GENERAL NOTES:

1 REFER TO SECTION 08 06 70 FOR DOOR HARDWARE SCHEDULE
2 REFER TO DOOR & FRAME SCHEDULE 08 06 13 AND INTERIOR ELEVATIONS FOR FRAME & SIDELITE CONFIGURATION
3 REFER TO EXTERIOR ELEVATIONS FOR CONFIGURATION OF EXTERIOR DOOR FRAMES, TRANSOMS & SIDELITES UNLESS OTHERWISE DETAILED
4 ALL PRESSED STEEL DOOR FRAMES IN GYPSUMBOARD FINISHED WALLS TO BE FULL WRAP FRAME PROFILE (THROAT DEPTH TO SUIT WALL THICKNESS), UNLESS OTHERWISE DETAILED
5 REFER TO SECTION 09 91 00 FOR DOOR AND FRAME PAINT AND STAIN COLOURS
6 CONTRACTOR IS RESPONSIBLE TO COORDINATE DOOR UNDERCUTS TO SUIT FINISH FLOOR THICKNESS - REFER TO INTERIOR FINISH SCHEDULE
7 PROVIDE MINIMUM 3 MUTES PER SINGLE DOOR LEAF
8 ALL KEYING TO BE CONFIRMED WITH THE CITY PRIOR TO INSTALLATION.
9 SHOP DRAWINGS INCLUDING FINAL LOCATIONS FOR GATEWAY DEVICES REQUIRED FOR ACCESS CONTROL HARDWARE TO BE PROVIDED BY INSTALLER FOR REVIEW. REFER TO MISCELLANEOUS ITEMS WITHIN SECTION 08 06 70 DOOR HARDWARE SCHEDULE.

KEYNOTES:

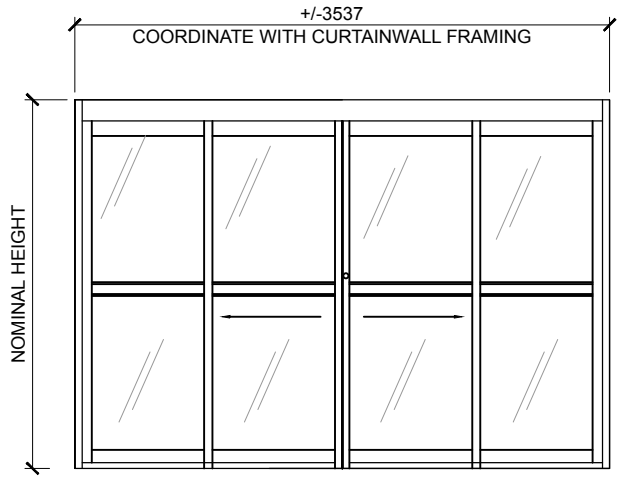
1 ELECTRIC KEYPAD LOCK. COORDINATE DOOR PREPARATION AND HARDWARE WITH ELECTRICAL.
-REFER TO FLOOR PLANS AND INTERIOR ELEVATIONS FOR READER LOCATION.
2 PROVIDE BARRIER-FREE DOOR OPERATOR MOUNTED ON ANOD. ALUM. SIDELIGHT AS SHOWN. COORDINATE WITH ELECTRICAL.
- REFER TO PLANS AND ELEVATIONS FOR HAND AND FOOT PUSH BUTTON LOCATIONS.
3 PROVIDE BARRIER-FREE DOOR OPERATOR MOUNTED ON WALL AS SHOWN. COORDINATE WITH ELECTRICAL.
- REFER TO PLANS AND ELEVATIONS FOR HAND AND FOOT PUSH BUTTON LOCATIONS.
4 AUTOMATIC SLIDING DOOR - REFER TO SECTION 08 42 29 AND ELECTRICAL.
5 DOOR FRAMES TO BE INTEGRAL WITH SSG CURTAIN WALL SYSTEM.
6 PROVIDE CARD ACCESS MOUNTED ON SIDELIGHT AS SHOWN. COORDINATE WITH ELECTRICAL.
- REFER TO PLANS AND ELEVATIONS FOR HAND AND FOOT PUSH BUTTON LOCATIONS.
7 ZERO-SIGHTLINE ALUMINUM-FRAMED SWING DOOR WITH EXTERIOR SURFACE APPLIED INSULATING GLAZING UNIT INTEGRAL WITH SSG CURTAIN WALL APPLICATION.
8 PROVIDE SWIPE CARD ACCESS. CARD ACCESS TO BE CONNECTED TO CENTRAL CONTROL SYSTEM AT CITY OF WINNIPEG CITY HALL (PEGASUS SYSTEM). REFER TO ELEC.

LEGEND

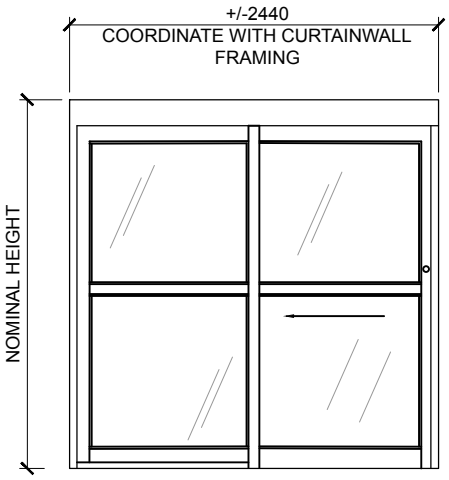
ALUM	ALUMINUM
ANOD	ANODIZED - CLEAR UNLESS NOTED OTHERWISE
CWS	CURTAIN WALL SYSTEM
HM	HOLLOW METAL
HMI	HOLLOW METAL, INSULATED
IGU	INSULATED GLASS UNIT - REFER TO SECTION 08 80 50
INSUL	INSULATED CORE
MAT	MATERIAL
NR	NON-RATED FIRE SEPARATION
PS	PRESSED STEEL
PSG	PRESSED STEEL, GALVANIZED
PSI	PRESSED STEEL, INSULATED
PST	PRESSSED STEEL, THERMALLY BROKEN & INSULATED
PT	PAINT - REFER TO SECTION 09 91 00
SC	SOLID CORE
ST	STAIN
WD	WOOD - REFER TO SECTIONS 06 40 00 & 08 14 16

DOOR AND FRAME SCHEDULE

DOOR										FRAME						
ROOM.		ROOM NAME	DESCRIPTION	NOMINAL SIZE (w x h)	TYPE	MAT.	CORE	FINISH	GLASS	TYPE	MAT.	FINISH	GLASS	UL RATING	HARD-WARE	KEYNOTES
C-02	002	CRAWLSPACE	FIRE BLOCK DOORS	915 x 1220	D	HM	-	-	-	D	PS	-	-	20min.	1	
C-03	003	CRAWLSPACE	FIRE BLOCK DOORS	915 x 1220	D	HM	-	-	-	D	PS	-	-	20min.	1	
D-101A	101	VESTIBULE	MAIN ENTRY	3536 x 2440	A	ALUM	INSUL	ANOD	IGU	A	CWS	ALUM	IGU	-	13	4,5
D-101B	101	VESTIBULE	MAIN ENTRY	2440 x 2440	B	ALUM	INSUL	ANOD	IGU	A	CWS	ALUM	IGU		14	4,5
D-103	103	WORKROOM	CLOSET DOOR	2743X2743	D2	WD	SC	PT	-	-	-	-	-	-	15	5
D-104	104	STAFF WC	STAFF WASHROOM	990 X 2135	D	WD	SC	PT	-	E	PSG	PT	-		2	3
D-105	105	STAFF ROOM	STAFF ROOM	990 X 2135	D	WD	SC	PT	-	E	PSG	PT	-		4	3
D-106	106	CORRIDOR	BACK ENTRY DOOR	990 x 2440	D	HM-I	INSUL	PT	-	E	PSI	PT	-		5	8
D-107	107	MECH/ELEC. ROOM	MECHANICAL ROOM	990 X 2135	D	WD	SC	PT	-	E	PSG	PT	-	45min	6	
D-108	108	JANITOR'S CLOSET	JANITOR'S CLOSET	990 X 2135	D	WD	SC	PT	-	E	PSG	PT	-	20min	6	
D-109	109	TUTORIAL ROOM	STUDY ROOM	990 x 2440	C	ALUM	-	ANOD	IGU	B	CWS	ALUM	IGU	-	7	2,5
D-110	110	TUTORIAL ROOM	STUDY ROOM	990 x 2440	C	ALUM	-	ANOD	IGU	B	CWS	ALUM	IGU	-	7	2,5
D-111	111	BRANCH HEAD OFFICE	OFFICE	990 x 2440	C	ALUM	-	ANOD	IGU	B	CWS	ALUM	IGU	-	8	5,6
D-112A	112	MAIN LIBRARY AREA	EGRESS DOOR	990 x 2440	E	ALUM	INSUL	ANOD	IGU	C	CWS	ALUM	IGU	-	9	2,7
D-112B	112	MAIN LIBRARY AREA	EGRESS DOOR	990 x 2440	E	ALUM	INSUL	ANOD	IGU	C	CWS	ALUM	IGU	-	9	2,7
D-112C	112	MAIN LIBRARY AREA	EGRESS DOOR	990 x 2440	E	ALUM	INSUL	ANOD	IGU	C	CWS	ALUM	IGU	-	10	7
D-113	113	PROGRAM ROOM	PROGRAM ROOM	1980 X 2440	C2	ALUM	-	ANOD	IGU	D	CWS	ALUM	IGU	-	11	2,5,6
D-114	114	STORAGE ROOM	STORAGE	1830 x 2440	D2	WD	SC	PT	-	E	PSG	PT	-	-	12	
D-116	116	UNIVERSAL TOILET ROOM	BARRIER FREE W/C	990 X 2440	D	WD	SC	PT	-	E	PSG	PT	-	-	3	2
D-117	117	JANITOR'S CLOSET	JANITOR'S CLOSET	1525 X 2135	D2	WD	SC	PT	-	E	PSG	PT	-	20min	6	



A



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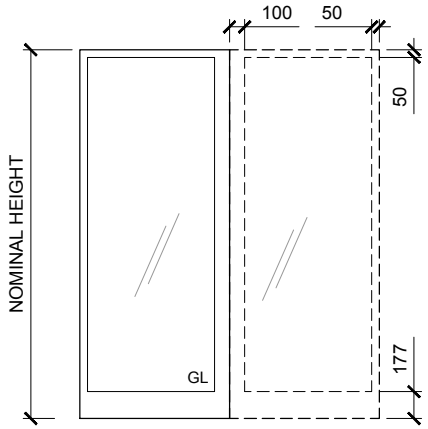
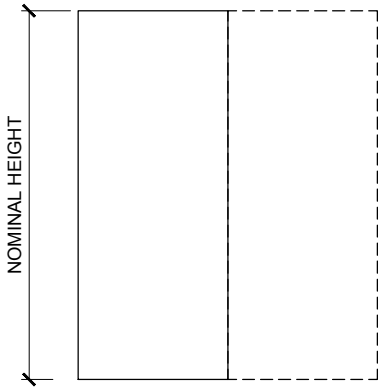


C
C2 (PAIRED DOORS)



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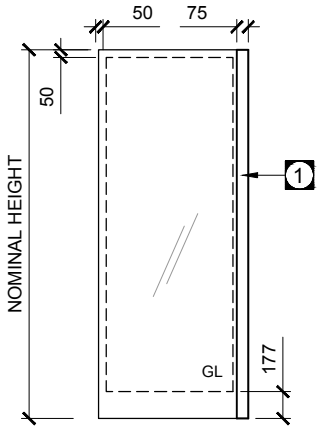
D2 (PAIRED DOORS)



E

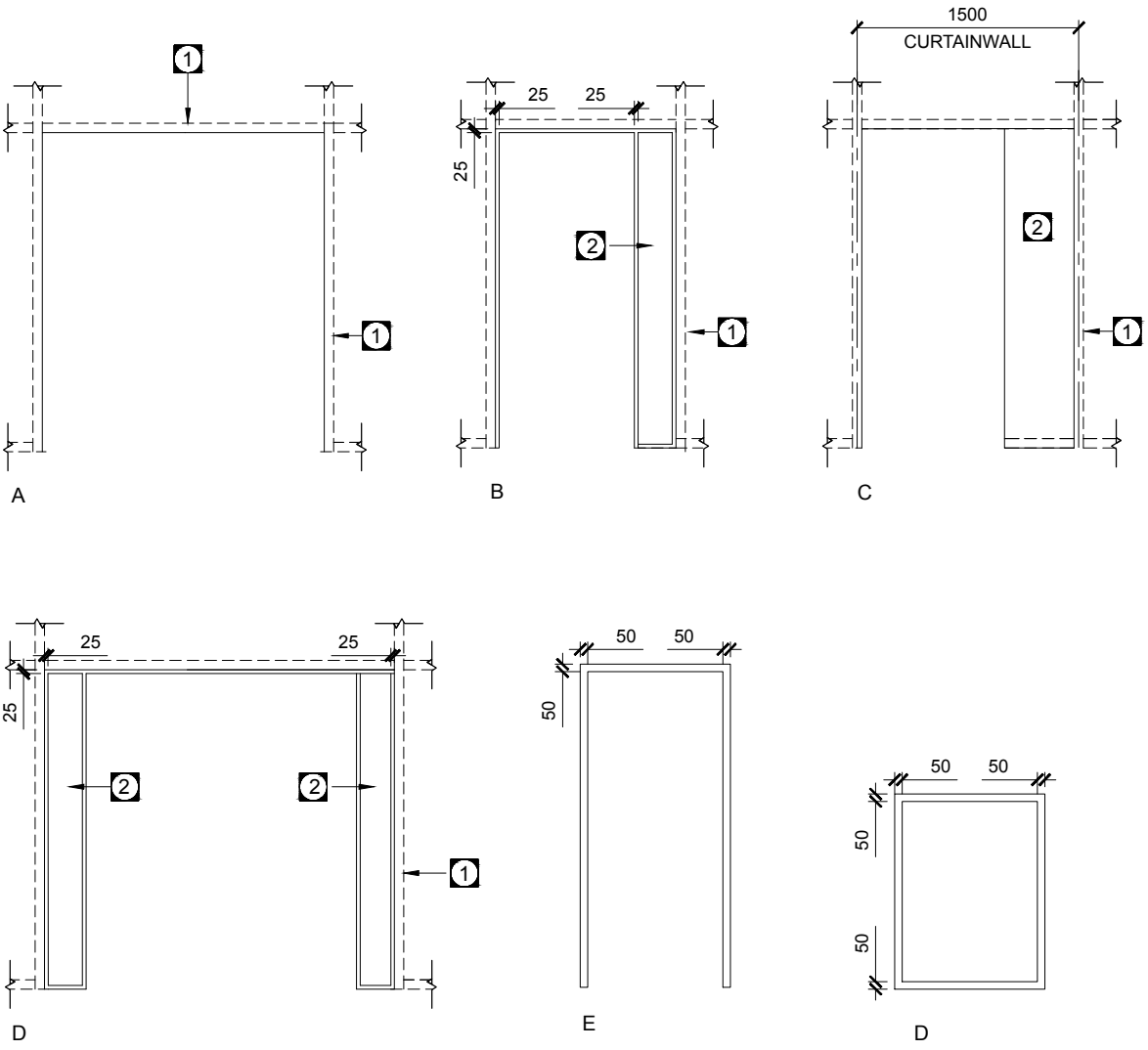
1 **DOOR TYPES**

GENERAL NOTES

1. REFER TO SPEC. SECTION 08 80 50 FOR GLAZING (GL) TYPE.
2. REFER TO EXTERIOR AND INTERIOR ELEVATIONS FOR CONFIGURATION OF ADJACENT FRAMING.
3. ALL DIMENSIONS TO BE VERIFIED ON SITE.
4. REFER TO SPEC. SECTION 08 71 00 FOR MOUNTING HEIGHTS OF DOOR HARDWARE.

KEYED NOTES

1 MOUNT DOOR HARDWARE TO ANOD. ALUM. PANEL . PANEL TO BE FLUSH WITH FRONT FACE OF GLASS.



1 **FRAME TYPES**

KEYED NOTES

1 ADJACENT CURTAIN WALL FRAMING

2 ANOD. ALUM. PANEL. REFER TO INTERIOR ELEVATIONS AND PLAN DETAILS..

HARDWARE SET : 01

Each Assembly to have:

2	EA	SPRING HINGE	3SP1 114 X 102	652	IVE
1	EA	PASSAGE SET	ND10S SPA	626	SCH
1	EA	OH STOP	450S	630	GLY
1	SET	WEATHERSTRIP	W-21 Size To Suit - 4 sides	BLK	KNC

Both levers always unlocked. Inside lever is always free for immediate egress.

HARDWARE SET : 02

Each Assembly to have:

3	EA	HINGE	5BB1 127 X 114	652	IVE
1	EA	DEAD LOCK W/OCC IND	L496P L583-363	626	SCH
1	EA	MONITOR STRIKE	LMS-1		SEC
1	EA	PUSH PLATE	8200 150MM X 405MM	630	IVE
1	EA	PULL PLATE	8303 255MM 150MM X 405MM	630	IVE
1	EA	SURF. AUTO OPERATOR	9131 WMS	ANCLR	LCN
2	EA	ACTUATOR, WALL MOUNT	**I36-5**	630	WIK
1	EA	KICK PLATE	8400 254MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET : 03

Each Assembly to have:

4	EA	HINGE	5BB1 127 X 114	652	IVE
1	EA	DEAD LOCK W/OCC IND	L496P L583-363	626	SCH
1	EA	MONITOR STRIKE	LMS-1		SEC
1	EA	PUSH PLATE	8200 150MM X 405MM	630	IVE
1	EA	PULL PLATE	8303 255MM 150MM X 405MM	630	IVE
1	EA	SURF. AUTO OPERATOR	9131 WMS	ANCLR	LCN
2	EA	ACTUATOR, WALL MOUNT	**I36-5**	630	WIK
1	EA	KICK PLATE	8400 254MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET : 04

Each Assembly to have:

3	EA	HINGE	5BB1 127 X 114	652	IVE
1	EA	PASSAGE SET	ND10S SPA	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON	630	VON
1	EA	OH STOP	100S	630	GLY
1	EA	SURF. AUTO OPERATOR	9131 WMS	ANCLR	LCN
2	EA	ACTUATOR, WALL MOUNT	**I36-5**	630	WIK
1	EA	KICK PLATE	8400 254MM X 40MM LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	WIRE HARNESS	CON-192P		VON

Both levers always unlocked. Inside lever is always free for immediate egress.Electric strike is released when power is applied (Fail Secure). With Connector. Automatically Opens & Closes Door.

HARDWARE SET : 05

Each Assembly to have:

4	EA	HINGE	5BB1 127 X 114 NRP	630	IVE
1	EA	POWER TRANSFER	EPT2 CON	689	VON
1	EA	PANIC HARDWARE	98-NL-OP-110MD	626	VON
1	EA	RIM CYLINDER	1E72 c/w Construction Cylinder	626	BST
1	EA	90 DEG OFFSET PULL	8190HD 305MM O	630	IVE
1	EA	OH STOP	90S	630	GLY
1	EA	SURF. AUTO OPERATOR	9542 WMS	689	LCN
2	EA	ACTUATOR, WALL MOUNT	**I36-5**	630	WIK
1	EA	KICK PLATE	8400 254MM X 40MM LDW B-CS	630	IVE
1	SET	WEATHERSTRIP	W-50 1/48" 2/84"	628	KNC
1	EA	DOOR SWEEP	W-13S 48"	628	KNC
1	EA	THRESHOLD	CT-65 Size To Suit	627	KNC
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
			ACCESS CONTROL BY OTHERS		
			CARD READER BY OTHERS		
1	EA	WIRE HARNESS	CON-192P		VON

HARDWARE SET : 06

Each Assembly to have:

3	EA	HINGE	5BB1 127 X 114	652	IVE
1	EA	STOREROOM LOCK	ND80PD SPA	626	SCH
1	EA	SURFACE CLOSER	1450 RW/PA	689	LCN
1	EA	KICK PLATE	8400 254MM X 40MM LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CVX	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET : 07

Each Assembly to have:

1	EA	CONTINUOUS HINGE	027XY	628	IVE
1	EA	PASSAGE SET	ND10S SPA 14-047 x 10-025	622	SCH
1	EA	SURF. AUTO OPERATOR	4631 WMS	693	LCN
2	EA	ACTUATOR, WALL MOUNT	**I36-5**	630	WIK
1	EA	WALL STOP	WS401/402CVX	619	IVE
1			SEALS BY DOOR SUPPLIER		

HARDWARE SET : 08

Each Assembly to have:

1	EA	CONTINUOUS HINGE	027XY	628	IVE
1	EA	ENTRANCE/OFFICE LOCK	CO-100-CY-70-KP-SPA-PD 14-047 x 10-025	619	SCH
1	EA	SURFACE CLOSER	1450 RW/PA	693	LCN
1	EA	WALL STOP	WS401/402CCV	619	IVE
1			SEALS BY DOOR SUPPLIER		

HARDWARE SET : 09

Each Assembly to have:

1	EA	CONTINUOUS HINGE	027XY	628	IVE
1	EA	PANIC HARDWARE	CDSI-35A-EO	711	VON
1	EA	MORTISE CYLINDER	20-001 114 XQ11-949-114,112,134	619	SCH
1	EA	90 DEG OFFSET PULL	8190HD 305MM O	619	IVE
1	EA	OH STOP	100S	622	GLY
1	EA	SURF. AUTO OPERATOR	4631 WMS	693	LCN
2	EA	ACTUATOR, WALL MOUNT	**I36-5**	630	WIK
1	EA	THRESHOLD	CT-65	627	KNC
1			SEALS BY DOOR SUPPLIER		

Free Egress at all times. Pressing Push Bar retracts latchbolts Dogging by key cylinder with visible security indicator locks down the pushbar or crossbar so the latchbolt remains retracted.Automatically Opens & Closes Door. Operator Must Be Off when Exit Device is secured.

HARDWARE SET : 10

Each Assembly to have:

1	EA	CONTINUOUS HINGE	027XY	628	IVE
1	EA	PANIC HARDWARE	LD-35A-EO	711	VON
1	EA	SURFACE CLOSER	4050 SCUSH	693	LCN
1	EA	THRESHOLD	CT-65	627	KNC
1			SEALS BY DOOR SUPPLIER		

HARDWARE SET : 11

Each Assembly to have:

2	EA	CONTINUOUS HINGE	027XY	628	IVE
2	EA	MANUAL FLUSH BOLT	FB457	619	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	CLASSROOM LOCK	ND70PD SPA 14-047 x 10-025	622	SCH
1	EA	ELECTRIC STRIKE	6224AL FSE CON	630	VON
1	EA	SURF. AUTO OPERATOR	4631 WMS	693	LCN
2	EA	ACTUATOR, WALL MOUNT	**I36-5**	630	WIK
1	EA	THRESHOLD	CT-65	627	KNC
1	EA	MULLION MOUNT KEYPAD	KP212		SCE
1			SEALS BY DOOR SUPPLIER		

Automatically Opens & Closes Door.Keypad to release electric strike and activate exterior actuator switch.

HARDWARE SET : 12

Each Assembly to have:

8	EA	HINGE	5BB1 114 X 102 NRP	652	IVE
2	EA	MANUAL FLUSH BOLT	FB457	619	IVE
1	EA	DUST PROOF STRIKE	DP1	626	IVE
1	EA	STOREROOM LOCK	ND80PD SPA	626	SCH
2	EA	OH STOP	100S	630	GLY
2	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET : 13

Each Assembly to have:

1	EA	MORTISE CYLINDER	20-013 118	626	SCH
			BALANCE OF HARDWARE BY DOOR SUPPLIER		

HARDWARE SET : 14

Each Assembly to have:

HARDWARE BY DOOR MANUFACTURER

HARDWARE SET : 15

Each Assembly to have:

2	EA	TRACK	C-204 TO SUIT OPENING WIDTH	628	KNC
4	EA	HANGERS	C-206-4		KNC
1	EA	FASCIA	C-130 TO SUIT OPENING WIDTH	628	KNC
2	EA	GUIDE TRACK	C-914 TO SUIT DOOR WIDTH	628	KNC
1	EA	FLOOR MOUNT GUIDE	C-913D 134		KNC
2	EA	FLUSH PULL	950	626	IVE
2	EA	STOP	C-100HD	628	KNC

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Hollow metal steel door.

.2 Pressed steel frames.

1.2 RELATED REQUIREMENTS

.1 Section 07 42 43 - Composite Wall Panels: for exterior cladding for exterior door

.2 Section 08 71 00 - Door Hardware - General: Hardware

.3 Section 09 91 10 - Painting: Field painting of doors

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM A653/A653M-13 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.2 CSDMA (Canadian Steel Door Manufacturers Association).

.1 Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2009

.3 National Fire Protection Agency (NFPA)

.1 NFPA 80 - Standard for Fire Doors and Other Opening Protectives, 2016 Edition

.2 NFPA 252 - Fire Tests of Door Assemblies, 2012 Edition

.4 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S104-10 - Standard Method for Fire Tests of Door Assemblies

.2 CAN/ULC-S105-09 - Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104

.3 CAN/ULC-S704-11 - Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 00: Project management and coordination procedures.

.2 Coordination:

.1 Coordinate with other work having a direct bearing on work of this section.

.2 Coordinate the work with frame opening construction, door, and hardware installation.

.3 Coordinate installation of metal wall panels on exterior doors indicated.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Indicate door and frame configurations and finishes, location of cut-outs for hardware reinforcement.

.3 Shop Drawings:

.1 Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.

.2 Indicate door elevations, internal reinforcement, closure method, and finishes.

1.6 DELIVERY, STORAGE, AND PROTECTION

.1 Section 01 61 00: Transport, handle, store, and protect products.

.2 Remove doors and frames from wrappings or coverings upon receipt on site and inspect for damage.

.3 Store in vertical position, spaced with blocking to permit air circulation between components.

.4 Store materials on planks or dunnage, out of water and covered to protect from damage.

.5 Clean and touch up scratches or disfigurement caused by shipping or handling with zinc-rich primer.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

Part 2 Products

2.1 REGULATORY REQUIREMENTS

.1 Fire Rated Door and Frame Construction: Labelled and listed to CAN/ULC-S104 or NFPA 252.

.2 Installed Door and Frame Assembly: Conform to NFPA 80 for fire rated class as scheduled.

2.2 MATERIALS

.1 Sheet Steel: Galvanized steel to ASTM A653/A653M, commercial grade (CS), Type B.

.1 Exterior Doors: Coating designation ZF180.

.2 Interior Doors: Coating designation ZF75.

2.3 DOOR CORE MATERIALS

.1 Honeycomb Core: Structural small cell, 25.4 mm maximum kraft paper honeycomb; weight 36.3 kg per ream minimum, density 16.5 kg/cu m minimum, sanded to required thickness.

.2 Polyisocyanurate Core: Rigid modified polyisocyanurate, closed cell board, 32 kg/cu m, thermal value minimum RSI-1.9.

2.4 ADHESIVES

.1 Cores and Steel Components: Heat resistant, structural reinforced epoxy, resin based adhesive.

2.5 PRIMERS

.1 Primer: Rust inhibitive touch-up only.

2.6 ACCESSORIES

.1 Door Silencers: Single stud rubber/neoprene.

.2 Exterior Top Caps: Rigid polyvinylchloride (PVC) extrusion.

.3 Frame Thermal Breaks: Rigid polyvinylchloride (PVC) extrusion.

.4 Bituminous Coating: Fibred asphalt emulsion.

2.7 FABRICATION - DOORS

.1 Exterior Doors: Laminated core construction.

.2 Interior Doors: Laminated core construction.

.3 Longitudinal Edges: Continuously welded, filled and sanded with no visible edge seams.

.4 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.

.5 Reinforce for surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges, or non-templated hardware.

.6 Top and Bottom Channels: Inverted, recessed, welded steel channels.

.7 Exterior Door: Flush PVC top caps.

.8 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

2.8 LAMINATED CORE CONSTRUCTION

.1 Exterior Doors: Both face sheets 1.6 mm steel, with polyisocyanurate core, laminated under pressure to face sheets, and clad with aluminum composite metal panel where indicated.

.2 Interior Doors: Both face sheets 1.2 mm steel with honeycomb core, laminated under pressure to face sheets.

2.9 FABRICATION - FRAMES

.1 Exterior Frames: 1.6 mm thick base metal thickness.

.1 Frames: Welded type construction, thermally broken.

.2 Interior Frames: 1.6 mm thick base metal thickness.

.1 Door Frames and Window Assemblies: Welded type construction.

.3 Mortised, blanked, reinforced, drilled and tapped for templated hardware, in accordance with templates provided by hardware supplier.

.4 Reinforce frames wider than 1200 mm with roll formed steel channels fitted tightly into frame head, flush with top.

.5 Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.

.6 Attach fire rated label to each fire rated door unit.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify that opening sizes and tolerances are acceptable; check floor area within path of door swing for flatness.

.3 Verify doors and frames are correct size, swing, rating and opening number.

.4 Remove temporary shipping spreaders.

3.2 INSTALLATION

.1 Install doors and frames in accordance with CSDMA.

.2 Install fire-rated doors and frames in accordance with NFPA 80, and local authority having jurisdiction.

.3 Coordinate with gypsum board wall construction for anchor placement.

.4 Coordinate installation of doors and frames with installation of hardware specified in Section 08 71 00.

.5 Set frames plumb, square, level and at correct elevation.

.6 Secure anchorages and connections to adjacent construction.

.7 Brace frames rigidly in position while building-in. Install wood spreaders at third points of frame rebate height to maintain frame width. Provide vertical support at centre of head for openings exceeding 1200 mm in width.

.8 Remove wood spreaders after frames have been built-in.

.9 Make allowance for deflection to ensure structural loads are not transmitted to frame product.

.10 Install doors, and hardware in accordance with hardware templates and manufacturer's instructions.

.11 Adjust operable parts for correct clearances and function.

.12 Install louvers, and door silencers.

.13 Finish paint as specified in Section 09 91 00.

.14 Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.3 ERECTION TOLERANCES

.1 Maximum Diagonal Distortion: 1.5 mm measured with straight edges, crossed corner to corner.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Flush wood doors.

1.2 RELATED REQUIREMENTS

.1 Section 08 06 10 - Door and Frame Schedule

.2 Section 08 11 13 - Metal Doors and Frames, pressed steel frames

.3 Section 08 71 00 - Door Hardware – General

.4 Section 09 91 00 - Painting

.5 Division 23 - HVAC, louvres

1.3 REFERENCES

.1 Architectural Woodwork Institute/Architectural Woodwork Manufacturers Association of Canada/Woodwork Institute (AWI/AWMAC/WI)

.1 Architectural Woodwork Standards, Edition 2, 2014

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S104-10 - Standard Method for Fire Tests of Door Assemblies

.3 National Fire Protection Association (NFPA)

.1 NFPA 80 - Standard for Fire Doors and Other Opening Protectives, 2016 Edition

.2 NFPA 252 - Fire Tests of Door Assemblies, 2012 Edition

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 00: Project management and coordination procedures.

.2 Coordination:

.1 Coordinate with other work having a direct bearing on work of this section.

.2 Coordinate the work with door opening construction, door frame and door hardware installation.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

.3 Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special blocking for hardware, factory machining criteria.

1.6 QUALITY ASSURANCE

.1 Perform work in accordance with AWI/AWMAC standards, Custom Grade.

1.7 DELIVERY, STORAGE, AND PROTECTION

.1 Section 01 61 00: Transport, handle, store, and protect products.

.2 Accept doors on site in manufacturer's packaging. Inspect for damage.

.3 Deliver materials only when Project is ready for installation and when area of operation is enclosed, plaster and concrete work dry and area broom clean.

.4 Protect doors from exposure to natural and artificial light after delivery.

.5 Maintain indoor temperature and humidity within range recommended by manufacturer.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.9 WARRANTY

.1 Section 01 78 10: Warranties.

.2 Provide warranty to include coverage for failure to meet specified requirements, to the following term:

.1 Interior Doors: Two years.

.3 Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

Part 2 Products

2.1 MANUFACTURERS

.1 Acceptable manufacturers:

.1 Baillargeon Wood Doors.
.2 DoorLam Manufacturing
.3 Dormond Industries.
.4 Lynden Doors.
.5 Lambton Doors.

2.2 REGULATORY REQUIREMENTS

.1 Fire Rated Doors:

.1 Labelled and listed to CAN/ULC-S104.
.2 Conform to NFPA 80 for fire rated class as scheduled.

2.3 DOOR CONSTRUCTION

.1 Flush Wood Doors: Custom quality, heavy duty performance.

.1 Core (Non-Rated): Solid particleboard core; particleboard to ANSI A208.1, Grade LD-2.
.2 Core (Fire Rated): Manufacturer's standard particleboard or mineral core to meet fire rating as indicated on Door Schedule.
.3 Thickness: As scheduled.
.4 Door Construction: 5-ply.
.5 Facing (Opaque Finish) Any closed-grain hardwood of mill option.
.6 Exposed Edges: Vertical edges, any closed-grain hardwood.

2.4 ADHESIVE

.1 Facing Adhesive: water-resistant.

2.5 ACCESSORIES

.1 Metal Louvres: Specified in Division 23.

.2 Astragals for Double Doors: Aluminum, overlapping astragal specifically for double doors.

.3 Astragals for Fire Rated Double Doors: Steel, type and shape to meet testing requirements.

2.6 FABRICATION

.1 Fabricate non-rated doors to AWMAC requirements, Custom grade.

.2 Fabricate fire rated doors to AWMAC requirements, Custom grade; and CAN/ULC S104 labelling requirements as shown on Door Schedule. Attach fire rating label to door.

.3 Blocking: Provide wood blocking in particleboard-core doors, and composite blocking in mineral-core doors as needed to eliminate through-bolting hardware.

.4 Bond edge banding to cores.

.5 Factory fit doors for frame opening dimensions identified on Shop Drawings.

.6 Provide edge clearances in accordance with NFPA 80.

2.7 FINISHES

.1 Shop finish doors with paint finish as specified in Section 09 91 00 – Painting.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify mechanical, electrical, plumbing, HVAC and other building components affecting work of this Section are in place and functioning.

.3 Verify that opening sizes and tolerances are acceptable.

.4 Verify frames set square, plumb, level, and in plane. Report openings not within tolerance before hanging doors.

3.2 INSTALLATION

.1 Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

.2 Install labelled fire rated doors to NFPA 80.

.3 Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

.4 Coordinate installation of doors with installation of frames and hardware.

3.3 ADJUSTING

.1 Adjust door for smooth and balanced door movement.

.2 Operation: Rehang or replace doors that do not swing or operate freely.

.3 Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Floor access hatch

.2 Access door and frame units.

1.2 RELATED REQUIREMENTS

.1 Section 03 35 30 Bonded Concrete Overlay: Topping

.2 Section 03 41 13 - Precast Concrete Hollowcore Planks: Openings in precast concrete hollowcore slab

.3 Section 05 50 00 - Metal Fabrications: access ladders

.4 Section 09 21 16 - Gypsum Board Assemblies: Openings in partitions and ceilings

.5 Section 09 77 53 - Vegetated Wall Systems: Control panel

.6 Section 09 91 10 - Painting: Field paint finish

.7 Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC): Mechanical components requiring access

.8 Division 26 - Electrical, Division 27 – Communications, and Division 28 – Electronic Safety and Security: Electrical components requiring access

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 00: Project management and coordination procedures.

.2 Coordination:

.1 Coordinate work of this Section with other work requiring access doors.

1.4 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide sizes, types, finishes, fire ratings, hardware, scheduled locations, and details of adjoining work.

.3 Shop Drawings:

.1 Include plans, elevations, sections, details, and attachments to other work.

.2 Detail fabrication and installation of access doors and frames for each type of substrate.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

Part 2 Products

2.1 REGULATORY REQUIREMENTS

.1 Conform to applicable code for fire rated access doors.

.2 Provide certificate of compliance indicating approval of fire rated doors.

.3 Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics according to the following test method and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.

.1 NFPA 252 or UL 10B for fire-rated access door assemblies installed vertically.

.2 NFPA 288 for fire-rated access door assemblies installed horizontally.

2.2 PERFORMANCE REQUIREMENTS

.1 Fabricate floor access assemblies to support live load of 4.7 kPa with deflection not to exceed 1/180 of span.

2.3 FLOOR ACCESS HATCH – FIRE RATED

.1 Steel Angle-Frame Floor Door: Single-leaf opening. Manufacturer's standard frame with diamond-pattern, galvanized structural-steel or aluminum tread plate door; non-watertight; loading capacity to support 7.2-kN/sq. m pedestrian live load. Provide mounting suitable for installation in precast concrete hollowcore floor slab with concrete topping.

.1 Fire-Resistance Rating: 1 hour.

.2 Finish: Yellow with wording "FIRE DOOR - DO NOT STORE MATERIALS ON SURFACE."

.3 Size: indicated.

.4 Hardware: Manufacturer's standard to meet fire-resistance rating.

.5 Acceptable Manufacturers: Bilco, Nystrom, and Acudor.

.2 Telescopic safety post constructed of mill finish aluminum, for mounting to top two rungs of access ladder. Automatic locking in fully extended position. Complete with fasteners for securing to access ladder rungs.

.1 Manufacturer/Product:

.1 Bilco; LadderUP LU-4.

.2 Nystrom; SPA.

.3 Acudor; TSP-1.

2.4 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

.1 Flush Access Doors with Concealed Flanges:

.1 Fabricate door to fit flush to frame. Provide frame with gypsum board beads for concealed flange installation.

.2 Locations: Walls and ceilings with gypsum board finish.

.3 Door Size:

.1 305 by 305 mm nominal size for hand-entry.

.2 915 by 915 mm nominal size for vegetated wall irrigation control system access.

.4 Metallic-Coated Steel Sheet for Door: Nominal 1.63 mm thick.

.1 Finish: Factory prime.

.5 Hinges: Manufacturer's standard.

.6 Hardware: Lock at vegetated wall irrigation control system access door, latch elsewhere.

.7 Manufacturer/Product:

.1 Acudor; DW-5040 series.

.2 Best Access Doors; BA-AHD-GYP.

.3 Larsen's Manufacturing; L-DWC.

.4 Maxam Metal Products; Model NDB.

.5 Mifab; MDW Series.

.6 Milcor; DW series

.7 Nystrom; NW series.

.2 Flush Access Doors with Exposed Flanges:

.1 Fabricate door to fit flush to frame. Provide manufacturer's standard-width exposed flange, proportional to door size.

.2 Locations: Walls with ceramic tile finish.

.3 Door Size: 300 by 300 mm nominal size for hand-entry.

.4 Stainless-Steel Sheet for Door: Nominal 1.59 mm thick, No. 4 finish.

.5 Hinges: Manufacturer's standard.

.6 Hardware: Latch.

.7 Manufacturer/Product:

.1 Acudor; UF-5000.

.2 Milcor; M – Architectural Flush Access Door.

.3 Hardware:

.1 Latch: Type and operation selected by Contract Administrator.

.2 Lock: Cylinder.

2.5 FABRICATION

.1 General: Provide access door and frame assemblies manufactured as integral units ready for installation.

.2 Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

.3 Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.

.1 For concealed flanges with drywall bead, provide edge trim for gypsum board securely attached to perimeter of frames.

.4 Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

2.6 FINISHES

.1 Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

.2 Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

.3 Steel and Metallic-Coated-Steel Finishes:

.1 Factory Prime: Apply manufacturer's standard, fast-curing, lead- and chromate free, universal primer immediately after surface preparation and pretreatment.

.4 Aluminum Finishes: Mill finish.

.5 Stainless Steel Finishes:

.1 Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

.2 Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

.3 Run grain of directional finishes with long dimension of each piece.

.4 When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

.5 Directional Satin Finish: No. 4.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify that rough openings for door and frame are correctly sized and located.

3.2 INSTALLATION

.1 Install units to manufacturer's written instructions.

.2 Install frames plumb and level in opening. Secure rigidly in place.

.3 Install doors flush with adjacent finish surfaces.

.4 Position unit to provide convenient access to concealed work requiring access.

3.3 ADJUSTING

.1 Adjust doors and hardware, after installation, for proper operation.

.2 Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Exterior swing doors installed in curtain wall framing.

.2 Interior swing doors and frames.

.3 Vision glass.

.4 Door hardware.

1.2 RELATED REQUIREMENTS

.1 Section 07 27 00 - Air Barriers: Perimeter air seal between glazing system and adjacent construction

.2 Section 07 92 00 - Joint Sealants: System perimeter sealant and back-up materials

.3 Section 08 44 30 - Structural Sealant Glazed Assemblies

.4 Section 08 71 00 - Door Hardware - General: Mortised hardware reinforcement requirements affecting framing members

.5 Section 08 71 43 - Automatic Door Operators

.6 Section 08 80 50 - Glass and Glazing

1.3 REFERENCES

.1 Aluminum Association (AA)

.1 DAF 45-2003 - Designation System for Aluminum Finishes

.2 American Architectural Manufacturers Association (AAMA)

.1 AAMA CW-10-15 - Care and Handling of Architectural Aluminum from Shop to Site

.2 AAMA 611-12 - Voluntary Specification for Anodized Architectural Aluminum

.3 ASTM International (ASTM)

.1 ASTM A123/A123M-15 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

.2 ASTM B209M-14 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

.3 ASTM B221M-12a - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

.4 ASTM E283-04(2012) - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

.5 ASTM E330-02(2010) - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

.6 ASTM E331-00(2009) - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

.4 Canadian Standards Association (CSA)

.1 CAN/CSA-S157-05/S157.1-05 (R2015) - Strength Design in Aluminum / Commentary on CSA S157-05, Strength Design in Aluminum

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 00: Project management and coordination procedures.

.2 Coordination:

.1 Coordinate the Work with installation of exterior wall assembly components or materials.

.2 Coordinate hardware with doors and frames.

.3 Coordinate electrical connections for electrified hardware.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware.

.3 Shop Drawings:

.1 Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

.2 Include diagrams for power, signal and control wiring.

.3 Include location of activation devices.

.4 Include hardware schedule and indicate hardware types, functions, mounting heights, attachment details, and locations.

.5 Include catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.

.4 Samples:

.1 Submit duplicate 300 by 300 mm size sample sections showing prefinished aluminum surface, finish, colour and texture, and including section of infill panel.

.1 Include corner sample of each type of door.

.2 Submit duplicate 300 by 300 mm sample sections of insulating glass unit showing glazing materials and edge and corner details.

1.6 CLOSEOUT SUBMITTALS

.1 Section 01 78 10: Submission procedures.

.2 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in the City's name and registered with manufacturer.

1.7 QUALITY ASSURANCE

.1 Conform to requirements of City of Winnipeg Accessibility Design Standard code for accessibility.

.2 Manufacturer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum five years documented experience.

.3 Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience, and trained and approved by manufacturer for installation of products specified.

1.8 DELIVERY, STORAGE, AND PROTECTION

.1 Section 01 61 00: Transport, handle, store, and protect products.

.2 Handle Products of this section in accordance with AAMA CW-10.

.3 Protect finished aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

.4 Protect glass with protective film.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.10 AMBIENT CONDITIONS

.1 Do not install sealants when ambient temperature is less than 5 degrees C during and 48 hours after installation.

1.11 WARRANTY

.1 Section 01 78 10: Warranties.

.2 Warranty: Manufacturer agrees to repair or replace components of entrances that do not comply with requirements or that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

.1 Structural failures including, but not limited to, excessive deflection.

.2 Noise or vibration created by wind and thermal and structural movements.

.3 Deterioration of metals, metal finishes, and other materials beyond normal weathering.

.4 Failure of operating components.

.3 Warranty Period for Doors: two years from date of Substantial Completion.

Part 2 Products

2.1 MANUFACTURERS

.1 Exterior Doors:

.1 Basis of Design Product: Provide Alumicor Phantom Door, or subject to compliance with specified requirements an approved equal by Kawneer in accordance with B6.

.2 Interior Doors:

.1 Alumicor; Product: Canadiana 100A with optional bottom rail.

.2 Kawneer; Product: 190 with optional bottom rail.

.3 Interior Frames:

.1 Alumicor; Product: FlushGlaze TL 1800 Series.

.2 Kawneer; Product: Tribfab VersaGlaze Framing System 1 3/4" sightline.

.4 Source Limitations: Obtain exterior doors, interior doors and curtain wall framing from single source from single manufacturer.

2.2 SYSTEM DESCRIPTION

.1 Exterior Doors: Aluminum-framed swing door with exterior, surface-applied insulating glass unit for minimal sitelines; shop fabricated and glazed, factory-finished, complete with related flashings, anchorage and attachment devices for installation in exterior curtain wall system.

.2 Interior Doors and Frames: Aluminum-framed swing door and frame made of tubular aluminum sections; shop fabricated, factory finished, vision glass, related anchorage and attachment devices for installation in interior storefront framing.

.3 System Assembly: Site assembled.

2.3 PERFORMANCE AND DESIGN CRITERIA – EXTERIOR DOORS

.1 Design aluminum components in accordance with CAN/CSA S157.

.2 Wind Load Resistance: Test according to ASTM E330.

.1 Achieve same performance as adjoining curtain wall assemblies.

.3 Air Infiltration: Test according to ASTM E283.

.1 Maximum air leakage of 5 L/s per sq. m. at static air pressure differential of 300 Pa.

.4 Water Leakage: None, when measured in accordance with ASTM E331.

.5 Expansion / Contraction: Provide for expansion and contraction within system components as specified in Section 08 44 30 – Structural Sealant Glazed Curtain Walls.

.6 System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

2.4 MATERIALS

.1 Extruded Aluminum: to ASTM B221M, 6063 alloy T5 or T6 temper.

.2 Sheet Aluminum: to ASTM B209M, utility grade for unexposed surfaces, anodizing quality for exposed surfaces.

.3 Fasteners, screws and bolts: Cadmium plated stainless steel to meet curtain wall requirements and as recommended by manufacturer.

2.5 COMPONENTS

.1 Doors:

.1 Exterior: thermally-broken, double-glazed. No cut-outs permitted in glazing for door hardware.

.2 Interior: non-thermally broken, double-glazed.

.3 Thickness: nominal 45 mm.

.4 Design: nominal 54 mm top rail, 54 mm hinge side vertical stile, 100 mm strike side vertical rail, and 177 mm bottom rail.

.5 Glazing Stops: Square, to accommodate double insulating glazed unit.

.2 Interior Storefront Framing: 45 by 115 mm tubular profile, non-thermally broken.

.3 Panels and Trim:

.1 Door Actuator Mounting Panel: Provide minimum 1.3 mm thick aluminum sheet adhered to 19 mm thick plywood backing. Exposed aluminum finish: Colour anodized to match framing. Single length piece per location, secured with concealed fasteners.

.2 Partition End Trim: Provide brake-formed aluminum sheet, minimum 3 mm thick by width required to cover end of partition with 25 mm returns; colour anodized finished to match framing. Single length piece per location.

2.6 GLASS AND GLAZING MATERIALS

.1 Glass and Glazing Materials: As specified in Section 08 80 50.

.2 Glazing Materials: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.7 SEALANT MATERIALS

.1 Structural Silicone Sealants:

.1 SSG Tensile Sealant: One- or multi-part, high performance, neutral cure, non-sag, high tensile strength to ASTM C1184 and ASTM C920; ultraviolet radiation resistant for 2000 to 4000 micro-watts minimum for 21 days; adhesion test when subjected to ultraviolet radiation through glass, in accordance with ASTM C794 without failure. Tested and approved by sealant manufacturer before application to curtain wall assembly, and compatible with other materials in contact with sealant.

.2 SSG Weather Seal: One- or multi-part, neutral cure, high modulus, elastomeric silicone to ASTM C920, compatible with structural silicone sealant and exterior gasket material, recommended and approved by sealant manufacturer.

.2 Structural Glazing Tape: two-sided pressure sensitive acrylic foam tape designed to bond glass to metal frames in glass curtain wall systems, acceptable to curtain wall manufacturer.

.1 Acceptable products: 3M VHB Structural Glazing Tape, Tremco SGT-900 Series.

2.8 HARDWARE

.1 Exterior Doors: Weather Stripping, Sill Sweep Strips, Thresholds, Hinges, Push/Pull Handles, Panic Device, Closer: Manufacturers standard type to suit application.

.2 Interior Doors: Weather Stripping, Hinges, Push/Pull Handles, Closer: Manufacturer's standard type to suit application.

2.9 FABRICATION

.1 Factory-fabricate and assemble doors in profiles indicated. Reinforce as required to support imposed loads.

.2 Construct doors square, plumb and free from distortion, waves, twists, buckles and other defects detrimental to performance or appearance.

.3 Accurately fit and secure joints and corners. Make joints flush, weatherproof, and hairline. Machine-cut joints; mitre corners.

.4 Stiles and Rails: Tubular extrusions designed for mechanical shear block fastening in combination with SIGMA deep penetration plug welds and fillet welds at stile/rail connections.

.5 Arrange fasteners and attachments to conceal from view.

.6 Prepare components with internal reinforcement for door hardware.

.7 Reinforce framing members for imposed loads.

.8 Exterior Doors:

.1 Factory-install glass and glazing materials for exterior doors, using structural sealant glazing methods.

.2 Provide extruded aluminum trim at perimeter of glazing light, mechanically fastened to door.

2.10 FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with DAF-45 - Aluminum Association Designation System for Aluminum Finishes.

.1 Colour Anodic Coating: AAMA 611, AA-M12C22A44, colour black.

.1 Class I, 0.018 mm or thicker: Exterior exposed aluminum surfaces.

.2 Class II, 0.010 mm or thicker: Interior exposed aluminum surfaces.

.2 Concealed Steel Items:

.1 Galvanized to ASTM A123/A123M, with 610 gm/sq m coating thickness.

.3 Concealed Aluminum Surfaces: Mill finish.

.4 Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify dimensions, tolerances, and method of attachment with other work.

.3 Verify door openings are ready to receive work of this Section.

3.2 INSTALLATION

.1 Install doors plumb and true in alignment, without warp or wrack.

.1 Install surface-mounted hardware using concealed fasteners to greatest extent possible.

.2 Set thresholds in bed of mastic and secure in place.

.2 Install hardware using templates provided. Refer to Section 08 71 00 for installation requirements.

.3 Site Installed Glass: Install in accordance with Section 08 80 50.

3.3 ADJUSTING

.1 Adjust operating hardware, moving parts, door operators, and controls to function smoothly.

.2 Adjust exterior doors for weathertight closure.

3.4 CLEANING

.1 Section 01 74 00: Cleaning installed work.

.2 Remove protective material from pre-finished aluminum surfaces.

.3 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.

.4 Remove excess sealant by method acceptable to sealant manufacturer.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Section Includes:

.1 Exterior, bi-parting sliding, power-operated automatic entrance

.2 Interior, single sliding, power-operated automatic entrance

.2 Related Requirements:

.1 Section 05 50 00 - Metal Fabrications, for supplementary steel framing and supports above doors

.2 Section 07 92 00 - Joint Sealants, for caulking not specified in this section

.3 Section 08 80 50 - Glazing, for material and installation requirements of glazing for automatic entrance doors

.4 Division 26 Sections for electrical connections including conduit and wiring for automatic entrance door operators

1.2 DEFINITIONS

.1 AAADM: American Association of Automatic Door Manufacturers

.2 Activation Device: Device that, when actuated, sends an electrical signal to the door operator to open the door.

.3 Safety Device: Device that prevents a door from opening or closing, as appropriate.

1.3 REFERENCES

.1 Aluminum Association (AA)

.1 Aluminum Association Designation System for Aluminum Finishes- DAF 45-03

.2 American Architectural Manufacturers Association (AAMA)

.1 AAMA 1303.5-76, Voluntary Specifications for Forced-Entry Resistant Aluminum Sliding Glass Doors

.3 ASTM International, (ASTM)

.1 ASTM B209-10, Specifications for Aluminum and Aluminum-Alloy Sheet and Plate

.2 ASTM B221-13, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

.3 ASTM E283-04(2012) Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

.4 ASTM E331-00(2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference

.4 Builders Hardware Manufacturers Association (BHMA)

.1 ANSI/BHMA A156.10-2011, Power Operated Pedestrian Doors

.5 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 1.181-99, Ready-Mixed, Organic Zinc-Rich Coatings

.6 Canadian Standards Association (CSA International)

.1 CAN/CSA-G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel

.2 CSA-C22.2 No. 247-2014, Operators and Systems of Doors, Gates, Draperies, and Louvres

.7 Underwriters Laboratories (UL)

.1 UL 325-2013, Electrical Door, Drapery, Gate, Louver, and Window Operators and Systems

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Coordination:

.1 Templates: Obtain templates for doors, frames, and other work specified to be factory prepared for installing automatic entrances, and distribute to parties involved. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing automatic entrances to comply with indicated requirements.

.2 Coordinate hardware with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish. Coordinate hardware for automatic entrances with hardware required for rest of Project.

.3 Electrical System Roughing-in: Coordinate layout and installation of automatic entrances with connections to power supplies, and access-control system.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

.3 Shop Drawings: For automatic entrances. Include plans, elevations, sections, details, hardware mounting heights, and attachments to other work.

.1 Wiring Diagrams: For power, signal, and control wiring, including location of junction and control boxes.

.2 Location of activation and safety devices, key switches.

.3 Include hardware schedule and indicate hardware types, functions, quantities, and locations.

.4 Indicate thickness of glass, metal components.

1.6 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.1 Qualification Data: For installer, manufacturer and certified inspector.

.2 Product Certificates.

.3 Test Reports.

.4 Site Reports.

1.7 CLOSEOUT SUBMITTALS

.1 Section 01 78 10: Submission procedures.

.2 Operation and Maintenance Data:

.1 Submit manufacturer's operation and maintenance data. Include:

.1 Cleaning and maintenance of aluminum finishes.

.2 As-built wiring diagrams of all interrelated parts and systems.

.3 Assembly diagrams.

.4 Suggested preventive maintenance routine and schedule.

.5 Troubleshooting guide.

.6 Name, address and telephone number of nearest authorized service representative.

.7 Parts list and numbers.

.8 Instructions for adjustment and operation applicable to each type of component or hardware.

.3 Site Quality Control Submittals:

.1 Submit completed AAADM recommended inspection forms after installation of automatic door equipment.

.2 Provide AAADM 'Safety Information' sticker at inside face of mullion for doors operated by barrier free equipment and automatic door operators. Ensure sticker shows step by step safety check required at start-up.

.4 Extra Materials:

.1 Provide tools required for maintenance of equipment.

1.8 QUALITY ASSURANCE

.1 Manufacturer Qualifications: A manufacturer with company certificate issued by AAADM.

.2 Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation and maintenance of units required for this Project.

.3 Certified Inspector Qualifications: Certified by AAADM.

.4 Source Limitations for Automatic Entrances: Obtain automatic entrances from single source from single manufacturer.

.5 Electrical Components, Devices, and Accessories: Listed and labeled as defined in Canadian Electrical Code, by a qualified testing agency, and marked for intended location and application.

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

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

.8 Emergency-Exit Door Requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

1.9 DELIVERY, STORAGE, AND HANDLING

.1 Cover exposed metal surfaces with pressure sensitive heavy protection paper or strippable plastic coating. Do not use materials of the type which will become bonded when exposed to the sun, or leave residue.

.2 Store inside building in dry protected area away from construction activity.

.3 Protect finish surfaces from damage during handling, erection and at point of installation.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.11 PROJECT CONDITIONS

.1 Field Measurements: Verify actual dimensions of openings to receive automatic entrances by field measurements before fabrication.

1.12 WARRANTY

.1 Contractor hereby warrants that automatic doors will function as specified in accordance with General Conditions, but for 36 months from date of Substantial Performance.

.1 Warranty: Include coverage of repair or replacement of components or entire units which fail in materials workmanship. Failures include but are not necessarily limited to, structural failures including excessive deflection, faulty operation of operators, speed control and hardware, deterioration of metals, metal finishes, and other materials beyond normal weathering.

Part 2 Products

2.1 DESIGN AND PERFORMANCE REQUIREMENTS

.1 Design Requirements:

.1 Design automatic entrance doors as emergency exits, as required means of egress from the building, and to comply with NFPA 101.

.2 Design automatic entrances to comply with applicable requirements of ANSI/BHMA A156.10, NFPA 101, and UL 325 or CSA-C22.2 No. 247.

.3 Exterior automatic entrances:

.1 Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with NBC, to a design pressure indicated on structural drawings.

.2 Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 5.0 L/(s·m^2) of fixed entrance system area when tested according to ASTM E283 at a minimum static-air-pressure difference of 75 Pa.

.3 Water Resistance, (static): no leakage when tested in accordance with ASTM E331, at static air pressure differential of 720 Pa, and as defined in AAMA 501.

.4 Water Resistance, (dynamic): no leakage when tested in accordance with AAMA 501.1, at air pressure differential of 720 Pa, and as defined in AAMA 501.

.5 Operating Temperature Range: Provide automatic entrances that operate within minus 35 to plus 30 deg. C.

.6 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes without causing detrimental effect to system components. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss. Temperature range: 85 degrees C, ambient.

.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 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

.2 Performance Requirements:

.1 Design framing members to withstand their own weight, weight of glass, loads imposed by motion of operable elements.

.2 Provide expansion joints to accommodate movement in door, door frame and sidelight framing system, and between system and building structure, caused by structural movements, and dynamic loading and release of loads, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.

.3 Provide for dimensional distortion of components during operation.

.4 Power-Operated Doors: Not more than 222 N required to manually set door in motion if power fails, and not more than 67 N required to open door to minimum required width.

.5 Breakaway Device for Power-Operated Doors: Not more than 222 N required for a breakaway door or panel to open.

.6 Entrapment Force Requirements: Power-Operated Sliding Doors: Not more than 133 N required to prevent stopped door from closing.

.7 Forced Entry Resistance: meet minimum requirements in accordance with AAMA 1303.5.

2.2 MANUFACTURERS

.1 Basis of Design: Subject to compliance with requirements, provide ProSlide Series 2003 Belt Drive, Type 310 by Horton Automatics, or approved equal by one of the following manufacturers, in accordance with B6:

.1 Stanley Access Technologies.

.2 Gyrotech.

.2 Source Limitations: Obtain automatic entrance doors from single source from single manufacturer.

2.3 SLIDING AUTOMATIC ENTRANCES

.1 General: Provide manufacturer's standard automatic entrances including doors, sidelites, framing, headers, carrier assemblies, roller tracks, door operators, activation and safety devices, and accessories required for a complete installation.

.2 Exterior Doors:

.1 Configuration: bi-parting sliding with two sliding leaves, and sidelight on each side, SO-SX-SX-SO.

.2 Emergency breakaway: full breakout.

.3 Traffic movement: two-way.

.4 Mounting: between jambs of exterior walls.

.3 Interior Door:

.1 Configuration: single-sliding door with one sliding leaf and sidelight, SO-SX.

.2 Emergency breakaway: full breakout.

.3 Traffic movement: two-way.

.4 Mounting: between jambs of interior partitions.

.4 Operator Features:

.1 CSA-approved.

.2 Power opening and closing.

.3 Drive System: Belt.

.4 Adjustable opening and closing speeds. Maximum closing speed: 305 mm/second.

.5 Adjustable hold-open time between 0 and 30 seconds.

.6 Obstruction recycle.

.7 On-off/hold-open switch to control electric power to operator, key operated.

.5 Sliding Door Carrier Assemblies and Overhead Roller Tracks: carrier assembly that allows ±6 mm vertical adjustment; consisting of nylon- or delrin-covered, stainless steel ball-bearing-center steel wheels operating on a continuous roller track, or ball-bearing-center steel wheels operating on a nylon- or delrin-covered, continuous roller track. Support doors from carrier assembly by cantilever and pivot assembly.

.1 Rollers: Minimum of two ball-bearing roller wheels and two anti-rise rollers for each active leaf.

.6 Sliding Door Threshold: Manufacturer's bottom-guide track system, with stainless-steel, ball-bearing-centre roller wheels.

.1 Configuration:

.1 Exterior Door: Saddle-type threshold across door opening and recessed guide track system at sidelites.

.2 Interior Door: No threshold at door opening, and recessed guide track at sidelites.

.7 Signs: Decals fixed to both sides of each door as required by BHMA A156.10 for type of door and its operation.

.1 Include "IN EMERGENCY PUSH TO OPEN" sign on power operated sliding doors with breakaway swinging leaves; red background with contrasting letters, design and mounting location to ANSI/BHMA A156.10.

.2 Include "AUTOMATIC SLIDING DOOR" sign on each side of power operated sliding door leaves; red horizontal background strip with minimum 25 mm high contrasting letters, each end of horizontal strip with arrow pointing toward nearest door stile. Locate sign centrally on door leaf 900 mm to 1.5 mm above floor.

.8 Finish exposed surfaces of aluminum components in accordance with DAF-45 - Aluminum Association Designation System for Aluminum Finishes.

.1 Colour Anodic Coating: AAMA 611, AA-M12C22A44, colour black.

.1 Class I, 0.018 mm or thicker: Exterior exposed aluminum surfaces.

.2 Class II, 0.010 mm or thicker: Interior exposed aluminum surfaces.

2.4 MATERIALS

.1 Aluminum Extrusions: Alloy and temper recommended by producer or finisher for type of use and finish indicated, and with not less than strength and durability properties specified in ASTM B221 for Aluminum Association designation 6063-T5 or T6.

.2 Aluminum Sheet: Alloy and temper recommended by producer or finisher for type of use and finish indicated, and with not less than strength and durability properties specified in ASTM B209M.

.3 Internal reinforcement: Steel to CAN/CSA-G40.21, Grade 300 W.

.4 Galvanizing Touch-Up: Zinc-rich, organic, ready mixed primer to CAN/CGSB 1.181.

.5 Fasteners: non-magnetic stainless steel, cadmium plated steel, or other non-corrosive metal fasteners compatible with aluminum components, hardware, anchors and other items being fastened.

.6 Isolation Coating: Acid and alkali resistant bituminous paint.

.7 Sealants and Gaskets:

.1 Types recommended and guaranteed by manufacturer to remain permanently elastic, non-shrinking and non-migrating, and required for fabrication and assembly of sidelight and door framing.

.2 Exposed Sealants and Back-up Required for Installation of System at Project Site: In accordance with Section 07 92 00 - Joint Sealants. Colour selected by Contract Administrator.

.8 Glass and Glazing Materials: Refer to Section 08 80 50 – Glazing.

.1 Exterior Doors: sealed clear tempered double glazing, 25 mm thick.

.2 Interior Doors: 6 mm clear tempered glass.

.9 Non-metallic, Shrinkage-Resistant Grout: Premixed, non-metallic, noncorrosive, nonstaining grout; complying with ASTM C 1107; of consistency suitable for application.

2.5 ENTRANCE COMPONENTS

.1 Framing Members: Manufacturer's standard extruded aluminum, minimum 3.2 mm thick and reinforced as required to support imposed loads.

.1 Interior Door: nominal size 45 by 114 mm.

.2 Exterior Door: nominal size 45 by 150 mm.

.2 Door Stile and Rail Members: manufacturer’s standard 45 mm deep, glazed doors with minimum 3.2 mm thick extruded aluminum tubular stile and rail members. Mechanically fasten corners with welded reinforcing brackets, or concealed tie-rods spanning full length of top and bottom rails.

.1 Glazing Stops: Square, snap-on, extruded aluminum stops and manufacturer’s standard preformed gaskets.

.2 Stile Design: Narrow stile.

.3 Rail Design:

.1 Top: 100 mm nominal height.

.2 Bottom: 165 mm nominal height.

.4 Intermediate Mullion: Horizontal tubular rail member for each door; match stile design and finish.

.3 Sidelites: Manufacturer's standard 45 mm deep sidelites with minimum 3.2-mm- thick, extruded-aluminum tubular stile and rail members, matching door design and finish.

.1 Glazing Stops and Gaskets: Same materials and design as for stile and rail door.

.4 Headers: Fabricated from minimum 5 mm thick, extruded aluminum and extending full width of automatic entrance units to conceal door operators and controls. Provide hinged or removable access panels for service and adjustment of door operators and controls on interior side of doors. Secure panels to prevent unauthorized access.

.1 Mounting: concealed, with one side of header flush with framing.

.2 Header capable of supporting up to 40 kg per sliding panel over a span of 4265 mm without intermediate supports.

.3 Door track and anti-riser guide: integral to structural member.

.5 Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with non-staining, nonferrous shims for aligning system components.

2.6 DOOR HARDWARE

.1 General: Provide units in sizes and types recommended by automatic entrance and hardware manufacturers for entrances and uses indicated. Finish exposed parts to match door finish unless otherwise indicated.

.2 Breakaway Device for Power-Operated Doors: Provide breakaway device that allows door to swing out in direction of egress to full 90 degrees from any operating position. Maximum force to open door shall be 222 N according to BHMA A156.10. Interrupt powered operation of door operator while in breakaway mode.

.3 Door Closers: Concealed spring closing device to return break away sliding panels to closed position.

.4 Safety and Security Hardware:

.1 On-Off Key Switch: Door control switch with key-controlled actuator; enclosed in 50-by-100-mm junction box. Provide stainless steel faceplate engraved with letters indicating switch functions. Mounting as follows:

.1 Exterior Door:

.1 Recess mounted in door jamb on interior side of door to engage night mode, which will disengage motion sensors and engage lock.

.2 Recess mounted in door jamb on exterior side of door to disengage lock and engage motion sensors for emergency services access. Key will be provided in nearby lock box.

.2 Interior Door:

.1 Recess mounted in door jamb on interior side of door to engage night mode, which will disengage motion sensors and engage lock.

.2 Monitored Power Fail (Battery Back-up): Provide autolock fail secure, so that if power fails, lock automatically engages.

.3 Security Monitoring: Provide door contacts to monitor if door is closed, or if broken away.

.1 Closed Door Monitoring Switch.

.2 SX Cut-off Switch.

.4 Include concealed, vertical-rod exit devices, UL 305, with latching into threshold and overhead carrier assembly and released by full-width panic bar; and that prevent emergency breakaway doors from swinging and that permit emergency egress.

.5 Include locking devices for sidelites, to prevent manual break out.

.5 Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.

.6 Thresholds: BHMA A156.21, extruded-aluminum raised thresholds; with beveled edges with a slope of not more than 1:2 and a maximum height of 13 mm. Provide cutouts as required for door operating hardware.

.7 Weatherstripping: Manufacturer's standard replaceable components. Surface-applied self-adhesive not permitted.

2.7 DOOR OPERATORS AND ACTIVATION AND SAFETY DEVICES

.1 Door Operators - General: Provide overhead door operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated.

.1 Performance: Provide door operators that will open and close doors and maintain them in fully closed position when subjected to Project's design wind loads.

.2 Electromechanical Operators: Concealed, self-contained, overhead unit powered by fractional-horsepower, permanent-magnet dc motor; with closing speed controlled mechanically by gear train and dynamically by braking action of electric motor; with solid-state microprocessor controller; UL 325; and with manual operation with power off.

.3 Fully adjustable without removal of doors. Provide adjustable speed control for checking, opening, closing and length of time door remains open.

.4 On-Off-Hold Open: Toggle switch at inside head of doors.

.5 Provide connections for power, and access control wiring.

.6 Provide for manual operation when power is off.

.7 Electrical power supply 120 VAC, 60 cycle, 1 phase, 15 amp.

.2 Combination Motion/Presence Sensors: Self-contained units; consisting of both motion and presence sensors in a single metal or plastic housing; adjustable to provide detection field sizes and functions required by BHMA A156.10.

.1 Motion Sensor: K-band-frequency, microwave-scanner units; with relay hold time of not less than 2 to 10 seconds.

.1 Provide capability for switching between bidirectional and unidirectional detection.

.2 Presence Sensor: Infrared-scanner units; with relay hold time of 1.5 seconds fixed. Sensors shall remain active at all times.

.3 Safety Devices: Two photoelectric beams mounted in sidelite jambs to detect pedestrians in presence zone and to prevent door from closing.

2.8 FABRICATION

.1 General: Factory fabricate automatic entrance components to designs, sizes, and thicknesses indicated and to comply with indicated standards.

.1 Form aluminum shapes before finishing.

.2 Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

.3 Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws, finished to match framing.

.1 Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.

.2 Reinforce members as required to receive fastener threads.

.4 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.

.2 Framing: Provide automatic entrances as prefabricated assemblies. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to Project site.

.1 Fabricate tubular and channel frame assemblies with manufacturer's standard welded or mechanical joints. Provide subframes and reinforcement as required for a complete system to support required loads.

.2 Perform fabrication operations in manner that prevents damage to exposed finish surfaces.

.3 Form profiles that are sharp, straight, and free of defects or deformations.

.4 Provide components with concealed fasteners and anchor and connection devices.

.5 Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.

.6 Fabricate exterior components to drain water passing joints and condensation and moisture occurring or migrating within system to the exterior.

.7 Provide anchorage and alignment brackets for concealed support of assembly from building structure.

.8 Allow for thermal expansion of exterior units.

.3 Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.

.4 Door Operators: Factory fabricated and installed in headers, including adjusting and testing.

.5 Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated, according to GANA's "Glazing Manual."

.6 Hardware: Factory install hardware to greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site. Cut, drill, and tap for factory-installed hardware before applying finishes.

.1 Provide sliding-type weather stripping, mortised into door, at perimeter of doors and breakaway sidelites.

.7 Activation and Safety Devices:

.1 General: Factory install devices in doors and headers as required by BHMA A156.10 for type of door and direction of travel.

.2 Install photoelectric beams in vertical jambs of sidelites, with dimension above finished floor as follows:

.1 Top Beam: 1219 mm.

.2 Bottom Beam: 610 mm.

2.9 FINISHES

.1 Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

.2 Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Part 3 Execution

3.1 EXAMINATION

.1 Examine conditions, with Installer present, for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrances.

.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

.1 General: Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints. Seal joints watertight.

.1 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.

.2 Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

.3 Co-ordinate installation of components with related and adjacent work. Attach and seal air/vapour barrier materials to perimeter framing.

.4 Set work plumb, square, level, free from warp, twist and superimposed loads.

.5 Securely anchor work in required position. Do not restrict thermal movement.

.6 Maintain clearances between head members and structure to ensure that structural loads are not transmitted to frames.

.2 Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.

.1 Install surface-mounted hardware using concealed fasteners to greatest extent possible.

.2 Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.

.3 Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within system to exterior.

.4 Provide thresholds at exterior doors.

.3 Door Operators: Connect door operators to electrical power distribution system as specified in Division 26 Sections.

.4 Activation and Safety Devices: Install and adjust devices to provide detection field and functions indicated.

.5 Glazing: Install glazing as specified in Section 08 80 50 - Glazing.

.6 Signs: Apply sign on both sides of each door and breakaway sidelight as required by referenced door standards

.7 Sealants: Comply with requirements specified in Section 07 92 00 - Joint Sealants to provide weathertight installation.

.1 Set thresholds, bottom-guide track system, framing members and flashings in full sealant bed.

.2 Seal perimeter of framing members with sealant.

.8 Wiring within Automatic Entrance Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's written limitations on bending radii. Provide and use lacing bars and distribution spools.

3.3 SITE QUALITY CONTROL

.1 Inspection: Engage installer's certified inspector to test and inspect automatic entrances and prepare test and inspection reports.

.1 Certified inspector shall test and inspect each automatic entrance to determine compliance of installed systems with applicable BHMA standards.

.2 Inspection Report: Certified inspector shall submit report in writing to Contract Administrator and Contractor within 24 hours after inspection.

3.4 ADJUSTING

.1 Adjust door operators, controls, and hardware for smooth and safe operation; comply with requirements in BHMA A156.10.

.2 Lubricate operating hardware and other moving parts as recommended by manufacturer.

.3 Readjust door operators and controls after repeated operation of completed installation equivalent to 3 days' use by normal traffic (100 to 300 cycles). Lubricate hardware, operating equipment, and other moving parts.

3.5 CLEANING

.1 Clean glass and metal surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish

3.6 DEMONSTRATION

.1 Refer to Section 01 79 00 – Demonstration and Training.

.2 Engage a certified inspector to train facility maintenance personnel to adjust, operate, and maintain automatic entrances.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Exterior thermally-broken, site-glazed structural sealant glazed (SSG) aluminum curtain wall framing system with vision glass, metal infill panels, and operable windows.

.2 Interior non-thermally broken, site-glazed structural sealant glazed (SSG) aluminum curtain wall framing system with vision glass, and metal infill panels.

1.2 RELATED REQUIREMENTS

.1 Section 01 21 00 - Allowances: for testing and inspection

.2 Section 05 12 23 - Structural Steel: Steel fabricated attachment members.

.3 Section 07 27 00 - Air Barriers: Perimeter air seal between curtain wall system and adjacent construction.

.4 Section 07 84 00 - Firestopping.

.5 Section 07 92 00 - Joint Sealants: System perimeter sealant and back-up materials.

.6 Section 08 41 13 - Aluminum Framed Entrances: Entrance doors.

.7 Section 08 42 29 - Automatic Entrances: for incorporation into curtain wall framing

.8 Section 08 80 50 - Glass and Glazing.

.9 Division 26 - Electrical: baseboard heaters attached to interior frame members

1.3 DEFINITIONS

.1 Delegated Design Professional: The design professional contracted to the contractor, fabricator or manufacturer to design specific components of the project and produce Delegated Design Submittals and Shop Drawings to meet the requirements of authorities having jurisdiction, and registered or licensed in the province where the project is located.

1.4 REFERENCES

.1 AA (Aluminum Association) DAF 45-2003 - Designation System for Aluminum Finishes

.2 Architectural Aluminum Manufacturers Association (AAMA)

.1 AAMA CW-DG-1-96 (R2005) - Aluminum Curtain Wall Design Guide Manual

.2 AAMA CW-10-15 - Care and Handling of Architectural Aluminum from Shop to Site

.3 AAMA 501-15 - Methods of Test for Exterior Walls

.4 AAMA 501.1-05 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure

.5 AAMA 611-12 - Voluntary Specification for Anodized Architectural Aluminum

.3 ASTM International (ASTM)

.1 ASTM A153/ASTM A153M-16a Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

.2 ASTM B209M-14 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

.3 ASTM B221M-12a - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

.4 ASTM C794-15a - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants

.5 ASTM C864-05(2015) Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers

.6 ASTM E283-04(2012) - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

.7 ASTM E331-00(2009) - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

.8 ASTM E1186-03(2009) Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems

.9 ASTM E2112-07(2016) - Standard Practice for Installation of Exterior Windows, Doors and Skylights

.4 CSA International (CSA)

.1 CAN/CSA-A440-00(R2005), Windows

.2 CAN/CSA-S157-05(R2015), Strength Design in Aluminum

.3 CAN/CSA W59.2-M1991(R2008), Welded Aluminum Construction

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 00: Project management and coordination procedures.

.2 Pre-installation meetings: Schedule pre-installation meeting with Contractor, installer, manufacturer, glazier, Contract Administrator, and necessary parties to review and discuss project conditions. Conduct pre-installation meeting minimum one week before starting curtain wall work and on-site installations to:

.1 Verify project requirements, including mock-up requirements.

.2 Verify conditions.

.3 Co-ordinate products, installation methods and techniques.

.4 Sequence work of related sections, including but not limited to structural-support framing, air/vapour barrier, and exterior cladding.

.5 Co-ordinate with other building subtrades.

.6 Review manufacturer's installation instructions.

.7 Review glazing procedure and schedule including methods of delivering and handling glass, and installing glazing materials.

.8 Verify compatibility of sealants, gaskets and glazing materials.

.9 Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.

.10 Review firestopping, flashings, special curtain wall details, and condition of other construction that may affect curtain wall.

.3 Coordination: Coordinate work of this section with installation of firestopping, air/vapour barrier placement, vapour retarder placement, flashing placement, and exterior wall components or materials.

1.6 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data:

.1 Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and metal infill, internal drainage details.

.2 Submit product data on sealants and gaskets to be used complete with recommendations and installation instructions, adhesion to glass and metal in accordance with ASTM C794, and cleaning and priming procedures.

.3 Submit manufacturer's compatibility statement that materials in contact with sealants and gaskets are compatible.

.4 Submit manufacturer's verification that sealants and gaskets are suitable for purpose intended, and are suitable for temperature, humidity and weather conditions at time of application.

.3 Shop Drawings: Prepared by manufacturer of curtain wall system; and stamped and sealed by a professional structural engineer licensed and registered in Manitoba.

.1 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required.

.2 Indicate materials and details in full size for head, jamb and sill, profiles of components, operable windows, junction between combination units, elevations of units, thermal break locations and details, glazing details and methods, anchorage details, location of isolation coating, description of related components; exposed finishes; hardware, fasteners and sealant locations.

.3 Indicate isometric views of joining and fastening where surfaces intersect or change plane.

.4 Indicate glass thermal and wind load stress analysis documenting adequate glass thickness and heat treatment to meet stresses generated. Thermal stress analysis to include effects of exterior and interior shading, conduction at glass edge, and contribution of low-e coatings.

.4 Samples:

.1 Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 300-mm lengths of full-size components and showing details of the following:

.1 Joinery, including concealed welds.

.2 Anchorage.

.3 Expansion provisions.

.4 Glazing.

.5 Flashing and drainage.

.6 Structural silicone weatherseal.

.7 Metal finishes of each type and colour

1.7 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Delegated-Design Submittal: For glazed aluminum curtain wall to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

.3 Quality-Control Program for Structural-Sealant-Glazed System: Include reports.

.4 Test Reports:

.1 Preconstruction Test Reports: For sealant.

.2 Submit substantiating engineering data, test results of previous tests of curtain wall system by independent laboratory, and other supportive data, which confirm compliance with specified requirements.

.3 Test reports shall be for size and configuration of components to be installed in the Work.

.4 For integrated exterior mock-up.

.5 For independent inspection and testing.

.5 Installation Data: Special installation requirements.

1.8 CLOSEOUT SUBMITTALS

.1 Section 01 78 10: Submission procedures.

.2 Provide maintenance data including period inspection and maintenance, and system monitoring program for SSG systems for incorporation into manual. Include:

.1 Written monitoring program including recommended cleaning schedule, and recommended periodic inspection schedule. Inspection schedule should include list of items that should be monitored per ASTM C1401 Section 50.3.

.2 Submit manufacturer's parts lists; include servicing frequencies, instructions for adjustment and operation applicable to each type of component or hardware, and name, address and telephone number of nearest authorized service representative.

1.9 QUALITY ASSURANCE

.1 Perform Work to AAMA CW-DG-1.

.2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.

.3 Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by the manufacturer.

.4 Delegated Design Professional Qualifications: Professional structural engineer experienced in design of this Work and licensed in Province of Manitoba.

.5 Quality-Control Program for Structural-Sealant-Glazed System: Develop quality control program specifically for Project. Document quality-control procedures and verify results for SSG curtain wall systems. Comply with ASTM C1401 recommendations including, but not limited to, system material-qualification procedures, preconstruction sealant-testing program, procedures for system fabrication and installation, and intervals of reviews and checks.

.6 Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

.1 Do not modify intended aesthetic effects, as judged solely by Contract Administrator, except with Contract Administrator’s approval. If revisions are proposed, submit comprehensive explanatory data to Contract Administrator for review.

.7 Preconstruction Sealant Testing: For SSG curtain wall systems, perform sealant manufacturer's standard tests for compatibility with and adhesion of each material that will come in contact with sealants and each condition required by curtain wall systems.

.1 Test a minimum five samples each of metal, glazing, and other material.

.2 Prepare samples using techniques and primers required for installed systems.

.3 For materials that fail tests, determine corrective measures necessary to prepare each material to ensure compatibility with and adhesion of sealants including, but not limited to, specially formulated primers. After performing these corrective measures on the minimum number of samples required for each material, retest materials.

.8 Structural-Sealant Glazing: Comply with ASTM C1401 for design and installation of structural-sealant-glazed systems.

.9 Structural-Sealant Joints: Design reviewed and approved by structural-sealant manufacturer.

1.10 MOCK-UP

.1 Section 01 45 00: Requirements for mock-up.

.1 Construct integrated exterior mock-ups of curtain wall assembly and adjacent composite metal wall panel assembly where directed by Contract Administrator.

.2 Perform tests under direction of an approved testing agency in the presence of the Curtain Wall sub-contractor, sealant applicator, Contractor, and Contract Administrator.

.3 Test for:

.1 Air infiltration by way of smoke testing per ASTM E1186. Video-record smoke testing.

.2 Water hose testing per AAMA 501.2.

.4 Exact test procedures will be determined with testing agency, but will include air infiltration and exfiltration tests, and water penetration tests.

.5 Costs for testing will be paid for by Cash Allowance.

.6 Alterations, repairs, additions necessary to achieve acceptable performance at the test locations and similar adjustments to all completed work shall be at no additional cost to the Contract.

.7 Include cost of re-testing to verify corrected work.

.2 Approved mock-up may remain as part of the Work.

1.11 DELIVERY, STORAGE, AND PROTECTION

.1 Section 01 61 00: Transport, handle, store, and protect products.

.2 Handle work of this Section to AAMA CW-10.

.3 Protect prefinished aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Puncture wrappings at ends for ventilation.

.4 Brace frames to maintain squareness and rigidity during shipment.

1.12 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.13 AMBIENT CONDITIONS

.1 Do not install sealants when ambient temperature is less than 5 degrees C.

.2 Maintain this minimum temperature during and after installation of sealants.

1.14 WARRANTY

.1 Section 01 78 10: Warranties.

.2 Manufacturer agrees to repair or replace curtain wall and aluminum windows that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, the following:

.1 Failure to meet performance requirements.

.2 Structural failures including excessive deflection, water leakage, condensation, and air infiltration.

.3 Faulty operation of movable sash and hardware.

.4 Deterioration of materials and finishes beyond normal weathering.

.3 Warranty Period: 5 years from date of Substantial Performance.

Part 2 Products

2.1 MANUFACTURERS

.1 Exterior System:

.1 Basis-of-Design Product: Provide Alumicor ThermaWall 2600, or subject to compliance with specified requirements the following product may be acceptable:

.1 Kawneer; Product: Clearwall SSIT system.

.2 Interior System:

.1 Basis-of-Design Product: Provide Alumicor VersaWall Midline 2200 SSG, or subject to compliance with specified requirements the following product may be acceptable:

.1 Kawneer; Product: Clearwall SSIT system.

.3 Operable Windows: Zero sightline for installation in curtain wall framing.

.1 Basis-of-Design Product: Alumicor Phantom Vent 5000, awning and casement, or subject to compliance with specified requirements the following product may be acceptable:

.1 Kawneer; Product: Glassvent.

2.2 SYSTEM DESCRIPTION

.1 Curtain Wall:

.1 4-sided SSG curtain wall systems with interior supporting aluminum mullions, and sealed insulating glass units.

.1 Exterior: thermally-broken, with operable windows.

.2 Interior: non-thermally-broken.

.2 System Assembly: Site assembled.

.3 Assembled system to permit re-glazing of individual glass units from exterior without requiring removal of structural mullion sections.

.2 Operable Windows: Aluminum framed, zero sightline, casement and awning windows with double glazed insulating glass units, for installation in curtain wall framing.

2.3 PERFORMANCE AND DESIGN CRITERIA

.1 Delegated Design: Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

.2 Design structural support framing components to CAN/CSA-S157 under direct supervision of a professional structural engineer experienced in design of this Work and licensed in the Province of Manitoba.

.3 Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with NBC, to a design pressure indicated on structural drawings

.4 Limit mullion deflection to L/175 for spans up to 4100 mm or maximum 19 mm; with full recovery of glazing materials.

.5 Sealant Criteria: Limit working stress of sealants to 138 kPa.

.6 Thermal Resistance of: maximum U-factor when tested to NFRC 100, as follows:

.1 Curtain wall: overall U-factor of total fenestration product: 2.0 $W/m^2/°C$.

.7 Air Infiltration: Limit air infiltration through assembly to 0.3 L/s/sq m of wall area, measured at a reference differential pressure across assembly of 300 Pa as measured to ASTM E283.

.8 Water Resistance, (static): no leakage when tested in accordance with ASTM E331, at static air pressure differential of 720 Pa, and as defined in AAMA 501.

.9 Water Resistance, (dynamic): no leakage when tested in accordance with AAMA 501.1, at air pressure differential of 720 Pa, and as defined in AAMA 501.

.10 Expansion / Contraction: System to provide for expansion and contraction within system components caused by a cycling temperature range of 95 degrees C over a 12 hour period without causing detrimental effect to system components.

.11 System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

.12 Air and Vapour Seal: Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

.13 Not Permitted: 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.

.14 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.

.1 Design, and verify maximum glass sizes, thickness, strength, for glass types specified, to support design, and maximum allowable uniform static loads, using design factor of 2.5, in accordance with CAN/CGSB 12.20, but thickness shall not be less than as scheduled in this Section.

.15 Operable Windows:

.1 Window classification: to CAN/CSA A440.

.1 Air tightness: A3.

.2 Water tightness: B7.

.3 Wind load resistance: C5.

.4 Condensation resistance: Temperature Index, I58.

.5 Forced Entry: F10.

.2 Performance Class and Performance Grade: to AAMA/WDMA/CSA 101/I.S.2/A440 AW85.

2.4 MATERIALS

.1 Extruded Aluminum: to ASTM B221M, 6063 alloy, T5 or T6 temper.

.2 Sheet Aluminum: to ASTM B209M, utility grade for unexposed surfaces, anodizing quality for exposed surfaces.

.3 Fasteners, screws and bolts: Cadmium plated stainless steel to meet curtain wall requirements and as recommended by manufacturer.

.4 Steel Sections: to CSA G40.20/G40.21; shaped to suit mullion sections.

.5 Insulation: to CAN/ULC S702, plain faced, semi-rigid board, 64 kg/m^3 density, 125 mm thickness typical minimum, and other thicknesses indicated RSI 0.74/25 mm thickness, mechanical pin/plate fasteners.

.1 Manufacturer/Product :

.1 Roxul Inc.; CurtainRock 40.

.2 Thermafiber FireSpan 40.

2.5 CURTAIN WALL COMPONENTS AND ACCESSORIES

.1 Mullion Profile:

.1 Exterior: 63 wide by 133 mm deep nominal dimension; thermally broken with interior section insulated from exterior attachments; temporary glazing stops of sufficient size and strength to provide bite on glass prior to and during glazing; drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system; internal mullion baffles to eliminate "stack effect" air movement within internal spaces.

.2 Interior: 50 wide by 100 mm deep nominal dimension; temporary glazing stops of sufficient size and strength to provide bite on glass and infill panels prior to and during glazing.

.2 Reinforced Mullion: 63 mm wide by 133 mm deep profile of extruded aluminum cladding with internal reinforcement of shaped steel structural section where required.

.3 Panels and Trim:

.1 Door Actuator Mounting Panel - Interior: Provide minimum 1.3 mm thick aluminum sheet adhered to 19 mm thick plywood backing. Exposed aluminum finish: Colour anodized to match framing. Single length piece per location, secured with concealed fasteners.

.2 Partition End Trim: Provide brake-formed aluminum sheet, minimum 3 mm thick by width required to cover end of partition with 25 mm returns; colour anodized finished to match framing. Single length piece per location.

.4 Insulated Spandrel Panels:

.1 Overall Panel Thickness: Same depth as curtain wall mullion.

.2 Exterior Skin: Minimum 1.3 mm thick aluminum sheet adhered to 19 mm thick plywood backing. Exposed aluminum finish: Colour anodized to match framing.

.3 Interior Skin: Minimum 1.3 mm thick aluminum sheet adhered to 19 mm thick plywood backing. Exposed aluminum finish: Colour anodized to match framing.

.4 Fabricate back pan from 0.91 mm thick zinc coated, sheet metal, to profiles indicated, with sealed corners. Size panels to provide maximum clearance 6 mm around perimeter, between pans, vertical, and horizontal aluminum framing members, and to allow installation of door activating devices.

.5 Install mineral wool board insulation in back pan.

.6 Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching exterior skin. Maintain cavity width of 25 mm unless otherwise indicated between insulation and exterior skin.

.7 Ventilate and pressure-equalize air space outside exterior surface of insulation, to the exterior.

.8 Arrange fasteners and attachments to ensure concealment from view.

.5 Thermal barrier: manufacturer's standard.

.6 Steel reinforcement: CSA-G40.20/G40.21M; shaped to suit mullion sections, Grade 300W.

.7 Anchors: 3-way adjustable hot-dip galvanized cast iron.

.8 Gaskets: to ASTM C864, extruded silicone-compatible EPDM rubber that provides for silicone adhesion.

.9 Flashings: 3 mm thick aluminum; secured with concealed fastening method; finish to match mullion sections where exposed; fabricate in maximum lengths.

.10 Firestopping: Specified in Section 07 84 00.

.11 Air Barrier: Specified in Section 07 27 00.

.12 Provide to other Sections purpose made weld plates, anchor bolts, other fastening devices for installation in concrete as required.

.13 Provide fastening devices and brackets to fasten to weld plates or other anchoring devices. Fastening devices to be slotted or otherwise assembled to accommodate building structure deflection, and movement.

.14 Anti-rotational blocks: non-conducting, phenolic, or polycarbonate, of size to suit glazing rabbet to curtain wall framing, one length piece per location.

.15 Trim:

.1 Minimum 3 mm thick extruded and sheet aluminum, except as specified or indicated otherwise. Secure with concealed fasteners.

.2 Fabricate aluminum trim pieces, angles and closure pieces at floors, jambs and heads, ends of partitions as indicated and as required.

.3 Profiles indicated, and as required.

.4 Finish to match curtain wall mullion sections where exposed.

2.6 OPERABLE WINDOWS COMPONENTS AND ACCESSORIES

.1 Zero sightline for installation in curtain wall framing.

.2 Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated

.3 Operating Types:

.1 Casement: Project out.

.2 Awning: Project out.

.4 Frames and Sashes: Aluminum extrusions complying with AAMA/WDMA/CSA 101/I.S.2/A440, minimum 1.6 mm thick.

.1 Thermally Improved Construction: Fabricate frames, sashes, and muntins with an integral, concealed, low-conductance thermal barrier located between exterior materials and window members exposed on interior side in a manner that eliminates direct metal-to-metal contact.

.5 Hardware:

.1 General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.

.1 Exposed Hardware Colour and Finish: Black, powder-coated.

.2 Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E 405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.

.3 Hinges: minimum one pair, stainless steel, four-bar friction arm hinges complete with semi-concealed operating tension adjustment device.

.4 Lock: Lever handle and cam-action lock with keeper.

.5 Limit Devices: designed to restrict sash opening.

.6 Insect Screen: Black aluminum mesh in black extruded aluminum frame.

.7 Weather Stripping: Provide full-perimeter weather stripping for each operable sash.

.6 Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

.1 Exposed Fasteners: Do not use exposed fasteners to the greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

2.7 GLASS AND GLAZING MATERIALS

.1 Glass and Glazing Materials: As specified in Section 08 80 50.

2.8 FABRICATION – CURTAIN WALLS

.1 Do aluminum welding to CAN/CSA W59.2.

.2 Vertical and horizontal members: Tubular extrusions designed for shear block corner construction.

.3 Construct units square, plumb and free from distortion, waves, twists, buckles or other defects detrimental to performance or appearance.

.1 Fabricate with separate, integrated support for insulating glass unit.

.2 Site glazing is permitted.

.4 Fabricate curtain wall with minimum clearances and shim spacing around panel perimeter and ensure installation and dynamic movement of perimeter seal is enabled.

.5 Accurately fit and secure joints and corners. Make joints are flush, hairline, and weatherproof.

.6 Prepare curtain wall to receive anchor devices.

.7 Use only concealed fasteners, unless otherwise approved by Contract Administrator.

.1 Ensure fasteners do not penetrate thermal break.

.8 Prepare components to receive doors and openings as indicated.

2.9 FABRICATION – OPERABLE WINDOWS

.1 Do aluminum welding to CAN/CSA W59.2.

.2 Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

.3 Glaze aluminum windows in the factory.

.4 Weather strip each operable sash to provide weathertight installation.

.5 Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.

.6 Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.10 FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with DAF-45 - Aluminum Association Designation System for Aluminum Finishes.

.1 Colour Anodic Coating: AAMA 611, AA-M12C22A44, colour black.

.1 Class I, 0.018 mm or thicker: Exterior exposed aluminum surfaces.

.2 Class II, 0.010 mm or thicker: Interior exposed aluminum surfaces.

.2 Shop and touch-up primer for steel components: SSPC 25 Paint red oxide.

.3 Touch-up primer for galvanized steel surfaces: SSPC 20 Paint zinc rich.

.4 Concealed steel items: galvanized in accordance with ASTM A153 to 600 g/m^2.

.5 Metal Protection:

.1 Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.

.2 Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify dimensions, tolerances, and method of attachment with other work, and compatibility of materials in the structural sealant glazing system.

.3 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2 PREPARATION

.1 Supply anchorage devices and inserts to the appropriate trades where required for building in or casting-in-place and instruct as to proper location and position.

.2 Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.

.3 Ensure that masonry and concrete surfaces to receive sealants are dry, firm, sound, smooth, suitable for bond, and free from loose material, projections, ice, frost, slick, grease, oil and other matter detrimental to bond.

.4 Ensure anchors are non-corrosive material, of sufficient strength for purpose required, suit wind loading specified, do not restrict thermal, wind movement, distort framing, or become overstressed from expansion, contraction of components.

3.3 INSTALLATION

.1 Install curtain wall in accordance with manufacturer's written instructions.

.2 Do aluminum welding to CAN/CSA W59.2.

.3 Attach curtain wall assemblies to structure plumb and level, free from warp, and allow for sufficient adjustment to accommodate construction tolerances and other irregularities.

.1 Maintain dimensional tolerances and align with adjacent work.

.2 Use alignment attachments and shims to permanently fasten elements to building structure.

.3 Clean welded surfaces and apply protective primer to field welds and adjacent surfaces.

.4 Devices for anchoring the frame assemblies shall have sufficient adjustment to permit correct and accurate alignment. After alignment, positively secure anchorage devices to prevent movement other than those designed for expansion and contraction. Take into consideration climatic conditions prevailing at time of installation.

.4 Cut and trim component parts during erection, only with approval of and in accordance with manufacturer's recommendations.

.5 Install thermal isolation where components penetrate or disrupt building insulation.

.6 Install aluminum flashings in conjunction with framing units, securely fastened to wall construction.

.7 Install sill flashings, and interior and exterior trim where indicated.

.8 Co-ordinate installation of fire stop insulation, and smoke sealing, in accordance with Section 07 84 00 - Firestopping.

.9 Co-ordinate attachment and seal of perimeter air barrier in accordance with Section 07 27 00 – Air/Vapour Barriers.

.10 Fill shim space around perimeter of frame with foam sealant to maintain continuity of thermal barrier.

.11 Install insulating glass units and infill panels in accordance with Section 08 80 50 - Glazing and to manufacturer's written instructions.

.12 At perimeter framing, or wherever there is no glazing installed in a glazing rabbet, install continuous anti-rotational channel in rabbet to prevent rotation of pressure plate when tightened down, and to facilitate clamping of air/vapour barrier membrane. Mechanically fasten in place at 300 mm oc., after membrane has been installed and channel has been fitted into place.

.13 Install perimeter sealant to method required to achieve performance criteria, backing materials, and installation criteria in accordance with Section 07 92 00 - Joint Sealants.

.14 Ensure uniform, continuous thermal and vapour barrier. Where adjacent insulation and vapour barriers are provided under other Sections, coordinate work such that thermal and vapour barrier continuity is achieved.

3.4 INSTALLATION – OPERABLE WINDOWS

.1 Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in CAN/CSA A440 and ASTM E 2112.

.2 Accurately install operable window in prepared openings.

.3 Provide reinforcing anchors, bolts, and other required fastening devices to ensure rigid installation able to withstand intended use.

.4 Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

.5 Install units to properly fit framing members. Install specified hardware and weatherstripping according to manufacturer's recommendations and check proper operation after installation and glazing.

.6 Adjust operable windows, screens, hardware, operators, and accessories for a tight fit at contact points and weatherstripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

.7 Install insect screens in accordance with manufacturer’s written recommendations.

.8 Seal joints between windows and curtain wall framing with sealant.

3.5 ERECTION TOLERANCES

.1 Section 01 73 00: Tolerances.

.2 Maximum variation from plumb: 1.5 mm/m non-cumulative or 12 mm/30 m, whichever is less.

.3 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.

.4 Maximum sealant space between curtain wall and adjacent construction: 13 mm.

.5 Sealant Space Between Glazing System Components and Adjacent Construction: Maximum 12 mm and minimum 6 mm.

3.6 FIELD QUALITY CONTROL

.1 Section 01 45 00: Field inspection and testing.

.2 Testing Agency: Engage a qualified testing agency to perform tests and inspections.

.3 Testing Services: Testing and inspecting of representative areas of glazed aluminum curtain walls shall take place as installation proceeds to determine compliance of installed assemblies with specified requirements.

.4 Field inspections will include:

.1 Periodic on-site testing.

.2 Verification of proper insulation, and air/vapour barrier installation.

.3 Review of panel to panel air seals.

.4 Review of panel fastening, exterior sealants, etc.

.5 Verification of flashing placement and continuity.

.6 Special review of interfaces between different elements to verify continuity of envelope performance.

.7 Review of exterior applied sealants and flashings.

.8 Review of drainage paths to confirm they are clear.

.9 Verification of glass type and position.

.5 Test for water penetration of curtain wall systems:

.1 Test for water leaks in exterior aluminum framing, glazing, in accordance with Field Check of Metal Curtain Walls for Water Leakage", AAMA 501.2 after completion of installation, nominal curing of sealant, glazing compounds. Perform minimum one test for each glass plane every plane, glass surface, at discretion of testing and inspection agency.

.6 Test for air infiltration of curtain wall systems:

.1 Air Infiltration and Exfiltration: Perform tests in accordance with ASTM E1186 to assess qualitative air tightness of systems and visually identify points of air by using smoke tracers and pressure chambers. Test after installation and nominal curing of sealants and glazing compounds. Test frequency at discretion of testing and inspection agency. Test after installation and nominal curing of sealants and glazing compounds.

.7 Structural-Sealant Glazing Inspection: After installation of SSG curtain wall systems is complete, structural-sealant glazing shall be inspected and evaluated according to recommendations in ASTM C1401.

.8 Repair work if test results and inspections indicate that it does not comply with specified requirements. Once repairs are completed, re-test system by same standard. Failure of test will result in re-testing of the same location and the additional testing of another location within the same curtain wall system.

.9 Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

.10 Curtain wall assemblies will be considered defective if they do not pass tests and inspections.

3.7 CLEANING

.1 Section 01 74 00: Cleaning installed work.

.2 Remove protective material from prefinished aluminum surfaces.

.3 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.

.4 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.8 PROTECTION OF FINISHED WORK

.1 Protect finished Work from damage.

.2 Repair damage to adjacent materials caused by aluminum curtain wall installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Hardware for doors.

1.2 RELATED REQUIREMENTS

.1 Section 08 06 70 - Door Hardware Schedule

.2 Section 08 11 13 - Metal Doors and Frames.

.3 Section 08 14 16 - Flush Wood Doors.

.4 Section 08 41 13 - Aluminum Framed Entrances

.5 Section 08 71 43 - Automatic Door Operators

.6 Division 26 - Electrical: Power supply to electric hardware devices

1.3 REFERENCES

.1 Builders Hardware Manufacturers Association (BHMA)

- .1 BHMA A156.13-2012 Mortise Locks & Latches 1000 Series
- .2 BHMA A156.1-2013, Butts and Hinges
- .3 ANSI/BHMA A156.3-2014, Exit Devices
- .4 BHMA A156.4-2013, Door Controls (Closers)
- .5 BHMA A156.15-2015, Release Devices – Closer Holder, Electromagnetic and Electromechanical
- .6 BHMA A156.16-2013, Auxiliary Hardware
- .7 BHMA A156.18-2016, Materials and Finishes

.2 DHI - Door and Hardware Institute:

- .1 Sequence and Format for the Hardware Schedule (1996)
- .2 Recommended Locations for Architectural Hardware for Standard Steel Doors & Frames (1980)
- .3 Recommended Locations for Architectural Hardware for Standard Steel Doors (1993)
- .4 Recommended Locations for Architectural Hardware for Wood Flush Doors (1993)
- .5 DHI Handbook, Keying Systems and Nomenclature

.3 National Fire Protection Agency (NFPA)

- .1 NFPA 80 Standard for Fire Doors and Other Protectives

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 00: Project management and coordination procedures.

.2 Pre-installation Meeting:

- .1 Convene pre-installation meeting with hardware supplier and installers to verify project requirements, manufacturers' installation instructions, manufacturers' warranty requirements, and to review inspecting and certifying procedures.

.3 Coordination: Coordinate with other work having a direct bearing on work of this section.

.1 Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.

.2 Coordinate keying requirements during the course of the Work.

.4 Sequencing: Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide for each specified item of hardware.

.3 Schedules:

.1 Use same door numbers as in the Contract Documents.

.2 Submit detailed Hardware Schedules in accordance with "Sequence and Format for the Hardware Schedule" vertical format as published by DHI.

.3 Submit proposed keying schedule for locks and cylinders to Contract Administrator for approval.

.4 Electrified Hardware:

.1 Submit riser diagrams and detailed method of operation for electrified hardware, including correct wire runs, back boxes,120 VAC requirements and fire alarm connections, gauge, quantity, type of wire, and termination points. Termination points to be snap-in connectors where possible.

.5 Samples:

.1 Submit duplicate samples of lockset illustrating style, colour, and finish.

.2 Samples will be incorporated into the Work.

1.6 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Certification:

.1 Provide written certificate stating completed installations and applications comply with manufacturers' warranty and recommended installation instructions.

.2 Submit written record of initial inspection of fire rated openings in conformance with NFPA 80.

1.7 CLOSEOUT SUBMITTALS

.1 Section 01 78 10: Submission procedures.

.2 Operation and Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.8 MAINTENANCE MATERIAL SUBMITTALS

.1 Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.9 QUALITY ASSURANCE

.1 Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant (AHC) who is available during the course of the Work to consult with Contractor, and Contract Administrator about door hardware and keying.

.1 Employ or retain services of an AHC in good standing with DHI for review of schedules prior to submittal, to verify effective coordination and proper function of components listed.

.2 Certified for installation of proprietary systems and specialized hardware as required.

1.10 DELIVERY, STORAGE, AND PROTECTION

.1 Section 01 61 00: Transport, handle, store, and protect products.

.2 Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.12 WARRANTY

.1 Section 01 78 10: Warranties.

.2 Submit manufacturer warranty and ensure forms have been completed in the City's name and registered with manufacturer.

.1 Manufacturers warranty shall be extended as listed for the following items:

.1 Closers - 25 years.

.2 Locksets and Exit Devices - 5 years.

.3 Electronic Devices and related components - 1 year.

Part 2 Products

2.1 REGULATORY REQUIREMENTS

.1 Conform to applicable code for Products requiring electrical connection. Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

2.2 HARDWARE ITEMS

.1 Refer to Section 08 06 70 – Door Hardware Schedule.

2.3 MANUFACTURERS

.1 Products listed in the hardware groups are from the manufacturers listed below:

ITEM	MANUFACTURER NAME
Full Mortise Hinges	Ives
Continuous Hinges	Ives
Locksets, Latchsets/Deadbolts	Schlage
Cylinders	Best
Exit Devices	Von Duprin
Surface/Flush Bolts	Ives
Door Closers	LCN
Overhead Door Holders/Stops	Glynn Johnson
Door Pulls/Flatware	Ives
Wall/Floor Stops	Ives
Weather/Smoke/Sound Seals	KN Crowder
Door Sweeps/Thresholds	KN Crowder
Automatic Door Operators/Actuators	LCN
Keyswitch/Magnetic Locks	Schlage Electronics
Electric Strikes	Von Duprin
Access Controllers	Schlage Electronics
Power Supplies	Schlage Electronics, Von Duprin

.2 Obtain each type of hardware and items of similar function from one manufacturer.

2.4 DOOR HARDWARE

.1 Screws and Fasteners

.1 Use manufacturers' standard fasteners per template and instruction information.

.2 Self-drilling and tapping fasteners as supplied by manufacturer will not be accepted for installation of hardware items. Drill and tap holes to accept manufacturer-supplied standard machine screws.

.3 Provide fasteners of similar finish and suited to material they pass through.

.4 Hardware attached to fire rated assemblies: Steel or stainless steel.

.5 Provide thru-bolt fasteners where reinforcing is insufficient to provide secure fastening.

.6 Fasteners for wood doors: Threaded to the head or thru-bolted machine screws.

.2 Hinges:

.1 Interior Doors: 5-knuckle ball bearing, steel or stainless steel in conformance with BHMA A156.1.

.2 Exterior Doors: 5-knuckle ball bearing, non-ferrous material in conformance with BHMA A156.1.

.3 Electrified Hinges: of sufficient gauge and quantity of conductors to operate specified electrical devices and in conformance with ANSI 156.1.

.4 Acceptable Manufacturers: Ives, Hager, Stanley

.3 Flushbolts:

.1 Type: Mortise lever extension.

.2 Upper Bolt: extended to maintain standard vertical location on door.

.3 Fire Rated and Automatic Flushbolts: Provide positive latching and activation in conformance to NFPA 80.

.4 Acceptable Manufacturers: Hager, Ives.

.4 Locks and Latches: to BHMA A156.13. Lock function indicated in door hardware schedule.

.1 Cylindrical:

.1 Latch bolts: Steel, minimum 12 mm throw deadlocking on keyed and exterior functions; 19 mm throw anti-friction latchbolt on pairs of fire doors.

.2 Provide manufacturer's standard wrought box strike for each latch or lock, with curved lip extended to protect frame.

.3 Locks and latchsets: Tested to exceed 8,000,000 cycles.

.4 Provide molex connections for electrified functions as a standard.

.5 Lock case: steel, incorporating one-piece spring cage and spindle. Precision solid brass 6-pin cylinder with nickel silver keys available in Schlage keyways.

.6 Levers: solid with no plastic inserts.

.7 Acceptable Manufacturers: Schlage "ND" series

.2 Mortise:

.1 Grade 1 Operational, Grade 1 Security, mortise lock for commercial and institutional buildings.

.2 Manufacture lock cases: Fully wrapped, heavy 12 gauge steel with protected leading edge and screw configuration that limits access to operating parts.

.3 Lock components: manufactured of zinc dichromate plated steel.

.4 Latch bolts: Two-piece anti-friction, stainless steel, 70 mm backset with 19 mm throw; non-handed, field reversible without opening the lock case.

.5 Deadbolts: Stainless steel construction with security roller pin minimum Rc60 rating for surface hardness; 45 mm total length with 25 mm throw with minimum 19 mm internal engagement when fully retracted. External lever assembly one-piece design attached by threaded bushing. Internal lever assembly attached by screwless shank. Lever attachments by common tools (allen nuts or set screws) are not acceptable. Thru-bolt lever assemblies through doors for positive interlock. Provide levers with independent rotation in both directions; freewheeling operation in locked mode. Incorporate spring cages into lever assemblies. Provide solid cast stainless steel hub blocking plate; open hub designs are not acceptable. Provide independent spindles, designed to "break away" at maximum 75 psi torque. Provide automatic vertically and horizontally self-adjusting mounting tabs, for door bevel and strike alignment. Provide cylinders secured by a cast stainless steel, dual retainer. Manufacturers utilizing screws or stamped retainers are not acceptable.

.6 Acceptable Manufacturers: Schlage "L" series.

.3 Lock Levers: Non-handed solid material.

.4 Locks for fire doors: listed by Underwriters Laboratories for ratings of 3 hr and less.

.5 Exit Devices: to ANSI/BHMA A156.3, Grade 1 designed for functions as stated in the hardware schedule.

.1 UL Listed for panic.

.2 Exit devices on doors in fire separations: UL Listed Fire Exit Hardware

.3 Concealed Vertical Rod, and Mortise Exit Devices: not permitted.

.4 Lever Trim For Exit Devices: of similar design to mortise locks and latches.

.5 Acceptable Manufacturers: Von Duprin

.6 Door Closers: to BHMA A156.4, Grade 1.

.1 Adjustable to provide sizes 1 through 6 and comply with ADA with full rack and pinion construction, closing speed, latch speed and backcheck controlled by key operated valves. Delayed action feature as scheduled available and controlled by a separate valve.

.2 Closer Covers: High impact plastic, secured by machine screws.

.3 Closers: Non-handed to meet a variety of door conditions and design requirements.

.4 Closers: Suitable for standard, top jamb, parallel arm and track type applications when provided with proper brackets and arms.

.5 Acceptable Manufacturers: LCN

.7 Cylinders: Type mortise and rim style, finished to 626, for installation in devices as listed in the hardware schedule. Key into keying system as directed.

.8 Door Plates:

.1 Push plates: 1.27 mm thick satin stainless steel, beveled four edges, countersunk holes pre-punched to accommodate fasteners.

.2 Kick Plate and Mop Plate: 1.27 mm thick satin stainless steel, beveled three edges with countersunk holes pre-punched to accommodate fasteners.

.3 Pull Handles: Type D, stainless steel, size as listed in hardware schedule, finished to 630.

.4 Acceptable Manufacturers: Ives, Hager, CBH.

.9 Auxiliary Hardware: to BHMA A156.16

.1 Stops:

.1 Wall Stops: Wrought material with concave or convex rubber insert to suit lock function.

.2 Floor Stops: Cast brass or bronze material, sized to suit clearance under door.

.3 Overhead Mounted Stop and Hold Mechanisms: Non-handed, slide track design providing spring actuated cushion prior to dead stop and sized to suit door opening.

.1 Acceptable Manufacturers: Glynn Johnson 90 Series

.2 Signage: Interior signage: Satin stainless steel base with black pictogram images, with double-sided self-adhesive tape for mounting.

.3 Silencers:

.1 Tamperproof and of rubber composition with built in acoustic chambers to absorb impact and reduce noise

.2 Provide three silencers for single door openings; two silencers in paired openings.

.10 Door Bottom:

.1 Exterior Door Sweeps: Extruded clear anodized aluminum retainer with rubber insert.

.11 Thresholds and Gasketing:

.1 Thresholds: Extruded aluminum with fluted ramp compliant to accessibility standards.

.2 Exterior Weatherstrip: Clear anodized extruded aluminum retainer with sponge neoprene insert.

.3 Interior Gasket: Self-adhesive silicone seal bulb, rated for smoke and fire as required.

2.5 KEYING

.1 Provide three keys for each lock in Contract.

.2 Keyed to existing keying system. Verify keying instructions with Contract Administrator.

.3 Supply keys in the following quantities:

.1 3 master keys.

.2 2 change keys for each lock.

2.6 FINISHES

.1 Finishes: to ANSI/BHMA A156.18 and identified in Section 08 06 70 – Door Hardware Schedule.

.2 Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify that doors and frames are ready to receive work.

.3 Verify that electric power is available to power operated devices and is of the correct characteristics.

3.2 INSTALLATION

.1 Install finish hardware in conformance with manufacturers printed instructions.

.2 Pre-fit hardware before application of final finishes. Remove and reinstall hardware once finishing is complete ensuring proper fit and function.

.3 Install surface mounted hardware with fasteners supplied by manufacturer where proper reinforcing is sufficient to securely attach. Self-threading fasteners are permitted only as indicated in manufacturers printed instructions and included in standard packaging for items. Pre-drill wood doors to accept fasteners and provide secure installation.

.4 Location of locks latches and operating trim in accordance with DHI "Recommended Locations for Architectural Hardware for Standard Steel Doors" and "Recommended Locations for Architectural Hardware for Flush Wood Doors".

.5 Locate surface mounted door closers on room side of door opposite corridors where possible. Method of installation shall provide positive latching and ease of operation without conflicting with other hardware installed at opening.

3.3 FIELD QUALITY CONTROL

.1 Section 01 45 00: Field inspection, testing, and adjusting.

.2 Engage qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

.1 Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

.3 Final inspection of installed assemblies shall be completed prior to certificate of occupancy with all building systems functional.

3.4 ADJUSTING

.1 Adjust door hardware, operators, closures, and controls for optimum smooth operating condition, safety, and weather-tight closure after building systems are in operation.

.2 Lubricate hardware, operating equipment, and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

3.5 PROTECTION OF FINISHED WORK

.1 Do not permit adjacent work to damage hardware or finish.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Low energy power operated swing door operators.

.2 Activation devices.

1.2 RELATED REQUIREMENTS

.1 Section 08 41 13 - Aluminum Framed Entrances and Storefronts: Aluminum doors and frames, mounting panels

.2 Section 08 44 30 - Structural Sealant Glazed Assemblies

.3 Section 08 71 00 - Door Hardware - General

.4 Division 26 Sections for electrical connections including conduit and wiring for door operators

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Coordination:

.1 Coordinate requirements for activation devices mounted into aluminum framing and metal panels adjacent to doors.

1.4 DEFINITIONS

.1 Low Energy Power Operated Doors: doors with a power mechanism that opens and closes the door upon receipt of an actuating signal and does not generate more kinetic energy than specified in ANSI/BHMA A156.19. Closing of doors is linked to and integral with power operator mechanism.

1.5 REFERENCES

.1 Builders Hardware Manufacturers Association (BHMA)

.1 BHMA A156.19-2013 - Power Assist and Low Energy Power Operated Doors

1.6 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide data on system components, sizes, features, and finishes.

.3 Shop Drawings:

.1 Indicate layout, dimensions, head, jamb and sill conditions, elevations, components, anchorage, recesses, materials and finishes.

.2 Identify installation tolerances required, assembly conditions, routing of service lines and conduit, and locations of operating components and boxes.

.4 Samples: Submit two samples of door activation devices. Samples will be returned for installation in the Work.

1.7 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Site Quality Control Submittals:

.1 Submit completed AAADM recommended inspection forms after installation of automatic door equipment.

.2 Provide AAADM 'Safety Information' sticker at inside face of mullion for doors operated by barrier free equipment and automatic door operators. Ensure sticker shows step by step safety check required at start-up.

1.8 CLOSEOUT SUBMITTALS

.1 Section 01 78 10: Submission procedures.

.2 Maintenance Contracts: Provide service and maintenance of operating equipment for one year from Date of Substantial Completion.

.3 Operation and Maintenance Data: Include the following:

.1 Parts lists referenced to isometric exploded view of door operator.

.2 Schematic wiring diagrams including all components, switching devices and current characteristics.

.3 Manufacturer's recommendations for servicing frequencies, adjustment and operation applicable to each component.

.4 Description of remedial action required to correct possible operational deficiencies.

.4 Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in the City's name and registered with manufacturer.

.5 Record Documentation: Record actual locations of concealed equipment, services, and conduit.

1.9 MAINTENANCE MATERIAL SUBMITTALS

.1 Section 01 78 10: Maintenance extra material requirements.

.2 Tools: Provide wrenches and tools required for maintenance of equipment.

1.10 QUALITY ASSURANCE

.1 Manufacturer: firm with not less than 5 years' successful experience in the fabrication of automatic doors of the type required for this project, with company certificate issued by AAADM.

.2 Installer: authorized representative of automatic door manufacturer for both installation and maintenance of the type of units required for this project.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.12 WARRANTY

.1 Section 01 78 10: Warranties.

.2 Provide five-year manufacturer warranty for door operating unit.

Part 2 Products

2.1 REGULATORY REQUIREMENTS

.1 Comply with City of Winnipeg Accessibility Design Standards for door release hardware at required exits and accessibility signs.

.2 Operators for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

2.2 PERFORMANCE REQUIREMENTS

.1 Meet or exceed performance requirements of ANSI/BHMA A156.19.

.2 Doors shall operate smoothly, quietly, safely and consistently

.1 at an operating temperature range from -35 to +40 degrees C ambient.

.2 under design wind and suction loads calculated in accordance with applicable code.

.3 Provide for thermal expansion and contraction of door and frame units, transmitted to operating equipment.

.4 Provide for dimensional distortion of components during operation.

.5 Force required to manually open doors shall not be more than force required in event of operator failure.

.6 Hold-open Time:

.1 Push Plate/Button Activation: field-adjustable from 5 to 30 seconds.

.2 Door Movement Switch Activation: less than 1 second.

.7 Locking electric strikes shall disable door operator activation devices. Momentary release of electric strikes during off-hours shall enable door operator activation devices for a period of time, field-adjustable from 1 to 30 seconds.

.8 Operators shall open doors 90 degrees from closed position.

2.3 MANUFACTURERS

.1 Operators: automatic door operators, surface mounted or overhead concealed cabinet type, electronically controlled, provisions for adjustment of operative speed and complete with accessories, including electric lock interface and provisions for safety sensors. Supply shut off switch mounted on door header.

.1 Manufacturer/Product for Exterior or Heavy Doors:

.1 Horton; Series 4100/4900 LE HD-Swing.

.2 Stanley Magic Force.

.3 BESAM; SW200i.

.2 Manufacturer/Product for Interior Doors:

.1 Horton; Series 7100/7900 LE EasyAccess.

.2 Stanley; Magic Force.

.3 BESAM; SW100.

2.4 ACTIVATION DEVICE

.1 Full-Length Actuator: Hard-wired, weather-resistant, extruded aluminum construction, tapered low profile design, complete with end caps, and International Access symbol and “Push to Open” lettering. Finish: Clear anodized. Provide activation devices on exterior of building with weatherproof housing, complete with gasket seal to insert into aluminum panel assembly

.1 Size: 915 high by 108 wide by 38 mm deep, with 64 mm wide full-length activation area.

.2 Acceptable Products: Wikk Industries Narrow Ingress’r. No substitutions.

2.5 FINISHES

.1 Exposed Operator and Components: Finish to match door frame finish.

.2 Concealed Steel Clips, Supports and Steel Anchors:

.1 Interior: One coat of steel primer.

.2 Exterior: Galvanized, 380 g/sq m coating.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify that electric power is available and of the correct characteristics.

3.2 INSTALLATION

.1 Install equipment to manufacturer's written instructions.

.2 Provide for thermal expansion and contraction of door and frame units and live and dead loads that may be transmitted to operating equipment.

.3 Provide for dimensional distortion of components during operation.

.4 Coordinate installation of components with related and adjacent work; level and plumb.

.5 Install rubber dampening devices to sound isolate operators from door frames.

.6 Conceal wiring between activating devices, electric locking system, and operators.

.7 Seal between members of aluminum work to provide a weatherproof installation. Conceal sealant within aluminum components.

3.3 ADJUSTING

.1 Adjust door equipment for correct function and smooth operation.

.2 Adjust door hold open time to 5 seconds or as directed by Contract Administrator.

3.4 CLEANING

.1 Section 01 74 00: Cleaning installed work.

.2 Remove temporary protection, clean exposed surfaces.

3.5 DEMONSTRATION AND INSTRUCTIONS

.1 Section 01 79 00: Demonstrating installed work.

.2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Glass and glazing for sections referencing this section for Products and installation, including curtain walls, glazed doors and frames.

1.2 RELATED REQUIREMENTS

.1 Section 08 41 13 - Aluminum Framed Entrances

.2 Section 08 42 29 - Automatic Entrances

.3 Section 08 44 30 - Structural Sealant Glazed Assemblies

.4 Section 08 83 00 - Mirrors

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM C1401-09a, Standard Guide for Structural Sealant Glazing

.2 ASTM C920-14a, Standard Specification for Elastomeric Joint Sealants

.3 ASTM C1184-14, Standard Specification for Structural Silicone Sealant

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB 12.1-M90 - Tempered or Laminated Safety Glass

.2 CAN/CGSB 12.3-M91 - Flat, Clear Float Glass

.3 CAN/CGSB 12.8-97 - Insulating Glass Units

.4 CAN/CGSB 12.20-M89 - Structural Design of Glass for Buildings

.3 Glass Association of North America (GANA)

.1 GANA Glazing Manual (50th Anniversary Edition)

.4 Insulating Glass Manufacturers Alliance (IGMA)

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Section 01 31 00: Project management and coordination procedures.

.2 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

.3 Samples:

.1 Submit 300 by 300 mm size samples of each type of sealed glazing unit.

1.6 SUBMITTALS FOR INFORMATION

.1 Section 01 33 00: Submission procedures.

.2 Certificates: Certify that Products meet or exceed specified requirements.

.3 Manufacturer's Certificate: Certify that sealed insulated glass, meets or exceeds specified requirements.

1.7 QUALITY ASSURANCE

.1 Perform Work in accordance with IGMA, GANA Glazing Manual glazing installation methods.

.2 Manufacturer Qualifications for Insulating-Glass Units with Low-E Coatings: A qualified insulating-glass manufacturer who is approved by coated-glass manufacturer.

.3 Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by the manufacturer.

.4 Safety Glazing Labeling: Permanently mark glazing with certification label of the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

.5 Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGMA.

.6 Structural-Sealant Glazing: Comply with ASTM C1401 for design and installation of structural-sealant-glazed systems.

.7 Structural-Sealant Joints: Design reviewed and approved by structural-sealant manufacturer.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

1.10 AMBIENT CONDITIONS

.1 Do not install glazing or glazing sealants when ambient temperature is less than 10 degrees C.

.2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.11 WARRANTY

.1 Section 01 78 10: Warranties.

.2 Provide a 10 year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

.3 Provide a 10 year warranty to include coverage for delamination of laminated glass and replacement of same.

Part 2 Products

2.1 PERFORMANCE REQUIREMENTS

.1 General: Installed glazing systems shall withstand normal thermal movement and wind loads without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

.2 Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:

.1 Use inner light of multiple light sealed units for continuity of air and vapour seal.

.3 Delegated Design: Design glass, including comprehensive engineering analysis according to CAN/CGSB-12.20 and NBC by a qualified professional engineer.

.1 Design Wind Pressures: As indicated on Structural Drawings.

.2 Design Snow Loads: As indicated on Structural Drawings.

.3 Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

.1 Temperature change: 65 deg C ambient.

.4 Design, and verify maximum glass sizes, thickness, strength, for glass types specified, to support design, and maximum allowable uniform static loads, using design factor of 2.5, in accordance with CAN/CGSB 12.20, but thickness shall not be less than as specified in this Section.

.4 Limit mullion deflection to L/175; with full recovery of glazing materials.

2.2 FLAT GLASS MATERIALS

.1 General:

.1 Source Limitations for Glass: Obtain coated float glass, and insulating glass from single source from single manufacturer for each glass type.

.2 Strength: Where float glass is indicated, provide annealed float glass, heat-strengthened heat-treated float glass, or fully-tempered heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide fully tempered float glass.

.2 Float glass: to CAN/CGSB-12.3, Glazing quality, 6 mm thick, heat-strengthened where indicated, or as required.

.3 Safety Glass: to CAN/CGSB-12.1, clear.

.1 Tempered: minimum 6 mm thick, Class B – float; Category: II - 540 J impact resistance; horizontal tempering.

.2 Laminated: made up of two layers of 3 mm clear tempered glass, and 0.76 mm thick clear PVB interlayer.

.4 Low Emissivity (Low E) Glass: Soft, sputtered coating on #2 surface.

.1 Acceptable Products: Viracon VE1-2M, PPG Solarban 60; Guardian SN68.

2.3 SEALED INSULATING GLASS UNITS

.1 GL1 - Insulated Glass Units: to CAN/CGSB 12.8, double pane; outer and inner pane of 6 mm tempered glass; soft sputtered coating on #2 surface within unit; interpane space filled with 90% argon gas and 10% air; with low conductivity spacers; total unit thickness of 25 mm.

.1 Visible Light Transmittance: 68 to 70%.

.2 Exterior Visible Light Reflectance: 11%.

.3 Interior Visible Light Reflectance: 12%.

.4 Solar Heat Gain Coefficient: 0.39 maximum.

.5 U-Value: winter 1.4 $W/m^2 \cdot$deg K maximum.

.2 GL2 - Insulated Glass Units: to CAN/CGSB 12.8, double pane, outer pane of 6 mm laminated tempered glass, inner pane of 6 mm tempered glass; interpane space filled with air; with spacers applicable to acoustic glazing; total unit thickness of 25 mm.

.3 Low Conductivity Spacers:

.1 Typical: reverse dual seal design consisting of thermoset foam spacer, multi-layer vapour barrier and pre-applied sealant/adhesive for glass bonding requiring a secondary seal. Basis of Design: Edgetech Super Spacer Premium Plus.

.2 For structural silicone glazed insulating units: triple seal design consisting of dessicant-filled thermoset foam spacer, pre-applied adhesive for glass bonding, polyisobutylene primary seal, and structural seal. Basis of Design: Edgetech Super Spacer TriSeal.

.3 Edge Seal Colour: black.

2.4 GLAZING ACCESSORIES

.1 General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

.2 Primer, Sealers, Cleaners: Types recommended by sealant or gasket manufacturer.

.2 Setting blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, ±5, recommended by the manufacturer as being acceptable for use in the intended application, and compatible with glass and glazing materials.

.3 Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lights in place for installation indicated.

.4 Edge blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

.5 Dense compression gaskets: Moulded or extruded gaskets of profile and hardness required to maintain watertight seal, manufacturer’s standard to suit system, compatible with silicone glazing sealants. UV-resistant, and resistant to weathering, oxidation and permanent deformation.

.6 Soft Compression Gaskets: Extruded or moulded, closed-cell, integral-skinned EPDM, silicone, or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.

.1 Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

.7 Glazing Sealants - General:

.1 Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, fire-rated glass, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

.2 Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

.3 Colours of exposed glazing sealants: as selected by Contract Administrator from manufacturer’s full range.

.8 Structural Silicone Sealants:

.1 SSG Tensile Sealant: One or multi-part, high performance, neutral cure, non-sag, high tensile strength to ASTM C1184 and ASTM C920; ultraviolet radiation resistant for 2000 to 4000 micro-watts minimum for 21 days; adhesion test when subjected to ultraviolet radiation through glass, in accordance with ASTM C794 without failure. Tested and approved by sealant manufacturer before application to curtain wall assembly, and compatible with other materials in contact with sealant.

.2 SSG Weather Seal: One or multi-part, neutral cure, high modulus, elastomeric silicone to ASTM C920, compatible with structural silicone sealant and exterior gasket material, recommended and approved by sealant manufacturer.

.9 Structural Glazing Tape: two-sided pressure sensitive acrylic foam tape designed to bond glass to metal frames in glass curtain wall systems, acceptable to curtain wall manufacturer.

.1 Acceptable products: 3M VHB Structural Glazing Tape, Tremco SGT-900 Series.

.10 Glazing Tape: Preformed butyl compound, paper released backed.

.1 Acceptable Products: Tremco 440 tape, black.

.11 Warning Decals: 50 mm dia.; spaced at 150 mm o.c., at 1200 and 1500 mm AFF to centre of decals. Decal colour selected by Contract Administrator.

2.5 FABRICATION OF GLAZING UNITS

.1 Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

.2 Provide stepped insulating glazing units where required to suit zero-sight line operable windows installed in 4-sided SSG curtain wall.

Part 3 Execution

3.1 EXAMINATION

.1 Section 01 70 00: Verify existing conditions before starting work.

.2 Verify that openings for glazing are correctly sized and within tolerance.

.3 Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.2 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.

.4 Install sealant in accordance with manufacturer's written instructions.

3.3 GLAZING, GENERAL

.1 Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

.2 Glazing channel dimensions: provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Site conditions during installation.

.3 Protect glass edges from damage during handling and installation. Remove damaged glass from site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

.4 Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

.5 Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

.6 Do not exceed edge pressures stipulated by glass manufacturers for installing glass lights.

.7 Provide spacers for glass lights where length plus width is larger than 1270 mm as follows:

.1 Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

.2 Provide 3-mm minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

.8 Provide edge blocking where indicated or needed to prevent glass lights from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

.9 Set glass lights in each series with uniform pattern, draw, bow, and similar characteristics.

.10 Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

.11 Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 INSTALLATION: INTERIOR AND EXTERIOR CURTAIN WALL

.1 Site install glass panels specified in Section 08 80 50 to curtain wall framing specified in Section 08 44 30, including use of temporary supports.

.2 Perform work in accordance with IGMA, curtain wall manufacturer, and structural silicone sealant manufacturer for glazing installation methods.

.3 Prepare substrates and apply silicone sealant to manufacturer's written instructions and reviewed Shop Drawings.

.4 Ensure frames are square and true before structurally glazing.

.5 SSG Joints: Bond glass to metal support members with structural silicone sealant using 4-sided method.

.1 Apply spacer gasket to mullions. Butt together at corners.

.2 Clean edges of glazing that will contact structural silicone and spacers using approved solvent or cleaner.

.3 Set glazing on spacer gaskets and glazing locators. Ensure edge of glazing is flush with edge of vertical mullion. Press glass firmly onto setting blocks.

.4 After glass is aligned remove setting block and glazing locators.

.5 Apply structural silicone sealant into void between glass and mullion in accordance with sealant manufacturer's application instructions. Tool sealant. Ensure joint is completely filled with sealant. Air bubbles and voids are not permitted.

.6 Use temporary glass supports to retain glass panels while sealant is applied and allowed to cure.

.7 Fill void in sealant joint after removal of temporary glass supports.

.6 Weather Seal:

.1 Clean sealant contact surfaces of glazing and adapters of oil and contaminants using solvent or cleaner recommended by sealant manufacturer.

.2 Apply sealant primer as required by manufacturer.

.3 Insert backer rod between glazing and adapters.

.4 Apply silicone weather seal into void between adapters and glazing. Tool sealant into joints smoothly. Eliminate air pockets and ensure complete contact on both sides of joint opening. Remove excess sealant from surrounding surfaces.

.5 Allow sealant to cure in accordance with sealant manufacturer's recommendations.

3.5 INSTALLATION – AUTOMATIC SLIDING GLASS DOORS AND INTERIOR ALUMINUM FRAMED GLASS DOORS

.1 Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

.2 Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints mitre cut and bonded together at corners.

.3 Installation with Drive-in Wedge Gaskets: Centre glass lights in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

.4 Installation with Pressure-Glazing Stops: Centre glass lights in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

.5 Install gaskets so they protrude past face of glazing stops.

3.6 FIELD QUALITY CONTROL

.1 Section 01 45 00: Field inspection and testing.

.2 Structural Sealant: Perform adhesion tests to manufacturer's written instructions and ASTM C1401, B - Hand-Pull Tab (Nondestructive).

.1 Perform five tests for first 300 m, of applied silicone sealant and one test for each 300 m, seal thereafter.

.2 For sealant applied between dissimilar materials, test both sides of joint.

.3 Remove sealants failing adhesion test, clean substrates, reinstall sealants and perform retesting.

.4 Maintain test log and submit report to Contract Administrator indicating tests, locations, dates, results, and remedial actions.

3.7 CLEANING

.1 Section 01 74 00: Cleaning installed work.

.2 Remove glazing materials from finish surfaces.

.3 Remove labels after Work is complete.

.4 Clean glass and adjacent surfaces.

3.8 PROTECTION OF FINISHED WORK

.1 After installation, mark pane with an 'X' by using removable plastic tape or paste.

3.9 GLASS SCHEDULE

.1 Exterior curtain wall, operable windows, exterior swing doors, and automatic sliding doors: GL1.

.2 Interior curtain wall and interior swing doors: GL2.

.3 Interior automatic sliding doors: 6 mm tempered glass.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Unframed mirrors.

1.2 RELATED REQUIREMENTS

.1 Section 10 28 14 - Toilet and Bath Accessories: Framed mirrors

1.3 REFERENCES

.1 ASTM International (ASTM)

.1 ASTM C1503-08(2013) - Standard Specification for Silvered Flat Glass Mirror

1.4 WARRANTY

.1 Section 01 78 10: Warranties.

.2 Provide a five year warranty to include coverage for reflective coating on mirrors and replacement of same.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for recycling in accordance with Section 01 74 20 – Waste Management and Disposal.

Part 2 Products

2.1 MIRROR MATERIALS

.1 Mirror Glass to ASTM C1503, clear float glass, type with copper and silver coating, organic overcoating, square polished edges, minimum 6 mm thick, size indicated.

.2 Mirror Adhesive: Chemically compatible with mirror coating and wall substrate.

Part 3 Execution

3.1 EXAMINATION

.1 Verify mirror is free of chips, cracks, and other inclusions that could inhibit structural or aesthetic integrity.

3.2 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

3.3 INSTALLATION

.1 Set mirrors plumb and level, free of optical distortion.

.2 Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

.3 Set mirrors with adhesive, applied in accordance with adhesive manufacturer's written instructions. Brace until adhesive sets.

3.4 CLEANING

.1 Section 01 74 00: Cleaning installed work.

.2 Clean mirror promptly after installation in accordance with manufacturer's instructions.

.3 Remove labels from mirror surface.

.4 Do not use harsh cleaning materials or methods that would damage mirror.

END OF SECTION