CAD) MULLION STABALIZER 154	600
1	Threshold	K.N. Crowder CT-45 X 84" AL	
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
1	Weatherstripping	Door Mftg. WEATHERSTRIP BY ALUM DR & FR SUPPLIER	US28
2	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
1	Miscellaneous Item	Camden ESCUTCHEON CM-89S X CM-89S-ADP1	630
1	Miscellaneous Hardware	MISC CARD READER/VIDEO PHONE BY SECURITY	
1	Miscellaneous Hardware	Camden CM-1190-7224 WALL MTD. 630	630
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
2	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	
1	Miscellaneous Hardware	MISC MULLION BY FRAME SUPLIER	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, VIDEO CAMERA & REMOTE RELEASE. GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY (WALL MTD. KEYSWITCH LED IS GREEN)

SECURED POSITION:DOORS LOCKED WALL MTD KEYSWITCH CM 1190 SHUNTS POWER TO EXTERIOR ACTUATOR ONLY (LED IS RED) .
INTERIOR ACTUATOR IS ALWAYS ACTIVE.
EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

INTERGRATION OF ACCESS SYSTEMS, VIDEO INTERCOM AND SECURITY TO THE AUTOMATIC OPERATOR BY OTHERS . (NOT PART OF THE OPERATOR INSTALLATION)

Heading #2 (Group: M101B)

Item #2 1 Pair of doors 101B, VESTIBULE FROM CORRIDOR 90° LHRA/RHRA

1000, 1000 x 2150 x 45 - HM DR x HM FR

FIXED HM MULLION

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Exit Device	Precision 3RO2101 x x 630 x	630
1	Exit Device	Stanley 3RO2103 x x 630 x LHR	630
1	Cylinder	Best 1E72S2RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
1	Electric Strike	HES 9600-630- 2005M3	630
2	Door Pull	Gallery GSH 1180-2 C32D 45	US32D
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE LHR LEAF	628
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Overhead Door Holder	Rixson 1-436 630	630
2	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
1	Miscellaneous Hardware	Camden CM-1190-7224 WALL MTD. 630	630
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, VIDEO CAMERA & REMOTE RELEASE. GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY.

SECURED POSITION: LOCKED . INTERIOR ACTUATOR IS ALWAYS ACTIVE.

EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

INTERGRATION OF ACCESS SYSTEMS, VIDEO INTERCOM AND SECURITY TO THE AUTOMATIC OPERATOR BY OTHERS . (NOT PART OF THE OPERATOR INSTALLATION)

Heading #3 (Group: OFFICE BEST 102A)

Item #3 — 1 Single door 102A, CORRIDOR TO GENERAL OFFICE — 90° LH

1000 x 2150 x 45 - HM DR x HM FR - 20MIN

4	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	BEST 45H7IND (Std.) 15 H 630 LH VIN	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Electric Strike	HES 1006CS-630- 2005M3	630
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
1	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
1	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
1	Miscellaneous Hardware	Camden CM-160/21 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

MODE OF OPERATION
ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY

SECURED POSITION:DOORS ARE LOCKED . INTERIOR ACTUATOR IS ALWAYS ACTIVE.

EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

INTERGRATION OF ACCESS SYSTEMS, VIDEO INTERCOM AND SECURITY TO THE AUTOMATIC OPERATOR BY OTHERS . (NOT PART OF THE OPERATOR INSTALLATION)

Heading #4 (Group: BYPASS)

Item #4 — 1 Pair of doors 102B, CLOSET — BYPASS
Item #5 — 1 Pair of doors 113C, CLOSET — BYPASS

825, 825 x 2200 x 45 - WD DR x HM FR

2	Track / Hanger	K.N. Crowder CCD-1-410 -W x 72" 2DR KIT INSTALL GUIDE CHANNEL IN BOTTOM OF DR.	W
4	Door Pull	Gallery GSH 950 C26D 45	US26D

Heading #5 (Group: Office BEST REV)

Item #6	1 Single door 103A, GENERAL OFFICE TO PRINCIPLE OFFICE	90° LH
Item #7	1 Single door 104A, GENERAL OFFICE TO VP OFFICE	90° LH
Item #8	1 Single door 105A, GENERAL OFFICE TO VP OFFICE	90° RH
Item #9	1 Single door 106A, GENERAL OFFICE TO GUIDANCE	90° RH
Item #10	1 Single door 108A, STAFF ROOM TO OSR	90° LH

950 x 2150 x 45 - HM DR x HM FR

15	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
3	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
2	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
5	Cylinder	Best 1E74(Std.) 626	626
5	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
5	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
5	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
5	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #6 (Group: WR WS)

Item #11	1 Single door 109A, HEALTH TO HEALTH WASHROOM	90° RH

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7T (Std.) 15 H 630 RH VIN	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #7 (Group: CLASS RM CL COHS BEST 110B)

Item #12	1 Single door 110A, CORRIDOR TO STAFF ROOM	90° RH
Item #13	1 Single door 117A, CORRIDOR FROM CLASSROOM	90° RHR

950 x 2150 x 45 - HM DR x HM FR - 20MIN

6	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
1	Lockset	Best 45H7R (Std.) 15 H 630 RHR	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
2	Overhead Door Stop	Norton Rixson 1-336 630	630
2	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA

Heading #8 (Group: CLASS RM CL COHS BEST 110B)

Item #14 — 1 Single door 110B, GENERAL OFFICE TO STAFF ROOM — 90° RH

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Overhead Door Stop	Norton Rixson 1-336 630	630
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
1	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA

Heading #9 (Group: CORR DE BEST)

Item #15 — 1 Pair of doors 111A, CORRIDOR FROM CORRIDOR — 130° L-LHR

1100, 1100 x 2150 x 45 - HM DR x HM FR - 20MIN

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Exit Device	BEST 3ROFL2201LBR x x 630 x x 2150	630
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
2	Electro-Magnetic Holder	Norton Rixson 998M TRI VOLT 689	689
2	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Miscellaneous Item	BEST FB277	

ELECTRICAL CONTRACTOR TO INTERFACE EMHO DEVICE WITH F/A PANEL.

Heading #10 (Group: CLASS RM ,CL,WS BEST)

Item #16 — 1 Single door 113A, CORRIDOR TO STAFF LOUNGE — 90° RH

950 x 2150 x 45 - HM DR x HM FR - 45MIN

3	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD7016-SPA 689 SNDTPK	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #11 (Group: CLASS RM CL COHS BEST 110B)

Item #17 1 Single door 113B, GENERAL OFFICE TO STAFF LOUNGE 90° RH

950 x 2150 x 45 - HM DR x HM FR - 45MIN

3	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Overhead Door Stop	Norton Rixson 1-336 630	630
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
1	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA

Heading #12 (Group: CLASS RM ,CL,WS BEST)

Item #18 1 Single door 114A, LEARNING COMMONS TO LEARNING COMM WORK ROOM 90° LH
Item #19 1 Single door 161B, CORRIDOR TO STUDENT FORUM 90° RH

950 x 2150 x 45 - HM DR x HM FR

6	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD7016-SPA 689 SNDTPK	689
2	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
2	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #13 (Group: LEARNING COMMONS BEST)

Item #20 — 1 Pair of doors 115A, CORRIDOR FROM LEARNING COMMONS — 90° RHR/LHR

1000, 1000 x 2150 x 45 - HM DR x HM FR

REM HARDWARE MULLION WITH QUICK DISCONNECT.

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Removable Mullion	Sargent EL980 USP 86"	USP
2	Exit Device	BEST 3RO2110V1-INT x V4908AA x x 630 x	630
4	Cylinder	Best 1E72S2RP 626	626
1	Cylinder	Best 1E7428(Std.)C4 RP 626	626
5	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
5	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Electric Strike	HES 9600-630- 2005M3	630
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Overhead Door Holder	Rixson 1-436 630	630
2	Weatherstripping	K.N. Crowder ASTRAGAL W-25-CA x 2150mm	CA
2	Weatherstripping	K.N. Crowder W-20S- 1219 CA	CA
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Weatherstripping	K.N. Crowder W-50S- 2150- CA	CA
2	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER DIV 08710 TO SUPPLY & INSTALL ADO

MODE OF OPERATION
UNLOCKED POSITION: ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY .

EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

Heading #14 (Group: M115B)

Item #21 — 1 Pair of doors 115B, CORRIDOR TO LEARNING COMMONS — 180° LHA/RHA

1000, 1000 x 2150 x 45 - HM DR x HM FR

PDSB APPROVED CBH 156 AS SPECIAL APPLICATION.

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Lockset	BEST 45H7IND (Std.) 15 H 630 VIN	630
4	Cylinder	Best 1E74(Std.) 626	626
4	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
4	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Floor Door Stop	CBH CBH 156 C26D	US26D
1	Miscellaneous Hardware	MISC MULLION BY FRAME SUPLIER	

Heading #15 (Group: VEST PR 950,COHS BEST)

Item #22	1 Pair of doors 116A, CORRIDOR FROM STUDENT FORUM	180° LHRA/RHRA
Item #23	1 Pair of doors 116B, CORRIDOR FROM STUDENT FORUM	180° LHRA/RHRA

1000, 1000 x 2150 x 45 - HM DR x HM FR - 20MIN

FIXED HM MULLION

16	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
4	Exit Device	Stanley 3ROFL2108 x V4908A x x 630 x	630
4	Cylinder	Best 1E72S2RP 626	626
4	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
4	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Electronic Closer	LCN 4040SE STDTRK 689 45 24V INSTALL 90 DEG DR LEAF PULL SIDE MTD	689
2	Electronic Closer	LCN 4314ME CYLB140 689 45 24V INSTALL 180 DEG LEAF PULL SIDE MTD	689
4	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Overhead Door Stop	Norton Rixson 1ADJ-436 630	630
2	Wall Door Stop	Standard Metal S120 C26D	US26D
4	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
4	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Miscellaneous Item	LCN 4040SE-3210 689	689
2	Miscellaneous Item	LCN 4310ME-3210 689	689

DIV 28 TO INTERFACE EMHO DOOR CLOSERS WITH FA PANEL

Heading #16 (Group: CLASS RM CL COHS BEST 117B)

Item #24	1 Single door 117B, LEARNING COMMONS TO CLASSROOM	90° LH

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Kick Plate	Standard Metal K10A 200 X 910 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #17 (Group: GLASS)

Item #25 1 Elevation 117C, LEARNING COMMONS TO CLASSROOM

__ x __ x 45 - GLASS DR x GLASS FR

GLASS DOOR
ALL HARDWRE BY GLASS DOOR SUPPLIER .

Heading #18 (Group: EXT STAIR ALUM OP FM)

Item #26	1 Pair of doors 118A, EXTERIOR FROM STAIR D	100°,100° LHRA/RHRA
Item #27	1 Pair of doors 142A, EXTERIOR FROM STAIR	90° LHA/RHA

1000, 1000 x 2150 x 51 - AL DR x AL FR

4	Continuous Hinge	Stanley 661 HD UL 83" AL	AL
2	Exit Device	Stanley 3RO2401 x x 630 x x 2150 x 51 DOOR	630
2	Exit Device	BEST 3RO2403 x RIM CYL x 630 x 51 DOOR	630
2	Cylinder	Best 1E72S2RP 626	626
4	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
4	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
4	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
2	Electric Strike	HES 9600-630- 2005M3	630
4	Door Pull	Gallery 1180-2 TB 2" THICK DR. C32D	USC32D
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Mounting Bracket	Stanley DROP PLATE DP80-BS 689	
2	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
4	Kick Plate	Gallery GSH 80 C32D (150 X 950)	US32D
4	Overhead Door Holder	Rixson 1-436 630	630
4	Accessory	Von Duprin (CAD) MULLION STABALIZER 154	600
4	Threshold	K.N. Crowder CT-45 x 1219mm	
4	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Weatherstripping	Door Mftg. WEATHERSTRIP BY ALUM DR & FR SUPPLIER	US28
4	Miscellaneous Item	Camden ACTUATOR CM-60/4 FOR EXTERIOR INSTALL	
4	Miscellaneous Item	Camden ESCUTCHEON CM-89S 630	630
2	Miscellaneous Hardware	Camden CM-1190-7224 WALL MTD. 630	630
2	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
2	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
2	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
4	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	
2	Miscellaneous Hardware	MISC MULLION BY FRAME SUPLIER	
2	Miscellaneous Hardware	Camden RELAY CX-33	
2	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, . GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY (WALL MTD. KEYSWITCH LED IS GREEN)

SECURED POSITION:DOORS LOCKED WALL MTD KEYSWITCH CM 1190 SHUNTS POWER TO EXTERIOR ACTUATOR ONLY (LED IS RED) .
INTERIOR ACTUATOR IS ALWAYS ACTIVE.
EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

Heading #19 (Group: VEST PR ULC OP EMHO)

Item #28	1 Pair of doors 118B, STAIR D FROM CORRIDOR	90°,180° LHRA/RHRA
Item #29	1 Pair of doors 142B, STAIR FROM CORRIDOR	90°,180° LHA/RHA

1000, 1000 x 2150 x 45 - HM DR x HM FR - 45MIN

16	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
4	Exit Device	Stanley 3ROFL2108 x V4908A x x 630 x	630
4	Cylinder	Best 1E72S2RP 626	626
4	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
4	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Electric Strike	HES 9500-630-LBM- 2005M3	630
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
4	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
4	Electro-Magnetic Holder	Norton Rixson 998M TRI VOLT 689	689
4	Electro-Magnetic Holder	Norton Rixson EXTENSIONS 900 900-300 689	689
4	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
4	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
4	Miscellaneous Item	Camden ACTUATOR CM-60/4 FOR EXTERIOR INSTALL	
4	Miscellaneous Item	Camden ESCUTCHEON CM-89S 630	630
2	Miscellaneous Hardware	Camden CM-160/21 MTD IN ADO HEADER	
2	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
2	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
2	Miscellaneous Hardware	MISC MULLION BY FRAME SUPLIER	
2	Miscellaneous Hardware	Camden RELAY CX-33	
2	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: . ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY.
EGRESS IS ALWAYS FREE
2 POSITION KEYSWITCH TURNS UNIT ON/OFF.

Heading #20 (Group: CLASS RM SS)

Item #30	1 Single door 119A, CORRIDOR TO INST MUSIC CLASSROOM	90° LH
Item #31	1 Single door 119B, VOCAL MUSIC CLASSROOM TO INST MUSIC CLASSROOM	90° LH

1000 x 2150 x 45 - HM DR x HM FR

6	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
2	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
2	Wall Door Stop	Standard Metal S120 C26D	US26D
2	Weatherstripping	K.N. Crowder W-50S- 1 x 1219, 2 x 2150 CA	CA
2	Gasketing	K.N. Crowder CT-54-CA x 950 mm x SHIM	CA

Heading #21 (Group: PRACTICE RM BEST WS)

Item #32	1 Single door 119AA, INST MUSIC CLASSROOM TO VESTIBULE	90° LH
Item #33	1 Single door 119AB, VOCAL MUSIC CLASSROOM TO VESTIBULE	90° RH

1000 x 2150 x 45 - HM DR x HM FR

8	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Latchset	Best 45H0N (LC) 15 H 630 LH	630
1	Latchset	Best 45H0N (LC) 15 H 630 RH	630
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Wall Door Stop	Standard Metal S120 C26D	US26D
2	Weatherstripping	K.N. Crowder W-50S- 1 x 1219, 2 x 2150 CA	CA
2	Gasketing	K.N. Crowder CT-54 X 42 AL x SHIM	

Heading #22 (Group: PRACTICE RM BEST)

Item #34	1 Single door 120A, VESTIBULE TO PRACTICE ROOM	90° RH
Item #35	1 Single door 121A, VESTIBULE TO PRACTICE ROOM	90° RH

1000 x 2150 x 45 - HM DR x HM FR

8	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
2	Latchset	Best 45H0N (LC) 15 H 630 RH	630
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Overhead Door Stop	Rixson 9-436 652	652
2	Weatherstripping	K.N. Crowder W-50S- 1 x 1219, 2 x 2150 CA	CA
2	Gasketing	K.N. Crowder CT-54 X 42 AL x SHIM	

Heading #23 (Group: CLASS RM SS)

Item #36	1 Single door 122A, CORRIDOR TO VOCAL MUSIC CLASSROOM	90° LH

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Weatherstripping	K.N. Crowder W-50S- 1 x 1219, 2 x 2150 CA	CA
1	Gasketing	K.N. Crowder CT-54-CA x 950 mm x SHIM	CA

Heading #24 (Group: CLASS RM WS)

Item #37	1 Single door 123A, CORRIDOR TO CLASSROOM	90° LR
Item #38	1 Single door 124A, CLASSROOM TO SPECIAL ED	90° LH
Item #39	1 Single door 171A, CORRIDOR TO SEMINAR ROOM	90° LH
Item #40	1 Single door 173A, CORRIDOR TO RESOURCE ROOM	90° RH
Item #41	1 Single door 204B, CLASSROOM TO CLASSROOM	90° RH

950 x 2150 x 45 - HM DR x HM FR

15	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
3	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
2	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
5	Cylinder	Best 1E74(Std.) 626	626
5	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
5	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
5	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
5	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #25 (Group: WR OP PUSH PDSB W SGL ANNUN)

Item #42 — 1 Single door 125A, CORRIDOR FROM UNIV WASHROOM — 90° LHR

1100 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 LHR	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Electric Strike	HES 1006CS-F-630 X 2005M3	630
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
2	Kick Plate	Gallery GSH 80A 200 X 1060 C32D MTD BOTH SIDES	US32
1	Overhead Door Stop	Rixson 1-536 630	630
1	Accessory	HES 2005M3 MUST BE INSTALLED WITH ES	
1	Accessory	Camden CM-45/4 PUSH TO EXIT -FLUSH MTD.(2 X 4BB)	
1	Miscellaneous Hardware	Camden ACTUATOR CM-45/455/SE1 FLUSH MTD IN CORR GC CUT BLOCK WALL TO SUIT	
1	Miscellaneous Hardware	Camden (CAD) CIRCUIT CM-4000-60N INSTALL IN PARALLEL WITH OFFICE ANNUN & EMERG WR	
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER MOUNT IN OP HEADER	
1	Miscellaneous Hardware	Camden CM-331-/43S / SGLR/ SGL GANG (2 X 4BB)	
1	Miscellaneous Hardware	Camden CONTACT CX-MDA	
1	Miscellaneous Hardware	Camden (CAD) CX-IRB (FOR CUST WR KIT)	
1	Miscellaneous Hardware	Camden CX-TRX-4024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden EMERGENCY WR KIT CX-WEC10K2 (corr sgl gang, wr dbl gang)	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER TO SUPPLY AND INSTALL AUTO OPERATOR.

PDSB STD IS FOR ACTUATORS TO BE FLUSH MTD . GC MUST HAVE WALLS CUT TO SUITE .
GC TO OBTAIN WALL CUTOUT TEMPLATE FROM PDSB . REFER TO FIG1 AND FIG 2 FOR TYPICAL INSTALLATION .

ELECTRICAL CONTRACTOR TO PROVIDE 120 VAC TO HEAD OF FRAME AND RUN LOW VOLTAGE WIRE TO PUSH BUTTON LOCATIONS AND ALL ELECTRICAL COMPONENTS LISTED . REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #26 (Group: ALE BEST)

Item #43 — 1 Single door 126A, SPECIAL ED FROM ALE — 90° RHR

950 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Latchset	ABH 6835-2-A US32D INSTALL PADDLE MTD UP.	US32D
1	Roller Latch	Standard Metal F76 C26D MTD 6" ABOVE LATCH	US26D
2	Kick Plate	Gallery GSH 80A 400 x 900 C32D MTD BOTH SIDES	US32D
1	Overhead Door Stop	Norton Rixson 1-336 630	630

PREP DOOR AND FRAME FOR 4 HINGES

Heading #27 (Group: SPRINKLER BEST REV)

Item #44 — 1 Single door 127A, ELEC ROOM FROM SPRINKLER ROOM — 110° RHR

950 x 2150 x 45 - HM DR x HM FR - 45MIN

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 RHR	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016-DS x SNDTPK x 689-SN	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
1	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA

Heading #28 (Group: ELECTRICAL INT BEST 1100)

Item #45 — 1 Single door 128A, CORRIDOR TO ELEC ROOM — 90° RH

1100 x 2150 x 45 - HM DR x HM FR - 45MIN

4	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016 ARP x SNDTPK x689 REG Arm SN	689
1	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
1	Miscellaneous Item	Crowder W-24S C.A. X 1200MM	C.A.

Heading #29 (Group: EXT STORAGE 1100)

Item #46	1 Single door 128B, EXTERIOR FROM ELEC ROOM	90° RHR
Item #47	1 Single door 143A, EXTERIOR FROM UTILITY STORAGE	90° RHR

1100 x 2150 x 45 - HM DR x HM FR

2		DOOR CONTACT BY DIV 16	
8	Standard Hinge	Stanley NRP-FBB199 4 1/2" x 4 1/2" US32D	US32D
2	Lockset	Best 47H 7 TD (Std.) 4 H 630 RHR	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
2	Overhead Door Stop	Rixson 1-536 630	630
2	Threshold	K.N. Crowder CT-45 x 1219mm	
2	Weatherstripping	K.N. Crowder W-20S-CA 48"	USCA
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
4	Weatherstripping	K.N. Crowder W-50S- 2150- CA	CA

Heading #30 (Group: EXT STAIR ALUM OP)

Item #48 1 Pair of doors 130A, EXTERIOR FROM STAIR 90° LHA/RHA

1000, 1000 x 2150 x 51 - AL DR x AL FR

REM HARDWARE MULLION WITH ELECTRICAL QUICK DISCONNECT BY 08710

2	Continuous Hinge	Stanley 661 HD UL 83" AL	AL
1	Removable Mullion	Sargent EL980 USP 86"	USP
1	Exit Device	Stanley 3RO2401 x x 630 x x 2150 x 51 DOOR	630
1	Exit Device	BEST 3RO2403 x RIM CYL x 630 x 51 DOOR	630
1	Cylinder	Best 1E72S2RP 626	626
1	Cylinder	Best 1E7428(Std.)C4 RP 626	626
3	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
3	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
1	Electric Strike	HES 9600-630- 2005M3	630
2	Door Pull	Gallery 1180-2 TB 2" THICK DR. C32D	USC32D
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Mounting Bracket	Stanley DROP PLATE DP80-BS 689	
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
2	Kick Plate	Gallery GSH 80 C32D (150 X 950)	US32D
2	Overhead Door Holder	Rixson 1-436 630	630
2	Accessory	Von Duprin (CAD) MULLION STABALIZER 154	600
1	Threshold	K.N. Crowder CT-45 X 84" AL	
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
1	Weatherstripping	Door Mftg. WEATHERSTRIP BY ALUM DR & FR SUPPLIER	US28
2	Miscellaneous Item	Camden ACTUATOR CM-60/4 FOR EXTERIOR INSTALL	
2	Miscellaneous Item	Camden ESCUTCHEON CM-89S 630	630
1	Miscellaneous Hardware	Camden CM-1190-7224 WALL MTD. 630	630
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
2	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, . GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY (WALL MTD. KEYSWITCH LED IS GREEN)

SECURED POSITION:DOORS LOCKED WALL MTD KEYSWITCH CM 1190 SHUNTS POWER TO EXTERIOR ACTUATOR ONLY (LED IS RED) . INTERIOR ACTUATOR IS ALWAYS ACTIVE.
EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

Heading #31 (Group: M130B)

Item #49 1 Pair of doors 130B, STAIR FROM CORRIDOR 90°,180° LHRA/RHRA

1000, 1000 x 2150 x 45 - HM DR x HM FR - 45MIN

REM HRWD MULLION WITH QUICK DISCONNECT.

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Removable Mullion	Sargent EL980 USP 86"	USP
2	Exit Device	Stanley 3ROFL2108 x V4908A x x 630 x	630
3	Cylinder	Best 1E72S2RP 626	626
1	Cylinder	Best 1E7428(Std.)C4 RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
3	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Electric Strike	HES 9500-630-LBM- 2005M3	630
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Electro-Magnetic Holder	Norton Rixson 998M TRI VOLT 689	689
2	Electro-Magnetic Holder	Norton Rixson EXTENSIONS 900 900-300 689	689
2	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Miscellaneous Item	Camden ACTUATOR CM-60/4 FOR EXTERIOR INSTALL	
2	Miscellaneous Item	Camden ESCUTCHEON CM-89S 630	630
1	Miscellaneous Hardware	Camden CM-160/21 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	MISC MULLION BY FRAME SUPLIER	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: . ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY.
EGRESS IS ALWAYS FREE
2 POSITION KEYSWITCH TURNS UNIT ON/OFF.

Heading #32 (Group: CLASS RM OH DC BUZZ)

Item #50	1 Single door 131A, CORRIDOR TO KINDERGARTEN	90° LH
Item #51	1 Single door 135A, CORRIDOR TO KINDERGARTEN	90° RH
Item #52	1 Single door 137A, CORRIDOR TO KINDERGARTEN	90° LH
Item #53	1 Single door 141A, CORRIDOR TO KINDERGARTEN	90° RH
Item #54	1 Single door 144A, CORRIDOR TO KINDERGARTEN	90° LH
Item #55	1 Single door 149A, CORRIDOR TO KINDERGARTEN	90° RH

950 x 2150 x 45 - HM DR x HM FR

18	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
3	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
3	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
6	Cylinder	Best 1E74(Std.) 626	626
6	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
6	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
6	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
6	Overhead Door Stop	Norton Rixson 9-336 630	630
6	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	

Heading #33 (Group: VEST SGL OP BEST)

Item #56	1 Single door 131B, VESTIBULE FROM BENCH & COAT	90° LHR
Item #57	1 Single door 137B, VESTIBULE FROM BENCH & COAT	90° LHR
Item #58	1 Single door 149B, VESTIBULE FROM BENCH & COAT	90° RHR
Item #59	1 Single door 154B, VESTIBULE FROM BENCH & COAT	90° RHR

1000 x 2150 x 45 - HM DR x HM FR

16	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Exit Device	Stanley 3RO2108 x V4908A x LHR x 630 x x 1000	
2	Exit Device	Stanley 3RO2108 x V4908A x RHR x 630 x x 1000	
4	Cylinder	Best 1E72S2RP 626	626
4	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
4	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
4	Electric Strike	HES 9500-630-LBM- 2005M3	630
4	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
4	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
4	Overhead Door Holder	Rixson 1-436 630	630
4	Accessory	HES 2005M3 MUST BE INSTALLED WITH ES	
8	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
4	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
4	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
4	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	
4	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION O8710 TO SUPPLY AND INSTALL AUTO OPERATORS.

ELECTRICAL CONTRACTOR TO PROVIDE 120 VAC TO HEAD OF FRAME AND LOW VOLTAGE WIRE TO PUSH BUTTON & ELECTRIC STRIKE AND ALL ELECTRIFIED DEVICES LISTED .
ELECTRICAL CONTRCTOR REQUIRED TO PROVIDE ELECTRICAL BACK BOXES .

DR CONTACT FOR AUDIBLE BUZZER COORDINATE WITH ELECTRICAL.

Heading #34 (Group: EXT SGL OP)

Item #60	1 Single door 132A, EXTERIOR FROM VESTIBULE	90° LHR
Item #61	1 Single door 138A, EXTERIOR FROM VESTIBULE	90° LHR
Item #62	1 Single door 145B, EXTERIOR FROM VESTIBULE	90° RHR
Item #63	1 Single door 151B, EXTERIOR FROM VESTIBULE	90° RHR

1000 x 2150 x 45 - HM DR x HM FR

16	Standard Hinge	Stanley NRP-FBB199 4 1/2" x 4 1/2" US32D	US32D
2	Exit Device	Stanley 3RO2103 x LHR x 630 x 1000	630
2	Exit Device	Stanley 3RO2103 x RHR x 630 x 1000	630
4	Cylinder	Best 1E72S2RP 626	626
8	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
4	Cylinder	CBH CBH 353 C32D 45	US32D
8	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
4	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
4	Electric Strike	HES 9600-630- 2005M3	630
4	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
4	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
4	Overhead Door Holder	Rixson 1-436 630	630
4	Accessory	HES 2005M3 MUST BE INSTALLED WITH ES	
4	Threshold	K.N. Crowder CT-45 x 1219mm	
4	Weatherstripping	K.N. Crowder W-20S- 1219 CA	CA
4	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
8	Weatherstripping	K.N. Crowder W-50S- 2150- CA	CA
8	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
4	Miscellaneous Item	Camden ESCUTCHEON CM-89S X CM-89S-ADP1	630
		AT EXTERIOR ACTUATOR ONLY	
4	Miscellaneous Hardware	Camden CM-1190-7224 WALL MTD. 630	630
4	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
4	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
4	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	
4	Miscellaneous Hardware	Camden RELAY CX-33	
4	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES AND ALL ELECTRICAL DEVICES LISTED. GC TO PROVIDE BACKBOXES FOR ACTUATORS

MODE OF OPERATION
UNLOCKED POSITION: EXIT DEVICES ARE DOGGED DOWN VIA DOGGING FEATURE. ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY (WALL MTD. KEYSWITCH LED IS GREEN)

SECURED POSITION:DOORS ARE UNDOGGRED AND LOCKED WALL MTD KEYSWITCH CM 1190 SHUNTS POWER TO EXTERIOR ACTUATOR ONLY (LED IS RED) . INTERIOR ACTUATOR IS ALWAYS ACTIVE.
EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

PREPARE DOOR AND FRAME FOR 4 HINGES

Heading #35 (Group: EXT SGL HM)

Item #64	1 Single door 132B, EXTERIOR FROM VESTIBULE	90° RHR
Item #65	1 Single door 138B, EXTERIOR FROM VESTIBULE	90° RHR
Item #66	1 Single door 145A, EXTERIOR FROM VESTIBULE	90° LHR
Item #67	1 Single door 151A, EXTERIOR FROM VESTIBULE	90° LHR

1000 x 2150 x 45 - HM DR x HM FR

16	Standard Hinge	Stanley NRP-FBB199 4 1/2" x 4 1/2" US32D	US32D
2	Exit Device	Stanley 3RO2103 x LHR x 630 x 1000	630
2	Exit Device	Stanley 3RO2103 x RHR x 630 x 1000	630
4	Cylinder	Best 1E72S2RP 626	626
4	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
4	Cylinder	CBH CBH 353 C32D 45	US32D
4	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
4	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
4	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
4	Overhead Door Holder	Rixson 1-436 630	630
4	Threshold	K.N. Crowder CT-45 x 1219mm	
4	Weatherstripping	K.N. Crowder W-20S- 1219 CA	CA
4	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
8	Weatherstripping	K.N. Crowder W-50S- 2150- CA	CA
4	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	

Heading #36 (Group: WR KINDER OP)

Item #68	1 Single door 133A, KINDERGARTEN TO WASHROOM	90° RH
Item #69	1 Single door 139A, KINDERGARTEN TO WASHROOM	90° RH
Item #70	1 Single door 147A, KINDERGARTEN TO WASHROOM	90° LH
Item #71	1 Single door 153A, KINDERGARTEN TO WASHROOM	90° LH

950 x 2150 x 45 - HM DR x HM FR

12	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Latchset	Best 45H0N (LC) 15 H 630 LH	630
2	Latchset	Best 45H0N (LC) 15 H 630 RH	630
4	Electric Strike	HES 1006CS-630- 2005M3	630
4	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
8	Kick Plate	Gallery GSH 80A 400 x 900 C32D	US32D
		MTD BOTH SIDES	
4	Wall Door Stop	Standard Metal S120 C26D	US26D
4	Accessory	HES 2005M3 MUST BE INSTALLED WITH ES	
8	Miscellaneous Item	Camden ACTUATOR CM-60/4 FOR EXTERIOR INSTALL	
8	Miscellaneous Item	Camden ESCUTCHEON CM-89S 630	630
4	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
		MOUNT IN OP HEADER	
4	Miscellaneous Hardware	Camden CONTACT CX-MDA	
4	Miscellaneous Hardware	Camden CX-TRX-4024 INSTALL IN OP HEADER	
4	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
4	Miscellaneous Hardware	Camden RELAY CX-33	
4	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER TO SUPPLY AND INSTALL AUTO OPERATOR.

PDSB STD IS FOR ACTUATORS TO BE FLUSH MTD . GC MUST HAVE WALLS CUT TO SUITE .
GC TO OBTAIN WALL CUTOUT TEMPLATE FROM PDSB . REFER TO FIG1 AND FIG 2 FOR TYPICAL INSTALLATION .

ELECTRICAL CONTRACTOR TO PROVIDE 120 VAC TO HEAD OF FRAME AND RUN LOW VOLTAGE WIRE TO PUSH BUTTON LOCATIONS AND ALL ELECTRICAL COMPONENTS LISTED . REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #37 (Group: VEST KINDER)

Item #72	1 Single door 134A, KINDERGARTEN TO WASHROOM	90° LH
Item #73	1 Single door 146A, KINDERGARTEN TO WASHROOM	90° RH
Item #74	1 Single door 152A, KINDERGARTEN TO WASHROOM	90° RH

950 x 2150 x 45 - HM DR x HM FR

12	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Exit Device	Stanley 3RO2108 x V4908A x LH x 630 x x 950	
2	Exit Device	Stanley 3RO2108 x V4908A x RH x 630 x x 950	
3	Cylinder	Best 1E72S2RP 626	626
3	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
3	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
3	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
3	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
3	Wall Door Stop	Standard Metal S120 C26D	US26D
3	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	

DOOR CONTACT FOR AUDIBLE BUZZER COORDINATE WITH ELECTRICAL

Heading #38 (Group: VEST KINDER)

Item #75	1 Single door 135B, VESTIBULE FROM BENCH & COAT	90° RHR
Item #76	1 Single door 141B, VESTIBULE FROM BENCH & COAT	90° RHR
Item #77	1 Single door 144B, VESTIBULE FROM BENCH & COAT	90° LHR
Item #78	1 Single door 150B, VESTIBULE FROM BENCH & COAT	90° LHR

1000 x 2150 x 45 - HM DR x HM FR

16	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Exit Device	Stanley 3RO2108 x V4908A x LHR x 630 x x 1000	
2	Exit Device	Stanley 3RO2108 x V4908A x RHR x 630 x x 1000	
4	Cylinder	Best 1E72S2RP 626	626
4	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
4	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
4	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
4	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
4	Wall Door Stop	Standard Metal S120 C26D	US26D
4	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	

DOOR CONTACT FOR AUDIBLE BUZZER COORDINATE WITH ELECTRICAL

Heading #39 (Group: W/R KINDER)

Item #79 — 1 Single door 140A, KINDERGARTEN TO WASHROOM — 90° LH

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Latchset	Best 45H0N (LC) 15 H 630 LH	630
2	Kick Plate	Gallery GSH 80A 400 x 900 C32D	US32D
		MOUNT BOTH SIDES	
1	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #40 (Group: STORAGE 1100)

Item #80 — 1 Single door 143B, UTILITY STORAGE FROM CORRIDOR — 90° RHR

1100 x 2150 x 45 - HM DR x HM FR - 90MIN

4	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 RHR	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016 ARP x SNDTPK x689 REG Arm SN	689
1	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
1	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA

1) PREPARE FRAME AND DOOR FOR 4 HINGES

Heading #41 (Group: CLASS RM OH DC BUZZ)

Item #81 — 1 Single door 150A, CORRIDOR TO KINDERGARTEN — 90° LH

Item #82 — 1 Single door 154A, CORRIDOR TO KINDERGARTEN — 90° RH

950 x 2150 x 45 - HM DR x HM FR - 20MIN

6	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
2	Overhead Door Stop	Norton Rixson 9-336 630	630
2	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	

Heading #42 (Group: GYM PR OP)

Item #83 1 Pair of doors 155A, CORRIDOR FROM GYM 180° LHRA/RHRA

1000, 1000 x 2150 x 45 - HM DR x HM FR

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Exit Device	Stanley 3RO2108 x V4908A x x 630 x x	
2	Cylinder	Best 1E72S2RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Electric Strike	HES 9600-630- 2005M3	630
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Electronic Closer	GYRO-TECH OP 8710 PULL SIDE 628 INSTALL FOR MAX DEG OF OPENING NO ALTERNATE	628
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
1	Floor Door Stop	CBH CBH 156 C26D INSTALL RHR LEAF	US26D
1	Wall Door Stop	Standard Metal S120 C26D INSTALL LHR LEAF	US26D
2	Weatherstripping	K.N. Crowder W-20S- 1219 CA	CA
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
4	Weatherstripping	K.N. Crowder W-50S- 2150- CA	CA
2	Miscellaneous Item	Camden ACTUATOR CM-60/4 FOR EXTERIOR INSTALL	
2	Miscellaneous Item	Camden ESCUTCHEON CM-89S 630	630
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	MISC MULLION BY FRAME SUPLIER	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: . ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY.
EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/ HO.

Heading #43 (Group: GYM PAIR F/R BEST 155B)

Item #84 — 1 Pair of doors 155B, CORRIDOR FROM GYM — 90° LHRA/RHRA

1000, 1000 x 2150 x 45 - HM DR x HM FR - 20MIN

REMOVABLE HARDWARE MULLION

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Removable Mullion	Stanley FLKR822 x 600 x Spacer MC822	600
2	Exit Device	Stanley 3ROFL2108 x V4908A x x 630 x	630
3	Cylinder	Best 1E72S2RP 626	626
3	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
3	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Wall Door Stop	Standard Metal S120 C26D	US26D
2	Weatherstripping	K.N. Crowder W-20S- 1219 CA	CA
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
4	Weatherstripping	K.N. Crowder W-50S- 2150- CA	CA

Heading #44 (Group: STAGE PAIR STORAGE BEST)

Item #85 — 1 Pair of doors 159A, STAGE FROM STORAGE — 90° RHRA

700, 700 x 2150 x 45 - HM DR x HM FR

NO HEADER ON FRAME

6	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Flush Bolt	Standard Metal F65UL C26D	US26D
		BOTTOM BOLT ONLY	
1	Lockset	Best 45H7D (Std.) 15 H 630	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Kick Plate	Gallery GSH 80A C32D (200 x 660)	US32D
1	Weatherstripping	K.N. Crowder W-8P x 2150mm	

Heading #45 (Group: GYM SGL, EXIT)

Item #86	1 Single door 160A, STUDENT FORUM FROM CORRIDOR	90° RHR
Item #87	1 Single door 160B, CORRIDOR FROM GYM	90° RHR

1000 x 2150 x 45 - HM DR x HM FR

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Exit Device	Stanley 3RO2108 x V4908A x RHR x 630 x x 1000	
2	Cylinder	Best 1E72S2RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Overhead Door Holder	Rixson 1-436 630	630
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Weatherstripping	K.N. Crowder W-50S- 1 x 1219, 2 x 2150 CA	CA

Heading #46 (Group: CLASS RM ,CL,WS BEST)

Item #88	1 Single door 161A, STUDENT FORUM TO SEMINAR ROOM	90° LH

950 x 2150 x 45 - HM DR x HM FR - 20MIN

3	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD7016-SPA 689 SNDTPK	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #47 (Group: STORAGE,915 ,WS)

Item #89	1 Single door 162A, CORRIDOR TO LAN	90° LH
Item #90	1 Single door 241A, CORRIDOR TO ACADEMIC STORAGE	90° LH
Item #91	1 Single door 242AA, CORRIDOR TO ELEC ROOM	90° RH
Item #92	1 Single door 242BA, ELEC ROOM TO LAN	90° RH
Item #93	1 Single door 253AA, CORRIDOR TO ELEC ROOM	90° RH
Item #94	1 Single door 253BA, ELEC ROOM TO LAN ROOM	90° RH

950 x 2150 x 45 - HM DR x HM FR

18	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Lockset	Best 45H7D (Std.) 15 H 630 LH	630
4	Lockset	Best 45H7D (Std.) 15 H 630 RH	630
6	Cylinder	Best 1E74(Std.) 626	626
6	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
6	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
6	Surface Closer	Stanley HD7016-ARP FPC SNDTPK 689-REG MTD.	689
6	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
6	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #48 (Group: W/R, WS BEST)

Item #95	1 Single door 163A, CORRIDOR TO STAFF WR	90° LH
Item #96	1 Single door 179A, CORRIDOR TO STAFF WR	90° RH
Item #97	1 Single door 180A, CORRIDOR TO STAFF WR	90° LH
Item #98	1 Single door 244A, CORRIDOR TO STAFF WASHROOM	90° RH
Item #99	1 Single door 251A, CORRIDOR TO STAFF WASHROOM	90° LH

950 x 2150 x 45 - HM DR x HM FR

15	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
3	Lockset	Best 45H7T (Std.) 15 H 630 LH VIN	630
2	Lockset	Best 45H7T (Std.) 15 H 630 RH VIN	630
5	Cylinder	Best 1E74(Std.) 626	626
5	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
5	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
5	Surface Closer	Stanley HD7016-ARP FPC SNDTPK 689-REG MTD.	689
10	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
5	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #49 (Group: chg rm ulc)

Item #100	1 Single door 167A, CORRIDOR TO CHANGE ROOM	90° RH
Item #101	1 Single door 170A, CORRIDOR TO CHANGE ROOM	90° LH

950 x 2150 x 45 - HM DR x HM FR - 20MIN

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
2	Wall Door Stop	Standard Metal S120 C26D	US26D
2	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA

Heading #50 (Group: CHG RM,DL Best)

Item #102	1 Single door 167B, GYM To CHG RM	90° RHR
Item #103	1 Single door 170B, GYM To CHG RM	90° LHR

950 x 2150 x 45 - HM DR x HM FR

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Dead Lock	Best 48H7R (Std.) 622 LHR	622
1	Dead Lock	Best 48H7R (Std.) 622 RHR	622
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Door Pull	Gallery 980 C26D MOUNT PUSH SIDE	US26D
2	Door Pull	Gallery GSH 4012-2 C32D # 2 45	US32D
2	Push Plate	GSH 127 X 505 TMS	US32D
2	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
2	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
2	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #51 (Group: ACADEMIC STORAGE BEST REG)

Item #104 1 Single door 168A, CORRIDOR TO ACAD STORAGE 90° LH

950 x 2150 x 45 - HM DR x HM FR - 20MIN

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 LH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD7016-ARP FPC SNDTPK 689-REG MTD.	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Overhead Door Stop	Norton Rixson 9-336 630	630

Heading #52 (Group: INSTRUCTOR GYM BEST)

Item #105 1 Single door 169A, GYM TO INSTRUCTOR ROOM 90° RH

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H 7XR 15 H 630 LEVER INSIDE ONLY	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Door Pull	Gallery 980 C26D	US26D
1	Surface Closer	Stanley HD7016-ARP FPC SNDTPK 689-REG MTD.	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #53 (Group: GYM STORAGE PR, BEST)

Item #106 1 Pair of doors 172A, GYM TO GYM STORAGE 90° RHA

1000, 1000 x 2150 x 45 - HM DR x HM FR

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Flush Bolt	Standard Metal F65UL C26D	US26D
		INACTIVE LEAF	
1	Lockset	Best 45H 7XR 15 H 630 LEVER INSIDE ONLY	630
		ACTIVE LEAF	
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Door Pull	Gallery 980 C26D	US26D
		ACTIVE LEAF	
2	Push Plate	GSH 127 X 505 TMS	US32D
2	Surface Closer	Stanley HD8016 ARP x SNDTPK x689 REG Arm SN	689
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Overhead Door Stop	Rixson 9-436 652	652
1	Weatherstripping	Crowder W-8S/7'	

Heading #54 (Group: STORAGE 1100 CLP)

Item #107 1 Single door 174A, CORRIDOR FROM CUSTODIAN OFFICE 110° LHR

1100 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 LHR	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016-DS x SNDTPK x 689-SN	689
1	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D

Heading #55 (Group: LAN BEST)

Item #108 1 Single door 175A, CORRIDOR TO ELEC ROOM 90° LH
Item #109 1 Single door 176A, CORRIDOR TO LAN ROOM 90° LH

950 x 2150 x 45 - HM DR x HM FR

6	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
2	Lockset	Best 45H7D (Std.) 15 H 630 LH	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD7016-ARP FPC SNDTPK 689-REG MTD.	689
2	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
2	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #56 (Group: EXTERIOR SGL VEST 301A)

Item #110 1 Single door 301A, EXTERIOR FROM VESTIBULE 90° RHR

1100 x 2150 x 51 - AL DR x AL FR

1	Continuous Hinge	Stanley 661 HD UL 83" AL	AL
1	Exit Device	BEST 3RO2403 x RIM CYL RHR x 630 x 1100 51 DOOR	630
1	Cylinder	Best 1E72S2RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
1	Electric Strike	HES 9600-630- 2005M3	630
1	Door Pull	Gallery 1180-2 TB 2" THICK DR. C32D	USC32D
1	Mounting Bracket	Stanley DROP PLATE DP80-BS 689	
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
1	Kick Plate	Gallery GSH 80 C32D (150 X 1050)	US32D
1	Overhead Door Stop	Rixson 1-536 630	630
1	Threshold	K.N. Crowder CT-45 x 1219mm	
1	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
1	Weatherstripping	Door Mftg. WEATHERSTRIP BY ALUM DR & FR SUPPLIER	US28
2	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
1	Miscellaneous Item	Camden ESCUTCHEON CM-89S X CM-89S-ADP1	630
		INSTALL ON EXTERIOR	
1	Miscellaneous Hardware	MISC CARD READER/VIDEO PHONE BY SECURITY	
1	Miscellaneous Hardware	Camden CM-1190-7224 WALL MTD. 630	630
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	
1	Miscellaneous Hardware	Camden RELAY CX-33	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, . GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY (WALL MTD. KEYSWITCH LED IS GREEN)

SECURED POSITION:DOORS LOCKED WALL MTD KEYSWITCH CM 1190 SHUNTS POWER TO EXTERIOR ACTUATOR ONLY (LED IS RED) .
INTERIOR ACTUATOR IS ALWAYS ACTIVE.
EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

Heading #57 (Group: VEST KINDER,FG 301B)

Item #111 1 Single door 301B, VESTIBULE FROM CORRIDOR 90° RHR

1100 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Exit Device	Stanley 3RO2108 x V4908A x RHR x 630 x x 1100	
1	Cylinder	Best 1E72S2RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
1	Electric Strike	HES 9600-630- 2005M3	630
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
1	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
1	Wall Door Stop	Standard Metal S120 C26D	US26D
2	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
1	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
1	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	

DOOR CONTACT FOR AUDIBLE BUZZER COORDINATE WITH ELECTRICAL

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, . GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY .

SECURED POSITION:DOORS LOCKED . INTERIOR ACTUATOR IS ALWAYS ACTIVE.

EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

Heading #58 (Group: OFFICE INFANTS 302A, 303A)

Item #112 1 Single door 302A, CORRIDOR TO OFFICE 90° RH

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
1	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A

Heading #59 (Group: M312A)

Item #113 1 Single door 305A, CORRIDOR TO KITCHEN 90° LH

1000 x 2150 x 45 - HM DR x HM FR - 45MIN

4	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD7016-ARP FPC SNDTPK 689-REG MTD.	689
1	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
1	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
1	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
1	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A

Heading #60 (Group: WR OP,FG 306A)

Item #114 1 Single door 306A, CORRIDOR TO WASHROOM 90° RH

950 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Electric Strike	HES 1006CS-F-630 X 2005M3	630
1	Electronic Closer	GYRO-TECH OPERATOR 8710 PULL SIDE FW HEADER 628 NO ALTERNATE	628
2	Kick Plate	Gallery GSH 80A 400 x 900 C32D MOUNT BOTH SIDES	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Accessory	Camden CM-45/4 PUSH TO EXIT -FLUSH MTD.(2 X 4BB)	
1	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
1	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A
1	Miscellaneous Hardware	Camden ACTUATOR CM-45/455/SE1 FLUSH MTD IN CORR GC CUT BLOCK WALL TO SUIT	
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER MOUNT IN OP HEADER	
1	Miscellaneous Hardware	Camden CM-331-/43S / SGLR/ SGL GANG (2 X 4BB)	
1	Miscellaneous Hardware	Camden CONTACT CX-MDA	
1	Miscellaneous Hardware	Camden (CAD) CX-IRB (FOR CUST WR KIT)	
1	Miscellaneous Hardware	Camden CX-TRX-4024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden EMERGENCY WR KIT CX-WEC10K2 (corr sgl gang, wr dbl gang)	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER TO SUPPLY AND INSTALL AUTO OPERATOR.

ELECTRICAL CONTRACTOR TO PROVIDE 120 VAC TO HEAD OF FRAME AND RUN LOW VOLTAGE WIRE TO PUSH BUTTON LOCATIONS AND ALL ELECTRICAL COMPONENTS LISTED. REFER TO WIRING DIAGRAM SUPPLIED BY HARDWARE SUPPLIER.

Heading #61 (Group: PRESCHOOL ENT)

Item #115	1 Single door 307A, CORRIDOR TO LAUNDRY	90° RH
Item #116	1 Single door 315A, CUBBIE AREA TO PRE SCHOOL CLASS	90° RH
Item #117	1 Single door 319A, CUBBIE AREA TO PRE SCHOOL CLASS	90° LH
Item #118	1 Single door 324A, CORRIDOR TO TODDLER ROOM	90° LH
Item #119	1 Single door 327A, CORRIDOR TO INFANTS	90° LH

950 x 2150 x 45 - HM DR x HM FR

15	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
3	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
2	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
5	Cylinder	Best 1E74(Std.) 626	626
5	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
5	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
5	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
5	Wall Door Stop	Standard Metal S120 C26D	US26D
5	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
5	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A

Heading #62 (Group: ELECT PRESCHOOL BEST)

Item #120	1 Single door 308A, CORRIDOR FROM ELEC ROOM	90° RHR

950 x 2150 x 45 - HM DR x HM FR - 45MIN

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 RHR	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016-DS x SNDTPK x 689-SN	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
1	Weatherstripping	K.N. Crowder W-24S- 965 CA	CA

Heading #63 (Group: STORAGE PRESCHOOL BEST)

Item #121 1 Single door 310A, CORRIDOR TO STORAGE 90° RH

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD7016-ARP FPC SNDTPK 689-REG MTD.	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
1	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A

Heading #64 (Group: STAFF FG)

Item #122 1 Single door 312A, CUBBIE AREA TO STAFF ROOM 90° RH

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD7016-ARP FPC SNDTPK 689-REG MTD.	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Overhead Door Stop	Norton Rixson 9-336 630	630
1	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
1	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A

Heading #65 (Group: WR 1/2 DR BEST)

Item #123 1 Single door 314A, PRE SCHOOL CLASS TO WASHROOM 90° LH
Item #124 1 Single door 318A, PRE SCHOOL CLASS TO WASHROOM 90° RH
Item #125 1 Single door 320A, PRE SCHOOL CLASS TO WASHROOM RH
Item #126 1 Single door 323A, TODDLER TO WASHROOM 90° LH

970 x 1000 x 45 - WD DR x WD FR

HALF DOOR

8	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
4	Latchset	BEST 9K 3 (LC) 0 N 15 D S3 626	626
8	Kick Plate	Standard Metal K10A 200 X 910 C32D	US32D
4	Wall Door Stop	Standard Metal S120 C26D	US26D
4	Miscellaneous Item	Zero FINGER GUARD 51A-180 -48" AL NO ALTERNATE	A
4	Miscellaneous Item	Zero FINGER GUARD 951A 48" NO ALTERNATE	A

Heading #66 (Group: COT STORAGE BEST)

Item #127	1 Pair of doors 316A, PRE SCHOOL CLASS FROM COT STORAGE	90° LHRA/RHRA
Item #128	1 Pair of doors 317A, PRE SCHOOL CLASS FROM COT STORAGE	90° LHRA/RHRA
Item #129	1 Pair of doors 325A, TODDLER ROOM FROM COT STORAGE	90° LHRA/RHRA

800, 800 x 2150 x 45 - HM DR x HM FR

18	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
6	Flush Bolt	Standard Metal F65UL C26D	US26D
		IN ACT LEAF	
3	Lockset	Best 45H7R (Std.) 15 H 630	630
		ACT LEAF	
3	Cylinder	Best 1E74(Std.) 626	626
3	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
3	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
6	Kick Plate	Gallery GSH 80A C32D (200 x 760)	US32D
6	Overhead Door Stop	Norton Rixson 10-336 630	630
3	Weatherstripping	K.N. Crowder W-8P x 2150mm	
6	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
6	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A

Heading #67 (Group: EXT SGL OP FG)

Item #130 1 Single door 322A, EXTERIOR FROM VESTIBULE 90° RHR

1100 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	Stanley NRP-FBB199 4 1/2" x 4 1/2" US32D	US32D
1	Exit Device	Stanley 3RO2103 x RHR x 630 x 1100	630
1	Cylinder	Best 1E72S2RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	CBH CBH 353 C32D 45	US32D
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
1	Electric Strike	HES 9600-630- 2005M3	630
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
1	Kick Plate	Gallery GSH 80A 400 X 1060 C32D	US32D
1	Overhead Door Stop	Rixson 1-536 630	630
1	Accessory	HES 2005M3 MUST BE INSTALLED WITH ES	
1	Threshold	K.N. Crowder CT-45 x 1219mm	
1	Weatherstripping	K.N. Crowder W-20S- 1219 CA	CA
1	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Weatherstripping	K.N. Crowder W-50S- 2150- CA	CA
2	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
1	Miscellaneous Item	Camden ESCUTCHEON CM-89S X CM-89S-ADP1	630
		AT EXTERIOR ACTUATOR ONLY	
1	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
1	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A
1	Miscellaneous Hardware	Camden CM-1190-7224 WALL MTD. 630	630
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES AND ALL ELECTRICAL DEVICES LISTED. GC TO PROVIDE BACKBOXES FOR ACTUATORS

MODE OF OPERATION
UNLOCKED POSITION: EXIT DEVICES ARE DOGGED DOWN VIA DOGGING FEATURE. ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY (WALL MTD. KEYSWITCH LED IS GREEN)

SECURED POSITION:DOORS ARE UNDOGGRED AND LOCKED WALL MTD KEYSWITCH CM 1190 SHUNTS POWER TO EXTERIOR ACTUATOR ONLY (LED IS RED) . INTERIOR ACTUATOR IS ALWAYS ACTIVE.
EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

PREPARE DOOR AND FRAME FOR 4 HINGES

Heading #68 (Group: VEST KINDER, FG 322B)

Item #131 1 Single door 322B, VESTIBULE FROM CORRIDOR 90° RHR

1100 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Exit Device	Stanley 3RO2108 x V4908A x RHR x 630 x x 1100	
1	Cylinder	Best 1E72S2RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
1	Electric Strike	HES 9600-630- 2005M3	630
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
1	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
1	Wall Door Stop	Standard Metal S120 C26D	US26D
2	Miscellaneous Item	Camden CM-331/42R-SGLR -ROUND-3 LOGO LIT RING FLUSH MTD (2 X 4BB)	630
1	Miscellaneous Item	Zero FINGER GUARD 51A-180 -72" AL NO ALTERNATE	A
1	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	

DOOR CONTACT FOR AUDIBLE BUZZER COORDINATE WITH ELECTRICAL

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, . GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY .

SECURED POSITION:DOORS LOCKED . INTERIOR ACTUATOR IS ALWAYS ACTIVE.

EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

Heading #69 (Group: WR KINDER FG BEST)

Item #132 1 Single door 328A, INFANTS FROM WASHROOM 90° LHR

950 x 2150 x 45 - HM DR x HM FR

3	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Latchset	Best 45H0N (LC) 15 H 630 LHR	630
2	Kick Plate	Gallery GSH 80A 400 x 900 C32D MOUNT BOTH SIDES	US32D
1	Overhead Door Stop	Norton Rixson 9-336 630	630
1	Miscellaneous Item	Zero FINGER GUARD 51A-180 -48" AL NO ALTERNATE	A
1	Miscellaneous Item	Zero FINGER GUARD 951A 72" NO ALTERNATE	A

Heading #70 (Group: EXT STAAIR AMUM OP-D)

Item #133 1 Pair of doors 130AA, EXTERIOR FROM STAIR 90° LHA/RHA

1000, 1000 x 2150 x 51 - AL DR x AL FR

REM HARDWARE MULLION WITH ELECTRICAL QUICK DISCONNECT BY 08710

2	Continuous Hinge	Stanley 661 HD UL 83" AL	AL
1	Removable Mullion	Sargent EL980 USP 86"	USP
1	Exit Device	Stanley 3RO2401 x x 630 x x 2150 x 51 DOOR	630
1	Exit Device	BEST 3RO2403 x RIM CYL x 630 x 51 DOOR	630
1	Cylinder	Best 1E72S2RP 626	626
1	Cylinder	Best 1E7428(Std.)C4 RP 626	626
3	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
3	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Cylinder	Best KEY SWITCH CYL 1E74 C4 626	626
1	Electric Strike	HES 9600-630- 2005M3	630
2	Door Pull	Gallery 1180-2 TB 2" THICK DR. C32D	USC32D
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Mounting Bracket	Stanley DROP PLATE DP80-BS 689	
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
2	Kick Plate	Gallery GSH 80 C32D (150 X 950)	US32D
2	Overhead Door Holder	Rixson 1-436 630	630
2	Accessory	Von Duprin (CAD) MULLION STABALIZER 154	600
1	Threshold	K.N. Crowder CT-45 X 84" AL	
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
1	Weatherstripping	Door Mftg. WEATHERSTRIP BY ALUM DR & FR SUPPLIER	US28
2	Miscellaneous Item	Camden ACTUATOR CM-60/4 FOR EXTERIOR INSTALL	
2	Miscellaneous Item	Camden ESCUTCHEON CM-89S 630	630
1	Miscellaneous Hardware	Camden CM-1190-7224 WALL MTD. 630	630
1	Miscellaneous Hardware	Camden CM-160/22 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
2	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, . GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY (WALL MTD. KEYSWITCH LED IS GREEN)

SECURED POSITION:DOORS LOCKED WALL MTD KEYSWITCH CM 1190 SHUNTS POWER TO EXTERIOR ACTUATOR ONLY (LED IS RED) . INTERIOR ACTUATOR IS ALWAYS ACTIVE.
EGRESS IS ALWAYS FREE
3 POSITION KEYSWITCH TURNS UNIT ON/OFF/HOLDOPEN.

Heading #71 (Group: M130B-D)

Item #134 1 Pair of doors 130BA, STAIR FROM CORRIDOR 90°,180° LHRA/RHRA

1000, 1000 x 2150 x 45 - HM DR x HM FR - 45MIN

REM HRWD MULLION WITH QUICK DISCONNECT.

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Removable Mullion	Sargent EL980 USP 86"	USP
2	Exit Device	Stanley 3ROFL2108 x V4908A x x 630 x	630
3	Cylinder	Best 1E72S2RP 626	626
1	Cylinder	Best 1E7428(Std.)C4 RP 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
3	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Electric Strike	HES 9500-630-LBM- 2005M3	630
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Electronic Closer	GYRO-TECH OPERATOR 8710 X FW HEADER 628 NO ALTERNATE	628
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
2	Electro-Magnetic Holder	Norton Rixson 998M TRI VOLT 689	689
2	Electro-Magnetic Holder	Norton Rixson EXTENSIONS 900 900-300 689	689
2	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Miscellaneous Item	Camden ACTUATOR CM-60/4 FOR EXTERIOR INSTALL	
2	Miscellaneous Item	Camden ESCUTCHEON CM-89S 630	630
1	Miscellaneous Hardware	Camden CM-160/21 MTD IN ADO HEADER	
1	Miscellaneous Hardware	Camden CX-TRX-2024 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	Camden DEDICATED PS CX-PS13V3 INSTALL IN OP HEADER	
1	Miscellaneous Hardware	MISC MULLION BY FRAME SUPLIER	
1	Miscellaneous Hardware	Camden RELAY CX-33	
1	Miscellaneous Hardware	MISC WIRING /RISER DIAGRAM BY HARDWARE SUPPLIER	

HARDWARE SUPPLIER SECTION 08710 TO SUPPLY AND INSTALL AUTO OPERATOR

ELECTRICAL CONTRACTOR TO PROVIDE 120 VOLT TO HEADER OF FRAME AND RUN ALL LVW IN CONDUIT TO PUSH BUTTONS,ELECTRIC STRIKES KEYSWITCH, GC TO PROVIDE 2 X 4 BACKBOXES FOR PUSHBUTTONS.

MODE OF OPERATION
UNLOCKED POSITION: . ACTUATOR BUTTON EITHER SIDE OPENS DOOR AUTOMATICALLY.
EGRESS IS ALWAYS FREE
2 POSITION KEYSWITCH TURNS UNIT ON/OFF.

Heading #72 (Group: M201)

Item #135 — 1 Pair of doors 201A, CORRIDOR TO STAIRS — 180°,90° LHRA/RHRA

1000, 1000 x 2150 x 45 - HM DR x AL FR - 45MIN

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Removable Mullion	Stanley FLKR822 x 600 x Spacer MC822	600
2	Exit Device	Stanley 3ROFL2108 x V4908A x x 630 x	630
3	Cylinder	Best 1E72S2RP 626	626
3	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
3	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Electronic Closer	LCN 4040SE STDTRK 689 45 24V	689
		INSTALL 90 DEG DR LEAF	
1	Electronic Closer	LCN 4314ME CYLB140 689 45 24V	689
		INSTALL 180 DEG DR LEAF	
2	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
1	Overhead Door Stop	Norton Rixson 1ADJ-436 630	630
		RHR LEAF	
1	Wall Door Stop	Standard Metal S120 C26D	US26D
2	Weatherstripping	K.N. Crowder ASTRAGAL W-25-CA x 2150mm	CA
1	Weatherstripping	K.N. Crowder W-22-BL x 21'	BL
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
1	Miscellaneous Item	LCN 4040SE-3210 689	689
1	Miscellaneous Item	LCN 4310ME-3210 689	689

ELECTRICAL CONTRACTOR TO INTERFACE EMHO DR CLOSERS WITH F/A PANEL

Heading #73 (Group: CLASS RM WS 2FL)

Item #136	1 Single door 203A, CO-LAB ZONE TO CLASSROOM	90° LH
Item #137	1 Single door 205A, CORRIDOR TO CLASSROOM	90° RH
Item #138	1 Single door 207A, CORRIDOR TO CLASSROOM	90° RH
Item #139	1 Single door 207AA, CORRIDOR TO SEMINAR	90° LH
Item #140	1 Single door 209A, CORRIDOR TO ART CLASSROOM	90° LH
Item #141	1 Single door 211A, CORRIDOR TO SEMINAR	90° RH
Item #142	1 Single door 212A, CORRIDOR TO STAC CLASSROOM	90° RH
Item #143	1 Single door 213C, SMT CLASSROOM TO SMT PREP ROOM	90° RH
Item #144	1 Single door 215A, CORRIDOR TO RESOURCE ROOM	90° RH
Item #145	1 Single door 217A, CORRIDOR TO CLASSROOM	90° LH
Item #146	1 Single door 218A, CORRIDOR TO CLASSROOM	90° RH
Item #147	1 Single door 219A, CORRIDOR TO CLASSROOM	90° LH
Item #148	1 Single door 220A, CORRIDOR TO CLASSROOM	90° RH
Item #149	1 Single door 221A, CORRIDOR TO CLASSROOM	90° RH
Item #150	1 Single door 223A, CORRIDOR TO CLASSROOM	90° LH
Item #151	1 Single door 224A, CORRIDOR TO CLASSROOM	90° RH
Item #152	1 Single door 226A, CORRIDOR TO CLASSROOM	90° LH
Item #153	1 Single door 227A, CORRIDOR TO CLASSROOM	90° RH
Item #154	1 Single door 228A, CORRIDOR TO CLASSROOM	90° LH
Item #155	1 Single door 229A, CORRIDOR TO CLASSROOM	90° RH
Item #156	1 Single door 231A, CORRIDOR TO CLASSROOM	90° LH
Item #157	1 Single door 232A, CORRIDOR TO CLASSROOM	90° RH
Item #158	1 Single door 233A, CORRIDOR TO CLASSROOM	90° LH
Item #159	1 Single door 235A, CORRIDOR TO CLASSROOM	90° RH
Item #160	1 Single door 236A, CORRIDOR TO CLASSROOM	90° LH
Item #161	1 Single door 238A, CORRIDOR TO CLASSROOM	90° RH
Item #162	1 Single door 239A, CORRIDOR TO RESOURCE ROOM	90° RH
Item #163	1 Single door 240A, CORRIDOR TO SEMINAR ROOM	90° LH

950 x 2150 x 45 - HM DR x HM FR

84	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
12	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
16	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
28	Cylinder	Best 1E74(Std.) 626	626
28	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
28	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
28	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
28	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #74 (Group: CLASS RM OH 2FL)

Item #164	1 Single door 204A, CO-LAB ZONE FROM CLASSROOM	90° RHR
Item #165	1 Single door 213A, CORRIDOR TO SMT PREP ROOM	90° RH
Item #166	1 Single door 213B, STAC CLASSROOM TO SMT PREP ROOM	90° RH
Item #167	1 Single door 214A, CORRIDOR TO SMT CLASSROOM	90° LH

950 x 2150 x 45 - HM DR x HM FR

12	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 LH	630
2	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
1	Lockset	Best 45H7R (Std.) 15 H 630 RHR	630
4	Cylinder	Best 1E74(Std.) 626	626
4	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
4	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
4	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
4	Overhead Door Stop	Norton Rixson 9-336 630	630

Heading #75 (Group: VEST PR ULC EMHO)

Item #168	1 Pair of doors 208A, STAIR FROM CORRIDOR	110°,180° LHRA/RHRA
Item #169	1 Pair of doors 222A, CORRIDOR FROM STAIR	180°,110° LHRA/RHRA
Item #170	1 Pair of doors 230A, CORRIDOR FROM STAIR	90°,180° LHRA/RHRA

1000, 1000 x 2150 x 45 - HM DR x HM FR - 45MIN

24	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
6	Exit Device	Stanley 3ROFL2108 x V4908A x x 630 x	630
6	Cylinder	Best 1E72S2RP 626	626
6	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
6	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
6	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
6	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
6	Electro-Magnetic Holder	Norton Rixson 998M TRI VOLT 689	689
6	Electro-Magnetic Holder	Norton Rixson EXTENSIONS 900 900-300 689	689
6	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
6	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
3	Miscellaneous Hardware	MISC MULLION BY FRAME SUPLIER	

ELECTRICAL CONTRACTOR TO INTERFACE EMHO WITH F/A PANEL.

Heading #76 (Group: CLASSRM CL WS 1000)

Item #171 1 Single door 210A, ART CLASSROOM TO ART PREP ROOM 90° RH

1000 x 2150 x 45 - HM DR x HM FR - 45MIN

4	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Lockset	Best 45H7R (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD7016-SPA 689 SNDTPK	689
1	Kick Plate	Gallery GSH 80A 200 X 950 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
1	Weatherstripping	K.N. Crowder W-24S- 965 CA	CA

Heading #77 (Group: STORAGE 1000 CLP)

Item #172 1 Single door 212AA, STAC CLASSROOM FROM DUST EXTRACTOR 90° LHR

1000 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 LHR	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016-DS x SNDTPK x 689-SN	689
1	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32

Heading #78 (Group: STORAGE 1100)

Item #173 1 Single door 243A, CORRIDOR TO CUSTODIAN 90° RH
Item #174 1 Single door 252A, CORRIDOR TO CUSTODIAN 90° RH

1100 x 2150 x 45 - HM DR x HM FR

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Lockset	Best 45H7D (Std.) 15 H 630 RH	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD8016 ARP x SNDTPK x689 REG Arm SN	689
2	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
2	Wall Door Stop	Standard Metal S120 C26D	US26D
2	Weatherstripping	K.N. Crowder W-22-BL x 18'	BL
2	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA

1) PREPARE FRAME AND DOOR FOR 4 HINGES

Heading #79 (Group: MECH RM ,1100 BEST)

Item #175 1 Single door 247A, CORRIDOR TO MECHANICAL ROOM 90° LH
Item #176 1 Single door 248A, CORRIDOR TO BOILER ROOM 90° LH

1100 x 2150 x 45 - HM DR x HM FR - 45MIN

8	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
2	Lockset	Best 45H7D (Std.) 15 H 630 LH	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
2	Surface Closer	Stanley HD8016 ARP x SNDTPK x689 REG Arm SN	689
2	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
2	Overhead Door Stop	Rixson 9-536 652	652
2	Weatherstripping	K.N. Crowder W-20S-CA 48"	USCA
4	Weatherstripping	K.N. Crowder W-50S- 2150- CA	CA
2	Gasketing	K.N. Crowder CT-54 X 48 AL x SHIM	

PREPARE DR AND FRAME FOR 4 HINGES

Heading #80 (Group: ROOF BEST)

Item #177 1 Single door 247B, ROOF

1100 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	Stanley NRP-FBB199 4 1/2" x 4 1/2" US32D	US32D
1	Lockset	Best 45H7G 15 H 630 LH	630
2	Cylinder	Best 1E74(Std.) 626	626
2	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
2	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD8016 -SPA x SNDTPKx 689 SN	689
1	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
1	Overhead Door Stop	Rixson 1-536 630	630
1	Threshold	K.N. Crowder CT-45 x 1219mm	
1	Weatherstripping	K.N. Crowder W-20S- 1219 CA	CA
1	Weatherstripping	K.N. Crowder W-24S- 1219 CA	CA
2	Weatherstripping	K.N. Crowder W-50S- 2150- CA	CA
1	Miscellaneous Hardware	MISC DOOR CONTACT BY SECURITY CONTRACTOR	

Heading #81 (Group: M248B)

Item #178 — 1 Single door 248B, BOILER ROOM TO STAIR — 90° LH

1100 x 2150 x 45 - HM DR x HM FR

4	Standard Hinge	BEST FBB179 (4 1/2" x 4) US26D	US26D
1	Latchset	Best 45H0N (LC) 15 H 630 LH	630
1	Surface Closer	Stanley HD8016-DS x SNDTPK x 689-SN	689
1	Kick Plate	Gallery GSH 80A 200 X 1060 C32D	US32
1	Wall Door Stop	Standard Metal S120 C26D	US26D

Heading #82 (Group: MECH. RMS, CL,WS)

Item #179 — 1 Single door 254A, CORRIDOR TO ELEV MECH ROOM — 90° RH

950 x 2150 x 45 - HM DR x HM FR - 45MIN

3	Standard Hinge	BEST FBB168 (4 1/2" x 4 1/2") US26D	US26D
1	Lockset	Best 45H7D (Std.) 15 H 630 RH	630
1	Cylinder	Best 1E74(Std.) 626	626
1	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
1	Cylinder	Best CONSTRUCTION CORE 1CA Brass	
1	Surface Closer	Stanley HD7016-ARP FPC SNDTPK 689-REG MTD.	689
1	Kick Plate	Gallery GSH 80A 200 x 900 C32D	US32D
1	Wall Door Stop	Standard Metal S120 C26D	US26D
1	Weatherstripping	K.N. Crowder W-50S- 1 x 1219, 2 x 2150 CA	CA
1	Gasketing	K.N. Crowder CT-54-CA x 950 mm x SHIM	CA

Heading #83 (Group: TEACHERS CLOSETS BEST)

Item #180 — 1 Elevation TC-CLOSET

__ x __ x 35 - WD DR x WD FR

19 CLOSETS GF / 2 PER CLOSET
28 CLOSETS 2ND FL / 2 PER CLOSET

94	Lockset	BEST 7KC 3 (Std.) 7 R 15 D STK 626	626
94	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626
94	Cylinder	Best CONSTRUCTION CORE 1CA Brass	

DOORS MUST BE MIN 1 3/8" THICK.
BALANCE OF HARDWARE BY MILLWORK SUPPLIER.

Heading #84 (Group: OFFICE OPS)

Item #181 1 Elevation OFFICE

__ x __ x __ - HM DR x HM FR

1		ADDITIONAL PRE INSTALL SITE NEETING WITH GC/ ELECTRICAL TO COORDINATE.	
1	Accessory	Camden (CAD) ANNUNCIATOR CC-CUST-FP-ENTDOO-04 (install in office)	
2	Miscellaneous Hardware	Camden (CAD) CIRCUIT CM-4000-60N INSTALL IN PARALLEL WITH OFFICE ANNUN & EMERG WR	
1	Miscellaneous Hardware	Camden CM-53 back box for office annunciator.	
1	Miscellaneous Hardware	Camden CX-PS10UL INSTALL IM GEN OFFICE	

HARDWARE SUPPLIER TO SUPPLY & INSTALL ABOVE LISTED ITEMS IN MAIN GENERAL OFFICE AND TERMINATE LVW.

ELECTRICAL CONTRACTOR TO SUPPLY & INSTALL 120VAC TO POWER SUPPLY AND 16GA LVW FROM WR AS REQUIRED.

Heading #85 (Group: MISC-BEST)

Item #182 1 Elevation MISC

__ x __ x __ - HM DR x HM FR

2		BEST CONSTRUCTION CONTROL KEYS	
5		BEST CONSTRUCTION KEYS	
5		BEST MASTER KEYS	
3		BEST PERMANENT CONTROL KEYS	
20	Cylinder	Best BEST PERMANENT CORE 1C7N1 GMK 3 Keys	626

Hospital Push/Pull Latches

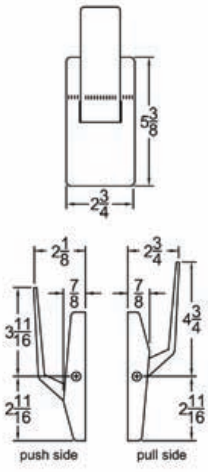
6830 Series – Low Profile Reverse Cylindrical Latches

Innovation, Quality, Customer Service...

Standard Features

- Ideal for time-out rooms, behavioral settings and other similar institutions
- Latch bolt is always retracted until handle is activated
- When handle is activated, the latch bolt projects until the handle is released
- Push or pull handle trim assembly on one side and flat plate on other side of door.
- Cylindrical reverse latch application – passage function
- 1-¾" standard door thickness (specify if different)
- Meets ADA requirements
- Trim is mounted using four thru-bolts for maximum stability
- Handing of unit is field-reversible by easily reversing the cam holder assembly on the backside of the unit
- Linear acting cam which provides for a smoother operating unit
- One continuous spring provides a smoother operation and an extended life for the unit
- UL Listed in U.S.A and Canada for use on door fire rated 90 minutes or less, up to 4'0" x 8'0"





Models

6830	6832	6834	6836	6831	6833	6835	6837
Push Handle Down	Pull Handle Down	Push Handle Up	Pull Handle Up	Push Handle Down	Push Handle Down	Push Handle Up	Pull Handle Up

How to Order:

Example: 6831 – 2 A – US32D – AM

Model:
• 6830 • 6831 • 6832 • 6833
• 6834 • 6835 • 6836 • 6837

Latch Backset:
• 2 = 2-¾" • 5 = 5"
• 3 = 3-¾" • 7 = 7"

Strike:
• T = 2-¾" T-Strike
• A = 4- " ASA Strike

Finish:
• US32D • US32 • US10B • US3
• US26D • US26 • US10 • US4

Options, if Needed:
• H • AM • L • EX • X • RC • THICK • P (See pages C-3 to C-5 for details)

Architectural Builders Hardware Manufacturing, Inc.
1222 Ardmore Avenue, Itasca, IL 60143
Tel: 630-875-9900 • Fax: 630-875-9918 / 800-932-9224
Web: www.abhmfg.com • Email: abhinfo@abhmfg.com

 2014 ABH Mfg., Inc.

CDH

Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26



BEST
dormakaba Group

40H Series

Heavy Duty Mortise Locks

by BEST



BEST: Setting the Standard for Security

40H Series - Standard Lever & Trims


Lever- 3
Rose - H


Lever- 12
Rose - H


Lever- 14
Rose - H


Lever- 15
Rose - H


Lever- 16
Rose - H

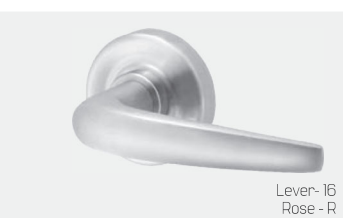

Lever- 17
Rose - H


Lever- 3
Rose - R

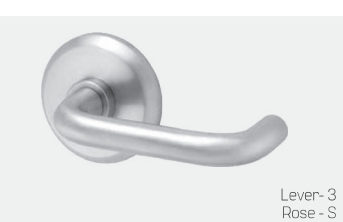

Lever- 12
Rose - R

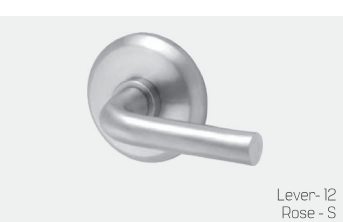

Lever- 14
Rose - R


Lever- 15
Rose - R


Lever- 16
Rose - R

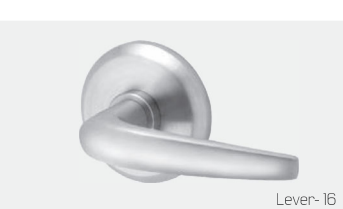

Lever- 17
Rose - R


Lever- 3
Rose - S


Lever- 12
Rose - S

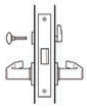
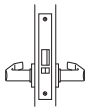
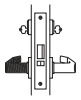
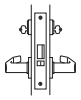
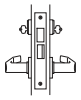
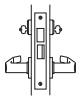

Lever- 14
Rose - S


Lever- 15
Rose - S


Lever- 16
Rose - S


Lever- 17
Rose - S

Functions

Function & Diag. (ANSI No.)	Description: Latch operated by	Description: Deadbolt operated by	Outside Lever or Knob: Locked by	Outside Lever or Knob: Unlocked by	Inside Knob/Lever: Locked by	Inside Knob/Lever: Unlocked by
Single keyed (continued)						
LT-Privacy 	Rotating inside lever Rotating outside lever—only when turn knob is unlocked	N/A	Turning inside turn lever Turning the emergency key.	Turning inside turn lever; Rotating inside lever; Turning the emergency key.	Cannot be locked	Always unlocked
N-Passage (F01) 	Rotating inside or outside lever	N/A	Cannot be locked	Cannot be unlocked	Cannot be locked	Cannot be locked
NX-Exit (F31) 	Rotating inside lever The latchbolt is deadlocked with an auxiliary deadlatch	N/A	Always unlocked	Cannot be locked	Cannot be locked	Always unlocked
Double keyed						
Entrance (*C-Public) F09 	Rotating inside lever; Rotating outside lever only when unlocked by key in inside cylinder Turning key in outside cylinder only. The latchbolt is deadlocked with an auxiliary deadlatch. When required, inside cylinder may be combinated to operate by master key only	N/A	Turning key in inside cylinder	Turning key in inside cylinder	Cannot be locked	Always unlocked
Holdback (CHB) 	Turning outside key; Rotating outside lever only when unlocked by key in inside cylinder Inside lever Latchbolt held retracted by turning inside key while holding up on inside lever. The latchbolt is deadlocked with an auxiliary deadlatch	N/A	Turning key in inside cylinder	Turning key in inside cylinder	Cannot be locked	Always unlocked
Communicating (G) F14 	Latch operated from either side only when the deadbolt is retracted.	Turning key in outside or inside cylinder	Turning key in inside or outside cylinder	Turning key in inside or outside cylinder	Turning key in inside or outside cylinder	Turning key in inside or outside cylinder
Intruder (IND) F33 	Turning key in inside or outside cylinder Rotating outside lever when deadbolt is retracted Rotating inside lever	Turning key in outside or inside cylinder Rotating inside lever (Retracts the deadbolt and latch simultaneously.)	Extending the deadbolt by turning key in inside or outside cylinder	Retracting the deadbolt by turning key in inside or outside cylinder Rotating inside lever (Retracts the deadbolt and latch simultaneously.)	Cannot be locked	Always unlocked
Intruder (INL) F32 	Rotating inside lever Rotating outside lever only when unlocked by inside or outside key Turning key in inside or outside cylinder. The latchbolt is deadlocked with an auxiliary deadlatch. When required, inside cylinder may be combinated to operate by master key only.	N/A	Turning key in inside or outside cylinder	Turning key in inside or outside cylinder	Cannot be locked	Always unlocked

*ATTENTION: Locksets that secure both sides of the door are controlled by building codes and the Life Safety Code®. In an emergency exit situation, failure to quickly unlock the inside lever could be hazardous or even fatal.



BEST
dormakaba Group

7KC Series

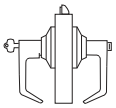
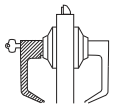
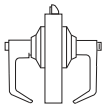
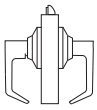
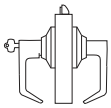
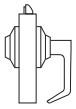
Medium Duty Cylindrical Locks

by BEST



BEST: Setting the Standard for Security

Functions

Function & Diag. (ANSI No.)	Description: Latch operated by	Outside Lever: Locked by	Outside Lever: Unlocked by	Inside Lever: Locked by	Inside Lever: Unlocked by
Single keyed					
Entry (AB) F109-Grade 2 	Rotating inside lever Rotating the outside lever – only when the inside push button is out Turning key in outside lever	Pushing the inside button Pushing and turning the inside button. Turning the button keeps the outside lever locked until the button is turned back	Turning the key in the outside lever (only when the button is not turned) Rotating the inside lever (only when the button is not turned) Closing the door (only when the button is not turned)	Cannot be locked	Always Unlocked
Storeroom (D) F86-Grade 2 	Turning key in the outside lever Rotating inside lever	Always locked	Cannot be unlocked	Cannot be locked	Always Unlocked
Privacy (L) F76-Grade 2 	Rotating inside lever Rotating outside lever– only when inside push button is out	Pushing inside button	Rotating the outside slotted button Rotating the inside lever, Closing the door	Cannot be locked	Always Unlocked
Passage (N) F75-Grade 2 	Rotating inside lever Rotating outside lever	Cannot be unlocked	Always unlocked	Cannot be locked	Always Unlocked
Classroom (R) F84-Grade 2 	Rotating inside lever Turning key in outside lever when outside lever is locked Rotating outside lever when not locked by key	Turning key in outside lever	Turning key in outside lever	Cannot be locked	Always Unlocked
Exit (Y) Grade 2 	Rotating the inside lever	No outside lever - Blank rose	No outside lever - Blank rose	Cannot be locked	Always Unlocked
Single Dummy (1DT) Grade 2 	This is a single, surface-mounted lever for an inactive door or a non-latching door				



BEST
dormakaba Group

9K Series

Heavy Duty Cylindrical Locks – Levers

by BEST



BEST: Setting the Standard for Security

Functions

Description		Outside Lever		Inside Lever	
Function & Diag.(ANSI No.)	Latch operated by	Locked by	Unlocked by	Locked by	Unlocked by
Double keyed (Continued)					
Storeroom* (G) F91 	Rotating the outside lever when not locked by key Rotating the inside lever when not locked by key	Turning the key in the inside lever Turning the key in the outside lever	Turning the key in the inside lever Turning the key in the outsidelever	Turning the key in the inside lever Turning the key in the outside lever	Turning the key in the inside lever, Turning the key in the outside lever
	Turning the key in either the inside or the outside, locks or unlocks both sides.				
Intruder (IN) F11 	Rotating inside lever; Rotating outside lever only when not locked by inside or outside key	Turning key in the inside lever Turning the key in the outside lever	Turning key in the inside lever, Turning the key in the outside lever	Cannot be locked	Always unlocked
Communicating* (S) F80 	Turning the key in the inside lever Turning the key in the outside lever Rotating the inside or outside lever (if unlocked)	Turning the key in the outsidelever	Turning the key in the outside lever	Turning the key in the inside lever	Turning the key in the inside lever
	Turning the key in either lever, locks or unlocks its own lever independently..				
Communicating* (W) F87 	Turning the key in the inside lever Turning the key in the outside lever	Always fixed	Cannot be unlocked	Always fixed	Cannot be unlocked
Keyless					
Privacy (L) F76 	Rotating the inside lever Rotating the outside lever only when the inside push button is out	Pushing the inside button	Rotating the outside slotted button Rotating the inside lever Closing the door.	Cannot be locked	Always unlocked
Passage (N) F75 	Rotating the inside lever Rotating the outside lever	Cannot be locked	Always unlocked	Cannot be locked	Always unlocked
Exit (NX) F89 	Rotating the inside lever	Always fixed	Always fixed	Cannot be locked	Always unlocked
Patio (P) F77 	Rotating the inside lever Rotating the outside lever only when the inside push button is out	Pushing the inside button	Rotating the inside lever Closing the door	Cannot be locked	Always unlocked
Exit (Y) 	Rotating the inside lever			Cannot be locked	Always unlocked
Single Dummy Trim (1DT) 	This is a single, surface-mounted lever for an inactive door or a non-latching door				

*ATTENTION: Locksets that secure both sides of the door are controlled by building codes and the Life Safety Code. In an emergency exit situation, failure to quickly unlock the inside knob could be hazardous or even fatal.

5 Knuckle Full Mortise Hinges

Standard Weight Ball Bearing

FBB179 – (ANSI A8112) Steel – polished and plated or phosphated and prime coated for painting

FBB191 – (ANSI A2112) Brass or bronze – polished and plated or painted

FBB191 (32) – (ANSI A5112) Stainless steel – highly polished

FBB191 (32D) – (ANSI A5112) Stainless steel – satin finish

- For medium weight doors of average frequency
- All hinges have template screw hole location for use on either wood or hollow metal doors and frames
- Equipped with two Stanley permanently lubricated non-detachable ball bearings
- Pins in non-ferrous hinges are stainless steel
- Hole in bottom tip for easy pin removal
- Reversible flush tips and pins
- Hinges can be furnished as follows:
  - with raised barrel (RB)
  - with electric wires and/or switches (CE and/or CS)
  - with hospital tips (HT)
  - with decorative tips
  - with security studs
  - with non-removable pins (NRP)



Size Open		Gauge of Metal		Flat Head Screws Per Piece		Quantity Per		Case Weight			
						Box	Case	Bronze		Steel	
Inches	(mm)	Inches	(mm)	Machine	Wood	Each	Each	Lbs.	(Kg)	Lbs.	(Kg)
3-1/2 x 3	(89 x 76)	.123	(3.1)	6 - 10-24 x 1/2	6 -10 x 1	3	90	58	(26)	54	(24)
3-1/2 x 3-1/2	(89 x 89)	.123	(3.1)	6 - 10-24 x 1/2	6 -10 x 1	3	90	65	(29)	59	(27)
4 x 3-1/2	(102 x 89)	.130	(3.3)	8 - 12-24 x 1/2	8 -12 x 1-1/4	3	48	43	(19)	39	(18)
4 x 4	(102 x 102)	.130	(3.3)	8 - 12-24 x 1/2	8 -12 x 1-1/4	3	48	45	(20)	42	(19)
4-1/2 x 4	(114 x 102)	.134	(3.4)	8 - 12-24 x 1/2	8 -12 x 1-1/4	3	48	55	(25)	52	(24)
4-1/2 x 4-1/2	(114 x 114)	.134	(3.4)	8 - 12-24 x 1/2	8 -12 x 1-1/4	3	48	59	(27)	55	(25)
5 x 4	(127 x 102)	.146	(3.7)	8 - 12-24 x 1/2	4 -12 x 1-1/4	3	30	41	(19)	39	(18)
5 x 4-1/2	(127 x 114)	.146	(3.7)	8 - 12-24 x 1/2	4 -12 x 1-1/4	3	30	45	(20)	43	(19)
5 x 5	(127 x 127)	.146	(3.7)	8 - 12-24 x 1/2	4 -12 x 1-1/4	3	30	50	(23)	46	(21)
*6 x 4-1/2	(152 x 114)	.160	(4.1)	10 -1/4 -20 x 1/2	5 -14 x 1-1/2	3	24	43	(19)	36	(16)
*6 x 5	(152 x 127)	.160	(4.1)	10 -1/4 -20 x 1/2	5 -14 x 1-1/2	3	24	47	(21)	40	(18)
*6 x 6	(152 x 152)	.160	(4.1)	10 -1/4 -20 x 1/2	5 -14 x 1-1/2	3	24	67	(30)	61	(28)

* Available in Steel only
Consult factory for other sizes not listed

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

5 Knuckle Full Mortise Hinges

Heavy Weight Ball Bearing

FBB168 – (ANSI A8111) Steel – polished and plated or phosphated and prime coated for painting

FBB199 – (ANSI A2111) Brass or bronze – polished and plated or painted

FBB199 (32) – (ANSI A5111) Stainless steel – highly polished

FBB199 (32D) – (ANSI A5111) Stainless steel – satin finish

- For use on heavy doors or doors where high frequency is expected such as entrance doors to office buildings, stores, public buildings and corridor entrance doors to offices
- All hinges have template screw hole location for use on either wood or hollow metal doors and frames
- Equipped with four Stanley permanently lubricated non-detachable ball bearings
- Pins in non-ferrous hinges are stainless steel
- Hole in bottom tip for easy pin removal
- Reversible flush tips and pins
- Hinges can be furnished as follows:
  - with raised barrel (RB)
  - with electric wires and/or switches (CE and/or CS)
  - with hospital tips (HT)
  - with decorative tips
  - with security studs
  - with non-removable pins (NRP)



Size Open		Gauge of Metal		Flat Head Screws Per Piece		Quantity Per		Case Weight		Case Weight	
						Box	Case	Bronze		Steel	
Inches	(mm)	Inches	(mm)	Machine	Wood	Each	Each	Lbs.	(Kg)	Lbs.	(Kg)
4-1/2 x 4-1/2	[114 x 114]	.180	[4.6]	8 - 12-24 x 1/2	8 - 12 x 1-1/4	3	30	45	[21]	42	[19]
5 x 4-1/2	[127 x 114]	.190	[4.8]	8 - 12-24 x 1/2	8 - 12 x 1-1/2	3	24	46	[21]	40	[18]
5 x 5	[127 x 127]	.190	[4.8]	8 - 12-24 x 1/2	8 - 12 x 1-1/2	3	24	50	[23]	46	[21]
6 x 4-1/2	[152 x 114]	.203	[5.2]	10 - 1/4 -20 x 1/2	10 - 14 x 1-1/2	3	24	63	[29]	53	[24]
6 x 5	[152 x 127]	.203	[5.2]	10 - 1/4 -20 x 1/2	10 - 14 x 1-1 /2	3	24	65	[30]	55	[25]
6 x 6	[152 x 152]	.203	[5.2]	10 - 1/4 -20 x 1/2	10 - 14 x 1-1/2	3	24	76	[35]	64	[29]
8 x 6*	[203 x 152]	.203	[5.2]	16 - 1/4 -20 x 1/2	16 - 14 x 1-1/2	3	12	57	[26]	51	[23]
8 x 8*	[203 x 203]	.203	[5.2]	16 - 1/4 -20 x 1/2	16 - 14 x 1-1/2	3	12	68	[31]	61	[28]

* Available in Steel only
Consult factory for other sizes not listed



BEST
dormakaba Group

Precision 2000 Series

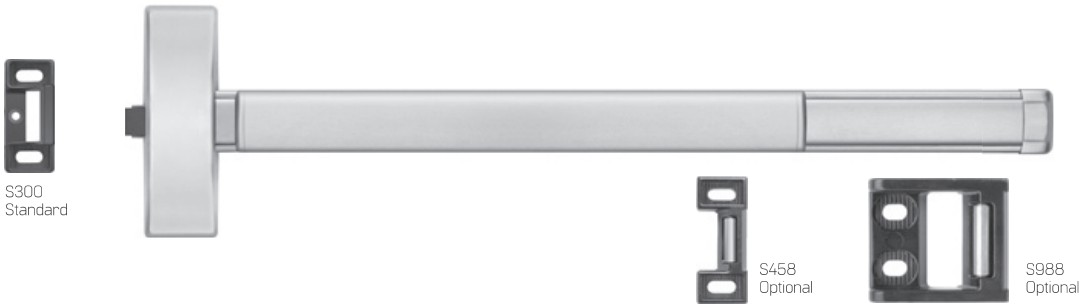
Touchbar Exit Devices

by BEST



Strength by design. Simply BEST.

Rim Exit Devices



Precision 2100 Series - Reversible
Precision FL2100 Fire Exit Series - Reversible

Doors – For all types of single and double doors with a mullion. For mullions, see page 18. Available for 1-3/4" to 2-1/4" thick, up to 4'-0" wide opening. For thicker doors, consult factory. Furnished standard for 1-3/4" thick, 3'-0" wide opening.

Device – Covers ANSI A115.2 (Type 161), A115.18 cylinder lock and A115.1 (Type 86) Mortise Lock preparation.

Functions – Functions are field selectable except for the Double Cylinder option. The device is furnished for a desired function if specified. If not specified the "03" function is furnished standard.

Double Cylinder – Handed, "10" Function available. Requires two rim type cylinders, not furnished standard. See page 20.

Base Material – The Cover, Touchbar, Device Channel, Lock/Hinge Side Filler and End Cap are furnished of heavy wrought Brass, Bronze or Stainless Steel. 628 Devices are furnished with Aluminum, Brass, Bronze and Stainless Steel components. See "Finish & Base Material" chart page 3.

Chassis – Investment Cast Steel, Zinc Dichromated.

Latchbolt – Stainless Steel, Deadlocking, 3/4" throw.

Strikes – No. S300, Investment Cast Stainless Steel, Black Powder Coated furnished standard. No. S988, optional strike for use on Aluminum Door applications, please specify when ordering. No. S458, optional strike for use on Mullion applications, please specify when ordering. For optional strike information see page 35.

Dogging – 1/4" turn hex key dogging standard. NOT available on Fire Exit Hardware.

Touchbar Height – 39-15/16" from floor standard. May be varied as situation dictates.

Reversible – Reversible for all functions and Trims. Standard packaging RHRB.

UL Listed – Panic and Fire Exit Hardware. Conforms to UL10C and UBC 7-2.

ANSI/BHMA – Devices are BHMA certified for ANSI 156.3, Grade 1.

Finishes –

605	606	612	613	622
625	626W	628	630	690

For Finish description see page 3.

Cylinders – Rim Type, not furnished standard. Specify when required. For cylinder details see page 19.

Stile Width – See Stile Information on page 37.

Retrofit Applications – The 2100 and FL2100 Series Devices are designed to retrofit into other manufacturers' mounting hole locations. 1700 Series Pull Trim and 4900 Series Lever Trim may also be factory set for these applications by specifying prefix "R" (e.g. 2108 R4908A). Consult factory for details.

Precision 21 Series – Nonhanded
The 21 Series Device is designed to be compatible with many manufacturers' Access Control exterior trim. The device incorporates a center driven cam to receive the tailpiece of the access control product. The tailpiece rotation required to retract the latch is a minimum of 50 degrees. Consult factory for details.

Device Options

Prefix	Description	Page
C	Quick Connect Plugs	40
DE	Delayed Egress	25
E	Electric Device	29
ELR	Electric Latch Retraction	23
HC	Windstorm and Hurricane Code Device	21
LDS	Latchbolt Monitoring Double Switch	30
LS	Latchbolt Monitoring Switch	30
MLR	Motorized Latch Retraction	41
Q	Wireless Access Management System	31
TDS	Touchbar Monitoring Double Switch	30
TS	Touchbar Monitoring Switch	30
WTDS	Weatherized Touchbar Mon. Dbl. Switch	30
WTS	Weatherized Touchbar Monitoring Switch	30

To specify add Prefix to Device No. (e.g. TS2103)

Suffix	Description	Page
ALK	Exit Alarm: battery operated	28
ALW	Exit Alarm: remote power	28
BRL	Braille Touchbar	36
CD	Cylinder Dogging	19
DS	Door Position Monitoring Switch	30
LD	Less Dogging	19
SEC	Security Screws	3
SNB	Sex Nut and Bolt	3
WALW	Weatherized Exit Alarm: remote power	28

To specify add Suffix to Device No. (e.g. 2103CD)

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

Trims

1. All Trims are furnished with wrought plates and extruded or cast solid grips.
2. Specify Grip Design (A,B,C) ("A" Grip furnished standard for 1700 Series Trim, "C" Grip furnished standard for 2000 Series Trim)
3. 630 Trim is furnished for 628 Devices.
4. 626 Trim is furnished for 626W Devices.

Retrofit Applications
The R1700 Series Trim is designed to retrofit into other manufacturers' installations when used with the wide stile Precision Series Devices. Consult factory for details.



1700A "A" Grip | 1700B "B" Grip | 1700C "C" Grip | 2000C "C" Grip

V4908A Vandal Resistant Trim
A heavy duty lever trim designed to withstand abuse and vandalism. Composed of extra strength shock-absorbing "overload" springs and heavy duty investment cast stainless steel internal components. Lever returns to the "home" position eliminating the need to reset the lever.

Retrofit Applications
The R4900 Series Trim is designed to retrofit into other manufacturers' installations when used with the wide stile Precision Series Devices.
Consult factory for details.



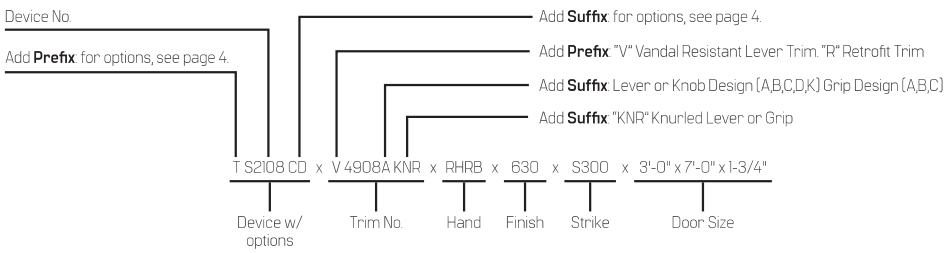
4900A "A" Lever | 4900B "B" Lever | 4900C "C" Lever | 4900D "D" Lever | 4900K "K" Knob

- For Trim dimensions see page 39.
- Trims are BHMA certified for ANSI 156.3, Grade 1.
- Trims are through bolted and will cover 161 and 86 cutouts (except for 2000C Trim).
- Cylinder, Rim Type, not furnished standard. For cylinder details see page 19.

1. All the escutcheons and levers are castings or forgings.
2. Specify Lever or Knob Design (A,B,C,D,K) and Handing ("A" Lever x RHRB furnished standard)
3. 626 Trim furnished for 626W, 628 and 630 Devices

ANSI Function	01 Exit Only (cover plate)	02 Dummy Trim	03 Key Retracts Latchbolt	05 Key Locks/ Unlocks Thumbpiece	08 Key Locks/Unlocks Lever/Knob	10* Double Cylinder Inside Key Locks/Unlocks Lever/Knob	14 No Cylinder Lever/Knob Always Active	15 No Cylinder Thumbpiece Always Active
Device Nos.	2101 FL2101	2102	2103** FL2103**	2105 FL2105	2108 FL2108	2110 FL2110	2114 FL2114	2115 FL2115
Trim Nos.	1701, R1701, 2001, 4901, R4901	1702A, R1702A, 2002C, 4902A, R4902A	1703A, R1703A, 2003C, 4903A, R4903A	1705A, R1705A, 2005C	4908A, V4908A, R4908A, RV4908A	4908A, V4908A, R4908A, RV4908A	4914A, R4914A	1715A, R1715A, 2015C

Device with Trim:



Device Only: Device no., hand, finish, strike, and door size including thickness (e.g. TS2108CD x RHRB x 630 x S300 x 3'-0" x7'-0" x 1-3/4")
Trim Only: Trim no., hand, finish, strike, and door size including thickness (e.g. V4908A x RHRB x 626 x 1-3/4")
* "10" Function is handed
** 2103 & FL2103 x Cylinder Only Application includes Cylinder Attachment Kit "CA-03"

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

Surface Verticle Rod Exit Devices

Precision 2200 Series - Reversible
Precision FL2200 Fire Exit Series - Reversible


S300

Doors – For all types of single and double door applications. Available for 1-3/4" to 2-1/4" thick, up to 4-0" wide by 10'- 0" high openings. For thicker doors, consult factory. Furnished standard for 1-3/4" thick, 3'-0" wide by 7'- 0" high openings.

Device – Covers ANSI A115.2 (Type 161), A115.18 cylinder lock and A115.1 (Type 86) Mortise Lock preparation.

Functions – Functions are field selectable. The device is furnished for a desired function if specified. If not specified the "03" function is furnished standard.

Base Material – The Covers, Touchbar, Device Channel, Lock/Hinge Side Filler, Vertical Rods and End Cap are furnished of heavy wrought Brass, Bronze or Stainless Steel. US28 Devices are furnished with Aluminum, Brass, Bronze and Stainless Steel components. See "Finish & Base Material" chart on page 3.

Chassis – Investment Cast Steel, Zinc Dichromated.

Top Latchbolt – Stainless Steel, Deadlocking, 3/4" throw.

Bottom Bolt – Steel plated, independent action 5/8" throw, with adjustment range to suit 3/4" door undercut.

Top Strike – No. S300 Surface applied, Investment Cast Stainless Steel, Black Powder Coated furnished standard. For optional strikes see page 35.

Bottom Strike – No. S460, Flush mounted, Steel, Black Powder Coated.

Dogging – 1/4" turn hex key dogging standard. NOT available on Fire Exit Hardware.

Touchbar Height – 39-15/16" from floor standard. Specify required height if other than standard.

Reversible – Reversible for all functions and trims. Standard packing RHRB.

UL Listed – Panic and Fire Exit Hardware. For FIRE EXIT HARDWARE Ratings see page 34. Conforms to UL10C and UBC 7-2.

ANSI/BHMA – Devices are BHMA certified ANSI 156.3, Grade 1.

Finishes –

605	606	612	613	622
625	626W	628	630	690

For Finish description see page 3.

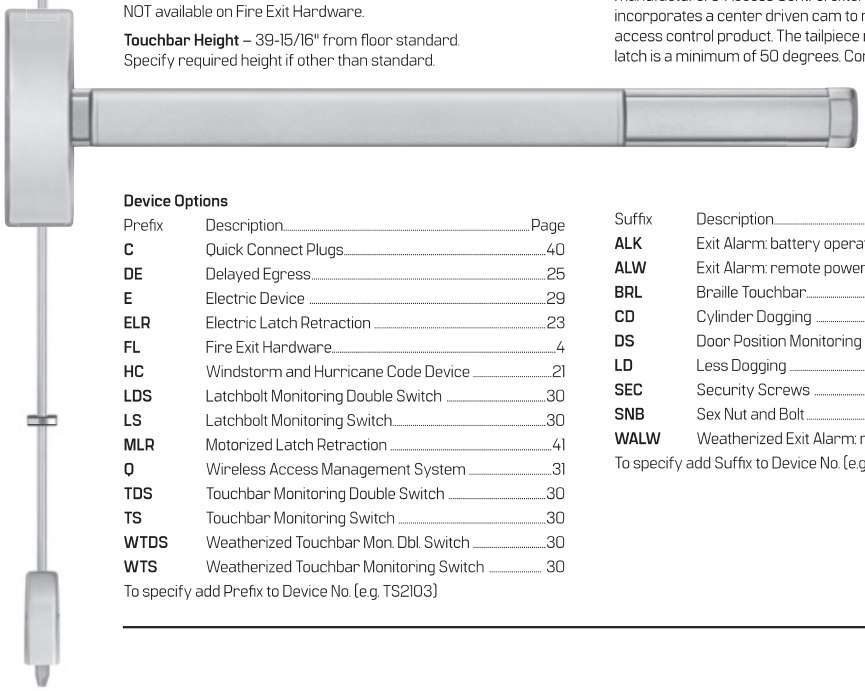
Cylinders – Rim type, not furnished standard. Specify when required. For cylinder details see page 19.

Stile Width – See Stile Information on page 37.

Less Bottom Rod (LBR) Option – Specify suffix "LBR" (e.g. 2208LBR). See UL FIRE LABEL RATING chart on page 34. Fire Rated Devices include FB277 Fire Bolt Assembly. For Fire Bolt Assembly image see page 36.

Retrofit Applications – The 2200 and FL2200 Series Devices are designed to retrofit into other manufacturers' mounting hole locations. 1700 Series Pull Trim and 4900 Series Lever Trim may also be factory set for these applications by specifying prefix "R" (e.g. 2208 R4908A).

Precision 22 Series - Reversible
The 22 Series Device is designed to be compatible with many manufacturers' Access Control exterior trim. The device incorporates a center driven cam to receive the tailpiece of the access control product. The tailpiece rotation required to retract the latch is a minimum of 50 degrees. Consult factory for details.




S460

Device Options

Prefix	Description	Page
C	Quick Connect Plugs	40
DE	Delayed Egress	25
E	Electric Device	29
ELR	Electric Latch Retraction	23
FL	Fire Exit Hardware	4
HC	Windstorm and Hurricane Code Device	21
LDS	Latchbolt Monitoring Double Switch	30
LS	Latchbolt Monitoring Switch	30
MLR	Motorized Latch Retraction	41
Q	Wireless Access Management System	31
TDS	Touchbar Monitoring Double Switch	30
TS	Touchbar Monitoring Switch	30
WTDS	Weatherized Touchbar Mon. Dbl. Switch	30
WTS	Weatherized Touchbar Monitoring Switch	30

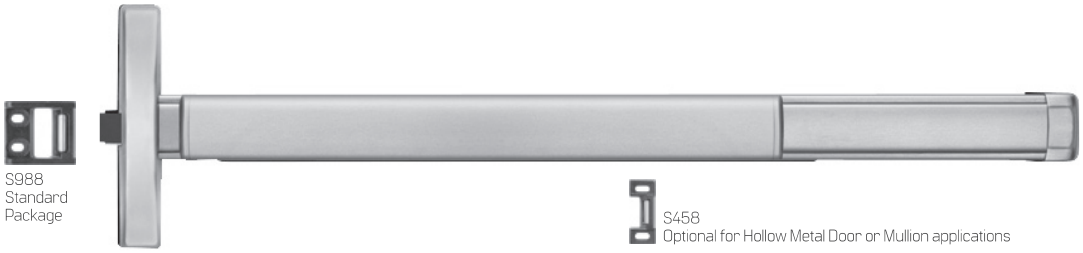
To specify add Prefix to Device No. (e.g. TS2103)

Suffix	Description	Page
ALK	Exit Alarm: battery operated	28
ALW	Exit Alarm: remote power	28
BRL	Braille Touchbar	36
CD	Cylinder Dogging	19
DS	Door Position Monitoring Switch	30
LD	Less Dogging	19
SEC	Security Screws	3
SNB	Sex Nut and Bolt	3
WALW	Weatherized Exit Alarm: remote power	28

To specify add Suffix to Device No. (e.g. 2103CD)

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

Rim Exit Devices



Precision 2400 Series - Non Handed
Precision FL2400 Fire Exit Series - Non Handed

Doors – For all types of single and double doors with a mullion. For mullions, see page 18. Available for 1-3/4" to 2-1/4" thick, up to 4'-0" wide opening. For thicker doors, consult factory. Furnished standard for 1-3/4" thick, 3'-0" wide opening.

Functions – A Universal Exit Device. Add Trim for desired function

Double Cylinder – Handed, "10" Function available. Requires two rim type cylinders, not furnished standard. See page 20.

Base Material – The Cover, Touchbar, Device Channel, Lock/Hinge Side Filler and End Cap are furnished of heavy wrought Brass, Bronze or Stainless Steel. US28 Devices are furnished with Aluminum, Brass, Bronze and Stainless Steel components. See "Finish & Base Material" chart on page 3.

Chassis – Investment Cast Steel, Zinc Dichromated.

Latchbolt – Stainless Steel, Deadlocking, 3/4" throw.

Strikes – No. S988, standard package for Aluminum Door applications, Black Powder Coated Stainless Steel Roller Strike. No. S458, optional for Hollow Metal Door or Mullion applications, please specify when ordering. For optional strike information see page 35.

Dogging – 1/4" turn hex key dogging standard. NOT available on Fire Exit Hardware.

Touchbar Height – 39-15/16" from floor standard. May be varied as situation dictates.

UL Listed – Panic and Fire Exit Hardware. For FIRE EXIT HARDWARE Ratings see page 34. Conforms to UL10C and UBC 7-2.

ANSI/BHMA – Devices are BHMA certified for ANSI 156.3, Grade 1.

Finishes –

605	606	612	613	622
625	626W	628	630	690

For Finish description see page 3.

Cylinders – Rim Type for "03" function, Mortise type for "08" function. Use 1-1/4" long standard mortise cylinder. Cylinders are not furnished standard. Specify when required. For cylinder details see page 19.

Stile Width – See Stile Information on page 37.

Device Options

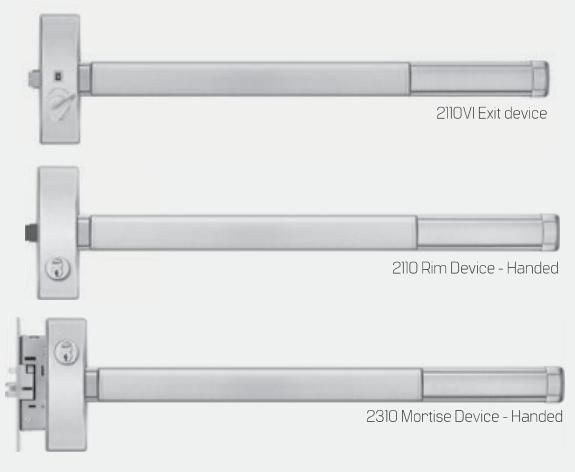
Prefix	Description	Page
C	Quick Connect Plugs	40
DE	Delayed Egress	25
E	Electric Device	29
ELR	Electric Latch Retraction	23
FL	Fire Exit Hardware	4
MLR	Motorized Latch Retraction	41
TDS	Touchbar Monitoring Double Switch	30
TS	Touchbar Monitoring Switch	30
WTDS	Weatherized Touchbar Mon. Dbl. Switch	30
WTS	Weatherized Touchbar Monitoring Switch	30

To specify add Prefix to Device No. (e.g. TS2103)

Suffix	Description	Page
ALK	Exit Alarm: battery operated	28
ALW	Exit Alarm: remote power	28
BRL	Braille Touchbar	36
CD	Cylinder Dogging	19
DS	Door Position Monitoring Switch	30
LD	Less Dogging	19
SEC	Security Screws	3
SNB	Sex Nut and Bolt	3
WALW	Weatherized Exit Alarm: remote power	28

To specify add Suffix to Device No. (e.g. 2103CD)

Double Cylinder / Intruder Function



Double Cylinder – Handed ("10" Function)

The double cylinder option is available on the Wide Stile Rim and Mortise Exit Devices. The inside Key or Thumb-Turn cylinder locks or unlocks the outside Knob or Lever trim. The outside key cylinder retracts the latchbolt.

The Wide Stile Rim may also be ordered with a Visual Indicator feature providing Lock/Unlock status of the outside trim.

Visual Indicator Features:

- Quarter-turn rotation for quick lock down
- Bright reflective material for low light conditions
- Durable integrated visual indicator assembly
- Field Conversion Kits – Quick conversion without removing the exit device

See chart below for how to order details of the Double Cylinder function exit devices

NOTE: Double Cylinder Function is handed. Rim Cylinder or Thumb-Turn sold separately. Hex or Cylinder Dogging not recommended for use with 2110 & 2110VI Double Cylinder Function.

Device Type	Device Number	Trim Number	Directional Indicator	Visual Lock Unlock Indicator
Rim	2110, FL2110	4908A, V4908A	Y	N/A
Rim	2110VI, FL2110VI	4908A, V4908A	Y	Y
Mortise	2310, FL2310	M4908A, VM4908A	N/A	N/A

Device Type	Conversion Description	Kit Nomenclature	Directional Indicator	Visual Indicator	10 Function locking assembly & Cylinder Sleeve	Chassis Cover	Visual Indicator Flag assembly	Mortise Lock & Extension Assembly
Rim	2103* or 2108 TO 2110 OR FL2110	RDC-10	Y	N/A	Y	Y	N/A	N/A
Rim	2103*, 2108 OR 2110 TO 2110VI	RDC-10VI	Y	Y	Y	Y – With Window	Y	N/A
Rim	FL2103*, FL2108 OR FL2110 TO FL2110VI	FRDC-10VI	Y	Y	Y	Y – With Window	Y	N/A
Mortise	2308 TO 2310	MDC-10	N/A	N/A	Y	Y	N/A	Y

*When converting from existing 2103/FL2103 to 10 or 10VI, the lever trim function must also be updated to 4908A or V4908A. Specify handing.

Double Cylinder Field Conversion Kits

There are two kit types available for field conversion. Standard or With Visual Indication

To convert existing 2108/FL2108 to 2110/FL2110 or 2308/FL2308 to 2310/FL2310 in the field

To convert from 2108/FL2108 to 2110VI/FL2110VI

The table above outlines the kit numbers and features included.

Miscellaneous Components


Dummy Touchbar

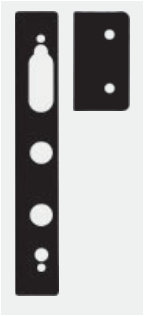
Rigid Dummy Touchbar – Touchbar is rigid. For push/pull operation specify Dummy Trim (02 function).

	3-0 Door	4-0 Door
Wide Stile:	671DR-3	671DR-4
Narrow Stile:	N673DR-3	N673DR-4

Active Dummy Touchbar with Microswitch – Has an internally mounted switch that is used to signal electromagnetic locks, horns, monitoring stations or other electronic components. For push/pull operation specify Dummy Trim (02 function). Available with CD, ALK, ALW, TDS, DS and NDS options.

	3-0 Door	4-0 Door
Wide Stile:	TS672DA-3	TS672DA-4
Narrow Stile:	TSN674DA-3	TSN674DA-4

To Order: specify Device No. x finish (e.g. 672DA-3 x 630)



Shim Kit - for Narrow Stile Devices
NSMK995 used to accommodate doors with raised glass moldings. The kit consists of one 1/8" thick shim for the Chassis and one 1/8" thick shim for the End Cap Bracket Assembly.

To Order: Specify NSMK995 (e.g. 2400 NSMK995)

Wide Stile Devices are designed with a 1/4" gap between the back of the touchbar and the door and do not require shims. If more than 1/4" space is needed behind the device specify Shim Kit SMK994.

Braille Touchbar
Embossed Touchbar with the message "CAUTION STAIRWELL" in raised letters and Braille provides assistance to persons with



impaired vision. Letters are 5/8" high and Braille is Grade 2, ADA compliant.

To Order: specify suffix "BRL" (e.g. 2103BRL)

Miscellaneous

Dogging Key
DK220 – 7/32 standard hex.


DK220

Rod Guide
RG124 – For Surface Vertical Rod Devices. Specify finish


RRG123

Miscellaneous

End Cap
EC992 – Wide Stile
NEC993 – Narrow Stile
For Hinge Stile end of all devices.
Specify finish.


EC99

Mounting Bracket
MB305 – Wide Stile
NMB591 – Narrow Stile
To mount the device to the door on the Hinge Stile side.


MB305


2200

Top Rod – 2200 and FL2200 Series.
Three stock lengths available for 7'-0", 8'-0", and 10'-0" high doors.
TR1854 – For 7'-0" doors, rod is 36" long.
TR1855 – For 8'-0" doors, rod is 48" long.
TR1857 – For 10'-0" doors, rod is 72" long.
TR5197 – For 12'-0" doors, rod is 96" long.
Note: 12'-0" top rod is not available in "FL" fire rated option.
For doors of lesser height rods must be field cut. Specify finish.


2200

Bottom Rod – 2200 and FL2200 Series.
Extended Bottom Rods – For exit device mounting heights greater than 39 15/16 exteded bottom rods are available.

To Order: B5247-09 x finish.

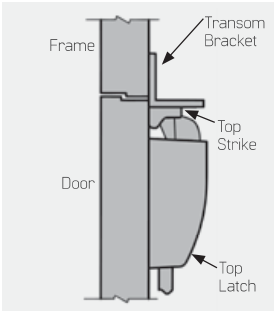
BR1859 – For Touchbar location at 39-15/16" from finished floor, rod is 32-5/16" long. Specify finish.

FB277 – Fire bolt assembly.

Transom Bracket – 2200 Series.

TMB453 – To mount the top strike in the flush transom application. Prepped for S300 Strike.





CX-33: ADVANCED LOGIC RELAY

CX-33 is a 'state of the art' door controller designed for 'universal' operation in automatic door and application security. This compact unit is small enough to fit inside most door operator cases. It provides a large 3 segment LED and simple push buttons for the easiest programming, and supports illuminated signage in restroom applications. It also leads the market with a range of exclusive operating features, including time duration in airlock applications and protection of automatic door operators when utilizing magnetic locks.



Features

- 15 operating modes with sub-modes
- Easily sequence multiple inputs with multiple maintain and hold outputs
- New V3.2 Features Include:
  - Lock down mode
  - Delayed relay activation
  - Selectable N.O or N.C. inputs
- Large 3 segment (blue) LED display
- Outstanding power filtering and surge protection
- Selectable time delays with delay on input activation
- Larger terminal strips
- 12V to 24V AC/DC
- 3 year warranty

MODEL	
CX-33	Advanced Logic Relay

Specifications

Voltage:	12V to 24V AC/DC
Current Draw:	105mA Typical, 320mA Max
Response Time:	0.5 Seconds
Display:	Blue Multi-Segment LED
Input:	4 x Dry 1 x Wet: min. 5V AC/DC N/O or N/C Selectable
Output:	3 x Form C (SPDT)
Contact Rating:	3A @ 30 VDC
Temp Range:	-22°F to +185°F (-30°C to +85°C)
Time Delay:	Hold 1 timer: 0-50 Seconds Delay 1 Timer: 0-15 Seconds Hold 2 timer: 0-50 Seconds Delay 2 timer: 0-60 Seconds Hold 3 Timer: 0-50 Seconds Delay on Activate: 0-10 Seconds
Dimensions:	2"H x 6"W x 7/8"D (51mm x 152mm x 22mm)

CX-33PS: ADVANCED LOGIC RELAY, POWER SUPPLY AND CABINET

*The industry leading **CX-33** Advanced Logic Relay is available in a metal cabinet that centralizes all door and security control system components; a 12/24 VDC power supply module, and color coded termination blocks for quick and easy installation.*



Features

- Rugged and compact metal cabinet
- Pre-wired with large terminal block for easy access
- Removable door with option for cabinet lock
- Five convenient conduit knockouts; one per side
- 12/24V DC power supply, 2 Amp. (UL listed)
- Available as part of Camden Restroom Control Kits (See pages 36-37)
- Short circuit and thermal overload protection
- 3 year warranty

MODEL	
CX-33PS	Advanced Logic Relay, 2 Amp Power Supply, Cabinet and Transformer
Option	
'L'	Add suffix '**L**' to model number for Cabinet Lock

Specifications

Voltage:	12V to 28V AC/DC
Output:	12V or 24 VDC
Current:	2 Amps
Temp Range:	32°F to +120°F (0°C to +49°C)
Dimensions:	11-1/16" H x 7-7/8"W x 2-13/16"D 281mm x 200mm x 72mm)

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

Page 80 of 129

ACTIVE INFRARED HANDS-FREE SWITCHES

RoHS COMPLIANT

ADA Compliant

SureWave™ touchless switches include exclusive features, including an extended range (up to 6 ft.), the option for wireless or hybrid wireless / wired operation and 'short range' activation designed to reduce false activation from highly reflective surfaces! CM-333 and CM-336 models are supplied with (2) 'AA' alkaline batteries.

***Outdoor Applications:** Lithium batteries recommended for environments below 32°F (0°C). Rain Hood recommended when installed with direct exposure to rain or snow.*



Hands-Free Features	
• A wide range of wired, wireless and battery powered models • Adjustable operating range 1" - 6 ft. • Adjustable time delay • Super-fast activation response	• Heavy duty relays, for use with all automatic operators and electrified locks • Narrow, single or double gang faceplates, stainless steel or polycarbonate

NOTE: See page 64 for faceplate, graphic and light ring options

Specifications - All Models

Technology:	Active Infrared with Micro Burst
Temp Range:	-4°F to 153°F (-20°C to +85°C)
Security:	Fail Secure or Fail Safe

CM-331: WIRED, 1 RELAY

Features	
• Standard Operating range, 1"- 28" • Extended Range up to 6 ft. • Adjustable time delay 1 - 30 seconds • (5) Selectable operating modes	• Inputs for REX and door contact • Option for light ring (stainless steel faceplates only) • Option for plug-in wireless transmitter

MODEL	
CM-331	Hands-free switch, wired, with 1 relay

NOTE: See page 64 for faceplate, graphic and light ring options



Specifications

Sensors: (2)	Voltage: 12/24V AC/DC
Current Draw:	40mA
Relay Outputs:	(1) Form 'C', 3A @ 30 VDC
Active Output:	9-12V
Inputs:	REX and Door Contact
Operating Modes:	Momentary, Momentary with Alarm, Maintained, Toggle, Extended Range

CM-332: WIRED, 2 RELAY

Features	
• Advanced switch with Door Control Functions • Standard operating range, 1" - 28" • Extended Range up to 6 ft. • Adjustable time delay 1 - 30 seconds	• (7) Selectable operating modes • Inputs for REX and door contact • Option for light ring (stainless steel faceplates only) • Option for plug-in wireless transmitter

MODEL	
CM-332	Hands-free switch, wired, with 2 relays

NOTE: See page 64 for faceplate, graphic and light ring options



Specifications

Sensors: (2)	Voltage: 12/24V AC/DC
Current Draw:	40 mA
Relay Outputs:	(2) Form 'C', 3A @ 30 VDC
Active Output:	9-12V
Inputs:	REX and Door Contact
Operating Modes:	Momentary, Momentary with Alarm, Maintained, Toggle, Security, Extended Range, and Sequence

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

CM-325: 'SHORT RANGE' MODEL

Features	
• Designed to eliminate false activations from highly reflective surfaces, commonly found in healthcare applications • Adjustable time delay 1 - 5 seconds	• Operating range : - 2" (51mm) minimum (Hand) - 12" (304mm) maximum (Hand) - 18" (457mm) maximum (Mirror)

MODEL	
CM-325	'Short Range' Hands-free switch, wired, with 1 relay. No option for light ring.



Specifications

Sensors: (1)	Voltage: 12/24V AC/DC
Current Draw:	60mA
Relay Outputs:	(1) Form 'C', 5A @ 30 VDC
Operating Modes:	Momentary

ALL HANDS-FREE SWITCH MODEL OPTIONS

OPTIONS	
NOTE: Unless specified, single gang polycarbonate faceplate will be supplied.	
Faceplate Material	
CM-xx/S	Single Gang Stainless Steel Faceplate. 2-3/4 W" x 4-1/4 H"
Faceplate Size Options - No Illumination	
CM-xx/N	Narrow Faceplate. Rubber gasket supplied. CM-324, 325, 331 & 332 Series narrow switches are compatible with CM-23D narrow jamb surface box. CM-336 Series narrow switches and CM-331, 332 & 336 Series narrow switches with optional CM-TX-99 plug-in wireless transmitter require CM-23DSER 1-7/8" deep surface box. 1-3/4 W" x 4-1/2 H"
CM-xx/W	Double Gang Faceplate. Rubber gasket supplied for weather/water resistant applications. Compatible surface mounting box CM-43CBLA. 4-1/2 W" x 4-1/2 H"
CM-xx/R	6" Round Stainless Steel Faceplate. Mounts on single gang in-wall box, CM-69SER surface round box or CM-79A semi-flush escutcheon. Not water resistant
Light Ring	
CM-xx-SGLR	Red / Green / Blue selectable. Supplied with stainless steel faceplate. Light ring option not available on battery powered SureWave™ (Only for CM-331 & CM-332)
Lithium Batteries	
CX-xxL1 CM-LP1	Add suffix 'L1' for (2) 'AA' Lithium Batteries in place of (2) Alkaline 'AA' lithium battery, pack of (2)
Wireless Options	
CM-TX-99	915MHz. plug-in transmitter for CM-331 & 332 series switches
CM-RX-90	Advanced, Compact Single Relay Receiver



Single Gang Stainless Steel
(CM-xx/S)



Polycarbonate Single Gang
(standard option)



Narrow
(CM-xx/N)



Double Gang
(CM-xx/W)



6" Round
(CM-xx/R)



Single Gang Faceplate & Light Ring
(SGLR)

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

KINETIC BY CAMDEN VERSIONS AVAILABLE

CM-40, CM-41 & CM-60 SERIES: ROUND PUSH PLATE SWITCHES

UL Listed Components ADA Compliant

CM-40, CM-41 and CM-60 Series 'All-Active' push plate switches are heavy-duty, ADA-compliant door controls. Faceplates are stainless steel or solid brass, and the assembly is designed for easy installation. The CM-41 4-1/2" square stainless steel backplate is large enough to cover a poorly installed electrical box. Also fits Camden 4-1/2" square surface boxes.


CM-40/2



CM-41/3



CM-60/4

Features

- Durable stainless steel or brass construction
- 4 stud switch design and rubber dampers for quieter operation
- All-Active design requires minimal actuation force
- Weather resistant boot included
- Large variety of graphics options
- Available in a range of architectural finishes
- 3 year 'Camden Tough' warranty with '2 for 1' replacement

Specifications

Contact Rating:	15A @ 30 VDC
Contact Type:	SPDT Form 'C'
Mounting:	**CM-40/41:** Single Gang **CM-60:** Single/Double Gang or 4 x 4
Switch Type:	Momentary
Std. Finish:	US32 / 630
Dimensions:	**CM-40:** 4-1/2" Diameter x 1-3/4"D (114mm x 44mm) **CM-41:** 4-1/2"H x 4-1/2"W x 1-3/4"D (114mm x 114mm x 44mm) **CM-60:** 6" Diameter x 1-1/8"D (152mm x 28.6mm)

ROUND SWITCHES

CM-40	4-1/2" Round push plate switch, brushed stainless steel finish
CM-41	4-1/2" Round push plate switch, with square back plate, brushed stainless steel finish
CM-60	6" Round push plate switch, brushed stainless steel finish

NO-BATTERY KINETIC BY CAMDEN™ WIRELESS ROUND SWITCHES with built-in transmitter. Receiver required.

CM-40K	4-1/2" Round push plate switch, brushed stainless steel finish
CM-41K	4-1/2" Round push plate switch, with square back plate, brushed stainless steel finish
CM-60K	6" Round push plate switch, brushed stainless steel finish

OPTIONS (Add suffix to model above)

Faceplate Graphic Options


CM-xx/1


CM-xx/2


CM-xx/A2


CM-xx/2AL


CM-xx/2AR



CM-xx/3



CM-xx/3F



CM-xx/4



CM-xx/A4



CM-xx/4AL



CM-xx/4AR



CM-xx/4F


CM-xx/4FE



CM-xx/8



CM-xx/8B



CM-xx/8F



CM-xx/8D

Architectural Finishes (Only available with /1, /2, /3, /4 graphic options)		Water Tight Option	Contact Option
CM-xx-AB Antique Brass	CM-xx-OB Oil Rub Bronze	CM-xx-WT Boot & watertight coating	CM-xx-DP DPDT switch instead of SPDT
CM-xx-SB Satin Brass	CM-xx-PB Polished Brass		

WWW.CAMDENCONTROLS.COM

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

CM-45 & 46 SERIES: STAINLESS STEEL 4-1/2" SQUARE PUSH PLATES

KINETIC BY CAMDEN VERSIONS AVAILABLE

UL Listed Components

ADA Compliant

CM-45 Series *(concealed screws) and CM-46 Series (exposed screws) stainless steel 4-1/2" square push plate switches mount to standard single gang or double gang electrical boxes. The SPDT (and optional DPDT) switches are rated 15A @ 30 VDC. The push switches are offered with different graphics, and in various architectural finishes. Water tight configurations available.*



CM-45/2



CM-45/A4



CM-46/4



CM-46CB/4

Features

- 4 stud switch design and rubber dampers for quieter operation
- Weather resistant boot included
- Available in a range of architectural finishes
- Available with 'Active' wheelchair symbol graphics
- 3 year 'Camden Tough' warranty with '2 for 1' replacement

SQUARE SWITCHES

CM-45	4-1/2" Square push plate switch, concealed screws, brushed stainless steel
CM-46	4-1/2" Square push plate switch, exposed screws, brushed stainless steel
CM-46CB	4-1/2" Square push plate switch, exposed screws, aluminum, **blue paint finish** **'/1', '/2', and '/4' graphic options only.**

NO BATTERY KINETIC BY CAMDEN™ WIRELESS SQUARE SWITCHES with built-in transmitters. Receiver required.

CM-45K	4-1/2" Square push plate switch, concealed screws, brushed stainless steel
CM-46K	4-1/2" Square push plate switch, exposed screws, brushed stainless steel
CM-46CBK	4-1/2" Square push plate switch, exposed screws, aluminum, **blue paint finish** **'/1', '/2', and '/4' graphic options only.**

Specifications

Contact Rating:	15A @ 30 VDC
Contact Type:	SPDT Form 'C'
Mounting:	Single or Double Gang
Switch Type:	Momentary
Std. Finish:	**CM-45/46:** US32 / 630 **CM-46CB:** Paint
Dimensions:	**CM-45/46/46CB:** 4-1/2"H x 4-1/2"W x 1-1/4"D (114mm x 114mm x 32mm)

OPTIONS (Add suffix to model above)

Faceplate Graphic Options (* Black graphics on CM-46 series only)



CM-xx/1



CM-xx/2



CM-xx/2AL



CM-xx/2AR



CM-xx/A2



CM-xx/3



CM-xx/3F



CM-xx/4



CM-xx/4F



CM-xx/4FE



CM-xx/4AL



CM-xx/4AR



CM-xx/A4



CM-xx/8



CM-xx/8B



CM-xx/8D



CM-xx/8F

Architectural Finishes (Only available with CM-45 /1, /2, /3, /4, /8 graphic options)		**Water Tight Option**	**Contact Option**
CM-xx-AB Antique Brass	CM-xx-OB Oil Rub Bronze	CM-xx-WT Boot & watertight coating	CM-xx-DP DPDT switch instead of SPDT
CM-xx-SB Satin Brass	CM-xx-PB Polished Brass		

CDH

Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

CM-54, CM-55 & CM-57 SERIES: ILLUMINATED PUSH PLATE ENCLOSURES & SWITCH KITS

UL Listed Components | ADA Compliant | RoHS COMPLIANT

*Aura™ **CM-54** (surface square) **CM-55** (flush square) and **CM-57** (flush round) illuminated push plate enclosures and switch kits provide high visibility and enhanced user convenience in ADA compliant automatic door and other applications.*

***Features include:** selection of backlight color activation, an audible sounder that confirms switch activation, and Form 'C' contacts used to switch your device.*

Aura™ illuminated mounting boxes are compatible with the widest range of 4-1/2" all-active push plate switches in the industry. Options include a complete selection of stock and custom graphic designs, architectural finishes (including polished brass and bronze) and water tight models.



CM-45/454



CM-45/455



CM-40/457

Features

- Illuminated surface and flush mount box compatible with any CM-40, CM-45 or CM-46 'All Active' push plate switch
- High efficiency LED technology
- Improves switch visibility, even in daylight
- Flame and impact resistant polycarbonate construction
- Selectable 12/24V, AC/DC

AURA™ ILLUMINATED ENCLOSURES	
CM-54i	Surface, 4-1/2" Square, Aura™ illuminated. Red, Green, Blue
CM-55i	Flush, 4-1/2" Square, Aura™ illuminated. Red, Green, Blue
CM-57GR	Flush, 4-1/2" Round (Illuminated Red/Green)
AURA™ ILLUMINATED SWITCH KITS - SURFACE MOUNT	
CM-45/x54	4-1/2" Square push plate (concealed screws)
CM-46/x54	4-1/2" Square push plate (exposed screws)
AURA™ ILLUMINATED SWITCH KITS - FLUSH MOUNT	
CM-40/x57	4-1/2" Round push plate
CM-45/x55	4-1/2" Square push plate
CM-46/x55	4-1/2" Square push plate

NOTES:

- DPDT Contacts: CM-40, CM-45 or CM-46 'DP' option cannot be used with Aura™ illuminated enclosures

- See Page 75 for faceplate graphic options and suffix to replace "x" in above models

Specifications

Voltage:	12/24V AC/DC
Current Draw:	130 mA. max.
Lumina:	**Red:** 5760 MCD **Green:** 3780 MCD
Contact Type:	1 Form 'C'
Contact Rating:	3A @ 24V AC/DC
Sounder:	85 DB @ 10cm
Dimensions:	**CM-54:** 5-1/4"H x 5-1/4"W x 2-1/8"D (133mm x 133mm x 54mm) **CM-55:** 6-1/2"H x 6-1/2"W x 2"D (165mm x 165mm x 51mm) **CM-57:** 6-5/8" Dia. x 2"D (168mm x 51mm)

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

AURA™ RESTROOM CONTROL SIGNS

Add suffix to Aura™ switch kit to add restroom sign. To order sign separately, add prefix 'CM-' to model (eg.CM-SE1)

/SE1	English, for CM-54 Square Surface box. Double sided. 'DOOR LOCKED WHEN RED' / 'UNLOCKED WHEN GREEN' and 'OCCUPIED WHEN RED' / 'VACANT WHEN GREEN'
/SF1	French, for CM-54 Square Surface box. Double sided. 'PORTE BARRÉE' / 'PORTE DÉBARRÉE' and 'OCCUPÉ' / 'LIBRE'
/SFE1	English, for CM-55 Square Flush box. Double sided. 'DOOR LOCKED WHEN RED' / 'UNLOCKED WHEN GREEN' and 'OCCUPIED WHEN RED' / 'VACANT WHEN GREEN'
/SFF1	French, for CM-55 Square Flush box. Double sided. 'PORTE BARRÉE' / 'PORTE DÉBARRÉE' and 'OCCUPÉ' / 'LIBRE'
/FRE1	English, for CM-57 Round Flush box. Double sided. 'DOOR LOCKED WHEN RED' / 'UNLOCKED WHEN GREEN' and 'OCCUPIED WHEN RED' / 'VACANT WHEN GREEN'
/FRF1	French, for CM-57 Round Flush box. Double sided. 'PORTE BARRÉE' / 'PORTE DÉBARRÉE' and 'OCCUPÉ' / 'LIBRE'

Faceplate Graphic Options



CM-xx/1 | CM-xx/2 | CM-xx/A2 | CM-xx/2AL | CM-xx/2AR | CM-xx/3 | CM-xx/3F | CM-xx/4

CM-xx/A4 | CM-xx/4AL | CM-xx/4AR | CM-xx/4F | CM-xx/4FE | CM-xx/8 | CM-xx/8D | CM-xx/8F

Lazerpoint™ 915MHz. Wireless Door Control

CM-TX-9	Wall Switch Transmitter

NOTE: TX-9 may be added to Aura to send switch signal to RX-90/91/92 receivers, and reduce wiring by two conductors.



CM-54 Sign
Switch not included



CM-55 Sign
Switch not included



CM-57 Sign
Switch not included



DOUBLE GANG / SQUARE MOUNTING BOXES (CONTINUED)	
CM-44	Surface Box, Shallow Depth, offset mount (on jamb). Stainless Steel 4-1/2" H x 4-1/2" W x 5/8" D. For use with **CM-45 & 46 Series**
CM-53	Surface Box, Standard depth. Double wall, flame/Impact resistant black polymer (ABS) 4-1/2" H x 4-1/2" W x 2" D. For use with **CM-2510/2520**
CM-54CBL	Surface Box (non-Illuminated, matches **CM-54i**). Standard Depth, flame/Impact resistant black polymer (ABS) 5-1/4"W X 5-1/4"H X 2"D
CM-54i	Surface, 4-1/2" Square, Aura™ illuminated. Enclosure, green/red
CM-55CBL	Flush Box. Standard Depth, flame/Impact resistant black polymer (ABS) 6-1/2"H x 6-1/2"W x 2"D. For use with **CM-45/46 Series**
CM-55i	Flush, 4-1/2" Square, Aura™ illuminated. Enclosure, green/red
CM-RH-DG	Stainless steel, double gang rain hood
CM-63CBL	Surface Box, Standard depth, provision for wireless. Flame and impact resistance black polymer (ABS) 4-1/2" H x 4-1/2" W x 2"D. For use with **CM-60** Series switches
CM-540B	Surface Box, Shallow Depth. Flame and impact resistant black polymer (ABS) 4-13/16"H x 4-13/16"W x 5/8"D
CM-660	6-1/2" Dress Plate, Cover for double gang or 4" square flush box. Heavy gauge stainless steel. For 6" switches
BACK MOUNTING BOXES FOR 36" COLUMN™ SWITCHES	
CM-75SB	Surface Box for CM-75 Series. Powder coated electrical gray, 16-gauge steel
CM-75SB-BK	Surface Box for CM-75 Series. Powder coated black, 16-gauge steel
ROUND MOUNTING BOXES FOR 4-1/2" SWITCHES	
CM-47S	Surface, Round, Standard Depth, provision for wireless. Flame and impact resistant black polymer (ABS), 5"dia. x 2-1/8" D
CM-47-ADP1	Retrofit extension ring & hardware for CM-47S mounting box
CM-47SER	Surface, Round, Extra Deep, for Kinetic by Camden™ CM-40K switches
CM-57CBL	Flush, Round, Standard Depth, flame / impact resistant black polymer (ABS) x 6-5/8" dia.x 2"D
CM-57GR	Flush, Round, Aura™ (Illuminated Green/Red). Standard Depth, flame/impact resistant black polymer (ABS) x 6-5/8" dia. x 2"D
CM-570B	Surface Round, Shallow Depth, Flame and impact resistant black polymer (ABS) 4-11/16" dia. x 5/8"D
ROUND MOUNTING BOXES FOR 6" SWITCHES	
CM-69S	Surface, Round Standard Depth, provision for wireless. Flame/impact resistant black polymer (ABS), 6-1/2" dia. x 2-1/8" D
CM-69-ADP1	Retrofit extension ring & hardware for CM-69S mounting box
CM-69SER	Surface Round, Extra Deep, for Kinetic by Camden™ CM-60K & SureWave™ 'R' suffix 6" round switches


CM-44


CM-53


CM-54i


CM-54CBL


CM-RH-DG

NEW!


CM-75SB


CM-55i


CM-540B


CM-47S


CM-47SER


CM-57CBL


CM-570B


CM-69S


CM-69SER

WWW.CAMDENCONTROLS.COM

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

CM-49, 59, 79 AND 89 SERIES: SURFACE AND FLUSH MOUNT ESCUTCHEONS (FOR ROUND PUSH PLATE SWITCHES)

*Camden offers a range of **flame and vandal resistant** low profile escutcheons for mounting 4-1/2" and 6" round push plate switches. ABS escutcheons feature a patented 2-piece design and may be ordered as complete 'kits' or individual parts. Stainless steel escutcheons feature one piece heavy gauge construction.*

Features	
• Exclusive 2 piece ABS escutcheons can be surface mounted or mounted on in-wall single gang, double gang or 4" square electrical boxes	• Heavy gauge stainless steel escutcheons provide an attractive, rugged look • ABS models are designed for use with Lazerpoint™ 915 MHz. wireless wall switch transmitters

FOR 4-1/2" ROUND SWITCH - STAINLESS STEEL ESCUTCHEON	
CM-59S	Surface, Round, Standard Depth. Heavy gauge stainless steel, 7-3/4" x 1-1/18"D
FOR 4-1/2" ROUND SWITCH - ABS SPACESHIP ESCUTCHEON	
CM-49	Surface / Flush Mount Kit, includes **CM-49A, CM- 49B, CM-49C & CM-49G,** 8-3/4" x 2"D
CM-49A	Flush enclosure only (fits single gang box), 7" x 13/16"D
CM-49AK	Flush Mount Kit, includes **CM-49A, CM-49C & CM-49G,** (fits single, double and 4 x 4 boxes), 7" x 13/16"D
CM-49B	Surface mount enclosure only (must be used with **CM-49A**), 8-3/4" x 1"D
CM-49C	Adapter plate for mounting on double gang or 4" Square box, 4" x 1/16"D
CM-49G	Gasket for **CM-49A** OR **CM-49B**, 6-1/4" x 1/8"D
FOR 6" ROUND SWITCH - STAINLESS STEEL ESCUTCHEON	
CM-89S	Surface, round standard depth. Heavy gauge stainless steel, 9-5/8" x 1-1/2"D
FOR 6" ROUND SWITCH - ABS SPACESHIP ESCUTCHEON	
CM-79	Surface / Flush Mount Kit, includes **CM-79A, CM-79B, CM-49C & CM-79G,** 9-5/8" x 2"D
CM-79A	Flush enclosure only (fits single gang box), 8" x 3/4"D
CM-79AK	Flush Mount Kit, includes **CM-79A, CM-49C & CM-79G,** (fits single, double and 4 x 4 boxes), 8" x 3/4"D
CM-79B	Surface mount enclosure only (must be used with **CM-79A**), 9-5/8" x 1-1/8"D
CM-79G	Gasket for **CM-79A or CM-79B**, 7-1/4" x 1/8"D



CM-59S



CM-49A *CM-49B*
(Shown with TX-9 Transmitter)



CM-89S



CM-79A *CM-79B*
(Shown with TX-9 Transmitter)

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

CM-1100 / CM-2000: FLUSH MOUNT KEY SWITCHES - CAST ALUMINUM FACEPLATE

Vandal resistant key switches *feature a 1/4" thick faceplate, with one-piece faceplate and switch bracket design. 1 or 2 contact switches can be mounted. These key switches offer the widest range of stock switch configurations in the industry. They accept virtually any 1" - 1-1/4" mortise cylinder and cam (sold separately).*



CM-1100
(LEDs optional. Mortise cylinder sold separately)



CM-2000
(Mortise cylinder sold separately)

Features

- Indoor or outdoor flush applications
- Accepts standard mortise cylinders, 1" - 1-1/4"
- Heavy duty 1/4" thick aluminum plate
- 1 piece die cast construction
- Locators prevent cylinder from spinning
- Cylinder sits flush to faceplate
- Tamper proof screws and driver provided
- No set screw required
- 1 or 2 switches may be installed
- Heat shrink protective sleeve over contacts

Note: See page 100 for LED and faceplate graphic options

SINGLE GANG KEY SWITCHES	
CM-1100	Flush mount key switch, SPST Momentary, N/O
CM-1105	Flush mount key switch, SPST Momentary, N/C
CM-1110	Flush mount key switch, SPST Maintained
CM-1120	Flush mount key switch, SPDT N.O. & N.C. Momentary
CM-1120-60KD	Flush mount key switch, SPDT N.O. & N.C. Momentary - INCLUDES CYLINDER
CM-1130	Flush mount key switch, SPDT N.O. & N.C. Maintained
CM-1150	Flush mount key switch, (2) SPDT Momentary
CM-1160	Flush mount key switch, (2) SPDT Maintained
CM-1170	Flush mount key switch, SPDT Momentary and SPDT Maintained
CM-1180	Flush mount key switch, DPDT Momentary
CM-1182	Flush mount key switch, (2) DPDT Momentary
CM-1190	Flush mount key switch, DPDT Maintained
CM-1192	Flush mount key switch, (2) DPDT Maintained
NARROW KEY SWITCHES	
CM-2000	Flush mount key switch, SPST Momentary, N/O
CM-2005	Flush mount key switch, SPST Momentary, N/C
CM-2010	Flush mount key switch, SPST Maintained
CM-2020	Flush mount key switch, SPDT Momentary
CM-2030	Flush mount key switch, SPDT Maintained
CM-2050	Flush mount key switch, (2) SPDT Momentary
CM-2060	Flush mount key switch, (2) SPDT Maintained
CM-2070	Flush mount key switch, SPDT Momentary and SPDT Maintained
CM-2080	Flush mount key switch, DPDT Momentary
CM-2082	Flush mount jamb key switch, (2) DPDT Momentary
CM-2090	Flush mount key switch, DPDT Maintained
CM-2092	Flush mount jamb key switch, (2) DPDT Maintained

Specifications

Contact Rating:	6A @ 30 VDC
Switch Life:	100,000 cycles
Temp Range:	32°F - 85°F (0°C to +30°C)
Std. Finish:	Brushed Aluminum
Dimensions:	**Single Gang:** 4-1/2"H x 2-3/4"W x 1-1/2"D (114mm x 70mm x 42mm) **Narrow:** 4-1/2" H x 1-3/4" W x 1-1/2"D (114mm x 44m x 42mm)

Architectural Finishes	
CM-xx-BZ	Add suffix '**BZ**' to model number for Dark Bronze finish (BHMA 710/313AN)

WWW.CAMDENCONTROLS.COM

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

CM-160 / 170 / 180 SERIES: KEY SWITCHES

***Key switches** for automatic doors are designed for mounting on the door operator cabinet or door frame, and are available in a range of 2 or 3 position momentary or maintained models. The key cylinder and 2 keys are included.*

Features	
• Black lamacoid (plastic) or stainless steel faceplates • Key removable in all maintained positions	• 2, 3, 4 position maintained and 2 position momentary models • All switches are keyed alike

MODELS	
CM-160	Key switch with plastic lamacoid (mini) faceplate
CM-170*	Key switch with stainless steel (narrow stile) faceplate
CM-180*	Key switch with stainless steel (single gang) faceplate

OPTIONS (Add suffix to model above)

Faceplate Graphics

MOMENTARY	MAINTAINED	MAINTAINED	MAINTAINED	MAINTAINED
OFF / OPEN	OFF / AUTO	OFF / AUTO / HOLD OPEN	DAY / OFF / NIGHT	EXIT AUTO / OFF / HOLD OPEN
CM-xx/20	*CM-xx/21*	*CM-xx/22*	*CM-xx/23*	*CM-xx/24*

Extra Keys

CM-A126	(2) Extra keys for CM-160, 170 and 180 series key switches

Faceplate includes "AUTOMATIC DOOR" text at bottom of switch (as shown in images)



CM-160/23



CM-170/21



CM-180/23

Specifications

Contact Rating: 4A @ 28 VDC

Switch Life: 100,000 cycles

Dimensions: **CM-160:** 3" H x 1-11/16"W x 1-3/8"D (76mm x 42mm x 35mm)
CM-170: 4-1/2"H x 1-3/4"W x 1-3/8"D (114mm x 44mm x 35mm)
CM-180: 4-1/2"H x 2-3/4" W x 1-3/8" D (114mm x 70mm x 35mm)

CM-190 SERIES: TOGGLE SWITCH

***CM-190 Series** maintained toggle switches are designed to control automatic door operators, featuring a choice of faceplates, for mounting on the operator cabinet/wall.*

Features	
• Mini metal faceplate designed to install on door operator cabinet or door frame • 2 or 3 position maintained operation	• Single gang faceplate for mounting on standard electrical box • Heavy duty 6 Amp. contacts

MODELS	
CM-190	Mini aluminum faceplate
CM-195*	Single gang stainless steel faceplate

OPTIONS (Add suffix to model above)

Faceplate Graphics

ON / OFF — *CM-xx/30*	AUTOMATIC / OFF / OFF / HOLD OPEN — *CM-xx/31*

Faceplate includes "AUTOMATIC DOOR" text at bottom of switch (as shown in images)



CM-190/30



CM-195/31

Specifications

Contact Rating: 6A @ 30 VDC

Switch Life: 50,000 cycles

Temp Range: -4°F - 185°F (-20°C - 85°C)

Dimensions: **CM-190:** 2-5/8" H x 1-1/2" W x 2"D (59mm x 38mm x 51mm)
CM-195: 4-1/2" H x 2-3/4" W x 2"D (114mm x 70mm x 51mm)

WWW.CAMDENCONTROLS.COM

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

GSH 80 KICK PLATE

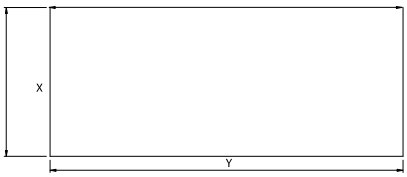


Gallery™
specialty hardware ltd.

GallerySpecialty.com
1.800.267.1236

- Base Metal: Brass, Bronze, Aluminum and stainless steel (Type 304).
- Screw Mounting with Beveled Edges supplied standard
- Finishes: All Standard
- Tape Mounting available

GSH80 = 20ga
GSH80A = 18ga
GSH80B = .062ga
GSH80C = .125ga



676 Petrolia Road, Toronto, ON, Canada M3J 2V2
Tel: 416.667.9593 Fax: 416.667.0806
Email: info@galleryspecialty.com

All product specifications are subject to change. For the most updated product features, contact our customer service department Toll Free at 1.800.267.1236

©2019 Gallery Specialty Hardware Ltd.

MADE TO ORDER P.O.A.

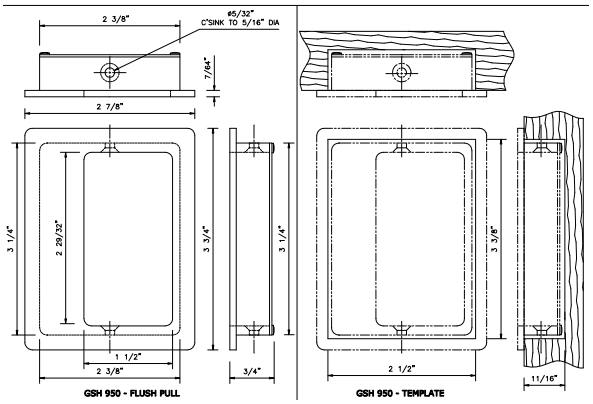
GSH 950 FLUSH PULL



Gallery™
specialty hardware ltd.

GallerySpecialty.com
1.800.267.1236

- Cast Brass or Bronze
- Wood Screws Provided
- C3, C4, C9, C10, C10B, C14, C15, C26, and C26D



676 Petrolia Road, Toronto, ON, Canada M3J 2V2
Tel: 416.667.9593 Fax: 416.667.0806
Email: info@galleryspecialty.com

All product specifications are subject to change. For the most updated product features, contact our customer service department Toll Free at 1.800.267.1236

©2024 Gallery Specialty Hardware Ltd.

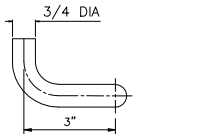
GSH 1180 - (1, 2, 3 OR 4) 12" C/C

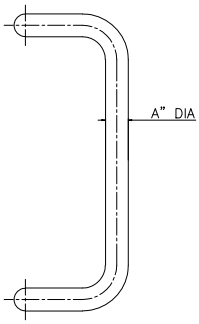


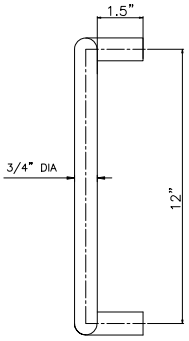
Gallery™
specialty hardware ltd.

GallerySpecialty.com
1.800.267.1236

- Wrought Brass, Bronze, Aluminum and Stainless Steel
- Fasteners for 1 3/4" Door provided
- C3, C4, C9, C10, C10B, C14, C15, C26, C26D, C28 and C32D
- 1=3/4" DIA
- 2=1" DIA
- 3=1-1/4" DIA
- 4=1-1/2" DIA







676 Petrolia Road, Toronto, ON, Canada M3J 2V2
Tel: 416.667.9593 Fax: 416.667.0806
Email: info@galleryspecialty.com

All product specifications are subject to change. For the most updated product features, contact our customer service department Toll Free at 1.800.267.1236

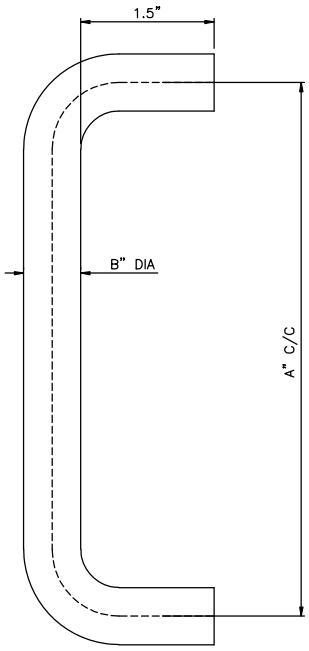
©2024 Gallery Specialty Hardware Ltd.

GSH 4007 7"-4009 9"-4012 12" (1, 2, 3 OR 4)

Gallery™
specialty hardware ltd.



GallerySpecialty.com
1.800.267.1236



- Wrought Brass, Bronze, Aluminum and Stainless Steel
- Fasteners for 1 3/4" Door provided
- C3, C4, C9, C10, C10B, C14, C15, C26, C26D, C28 and C32D
- 1=3/4" DIA
- 2=1" DIA
- 3=1-1/4" DIA
- 4=1-1/2" DIA

676 Petrolia Road, Toronto, ON, Canada M3J 2V2
Tel: 416.667.9593 Fax: 416.667.0806
Email: info@galleryspecialty.com

All product specifications are subject to change. For the most updated product features, contact our customer service department Toll Free at 1.800.267.1236

©2024 Gallery Specialty Hardware Ltd.

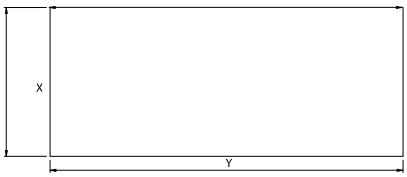
GSH 80 KICK PLATE



Gallery™
specialty hardware ltd.

GallerySpecialty.com
1.800.267.1236

- Base Metal: Brass, Bronze, Aluminum and stainless steel (Type 304).
- Screw Mounting with Beveled Edges supplied standard
- Finishes: All Standard
- Tape Mounting available
  GSH80 = 20ga
  GSH80A = 18ga
  GSH80B = .062ga
  GSH80C = .125ga



676 Petrolia Road, Toronto, ON, Canada M3J 2V2
Tel: 416.667.9593 Fax: 416.667.0806
Email: info@galleryspecialty.com

All product specifications are subject to change. For the most updated product features, contact our customer service department Toll Free at 1.800.267.1236

©2024 Gallery Specialty Hardware Ltd.

MADE TO ORDER P.O.A.

The 1006 Series is also available in a **Complete One Box Solution**

HES® 1006 Electric Strike

Works with all cylindrical and mortise locksets with or without a deadbolt



The strongest, most versatile electric strike available.

The 1006 series is the strongest and most versatile electric strike available. The dual interlocking plunger design and heavy duty stainless steel construction, enables it to exceed every standard developed for electric strikes. With multiple faceplate options, the 1006 will fully accommodate every lock designed to work within an ANSI 4-7/8" strike plate. Tested to exceed 3,000 lbs of static strength, 350 ft-lbs of dynamic strength and factory tested to exceed 1 million cycles of operation, the 1006 is in a class of its own.

Features

Standard Features

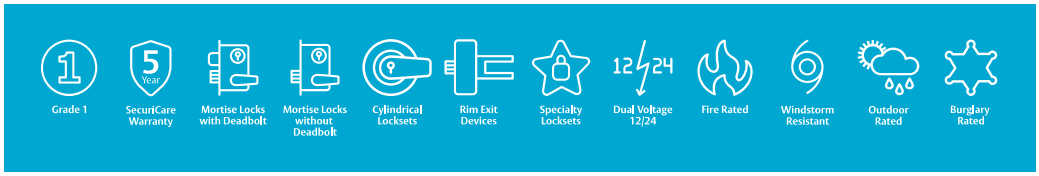
- Stainless steel construction
- Tamper-resistant
- Static strength 2,500 lbs
- Dynamic strength 350 ft-lbs (fail secure)
- Endurance 1 million cycles
- Fail secure (Standard)
- Non-handed
- Accommodates up to 1" deadbolt
- Plug-in connector
- Full keeper shims for horizontal adjustment
- Trim enhancer
- Strike body depth 11/16"
- SecuriCare five-year, no fault, no questions asked warranty

Optional Features

- **LBM** Latchbolt monitor
- **LBSM** Latchbolt strike monitor
- Fail safe
- Interchangeable faceplates
- Monitor switches may not work with all faceplate options

Accessories

- **1000-102** Rain guard
- **1006-103** Full keeper shims
- **1000-104** Lip extension trim adapter
- **1006-105** Trim enhancer BLK (goof plate)
- **1006-109** Trim adapter
- **1000-110** Replacement strike plate
- **1000-130** KD filler plate
- **150** Strike latch guard
- **HESCUT-MTK** Metal template kit
- **2005M3** SMART Pac® III



The global leader in door opening solutions

ASSA ABLOY

HES® 9500 Surface Mounted Electric Strike

Works with rim exit devices up to 3/4" throw latchbolt



The strong durable, fire-rated surface mounted solution.

The 9500 series is a 3 hour fire-rated, surface mounted electric strike designed to accommodate rim exit devices with a 3/4" throw Pullman latchbolt. All components are completely encased within its 3/4" thick stainless steel housing, so no cutting on the frame is required for installation. Simply place the electric strike on the surface of the frame, align it with the exit latchbolt and install. Adjustments have never been easier as the base is now separate from the cover.

The 9500 exceeds Grade 1 standards for strength and performance. It is field selectable for fail secure or fail safe operation, and for 12 or 24 VDC. This unique electric strike complies with NFPA 80-07 guidelines for retrofit into fire-rated frames.

Features

Standard Features

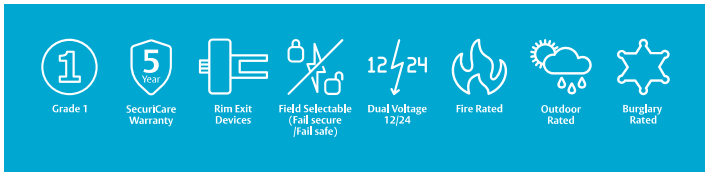
- Installs in metal or wood frames
- Wood screws not provided
- Separate base and decorative cover for easy adjustments
- Stainless steel construction
- Tamper-resistant
- Static strength 1,500 lbs
- Dynamic strength 70 ft-lbs
- Endurance 1 million cycles
- Field selectable fail secure/fail safe
- Horizontal adjustability
- Non-handed
- Internally mounted solenoid
- Accommodates up to 3/4" Pullman latch
- SecuriCare five-year, no fault, no questions asked warranty

Optional Features

- **LBM** Latchbolt monitor
- **LBSM** Latchbolt strike monitor

Accessories

- **9000-108** Spacer plate (black or 630 finish)
- **9000-MTK** Metal template kit
- **SMB** Surface mounting box
- **2001M** Plug-in bridge rectifier
- **2004M** ElectroLynx® adapter
- **2005M3** SMART Pac® III
- **2006M** Plug-in buzzer



The global leader in door opening solutions

ASSA ABLOY

HES® 9600 Surface Mounted Electric Strike

Works with rim exit devices up to a 3/4" throw latchbolt



The stylish windstorm-rated, surface mounted solution.

The 9600 series is a windstorm-rated, surface mounted electric strike designed to accommodate rim exit devices with a 3/4" throw Pullman latchbolt. All components are completely encased within its 3/4" thick stainless steel housing, so no cutting on the frame is required for installation. Simply place the electric strike on the surface of the frame, align it with the exit latchbolt and install. Adjustments have never been easier as the base is now separate from the cover. It is field selectable for fail secure or fail safe operation, and for 12 or 24 VDC.

The 9600 is a surface mounted electric strike designed with the strength and durability required to exceed the severe forces of ANSI Windstorm testing.

Features

Standard Features

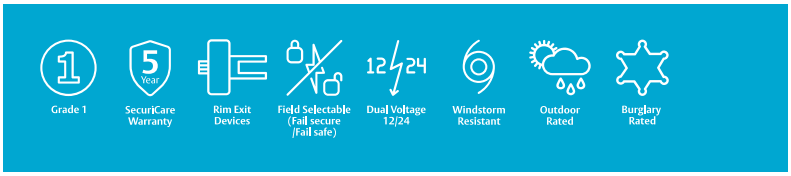
- Installs in metal or wood frames
- Wood screws not provided
- Separate base and decorative cover for easy adjustments
- Stainless steel construction
- Tamper-resistant
- Static strength 2,000 lbs
- Dynamic strength 120 ft-lbs
- Endurance 1 million cycles
- Field selectable fail secure/fail safe
- Horizontal adjustment
- Non-handed
- Internally mounted solenoid
- Accommodates up to 3/4" Pullman latch
- SecuriCare five-year, no fault, no questions asked warranty

Optional Features

- **LBM** Latchbolt monitor
- **LBSM** Latchbolt strike monitor

Accessories

- **9000-108** Spacer plate (black or 630 finish)
- **9000-MTK** Metal template kit
- **SMB** Surface mounting box
- **2001M** Plug-in bridge rectifier
- **2004M** ElectroLynx adapter
- **2005M3** SMART Pac III
- **2006M** Plug-in buzzer

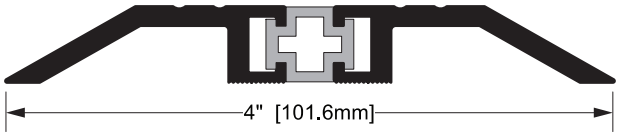


The global leader in door opening solutions

ASSA ABLOY

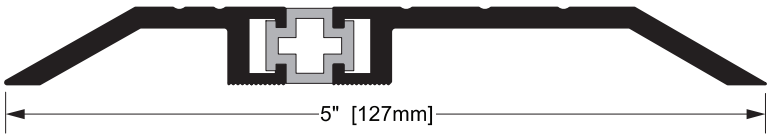
1/2” THERMAL BREAK THRESHOLDS

CT-44
EXTRUDED ALUMINUM
WITH RIGID P.V.C.

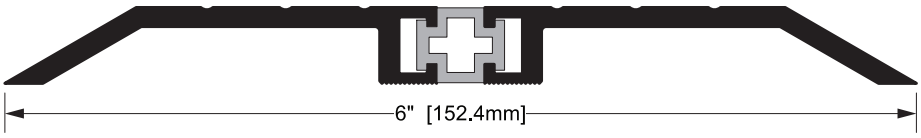


ALL PRODUCTS ON THIS PAGE

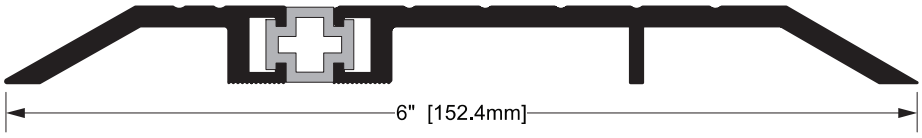
CT-45
EXTRUDED ALUMINUM
WITH RIGID P.V.C.



CT-46
EXTRUDED ALUMINUM
WITH RIGID P.V.C.



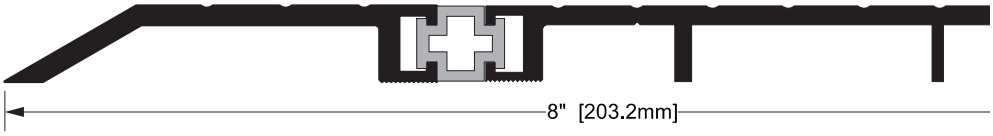
CT-44-1
CT-42-1
FROST INSERT



CT-44-1
CT-43-1
FROST INSERT



CT-45-1
CT-43-1
FROST INSERT



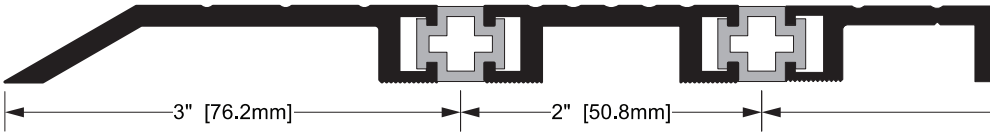
CT-42-1
CT-43-1
FROST INSERT



CT-43-1
CT-43-1
FROST INSERT



CT-45-1
CT-41-1
CT-43-1
FROST INSERT



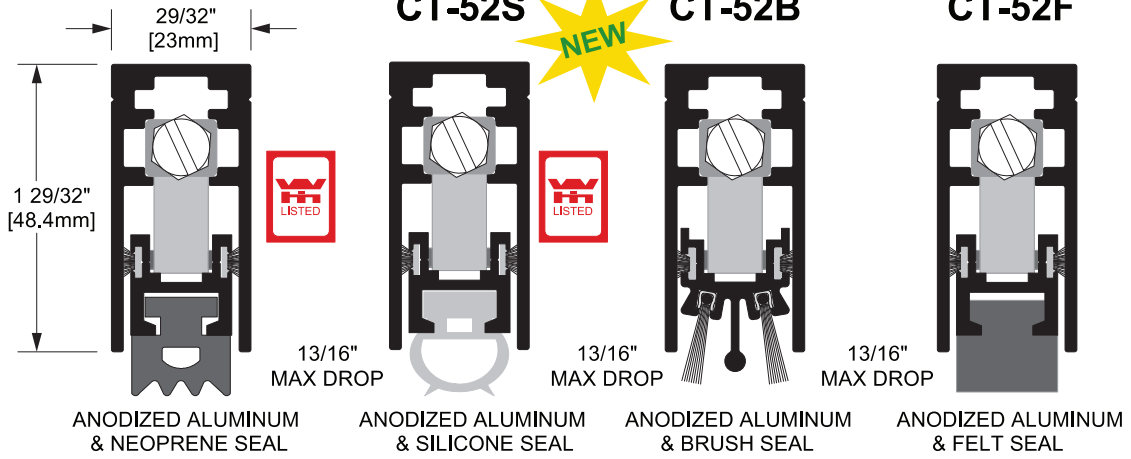
CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

AUTOMATIC DOOR BOTTOMS

CT-52

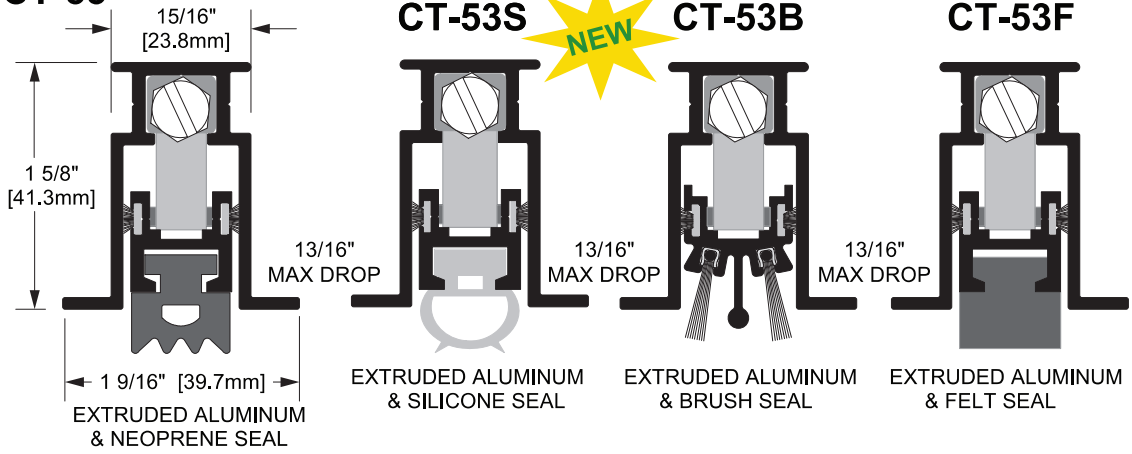


CT-52S NEW

CT-52B

CT-52F

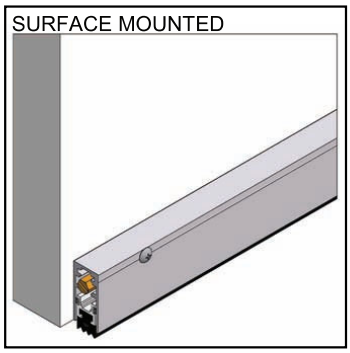
CT-53

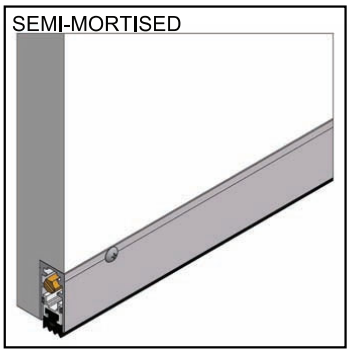


CT-53S NEW

CT-53B

CT-53F







CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

AUTOMATIC DOOR BOTTOMS

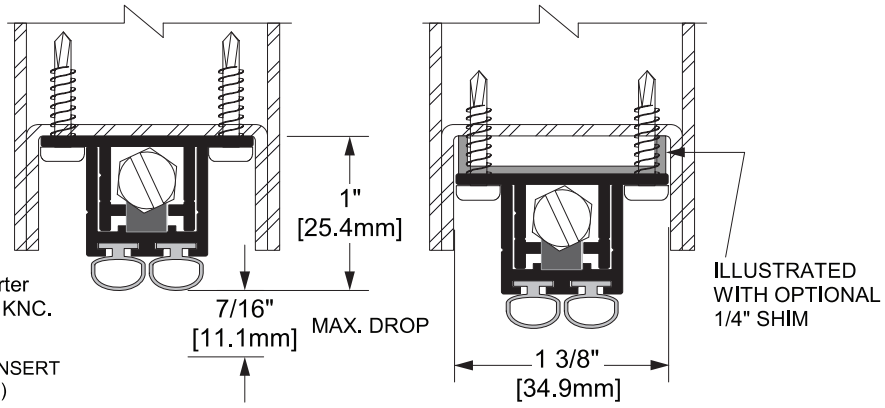
CT-54

EXTRUDED
ALUMINUM AND VINYL

Designed to fit the recess of a standard hollow metal door. Available from stock sizes of 24", 30" 36", 42" and 48". 'Stock sizes can be shortened up to 6" except 24" which can be shortened to 21". Longer and shorter sizes fabricated to order - contact KNC.

CT-54N

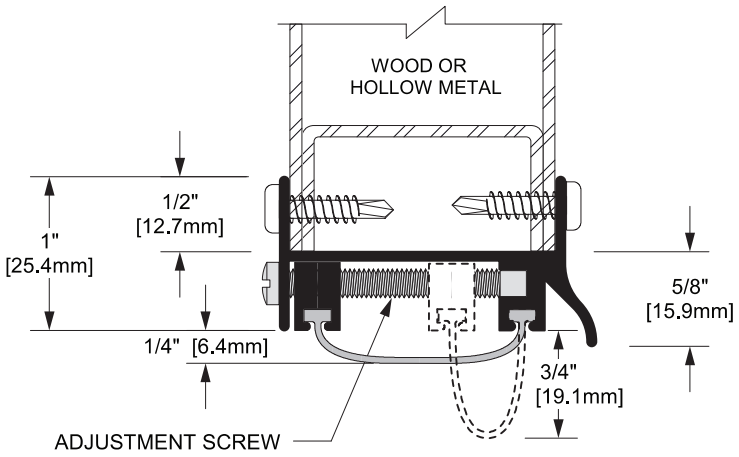
C/W NEOPRENE INSERT
(NOT FIRE RATED)



ADJUSTABLE DOOR SHOE

CT-730

ADJUSTABLE DOOR SHOE
EXTRUDED ALUMINUM AND
VINYL. FOR 1-3/4" DOORS



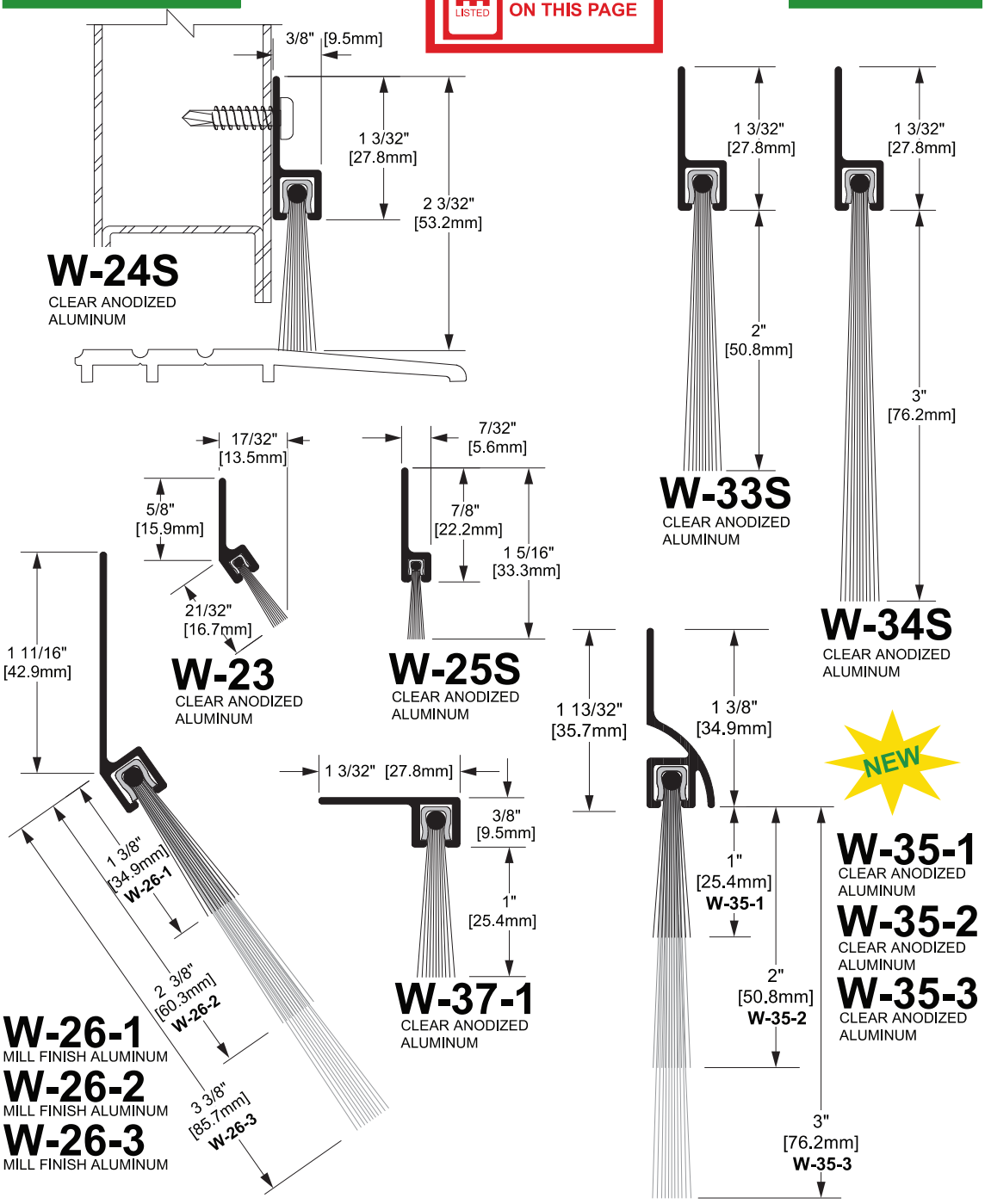
CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

SWEEPS

ALL PRODUCTS ON THIS PAGE



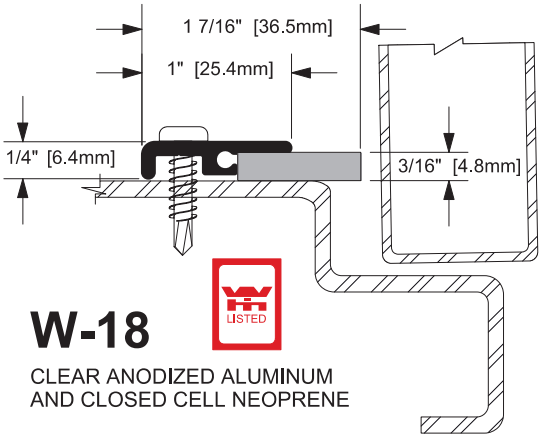
CDH

Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

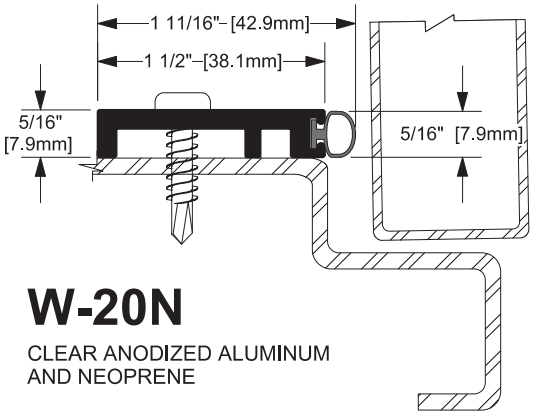
Submittal Date: FEB 2/26

WEATHERSTRIP



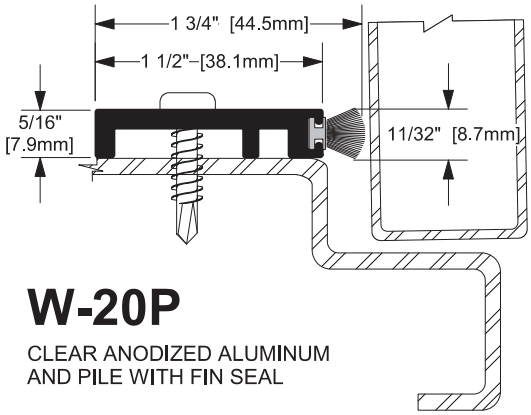
W-18

CLEAR ANODIZED ALUMINUM
AND CLOSED CELL NEOPRENE



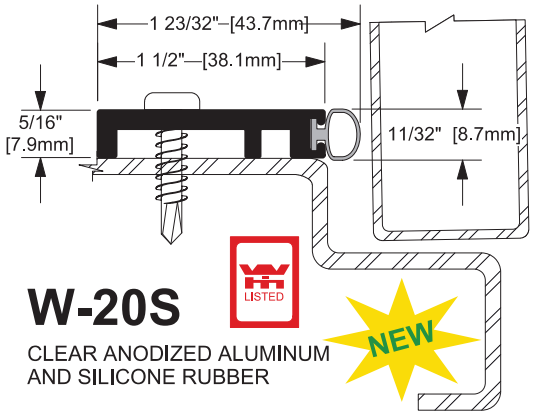
W-20N

CLEAR ANODIZED ALUMINUM
AND NEOPRENE



W-20P

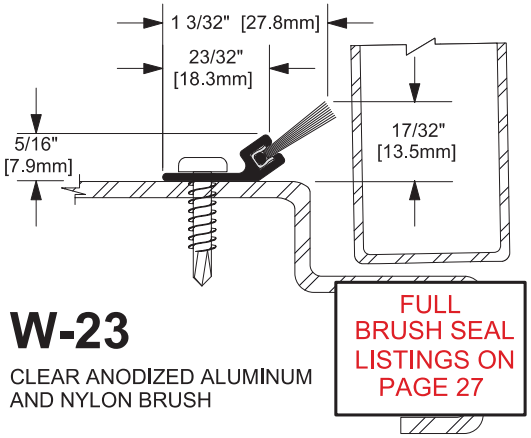
CLEAR ANODIZED ALUMINUM
AND PILE WITH FIN SEAL



W-20S

CLEAR ANODIZED ALUMINUM
AND SILICONE RUBBER

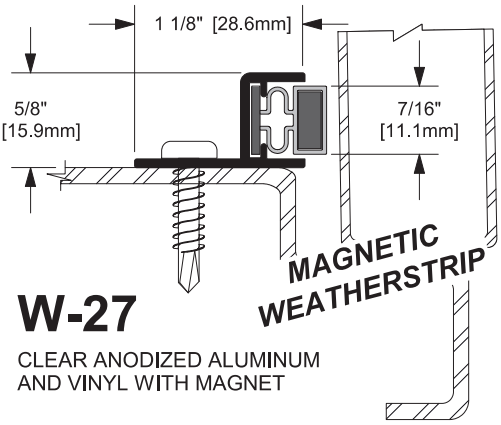
NEW



W-23

CLEAR ANODIZED ALUMINUM
AND NYLON BRUSH

FULL BRUSH SEAL LISTINGS ON PAGE 27



W-27

CLEAR ANODIZED ALUMINUM
AND VINYL WITH MAGNET

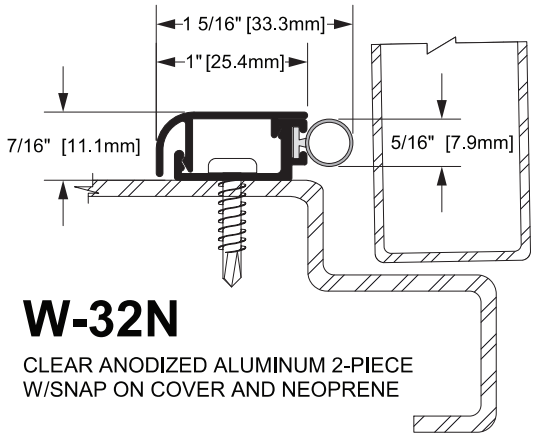
MAGNETIC WEATHERSTRIP

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

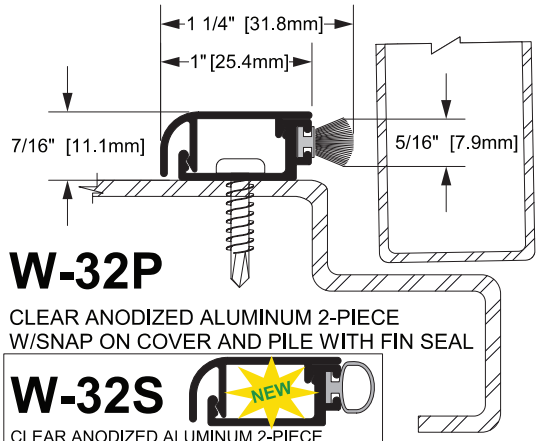
Submittal Date: FEB 2/26

WEATHERSTRIP



W-32N

CLEAR ANODIZED ALUMINUM 2-PIECE
W/SNAP ON COVER AND NEOPRENE



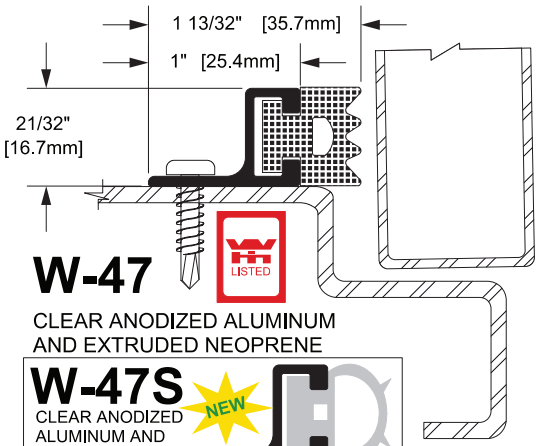
W-32P

CLEAR ANODIZED ALUMINUM 2-PIECE
W/SNAP ON COVER AND PILE WITH FIN SEAL

W-32S

NEW

CLEAR ANODIZED ALUMINUM 2-PIECE
W/SNAP ON COVER AND SILICONE



W-47

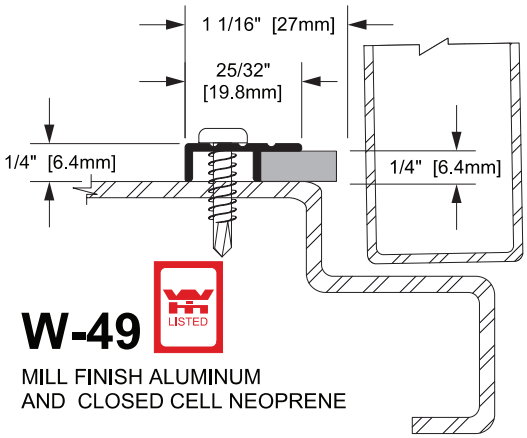
LISTED

CLEAR ANODIZED ALUMINUM
AND EXTRUDED NEOPRENE

W-47S

NEW

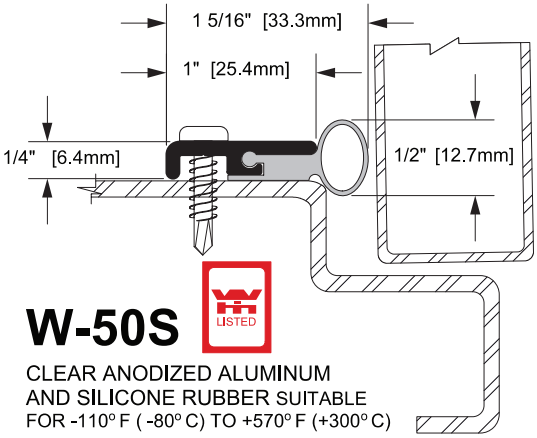
CLEAR ANODIZED
ALUMINUM AND
SILICONE



W-49

LISTED

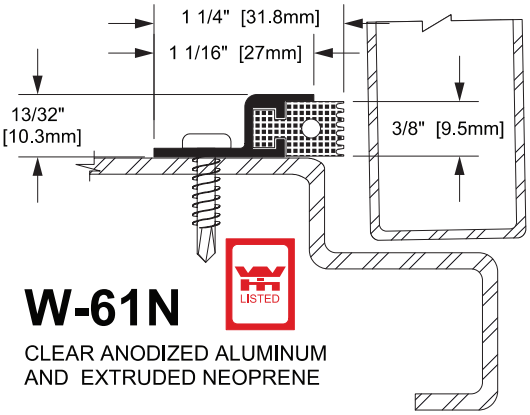
MILL FINISH ALUMINUM
AND CLOSED CELL NEOPRENE



W-50S

LISTED

CLEAR ANODIZED ALUMINUM
AND SILICONE RUBBER SUITABLE
FOR -110° F (-80° C) TO +570° F (+300° C)



W-61N

LISTED

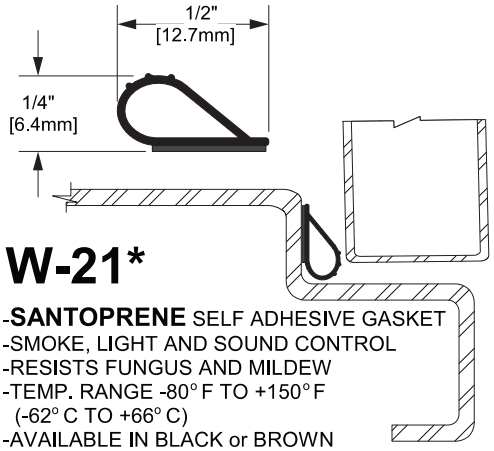
CLEAR ANODIZED ALUMINUM
AND EXTRUDED NEOPRENE

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

SELF ADHESIVE WEATHERSTRIP



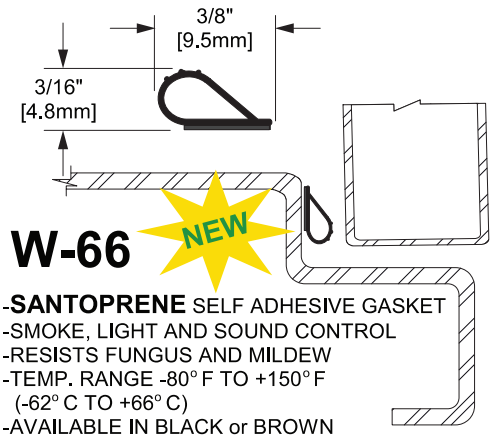
W-21*

-**SANTOPRENE** SELF ADHESIVE GASKET
-SMOKE, LIGHT AND SOUND CONTROL
-RESISTS FUNGUS AND MILDEW
-TEMP. RANGE -80° F TO +150° F
(-62° C TO +66° C)
-AVAILABLE IN BLACK or BROWN



W-22 NEW

-**SILICONE** SELF ADHESIVE GASKET
-SMOKE, LIGHT AND SOUND CONTROL
-UNAFFECTED BY FUNGUS AND MILDEW
-TEMP. RANGE -110° F TO +400° F
(-80° C TO +204° C)
-AVAILABLE IN BLACK or BROWN

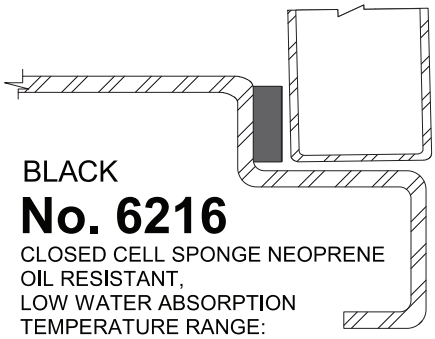


W-66 NEW

-**SANTOPRENE** SELF ADHESIVE GASKET
-SMOKE, LIGHT AND SOUND CONTROL
-RESISTS FUNGUS AND MILDEW
-TEMP. RANGE -80° F TO +150° F
(-62° C TO +66° C)
-AVAILABLE IN BLACK or BROWN

AIR

* W-21 is approved for use with 90 minute rated mineral core wood, plastic lamfaced fire doors & wood veneered steel frames.



BLACK

No. 6216

CLOSED CELL SPONGE NEOPRENE
OIL RESISTANT,
LOW WATER ABSORPTION
TEMPERATURE RANGE:
-70° TO +250° F (-57° C TO +121° C)

ADHESIVE BACKED NEOPRENE WEATHERSTRIP

1/16" x 3/8"	3/16" X 1/4"	3/8" X 1/2"
1/16" x 1/2"	3/16" X 3/8"	3/8" X 3/4"
1/8" x 1/4"	3/16" X 1/2"	1/2" X 1/2"
1/8" x 3/8"	1/4" X 3/8"	1/2" X 3/4"
1/8" x 1/2"	1/4" X 1/2"	
	1/4" X 3/4"	

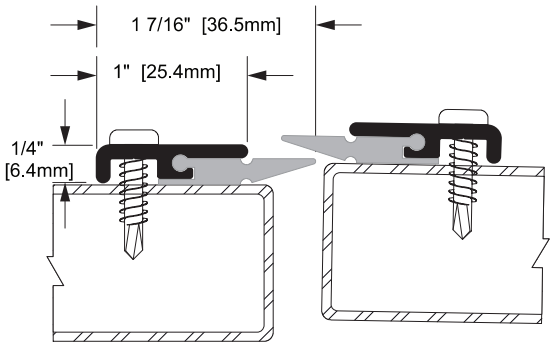
OTHER SIZES/COLOURS, SPECIAL ORDER: CONTACT OFFICE

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

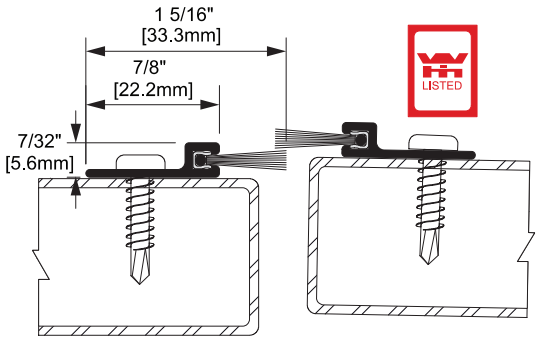
MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

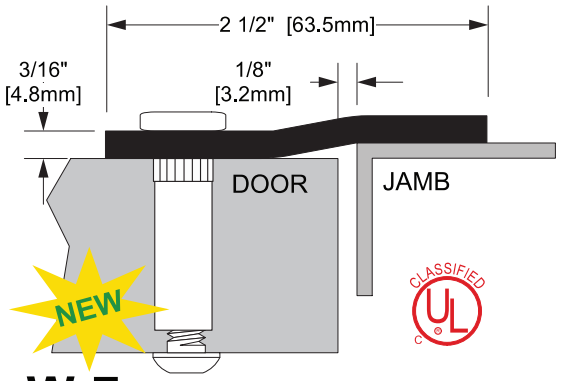
ASTRAGALS



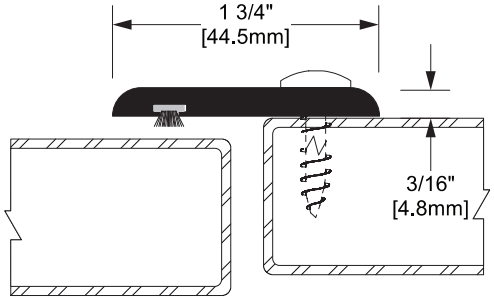
W-5 CLEAR ANODIZED ALUMINUM AND VINYL



W-25 CLEAR ANODIZED ALUMINUM AND NYLON BRUSH



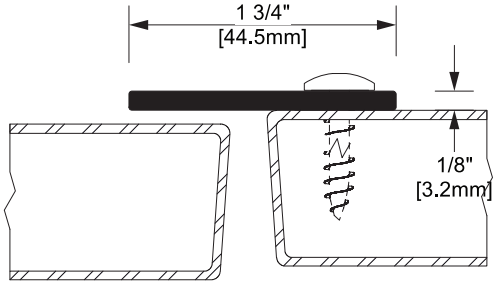
W-7 SECURITY ASTRAGAL
PRIMED C.R. STEEL c/w SECURITY SLEEVE



W-8 EXTRUDED ALUMINUM

W-8P EXTRUDED ALUMINUM WITH PILE

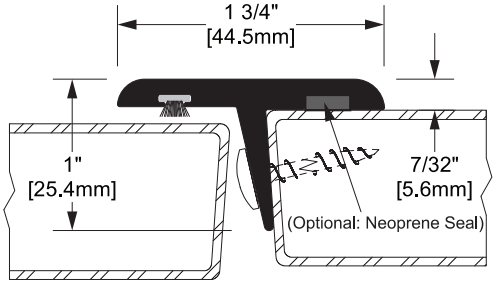
W-8SL EXTRUDED ALUMINUM WITH SILICONE



W-8S C.R. STEEL WITH CONDITIONED EDGES

W-8SP AS ABOVE, PRIMED FINISH

W-8SS STAINLESS STEEL, SEE PG. 20



W-9 EXTRUDED ALUMINUM WITH PILE

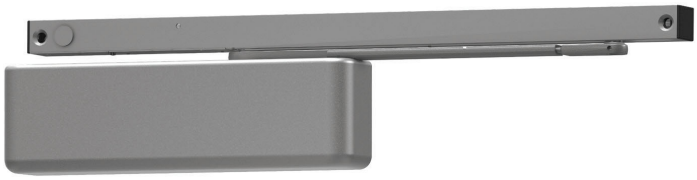
W-9S EXTRUDED ALUMINUM WITH SILICONE

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

4040SE Series



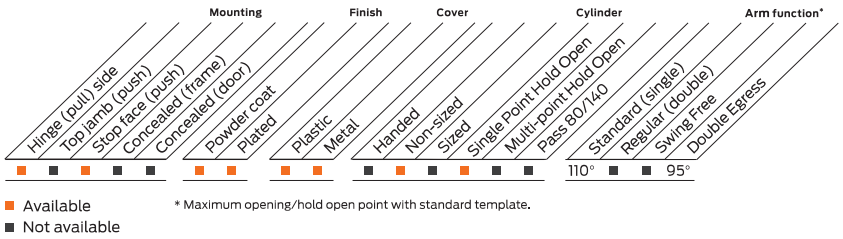
The 4040SE SENTRONIC® is a heavy duty, non-handed, nonsized closer/holder designed to provide single point hold open for fire and smoke barrier doors. Single lever (track) arm closer is specifically designed for interior doors.

Features

Certifications	Grade 1 - ANSI A156.15, UL 10C, 100 hour salt spray, meets BAA - Buy American Act, NFPA 101
Body construction	▪ Cast iron body ▪ Full complement bearing ▪ 1 ½" diameter piston ▪ ¾" diameter double heat treated pinion journal
Fluid	All weather fluid
Handing	Non-handed
Size	Adjustable spring size, up to 4
Warranty	2 years
Cover	▪ Plastic, standard ▪ Metal, optional

Fasteners	Wood and Machine Screws (WMS)
Mounting	Hinge (pull side), stop face (push side)
Arms	Standard Arm and SE track, standard Double Egress Arm and SEL track, optional
Finishes/colors/ powder coat	▪ 689 Aluminum paint ▪ 690 Statuary Bronze paint ▪ 691 Light Bronze paint ▪ 693 Black paint ▪ 695 Dark Bronze paint ▪ 696 Brass paint ▪ Custom colors optional
	▪ Optional SRI primer - powder coat only
Wiring	Concealed or surface, interfaces with fire alarm systems

Special templates | Customized installation templates or products may be available to solve non-standard applications. Contact LCN Product Support for assistance.



CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

Accessories

Installation accessories



4040SE-18
Plate
- Required where top rail is less than 3 ½" (89 mm)
- Requires minimum 2" (51 mm) top rail
- Installations require a special template



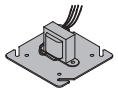
4040SE-18PA
Plate
- Required where top rail is less than 5 ¾" (146 mm)
- Requires minimum 2" (51 mm) top rail
- Installations require a special template



4040SE-81
Conduit Quick-Connector
- Two piece connector for use with ½" conduit



4040SE-3034SE
Track Roller and Track Slider
- Quiet, low friction roller assembly
- Shoulder dimension "X" = ⅛" (3 mm)
- Alloy metal slider for use in SE series tracks only



4040SE-3210
Transformer
- Reduces line voltage from 120V to 24V AC
- Mounted on cover for 4" (102 mm) x 4" x 2 ⅛" (54 mm) junction box (by others)

4310ME Series



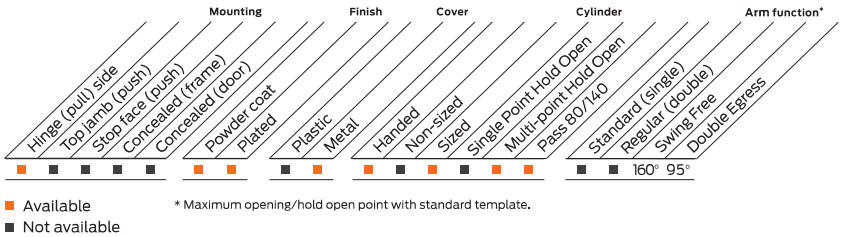
The 4310ME SENTRONIC® is a heavy duty, electrically controlled closer/holder designed to provide infinitely adjustable hold open for fire and smoke barrier doors. Door is held open until current interruption releases mechanism and the door closes. Single lever (track) arm closer is specifically designed for interior doors. Choice of finishes, cylinder functions, and installation accessories meet virtually all life safety requirements. An ME provides only the closer / holder function.

Features

Certifications	Grade 1 - ANSI A156.15, UL 10C, 100 Hour Salt Spray, Meets BAA - Buy American Act, NFPA 101
Body construction	▪ Cast iron body ▪ Full complement bearing ▪ 1 1/2" diameter piston ▪ 11/16" diameter double heat treated pinion journal
Fluid	All weather fluid
Handing	Handed
Size	Sized, 4 only
Warranty	2 years
Wiring	▪ Concealed or exposed electrical connectors ▪ Built in "On/Off" switch controls hold open function ▪ Interfaces with fire alarm systems

Cover	Metal, Standard
Fasteners	Wood and Machine Screws (WMS)
Mounting	Hinge (Pull Side)
Arms	▪ Swing Free Arm, standard ▪ Double Egress, optional
Finishes/ colors/ powder coat	▪ 689 Aluminum paint ▪ 690 Statuary Bronze paint ▪ 691 Light Bronze paint ▪ 693 Black paint ▪ 695 Dark Bronze paint ▪ 696 Brass paint ▪ Custom colors optional
	▪ Optional SRI primer - powder coat only ▪ Optional plated finishes

Special templates | Customized installation templates or products may be available to solve non-standard applications. Contact LCN Product Support for assistance.



■ Available
■ Not available

* Maximum opening/hold open point with standard template.

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

Accessories

Cylinder



4310ME-3971
Cast iron cylinder assembly (CYL)
- Handed
- Cast iron
- Specify 24V or 120V
- Standard



4310ME-3071
Cast iron cylinder assembly (CYL)
- Handed
- "On/Off" switch assembly controls hold open function
- Circuitry accepts either AC or DC input
- 24V or 120V, please specify
- Standard

Cover



4310ME-72MC
Metal Cover (MC)
- Handed
- Standard

Arms



4310ME-3077SF
Swing Free Arm (SF)
- Handed
- After door is placed in hold open, secondary pivot point allows up to 160° swing without door closer resistance



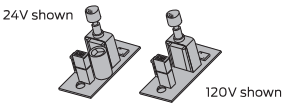
4310ME-3077DE
Double Egress Arm (DE)
- Handed
- For double egress doors and frames
- 2 11/16" (68 mm) maximum reveal
- Optional

Track



4310ME-3038
Standard Track (STDTRK)
- Non-handed
- Standard

Switch

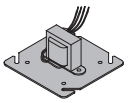


4310ME-3351
Switch Assembly
- Provides continuous hold open function
- 24V or 120V, please specify

Installation accessories



4310ME-3034
Track Roller
- Quiet, low friction roller assembly
- Shoulder dimension "X" = 1/8" (3mm)

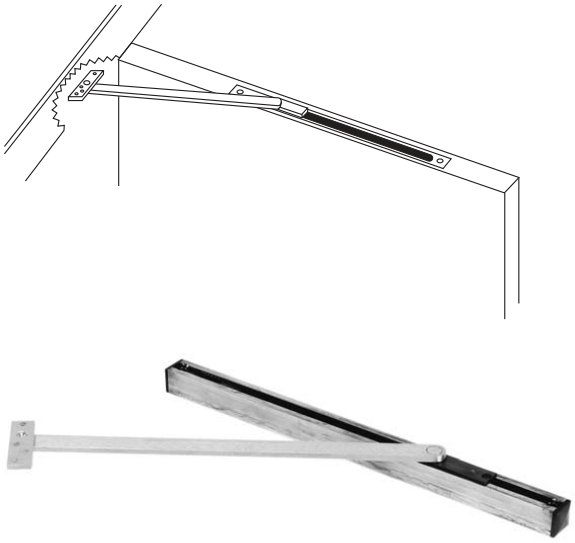


4310-3210
Transformer
- Reduces line voltage from 120V to 24V AC
- Mounted on cover for 4" (102 mm) x 4" x 2 1/8" (54mm) junction box (by others)



4310ME-3354
ME Wiring Harness
- Three wire harness with 6" (152 mm) leads for field wiring connections

1 Series



Application
- Interior or exterior doors
- Single or double acting
- Non-handed
- Recommended for high traffic, heavy abuse installations

Features
- Heavy-duty
- Slide track design
- Stop, friction stay or hold open functions
- 1-3/4" minimum door thickness. For thicker doors, specify when ordering
- 110° maximum opening
- Heavy shock absorber spring provides 5-7° compression before dead stop
- LS option omits spring for special applications
- Durable slider cam and shock block
- Surface on/off knob on hold open models
- 1-3/16" square channel
- Complete screw packet for installation in wood and machine screws for door and frame.
- For security areas, Torx® screws available for exposed fasteners
- Hanging means other than standard butts or offset pivots require special templating and pricing. Consult factory
- Standard architectural finishes

Compliance
- Stop function UL listed for fire door assemblies
- ANSI: C01531 (Friction)
  C01511 (HO)
  C01541 (Stop)

Door Opening Chart (In Inches)

Butts Offset Pivots	Center Hung Pivots	Model Number		
		Friction	H.O.	Stop
*24 - 28	—	1-116	1-126	1-136
28-1/16 - 33	30 - 36	1-216	1-226	1-236
33-1/16 - 38	36-1/16 - 41	1-316	1-326	1-336
38-1/16 - 43	41-1/16 - 46	1-416	1-426	1-436
43-1/16 - 48	46-1/16 - 50	1-516	1-526	1-536

Butt hung only on this size door. No swing clear hinges.

RIXSON®
ASSA ABLOY

ASSA ABLOY, the global leader in door opening solutions

Copyright © 2001-2018, ASSA ABLOY Accessories and Door Controls Group, Inc. All rights reserved. Reproduction in whole or in part without the express written permission of ASSA ABLOY Accessories and Door Controls Group, Inc. is prohibited.

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

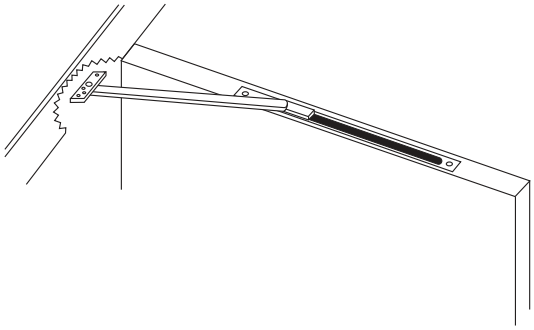
Submittal Date: FEB 2/26

1ADJ Series

Application
- Interior or exterior doors
- Single or double acting
- Non-handed
- Recommended for high traffic, heavy abuse situations

Features
- Heavy-duty, adjustable
- Slide track design
- Order specifically as a stop or hold open
- 1-3/4" minimum door thickness, for thicker doors consult factory
- 110° maximum opening (except 1ADJ for center hung 30-36" door which is 105°)
- Degree of opening is fully adjustable and can be adapted to changing needs
- Heavy shock absorber spring provides 5-7° compression before dead stop
- 1-3/16" square channel
- Complete screw packet kit for installation in wood or metal door and frame
- For security areas, Torx® screws available for exposed fasteners
- Durable slider cam and shock block
- Hanging means other than standard butts or offset pivots require special templating and pricing. Consult factory.
- Standard architectual finishes

Compliance
- Stop function UL listed for fire door assemblies
- ANSI: C01511 (HO)
  C01541 (Stop)





Door Opening Chart (in inches)

Butts Offset Pivots	Center Hung Pivots	Model Number	
		H.O.	Stop
*24 - 28	—	1ADJ-126	1ADJ-136
28-1/16 - 33	30 - 36	1ADJ-226	1ADJ-236
33-1/16 - 38	36-1/16 - 41	1ADJ-326	1ADJ-336
38-1/16 - 43	41-1/16 - 46	1ADJ-426	1ADJ-436
43-1/16 - 48	46-1/16 - 50	1ADJ-526	1ADJ-536

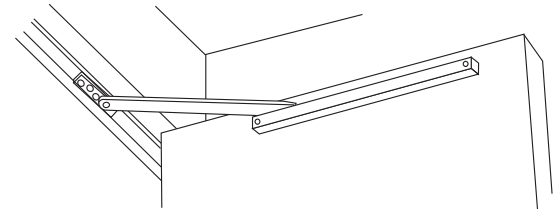
Butt hung only on this size door. No swing clear hinges.

RIXSON
ASSA ABLOY

ASSA ABLOY, the global leader in door opening solutions

Copyright © 2001-2018, ASSA ABLOY Accessories and Door Controls Group, Inc. All rights reserved. Reproduction in whole or in part without the express written permission of ASSA ABLOY Accessories and Door Controls Group, Inc. is prohibited.

9 Series





Application

- Interior or exterior doors
- Doors are single acting
- Non-handed
- Recommended for high traffic, heavy abuse installations

Features

- Heavy-duty
- Slide track design
- Heavy shock absorber spring provides 5-7° compression before deadstop
- LS option omits spring for special application
- On/off knob on hold open models
- Stop, friction stay or hold open function
- Complete screw packet with thru-bolts for door, wood and machine screws for frame
- Torx® screws optional for security applications
- Standard architectural finishes
- Durable slider cam and shock block
- 110° maximum opening
- 1-3/4" minimum door thickness
- 1-3/16" square channel
- For pull side mounting or flush mounting on push side or for rabbeted push side use angle jamb bracket adapter 5458-LH or 5459-RH
- Hanging means other than standard butts or offset pivots require special templating

Compliance

- Stop function UL listed for fire door assemblies
- ANSI: C02531 (Friction)
  C02511 (HO)
  C02541 (Stop)

Door Opening Chart (in inches)

Butts Offset Pivots	Center Hung Pivots	Model Number		
		Friction	H.O.	Stop
*24 - 28	25-1/2 - 30	9-116	9-126	9-136
28-1/16 - 33	30-1/16 - 36	9-216	9-226	9-236
33-1/16 - 38	36-1/16 - 41	9-316	9-326	9-336
38-1/16 - 43	41-1/16 - 46	9-416	9-426	9-436
43-1/16 - 48	46-1/16 - 50	9-516	9-526	9-536

Butt hung only on this size door. No swing clear hinges.

RIXSON®
ASSA ABLOY

ASSA ABLOY, the global leader in door opening solutions

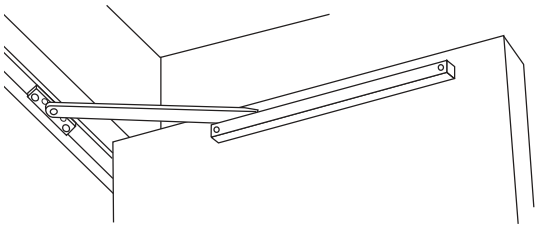
Copyright © 2001-2018, ASSA ABLOY Accessories and Door Controls Group, Inc. All rights reserved. Reproduction in whole or in part without the express written permission of ASSA ABLOY Accessories and Door Controls Group, Inc. is prohibited.

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

10 Series





Application
- Interior doors
- Doors are single acting
- Non-handed
- Recommended for moderate, medium weight doors

Features
- Standard duty, adjustable
- Slide track design
- Degree of opening fully adjustable and can be adapted to changing needs
- Heavy shock absorber spring provides compression before deadstop
- Can be ordered specifically as a stop, friction stay, or hold open.
- Multi-function unit is shipped as a stop. Can be converted to a hold open or friction in field. 5012-PKG (Adapter kit) included
- Complete screw packet with thru-bolts for door, wood and machine screws for frame
- Torx® screws optional for security applications, but heavy-duty units should be considered for high-security applications
- Standard architectural finishes
- Durable slider cam and shock block
- 110° maximum opening
- 3/4" square channel
- For pull side mounting or flush and rabbeted mounting on push side use angle jamb bracket adapter 5258
- Hanging means other than standard butts or offset pivots require special templating and pricing. Consult factory.

Compliance
- Stop function UL listed for fire door assemblies
- ANSI: C05532 (Friction)
  C05512 (HO)
  C05542 (Stop)

Door Opening Chart (in inches)

Butts Offset Pivots	Center Hung Pivots	Model Number			
		Friction	H.O.	Stop	Multi
*18 - 24	21 - 26-1/2	10-116	10-126	10-136	10-146
24-1/16 - 30	26-9/16 - 32	10-216	10-226	10-236	10-246
30-1/16 - 36	32-1/16 - 38	10-316	10-326	10-336	10-346
36-1/16 - 42	38-1/16 - 45	10-416	10-426	10-436	10-446
42-1/16 - 48	45-1/16 - 48	10-516	10-526	10-536	10-546

Butt hung only on this size door. No swing clear hinges.

RIXSON®
ASSA ABLOY

ASSA ABLOY, the global leader in door opening solutions

Copyright © 2001-2018, ASSA ABLOY Accessories and Door Controls Group, Inc. All rights reserved. Reproduction in whole or in part without the express written permission of ASSA ABLOY Accessories and Door Controls Group, Inc. is prohibited.

RIXSON

ASSA ABLOY

ASSA ABLOY, the global leader in door opening solutions



ELECTROMAGNETIC
DOOR HOLDER/RELEASES

Designed for remote door release applications

Copyright © 2001-2018, ASSA ABLOY Accessories and Door Controls Group, Inc., an ASSA ABLOY Group company. All rights reserved. Reproduction in whole or in part without the express written permission of ASSA ABLOY Accessories and Door Controls Group, Inc. is prohibited.

Model 997M

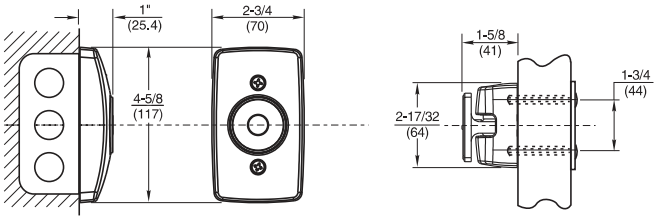
Application
- Wall mount
- Concealed wiring
- Shipping weight: 2 lbs. (0.9 kg)

Features
- Total projection: 2-5/8" (67mm)
- Mounting requirements: 2" x 4" x 1-3/4" (51 x 102 x 45mm) outlet box
- Wall must be properly reinforced and outlet box adequately fastened
- 2 year limited warranty

Compliance
- ANSI/C00011

Electrical Data
- Voltage and current:
  120VAC, 60Hz., .020 amp
  24VAC/DC, 60Hz., .020 amp
  12VDC, .040 amp
- For 50-55 lbs. of holding force, specify voltage
  120VAC, 60Hz .017 amp
  24VAC, 60Hz .080 amp
  24VDC, .068amp
  12VDC, .180amp
  240VAC, 50/60Hz. .009 amp





Model 998M

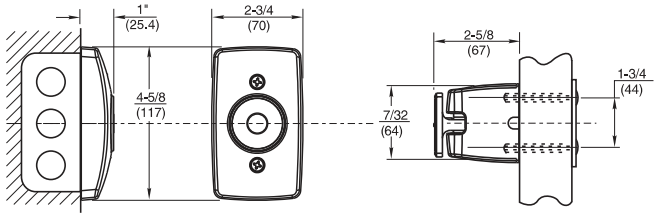
Application
- Wall mount
- Concealed wiring
- Shipping weight: 2-1/2 lbs. (1.1 kg)

Features
- Total projection: 3-5/8" (92mm)
- Mounting requirements: 2" x 4" x 1-3/4" (51 x 102 x 45mm) outlet box
- Wall must be properly reinforced and outlet box adequately fastened
- 2 year limited warranty

Compliance
- ANSI/C00011

Electrical Data
- Voltage and current:
  120VAC, 60Hz., .020 amp
  24VAC/DC, 60Hz., .020 amp
  12VDC, .040 amp
- For 50-55 lbs. of holding force, specify voltage
  120VAC, 60Hz .017 amp
  24VAC, 60Hz .080 amp
  24VDC, .068amp
  12VDC, .180amp
  240VAC, 50/60Hz. .009 amp





RIXSON®
ASSA ABLOY

ASSA ABLOY, the global leader
in door opening solutions

Copyright © 2001-2018, ASSA ABLOY Accessories and Door Controls Group, Inc., an ASSA ABLOY Group company. All rights reserved.
Reproduction in whole or in part without the express written permission of ASSA ABLOY Accessories and Door Controls Group, Inc. is prohibited.

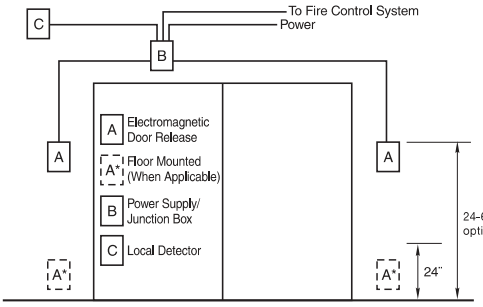
CDH

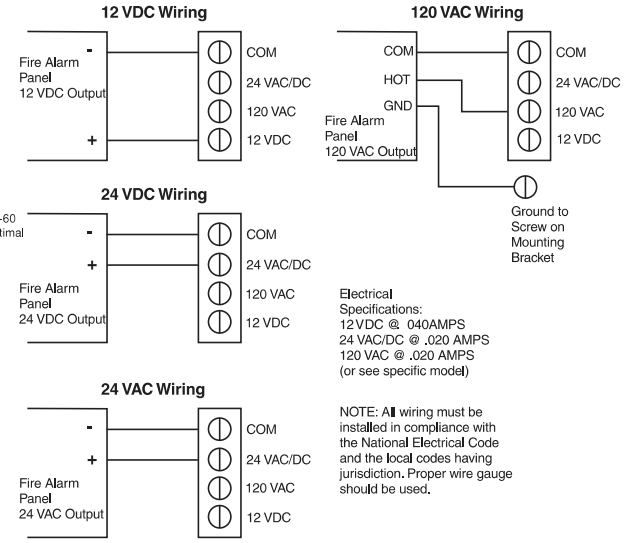
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

Schematics





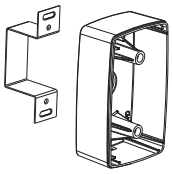
Electrical Specifications:
12 VDC @ 040AMPS
24 VAC/DC @ .020 AMPS
120 VAC @ .020 AMPS
(or see specific model)

NOTE: All wiring must be installed in compliance with the National Electrical Code and the local codes having jurisdiction. Proper wire gauge should be used.

Operation Narrative

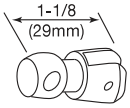
Doors are to be normally held open. The electromagnetic door releases will be energized with the voltage shown (at right) in the hardware set for this opening. Power shall be controlled by the fire control system. It will interrupt the power if alarmed, causing the doors to be released, thus allowing the door closers to close the doors. When power is restored the magnets will re-energize, permitting the doors to be manually returned to their held open position.

Accessories

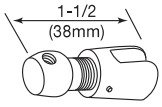


1-1/2" (38mm) Extension (for use only with Models 997M, 998M & 994M) Mounts behind wall cover.

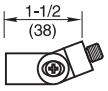
XK996M
Part# 996631M-*



994M Swivel Armature (cannot be used with extension spacers)
Part# 900-3



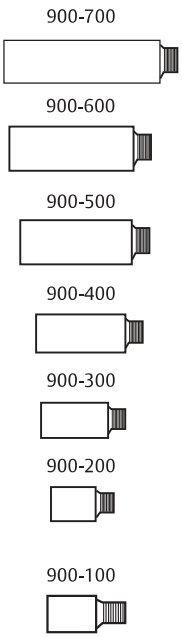
Base Unit Armature Extension Mounts between armature and contact plate.
Part# 900
Cannot be used with model 994M



Armature Extension 90° Bend
Part# 900-Z
Must be used with 900 base unit. Those two pieces will extend armature 3" longer than the contact plate.

*specify finish

Spacer lengths – must be used with 900 base



For dimensions, see chart below



Extension pieces must be used in conjunction with 900 Base Unit

Part# 900-700 = 7"
Part #900-600 = 6"
Part# 900-500 = 5"
Part# 900-400 = 4"
Part# 900-300 = 3"
Part# 900-200 = 2"
Part# 900-100 = 1"
Part# 900-75 = 3/4"
Part# 900-50 = 1/2"

RIXSON
ASSA ABLOY

ASSA ABLOY, the global leader in door opening solutions

Copyright © 2001-2018, ASSA ABLOY Accessories and Door Controls Group, Inc., an ASSA ABLOY Group company. All rights reserved.
Reproduction in whole or in part without the express written permission of ASSA ABLOY Accessories and Door Controls Group, Inc. is prohibited.

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

Mullions and Door Kits

20 Series Exit Device

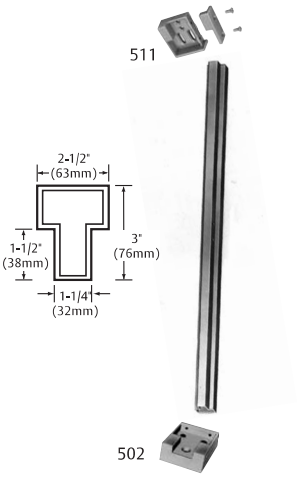
SARGENT
ASSA ABLOY

980 Removable Mullion

980 Extruded Aluminum (prime coat)
980A Aluminum (US28)

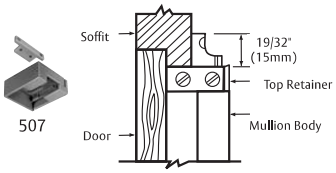
Consists of:

- Mullion
- 511 Top retainer
- 502 Bottom retainer
- 96" (2438mm) stock size; 120" (3000mm) available



507 Adapter for Narrow Transom Bars

- Available with 980 and 980A
- Required when soffit is 1-1/4" (32mm) to 2" (51mm) wide



12-980 Mullion (96" maximum)

For 12-2828

2"x 3" Channel Iron. Malleable iron top and bottom retainers.

- 96" (2438mm) stock size; 120" (3000mm) available
- 120" Mullions do not carry UL Fire label

Top Retainer Shim Kit - 601



543 Stock Hollow Metal Door Kit

Kit consists of a 649 Strike Shim, a 161F Lock Front Filler, and a 86S Strike Filler for applying a 2828 Series Exit Device on doors prepared with Fed. Type 161 cutouts, and frames prepared for ANSI A115-2 Strikes.

The 649 strike shim is 1/8" (3mm) thick and is used to obtain the correct distance between the exit device case and the 649 surface applied strike, when the stop is 1/2" (13mm) high.

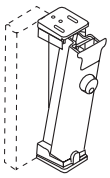


649 Strike Shim

161 Lock Front Filler

86S Strike Filler

L980 Lockable Mullion



- Aluminum Prime Coat
- Specify: "L980A" Anodized Aluminum
  Specify: "L980A x10B" for 313AN to match 10B
- Used for non fire rated applications
- 96" (2438mm) stock size
- 120" (3000mm) available
- Standard #41 cylinder (1-1/8")
- Cylinder options: Signature, XC-, Schlage Keyways SC- & SE- available
- Wall Mount Kit 98-2578
- Top Ret Pack 98-2526
- Bottom Ret Pack 98-2525
- Cylinder Kit must be ordered separate (980C1)

12-L980 Lockable Mullion

- Steel
- Fire rated for 8'0" x 8'0" (2438mm x 2438mm) paired openings
- 96" (2438mm) Stock Size
- 120" (3000mm) (non fire rated) available
- #41 cylinder standard
- Cylinder options: Signature, XC-, Schlage Keyways SC- & SE- available
- Top Retainer Shim Kit - 601
- Cylinder Kit must be ordered separate (980C1)

EL980 Electric Lockable Mullion

- Steel
- For use with monitor or electric strikes
- Quick-Connect wiring supplied
- 96" (2438mm) stock size
- 120" (3000mm) available
- Requires a #46 cylinder
- Top Retainer Shim Kit - 601
- Not available in 12- option
- Cylinder Kit must be ordered separate (980C2)

Mullion Accessories

RK980
Latchbolt assembly retrofit kit with top and bottom retainers for 980 mullion

Retainer Packs

Product #	Description
98-2526	Top Ret. pack for L980
98-2525	Bottom Ret. pack for L980
98-2558	Top Ret. pack for 12-L980
98-2556	Bottom Ret. pack for 12-L980
98-2559	Top Ret. pack for EL980

Note: For complete listing of available mullions, see the 80 Series Catalog

Copyright © 2003-2020, SARGENT Manufacturing Company. All rights reserved. Reproduction in whole or in part without the express written permission of SARGENT Manufacturing Company is prohibited. Patent pending and/or patent www.assaabloydss.com/patents.

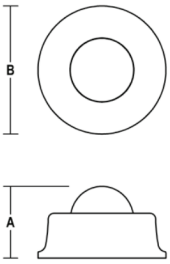
CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

DOOR STOPS
WALL STOPS



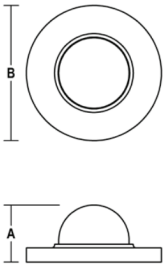


S119
BUTTON WALL STOP

NO.	A	B
S119	0.5625″	Ø 1″

FEATURED FINISHES: Flat Black (19), Satin Chrome (26D)
FINISHES: 10BE, 19, 26D, PC
MATERIAL: Brass



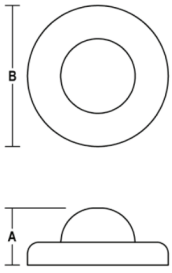


S120
CONVEX WALL STOP

NO.	A	B
S120	1″	Ø 2.5″

FEATURED FINISHES: Flat Black (19), Satin Chrome (26D)
FINISHES: 3, 4, 10B, 15, 19, 26, 26D
MATERIAL: Zinc Die Cast





S121
CONVEX WROUGHT WALL STOP

NO.	A	B
S121	1″	Ø 2.5″

FEATURED FINISHES: Flat Black (19), Satin Stainless (32D)
FINISHES: 19, 26D, 32D
MATERIALS: Wrought Brass, Stainless

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26



F65UL
MANUAL FLUSH BOLT - FOR METAL DOORS

FEATURED FINISHES: Flat Black (19), Satin Chrome (26D)
FINISHES: Standard & Custom Available (See Pages 14 & 15)
NOTES: UL Listed

NO	FACE	STRIKE1	STRIKE2	ROD	THROW	PLATE THICKNESS	BOLT LENGTH
F65UL	1" X 6.75"	1" X 2"	0.9375" X 2.25"	10.5"	0.875"	0.085"	1.125"

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1



F75
HEAVY DUTY ROLLER LATCH W/ T-STRIKE

NO.	FACE	DEPTH	PLATE THICKNESS	STRIKE
F75	1" X 3.4375"	1.625"	0.1562"	1.1562" X 2.7812"

FEATURED FINISHES: Flat Black (19), Satin Chrome (26D)
FINISHES: Standard & Custom Available (See Pages 14 & 15)
MATERIAL: Cast Brass
PRODUCT OPTIONS: Stainless Roller Optional
NOTES: Fully Adjustable Roller for Various Door Clearances, Nylon Roller



F76
HEAVY DUTY ROLLER LATCH W/ ASA STRIKE

NO.	FACE	DEPTH	PLATE THICKNESS	STRIKE
F76	1" X 3.4375"	1.625"	0.1562"	1.25" X 4.9062"

FEATURED FINISHES: Flat Black (19), Satin Chrome (26D)
FINISHES: Standard & Custom Available (See Pages 14 & 15)
MATERIAL: Cast Brass
PRODUCT OPTIONS: Stainless Roller Optional
NOTES: Fully Adjustable Roller for Various Door Clearances, Nylon Roller

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

Solutions and specialty products

Finger guards



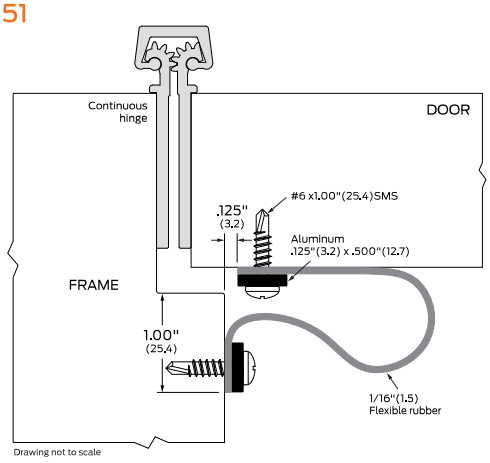
Finger guards

Hand and finger protection for heavy-duty industrial applications, child care, school safety, hospitals, and workplaces.

A commercial-quality, maintenance-free product. Aluminum and flexible rubber available in grey color.

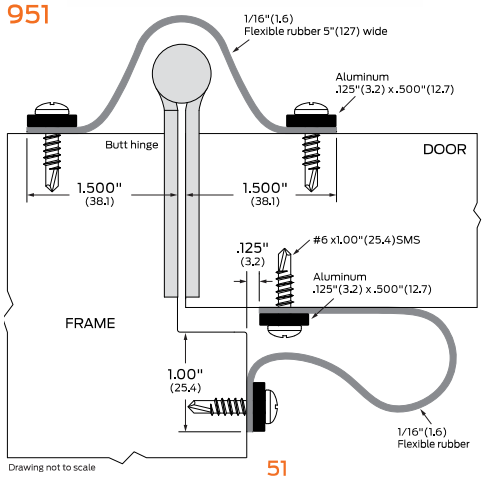
51A-90 (6.5" wide) For door opening up to 90°
51A-180 (8.5" wide) For door opening up to 180°
951 Cover for mortise type hinges

51



Finishes: A, BK, D, G
Options: SEC
Opening degree: 90, 180

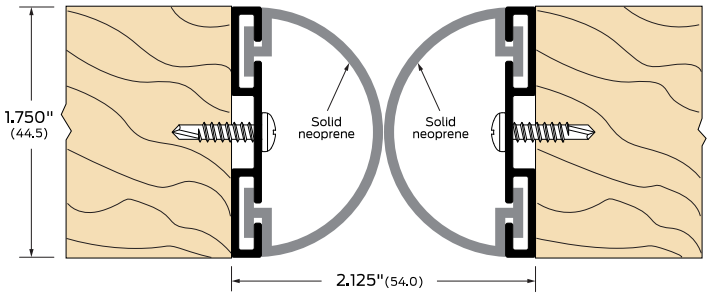
951



51

Finishes: A, BK, D, G
Options: SEC

72





Finishes: A
Options: SEC

Finishes:

A	Aluminum Mill Finish
BK	Black Anodized Aluminum
D	Dark Bronze Anodized Aluminum
G	Gold Anodized Aluminum

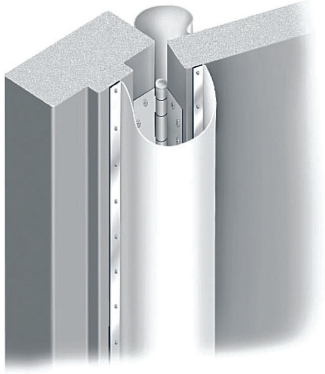
Options:

SEC	Torx security screws

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1
MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

Solutions and specialty products

Finger guards



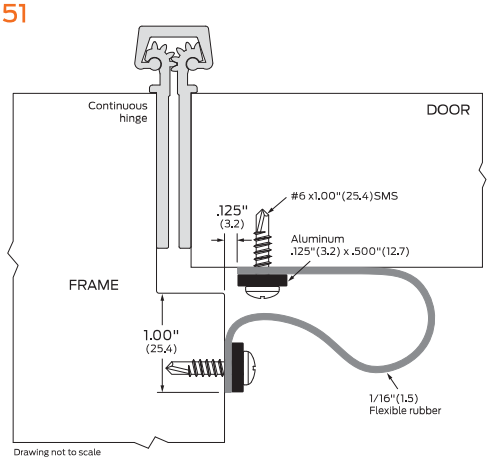
Finger guards

Hand and finger protection for heavy-duty industrial applications, child care, school safety, hospitals, and workplaces.

A commercial-quality, maintenance-free product.
Aluminum and flexible rubber available in grey color.

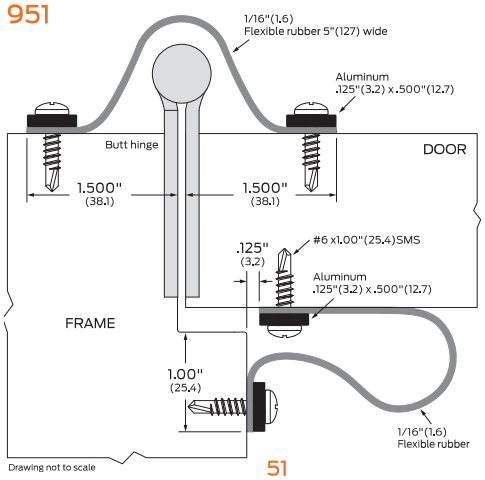
51A-90 (6.5" wide) For door opening up to 90°
51A-180 (8.5" wide) For door opening up to 180°
951 Cover for mortise type hinges

51



Finishes: A, BK, D, G
Option: SEC
Opening degree: 90, 180

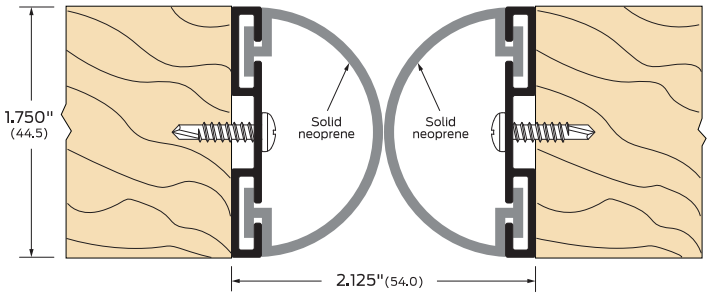
951



51

Finishes: A, BK, D, G
Option: SEC

72





Finishes: A
Option: SEC

Finishes:

A	Aluminum Mill Finish
BK	Black Anodized Aluminum
D	Dark Bronze Anodized Aluminum
G	Gold Anodized Aluminum

Option:

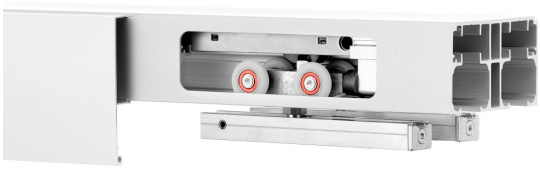
SEC	Torx security screws

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026
Submittal Date: FEB 2/26

CCD-410-W

KNC
Catch 'N' Close



FEATURES

- 150 lbs. [68 kg] weight capacity
- Effortless opening and closing of the door with the Catch 'N' Close Closing System (for doors wider than 18 in [457 mm])
- Zero Clearance hangers minimize the visual gap between the track and the door, eliminating the need for fascia
- Nylon wheels and precision ball bearings provide smooth and quiet door operation
- Adjustable in-track stops
- Cycle tested for up to 150,000 cycles without fail
- ADA Compliant (Barrier-free) design
- Anodized or powder-coated finishes also available
- For 1 3/4 in [44.5 mm] thick doors

COMPLETE 2 DOOR KIT BREAKDOWN



1 - CC-500 Double Track
x length based on kit size (e.g. 72 in [1829 mm] kit for 36 in [914 mm] wide doors)



4 - CC-410 Zero Clearance Catch 'N' Close Hangers
complete with screws and adjustment tools



4 - CC-100 Catch 'N' Close In-Track Stops
complete with set screws for friction fit



4 - Catch 'N' Close Closing Devices
complete with screws
CC-75 for doors up to 75 lbs. [34 kg]
CC-1 for doors up to 150 lbs. [68 kg]



2 - C-914 Aluminum Guide Channels
x length based on kit size (e.g. 36 in [914 mm] guide channel for 72 in [1829 mm] kit)



1 - C-913D-134 Bypass Double Guide
complete with screws

OPTIONAL

Door Locks & Pulls



Add-On Products



CC-440 Fascia x 1
x track length

CC-440 Fascia x 2
x track length

Customer Name _____ **Job No./Name** _____ **Date** _____ **Provided By** _____

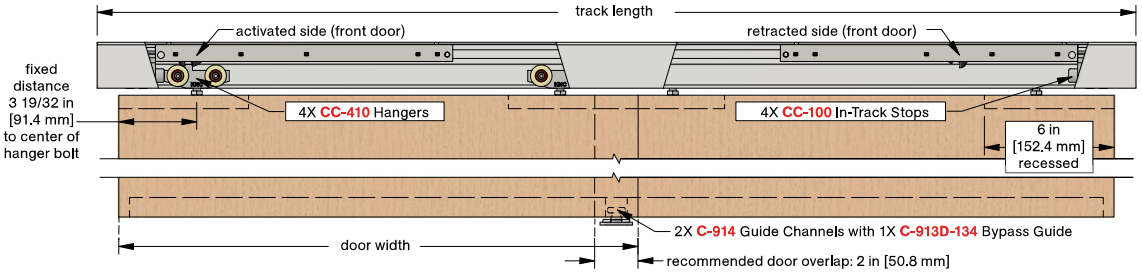
Notes

KN Crowder
1220 Burloak Drive, Burlington, Ontario, Canada, L7L 6B3
T. 1–866–999–1562 customerservice@kncrowder.com kncrowder.com
© 2020-2025 K.N. Crowder Mfg. Inc. All Rights Reserved.

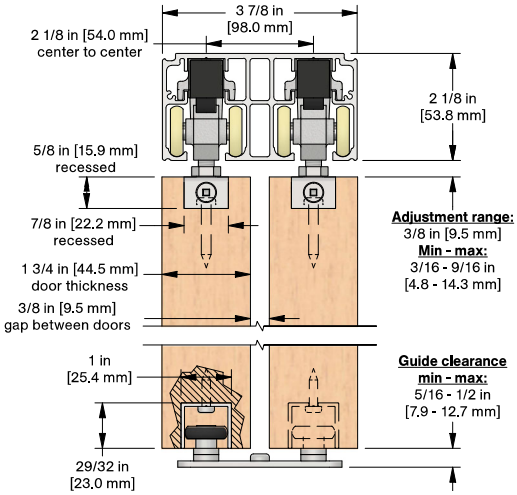
CCD-410-W

KNC
Catch 'N' Close

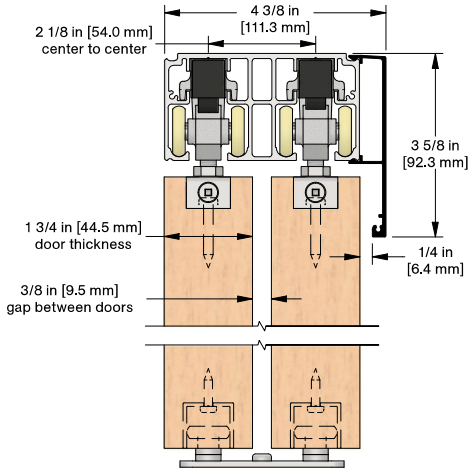
COMPLETE ELEVATION VIEW



PRODUCT DIMENSIONS



Optional CC-440 Snap-on Fascia, illustrated as solid black profile



Installation Instructions

Customer Name _____ **Job No./Name** _____ **Date** _____ **Provided By** _____

Notes

KN Crowder
1220 Burloak Drive, Burlington, Ontario, Canada, L7L 6B3
T. 1–866–999–1562 customerservice@kncrowder.com kncrowder.com

© 2020-2025 K.N. Crowder Mfg. Inc. All Rights Reserved.

CDH
Commercial Doors & Hardware Ltd.
2150 Winston Park Drive, Unit 16
Oakville, L6H 5V1

MAYFIELD WEST #2 PS 2026

Submittal Date: FEB 2/26

GT710/8710

Low-Energy
ADA Swing Door Operator

Where SOLUTIONS are AUTOMATIC



Product Features and Benefits

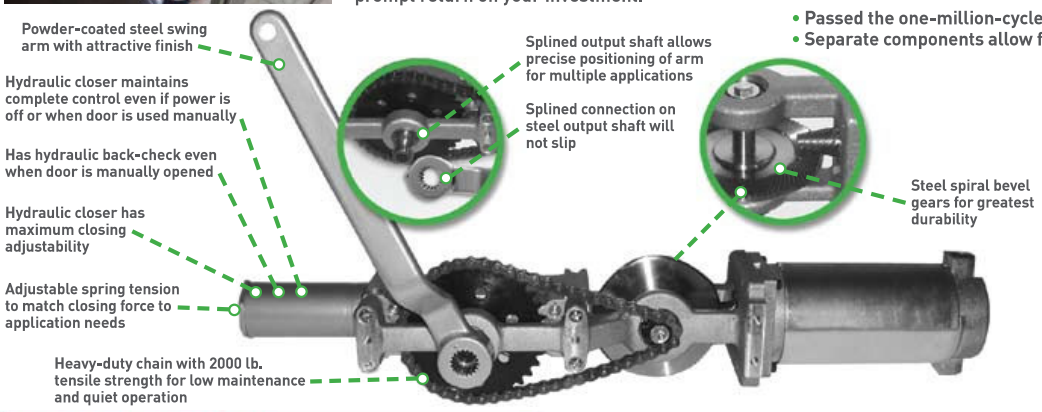
- Hydraulic design offers **proven reliability**
- Adjustable closing speeds to **enhance energy savings**
- Manual mode requires very little pressure to open **promoting ease of operation**
- Approved on fire door assemblies rated up to 3 hours, **maintaining security and safety**
- Hydraulic back-check during windy conditions **protects the door and operator from damage**



GT710/8710 Low-Energy ADA Swing Door Operator

The NABCO GT710/8710 Low-Energy Operator is engineered for interior and exterior use, and designed to automate essentially any new or existing door frame. The GT710/8710 operates in both automatic and manual modes with a hydraulic back-check that protects the door and mechanical operator from damage when forced open in windy conditions or when manually operated. The GT710/8710 Operator has been approved for use on fire door assemblies rated up to 3 hours. The low-energy performance, combined with the adjustable opening and closing speeds, reduces energy consumed, which offers a prompt return on your investment.

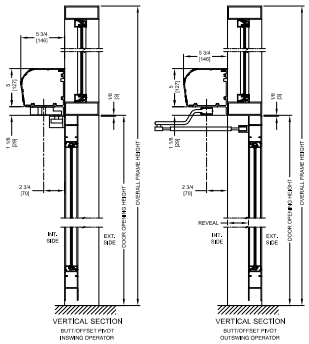
- Passed the one-million-cycle endurance test
- Separate components allow for lower repair costs



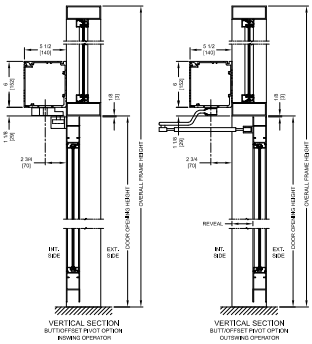
PRODUCT INFORMATION

Header dimensions	**Side load - 5" H X 5 3/4" D** (GT710) **curved header** **Side load - 6" H X 5 1/2" D** (GT8710)
Standard finish	**Clear and dark bronze anodized**
Optional finishes	**Painted, clad, special anodized**
Mounting	**Surface applied or overhead concealed**
Installation types	**Push or pull**
Operating voltage	**120 VAC @ <5 amps**
Auxiliary power output	**12VDC 750mA**
Operator drive	**Electro-hydraulic**
Motor voltage	**Pulse width modulated**
Motor type	**1/8th HP @ peak**
Control type	**Microprocessor**
Door panel weight	**300 lbs.**
Adjustable open	**Force and speed**
Adjustable close	**Force and speed**
Closing method	**Spring/hydraulic** (with selectable power assist)
Adjustable opening angle	**Up to 145º**
Power boost close	**Selectable**
Basic features	**Low-energy operation** **Push and go** **Obstacle detection in opening and closing cycles** **Sequential or timer mode operation** **LCD display for programming and diagnostics** **Open- or closed-circuit safety inputs** **Momentary or maintained activation**
Switch modes	**On, off, hold-open**
Opening and closing speed	**Adjustable**
Hold-open time	**Adjustable** (0-30 seconds)
Code compliances	**ANSI A156.19/ANSI A117.1**
Approvals	**UL, ULC**

GT710 Operator



GT8710 Operator



CONFIGURATIONS:
The GT710/8710 is available for multiple configurations, such as single doors, simultaneous pairs, and dual-egress, as well as the Opman configuration, which is a single continuous header for a pair of doors containing a manual closer on one side and an automatic operator on the other.

NABCO Service and Specifications

Along with the NABCO factory branches, NABCO has the largest independently owned network of automatic door distributors in North America. Their friendly, qualified installers and technicians always strive to exceed your expectations from install to after-sales service. NABCO's factory branches and independent distributors provide AAADM-certified technicians to ensure your doors meet all ANSI A156.10/A156.19 standards.

Complete three-part specifications and CAD drawings are available on the NABCO website.

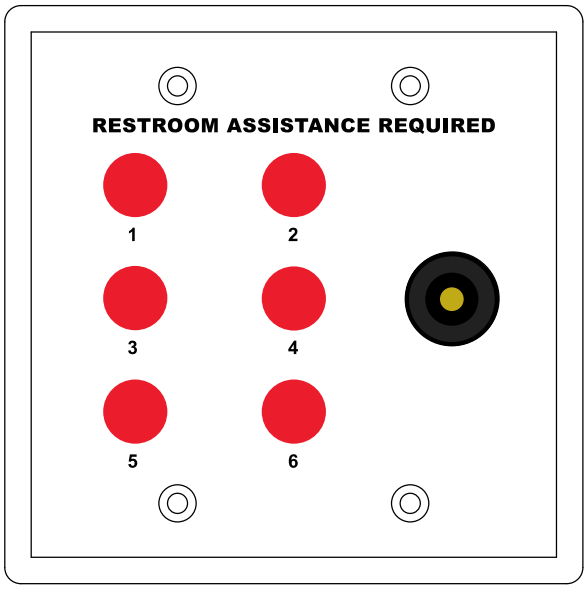
NABCO
Member of the Nabtesco Group

Member AAADM

NABCO ENTRANCES INC.
S82 W18717 Gemini Drive | Muskego, WI 53150 | 877-622-2694 | Fax 888-679-3319
www.NABCOentrances.com | Email info@nabcoentrances.com

Distributed by:

06/15



Size/Placement Reference

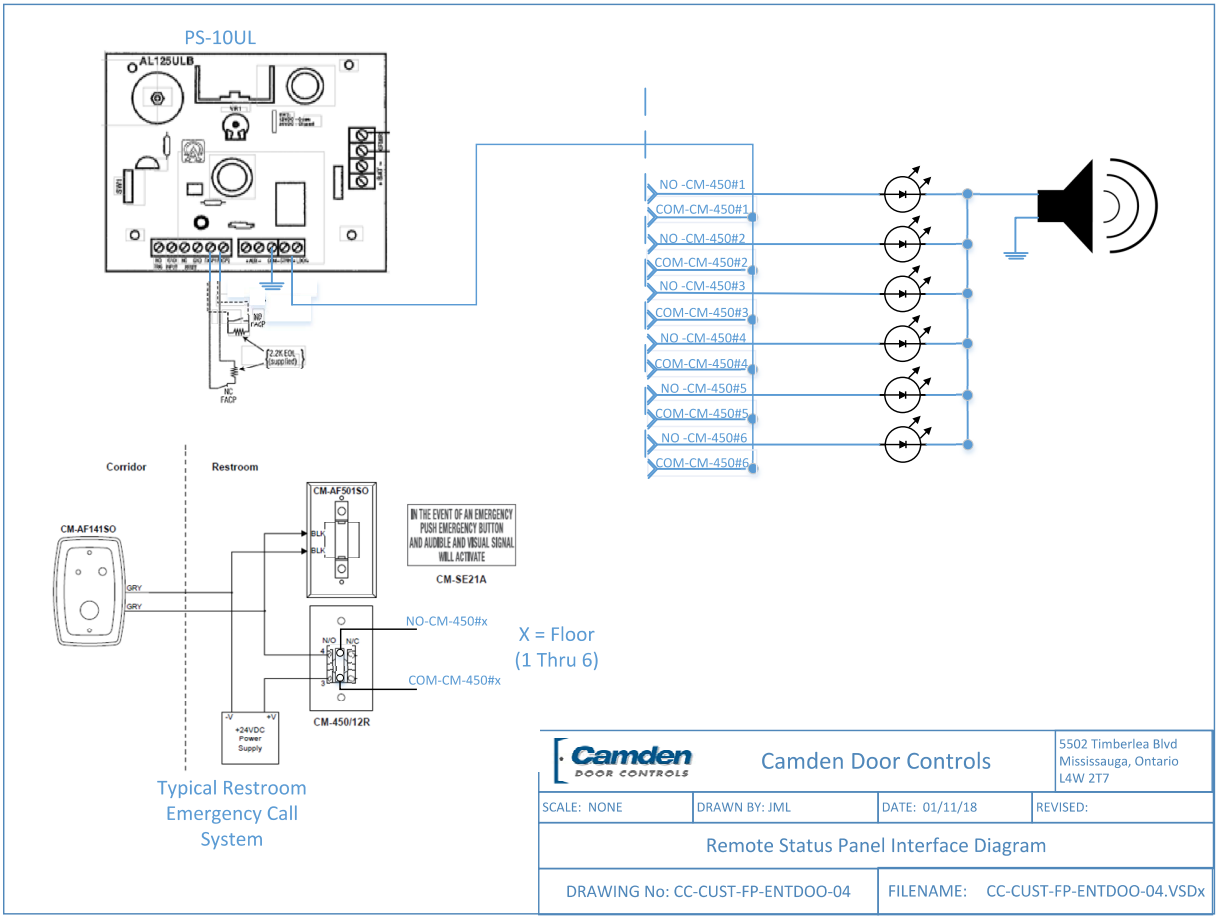
GRAPHIC PRODUCTION METHOD

☑ Laser engraved, black ☐ Engraved, paint filled PMS color _____ ☐ Silkscreened PMS color (s) _____ _____

NOTES:

1- This drawing as per terms & conditions of approved quotation/purchase order
2- Written approval of this proof required prior to production scheduling
3- Pre-production sample not provided unless agreed to in writing by Camden

Camden DOOR CONTROLS	CUSTOM PRODUCT PROOF	
	Model #: CC-CUST-FP-ENTDOO-04	
CUSTOMER APPROVAL	DATE:	
	REVISED:	SHEET: 1


PS-10UL
AL125ULB
NO -CM-450#1
COM-CM-450#1
NO -CM-450#2
COM-CM-450#2
NO -CM-450#3
COM-CM-450#3
NO -CM-450#4
COM-CM-450#4
NO -CM-450#5
COM-CM-450#5
NO -CM-450#6
COM-CM-450#6
Corridor
Restroom
CM-AF141SO
CM-AF501SO
IN THE EVENT OF AN EMERGENCY PUSH EMERGENCY BUTTON AND AUDIBLE AND VISUAL SIGNAL WILL ACTIVATE
CM-SE21A
NO-CM-450#x
COM-CM-450#x
X = Floor
(1 Thru 6)
CM-450/12R
Typical Restroom
Emergency Call
System
Camden Door Controls
5502 Timberlea Blvd
Mississauga, Ontario
L4W 2T7
SCALE: NONE
DRAWN BY: JML
DATE: 01/11/18
REVISED:
Remote Status Panel Interface Diagram
DRAWING No: CC-CUST-FP-ENTDOO-04
FILENAME: CC-CUST-FP-ENTDOO-04.VSDx

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 11 – Final Cleaning.

.3 Section 01 78 00 - Closeout Submittals

.4 Section 08 11 14 – Metal Doors and Frames.

.5 Section 08 50 50 – Aluminum Windows.

.6 Section 07 92 10 - Joint Sealing: caulking of joints between frames and other building components.

.7 Section 10 28 10 – Toilet, Bath and Laundry Accessories.

1.2 REFERENCES

.1 American National Standards Institute (ANSI).

.1 ANSI/ASTM E330-[02], Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM C542-[94(1999)], Specification for Lock-Strip Gaskets.

.2 ASTM D790-[02], Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

.3 ASTM D1003-[00], Test Method for Haze and Luminous Transmittance of Plastics.

.4 ASTM D1929-[96(R2001)e1], Test Method for Determining Ignition Temperature of Plastics.

.5 ASTM D2240-[02b], Test Method for Rubber Property - Durometer Hardness.

.6 ASTM E84-[01], Test Method for Surface Burning Characteristics of Building Materials.

.7 ASTM F1233-[98], Test Method for Security Glazing Materials and Systems.

.3 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.1-[M90], Tempered or Laminated Safety Glass.

.2 CAN/CGSB-12.2-[M91], Flat, Clear Sheet Glass.

.3 CAN/CGSB-12.3-[M91], Flat, Clear Float Glass.

.4 CAN/CGSB-12.4-[M91], Heat Absorbing Glass.

.5 CAN/CGSB-12.5-[M86], Mirrors, Silvered.

.6 CAN/CGSB-12.6-[M91], Transparent (One-Way) Mirrors.

.7 CAN/CGSB-12.8-[97], Insulating Glass Units.

.8 CAN/CGSB-12.9-[M91], Spandrel Glass.

.9 CAN/CGSB-12.10-[M76], Glass, Light and Heat Reflecting.

.10 CAN/CGSB-12.11-[M90], Wired Safety Glass.

.11 CAN/CGSB-12.12-[M90], Plastic Safety Glazing.

.12 CAN/CGSB-12.13-[M91], Patterned Glass.

.13 CAN/CGSB-12.1-M90 Tempered or Laminated Safety Glass

.14 CAN/CGSB-12.3-M76 Glass, Polished Plate or Float, Flat, Clear

.4 Canadian Standards Association (CSA International).

.1 CSA A440.2-[98], Energy Performance Evaluation of Windows and Sliding Glass Doors.

.2 CSA Certification Program for Windows and Doors [2000].

.5 Environmental Choice Program (ECP).

.1 CCD-045-[95], Sealants and Caulking.

.6 Flat Glass Manufacturers Association (FGMA).

.1 FGMA Glazing Manual - [1997].

.7 Laminators Safety Glass Association (LSGA).

.1 LSGA Laminated Glass Design Guide [2000].

1.3 SAMPLES

.1 Submit a 300 x 300 sample of all glass products in accordance with Section 01 33 00 - Submittal Procedures.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 013300 – Submittal Procedures. Co-ordinate location with Consultant.

1.5 WARRANTY

.1 Contractor hereby warrants glass against defects and failure, including leakage, under normal conditions of use, in accordance with the Contract, but for ten (10) years total, as follows:

.2 Supplier shall submit a written warranty from the insulated glass manufacturer to replace or repair any defects in materials or sealed units for a period of ten (10) years from the date of Substantial Completion.

.3 Mirrors:

.1 Submit a warranty for mirrors, covering the repair or replacement of defective work in accordance with the Contract, but for five (5) years total.

.2 Warranty shall apply against defects in workmanship and materials and, against silver deterioration and loosening of fastenings.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site] for recycling.

.3 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.4 Divert unused or damaged wood materials from landfill to [recycling] [reuse] [composting] facility approved by Consultant.

.5 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.6 Divert unused caulking material from landfill to official hazardous material collections site approved by Consultant.

.7 Plastic caulking tubes are not recyclable and must not be diverted for recycling with other plastic materials.

Part 2 Products

2.1 MATERIALS

.1 Acceptable Manufacturers:

.1 AFG Glass Inc
.2 Libby-Owens Ford
.3 Vitro Architectural Glass
.4 Others approved that meet this specification.

.2 Exterior Tempered Safety Glass: All exterior Vision Glass to exterior windows, curtain wall and non-fire-rated screens to be sealed insulated units conforming to CAN/CGSB-12.8. Exterior lite 6mm tempered clear glass, Solarban 70 Low Emmissivity Coating on inner pane (2nd surface), 13mm Argon filled air space, inner lite 6 mm clear tempered glass.

.1 All tempered glass to conform to CAN2-12.1 M-90 Type 2 tempered glass, Class B Double glazed units to have an integral non-metallic space creating a 13 mm hermetically sealed Argon filled air space. Spacers shall be continuous with butt joints (if any) at corners only. Pieces are not permitted. Butyl based spacers are not permitted.

.2 Interior Tempered Safety Glass: All interior Vision Glass to <u>non-fire rated</u> interior doors and screens to be tempered 6 mm clear float glass complete with etched tempered glass designation visible.

.3 Spandrel Glass (SP): CAN/CGSB-12.9-M, 6 mm thick unless otherwise indicated, with water-based silicone emulsion coating applied to backside, ‘Opaci-Coat 300' by ICD High Performance Coatings or approved alternative. Colour: To be selected by the Consultant.

.4 Polished Plate or Float Glass: To CAN/CGSB-12.3 clear.

.5 Fire Rated Glazing ('FR' 'FRG' or 'GW'): Fire rated glazing to be impact safety rated, intumescent or ceramic laminated glazing to meet required fire resistance rating. Coordinate glazing thickness with screen frame manufacturer. Location: Required for ALE Room door lite. All other windows within fire separations are to be sprinklered:

.1 Fireswiss by Glas Trosch
.2 Pyrostop by Pilkington
.3 Pyrobel by AGC
.4 ContraFlam by VetroTech/St-Gobain

.6 No georgian-wired glazing is to be used on this project.

.7 Impact/safety film for all Fire Rated Glazing is to be approved and factory applied by manufacturer/distributor.

.8 Locations: as required on drawings to fire rated doors and screens.

.9 Mirrors: Refer to Section 10 28 10 Washroom Accessories.

.10 Setting blocks: neoprene, 80 durometer hardness, 102 mm x 6 mm width to suit glass to extend from the fixed stop to the opposite face of the glazing unit.

.11 Spacer Blocks: neoprene, thickness to provide a minimum glass to face clearance of 3mm.

.12 Glazing tape**:** preformed polyisobutylene-butyl glazing tape with integral shim strip, 10-15 durometer, hardness, paper release, black color. Acceptable materials**:** Tremco Polyshim II by Tremco Ltd. or approved alternate.

.13 Gasket: black neoprene "U" cavity type with lock strip.

.14 Sealant: one component silicone, Spectrem 2 by Tremco Ltd. Refer to Section 07900.

.15 Display cases: shelves to be 13mm tempered glass with polished rounded edges. Doors to be tempered 8mm tempered glass. Coordinate sizes and provide to Section 06 40 00 for installation.

2.2 FABRICATION

.1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:

.2 Make field measurements before cutting and assembling materials.

.3 Maintain minimum bite or lap of glass as recommended by the glazing unit manufacturer.

.4 Each glass lite shall be labeled with the name of the product, weight and quality and year manufactured.

.5 If requested, provide owner or consultant access to the plant or shop to review fabrication. Consultant or owner to provide 24 hour advance notice of visit.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 EXAMINATION

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.3 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.4 INSTALLATION:

.1 Inspect all glazing channels prior to application. All openings in joints and channels to be sealed shall be clean, dry and free of dust, oil, grease, loose mortar or any foreign material.

.2 All surfaces to receive glazing tape shall be wiped dry with a clean rag dampened in Xylol, followed by a dry wipe.

.3 Examine all sashes prior to glazing to determine if the openings are square and plumb. Any butt and miter joints which are open shall be sealed prior to glazing. Adjust all operating sashes and glaze in the closed position.

.4 Compression Glazing:

.1 When butt joint is in a vertical direction, the glazier shall first run the tape on the head and sill members while going over the joint. If joints at the sash run horizontally, the tape must be applied first to the jambs so that it crosses over the joint.

.2 When an offset condition exists at each corner where a horizontal member passes behind vertical mullions, two different sized tapes shall be used to equalize the pressure seal. The thinner tape is to applied first on the glazing leg closest to the interior. The thicker tape shall be cut to the length between the two tapes and applied.

.3 Each section of tape shall butt the adjoining tape and be united with a tool to eliminate any openings. Lapping of the adjoining tapes at the corners is not permitted.

.4 Remove paper backing just prior to setting glass and apply a toe bead of sealant 150 mm long in each of the corners.

.5 Position one setting block at the quarter point of each corner on the sill members or as recommended by IGMA guidelines.

.6 Set the glass on the setting blocks and press firmly in place. Snap in the interior glazing stops.

.7 Set the spacer blocks to prevent any “walking” of the lite.

.5 Mirrors:

.1 Install mirrors by means of concealed vandalproof clips If clips are used, install cushioning tape completing around perimeter of mirror back, set in concealed location within 25 mm of edge. Install fixed mirrors in washrooms at two different heights as indicated on drawings.

.2 Follow manufacturer’s installation recommendations.

.6 Install any wired glass with the wire parallel to the opening.

.7 Replace any loose glazing stops and tighten all screws.

.8 Contractor shall include for needle point (cap beads) at all lower horizontal rail joints of all sash/glazing units at the discretion of and as may be requested by the Consultant or owner.

3.5 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Remove traces of primer, caulking.

.3 Remove glazing materials from finish surfaces.

.4 Remove labels after work is complete.

.5 Immediately upon job completion and when sealants have cured, remove any temporary protection and clean all exposed interior and exterior surfaces. Use proper cleaning materials only which will not harm the window components or any adjacent surfaces.

.6 Ensure all temporary labels have been removed and fully cleaned.

.7 Mirrors:

.1 Clean mirrors using non-abrasive soap or detergent and rinse with clean water. Leave in clean, polished condition for Owner occupancy.

3.6 INSPECTION

.1 Where inspection is called for elsewhere in the specification, perform Window air and water leakage test to ensure installation meets performance requirements stated herein. Should test fail, take remedial measures and re-test a different location at not additional cost to the owner until the test passes.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 Submittal Procedures.

.2 Section 01 78 00 Closeout Submittals.

.3 Section 07 92 10 Joint Sealants.

1.2 REFERENCES

.1 American Architectural Manufacturers Association (AAMA) Aluminum Association Designation System for Aluminum Finishes.

.2 American Society for Testing and Materials (ASTM International)
- .1 ASTM B209M-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .2 ASTM B211M-03, Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire.
- .3 ASTM C920-10, Specification for Elastomeric Joint Sealants.

.3 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-1.108-M89, Bituminous Solvent Type Paint.

1.3 DESIGN REQUIREMENTS

.1 Design louvre Work in accordance with OBC and to withstand live, dead, lateral. wind, seismic, handling, transportation and erection loads.

.2 Design louvers to accommodate expansion and contraction of components due to temperature changes.

1.4 SUBMITTALS

.1 Shop drawings: Submit shop drawings in accordance with Section 01 33 00 indicating fabrication and erection details, including anchorage, accessories, thicknesses, profiles, finishes, pressure drop, face area, and free area.

.2 Samples: Submit duplicate 600 x 600 mm samples of louvres in accordance with Section 01 33 00 indicating frame and reinforcing, finished in selected colours.

.3 Certification: Submit certified data from independent laboratory substantiating aerodynamic performance.

.4 Close-out submittals: Submit operation and maintenance data for incorporation into Operations and Maintenance Manual in accordance with Section 01 78 00.

Part 2 Products

2.1 MANUFACTURED UNITS

.1 Mechanical Penthouse Louvre:
- .1 Conforming to ASTM B209M and ASTM B211M;
- .2 100 mm (4") weather resistant louvre, 'Model SP-645' as manufactured by McGill Louvers, (Pickering ON 905-420-0485).
- .3 Acceptable Alternate: Product meeting the same profile and specifications as above by Cometal Inc., TenPlus Architectural and Ventex.
- .4 Colour: Custom colour to be later selected by the Consultant.
- .5 Provide concealed mullions. Refer to Exterior Elevations & sections.
- .6 Locations:
  - .1 Second floor Mechanical Room 240 (south and north elevations).

.2 Dust Collector Screen Acoustic Louvre:
- .1 Conforming to ASTM B209M and ASTM B211M;
- .2 153 mm acoustic louvre, 'AC-645' as manufactured by McGill Louvers, (Pickering ON 905-420-0485).
- .3 Acceptable Alternate: Product meeting the same profile and specifications as above by Cometal Inc., TenPlus Architectural and Ventex.
- .4 Colour: Custom colour to be later selected by the Consultant.
- .5 Locations: Dust Collector gates.

.3 Sunshades:
- .1 Outrigger sunshade by CRL, comprised of:
  - .1 Square profile outrigger
  - .2 Flat bar or rectangular tube blades
  - .3 Wall mount bracket
  - .4 C Channel Fascia
  - .5 Finish: anodized aluminum
  - .6 102mm (4") high x 900mm (36") outrigger x length noted on drawings
- .2 Locations: South Elevation, refer to drawings.

.4 Isolation coating: CAN/CGSB-1.108-M; Bituminous solvent type paint.

.5 Anchors and fasteners: AISI Type 304 stainless steel.

.6 Sealant: ASTM C920, Type M, Grade NS, Class 25; Two-part, Polyurethane non-sag type. Dymeric by Tremco Ltd., Sikaflex 2C-NS by Sika Inc., colour as selected by Consultant. Primer and joint backing as recommended by sealant manufacturer.

Part 3 Execution

3.1 INSTALLATION

.1 Coordinate framing and anchorage for louvres with other parts of the Work.

.2 Install louvres in accordance with manufacturer's instructions and accepted shop drawings. Securely anchor into opening.

.3 Apply isolation coating to separate dissimilar metals, and metals and masonry or concrete unless neoprene washers are shown.

.4 Seal louvre perimeter perimeter with sealant and joint backing for weather tight seal in accordance with requirements of Section 07 92 10.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 04 21 13 – Masonry

.3 Section 09 22 16 – Non-structural Metal Framing.

.4 Supply of access doors for mechanical and electrical devices in mechanical and electrical sections.

1.2 REFERENCES

.1 Aluminum Association

.1 Designation for Aluminum Finishes-[1997].

.2 American Society for Testing and Materials International, (ASTM)

.1 ASTM C36/C36M-[01], Specification for Gypsum Wallboard.

.2 ASTM C79/C79M-[01], Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board.

.3 ASTM C442/C442M-[01], Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.

.4 ASTM C475-[01], Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.5 ASTM C514-[01], Specification for Nails for the Application of Gypsum Board.

.6 ASTM C557-[99], Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.

.7 ASTM C630/C630M-[01], Specification for Water-Resistant Gypsum Backing Board.

.8 ASTM C840-[01], Specification for Application and Finishing of Gypsum Board.

.9 ASTM C931/C931M-[01], Specification for Exterior Gypsum Soffit Board.

.10 ASTM C954-[00], Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.

.11 ASTM C960/C960M-[01], Specification for Pre-decorated Gypsum Board.

.12 ASTM C1002-[01], Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.13 ASTM C1047-[99], Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.14 ASTM C1280-[99], Specification for Application of Gypsum Sheathing Board.

.15 ASTM C1177-[01], Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

.16 ASTM C1178/C1178M-[01], Specification for Glass Mat Water-Resistant Gypsum Backing Board.

.3 Association of the Wall and Ceilings Industries International (AWEI)

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.2 CAN/CGSB-71.25-[M88], Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-[1988(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in original packages, containers or bundles bearing manufacturers brand name and identification.

.2 Store materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.

.3 Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim from being bent or damaged.

1.4 SITE ENVIRONMENTAL REQUIREMENTS

.1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.

.2 Apply board and joint treatment to dry, frost free surfaces.

.3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site for recycling.

.3 Divert unused gypsum from landfill to gypsum recycling facility for disposal approved by Consultant.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.5 Divert unused wood materials from landfill to recycling facility.

.6 Divert unused paint and caulking material from landfill to official hazardous material collections site approved by Consultant.

.7 Do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Standard board: to ASTM C36/C36M, 16 mm or 19 mm thick or as indicated, tapered edges.

.2 Standard board: to ASTM C36/C36M, X Rated, 16 mm or 19 mm thick or as indicated, tapered edges.

.3 Water-resistant board: to ASTM C630/C630M, 13 mm water resistant, tapered edges (WRGB in Finish Schedule).

.4 Abuse resistant/Fire rated: to CSA A82.27-M1977 Fire-Rated Type X, 5/8" thick, "Abuse Resistant Fire Code" gypsum board panels, tapered edges, by CGC, Fibrerock interior AquaTuff and CertainTeed, AirRenew Extreme Abuse Resistant Type X Gypsum Board with M2Tech. All gypsum board to have anti-microbial and anti-mould properties.

.5 All gypsum board to have Anti-Microbial and Anti Mold properties.

.6 Nails: to ASTM C514.

.7 Steel drill screws: to ASTM C1002.

.8 Stud adhesive: to CAN/CGSB-71.25.

.9 Laminating compound: as recommended by manufacturer, asbestos-free.

.10 Concrete Anchors: Phillips Red Head TW-614 or equivalent. Do not use powder activated fasteners for ceiling support.

.11 Tie Wire: #16 ga. galvanized soft annealed steel wire.

.12 Caulking: Acoustical sealant.

.13 38 mm thick mineral wool batts ULC labeled, if indicated on drawings.

.14 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, 0.5 mm base thickness commercial sheet steel with G90 zinc finish, perforated flanges, and one piece length per location.

.15 Sealants: in accordance with Section 07 92 10 - Joint Sealing.

.16 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.

.17 Joint compound: to ASTM C475, asbestos-free.

2.2 ACOUSTIC WALL ASSEMBLY AND NOISE BARRIER CEILING MATERIALS

.1 **Location: Music Practice Rooms**:

.2 Acoustic insulation inside partitions: AFB Acoustic Fire Bat by Roxul or equivalent product by Fibrex, or Quietzone by Owens Corning.

.3 Steel deck closures: Emseal 25V Expanding Foam Sealant sized and shaped to fit flutes.

.4 Acoustic Insulation: mineral fibre acoustical batt insulation, as specified under Section 07210. Thickness of 90% of wall assembly cavity depth; Acceptable products:

.1 Fibrex ‘Sound Attenuation Fire Batt (SAFB)’
.2 Johns Manville ‘Sound-SHIELD’.
.3 Roxul ‘AFB’.
.4 Owens-Corning ‘QuietZone’.
.5 CertainTeed Canada Inc., Sustainable Insulation NoiseReducer Sound Attenuation Batts.

.5 Acoustical sealant: CAN/CGSB-19.21-M87; non-skinning acoustic sealant, non-hardening type.

.6 Acoustical compound: pre-mixed perlite plaster.

.7 Fasteners: use mechanical fasteners to secure batts into position as recommended by manufacturer.

Part 3 Execution

3.1 ERECTION

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.

.3 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.4 Install work level to tolerance of 1:1200.

3.2 APPLICATION

.1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical works are approved.

.2 Apply single layer gypsum board to metal furring or framing using screw fasteners and laminating adhesive. Maximum spacing of screws 300 mm on centre.

.1 Single-Layer Application:

.1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.

.2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.

.2 Double-Layer Application:

.1 Install gypsum board for base layer and exposed gypsum board for face layer.

.2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.

.3 Apply base layers at right angles to supports unless otherwise indicated.

.4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.

.3 Apply concrete board where wall tiles are to be applied and adjacent to sinks or showers. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.

.4 Apply gypsum board to concrete block surfaces, where indicated, using laminating adhesive.

.5 Apply type X gypsum board where indicated, in accordance with U.L.C. requirements and with supplement to the National Building Code of Canada to obtain the required fire protection, fire rating and fire separation.

.6 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.

.7 Where indicated on drawings, staple blanket to wallboard in accordance with ULC design requirements. Blanket shall be continuous and tightly fitted between studs and at perimeter.

.8 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.

.9 Install gypsum board with face side out.

.10 Do not install damaged or damp boards.

.11 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

.12 Where a floor or roof structural member interferes with an interior partition wall at which a smoke or fire separation is required, a gypsum board enclosure with a fire rating not less than required for the wall must be provided to continue the required, a gypsum board

enclosure with a fire rating not less than required for the wall must be provided to continue the required separation to the floor or roof above (typical)

3.3 INSTALLATION

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre[using contact adhesive for full length.

.2 Install casing beads around perimeter of suspended ceilings.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

.4 Construct control joints of [preformed units] [two back-to-back casing beads] set in gypsum board facing and supported independently on both sides of joint.

.5 Provide continuous polyethylene dust barrier behind and across control joints.

.6 Locate control joints at approximate 10 m spacing on long corridor runs at approximate 15 m spacing on ceilings.

.7 Install control joints straight and true.

.8 Construct expansion joints at building expansion and construction joints. Provide continuous dust barrier.

.9 Install expansion joint straight and true.

.10 Install cornice cap where gypsum board partitions do not extend to ceiling.

.11 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.

.12 Splice corners and intersections together and secure to each member with 3 screws.

.13 Seal with acoustical sealant at ceilings, floors, wall intersections and all penetrations such as electrical outlets.

.14 Install access doors to electrical and mechanical fixtures specified in respective sections.

.1 Rigidly secure frames to furring or framing systems.

.15 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

.16 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:

.1 Levels of finish:

.1 Level 0: No tapping, finishing or accessories required.

.2 Level 1: Embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable.

.3 Level 2: Embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.

.4 Level 3: Embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

.5 Level 4: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

.6 Level 5: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.

.17 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

.18 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.

.19 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

.20 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

.21 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.

.22 Mix joint compound slightly thinner than for joint taping.

.23 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.

.24 Allow skim coat to dry completely.

.25 Remove ridges by light sanding or wiping with damp cloth.

.26 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

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

.1 ASTM C645-[00], Specification for Nonstructural Steel Framing Members.

.2 ASTM C754-[00], Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.40-[97], Primer, Structural Steel, Oil Alkyd Type.

.3 Environmental Choice Program (ECP).

.1 CCD-047a -[98], Paints - Surface Coatings.

.2 CCD-048-[98], Surface Coatings - Recycled Water-borne.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material in appropriate on-site bins for recycling.

.3 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.4 Divert unused gypsum materials from landfill to recycling facility approved by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Non-load bearing channel stud framing: to ASTM C645, roll formed from 0.59mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum lath and metal lath. Knock-out service holes at 150 mm centres.

.2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 30 mm legs for floor track, 50 mm for ceiling track.

.3 Metal channel stiffener: 38 mm size, 2 mm thick cold rolled galvanized steel.

.4 Metal Accessories: CSA A82.30-1965 (R-1971).

.5 “Unistrut” support channel framing, by Tyco Electrical and Metal Products.

Part 3 Execution

3.1 ERECTION

.1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.

.2 Place studs vertically at 400 mm on centre and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

.3 Erect metal studding to tolerance of 1:1000.

.4 Attach studs to bottom track using screws.

.5 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.6 Install steel frames and anchor frames securely to studs using minimum of three (3) anchors per jamb for jambs up to 2100 mm high and a minimum of four (4) anchors per jambs for jambs over 2100 mm high.

.7 Provide two (2) studs at each side of openings wider than stud centre specified.

.8 Install, cut to length, piece of runner horizontally over door frames and at top and bottom of rough opening in glazed partitions.

.9 Provide 38 mm x 89 mm vertical and horizontal wood studs secured between metal studs for attachments of bathroom fixtures, accessories, cabinet work, and other fixtures, including grab bars, towel rails, attached to steel stud partitions.

.10 Install steel stud or furring channel between studs for attaching electrical and other boxes.

.11 Extend all partitions to underside of deck above for sound and fire separation.

.12 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.

3.2 CEILING FURRING TO CANOPIES & CEILING PANELS

.1 Provide to all interior and exterior canopies where shown to receive wood slat or plywood finishes.

.2 Framing channel to be model P1000 (1-5/8”) ; 12 ga.

.3 For exterior locations provide with 4 m dia. Holes at 500 o.c. for drainage and hot dip galvanize.

.4 Provide shop drawings for layouts.

.5 Refer to drawings for locations.

3.3 CEILING FURRING

.1 Install runners level to tolerance of 3 mm over 3.5 m. Provide runners at interruptions of continuity and change in direction.

.2 Frame with furring channels, perimeter of openings to accommodate access panels, light fixtures, diffusers, grilles, etc.

.3 Furr for bulkheads within or at termination or ceilings.

.4 Install furring channels at 400 mm o.c. maximum.

3.4 WALL FURRING

.1 Install steel furring, as indicated.

.2 Frame opening and around built-in equipment on four (4) sides with channels.

.3 Box-in beads, columns, pipes, and around exposed services.

3.5 FIRE RATED ASSEMBLIES

.1 If required, install Metal Stud System and Furring in accordance with appropriate ULC Design and with supplement to the National Building Code of Canada 1985.

3.6 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 07 92 10 - Joint Sealing.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)

.1 ANSI A108.1-[99], Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).

.2 CTI A118.3-[92], Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).

.3 CTI A118.4-[92], Specification for Latex Portland Cement Mortar (included in ANSI A108.1).

.4 CTI A118.5-[92], Specification for Chemical Resistant Furan Resin Mortars and Grounts for Tile Installation (included in ANSI A108.1).

.5 CTI A118.6-[92], Specification for Ceramic Tile Grounts (included in ANSI A108.1).

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

.1 ASTM C144-[99], Specification for Aggregate for Masonry Mortar.

.2 ASTM C 207-[91(1997)], Specification for Hydrated Lime for Masonry Purposes.

.3 ASTM C847-[95(2000)], Specification for Metal Lath.

.4 ASTM C979-[99], Specification for Pigments for Integrally Coloured Concrete.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.2 CGSB 71-GP-22M-[78], Adhesive, Organic, for Installation of Ceramic Wall Tile.

.3 CAN/CGSB-75.1-[M88], Tile, Ceramic.

.4 CAN/CGSB-25.20-[95], Surface Sealer for Floors.

.4 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-[98], Cementitious Materials Compendium (Consists of A5-98, A8-98, A23.5-98, A362-98, A363-98, A456.1-98, A456.2-98, A456.3-98).

.2 CSA A123.3-[98], Asphalt Saturated Organic Roofing Felt.

.5 Terrazzo Tile and Marble Association of Canada (TTMAC)

.1 Tile Specification Guide 09300 [2000], Tile Installation Manual.

.2 Tile Maintenance Guide [2000].

1.3 PRODUCT DATA

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

.2 Include manufacturer's information on:

.1 Ceramic tile, marked to show each type, size, and shape required.
.2 Chemical resistant mortar and grout (Epoxy and Furan).
.3 Cementitious backer unit.
.4 Dry-set Portland cement mortar and grout.
.5 Divider strip.
.6 Elastomeric membrane and bond coat.
.7 Reinforcing tape.
.8 Levelling compound.
.9 Latex-Portland cement mortar and grout.
.10 Commercial Portland cement grout.
.11 Organic adhesive.
.12 Slip resistant tile.
.13 Waterproofing isolation membrane.
.14 Fasteners.

1.4 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
.2 Base tile: submit 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.
.3 Floor tile: submit 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.
.4 Trim shapes, bullnose cap and cove including bullnose cap and base pieces at internal and external corners of vertical surfaces, each type, colour, and size.
.5 Provide bullnose trim at top course of wall tile in washrooms and locations shown on drawings..
.6 Stair Accessories: submit duplicate samples of each trim.
.7 Adhere tile samples to [11] mm thick plywood and grout joints to represent project installation.
.8 Prepare a 2 m x 3m mock-up sample on site to ensure demonstration of installation details and quality control. Include stair accessories in mock-up.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in containers with labels legible and intact and grade-seals unbroken.
.2 Store material so as to prevent damage or contamination.
.3 Store materials in a dry area, protected from freezing, staining and damage.
.4 Store cementitious materials on a dry surface.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal packaging material in appropriate on-site bins for recycling.

.3 Unused adhesive, sealant and coating materials must be disposed of at an official hazardous material collections site as approved by the Consultant.

.4 Unused adhesive, sealant and coating materials must not be disposed of into the sewer system, into streams, lakes, onto the ground or in other location where it will pose a health or environmental hazard.

.5 Broken ceramic materials must be diverted from landfill to a local facility as approved by Consultant.

1.7 ENVIRONMENTAL CONDITIONS

.1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 °C for 48 h before, during, and 48 h after, installation.

.2 Do not install tiles at temperatures less than 12 °C or above 38 °C.

.3 Do not apply epoxy mortar and grouts at temperatures below 15 °C or above 25 °C.

1.8 EXTRA MATERIAL

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide minimum 5% of each type and colour of tile required for project for maintenance use. Store where directed.

.3 Maintenance material to be of same production run as installed material.

1.9 EXTENDED WARRANTY

.1 Submit a warranty for entire wall tile installation, covering materials and labour and the repair or replacement of defective work in accordance with the Contract, but for three (3) years total.

Part 2 Products

2.1 FLOOR TILE

.1 Porcelain floor tile (Designation: POR1 & POR2): to CAN/CGSB-75.1.

.1 Acceptable Materials: Size 300 mm x 600 mm; "NuStone" by Centura, "Regal" by Olympia Tile, "Ultra Modern" by Daltile, or "Anchorage" by Daltile, all in matte finish. Allow for one (1) field colour from manufacturer's full line and two (2) accent floor tiles.

.2 Locations: First Floor corridors, vestibules, washrooms and stairs where indicated – refer to drawings. Refer to Room Finish Schedule for locations.

.3 Install in a one-third staggered pattern.

.4 Provide prefabricated movement joints in conjunction with slab saw cuts approx. 3500-6000mm distance (refer to floor pattern drawing).

.2 Porcelain tile (Designation: POR3): to CAN/CGSB-75.1, Type 5, Class MR 4, 111mm to 150mm wide x 914mm size, 'wood look'and slip resistant Porcelain Tile. Colour to be selected from full line. Thin-set application.

.1 Acceptable Materials: "Cottage", by Centura.

.2 Alternative: "Larix", by Olympia

.3 Porcelain floor tile bull-nose base (Designation: POR): to CAN/CGSB-75.1.

.5 Acceptable Materials: Size 76mm or 100 mm x 300 mm 'sit-on' bull-nose base; "Vitra", by Centura or "Regal" or "Omnia", by Olympia Tile, "Ultra Modern" by Daltile, or "Anchorage" by Daltile, all in matte finish. Allow for two (2) colours from manufacturer's Category/Group 2 colours.

.4 Porcelain Tactile Attention Indicator Tiles: to CAN/CGSB-75.1.

.1 Acceptable Materials: Size 300 mm x 300 mm GT Black STOP Matt, 11 ¾" x 11 ¾", as manufactured by Atlas Concorde and distributed by Centura Tile. Colour: contrasting to field tile.

.2 Conforming to OBC Article 3.8.3.18., required to be installed at the top of all stairs, starting one tread depth back from the edge of the top stair. The depth of the tactile attention indicator shall be not less than 300mm and not more than 610mm. Tactile attention indicator to be porcelain tile of contrasting colour from landing and stair treads with differing textured finish.

.5 Designation CMT: 50 x 50 porcelain mosaic floor tile to CAN/CGSB-75.1.

.6 Acceptable materials: Dotti by Vitra as distributed by Centura Tile. 2 colours from full range in matte non-slip finish.

.7 Acceptable Alternates: Quebec distributed by Olympia; Dal 'Keystone' by Dal-tile and American Olean full mosaic collection, including 'Egyptstone' Series. Allow 3 colours from manufacturer's full range.

.8 Include cove base, top slope edges, fitted corners; include all pieces and trims. Contractors to fit around bullnose block walls.

.9 Locations: Floors of all shower areas.

2.2 WALL TILE

.1 Ceramic tile (Designation: CWT): to CAN/CGSB-75.1, Type 5, Class MR 4

.1 Size: 4" x 16", matte surface.
.2 Four colours to be selected from full colour line. Thin-set application.
.3 Acceptable Materials: Spectra, by Centura, or similar by Olympia.

.2 Soap Dishes: Supplied under Section 102810 – Washroom and Shower Accessories.

.3 Locations: Washrooms, Drinking Fountain Niches, Corridor locations, other locations noted on Interior Elevations

.4 Tile Edging: Purpose-made, anodized aluminum, polished chrome finish, metal edge strips as manufactured Schluter Systems at all exposed tile edging: Profile – JOLLY; thickness as required for tile and tile set. Colour to be selected by consultant. Allow for three (3) colours from manufactures full range.

2.3 TRIM SHAPES

.1 Conform to applicable requirements of adjoining floor and wall tile.

.2 Use slip resistant trim shapes for horizontal surfaces of showers, overflow ledges, recessed steps, shower curbs, drying area curbs, and stools.

.3 Use trim shapes sizes conforming to size of adjoining field wall tile, including existing spaces, unless specified otherwise.

.4 Internal and External Corners: Provide trim shapes as follows where indicated.

- .1 Bullnose shapes for external corners including edges.
- .2 Coved shapes for internal corners.
- .3 Special shapes for:
  - .1 Base to floor internal corners to provide integral coved vertical and horizontal joint.
  - .2 Base to floor external corners to provide bullnose vertical edge with integral coved horizontal joint. Use as stop at bottom of openings having bullnose return to wall.
  - .3 Wall top edge internal corners to provide integral coved vertical joint with bullnose top edge.
  - .4 Wall top edge external corners to provide bullnose vertical and horizontal joint edge.

.5 Provide cove and bullnose shapes for where indicated and required to complete tile work.

2.4 MORTAR AND ADHESIVE MATERIALS

.1 Manufacturer's of commercial mortar, grout and adhesive having Product considered acceptable for use:

- .1 Mapei
- .2 Laticrete
- .3 Flextile

.2 Walls: Mortarcrete Latex Mortar conforming to ANS1A118.4-1973, manufactured by L & M Ceramo Inc.

.3 Floors:

- .1 Cement Mortar: Mixture of 1 part Portland cement, 4 parts dry sand and 1/10 hydraulic lime. Materials shall conform to the following:
- .2 Portland Cement: To CAN3-A, Type 10.
- .3 Hydrated Lime: To ASTM C-206 or 207, Type 5.
- .4 Sand: To CSA A82.56, passing 1.6 mm sieve.
- .5 Water: Potable, containing no contaminants which cause efflorescence.
- .6 Thin Set Mortar: field mixed, blended sand-Portland cement-latex mortar, "Kerabond/Keralastic by Mapei.
  - .1 Acceptable Alternates: "Laticrete 4237 distributed by Ceratec Inc., or Flextile 52 thin set.

.2 Latex Additive: "Cemtex" by Master Builders, Laticrete 2022" distributed by Ceratec Inc.,

2.5 GROUT

.1 Colouring Pigments:

.1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C979.

.2 Colouring pigments to be added to grout by manufacturer.

.3 Job coloured grout are not acceptable.

.4 Use in Commercial Portland Cement Grout, Dry-Set Grout, and Latex-Portland Cement Grout.

.2 Chemical-Resistant Grout for Walls:

.1 Epoxy grout: to ANSI A108.1, having quality, colour and characteristics to match epoxy bond coat. Adhesive and grout by same manufacturer.

.2 Epoxy Grout: "Latapoxy SP-100" Stainless, chemical resistant epoxy grout by Laticrete International. Colour from manufacturer's full range. Alternate: Kerapoxy by Mapei.

.3 Floors:

.1 Polymer modified grout as manufactured by MAPEI.

2.6 ACCESSORIES

.1 Stairs Nosings and Edge Trims:

.1 Stair nosing to be Schluter, TREP-S, Aluminum support with thermoplastic rubber insert (26mm), installed in conjunction with porcelain tile as per manufacturer's recommendations. Thermoplastic rubber insert piece colour to be selected by consultant.

.2 SCHIENE edge protection by Sch;uter, anodized aluminum to installed at all exposed stair tile edges. Mitre joints to suite stair angle. Size as required for tile and mortar bed.

.2 Prefabricated Movement Joints: purpose made Schluter, Dilex-KSN aluminum, sized as required for tile and mortar bed. Colour to be selected by consultant. To be installed directly above slab saw-cuts. Refer to floor pattern drawing for locations.

.3 Reinforcing mesh: 50 x 50 x 1.6 x 1.6 mm galvanized steel wire mesh, welded fabric design, in flat sheets.

.4 Divider strips:

.1 Laminated strips, core 32 x 3 mm black neoprene, outsides (both sides) brass 32 x 1.29 mm complete with anchors, both sides spaced at 150 mm on centre.

.2 Brass complete with anchors, both sides spaced at 150 mm on centre.

.5 Cleavage plane: [polyethylene film to CGSB 51-34] [No. 15 asphalt saturated felt to CSA A123.3] .

.6 Metal lath: to ASTM C847 [galvanized] [painted] finish, 10 mm rib at 2.17 kg/m^2.

.7 Transition Strips: purpose made metal extrusion; [stainless steel] [brass] [zinc] [anodized aluminum] type.

.8 Reducer Strips: purpose made metal extrusion; [stainless steel] [brass] [zinc] [anodized aluminum] type; maximum slope of 1:2.

.9 Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and elasticity of plus or minus 40 percent when used in accordance to TTMAC Detail 301EJ.

.10 Sealant: in accordance with Section 07 92 10 - Joint Sealing.

.11 Floor sealer and protective coating: [to CAN/CGSB-25.20, Type [1] [2]] [to tile and grout manufacturers recommendations].

2.7 MIXES

.1 Portland Cement:

.1 Scratch coat: 1 part portland cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand, 1 part water, [and latex additive where required]. Adjust water volume depending on water content of sand.

.2 Slurry bond coat: portland cement and water mixed to creamy paste. Latex additive may be included.

.3 Mortar bed for floors: 1 part portland cement, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand. [Latex additive may be included].

.4 Mortar bed for walls and ceilings: 1 part portland cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand and 1 part water. Adjust water volume depending on water content of sand. [Latex additive may be included].

.5 Levelling coat: 1 part portland cement, 4 parts sand, minimum 1/10 part latex additive, 1 part water including latex additive.

.6 Bond or setting coat: 1 part portland cement, 1/3 part hydrated lime, 1 part water.

.7 Measure mortar ingredients by volume.

.2 Dry set mortar: mix to manufacturer's instructions.

.3 Organic adhesive: pre-mixed.

.4 Mix bond and levelling coats, and grout to manufacturer's instructions.

.5 Adjust water volumes to suit water content of sand.

2.8 PATCHING AND LEVELING COMPOUND

.1 Portland cement base, acrylic polymer compound, manufactured specifically for resurfacing and levelling concrete floors. Products containing gypsum are not acceptable.

.2 Have not less than the following physical properties:

.1 Compressive strength - 25 MPa.

.2 Tensile strength - 7 MPa.

.3 Flexural strength - 7 MPa.

.4 Density - 1.9.

.3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish.

.4 Ready for use in 48 hours after application.

2.9 CLEANING COMPOUNDS

.1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and levelling compounds and elastomeric waterproofing membrane and coat.

.2 Materials containing acid or caustic material are not acceptable.

Part 3 Execution

3.1 WORKMANSHIP

.1 Do tile work in accordance with TTMAC Tile Installation Manual 2000, "Ceramic Tile", except where specified otherwise.

.2 Apply tile [or backing coats] to clean and sound surfaces.

.3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.

.4 Maximum surface tolerance 1:800.

.5 Make joints between tile uniform and approximately [1.5 mm] wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.

.6 Lay out tiles so perimeter tiles are minimum 1/2 size.

.7 Install floor tiles as per pattern. Layout and install flash cove tile first, before floor tile, ensuring a flush edge on the horizontal surface by feathering to masonry walls as required to produce a straight line on the floor. Install floor tiles to pattern supplied by Architect at a later date. Contact consultant to review when approximately no more than 10 sq. m has been installed.

.8 Sound tiles after setting and replace hollow-sounding units to obtain full bond.

.9 Make internal angles square, external angles rounded.

.10 Make internal angles square, external angles chamfered at 45° with narrow tile strip.

.11 Construct cove base, as described using all special pieces available for inside and outside corners.

.12 For Floors: Use bull nose edged tiles at termination of wall tiles, except where tiles abut projecting surface or differing plane.

.13 Seal grouted joints with sealer.

.14 Keep building expansion joints free of mortar or grout.

.15 For Walls: Use round edged tiles at termination of wall tile panels, except where panel abuts projecting surface or differing plane.

.16 Install divider strips at junction of tile flooring and dissimilar materials.

.17 Allow minimum 24 h after installation of tiles, before grouting.

.18 Clean installed tile surfaces after installation and grouting cured.

3.2 FLOOR TILE

.1 Install in accordance with TTMAC to applicable thinset detail.

3.3 STAIR TILE ACCESSORIES

.1 Install all accessories specified per manufacturer’s instructions using whole lengths.

.2 Provide sample installation for architect for review.

3.4 FLOOR SEALER AND PROTECTIVE COATING

.1 Advise Owner and Consultant prior to application of any floor or tile sealer.

.2 If approved, apply in accordance with manufacturer's instructions.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

.3 Section 06 10 10/06101 - Rough Carpentry: Wood strapping.

.4 Fabrication: to ASTM 365-78 and CAN/GSB-92.1-M77.

.5 Installation: to ASTM C636-76, except where specified otherwise.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM E1264-[98], Classification for Acoustical Ceiling Products.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86], Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

.2 CAN/CGSB-92.1-[M89], Sound Absorptive Prefabricated Acoustical Units.

.3 Canadian Standards Association (CSA)

.1 CSA B111-[74(R1998)], Wire Nails, Spikes and Staples.

.4 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102-[88(R2000)], Surface Burning Characteristics of Building Materials.

1.3 SAMPLES

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

.2 Submit two each 300 x 300 mm samples of each individual tile and grid type in accordance with Section 01340.

1.4 REGULATORY REQUIREMENTS

.1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by a Canadian Certification Organization accredited by Standards Council of Canada.

1.5 DESIGN CRITERIA

.1 Maximum deflection 1/360 of span to ASTM 365-78 deflection test.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Permit wet work to dry before commencement of installation.

.2 Maintain uniform minimum temperature of [15]^{0}C and humidity of [20] - [40] % before and during installation.

.3 Store materials in work area [48] hours prior to installation.

1.8 EXTRA MATERIALS

.1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide acoustical units amounting to [2] % of gross ceiling area for each pattern and type required for project.

.3 Extra materials to be from same production run as installed materials.

.4 Clearly identify each type of acoustic unit, including colour and texture.

.5 Store where directed by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1.

.2 Acoustic Ceiling Panels, Designation LAP: Acoustic Ceiling Panels, wet formed mineral fibre panels, by Armstrong World Industries Canada Inc., Mississauga. Colour: White; Types as noted below:

.3 **Panel Types**:

.1 Type 1: LAP 1: 600 x 1200 mm x 15.9 mm thick; 'Fine Fissured' with medium texture, Square Lay-In, #1729; Location: For use at classroom areas and any additional areas as indicated.

.2 Type 2: LAP 2: 600 x 600 mm x 15.9 mm thick; 'Fine Fissured' with medium texture, Square Lay-In, #1728; Location: For use in some corridor areas as indicated on RCPs.

.3 Type 3: AB: Acoustic Linear Blades: Microperforated Metalworks Linear 4" x 96" '5492 Effects Oak FXOK' ceiling panels by Armstrong Ceilings, installed in locations and patterns noted on Reflected Ceiling Plans. Location: Entrance Vestibule and Co-Lab Zone 202. Colour: Effects Oak. Provide matching colour 150mm deep axiom trim (Armstrong) and groupings of hanging panels.

.4 Acceptable alternates: similar purpose-designed high humidity ceiling panels by CGC Interiors, BPB Canada Inc. and Certainteed.

.5 **Suspension system Type 1**: 23.8 mm (15/16") "Prelude XL" exposed tee bar grid, including wall moulding, by Armstrong. Colour: white. Acceptable alternate: similar suspension system by CGC Interiors, Oakville, Chicago Metal Corp. and Certainteed. Grid sizes to suit ceiling panel types as shown on drawings.

.6 **Perimeter Trim**: 2" (50mm) and 6" (150mm) 'Axiom' class trim or CGC 'Compasso' for edging at lower or floating ceilings where noted, such as Learning Commons.

.7 Suspension System for Radiant Panel Heaters: not applicable to this project.

.8 Hangers: 2.6 mm galvanized soft annealed steel wire.

.9 Accessories: splices, clips, retainers, etc., to complement suspension system components.

.10 Adhesive: low VOC type recommended by acoustic unit manufacturer.

.11 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.

Part 3 Execution

3.1 EXAMINATION

.1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Consultant.

3.2 INSTALLATION

.1 Install acoustical panels and tiles in ceiling suspension system.

.2 Install acoustic units parallel to building lines with edge unit not less than 50% of unit width.

.3 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

.4 Support suspension system main runners at 1200 oc maximum with hangers from structure. Assembly shall support super-imposed loads. Maximum permissible deflection, 1/360 of span.

.5 Attach cross member to main runner to provide rigid assembly.

.6 Install suspension assembly to manufacturer's written instructions.

.7 Install flush edge moulding at junction of acoustic unit ceiling and other materials around entire length of joint. Secure to construction. Butt joints neatly, square and true in alignment.

.8 Set acoustic units in place.

.9 Set all ceiling levels by the use of transit or laser level.

.10 Ensure all installations are clean upon owner acceptance. Be responsible for monitoring damage and soiling after installation and before owner occupancy. Prior to owner takeover, replace all tiles with damage, blemishes or soiling whether caused by subcontractor handling or post installation above-ceiling adjustments, balancing, cabling, etc.

.11 Provide for Owner twelve (12) complete, undamaged ceiling tiles of each type, sealed and boxed. Leave in location as directed by Architect.

3.3 INTERFACE WITH OTHER WORK

.1 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures

1.2 REFERENCES

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

.1 ASTM F1303-[99], Specification for Sheet Vinyl Floor Covering with Backing.

.2 Canadian Standards Association (CSA International)

.1 CAN/CSA-ISO 14040-[97], Environmental Management - Life Cycle Assessment - Principles and Framework (Adopted ISO 14040:1997, first edition).

1.3 SAMPLES

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

.2 Submit duplicate 300 x 300 mm sample pieces of sheet material, 300 mm long base, nosing, feature strips, treads, edge strips.

1.4 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Maintain air temperature and structural base temperature at flooring installation area above 20° for 48 hours before, during and 48 hours after installation.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Do not dispose of unused sealant and adhesive materials into landfill. Divert materials to municipal hazardous materials depot approved by Consultant.

.2 Divert unused metal and wiring materials from landfill to metal recycling facility approved by Consultant.

.3 Remove from site and dispose of packaging materials at appropriate recycling facilities.

1.7 QUALITY ASSURANCE

.1 Supplier shall be an established firm experienced in the field.

.2 Installer:

.1 Flooring contractor experienced in the field and approved by the manufacturer.

.2 Flooring contractor shall have manual instructions and be trained by the manufacturer and distributor.

.3 Manufacturer’s recommendations for the correct preparation, finishing and testing sub floor surface.

1.8 EXTENDED WARRANTY

.1 Submit a warranty for all the installation of all resilient sheet flooring, covering materials and labour and the repair or replacement of defective work in accordance with the General Conditions of the Contract, but for seven (7) years total.

Part 2 Products

2.1 MATERIALS

.1 Resilient Sheet Flooring (SF-SP): Acceptable materials:

.1 Acceptable Materials:
.1 Gerflor, Taraflex Sport 'M Plus'
.2 Tarkett OmniSports Active+

.2 Locations: Gymnasium. Refer to Room Finish Schedule and Drawings

.2 Self Levelling Underlayment: **"**Ultraplan 1**"** by Mapei fast setting, polymer-modified; for over cured concrete, plywood, ceramic tile, old cutback adhesive, and old vinyl and vinyl composition flooring, feather edge to 1 1/2" (38 mm).for use to prepare floor at locations where existing flooring has been removed and subfloor is not level..

.3 Filler and Cover Former:

.1 As recommended by manufacturer to suit subfloor on which its material is installed and to suit vertical wall/floor junctions.

.4 Primers and Adhesives: As recommended by manufacturer of material to suit subfloor condition.

.5 Cleaner: Neutral chemical compound that will not damage sheet or affect its colour.

.6 Welding Rod: PVC welding rod, colour to match resilient sheet flooring.

.7 Cap strip: sized to suit application, type recommended by flooring manufacturer, Altro Stainless Steel Cap, mechanically fastened to wall

Part 3 Execution

3.1 SITE VERIFICATION OF CONDITIONS

.1 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

3.2 PREPARATION

.1 Scope includes preparation of floor using self levelling coating and patching compound as required.

.2 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

.4 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.

.5 As required, seal concrete slab to resilient flooring manufacturer's printed instructions.

3.3 INSTALLATION

.1 Install on a smooth, flat concrete finish, which will be achieved manually or mechanically.

.2 Ensure concrete sub floor temperature to be maintained at a minimum of 70°F during installation and ensure the moisture content does not exceed 3 Lbs per 1000 Sq Ft per 24 hours or lower.

.3 Paint game lines using approved game line paint primer and game line paint in strict accordance with the game line paint manufacturer’s instructions.

.4 Before proceeding with any work, inspect the sub floor surface and report, in writing, to the project manager and the General Contractor any visible defect on the surface, such as cracks, bumps, rough areas or variations in planarity.

.5 This installation is to proceed on an existing concrete slab in addition to new concrete work as required for mechanical services. Ensure slab is adequately cured and free of moisture or contaminants. If necessary, as part of the work of this section, scarify existing surfaces to prepare surface for adhesive, or to meet manufacturer’s installation requirements. Fill joints, cracks, and holes in these surfaces and level surface irregularities with filler. Remove prime paint and wire brush steel base surfaces.

.6 Check for any grease, oil, paint, duct or any combination remaining on the concrete sub floor.

.7 Before proceeding with installation, clean concrete surface to remove any dirt or foreign materials, rinse thoroughly and allow eight (8) hours minimum to dry, if required, sanding is necessary in all installations.

.8 Fill any areas not meeting ±1/8” in 10’ for level before installation. This will insure levelness and proper adhesion of material.

.9 Lay each material in accordance with manufacturer’s specifications.

.10 Weld joints on flooring and internal and external angles of coves using welding rod in matching plain colours, and the standard hot-air-welding technique.

.11 Install standard rubber base at resilient sheet flooring locations.

.12 Flash into drain openings; do not cut on surface at edge of drain cover. Coordinate with Division 15 for installation with suitable drain type and cover. Bond flooring to drain flange under clamping ring using epoxy adhesive.

.13 Extend resilient sheet under all cabinet work and casework to the wall line.

3.4 CLEANING

.1 Remove excess adhesive from floor, base and wall surfaces without damage.

.2 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

3.5 PROTECTION

.1 Protect new floors from time of final set of adhesive, with polyethelene or Kraft paper until final inspection.

.2 Prohibit traffic on floor for 48 hours after installation.

.3 Do not wax.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 03 30 00 – Cast-in-Place Concrete.

.3 Section 03 35 05 – Concrete Floor Hardeners.

1.2 REFERENCES

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

.1 ASTM F1066-[99], Specification for Vinyl Composition Floor Tile.

.2 ASTM F1344-[00], Specification for Rubber Tile.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-25.20-[95], Surface Sealer for Floors.

.2 CAN/CGSB-25.21-[95], Detergent-Resistant Floor Polish.

1.3 SAMPLES

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

.2 Submit duplicate tile in size specified, [[300] mm long] [base,] [nosing,] [feature strips,] [treads,] [edge strips].

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling.

.3 Dispose of unused finish and adhesive materials at official hazardous material collections site approved by Consultant.

.4 Do not dispose of unused finish and adhesive materials into sewer system, into streams, lakes, onto ground or in other locations where it will pose health or environmental hazard.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Maintain air temperature and structural base temperature at flooring installation area above 20°C for 48 hours before, during and for 7 days after installation.

1.6 EXTRA MATERIALS

.1 Provide 6 m^2 or 3% of each colour, pattern and type flooring material required for this project for maintenance use.

.2 Extra materials to be from same production run as installed materials.

.3 Clearly identify each container of floor tile and each container of adhesive.

.4 Store where directed by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Luxury Vinyl Tile (**LVT**):3mm tile thickness, 299mm x 1219mm (9" x 48") or 457 x 457mm (18" x 18") size square or plank sizing, with 20 year commercial warranty. Allow for total of three (3) colours from full line.

.1 Acceptable Manufacturers:

.1 Mirra, by Centura
.2 I.D. Latitude, by Tarkett
.3 Natural Creations Arbor Art, by Armstrong
.4 Spacia First 20, by Mannington
.5 Lavencia, by Altro

.2 Resilient base (RB): rubber, top set coved, 3 mm thick, rubber, 100 mm high minimum 1200 mm long, including premoulded end stops and external corners. Acceptable materials: non-shrink Rubber Wall Base with toe as manufactured by Johnsonite, Roppe or approved alternates. Colours: Six (6) from full Johnsonite "Coloright" colour line.

.3 Stair Tread/ Riser combination (RSTR): visually impaired Roundel Round Raised Disk pattern rubber one-piece tread/ riser combination VIRTR-Rd, as manufactured by Johnsonite, Roppe or approved alternates. Colour to be selected by consultant. Stair tread with contrast edge strip and no upstand is to be inserted into floor tile at top stair at mid and top landings. Stair treads to be speckled using minimum three colours.

.4 Rubber Tile at Stair Mid and Upper Landings: Minimum of 5 mm thick, hammered finish rubber tile, 600mm x 600mm square, if noted on drawings and room finish schedule. Stair tread with contrast edge strip and no upstand is to be inserted into floor tile at top stair at mid and top landings. Acceptable materials: Johnsonite, ROPPE, Activa Rubber Flooring, Flexco, or Nora Rubber Flooring. Tile to be marbleized or speckled using three colours.

.5 Primers and adhesives: waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade. Use Johnsonite 990 Solvent Free Environmentally Safe White Acrylic Cove Base Adhesive for rubber base. Use Roberts #2057 clear water resistant low odour adhesive for VCT or acceptable alternate approved during tender period by consultant. Submit data sheets for any alternate products considered.

.6 Sub-floor filler and leveller: white premix latex requiring water only to produce cementitious paste, as recommended by flooring manufacturer for use with their product.

.7 Metal edge strips: aluminum extruded, smooth, with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.8 Polyethylene sheet: to CAN2 51.33-M77, Type 2, for protection.

.9 Nose filler: Epoxy caulking compound Johnsonite 930.

.10 Solid vinyl colour strips: smooth 3 mm thick pre-cut vinyl colour strips to location and dimensions as shown on gymnasium plan.

.11 Gym logo may be required in floor through Cash Allowance.

.12 Tactile attention indicator: conforming to OBC Article 3.8.3.18. required to be installed at the top of all stairs, starting one tread depth back from the edge of the top stair. The depth of the tactile attention indicator shall be not less than 300mm and not more than 610mm. Tactile attention indicator to be rubber tile of contrasting colour from landing and stair treads with differing textured finish. Acceptable Products: 300mm x 600mm 'Safe Sense Warning Indicator' rubber tiles by Johnsonite, or approved alternates

Part 3 Execution

3.1 INSPECTION

.1 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer. Inspect for negative alkalinity, carbonization or dusting.

.2 Commencement of work indicates acceptance of conditions by flooring installer.

3.2 SUB-FLOOR TREATMENT

.1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

3.3 TILE APPLICATION

.1 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.2 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.

.3 Install tiles in corridor as per pattern provided by Consultant. Pattern will be provided at a later date.

.4 Cut tile and fit neatly around fixed objects.

.5 Install flooring in pan type floor access covers. Maintain floor pattern.

.6 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.

.7 Install metal edge strips at unprotected or exposed edges where flooring terminates.

.8 At doorways to incrapack units, extend tile and base fully into door opening to incrapak classroom.

.9 Install solid colour vinyl strips, manufactured for this purpose, to form gymnasium game lines, as indicated on drawings. Cut field tiles tight and smooth contour against game lines. Strips to be minimum of 300 mm long on curves and of indicated width and colour.

.10 Install solid colour vinyl strips, manufactured for this purpose, to indicate the hazardous zone around equipment in the STAC classroom. Cut field tiles tight and smooth contour against the solid coloured lines.

3.4 STAIR APPLICATION

.1 Areas to receive stair treads shall be clean, fully enclosed, weathertight, and maintained at a uniform temperature of at least 70°F for 24 hours before, during, and after the installation in completed. The stair treads and adhesives shall be conditioned in the same manner. Stair steps shall be smooth, flat, level, permanently dry, clean and free of all foreign material, such as dust, paint, grease, oils, solvents, curing and hardening compounds, sealers, asphalt and old adhesive residue. An epoxy caulking nose filler shall be applied to ensure a tight fit and eliminate any open spaces between the step edge and stair tread nosing. Stair treads shall be trimmed to within 1/16” of the riser and stringer to allow for expansion. Adhesives shall be applied to the stair step surface and the back and nosing area of the stair tread. Stair treads shall be rolled, with a J-hand roller, after installation, to ensure proper bonding.

3.5 BASE APPLICATION

.1 Lay out base to keep number of joints at minimum. Use lengths as long as practicable and not less than minimum 500 mm long.

.2 Clean substrate and prime with one coat of adhesive.

.3 Apply adhesive to back of base.

.4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.

.5 Install straight and level to variation of 1:1000.

.6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.

.7 Miter internal corners. Use premoulded corner pieces at all external corners and ensure full adhesion through to ends of corner pieces. See detail for termination at door frames.

.8 Install toeless type base before installation of carpet on floors.

.9 Leave in the building one (1) complete carton of each of two (2) colours of floor tile and twelve (12) tiles of each of the remaining colours. Colours of extra tile to be specified by Consultant.

3.6 INITIAL MAINTANANCE AFTER INSTALLATION

.1 Broom sweep or vacuum thoroughly.

.2 Do not wet mop, wash, scrub, or strip the floor. These procedures will be done by the Owner.

3.7 PROTECTION OF FINISHED WORK

.1 Following broom sweeping, protect new floors with 0.15 mm thick Polyethylene cover and lay planking in all necessary traffic areas to minimize damage by other trades. Maintain until just before final inspection.

.2 Prohibit traffic on floor for 48 hours after installation.

3.8 PREPARATION FOR INSPECTION

.1 Only if so notified by Architect, and in the presence of the Owner, scrub the floor using a neutral detergent and a floor machine of 170-250 rpm capability equipped with a scrub brush or a scrubbing pad (3M blue or equal).

.2 Lightly rinse and allow to dry. Note: Do not flood the floor with rinse water, scrubbing, or stripping solutions. Final re-washing, if required, and waxing will be done by owner.

END OF SECTION

Part 1 General

1.1 APPROVED CARPET MATERIALS (CPT) – Carpet Tiles and Roll product

Product shall be suitable for direct glue-down installation as per CGSB-4-SP-156. The consultant may select any of the following styles from one of the manufacturers listed below.

(Note: Pre-glued products are NOT acceptable)

1. Interface Cubics
2. Interface Space
3. Interface the Standard
4. Interface Ice Breaker
5. Interface Platform
6. Interface Mainline Sidetrack
7. Interface Profile,
8. Interface Exposed,
9. Interface Aerial

10. Tandus Aftermath
11. Tandus Field Day
12. Tandus City Walk –Street Life
13. Tandus Top Shelf

14. Mohawk Classact
15. Mohawk One First
16. Mohawk Function
17. Mohawk Remix

1.1.1 All carpet rolls supplied for each installation shall be manufactured from yarn of the same dye lot. Carpet will be selected by the Project Manager or Board Designee from Manufacturer's stock colour and pattern range.

1.1.2 'NEW' CARPET PRODUCTS

When requested, and if time allows, new carpet products other than those indicated above, to be considered, must be submitted to the Peel District School Board along with specification sheets and samples. If samples are deemed appropriate for further testing and approval, the Board will require an installation at a Peel District School Board site for sampling. The site sample installation to be provided and installed free of charge and to be left on site for a set period of time to be arranged and agreed to at the time of installation. The decision to accept any samples provided for future use within the Board is at the sole and unfettered discretion of the Board.

The Board may award the supply and installation of specialty products other than those noted within the specifications at its sole and unfettered discretion.

1.1.3 WARRANTY

Carpet and installation shall carry a minimum Manufacturer’s ten (10) year warranty.

1.1.4 ADHESIVES

Use Manufacturers recommended adhesive. Provide with bid submission all adhesive products MSDS. Failure to provide MSDS information **MAY** result in the rejection of the bid.

IMPORTANT: Spraying of adhesive will not be accepted.

1.1.5 INSTALLATION

All carpet to be installed as per Manufactures instructions (latest editions/amendments) and in accordance with good installation practices.

In addition: Seams shall be joined with seam adhesive.
Carpet shall be rolled during installation using minimum 75 lb. linoleum roller.

IMPORTANT: Spraying of adhesive will not be accepted.

Carpet shall be of maximum widths and lengths, with all pile running the same direction, free from end joints in a run and with a minimum of side seams. Side seams shall be parallel to each other.

Where variations of colour within normal textile tolerance occur (i.e. more than two (2) variations of colours within a given room), the change in colour shall be restricted to between individual classrooms and/or designated rooms, with such changes occurring at the door line unless authorized in writing to do otherwise by the Peel District School Board. No classrooms or rooms shall have two (2) variations of the same colour and pattern within its boundaries, unless written authority from the Peel District School Board.

Carpeting shall be wall to wall, where carpet meets vinyl tile or other surfaces of less thickness, a carpet to resilient adapter as manufactured by Johnsonite compatible with the decor, shall be installed, using mechanical fasteners, plastic plugs and screws or concrete nails. Do not use powder actuated devices. Carpet shall neatly follow line of walls, bulkheads, columns and door framing.

At openings, seams to occur under door edges.

1.1.6 SEAMS

End seams are generally not acceptable. However where such seams can be so located that they are hidden from view or are otherwise inconspicuous, Project Manager or Board Designee may permit an exception.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

.3 Section 09 22 16 - Non-structural Metal Framing.

.4 Section 06 10 10 - Rough Carpentry: Wood strapping.

.5 Section 09 51 13 – Acoustic panel Ceiling.

.6 Section 04 21 13 – Masonry.

.7 Section 06 40 00 – Architectural Woodwork.

1.2 REFERENCES

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

.1 ASTM C423-09a, Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

.2 Underwriter Laboratories of Canada (ULC)

.1 CAN/ULC-S702-09, Thermal Insulation, Mineral Fibre, for Buildings.

1.3 SUBMITTALS

.1 Product data:

.1 Submit duplicate copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:

.1 Performance criteria, compliance with appropriate reference standard(s), characteristics, limitations, and trouble-shooting protocol.

.2 Product transportation, storage, handling and installation requirements.

.2 Shop drawings:

.1 Submit shop drawings in accordance with Section 01 33 00 indicating:

.1 Elevations, sections, details, materials, dimensions, and finishes.

.3 Samples:

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

.2 Submit one 300 x 300 sample of acoustic panel.

.4 Certificates: Submit certification from an independent inspection company that panels meet specified design requirements.

.5 Closeout submittals:

.1 Submit following for panels incorporation into Operations and Maintenance Manuals in accordance with Section 01 78 00:

.1 Performance criteria and maintenance data.

1.4 QUALITY ASSURANCE

.1 Installers qualifications: Perform Work of this Section by a company that has a minimum of five years proven experience in the installation of acoustical panel units of a similar size and nature and that is approved by manufacturer. Submit to Consultant, applicator's current certificate of approval by the material manufacturer as proof of compliance.

.2 Mock-up:

.1 Construct one 2 sq. m. mock-up of acoustical panels in location acceptable to Consultant.

.2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with Work.

.3 Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.

.4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Commence installation after building enclosed and dust generating activities are completed.

.2 Permit wet work to dry prior to commencement of installation.

.3 Maintain uniform minimum temperature of 15°C and relative humidity of 20- 40% prior to, during and after installation.

1.6 WASTE MANAGEMENT

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, and corrugated cardboard, packaging material in appropriate on-site bins for recycling.

1.7 EXTRA MATERIALS

.1 Provide acoustical units for maintenance use amounting to 2% of gross wall area for each pattern and type required for project.

.2 Provide sufficient adhesive to install extra material provided.

.3 Extra materials to be from same production run as installed materials.

.4 Clearly identify each package of acoustical units including colour and type, and each container of adhesive.

.5 Store where directed by Consultant.

Part 2 Products

2.1 MATERIALS

.1 General: Provide all components and accessories as required for complete and secure installation including but not limited to strapping, z-clips and fasteners.

.2 Type 1: Fabric Acoustic Panels (FAB):

.1 Supply and install surface mounted panels for use at Learning Commons.
.2 Acoustical construction products must:
  .1 Not require being labelled as poisonous, corrosive, flammable or explosive under the Consumer Chemical and Container Regulations of the Hazardous Products Act.
  .2 Be accompanied by detailed instructions for proper handling and installation so as to minimize health concerns.
.3 Composition: Fiberglass with resin-hardened edges with 25% recycled content.
.4 Panels shall be square edged with mechanical butt joints. A Flame Spread rating shall not exceed 25 and NRC-0.80 in accordance with ASTM C423.
.5 Colour: Colours shall be selected by Consultant from Manufacturer's standard colour range.
.6 Panel size: As selected by the Consultant.
.7 Mounting method: Z-clips.

.8 Acoustic Insulation: CAN/ULC S702; 63 mm thick acoustic insulation "Fiberglass Noise Stop Blanket".

.9 Screws: Non corrosive finish, type recommended by acoustic unit manufacturer.
.10 'Custom Soundsoak' by Armstrong (Contact: Ruth Shannon) or acceptable alternatives by Decoustics or approved alternative manufacturer including Wallworks, Fabri-Lok Tensioned Fabric System (Contact Darcey Jerrom 877 829-2550 Ext. 35).

.3 Type 2: Solid Board Acoustic Panels (TEC)

.1 Tectum panels:
  .1 Use only undamaged, single pieces of 600 mm x 2400 mm nom. x 25 mm thick Tectum board. Material shall be ULC rated for fuel contributed, flame spread and smoke development in compliance with Ontario Building Code.
  .2 Locations: Instrumental and Vocal Music Rooms as noted on drawings and Room Finish schedule.
  .3 Colour: colour as selected by Architect.
  .4 Acceptable alternate: Acoustiplank manufactured by Acoustex (tel: 905-692-0916)

.2 Metal Framing: 64 mm deep metal furring channels

.3 Acoustic Insulation: 63 mm thick acoustic insulation "Fiberglass Noise Stop Blanket".

.4 Type 3: Plastic Acoustic Panels (PMP1)

.1 381 mm x 762 mm x 21 mm - recycled plastic fibre-mesh acoustic panels fabricated with 9 mm thick recycled plastic fibre panels mounted on 12mm plywood backing with clear anodized J-mold edging.
.2 Fastening clip: steel "zee clip," bolted to wall.
.3 Acceptable materials: Panels by ezoBord as distributed by iVekter Inc., Burlington, ON (416-665-3571).
.4 Location: on walls of music practice rooms. Refer to Interior Elevation Drawings
.5 Colour – PB10 - black

.5 **Type 4: Plastic Acoustic Panels (PMP2)**

.1 600 mm tall x 21 mm - recycled plastic fibre-mesh acoustic panels fabricated with 9 mm thick recycled plastic fibre panels mounted on 12mm plywood backing with clear anodized J-mold edging.
.2 Fastening clip: steel "zee clip" bolted to wall.
.3 Acceptable materials: Panels by ezoBord as distributed by iVekter Inc., Burlington, ON (416-665-3571).
.4 Location: on walls of STA Classroom 212, refer to interior elevation drawings
.5 Colour – to be selected from manufacturer's full range.

.6 **Type 5: Perforated Wood Acoustic Panels**

.1 Core: FSC-certified fire retardant particle board with face-cut veneer.
.2 Finish: Face-cut veneer finish to be selected by Consultants in manufacturer full colour range with perforated option.
.3 Panel size: as indicated on drawings.
.4 Attachment method: Wall splines or z-clips.
.5 Acceptable Products: 'Woodworks' W2 with round perforations in straight pattern in maple or light cherry finish complete with solid wood peak corner (square) edge banding as manufactured by Armstong, Atkar (905 648-7580), WoodTrends (dist. by Wallworks Acoustic Arch. Products 647 808-5450) or Decoustics (dist. by Kinetics Noise Control 905 670-4922), or by Norton Industries as distributed by Acoustex Group (604 720-0024) or by ACGI Wood as distributed by Rieger Architectural Products.
.6 Locations: Learning Commons 115 above overhead door, Student Forum 116 at sides of stage opening. Refer to Interior Elevations.

.7 **Type 6: Wood Grille Acoustic Panels**

.1 Solid wood dowel acoustic panels.
.2 Overall Panel sizes: as indicated on drawings.
.3 Attachment method: Wall splines or z-clips.
.4 Acceptable Product: 'WOODWORKS® Grille' Model 7099 by Armstrong
.5 Connection type: Dowel Only
.6 Slat width: 1-1/4"
.7 Slat height: 5-1/4"
.8 Slat spacing: 2-3/4"
.9 Nominal unit size: 12 x 96 x 5-1/4"
.10 Finish: Walnut or maple
.11 Alternates meeting these specifications, including Armstong, Atkar (905 648-7580), WoodTrends (dist. by Wallworks Acoustic Arch. Products 647 808-5450) or Decoustics (dist. by Kinetics Noise Control 905 670-4922), or by Norton Industries as distributed by Acoustex Group (604 720-0024) or by ACGI Wood as distributed by Rieger Architectural Products.

.12 Location: Student Forum 116 above stage opening. Refer to Interior Elevations.

2.2 FABRICATION

.1 Verify dimensions of existing Work before commencing fabrications and report discrepancies to Consultant.

.2 Fabricate Work in accordance with Contract Drawings and reviewed shop drawings. Fabricate, fit and assemble Work in shop where possible. Where shop fabrication is not possible, make trial assembly in shop.

.3 Fabricate Work free from defects impairing function, appearance, strength and durability.

Part 3 Execution

3.1 EXAMINATION

.1 Examine carefully surfaces to which panels will be attached and report defects to the Architect. Commencement of installation will signify complete acceptance of substrate.

3.2 INSTALLATION OF FABRIC ACOUSTIC PANELS

1. Install panels, support and anchoring system, fasteners, trim and related items to lines and elevations indicated and in strict accordance with reviewed shop/erection drawings and manufacturer's printed instructions. Carefully co-ordinate work with other Sections.

2. Install acoustic insulation to suitable friction fit between channels.

3. Z-Girts: Install girt/support system true and plumb in order to provide proper support for wall.

4. Insulation:
   .1 Install thermal insulation in longest panel sizes possible in accordance with manufacturer's instructions.
   .2 Butt insulation with moderate contact and, cut and fit them tightly around other construction elements.

5. Fasten panels with screws where screw heads are to be flush with panel surface.

6. Damaged panels, waviness, warp or distortion of finished work will not be accepted.

3.3 INSTALLATION OF PAINTED SOLID BOARD PANELS

1. Fasten metal furring channels to wall at 600 mm O.C. and at perimeter to receive panels, insulation and wood trim. Refer to detail drawings.

2. Install acoustic insulation to suitable friction fit between channels.

3. Fasten panels, long dimension to the vertical, to furring using suitable self tapping screws at maximum 300 mm O.C.

4. Install wood surround trim. Refer to Section 06 40 00.

3.4 INSTALLATION METAL PANELS

1. Fasten zee clips to wall-shim, as required, for level and even appearance.

2. Install insulated panels on clips. Provide vandal resistant fastening and metal trim.

3.5 CLEANING

.1 Keep acoustic installation and all components clean. Remove blemishes immediately.

3.6 PROTECTION

.1 Use cardboard to protect finished acoustical wall treatment from damage.

.2 Remove prior to substantial completion.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 40 00 - Architectural Woodwork.

.3 Section 05 12 23 – Structural Steel for Buildings.

.4 Section 05 50 00 – Metal Fabrications.

.5 Section 08 11 14 – Metal Doors and Frames.

.6 Section 09 91 27 – Finish and Colour Notes.

.7 Section 09 91 30 – Door and Room Finish Schedule.

1.2 REFERENCES

.1 Architectural Painting Specifications Manual, Master Painters Institute (MPI).

1.3 WARRANTY

.1 Upon completion of the work, contractor shall warrant that the work has been performed with respect to the standards and requirements incorporated in the MPI specification manual-latest edition.

1.4 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Do not apply paint finish in areas where dust is being generated.

.2 Conform to requirements of MPI Manual.

.3 Comply with the requirements of Section 01 35 30- Health and Safety.

1.5 JOB MOCK-UP

.1 Complete a mock-up room to be reviewed and approved by Owner and Consultant for approval on application of block filler and finish paint coats.

1.6 SCHEDULING OF WORK

.1 Submit work schedule for various stages of painting to Consultant for approval. Submit schedule minimum of 72 hours in advance of proposed operations.

.2 Obtain written authorization from Consultant for any changes in work schedule.

.3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.7 EXTRA MATERIALS

.1 Submit one - four litre can of each type and colour of [primer] [stain] [finish coating]. Identify colour and paint type in relation to established colour schedule and finish system.

.2 Deliver to Contractor and store where directed.

1.8 DELIVERY, HANDLING AND STORAGE

.1 Labels shall clearly indicate:

- .1 Manufacturer's name and address.
- .2 Type of paint or coating.
- .3 Compliance with applicable standard.
- .4 Colour number in accordance with established colour schedule.

.2 Remove damaged, opened and rejected materials from site.

.3 Provide and maintain dry, temperature controlled, secure storage.

.4 Observe manufacturer's recommendations for storage and handling.

.5 Store materials and supplies away from heat generating devices.

.6 Store materials and equipment in a well ventilated area with temperature range 7^0C to 30^0C.

.7 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.8 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.

.9 Remove paint materials from storage only in quantities required for same day use.

.10 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.11 Fire Safety Requirements:

- .1 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.9 FINISHES AND COLOURS

.1 Review the requirements outlined in Section 099127, Finish Schedule and Colour Notes. A separate colour schedule will be issued after contract award.

.2 Allow for 10 colours total from all formulations for this project including room wall accent colours.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.,) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.

.2 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.3 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.4 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground the following procedures shall be strictly adhered to:

.1 Retain cleaning water for water-based materials to allow sediments to be filtered out.

.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.

.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

.5 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

.6 Set aside and protect surplus and uncontaminated finish materials: galvanized touch up; wood stain, prefinished metal touch up paint. Deliver to or arrange collection by recycling organization for verifiable re-use or re-manufacturing.

.7 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

Part 2 Products

2.1 MATERIALS

.1 Acceptable Manufacturer's: Where MPI code numbers are not referenced, use Products from one of the following manufacturers:

.1 Benjamin Moore & Co. Ltd.

.2 Canadian Industries Ltd.

.3 ICI (Glidden) Paints.

.4 Para Paints.

.5 Pratt & Lambert Inc.

.6 SICO Coatings.

.7 The Sherwin-Williams Company.

.2 Manufacturers of intumescent coatings having Product considered acceptable for use:

.1 A/D Fire Protection Systems Inc.

.2 Carboline.

.3 Paint materials for paint systems shall be products of a single manufacturer.

.4 Acceptable products: Per MPI Manual and as listed.

.5 Paint materials for each paint system to be products of a single manufacturer.

.6 Use low-VOC and low-odour paints only.

Part 3 Execution

3.1 GENERAL

.1 Prepare surfaces to receive paint per MPI Manual.

3.2 APPLICATION

.1 Sand and dust between each coat to remove defects visible from distance up to 1.5 m.

.2 Finish closets and alcoves as specified for adjoining rooms.

.3 Apply each coat at the proper consistency. Each coat of finish should be fully dry and hard before applying the next coat, unless the manufacturer’s instructions state otherwise.

.4 Method of application to be as approved by Consultant. Apply paint by [brush] [roller] [air sprayer] [airless sprayer]. Conform to manufacturer's application instructions unless specified otherwise.

.5 Brush and Roller Application:

.1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple unless approved by Consultant.

.5 Remove runs, sags and brush marks from finished work and repaint.

.6 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.

.4 Brush out immediately all runs and sags.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.7 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Consultant.

.8 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.9 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.10 Sand and dust between coats to remove visible defects.

.11 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.12 Finish inside of cupboards and cabinets as specified for outside surfaces.

.13 Finish closets and alcoves as specified for adjoining rooms.

.14 Finish top, bottom, edges and cut-outs of doors after fitting as specified for door surfaces.

3.3 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Refer also to Finish Notes in Section 099127- Finish and Colour Notes.

.2 Paint exposed conduits, pipes, hangers and other mechanical and electrical equipment occurring in finished areas as well as inside cupboards and cabinet work. Colour and texture to match adjacent surfaces, except as noted otherwise. Coordinate with mechanical trades applying banding and labeling after pipes have been painted. Do not paint white PVC covers on exposed mechanical water, drain and other lines

.3 Paint gas piping standard yellow where visible on roof or in service spaces. Do not paint gas meter or gas equipment in wall niche yellow—colour to later selection by Architect.

.4 Paint surfaces inside of ductwork and elsewhere behind grilles where visible using primer and one coat of matte black paint.

.5 Paint both sides and edges of plywood backboards for equipment before installation.

.6 Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.4 PAINT SYSTEMS

.1 System references listed are based on Chapters 4A and 4B of MPI Manual and are MPI Premium Grade, unless noted otherwise.

3.5 INTERIOR FINISHES

.1 Wood, where applicable:

- .1 Miscellaneous trim: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
- .2 Wood slat ceiling to Foyer 102: INT. 1-J Premium Grade; satin finish, Fire Retardent. Slats to be sealed and shop finished prior to installation. Refer also to Section 064000.
- .3 Casework and miscellaneous wood items:
  - .1 Exterior surfaces: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
  - .2 Interior surfaces: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
  - .3 Wood Benches and Upper Shelves: INT. 2-F, Stained Alkyd Satin Finish, Premium Grade.
  - .4 Gym Storage Shelves: INT. 3-A, Stain Finish, Custom Grade

.2 Gypsum board: INT.4-B, Latex Eggshell Finish, Premium Grade.

.3 Acoustical wall panels: INT. 6-A, Latex Flat Finish, Custom Grade.

.4 Concrete Block: INT.8-C -modified; Latex Semi-Gloss Finish, Premium Grade. Modified system refers to all work where 2 full coats of block filler shall be applied.

.5 Concrete Block (P-GF): Two-coats of 100% zero VOC epoxy, Premium Grade - shown on Room Finish Schedule as P-GF (Paint - Gloss) finish.

.6 Concrete Floors (S.CONC); refer to Section 033505 - Concrete Floor Hardeners and Sealers for liquid sealer.

.7 Concrete Floors (EWPM); refer to Section 099724 for epoxy floor finish.

.8 Exposed Cast in Place Concrete ceilings: INT. 8-A, Latex Flat Finish, Premium Grade

.9 Exposed Precast Concrete ceilings: INT. 8-A, Latex Flat Finish, Custom Grade

.10 Miscellaneous metal:

- .1 Primed: INT. 12-A, Alkyd Semi-Gloss Finish, Premium Grade
- .2 Galvanized: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade
- .3 INT. 12-G, Water based Epoxy finish, two coats on a rust inhibitive primer for all exposed steel on Stairs 1S1 & 1S2 including exposed steel nosing at porcelain tile stair landing, stair stringer, pickets and railings".

.11 Galvanized metal: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade

.12 Hollow Metal Doors and Frames: Without exception, all wipecoated Galvanized Hollow Metal Doors, Frames and Screens, interior and exterior shall be field cleaned with solvent, galvanized prime paint coated and then finished with INT. 13-A Premium Grade,

Gloss Finish. Base coat primer shall be submitted for review in advance or door/frame painting shall be rejected by Consultant. For exterior hollow metal frames, if any, adjacent to aluminum windows, provide finish coat as an exterior premium grade metallic gloss finish to match anodized windows or Aluminum Composite panels. Colour to be confirmed by Architect during construction.

.13 Gymnasium Painting:

.1 note that painting of gymnasium acoustic deck and structural steel is part of painting contract.

.2 Allow for single colour for deck and joists.

.3 Allow for complete painting of all hangers and equipment brackets including but not limited to basket ball baskstops, electrical pipe rails, mechanical equipment fan cages, etc.

.4 Allow for accent painting of 2 perimeter stripes to all walls and over proscenium, shown on drawings. Total of 2 accent colours for these stripes.

.14 Other Painting:

.1 Painting of Elevator/Lift doors and frame is part of this contract.

.2 In the following rooms with exposed metal deck including mechanical rooms and storage rooms:

.1 Allow for single colour for deck and joists.

.2 Allow for complete painting of all hangers and equipment brackets including but not limited to, electrical and mechanical equipment, etc.

.3 painting deck/floor slab and structural steel is part of painting contract.

.15 Corridor Graphic Silouette Painting:

.1 Provide the single colour silhouette image in one location of corridor as shown on drawing A17.

.2 Consultant can provide the digital file of images to be transcribed if required.

3.6 EXTERIOR PAINTING

.1 Wood Soffits and Column Inserts: Refer to Section 06 20 13.

.2 Pavement markings: EXT. 7-A, Zone Marking Alkyd Finish, Premium Grade.

.3 Columns at front entrance or exposed on exterior of building: Primed with an inorganic zinc primer over commercial blast cleaning 63-75 micrometers (2-3 mils). Field coat of 75-100 micrometers (3-4 mils) of high build two component epoxy, premium grade. Colour to be selected by the Consultant.

.4 Miscellaneous metal:

.1 Primed: EXT. 11-A-Gloss, Premium Grade

.2 Galvanized: Touch up any welds, cuts or damage with ‘Galvafroid’ Paint by W.R. Meadows prior to prime and finish coats.; Finish System EXT. 12-A-Gloss, Premium Grade

.5 Galvanized Structural Steel: Touch up any welds, cuts or damage with 'Galvafroid' Paint by W.R. Meadows prior to prime and finish coats.; Finish System: EXT. 12-A-Gloss, Premium Grade.

.6 Steel - high heat: EXT. 15-A

.7 Paint exterior vents and louvres located in masonry to match adjacent masonry in colour.

3.7 INSPECTIONS

.1 Provide Architect with all formulations at outset of project.

.2 Provide inspections by representative of the Master Painters Institute (MPI) in compliance with the terms of the Canadian Painting Contractors Association Inspection and Guarantee Program.

.3 Cooperate at all times with the paint inspection agency in the performance of their duties as required as part of the work of this Section.

.4 MPI inspection costs to be paid from Cash Allowance.

END OF SECTION

Part 1 General

1.1 GENERAL FINISH NOTES

.1 The Material and Colour Schedule will be issued by the Consultant after tender. It shall be read in conjunction with the Drawings, Specifications, Room Schedule and Door Schedule. Colour and material references named will be based on one manufacturer, as carried by the Contractor or, in the case that no specific manufacturer is carried, based on the Consultant's choice.

.2 Approved alternative manufacturers will be acceptable only as indicated in the specifications. However, approved alternate products submitted must match the products named in the Specification to the Consultant's selection. Alternate products other than those named in the specifications will not be allowed unless previously approved by the Consultant.

.3 Consult Consultant prior to painting any surface not included in the formulae as listed.

.4 Final colour for exterior painted surfaces and prominent interior areas shall be approved on the job site by the Consultant.

.5 Paint samples: Contractor to submit paint samples for all areas required to "Match Adjacent Finish".

.6 All similar paint formulations are to be identical when dry. Variations in tone, texture or sheen shall not be accepted.

.7 Submit two 300 mm x 300 mm paint samples of each colour required for approval by the Architect.

.8 Exact locations of accent paint called for in the Material and Colour Schedule, to be issued after Contract award, not specifically identified on the drawings are to be verified on site with the Consultant.

1.2 EXTERIOR FINISH NOTES

.1 All exposed metal (doors, frames, lintels, stairs, handrails, mechanical equipment, etc.) to be painted except for prefinished metal louvres, stainless steel, and aluminum. Mechanical equipment is to be painted whether delivered to the site prepainted or not (exhaust fans, goosenecks, exhaust stacks, supports, HVAC units, HRU units, etc.). Colours to match adjacent material-generally either to match brick or tan to match flashing or siding material. Do not paint exposed white PVC pipe covers on interior. Architect will advise on jobsite which other items mentioned above, if any, do not require painting.

.2 All unfinished metal work provided by landscaping is to be painted by Section 099122-Painting.

1.3 INTERIOR FINISH NOTES

.1 All heating units, recessed convectors, grilles, pipes, access panels, hangers and miscellaneous exposed metal work (except stainless steel or anodized aluminum) to be

painted to match the surfaces on which they occur unless noted otherwise on the colour schedule, prefinished in suitable colour or directed by the Consultant. If prefinished equipment is damaged, it shall be re-painted. Painting to be by formulations specified in Section 09 91 12- Painting.

.2 All interior fitments, casework, millwork, etc. to be melamine unless otherwise noted. Refer to Sections for specific requirements regarding materials, construction, finishes and hardware. Note that drawer and cupboard interiors are to be considered as exposed surfaces and will therefore be finished.

.3 Do not paint over nameplates, identification tags, etc.

.4 Make good all existing surfaces and finishes that are damaged during construction.

END OF SECTION

PART 1 - GENERAL

1.1 General Notes

1. Find the **Room Finish Schedule** on the following pages
2. **This schedule MUST be read in conjunction with a complete set of drawings** to ascertain all details and finished surfaces that may not be listed on the schedule.
3. Refer to interior elevations, plans sections and reflected ceiling plans to coordinate finish notes and extents of materials.
4. Refer to various specifications sections for different types of materials including, but not limited to:
   - .1 flooring materials such as resilient tile
   - .2 ceiling materials such as Lay-In Acoustical panel (LAP)
   - .3 Acoustical wall treatment
5. Abbreviations Legend:

Code	Reference
AB	Acoustic Blades
ASD	Acoustic Steel Deck
CMT	Porcelain Mosaic Floor Tile
CPT	Carpet Tile
CW	Curtain Wall
CWT	Ceramic Wall Tile
CB	Concrete Block
EWPM	Exposed Waterproof Membrane (refer to Section 09 97 24)
GYP	Gypsum Wall Board
HAP	Hanging Acoustic Panels
LAP	Lay-in Acoustic Panel
P.GF	Paint - Gloss Finish
POR	Porcelain Tile
P	Paint
RB	Resilient Rubber Base
RSTR	Rubber Stair Tread & Riser
S.CONC	Sealed Concrete (refer to Section 03 35 05)
VCT	Vinyl Composite Tile
WRGYP	Water-Resistant Gypsum Board

END OF SECTION

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
GROUND FLOOR									
101	VESTIBULE	POR	POR	CB	P.GF	GYP/EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
102	GENERAL OFFICE	LVT	RB	CB	P	LAP/GYP	P	2820	
103	PRINCIPAL OFFICE	LVT	RB	CB	P	LAP	-	2810	
104	VP OFFICE	LVT	RB	CB	P	LAP	-	2810	
105	VP OFFICE	LVT	RB	CB	P	LAP	-	2810	
106	GUIDANCE	LVT	RB	CB	P	LAP	-	2810	
107	HEALTH	LVT	RB	CB	P	LAP	-	2810	
108	OSR	LVT	RB	CB	P	LAP	-	2610	
109	HEALTH WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
110	STAFF WORK ROOM	LVT	RB	CB	P	LAP	-	2810	
111	FOYER	POR	POR	CB	P	LAP/GYP/ AB	P	2610	ACOUSTIC BLADES NEAR MAIN ENTRANCE VESTIBLE. CWT ON SOME WALLS, FULL HEIGHT, REFER TO INT. ELEVATIONS FOR LOCATIONS / EXTENT

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
112	STAIR A	POR	POR	CB	P.GF	EXP	P	-	PAINT ALL EXPOSED STEEL STAIR STRINGERS, PICKETS. POR. AT TREADS RISERS AND LANDINGS. PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
113	STAFF LOUNGE	LVT	RB	CB	P	LAP	-	2810	
114	LEARNING COMMONS WORKROOM	LVT	RB	CB	P	LAP	-	2810	
115	LEARNING COMMONS	LVT	RB	CB/GYP	P	EXP ASD/ LAP	P	-	ACOUSTIC STEEL DECK. PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC. LAP HANGING PANELS WITH PERIMETER TRIM. FABRIC ACOUSTIC WALL PANELS (FAB)
116	STUDENT FORUM	POR	POR	CB	P.GF	EXP ASD	P	-	WOOD ACOUSTIC PANEL SURROUND AT STAGE. REF. INT. ELEVATIONS. PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
117	CLASSROOM	LVT	RB	CB	P	LAP	-	2975	
118	STAIR D	POR/RSTR	POR/RB	CB	P.GF	LAP/GYP	P	2600	PAINT ALL EXPOSED STEEL STAIR STRINGERS, PICKETS. 1-PIECE RUBBER STAIR TREAD & RISER, POR. AT LANDINGS.
119	INSTRUMENTAL MUSIC ROOM	LVT	RB	CB	P	LAP	-	2810	PAINT WALL MTD. TECTUM PANELS (TEC) (CLEAR WOOD TRIM) AD 960
119A	VESTIBULE	LVT	RB	CB	P	LAP	-	2810	
120	PRACTICE ROOM	LVT	RB	CB	P	LAP	-	2810	PAINT METAL WALL MTD. ACOUSTIC PANELS (PMP1)
121	PRACTICE ROOM	LVT	RB	CB	P	LAP	-	2810	PAINT METAL WALL MTD. ACOUSTIC PANELS (PMP1)

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
122	VOCAL MUSIC ROOM	LVT	RB	CB	P	LAP	-	2810	PAINT WALL MTD. TECTUM PANELS (TEC) (CLEAR WOOD TRIM) AD 960
123	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
124	SPECIAL EDUCATION	LVT	RB	CB	P	LAP	-	2810	
125	UNIVERSAL WASHROOM	POR	POR	CB	CWT	LAP/ WRGYP	P	2610	FULL HEIGHT CWT ON WALLS IN SHOWER, CMT ON FLOOR IN SHOWER. FULL HEIGHT CWT IN ROOM ON ALL WALLS
126	ALE	LVT	-	CB	EP	GYP	EP	2810	INSTALL LVT TIGHT TO WALLS. NO BASE TO BE INSTALLED IN THIS ROOM. NO CAULKING TO BE INSTALLED IN THIS ROOM. ALL FILLER AROUND PERIMETER OF FLOOR AND DOOR FRAME MUST BE FILLED WITH SMOOTH MORTAR. CEILING AND WALLS SHALL BE PAINTED WHITE
127	SPRINKLER ROOM	EWPM	EWPM	CB	P	EXP	P	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
128	ELECTRICAL ROOM	EWPM	EWPM	CB	P	EXP	P	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
129	CORRIDOR	POR	POR	CB	P	LAP	-	2610	
130	STAIR C	POR/RSTR	POR/RB	CB	P.GF	LAP/GYP	P	2610	PAINT ALL EXPOSED STEEL STAIR STRINGERS, PICKETS. 1-PIECE RUBBER STAIR TREAD & RISER, POR. AT LANDINGS.
131	KINDERGARTEN CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
132	VESTIBULE	POR	POR	CB	P.GF	LAP	-	2810	
133	BOYS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
134	GIRLS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
135	KINDERGARTEN CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
136	CORRIDOR	POR	POR	CB	P.GF	LAP	-	2610	
137	KINDERGARTEN CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
138	VESTIBULE	POR	POR	CB	P.GF	LAP	-	2810	
139	BOYS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
140	GIRLS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
141	KINDERGARTEN CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
142	STAIR B	POR/RSTR	POR/RB	CB	P.GF	LAP/GYP	P	2610	PAINT ALL EXPOSED STEEL STAIR STRINGERS, PICKETS. 1-PIECE RUBBER STAIR TREAD & RISER, POR. AT LANDINGS.
143	CUSTODIAN/ EXTERIOR STORAGE	S.CONC	RB	CB	P.GF	EXP	P	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
144	KINDERGARTEN CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
145	VESTIBULE	POR	POR	CB	P.GF	LAP	-	2810	
146	GIRLS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
147	BOYS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
148	CORRIDOR	POR	POR	CB	P.GF	LAP	-	2610	
149	KINDERGARTEN CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
150	KINDERGARTEN CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
151	VESTIBULE	POR	POR	CB	P.GF	LAP	-	2810	
152	GIRLS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
153	BOYS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
154	KINDERGARTEN CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
155	GYMNASIUM	SF-SP	RB	CB	P	EXP ASD	P	-	ACOUSTIC STEEL DECK. JOISTS TO BE PAINTED DIFFERENT COLOUR THAN ACOUSTIC DECK. PAINT DUCTS, SUPPORTS, CONDUITS, ETC. TO MATCH DECK. PAINT ACCENT STRIPES AS INDICATED ON GYM ELEVATION DRAWINGS
156	ELEVATOR	POR	REFER TO SPECIFICATIONS FOR FINISHES BY MANUFACTURER						
157	STAGE	LVT	RB	CB	P	EXP ASD	P	-	ACOUSTIC STEEL DECK. PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
158	STAIR E (STAGE)	RSTR	RB	CB	P	GYP	P	VARIES	PAINT ALL EXPOSED STEEL STAIR STRINGERS, PICKETS. 1-PIECE RUBBER STAIR TREAD & RISER.
159	STORAGE	LVT	RB	CB	P	EXP	-	-	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
160	CORRIDOR	LVT	RB	CB	P.GF	LAP	-	2600	
161	SEMINAR ROOM	LVT	RB	CB	P	LAP	-	2810	
162	LAN ROOM	LVT	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
163	STAFF WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
164	GIRLS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
165	BOYS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
166	CORRIDOR	POR	POR	CB	P.GF	LAP	-	2610	
167	CHANGE ROOM	LVT	RB	CB	P.GF	GYP	P	2610	
168	ACAD. STORAGE	LVT	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
169	INSTRUCTOR ROOM	LVT	RB	CB	P.GF	LAP	-	2810	
170	CHANGE ROOM	LVT	RB	CB	P.GF	GYP	P	2610	
171	SEMINAR ROOM	LVT	RB	CB	P	LAP	-	2810	
172	GYM STORAGE	LVT	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
173	RESOURCE ROOM	LVT	RB	CB	P	LAP	-	2810	
174	CUSTODIAN OFFICE	LVT	RB	CB	P	LAP	P	2810	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
175	ELECTRICAL ROOM	S.CONC	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
176	LAN ROOM	LVT	RB	CB	P.GF	EXP	P	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
177	GIRLS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
178	BOYS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
179	STAFF WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
180	STAFF WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
GROUND FLOOR - CHILDCARE									
301	VESTIBULE	POR	POR	CB	P.GF	LAP	-	2810	
302	OFFICE	LVT	RB	CB	P	LAP	-	2810	
303	CORRIDOR	LVT	RB	CB	P	LAP	-	2810	
304	PANTRY	POR	POR	CB	P.GF	LAP	-	2610	
305	KITCHEN	POR	POR	CB	P.GF	LAP	-	2610	
306	BARRIER FREE WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
307	LAUNDRY	POR	POR	CB	P.GF	LAP	-	2610	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
308	ELECTRICAL ROOM	EWPM	EWPM	CB	P	EXP	P	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
309	CORRIDOR	POR	POR	CB	P.GF	LAP	-	2610	
310	STORAGE	LVT	RB	CB	P	LAP	-	2810	
311	CUBBIE AREA	POR	POR	CB	P.GF	LAP	-	2610	
312	STAFF ROOM	LVT	RB	CB	P.GF	LAP	-	2610	
313	NOT USED								
314	WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS.
315	PRE-SCHOOL CLASSROOM	LVT	RB	CB	P	LAP	-	-	
316	COT STORAGE	LVT	RB	CB	P	LAP	-	-	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
317	COT STORAGE	LVT	RB	CB	P	LAP	-	2810	PAINT ALL EXPOSED SLAB, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
318	WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS.
319	PRE-SCHOOL CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
320	WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS.
321	CORRIDOR	POR	POR	CB	P.GF	LAP	-	2610	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
322	VESTIBULE	POR	POR	CB	P.GF	LAP	-	2610	
323	WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS.
324	TODDLER ROOM	LVT	RB	CB	P	LAP	-	2810	
325	COT STORAGE	LVT	RB	CB	P	LAP	-	2810	
326	SLEEPING AREA	LVT	RB	CB	P	LAP	-	2810	
327	INFANTS	LVT	RB	CB	P	LAP	-	2810	
328	WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS.
SECOND FLOOR									
201	STAIR A	POR	POR	CB	P.GF	EXP ASD	P	-	ACOUSTIC STEEL DECK. PAINT ALL EXPOSED STEEL STAIR STRINGERS, PICKETS. POR. AT TREADS RISERS AND LANDINGS. PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
202	CO-LAB ZONE	POR	POR	CB	P.GF	EXP ASD/ AB	P	-	ACOUSTIC STEEL DECK. PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC. HANGING ACOUSTIC BLADES.
203	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
204	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
205	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
206	CORRIDOR	LVT	POR	CB	P.GF	LAP	-	2610	
207	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
207A	SEMINAR ROOM	LVT	RB	CB	P	LAP	-	2810	
208	STAIR D	POR/RSTR	POR/RB	CB	P.GF	LAP	-	2810	PAINT ALL EXPOSED STEEL STAIR STRINGERS, PICKETS. 1-PIECE RUBBER STAIR TREAD & RISER, POR. AT LANDINGS.
209	ART CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
210	ART PREP. ROOM	LVT	RB	CB	P	LAP	-	2810	
211	SEMINAR ROOM	LVT	RB	CB	P	LAP	-	2810	
212	STAC CLASSROOM	LVT	RB	CB	P	LAP	-	2810	2 LVT COLOURS ON FLOOR TO DENOTE SAFETY ZONE. PLASTIC ACOUSTIC WALL PANELS (PMP2)
212A	DUST EXTRACTOR ROOM	S.CONC	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
213	SMT PREP CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
214	SMT CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
215	RESOURCE ROOM	LVT	RB	CB	P	LAP	-	2810	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
216	CORRIDOR	POR	POR	CB	P.GF /CWT	LAP/GYP	P	2610	CWT FROM BENCHES TO CEILING IN CORRIDOR NICHES. REFER TO INTERIOR ELEVATIONS. CWT AT DRINKING FOUNTAIN NICHES, FULL HEIGHT.
217	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
218	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
219	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
220	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
221	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
222	STAIR C	POR/RSTR	POR/RB	CB	P.GF	LAP	-	2610	PAINT ALL EXPOSED STEEL STAIR STRINGERS, PICKETS. 1-PIECE RUBBER STAIR TREAD & RISER, POR. AT LANDINGS.
223	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
224	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
225	CORRIDOR	POR	POR	CB	P.GF /CWT	LAP/GYP	P	2610	CWT FROM BENCHES TO CEILING IN CORRIDOR NICHES. REFER TO INTERIOR ELEVATIONS.
226	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
227	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
228	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
229	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
230	STAIR B	POR/RSTR	POR/RB	CB	P.GF	LAP	-	2610	PAINT ALL EXPOSED STEEL STAIR STRINGERS, PICKETS. 1-PIECE RUBBER STAIR TREAD & RISER, POR. AT LANDINGS.
231	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
232	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
233	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
234	CORRIDOR	POR	POR	CB	P.GF /CWT	LAP/GYP	P	2610	CWT FROM BENCHES TO CEILING IN CORRIDOR NICHES. REFER TO INTERIOR ELEVATIONS. CWT AT DRINKING FOUNTAIN NICHES, FULL HEIGHT.
235	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
236	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
237	CO-LAB ZONE	POR	POR	CB	P.GF /CWT	LAP/GYP	P	2610	CWT FROM BENCHES TO CEILING IN CORRIDOR NICHES. REFER TO INTERIOR ELEVATIONS.
238	CLASSROOM	LVT	RB	CB	P	LAP	-	2810	
239	RESOURCE ROOM	LVT	RB	CB	P	LAP	-	2810	
240	SEMINAR ROOM	LVT	RB	CB	P	LAP	-	2810	
241	ACADEMIC STORAGE	LVT	RB	CB	P	LAP	-	2810	
242A	ELECTRICAL ROOM	S.CONC	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
242B	LAN ROOM	LVT	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
243	CUSTODIAN	POR	POR	CB	P.GF	EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS. CONDUITS. ETC.
244	STAFF WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
245	GIRLS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
246	BOYS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
247	MECHANICAL ROOM	EWPM	EWPM	CB	P	EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
248	BOILER ROOM	EWPM	EWPM	CB	P	EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
249	BOYS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
250	GIRLS WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
251	STAFF WASHROOM	POR	POR	CB	CWT	WRGYP	P	2610	FULL HEIGHT CERAMIC WALL TILE ON ALL WALLS
252	CUSTODIAN	POR	POR	CB	P.GF	LAP	-	2810	
253A	LAN ROOM	LVT	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
253B	ELECTRICAL ROOM	S.CONC	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.
254	ELEVATOR MACHINE ROOM	S.CONC	RB	CB	P	EXP	P	-	PAINT ALL EXPOSED STEEL DECK, STRUCTURE, INCLUDING MECH. DUCTS, SUPPORTS, CONDUITS, ETC.

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
255	ELEVATOR	POR	1 HOUR RATED FIRE SEPARATION AT ROOF OBTAINED WITH SPRAY FIRE PROOFING. REFER TO SPECIFICATIONS FOR FINISHES BY MANUFACTURER						
GENERAL NOTES:									
1	REFER TO SPECIFICATION SECTION 09 91 30 FOR ABBREVIATIONS LEGEND.								
2	This schedule MUST be read in conjunction with a complete set of drawings to ascertain all details and finished surfaces that may not be listed on the schedule.								
3	Where ceramic wall tile is identified, G.C. to coordinate tile installation behind all fixtures (do not tile around fixtures).								
4	Where a gypsum board bulkhead is identified above millwork, it shall have a painted finish. Refer to Interior Elevations for where acoustic panels or other mateirals wrap onto bulkhead								
5	Refer to interior elevations, plans sections and reflected ceiling plans to coordinate finish notes and extents of materials.								

1 General

1. SUMMARY

.1 Section Includes:
  .1 Compliance with requirements of the sections of Division 1 of the specifications.
  .2 Requirements for providing the concrete floor sealer parts of the Work.

2. SUBMITTALS

.1 Product Data:
  .1 Submit manufacturer's technical data, installation instructions, maintenance instructions and general recommendations for concrete floor sealer.

.2 Samples:
  .1 Provide samples as specified in section 01 33 00 Samples, supplemented as follows:
    .1 Submit 300 mm x 300 mm square sample of concrete floor sealer applied to a smooth trowel finish concrete paver.
    .2 Submit each type of sample in triplicate.
    .3 Modify and resubmit samples as many times as may be necessary to obtain Consultant’s approval.

.3 Closeout Documents:
  .1 Provide manuals that contain the floor sealer manufacturer's maintenance and repair manual. The maintenance and repair manuals shall give specific warning of maintenance practices, Products and materials which may cause damage and disfigurement.

3. QUALITY ASSURANCE

.1 Single Source Responsibility:
  .1 Obtain concrete floor sealer Products from the same manufacturer with not less than ten (10) years of successful experience in manufacturing and installing principal materials described in this section. Contractor must have completed at least five projects of similar size and complexity. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.

.2 Pre-installation Meeting:
  .1 Hold a pre-installation meeting at the Place of the Work.

.3 Mock-up:
  .1 At site, under manufacturer's supervision, apply for approval 9 m2 of each type of complete floor finish in area designated, to match submitted samples. When approved, site applied sample to be standard for appearance, texture, workmanship, etc. All Work to conform to this sample.

4. DELIVERY, STORAGE AND HANDLING

.1 Deliver Products to the Place of the Work. Check material for completeness and shipping damage prior to job start.

.2 All materials must be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

.3 Store Products in a dry, enclosed area protected from exposure to moisture. Temperature of storage area shall be maintained between 16° and 32°C.

5. PROJECT CONDITIONS

.1 Environmental Requirements:
- .1 Concrete substrate must be properly cured for a minimum of 30 days.

.2 Temperature:
- .1 Maintain ambient temperature of not less than 18 deg.C/65 deg.F and a floor temperature of not less than 16 deg.C/60 deg.F from 7 days before installation to at least 48 hours after completion of work and maintain relative humidity not higher than 40% during same period.

.3 Moisture:
- .1 Ensure substrate is within moisture limits prescribed by concrete floor sealer manufacturer.

.4 Protection:
- .1 Areas to accept concrete floor sealer shall be free of other trades during, and for a period of 24 hours, after floor installation.

.5 Manufacturer’s Representative:
- .1 Manufacturer's representative must be on job site at start of installation.

6. WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate packaging material for recycling in accordance with the Waste Management Plan.

.2 Remove from the Place of the Work and dispose of packaging materials at appropriate recycling facilities.

.3 Dispose of unused finish and adhesive materials at official hazardous material collections site.

7. WARRANTY

.1 Furnish a single, written warranty covering both material and workmanship for a period of three (3) full years from date of Substantial Performance of the Work. The Warranty shall cover defects such as cracking, delamination under impact and under heavy loaded carts and under thermal shock, and excessive wear.

2 Products

1. MATERIALS

.1 Manufacturers:
  .1 The specifications are based on Products manufactured by Sika Canada Inc. Products by Duochem Inc, division of Corrosion Services, CPD Construction Products, Niagara Protective Coatings, Selby/Ucrete,. Stonhard Ltd. Euclid or other approved manufacture may be approved on condition of being able to furnish evidence of equivalency or better to the specified Products.

.2 Concrete Floor Sealer System (EWPM)
  .1 General:
    .1 Two-component, clear, water based mat epoxy coating, Sika MRW roller applied two coat system on a sealed/primed substrate.
  .2 Characteristics
    .1 Seamless and very easy to clean.
    .2 Abrasion and chemical resistant.
    .3 No odour typical of solvent based coatings
  .3 Minimum Technical requirements
    .1 Solids content: 100% by weight, 100% by volume.
    .2 Pot life90 mins.
    .3 Application method: Brush, or roller.
    .4 Number of coats: Two.
    .5 Dry film thickness per coat: as per manufacturer's instructions
    .6 Cleaning solvent: Warm water.
    .7 Cure time: Touch dry: 4-5 hours.
      .1 Hard dry: 16-18 hours.
      .2 Complete cure: 7 days.
    .8 Recoat time: 16 hours.
  .4 Minimum Physical properties
    .1 Abrasion resistance: 175 mg loss per ASTM D 4060 CS-17 wheels 1000 revolutions 1000 gr/wheel.
    .2 Tensile strength 2.1 MPa per ASTM D 2370 (2.8 mils D.F.T.)
  .5 Primer: as recommended by manufacturer.

3 Execution

1. WORKMANSHIP

.1 General
  .1 Handle, mix and apply Products as per the Product manufacturer's printed surface preparation and application specifications, and as specified in this specification section 09 97 24.
  .2 Application tools and equipment shall be as per the Product manufacturer's printed requirements.

2. PREPARATION

.1 Prepare concrete by sanding smooth and for removal of bond inhibiting substances.

.2 Apply as per manufacturer's instructions.

3. **APPLICATION**

.1 Apply concrete sealer as indicated.
.2 Rolling direction of each coat shall be the same.

4. **FIELD QUALITY CONTROL**

.1 The Owner reserves the right to invoke the following material testing procedure at any time, and any number of times during period of flooring application.

.2 The Owner may engage service of an independent testing laboratory to sample materials being used on the jobsite. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.

.3 Testing laboratory will perform tests for any of characteristics specified, using applicable testing procedures referenced herein, or if none referenced, in manufacturer's product data.

.4 If test results show materials being used do not comply with specified requirements, the Contractor may be directed by Owner to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

5. **CURING, PROTECTION AND CLEANING**

.1 Cure concrete floor sealing materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

.2 Protect concrete floor sealing from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. Contractor is responsible for protection and cleaning of surfaces after final coats.

.3 Cleaning: Remove temporary covering and clean flooring just prior to final inspection. Use cleaning materials and procedures recommended by the concrete floor sealer manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

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

.3 Samples:

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

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site packaging materials at appropriate recycling facilities.

.2 Dispose of recyclable packaging material in appropriate on-site bin for recycling.

Part 2 Products

2.1 MATERIALS

.1 Tackboard (TB) - natural coloured cork tackboard:

.1 Single layer cork sheet 6 mm thick; natural color, on 6 mm particle board to CAN 3.188.1-M78, Grade R.

.2 Extruded aluminum trim No. 205, 1.5 mm wall thickness, mitered, clear anodized finish

.3 Concealed steel fastenings (1 coat CGSB 1-GP-81e baked primer) to toggle bolts. Do not fasten to wall with adhesive.

.4 Sizes: Height and Width varies as indicated on floor plans and interior elevations. Size 600mm x 1900mm required for AD632, quantity as indicated on the drawings.

.5 Acceptable manufacturer: Architectural School Products, Global, Claridge Products Inc., Martack Specialties Limited or approved alternates meeting or exceeding these specifications.

.2 White Board (WB) - “Vit-Rite: Rite on, Wipe off” model as manufactured by Architectural School Products, Mississauga.

.1 Wall mounted whiteboard; porcelain enameled 22 ga. steel on 11 mm fiberboard core on 28 ga. zinc coated steel back up sheet.

.2 Color: White. Flush trim No. 205, marker tray No. 212, 89 mm deep, minimum, Display Rail No. 200, KWIK Grip.

.3 Provide all hardware and fasteners suitable for secure recessed mounting.

.4 Size, as per drawings.

.5 White Board Music Lines: Provide black epoxy painted music lines on two whiteboards in each Music Rooms 132 & 136.

.6 Acceptable manufacturer: Architectural School Products, Global, Claridge Products Inc., Martack Specialties Limited or approved alternates meeting or exceeding these specifications.

.3 Sliding White Board (SWB): “Vit-Rite: Rite on, Wipe off” model as manufactured by Architectural School Products, Mississauga. With extruded aluminum, clean anodized finish; e.g. ASP Horizontal slide Series 20, as follows:

.1 Architectural school products Ltd. Horizontal Slider Series #20 aluminum framed as detailed on architectural drawings, aluminum to be 6063T5 alloy with clear etched and anodized 0.051mm (.002”) satin finish free from extruding draw marks and surface scratches.

.2 Head Section to be one continuous piece extrusion consisting of wall fastening member, integral maprail complete with cork insert and map hooks as previously specified, 1, 2 or 3 enclosed track sections as required. Preframed sliding Whiteboard/tackboard unit to be suspended from head section by providing two heavy duty 4 nylon wheeled assemblies per sliding unit. Whiteboard and tackboard utilized for back panels and/or sliding panels, as clearly indicated in architectural drawings to be as specified in section 2.2. and 2.3 hereof. Sliding tackboard panels shall be of warp resistant construction.

.3 Location: SMT Classroom 214, S.T.A. Centre 212.

.4 Acceptable manufacturer: Architectural School Products, Global, Claridge Products Inc., Martack Specialties Limited or approved alternates meeting or exceeding these specifications.

.4 WhiteBoards, Recessed (WB Recessed) - "Vitrite" model as Manufactured by Architectural School Products, Mississauga;

.1 Recessed wall mounted whiteboards; porcelain enameled 22 ga. steel on 11 mm fibreboard core on 28 ga. zinc coated steel back up sheet.

.2 Colour: White. Flush trim and flush marker tray No. 461.

.3 Provide all hardware and fasteners suitable for secure recessed mounting.

.4 Size as per drawings.

.5 Acceptable alternates: Global or Martack Specialties Limited.

.6 Quantity: 2; Location: Gymnasium 160

.5 Lockers, Single Tier: 305 (12”) wide x 380 (15”) deep x 1828 high. Fabricate from cold rolled steel, with galvanized bottom shelf (floor), min. 16 ga. framing unless noted; lockers will mount on 100 mm concrete base.

.1 Locations: Custodian Storage, ground & second floor corridors. Refer to drawings

.2 Double-walled honeycomb type doors with 16 ga. outer panel and 20 ga. inner panel

.3 Body and back not less than 24 gauge.

.4 Frame vertical members not less than 16 gauge. Bottom and cross members not less than 18 gauge steel.

.5 Continuous piano hinge, recessed extruded aluminum lock pocket, metal hasp with no moving part for padlock, individual number plate,

.6 Inside Equipment: 2 metal shelves (one near top and one near mid height), 2 hooks (one on side wall near top and one on side wall at underside of mid height shelf.)

.7 Sloping Tops: 16 ga. pre-finished steel; c/w clips and other attachment devices.

.8 Include jamb trims, min. 20 ga. gables and sloped tops.

.9 Shelves shall have rolled fronts and rear flanges. Provide 25 mm air space between shelf and back of locker for ventilation. Install shelves at height to be determined by Architect at shop drawing stage.

.10 Colours: Allow for 3 colours total to later selection by Architect. 2 colours shall be from manufacturers standard colour range and allow for 1 custom colour for 25% of total locker quantity shown on drawings.

.10 Lockers to be installed on a 100 mm concrete base.

.11 Barrier free lockers (BFL) - similar to standard locker, except: top shelf to be relocated at 355mm from locker's bottom and one hook to be lowered to 1100 above locker bottom.

.12 Acceptable products: providing they meet or exceed all details of this specification as manufactured by:

.1 Hadrian Manufacturing Inc

.2 ASI Storage Solutions as distributed by ASI Group Canada.

.3 Lincora Metal Inc.

.4 Shanahan Manufacturing Ltd

.5 North American Steel Equipment Co. Ltd

.6 Buddsteel Architectural Products Ltd

.7 General Storage Systems

.6 Lockers, Double Tier: 381 (15") wide x 380 (15") deep x 1828 high. Fabricate from cold rolled steel, with galvanized bottom shelf (floor), min. 16 ga. framing unless noted; lockers will mount on 100 mm concrete base.

.1 Double-walled honeycomb type doors with 16 ga. outer panel and 20 ga. inner panel,

.2 Continuous stainless piano hinge, recessed stainless steel handle, metal hasp for padlock, individual number plate, single shelf, 3 single hooks.

.3 Include jamb trims, min. 20 ga. gables and sloped tops.

.4 Colours: single colour frame and doors to later selection by Architect from manufacturers standard colour range.

.5 Acceptable alternates: as listed above.

.6 Quantity: 3 total; Locations: Instructors' Rooms.

.7 Safety Release Coat Hook:

.1 High strength polycarbonate coat hook with safety release weight under downward pressure to not exceed 12 kg (26 lbs.)

.2 Supply all suitable mounting hardware for a vandal proof, secure installation using stainless steel sleeve bolts on partition doors or panels. Do not supply standard Robertson or Phillips head screws.

.3 Colours: Allow for three (3) colours from Manufacturers standard line

.4 Acceptable Materials: "HenkelHook" as manufactured/distributed by Henkel Diversified Inc, London ON, tel (519) 641-5872.

.5 Alternate Acceptable product by "Frost" distributed by Architectural School Products.

.6 Locations:

.1 Coat hooks to be mounted in ALL barrier free washrooms and shall be safety release style and mounted on the side wall

.2 Kindergarten Cubbie Areas. Refer to AD architectural drawings for quantity and locations.

.3 Gym Change Rooms, below upper shelving.

.7 Samples: submit test data and samples for review as specified in Section 013330 – Submittal Procedures.

.8 Flagpole:

.1 Refer to Section 32 32 00 Site Furnishings.

.2 Quantity: 2; Location: refer to site drawings.

.9 Motorized Projector Screen:

.1 Supply and install stage automatic electric projector screen model 'Cosmopolitan Electrol' by Da-Lite 267cmx356cm+45cmED (105"x140"+18"ED), matte white, with extra drop at top min. 18". Electrically operated with low-voltage, wireless remote control.

.2 Quantity: 2 required at Stage. Refer to sections and drawing details. Screens to be surface mounted.

.3 Supply and install power to motorized screen.

.4 Shop Drawings: Submit shop drawings in accordance with Section 01300 Submittals.

.10 Coat rods, hooks and shelves**:**

.1 Student line Model STL 1001 as manufactured by ASI or Global School Products. Location: Corridors as indicated on drawings (coat rack & hooks) and location designated as 'CR' within Kindergarten Classroom cubbies area.

.2 Hook Strip HS 100 as manufactured by ASI or Global School Products. Location: Childcare Cubbies areas, quantities as noted on AD 641A & B.

.3 Student line Model STL 2001 as manufactured by ASI, Mississauga. Location: closets designated as CR&S.

.11 Projector Mounting Plate: Model "CMJ-455" by Peerless.

.1 Provide mounting system complete with universal adapter bracket suitable for mounting projector below level of suspended acoustic ceiling. Mounting Plate to be inlayed within ceiling grid and is fastened to underside of concrete or steel deck for using aircraft cable.

.2 Submit shop drawings at which time final locations will be determined.

.3 Contractor to coordinate power and wiring locations to brackets with Electrical Sections.

.4 Colour: white

.5 Quantity: 1 per Classroom, Staff Room, Special Education Room. Project locations noted on electrical drawings.

.12 Fire Safety Plan Lock Box: steel, surface mounted, prefinished white with text "Fire Safety Plan". Approx. 330mm x 330mm x 100mm (13″ x 13″ x 4″). Location: Vestibule 101.

.13 Dome Convex Security Mirror: mounted to the ceiling at room corner.

.1 Mirror face to be optical grade 100% virgin acrylic and vacuum metalized using 99% pure Aluminum.

.2 Size: 36" (18" dia. x 18" high).

.3 Location: 9 units; one Half Moon shape in each Kindergarten Classroom Cubbie Area and one Quarter Dome shape in Special Education ALE Room.

.14 Time Capsule**:**

.1 6" x 24" cylindrical stainless steel time capsule bundle SDSC model 08628sdsc by Future Packaging & Preservation, 1 800 786-6627 or www.futurepkg.com, or similar.

.2 Place inside Foyer display case.

.3 Provide time capsule stone per Section 42 21 13 Concrete and Clay Brik Unit Masonry Veneer, placed after installation of time capsule. Confirm wording of engraving and final location with consultant.

.15 Open Metal Shelving Units

Product: boltless, clipless system: North American Steel "Easy-Up 5000 Shelving", or equivalent system by other manufacturer approved by Consultant.

1. Height of bay: 2100 mm
2. Length of bay: 915 mm
3. Depth of bay: 600 mm.
4. Provide seven shelves in each unit, including top and bottom, at each by, unless otherwise indicated.
5. Uprights: 2 mm thick square tubular posts with slots at 25 mm o.c.
6. Shelves: full panel steel shelves with U-shaped front edge.
7. Beams: 2 mm thick, with double locking, V-type clip, 25 mm high.
8. Base plate: 2 mm thick, similar to beam, 40 mm high.
9. Foot plates: square steel, designed to clip onto posts.
10. Beam safety clips: designed to lock beam to post, easily removable.
11. Post caps: plastic.
12. Provide a total of 8 units

.17 Change Table with integrated stairs:

.1 Change table with integrated 'Toddler Walk-up' stairs, manufactured by Totmate.

.2 Maple finish, right-handed.

.3 Location & Quantity: Refer to drawings (Childcare area).

.18 Vinyl Wall Mural:

.1 4 mils (0.10mm) thick vinyl, matte finish.
.2 Class A Fire Resistant.
.3 Custom printed from digital file to be supplied by Architect.
.4 Adhered to wall as recommended by supplier.
.5 Quantity: 2 murals
.6 Size: Refer to drawings
.7 Locations: Refer to drawings 3/A19 and 9/A19.

.19 Vinyl Adhesive Decals (on Learning Commons Glazing at Student Forum 116):

.1 Self-adhering 4 mils (0.10mm) thick vinyl decals, luster finish.
.3 Wording to be confirmed prior to supply.
.4 Adhere to glazing as recommended by supplier.
.5 Quantity: 6 separate words
.6 Size: 250mm high x 1400mm wide.
.7 Locations: Refer to drawings 3/A19 and 8/A19.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 Install where indicated on drawings and as per manufacturer’s instructions.

3.3 DEMONSTRATION AND TRAINING

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training for operation, maintenance and repairs.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean surfaces after installation using manufacturer's recommended cleaning procedures.

.3 Clean aluminum with damp rag and approved non-abrasive cleaner.

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

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Section 01 33 00 - Submittal Procedures.

1.2 WORK INCLUDED

.1 Supply and install exterior signage as specified and listed. All signage may not be shown on the drawings.

.2 Supervision, inspection and checking of signage as installed on site.

1.3 REFERENCES

.1 All fire route signage to be fabricated in strict accordance with the signage standard of the Municipality where the site is located. All other exterior signage such as stop signs, one-way signs, do not enter signs, etc., shall be to M.O.T. standard.

.2 Aluminum Association, Inc. (AA)

.1 Designation System for Aluminum Finishes -[1997].

.3 American Society for Testing and Materials (ASTM)

.1 ASTM A653/A653M-[01a], Standard Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B32-[00], Standard Specification for Solder Metal.

.3 ASTM B456-[95], Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.81-[M90], Air Drying and Baking Alkyd Primer for Vehicles and Equipment.

.2 CAN/CGSB-1.88-[92], Gloss Alkyd Enamel, Air Drying and Baking.

.3 CGSB 31-GP-107Ma-[90], Non-Inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.

.4 CGSB 41-GP-6M-[1983], Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced. Reaffirmation of September 1976.

.5 Canadian Standards Association (CSA)

.1 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.2 CSAW47.2-[M1987(R1998)], Certification of Companies for Fusion Welding of Aluminum.

.3 CSA W59-[M1989(R2001)], Welded Steel Construction (Metal Arc Welding) (Imperial Version).

.4 CSA W59.2-[M1991(R1998)], Welded Aluminum Construction.

.6 Canadian Sheet Steel Building Institute (CSSBI)

.1 Sheet Steel Facts # 6, Metallic Coated Sheet Steel for Structural Building Products-[July 1995].

.7 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - [March 1998].

1.4 SHOP DRAWINGS

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

1.5 SAMPLES

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

1.6 QUALITY ASSURANCE

.1 Welding Certification in accordance with CSA W47.2.

1.7 SIGNAGE LIST

.1 A full Signage list is included with this document for the Tender of Signage.

1.8 GUARANTEE

.1 Submit a written Guarantee to the Board, that all work of this Tender shall be free from defects in workmanship and materials for a minimum period of one (1) year from date of approved completion.

.2 All defects (excluding vandalism) in materials and workmanship that become apparent during the Guarantee period shall be made good or material replaced at no cost to the Board.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site bins] for recycling.

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

.4 Divert unused [metal] [and] [wiring] materials from landfill to metal recycling facility as approved by Consultant.

.5 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Consultant.

.6 Fold up metal banding, flatten and place in designated area for recycling.

.7 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Aluminum extrusions: to designation AA 6063-T5 and AA 6006-T5.

.2 Sheet aluminum: anodizing quality.

.3 Prefinished sheet steel: conforming to CSSBI - Sheet Steel Facts #6: for normal environment: in colours selected from manufacturer's standard range.

.4 Galvanized steel sheet to ASTM A653/A653M: Commercial Quality.

.5 Welding materials: to CSA W59.

.6 Solder: to ASTM B32, Type [Sn50].

.7 Self-stick foam tape: 2.4 mm thick, [352.4] Kg/m^3 density polyurethane open-cell foam tape for sign purposes, with synthetic self-stick adhesive on both sides. Width: to suit sign sizes.

.8 Acrylic top-coat: clear, non-yellowing, exterior grade, satin finish, acrylic polyester resin protective coating, compatible with metal surface of type recommended by sheet manufacturer.

.9 Bituminous paint: to MPI [EXT 5.4D].

.10 Mounting Hardware:

.1 Furnish all signage with the necessary screws, bolts, and other fasteners of suitable size and type, to anchor signage into position for long life under hard use.

.2 Exterior Fire route and School signs shall be permanently mounted on a strong flanged hot dipped rolled high tensile galvanized steel U-Channel posts. Theses posts are to have 10mm (3/8”) dia. Holes spaced 25mm (1”) on centre for easy sign mounting. Signs to be mounted to flanged side of post. All exterior signs are to come completed with galvanized steel mounting hardware, necessary to properly mount sign for exterior use. Fire route sign FR-6 when required is to be installed at a 45 degree angle in relation to the edge of the traveled portion of the designated fire route facing approaching traffic. Fire route signs FR-7 and FR-8 when required are to be installed at a 90 degree angle in relation to the edge of the traveled portion of the designated fire route, in such manner as to allow both sign faces to be visible to traffic, or as listed otherwise. Fire route sign FR-9 when required is to be installed at a 90-degree angle to the edge of the traveled portion of the designated fire route. Not withstanding what is stated here in 2.1.2, all signage must comply with the latest by-laws in the Municipalities applicable to the work.

.11 School Name and Address:

.1 Cast aluminum, Duracron finish, Gotham Bold font.
.2 Letters: for school name line 1: Upper case, 300 mm high x 13 mm return
.3 Letters: for school name line 2: Upper case, 200 mm high x 10 mm return.
.4 Letters for address: Upper case, 150 mm high x 10 mm return.
.5 Wording as shown on elevation drawing: school name to be confirmed prior to ordering.

.12 School Board Panel Sign:

.1 950mm high x 2438 wide satin aluminum panel sign.
.2 Black vinyl or silkscreen graphic of school board logo.
.3 To be mounted using welded boses and stainless steel studs and spaced a minimum of 6mm from face of exterior wall.

.13 U-Posts:

.1 Hot dipped rolled light temple galvanized steel
.2 Type: Flanged, 10 mm 0 holes @ 25 mm.o.c.
.3 Height: 3658 mm overall

.14 Free Standing Posts:

.1 Material: 25 mm x 25 mm galvanized steel hollow sections, primed + 2 coats exterior grade enamel
.2 Base: 100lb weight concrete base.
.3 Modified height: bottom of base to top of port: 15 25 mm

.15 Exterior Traffic Signs:

.1 Material: Aluminum
.2 Letters: Refer to style detail
.3 Mounting height: 2.0 to bottom of sign

2.2 SIGNAGE LIST

.1 All styles, quantities and location to be confirmed prior to ordering. Refer to site plans for quantity and locations.

.2 “Stop” Signs:

.1 600 m x 600 m, red background, white lettering, white border.
.2 Quantity: refer to drawings.

.3 “Do Not Enter” Signs:

.1 600mm x 600mm, background, red circle, white bar, black border and lettering
.2 Quantity: refer to drawings.

.4 "One Way" Signs:

.1 Quantity: refer to drawings.

.5 "No Left Turn" Sign:

.1 600 mm x 600 mm

.2 Quantity: refer to drawings

.6 "Barrier-Free Parking" Signs:

.1 300 mm x 635mm white background, black border and letters, blue handicapped symbols and border, red circle and diagonal bar

.2 Quantity: refer to drawings

.3 Mounted on U-posts.

.7 "Visitor Parking" Signs:

.1 Quantity: refer to drawings

.8 "No Stopping" Signs:

.1 300mm x460 mm white background, black border and lettering, black arrow

.2 3 required (1 arrow left, 1 arrow left/right, 1 arrow right)

.3 3 mounted on freestanding posts adjacent to bus lane

.9 "Fire Department Connection" Signs:

.1 300mm x 450 mm, red background, white letters and borders

.2 1 required

.3 Mount on building at Fire Department Connection

.10 "Fire Route" Signs:

.1 As per Municipal standards

.2 12 required (or as required by Fire Department)

.3 Mounted on U-posts in asphalt and concrete sidewalk.

.11 "Student Drop Off" Signs (Kiss 'N' Ride):

.1 300 mm x 460 mm

.2 Quantity: refer to drawings

.3 Mounted on U-posts in asphalt.

Part 3 Execution

3.1 INSTALLATION

.1 Erect and secure signs plumb and level at elevations as indicated.

.2 Comply with sign manufacturer's installation instructions and approved shop drawings.

.3 Mechanical attachment:

.1 To concrete or solid masonry use lag screws and expansion bolts or screws and fibre plugs, as appropriate for stresses involved.

.2 To hollow masonry use toggle bolts or equivalent.

.3 To steel use bolts with nut and lock washers, self-tapping screws.

.1 Do [steel welding to CSA W59] [and] [aluminum welding to CSA W59.2]. Finish exposed welds flush and smooth.

.4 To wood use screws.

.5 Secure into framing members behind stud walls or above ceilings.

.6 Mechanical fasteners on exterior to be non-staining, non-ferrous type.

.7 Fabricate special fasteners as required for installation conditions.

.8 Mechanical fasteners and methods of attachment subject to Engineer's approval. Obtain Engineer's approval before fixing to structural steel.

.4 Adhesive attachment:

.1 Use self-stick adhesive foam tape to manufacturer's instructions to adequately fix sign and prevent "rocking". Keep tape maximum 1.6mm from edges.

3.2 CLEANING

.1 Leave signs clean. Remove debris from interior of sign boxes.

.2 Touch up any damaged finishes.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 05 50 00 - Metal Fabrications.

.3 Section 10 28 10 - Toilet And Bath Accessories.

.4 Section 03 41 00 – Plant- Precast Structural Concrete.

1.2 REFERENCES

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

.1 ASTM A167-[99], Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A240/A240M-[02], Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.3 ASTM A480/A480M-[03], Specification for General Requirements for Flat-Rolled Stainless and Heat Resisting Steel Plate, Sheet, and Strip.

.4 ASTM A653/A653M-[02a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.81-[M90], Air Drying and Baking Alkyd Primer for Vehicles and Equipment.

.2 CAN/CGSB-1.88-[92], Gloss Alkyd Enamel Air Drying and Baking.

.3 CAN/CGSB-1.104M-[91], Semigloss Alkyd, Air Drying and Baking Enamel.

.3 Canadian Standards Association (CSA International).

.1 CAN/CSA-B651-[95(R2001)], Barrier-Free Design.

1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures].

.2 Shop Drawings:

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

.2 Indicate fabrication details, plans, elevations, hardware, and installation details.

.3 Samples:

.1 Submit samples of finish hardware and phenolic plastic in selected colour and finish in accordance with Section 01 33 00 - Submittal Procedures, for approval of Consultant.

.2 Submit duplicate representative samples of hardware items, including brackets, fastenings and trim.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, corrugated cardboard packaging material in appropriate on-site bins for recycling.

Part 2 Products

2.1 MATERIALS

.1 Metal toilet partitions.

.2 Metal Partitions: Metal, floor anchored and head rail braced. Two (2) colours will be chosen by the Consultant from manufacturers' full range of baked enamel. Locations: Staff Washrooms.

2.2 MATERIAL DESCRIPTION

.1 Metal Partitions: floor mounted and head rail braced. Fabricated with:

.1 25 mm thick doors and partitions of 20 ga. cold rolled steel cemented on 22 mm sound deadening fibre core, and complete with hardware and fittings.

.2 Pilasters to be min, 32 mm thick.

.3 pilasters to have 32 mm core and integral leveling device concealed by 100 mm high stainless steel shoe.

.4 all hardware to be chrome plated over non-ferrous metal.

.5 hinges to be Model 7700 fully enclosed gravity action, ball-bearing type; adjustable for inswinging as outswinging doors as per plans.

.6 pulls on outside of handicapped doors

.7 all doors to have rubber tipped bumper and slide bar latch, combination door stop and keeper, all attached with chrome plated brass sleeve bolts with theft proof heads.

.8 rubber tipped die cast chrome plated coat hooks to be provided on inside of doors.

.9 provide stops on top and bottom of all doors

.10 Finish painting to be 2 coats of acid resistant baked enamel on all tubular and sheet steel.

.11 Acceptable Materials: meeting these specifications as manufactured by Hadrian Manufacturing Inc., Burlington of Canada Ltd.

.12 Acceptable alternates: meeting these exact specifications as manufactured by G.S.W Ltd. or Shanahan's Ltd. and distributed by W.G. Wood Sales Ltd., ASI

Global Partitions and Metpar or others meeting or exceeding these exact specifications if reviewed and approved by the Consultant during the tender period.

.2 Safety Release Coat Hooks:

.1 Refer to Manufactured Specialties section 10 11 25 for information.

2.3 FABRICATION

.1 Fabricate pilasters and stiles minimum 25 mm thick, and panels and doors minimum 25 mm thick, of materials as specified.

.2 Supply steel floor inserts and locations to Contractor for placing prior pouring of floor slab.

.3 Provide pilasters with 2.9 mm, stainless steel leveling bar, rod and anchor concealed by one-piece 102 mm high stainless steel.

.4 Include panel brackets, hinges, door stops, latches, safety release coat hooks for metal partitions, fastening devices, bumpers, and pull on the outside of doors to handicapped accessible compartments.

.5 Coat hooks to be mounted in ALL barrier free washrooms and shall be safety release style and mounted on the side wall.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

.1 Install compartments in accordance with reviewed shop drawings and in a neat, rigid manner free of defects.

.2 Provide anchors, inserts and fixings necessary for attachment of supports. Supply steel floor inserts and locations to Contractor for placing prior pouring of floor slab. Elsewhere, drill supports as required to receive attachment of compartments.

.3 Install units secure, accurately positioned, plumb, level, square and free from sag and distortion. Provide 3 brackets per partition.

.4 Perform drilling of steel, masonry and concrete necessary to install this work.

.5 Ensure spaces between panels and pilasters, between panels and walls and between pilasters and walls are of uniform consistent width and sized to ensure it is not possible to see persons using the compartments.

.6 Coordinate installation with the work of trades providing ceilings, wall and floor finishes, shower accessories and other adjacent components and construction.

.7 Use stainless steel anchors and fasteners; ferrous metals are not acceptable.

.8 Provide for adjustment of ceiling variations with screw jack through steel saddles made integral with pilaster. Conceal fixings with stainless steel shoes.

.9 Do work in accordance with CAN/CSA-B651.

3.3 ADJUSTMENT

.1 Upon completion of the work or when directed, remove all traces of protective coating or paper.

.2 Clean exposed surfaces and fittings.

.3 Test safety release Coat Hooks, hinges, locks and hatches and where necessary, adjust and lubricate. Set hinges so that doors stand open maximum 30 degrees when compartment is not in use. Ensure that partitions are in working order.

.4 Lubricate hardware and other moving parts.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean surfaces after installation using manufacturer's recommended cleaning procedures.

.3 Clean aluminum with damp rag and approved non-abrasive cleaner.

.4 Clean and polish hardware and stainless components.

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 05 50 00 - Metal Fabrications: Suspended channel support for ceiling hung partitions.

.3 Section 10 28 10 - Toilet And Bath Accessories.

.4 Section 03 41 00 – Plant- Precast Structural Concrete.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A167-[99], Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-B651-[95(R2001)], Barrier-Free Design.

1.3 SHOP DRAWINGS

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

.2 Indicate fabrication details, plans, elevations, hardware, and installation details.

1.4 SAMPLES

.1 Submit samples of finish hardware and phenolic plastic in selected colour and finish in accordance with Section 01 33 00 - Submittal Procedures, for approval of Consultant.

1.5 STORAGE AND PROTECTION

.1 Protect finished laminated plastic surfaces during shipment and installation. Do not remove until immediately prior to final inspection.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site bins] for recycling.

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

.4 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

.5 Unused sealant and adhesive material must be disposed of at an official hazardous material collections site as approved by Consultant.

.6 Fold up metal banding, flatten and place in designated area for recycling.

.7 Do not dispose of unused sealant and adhesive material into sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Laminated plastic toilet partitions.

.2 Plastic Laminate Faced Partitions: high pressure laminate matte finish surface on high density particle board, floor anchored and head braced. Two (2) colours will be chosen by the Consultant from laminate manufacturer's standard selection. Locations: Washrooms; refer to drawings.

.3 Laminated plastic adhesive: to CAN/CGSB-71.20.

.4 Sealer: water resistant sealer or glue as recommended by laminate manufacturer.

2.2 COMPONENTS

.1 Safety Release Coat hook:

- .1 High strength polycarbonate coat hook with safety release weight under downward pressure to not exceed 12 kg (26 lbs.)
- .2 Supply all suitable mounting hardware for a vandal proof, secure installation using stainless steel sleeve bolts on partition doors or panels. Do not supply standard Robertson or Phillips head screws.
- .3 Colours: 2 premium colours from manufacturer’s complete range.
- .4 Acceptable Materials: “HenkelHook” as manufactured/distributed by Henkel Diversified Inc, London ON, tel (519) 641-5872.
- .5 Alternate Acceptable product by “Frost” distributed by Architectural School Products.
- .6 Locations: in all barrier free washroom locations as noted in article 2.4 below.
- .7 Samples: submit test data and samples for review as specified in Section 013330 – Submittal Procedures.

.2 Door pull: Barrier-free type suited for outswinging doors stainless steel.

2.3 MATERIAL DESCRIPTION

.1 Laminate Faced Partitions: floor mounted and head rail braced. Fabricated with:

- .1 1.6 mm high pressure laminate facings and edging on 45 lb. density resin impregnated high density fibreboard, and complete with stainless steel hardware and fittings.
- .2 Doors, pilasters and partitions to be min, 25 mm thick.

.3 headrails to be 24 x 41 anodized aluminum anti-grip type with sloped top configured and installed to prevent swinging or concealment of small items.

.4 pilasters to have 3.2 mm core and integral leveling device concealed by 100 mm high stainless steel shoe.

.5 all hardware to be stainless steel; fully enclosed gravity action, ball-bearing hinges; 3 hinges per door; adjustable for inswinging as outswinging doors as per plans.

.6 pulls on outside of handicapped doors

.7 all doors to have rubber tipped bumper and slide bar latch, combination door stop and keeper, all attached with stainless steel sleeve bolts with theft proof heads.

.8 no coat hooks to be provided.

.9 provide stops on top and bottom of all doors

.10 All partitions to be anchored to wall by means of stainless steel channel bracket for full height of partition.

.11 Acceptable Manufacturers: Model 1042 series by Bobrick Washroom Equipment of Canada Ltd.; Series 130GP by ASI Global Partitions; Series 3 style 2 by Twin-Cee, Metpar or products meeting these exact specifications by Ampco Products Ltd., Shanahan's Ltd., Bradley and others meeting or exceeding these exact specifications if reviewed and approved by the Consultant during the tender period.

2.4 FABRICATION

.1 Fabricate pilasters and stiles minimum 25 mm thick, and panels and doors minimum 25 mm thick, of materials as specified.

.2 Supply steel floor inserts and locations to Contractor for placing prior pouring of floor slab.

.3 Provide pilasters with 2.9 mm, stainless steel leveling bar, rod and anchor concealed by one-piece 102 mm high stainless steel.

.4 Include panel brackets, hinges, door stops, latches, safety release coat hooks for metal partitions, fastening devices, bumpers, and pull on the outside of doors to handicapped accessible compartments.

.5 Coat hooks to be mounted in ALL barrier free washrooms and shall be safety release style and mounted on the side wall.

Part 3 Execution

3.1 INSTALLATION

.1 Install compartments in accordance with reviewed shop drawings and in a neat, rigid manner free of defects.

.2 Provide anchors, inserts and fixings necessary for attachment of supports. Supply steel floor inserts and locations to Contractor for placing prior pouring of floor slab. Elsewhere, drill supports as required to receive attachment of compartments.

.3 Install units secure, accurately positioned, plumb, level, square and free from sag and distortion. Provide 3 brackets per partition.

.4 Perform drilling of steel, masonry and concrete necessary to install this work.

.5 Ensure spaces between panels and pilasters, between panels and walls and between pilasters and walls are of uniform consistent width and sized to ensure it is not possible to see persons using the compartments.

.6 Coordinate installation with the work of trades providing ceilings, wall and floor finishes, shower accessories and other adjacent components and construction.

.7 Use stainless steel anchors and fasteners; ferrous metals are not acceptable.

.8 Provide for adjustment of ceiling variations with screw jack through steel saddles made integral with pilaster. Conceal fixings with stainless steel shoes.

.9 Do work in accordance with CAN/CSA-B651.

3.2 ADJUSTMENT

.1 Upon completion of the work or when directed, remove all traces of protective coating or paper.

.2 Clean exposed surfaces and fittings.

.3 Test safety release Coat Hooks, hinges, locks and hatches and where necessary, adjust and lubricate. Set hinges so that doors stand open maximum 30 degrees when compartment is not in use. Ensure that partitions are in working order.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 05 50 00 – Metal Fabrications.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM E90-[99], Standard Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions and Elements.

.2 ASTM E336-[97], Standard Test Method for Measurement of Airborne Sound Insulation in Buildings.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-11.3-[M87], Hardboard.

.3 Canadian Standards Association (CSA)

.1 CSA O115-[M1982(R2001)], Hardwood and Decorative Plywood.

.2 CSA O151-[M1978(R1998)], Canadian Softwood Plywood.

.4 Underwriters Laboratories' of Canada (ULC)

.1 CAN/ULC-S102-[1998R2000], Surface Burning Characteristics of Building Materials and Assemblies.

1.3 DESIGN REQUIREMENTS

.1 Use carpet finish for covering with maximum

.1 flame spread -[25];

.2 fuel contributed -[35];

.3 smoke developed -[50]; when tested to CAN/ULC-S102.

1.4 WELDING

.1 Welding of structural components shall be done only by fabricators certified by CSA Welding Qualification Codes, CSA W47 or W55.3 as applicable, for welding of steel, and who shall perform welding to meet specified requirements of CSA W55.2 or W59.1, as may apply.

.2 Weld all connections where possible, and bolt where not possible. Provide method to prevent loosening of nuts. Ream holes drilled for fastenings. Make welded joints tight, flush, and in true planes with base metals. Make welds continuous at joints. Grind welds in exposed locations smooth in a manner that will not leave blemishes on exposed surfaces. Join members generally by inert metal arc welding where practicable, using materials recommended by manufacturers of metals being welded. Remove flux completely following welding, and grind and polish joints smooth and clean.

1.5 SHOP DRAWINGS

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

1.6 SAMPLES

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

1.7 MAINTENANCE DATA AND OPERATING INSTRUCTIONS

.1 Provide maintenance and operating instructions for incorporation into maintenance manual in accordance with Section 01 33 30- Submittal Procedures.

1.8 TEST DATA

.1 Submit test reports to the Consultant from ULC confirming that carpet and vinyl fabric conforms to these Specifications.

.2 Submit tests to confirm STC ratings based on ASTM E90-04.

.3 Submit test reports from an independent laboratory confirming that the partition meets the flame spread and STC ratings specified.

.4 Submit test data indicating compliance with design criteria regarding sound transmission and fire hazard classification.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate on-site bins] for recycling.

.3 Divert unused [wood] [and] materials from landfill to recycling facility as approved by Consultant.

.4 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 DESIGN CRITERIA

.1 Use finish for partition covering with maximum flame spread 25; fuel contributed 35; smoke developed 50; when tested to ASTM E84-81a.

.2 Specifications in this Section are based upon products and systems as manufactured by Modernfold. It is understood that certain aspects of partition systems by other manufacturers are slightly different than those specified. The Consultant will make some allowances for differing designs when reviewing shop drawings but will insist that the overall system present features and performance which are at least equal to those specified.

2.2 DESCRIPTION OF PARTITIONS

.1 Stage/Gymnasium Partition:

.1 Location: Gym 160 - One required.

.2 Type: Modernfold 931 - STC 50 or approved equivalent by Moderco, Hufcor or C.S.I. Sales and Manufacturing, Aluflex and Moduflex by Panelfold.

.3 Features: Manually operated, single panels, acoustically rated system. Panel facing shall be roll formed steel welded to panel frame. Integral whiteboards and recessed marker tray on stage side of partition on all panels, head and floor retractable seals; end panel modified; end panel modified to suit end wall condition. Carpet finish both sides, colour selection by Consultant from full range.

.4 Opening Size: Refer to floor plan and confirm on site.

2.3 MATERIALS

.1 General: Metals shall be free from defects which impair strength or durability, or which are visible. Metals shall be new, of best quality, and free from rust, or waves, or buckles, clean, straight, and with sharply defined profiles.

.2 Metals:

.1 Steel: Structural: hot rolled to meet requirements of CAN3-G40.21, Grade 50W for tubes and Grade 44W for flat shapes. Sheet: cold-rolled furniture steel, double annealed, mill stretched and levelled, and fully pickled. Otherwise, steel shall be hot-rolled or cold-rolled of alloy to suit needs of fabrication, use, and appearance.

.3 Carpet: Acoustical, non-woven needle punch carpet, with fused fibers to prevent unravelling or fray of material.

.4 Provide min. 100mm high stainless steel kickplates on stage side of all panels.

2.4 COMPONENTS

.1 Overhead suspension system.

.1 Track: manufacturer's standard cold rolled steel channel housing designed to support partitions.

.1 Equip track with brackets for hanger attachment.

.2 Provide threaded steel rods and nuts type hangers and stabilizers.

.2 Trolley: nylon wheels with ball bearings, equipped with thrust bearing and steel pendant bolt at each wheel assembly for height adjustment.

.2 Hardware.

.1 Equip partition with manufacturer's standard hardware. Hardware finish selected from manufacturer's [standard] [special] finishes.

.3 Sound seals.

.1 Provide sound seals to manufacturer's standard.

.2 Use head and floor retractable compression type floor and head seals.

.3 Design retractable seals to secure panel in position.

.4 Use manufacturer's standard astragal inserts for jamb and panel joint seal. Finish in Satin Black.

2.5 ACCESSORIES

.1 Provide manufacturer's standard closure panel, with lever operator.

Part 3 Execution

3.1 INSTALLATION

.1 Secure and level track.

.2 Install folding partitions in accordance with manufacturer's printed instructions.

.3 Touch up damaged finishes, repair damage to partitions to match original finish.

.4 Clean folding partition system and protect from damage.

.5 Adjust and leave partitions in smooth operating condition.

3.2 SITE TESTS

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training for operation, maintenance and repairs.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 10 21 14 – Metal Toilet Compartments.

.3 Section 102810 – Plastic Toilet Compartments.

.4 Section 08 80 50 - Glazing: Mirrors.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A167-[99], Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM B456-[95], Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 ASTM A653/A653M-[99], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM A924/A924M-[99], Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.81-[M90], Air Drying and Baking Alkyd Primer for Vehicles and Equipment.

.2 CAN/CGSB-1.88-[92], Gloss Alkyd Enamel, Air Drying and Baking.

.3 CAN/CGSB-12.5-[M86], Mirrors, Silvered.

.4 CGSB 31-GP-107Ma-[90], Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-B651-[95], Barrier-Free Design.

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

1.3 SHOP DRAWINGS

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

.2 Shop drawings of units for use by the handicapped shall be distinctly marked and cross-referenced to the corresponding article in the specifications.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

Part 2 Products

2.1 MATERIALS

.1 Ferrous Steel: Sheet, cold-rolled furniture steel, double annealed, mill stretched and leveled, and fully pickled. Otherwise, steel shall be hot-rolled or cold-rolled of alloy to suit needs of fabrication, use, and appearance.

.2 Galvanized Steel: For sheet, Z275 zinc coating designation in accordance with ASTM Specification A525. For irregular sections, hot dip galvanized to comply with CSA G164.

.3 Stainless steel sheet metal: to ASTM A167, Type 304, with No. 4 finish.

.4 Anchors and Fastenings: Where exposed, use stainless steel and otherwise to match metal anchored. Where non-exposed, use the same as that specified for exposed, or use galvanized steel. Anchors and fastenings shall be of the type appropriate for the substrate to which accessory unit is secured.

2.2 COMPONENTS

.1 Towel Bars (TWB): Model B530 (peened finish) by Bobrick or ASI 3800-Series by ASI Group Canada:

.1 16 ga., 32 mm O.D. by 750 mm long with concealed mounting hardware.
.2 Install at 1000 mm above finish floor level.
.3 Quantity: 1
.4 Location: in 123 Orthopedic Washroom adjacent shower stall.
.5 Acceptable Alternatives: Watrous

.2 Folding Shower Seats (FSS): Model B5181 by Bobrick or F974-P by Frost or ASI 8206 by ASI Group Canada:

.1 One in the handicapped shower stall, with s.s. retaining clips.
.2 Quantity: 1
.3 Location: in 123 Orthopedic Washroom shower stall.

.3 Handicapped Grab Bars (GB & GBL): Model 1001-24”, 1001-36” and 1003-30”x30” by Frost or ASI 3801-24P, ASI 3801-36P, and ASI 3807-4P by ASI Group Canada or alternates by Bobrick:

.1 Two (2) bars per water closet stall: one 600 mm long bar behind water closet and one 750 mm x 750 mm L shaped grab bar beside water closet mounted as per O.B.C. requirements.
.2 One in each shower stall: model FP (peened finish) 900 mm long L shaped grab bar, mounted as per O.B.C. requirements. Refer to interior elevation drawings.
.3 all bars to have concealed mounting hardware
.4 Quantity: refer to drawings.
.5 all bars to withstand horizontal and vertical pull of 2.2 kN

.4 Handicapped Grab Bars - Flip-Up (GBF):

.1 18 gauge stainless steel, 38 mm diameter, 800 mm long flip-up grab bar with white wall mounting bracket, automatic locking system.

.2 Model: Bradley 8370-108 (with toilet paper holder) and Bradley 8370-107 (without toilet paper holder).

.3 Quantity: 2 - one with toilet paper holder and one without.

.4 Location: Orthopedic Washroom.

.5 Hand Dryers (HD): refer to Electrical specifications.

.6 Purse/Convenience Shelves (CS): Model B298x18 by Bobrick or Frost F-950-18 or ASI 0692-818 by ASI Group Canada:

.1 Quantity: 3

.2 Location: Washrooms: Health 106, Orthopedic 123, Barrier-Free 219.

.7 Shower Rod and Curtain (SR+C):

.1 Rod: No. B6047 extra heavy duty, by Bobrick or Frost F-1145-S or ASI 1204 by ASI Group Canada, 18 gauge stainless steel. Include vertical post to support corner of shower rod hanging from ceiling.

.2 Curtain: 8 gauge vinyl fabric No. B204-3 (1780mm width) B204-1 shower curtain hook by Bobrick or ASI 1200-V and 1200-SHU by ASI Group Canada; 1830 mm high, 300 mm wider than opening.

.3 Location: Orthopedic Washroom.

.8 Privacy Curtain Track including Curtain (PCT):

.1 Quantity: 3. Two (2) in Orthopedic Washroom 123 and one (1) in Health Room 107.

.2 Model 2001 hospital cubical curtain with track and accessories distributed by Quality Cubical Curtain, 403-484-3052

.3 Confirm final positioning in room with Consultant.

.9 Paper Towel Dispensers (PTD): Model B2860 by Bobrick or Frost Model 109-605 or ASI 8523A by ASI Group Canada:

.1 Quantity & Location: refer to drawings

.2 Confirm final positioning in room with Consultant.

.10 Sanitary Napkin Disposal (SN): Model Bobrick B-254 or Frost F-622 or ASI 0473-1A by ASI Group Canada:

.1 Quantity & Location: Washrooms: Refer to drawings

.11 Sanitary Napkin and Tampon Dispenser Recessed (SND)

.1 Quantity: 9

.2 Location: Washrooms 106, 123, 163, 173, 174, 219, 239, 242, 243.

.3 Bobrick B-3500x2 or Frost F-615-5-25

.12 Toilet Tissue Dispenser (TD): Model Frost F-159

.1 Quantity: 1 per toilet fixture.

.13 Mirrors:

.1 Fixed Mirrors (designation Type M):

.1 Best quality, 6 mm thick float glass, with concealed tamperproof clip fasteners.

.2 24 ga., Type 302 or 304 No 4 finish stainless steel frames on all edges and galvanized iron backing with concealed mounts.

.3 Sizes: each unit 457 mm x 610 mm.

.4 Locations: as shown on Drawings.

.5 Acceptable Materials: Frost 'Stock series' model 941TG Tempered Glass; 18" x 24" each.

.6 Acceptable alternate: Model 5440 by Twin Cee; or "Tamperproof" model by Pilkington Ford or ASI 0620 by ASI Group Canada.

.2 Fixed Mirrors (designation Type ML):

.1 Best quality, 6 mm thick float glass complete with concealed, tamperproof clip fasteners

.2 24 ga., Type 302 or 304 No 4 finish stainless steel frames on all edges and galvanized iron backing with concealed mounts.

.3 Sizes: each unit 610 mm x 1520 mm.

.4 Locations: as shown on Drawings.

.5 Acceptable Materials: Bobrick Model B-290 2460; 24" x 60" each.

.6 Acceptable alternate: equivalent size and details by Bobrick or Twin Cee or ASI 0600 by ASI Group Canada.

.3 Handicapped Mirrors (designation Type TM):

.1 Tilt mirror

.2 Acceptable Materials: Frost 'Stock series' model 941FG Tempered Glass; Bobrick 290 series or Frost F974FT series or ASI 0535 by ASI Group Canada.

.3 18" x 24" each.

.4 Locations: as shown on drawings.

.5 Frames: Type 302 or 304 No. 4 finish stainless steel.

.6 Mirror Cushioning: PVC pressure-sensitive foamed tape, 6 mm thick with adhesive on one side.

.14 Soap Dispensers (SD): Supplied and installed by Owner.

.15 Soap Dispensers (Recessed): Model B-4063 by Bobrick or ASI 9326 by ASI Group Canada.

.1 Quantity & Location: 1 located in Orthopedic Washroom 123 shower stall.

.16 Acceptable Alternates to those items 2.2.1 – 2.2.15 listed above as manufactured by Bradley Corp. & Supplied by Wentworth Assoc. Ltd 905 627-7070 or Frost Products Ltd. meeting or exceeding these specifications.

2.3 FABRICATION

.1 Construction**:** Fabricate with materials, component sizes, metal gauges, reinforcing, anchors and fasteners of adequate strength to withstand intended use.

.2 Where specified as frameless, provide stainless steel accessories with one-piece fronts having 90 degree formed returns at their edges and openings.

.3 Where accessory fronts are framed, frame edges, both inside and outside, with 90 degree formed returns continuously welded and ground smooth at the corners. Doors shall also have 90 degree formed returns as specified.

.4 Unless otherwise specified, hinges shall be semi-concealed stainless steel piano hinges extending full-length of hinged element. Provide hinged elements with concealed, mechanically-retained rubber bumpers for silent closing, and shall close flush with faces of fronts or frames.

.5 Ensure that work will remain free of warping, buckling, opening of joints and seams, distortion and permanent deformation.

.6 No exposed fixings permitted. Cut edges and openings square and smooth. Chamfer corners of edges and cut-outs 1.6 mm.

.7 Assembly: Accurately cut, machine and fit joints, corners, copes and mitres so that junctions between components fit together tightly and in true planes.

.8 Fasten work with concealed methods, unless otherwise indicated on Drawings.

.9 Weld all connections where possible, bolt where not possible and cut off bolts flush with nuts. Countersunk bolt heads, and provide method to prevent loosening of nuts. Ream holes drilled for fastening.

.10 Welded joints shall be tight, flush, and in true planes with base metals. Make welds continuous at joints where entry of water into voids of members or assemblies is possible.

.11 Provide for differential movements within assemblies and at junctions of assemblies with surrounding work.

.12 Welds in exposed locations shall be ground and polished smooth.

.13 Finish Work**:** Provide holes and connections for related work installed under other Sections of this specification, if applicable.

.14 Cleanly and smoothly finish exposed edges of materials, including holes.

Part 3 Execution

3.1 INSPECTION OF SECTION

.1 Take site measurements to ensure that work is fabricated to fit surrounding construction around obstructions and projects in place, or as shown on drawings, and to suit service locations.

3.2 INSTALLATION

.1 Install all accessories in accordance with manufacturers' instructions at their recommended mounting heights unless noted otherwise on drawings.

.2 Securely fasten accessories plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding work. Install in locations shown and specified herein. Mounting heights as shown or in accordance with the OBC in the case of barrier-free accessories.

.3 Work shall include anchor bolts, bolts, washers and nuts, lag screws, expansion shields, toggles, straps, sleeve brackets, clips, and other items necessary for secure installation, as required by loading and by Jurisdictional Authorities.

.4 Attach work at wood by screws through countersunk holes in metal.

.5 Attach work to masonry with lead plugs and non-corrosive fastenings, to support load with a safety factor of 3. Perform all drilling necessary to install the work.

.6 Insulate between dissimilar metals or between metals and masonry or concrete with bituminous paint, to prevent electrolysis.

.7 Coordinate installation with the work of other trades adjacent to accessories to achieve the reveals or other edge conditions shown, where their front faces are flush with the finished wall surfaces.

.8 Owner to supply and install remainder of washroom accessories not specified here (toilet paper dispensers, etc.). Cooperate with Owner as required.

3.3 CLEANING UP AND ADJUSTMENT

.1 Upon completion of work, or when directed, remove all traces of protective coatings or paper.

.2 Test mechanisms, hinges, locks and latches, and where necessary, adjust and lubricate and ensure that accessories are in perfect working order.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Section 01 33 00 - Submittal Procedures.

1.2 WORK INCLUDED

.1 The supply and install of the electronic reader board is to be supplied and installed in the base bid contract. Refer to site and AD drawings AD2001A – AD2001C in Binder C.

.2 Supervision, inspection and checking of signage as installed on site.

1.3 REFERENCES

.1 Aluminum Association, Inc. (AA)

.1 Designation System for Aluminum Finishes -[1997].

.2 American Society for Testing and Materials (ASTM)

.1 ASTM A653/A653M-[01a], Standard Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B32-[00], Standard Specification for Solder Metal.

.3 ASTM B456-[95], Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.81-[M90], Air Drying and Baking Alkyd Primer for Vehicles and Equipment.

.2 CAN/CGSB-1.88-[92], Gloss Alkyd Enamel, Air Drying and Baking.

.3 CGSB 31-GP-107Ma-[90], Non-Inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.

.4 CGSB 41-GP-6M-[1983], Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced. Reaffirmation of September 1976.

.4 Canadian Standards Association (CSA)

.1 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.2 CSAW47.2-[M1987(R1998)], Certification of Companies for Fusion Welding of Aluminum.

.3 CSA W59-[M1989(R2001)], Welded Steel Construction (Metal Arc Welding) (Imperial Version).

.4 CSA W59.2-[M1991(R1998)], Welded Aluminum Construction.

.5 Canadian Sheet Steel Building Institute (CSSBI)

.1 Sheet Steel Facts # 6, Metallic Coated Sheet Steel for Structural Building Products-[July 1995].

1.4 SHOP DRAWINGS

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

1.5 SAMPLES

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

1.6 QUALITY ASSURANCE

.1 Welding Certification in accordance with CSA W47.2.

1.7 GUARANTEE

.1 Submit a written Guarantee to the Board, that all work of this Tender shall be free from defects in workmanship and materials for a minimum period of one (1) year from date of approved completion.

.2 All defects (excluding vandalism) in materials and workmanship that become apparent during the Guarantee period shall be made good or material replaced at no cost to the Board.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling.

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

.4 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

.5 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Consultant.

.6 Fold up metal banding, flatten and place in designated area for recycling.

.7 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.

1.9 SIGN CONSTRUCTION

.1 Pylon sign must meet or exceed the requirements of *the Americans with Disabilities Act* Accessibility Guideline (ADAAG), the Canadian Building Code and *Ontarians with Disabilities Act (ODA*).

.2 Sign manufacturers must supply shop drawings showing layout, profiles, and product components, including dimensions, anchorage, and accessories.

.3 Permit application and all associated fees required by local municipality are to be completed by sign supplier/installer and under this section.

1.10 SIGN LOCATION

.1 Refer to site drawings for location of sign.
.2 Refer to drawing AD 214A, 214B & 214C for description, size, and base details.

Part 2 Products

2.1 MATERIALS

.1 Exterior Grade illuminated pylon sign per drawings.
.2 LED display: 6HDD 88 x 24df.
.3 Secure faces on structure with stainless steel counter sunk screws through sides only.
.4 Approved Installers/Suppliers
  .1 New Style Signs
  .2 Spectra Advertising
  .3 Arihunt Signs

Part 3 Execution

3.1 INSTALLATION

.1 Erect and secure signs plumb and level at elevations as indicated.

.2 Comply with sign manufacturer's installation instructions and approved shop drawings.

3.2 CLEANING

.1 Leave signs clean. Remove debris from interior of sign boxes.

.2 Touch up any damaged finishes.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Section 01 33 00 - Submittal Procedures.

1.2 WORK INCLUDED

.1 Supply and install prefabricated unit as specified in location shown on drawings.

.2 Supervision, inspection and checking of unit as installed on site.

1.3 REFERENCES

.1 Drawing designation: “Precast Concrete Storage Shed”. Refer to Site Plan drawing.

1.4 SHOP DRAWINGS

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

1.5 SAMPLES

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

1.6 GUARANTEE

.1 Submit a written Guarantee to the Board, that all work of this Tender shall be free from defects in workmanship and materials for a minimum period of one (1) year from date of approved completion.

.2 All defects (excluding vandalism) in materials and workmanship that become apparent during the Guarantee period shall be made good or material replaced at no cost to the Board.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material in appropriate on-site bins for recycling.

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

.4 Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

.5 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Consultant.

.6 Fold up metal banding, flatten and place in designated area for recycling.

.7 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in any other location where it will pose health or environmental hazard.

1.8 LOCATION

.1 Provide four (4) units. Refer to site drawing for location.

Part 2 Products

2.1 MATERIALS

.1 Pre-cast concrete building/storage unit, model Redicast 10, 3000mm x 3000mm, 10 Service Building (MS1024) (10' x 10' x 8'4" high) as manufactured by Anchor Concrete Products Ltd. 1645 Sydenham Road, Kingston, ON K7L 4V4 Tel: (613) 546-6683,1-800-223-0012.

.2 Size: 9'5" x 9'5" x 7'2" high (2.87 x 2.87 x 2.18m) inside.

.3 Weight: 24,000 lbs (10,886 kg) gross.

.4 Construction:

.1 steel reinforced walls, roof & base.

.2 16 ga. painted steel doorframe cast into wall for security.

.3 live roof load 40 p.s.f.

.4 max.wind load 31 p.s.f. (equivalent hourly wind pressure 14.4 p.s.f.)

.5 concrete 4000 p.s.i. minimum.

.6 exposed aggregate walls (natural stone finish)

.7 base, clean smooth (white) concrete.

.8 graffiti resistant exterior coating.

.9 no joints between walls or between walls & roof for superior weather protection and to eliminate maintenance.

.10 delivered and place as (1) piece (no on-site assembly)

.11 seal between walls & base is maintenance free mastic.

.12 (2) heavy duty aluminum vents with birdscreen to provide free area of 120 square inches.

.5 Door & hardware:

.1 (2) 36" x 80" x 1 %"thick hollow metal doors.

.2 16 ga. steel, wipe coated zinc base coat, with one coat galvaprime and two coats gloss exterior alkyd paint.

.3 spot welded edges.

.4 (3) vandal resistant hinges/door (Hagar BB2222x4, 5x4x619xNRP)

.5 steel top cap each door.

.6 aluminum & fibre door sweep bottom

.7 Schlage B160N deadbolt lock, standard (can be fitted with spec lock to match existing sets)

.8 Keying to be confirmed with Consultant.

.9 Both doors w/ spring softened chain checks (Mallory 1225).

.10 fixed doors w/top & bottom surface bolts (onward564)

Part 3 Execution

3.1 INSTALLATION

.1 For concrete or asphalt surface: Bearing pads to be provided if levelling is required

.2 For grass site: 11'0" x 11'0" x 6" thick compacted stone chip base with 2" loose stone chips on top.

.3 Comply manufacturer's installation instructions and approved shop drawings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 03 30 00- Cast-in-Place Concrete.

.3 Section 04 21 13 – Masonry.

.4 Section 05 21 10 – Steel Joists Framing.

.5 Section 05 50 00 – Metal Fabrications.

.6 Electrical Connections : Division 26 (16)

1.2 REFERENCE STANDARDS

.1 All gymnasium equipment shall meet all regulatory requirements of the International Amateur Athletics Federation (I.A.A.F.) for official tournament play as well as all safety standards as set forth by CSA and/or CGSB for the applicable equipment item and/or category, as well as all local codes and regulations.

1.3 SHOP DRAWINGS

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

.2 As part of Shop Drawings, details of attachment to the building structure (walls and roof structure) must bear stamp of a professional engineer licensed to design structures in the Province of Ontario certifying their strength and safety.

.3 Clearly indicate fabrication details, plans, deviations, hardware and installation details.

.4 Take measurements on site of spaces and conditions to which work must conform.

.5 At completion of installation provide written certification from professional engineer that the installation is structurally safe and in accordance with approved shop drawings.

1.4 PROTECTION

.1 Protect work from damage during storage, handling, installation and until building is turned over to the Owner.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material [in appropriate on-site bins] for recycling Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

.3 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Consultant.

.4 Fold up metal banding, flatten and place in designated area for recycling.

1.6 PROTECTION

.1 Protect work from damage during storage, handling, installation and until building is turned over to the Owner.

Part 2 Products

2.1 MATERIALS

.1 Motorized Basketball Backstops to Main Court:

.1 Location: Ceiling mounted at Main Court. Total of two complete assemblies required.

.2 Steel frame: 3mm thick steel tubing, 50x50mm size. BB-17 RG by Gymnasium & Health Equipment Ltd.

.3 Safety Belt: BB-48 Auto-Loc by Gymnasium & Health Equipment Ltd. One required for each ceiling suspended backstop assembly.

.4 Backboard: 1067 x 1829mm size, 13mm thick tempered glass set in extruded aluminum frame, official border and target area fired into glass, BB-29-RGII by Gymnasium & Health Equipment Ltd.

.5 Cushion Edge Padding: pre-moulded urethane foam, purpose made to fit along lower edge of glass backboard, c/w fixing hardware, colour shall be selected by Consultant, BB-44 by Gymnasium & Health Equipment Ltd.

.6 Goal: 457mm OD, front mounted shock absorber goal, with completely enclosed positive locking mechanism, BB-33B by Gymnasium & Health Equipment Ltd.

.7 Net: 120 count nylon, hourglass design, official anti-whip net, BB-41 by Gymnasium & Health Equipment Ltd.

.8 Electric winch: model TW2000 for electrically-operated ceiling-suspended backstops, complete with flush wall-mounted key switch mounted 1350mm above finished floor.

.9 Approved alternates: See item 2.1.6 below.

.2 Basketball Backstops at Cross Courts:

.1 Location: At cross courts. A total of four (4) complete assemblies are required.

.2 Backstops: BB-12 with BB-3 height adjustor by Gymnasium and Health Equipment, Markham.

.3 Backboard, Goal and Nets: Model BB-22 backboard with target orange border area, Model BB-30 and net BB-40 and hardware all by Gymnasium and Health Equipment, Markham.

.4 Operator: Not required.

.5 Safety Straps: not required.

.6 Supply all framing, wall anchor bolts, stringers, mounting hardware for a complete operating installation. Framing finish: enamel paint, custom colour.

.7 Approved alternates: See item 2.1.6 below.

.3 Co-ordination for Items 2.1 and 2. 2:

.1 Provide Section 04 22 00- Masonry with all mounting locations, types and hardware for wall-mounted backstops.

.2 Co-ordinate design of swing up type to permit maximum clear height in up position.

.4 Floor Sockets:

.1 Supply and install Model MA Series, 47.6 mm (1-7/8") I.D. By Murray Anderson Ltd. complete with retainer ring, removable cap and threaded assembly. Refer to Drawing A21 for detail.

.2 Locations: Designated FS, located in Gym 155 (drawing A21) and sixteen (16) along Stage 157 (at Student Forum 116).

.5 Gymnasium Divider Curtain:

.1 Type: Electrically operated, vertically folding divider curtain. Curtain is to fold accordion style.

.2 Curtains: Abrasion resistant polyester reinforced vinyl for the lower 3m, the remaining upper section being 1¼" net.

.1 curtain weight 25 oz/sq yd minimum.

.2 Tensile strength: 300 lb minimum.

.3 Tear strength: 100 lb minimum

.4 Vinyl curtain and net to meet ULC S109, S102.2 and NFPA 701, flame spread not to exceed 75. Fire label to be fixed permanently to the curtain.

.5 Curtain to have vertical welded seams at 1.5 m interval and side shall be hemmed and quadruple sewn to provide clean and durable edge. Seam strength to equal fabric strength.

.6 Colour: To later selection by Consultant from manufacturer's full range.

.3 Valence: same material as curtain fabric on each side of retracted curtain and motor mechanism so as to fully conceal curtain and motor.

.4 Raising mechanism:

.1 motor drive unit, 3 phases, 208V, equipped with magnetic contractor to reverse movement of the curtain at any point, an emergency break and travel limit switches for up and down position.

.2 Lifting pullies at 3 m o.c. attached to the structure, lifting cables to be 5 mm aircraft type.

.3 All roller chains tension shall be monitored by safety switches.

.4 Hydraulic emergency stopping device shall be installed to prevent the free fall of the curtain or to limit the descending speed.

.5 The operating control shall be spring leader type key switch.

.5 Mounting Hardware:

.1 include all mounting hardware for a complete installation

.2 Refer to structural drawings and include all subframing required to fasten to structure. The curtain mount is to be designed to allow the curtain to be raised within the centre joist space.

.6 Warranty: Total warranty for a period of 5 years

.7 Acceptable products: noting or exceeding these specifications 1100 Series by Corflex Partitions Inc. or Moderco Inc., Arpro Folding partitions, Porter, Hufcor, or Quad.

.6 Acceptable Alternates to Specified Products:

.1 Products and complete systems meeting or exceeding the quality and features specified as manufactured by Porter and supplied by Hussey Seating Co.; or Laurentian Gymnastics Industries Ltd.; or Sheridan Gym Equipment or Centaur Products Inc; or Ash-Stevenson or Forum Athletic Products Inc.

Part 3 Execution

3.1 FABRICATION

.1 Fix and assemble work in shop where possible.

.2 File and grind exposed welds, smooth and flush. Make exposed welds continuous.

.3 Workmanship shall be best grade of modern shop and field practice known to recognized manufacturers specializing in this work. Accurately fit joints and intersecting members and made in true planes with adequate fastening.

3.2 INSTALLATION

.1 Install work square, plumb, straight, true and accurately fitted.

.2 Included anchors, dowels and fastenings necessary to anchor work together or to work of other trades.

.3 Where installing in masonry, centre equipment between masonry block joints unless indicated otherwise on details. Verify location mounting heights, and dimensions of all units before installation. Anchor in accordance with manufacturer's printed instructions.

.4 Insulate where necessary to prevent electrolysis between dissimilar materials.

.5 Co-ordinate installation of floor sockets with Section 09 65 19.

.6 Install, connect, make operational and adjust all electrically operated components for proper function.

.7 Deliver to Owner all special tools, accessories, controls, spare parts, etc. which are related to the work of this Section.

3.3 DEMONSTRATION AND CLEANING

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training or maintenance and repairs to the Stage Rigging and Drapery.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 05 50 00 – Metal Fabrications.

.3 Electrical Connections : Division 26 (16)

1.2 SHOP DRAWINGS

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

.2 Clearly indicate fabrication details, plans, deviations, hardware and installation details.

.3 Take measurements on site of spaces and conditions to which work must conform.

1.3 PROTECTION

.1 Protect work from damage during storage, handling, installation and until building is turned over to the Owner.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material [in appropriate on-site bins] for recycling Divert unused metal materials from landfill to metal recycling facility as approved by Consultant.

.3 Unused paint or coating material must be disposed of at an official hazardous material collections site as approved by Consultant.

.4 Fold up metal banding, flatten and place in designated area for recycling.

1.5 PROTECTION

.1 Protect work from damage during storage, handling, installation and until building is turned over to the Owner.

Part 2 Products

2.1 MATERIALS

.1 Work Bench:

.1 Size: 1240x1240 Built-Rite Standard Shop Stand, Shop Top, Square Edge.

.2 Location: STAC Classroom

.3 Quantity: refer to drawings

.2 Equipment Bench:

.1 1220 x 610 Built Rite Standard Shop Stand, Shop Top, Square Edge

.2 Location: STAC Classroom

.3 Quantity: refer to drawings

.3 Drill Press:

.1 17" Drill Press by King Canada, Model KC-118FC or approved alternate.

.2 Coordinate electrical requirements with Div. 26.

.3 Location: STAC Classroom

.4 Quantity: refer to drawings

.5 Refer to 'start/stop buttons' below.

.4 Sander:

.1 6"x48" Belt Sander with 9" disc sander by King Canada, Model KC-760L or approved alternate

.2 Coordinate electrical requirements with Div. 26.

.3 Location: STAC Classroom

.4 Quantity: refer to drawings

.5 Refer to 'start/stop buttons' below.

.5 Table Sander:

.1 1" Belt Sander with 5" disc sander by King Canada, Model KC702C or approved alternate

.2 Coordinate electrical requirements with Div. 26.

.3 Location: STAC Classroom

.4 Quantity: refer to drawings

.5 Refer to 'start/stop buttons' below.

.6 Scroll Saw:

.1 20" Variable Speed Scroll Saw by DeWalt, Model DW788BS, including stand or approved alternate. Scroll saw to include veritas dust chute.

.2 Coordinate electrical requirements with Div. 26.

.3 Location: STAC Classroom

.4 Quantity: refer to drawings

.5 Refer to 'start/stop buttons' below.

.7 Band Saw:

.1 14" Wood Bandsaw with Resaw Guide by King Canada, Model BB552 or approved alternate

.2 Coordinate electrical requirements with Div. 26.

.3 Location: STAC Classroom

.4 Quantity: refer to drawings

.5 Refer to 'start/stop buttons' below.

.8 Plastic Safety Guards:

.1 Provide plastic safety guards for electric operated equipment noted above.

.9 Start/Stop Buttons:

.1 Some equipment may have requirement for more than one start/stop operators. Refer to drawings for information.

Part 3 Execution

3.1 FABRICATION

.1 Fix and assemble work in shop where possible.

.2 File and grind exposed welds, smooth and flush. Make exposed welds continuous.

.3 Workmanship shall be best grade of modern shop and field practice known to recognized manufacturers specializing in this work. Accurately fit joints and intersecting members and made in true planes with adequate fastening.

3.2 INSTALLATION

.1 Install work square, plumb, straight, true and accurately fitted.

.2 Included anchors, dowels and fastenings necessary to anchor work together or to work of other trades.

.3 Where installing in masonry, centre equipment between masonry block joints unless indicated otherwise on details. Verify location mounting heights, and dimensions of all units before installation. Anchor in accordance with manufacturer's printed instructions.

.4 Insulate where necessary to prevent electrolysis between dissimilar materials.

.5 Co-ordinate installation of floor sockets with Section 09 65 19.

.6 Install, connect, make operational and adjust all electrically operated components for proper function.

.7 Deliver to Owner all special tools, accessories, controls, spare parts, etc. which are related to the work of this Section.

3.3 DEMONSTRATION AND CLEANING

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training or maintenance and repairs to the Stage Rigging and Drapery.

END OF SECTION

Part 1 General

1.2 RELATED WORK

.1 Section 08 44 13 – Glazed Aluminum Curtain Walls
.2 Section 08 50 00 – Aluminum Windows

1.3 SUBMITTALS

.1 Product data:
  .1 Submit duplicate copies of manufacturer's Product data in accordance with Section 01 33 00 indicating:
    .1 Performance criteria, compliance with appropriate reference standard(s), characteristics, limitations, and finishes.
    .2 Product transportation, storage, handling and installation requirements.

.2 Shop drawings:
  .1 Submit shop drawings in accordance with Section 01 33 00.
  .2 Provide layout, details of track and operating hardware, installation details.

.3 Samples: Submit 600 mm x 600 mm duplicate samples of Dual Sun Shade material and colour.

.4 Closeout submittals:
  .1 Submit following for each Product for incorporation into Operations and Maintenance Manuals in accordance with Section 01 78 00:
    .1 Functional description detailing operation and control of components.
    .2 Performance criteria and maintenance data.
    .3 Operating instructions and precautions.
    .4 Safety precautions.
  .2 Submit maintenance data, wrenches or specialty tools, cleaning and maintenance instructions

1.5 QUALITY ASSURANCE

.1 Shades and track shall be installed by a qualified specialist with 5 years proven experience in this type of work.

Part 2 Products

2.1 MATERIALS

.1 **Motorized Shading System:**
  .1 Extruded aluminum hanger and closure using a linear motor, fabloc tube and necessary electrical accessories for a single switch or Motor group control operated as indicated on the Shading Schedule. Internal limit switches are adjusted by two hex keys to allow for exact stop positions. Solenoid activated disc brake stops and holds in any position. Asynchronous motor with built in reversible capacitor start

and run, 95-125V-AC at 60Hz CSA and UL approved.

.2 Specifications are based on 300 Series Solarblock 3%, colour to be selected later by Consultant.

.3 Locations: all windows and curtain wall locations noted with "RS" on floor plans. Blinds to span between curtain wall mullions, using maximum fabric widths available.

.4 'Motorized Shade with wall mount fascia' by Solarfective or approved alternative.

.5 Manufactured by Solarfective Products Ltd., Rep: Patri Products, Kevin Booth (416)421-3800 Fax: (416)421-8424, or Silent Gliss Model 4110 by Architectural Products, Rep. Tim MacCallum Tel: (905)507-1275 Fax: (905)507-1282 or Mecho/5 Model by CartsPlus Healthcare Products Ltd., Rep. Eva Speziale Tel: (905) 602-6794.

.2 All shades systems specified in this section shall be provided by one manufacturer who shall take full responsibility for the total individual school project.

2.2 Solarfective Shading blackout fabric:

.1 Shade cloths shall be woven of .018 opaque, vinyl coated polyester yarn consisting of approx. 79% vinyl and 21% 500 dernier polyester core yarn. The fabric shall be tensioned in the finishing range prior to heat setting to keep the warp ends straight and minimize or eliminate weave distortion to keep the fabric flat. The fabric shall be dimensional stable. Colour will be selected from standard range. It shall be tear resistant meeting NFPA 701.

.2 Meet or exceed the following statistics:

Openness Factor			3%+0.0%-0.5%
Weight per sq.yd.			21 oz.
Warp ends per inch			42
Fill ends per inch			31
Stretch % (271lb.wt.):	warp		2%
	fill		3%
Set %	warp		1.5%
	fill		1.5%
Abrasion Resistance		YARN	none
(500 Tarber Cycles)		RAPTURE	none
		WEAR	TRACE
U.V. Deterioration		Fade	none
(200 Sun Fade Hours)			
Tensile Retention			96%

2.2 FABRICATION

.1 Fabricate shades in accordance with reviewed shop drawings and manufacturer's written instructions.

Part 3 Execution

3.1 INSTALLATION

.1 Securely install shades and track adding brackets as required but in no case less than four brackets.

.2 After installation fabric shall hang flat, without buckling or distortion. The edge when trimmed, shall hang straight without ravelling. An unguided roller shade cloth shall roll true and straight, without shifting sideways more than 3mm in either direction due to warp distortion, or weave design.

3.3 ASSEMBLY – MOTORIZED SHADE

.1 Extruded Aluminum Shade Tube: 1.52 mm thick, 75 mm diameter with three internal, continuous fins 4.82 mm high for strength and drive capabilities when attached to the nylon sprocket. The fins shall be spaced 120 degrees apart.

.2 Fascia: 1.7 mm thick, extruded aluminum cover, clear anodized finish. To cover front of shade and return at underside to conceal roller and hardware.

.3 Internal Limit switches: adjustable with two hex keys to allow exact setting of stop position. Micro switches to provide circuit breaking at end of run. Switch setting not to be disturbed by roller tube action.

.4 Brake: solenoid activated disc brake mechanism stops and holds any position, brake to disengage when motor is running.

.5 Motor: Built-in reversible capacitor start and run. Single phase 95-125V-AC, 60 Hz motor with thermally protected class A temperature rating.

.6 Gear box: Satellite gears with 3 levels for load distribution with planetary type gears machined to close tolerance of tempered steel.

.7 Controls: Motors will be operated by white three position rocker switch, located remotely.

.8 Exterior Hembar: Extruded aluminum in clear anodized finish with plastic end finials.

.9 Dynamic Hembar: At sill locations, in lieu of bottom channel, provide aluminum Dynamic Hembar with same finish as side channels. Upon contact with sill, it shall provide a light seal even if the sill is slightly out of level.

.10 Colour: Exposed surfaces (excluding fabric) shall be colour selected by Consultant, and not necessarily from manufacturer's full colour range. Metal components shall be

pretreated and finished with an acceptable baked enamel finish.

.11 Fasteners: Non-corrosive metal screws for attachment to windows or curtain wall framing, concealed in completed installation.

.12 Shade and mounting system to be designed to allow air between shade and glass.

.13 Fabric shall hang flat, without buckling or distortion. Trimmed edges shall hang straight without curling or raveling.

.14 Unguided vertical shades shall not drift sideways more than 3 mm in total run.

.15 Provide stops at highest and lowest shade positions to prevent over winding and unrolling.

.26 Design and fabricate shades so that there is a maximum 12 mm gap both sides of fabric.

3.4 CLEAN UP

.1 At conclusion of work remove all debris, dirt; clean surfaces like glass, floor, stools, heating units if soiled. Test each re-installed drape, each sunshade numerous times and make adjustments to assure trouble-free installation and operation.

.2 Brief maintenance staff regarding proper care, cleaning, lubricating, adjusting, etc.

END OF SECTION

Part 1 General

1.1 DRAWINGS

.1 AD 530 – AD 543 Stage Pipe Grid, Support Channels, Tracks & Soft Goods drawings & details

1.2 SUBMITTALS

.1 Shop Drawings: Submit shop drawings for Consultant's review, in accordance with Section 01 33 00.

.2 Samples: Submit samples of fabric for Consultant's approval, in accordance with Section 01 33 00.

.3 Maintenance Data and Operating Instructions: Provide maintenance and operating instructions for incorporation into maintenance manual in accordance with Section 01 78 10.

.4 Test Reports

.1 Submit test reports to the Consultant confirming that fabric conforms to flame resistance as listed in these Specifications.

.2 Submit test reports from an independent laboratory confirming that the stage curtain meets the flame spread ratings specified.

.5 Engineer's Certificate:

.1 Submit certificate from Professional Engineer registered in the Province of Ontario stating the strength of the suspension system of the curtain track, including stage rigging connection and the stage rigging and lighting connections at stage, gym and forum as mounted to the structural steel provided.

.6 Pre-Qualified Suppliers / Installers:

JOEL Theatrical Rigging Contractors Ltd.
365 Watline Avenue
Mississauga, ON
L4Z 1P3
Contact: Van Marineau
(905) 890-8802

Ontario Staging Limited
78 Mack Street
Toronto, ON
M1L 1M9
Contact: Tony Physenzou
(416) 694-8980

Scenework
67 Watson Rd. S. Unit 7
Guelph, ON
N1L 1E3
Contact: Ron Foley
(519) 837-0583

Jack A. Frost Limited
3245 Wharton Way
Mississauga, ON
L4X 2R9
Contact: Craig Blackley
(905) 624-5344

Part 2 Products

2.1 STANDARD ASSEMBLIES

.1 Rigging Support: Rigging support shall consist of:

.1 Proscenium Brackets. There shall be:

.1 (a) Type A Brackets, each of which will require:

.1 One (1) 450 mm Unistrut P3300 channel

.2 Three (3) Unistrut P1068 90 degree angle fittings

.3 Various quantities of nuts, spring nuts, washers, bolts and woodscrews as indicated on AD drawing 533, Bracket Detail A

.2 (b) Type C Brackets, each of which will require:

.1 One (1) Unistrut P2452 Bracket

.2 Two (2) Unistrut P1068 90 degree angle fittings

.3 Various quantities of nuts, spring nuts, washers, bolts and woodscrews as indicated by AD drawing 533, Bracket Detail A.

.4 Two (2) ½" threaded rods secured with Epcon 6 Ceramic Epoxy System or equal.

.2 Unistrut Channel.

.1 (a) Channel shall be positioned as indicated in drawings A 1.1 support Structure

2.2 VALANCE PIPE

.1 The valance rigging shall consist of: One (1) 1" x 6" Birch attached to main drape brackets.

2.3 MAIN DRAPE TRACK

.1 The main drape rigging shall consist of: Track: There shall be:

.1 Two (2) lengths of H&H Specialties Inc. #110A, 6063-T5 extruded aluminum, or similar

.2 Lengths allow for 600mm track overlap at proscenium centre.

.3 Hand line position shall be determined

.4 One (1) H & H Specialties Inc. #103 Double End Pulley.

.5 One (1) H & H Specialties Inc. # 104 Single End Pulley.

.6 Two (2) H & H Specialties Inc. # 105 Overlap Clamp

.7 Two (2) H & H Specialties Inc. #109 End Stop and Cord Support.

.8 H & H Specialties Inc., #106 Clamp Hanger, as required: please refer to beam clamp description below.

.9 H & H Specialties Inc., #126 Centre Support Hanger: please refer to beam clamp descriptions below.

.10 One (1) H & H Specialties Inc., #108 Floor Block with #108DK Detachable Floor Block Kit, complete with attachment hardware:

.11 Hand line position shall be determined on site.

.12 H & H Specialties Inc., #114 Operating Line, as required.

.13 Two (2) H & H Specialties Inc., #102 Master Carriers.

.14 H & H Specialties Inc., #101 Single Carrier, one (1) per grommet.

.15 Install the main drape panels on track carriers using Turner & Seymour #105 Special s-hooks to attach each grommet.

2.4 BORDER TRACKS

.1 Border track rigging shall consist of :

.1 Rigging Points. There shall be Seven (7) rigging points securing the track to the bottom cords of the open web steel joists. See Drawings AD 530 – 543.

.2 Track. There shall be: One (1) length of H & H Specialties Inc. #110A, 6063- T5 extruded aluminum, or similar, complete with:

.1 Two (2) H & H Specialties Inc., #109 End Stops.

.2 H & H Specialties Inc., #101 Single Carrier, one (1) 300 mm of track length plus one (1).

2.5 ELECTRIC PIPES

.1 Electric pipe rigging shall consist of:

.1 Rigging Points. There shall be: Seven (7) rigging points securing the pipe to the bottom of the open web steel joists. See Drawings AD 530 – 543.

.2 Pipe: 1.5” ID schedule 40 steel pipe and Alvin A8-8 Straight Coupling, or similar, to join pipe lengths.

2.6 LEG TRACKS

.1 Leg tracks rigging shall consist of:

.1 Brackets: There shall be:

.1 Seven (7) rigging points securing the track to the bottom cords of the open web steel joists. See Drawings AD 530 - 543.

.2 Required quantities of rigging points securing the track to the rigging support members.

.2 Track: There shall be:

.1 One (1) continuous length of H & H Specialties Inc., #300.

.2 H & H Specialties Inc. #307 splices to connect track lengths.

.3 H & H Specialties Inc.321 end stops on each end of the leg track.

.4 Two (2) H & H Specialties Inc., #30 Pivot Devices, on each of the leg track each complete with: One (1) #30BK brake kit complete with operating lanyard and One (1) 1” ID schedule 40 steel pipe, 1,550 mm long, centred on each device.

2.7 TRAVELLER TRACK

.1 The main drape rigging shall consist of:

.1 Brackets: There shall be:

.1 Seven (7) rigging points securing the track to the bottom cords of the open web steel joists. See Drawings AD 530 - 543

.2 Required quantities of rigging points securing the track to the rigging support members.

.2 Track: there shall be:

.1 Two (2) lengths of H & H Specialties Inc. #310A, 6063-T5 extruded aluminum, or similar.

.2 Lengths allow for 600mm track overlap at proscenium centre.

.3 Hand line position shall be determined on site.

.4 Two (2) H & H specialties Inc., #309 End Stop.

.5 H & H Specialties Inc., #301 single Carrier, one (1) per 300 mm of track plus one (1).

.6 Install the traveler drape panels on track carriers using Turner & Seymour #105 Special s-hooks to attach each grommet.

.7 Provide two (2) H & H Specialties Inc. #342 Walk Along Master Carriers.

2.8 PANELS

.1 All fabric, including jute webbing, shall meet the requirements for a high degree of flame resistance, as described in NOTE 4 of CAN 2-4M77: "TEXTILE TEST METHODS". Method 27.

.2 A certificate confirming compliance with the above standard shall be shipped with all drapery panels"
- One (1) additional copy of the certificate must be forwarded to the Consultant by mail or fax.
- The following information must be displayed on the certificate:
(a) Project Name.
(b) Date of Certificate Issue.
(c) Material Used.
(d) Material Colour
(e) Fabrication Date.

2.9 VALANCE AND MAIN DRAPE AS MANUFACTURED BY:

.1 JB Martin Ltd. (21 oz.Concertino)

.2 JL DeBall (21 oz. Sydney)

2.10 UPSCALE MASKING AS MANUFACTURED BY:

.1 Melfabco

.2 Fred Krieger & Co. Inc.

2.11 PANELS

.1 Approximate dimensional information is noted throughout this specification and on associated drawings, but, it is the responsibility of the Contractor to confirm exact measurements in accordance with the intent of this specification.

.2 Panels showing blemishes, puckers or any irregularity will not be accepted.

.3 Each panel shall have six (6) 40mm wide x 130mm long flame test swatches sewn to an offstage, bottom corner.
- The swatches shall be made from the same fabric used to construct the drape
  These fabric swatches shall be used for flame testing purposes.

.4 Provide on each panel a sewn-on label which clearly states:
- Manufacturer's Name
- Material Used.
- Material Colour.
- Fabrication Date.
- Flame Resistance Compliance.
- Finished Panel Size.
- This information label shall be sewn next to the flame test swatches.

2.12 VALANCE DRAPE PANEL

.1 The panel shall be fabricated as follows:

.1 21 oz. velour
.2 single backed
.3 100% cotton
.4 Concertino 2603
.5 or similar.

.2 Colour to be determined; please provide fabric samples for selection.

.3 Sewn with 50% fullness.

.4 Minimum 100 mm flame-resistant jute webbing sewn across the top.

.5 Minimum 76 mm offstage hems with 50 mm turn backs.

.6 Minimum 152 mm bottom hem with 76 mm turn under.

.7 Use new, black, tie line, 1,000 mm long at each grommet.

2.13 MAIN DRAPE PANELS

.1 Each panel shall be fabricated as follows:

.1 21 oz. velour
.2 single backed
.3 100% cotton
.4 Concertino 2603
.5 or similar.

.2 Colour to be determined; please provide fabric samples for selection.

.3 Sewn with 50% fullness.

.4 Minimum 100 mm flame-resistant jute webbing sewn across the top.

.5 #6 brass grommets installed 25 mm in from each end with additional grommets equally spaced on maximum 305 mm centres.

.6 Minimum 150 mm offstage hems with 50 mm turnbacks.

.7 Minimum 300 mm onstage hems with 76 mm turnbacks.

.8 Minimum 300 mm bottom hem with 76 mm turnunder.

.9 Special Turner & Seymour #105 s-hooks to attach each grommet to a carrier.

2.14 LEG PANELS

.1 Each panel shall be fabricated as follows:

- .1 Each shall be made of:
  - .1 16oz. heavy duty
  - .2 100 % cotton
  - .3 Commando Cloth
  - .4 or similar
- .2 Colour to be: Black
- .3 Sewn flat.
- .4 Minimum 100 mm flame-resistant jute webbing sewn across the top.
- .5 #6 brass grommets installed 25 mm in from each end with additional grommets equally spaced on maximum 305 mm centres.
- .6 Minimum 76 mm offstage hems with 50 mm turnbacks.
- .7 Minimum 152 mm bottom hem with 76 mm turnunder.
- .8 Use new, black, tie line, 1,000 mm long at each grommet.

2.15 BORDER PANELS

.1 Each panel shall be fabricated as follows:

- .1 Each shall be made of
  - .1 16oz. heavy duty
  - .2 100 % cotton
  - .3 Commando Cloth
  - .4 or similar
- .2 Colour to be: Black.
- .3 Sewn flat.
- .4 Minimum 100 mm flame-resistant jute webbing sewn across the top.
- .5 #6 brass grommets installed 25 mm in from each end with additional grommets equally spaced on maximum 305 mm centres.
- .6 Minimum 76 mm offstage hems with 50 mm turnbacks.

.7 Minimum 152 mm bottom hem with 76 mm turnunder.

.8 Use new, black, tie line, 1,000 mm long at each grommet.

2.16 TRAVELER PANELS

.1 Each panel shall be fabricated as follows:

.1 Each shall be made of:

.1 16oz. heavy duty

.2 100 % cotton

.3 Commando Cloth

.4 or similar

.2 Colour to be: Black

.3 Sewn with 50% fullness.

.4 Minimum 100 mm flame-resistant jute webbing sewn across the top.

.5 #6 brass grommets installed 25 mm in from each end with additional grommets equally spaced on maximum 305 mm centres.

.6 Minimum 150 mm offstage hems with 50 mm turnbacks.

.7 Minimum 300 mm bottom hem with 76 mm turnunder.

.8 Special Turner & Seymour #105 s-hooks to attach each grommet to a carrier.

2.17 MISCELLANEOUS HARDWARE

.1 Eye Bolts

.1 Shoulder type, ½", forged eyebolts, Crosby S-279 or equal.

.2 Turnbuckles

.1 Jaw & eye turnbuckles, 5/16", forged, Crosby HG-227 or equal.

.3 Compressions Sleeves

.1 Crosby "Cold TuffTM" Sleeve, or Nicopress copper, use recommended turn back and manufacturer's grip verification methods.

.4 Shackles

.1 Anchor shackles, bolt type, 5/16", Crosby G-2130 or equal.

.2 Any equals must be pre-approved by the Owner or Consultant before use.

.5 Channel

.1 Channel, 1 5/8" x 1 5/8", structural channel, Unistrut P1000 or equal.

.2 Flat plate fitting, 1 5/8" x 1 5/8", Unistrut P1045 or equal.

.3 Spring nuts, Unistrut P1010 or equal.

.4 Remove all burrs and break sharp edges.

.6 Cable Cradle

.1 Manufacturer, Altman Lighting

.2 Part Number, Altman 512, ¾" to 1 ¼" or

.7 Drapery Trim Chain

.1 Description. No. 8 Jack Chain
.2 Length, 12".
.3 Quantity, one (1) per grommet on main drape.

.8 Main Drape Operating Line

.1 (a) Manual
.1 Description, 3/8" black cord
.2 Length, as required
.2 (b) Winch
.1 Description, 1/8" galvanized aircraft cable
.2 Length, as required.

.9 Steel Pipe

.1 Schedule 40 steel pipe, diameters as noted.
.2 Remove all burrs and break sharp edges

.10 Unistrut Spring Nuts.

.1 Hex nuts and bolts, SAE Grade 3 typical
.2 13 UNC threaded rod (remove burrs and sharp edges).

.11 Washers and Flat Plates

.1 ANSI standard plain and helical spring lock washers.
.2 Unistrut Flat Plate fittings.

.12 Beam Clamps

.1 Unistrut clamp assemblies as noted.

.13 Batten Clamps

.1 H&H Specialties Inc., styles as noted.
.2 Alvin or Kee clamps, styles as noted.

.14 Wire Rope

.1 Galvanized 7 x 19, diameter as noted, use recommended turn back.

.15 Thimble

.1 Wire rope thimbles, ¼", hot dip galvanized steel, Crosby G-411 or or equal.

.16 Other

.1 Additional hardware, components and responsibilities may be described in this Section, on drawings and in SECTION 3: INSTALLATION.

Part 3 Execution

3.1 GENERAL CONDITIONS

.1 Approximate dimensional information is as noted throughout this Specification and on associated drawings, but is the responsibility of the Contractor to exact dimensions, quantities of hardware and final placement of equipment in accordance with the intent of this Specification.

.2 Tighten all hardware to manufacturer's specifications.

.3 Use hardware only for its designed purpose.

.4 Install all equipment generally as described by this documentation, as required by codes, and as intended by the manufacturers.

.5 Install all pipes, track and channel parallel to the stage floor.

.6 Report unforeseen or unsafe conditions to the Owner or the Consultant immediately.

.7 The position of installed electrical and mechanical equipment shall take precedence during installation.

.8 Inform the Consultant prior to adjusting any rigging positions.

.9 All positions shall be finally determined on site.

3.2 INSTALLATION OF DRAPERY

.1 The Contractor will install the drapery panels.

.2 The drapery will be installed as soon as possible after the completion of the rigging installation.

.3 Report unforeseen or unsafe conditions immediately.

.4 Use trim chain with s-hooks on carriers as required.

.5 Drapery panels, when installed, shall hang between 5mm and 25mm from the stage floor when in playing position.

.6 This project involves installation as part of new construction.

.7 All dimensions shall be finally determined by site conditions.

3.3 DIMENSIONS

.1 Distance from Plaster Line:

.1	Valance	*-200*
.2	Main Drape	*60*
.3	1st Electric Pipe	*600*
.4	1st Border	*1400*
.5	1st Legs	*1600*
.6	2nd Electric Pipe	*2200*
.7	2nd Legs	*2450*
.8	2nd Border	*3900*

.9	3rd Legs	*4600*	
.10	Upstage Traveller	*6700*	

.2 Distance from Stage Floor:

.1	Valance		*3920*
.2	Main Drape	*3900*	
.3	1st Electric Pipe	*3900*	
.4	1st Border	*5400*	
.5	1st Legs	*5400*	
.6	2nd Electric Pipe	*4100*	
.7	2nd Legs	*5400*	
.8	2nd Border	*5400*	
.9	3rd Legs	*5400*	
.10	Upstage Traveller	*5400*	

.3 Length:

.1	Valance		*12100*
.2	Main Drape	*12100*	
.3	1st Electric Pipe	*12100*	
.4	1st Border	*14000*	
.5	1st Legs	*15000*	
.6	2nd Electric Pipe	*12100*	
.7	2nd Legs	*15000*	
.8	2nd Border	*14000*	
.9	3rd Legs	*17000*	
.10	Upstage Traveller	*20000*	

3.4 QUANTITIES AND DIMENSIONS

.1 There is one (1) Valance Drape Panel

.1 Its height is 950mm.

Its width is 12100 mm.

.2 There are two (2) Main Drape Panels

.1 Their height is 4500 mm.

.2 Their width is 6150.

.3 There are six (6) Leg Panels.

.1 Their height is 3900 mm.

.2 Their width is 1800 mm.

.4 There are two (2) Border Panels

.1 Their height is 1000 mm.

.2 Their width is 12800 mm.

.5 There are two (2) Traveler Panels.

.1 Their height is 5360 mm.
.2 Their width is 6500 mm.

3.5 INSTALLATION CONDITIONS

.1 There is one (1) Valance Drape Panel

.1 Its height is 950mm.
.2 Its width is 12100 mm.

.2 There are two (2) Main Drape Panels

.1 Their height is 4500 mm.
.2 Their width is 6150.

.3 There are six (6) Leg Panels.

.1 Their height is 3900 mm.
.2 Their width is 1800 mm.

.4 There are two (2) Border Panels

.1 Their height is 1000 mm.
.2 Their width is 12800 mm.

.5 There are two (2) Traveler Panels.

.1 Their height is 5360 mm.
.2 Their width is 6500 mm.

3.6 DEMONSTRATION AND TRAINING

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training or maintenance and repairs to the Stage Rigging and Drapery.

3.7 ENGINEERING CERTIFICATION

.1 Submit as part of Shop Drawings:

.1 Written certification bearing the seal of a Professional Engineer registered in the Province of Ontario, confirming that the connection strengths of the rigging system to the building structure. State that such design has been reviewed to withstand load conditions as may be imposed by the dead and live loads of both the equipment and persons using this equipment.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work: Protection of openings; temporary power and lighting.

.2 Section 01 52 00 – Construction Facilities: Protection of openings; temporary power and lighting.

.3 Section 03 30 00 - Cast-in-Place Concrete: Elevator pit, elevator motor and pump foundation, and grouting thresholds

.4 Section 05 50 00 - Metal Fabrications: Divider beams, support for entrances and rails, hoisting beam at top of hoistway.

.5 Section 04 21 13 – Masonry: Masonry hoistway enclosure, building-in and grouting hoistway door frames, grouting thresholds.

.6 Section 05 50 00 – Metal Fabrications: Divider beams, support for entrances and rails, hoisting beam at top of hoistway.

.7 Division 26: Electrical service to main disconnect in elevator machine room; machine room; machine room and pit receptacles with ground-fault current protection; lighting in machine room and pit; wiring for telephone service to machine room, cab telephone wiring.

1.2 SUMMARY

.1 This specification is based on a Model 3000 hydraulic elevator as manufactured by Otis Elevator Company.

.2 Acceptable Alternates: Elevators meeting or exceeding these base specifications by Thyssen, Kone, Delta Elevator, or others providing they meet this specification and complete data is submitted to the Architect's office not later than 4 business days prior to close of Tender and approved and formally accepted in writing by the Consultant during the tender period.

.3 Tender price shall include the complete price for supply and install and the **3 year** maintenance contract specified herein. Note that the bidder shall identify his Maintenance Contract component separately and this shall be provided as "Itemized Price No. 2" in *Section 00 22 00-Supplementary Form of Tender* to be submitted 24 hrs. after tender.

1.3 REFERENCES

.1 ADAAG, Americans with Disabilities Act Accessibility Guidelines.

.2 ANSI/NFPA 70, National Electrical Code.

.3 ANSI/NFPA 80, Fire Doors and Windows.

.4 ANSI/UL 10B, Fire Tests of Door Assemblies.

.5 CAN/CSA C22.1, Canadian Electrical Code.

.6 CAN/CSA-B44, Safety Code for Elevators and Escalators.

.7 Model Building Codes.

.8 Ontario Building Code and all other local applicable codes.

.9 American National Standards Institute (ANSI)

.1 ANSI/NEMA MG1-[1993], Motors and Generators.

.10 Canadian Standards Association (CSA)

.1 CAN/CSA-B44-[M94], Safety Code for Elevators.

.2 CAN/CSA-B651-[95], Barrier-Free Design - Public Safety.

.11 National Building Code (NBC)

1.4 SYSTEM DESCRIPTION

.1 Performance Requirements for Elevators:

.1 Quantity & Elevator Numbers: 1 Elevator

.2 Type: Twin telescopic hydraulic cylinders without well holes

.3 Number of Stops: 2 Front Only

.4 Number of Openings: 2 at front and 1 at rear

.5 Rise: As per drawings

.6 Rated Capacity/Speed: 3000 pounds, 100/ fpm (1361 kg, 0.50/ m/sec.)

.7 Minimum Car Inside: Front Opening: Model 3000: 6’ 8” wide x 4’ 9” deep (2032 mm x 1448 mm)

.8 Inside Cab Height: 8’0”(2438 mm); Height Under Ceiling: 7’ 4 1/2”(2223mm)

.9 Entrance Width & Type: Model 3000: Single-Slide Door 3’ 6” x 7’ 0” (1067 mm x 2134 mm)

.10 Main Power Supply: 600 Volts + or - 5% of normal, 3 Phase, with a separate equipment grounding conductor.

.11 Lighting Power Supply: 120 Volts, 1 Phase, 15 Amp, 60 Hz.

.12 Stopping Accuracy: ±1/4" (6.4 mm) under any loading condition or direction of travel.

.13 Door Opening Time for 7ft. painted hoist way and car doors: Model 3000: 4.0 seconds – Single Slide 42” door.

.2 Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.

.3 Provide microprocessor-based control system, which utilizes on-board diagnostics for servicing, trouble-shooting, and adjusting without requiring the use of an outside service tool. If an on-board diagnostic system is not provided, a handheld service tool (or laptop), owner’s license, operation manual, and tool instructions must be provided in addition to the control system.

.4 Car Operating Features

.1 Full Collective Operation.

.2 Single Speed Fan.

.3 On/Off Light Switch.

.4 Solid State Starting

.5 Remote elevator monitoring REM® ready.

.6 Car-Stall Protection.

.7 Top of Car Inspection.

.5 Door Control Features:

.1 Closed Loop Door Operator is a closed loop, microprocessor based door operator system. The door operator will facilitate smooth operation under varying environmental influences such as, temperature, wind, friction, and component variation. The processor will monitor the door's actual position and velocity compared to its desired position and velocity. If variations are detected in the profile the command will be automatically corrected. The Closed Loop Door Operator control system shall not require machine room door control equipment.

.2 Door noise not to exceed 58dBA.

.3 Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

.4 Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

.5 Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.

.6 Primary door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening. Under normal operation and for any door position, the system shall detect as a blockage an opaque object that is equal to or greater than 1.3 inches (33 mm) in diameter when inserted between the car doors at vertical positions from within 1 inch (25 mm) above the sill to 71 inches (1800 mm) above the sill. Under degraded conditions (one or more blocked or failed beams), the primary protection shall detect opaque objects that are equal to or greater than 4" (100 mm) in diameter for the same vertical coverage. If the system performance is degraded to the point that the 4" object cannot be detected, the system shall maintain the doors open or permit closing only under nudging force conditions.

.7 The door reopening device shall also include a secondary, three dimensional, triangular infrared multi-beam array projecting across the door opening and extending into the hoistway door zone. The door opening device will cause the doors to reopen when it detects a person(s) or object(s) entering or exiting the car in the area between the hoistway doors or the entryway area adjacent to the hoistway doors.

.8 The size of the secondary protection zone shall vary as the door positions vary during opening and closing. The width of the zone shall be approximately one-third the size of the separation between the doors (or door and strike plate for single-slide doors) and shall be approximately centered in the door separation. In order to minimize detection of hallway passers-by who are not entering the elevator, the maximum zone penetration into the entryway shall not exceed 20" for any door separation. Normal penetration depth into the entryway from the car

doors shall be ~14" for a door separation of 42". The penetration shall reduce proportionally as the doors close. At door separations of 18" or less the secondary protection system may cease its normal operation since the depth of the zone recedes to where it is inside the hoistway doors. The vertical coverage of the secondary protection shall be ~19" (480 mm) above the sill to ~55" (1400 mm) above the sill (mid-thigh to shoulder of a typical adult).

.9 The secondary protection shall have an anti-nuisance feature which will ignore detection in the secondary zone after continual detection occurs for a significant time period in the secondary zone without corresponding detection in the primary protection zone; i.e. a person/object is in the entryway but does not enter. Normal secondary protection shall be re-enabled whenever detection occurs in the primary zone.

.10 The reaction time of the door detector sub-system shall not exceed 60 milliseconds when both primary and secondary protection capabilities are active; nor 40 milliseconds when the secondary protection is disabled.

.11 Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

.6 Provide equipment according to Seismic zone: zone 0

.7 Design and construct elevator in accordance with CAN/CSA-B44, local codes and regulations.

1.5 SUBMITTALS

.1 Product Data: Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.1 Signal and operating fixtures, operating panels and indicators.

.2 Cab design, dimensions and layout.

.3 Hoistway-door and frame details.

.4 Electrical characteristics and connection requirements.

.5 Expected heat dissipation of elevator equipment in machine room (BTU).

.2 Shop Drawings: Submit in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit shop drawings to indicate project layout, including details and the following information:

.1 Car, guide rails, buffers and other components in hoistway.

.2 Maximum rail bracket spacing.

.3 Maximum loads imposed on guide rails requiring load transfer to building structure.

.4 Loads on hoisting beams.

.5 Clearances and travel of car.

.6 Clear inside hoistway and pit dimensions.

.7 Location and sizes of access doors, hoistway entrances and frames.

.2 Operation and Maintenance Data

.1 Provide 4 copies manufacturer's standard operations and maintenance manual.

1.6 QUALITY ASSURANCE

.1 Manufacturer: Provide elevators manufactured by a firm with a minimum of 10 years experience in fabrication of elevators equivalent to those specified. Elevator manufacturer shall be ISO9002 certified.

.2 Installer: Elevators shall be installed by the manufacturer.

.3 Regulatory Requirements: Elevator system design and installation shall comply with the latest versions of CAN/CSA-B44 -00.

.1 Elevator shall be designed to meet to Americans with Disabilities Act Accessibility Guidelines (ADAAG)

.4 Permits and Inspections: Provide licenses and permits and perform required inspections and tests.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Manufacturer shall issue delivery schedule within 7 days of issuance of purchase order. Manufacturer shall maintain regular contact with the contractor and Consultant regarding expediting shop drawings and delivery.

.2 At least 3 weeks in advance of delivery, manufacturer's representative shall visit the site to discuss site preparedness. Manufacturer's rep. shall make a second visit one week in advance of the delivery and again liaise with General Contractor and Consultant to ensure site preparation.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Deposit packaging materials in appropriate container on site for recycling or reuse.

.2 Avoid using landfill waste disposal procedures when recycling facilities are available.

.3 Collect and separate plastic, paper packaging and corrugated cardboard.

.4 Dispose of corrugated cardboard, polystyrene and plastic packaging material in appropriate on-site bin.

1.9 WARRANTY

.1 The elevator warranty shall cover defective functionality, programming, materials and workmanship for a period of One Year from the date of Substantial Completion of the contract. The guarantee includes ordinary wear but excludes improper use, vandalism, abuse, and misuse by the owner.

.2 Project Warranty: Refer to CCDC 2 for project warranty provisions.

1.10 MAINTENANCE SERVICE

.1 Included in the Tender price is the maintenance service consisting of regular examinations, adjustments and lubrication of the elevator equipment shall be provided by the elevator contractor for a period of three (3) years after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24-hour callback service. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons

other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

Part 2 Products

2.1 MATERIALS

.1 Materials: As required to achieve specified performance criteria; functionally compatible with adjacent materials and components.

2.2 ACCEPTABLE MANUFACTURERS

.1 This specification is based on a Model 3000 hydraulic elevator as manufactured by Otis Elevator Company.

.2 Acceptable Alternates: Elevators meeting or exceeding these base specifications by Thyssen, Kone, Southwestern Elevator or Delta Elevator.

.3 NOTE: hoist is required to suit noted floor to floor to roof heights. Custom hoist may be required, depending on supplier, to suit building floor to floor and roof structure height. Pop-up above the roof is not permitted.

2.3 EQUIPMENT: MACHINE ROOM COMPONENTS

.1 The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a muffler, low-pressure switch and a shut-off valve.

.2 A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three (3) phase overload device shall be provided to protect the motor against overloading.

.3 A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.

.4 Pressure Switch

2.4 EQUIPMENT: HOISTWAY COMPONENTS

.1 Plunger(s) and Cylinder(s): Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it

to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.

.2 Car Guide Rails: Tee-section steel rails with brackets and fasteners.

.3 Spring Buffer: Helical coil spring type.

.4 Wiring: Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car, operating telephone handset call system in Cab.

.5 Hoistway Entrances

.1 Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of 14-gauge (2 mm) sheet steel. Additional sill angle support will be provided with 4'0" and 4'6" two speed opening door arrangements (4500 & 5000 lb. cars). Sills shall be extruded aluminum.

.2 Doors: Entrance doors shall be of hollow metal construction with vertical internal channel reinforcements.

.3 Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour.

.4 Entrance Finish: Prime white paint, baked enamel. All doors & frames, suitable for finish painting.

.5 Entrance Markings: Entrance jambs shall be marked with 4" x 4" (102 mm x 102 mm) plates having raised floor markings with Braille adjacent. Markings shall be provided on both sides of the entrance.

.6 Sight Guards: Black sight guards will be furnished with any metal finish door. Powder paint matching sight guards will be furnished with powder paint doors.

2.5 EQUIPMENT: CAR COMPONENTS

.1 Car Frame: A suitable car frame shall be provided with adequate bracing to support the platform and car enclosure. The buffer striking plate on the underside of the car-frame platform assembly must fully compress the spring buffer mounted in the pit before the plunger reaches its lower limit of travel.

.2 Platform, Heavy Loading Type: The car platform shall be arranged to accommodate one-piece loads weighing up to 25% of the rated capacity, such as wheeled food carts, stretchers, x-ray equipment, etc. The platform shall be recessed 5/16" for flooring by others.

.3 Cab walls to have attached vertical non-removable panels, laminated front and back with plastic laminate.

.4 Car Door Finish: Car front(s) and door finish can be independent elevators. Satin stainless steel

.5 Car top to be of wood material clad on both sides with a natural finish aluminum panel.

.6 Ceiling Type:

.1 Aluminum Eggcrate [DC22E Ceiling] suspended ceiling shall consist of aluminum eggcrate diffusers set in frame of extruded aluminum with fluorescent lighting fixtures.

.7 Emergency Car Lighting: An emergency power unit employing a 6 volt, sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car and provide current to the emergency siren in the event of building power failure.

.8 Emergency Pulsating Siren: Siren mounted on top of the car that is activated when the Alarm button in the car operating panel is engaged. Siren shall have a rated sound pressure level of 80 dba at a distance of 3.0 m from the device. Siren shall respond with a delay of not more than 1 second after the switch or push button has been pressed

.9 Exhaust Fan: An exhaust fan shall be mounted on the car top.

.10 Utility Outlet: A 125V 15 amperes utility outlet with ground-fault circuit-interrupter protection shall be furnished on top of the cab.

.11 Handrail:

.1 Rectangular Tubular Metal Bar DH50 Handrails 1/2" (13 mm) x 1-1/2" (38 mm) in stainless steel.

.12 Threshold: aluminum.

2.6 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

.1 Car-Operating Panel: A panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. Raised markings **Braille** markings shall be provided for each push-button.

.2 Car Fixture Finish: satin stainless steel.

.1 [Series 2 Fixtures] Applied car operating panel shall be furnished. It shall contain a bank of round mechanical illuminated buttons marked to correspond to the landings served, an emergency call button, door open and door close buttons, and switches for lights, inspection and the exhaust fan. The emergency call button shall be connected to a bell that serves as an emergency signal. All buttons to have both raised and Braille markings. LED (red) button illumination with 1/8" projecting target. All buttons to be stain stainless steel.

.3 Car Position Indicator: A 16-segment, digital, vacuum fluorescent car position indicator shall be integral to the car operating panel.

.4 An ADA compliant communication device shall be provided which has been designed in response to ADAAG requirements integral with the car operating panel.

.5 Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.

.6 Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Raised markings shall be provided for each push-button. Otis series 5.

.7 Fixture Finish**: satin stainless steel.**

.8 Landing Passing Signal: A chime bell shall sound in the car to tell a passenger that the car is either stopping at or passing a floor served by the elevator.

.9 Security Lockout Key switches to disable activation of hall buttons.

Part 3 Execution

3.1 MANUFACTURER□S INSTRUCTIONS

.1 Compliance: Comply with manufacturer□s written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions, and data sheet.

3.2 PREPARARTION

.1 Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.3 INSTALLATION

.1 Installation of all elevator components except as specifically provided for elsewhere by others.

3.4 SITE TESTS

.1 Perform and meet tests required by CAN/CSA-B44.

.2 Supply instruments and execute specific tests.

.3 Furnish test and approval certificates issued by jurisdictional authorities.

3.5 CLEANING

.1 Remove protective coverings from finished surfaces and components.

.2 Clean surfaces and components ready for inspection.

3.6 ADJUSTMENTS

.1 The elevator contractor shall make a final check of each elevator operation with the Owner or Owner’s representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

.2 Adjust door opening and closing times to suit handicapped users in accordance with Engineer's instructions.

.3 Adjust control system to cause elevators to answer hall calls during working day within performance criteria specified.

.4 Adjust for smooth acceleration and deceleration of car as so not to cause passenger discomfort.

.5 Adjust automatic floor levelling feature at each floor.

END OF SECTION

Part 1 General

1.1 GEOTECHNICAL INVESTIGATION

.1 A copy of the geotechnical investigations, reports and borehole logs are enclosed in Binder C "Architectural Details & Geotechnical Report".

1. Geotechnical Investigation

Proposed Mayfield West #2 Public School, Caledon, Ontario
Prepared by: Forward Engineering & Associates Inc.
Date: August 8, 2025
Proj. Ref. No. 7460 R1

2. Soil Chemical Testing Report

Prepared by: Forward Engineering & Associates Inc.
Date: February 1, 2025
Proj. Ref. No. 7460

1.2 DISCLAIMER

.1 The Geotechnical Report is not part of the Contract Documents prepared by the Architect or his sub consultants. It is bound into the Specifications set for convenient reference only. The Geotechnical report was not prepared by or under the supervision of the Architect. While every effort has been made to attempt to provide comprehensive geotechnical information for the purposes of design and tendering, the Architect claims no responsibility for the accuracy of the information contained in the report.

.2 Refer to Section 00 21 13 – 'Instruction to Bidders', Examination of the Site.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1	Summary of Work – Phasing and Sequencing	Section 00 22 00
.2	Site Grading	Section 31 23 13
.3	Excavating, Trenching and Backfilling	Section 31 23 10

1.2 SCOPE

.1 Refer to survey, site layout, site servicing, landscape and grading drawings and Geotechnical Report.

.2 Work to this section is anticipated to be carried out under a Site Alteration Permit (Fill Permit).

1.3 EXAMINATION

.1 Examine the Drawings, Specifications, and Geotechnical Report which summarize site soil conditions. Visit the site and determine the work extent and nature of the existing conditions. In no circumstances will any claims against the Owner be allowed resulting from failure to ascertain the work herein described or implied.

.2 Report to the Consultant in writing any conditions which will prejudice the proper completion of the work of this Section. Commencement of work constitutes acceptance of existing conditions.

1.4 BURIED SERVICES

.1 Before commencing work confirm no buried services remain on the site and locate all services adjacent to the site. Engage private locate firm for underground scan for all areas of work outside the property lines.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.

1.5 PROTECTION

.1 Establish locations of all electrical, telephone, or other service installations existing in the areas of site preparation by contacting the service owners and obtaining their approval to work in such areas. Contact the Municipality, the Region of Peel and local utilities to review proposed scheduling, work activities and regulations pertaining to all work beyond the limits of the property including but not limited to parking areas, storm water outlet and headwall and asphalt driveway entrances. Provide adequate markers or take protective measures to ensure that no damage will be caused under this Section. Repair or replace damaged work as required without cost to the Owner.

.2 Electronically locate, map and record location of services prior to doing any excavation.

1.6 DUST CONTROL

.1 Provide and maintain to the Consultant's satisfaction, adequate system to avoid any nuisance caused by dust and dirt rising throughout the area of operations.

1.7 SILT CONTROL

.1 Refer to site Plans and any approved Plans issued with the Site Alteration Permit.

.2 Provide and maintain to the Consultant's and to the Authorities' satisfaction, control systems to prevent silt from entering any storm drainage system.

Part 2 Products

2.1 NOT APPLICABLE

Part 3 Execution

3.1 DISPOSAL OF WASTE AND SURPLUS MATERIALS

.1 Except where specified or indicated on Drawings to be retained on site, or to be reused, remove from the site, all waste and surplus materials resulting from site preparation work on a daily basis. Dispose of as required in accordance with local or provincial regulations. Under no circumstances shall the burning of rubbish be permitted on the site. Where items are to be reused, store on site where designated and provide temporary protection to same to prevent damage by construction operations.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

.1 Read and be governed by conditions of the Contract and sections of Division 1.

1.2 SITE CONDITIONS

.1 Known underground and surface utility lines and buried objects are indicated on site plan. Underground utility lines or other buried objects not shown on site plan are the responsibility of the Contractor and must be established in location and depth before commencing work.

1.3 PROTECTION

.1 Prevent damage to trees, landscaping, natural features, benchmarks, surface or underground utility lines, which are to remain. Make good any damage.

Part 2 Products

2.1 MATERIALS

.1 Obtain approval of excavated or graded material used in fill for grading work. Protect approved material from contamination.

Part 3 Execution

3.1 GRADING

.1 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Rough grade to depths below finish grades as required to install pavements and landscape treatments. Refer to details for required depths.

.3 Slope rough grade away from building 1:50 minimum.

.4 Prior to placing fill over existing ground, scarify surface to depth of 150mm. Fill all depressions, etc., with approved fill. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.5 Compact filled and disturbed areas to corrected minimum dry density/maximum dry density to ASTM D698-00, Standard Proctor, method C/D, as follows:

.1 90% under soft landscaped areas

.2 98% under paved and walkway areas

.6 Do not disturb soil within branch spread of trees or shrubs to remain.

3.2 TESTING

.1 Inspection and testing of soil compaction will be carried out by designated testing laboratory.

3.3 SURPLUS MATERIAL

.1 Remove surplus material from site as directed by Consultant and in accordance with all municipal with provincial regulations.

.2 Remove material unsuitable for fill, grading or landscaping from site.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 00 22 00 – Summary of Work – Phasing and Sequencing

.2 Section 01 33 00 - Submittal Procedures.

.3 Section 01 56 00 - Temporary Barriers and Enclosures.

.4 Section 01 35 43 - Environmental Procedures.

.5 Section 31 23 13 - Rough Grading.

.6 Section 32 91 21 – Top soil and Finish Grading.

.7 Section 31 05 17 - Aggregate Materials.

.8 Section 32 93 10 - Landscaping and Plant Maintenance.

.9 Section 33 46 20 – Foundation and Underslab Drainage.

.10 Section 32 12 17 – Asphalt Paving.

1.2 REQUIREMENTS OF REGULATORY AGENCIES

.1 Work of this Section shall include protection measures, consisting of materials, constructions, and methods required by the Occupational Health and Safety Act, 1987, of the Province of Ontario, and as otherwise imposed by Jurisdictional Authorities to save persons and property from harm.

.2 Submit shop drawings required by authorities.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C117-95, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-96a, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-98, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698-00a, 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 D1557-00, Test Method 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)

.1 CAN/CSA-A3000-98-A5-98, Portland Cement.

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

1.4 DEFINITIONS

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.

.1 Rock : any solid material in excess of 0.25 m^3 and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 bucket. Frozen material not classified as rock.

.2 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: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.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 Unsuitable materials:

.1 Weak and compressible materials under excavated areas.

.2 Frost susceptible materials under excavated areas.

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

.7 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.

1.5 SUBMITTALS

.1 Samples:

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

.2 Inform Consultant at least 2 weeks prior to commencing Work, of proposed source of fill materials and provide access for sampling.

.3 Submit 25 kg samples of type of fill specified including representative samples of excavated material.

.4 Ship samples prepaid to Inspection firm, in tightly closed containers to prevent contamination.

1.6 QUALITY ASSURANCE

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

.2 Where Consultant/Engineer is employee of Contractor, submit proof that Work by Consultant/Engineer is included in Contractor's insurance coverage.

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

.4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Ontario, Canada.

.5 Keep design and supporting data on site.

.6 Engage services of qualified professional Engineer who is registered or licensed in Province of Ontario, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard and place in designated containers.

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

.3 Ensure emptied containers are sealed and stored safely.

1.8 PROTECTION OF EXISTING FEATURES

.1 Refer to *Section 01 11 00 – 'Summary of Work – article 1.5 Existing Conditions'* and *Section 31 23 13 – 'Rough Grading'* for requirements to provide underground scan in addition to service locates for all areas of work beyond the property lines.

.2 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

.3 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 commencing excavation Work, notify applicable Owner or authorities having jurisdiction, establish location and state of use of buried utilities and structures. Owners or authorities having jurisdiction 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 as indicated.

.5 Ensure that adjacent property is not damaged in any way by excavating and grading work; by the removing, stockpiling and transporting of materials; by blown sand and dust or by spillage during the removing, stockpiling and

transporting of materials; by the collapse or movement of excavated banks and stockpiles; or by storm water from altered drainage course.

.6 Ensure that no damage is caused by earthwork to existing structures, trees, buried and above-ground services, bench marks, and survey monuments on the site, or adjacent property. Arrange or ensure that all damage which occurs is repaired completely and immediately.

.7 Protect newly-graded areas from the action of the elements. Repair settlement and washouts that occurs before acceptance of the work, and re-establish grades to the required elevations and slopes. Fill to required subgrade levels any area where settlement occurs.

.8 Bail or pump all water out of excavation, from whatever cause, as it accumulates. Take all necessary measures to prevent flow of water and earth fines into the excavation.

.9 Support existing buildings, walks, roads, and services, and prevent cave-ins of excavated banks. A Professional Engineer specializing in this work shall design all protection. Provide shop drawings for authorities as required.

.10 Temporarily cover all existing catchbasins and manholes to prevent entry of earth or debris.

.11 Electronically locate underground services such as electrical and telephone lines, gas and water and sewer lines. Mark line of services with yellow ribbons or stakes with tip fluorescent painted, and indicating both plan location and depth.

.12 Protect the bottom and sides of the excavated pits and trenches from exposure to sun and rain to prevent cave-ins and softening of the bed upon which concrete and drains rest.

1.9 DUST CONTROL

.1 Provide and maintain adequate system to avoid any nuisance caused by dust and dirt rising throughout the area of operations. The use of calcium chloride is prohibited.

1.10 UNIT PRICES REQUESTED IN TENDER FORM

.1 For excavation, prices shall include excavation and disposal and units shall represent material measured in its original position by cross-sectioning of the area excavated. Volumes will be computed from the cross-section measurements by average end area method.

.2 For fill, prices shall include material, compacted to specified degree and measured in place.

Part 2 Products

2.1 MATERIALS

.1 NOTE: No recycled material is permitted.

.2 Fill "A": Granular material meeting OPSS Material Specification for Aggregates, Form 1010, Granular "A" to be clean, graded 19mm angular, natural clear stone from approved source, free from shale, clay and friable materials and organic matter and containing no more than 10% passing the No.4 sieve Minimum compaction density 98% Standard

Proctor. For use as bedding material and as moisture barrier under concrete slab on grade.

.3 Fill "B": Granular material meeting OPSS Material Specification for Aggregates, Form 1010, Granular "B"-Type 2. Minimum compaction density 100% Standard Proctor. For use primarily as fill under building slab on grade and paving areas up to underside of sub-base elevation.

.4 Fill "C": Site (native) material, containing no organic or foreign matter, and which the Contractor can demonstrate is compactable to a density of 95% Standard Proctor. Minimum compaction density: 95% Standard Proctor under landscaped areas. For use primarily as fill under playfields areas.

.5 Fill "D": Refer to Section 32 12 17 –'Asphalt Paving' for 50 mm Crushed limestone sub-base and 19 mm crushed limestone base course used under paved areas.

.6 "Fill E": Imported fill for general site areas. Imported fill shall be clean, free of organic material and rocks, shale and cobbles, and Contractor to supply environmental documents, including results of sufficient number of chemical tests, to ensure that the fill meets Reg 153/04 (2011)-Table 1 Residential/Industrial. Approval to proceed with importing the fill to the Site will only be issued following review and acceptance by our Consultant.

.7 Impervious Fill: Fine grain material such as clay, which is relatively impervious to the flow of water.

.8 Crushed Stone Fill Under Slabs on Grade: Clean, Graded 19mm angular, natural clear crushed stone from approved source, free from shale, clay and friable materials and organic matter and containing no more than 10% passing the No.4 sieve.

Part 3 Execution

3.1 SITE PREPARATION

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

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

.3 Refer to geotechnical investigation report provided in specification Binder C, for data regarding required removal of organic soils and fill/disturbed soils with noticeable amounts of organics, as these are to be removed and the base thoroughly proof-roller. Any soft spots revealed during proof-rolling are to be sub-excavated, backfilled and adequately compacted.

.4 As recommended by the Forward Engineering as a clarification to the Geotechnical Report provided in specification Binder C, the following to be followed for the site preparation and upfill requirements:

1. Remove all vegetation in area of proposed building and asphalt, and dispose (approximately 100mm deep). Remaining fill to be proof-rolled.

2. Building area to be upfilled as required with “Fill B” (Granular B, Type 2).

3. 150mm depth of 19mm clear stone is to be placed under the building area floor slab, as a drainage vapour barrier.

4. Asphalt area to be upfilled to underside of sub-base as required with native Fill “C” or imported Fill “E”.

3.2 EXAMINATION

.1 Ensure in examination of the site that all possible factors concerning earthwork are investigated, and that the following are known in particular:

.1 Methods and means available for material handling, disposal, storage, and transportation.

.2 Physical conditions of site, including ground water table and drainage courses.

.3 Conformation and condition of ground surfaces.

.4 Character, quality, and quantity of surface and subsurface materials.

3.3 SOIL INVESTIGATION

.1 Soil investigation of the site was carried out by other consultants engaged by the Owner for the purpose of guidance in design and construction. A report and bore hole log on this investigation were prepared and are provided for information purposes. No responsibility is assumed by the Owner or Architects for the scope, accuracy, or interpretation of the soil investigation report. Be responsible for adjusting estimates to incorporate conditions identified or reasonably inferred in the report, as documented in the Geotechnical Data.

3.4 STOCKPILING

.1 Stockpile fill materials in areas designated by Engineer Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

.1 Obtain permit from authority having jurisdiction for temporary diversion of water course.

.2 Construct temporary Works to depths, heights and locations as directed by Engineer.

.3 During backfill operation:

.1 Unless otherwise as indicated or as directed by Engineer, remove sheeting and shoring from excavations.

.2 Do not remove bracing until backfilling has reached respective levels of such bracing.

.3 Pull sheeting in increments that will ensure compacted backfill is maintained at an elevation at least 500 mm above toe of sheeting.

.4 When sheeting is required to remain in place, cut off tops at elevations as indicated.

.5 Upon completion of substructure construction:

.1 Remove cofferdams, shoring and bracing.

.2 Remove excess materials from site and restore water courses as indicated and as directed by Engineer.

3.6 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

.2 Dewater the site as necessary for the installation of the work, by providing a series of temporary trenches/pits and pumping as necessary. Backfill temporary trenches/pits and restore area when dewatering is no longer required.

.3 At no additional cost to the Owner, dewater the site as necessary to maintain the schedule and protect the work. Ensure the water pumped from site does not contaminate sewers municipal or on site sewer system. If required, arrange and pay for the cost of flushing sewers used for dewatering drainage routes.

.4 Submit for Engineer's approval details of proposed dewatering or heave prevention methods, such as dikes, well points, and sheet pile cut-offs.

.5 Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

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

.7 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures and in manner not detrimental to public and private property, or any portion of Work completed or under construction.

.8 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, water courses or drainage areas.

3.7 EXCAVATION

.1 Advise Engineer at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Perform bulk excavation and detailed excavation for construction of building (and for installation of mechanical and electrical services). Excavate beyond wall faces sufficiently to allow removal of forms, if applicable, but generally no more than 900 mm beyond centre of wall. Do not re-fill over excavated areas with materials removed, nor any other material without the approval of the Consultant. Excavation and disposal of boulders is part of this section.

.3 Remove disturbed earth displaced by adjacent construction.

.4 Notify the Consultant of completion of excavation work and before any concrete or fill is placed on the bearing strata, in order that he may inspect the exposed bearing surfaces.

.5 If the Consultant requires additional excavation below the elevation indicated or specified, such additional excavation and disposal will be paid for on the basis of unit prices quoted in the Bid Form. Units of measurements will be those given for the unit

prices, and shall be measured in their original position and computed by the method of average end areas.

.6 Remove excess and unsuitable excavated materials from the site. Comply with the MOE regulations and those of other regulating bodies, regarding disposal of contaminated soil.

.7 Blasting is prohibited, except upon written permission of Consultant. Rock removal, if required, shall be by means of Ram Splitting equipment only.

.8 Keep all surfaces against which concrete, unit masonry or fill is to be placed free from frost. Thaw out frozen surfaces against which concrete or fill is to be placed to unfrozen depth.

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

.10 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.

.11 Keep excavated and stockpilled materials a safe distance away from edge of trench as directed by Engineer.

.12 Restrict vehicle operations directly adjacent to open trenches.

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

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

.15 Notify Engineer when bottom of excavation is reached.

.16 Obtain Engineer approval of completed excavation.

.17 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Engineer.

.18 Surplus Excavated Material and Removals: The Contractor is to make his own arrangements for the disposal of all excavated materials, removals, grindings and all other debris not suitable for re-use in the construction. If the Contractor enters into an agreement with an individual for the use of land for the disposal of excavated materials or for any other reason, a copy of the said Agreement clearly stating the obligation of all concerned and signed by all parties shall be submitted to the Consultant. The Contractor shall comply with the requirements of all Federal, Provincial and Municipal Laws, Acts, Ordinances, Regulations, Orders-in-Council and By-Laws, which could in any way pertain to the work outlined in the Contract. The items in the Form of Tender include all costs for disposal of unsuitable material off the site and the Contractor shall make the arrangements for the disposal of the materials removed in accordance with MOE Reg. 558.

3.8 COMPACTION

.1 Provide, operate and maintain compacting equipment necessary to achieve the compaction densities specified.

.2 Compact fill until the required density is achieved. Do not compact material containing frost.

.3 Fill hollows and depressions which develop under compaction with matching backfill material. If the base becomes rutted or displaced due to any cause, regrade the surface.

.4 Compact backfill by means of vibratory type equipment capable of achieving the desired degree of compaction. Use manually operated vibratory tampers in the proximity of foundations and in areas not readily accessible to roller equipment. Make good damage to the structure due to compaction and settlement of fill. Report damage to foundations promptly to the Consultant. Obtain approval of remedial procedures.

3.9 BACKFILLING

.1 Plug unused services such as drains, sewers, field tile, and service pipes uncovered by excavation.

.2 Backfill at foundation walls only after they have been approved by Consultant.

.3 Backfill with 200 mm deep layers of fill or as specified, each consolidated before the next is placed.

.4 Backfill to mechanical and electrical service trenches as specified in the electrical and mechanical specifications.

.5 When backfilling both sides of walls, place fill simultaneously on both inner and outer faces to balance pressure on wall.

.6 Where walls are to be backfilled on one side only, commence backfilling only when the ground floor structural members are in place, if applicable, or adequate bracing is provided for top and bottom of foundation walls.

.7 Compact fill to densities specified for material requirements.

.8 Do not proceed with backfilling operations until [Engineer] [Consultant] has inspected and approved installations.

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

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

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

.12 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 Place layers simultaneously on both sides of installed Work to equalize loading.
- .4 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 Engineer.

.2 If approved by Engineer erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Engineer.

.13 Install drainage system in backfill as directed by Consultant.

3.10 FILL UNDER FLOOR SLABS

.1 Prior to filling, proof-roll existing earth subgrade in order to identify inconsistencies or soft areas. Proceed with filling operations only after inconsistencies or soft areas have been reworked and compacted or excavated, backfilled and compacted as required to eliminate such conditions.

.2 Avoid proof-rolling close to caissons, columns, walls and other structures within the confines of the proof rolling operations.

.3 Prior to placing fill, ensure existing ground is compacted to 98% Standard Proctor density.

.4 Place approved fill under floor slabs as soon as foundation walls are completed to floor level and mechanical and electrical services are installed in trenches.

.5 Place fill in layers of 150mm maximum, and consolidate each before placing next layer.

.6 Compact fill to density specified for material requirements with a heavy vibrating roller. Compact fill adjacent to walls, piers, or wherever else heavy roller equipment cannot approach, with mechanical tampers to equivalent density. Dig out soft spots and re-fill and compact to specified density.

.7 Where undisturbed soil surface is low below areas of slab-on-grade, bring level up to within 200 mm of underside of slab fill with Fill "B". Do not use fill “C” within building area.

.8 Backfill trenches to within 200 mm of underside of slab fill with Fill "B".

.9 The final 200 mm layer under slabs shall be 19mm angular, natural clear stone, as specified. Place crushed stone in maximum 100 mm layers and compact to min. 98% Standard Proctor Density.

3.11 FILL UNDER PAVED AREAS

.1 Prior to filling, proof-roll existing earth subgrade in order to identify inconsistencies or soft areas. Proceed with filling operations only after inconsistencies or soft areas have been reworked and compacted or excavated, backfilled and compacted as required to eliminate such conditions.

.2 Avoid proof-rolling close to caissons, columns, walls and other structures within the confines of the proof rolling operations.

.3 Prior to placing fill, ensure existing ground is compacted to 98% Standard Proctor density.

.4 Place specified granular fill in layers of 150mm maximum, and consolidate each before placing next layer, up to underside of pavement sub-base elevation.

.5 Compact fill to density specified for material requirements with a heavy vibrating roller. Compact fill adjacent to walls, piers, or wherever else heavy roller equipment cannot approach, with mechanical tampers to equivalent density. Dig out soft spots and re-fill and compact to specified density.

3.12 FILL UNDER PLAYFIELDS AND LANDSCAPED AREAS

.1 Construction access, contractor parking areas and Portables Area are intended to be reinstated in time for sod to have a minimum of 6 weeks to "take" prior to Fit for Occupancy. Identify this target date on the project schedule. Conduct site work and schedule accordingly to complete work related to sodding these areas as early as possible prior to contract completion.

.2 Use Fill "C" native site material for fill under the landscaped areas as indicated on drawings. Fill Type "E" may be considered for use, subject to all of the conditions being met as outlined above.

.3 Prior to placing fill, ensure existing ground is compacted to 95% Standard Proctor Density.

.4 Place fill in layers of 300 mm maximum and consolidate each before placing next layer.

.5 Compact Fill "C" to minimum 95% Standard Proctor Density under playfields.

3.13 RESTORATION

.1 Upon completion of Work, remove waste materials and, trim slopes, and correct defects as directed by Consultant.

.2 Place topsoil as directed by Consultant.

.3 Reinstate lawns to elevation which existed before excavation.

.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 Consultant.

.6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

.7 The Owner will engage the services of an Inspection and Testing Company to verify that work conforms to the requirements of the specifications.

.8 The Contractor shall cooperate fully with the testing and inspection company.

.9 The Contractor shall maintain its own quality control program to ensure that its work conforms to the drawings and specifications.

.10 Submit 4 kg. samples of the fill materials to the inspection and testing company at least 10 days prior to commencement of backfill operations. Materials tested and approved shall constitute a standard for the acceptance of material delivered to the site.

.11 The inspection and testing company shall be responsible for the following work:

.12 Determine the depth of unsatisfactory material, if any, to be removed.

.13 Inspect and approve the sub-grade prior to commencement of backfill operations.

.14 Test and approve the proposed backfill materials.

.15 Be present full time during operations in order to inspect and approve the methods of placing and compacting and to carry out the necessary tests to determine the Proctor Density of the backfill and the actual field densities being obtained. Take sufficient tests to ensure that adequate information is obtained to judge the uniformity of compaction. Inspect all piping and conduit in place in trenches prior to backfilling to ensure correct slope and placement as designed.

.16 Check the quality of backfill being delivered to the site.

.17 Check the depth of granular fill.

.18 Confirm bearing elevations. Confirm and record spot elevations of all piping at critical locations to confirm design depths and slopes.

.19 Check installation of weeping tile.

.20 Issue reports to the Consultant tabulating test results and giving final approval and suggestions as to the backfilling and compaction operation.

.21 The cost of such inspection and testing shall be paid for under the Fill and Compaction Testing Allowance specified in Section 01 11 00- Summary of Work. The cost of retesting unacceptable compaction shall be borne by this Section.

3.14 INSPECTION AND TESTING

.1 Refer to Section 01 11 00- Summary of Work, Section 1.29.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work-*Phasing and Sequencing*

.2 Section 013543 – Environmental Protection.

.3 Section 329121 – Topsoil and Finish Grading.

.4 Section 329310 – Planting of Trees, Shrubs and Ground Covers.

.5 Section 31 23 10 - Excavation, Trenching and Backfilling.

.6 Section 33 46 20 – Foundation and Underslab Drainage .

.7 Section 033000 – Cast-in-Place Concrete.

.8 Section 32 12 17 – Asphalt Paving.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D698-[91(1998)], Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m ^{3}).

1.3 EXISTING CONDITIONS

.1 Contractor shall coordinate and obtain required separate Temporary Road Occupancy Permit and Fill Permits for all work.

.2 For work to public boulevard areas outside the property line. Refer to *Section 00 11 00 – 'Summary of Work, article 1.5 Existing Conditions*' for permit requirements prior to construction.

.3 Contractor is responsible to coordinate with Site Plans, Structural Drawings and Specifications to determine depths of foundations and grade levels to be reached as Part of Phase 1 operations, prior to issuance of Building Permit. Refer to Geotechnical Report and all site plans.

.4 Contractor is responsible to quantify all on-site material to achieve design grades and is responsible for the importation or exportation of material from the site as required.

.5 Any known underground and surface utility lines and buried objects are indicated on site plan. Confirm exact locations of utility lines and buried objects prior to machine excavation or grading. In addition to all utility locates, contractor shall conduct engage a private locate company to conduct an underground scan for all areas of grading and excavation outside the property lines.

1.4 PROTECTION

.1 Protect and/or transplant existing trees, landscaping, natural features, bench marks, pavement, surface or underground utility lines which are to remain as directed by Consultant. If damaged, restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

Part 2 Products

2.1 MATERIALS

.1 Fill material to all parking and driveway areas, asphalt and concrete paving areas and building pad: OPSS Granular B-Type 2 in accordance with of Section 31 23 10 - Excavating, Trenching and Backfilling.

.2 Excavated or graded material existing on site may be suitable to use as fill for grading work if approved by Consultant and uncontaminated type of existing materials meets the requirements herein for stated locations.

Part 3 Execution

3.1 STRIPPING OF TOPSOIL

.1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected as determined by Consultant

.2 Examine the site and determine the extent of areas previously stripped and approximate depth of remaining topsoil, if any.

.3 Strip the topsoil from the site as part of the work in this Section.

.4 Remove top soil from areas to be excavated, paved and regraded.

.5 Strip top soil when dry enough to prevent contamination of subgrade.

.6 Contractor is responsible to quantify all on-site material to achieve design grades and is responsible for the importation or exportation of material from the site as required. Existing excess topsoil, if any, must be quantified before tender and may be re-used for general sodded areas as described in Section 32 91 21 Topsoil Placement and Grading.

.7 Remove from site existing grass and vegetation and surplus top soil, if any.

3.2 BULK FILL & ROUGH GRADING

.1 Refer to site plans (SP1, SC1, SG1, and L1) and related details and specification sections and note the initial permit will include rough grading only and not site servicing or foundation or building work.

.2 Begin rough grading operation only after all sedimentation measures have been established and inspected.

.3 The Contractor shall use the information shown on the site plan, the grading plan, the Geotechnical Report, as well as the information observed during visits to the site during the Tender Period, as the basis for the "Existing Conditions" of the site and to determine the extent of engineered fill in the building area to be completed as part of Phase 1, based on his approach to foundation construction.

.4 Rough grade to levels, profiles, and contours allowing for surface treatment as indicated. Ensure that rough grading operations to not promote water ponding in construction areas. Level depressions outside the building area with Type “D” for paved areas. Fill “E” or Type “C” may only be used fill if suitable moisture content and compaction can be demonstrated.

.5 Perform construction grading to allow proper construction access to the work.

.6 Grade to prevent water ponding on site during construction period. Create additional ditches, swales, slopes, ponds, etc. as required by Contract Documents and Municipal Authorities for control of drainage, sedimentation and topsoil retention.

.7 Unless suitable uncontaminated fill or cut has been completed by previous contract, rough grade to following depths below finish grades:

.1 200 mm for grassed areas.
.2 400 mm for flowerbeds.
.3 450 mm for shrub beds.
.4 600 mm for heavy asphalt paving.
.5 540 mm for medium duty asphalt paving.
.6 275 mm for concrete walks.
.7 Maximum tolerance for rough grade elevation : .+- 25 mm

.8 Slope rough grade away from building 1:50 2 % minimum.

.9 Grade swales and ditches to depths as indicated.

.10 Prior to placing fill over existing ground, scarify surface to depth of 150 mm. Maintain fill and existing surface at approximately same moisture content to facilitate bonding.

.11 Compact filled and disturbed areas to maximum dry density to ASTM D698, as follows:

.1 95% under landscaped areas.
.2 98 % under paved and walk areas.

.12 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 TESTING

.1 Inspection and testing of soil compaction will be carried out by testing agency hired by the owner.

.2 Tests to be conducted on imported soils and provided by a ULC designated laboratory prior to bringing to and placing on the site.

.3 Costs of tests will be paid under a Cash Allowance. Refer to Section 01 11 00 – Summary of Work.

.4 Submit testing procedure, frequency of tests, [testing laboratory as designated by ULC or certified testing personnel to Consultant for approval and review.

3.4 SURPLUS MATERIAL

.1 Remove surplus material and material unsuitable for fill, grading or landscaping as directed by Consultant and Municipal Authorities.

.2 Include for removal and disposal of asphalt driveways, excess fill, rubble, etc. beyond property lines within work areas shown on site plans

.3 Confirm locations on site prior to tender.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work.

1.2. Related Work

1. Aggregates — Section 31 05 17

1.3. References

1. ASTM D4791-10, Test Method for Flat or Elongated Particles in Coarse Aggregate.
2. Ontario Provincial Standard Specification 1001.

2. PRODUCTS

2.1. Materials

1. Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
2. Geotextile for siltation control fence shall be Class I non-woven geotextile fabric in accordance with OPSS PROV 1860.

2.2. Source Quality Control

1. Inform Consultant of proposed source of aggregates and provide access for sampling at least four weeks prior to commencing production.
2. If, in opinion of Consultant, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
3. Advise Consultant four weeks in advance of proposed change of material source.
4. Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

3. EXECUTION

3.1. Installation

1. Silt Control Fence
    1. Install silt control fence along construction site perimeter including tee bars, geotextile filter fabric, clear stone along the upstream side of the fence in the instance the ground is frozen.

3.2. Maintenance

1. Maintain silt control fencing for the duration of the construction and replace as required until the site is stabilized.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Town of Caledon Tree Preservation Standard No. 707, dated June 2008

.2 Town of Caledon Tree Preservation Standard No. 710, dated August 2017

.3 Town of Caledon Tree Preservation Standard No. 711, dated August 2017

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide monthly written reports on maintenance during construction period, to Consultant identifying:

- .1 Maintenance work carried out.
- .2 Development and condition of plant material.
- .3 Preventative or corrective measures required which are outside Contractor's responsibility.

1.3 QUALITY ASSURANCE

.1 Contractor

- .1 The Contractor shall carry out all works to proper arboricultural and horticultural standard practices.
- .2 The Contractor shall ensure that the hoarding is erected beyond the drip line of the trees and root systems of the trees to be protected.
- .3 The Contractor shall supervise all work in this section including implementation and maintenance until final acceptance.
- .4 The Contractor shall obtain approvals for suppliers, sub- contractors and all materials to be used in this section of Work.
- .5 Comply with the Town of Caledon, details and requirements for tree protection.

.2 Maintenance

- .1 Maintain all hoarding and accessories until final acceptance of Work. Maintenance includes all measures necessary to protect the existing trees.
- .2 Remove any garbage and foreign debris from the tree protection zone, daily.
- .3 Irrigate during drought conditions, June to September.

1.4 PRODUCT DELIVERY, STORAGE, & HANDLING

.1 Deliver hoarding in a timely manner prior to commencement of construction.

.2 The Contractor shall not be responsible for the cost of replacements resulting from theft, vandalism, carelessness or neglect on the part of others or any other causes due to circumstances beyond his control.

1.5 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by The Town of Caledon to end of warranty period, perform following maintenance operations, if recommended by Consultant.

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Remove dead, broken or hazardous branches from plant material to proper arboricultural and horticultural standard practices.

.2 Apply mulch over root zone.

Part 2 Products

2.1 MATERIALS

.1 Fencing: orange plastic snow fence, 1.2 m high.

.2 Stakes and braces: metal ‘T’ bars, 2400mm length.

.3 Siltation fence: woven geotextile with minimum equivalent opening size of 0.15mm and a maximum opening equivalent opening size of 0.25mm by Terrafix, Terrafence or approved equal.

.4 Tree Protection Zone Sign: 40x60mm white PVC foam board or equivalent

.5 Conform to Municipal details and requirements.

Part 3 Execution

3.1 INSPECTION

.1 Verify areas to receive work in this section and report any conditions or defects encountered to the Consultant. before Work commences.

.2 Do not commence Work until hoarding has been approved.

3.2 PROTECTION AND PRESERVATION OF EXISTING VEGETATION

.1 As indicated on TP100 and TP101, Town of Caledon Standards.

3.3 FINAL ACCEPTANCE

.1 Remove tree preservation fencing upon review and approval of the Town of Caledon.

END

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 31 23 13 - Rough Grading.

.3 Section 31 23 10 – Excavation, Trenching and Backfilling.

.4 Section 03 30 00 – Cast-in-Place Concrete.

1.2 REFERENCES

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

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

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.5- [M91 (March 1999)], Low Flash Petroleum Spirits Thinner (Reaffirmation of December 1991).

.2 CAN/CGSB-1.74- [2001], Alkyd Traffic Paint.

.3 Government of Québec, Minister of Transport

.1 Cahier des charges et devis généraux (CCDG)-[97].

.4 Ontario Provincial Standard Specifications (OPSS)

.1 OPSS 302-[April 1999], Construction Specification for Primary Granular Base.

.2 OPSS 310-[March 1993], Construction Specification for Hot Mixed, Hot Laid Asphaltic Concrete Paving and Hot Mix Patching.

.3 OPSS 314-[December 1993], Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder and Stockpiling.

.4 OPSS 1010-[March 1993], Material Specification for Aggregates, Granular A, B, M and Select Subgrade Material.

.5 OPSS 1103-[February 1996], Material Specification for Emulsified Asphalt.

.6 OPSS 1150-[May 1994], Material Specification for Hot Mixed, Hot Laid Asphalt Concrete.

1.3 SAMPLES

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

.2 Submit to Consultant, samples of material for sieve analysis at least 2 weeks before beginning Work.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

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

.3 Divert unused aggregate materials from landfill to facility for reuse as approved by Consultant.

.4 Dispose of unused paint and paint thinner materials at official hazardous material collections site as approved by Consultant.

.5 Fold up metal banding, flatten and place in designated area for recycling.

.6 Do not dispose of unused paint and paint thinner material into sewer system, into streams, lakes, onto ground or in other location where it will pose health environmental hazard.

.7 Divert unused asphalt from landfill to facility capable of recycling materials.

1.5 EXTENDED WARRANTY

.1 Submit a warranty for asphalt paving installation, covering materials and labour and the repair or replacement of defective work in accordance with the Contract, but for two (2) years total.

Part 2 Products

2.1 MATERIALS

.1 Sub-Base**:** Suitably compacted native material only where approved density and drainage is achieved**.** Otherwise in upfill locations use Fill type"B" where required to reach design elevations.

.2 Base: 50 mm and 19 mm graded, crusher run limestone to depths indicated on AD details.

.3 Heavy Duty Pavement for Parking and Driveways**:** Hot mix, hot laid asphaltic concrete HL8 and HL3, mixture conforming to O.P.S.S. #1150.05.

.4 Medium Duty Pavement for Play Areas, Parking (where indicated on Site Plan) and Walkways**:** Hot mix, hot laid asphaltic concrete HL8 and HL3, mixtures conforming to O.P.S.S. #1150.05.

.5 Joint Painting Material**:** SS-1 emulsion in accordance with O.P.S.S. #1103.05.

Part 3 Execution

3.1 PREPARATION

.1 Regard locations and instructions on drawings. Report any discrepancies or questions to the Consultant prior to proceeding with the work. In particular pay attention to the exact delineation of all edges of pavement and types of pavement;

.2 Set out work in accordance with lines and levels shown on Drawings. Maintain such lines and levels through duration of work. Ensure positive drainage toward catch basins is maintained in all areas.

.3 Compact sub-grade to a minimum of 98% Standard Proctor density.

.4 Paint exposed edge of asphaltic joints, edge of manhole and catchbasin frames, curbs and similar items with SS-1 emulsion.

3.2 INSTALLATION

.1 Inspect site grades prior to installation. Review the precise grade requirements required on the grading plan. Review with the Consultant prior to installation if any conditions

exist that may cause deviations from grades shown on Drawings. Coordinate catchbasin elevations with those shown on Mechanical site plan.

.2 **Pavement Section:**

.1 Heavy Duty: at all parking and driveway areas (refer also to AD 200)

.1 Minimum 300 mm compacted thickness of 50 mm Crusher-Run Limestone, compacted to 100% Standard Proctor Maximum Dry Density (SPMDD), ASTM-D698.

.2 150 mm compacted thickness Base course of 19 mm crusher run limestone compacted to 100% SPMDD.

.3 65 mm compacted thickness of granular asphalt HL8.

.4 40 mm compacted thickness of granular asphalt HL3.

.2 Medium Duty: at rear and side yard play and walkway areas noted on Site Plans.(refer also to AD 200)

.1 Minimum 200 mm compacted thickness of 50 mm Crusher-Run Limestone, compacted to 100% Standard Proctor Maximum Dry Density (SPMDD), ASTM-D698.

.2 150 mm compacted thickness Base course of 19 mm crusher run limestone compacted to 100% SPMDD.

.3 40 mm compacted thickness of granular asphalt HL8.

.4 40 mm compacted thickness of granular asphalt HL3.

.3 Placing Granular Materials:

.1 Exercise due care at all times to prevent granular materials from being contaminated by clay or other types of deleterious materials.

.2 Place materials immediately after sub-grade is inspected by the Architect and as follows:

.1 To required width and thickness indicated on Drawings in layers not exceeding 100 mm compacted thickness crusher run limestone.

.2 Grade each layer and compact to a minimum 100% standard Proctor density to a smoother surface conforming to required cross-section.

.4 Finished surface of granular material must not deviate more than 10 mm from designed grade.

.5 Placing Asphaltic Pavement:

.1 Obtain Consultant's inspection of compacted granular base before commencing asphalt paving.

.2 Air temperature during placing of mixture must be minimum 7 deg. C and rising. Temperature of mixture when spread must be not less than 120 deg. C nor more than 150 deg. C. Do not increase temperature of mixture to offset long distance hauling.

.3 Compact asphaltic mixture as soon as it can bear roller without undue displacement and hairline cracking and continue until all roller marks are eliminated. Speed of roller must at all times be slow enough to avoid displacement of mixture. Keep roller wheels slightly moistened by water to

prevent adhesion of mixture. Excess water will not be permitted. Compact mixture with hot tampers in locations that are not easily accessible to machine roller.

.4 Rolling Procedure:

.1 Initial and final rolling must be accomplished using self-propelled Class "B" roller.

.2 Intermediate rolling must be carried out using self-propelled Class "C" roller or "D" roller. Intermediate roller must follow breakdown roller as closely as possible.

.5 Upon completion of compaction each pavement course must be:

.1 Smooth and true to crown and grade with variation not more than 6 mm from thickness shown on Drawing. Do not place any asphaltic course less than 25 mm thick nor more than 75 mm thick.

.2 Free from depressions exceeding 3 mm as measured with 3 m straight edge paralleling centre line of driveways/aisles.

.3 Compacted to a density not less than 97% Marshall.

.6 Joints:

.1 Cut back bituminous course to its full depth in straight or curved lines as required to expose fresh, straight, vertical surface. Remove broken and loose material.

.2 Asphalt must be placed in such a manner that joint must not be allowed to cool before adjacent asphalt course is applied.

.3 Where paving is comprised of two or more courses, joints must overlap by not less than 600 mm.

.4 Carefully place and compact hot asphaltic material against joints. Correct any unsatisfactory joint before proceeding with work.

.5 Feathering of joints will not be permitted.

.7 Inspection and Testing:

.1 Refer to Section 01 11 00 – Summary of Work, section 1.29.

.2 Field inspections during installation, and core samples of all asphalt areas will be taken as part of Inspection and Testing. If tests show asphalt to be substandard to that specified, all asphalt shall be removed and replaced at the Contractor's expense. Cash credits will not be accepted for work which does not fully comply with drawings and specifications.

3.3 CERTIFICATION OF GRADES

.1 The Contractor is required to provide as-constructed elevations of the parking area to verify that the parking lot has been constructed in accordance with the contract drawings.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 13 02 Landscape Cast-in-Place Concrete

.2 Section 32 14 13 Precast Concrete Unit Paving

1.2 REFERENCE STANDARDS

.1 CSA Group (CSA)

.1 CSA-A23.1-[14] /A23.2-[14] , Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA S269.1-[16] , Falsework and Formwork.

.3 CAN/CSA-S269.3-[M92(R2003)] , Concrete Formwork.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in formwork liners and include product characteristics, performance criteria, physical size, finish, and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store, and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect formwork from damages.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

.1 Use formwork materials to CSA-A23.1/A23.2.

.2 Tubular forms: round, sonotube or

.1 Top of form to be set below or at grade.

.3 Form ties:

.1 For concrete seat walls; snap ties complete with plastic cones and light grey concrete plugs.

.4 Form liner:

.1 Plywood: medium density overlay

.5 Form release agent: Proprietary, non volatile material not to stain concrete or impair subsequent application of finishes or coatings to surface of concrete, derived from agricultural sources, non petroleum containing, low VOC and non-toxic.

.6 Falsework materials: to CSA-S269.1.

Part 3 Execution

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels, and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Fabricate and erect falsework in accordance with CSA S269.1.

.3 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.4 Align form joints and make watertight.

.1 Keep form joints to minimum.

.5 Use 25 mm chamfer strips on external corners and 25 mm fillets at interior corners, joints, unless specified otherwise.

.6 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.7 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.8 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

.1 Remove formwork when concrete has reached 70% of its 28 day design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

.2 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

3.3 CLEANING

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 13 01 Landscape Concrete Forming and Accessories

.2 Section 32 14 13 Precast Concrete Unit Paving

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C260/C260M-[10a(2016)] , Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-[11] , Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M-[16] , Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM C 881/C881M-[15] , Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

.5 ASTM C1017/C1017M-[13e1] , Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.6 ASTM C C1059/C1059M-[13] , Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.

.7 ASTM D412-[16] , Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.

.8 ASTM D624-[2012] , Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.

.9 ASTM D1751-[04(2013)e1] , Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.10 ASTM D1752-[04a(2013)] , Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.2 CSA Group

.1 CSA A23.1/A23.2-[14] , Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-[06-R2016] , Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000-[13] , Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005),

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Cast-In-Place Concrete and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Site Quality Control Submittals:

.1 Provide testing and inspection reports for review by Consultant and do not proceed without written approval when deviations from mix design or parameters found.

.2 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

.3 Shop Drawings:

.1 Submit complete reinforcement shop drawings prepared by a qualified steel supplier indicating, reinforcement sizes, grades, spacing, quantities, locations, concrete cover requirements, bar bending details, laps and coordination with adjoining elements and embedded items.

1.4 QUALITY ASSURANCE

.1 Provide Consultant, minimum 4 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture meet specified requirements.

.2 Minimum 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by Consultant on following items:

.1 Falsework erection.

.2 Hot weather concrete.

.3 Cold weather concrete.

.4 Curing.

.5 Finishes.

.6 Formwork removal.

.7 Joints.

.3 Quality Control Plan: provide written report to Consultant verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

.4 Mock-Ups:

.1 Provide site mock-up for finished concrete indicating forming methods and materials, and procedures proposed to achieve finish as shown on drawings, and to comply with following requirements, using materials indicated for completed work:

.1 Build mock-ups in location and of size as directed by Consultant.

.2 Obtain Consultant's acceptance of mock-ups before starting construction; mock-up used throughout construction period and used as standard of acceptance for subsequent concrete work.

.3 Mock-up may form part of permanent structure when accepted by Consultant; repair or replace unacceptable mock-ups at no additional cost to Owner.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.2 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.1 Modifying maximum time limit without receipt of prior written agreement from laboratory representative and concrete producer as described in CSA A23.1/A23.2. is prohibited.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

1.6 SITE CONDITIONS

.1 Placing concrete during rain or weather events that could damage concrete is prohibited.

.2 Protect newly placed concrete from rain or weather events in accordance with CSA A23.1/A23.2.

.3 Cold weather protection:

.1 Maintain protection equipment, in readiness on Site.

.2 Use such equipment when ambient temperature below 5°C, or when temperature may fall below 5°C before concrete cured.

.3 Placing concrete upon or against surface at temperature below 5°C is prohibited.

.4 Hot weather protection:

.1 Protect concrete from direct sunlight when ambient temperature above 27°C.

.2 Prevent forms of getting too hot before concrete placed. Apply accepted methods of cooling not to affect concrete adversely.

.5 Protect from drying.

Part 2 Products

2.1 MATERIALS

.1 Portland Cement: GU or GUb to CSA A3001.

.1 Supplementary cementing materials: fly ash (max 25%, Class F or CI), slag (Max 50%) or silica fume (max. 10% along or combination not exceeding 35% replacement) in accordance with CSA A3001 and CSA A23.1.

.2 Water: to CSA A23.1.

.3 Aggregates: to CSA A23.1/A23.2.

.4 Admixtures:

.1 Air entraining admixture: to ASTM C260.

.1 Sika AER, as distributed by Sika.

.2 Chemical admixture: to ASTM C494. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.

.5 Curing compound: to CSA A23.1/A23.2.

.6 Premoulded joint fillers:

.1 Bituminous impregnated fibre board: to ASTM D1751.

.7 Weep hole tubes: plastic or galvanized steel.

.8 Concrete Bonding Agents: Latex to ASTM C1059/C1059M.

.9 Reinforcing Steel:

.1 Concrete Seat Walls; #10M or #15M, epoxy coated, placed as indicated on approved shop drawings.

.2 Flush Concrete Edges: two #15M, epoxy coated continuous bars, placed as indicated on drawings.

.3 Flatwork, Unit Paving Concrete Base: WWM 152x152 MW11.1

.10 Granular Base: Granular 'A' in accordance with OPSS 101.05.02.

2.2 MIXES

.1 Mix in accordance with CSA A23.1/A23.2.

.1 Ensure materials used in concrete mix have been submitted for testing and meet requirements of CSA A23.1.

.2 Co-ordinate construction methods to suit concrete mix proportions and parameters.

.3 Identify and report immediately to Consultant when concrete mix design and parameters pose anticipated problems or deficiencies related to construction.

.1 Class of exposure: C-2.

.2 Nominal size of course Aggregate: 19mm

.3 Admixture: chemical to ASTM C494/C494M.

.4 Water to cementing materials ratio (w/cm) : maximum 0.45 to CSA A23.1/A23.2

.5 Air content: 5-8%.

.6 Slump: 75 ± 15mm at time and point of discharge. Maximum 120mm with approved superplasticizer.

2.3 FINISHES

.1 Concrete Seat walls: As indicated on drawings.

.1 Formed finish with steel trowel top and beveled edge to match anti-skate hardware requirements. Light sandblast.

.2 Keep form joints to a minimum.

.2 Raised Concrete Planter:

.1 Formed finish with steel trowel top and beveled edge to match anti-skate hardware requirements or 20mm chamfer on walkway side. Light sandblast.

.2 Keep form joints to a minimum.

.3 Flush Concrete Edges:

.1 Formed finish with steel trowel top and 10mm radius on edges.

.2 Keep form joints to a minimum.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Consultant's approval before placing concrete.

.1 Provide consultant 24 hours minimum notice prior to placing of concrete.

.2 Place concrete reinforcing accurately and secure in place.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitate placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete permitted only after approval of equipment and mix.

.5 Disturbing reinforcement and inserts during concrete placement is prohibited.

.6 Prior to placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, workability, air content, temperature and test samples taken.

.10 In locations where new concrete dowelled to existing work, drill holes in existing concrete.

.1 Place steel dowels and pack solidly with shrinkage compensating grout to anchor and hold dowels in positions as indicated.

.11 Do not place load upon new concrete until authorized by Consultant.

3.2 INSTALLATION/APPLICATION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

.2 Anchor bolts:

- .1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.
- .2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Consultant.
  - .1 Drilled holes: to manufacturers' recommendations.
- .3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.
- .4 Set bolts and fill holes with shrinkage compensating grout.
- .5 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

.3 Finishing and curing:

- .1 Finish concrete to CSA A23.1/A23.2.
- .2 Use procedures as noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface not damaged.
- .3 Use curing compounds compatible with applied finish on concrete surfaces.
- .4 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

.4 Joint fillers:

- .1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant.
- .2 When more than one piece required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.
- .3 Locate and form expansion joints as indicated.
- .4 Install joint filler.
- .5 Use 13 mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12mm of finished slab surface unless indicated otherwise.

3.3 SURFACE TOLERANCE

.1 Concrete tolerance to CSA A23.1, 3mm in 3m using straight edge method.

3.4 FIELD QUALITY CONTROL

.1 Site tests: conduct tests as follows and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

- .1 Concrete pours.
- .2 Slump.
- .3 Air content.
- .4 Compressive strength at 7 and 28 days.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials carried out by testing laboratory to CSA A23.1/A23.2.

.1 Ensure testing laboratory certified to CSA A283.

.3 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

.4 Inspection or testing by Consultant not to augment or replace Contractor quality control nor relieve Contractor of contractual responsibility.

3.5 CLEANING

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END OF SECTION

1. **GENERAL**

1.1 **Related Sections**

1.1.1 Site Plan drawings and Binder C detail drawings.

1.2 **Samples**

1.2.1 Submit a sample panel in accordance with Section 01 33 00 - Submittal Procedures.

1.3 **Warranty**

1.3.1 5 years after the date of installation that the panels purchased shall be free from defects in material and workmanship and shall not split or crack under normal use and conditions.

2. **PRODUCTS**

2.1 **Materials**

2.1.1 Detectable Warning Panels (TWSI)

.1 600mm x 600mm Cast Irong Detectable Warning Tactile Panels

.2 Advantage™ Cast Iron Tacktile Walking Surface Indicator plate system.

.3 ASTM A-48, Class 35B Grey Cast Iron

.4 Cast Iron Alternates approved by consultant.

.5 Install to be approx. 24" x 60" – 72" wide, or as indicated on drawings.

3. **EXECUTION**

3.1 **Installation**

3.1.1 Panels are to be cast in concrete at top of all pedestrian depressed curbs & curb ramps (whether shown on drawings or not) and additional locations where shown on drawings and where required by municipal by-law.

3.1.2 The work shall consist of all labor, material, tools, equipment and services necessary to satisfactorily complete the installation of detectable/tactile warning surfaces in non-vehicular areas, at curb ramps and other locations such as depressed corners, raised crosswalks, raised intersections, borders of medians and islands, the edge of transit platforms, and sidewalks where railroad tracks cross to warn pedestrians of an upcoming change from pedestrian to vehicular way.

3.1.3 Install per manufacturers recommendations.

3.1.4 Expansion joints and control joints shall be located in compliance with manufacturer's recommendations. Joint materials shall follow manufacturer's directions and instructions.

3.1.5 Protect installed products until completion of project. If necessary, protect panels with plywood and an underlayment layer of non-staining, non-woven curing blanket until acceptance of work. Secure plywood if needed.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 13 01 Landscape Concrete Forming and Accessories

.2 Section 32 13 02 Landscape Cast-in-Place Concrete

1.2 REFERENCE STANDARDS

.1 ASTM International, latest edition:

.1 C 33, Standard Specification for Concrete Aggregates.

.2 C 136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 C 140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.

.4 C 144 Standard Specifications for Aggregate for Masonry Mortar.

.5 C 936, Standard Specification for Solid Concrete Interlocking Paving Units.

.6 C 979, Standard Specification for Pigments for Integrally Colored Concrete.

.7 C 1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units

.2 CSA Group

.1 CSA A23.1/A23.2-[09] , Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A179-[04(R2009)] , Mortar and Grout for Unit Masonry.

.3 CSA A231.1/A231.2-[06(R2010)] , Precast Concrete Paving Slabs/Precast Concrete Pavers.

.4 CSA A283-[06(R2011)] , Qualification Code for Concrete Testing Laboratories.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Concrete Pavers:

.1 Samples for verification: Three representative full-size samples of each paver type, thickness, color and finish that indicate the range of color variation and texture expected upon project completion.

.2 Accepted samples become the standard of acceptance for the product produced.

.3 Test results from an independent testing laboratory for compliance of concrete pavers with ASTM C 936.

.4 Manufacturer’s catalog product data, installation instructions, and material safety data sheets for the safe handling of the specified materials and products.

.2 Joint and Setting Bed Sand:

.1 Provide three representative one pound samples in containers of Joint Sand materials.

.2 Provide three representative one pound samples in containers of Setting Bed Sand materials.

.3 Test results from an independent testing laboratory for sieve analysis per ASTM C 136 conforming to the grading requirements of ASTM C 144.

.3 Polymeric Joint Sand:

.1 Test results from an independent testing laboratory for sieve analysis per ASTM C 136 conforming to the grading requirements of ASTM C 144.

.2 Samples for Initial Selection: Provide three representative samples in containers of Setting Bed Sand material, cured and dried, for color selection.

.3 Samples for Verification: Provide three one pound samples in containers of Polymeric Joint Sand.

.4 Base and Subbase Aggregate:

.5 Test results from an independent testing laboratory for sieve analysis per ASTM C 136.

.6 Paving Installation Contractor:

.1 Job references from a minimum of three projects similar in size and complexity. Provide Owner/Client/General Contractor names, postal address, phone, fax, and email address

1.4 QUALITY ASSURANCE

.1 Utilize a Manufacturer having at least ten years of experience manufacturing concrete pavers on projects of similar nature or project size.

.2 Source Limitations:

.1 Obtain Concrete Pavers from one source location with the resources to provide products of consistent quality in appearance and physical properties.

.2 Obtain Joint and Setting Bed Sands from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.

.3 Obtain Polymeric Joint Sand from one source with the resources to provide materials and products of consistent quality in appearance and physical properties.

.3 Paving Contractor Qualifications:

.1 Utilize an installer having successfully completed concrete paver installation similar in design, material, and extent indicated on this project.

.4 Mockups:

.1 Install a 5 ft x 5 ft paver area per each paving pattern.

.2 Use this area to determine surcharge of the Setting Bed Sand layer, joint sizes, lines, laying pattern(s) and levelness. This area will serve as the standard by which the workmanship will be judged.

.3 Subject to acceptance by consultant, mock-up may be retained as part of finished work. Allow 24 hours for inspection of mock-up before proceeding with work.

.4 If mock-up is not retained, remove and dispose legally.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver Concrete Pavers in manufacturer's original, unopened and undamaged container packaging with identification labels intact.

.1 Coordinate delivery and paving schedule to minimize interference with normal use of streets and sidewalks adjacent to paver installation.

.2 Deliver Concrete Pavers to the site in steel banded, plastic banded or plastic wrapped packaging capable of transfer by forklift or clamp lift.

.3 Unload Concrete Pavers at job site in such a manner that no damage occurs to the product or adjacent surfaces.

.4 Store and protect precast concrete units from nicks, scratches, and blemishes.

.5 Replace defective or damaged materials with new.

.2 Store and protect materials free from mud, dirt and other foreign materials.

.3 Prevent Joint and Setting Bed Sand from exposure to rainfall or removal by wind with secure, waterproof covering.

.4 Store Polymeric Joint Sand on elevated platforms, under a cover and/or in a dry location.

1.6 PROJECT/SITE CONDITIONS

.1 Environmental Requirements:

.1 Install Concrete Pavers only on unfrozen and dry Setting Bed Sand.

.2 Install Concrete Pavers only on unfrozen and dry Base or Subbase Aggregate materials.

.3 Install Base or Subbase Aggregates only over unfrozen subgrade.

.4 Install Setting Bed Sand or Concrete Pavers only when there is no heavy rain or snowfall.

.2 Weather Limitations for Polymeric Jointing Sand:

.1 Install Polymeric Joint Sand only when ambient temperature is above 40°F (5°C), under dry conditions with no rain forecast for 24 hours and when surface of pavement is completely dry.

1.7 CONCRETE PAVER OVERAGE AND ATTIC STOCK

.1 Provide a minimum of 5% additional material for overage to be used during construction.

.2 Manufacture to supply maintenance and reinstatement manuals for Concrete Paver units.

Part 2 Products

2.1 CONCRETE PAVERS

.1 Concrete pavers: Artline as manufactured by Unilock or approved equivalent.

.1 Size: 7 unit random bundle, 80mm depth

.2 Shape: Rectangular

.3 Colour: French Grey

.4 Layout Pattern: Running bond

.2 Pigment in concrete pavers: to ASTM C979/C979M.

2.2 JOINT SAND

.1 Provide natural Joint Sand as follows:

.1 Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.

.2 Do not use limestone screenings, stone dust, or sand for the Joint Sand material that does not conform to conform to the grading requirements of ASTM C 33.

.3 Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.

.4 Gradation as shown in Table 1 below:

Table 1 – Joint Sand
Gradation Requirements for Joint Sand

Sieve Size	Natural Sand Percent Passing	Manufactured Sand Percent Passing
No. 4 (4.75 mm)	100	100
No.8 (2.36 mm)	95 to 100	95 to 100
No.16 (1.18 mm)	70 to 100	70 to 100
No.30 (0.600 mm)	40 to 75	40 to 75
No. 50 (0.300 mm)	10 to 30	20 to 40
No. 100 (0.150 mm)	2 to 15	10 to 25
No. 200 (0.075)	0 to 1	0 to 10

2.3 POLYMERIC JOINT SAND

.1 Provide Polymeric Joint Sand as manufactured by:

.1 Alliance Gator G2

.1 Product Type: Dry mix, contains polymeric binding agent, activated with water.

.2 Color: to match paver colour, selected by Consultant from colour chart.

.2 Unicare HP Polymeric Max Sand

.1 Product Type: Dry mix, contains polymeric binding agent, activated with water.

.2 Color: to match paver colour, selected by Consultant from colour chart.

.2 Provide Polymeric Joint Sand meeting the minimum material and physical properties as follows:

.1 Compression Strength: proven resistance to compression of 550 PSI after drying for 7 days under controlled conditions (73°F (23°C) at 50% humidity).

.1 Test sand sample shape: cylinder (2" (5 cm) dia. X 4" (10 cm) high).

.2 Gradation as shown Table 1 above.

2.4 SETTING BED SAND

.1 Provide Setting Bed Sand as follows:

.1 Washed, clean, non-plastic, free from deleterious or foreign matter, symmetrically shaped, natural or manufactured from crushed rock.

.2 Do not use limestone screenings, stone dust, or sand material that does not conform to conform to the grading requirements of ASTM C 33.

.3 Do not use mason sand or sand conforming to ASTM C 144.

.4 Utilize sands that are as hard as practically available where concrete pavers are subject to vehicular traffic.

.5 Conform to the grading requirements of ASTM C 33 with modifications as shown in Table 2 below:

Table 2 – Setting Bed Sand

Gradation Requirements for Setting Bed Sand

Sieve Designation	% Passing for Bedding Sand
3.8 in (9.5 mm)	100
No. 4 (4.75 mm)	95 to 100
No.8 (2.36 mm)	85 to 100
No.16 (1.18 mm)	50 to 85
No.30 (0.600 mm)	25 to 60
No. 50 (0.300 mm)	10 to 30
No. 100 (0.150 mm)	2 to 10
No. 200 (0.075)	0 to 1

2.5 CONCRETE UNDERLAYMENT

.1 Refer to Section 32 13 02 Landscape Cast-in-Place Concrete.

2.6 CLEANING COMPOUND

.1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete pavers of contamination encountered.

.2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on pavers.

2.7 SEALING COMPOUND

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

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for precast concrete unit paving installation in accordance with manufacturer's written instructions.

- .1 Verify the Concrete Underlayment has cured.
- .2 Verify the Concrete Underlayment thickness, strengths, surface tolerances and elevations conform to specified requirements.
- .3 Provide written density test results for soil subgrade, concrete underlayment P.S.I testing to the Owner, General Contractor and paver installation subcontractor.
- .4 Verify location, type, and elevations of edge restraints, concrete curbing, concrete collars around utility structures, and drainage inlets.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

- .1 Beginning of Bedding Sand and Concrete Paver installation signifies acceptance of Base.

3.2 PREPARATION

.1 Verify the Concrete Underlayment is clean and dry, certified by General Contractor as meeting material, installation and grade specifications.

.2 Stockpile Setting Bed Sand and Joint Sand such that they are free from standing water, uniformly graded, free of any organic material or sediment, debris, and ready for placement.

.3 Verify that base is ready to support sand and pavers and imposed loads.

.4 Keep area where pavement is to be constructed free from sediment during entire job. Remove and replace all Joint Sand and Setting Bed Sand materials contaminated with sediment with clean materials.

3.3 PLACING OF BEDDING MATERIAL

.1 Provide, spread and screed Setting Bed Sand evenly over the Concrete Underlayment.

- .1 Protect screeded Setting Bed Sand from being disturbed by either pedestrian or vehicular traffic.
- .2 Screed only the area which can be covered by pavers in one day. 2.

.2 Keep moisture content constant and density loose and constant until Concrete Pavers are set and compacted.

.3 Screed Setting Bed Sand using either an approved mechanical spreader (e.g.: an asphalt paver) or by the use of screed rails and boards. Maintain in a loose condition slightly ahead of the paving units and fully protect against incidental compaction following screeding. Loosen compacted sand by rain or screeded sand left overnight before further paving units are placed.

.4 Inspect the Setting Bed Sand course prior to commencing the placement of the Concrete Pavers. Acceptance of the Setting Bed Sand occurs with the initiation of Concrete Paver placement.

3.4 INSTALLATION OF CONCRETE PAVERS

.1 Replace Concrete Pavers with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.

.2 Mix Concrete Pavers from a minimum of three (3) bundles simultaneously drawing the paver vertically rather than horizontally, as they are placed, to produce uniform blend of colors and textures. (Color variation occurs with all concrete products. This phenomenon is influenced by a variety of factors, e.g. moisture content, curing conditions, different aggregates and, most commonly, from different production runs. By installing from a minimum of three (3) bundles simultaneously, variation in color is dispersed and blended throughout the project).

.3 Exercise care in handling face mix concrete pavers to prevent surfaces from contacting backs or edges of other units.

.4 Provide Concrete Pavers using laying pattern as indicated. Adjust laying pattern at pavement edges such that cutting of edge pavers is minimized. Cut all pavers exposed to vehicular tires no smaller than one-third of a whole paver.

.5 Use string lines or chalk lines on Setting Bed Sand to hold all pattern lines true.

.6 Set surface elevation of pavers 1/8 in. (3 mm) above adjacent drainage inlets, concrete collars or channels.

.7 Place units hand tight against spacer bars. Adjust horizontal placement of laid pavers to align straight.

.1 When installation is performed with mechanical equipment, use only unit pavers with spacer bars on sides of each unit.

.2 A vacuum placement tool (Pavemor Paver Placer) must be used when placing 16” x 16” or 24” x24” sizes. Care must be taken to avoid tossing stones so that they bang against each other. Damage to the surface appearance can happen if handled too rough.

.8 Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.

.9 Prevent joint (bond) lines from shifting more than ±1/2 in. (±13 mm) over 50 ft. (15 m) from string lines.

.10 Fill gaps between units or at edges of the paved area that exceed 3/8 inch (10 mm) with pieces cut to fit from full-size unit pavers.

.11 Prevent all traffic on installed Concrete Pavers until Joint Sand has been vibrated into joints. Keep skid steer and forklift equipment off newly laid Concrete Pavers that have not received initial compaction and Joint Sand material.

.12 Vibrate Concrete Pavers into leveling course with a low-amplitude plate vibrator capable of a to 5000-lbf (22-kN) compaction force at 80 to 90 Hz. Perform at least three passes across paving with vibrator. Vibrate under the following conditions:

.1 After edge pavers are installed and there is a completed surface or before surface is exposed to rain.

.2 Compact installed Concrete Pavers to within 6 feet (2 meters) of the laying face before ending each day's work. Cover Concrete Pavers that have not been compacted and leveling course on which pavers have not been placed, with nonstaining plastic sheets to prevent Setting Bed Sand from becoming disturbed.

.3 Make sure that there is NO sand on the surface nor in the joints prior to final surface compaction.

.13 Protect face mix Concrete Paver surface from scuffing during compaction by utilizing a urethane pad.

.14 Remove any cracked or structurally damaged Concrete Pavers and replace with new units prior to installing Joint Sand material.

3.5 INSTALLATION OF JOINT SAND

.1 Provide, spread and sweep dry Joint Sand into joints immediately after vibrating pavers into Setting Bed Sand course until full. Vibrate pavers and add Joint Sand material until joints are completely filled, then remove excess material. This will require at least 4 passes with a plate compactor.

.2 Leave all work to within 3 ft. (1 m) of the laying face fully compacted with sand-filled joints at the completion of each day.

.3 Remove excess Joint Sand broom clean from surface when installation is complete.

.4 Polymeric Joint Sand

.1 Install Polymeric Joint Sand per manufacturers recommended instructions.

3.6 FIELD QUALITY CONTROL

.1 Verify final elevations for conformance to the drawings after sweeping the surface clean.

.1 Prevent final Concrete Paver finished grade elevations from deviating more than ±3/8 in. (±10 mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.

.2 Lippage: Paver-to-Paver Lippage:

.1 No greater than 3 mm (1/8 inch) difference in height between adjacent pavers

3.7 REPAIRING AND CLEANING

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

.2 Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.

.1 Clean Concrete Pavers in accordance with the manufacturer’s written recommendations.

3.8 PROTECTION

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

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit images of crushed stone to be supplied for consultant approval.

.2 Upon request of the Consultant, supply samples of crushed stone for Consultant review and Approval.

.3 Stabilized crushed aggregate gradation indicating that the product meets specifications.

.4 Manufacturer's Material Safety Data Sheet.

1.2 DELIVERY, HANDLING AND STORAGE

.1 Handle stabilizer or stabilized aggregates as per manufacturer's instructions.

.2 Protect stabilized crushed aggregate mix from contamination. Store undercover. If the blended and hydrated aggregate is sitting for long periods of time (longer than 48 hours), or when subject to rainfall, it needs to be turned with a skid steerer or loader to ensure consistent moisture content throughout prior to installation. Verify hydration level with snowball test before installation. For any questions regarding storage, contact the manufacturer or local dealer.

Part 2 Products

2.1 MATERIALS

.1 Granular 'A' in accordance with OPSS 1010.

.2 Filter Cloth: "Terrafix 270R " by Terrafix Erosion Control Products Inc.

.3 Limestone Screenings: 3/16" limestone screenings, premixed with stabilizer, 'Organic-Lock' (T: 416-628-3704) or approved equivalent. Provide sample for approval.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for installation.

.2 Visually inspect substrate and inform Consultant of unacceptable conditions immediately upon discovery.

.1 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

.1 Prepare the Subgrade

.1 Excavate the area to the depth required so that finish grade can be established as noted on plans.

.2 The subgrade shall be graded smooth and compacted to 98% Standard Proctor Maximum Dry Density.

.2 Prepare the Base

.1 Install granular 'A' to depth indicated and compact to 98% Standard Proctor Maximum Dry Density.

3.3 WATERSHED MANAGEMENT

.1 Cross slopes must be incorporated into the compacted base material.

3.4 SPREADING

.1 Spread the loose and uncompacted pre-stabilized aggregate over the compacted base material.

.2 Apply a lift of 4 inches of loose, pre-wet pre-stabilized aggregate and compact to the required 3 inch depth indicated.

.3 Screed the material to ensure the depth is consistent.

3.5 COMPACTION OF PRE-STABLIZED AGGREGATE

.1 Make 4-6 passes using a 1-ton double or single static drum roller, or equivalent.

.2 Compact to 95% Modified Proctor Density.

.3 Ensure adequate hydration as per manufacturer's instructions.

3.6 COMPLETION

.1 At the completion of stone installation and prior to final inspection, clean all adjacent areas of loose stone.

.2 Apply a light spray to the surface of the material to give a clean appearance. Apply water until the water begins to run-off.

.3 Do not allow any traffic on the newly installed pathway until fully cured, a minimum of 24-72 hours.

.4 Upon completion of the work in this section, remove surplus materials, tools, equipment and debris, and leave site in a clean and tidy condition to the complete satisfaction of the Owner.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Section 32 13 13 Concrete Paving and Edges

1.2 STANDARD PRODUCT AND MATERIAL SPECIFICATIONS

.1 American Standard Testing Materials, (ASTM)

.1 ASTM F1015 - Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces.

.2 Synthetic Turf Council Suggested Guidelines for the Essential Elements of Synthetic Turf Systems

1.3 CONSTRUCTION SUBMITTALS

.1 Product Data: For each type of product specified.

.2 Shop Drawings: Provide installation details including roll layout, methods of attachment and details at penetrations and terminations.

.3 Samples: For each type of synthetic turf surfacing indicated.

.1 Minimum 12-by-12-inch- square sample of synthetic turf surface with tufted perimeter line and carpet seam.

.4 Manuals:

.1 Submit the operation and maintenance manual to the Consultant for approval prior to commencing with the installation. Provide descriptions of any equipment required or recommended for maintenance and repair, citing specific vendors for each unit. Provide a separate section stating the approved activity usage for the turf and activities not recommended, all relative to the Warranty. Include maintenance recommendations including small repair procedures, discussion of precautions to be practiced, general maintenance, and uses to avoid to protect turf surface and to maintain installation's Warranty.

.5 Site Acceptance: Submit a letter confirming that an inspection of the finished sub-grade has been conducted, noting all discrepancies, problems and conflicts. If no problems are found, this shall be so indicated. The Contractor’s inspection shall include acceptance of the base materials for both planarity and permeability, as well as any other factors the Contractor considers relevant to the synthetic turf installation. The Contractor’s certification letter shall also include acceptance of the subgrade and base as being totally suitable for the application of the Work, with the assurance that the synthetic turf installation work carried out on the play area subgrade and base will result in a "superior quality" play surface, fully warranted for the period and conditions specified herein.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Packing and Shipping: Deliver products in original unopened packaging with legible manufacturer's identification.

.2 Storage and Protection:

.1 Comply with manufacturer's recommendations.

.2 Store in dry place out of direct sunlight.

.3 Protect from damage by the elements and construction procedures.

1.5 WARRANTY OF SYNTHETIC TURF SYSTEM

.1 Manufacturer's Warranty: Submit manufacturer's standard published limited warranty form in which manufacturer agrees to repair or replace components of synthetic turf surfacing installation installed by manufacturer-certified Installer that fail in materials under normal use and maintenance, or provide other relief, within specified warranty period.

.1 Failures include ultraviolet degradation, backing integrity, more than 50 percent loss of face fiber, and loss of tuft bind strength.

.2 Warranty Period: Life of product.

.2 Installer Project Warranty: Submit synthetic turf surfacing Installer's warranty, signed by Installer, covering the Work of this Section, including installation of all components of synthetic turf surfacing system, for the following warranty period:

.1 Warranty Period: Two years from date of Substantial Completion.

Part 2 Products

2.1 GENERAL

.1 All backing layers and coatings shall be firmly bonded together. Coating materials must be completely cured and bonded to the other backing layers. Synthetic turf rolls that do not meet this requirement will be rejected.

.2 The entire system shall be resistant to weather, insects, rot, mildew, and fungus growth, and be non-allergenic and non-toxic. The entire system shall be constructed to maximize dimensional stability, to resist damage and normal wear and tear from its designated use, and to minimize ultraviolet degradation.

.3 All adhesives used in bonding the system together shall be resistant to moisture, bacterial and fungus attacks, and resistant to ultraviolet rays at any location upon installation.

2.2 SYNTHETIC TURF

.1 Play Premium as manufactured by SynLawn or approved equivalent.

.1 Colour to be selected from colour chart.

.2 Complete surfacing system, consisting of delustered UV-stabilized antimicrobial synthetic yarns bound to water-permeable bio-based primary and secondary backing. IPEMA-certified. Non-abrasive blades with low surface temperature. Anti-Static and Ultra Violet reflective pigment-enhanced.

2.3 SYNTHETIC TURF INFILL

.1 T°Cool Synthetic Turf Cooling Infill as manufactured by T°Cool (T:404-490-3554).

2.4 GLUE, SEAMING FABRIC AND THREAD

.1 Per manufacturer’s recommendations, suitable for application.

2.5 TURF SPIKES

.1 Per manufacturers approved fasteners.

2.6 NAILER BOARD

.1 Per manufacturer’s approved nailer / edger board.

2.7 FLUSH CONCRETE CURBS

.1 Refer to Section 32 13 02 Landscape Cast in Place Concrete.

2.8 GRANULAR BASE

.1 High Performance Bedding: 3/8" clear limestone with no fines.

.2 Granular 'A': In accordance with OPSS.PROV 1010 (2013)

2.9 SYNTHETIC TURF FABRIC SURFACE

.1 Rolls that do not lay evenly and with full dimension width will be rejected.

2.10 SYNTHETIC TURF SYSTEM MATERIAL COMPONENTS

.1 Pile fibers shall resemble freshly-grown natural grass in appearance, texture and colors.

Part 3 Execution

3.1 CERTIFICATION OF SYNTHETIC TURF BASE INSTALLATION

.1 The Contractor shall perform an inspection of the synthetic turf base and submit written

certification of acceptance of the base for the installation of the synthetic turf system. The inspection and certification shall be completed at least two working days prior to turf installation. When planning the installation schedule, the Contractor shall allow for minor synthetic turf base restoration work to be performed by the synthetic turf base contractor.

.2 Summary of certification shall include, but not be limited to:

.1 Acceptance of the base construction "finish surfaces" (planarity, granular surface stability, etc.) as being totally suitable for the application of Work specified under this section, and with the assurance that the synthetic turf installation work carried out on the subgrade and base will result in a "superior quality" play surface, fully warranted for the period and conditions specified herein.

.2 Verification and certification of the infiltration and permeability rates of the permeable base and subdrainage as applying to the Warranty.

.3 All discrepancies between the required materials, application and tolerance requirements noted by the Contractor shall be brought immediately to the attention of the Consultant.

3.2 INSTALLATION - GENERAL

.1 The installation shall be performed in full compliance with approved Shop Drawings.

.2 Only trained technicians, skilled in the installation of playground caliber synthetic turf systems working under the direct supervision of the approved installer supervisors, shall undertake any cutting, sewing, gluing, shearing, top-dressing or brushing operations.

.3 The designated Supervisory personnel on the project must be certified, in writing by the turf manufacturer, as competent in the installation of this material, including sewing seams and proper installation of the Infill mixture.

3.3 SYNTHETIC TURF INSTALLATION

.1 Perform all Work in strict accordance to the drawings, shop drawings and manufacturer's Specifications and instructions.

.2 Verification: The Contractor is responsible for inspecting, verifying, and accepting all installed Work of this section.

.3 Environmental Conditions: Do not apply adhesive materials when:

.1 Ambient air temperature is below 10 degrees C.

.2 Material temperatures are below 10 degrees C.

.3 Rain is falling or pending

.4 Conditions exist, or are pending, that will be unsuitable to the installation of the system.

.4 Preparation:

.1 Accept base onto which the synthetic turf surfacing system and the anchoring system are to be applied, as specified above.

.2 Immediately prior to application of the synthetic turf, the base shall be thoroughly cleaned of all foreign material, soil, or any other substances that may be detrimental to permeability and the installation of the turf system.

.5 Artificial turf panel seams shall be flat, tight, and permanent with no separation or fraying.

.6 Infill Materials:

.1 Infill materials shall be applied in numerous thin lifts. The turf shall be brushed as the mixture is applied. The infill material shall be installed to a depth determined by the manufacturer.

3.4 INSPECTION OF MATERIALS

.1 Prior to installation, and immediately upon delivery of synthetic turf system materials to the Project site, the Contractor shall inspect material as follows:

.1 General inspection for damaged or defective items;

.2 Measure turf pile height and thickness of each roll;

.3 Reject damaged materials and all materials out of tolerance with the Specifications.

.4 Conduct such additional inspections as are required to ensure quality control is maintained to a high level.

.2 After installation, inspect Project area for acceptable seaming, adhesive bonding, uniformity of color of turf, bubble-free surface smoothness as laid, insert installations, edge details. Remove and/or repair deficient workmanship prior to requesting the Consultant's inspection pursuant to completion and acceptance of the Work.

3.5 CLEANING

.1 The Contractor shall remove all excess materials of all types, equipment, debris, etc., from the site immediately after completion of the Work. Remove all stains and other blemishes from all finished surfaces. Leave Work in a clean, new appearing condition, ready for use by Owner.

.2 The Contractor shall inspect the entire synthetic turf area with a hand held metal detector to identify any construction materials or tools left on the field. All such materials shall be removed prior to Owner occupancy of the site.

3.6 PROTECTION

.1 Adequate protection of materials and Work from damage will be the responsibility of the Contractor during installation and until acceptance of the Work. The Contractor will be responsible for protection after the acceptance of the Work until final acceptance of all Contract Work by the Owner. All material damaged prior to acceptance by the Owner shall be replaced at no cost to the Owner.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 13 02 Landscape Cast-in-Place Concrete

.2 Section 32 13 13 Concrete Paving and Edges

1.2 SCOPE OF WORK

.1 Supply all labour, materials, methods and equipment to supply, fabricate and place fences, shown on drawings, specified herein, and as required for a complete and proper installation including;

.1 Chain link fences and gates

1.3 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A53/A53M-[10] , Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A90/A90M-[09] , Standard Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.

.3 ASTM A121-[07] , Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.

.4 A653/A653M-[10] , Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM C618-[08a] , Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

.6 ASTM F1664-[08] , Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.

.7 ASTM A123/A123M-[09] , Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-138.1-[96] , Fabric for Chain Link Fence.

.2 CAN/CGSB-138.2-[96] , Steel Framework for Chain Link Fence.

.3 CAN/CGSB-138.3-[96] , Installation of Chain Link Fence.

.4 CAN/CGSB-138.4-[96] , Gates for Chain Link Fence.

.5 CAN/CGSB-1.181-[99] , Ready-Mixed Organic Zinc-Rich Coating.

.3 CSA Group (CSA)

.1 CSA A23.1/A23.2-[09] , Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A3000-[08] , Cementitious Materials Compendium.

.4 Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - [current edition] .

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for fences, posts and gates and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings indicating locations of posts, all fencing materials and hardware. Show dimensions from property lines to all end, corner and terminator posts.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations.

.2 Store and protect fence and gate materials from damage.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS – CHAIN LINK FENCE

.1 Concrete mixes and materials: in accordance with CSA A23.1 and Section 32 13 02 – Landscape Cast-in-Place Concrete .

.1 Compressive strength: 20 MPa minimum at 28 days.

.2 Chain-link fence fabric: to CAN/CGSB-138.1.

.1 38mm x 6ga. Mesh, zinc coated before weaving.

.2 Height of fabric: 1.2 m or 1.5m as per plans.

.3 Posts, braces and rails: to CAN/CGSB-138.2, galvanized steel pipe.

.1 Dimensions;

.1 End and straining posts: 89.0mm O.D.

.2 Line posts: 60.0mm O.D.

.3 Rails and Braces: 43.0mm O.D.

.4 Tension wire: to CAN/CGSB-138.2, black vinyl coated steel wire, conforming to requirements of fence fabric, 6 ga.

.5 Tie wire fasteners: single strand, steel wire conforming to requirements of fence fabric, 9ga.

.6 Tension bar: to ASTM A653/A653M, 5 x 20 mm minimum galvanized steel.

.7 Gates: to CAN/CGSB-138.4.

.8 Gate frames: to ASTM A53/A53M, galvanized steel pipe, standard weight 51.0 mm outside diameter pipe for outside frame, 43.0 mm outside diameter pipe for interior bracing.

.1 Fabricate gates as indicated with electrically welded joints, and hot-dip galvanized after welding.

.2 Fasten fence fabric to gate with knuckle selvage at top.

.3 Furnish gates with galvanized malleable iron and self closing hinges, latch and latch catch with provision for padlock which can be attached and operated from either side of installed gate.

.4 Furnish double gates with and centre rest with drop bolt for closed position.

.9 Fittings and hardware: to CAN/CGSB-138.2, ductile cast iron, malleable galvanized steel or cast aluminum alloy.

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

.2 Overhang tops to provide waterproof fit, to hold top rails.

.3 Turnbuckles to be drop forged.

.4 Hot dipped galvanized and PVC coated

.5 Use black painted or vinyl coated fittings at all locations.

.10 Grounding rod: 16mm diameter x 3m long, copper well rod.

.11 Zinc-Rich Pigmented Paint: to CGSB 1-GP-178Ma: Black.

.12 'Safety Top Caps' by Pexco (supplied by PDS Fence Products) are to be installed at all fencing around kindergarten and child care play areas. Colour: Black.

2.2 FINISHES

.1 Galvanizing:

.1 For chain link fabric: to CAN/CGSB-138.1 Grade 2.

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

.3 For other fittings: to CAN/CSA G164-18 .

.2 Black Vinyl Coating:

.1 All mesh fabric shall be finished with black vinyl coating, 0.64 mm dry film thickness minimum, in accordance with the latest Canadian Government specifications of vinyl coated galvanized steel. Components shall be coated by thermal extrusion method, using an adhesive agent to bond the P.V.C. coating to the galvanized metal.

.3 Black Enamel Powder Coating:

.1 All posts, rails, framework fasteners, fittings hardware and caps to be black gloss enamel by powder coat application. All surfaces to be chemically cleaned and treated prior to coating with parker bondrite and chlorothene solvent or equals. Powder coating must be a polyester 2000 series, thickness of 4-5mils, oven-cured to a smooth even surface.

2.3 FABRICATION

.1 Wire fabric shall be woven into 38 mm mesh with top of fabric and bottom knuckled. Fabric shall be hot-dip galvanized after weaving.

.2 All posts to be complete with necessary fittings and hardware.

.3 Gate frames and braces shall be electrically welded at all joints and hot-dip galvanized after welding, and complete with malleable iron hinges, latch and latch catch.

.4 Gate latches are to be designed such that padlock can be attached and operated from either side of gate.

.5 Double gates are to have centre rest with drop bolt for closed position and chain hook to hold gates open.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

.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 50mm.

3.3 ERECTION OF CHAIN LINK FENCE

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

.2 Excavate post holes to dimensions indicated.

.3 Space line posts as indicated, maximum 3m apart, measured parallel to ground surface.

.1 Gaps in play space enclosures including, but not limited to, between building face and post or at gates, greater than 88.9mm are not permitted.

.4 Space straining posts at equal intervals not to exceed 150m if distance between end or corner posts on straight continuous lengths of fence over reasonably smooth grade, is greater than 150m.

.5 Install additional straining posts at sharp changes in grade.

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

.7 Install end posts at end of fence and at buildings.

.1 Install gate posts on both sides of gate openings.

.8 Place concrete in post holes then embed posts into concrete to depths indicated, minimum 450mm depth.

.1 Ensure concrete is not above grade level.

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

.9 Install fence fabric after concrete has cured, minimum of 5 days.

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

.1 Install braces on both sides of corner and straining posts in similar manner.

.11 Install top and bottom rails between posts and fasten securely to posts and secure waterproof caps.

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

.13 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 top and bottom.

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

.1 Give tie wires minimum two twists.

.15 Nuts and bolts for fittings shall be installed with the head on the exposed side of the fence. Bolts shall be peened over to precent removal of the nut.

.16 Grind and touch up all sharp ends or edges.

.17 Provide grounding, which shall be installed by licenced electrician.

3.4 INSTALLATION OF GATES

.1 Install gates in locations as indicated with direction of swing as indicated.

.2 Gates shall be plumb in the closed position having a bottom clearance of maximum 50mm. Hinge and latch offset opening space shall be no greater than 75mm in the closed position.

.3 Swing gateposts shall be installed in accordance with ASTM F 567.

.4 Determine position of centre gate rest for double gate.

.1 Cast gate rest in concrete as directed.

.2 Dome concrete above ground level to shed water.

.5 Install gate stops where indicated.

3.5 TOUCH UP

.1 Clean and touch-up damaged surfaces in accordance with manufacturers recommendations to the satisfaction of the Consultant.

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

3.6 CLEANING

.1 The area shall be left clean, neat and free of any debris resulting from the fence installation. Dispose of surplus material off site.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 13 13 Concrete Paving and Edges

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Provide manufacturer's instructions, printed product literature and data sheets for furniture and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Shop Drawings:

.1 Submit shop drawings indicating dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.

1.3 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for care and cleaning of site furnishings for incorporation into manual.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect furnishings from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

Part 2 Products

2.1 BICYCLE RACK

.1 Product:

.1 MBR-0400-00009 as manufactured by Maglin Site Furniture (T-1-800-716-5506)

.2 Approved equivalent.

.2 Finish: Powdercoat Black

.3 Quantity: 13

2.2 ANTI-SKATE HARDWARE

.1 Stainless Steel Flat Bar with 0.75” Beveled Corner, FB.75B, Skateblock as manufactured by Ravensforge (T: 1-800-743-3490)

.2 Quantity: as required as shown on drawing details.

2.3 FLAGPOLE

.1 Product:

.1 Tapered aluminum flagpole: Model “HCAN” as manufactured by Ewing.
.2 Cone tapered models meeting or exceeding these criteria will be accepted as
.3 alternate products.
.4 Acceptable Alternates: John Ewing or All-Canadian Flagpole Co.

.2 Dimensions and Components:

.1 Minimum 9150 mm high (30'), complete with tilt anchor base, base cover, and
.2 concrete anchors.
.3 Shaft to be fitted with an internal #12 braided nylon halyard revolving truck
.4 system, stepped shaft aluminum alloy 6063-T6 (butt 127 o.d., butt wall 4.8 mm).
.5 Ball -152 mm in diameter, color ball: clear anodized.
.6 Base cover spun aluminum alloy 6061, 254 mm in diameter, wall thickness of 2.3
.7 mm.

.3 Finish:

.1 Finish of pole and accessories: Clear anodized.

.4 Quantity: 2

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Consultant.
.2 Inform Consultant of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PREPARATION

.1 Locate and protect utility lines.

.2 Notify and acquire written acknowledgement from utility authorities before beginning installation Work.

3.3 INSTALLATION

.1 Assemble furnishings in accordance with manufacturer's written recommendations.

.2 Install anchored, true, level, and plumb.

.3 Touch-up damaged finishes to approval of Consultant, by method as recommended by manufacturer.

3.4 CLEANING

.1 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by site furnishings installation.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 Includes furnishing all labour, materials and equipment for the proper installation of the irrigation system. Include everything requisite and necessary to property complete the entire system, notwithstanding that every item may not be specifically mentioned. The work includes, but is not necessarily limited to, the following:

- .1 Production and submission of approved irrigation plans for all area within limit of contract.
- .2 Trenching and backfilling (compacting by General Contractor).
- .3 Automatically controlled irrigation system.
- .4 Test all systems and make operative.
- .5 Laying out of the irrigation system.
- .6 'As-Built' drawings.
- .7 Training sessions for staff and agents.
- .8 Related Work: Site Grading

.2 All materials and construction to conform to the latest applicable codes and Municipal Standards.

.3 Water supply and booster pump will be provided by Mechanical - refer to Mechanical drawings. Exact location of connection to be determined through consultation with Consultant and Owner.

1.2 PERMITS AND FEES

.1 Obtain all permits and pay required fees to any governmental agency having jurisdiction over the work. Inspections required by local ordinances during the course of construction shall be arranged by Contractor as required. On completion of work, satisfactory evidence shall be furnished to the Consultant to show that all work has been installed in accordance with the ordinances and code requirements.

1.3 ALTERNATES

.1 Plans and specifications to refer to materials manufactured by 'Rainbird'. Any alternate manufacturers must be approved in writing as per 1.3.2.

.2 The only acceptable automatic controller is ESP-LXME type controller with IQ NCC Ethernet Cartridge manufactured by “Rainbird”. With the exception of the automatic controller, other irrigation type materials may be considered by the Board, but only upon review and approval by the Board’s Plan and Design Departments, a minimum of four weeks prior to the issuance of Tender Documents by the Prime Consultant or Certified Irrigation Designer.

.3 Any proposed substitutions by the Irrigation Sub-Contractor must be accompanied by scaled shop drawings showing how alternative products will be applied to the specific site being considered.

.4 Wherever the terms "approve", "approval" or "approved" are used in these Guidelines, they shall mean the approval of the Board or his representative in writing.

1.4 CO-ORDINATION

.1 Before any work is started, a conference shall be held between the General Contractor, his/her subcontractors, the Prime Consultant and/or Certified Irrigation Designer, the School Principal and the Board's Construction Department representative concerning the work under this Contract, to ensure minimum disruption of services.

.2 Install ALL subsurface utilities associated with the irrigation system including waterlines, PVC shelving, wiring, etc. prior to finish surfaces.

.3 Co-ordinate and co-operate with all other contractors to enable the work to proceed as rapidly and efficiently as possible.

.4 All irrigation work to be co-ordinated with other Contractor(s). This includes, but is not limited to grading, paving and sodding contractors.

.5 Within two weeks after award of contract, the Contractor shall submit a work schedule to the Board.

1.5 ACCEPTANCE OF SITE

.1 The Contractor shall conduct the scheduled work as directed by the Prime Consultant or the Certified Irrigation Designer.

.2 Contractor shall acquaint himself with all site conditions including water pressure. Contractor is responsible for locating all utilities prior to initiating construction. Failure to do so will make Contractor liable for any and all damage thereto arising from his/her operations.

.3 Contractor shall make necessary adjustments in the layout as may be required to connect to existing stubouts, should such stubs not be located exactly as shown, and as may be required to work around existing work at no increase in cost.

.4 Protection of Existing Plants and Site Conditions: The Contractor shall take necessary precautions to protect site conditions which are to remain. Should damage be incurred, the Contractor shall repair the damaged area to its original condition at his/her own expense.

.5 Where alternatives occur or new and existing wires join, the Contractor is to cut, remove, patch, repair or finish the adjacent surfaces as required and approved by the Owner.

1.6 PROTECTION OF EXISTING PLANTS AND SITE CONDITIONS

.1 Necessary precautions shall be taken to protect site conditions that are to remain. Should damage be incurred, the Irrigation Sub-Contractor shall repair the damaged area to its original condition at no additional cost to the tendered cost.

.2 Where alternatives occur or new and existing wires join, the Irrigation Sub-Contractor is to cut, remove, patch, repair or finish the adjacent surfaces as required and approved by the Prime Consultant or Certified Irrigation Designer.

1.7 SUBSTITUTIONS

.1 The Owner reserves the right to substitute, add or delete any material or work as the work progresses. Adjustment to the contract price shall be negotiated if deemed necessary by the Owner.

.2 The Owner reserves the right to reject material or work which does not conform to the contract documents. Rejected work shall be removed or corrected at the earliest possible time.

.3 No substitutions will be permitted which have not been submitted for prior approval to the Consultant at least fourteen working days before the specified closing date and must be accompanied by a scaled shop drawings showing how alternative products will be applied to the specific site being considered.

1.8 SYSTEM DESCRIPTION

.1 The system shown on the drawing(s) is only approximate and schematic, and shall be adjusted to site conditions.

.2 It is the responsibility of the irrigation contractor to inform the Owner of any and all discrepancies, errors or conflicts that may be found prior to and during installation.

.3 Any changes to the specifications or drawing(s) are subject to written approval by the Owner. Any and all changes made by the Contractor without written permission shall be the Contractor's responsibility. The Contractor will be solely responsible for all costs to reinstall such changes to conform to these specifications.

.4 Pay all costs as required for such permits and inspections at no extra cost to the Owner.

.5 All work shall be carried in strict accordance with all applicable Federal, Provincial and Municipal Codes, regulations and by-laws.

1.9 **SUBMITTALS**

.1 Prepare shop drawings, prepared and stamped by a certified irrigation designer, which show exact layout of irrigation system, including electrical and water connections. Products from alternate suppliers will only be considered if Contractor has qualified his tender indicating proposed alternate.

.2 Determine available water pressure and water volume prior to commencement of shop drawings. Verify existing maximum and minimum water pressure available and notify the Consultant immediately if pressures are unsuitable for proposed irrigation system. Verify maximum and minimum water pressure available, and notify the Consultant immediately if pressures are not suitable for proposed irrigation system.

.3 The sprinkler head locations as shown on the landscape plan may be adjusted to suit site or mechanical conditions.

.4 Upon completion of work, submit an autocad file or a single reproducible drawing or three (3) sets of record drawings showing the exact "as built" location of system including all lines, quick couplers, electrical wiring (colour coded), type of sprinkler heads, controllers and zone controlled from each station.

.5 Submit two (2) copies of a data book containing all necessary operating and maintenance instructions for the entire system, including parts lists of all components with catalogue numbers where applicable and instruction on winterizing and activation process.

.6 Submit two (2) sets of all special tools required for the maintenance or adjustment of sprinkler heads and remote control valves.

.7 Provide "as built" record drawings of the system.

1.10 **LAYOUT AND "AS-BUILT" IRRIGATION DRAWINGS**

.1 Prepare an irrigation layout plan for review and approval by the Consultant.

.2 The Contractor is to prepare "As-Built" drawings on blueline prints or in digital format which shall show deviations from the bid documents made during construction affecting the main line pipe, controller and rain sensor locations, main shut-off and remote control valves, quick-coupling valves, all sprinkler heads and location of buried sleeves. The drawings shall also indicate and show approved substitutions of size, material and manufacturer's name and catalog name and catalog number. Three sets of drawings and a digital CADD format shall be delivered to the Prime Consultant or Certified Irrigation Designer before final acceptance of work.

.3 The ‘As Built’ drawings shall be drawn to scale and indicate:

.1 sprinkler head model and location.

.2 pipe size and location.

.3 automatic valves model and location.

.4 quick coupling valves.

.5 controller and wire location.

.6 main shut off valve and any valve locations.

.7 dimensioned location of buried sleeves.

.4 The Irrigation Sub-Contractor is to provide two copies of the completed controller programming Chart to the Prime Consultant and post an additional framed copy in the location of the Controller.

1.11 FINAL ACCEPTANCE

.1 Final acceptance of the work may be obtained from the Consultant upon the satisfactory completion of all work.

1.12 GUARANTEE

.1 All work shall be guaranteed by the Irrigation Sub-Contractor for two (2) years from date of Substantial Performance against all defects in material, equipment and workmanship. Guarantee shall also cover repair of damage to any part of the premises resulting from leaks or other defects in material, equipment and workmanship to the satisfaction of the Certified Irrigation Designer. Repairs, if required, shall be done promptly at no cost to the Owner.

.2 Guarantee shall include adjustment of sprinkler heads required due to settlement.

.3 Guarantee on materials and equipment may extend beyond the irrigation system guarantee date. Should equipment fail within manufacturer's warranty period but beyond the guarantee period, the irrigation Sub-Contractor shall be entitled to labour costs for the replacement of parts, only if accompanied by an acceptable rate of labour costs.

Part 2 Products

2.1 GENERAL

.1 All materials shall be new and in perfect condition. One month after award of the Contract, the Irrigation Sub-Contractor shall submit for approval six copies of the Irrigation Design Plans prepared by a Certified Irrigation Designer.

.2 Submit a complete list of proposed materials to be installed to the Prime Consultant. Quantities of materials need not be included.

.3 These design requirements for the system are the minimum requirements for water conservation oriented design:

.1 Pressure:

.1 Systems shall be designed to the lowest static pressure available in any 12 month period, or other side noted.

.2 If static pressure exceeds design pressure by 15 PSI or more in any zone, a pressure regulating device shall be used.

.3 Pressure at any point within a zone shall not vary by more than 10% from the designed sprinkler operating pressure.

.2 Provide separate zoning for:

.1 Dissimilar types of sprinklers (rotary, pop-up spray, bubbler, drip emitter, etc.).

.2 Similar types of sprinkler head shall have matched precipitated rates for full and part circle heads. If sprinkler heads do not have matched precipitation rates, full and part circle heads shall be zoned separately.

.3 Sprinkler head location and spacing:

.1 Rotary head spacing shall not exceed 50% of diameter.

.2 Spacing shall make allowance for local wind conditions.

.3 Trim perimeters with correct arc and radii selection to minimize water thrown onto non-landscaped areas.

.4 Show radius of coverage for each type of sprinkler.

.5 Avoid placing heads adjacent to areas where traffic may cause damage to sprinklers.

.4 Shop drawing plan requirements for the system are as follows:

.1 All irrigation designs shall contain the following *minimum* elements:

.1 Name of project an address/location

.2 North compass indication.

.3 Prevailing wind direction.

.4 Design scale to 1:300 (minimum). Sheet size to be as for all other plans for this project.

.5 Date of design.

.6 Certified irrigation designer seal and signature.

.7 System component legend with clear, consistent symbols of all components.

.8 Calculate precipitation rate for each zone as a guide for programming.

.9 Installation details and specifications describing and/or illustrating all material used and the installation thereof. These may be brief statements shown on the plan or included in a supplemental document.

.10 Point of connection shall indicate location and size of meter and size, length and type of service.

.11 Type and location of rain by-pass and/or moisture sensing device.

.12 Static pressure and design pressure.

.13 Pressure loss calculation shall be available for review.

.14 The irrigation design is to include a programming chart indicating the proposed schedule of the Irrigation Controller for review by the Board's Plant Department representative.

.15 All construction methods, design and materials shall be in accordance with current municipal and provincial standards, and drawings.

.2 Whenever any material is specified by name and/or number thereof, such specifications shall be deemed to be used for the purpose of facilitating a description of the materials and establishing quality, and shall be deemed and construed to be followed by the words "or approved equal".

.3 Provide shop drawings detailing system conforming to this Specification.

2.2 MATERIALS

.1 Whenever any material is identified by name and/or number thereof, such specifications shall be deemed to be used for the purpose of facilitating a description of the materials and establishing quality, and shall be deemed and construed to be followed by the words 'or approved equal'.

.2 Plastic Piping:

.1 All PVC pipe shall be continuously and permanently marked with manufacturer's name, material, size and schedule or type. Pipe shall be minimum Type 1120-1220 PVC.

.3 Plastic Fittings:

.1 Schedule 40, PVC as shown on drawings or approved equal. Polyethylene Pipe fittings should be insert type or brass saddle tees where applicable. All joints 1 " (24 mm) and larger shall be double clamped with all stainless steel clamps.

.4 Solvent Cement:

.1 Compatible with PVC pipe and of proper consistency.

.5 Copper Piping:

.1 Copper piping shall be Type L or M, hard copper.

.6 Copper Pipe Fittings:

.1 Pipe fittings shall be wrought solder-type cast solder.

.7 Manual Valves:

.1 Manual valves shall be as specified on plan. Isolation valves to be brass gate valves.

.8 Quick Coupling Valve

.1 Quick Coupling Valve shall be "Rainbird" 5NP complete with valve box.

.9 Automatic Controllers:

.1 The only acceptable automatic controller is to be ESP-LXME2 type controller by "Rainbird" with multiple programming capability, rain sensor override, IQ NCC-EN Ethernet Cartridge and FS200B Flow Senor as specified on the plans. The controller must be designed to be expandable by a minimum of two unused stations.

.2 Controller to be located on wall inside building.

.3 Each controller location shall be easily accessible for maintenance, adhere to the manufacturer's recommendations and be approved by the Owner. The controller shall be capable of operating 24 VAC electric remote control valves. The controller shall be CSA certified and installed as per manufacturer's specifications.

.4 AC wiring to the controller shall be plug-in type. Control wires from controller to valves and from controller to rain sensor shall be hard wired.

.5 Controllers are to be capable of operating a twelve zone system during a 6-hour period.

.10 Remote Control Valves:

.1 Valves for use in electrically controlled automatic control systems shall be diaphragm actuated and hydraulically operated solenoid valves as "Rainbird 150 PGA" for 40mm main and "Rainbird 200 PGA" for 50 mm main, or approved equivalents.

.2 All remote control valves are to be installed in properly sized and lockable Valve Boxes with gravel bedding, connect to nearest catch basin.

.3 The Electric Master Valve is to be in a Locking Valve Box, if located outside of mechanical room, and is to be operated as a control valve in normally closed position and controlled by master valve output on controller.

.11 Tracer, Control and Common Ground Wiring:

.1 Control and common wiring from controller to automatic valves shall be 24-volt, single strand, 14 gauge copper T.W.U. wire of a type approved for direct burial in ground and meeting Code requirements. White jackets for the common wire and colour coded power wire for each station.

.2 Tracer wiring shall be 24-volt, single strand, 14 gauge copper wire T.W.U. wire of a type approved for direct burial in ground meeting Code requirements.

.3 All wiring shall be enclosed in PVC electrical conduit. Solid wire to be approved for direct burial wire into ground. Provision to be made for expansion and contraction of direct burial wire.

.4 All pipes to have 14 gauge tracer wire.

.12 Sleeves:

.1 Rigid PVC sleeves under all walks and paving and where indicated, to be as per drawings, of rigid PVC.

.13 Valve Boxes:

.1 Valve boxes with a minimum 250 mm granular base and 50 mm diameter perforated drain tile, shall be provided with each valve or group of valves. Boxes shall be lockable and located normally in locations not very visible. Covers to be vandal-resistant. Colour to be green.

.14 Sprinkler Heads:

.1 Sprinkler heads to be first quality of types indicated on the drawings, manufactured by Rainbird or approved equal. Heads to meet head to head radius of spray and have matched precipitation rates.

.2 All full, part and quarter circle sprinklers shall be "Rainbird" model 8005.

.3 Sprinkler heads operating on one valve shall have matched radius of throw and rotation.

.4 All sprinkler heads shall be complete with swing joints and couplers.

.15 Accessories:

.1 Electrical tape to be black plastic 19mm wide, a minimum 0.177mm thick and all weather type, meeting Code requirements.

.2 Electrical wire splices to be made water tight, using 3M DBY or DBR connectors.

.3 Thread lubricant to be of a type manufactured for plastic to metal such as Teflor Tape or Permatex #2.

.4 Washed concrete sand to be used for backfilling pipe, sprinkler heads and valves. Sand backfill must be clean, free of organic matter, stones and sharp objects which may damage piping, etc.

.5 Pea gravel to 12mm diameter, round stone, free of organic matter, with no sharp edges.

.16 Backflow Prevention Units:

.1 Backflow prevention units shall be provided by Mechanical. Backflow device shall meet local and provincial standards. Refer to Mechanical Drawings.

.17 Thrust Blocks:

.1 Install at all changes in pipe direction.

.18 Rain Sensors:

.1 Rain sensor to be "Rainbird" RSD or approved equal, shall be mounted on the canopy roof where it will be unhindered by rainfall. Location and mounting of bracket is to be indicated by the Certified Irrigation Designer on the drawings of the Irrigation System. (Conduit and wiring from location of controller to the location of the rain sensor is by the Electrical Sub-Contractor.)

.19 Flow Sensor Unit:

.1 Flow Sensor Unit to be "Rainbird" FS200B. Flow sensor unit shall be supplied and installed by the Mechanical Sub-Contractor for irrigation system water usage monitoring. (Irrigation Sub-Contractor is to hard wire to controller.)

.20 Booster Pump

.1 Use a "Berkley" Booster pump supplied and installed by the Mechanical Sub-Contractor.

.2 The pump shall be equipped with necessary unions, isolation valves to make it a permanent, year round installation.

.3 The booster pump shall have a flow switch and pressure relief valve to protect the operations of the booster pump.

Part 3 EXECUTION

3.1 WORKMANSHIP

.1 All work shall be performed by skilled trades, with a minimum of five years experience in the field. All finishing shall be of the highest quality.

.2 Install all subsurface utilities associated with irrigation system, including waterlines, PVC sleeving, wiring etc. prior to finish surfaces.

.3 Layout work as accurately as possible to the drawings. The drawings, though carefully drawn, are generally diagrammatic to the extent that swing joints, offsets and all fittings are not shown.

.4 The Irrigation Sub-Contractor shall be responsible for full 100% coverage of all irrigated areas and shall make any necessary minor adjustments at no additional cost to the Owner.

.5 Any major revisions to the irrigation system must be submitted and answered in written form, along with any change in contract price.

.6 If applicable, schedule work to minimize interruptions to existing services.

.7 Submit schedule of expected interruptions to Consultant for approval and adhere to interruption schedule as approved by Consultant.

.8 Notify Consultant and Owner's staff a minimum of 48 hours in advance of any interruption in service.

.9 Do not interrupt water service for more than 3 hours.

.10 Notify fire department of any planned or accidental interruption of water supply to hydrants.

3.2 SITE PREPARATION

.1 Staking of sprinkler locations shall be completed by the Contractor and approved by the Consultant prior to installation.

.2 Drawings are schematic only and layout shall be adjusted to suit site conditions, at no extra cost.

.3 Have complete layout inspected by the Consultant and do not start work until layout has been approved.

.4 Any damages to the site of other property shall be the Contractors responsibility. Restore damages to original condition, at no charge to the Owner.

3.3 EXCAVATING AND TRENCHING

.1 Perform all excavations as required for the installation of the work included under this section, including shoring of earth banks to prevent cave-ins. Restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavations to their original condition and in a manner approved by the Prime Consultant.

.2 Trenches shall be made wide enough to allow a minimum of 150 mm between parallel pipe lines. Trenches for pipe lines shall be made of sufficient depths to provide the minimum cover from finish grade as follows:

.1 600mm minimum cover over main lines.

.2 500mm minimum cover over conduit with control wires from controller to valves.

.3 500mm minimum cover over lateral lines to heads.

.4 Pipes may be pulled into position through the use of vibratory plows. The same depths of burial as above should be maintained. Wire may also be installed with the use of a vibratory plow provided it is installed with a wire blade.

.3 Trenches to be minimum width of excavated 50 mm deeper than pipe invert.

.4 Remove from the site all subsoil excavated from the trenches to keep the subgrade elevations parallel with finished elevations. Topsoil to be integral over pipes as in surrounding areas.

3.4 WALKWAY/ROADWAY CROSSINGS

.1 Pressure mains & lines crossing roadways, sidewalks, parking areas shall be placed in rigid PVC conduit.

.2 Extend conduit 1000 mm either side of area requiring conduit.

.3 Place conduit as required to enclose piping under paved areas and as shown on drawings. Depth of conduit shall be a minimum 1000 mm depth below roadways.

3.5 PIPE LINE ASSEMBLY

.1 Install remote control valves where shown and group together where practical; place no closer than 300 mm to walk edges, buildings, and walls.

.2 Plastic pipe and fittings shall be solvent welded using solvents and methods as recommended by manufacturer of the pipe, except where screwed connections are required. Pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before applying solvent with a non-synthetic bristle brush. Polyethylene pipe shall use barbed insert fittings. Pipe 1 " (25 mm) and larger shall be double clamped with all stainless steel clamps.

.3 Pipe joints shall be allowed to set for 24 hours in normal conditions before pressure is applied to the system on PVC pipe.

3.6 CLOSING OF PIPE AND FLUSHING LINES

.1 Cap or plug all openings as soon as lines have been installed to prevent the entrance of materials that would obstruct the pipe. Leave in place until removal is necessary for completion of installation.

.2 Thoroughly flush out all water lines before installing heads, valves and other hydrants.

.3 Upon completion of testing and to Consultant’s approval, the Irrigation sub-Contractor shall complete assembly and adjust sprinkler heads for proper distribution.

3.7 AUTOMATIC CONTROL WIRING & TRACER WIRE

.1 Install control wires that are not in conduit at least 600 mm below finish grade and lay to the side of main line. Provide looped slack at valves and snake wires in trench. Wire connections shall be made with approved watertight sealants. All control circuitry passing through the wall of the building or beneath any walk, road, or drive, shall be installed in a suitable sleeve.

.2 All piping shall be traced including pipe to the sprinkler heads.

3.8 SPRINKLERS

.1 Install sprinkler heads at grade to 10mm below grade.

.2 Heads shall not be located in centre field or goal areas.

.3 All sprinklers are to be installed perpendicular to and flush with finished grade using a Lasco unitized Full-Circle Swing Joint or "funny pipe" flexible tubing as per manufacturers details. Use Teflon tape on all threaded fittings.

.4 Heads or valves installed above the level of the surrounding finished grade will not be acceptable.

3.9 BACKFILL AND COMPACTING

.1 After system is operating and required tests and inspections have been made to approval of Consultant, backfill excavations and trenches with clean soil, free of rubbish to match surrounding soil regimes.

.2 Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to minimum 90% density. Compaction around sprinkler heads should be at the same density as pipe trenches. Dress off all areas to finish grades.

.3 Plant grass after installation of irrigation system.

3.10 CLEAN-UP

.1 Remove from the site and dispose off-site all debris resulting from work of this section.

3.11 WINTERIZATION

.1 The Contractor to provide first and second year winterization with two spring start-ups at no charge to the Client. Provision for a winterization hook-up to be the irrigation Contractor's responsibility.

.2 Inspect sprinkler heads at start-up and winterization visits and adjust where required to maintain heads at between grade level and 10mm below grade and insure all heads and all zones are working properly.

3.12 SPECIAL CONDITIONS

.1 All material needed for a complete irrigation system as shown on the approved submitted drawings and as stated in the specification shall be provided by a recognized Ontario Irrigation Distributor, having no interest in any one contractor or a contractor division or wholly owned contractor subdivision.

.2 Irrigation sub-Contractor to provide a training session for the grounds staff following acceptance of the irrigation work.

.3 Irrigation sub-Contractor to assemble and provide operational manual to staff.

.4 In compliance with the above, Contractor shall provide the Prime Consultant with a purchase order to a recognized distributor for all material necessary. The distributor shall provide the Prime Consultant with a letter stating that the materials as specified have been shipped, along with a copy of the Contractor's purchase order.

3.13 RESTORATION

.1 Contractor to repair/restore areas affected by irrigation work to satisfaction of Consultant.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 91 19 Topsoil and Finish Grading

.2 Section 32 92 23 Sodding

.3 Section 32 93 10 Trees, Shrubs and Groundcover Planting

1.2 SCOPE OF WORK

.1 The Landscape Contractor shall provide a landscape maintenance services as specified herein for all sodded areas and plant material, for a warranty period of two (2) years from date of acceptance by consultant for sod and planting material.

1.3 DELIVERY AND STORAGE

.1 As per Section 32 92 23 Sodding and 32 93 10 Trees, Shrubs and Groundcover Planting.

.2 Obtain approval from Maintenance Supervisor of Grounds for Storage of maintenance materials on site.

.3 Materials which include chemicals must be stored in a special approved area away from school site. Safety data sheets must be submitted for Chemicals, in accordance with Division 1.

1.4 SAFETY DATA SHEETS

.1 The Contractor shall submit material and safety data sheets to the Owner prior to the commencing the application of:

.1 Fertilizers.

Part 2 Products

2.1 MATERIALS

.1 Topsoil: in accordance with Section 32 91 19 Topsoil and Finish Grading

.2 Peatmoss: in accordance with Section 32 91 19 Topsoil and Finish Grading

.3 Sand: in accordance with Section 32 91 19 Topsoil and Finish Grading

.4 Limestone: in accordance with Section 32 91 19 Topsoil and Finish Grading

.5 Fertilizer:

.1 4:1:2 ratio fertilizer with minimum 40% slow release at a rate of 0.5kg nitrogen/100m2.

.2 Liquid fertilizer of type specified for trees with a minimum 4:2:3 ratio (27-10-13).

.6 Bonemeal: raw bonemeal, finely ground with minimum 3% nitrogen and 20% phosphoric acid.

.7 Water: potable and free of impurities that would inhibit plant growth.

.8 Sod: in accordance with Section 32 92 23 Sodding

.9 Mulch: in accordance with Section 32 93 10 Trees, Shrubs and Groundcover Planting.

.10 Replacement Stock: as specified for original plantings in accordance with Section 32 93 10 Trees, Shrubs and Groundcover Planting.

Part 3 Execution

3.1 GENERAL WORKMANSHIP

.1 Program timing of operations to growth, weather conditions and use of site.

.2 Notify Maintenance Supervisor of Grounds at least 7 days in advance of start of operations.

.3 Do each operation continuously and complete within a reasonable time period.

.4 Supply materials, topsoil, planting soil, mulch, fertilizer, replacement of tree stakes, wire and plant material as specified in the relevant sections of these specifications.

.5 Obtain acceptance in writing from Maintenance Supervisor of Grounds with detailed description of work completed, prior to submission of progress claims.

.6 Notify Maintenance Supervisor of Grounds immediately of damage incurred by pest, disease, mechanical or vandalism.

3.2 SEASONAL MAINTENANCE

.1 Spring Maintenance:

.1 Sodded Areas:

.1 Rake sodded areas and remove dead vegetation, leaves and debris. Do heavy raking with flexible grass rake on areas with “snow mold”.

.2 Roll lightly areas where sodded areas have lifted due to frost action.

.3 Aerate areas where soil has been compacted through pedestrian traffic or other causes. Use aerating equipment which extracts earth plugs from soil. Re-sod areas where turf has been killed by pedestrian traffic or salt damage.

.2 Planting Beds:

.1 Clean planting beds of debris and dead plant material. Loosen and cultivate soil lightly without disturbing roots below surface.

.2 Where mulching material used in planting beds, remove temporarily, material that has not been decomposed and mix decomposed mulch with planting soil. Replace mulching material. Supply and add sufficient material of equal quality to provide covering of 75mm.

.2 Winter Preparation:

.1 Rake and assemble leaves after they have been shed by trees.

.2 Clean out and water planting beds prior to freeze-up.

3.3 SOD MAINTENANCE

.1 Water sodded areas at weekly intervals to obtain optimum soil moisture conditions to a depth of 100mm.

.2 Repair: Repair and resod dead or bare spots to satisfaction of Consultant.

.1 Resodding:

.1 Remove dead sod, weeds and debris from area to be re-sodded. Loosen top layer to a depth of 150-200mm by discing or roto-tilling. Prepare smooth, loose surface for laying sod.

.2 Add Topsoil and re-grade low spots.

.3 Apply a 4:1:2 ratio fertilizer at a rate of 0.5kg nitrogen/100m2. Rake into top layer of soil.

.4 Use sod as specified.

.5 Lay sod with sections closely butted, without overlapping gaps, smooth and even with adjoining areas. Stagger sod joints when sodding large areas. Roll lightly and tamp. Water to obtain moisture penetration with 75 to 100mm. Continue watering at intervals to maintain sufficient plant growth.

.6 Keep grass cut at a height of 65mm.

.3 Aerating:

.1 Select time during early spring when soil is sufficiently dry to allow breaking up of soil particles.

.2 Clean sodded areas to be aerated and mow grass to a height of 50mm.

.3 Aerate sodded areas using aerating equipment which extracts earth plugs and deposits to location of extraction, minimum 100mm deep and spaced a maximum of 120mm on centres.

.4 Drag heavy mat over sodded areas or rake to break up plugs and spread resulting soil evenly through sodded areas.

.4 Fertilizing:

.1 Apply a 4:1:2 ratio fertilizer with minimum 40% slow release at a rate of 0.5kg nitrogen/100m2. Apply in early spring as soon as frost is out of ground.

.2 Make supplementary application of 0.5kg nitrogen/100m2 towards end of August.

.3 Use calibration to ensure specified rate is spread evenly.

.4 Water immediately after fertilizing to obtain moisture penetration of 40-50mm.

.5 Rectify uneven spreading as soon as it becomes apparent. Spread additional fertilizer over areas affected or rake out excess application.

.5 Cut Grass and remove clippings to height as follows:

.1 50 mm during normal growing conditions.

.2 Cut grass at 2 week intervals, or at intervals so that approximately one third of growth is removed in single cut.

.3 Fertilize areas in accordance with fertilizing program as recommended by manufacturer. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

.4 Eliminate weeds by hand means to extent acceptable to Consultant.

3.4 PLANTING BED MAINTENANCE

.1 Watering:

.1 Maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2

.3 The Owner will supply water required for watering purposes. Become familiar with location of water supply, water outlets and/or pumping equipment required.

.4 Supply equipment such as pumps, portable sprinkler systems, tank trucks, hose and sprinklers required for watering operations.

.5 Apply sufficient water per application to obtain moisture penetration of 75 to 100mm.

.6 Apply water in soft spray to avoid "packing" of soil.

.7 Move sprinklers as required to avoid running of water and return to those areas until moisture penetration has been reached.

.8 Do not impede use of sidewalks and other paved areas.

.2 Reform damaged watering saucers.

.3 Weeding:

.1 Remove weeds monthly.

.2 Weeds are to be hand pulled.

.4 Replace or respread damaged, missing or disturbed mulch.

.5 For non-mulched areas, cultivate monthly to keep top layer of soil friable.

.6 Pest and disease control:

.1 Cultivate whenever required to keep top layer of soil, loose, friable, and free from weeds. Any operation must be continuous without interruption.

.2 Remove weeds including their roots.

.3 Take care not to damage roots of shrubs. Use small hand tools for closely planted shrubs.

.4 Collect and dispose of paper and refuse. Remove dead plants, leaves, branches, and seed pods.

.5 Clean, by hand, areas that are covered with mulch.

.7 Fertilizer:

.1 Apply ground injection of a liquid fertilizer of type specified for trees with a minimum 4:2:3 ratio (27-10-13) to be applied in November or April.

.2 Mix 15kg/100m2 of bonemeal in top 200mm.

.8 Pruning:

.1 Prune only to remove dead, broken or hazardous branches from plant material, unless otherwise directed by Owner or Consultant

.2 Prune Trees and Shrubs according to accepted horticulture practices to International Arborist Society pruning standards.

.9 Keep trunk protection and tree supports in proper repair and adjustment.

.10 Level watering saucers at end of warranty period.

.11 Remove and replace dead plants and plants not in healthy and vigorous growing condition. Make replacements in same manner as specified for original plantings.

.12 Submit monthly written reports to Consultant identifying:

.1 Maintenance work carried out.

.2 Development and condition of plant material.

.3 Preventative or corrective measures required which are outside Contractor's responsibility.

3.5 CLEANING

.1 At the end of the maintenance warranty period, remove all tree protection, stakes and wires, except those around trees which are not self-supporting replacement stock.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 92 23 Sodding

.2 Section 32 93 10 Trees, Shrubs and Groundcover Planting

1.2 SCOPE

.1 This section addresses the labour, materials, tools, services and equipment necessary for the supply and installation of topsoil and planting soil.

.2 Provide sufficient topsoil for work of this project. Amend suitable existing site topsoil for reuse or import sufficient topsoil to provide depths as specified herein, and remove any excess topsoil from site after final grading.

1.3 REFERENCE STANDARDS

.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment

.1 PN1340-[2005] , Guidelines for Compost Quality.

1.4 DEFINITIONS

.1 Compost:

.1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.

.2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.

.3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminates.

.4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category (A).

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Quality control submittals:

.1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL for review by the Consultant and PDSB Representative.

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

Part 2 Products

2.1 TOPSOIL

.1 Topsoil for general use within sodded areas and base soil for planting mixture: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

- .1 Imported Topsoil:
  - .1 Soil texture based on The Canadian System of Soil Classification, to consist of 45 % sand, 35% silt and 20 % clay, and contain 5 % organic matter by weight to a maximum of 25% by volume. Ph value: 6.5 to 7.5.
  - .2 Imported topsoils or soil blends designed to serve as topsoil may not include the following:
    - .1 Soils mined from lands with an agricultural conservation easement as defined by the Ontario Ministry of Agriculture, Food and Rural Affairs.
    - .2 Soils mined from other greenfield sites, unless those soils are a by-product of a construction process.
- .2 Native topsoil:
  - .1 To be amended as per analysis report recommendations to ensure topsoil is within typical guideline range and is suitable for intended use.
- .3 Contain no toxic elements, litter or growth inhibiting materials.
- .4 Topsoil to be free from:
  - .1 Debris and stones over 25 mm diameter.
  - .2 Subsoil, clay lumps
  - .3 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
  - .4 Sod clumps, crabgrass, couchgrass or other noxious weeds.
- .5 Consistency: loose and friable when moist.

.2 Imported topsoil for sodded sports field: mixture of particulates, micro organisms and organic matter which provides suitable medium for supporting intended plant growth.

- .1 Sandy loam soil texture based on The Canadian System of Soil Classification, to consist of 65 % sand, 25% silt and 10% clay, and contain 5 % organic matter by weight. Ph value: 6.5 to 7.5.
- .2 Contain no toxic elements, litter or growth inhibiting materials.
- .3 Topsoil to be free from:
  - .1 Debris and stones over 25 mm diameter.
  - .2 Subsoil, clay lumps
  - .3 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.
  - .4 Sod clumps, crabgrass, couchgrass or other noxious weeds.
- .4 Consistency: loose and friable when moist.

2.2 PLANTING SOIL

.1 Planting Soil: pH range of 6.5 to 7.5, mixture to be 50% topsoil, 25% peat moss, 25% well rotted manure, and 500g bonemeal per cubic metre of planting soil; screened and free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

.2 Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

2.3 SOIL AMENDMENTS

.1 Fertilizer:

.1 Fertility: major soil nutrients present in following amounts:

.1 Nitrogen (N): [20] to [40] micrograms of available N per gram of topsoil.

.2 Phosphorus (P): [40] to [50] micrograms of phosphate per gram of topsoil.

.3 Potassium (K): [75] to [110] micrograms of potassium per gram of topsoil.

.4 Calcium, magnesium, sulphur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.

.2 Peatmoss:

.1 Derived from partially decomposed species of Sphagnum Mosses.

.2 Elastic and homogeneous, brown in colour.

.3 Free of wood and deleterious material which could prohibit growth.

.4 Shredded particle minimum size: [5] mm.

.3 Sand: washed coarse silica sand, medium to course textured.

.4 Organic matter: compost Category A, in accordance with CCME PN1340 , unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

.5 Use composts meeting Category B requirements for land fill reclamation and large scale industrial applications.

.6 Limestone:

.1 Ground agricultural limestone.

.2 Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

.7 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.4 SOURCE QUALITY CONTROL

.1 Advise Consultant and PSDB Representative of sources of topsoil to be utilized with sufficient lead time for testing.

.2 Soil testing to be completed by recognized testing facility for pH, P and K, soil texture and organic matter, as well as recommended amendments to ensure topsoil is suitable for intended use.

.3 Testing of topsoil will be carried out by SGS Agrifood Laboratories (T:519-837-1242).

.1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

.4 Contractor is responsible for amendments to topsoil, as recommended within testing report at no additional cost to Owner.

Part 3 Execution

3.1 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.

.1 If discrepancies occur, notify Consultant and do not commence work until instructed by Consultant.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.

.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.

.2 Remove debris which protrudes more than 75 mm above surface.

.3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.

.1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.2 PLACING AND SPREADING OF TOPSOIL / PLANTING SOIL

.1 Place topsoil after Consultant has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150 mm.

.3 For sodded areas keep topsoil 15 mm below finished grade.

.4 Spread topsoil or planting soil to following minimum depths after settlement.

.1 300 mm for sodded areas – loam topsoil.

.2 300 mm for sodded play fields – sandy loam topsoil.

.3 350 mm for perennial beds – planting soil.

.4 600 mm for shrub beds – planting soil.

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

3.3 SOIL AMENDMENTS

.1 Apply and thoroughly mix soil amendments into full specified depth of topsoil at rates recommended within soil testing reports.

3.4 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.

.1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Leave surfaces smooth, uniform and firm against deep footprinting.

3.5 ACCEPTANCE

.1 Consultant will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.6 SURPLUS MATERIAL

.1 Dispose of materials except topsoil not required off site at no additional cost to Owner.

3.7 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 32 91 19 Topsoil and Finish Grading

.2 Section 32 90 00 Landscape Maintenance

1.2 DELIVERY AND STORAGE

.1 Schedule deliveries in order to keep storage at job site to minimum without causing delays.

.2 Deliver sod to site within 24 hours of being lifted and lay sod within 36 hours of being lifted.

.3 Do not deliver small, irregular or broken pieces of sod.

.4 During wet weather protect sod from drying and water sod as necessary to ensure its vitality and prevent dropping of soil in handling. Dry sod will be rejected.

1.3 SUBMITTALS

.1 Samples.

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

.2 Submit:

.1 Sod for each type specified.

.1 Install approved samples in one square metre mock-ups and maintain in accordance with maintenance requirements during establishment period.

.3 Obtain approval of samples by Consultant.

1.4 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.

.4 Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing of Landscape Ontario.

.2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

.3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Turf Maintenance designation.

1.5 SCHEDULING

.1 Schedule sod laying to coincide with topsoil operations. **Schedule sodding as early as possible to allow minimum 6 weeks for sod to establish, prior to owner take over**. In any case, sod shall be placed not later than June 30 of any given year to allow for this period.

.2 **Cautionary Note**: The contractor shall be responsible for the erection and maintenance of a temporary, leased, perimeter "Mod-U-Lock" fence around the sodded areas to remain until the consultant at no additional cost to the owner.

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

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused fertilizer from landfill to official hazardous material collections site.

.2 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 - 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 cultivars .

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

.2 Turf Grass Nursery Sod quality:

.1 Not more than 1 broadleaf weed and up to 1% native grasses 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 Sod establishment support:

.1 Wooden pegs: 17 x 8 x 200 mm.

.2 Biodegradable starch pegs: 17 x 8 x 200 mm.

.3 Water:

.1 Potable.

.4 Fertilizer:

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

.2 Complete, synthetic, slow release with 65 % of nitrogen content in water-insoluble form.

2.2 SOURCE QUALITY CONTROL

.1 Obtain approval from Consultant of sod at source.

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

Part 3 Execution

3.1 PREPARATION

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

.2 Fine grade surface free of humps and hollows to smooth, even grade, elevations indicated, to tolerance of plus or minus 8 mm, for Turf Grass Nursery Sod and plus or minus 15 mm for Commercial Grade Turf Grass Nursery, surface to drain naturally.

.3 Remove and dispose of weeds; debris; stones 50mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.

3.2 SOD PLACEMENT

.1 Obtain approval of topsoil grade and depth before starting sodding.

.2 Lay sod during growing season.

.3 Lay sod in rows, perpendicular to slope, smooth and even with adjoining areas, and with joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with a sharp knife.

.4 Sod is to be pegged on slopes in excess of three horizontal to one vertical.

.5 Provide close contact between sod and soil by means of light roller. Heavy rolling to correct irregularities in grade is not permitted.

.6 Water immediately after sod laying to obtain moisture penetration through sod into 100 mm of topsoil.

.7 Provide adequate protection of sodded areas against erosion and mechanical damage. Remove protection after lawn areas have been accepted.

.8 Apply fertilizer immediately following sodding (prior to watering) at a rate of 2 lbs/1000 sq.ft.

3.3 MAINTENANCE BEFORE ACCEPTANCE

.1 Maintain all sodded areas from time of installation until acceptance. This period shall not be less than **48** days after installation.

.2 Check sodded areas for evidence of weeds and disease. Take immediate measures to remedy.

.3 Be responsible for protection of sodded areas until end of maintenance period. Perform following operations from time of installation until acceptance.

.4 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.

.5 Regularly cut grass to 60 mm when it reaches height of 80 mm. Remove clippings which will smother grassed areas.

.6 Install protective barriers and signs where necessary. Remove at end of maintenance period.

.7 Maintain sodded areas weed free. Eliminate weeds and disease by chemical means in strict accordance with manufacturer's recommendations, the Pesticides Act, and federal, provincial and municipal regulations. Be fully responsible for the use of such chemicals, including the repair or replacement of all damage as a result of the use of such chemicals. Obtain all necessary permits.

.8 Fertilize areas in accordance with soil test report recommendations. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

.9 Repair all damages, erosion and wash-outs resulting from weather, faulty installation or other causes.

.10 Notify Architect in writing of all damages arising from vandalism or other causes beyond the Contractor's control.

3.4 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Notwithstanding Maintenance before acceptance, this maintenance period to be minimum 6 weeks prior to occupancy or later if sod not installed 6 weeks prior to occupancy.

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

.3 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 100 mm.

.4 Cut grass to 60mm when or prior to it reaching height of 80 mm. Remove clippings which will smother grassed areas.

.5 Maintain sodded areas weed free 95%.

3.5 ACCEPTANCE

.1 Sodded areas will be accepted no sooner than the date at which the project is declared fit for occupancy provided that the following criteria are meet:

- .1 Sodded areas are properly established. (6 weeks minimum).
- .2 Sod is free of bare and dead spots and without weeds.
- .3 No surface soil is visible when grass has been cut to a height of 60 mm.
- .4 Sodded areas have been cut a minimum of 2 times and within 24 h prior to acceptance. Cut height to be 60 mm.
- .5 Fertilizing in accordance with soil test report recommendations has been carried out at least once.

3.6 PROTECTION/TEMPORARY FENCING

.1 Following installation of sod to the playfield areas, supply & install a temp. leased 1800 high “Mod U Lok” fence. Stake w/iron “T” at min. 2400 o.c. and maintain for min. 6 weeks while sod is maintained as part of this contract and is deemed established.

3.7 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 91 19 Topsoil and Finish Grading

.2 Section 32 90 00 Landscape Maintenance

1.2 REFERENCE STANDARDS

.1 Agriculture and Agri-Food Canada (AAFC).

.1 Plant Hardiness Zones in Canada-[2000] .

.2 Canadian Nursery Landscape Association (CNLA)

.1 Canadian Standards for Nursery Stock-[2006] .

1.3 DEFINITIONS

.1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling: obtain approval from Consultant of schedule 7 days in advance of shipment of plant material.

.2 Schedule to include:

.1 Quantity and type of plant material.

.2 Shipping dates.

.3 Arrival dates on site.

.4 Planting Dates.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for [trees, shrubs, ground cover, fertilizer, mycorrhiza, anti-desiccant, anchoring equipment, and mulch] and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Samples:

.1 Submit samples of mulch.

1.6 QUALITY ASSURANCE

.1 Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing of Landscape Ontario.

.2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

.3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Ornamental Maintenance designation.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.1 Protect plant material from frost, excessive heat, wind and sun during delivery.

.2 Protect plant material from damage during transportation:

.1 Delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.

.2 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.

.3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.

.2 Storage and Handling Requirements:

.1 Immediately store and protect plant material which will not be installed within on working day in accordance with supplier's written recommendations and after arrival at site.

.2 Protect stored plant material from frost, wind and sun and as follows:

.1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in topsoil and watering to full depth of root zone.

.2 For pots and containers, maintain moisture level in containers.

.3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

.3 Store and manage hazardous materials in accordance with manufacturer's written instructions.

1.8 WARRANTY

.1 Plant material as itemized on plant list to include the 12 months warranty period from time of acceptance. Plant material that is planted after leaf drop will be reviewed for acceptance the following spring, after leaf-out.

.2 Contractor hereby warrants that plant material as itemized on plant list will remain free of defects, in healthy and vigorous growing condition, for 1 full growing season, providing adequate maintenance has been provided.

.3 End-of-warranty inspection will be conducted by Consultant.

.4 Consultant reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

Part 2 Products

2.1 PLANT MATERIAL

.1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.

- .1 Source of plant material: grown in Zone 5
- .2 Plant material must be planted in zone specified as appropriate for its species.
- .3 Plant material in location appropriate for its species.

.2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

.3 Trees: with straight trunks, well and characteristically branched for species.

.4 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.

2.2 WATER

.1 Potable and free of impurities that would inhibit plant growth.

2.3 STAKES

.1 Wood, pointed one end, pressure treated, 50 x 50 x 2400 mm

2.4 GUYING WIRE

.1 Type 2: Green Arbortie or equivalent, secured to stake with 1” galvanized roofing nails.

2.5 TRUNK PROTECTION

.1 Plastic: flexible plastic, 200mm diameter, 400mm long

2.6 MULCH

.1 Shredded wood: varying in size from 25 to 125 mm in length, from cedar trees.

2.7 FERTILIZER

.1 Synthetic commercial type as recommended by manufacturer or soil test report.

- .1 Ensure new root growth is in contact with mycorrhiza.
- .2 Use mycorrhiza as recommended by manufacturer's written recommendations.

2.8 ANTI-DESICCANT

.1 Wax-like emulsion to provide film over plant surfaces reducing evaporation but permeable enough to permit transpiration.

2.9 FLAGGING TAPE

.1 Fluorescent, orange

2.10 SOURCE QUALITY CONTROL

.1 Obtain approval from Consultant of plant material prior to planting.

2.11 ADDITIONAL PLANT MATERIAL QUALIFICATIONS

.1 Plant material obtained from areas with milder climatic conditions from those of site acceptable only when moved to site prior to the breaking of buds in their original location and heeled-in, in a protected area until conditions suitable for planting.

.2 Use trees and shrubs must have been root pruned regularly, but not later than one growing season prior to arrival on site.

.3 Cold storage: written request and approval required for plant material which has been held in cold storage.

.4 Container-grown stock: acceptable if containers large enough for root development. Shrubs must have grown in container for minimum of one growing season but not longer than two. Root system must be able to "hold" soil when removed from container. Plants that have become root bound are not acceptable. Container stock must have been fertilized with slow releasing fertilizer.

.5 Balled and burlapped: coniferous and broad-leafed evergreens over 500mm. tall must be dug with soil ball. Deciduous trees in excess of 3m height must have been dug with large ball. Root balls must include 75% of fibrous and feeder root system. This excludes use of native trees grown in light sandy or rocky soil. Secure root balls with burlap and heavy twine, rope or a wire basket.

.6 Collected plant material: will not be permitted.

.7 Substitutions to plant material as indicated on planting plan not permitted unless written approval has been obtained as to type, variety and size. Plant substitutions must be of similar species and of equal size as those originally specified.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for planting installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 PRE-PLANTING PREPARATION

.1 Proceed only after receipt of written acceptability of plant material from Consultant.

.2 Remove damaged roots and branches from plant material.

.3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

.4 Locate and protect utility lines.

.5 Notify and acquire written acknowledgement from utility authorities before beginning excavation of planting pits for trees and shrubs.

3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS

.1 Preparation of planting beds in accordance with Section 32 91 19- Topsoil and Finish Grading.

.2 For individual planting holes:

.1 Stake out location and obtain approval from Consultant prior to excavating.

.2 Excavate to depth and width as indicated. All pits and beds shall be shaped and prepared as to allow for free drainage from the excavation.

.3 Scarify subgrade surfaces sides of planting hole to a depth of 75mm in areas where planting soil will be placed to produce an even, loose textured surface, free from line weeds, stones, roots, branches and similar materials larger than 50mm.

.4 Dispose of surplus excavated materials off-site.

.5 Remove water which enters excavations prior to planting. Notify Consultant if water source is ground water.

.6 Prevent freezing of bottom of plant pits.

.7 Excavate plant pits to receive frozen root balls while soil is unfrozen, and mulch with straw to protect from freezing until trees are planted.

3.4 PLANTING

.1 Planting shall be done during periods suitable with respect to weather conditions and locally accepted practice.

.2 Handle plants carefully, supporting entire plant while moving.

.3 For bare root stock, place 75 mm backfill soil in bottom of hole.

.1 Plant trees and shrubs with roots placed straight out in hole.

.4 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball.

.1 Do not pull burlap or rope from under root ball.

.5 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.

.6 Plant vertically in locations as indicated.

.1 Orient plant material to give best appearance in relation to structure, roads and walks and to the approval of Consultant.

.2 Tag specimen trees (over 75mm caliper) in the nursery and install with same north-south orientation on site

.7 For trees and shrubs:

.1 Backfill soil in 150 mm lifts.

.1 Tamp each lift to eliminate air pockets.

.2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.

.3 After water has penetrated into soil, backfill to finish grade.

.2 Form earth watering saucer at the base of each plant with a diameter as large as the excavated area.

.8 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.

.9 Water plant material thoroughly.

.10 After soil settlement has occurred, fill with soil to finish grade.

.11 After plant installation, remove all labels attached by wire or cord.

3.5 TRUNK PROTECTION

.1 Install trunk protection on deciduous trees as indicated.

.1 Wrap the main stem of each tree having caliper of 50mm or greater.

.2 Apply wrapping in a spiral manner with one-half overlap, each time starting at grade and extending upwards to just above the second branches.

.3 Make sure all wrapping is neat and snug and held in place by suitable cord. All areas of contact with support systems shall be double wrapped.

.1 Install trunk protection before installation of tree supports.

3.6 TREE SUPPORTS

.1 Stake or guy all plants as shown on drawings for individual materials with all supports, guys and fasteners snug and secure

.2 Space stake equally around plant and drive into undisturbed soil beneath roots, 150 mm minimum. Ensure stake is secure, vertical and unsplit.

.3 Ensure stakes are placed on prevailing wind side.

.4 Install guying collars above branch to prevent slipping at approximately 2/3 height for evergreens and 1/2 height for deciduous trees. Collar mounting height not to exceed 2.5 m above grade.

.5 Guying collars to be of sufficient length to encircle tree plus [50] mm space for trunk clearance.

.6 Install flagging tape to guys as indicated.

3.7 PRUNING

.1 After tree supports have been installed, remove broken branches with clean, sharp tools. Do not prune plants except to remove dead or injured branches.

.2 Prune in such a manner as to preserve the natural character of the plants. Do not remove leaders.

3.8 MULCHING

.1 Ensure soil settlement has been corrected prior to mulching.

.2 Spread mulch as indicated.

3.9 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following maintenance operations from time of planting to acceptance by Consultant.

.1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.

.1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.

.2 Remove weeds monthly.

.3 Replace or respread damaged, missing or disturbed mulch.

.4 For non-mulched areas, cultivate as required to keep top layer of soil friable.

.5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Municipal regulations. Obtain product approval from Consultant prior to application.

.6 Remove dead or broken branches from plant material.

.7 Keep trunk protection and guy wires in proper repair and adjustment.

.8 Remove and replace dead plants and plants not in healthy and vigorous growing condition. Make replacements in same manner as specified for original plantings.

3.10 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by Consultant to end of warranty period, perform following maintenance operations.

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Reform damaged watering saucers.

.3 Remove weeds monthly.

.4 Replace or respread damaged, missing or disturbed mulch.

.5 For non-mulched areas, cultivate monthly to keep top layer of soil friable.

.6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Municipal regulations. Obtain product approval from Consultant prior to application.

.7 Apply fertilizer in early spring as indicated by soil test.

.8 Remove dead, broken or hazardous branches from plant material.

.9 Keep trunk protection and tree supports in proper repair and adjustment.

.10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.

.11 Remove and replace dead plants and plants not in healthy and vigorous growing condition. Make replacements in same manner as specified for original plantings.

.12 Submit monthly written reports to Consultant identifying:

.1 Maintenance work carried out.

.2 Development and condition of plant material.

.3 Preventative or corrective measures required which are outside Contractor's responsibility.

.2 Provide written warranty for 2 years from date of substantial performance. Replace any exterior plants which in the opinion of the Consultant, are not in acceptable condition at the end of the warranty period.

.3 Any damage to plant materials from any source whatsoever shall be reported in writing to the Consultant and Owner.

3.11 CLEANING

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.12 CLOSEOUT ACTIVITIES

.1 Submit maintenance reports for trees, shrubs, and other plantings.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 The scope of work includes all labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, delivery, and installation of landscape edging materials (also known as "edging") complete as shown on the drawings and as specified herein.

.2 The scope of work in this section includes, but is not limited to, the following;

.1 Precast Maintenance Edge

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C136-[13] , Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM C140, Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.

.3 ASTM C936, Standard Specification for Solid Concrete Interlocking Paving Units.

.4 ASTM C979/C979M-[10] , Standard Specification for Pigments for Integrally Colored Concrete.

.5 ASTM C1645 Standard Test Method for Freeze-thaw and De-icing Salt Durability of Solid Concrete Interlocking Paving Units

.2 CSA Group

.1 CSA A23.1/A23.2-[09] , Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A179-[04(R2009)] , Mortar and Grout for Unit Masonry.

.3 CSA A231.1/A231.2-[06(R2010)] , Precast Concrete Paving Slabs/Precast Concrete Pavers.

.4 CSA A283-[06(R2011)] , Qualification Code for Concrete Testing Laboratories.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for precast concrete units and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Submit full size samples of each paver type, thickness, colour and finish that indicate the range of colour variation and texture expected upon project completion if requested by consultant for approval.

.2 Accepted samples become the standard of acceptance for the product produced.

.4 Test and Evaluation Reports:

.1 Submit following sampling and testing data:

.1 Sieve analysis for gradation of bedding and joint material.

.2 Precast Unit sampling and testing.

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

1.4 QUALITY ASSURANCE

.1 Qualifications:

.1 Installer: company or person specializing in precast concrete paver installations of similar complexity, size and material with 5 documented years of experience.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect materials free from mud, dirt, and other foreign materials.

.3 Store and protect precast concrete units from nicks, scratches, and blemishes.

.4 Replace defective or damaged materials with new.

Part 2 Materials

2.1 CONCRETE UNITS

.1 Concrete units to be manufactured by Unilock or approved equivalent.

.1 500mm width: Unilock SiennaStone Coping

.1 Finish: Standard

.2 Color: Natural

.3 Dimensions: 500 mm (20 in) x 1200 mm (47 1/4 in) x 185 mm (7 1/4 in) thick

.2 Pavers shall meet the minimum material and physical properties set forth in ASTM C936.

.1 Average compressive strength 8000psi (55 MPa) with no individual unit under 7,200 psi (50 MPa)

.2 Average absorption of 5% with no greater than 7% when tested according to ASTM C140.

.3 Conforming to ASTM C 1645 when tested for freeze-thaw requirements.

.4 Height tolerances +/- 3.2mm.

.3 Pigment in concrete pavers: to ASTM C979/C979M.

.4 Maximum allowable breakage of product is 5%.

2.2 BASE AGGREGATE

.1 Unit Paving Base Aggregate

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

Table – Base Aggregate
Gradation Requirements

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

2.3 CLEANING COMPOUND

.1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete units of contamination encountered.

.2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on concrete units.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for precast concrete unit installation in accordance with manufacturer's written instructions and requirements for installation tolerances and other conditions affecting performance prior to placing concrete units.

.1 Precast Concrete Units on Aggregate Base:

.1 Verify that the Base aggregate materials, thickness, compacted density, surface tolerances and elevations conform to specified requirements.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

.1 Beginning Paver installation signifies acceptance of base and edge restraint conditions.

3.2 BASE AGGREGATES

.1 Unit Base:

.1 Provide the Base Aggregate material in uniform lifts not exceeding 6 in. (150 mm) over the compacted Subgrade material and compact to at least 98 percent Standard Proctor Density as per ASTM D 698.

.2 Compact the Base Aggregate material with at least two passes in the vibratory mode then at least two in the static mode with a minimum 10 ton vibratory roller until there is no visible movement. Do not crush aggregate with the roller.

.3 Tolerance: Do not exceed the specified surface grade of the compacted Base Aggregate material more than ±3/8 in. (10 mm) over a 10 ft. (3 m) long straightedge laid in any direction.

3.3 INSTALLATION OF CONCRETE UNITS

.1 Replace Concrete Units with chips, cracks, voids, discolorations, and other defects that might be visible in finished work.

.2 Adjust laying pattern at pavement edges such that cutting of edge pavers is minimized. All cut units shall be no smaller than one-third of a whole unit.

.3 Use string lines or chalk lines to hold all pattern lines true.

.4 Set surface elevation of pavers 1/8 in. (3 mm) above adjacent drainage inlets, concrete collars or channels.

.5 Place units hand tight against spacer bars. Adjust horizontal placement of laid units to align straight.

.6 Provide space between paver units of 1/32 in. (1 mm) wide to achieve straight bond lines.

.7 Cut units with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

3.4 FIELD QUALITY CONTROL

.1 Verify final elevations for conformance to the drawings after sweeping the surface clean.

.1 Prevent final Concrete Unit finished grade elevations from deviating more than ±3/8 in. (±10 mm) under a 10 ft (3 m) straightedge or indicated slope, for finished surface of paving.

.2 Paver-to-Paver Lippage:

.1 No greater than 3 mm (1/8 inch) difference in height between adjacent pavers.

3.5 REPAIRING AND CLEANING

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

.2 Cleaning: Remove excess dirt, debris, stains, grit, etc. from exposed paver surfaces; wash and scrub clean.

.1 Clean Concrete Pavers in accordance with the manufacturer's written recommendations.

3.6 PROTECTION

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

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

.1 Read and be governed by conditions of the Contract and sections of Division 1.

1.2 SITE CONDITIONS

.1 Underground utility lines or other buried objects not shown on landscape plan are the responsibility of the Contractor and must be established in location and depth before commencing work.

1.3 PROTECTION

.1 Prevent damage to trees, landscaping, natural features, bench marks, surface or underground utility lines, which are to remain. Make good any damage.

Part 2 Products

2.1 MATERIALS

.1 Outdoor Classroom Limestone Boulder Seating:

- .1 Material: Wiarton limestone, as supplied by Beaver Valley Stone, T: (416) 222-2424, or approved equal.
- .2 Size: 1000(L)x600(W)x600mm ht., sawn sides to ensure no gaps exceed 10mm when placed.
- .3 Finish: natural top and bottom, sawn sides. Sharp edges to be ground smooth to the touch.
- .4 Quantity: in sufficient number to complete layout as shown on plan.

.2 Bedding and backfill material:

- .1 Granular ‘A’, conforming to OPSS.

.3 Filter Fabric:

- .1 ‘Terrafix 270R’ by Terrafix Geosynthetics Inc. or approved equal, (416) 674-0363.

Part 3 Execution

3.1 EXAMINATION

.1 Examine surfaces and conditions upon which work of this Section depends.

.2 Commencement of work will denote acceptance of surfaces and conditions.

3.2 PREPARATION

.1 Verify dimensions and grades on site and make minor adjustments to suit site conditions and to Landscape Architect's approval. Report any discrepancies to Consultant prior to placing stone.

.2 Remove any unconsolidated soils or deleterious material from bedding area.

.3 Face bedding course as specified to the satisfaction of Consultant prior to placing any stone.

3.3 INSTALLATION

.1 The subgrade shall be graded smooth and compacted to 98% Standard Proctor Maximum Dry Density.

.2 All pieces shall be bedded as shown on the drawings.

.3 All boulders shall tightly abut together, maximum gap between boulders shall be 10mm.

.4 Grind all sharp corners and edges smooth.

3.4 COMPLETION

.1 Upon completion of the work in this section, remove surplus materials, tools, equipment and debris, and leave site in a clean and tidy condition to the complete satisfaction of the Owner.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 32 01 90 Tree Preservation

.2 Section 32 91 19 Topsoil and Finish Grading

.3 Section 32 93 10 Trees, Shrubs and Groundcover Planting

1.2 SUMMARY

.1 Section includes the requirements for transplanting trees.

1.3 REFERENCE STANDARDS

.1 American National Standard Institute

.1 A300 Pruning standard Part 1 (2017)

.2 A300 Transplanting Standard – Part 6 (R2018)

1.4 SEQUENCING AND SCHEDULING

.1 Proceed and coordinate work as the site becomes available, consistent with seasonal limitations for transplanting.

.2 Plants to be transplanted to new locations are indicated on the L200 Planting Plan.

.3 Deciduous and evergreen plant material must be transplanted from late March-May or mid-October-November. Avoid moving plants on very hot, dry, or windy days. Transplanting should occur when trees have become dormant in the fall or prior to bud-break in the spring.

.4 The time limitation from digging, removing, transporting, to installing transplanted plant material must be the same day. The time limitation between installing the plant material and placing the mulch must be a maximum 48 hours. If project conditions prevent the Contractor from transplanting and installing plant material on the same day, plant materials must be boxed or heeled in as required. Plant material must be maintained and protected by the Contractor.

.5 Transplant trees after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after digging, set exterior trees in shade, protect from weather and mechanical damage, and keep roots moist.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data: For each type of product indicated.

.2 Qualifications: Statement of qualifications including not less than five years experience in tree transplantation in the Province of Ontario and whose work has resulted in successful establishment of transplanted trees.

.3 Samples of bark mulch.

.4 Product certificates.

.5 Planting Schedule: Indicating anticipated planting dates for transplanting trees including:

.1 Time of year for transplanting.

.2 Transplanting methods.

.3 Follow-up care and maintenance.

.6 Maintenance Instructions: Recommended procedures to be established by Landscape Architect for maintenance of exterior plants during a calendar year.

1.6 QUALITY ASSURANCE

.1 Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

.2 Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by Agriculture Canada, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

.3 Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

.1 Report suitability of topsoil for plant growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce a satisfactory topsoil.

.4 The contractor must provide a clear digital color photograph of the plant material to be relocated. Trees must be documented by an individual photograph of each. Photographs must indicate the date, species and inventory number of each plant on each photo.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Protection of Plant Material to be Transplanted

.1 Protect plant material slated for transplanting that is not transplanted at the beginning of construction operations.

.2 Prior to construction operations, tag plants to be transplanted with plastic or vinyl tape tied to the plant caliper.

.3 Plants to be transplanted must be protected from root compaction and any other damage with Tree Protection Zone barrier erected prior to the start of any construction operations. Plastic tape and barrier fencing must not be removed until transplanting operations are ready to begin and or instructed by the consultant.

.4 Water and prune plant material as necessary to keep healthy and vigorous, particularly when water is shut off. Water existing plant material to be transplanted from the start of construction operations until the maintenance period is over.

.5 Outside storage locations must be continually shaded and protected from the wind. Bare root plants must be heeled in. Plants stored on the project site must be protected from any drying at all times covering the balls or roots with moist sawdust, wood chips, shredded bark, peat moss, or other similar mulching material.

.2 Protection of Plant Material During Transplanting

.1 Plant material must be protected during transplanting to prevent desiccation and damage to the branches, trunk, and root system. Exposed branches must be covered during transport.

.2 Plant material must be undamaged, vigorous and healthy with a well-branched root system, free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement or abrasion after transplanting.

.3 Plant material showing desiccation, abrasion, sun scald injury or structural branching damage will not meet final acceptance.

1.8 FINAL ACCEPTANCE

.1 Work under this Section will be accepted by Landscape Architect upon satisfactory completion of all work including maintenance, but exclusive of replacement of plant materials under warranty period. Upon Final Acceptance, Owner will assume responsibility of maintenance of the work.

1.9 WARRANTY

.1 Special Warranty: Installer's standard form in which Installer agrees to repair or replace plantings which fail in materials, workmanship, or growth within specified warranty period.

.1 Failures include, but are not limited to, the following:

.1 Death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner, or incidents that are beyond Contractor's control.

.2 Structural failures including plantings falling or blowing over.

.2 Any delay in completion of planting operations which extends planting into more than one planting season shall extend Warranty Period correspondingly.

.3 Warranty Periods from Date of Substantial Completion:

.1 Warrant that all trees planted under this Contract will be healthy and in flourishing condition of active growth two years from date of Final Acceptance.

.2 Replace, without cost to Owner, and as soon as weather conditions permit, all dead plants and all plants not in vigorous, thriving condition as determined by Consultant during and at the end of Warranty Period.

.3 Plants shall be free of dead or dying branches and branch tips, and shall bear foliage of a normal density, size, and color.

.4 Replacements shall closely match adjacent specimens of the same species and shall be subject to all specified requirements

Part 2 Products

2.1 TOPSOIL

.1 Refer to Section 32 91 19 Topsoil and Finish Grading

2.2 PLANTING SOIL

.1 Refer to Section 32 91 19 Topsoil and Finish Grading

2.3 SOIL AMENDMENTS

.1 Refer to Section 32 91 19 Topsoil and Finish Grading

2.4 ANTI-DESICCANT

.1 commercial, wax-like emulsion.

2.5 FERTILIZER

.1 Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.

.2 Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

.1 Composition: 5 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

.2 Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

.3 Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

.1 Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

.2 Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.6 MULCHES

.1 Refer to Section 32 93 10 Trees, Shrubs and Groundcover Planting

2.7 TREE PROTECTION BARRIERS

.1 Refer to Section 32 01 90 Tree Preservation

2.8 PLANTING ACCESSORIES

.1 Refer to Section 32 93 10 Trees, Shrubs and Groundcover Planting

2.9 EQUIPMENT

.1 Pruning Tools: Use only sharp, clean tools, sterilized prior to use.

.2 Transplanting Tools: Size of Vermeer Spade, if used is to be large enough to encompass fibrous feeder roots of each plant, consistent with standard nursery sizes for plant being relocated.

.3 Watering Tubes: Gray, perforated SDR PVC drainage pipe, four inches in diameter.

.4 Vehicles: Do not drive onto or operate a vehicle on jobsite carrying dirt or plant debris from another site. Wash all dirt and mud from tires prior to entering jobsite.

Part 3 Execution

3.1 PREPARATION

.1 Verify with Landscape Architect all plants to be transplanted prior to beginning work.

.2 Stake plant layout for adjustment and approval prior to transplanting.

.3 Transplant all plantings as shown on Drawings. Proceed with transplanting operations based upon consultant accepted schedule and methods.

.4 Root Pruning: Large canopy and specimen plant material must be root pruned a minimum of 6 months before transplanting. Minimum rootball diameter should be 12 times the diameter of the trunk [or combined trunk diameters for multi-stemmed trees], measured 1.4m above the existing undisturbed grade at the base of the tree. Refer to table below.

Trunk Diameter (DBH)	Distance From Trunk	
	Minimum	Preferred
< / = 150mm	1.2m	1.5m
225mm	1.2m	1.5m
30mm	1.2m	1.8m
375mm	1.5m	2.1m
450mm	1.8m	2.4m
525mm	2.1m	2.7m

.5 Plant Material Preparation

.1 Plant material designated for transplanting must be watered thoroughly several days before root pruning, digging or moving. Broken or interfering growth must be pruned. Large canopy and specimen plant material must be wire balled and burlapped. Mark north side of plants prior to excavation. Relocate in new location with north facing same direction

3.2 LAYOUT

.1 Relocate plant material as shown on drawings. Plant material locations may be adjusted to meet field conditions, only with Consultant approval.

3.3 TREE PRUNING

.1 All pruning shall conform to ANSI A300 Tree Care Operations - Tree, Shrub, and Other Woody Plant Maintenance - Standard Practices.

.2 Maintenance pruning during the site preparation stage shall consist of crown cleaning to remove all dead, diseased, damaged, defected, and selective crossing branches and shall be done by or under the direction of a qualified professional.

.3 Tree conditions not correctable by sound horticultural pruning shall be identified and brought to the owner and/ or consultant's attention.

.4 Risk reduction pruning shall be completed by or done under the direction of a qualified professional.

3.4 TREE PLANTING

.1 Refer to drawing details and Section 32 93 10 Trees, Shrubs and Groundcover Planting

3.5 PLANT MAINTENANCE

.1 Tree and Shrub Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

.2 Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

3.6 FIELD QUALITY CONTROL

.1 Make written request for inspection after planting operations are complete.

.2 Submit requests for inspection to Owner at least two (2) days prior to anticipated inspection date.

3.7 CLEANING

.1 Clean all areas as required for complete and acceptable inspection.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work, including work outside the property line including work within Regional and Municipal right of way unless otherwise noted.

1.2. Related Work

1.	Site Grading	Section 31 23 13
2.	Excavating, Trenching and Backfilling	Section 31 23 10
3.	Storm Sewers	Section 33 44 00
4.	Aggregates: General	Section 31 05 17

1.3. References

1. ASTM A48/A48M-03 (2016), Specification for Gray Iron Castings.
2. ASTM C139-18 (1989), Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
3. ASTM C478M-90, Specification for Precast Reinforced Concrete Manhole Sections
4. CSA A3000, Portland Cement.
5. CSA A3000, Masonry Cement.
6. CAN/CSA-A23.1-M90, Concrete Materials and Methods for Concrete Construction.
7. CSA A82.56-M1976, Aggregate for Masonry Mortar.
8. CAN3-A165 Series-M85, CSA Standards on Concrete Masonry Units.
9. CAN/CSA-G30.18-M92, Billet Steel Bars for Concrete Reinforcement.
10. CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
11. Ontario Provincial Standard Specification 407.

2. PRODUCTS

2.1. Materials

1. Precast manhole units: to ASTM C478M, circular or oval. Top sections eccentric cone or flat slab top type with opening offset for vertical ladder installation. Monolithic bases to be approved by Consultant and set on concrete slabs cast in place.
    1. 1200 mm diameter manhole as per OPSD 701.010.
2. Precast catch basins: to ASTM C478M.
    1. Catch basins as per OPSD 705.010
3. Joints: to be made watertight using rubber rings or cement mortar.
4. Mortar:
    1. Aggregate: to CSA A82.56.
    2. Cement: to CAN/CSA-A8.
5. Ladder rungs: to CAN/CSA-G30.18, No. 25M billet steel deformed bars, hot dipped galvanized to

CAN/CSA G164 Rungs to be safety pattern (drop step type).

6. Adjusting rings: to ASTM C478M.

7. Concrete Brick: to CAN3-A165 Series.

8. Frames, gratings, covers to dimensions as indicated and following requirements:

    1. Metal gratings and covers to bear evenly on frames. A frame with grating or cover to constitute one unit. Assemble and mark unit components before shipment.

    2. Gray iron castings: to ASTM A48, strength class 30B.

    3. Castings: coated with two applications of asphalt varnish.

    4. Storm manhole frames and covers: heavy duty municipal type for road service. Cover cast without perforations and complete with two 25 mm square lifting holes, as per OPSD 400.010, unless otherwise specified.

    5. Catchbasin frame and cover: as per OPSD 400.010.

    6. Manhole frame and cover as per OPSD 401.010 Type A.

9. Granular bedding and backfill: Granular B Type I: to OPSD 1010 and Section 02701 – Aggregates: General and to Section 02315 – Excavating, Trenching and Backfilling.

10. Unshrinkable fill: to Section 02315 – Excavating, Trenching and Backfilling.

3. EXECUTION

3.1. Excavation and Backfill

1. Excavate and backfill in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.

2. Obtain approval of Consultant before installing manholes or catch basins.

3.2. Installation

1. Construct units in accordance with details indicated, plumb and true to alignment and grade.

2. Complete units as pipe laying progresses. Maximum of three units behind point of pipe laying will be allowed.

3. Dewater excavation free of standing water or as directed by Consultant and remove soft and foreign material before placing concrete base.

4. Set precast concrete base on 150 mm minimum of granular bedding compacted to 100% Corrected Maximum Dry Density.

5. Precast units.

    1. Set bottom section of precast unit in bed of cement mortar and bond to concrete slab or base. Make each successive joint watertight with rubber ring gaskets, cement mortar, or combination thereof.

    2. Clean surplus mortar and joint compounds from interior surface of unit as work progresses.

    3. Plug lifting holes with precast concrete plugs set in cement mortar or mastic compound.

6. For sewers:

    1. Place stub outlets and bulkheads at elevations and in positions indicated.

    2. Bench to provide a smooth U-shaped channel in manholes.

7. Compact granular backfill to 98% Corrected Maximum Dry Density.

8. Place frame and cover on top section to elevation as indicated. If adjustment required use concrete ring.

9. Clean units of debris and foreign materials. Remove fins and sharp projections. Prevent debris from entering system.

3.3. **Leakage Test**

1. Visual inspection of leakage will be carried out. If any leakage is observed, correct leakage as directed by Consultant at no additional cost.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work, including work outside the property line including work within Regional and Municipal right of way unless otherwise noted.

1.2. Description

1. The work included in this Section includes for all labour, equipment and materials required for the watermain construction within the site, and watermain construction within the municipal right of way connecting to existing municipal servicing.
2. Included in the work is coordination and cooperation with Municipal forces as required to complete the work including providing temporary blow offs, isolation valves, pressure testing and chlorination as required by Municipal forces.

1.3. Related Work

1. Excavating, Trenching and Backfilling — Section 31 23 10

1.4. References

1. The Municipality Standards and Specifications for watermain construction.

1.5. Scheduling Of Work

1. Schedule work to minimize interruptions to existing services.

2. PRODUCTS

1. All products utilized within the water system to comply with the Municipality Standards and Specifications.

3. EXECUTION

3.1. Preparation

1. Clean pipes, fittings, and appurtenances of accumulated debris and water before installation. Carefully inspect materials for defects to approval of Consultant. Remove defective materials from site as directed by Consultant.

3.2. Trenching

1. Do trenching work in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.
2. Trench depth to provide cover over pipe of not less than 1.75 metres from finished grade or as indicated.
3. Trench alignment and depth require Consultants' approval prior to placing bedding material and pipe.

3.3. **Granular Bedding**

1. Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness to depth of 300 mm below bottom of pipe or to depth as indicated.
2. Do not place material in frozen condition.
3. Shape bed true to grade to provide continuous uniform bearing surface for pipe.
4. Shape transverse depressions in bedding as required to suit joints.
5. Compact each layer full width of bed to at least 95% of corrected maximum dry density.
6. Fill authorized or unauthorized excavation below design elevation of bottom of specified bedding in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling with compacted bedding material.

3.4. **Pipe Installation**

1. Lay pipes to ANSI/AWWA C600 Manual of Practice and manufacturer's standard instructions and specifications. Do not use blocks except as permitted in 3.3.2.
2. Join pipes in accordance with ANSI/AWWA C600, ANSI/AWWA C206, AWWA Manual of Practice and manufacturer's recommendations.
3. Bevel or taper ends of PVC pipe to match fittings.
4. Handle pipe by methods approved by Engineer recommended by pipe manufacturer. Do not use chains or cables passed through pipe bore so that weight of pipe bears on pipe ends.
5. Lay pipes on prepared bed, true to line and grade. Ensure barrel of each pipe is in contact with shaped bed throughout its full length. Take up and replace defective pipe. Correct pipe which is not in true alignment or grade or pipe which shows differential settlement after installation greater than 10 mm in 3 m.
6. Face socket ends of pipe in direction of laying. For mains on a grade of 2% or greater, face socket ends upgrade.
7. Do not exceed permissible deflection at joints as recommended by pipe manufacturer.
8. Keep jointing materials and installed pipe free of dirt and water and other foreign materials. Whenever work is stopped, install a removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
9. Position and join pipes with equipment and methods approved by Consultant.
10. Cut pipes in an approved manner as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
11. Align pipes carefully before jointing.
12. Install gaskets to manufacturer's recommendations. Support pipes with hand slings or crane as required to minimize lateral pressure on gasket and maintain concentricity until gasket is properly positioned.
13. Avoid displacing gasket or contaminating with dirt or other foreign material. Gaskets so disturbed or contaminated shall be removed, cleaned, lubricated and replaced before jointing is attempted again.
14. Complete each joint before laying next length of pipe.
15. Minimize deflection after joint has been made.
16. Apply sufficient pressure in making joints to ensure that joint is completed to manufacturer's recommendations.

17. Ensure completed joints are restrained by compacting bedding material alongside and over installed pipes or as otherwise approved by the Consultant.

18. Provide necessary fittings and adaptors as required between existing watermain pipe materials and proposed watermain pipe materials.

19. When stoppage of work occurs, block pipes in an approved manner to prevent creep during down time.

20. Recheck plastic pipe joints assembled above ground after placing in trench to ensure that no movement of joint has taken place.

21. Do not lay pipe on frozen bedding.

22. Contractor responsible for satisfactory completion of hydrostatic and leakage testing to Consultant's approval. Contractor also responsible for degree of backfilling complete prior to hydrostatic and leakage testing as well as isolation and correction of any leaks resulting in failed tests.

23. Backfill remainder of trench.

3.5. **Cathodic Protection And Tracer Wire**

1. Install as per Municipal Standards,

3.6. **Hydrostatic And Leakage**

1. Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described as required by the Municipality standards.

2. Notify Consultant at least 24 h in advance of all proposed tests. Perform tests in presence of Consultant.

3. Where any section of system is provided with concrete thrust blocks, conduct tests at least 5 days after placing concrete or 2 days if high early strength concrete is used.

4. Test pipeline in sections not exceeding 365 m in length, unless otherwise authorized by Consultant.

5. Upon completion of pipe laying and after Consultant has inspected work in place, surround and cover pipes between joints with approved granular material placed to dimensions indicated or directed by Consultant.

6. Leave hydrants, valves, backflow preventer, water meter, joints and fittings exposed.

7. When testing is done during freezing weather, protect hydrants, valves, backflow preventer, water meter, joints and fittings from freezing.

8. Strut and brace caps, bends, tees, and valves, to prevent movement when test pressure is applied.

9. Open valves.

10. Expel air from main by slowly filling main with potable water. Install corporation stops at high points in main where no air-vacuum release valves are installed. Remove stops after satisfactory completion of test and seal holes with plugs.

11. Thoroughly examine exposed parts and correct for leakage as necessary.

12. Examine exposed pipe, joints, fittings and appurtenances while system is under pressure.

13. Remove joints, fittings and appurtenances found defective and replace with new sound material and make watertight.

14. Repeat hydrostatic test until all defects have been corrected.

15. Apply a leakage test pressure of equal to design pressure after complete backfilling of trench, based on elevation of lowest point in main and corrected to elevation of gauge, for period of 2 h.

16. Define leakage as amount of water supplied from water meter in order to maintain test pressure for 2 h.

17. Do not exceed allowable leakage of 0.03 L/mm diameter per 300 m of pipe, including lateral connections, per hour.

18. Locate and repair defects if leakage is greater than amount specified.

19. Repeat test until leakage is within specified allowance for full length of water main.

Pipe Surround

20. Upon completion of pipe laying and after Consultant has inspected work in place, surround and cover pipes as indicated.

21. Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated. Do not dump material within 5 m of pipe.

22. Place layers uniformly and simultaneously on each side of pipe.

23. Do not place material in frozen condition.

24. Compact each layer from pipe invert to mid height of pipe to at least 95% of SPMDD to ASTM D698.

25. Compact each layer from (mid height) of pipe to underside of backfill to at least 95% of SPMDD and in accordance with Geotechnical Report for site.

3.7. **Backfill**

1. Place backfill material above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

2. Do not place backfill in frozen condition.

3. Compact native backfill to at least 95% of SPMDD.

3.8. **Flushing And Disinfecting**

1. The Municipality shall perform all chlorination works.

2. Flush water mains through available outlets with a sufficient flow of potable water to produce a velocity of 1.5 m/s, within pipe for 10 min., or until foreign materials have been removed and flushed water is clear.

3. Flushing flows shall be as follows:

Pipe Size NPS	Flow (L/s) Minimum
6 and below	38
8	75

4. Provide connections and pumps for flushing as required.

5. Open and close valves, hydrants and service connections to ensure thorough flushing.

6. Complete flushing to satisfaction of Consultant and The Municipal forces.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work, including work outside the property line including work within Regional and Municipal right of way unless otherwise noted.

1.2. Related Work

1.	Site Grading	Section 31 23 13
2.	Excavating, Trenching and Backfilling	Section 31 23 10
3.	Manholes and Catchbasins	Section 33 05 14
4.	Aggregates: General	Section 31 05 17

1.3. References

1. ASTM D3034, Specification for Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and fittings.
2. CAN/CSA-B182.2, PVC Sewer Pipe and Fittings (PSM Type),
3. CAN/CSA-B182.11, Recommended Practice for the Installation of Plastic Crain and Sewer Pipe and Pipe Fittings.
4. Ontario Provincial Standard Specification MUNI 410.

1.4. Material Certification

1. Submit manufacturer's test data and certification at least 2 weeks prior to commencing work.
2. Certification to be marked on pipe.

1.5. Scheduling of Work

1. Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.

2. PRODUCTS

2.1. PVC Pipe

Poly Vinyl Chloride pipe as specified in the Contract Drawings shall be in accordance with OPSS 410, Pipe Sewer Installation in Open Cut.

2.2. Pipe Bedding, Surround and Cover Materials

1. Granular embedment materials to Section 31 05 17 – Aggregates.

2.3. Backfill Material

1. Backfill to Section 31 23 10 – Excavation, Trenching and Backfilling
2. Backfill within the public right of way to be un-shrinkable fill.

2.4. Joint Mortar

1. Portland cement: to CAN/CSA-A5, normal type 10.
2. Mortar: one part Portland cement to two parts clean sharp sand mixed with minimum amount of water to obtain optimum consistency for use intended. Do not use additive..

3. EXECUTION

3.1. Preparation

1. Clean pipes and fittings of debris and water before installation, and remove defective materials from site.

3.2. Trenching

1. Do trenching work in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.
2. Do not allow contents of any sewer or sewer connection to flow into trench.
3. Trench alignment and depth to approval of Consultant prior to placing bedding material and pipe.

3.3. Granular Bedding

1. Place granular bedding material to details indicated in bedding detail OPSD 802.010 to OPSD 802.054, depending on type of soil and pipe. Use Class B bedding and place bedding in unfrozen condition. Type of soil to be defined in the field as Type 1, 2, 3, or 4 as per Health and Safety Act and Regulations for Construction Projects.
2. Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness.
3. Compact each layer full width of bed to at least 95% corrected maximum dry density.
4. Shape bed true to grade and to provide continuous, uniform bearing surface for pipe. Do not use blocks when bedding pipes.
5. Shape transverse depressions as required to suit joints.
6. Fill excavation below bottom of specified bedding adjacent to manholes or catch basins with compacted common backfill.

3.4. Installation of Sanitary Sewer Pipes

1. Lay and join pipe in accordance with manufacturer's recommendations and to approval of Consultant.
2. Handle pipe using methods approved by Consultant. Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.
3. Commence laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.
4. Do not exceed maximum joint deflection recommended by pipe manufacturer.
5. Do not allow water to flow through pipes during construction except as may be permitted by Consultant.
6. Whenever work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
7. PVC Pipe as specified in the Contract Drawings shall be installed in accordance with OPSS MUNI 410, Pipe Sewer Installation in Open Cut.
8. When any stoppage of work occurs, restrain pipes as directed by Consultant, to prevent "creep" during down time.
9. Cut pipes as required for special inserts, fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.
10. Make watertight connections to manholes and catch basins. Use shrinkage compensating grout

when suitable gaskets are not available. Support connections as per OPSD 708.020.

11. Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes. Joint to be structurally sound and watertight.

12. Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

3.5. **Pipe Surround**

1. Place surround material in unfrozen condition.

2. Upon completion of pipe laying, and after Consultant has inspected pipe joints, surround and cover pipes as indicated.

3. Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated. Pipe surround material to extend 300 mm above crown of pipe.

4. Place layers uniformly and simultaneously on each side of pipe.

5. Compact each layer from pipe invert to mid height of pipe to at least 95% corrected maximum dry density.

3.6. **Backfill**

1. Place backfill material in unfrozen condition.

2. Place backfill material above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

3.7. **Field Testing**

1. Repair or replace pipe, pipe joint or bedding found defective.

2. When directed by Consultant, draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.

3. Remove foreign material from sewers and related appurtenances by flushing with water.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda.

1.2. Related Work

1.	Excavating, Trenching and Backfilling	Section 31 23 10
2.	Manholes and Catchbasins	Section 33 05 14
3.	Aggregates: General	Section 31 05 17

1.3. References

1. ASTM C14, Specification for Concrete Sewer, Storm Drain and Culvert Pipe.
2. ASTM C76, Specification for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
3. ASTM C443M-85a (1990), Specification for Joints for Circular Concrete Sewer and Culvert Pipe, using Rubber Gaskets.
4. CSA A3000, Portland Cement.
5. CAN/CSA-A257, Series M92, Standards for Concrete Pipe.
6. CAN3-G401-M81, Corrugated Steel Pipe products.
7. Ontario Provincial Standard Specification MUNI 410.

1.4. Material Certification

1. Certification to be marked on pipe.

1.5. Scheduling of Work

1. Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.

2. PRODUCTS

2.1. Concrete Pipe

1. Non-reinforced circular concrete pipe and fittings: to CAN/CSA-A-257-2, ASTM C14M, Class 3 designed for flexible rubber gasket joints to ASTM C443 M and CAN/CSA A257.
2. Reinforced circular concrete pipe and fittings: to CAN/CSA-A257, ASTM C76M, strength classification as indicated in the Contract Drawings, designed for flexible rubber gasket joints to ASTM C443M and CAN/CSA A257.
3. Manufactured tees for pipe-to-pipe connections.
4. Lifting holes:
    1. Pipe 900 mm and less diameter: no lift holes.
    2. Pipe greater than 900 mm diameter: lift holes not to exceed two in piece of pipe.

3. Provide pre-fabricated plugs to effectively seal lift holes after installation of pipe.

2.2. PVC Pipe

Poly Vinyl Chloride pipe as specified in the Contract Drawings shall be in accordance with OPSS MUNI 410, Pipe Sewer Installation in Open Cut.

2.3. Trench drains

Trench drains as specified in the Contract Drawings shall be in accordance with manufacturers requirements.

2.4. Pipe Embedment, Surround and Cover Materials

1. Granular material to Section 31 05 17 – Aggregates.
2. Granular A to Section 31 23 13 – Site Grading
3. Pipe embedment shall be in accordance with OPSD 802.010

2.5. Backfill Material

1. Backfill shall be granular material as specified in Section 31 23 10 – Excavation, Trenching and Backfilling.

2.6. Joint Mortar

1. Portland cement: to CAN/CSA-A5, normal type 10.
2. Mortar: one part Portland cement to two parts clean sharp sand mixed with minimum amount of water to obtain optimum consistency for use intended. Do not use additives.

3. EXECUTION

3.1. Preparation

1. Clean pipes and fittings of debris and water before installation and remove defective materials from site.

3.2. Trenching

1. Do trenching work in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.
2. Do not allow contents of any sewer or sewer connection to flow into trench.
3. Trench alignment and depth to approval of Consultant prior to placing bedding material and pipe.

3.3. Granular Bedding

1. Place granular bedding material to details indicated in bedding detail OPSD 802.010 to OPSD 802.054, depending on type of soil and pipe. Use Class B bedding and place bedding in unfrozen condition.

Type of soil to be defined in the field as Type 1, 2, 3, or 4 as per Health and Safety Act and Regulations for Construction Projects.

2. Place granular bedding material in uniform layers not exceeding 150 mm compacted thickness.

3. Compact each layer full width of bed to at least 95% corrected maximum dry density.

4. Shape bed true to grade and to provide continuous, uniform bearing surface for pipe. Do not use blocks when bedding pipes.

5. Shape transverse depressions as required to suit joints.

6. Fill excavation below bottom of specified bedding adjacent to manholes or catch basins with compacted granular backfill.

3.4. Installation of Storm Drainage Pipes

1. Lay and join pipe in accordance with manufacturer's recommendations and to approval of Consultant.

2. Handle pipe using methods approved by Consultant. Do not use chains or cables passed through rigid pipe bore so that weight of pipe bears upon pipe ends.

3. Commence laying at outlet and proceed in upstream direction with socket ends of pipe facing upgrade.

4. Do not exceed maximum joint deflection recommended by pipe manufacturer.

5. Do not allow water to flow through pipes during construction except as may be permitted by Consultant.

6. Whenever work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.

7. Joints

1. Poly Vinyl Chloride Pipe

PVC Pipe as specified in the Contract Drawings shall be installed in accordance with OPSS MUNI 410, Pipe Sewer Installation in Open Cut.

8. When any stoppage of work occurs, restrain pipes as directed by Consultant, to prevent "creep" during down time.

9. Cut pipes as required for special inserts, fittings or closure pieces, as recommended by pipe manufacturer, without damaging pipe or its coating and to leave smooth end at right angles to axis of pipe.

10. Make watertight connections to manholes and catch basins. Use shrinkage compensating grout when suitable gaskets are not available. Support connections as per OPSD 708.020.

11. Use prefabricated saddles or approved field connections for connecting pipes to existing sewer pipes. Joint to be structurally

sound and watertight.

12. Temporarily plug open upstream ends of pipes with removable watertight concrete, steel or plastic bulkheads.

3.5. Pipe Surround

1. Place surround material in unfrozen condition.
2. Upon completion of pipe laying, and after Consultant has inspected pipe joints, surround and cover pipes as indicated.
3. Hand place surround material in uniform layers not exceeding 150 mm compacted thickness as indicated. Pipe surround material to extend 300 mm above crown of pipe.
4. Place layers uniformly and simultaneously on each side of pipe.
5. Compact each layer from pipe invert to mid height of pipe to at least 95% corrected maximum dry density.

3.6. Backfill

1. Place backfill material in unfrozen condition.
2. Place backfill material above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.
3. Trench backfill shall be imported granular material consisting of Granular B Type I, or reclaimed granulars free of organics.
4. Trench backfill within the public right of way is to be un-shrinkable fill.

3.7. Field Testing

1. Repair or replace pipe, pipe joint or bedding found defective.
2. When directed by Consultant, draw tapered wooden plug with diameter of 50 mm less than nominal pipe diameter through sewer to ensure that pipe is free of obstruction.
3. Remove foreign material from sewers and related appurtenances by flushing with water.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda.

1.2. Related Work

1.	Excavating, Trenching and Backfilling	Section 31 23 10
2.	Aggregates: General	Section 31 05 17

1.3. References

1. OPSS 1801 – Corrugated Steel Pipe Products
2. OPSS 1840 – Polyethylene Pipe Products
3. OPSS 1860 – Geotextiles
4. CSA G164-M1981 – Hot Dip Galvanizing of Irregularly Shaped Articles.
5. CGSB 41-GP-29Ma-1983 - Tubing, Plastic, Corrugated, Drainage

1.4. Material Certification

1. Certification to be marked on pipe.

1.5. Scheduling of Work

1. Schedule work to minimize interruptions to existing services and to maintain existing flow during construction.

2. PRODUCTS.

2.1. PVC Pipe

Poly Vinyl Chloride pipe as specified in the Contract Drawings shall be in accordance with OPSS 410, Pipe Sewer Installation in Open Cut.

2.2. Pipe Embedment, Surround and Cover Materials

1. Granular material to Section 31 05 17 – Aggregates.
2. Pipe embedment shall be in accordance with OPSD 802.010

2.3. Backfill Material

1. Backfill shall be granular material as specified in Section 31 23 10 – Excavation, Trenching and Backfilling.

3. EXECUTION

3.1. Preparation

1. Clean pipes and fittings of debris and water before installation, and remove defective materials from site.

3.2. Trenching

1. Do trenching work in accordance with Section 31 23 10 – Excavating, Trenching and Backfilling.

2. Do not allow contents of any sewer or sewer connection to flow into trench.

3. Trench alignment and depth to approval of Consultant prior to placing bedding material and pipe.

3.3. Granular Pipe Surround

1. Granular materials surrounding the pipe shall be in accordance with OPSS MUNI 1010.

3.4. Installation of Subdrains

1. Installation of subdrains is to be in accordance with OPSS MUNI 405.

3.5. Pipe Surround

1. Place surround material in unfrozen condition.

2. Pipe surround material shall be HL-8 Coarse Bedding Stone

3.6. Backfill

1. Place backfill material in unfrozen condition.

2. Place backfill material above pipe surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

3. Trench backfill shall be imported granular material consisting of Granular B Type I, or reclaimed granulars free of organics.

4. Trench backfill within the public right of way is to be un-shrinkable fill.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 This Section includes sub drainage systems for planting areas, artificial turf surfacing, landscape walls and edges.

1.2 References

.1 ASTM International, latest edition:

- .1 D2321: Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications
- .2 D3034, Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe
- .3 D4491/D4491M Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- .4 F405 Standard Specification for Corrugated Polyethylene (PE) Pipe and Fittings.
- .5 F667, Standard Specification for Large Diameter Corrugated Polyethylene (PE) Pipe and Fittings

.2 American Association of State Highway and Transportation Officials (AASHTO)

- .1 M 252 - Standard Specification for Corrugated Polyethylene Drainage Pipe 3”-10” (75mm to 250mm)

.3 Ontario Provincial Standard Specification

- .1 OPSS.PROV 1010 Material Specification for Aggregates – Base, Subbase, Select Grade and Backfill Material

Part 2 Products

2.1 PIPES AND FITTINGS

.1 Perforated / Non-Perforated PE Pipe and Fittings: ASTM F 405 or AASHTO M 252, Type CP; corrugated, for coupled joints.

- .1 Couplings: Manufacturer's standard, band type.

2.2 CLEANOUTS

.1 PVC Cleanouts: ASTM D 3034, PVC cleanout threaded plug and threaded pipe hub.

.2 Pipe Plug for Softscape: PVC

.3 Pipe Plug for Hardscape:

- .1 Cast Iron plug and housings, flush with surrounding surfaces and suitable for heavy duty exterior applications.

2.3 SOIL MATERIALS

.1 Backfill, drainage course, impervious fill, and satisfactory soil materials are specified in Division 31 Section "Excavation and Fill."

2.4 GEOTEXTILE FILTER FABRICS

.1 Description: Fabric of PP or polyester fibers or combination of both, with flow rate range from to 330 gpm/sq. ft. when tested according to ASTM D 4491.

.1 Structure Type: Nonwoven, needle-punched continuous filament.

.2 Style(s): Flat and sock.

2.5 GRANULAR

.1 Perforated Drainage Pipes: 19mm Clear Stone, 50mm min. pipe surround and minimum 300mm depth to bottom of pipe.

.2 Non-Perforated Drainage Pipes: Granular 'A' to OPSS 1010.

Part 3 Execution

3.1 EARTHWORK

.1 Excavating, trenching, and backfilling are specified in Division 31.

3.2 PIPING APPLICATIONS

.1 Underground Subdrainage Piping:

.1 Perforated PE pipe and fittings, couplings, and coupled joints.

3.3 PIPING INSTALLATION

.1 Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.

.2 Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.

.3 Install PE piping according to ASTM D 2321.

3.4 CLEANOUT INSTALLATION

.1 Cleanouts for Subdrainage:

.1 Install cleanouts and riser extensions from piping to top of slab or grade. Locate cleanouts at beginning of piping run in soft landscape and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.

3.5 CONNECTIONS

.1 Connect low elevations of subdrainage system to storm drainage system.

3.6 FIELD QUALITY CONTROL

.1 Testing: After installing drainage course to top of piping, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

3.7 CLEANING

.1 Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials and installation for foundation and underslab drainage.

1.2 RELATED SECTIONS

.1 Section 31 23 10 - Excavating, Trenching and Backfilling.

.2 Section 03 30 00 – Cast-in-Place Concrete.

1.3 REFERENCES

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

.1 ASTM D698-[00a], Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-34.22-[94], Asbestos-Cement Drain Pipe.

.3 Canadian Standards Association (CSA International)

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

.2 CSA B1800-[02], Plastic Non-pressure Pipe Compendium - B1800 Series (Consists of B181.1, B181.2, B181.3, B181.5, B182.1, B182.2, B182.4, B182.6, B182.7, B182.8 and B182.11).

.1 CSA B182.2-[02], PVC Sewer Pipe and Fittings (PSM Type).

.3 CSA-G401-[01], Corrugated Steel Pipe Products.

.4 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act, 1999 (CEPA)

.5 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA)

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal packaging material for recycling.

.3 Divert unused concrete materials from landfill to local facility.

.4 Divert excavated native material to local facility.

.5 Divert unused aggregate materials from landfill to facility for reuse.

.6 Divert unused metal materials from landfill to metal recycling facility for disposal approved by Consultant.

.7 Divert unused geotextiles from landfill to plastic recycling facility for disposal approved by Consultant.

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

.9 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.10 Dispose of unused asbestos cement pipe in accordance with regulations governing the disposal of hazardous materials.

1.5 SITE CONDITIONS

.1 Examine sub-surface investigation report which is bound into specifications.

.2 Known underground utility lines and buried objects are as indicated on plans.

Part 2 Products

2.1 BEDDING AND SURROUND MATERIALS

.1 Coarse filter aggregate: to CSA-A23.1/A23.2, Group 1, 15 mm.

.2 Fine filter aggregate: to CSA-A23.1/A23.2.

.3 Flexible plastic tubing and fittings. Corrugated, Non-perforated, nominal inside diameter 100 and 150 mm. Type 1 for discharge lines, Type 2 perforated and wrapped with filter fabric for collector lines.

.4 Geodrains: “Terradrain” 600 by Terrafix or approved equal.

.5 Filter Fabric: “Terrafix” 270R or Mirafi 140.

2.2 BACKFILL MATERIAL

.1 In accordance with Section 31 23 10 - Excavating, Trenching and Backfilling and as indicated on drawings.

.2 Excavated or graded material existing on site is not suitable for backfill. Backfill shall be Granular “B” Type II, refer to drawings.

.3 The drawings and specifications supersede all recommendations from the geotechnical report prepared by McClymont & Rak Engineers Inc. (G3947).

Part 3 Execution

3.1 EXAMINATION

.1 Ensure graded subgrade conforms with required drainage pattern before placing bedding material.

.2 Ensure improper slopes, unstable areas, areas requiring additional compaction or other unsatisfactory conditions are corrected to approval of Consultant.

.3 Ensure foundation wall have been installed and approved by Consultant before placing bedding material.

3.2 BEDDING PREPARATION

.1 Cut trenches in subgrade and place bedding material in uniform layers not exceeding 150 mm compacted thickness to depth as indicated.

.2 Shape bed true to grade and to provide continuous, uniform bearing surface for tubing.

.3 Shape transverse depressions, as required, to suit joints.

.4 Compact each layer full width of bed to at least 95% of corrected maximum dry density.

.5 Fill excavation below design elevation of bottom of specified bedding with compacted bedding material.

3.3 INSTALLATION AT PERIMETER OF BUILDING AND AREAS WITHIN FOUNDATION PERIMETER

.1 If drain is not on footing, place a min. 100 mm of coarse filter material.

.2 At planter locations, install geodrain against wall from finish grade to weeping tile invert elevation – temporary hold it in place until backfilled.

.3 Lay wrapped perforated pipe directly on coarse filter material. Invert of pipe to be minimum of 250 mm below underside of floor slab. Provide pipes sloping to drains as shown on drawings. Minimum slope 1%. Connect perforated pipe to storm main.

.4 Install minimum 150 mm of coarse filter material to sides and top of perforated pipe for perimeter drainage.

.5 Install minimum 300 mm Granular "B" all around coarse filter material (sides and top).

.6 Install minimum 150 mm coarse filter material cover on all sides of non-perforated pipe.

.7 Ensure pipe interior and coupling surfaces are clean before laying.

.8 Do not use concrete, masonry, stones, wood or any type of shim to establish pipe slope.

.9 Connect pipes using manufacturer's recommended fittings and seal joints with sewer compound.

.10 Protect pipe ends from damage and ingress of foreign material at each end of each day's work or work stoppage.

.11 Place filter material after pipe installation has been inspected.

.12 Place filter material by hand in 150 mm lifts. Consolidate by tamping lightly. Prevent displacement of pipe.

.13 Backfill trench (1 m wide minimum) with Granular "B" lightly compacted to 95% standard density (except under paved and slab on grade areas: 98%) up to 700 mm below finished grade.

.14 In landscaped areas place 600 mm of impermeable backfill seal compacted clay prior to the placing of top soil.

3.4 INSTALLATION UNDER PAVED AREAS

.1 Install weeping tile around parking perimeter at concrete curbs and at drains were indicated.

.2 Trench for weeping tile will be 300 mm wide and extend to a depth of 350 mm minimum in the subgrade below granular base.

.3 Line trench with filter cloth. Filter cloth shall be wide enough to overlap 150 mm minimum after backfilling.

.4 Place 40 mm of clear crushed aggregate and compact to 98% standard proctor maximum dry density.

.5 Lay 150 mm diameter perforated pipe directly on compacted granular material. Minimum slope 0.5%.

.6 Where weeping tile pipe joins into other piping or material at storm drains or catch basins and at all direction changes, use specifically designed fittings and seal joints with sewer compound in accordance with manufacturer's instructions.

.7 Fold filter cloth over compacted granular. Overlap 150 mm minimum.

.8 Backfill trench up to subgrade elevation with clear crushed aggregate compacted to 98% standard proctor maximum dry density.

3.5 BACKFILL MATERIAL

.1 Place backfill material above tubing surround in uniform layers not exceeding 150 mm compacted thickness up to grades as indicated.

.2 Under paving and walks, compact backfill to at least 95% corrected maximum dry density. In other areas, compact to at least 90% corrected maximum dry density.

END OF SECTION