

New Municipal Office and Renovation of the Perneel Building

RFT#: PW-2017-08

+VG #21688

+VG ADDENDUM NUMBER 1

October 23, 2017

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The following additional instructions shall apply to and govern the tender documents:

AMENDMENT NO.1 – Revised Tender Closing Date

1. **Closing Date and Time: Tuesday, October 31, 2017 @ 2:00pm (local time)**
2. **Supplementary Tender Form** to be submitted on **Tuesday, October 31, 2017 by 4pm (local time)**.
3. Inquiry/Questions
 - a) All questions shall be submitted in writing with ample time before the deadline for submissions. No inquiries, if received after **5:00 pm on Wednesday October 25, 2017** will be given any consideration.
4. Tender form will be amended so that bidders only need to submit (1) one price to complete the entire project. A cost break down will need to be provided by the successful contractor prior to the start of construction.

AMENDMENT NO. 2 – CLARIFICATIONS

1. SPECIFICATIONS

- a) 08700 Finishing Hardware
 - i) 1.4 Hardware List
Please refer to attached revised hardware lists from Architectural Openings Consulting Inc.
- b) Division 3 Concrete
 - i) Please see attached revised Division 3 Concrete including the following changed / added items:
 - (1) 03100 Concrete Formwork
 - (2) 03200 Concrete Reinforcing

400 Slater Street, Penthouse 2102, Ottawa, Ontario K1R 7S7 | T: 613.915.6412

50 Dalhousie Street, Brantford, Ontario N3T 2H8 | T: 519.754.1652 | F: 519.754.0830

72 Stafford Street, Suite 200, Toronto, Ontario M6J 2R8 | T: 416.588.6370 | F: 416.588.6327

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- (3) 03300 Cast-In-Place
- (4) 03450 Concrete Finishes

c) Division 5 Metals, Structural & Miscellaneous

- i) Please see attached revised Division 5 Metals, Structural & Miscellaneous including the following changed / added items:
 - (1) 5120 Structural Steel
 - (2) 5310 Steel Deck

d) Division 6 Wood Work

- i) Please see attached revised Division 6 Woodwork including the following changed / added items:
 - (1) 06180 Glued-Laminated Structural Units

e) 09300 Ceramic Tile

- i) 2.1.4 Ceramic Tiles: (coordinate with room finish schedules)
Please see revised spec section with Olympia Tile as an Approved Alternative.

4. Ceramic Tiles: (coordinate with room finish schedules)

1. CET1 - Floor Tile: Equal to American Olean, unglazed colourbody porcelain Mosaics 2" x 2" (50mm x 50mm) with abrasive content – shower & adjacent ancillary locations. **Alternate by Daltile or Olympia.** Final colour to be selected by Architect.
2. CET2 - Wall Tile: 100mm x 300mm (4" x 12") Touch by Stonetile. Colour to be White Mat; stack bond pattern installed vertically. **Alternate by Daltile or Olympia.** Final colour to be selected by Architect.

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AMENDMENT NO. 3 – ARCHITECTURAL DRAWINGS

- 1 A0.2A
 - a. Revised ceiling and roof assemblies to coordinate with construction details.
- 2 A2.1 Level 1 Floor Plan
 - a. Revised wall tag corridor A100d wall 3D to 3AS.
- 3 A3.5 – A3.8 Building Sections
 - a. Please refer to attached drawing package for drawings A3.5-A3.8 Building Sections.
- 4 A8.3 Window Schedule
 - a. Please refer to attached drawing A8.3 for the addition of screens 15 & 16. Screens are to be interior glass partitions located between rooms B101 and B103

AMENDMENT NO. 4 – ASSOCIATED ADDENDUM

1. Mechanical and Electrical
 - a. Refer to attached Mechanical and Electrical Addendum ME-01, as prepared by VR Engineers, dated October 19, 2017

End of +VG Addendum 1

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October 19, 2017

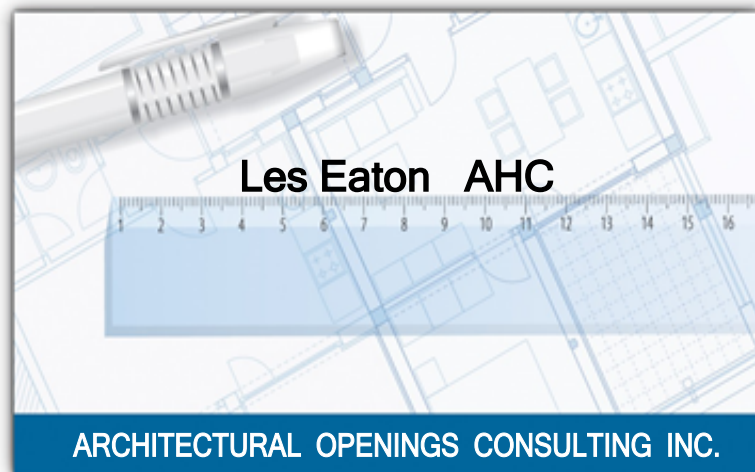
Revision: 3

Hardware List for:

McNab/Braeside Town Centre Addenda #1

Architect:

+ VG Architects



1 Pair of doors D1 Exterior from Vestibule 19

Aluminum frame

Aluminum door

2-965 x 2375 x 52

1	Continuous hinge	112XY x transfer prep x DH	628	Ives
1	Continuous hinge	112XY x DH	628	Ives
1	Power transfer	EPT-10	628	Von Duprin
1	Exit device	QEL-SD-3349A-NL-OP x 4' x INS-4	626	Von Duprin
1	Exit device	3349A-EO x 4' x INS-4	626	Von Duprin
1	Rim cylinder	20-021 x 50-210 x 50-211	626	Schlage
2	Door pull	9264F x DH x 3 mtg posts	630	Ives
1	Concealed door closer	5013 reg x ST-2714	689	LCN
1	Automatic surface door operator	4640 (push side mount)	689	LCN
2	Actuators	8310-852	630	LCN
2	Overhead concealed door stay	GJ100S x DW	630	Glynn Johnson
1	Power supply	PS914		Von Duprin
2	Door sweep	8192AA x DW	628	Zero International
1	Threshold	566A x DW	628	Zero International

Balance of weatherseal complete by the aluminum door supplier

Complete supply, installation, testing and commissioning of the auto operator, actuators and latch retracting exit device are complete by this section (08710)

All 120VAC, conduit and back boxes by electrical

1 Pair of doors D1 Vestibule 19 from Banquet 01

Aluminum frame

Aluminum door

2-965 x 2375 x 45

2	Continuous hinge	112XY x DH	628	Ives
2	Door pull	9264F x DH x 3 mtg posts	630	Ives
2	Push bar	350	626	Von Duprin
1	Automatic surface door operator	4640 (push side mount)	689	LCN
1	Concealed door closer	5013 reg x ST-2714	689	LCN
2	Actuators	8310-852	630	LCN
2	Overhead concealed door stay	GJ100S x DW	630	Glynn Johnson

Complete supply, installation, testing and commissioning of the auto operator, and actuators are complete by this section (08710)

All 120VAC, conduit and back boxes by electrical

1 Single door D2 Patio from Banquet 01

Pressed steel frame

Hollow metal door

965 x 2135 x 45

1	Continuous hinge	112XY x DH	628	Ives
1	Exit device	98EO x 4'	626	Von Duprin

1	Surface door closer	4040XP SCUSH	689	LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630	Ives
1	Weatherseal/soundseal	870AA x 2 x DH x 1 x DW	628	Zero International
1	Threshold	566A x DW	628	Zero International
1	Door sweep	8192AA x DW	628	Zero International

1 Single door D2 Exterior from Corridor 30

Pressed steel frame

Hollow metal door

965 x 2135 x 45

1	Continuous hinge	112XY x DH	628	Ives
1	Exit device	RX-LC-98EO x CO200-993R x tub x MT x LC	626	Von Duprin
1	KIL cylinder	20-854XP x GMKE	626	Schlage
30	Key fobs	7610		Schlage
1	Surface door closer	4040XP SCUSH	689	LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630	Ives
1	Weatherseal/soundseal	870AA x 2 x DH x 1 x DW	628	Zero International
1	Threshold	566A x DW	628	Zero International
1	Door sweep	8192AA x DW	628	Zero International

1 Single door D2 Patio from Corridor 30

Pressed steel frame

Hollow metal door

965 x 2135 x 45

1	Continuous hinge	112XY x DH	628	Ives
1	Exit device	98EO x 4'	626	Von Duprin
1	Surface door closer	4040XP SCUSH	689	LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630	Ives
1	Weatherseal/soundseal	870AA x 2 x DH x 1 x DW	628	Zero International
1	Threshold	566A x DW	628	Zero International
1	Door sweep	8192AA x DW	628	Zero International

1 Single door D4 Exterior from Storage 02

Pressed steel frame

Hollow metal door

965 x 2135 x 45

1	Continuous hinge	112XY x DH	628	Ives
1	Exit device	98EO x 4'	626	Von Duprin
1	Surface door closer	4040XP SCUSH	689	LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630	Ives
1	Weatherseal/soundseal	870AA x 2 x DH x 1 x DW	628	Zero International
1	Threshold	566A x DW	628	Zero International
1	Door sweep	8192AA x DW	628	Zero International

1 Tri-folding door D5 Patio from Banquet 01

Aluminum frame
Glass door

All Hardware complete by the door and frame supplier

1 Tri-folding door D5 Patio from Kitchen 04

Aluminum frame
Glass door

All Hardware complete by the door and frame supplier

1 Single door D6 Banquet 01 to Coat Room 22

Pressed steel frame
Hollow metal door
915 x 2134 x 45

3	Hinges	3CB1 114 x 101	652		Ives
1	Classroom function lockset	L9070P 03B x 50-210 x 50-211	626		Schlage
1	Floor stop	FS439	626		Ives

1 Single door D6 Corridor 30 to Womens Washroom 08

Pressed steel frame
Hollow metal door
915 x 2134 x 45

3	Hinges	3CB1HW 114 x 101	652		Ives
1	Door pull	8305-8 x 4" x 16"	630		Ives
1	Push plate	8200 x NMH-A 4" x 16"	630		Ives
1	Surface door closer	4040XP Reg 180 degree swing	689		LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630		Ives
1	Floor stop	FS439	626		Ives

1 Single door D6 Corridor 30 to Mens Washroom 07

Pressed steel frame
Hollow metal door
915 x 2134 x 45

3	Hinges	3CB1HW 114 x 101	652		Ives
1	Door pull	8305-8 x 4" x 16"	630		Ives
1	Push plate	8200 x NMH-A 4" x 16"	630		Ives
1	Surface door closer	4040XP Reg 180 degree swing	689		LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630		Ives
1	Floor stop	FS439	626		Ives

1 Single door D6 Corridor 30 to Staff W/C 05

Pressed steel frame

Hollow metal door

915 x 2134 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Privacy set	L9040 03B	626	Schlage
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 Single door D6 Corridor 30 to Universal Shower 11

Pressed steel frame

Hollow metal door

915 x 2134 x 45

3	Hinges	3CB1 114 x 101	630	Ives
1	Privacy set	L9040 03B	626	Schlage
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 Single door D6 Corridor 30 to Kitchen 04

Pressed steel frame

Hollow metal door

915 x 2134 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Classroom function lockset	L9070P 03B x 50-210 x 50-211	626	Schlage
1	Floor stop	FS439	626	Ives

1 Single door D6 Banquet 01 to Mech Room 03

Pressed steel frame

Hollow metal door

915 x 2134 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Storeroom function lockset	L9080P 03B x 50-210 x 50-211	626	Schlage
1	Floor stop	FS439	626	Ives

1 Single door D7 Corridor 30 to Janitors Closet

Pressed steel frame

Hollow metal door

762 x 2135 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Storeroom function lockset	L9080P 03B x 50-210 x 50-211	626	Schlage
1	Floor stop	FS439	626	Ives

1 Pair of doors D8 Banquet 01 from Corridor 30

Pressed steel frame

Hollow metal door

2 x 915 x 2135 x 45

6	Hinges	3CB1HW 114 x 101	652	Ives
2	Door pull	8305-8 x 4" x 16"	630	Ives
2	Push plate	8200 x NMH-A 4" x 16"	630	Ives
2	Surface door closer	4040XP SCUSH	689	LCN
2	Kick plate	8400 200 mm x DW x NMH-A	630	Ives

1 Pair of doors D8 Banquet to Storage 02

Pressed steel frame

Hollow metal door

2 x 915 x 2135 x 45

6	Hinges	3CB1 127 x 114	652	Ives
1	Classroom function lockset	L9070P 03B x 50-210 x 50-211	626	Schlage
1	Set of flushbolts	457 x DP2	626	Ives
2	Floor stop	FS439	626	Ives

1 Single door D9 Corridor 30 to Universal W/C 10

Pressed steel frame

Hollow metal door

965 x 2135 x 45

3	Hinges	3CB1 127 x 114	652	Ives
1	Storeroom function lockset	L9080P 03B x 50-210 x 50-211	626	Schlage
1	Electric strike	5100 Fail safe	689	Von Duprin
1	Automatic surface door operator	4630 (pull side mount)	689	LCN
1	Actuators	8310-852	630	LCN
1	Washroom package	CX-WC15 STD	630	Camden
1	Audible alarm/ light	CXWCE-11		Camden
1	Kick plate	8400 400 mm x DW x NMH-A	630	Ives
1	Floor stop	FS439	626	Ives

Complete supply, install, testing and commissioning of the auto operator, washroom package, actuators, alarm/light and electric strike are complete by this section (087100)

All 120VAC, conduit and back boxes are by electrical

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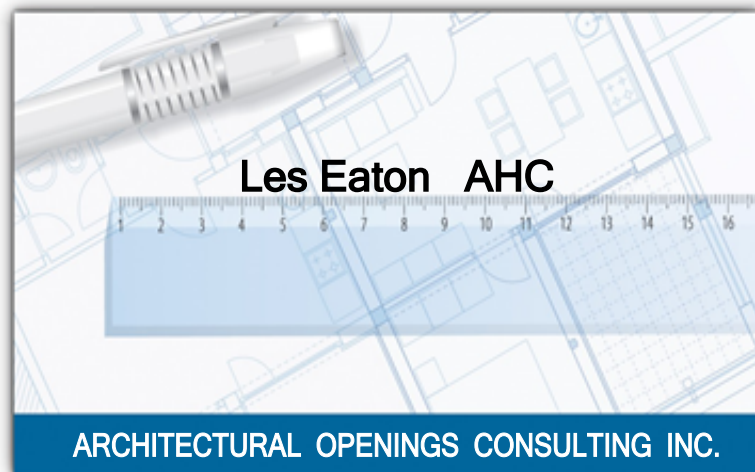
Revision: 4

Hardware List for:

McNab/Braeside Municipal Building Addenda #1

Architect:

+ VG Architects



1 Single door D1 Vestibule from Lobby A100

Aluminum frame

Aluminum door

1070 x 2375 x 45

1	Continuous hinge	112XY x DH	628	Ives
1	Door pull	9264F x DH x 3 mtg posts	630	Ives
1	Push bar	350	626	Von Duprin
1	Automatic surface door operator	4640 (push side mount)	689	LCN
2	Actuators	8310-852	630	LCN
1	Overhead concealed door stay	GJ100S x DW	630	Glynn Johnson

Complete supply, install, testing and commissioning of the auto operator and actuators is complete by this section (087100)

All 120VAC, conduit and back boxes is complete by electrical

1 Single door D1 Exterior from Vestibule

Aluminum frame

Aluminum door

1070 x 2375 x 45

1	Continuous hinge	112XY x DH	628	Ives
1	Exit device	33ANL-OP x 4' x INS-2	626	Von Duprin
1	Rim cylinder	20-021 x 50-210 x 50-211	626	Schlage
1	Electric strike	6300-S024	630	Von Duprin
1	Door pull	9264F x DH x 3 mtg posts	630	Ives
1	Automatic surface door operator	4640 (push side mount)	689	LCN
2	Actuators	8310-852	630	LCN
1	Power supply	PS914		Von Duprin
1	Overhead concealed door stay	GJ100S x DW	630	Glynn Johnson
1	Threshold	566A x DW	628	Zero International
1	Door sweep	8192AA x DW	628	Zero International

Balance of weatherseal is by the door and frame supplier

Complete supply, install, testing and commissioning of the auto operator, actuators and electric strike is complete by this section (087100)

All 120VAC, conduit and back boxes is complete by electrical

1 Single door D1 Exterior from Vestibule

Aluminum frame

Aluminum door

1070 x 2375 x 45

1	Continuous hinge	112XY x DH	628	Ives
1	Exit device	33ANL-OP x 4' x INS-2	626	Von Duprin
1	Rim cylinder	20-021 x 50-210 x 50-211	626	Schlage
1	Electric strike	6300-S024	630	Von Duprin
1	Door pull	9264F x DH x 3 mtg posts	630	Ives
1	Automatic surface door operator	4640 (push side mount)	689	LCN

2	Actuators	8310-852	630		LCN
1	Power supply	PS914			Von Duprin
1	Overhead concealed door stay	GJ100S x DW	630		Glynn Johnson
1	Threshold	566A x DW	628		Zero International
1	Door sweep	8192AA x DW	628		Zero International

Balance of weatherseal is by the door and frame supplier

Complete supply, install, testing and commissioning of the auto operator, actuators and electric strike is complete by this section (087100)

All 120VAC, conduit and back boxes is complete by electrical

1 Single door D1 Vestibule from Lobby A100

Aluminum frame

Aluminum door

1070 x 2375 x 45

1	Continuous hinge	112XY x DH	628		Ives
1	Door pull	9264F x DH x 3 mtg posts	630		Ives
1	Push bar	350	626		Von Duprin
1	Automatic surface door operator	4640 (push side mount)	689		LCN
2	Actuators	8310-852	630		LCN
1	Overhead concealed door stay	GJ100S x DW	630		Glynn Johnson

Complete supply, install, testing and commissioning of the auto operator and actuators is complete by this section (087100)

All 120VAC, conduit and back boxes is complete by electrical

1 Single door D2 Exterior from Public Office B101

Pressed steel frame

Hollow metal door

965 x 2300 x 45

1	Continuous hinge	112XY x DH	628		Ives
1	Exit device	RX-LC-98EO x CO200-993R x tub x MT x LC	626		Von Duprin
1	KIL cylinder	20-854XP x GMKE	626		Schlage
50	Key fobs	7610			Schlage
1	Surface door closer	4040XP SCUSH	689		LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630		Ives
1	Weatherseal/soundseal	870AA x 2 x DH x 1 x DW	628		Zero International
1	Door sweep	8192AA x DW	628		Zero International
1	Threshold	566A x DW	628		Zero International
1	Software package	SXPR-SFT-1			Schlage
1	Handheld Device	HHD KIT-USB			Schlage

1 Single door D2 Exterior from Office Space B111

Pressed steel frame

Hollow metal door

965 x 2300 x 45

1	Continuous hinge	112XY x DH	628	Ives
1	Exit device	98EO x 4'	626	Von Duprin
1	Surface door closer	4040XP SCUSH	689	LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630	Ives
1	Weatherseal/soundseal	870AA x 2 x DH x 1 x DW	628	Zero International
1	Door sweep	8192AA x DW	628	Zero International
1	Threshold	566A x DW	628	Zero International

1 Single door D3 Office B101 to Office B101A

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 Single door D3 Office B101 to Office B101B

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D3 Office B111 to F/A B107

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D3 Office B111 to B108

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D3 Office B111 to R/C B109

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D3 Office B111 to B110

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D3 Office B111 to B112

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D3 Office B111 to B113

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D3 Office B111 to B115

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D3 Office B111 to B116

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D3 Office B111 to B117

Wood frame

Wood door

965 x 2719 x 45

4	Hinges	3CB1 127 x 114	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 Single door D4 Lobby A100 from Office B101

Wood frame

Wood door

935 x 2150 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Electronic lockset	CO200-MS x tub x MT x LC	626	Schlage
1	KIL cylinder	20-854XP x GMKE	626	Schlage
1	Surface door closer	4040XP Reg	180 degree swing	689 LCN
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Kick plate	8400 200 mm x DW x NMH-A	630	Ives
		<i>confirm height required</i>		
	Note: See software and handheld device specified on door D2			

1 single door D4 Lobby A100 from Corr B118

Wood frame

Wood door

935 x 2150 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Classroom function lockset	L9070P 03B x 50-210 x 50-211	626	Schlage
1	Surface door closer	4040XP Reg	180 degree swing	689 LCN
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Kick plate	8400 200 mm x DW x NMH-A	630	Ives
		<i>confirm height required</i>		

1 Single door D5 Corr from Council A105

Wood frame

Wood door

915 x 2134 x 45

3	Hinges	3CB1 114 x 101 NRP	652		Ives
1	Exit device	98L-03	626		Von Duprin
1	Rim cylinder	20-021 x 50-210 x 50-211	626		Schlage
1	Automatic surface door operator	4630 (pull side mount)	689		LCN
2	Actuators	8310-852	630		LCN
1	Electric strike	6300-S024	630		Von Duprin
1	Floor stop	FS439	626		Ives
1	Kick plate	8400 200 mm x DW x NMH-A	630		Ives
		<i>Confirm height required</i>			
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface		Zero International
		Blk			
1	Automatic door bottom	365AA x DW	628		Zero International
		<i>Complete supply, install, testing and commissioning of the auto operator, actuators and electric strike is complete by this section (087100)</i>			
		<i>All 120VAC, conduit and back boxes is complete by electrical</i>			

1 Single door D5 Corr from Council A105

Wood frame

Wood door

915 x 2134 x 45

3	Hinges	3CB1 114 x 101 NRP	652		Ives
1	Exit device	98L-03	626		Von Duprin
1	Rim cylinder	20-021 x 50-210 x 50-211	626		Schlage
1	Automatic surface door operator	4630 (pull side mount)	689		LCN
2	Actuators	8310-852	630		LCN
1	Electric strike	6300-S024	630		Von Duprin
1	Floor stop	FS439	626		Ives
1	Kick plate	8400 200 mm x DW x NMH-A	630		Ives
		<i>Confirm height required</i>			
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface		Zero International
		Blk			
1	Automatic door bottom	365AA x DW	628		Zero International
		<i>Complete supply, install, testing and commissioning of the auto operator, actuators and electric strike is complete by this section (087100)</i>			
		<i>All 120VAC, conduit and back boxes is complete by electrical</i>			

1 Single door D5 Vestibule to Meeting A103

Wood frame

Wood door

915 x 2134 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives

1 Single door D5 Vestibule to Office A101

Wood frame

Wood door

915 x 2134 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Office function lockset	L9050P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 Single door D5 Office B101 to Lunch B103

Wood frame

Wood door

915 x 2134 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Classroom function lockset	L9070P 03B x 50-210 x 50-211	626	Schlage
1	Weatherseal/soundseal	188S x 2 x DH x 1 x DW	install on a clean dry surface	Zero International
		Blk		
1	Floor stop	FS439	626	Ives

1 Single door D6 Corr to Storage A107

Wood frame

Wood door

915 x 2150 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Classroom function lockset	L9070P 03B x 50-210 x 50-211	626	Schlage
1	Floor stop	FS439	626	Ives

1 Single door D6 Vestibule to Jan A108

Wood frame

Wood door

915 x 2150 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Storeroom function lockset	L9080P 03B x 50-210 x 50-211	626	Schlage

1	Surface door closer	4040XP Reg	180 degree swing	689	LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630		Ives
1	Floor stop	FS439	626		Ives

1 Single door D6 Corr B118 to Mens B104

Wood frame

Wood door

915 x 2150 x 45

3	Hinges	3CB1 114 x 101	652		Ives
1	Privacy set	L9040 03B	626		Schlage
1	Floor stop	FS439	626		Ives
1	Coat hook	508C	626		Ives

1 Single door D6 Corr B118 to Womens B105

Wood frame

Wood door

915 x 2150 x 45

3	Hinges	3CB1 114 x 101	652		Ives
1	Privacy set	L9040 03B	626		Schlage
1	Floor stop	FS439	626		Ives
1	Coat hook	508C	626		Ives

1 Single door D6 Corr B118 to Equip B106

Wood frame

Wood door

915 x 2150 x 45

3	Hinges	3CB1 114 x 101	652		Ives
1	Classroom function lockset	L9070P 03B x 50-210 x 50-211	626		Schlage
1	Floor stop	FS439	626		Ives

1 Single door D7 Vest to Womens A106

Wood frame

Wood door

965 x 2150 x 45

3	Hinges	3CB1HW 127 x 114	652		Ives
1	Door pull	8305-8 x 4" x 16"	630		Ives
1	Push plate	8200 x NMH-A 4" x 16"	630		Ives
1	Surface door closer	4040XP Reg	180 degree swing	689	LCN

1	Kick plate	8400 200 mm x DW x NMH-A	630	Ives
1	Floor stop	FS439	626	Ives

1 Single door D7 Vest to Universal WR A104

Wood frame

Wood door

965 x 2150 x 45

3	Hinges	3CB1HW 127 x 114	652	Ives
1	Door pull	8305-8 x 4" x 16"	630	Ives
1	Push plate	8200 x NMH-A 4" x 16"	630	Ives
1	Automatic surface door operator	4630 (pull side mount)	689	LCN
1	Actuators	8310-852	630	LCN
1	Washroom package	CX-WC15 STD	630	Camden
1	Audible alarm/ light	CXWCE-11		Camden
1	Kick plate	8400 400 mm x DW x NMH-A	630	Ives
1	Floor stop	FS439	626	Ives

Complete supply, install, testing and commissioning of the auto operator, actuator, washroom package and alarm/light is complete by this section (087100)
All 120VAC, conduit and back boxes is complete by electrical

1 Single door D7 Vest to Mens A102

Wood frame

Wood door

965 x 2150 x 45

3	Hinges	3CB1 114 x 101	652	Ives
1	Privacy set	L9040 03B	626	Schlage
1	Floor stop	FS439	626	Ives
1	Coat hook	508C	626	Ives

1 single door D8 Office B111 to Storage B114

Pressed steel frame 90 minute

Hollow metal door 90 minute

965 x 2150 x 45

3	Hinges	3CB1 127 x 114	652	Ives
1	Electronic lockset	CO200-MS x tub x MT x LC	626	Schlage
1	KIL cylinder	20-854XP x GMKE	626	Schlage
1	Surface door closer	4040XP Reg 180 degree swing	689	LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630	Ives
1	Floor stop	FS439	626	Ives

Note: See software and handheld device specified on door D2

1 single door D8 Office B111 to Storage B114

Pressed steel frame 90 minute

Hollow metal door 90 minute

965 x 2150 x 45

3	Hinges	3CB1 127 x 114	652		Ives
1	Electronic lockset	CO200-MS x tub x MT x LC	626		Schlage
1	KIL cylinder	20-854XP x GMKE	626		Schlage
1	Surface door closer	4040XP Reg	180 degree swing	689	LCN
1	Kick plate	8400 200 mm x DW x NMH-A	630		Ives
1	Floor stop	FS439	626		Ives

Note: See software and handheld device specified on door D2

1 Pair of By-Passing doors D9 B101 to Closet

Wood frame

Wood door

2-1225 x 2150 x 45

1	Sliding track	CCS-2-410-W x Opening width x 2 door	628		KN Crowder
2	Flush pull	C90B	626		KN Crowder

1 Single door D6 Council Chamber A105 to AV Storage

Wood frame

Wood door

915 x 2150 x 45

3	Hinges	3CB1 114 x 101	652		Ives
1	Classroom function lockset	L9070P 03B x 50-210 x 50-211	626		Schlage
1	Floor stop	FS439	626		Ives

1 GENERAL

1 RELATED WORK

- .1 Concrete Reinforcement - Section 03200
- .2 Cast-in-place Concrete - Section 03300
- .3 Concrete Curbs and Walks - Section 03400
- .4 Concrete Floor Finishes - Section 03450

2 REFERENCE STANDARDS

- .1 CAN/CSA-A23.1-14 Concrete Materials and Methods of Concrete Construction.
- .2 CAN/CSA-O86-01 CAN/CSA-O 86S1-05 Engineering Design in Wood (Limit States Design)
- .3 CSA 0151-04 Canadian Softwood Plywood.
- .4 CAN/CSA-S269.3-(M92), Concrete Formwork.

3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .4 Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

2 PRODUCTS

1 FORMWORK MATERIALS

- .1 Formwork materials:
 - .1 For concrete without special architectural features use wood and wood product formwork materials to CSA-0121,CAN/CSA-086-09,CSA 0437 Series and CSA-0153-M1980.
 - .2 For concrete with special architectural features, use formwork materials to CAN/CSA-A23.14
- .2 Form ties:
 - .1 For concrete not exposed to view, use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm dia. in concrete surface.

- .2 For concrete exposed to view, use snap ties complete with plastic cones and light gray concrete plugs.
- .3 Form liner:
 - .1 Plywood: medium density overlay Canadian Softwood Plywood to CSA O121 –M1978
 - .2 Form release agent: non-toxic, biodegradable, low VOC.
- .4 Tubular Column Forms:
 - .1 Round, spirally wound laminated fibre and lined to eliminate projecting spiral ridges. Align seams to architects' instruction
- .5 Sealant: to Section 07 90 00 – Joint Sealers.

3 **EXECUTION**

.1 **FABRICATION AND ERECTION**

- .1 Verify lines, levels and centers before proceeding with formwork and ensure dimensions agree with drawings.
- .2 The use of earth forms is not permitted.
- .3 All exposed finish walls are to be formed with new formply, or lined with masonite keeping joints tight. The top 600 mm of foundation is exposed and should be considered Architectural formwork. Avoid form ties at exposed locations.
- .4 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1-14.
- .5 Align form joints and make watertight. Keep form joints to minimum.
- .6 Use 25 mm chamfer strips on external corners unless specified otherwise.
- .7 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.
- .8 Construct forms for architectural concrete, and place ties as indicated and/or as directed. Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.
- .9 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes including painting.
- .10 Clean formwork in accordance with CAN/CSA-A23.1-14, before placing concrete.

.2 REMOVAL

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
 - .1 36 hours for walls and piers.
 - .2 24 hours for grade beams.
- .2 Formwork removal must be done in such a manner as to avoid rapid temperature change and loss of moisture on the concrete surface.
- .3 Re-use formwork, subject to requirements of CAN/CSA-A23.1-14.

END OF SECTION

1 **GENERAL**

.1 RELATED WORK

- .1 Concrete Formwork -Section 03100
- .2 Cast-in-place Concrete - Section 03300
- .3 Concrete Floor Finishes - Section 03450
- .4 Concrete Curbs & Walks - Section 03400

.2 REFERENCE STANDARDS

- .1 CAN/CSA-A23.1-14 Concrete Materials and Methods of Concrete Construction.
- .2 CAN3-A23.3-14, Design of Concrete Structures for Buildings.
- .3 CSA G30.3-(M1983 (R1991)), Cold Drawn Steel Wire for Concrete Reinforcement.
- .4 CSA G30.5-(M1983 (R1991)), Welded Steel, Wire Fabric for Concrete Reinforcement.

.3 SHOP DRAWINGS

- .1 Submit shop drawings including placing of reinforcement in accordance with Section 01 33 00
- .2 Indicate on shop drawings, bar bending details, lists, quantities of reinforcement, sizes, spacings, locations of reinforcement and mechanical splices if approved by Consultant, with identifying code marks to permit correct placement without reference to structural drawings. Prepare reinforcement drawings in accordance with Reinforcing Steel Manual of Standard Practice- by Reinforcing Steel Institute of Canada.
- .3 Detail lap lengths and bar development lengths to CAN3-A23.3-14 unless noted otherwise.
- .4 Detail placement of reinforcement where congestion or special conditions occur.

2 **PRODUCTS**

.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Consultant
- .2 Reinforcing steel: billet steel, grade 400 R, deformed bars to CAN/CSA-G30.18-M92, unless indicated otherwise.
- .3 Reinforcing steel: weldable low alloy steel deformed bars to CAN/CSA-G30.18-M92.

- .4 Cold-drawn annealed steel wire ties: to CSA G30.3.
- .5 Deformed steel wire for concrete reinforcement: to CSA G30.14.
- .6 Welded steel wire fabric: to CSA G30.5. Provide in flat sheets only.
- .7 Chairs, bolsters, bar supports, spacers: to CAN/CSA-A23.1-14.
- .8 Mechanical splices: subject to approval of Consultant.

.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CAN/CSA-A23.1-14, and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Obtain Consultant's approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Consultant, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement clearly identified in accordance with bar bending details and lists.

.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Consultant with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis,
- .2 Upon request inform the Consultant of proposed source of material to be supplied.

3 **EXECUTION**

.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Consultant.
- .2 When field bending is authorized, bend without heat, applying a slow and steady pressure.
- .3 Replace bars that develop cracks or splits.

.2 PLACING REINFORCEMENT

- .1 Place reinforcing steel as indicated on reviewed placing drawings and in accordance with CAN/CSA-A23.1-14.
- .2 Prior to placing concrete, obtain Consultant's approval of reinforcing material and placement.
- .3 Ensure cover to reinforcement is maintained during concrete pour.

END OF SECTION

1 **GENERAL**

.1 RELATED WORK

- .1 Concrete Forms and Accessories - Section 03100
- .2 Concrete Reinforcement - Section 03200
- .3 Concrete Floor Finishes - Section 03450
- .4 Concrete Curbs and Walks - Section 03400
- .5 Masonry Procedures - Section 04050

.2 REFERENCE STANDARDS

- .1 CAN/CSA-A5-(93), Portland Cement.
- .2 CAN/CSA-A23.1-14 Concrete Materials and Methods of Concrete Construction
- .3 CAN/CSA-A23.2-(94), Methods of Test for Concrete.
- .4 CAN/ CSA-A23.5-(M86(R1992)), Supplementary Cementing Materials.
- .5 CAN/CSA A363-(M88(R1196)), Cementitious Hydraulic Slag.

.3 CERTIFICATES

- .1 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1-14.
- .2 Provide certification that plant, equipment, and materials to be used in concrete comply with requirements of CAN/CSA-A23.1-14.
- .3 Submit product data for admixtures, grout, joint fillers proposed.

.4 QUALITY ASSURANCE

- .1 Prior to starting concrete work, submit proposed quality control procedures for Consultant's approval for following items:
 - .1 Hot weather concrete or cold weather concrete
 - .2 Curing.
 - .3 Finishes.
 - .4 Formwork removal.
 - .5 Joints.

2 **PRODUCTS**

.1 MATERIALS

- .1 Portland cement replacement: to CAN/CSA-A5.
- .2 Blended hydraulic cement: to CANB-A362-M1988.
- .3 Supplementary cementing materials: to CAN/CSA-A23.5.
- .4 Cementitious hydraulic slag: to CAN/CSA-A363.

- .5 Water: to CAN/CSA-A23.1-09.
- .6 Aggregates: to CAN/CSA-A23.1-09 Coarse aggregates to be normal density.
- .7 Air entraining admixture: to CAN3-A266.1-M78
- .8 Chemical admixtures: to CAN3-A2662-M78 Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.
- .9 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents. Compressive strength: 45 MPa at 28 days.
- .10 Non premixed dry pack grout: composition of non metallic aggregate Portland cement with sufficient water for the mixture to retain its shape when made into a ball by hand and capable of developing compressive strength of 45 MPa at 28 days.
- .11 Curing compound: to CAN/CSA-A23.1-09 to ASTM C 309, Type 1.
- .12 Pre-moulded joint fillers: Bituminous impregnated fiber board: to ASTM D 1751

.2 MIXES

Concrete Mixes

- .1 Proportion normal density concrete in accordance with CAN3-A23.1-09, to give the following properties for concrete used in perimeter foundation walls and piers.
 - .1 Cement: use Type 10 GU or GUb.
 - .2 Minimum compressive strength at 28 days: 25 MPa
 - .3 Class of exposure: F-2
 - .4 Nominal size of coarse aggregate: 20mm
 - .5 Slump at time and point of discharge: 75mm
 - .6 Air Content: 4 to 7%
- .2 Proportion normal density concrete in accordance with CAN3-A23.1-09, to give the following properties for exterior concrete including slabs on grade, sidewalks and curbs.
 - .1 Cement: use Type 10 GU or GUb
 - .2 Minimum compressive strength at 28 days: 32 MPa
 - .3 Class of exposure: C-2
 - .4 Nominal size of coarse aggregate: 20mm
 - .5 Slump at time and point of discharge: 85mm
 - .6 Air Content: 5 to 8%

- .3 Proportion normal density concrete in accordance with CAN3-A23.1-09, to give the following properties to underpinning concrete.
 - .1 Cement: use Type 10 GU or GUb.
 - .2 Minimum compressive strength at 28 days: 25 MPa
 - .3 Class of exposure: F-2
 - .4 Nominal size of coarse aggregate: 20mm
 - .5 Slump at time and point of discharge: 200mm
 - .6 Air Content: 4 to 7%
 - .7 Shrinkage compensating admixture
- .4 Proportion normal density concrete in accordance with CAN3-A23.1-09, to give the following properties for all other concrete.
 - .1 Cement: use Type 10 GU or GUb.
 - .2 Minimum compressive strength at 28 days: 25 MPa
 - .3 Class of exposure: N
 - .4 Nominal size of coarse aggregate: 20mm
 - .5 Slump at time and point of discharge: 75mm
 - .6 Use of calcium chloride or admixtures containing calcium chloride not permitted.
- .5 Proportion normal density concrete in accordance with CAN3-A23.1-09, to give the following properties for exterior suspended frost slab.
 - .1 Cement: use Type 10 GU or GUb
 - .2 Minimum compressive strength at 28 days: 35 MPa
 - .3 Class of exposure: C-1
 - .4 Nominal size of coarse aggregate: 20mm
 - .5 Slump at time and point of discharge: 85mm
 - .6 Air Content: 5 to 8%

3 EXECUTION

.1 PREPARATION

- .1 Obtain Consultant's approval before placing concrete. Provide 24 hours notice prior to placing of concrete.
- .2 Pumping of concrete is permitted only after approval of equipment and mix.
- .3 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .4 Prior to placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing.

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- .5 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
 - .6 In locations where new concrete is dowelled to existing work drill holes in existing concrete. Place steel dowels of deformed steel reinforcing bars and pack solidly with shrinkage compensating grout to anchor and hold dowels in positions as indicated.
 - .7 Do not place load upon new concrete until authorized by Consultant.
- .2 CONSTRUCTION
- .1 Do cast-in-place concrete work in accordance with CAN/CSA-A23.1-09.
 - .2 Sleeves and inserts.
 - .1 No sleeves, ducts, pipes or other openings shall pass through piers or footings, except where indicated or approved by Consultant
 - .2 Where approved by Consultant, set sleeves ties, pipe hangers and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 x 100 mm not indicated, must be approved by Consultant.
 - .3 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Consultant before placing of concrete.
 - .4 Check locations and sizes of sleeves and openings shown on drawings.
 - .5 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.
 - .3 Anchor bolts
 - .1 Set anchor bolts to templates under supervision of appropriate trade and professional land surveyor prior to placing concrete.
 - .2 Protect anchor bolt holes from water accumulations, snow, ice build-ups and construction traffic.
 - .4 Drainage holes and weep holes:
 - .1 Form weep holes and drainage holes. If wood forms are used, remove them after concrete has set.
 - .2 Install weep hole tubes and drains as indicated.
 - .5 Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in (100)% contact over grouted area.
 - .6 Finishing
 - .1 Finish concrete in accordance with CAN/CSA-A23.1-09
 - .2 Use procedures noted in CAN/CSA-A23.1-09 to remove excess bleedwater. Ensure surface is not damaged.
 - .3 Use curing compounds compatible with applied finish on concrete surfaces

- .7 Joint fillers.
 - .1 Furnish purpose made cementitious filler for each joint for depth and width required for joint, unless otherwise authorized by Consultant.
 - .2 Locate and form isolation joints as indicated. Install joint filler.
 - .3 Use 12mm thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to within 12mm of finished slab surface unless indicated otherwise.

.3 SITE TOLERANCE

- .1 Slabs on grade shall have a steel trowel finish Class A in accordance with CAN/ CSA-A23.1-09, straight edge method.

.4 FIELD QUALITY CONTROL

- .1 Inspection and testing of concrete and concrete materials will be carried out by a Testing Laboratory designated by Owner in accordance with CAN/CSA-A23.1-09 and Section 01450 – Quality Control.
- .2 Owner will pay for costs of tests as specified in Section 01293 – Payment Procedures: Testing Laboratory Services.
- .3 Owner may take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete, which they represent.
- .4 Non-destructive Methods for Testing Concrete shall be in accordance with CAN/CSA-A23.2.
- .5 Inspections or testing by Owner will not augment or replace Contractor quality control nor relieve him of his contractual responsibility.

END OF SECTION

1 **GENERAL**

.1 RELATED WORK

- .1 Concrete Reinforcing - Section 03200
- .2 Cast-in-Place - Section 03300
- .3 Crystalline Capillary Waterproofing - Section 07161
- .4 Sealants - Section 07900
- .5 Closed Cell Resilient Sports Flooring - Section 09624
- .6 Rubber Flooring and Stair Treads - Section 09665

.2 REFERENCE STANDARDS

- .1 Do concrete floor finishing work in accordance with CAN/CSA-A23.1-09 except where specified otherwise.

2 **PRODUCTS**

.1 MATERIALS

- .1 Epoxy Moisture Remediation Barrier System for Closed Cell Resilient Sports Flooring (GSF) and for Rubber Flooring (RF) Refer also to Specification Section 09624 and Specification Section 09665:

Moisture Mitigation Barrier: PlaniSeal EMB by MAPAI for application to ground floor concrete slabs (only) of up to 10 lbs. per 1,000 ft² (4.54 kg per 92.9 m²) per 24 hour at 90% relative humidity = 130 sq. ft. per U.S. gal. (3.18 m² per L) or 10 mils of wet film thickness (WFT)

- .2 Concrete materials to Specification Section 03300 - Cast-in-Place Concrete and reinforcement to Specification Section 03200 - Concrete Reinforcement.
- .3 Curing and sealing compound: to ASTM C309 Type 1 Class B, clear.
- .4 Crystalline Capillary Waterproofing

3 **EXECUTION**

.1 FLOOR FINISHES

- .1 All floor slab surfaces shall be finished to Class A classification as defined in of CAN/CSA-A23.1-09, Table 22.
- .2 Do not sprinkle dry cement or dry cement and sand mixture over concrete surfaces.
- .3 Saw cut crack-control joints to CSA-A23.1-09.
- .4 Apply floor curing and sealing compound to manufacturer's instructions to all slabs on grade. Cure to manufacturer's recommendations.

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- .5 Cure concrete in accordance with CAN/CSA-A23.1-09 except where specified otherwise.
 - .6 Provide any housekeeping pads for electrical and mechanical equipment.
 - .7 Slope floor to drain at 5mm/m. except as indicated otherwise. Floors to be level around walls.
 - .8 Provide non-slip light broom finish to exposed interior steps and landings. Provide non-slip medium broom finish to exposed exterior steps, ramps and landings.
 - .9 Sandblast exterior concrete slabs as noted on Architectural site plan drawing and seal surface.
 - .10 For concrete slabs on grade where Rubber flooring (RF) and Closed Cell Resilient Sports Flooring (GSF) is Identified in the Room Finish Schedule, to ensure that the moisture is in-keeping with the flooring manufacturers recommendations, provide Epoxy Moisture Remediation System. Apply in strict compliance with Moisture Mitigation System Manufacturer's instructions.
 - .11 Treat the interior surface of the elevator and sump pits with Crystalline Capillary Waterproofing.
- .2 PROTECTION
- .1 Protect concrete to be left exposed throughout the course of construction. Make good damaged areas to the approval of the Engineer.

END OF SECTION

1 **GENERAL**

.1 RELATED WORK

- .1 Steel Joist Framing - Section 05210
- .2 Steel Deck - Section 05310

.2 REFERENCES

- .1 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers' Association (CPMA).
 - .1 CISC/CPMA1-(73b), Quick Drying, One-Coat Paint for Use on Structural Steel.
 - .2 CISC/CPMA2-(75), Quick-Drying, Primer for use on Structural Steel
- .2 Canadian Standards Association (CSA)
 - .1 CAN/CSA-G40.20-04 General Requirements for Rolled or Welded Structural Quality Steel
 - .2 CAN/CSA-G40.21-04 Structural Quality Steels.
 - .3 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .4 CAN/CSA-S16-09 CAN/CSA-S16S1-05 Limit States Design of Steel Structures.
 - .5 CAN/CSA-S136-01 / CAN/CSA-S136S1-04 Cold Formed Steel Structural Members.
 - .6 CSA W57.1-(92), Certification of Companies for Fusion Welding of Steel Structures.
 - .7 CSA W48 Series, Electrodes.
 - .8 CSA W55.3-(1965), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
 - .9 CSA W59-(M1989), Welded Steel Construction Metal Arc Welding.

.3 SHOP DRAWINGS

- .1 Submit shop drawings including fabrication and Erection documents and materials list in Accordance with Section 01330- Submittal Procedures.
- .2 Ensure Fabricator designed assemblies, components and connections, and drawings are stamped and signed by qualified professional engineer licensed in the province of Ontario

.4 DESIGN OF DETAILS AND CONNECTION

- .1 Design details and connections in accordance with requirements of CAN/CSA-S16-09 CAN/CSA-S16S1-05 and CAN/CSA-S136-01 / CAN/CSA-S136S1-04.1 to resist forces, moments, shears and allow for movements indicated.
- .2 If connection for shear only (standard connection) is required:
 - .1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction".

- .2 If Shears are not indicated, select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam.
- .3 For all connections, submit sketches and design calculations stamped and signed by qualified professional engineer licensed in Province on Ontario.

.5 QUALITY ASSURANCE

- .1 If requested, submit copies of mill test reports, showing chemical and physical properties and other details of steel to be incorporated into work prior to fabrication of structural steel. Mill test reports shall be certified by metallurgists qualified to practice in province of Ontario.
- .2 Ensure Fabricator of structural steel, in addition, provides an affidavit stating that materials and products used in fabrication conform to applicable material and products standards called for by design drawings and specifications.

2 PRODUCTS

.1 MATERIALS

- .1 Structural steel: to CAN/CSA-G40.21-04 Grade as indicated on shop drawings.
- .2 Anchor bolts: to CAN/CSA-G40.21-04, Grade A307.
- .3 Bolts, nuts and washers: to ASTM A 325,ASTM A 325M,ASTM A490,ASTM A 490M
- .4 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.
- .5 Shop paint primer: to CISC/CPMA2.
- .6 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164-M92, minimum zinc coating of 600 g/m².

.2 FABRICATION

- .1 Fabricate structural steel in accordance with CAN/CSA-S16-09 and in accordance with reviewed shop drawings.
- .2 Continuously seal members by continuous weld (grind smooth).

.3 SHOP PAINTING

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16-09 (except where members to be encased in concrete).
- .2 Apply paint under cover, on dry surfaces when surface and air temperature are above 10° C.
- .3 Maintain dry condition and 10°C minimum temperature until paint is thoroughly dry.
- .4 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.
- .5 For steel structure to be protected with intumescent or spray on Fireproofing, coordinate work with the fireproofing contractor to have

primer recognized as being compatible with the fireproofing product requirements.

- .6 Do not prime-paint the webs of wide flange beams receiving fireproofing, which are W410 or deeper.

3 **EXECUTION**

.1 **GENERAL**

- .1 Structural steel work: in accordance with CAN/CSA-S16-09
- .2 Welding: in accordance with CSA W59.
- .3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

.2 **MARKING**

- .1 Mark materials in accordance with CAN/CSA-G40.20-04 and CAN/CSA-G40.21-04. Do not use die stamping. If steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.
- .2 Match marking: shop mark bearing assemblies and splices for fit and match.

.3 **ERECTION**

- .1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16-09 and in accordance with reviewed erection drawings.
- .2 Field cutting or altering structural members; to approval of Consultant.
- .3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.
- .4 Continuously seal members by continuous welds where indicated. Grind smooth.

.4 **FIELD QUALITY CONTROL**

- .1 Inspection and testing of materials and workmanship will be carried out by test Laboratory designated by Owner.
- .2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Consultant.
- .3 Owner will pay costs of tests.

.5 **FIELD PAINTING**

- .1 Paint in accordance with Section 09911 – Painting.
 - .1 Touch up all damaged surfaces and surfaces without shop coat with primer to CAN/CGSB-1.40 except as specified otherwise. Apply in accordance with CGSB 85-GP-14M.

END OF SECTION

1 GENERAL

.1 RELATED WORK

- .1 Structural Steel - Section 05120
- .2 Steel Joist Framing - Section 05210

.2 REFERENCE STANDARDS

- .1 CAN3-S136-01, CSA S136S1-04
- .2 Canadian Sheet Steel Building Institute Standards (CSSBI) for Steel Roof Deck.
- .3 CSA W59-M1989.
- .4 CAN/CGSB-1-40

.3 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups
- .2 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.

2 PRODUCTS

.1 MATERIALS

- .1 Sheet steel for decking: ASTM A446M-85 structural quality Grade A, with minimum ZF75 LZC galvanized coating.
- .2 Cover plates, cell closures and flashings: sheet steel with minimum base steel thickness of 0.91mm. Metallic coating same as deck material.
- .3 Primer: zinc rich, ready mix to CGSB 1.40-M89.

.2 TYPES OF DECKING

- .1 Typical Roof deck: 0.91 mm minimum base steel thickness, 38mm deep profile, fluted, @152 o/c, non-cellular, overlapping side laps unless noted on drawing.
- .2 Where steel decking is noted as painted on architectural drawings, provide compatible surface preparation and coating.

3 EXECUTION

.1 ERECTION

- .1 Erect metal decking as indicated to manufacturer's instructions
- .2 Immediately after decking is permanently secured in place touch-up galvanized surface with primer where burned by welding. Repair and re-coat scratched in pre-finished deck with factory paint product.
- .3 Fastening requirements shall be as noted on structural drawings.
- .4 The decking shall be continuous over at least 3 spans with ends lapped 50mm minimum over supports.
- .5 At all exposed deck locations ensure work is neat and with clean lines.

.2 STORAGE

- .1 Decking shall be stored on wood supports above the grade and sloped so as to allow runoff along down flutes.
- .2 Take care not to scratch pre-finished surfaces.

.3 ACCESSORIES

- .1 Provide all required closures, reinforcing sheet steel, flashing and insulation.

.4 OPENINGS AND AREAS OF CONCENTRATED LOADS

- .1 Framing of deck openings 100 to 300 mm shall be as recommended by manufacturer except as otherwise indicated on structural drawings. No reinforcement required for openings cut in deck, which are smaller than 100 mm where minimum distance between unreinforced openings is 1200 mm transverse and one span longitudinally

.5 FIELD QUALITY CONTROL

- .1 Inspection and testing of material and workmanship will be carried out by testing laboratory.
- .2 Quality assurances shall be in conformance with Section 01450.
- .3 Damaged decking shall be replaced at Consultants discretion.

.6 REVIEW OF CONSTRUCTION

- .1 Review of construction by the Consultant and inspection and testing by an independent inspection is to ascertain general conformity with design documents. The review does not relieve contractor from carrying out his own quality control and making the work accurate and in conformity with the drawings and specification.
- .2 Exercise care when welding to avoid piercing the deck or damage to the supporting joists. Any damage to supporting structure is to be reported to Consultant.

END OF SECTION

1 GENERAL

.1 RELATED SECTIONS

- .1 Section 01330 - Submittal Procedures

.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
- .2 Canadian Standards Association (CSA International)
 - .1 CSA G40.20/G40.21- 04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA-G164- M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CAN/CSA-O86-09, Engineering Design in Wood.
 - .4 CSA O112 Series- M1977 (R2001), CSA Standards for Wood Adhesives.
 - .5 CAN/CSA-O122- M89(R1999), Structural Glued-Laminated Timber.
 - .6 CAN/CSA-O177- M89(R1998), Qualification Code for Manufacturer's of Structural Glued-Laminated Timber.
 - .7 CAN/CSA-S16- 09, Limit States Design of Steel Structures.
 - .8 CSA W47.1- 03(R2001), Certification of Companies for Fusion Welding of Steel Structures.

.3 SHOP DRAWINGS

- .1 Submit shop and erection drawings in accordance with Section 01330 - Submittal Procedures.
- .2 Submit erection drawings in accordance with CAN/CSA-S16 and CSA O86
- .3 Shop drawings for members to indicate stress grade, service grade and appearance grades, shop applied finishes, camber, cuts, ledgers, holes and connection details.
- .4 Each erection and shop drawing submission shall bear signature and stamp of qualified professional engineer registered or licensed in Province of Ontario, Canada, for items designed by fabricator or manufacturer.
- .5 Coordinate with steel fabricator for connections attached to steel structure.

.4 QUALIFICATIONS

- .1 Manufacture structural glued-laminated members in plant certified by CSA as meeting requirements of CAN/CSA-O177.

- .2 Submit certificate in accordance with CAN/CSA-O177, Appendix B at completion of fabrication.
- .3 Fabricator for welded steel connections to be certified in accordance with CSA W47.1.
- .4 Place authorization labels on glued-laminated members indicating manufactured in CSA certified plant.
- .5 DELIVERY, STORAGE AND HANDLING
 - .1 Deliver, handle, store and protect materials of this section in accordance with Section 01610 - Basic Product Requirements.
 - .2 Apply protective sealer to glued-laminated units before shipping unless specified otherwise.
 - .3 Wrap quality grade members prior to leaving plant with a moisture resistant wrapping.
 - .4 Use padded, non-marring slings for handling glued-laminated members.
 - .5 Protect corners with wood blocking.
 - .6 Slit underside of membrane covering during storage at site. Do not deface member.
 - .7 Store glued-laminated units and protect from weather, block off ground and separate with stripping, so air may circulate around all faces of members.
 - .8 Cover glued-laminated units with opaque moisture resistant membrane if stored outside.
 - .9 Make adequate provision for delivery and handling stresses.
- .6 WASTE MANAGEMENT AND DISPOSAL
 - .1 Separate and recycle waste materials in accordance with Section 01355 - Waste Management and Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

2 PRODUCTS

- .1 MATERIALS
 - .1 Laminating stock: Spruce - Pine - to CAN/CSA-O122.
 - .2 Adhesive: to CSA O112 Series, to grade of service required in accordance with CAN/CSA-O122.
 - .3 Sealer for glued-laminated members: penetrating type, clear, non-yellowing liquid.

- .4 Coating for glued-laminated members: Clear varnish as recommended by manufacturer.
- .5 Fastenings:
 - .1 Bolts: to ASTM A325.
 - .2 Side plates: to CAN/CSA-G40.20/G40.300W.
- .6 Shop coat primer for steel connections: to CAN/CGSB-1.40.
- .7 Galvanizing: to CAN/CSA-G164, hot dipped, minimum zinc coating of 600 g/m².

.2 FABRICATION

- .1 Fabricate members to following classifications:
 - .1 Stress grade: to 20f-E.
 - .2 Service grade: Interior; exterior.
 - .3 Appearance grade: Quality.
- .2 Mark laminated members for identification during erection. Marks not to be visible in final assembly.
- .3 Do not apply sealer to areas that are to receive stained finish or preservative treatment.
- .4 Detail connections to CAN/CSA-O86, and CAN/CSA-S16 unless specifically detailed, to resist shears, moments and forces indicated.
 - .1 Fabricate in accordance with CAN/CSA-S16 and CAN/CSA-S16.
- .5 Galvanize connections after fabrication.

3 EXECUTION

.1 ERECTION

- .1 Protect protective sealer from damage before erection.
 - .1 Touch up damaged areas on site with specified sealer.
- .2 Erect glued-laminated members in accordance with reviewed erection drawings.
- .3 Brace and anchor members until permanently secured by structure.
- .4 Make adequate provisions for erection stresses.
- .5 Splice and join only at locations as indicated on reviewed erection drawings.
- .6 Do not field cut or alter members without Consultant's approval. If approved, preservative treat cut ends.

END OF SECTION

MECHANICAL/ELECTRICAL ADDENDUM

ME-01

Architect: +VG Architects

Date: October 19, 2017

Project: McNab Braeside Town Hall

Project No.: 16-178

This addendum forms part of the contract documents and amends the original bidding requirements, drawings and specifications noted below.

1.0 MECHANICAL

1.1 SPECIFICATIONS

.1 Refer to Section 22 11 19 Plumbing Specialties

.1 Add the following specification for grease interceptors:

2.9 GREASE INTERCEPTOR

.1 **Floor mounted, epoxy coated steel low rough-in grease interceptor with gasketed epoxy coated steel skid-proof cover, secured with hex head centre bolts, removable baffle assembly, deep seal trap with cleanout, external cast iron flow control fitting, no hub connections.**

.1 **Watts WD-135-L-CSA**

.2 Refer to Section 22 40 00 Plumbing Fixtures and Trim

.1 Add the following to item 2.5 Stainless Steel Sinks:

.2 Triple Compartment Scullery Sink (S2)

.1 **Floor mounted, 14 ga. (2.0mm), 302 stainless steel, polished satin finish, 9" (229mm) high backsplash, square corner construction, rolled rim, adjustable feet, 3-1/2" (89mm) crumb cup waste assembly with 1-1/2" (38mm) tailpiece.**

.1 **Nominal dimensions: 57" (1448mm) wide x 27-3/16" (691mm) long x 35" (889mm) high.**

.2 **Franke STL2454-1/2**

.2 **Faucet: chrome plated, wall mounted, solid brass exposed body, two handles, 12" (305mm) swing spout with full flow outlet, 1.0 gpm (3.8 LPM) at 60 psi spray valve, 12" (305mm) auxiliary L-type swing spout, 2-3/8" (60mm) secondary metal vandal proof lever handle.**

.1 **Provide two (2) sets of faucets.**

.2 **Chicago Faucet 510-GC613AL12ABCP.**

- .3 **Mixing valve: nickel plated bronze body, temperature adjusting spindle, integral checks, adjustable temperature range to be set to 46C. Provide external checks in addition.**
 - .1 **Lawler 570-86820 point of use thermostatic mixing valve**
- .3 **Single Compartment Stainless Steel Hand Wash Sink (S3)**
 - .1 **Single bowl, countertop mount, 20ga. (0.9mm) type 302 stainless steel, self-rimming, back ledge, stain finish, mounting kit provided, undercoated, factory applied rim seal, 3-1/2" (89mm) crumb cup waste assembly with 1-1/2" (38mm) tailpiece.**
 - .1 **Nominal dimensions: 13-5/8" (346mm) wide x 13-3/4" (349mm) long x 6" (152mm) high.**
 - .2 **Franke LBS9106-1/3**
 - .2 **Faucet: heavy duty cast brass, 4" (102mm) centres, two 6" (152mm) wrist blade handles, ADA compliant, polished chrome finish, 4.5" reach, rigid gooseneck spout, vandal resistant, laminar flow, 1.0 gpm (3.8 LPM) flow.**
 - .1 **Delta 27C4875**
 - .3 **Mixing valve: nickel plated bronze body, temperature adjusting spindle, integral checks, adjustable temperature range to be set to 46C. Provide external checks in addition.**
 - .1 **Lawler 570-86820 point of use thermostatic mixing valve**
- .2 **Revise item 2.6.1 to read as follows: **Urinal (U1)****
- .3 **Add the following specification for Mop Sinks (MS)**

2.8 MOP SINKS

- .1 **Mop Sink (MS)**
 - .1 **Floor mounted terrazzo composed of pearly gray marble chips and Portland cement ground smooth and sealed to be stain resistant, cast brass drain with stainless steel strainer, 3" (75mm) outlet, 20 ga. (0.9mm) type 304 stainless steel backsplash panel, hose and wall hook.**
 - .1 **Nominal dimensions: 24" (610mm) wide x 24" (610mm) long x 10" (254mm) high.**
 - .2 **Stern Williams MTB-2424**
 - .2 **Faucet: yoke wall mounted, polished chrome finish, cast brass body, two wrist blade handles, integral stops, spout with atmospheric vacuum breaker and bucket hook, bottom fork brace, offset shank with 1/2" (13mm) NPT female inlets and integral supply stops.**
 - .1 **American Standard 8355.115.002**

- .4 Add the following specification for Showers (SH)

2.9 SHOWERS

.1 Shower (SH)

- .1 Shower walls and floor by General Contractor**
- .2 Shower Valve: pressure balance, in wall shower rough valve, cast brass body, ceramic disc valve cartridges, integral hot water limit stop, metal wall plate, stain nickel finish, 7-1/4" (184mm) diameter trim face plate, factory installed red/blue decal ring, on/off and temperature control single lever handle.**
 - .1 American Standard R115SS**
 - .2 American Standard T431WD.500.295 valve trim**
- .3 Hand Shower: 6-function hand shower, satin nickel finish, 4-1/2" (114mm) face diameter, 2.0 gpm (7.6 LPM) flow rate, 10-3/16" (258mm) long, check valve included, in-line vacuum breaker, hand slide bar and metal shower hose.**
 - .1 American Standard 1660.207.295 hand shower**
 - .2 American Standard 1660.225.295 slide bar**
 - .3 American Standard 8888.053.002 Metal hose.**
 - .4 American Standard 1660.400.295 vacuum breaker**

- .5 Add the following specification for Drinking Fountains (DF):

2.11 DRINKING FOUNTAINS

.1 Drinking Fountain (DF1)

- .1 Unit shall include an electric water cooler with bottle filling station, refrigerated 8 GPH of 50°F of drinking water at 90°F ambient and 80°F inlet water, lower unit shall have pushbar activation, bottle filling unit shall include an electronic sensor for touchless activation with an automatic 20(second shut-off timer. LED light illuminating the water dispensing area, brightening as water is being dispensed.**
- .2 Unit shall include a Green Ticker™ displaying count of plastic bottles saved from waste, bottle filler shall provide a 1.1 -1.5 gpm flow rate with laminar flow to minimize splashing, shall include the WaterSentry® Plus 3000 gallon capacity filter, certified to NSF/ANSI 42 & 53, with visual filter monitor to indicate when replacement is necessary. Unit shall automatically detect a new filter and reset visual filter monitor accordingly.**
- .3 Unit shall have the ability to turn off refrigeration system as needed, in addition to self-diagnosing system issues and display messages related. Shall include integrated silver ion anti-microbial protection in key areas. Unit shall meet ADA guidelines. Unit shall be a lead free design which is certified to NSF/ANSI 61. Unit shall be certified to UL399 and CAN/CSA 22.2 No. 120 & is FCC compliant.**
- .4 Compressor: hermetically sealed, reciprocating type, single phase. Sealed in lifetime lubrication.**

- .5 **Condenser: Fan cooled, copper tube with aluminum fins. Fan motor is permanently lubricated.**
- .6 **Cooling Unit: Combination tube(tank type. Self(cleansing. Continuous copper tubing with stainless steel tank. Fully insulated with EPS foam which meets UL requirements for self-extinguishing material.**
- .7 **Refrigerant Control: Refrigerant R134a is controlled by accurately calibrated capillary tube.**
- .8 **Temperature Control: Electronic temperature control requires no adjustment**
- .9 **Temperature Sensing Device: Fully solid-state temperature sensing has no moving parts.**
- .10 **Stainless Steel basin with integral drain**
- .11 **Galvanized structural steel cooler chassis provides structural integrity**
- .12 **Stainless Steel bottle filler wrapper with ABS plastic alcove**
- .13 **Flexi-Guard® Safety Bubbler utilizes an infused anti-microbial pliable polyester elastomer to prevent accidental mouth injuries. Flexes on impact.**
- .14 **Vandal-resistant bubbler (option at additional cost) is one piece, heavy duty construction**

.1 Elkay EZH2O LZ

- .6 Add the following alternate manufacturer for all flush valves and faucets: Moen.

.3 Refer to Section 23 05 14 Variable Frequency Drives (attached)

- .1 Add the attached specification section for variable frequency drives.

.4 Refer to Section 23 31 00 Ductwork

- .1 Add the following specification for kitchen exhaust ductwork:

2.8 KITCHEN EXHAUST DUCTWORK

- .1 **UL listed insulated grease duct shall be certified for zero clearance to combustible material per UL 2221 with a 2 hour fire rating and have a 1 hour fire rating per ASTM-E2336. Hourly ratings are met with use of factory fire stop at necessary floor/wall penetrations.**
- .2 **The double wall exhaust system shall have a 304 stainless steel inner liner (20 ga minimum) and an aluminized steel outer jacket (24 ga minimum). The materials and construction of the modular sections and accessories shall be as specified by the terms of the product's U.L. listing.**
 - .1 **10 pound ceramic fiber insulation between the inner liner and outer jacket shall be a nominal three inches thick.**
- .3 **Aluminized steel surfaces exposed to the elements shall be protected by a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer**

jacket skin temperatures of the given application. All primer and paint to be supplied by the installing contractor and shall be equivalent to series V2100 as manufactured by Rust-Oleum. Alternatively, an outer jacket constructed of 304 or 316 stainless steel may also be considered in lieu of painting.

- .4 This exhaust system shall be designed and installed to be liquid tight and thus prevent leakage of grease and/or grease laden vapors into a building.
- .5 Inner pipe joints shall be securely connected and sealed with factory supplied overlapping V bands and appropriate sealant as specified in the manufacturer's installation instructions.
- .6 Each system shall be designed to provide access for inspection and cleaning of each change of duct direction, permit drainage of grease residue through a duct section, enable the system to allow for the thermal expansion and allow various types of fire suppression equipment to be integrated into the grease ductwork, as necessary per local code.
- .7 Inner pipe joints shall be sealed by use of factory supplied overlapping V bands and sealant as specified in the manufacturer's installation instructions.
- .8 Roof penetrations shall be suitable for a non-combustible roof and shall be according to the manufacturer's detail drawings and installation instructions.
- .9 When installed according to the manufacturer's installation instructions, the exhaust piping and its supporting system shall resist side loads at least 1.5 times greater than the weight per foot of the piping for both horizontal and vertical portions of the system.
- .10 The exhaust system shall be installed according to the manufacturer's installation instructions and shall conform to all applicable state and local codes.
- .11 Provide all supports, guides, expansion joints, guy sections, guy tensioners, roof thimbles, roof flashings, storm collars and flip top terminations as required to provide a complete system per the manufacturer's installation instructions.
- .12 The entire exhaust system from hood to the termination point, including all accessories, except as noted, shall be from one manufacturer.
- .13 **Standard of Acceptance: Selkirk Commercial/Industrial Model IPS ZeroClear**

.5 Refer to Section 23 37 00 Air Outlets and Inlets

- .1 Replace section with attached revised specification section, which includes all relevant types of inlets and outlets.

.6 Refer to Section 23 37 20 Louvres and Vents

- .1 Add the following specification for Louvred Penthouses to the specification:

2.2 LOUVRED PENTHOUSES

- .1 **Manufacturer: Greenheck EHH-601PD**

- .2 **General: Drainable Louvre Penthouse furnished with bird screen, insect screen, sill pans, supports, installation hardware and finishes as specified and as required for a complete installation.**
- .3 **Products: Louvre penthouses shall be drainable louvre penthouse with visible mullions. Louvred penthouses shall be 6-inches (152.4 mm) deep and assembled entirely from extruded aluminum components. Blades and frames shall be 0.081-inch (2 mm) thick aluminum, alloy 6063-T5. Blades shall be drainable and spaced approximately 4-inches on center. Penthouse louvres shall be the same as the louvres specified above.**
- .4 **Structural Design Criteria: Louvre penthouses shall be certified by an Ontario licensed Professional Structural Engineer to comply with the requirement of Ontario Building Code for the size, location and application. Louvre penthouses shall be tested for wind forces up to 115 psf. Louvre penthouses must be secured to a structural substrate in accordance with the Ontario Building Code. In addition, the structural substrate must be designed to accommodate the point loads transferred by the louvred penthouses when subject to the design wind loads.**
- .5 **Performance Ratings:**
 - .1 **Dimensions: 12" x 24" x 16"**
 - .2 **Louvre throat area: 2 sq.ft.**
 - .3 **Maximum velocity at throat: 700 ft./min**
 - .4 **Maximum pressure drop: 0.08 in. w.g.**
- .6 **Finishes: to be coordinated with Architect during shop drawing stage.**
- .7 Refer to Section 23 74 23 Packaged Make-up Air Units (attached)
 - .1 Add the attached specification section for makeup air units.
- .8 Refer to Section 25 30 00 Controls and Instrumentation
 - .1 Clarification: Any reference to proprietary controls hardware / systems shall be used as reference only and does not indicate that only one controls supplier may bid on the project.
 - .2 Clarification: BMS contractor shall provide one single front end for both buildings, c/w all required wiring between buildings.
 - .3 Revise item 2.12.1.2.5 Acceptable manufacturers to read: **Belimo**. (Delete reference to Johnson Controls for Electronic Damper Actuators).
 - .4 Revise item 2.12.3.6 Acceptable manufacturers to read: **Belimo**. (Delete reference to Johnson Controls for Electronic Valve Actuators).
 - .5 Revise item 2.12.4.6 Acceptable manufacturers to read: **Belimo**. (Delete reference to Johnson Controls for Control Valves).
 - .6 Revise item 2.13.2.7 Acceptable manufacturers to read: **Belimo**. (Delete reference to Siemens Building Technologies and Johnson Controls for Electric Damper Actuators).
 - .7 Revise item 2.13.3.9 Acceptable manufacturers to read: **Belimo**. (Delete reference to Johnson Controls for Automatic Control Valves).

1.2 DRAWINGS

.1 Refer to Drawing No. M001 – Municipal Building Mechanical Schedules

- .1 Add RTU Schedule to drawing, as shown on attached sketch M001.1
- .2 Add AHU Schedule to drawing, as shown on attached sketch M001.2
- .3 Add MUA Schedule to drawing, as shown on attached sketch M001.3

.2 Refer to Drawing No. M001 – Perneel Building Mechanical Schedules

- .1 Add RTU Schedule to drawing, as shown on attached sketch M001.1
- .2 Add AHU Schedule to drawing, as shown on attached sketch M001.2
- .3 Add MUA Schedule to drawing, as shown on attached sketch M001.3

.3 Refer to Drawing No. M201 – Town Hall Building Piping and Controls Schematics

- .1 Add VAV and Perimeter Heating Controls Schematics as shown on attached sketch M201.1
- .2 Clarification: Controls Schematics are to be used in conjunction with specification to provide a complete, functional package. Any controls points listed in specification, but not shown on schematics shall be provided by contractor.

.4 Refer to Drawing No. M201 – Perneel Building Piping and Controls Schematics

- .1 Add VAV and Perimeter Heating Controls Schematics as shown on attached sketch M201.1
- .2 Clarification: Controls Schematics are to be used in conjunction with specification to provide a complete, functional package. Any controls points listed in specification, but not shown on schematics shall be provided by contractor.

END OF ADDENDUM ME-01

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with General Requirements of Section 20 01 01 applies to and governs all work of Division 21, 22 and 23.

1.2 SECTION INCLUDES

- .1 Variable Frequency Drives.

1.3 SUBMITTALS

- .1 Section 20 01 01: Procedures for submittals.
- .2 Product Data: Provide wiring diagrams with electrical characteristics and connection requirements.
- .3 Manufacturer's Installation Instructions: indicate setting, mechanical connections, lubrication, and wiring instructions.
- .4 Submit manufacturer's performance data including dimensional drawings, power circuit diagrams, installation and maintenance manuals, warranty description, VFD's FLA rating, certification agency file numbers and catalog information.
- .5 The specification lists the minimum VFD performance requirements for this project. Each supplier shall list any exceptions to the specification. If no departures from the specification are identified, the supplier shall be bound by the specification.
- .6 Harmonic filtering. The seller shall, with the aid of the buyer's electrical power single line diagram, providing the data required by IEEE-519, perform an analysis to initially demonstrate the supplied equipment will meet the IEEE standards after installation. If, as a result of the analysis, it is determined that additional filter equipment is required to meet the IEEE recommendations, then the cost of such equipment shall be included in the bid. A harmonic analysis shall be submitted with the approval drawings to verify compliance with the latest version of IEEE-519 voltage and current distortion limits as shown in table 10.2 and 10.3 at the point of common coupling (PCC). The PCC shall be defined as the consumer-utility interface or primary side of the main distribution transformer.
- .7 Operating and Maintenance manuals: Include instructions for safe operating procedures and maintenance requirements. Include complete assembly and wiring drawings.

1.4 QUALITY ASSURANCE

- .1 Manufacturer: Company specializing in manufacture of variable frequency drives for HVAC use, and their accessories, with minimum ten (10) years documented product development, testing, and manufacturing experience.
- .2 To ensure quality and minimize infantile failures at the jobsite, the complete VFD shall be tested by the manufacturer. The VFD shall operate a dynamometer at full load and speed and shall be cycled during the test.
- .3 All optional features shall be functionally tested at the factory for proper operation.

1.5 REGULATORY REQUIREMENTS

- .1 Conform to Ontario Electrical Safety Code.
- .2 Provide certificate of compliance from authority having jurisdiction indicating approval of variable frequency drives.
- .3 Products Requiring Electrical Connection: Listed and classified by CSA, ULC, cUL or Special Inspection as suitable for the purpose specified and indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Transport, handle, store, and protect products.
- .2 Protect variable frequency drives stored on site from weather and moisture by maintaining factory covers and suitable weather-proof covering.

1.7 WARRANTY

- .1 Refer to Division 1 and Section 20 01 01.
- .2 Provide extended coverage five year warranty for variable frequency drives.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Provide Danfoss VLT FC102 Variable Frequency Drives as per the specifications below and the schedules shown.
- .2 Acceptable alternates;
 - .1 ABB, ACH550

2.2 VARIABLE FREQUENCY DRIVES

- .1 Furnish complete variable frequency VFDs as specified herein for the fans and pumps designated on the drawing schedules to be variable speed. All standard and optional features shall be included within the VFD enclosure, unless otherwise specified. VFD shall be housed in a metal NEMA 1 enclosure; The VFD's UL listing shall allow mounting in plenum or other air handling compartments.
- .2 The VFD shall convert incoming fixed frequency three-phase AC power into a variable frequency and voltage for controlling the speed of three-phase AC motors. The motor current shall closely approximate a sine wave. Motor voltage shall be varied with frequency to maintain desired motor magnetization current suitable for centrifugal pump and fan control and to eliminate the need for motor de-rating.
- .3 With the motor's rated voltage applied to the VFD input, the VFD shall allow the motor to produce full rated power at rated amps, RMS fundamental volts, and speed without using the motor's service factor. VFDs utilizing sine weighted/coded modulation (with or without 3rd harmonic injection) must provide data verifying that the motors will not draw more than full load current during full load and full speed operation.
- .4 The VFD shall include an input full-wave bridge rectifier and maintain a fundamental power factor near unity regardless of speed or load.
- .5 The VFD and options shall be tested to ANSI/UL Standard 508. The complete VFD, including all specified options, shall be assembled by the manufacturer, which shall be UL-508 certified for the building and assembly of option panels. Assembly of the option panels by a third-party panel shop is not acceptable. The appropriate CSA or C-UL stickers shall be applied to both the VFD and option panel, in the case where these are not contained in one panel. Both VFD and option panel shall be manufactured in ISO 9001 certified facilities.
- .6 The VFD shall have DC link reactors on both the positive and negative rails of the DC bus to minimize power line harmonics. VFDs without DC link reactors shall provide a minimum 3% impedance line reactor.
- .7 The VFD's full load amp rating shall meet or exceed NEC Table 430-150. The VFD shall be able to provide full rated output current continuously, 110% of rated current for 60 seconds and 160% of rated current for up to 0.5 second while starting.
- .8 The VFD shall be able to provide full torque at any selected frequency from 28 Hz to base speed to allow driving direct drive fans without de-rating.
- .9 An automatic energy optimization selection feature shall be provided standard in the VFD. This feature shall automatically and continually monitor the motor's speed and load and adjust the applied voltage to maximize energy savings and provide up to an additional 3% to 10% energy savings.
- .10 Input and output power circuit switching shall be able to be accomplished without interlocks or damage to the VFD. Switching rate may be up to 1 time per minute on the input and unlimited on the output.
- .11 An automatic motor adaptation test algorithm shall measure motor stator resistance and reactance to optimize performance and efficiency. It shall not be necessary to run the motor or de-couple the motor from the load to run the test.
- .12 Galvanic and/or optical isolation shall be provided between the VFD's power circuitry and control circuitry to ensure operator safety and to protect connected electronic control equipment from damage

caused by voltage spikes, current surges, and ground loop currents. VFDs not including either galvanic or optical isolation on both analog I/O and discrete I/O shall include additional isolation modules.

- .13 VFD power components to be designed for 575VAC. Components designed for 480VAC are not acceptable.
- .14 VFD shall minimize the audible motor noise through the use of an adjustable carrier frequency. The carrier frequency shall be automatically adjusted to optimize motor and VFD efficiencies while reducing motor noise.
- .15 VFD's operating motors not designed to meet Nema MG1 Part 31 should include Output Load reactors.
- .16 VFD's to be complete with integral motor disconnect for OESC Requirements.

2.3 PROTECTIVE FEATURES

- .1 A minimum of Class 20 I2t electronic motor overload protection for single motor applications and thermal-mechanical overloads for multiple motor applications shall be provided.
- .2 Protection against input transients, loss of AC line phase, output short circuit, output ground fault, over-voltage, under-voltage, VFD over-temperature and motor over-temperature. The VFD shall display all faults in plain English. Codes are not acceptable.
- .3 Protect VFD from sustained power or phase loss. The VFD shall provide full rated output with an input voltage as low as 90% of the nominal.
- .4 The VFD shall incorporate a motor preheat circuit to keep the motor warm and prevent condensation build up in the stator.
- .5 To prevent breakdown of the motor winding insulation, the VFD shall be designed to comply with IEC Part 34-17. Motors shall have inverter rated insulation (1600V).
- .6 VFD shall include a "signal loss detection" circuit to sense the loss of an analog input signal such as 4 to 20 mA or 2 to 10 V DC, and shall be programmable to react as desired in such an instance.
- .7 VFD shall function normally when the keypad is removed while the VFD is running and continue to follow remote commands. No warnings or alarms shall be issued as a result of removing the keypad.
- .8 VFD shall catch a rotating motor operating forward or reverse up to full speed.
- .9 VFD shall be rated for 100,000 amp interrupting capacity (AIC).
- .10 VFD shall include current sensors on all three output phases to detect and report phase loss to the motor. The VFD will identify which of the output phases is low or lost.
- .11 VFD shall continue to operate without faulting until input voltage reaches 300 V AC on 208/230 volt VFDs, 539 V AC on 460 volt VFDs, and 701V AC on 575 volt VFDs.

2.4 INTERFACE FEATURES

- .1 Hand/Start, Off/Stop and Auto/Start selector switches shall be provided to start and stop the VFD and determine the speed reference.
- .2 The VFD shall be able to be programmed to provide a 24 V DC output signal to indicate that the VFD is in Auto/Remote mode.
- .3 The VFD shall provide digital manual speed control. Potentiometers are not acceptable.
- .4 Lockable, alphanumeric backlit display keypad can be remotely mounted up to 10 feet (3 m) away using standard 9-pin cable.
- .5 The keypads for all sizes of VFDs shall be identical and interchangeable.
- .6 To set up multiple VFDs, it shall be possible to upload all setup parameters to the VFD's keypad, place that keypad on all other VFDs in turn and download the setup parameters to each VFD. To facilitate setting up VFDs of various sizes, it shall be possible to download from the keypad only size independent parameters.
- .7 Display shall be programmable to display in 9 languages including English, Spanish and French.
- .8 The display shall have four lines, with 20 characters on three lines and eight large characters on one line.
- .9 A red FAULT light, a yellow WARNING light and a green POWER-ON light shall be provided. These indications shall be visible both on the keypad and on the VFD when the keypad is removed.
- .10 A quick setup menu with factory preset typical HVAC parameters shall be provided on the VFD

- eliminating the need for macros.
- .11 The VFD shall include a standard RS-485 communications port and capabilities to be connected at a future date to a Johnson Controls N2, Siemens FLN, or Lonworks. The connection shall be software selectable by the user.
 - .12 As a minimum, the following points shall be controlled and/or accessible:
 - .1 VFD Start/Stop, Speed reference, Fault diagnostics, and Meter points as follows;
 - .2 Motor power in HP, Motor power in kW, Motor kW-hr, Motor current, Motor voltage, Hours run, Feedback signal #1, Feedback signal #2, DC link voltage, Thermal load on motor, and Thermal load on VFD, Heatsink temperature.
 - .13 Four additional Form C 230 volt programmable relays shall be available for factory or field installation within the VFD.
 - .14 Two set-point control interface (PID control) shall be standard in the unit. VFD shall be able to look at two feedback signals, compare with two set-points and make various process control decisions.
 - .15 Floating point control interface shall be provided to increase/decrease speed in response to contact closures.
 - .16 Four simultaneous displays shall be available. They shall include frequency or speed, run time, output amps and output power. VFDs unable to show these four displays simultaneously shall provide panel meters.
 - .17 Sleep mode shall be provided to automatically stop the VFD when its speed drops below set "sleep" level for a specified time. The VFD shall automatically restart when the speed command exceeds the set "wake" level.
 - .18 The sleep mode shall be functional in both follower mode and PID mode.
 - .19 Run permissive circuit shall be provided to accept a "system ready" signal to ensure that the VFD does not start until dampers or other auxiliary equipment are in the proper state for VFD operation. The run permissive circuit shall also be capable of sending an output signal as a start command to actuate external equipment before allowing the VFD to start.
 - .20 The following displays shall be accessible from the control panel in actual units: Reference Signal Value in actual units, Output Frequency in Hz or percent, Output Amps, Motor HP, Motor kW, kWhr, Output Voltage, DC Bus Voltage, VFD Temperature in degrees, and Motor Speed in engineering units per application (in GPM, CFM, etc.). VFD will read out the selected engineering unit either in a linear, square or cubed relationship to output frequency as appropriate to the unit chosen.
 - .21 The display shall be programmed to read in inches of water column (in-wg) for an air handler application, pressure per square inch (psi) for a pump application, and temperature (°F) for a cooling tower application.
 - .22 VFD shall be able to be programmed to sense the loss of load and signal a no load/broken belt warning or fault.
 - .23 If the temperature of the VFD's heat sink rises to 176 °F (80 °C), the VFD shall automatically reduce its carrier frequency to reduce the heat sink temperature. If the temperature of the heat sink continues to rise the VFD shall automatically reduce its output frequency to the motor. As the VFD's heat sink temperature returns to normal, the VFD shall automatically increase the output frequency to the motor and return the carrier frequency to its normal switching speed.
 - .24 The VFD shall have temperature controlled cooling fans for quiet operation and minimized losses.
 - .25 The VFD shall store in memory the last 10 faults and related operational data.
 - .26 Eight programmable digital inputs shall be provided for interfacing with the systems control and safety interlock circuitry.
 - .27 Two programmable relay outputs, one Form C 240 V AC, one Form A 30 V AC, shall be provided for remote indication of VFD status.
 - .28 Three programmable analog inputs shall be provided and shall accept a direct-or-reverse acting signal. Analog reference inputs accepted shall include two voltages (0 to 10 V DC, 2 to 10 V DC) and one current (0 to 20 mA, 4 to 20 mA) input.
 - .29 Two programmable 0 to 20 mA analog outputs shall be provided for indication of VFD status. These outputs shall be programmable for output speed, frequency, current and power. They shall also be programmable to provide a selected 24 V DC status indication.
 - .30 Under fire mode conditions, the VFD shall be able to be programmed to automatically default to a preset speed.

2.5 ADJUSTMENTS

- .1 VFD shall have an adjustable carrier frequency in steps of not less than 0.1 kHz to allow tuning the VFD to the motor.
- .2 Sixteen preset speeds shall be provided.
- .3 Four acceleration and four deceleration ramps shall be provided. Accel and decel time shall be adjustable over the range from 0 to 3,600 seconds to base speed. The shape of these curves shall be automatically contoured to ensure no-trip acceleration and deceleration.
- .4 Four current limit settings shall be provided.
- .5 If the VFD trips on one of the following conditions, the VFD shall be programmable for automatic or manual reset: under voltage, overvoltage, current limit and inverter overload.
- .6 The number of restart attempts shall be selectable from 0 through 20 or infinitely and the time between attempts shall be adjustable from 0 through 600 seconds.
- .7 An automatic "on delay" may be selected from 0 to 120 seconds.

2.6 BY-PASS

- .1 Provide a manual 3-contactor bypass, were indicated in schedules, consisting of a door interlocked main fused disconnect pad lockable in the off position, a built-in motor starter and a four position DRIVE/OFF/BYPASS/TEST switch controlling three contactors. In the DRIVE position, the motor is operated at an adjustable speed from the VFD. In the OFF position, the motor and VFD are disconnected. In the BYPASS position, the motor is operated at full speed from the AC power line and power is disconnected from the VFD so that service can be performed. In the TEST position, the motor is operated at full speed from the AC line power while power is applied to the input of the VFD. This allows the VFD to be given an operational test while continuing to run the motor at full speed in bypass. In case of an external safety fault, a customer supplied normally closed dry contact shall be able to stop the motor whether in DRIVE or BYPASS mode.
- .2 Service personnel shall be able to defeat the main power disconnect and open the bypass enclosure without disconnecting power. This shall be accomplished through the use of a specially designed tool and mechanism while meeting all local and national code requirements for safety.

2.7 SERVICE CONDITIONS

- .1 Ambient temperature, 14° to 104°F (-10° to 40°C).
- .2 0 to 95% relative humidity, non-condensing.
- .3 Elevation to 3,300 feet (1006 m) without de-rating.
- .4 AC line voltage variation, -10 to +10% of nominal with full output.
- .5 No side clearance shall be required for cooling of any units. All power and control wiring shall be done from the bottom.

3 EXECUTION

3.1 START-UP SERVICE

- .1 The manufacturer shall provide start-up commissioning of the VFD and its optional circuits by a factory certified service technician who is experienced in start-up and repair services. Sales personnel and other agents who are not factory certified shall not be acceptable as commissioning agents. Start-up services shall include checking for verification of proper operation and installation for the VFD, its options and its interface wiring to the building automation system.
- .2 Adjust and record minimum and maximum speeds to accommodate required design flows and flow variations.
- .3 Record internal overload settings on start-up form.

3.2 WARRANTY

- .1 The VFD shall be warranted by the manufacturer for a period of 5 years from date of Substantial Performance.

- .2 The warranty shall include parts, labour, travel costs and living expenses incurred by the manufacturer to provide factory authorized on-site service.

3.3 EXAMINATION

- .1 Contractor to verify that job site conditions for installation meet factory recommended and code-required conditions for VFD installation prior to start-up, including clearance spacing, temperature, contamination, dust, and moisture of the environment. Separate conduit installation of the motor wiring, power wiring, and control wiring, and installation per the manufacturer's recommendations shall be verified.
- .2 The VFD is to be covered and protected from installation dust and contamination until the environment is cleaned and ready for operation. The VFD shall not be operated while the unit is covered.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with General Requirements of Section 20 01 01 applies to and governs all work of Division 21, 22 and 23.

1.2 SECTION INCLUDES

- .1 Diffusers
- .2 Linear Diffusers and Grilles
- .3 Grilles and Registers

1.3 REFERENCES

- .1 ADC 1062 - Air Distribution and Control Device Test Code.
- .2 AMCA 500 - Method of Testing Louvres for Ratings.
- .3 AMCA 5000 - Method of Testing Dampers for Ratings.
- .4 AHRI 650 - Air Outlets and Inlets.
- .5 ASHRAE 70 - Method of Testing for Rating the Performance of Outlets and Inlets.
- .6 SMACNA - HVAC Duct Construction Standard - Metal and Flexible.
- .7 NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

1.4 SUBMITTALS

- .1 Section 20 01 01: Procedures for submittals.
- .2 Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.
- .3 As built record drawings to record actual locations of air outlets and inlets.

1.5 QUALITY ASSURANCE

- .1 Test and rate air outlet and inlet performance to ADC Equipment Test Code 1062 and ASHRAE 70.
- .2 Test and rate louvre performance to AMCA 500.

1.6 QUALIFICATIONS

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

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Diffusers, grilles and registers shall be model indicated or equivalent products by;
 - .1 E.H Price
 - .2 Nailor
 - .3 Titus
 - .4 Metalaire

2.2 SQUARE CONE DIFFUSERS, FIXED PATTERN

- .1 Manufacturer's Reference: Price Model SCD/31/3C/B12
- .2 Type: Square, fixed pattern, stamped, multi-core diffuser to discharge air in 360 degree pattern with sectorizing baffles where indicated.
- .3 Frame: Inverted T-bar type. In plaster ceilings, provide plaster frame and ceiling frame.
- .4 Fabrication: Steel with B12 white powder coat finish.

- .5 Accessories: Radial opposed blade damper and multi-louvred equalizing grid with damper adjustable from diffuser face.

2.3 CEILING GRID CORE GRILLES RETURN/EXHAUST

- .1 Manufacturer's Reference: Price Model 80DAL.
- .2 Type: Fixed grilles of 1/2"x1/2"x1/2" (13x13x13mm) grid (egg crate core) with extruded aluminum border.
- .3 Frame: 1-1/4" (32mm) margin with concealed mounting. Channel lay-in frame for suspended grid ceilings.
- .4 Fabrication: Aluminum with B12 white powder coat finish.
- .5 Damper: Integral, Aluminum, gang-operated, opposed blade type with removable key operator, operable from face.

2.4 LINEAR FLOOR GRILLES

- .1 Manufacturer's Reference: Price Model LFG
- .2 Type: Fixed grilles with pencil proof bar spacing
- .3 Frame: 1-1/4" (32mm) heavy duty flanged border
- .4 Fabrication: Heavy duty aluminum construction with removable core, B12 white powder coat finish.

2.5 CEILING ROUND CONE DIFFUSER

- .1 Manufacturer's Reference: Price Model RCDE
- .2 Type: Two position round cone ceiling diffuser with spring lick and removable inner cone assembly.
- .3 Fabrication: Heavy gauge spun steel construction with B12 white powder coat finish

2.6 SIDEWALL SURFACE MOUNTED LOUVRED FACE SUPPLY GRILLE

- .1 Manufacturer's Reference: Price Model 510D-L
- .2 Type: fixed position louvred face supply grilles for sidewall installation.
- .3 Frame: 1-1/4" (32mm) flat border for surface mount applications.
- .4 Fabrication: steel construction, 3/4" (19mm) blade spacing, blades parallel to long dimension, B12 white powder coat finish
- .5 Damper: opposed blade steel damper with black finish

2.7 SURFACE MOUNTED LOUVRED FACE RETURN GRILLE

- .1 Manufacturer's Reference: Price Model 530
- .2 Type: fixed position louvred face return grilles with 45° deflection
- .3 Frame: 1-1/4" (32mm) flat border for surface mount applications.
- .4 Fabrication: steel construction, 3/4" (19mm) blade spacing, blades parallel to long dimension, B12 white powder coat finish

2.8 RETURN DISSIPATER

- .1 Manufacturer's Reference: Price Model TLRD
- .2 Type: low profile return dissipater to be installed in walls above ceiling.
- .3 Fabrication: galvanized steel casing with paintable satin coat, fiberglass acoustic media

2.9 STEEL FIRE RATED DOOR GRILLE

- .1 Manufacturer's Reference: Nailor 61DGD-FR
- .2 Type: UL Listed door grille suitable for 1-1/2 hr rating, for installation in 1-3/4" thick doors.
- .3 Fabrication: 18 ga. Cold rolled steel frame and blades, 160°F (71°C) UL listed fusible link with

stainless steel operating spring and dead lock bar.

2.10 ALUMINUM DOOR GRILLE

- .1 Manufacturer's Reference: Nailor 51DGD
- .2 Type: louvred door grille with sight-proof design
- .3 Fabrication: extruded aluminum, heavy gauge frame, mechanically interlocked with reinforced mitred corners.

3 EXECUTION

3.1 INSTALLATION

- .1 Install in accordance with manufacturer's instructions.
- .2 Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
- .3 Install diffusers and grilles and connect to ductwork with air tight connections.
- .4 Provide balancing dampers in duct take-off to diffusers, grilles and registers, whether or not dampers are included as part of the diffuser, grille or register assembly.
- .5 Paint visible ductwork behind air outlets and inlets matte black.
- .6 Provide safety chains for diffusers 24" x 48" (600 x 1200mm) and larger.

3.2 PROTECTION

- .1 Protect each diffuser, grille and register from damage during construction.
- .2 Protect each diffuser, grille, register and ductwork from contamination and entry of dust and debris during construction.

END OF SECTION

1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with General Requirements of Section 20 01 01 that apply to and govern all work of Divisions 20, 21, 22 and 23.

1.2 REFERENCES

- .1 AFBMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
- .2 AFBMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
- .3 AMCA 99 - Standards Handbook.
- .4 AMCA 210 - Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
- .5 AMCA 300 - Reverberant Room Method for Sound Testing of Fans.
- .6 AMCA 301 - Method of Publishing Sound Ratings for Air Moving Devices.
- .7 AMCA 500 - Method of Testing Louvres for Ratings.
- .8 AMCA 5000 - Method of Testing Dampers for Ratings.
- .9 AHRI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils.
- .10 AHRI 430 - Fabrication of Central Station Air Handling Units.
- .11 AHRI 435 - Application of Central-Station Air-Handling Units.
- .12 AHRI 610 - Central System Humidifiers for Residential Applications.
- .13 SMACNA - HVAC Duct Construction Standards - Metal and Flexible.
- .14 UL 900 - Air Filter Units.

1.3 SUBMITTALS

- .1 Section 20 01 01: Procedures for submittals.
- .2 Shop Drawings: Indicate assembly, unit dimensions, weight loading, required clearances, construction details, field connection details, and electrical characteristics and connection requirements.
- .3 Product Data:
 - .1 Provide literature which indicates dimensions, operating weights, capacities, ratings, fan performance, gauges and finishes of materials, and electrical characteristics and connection requirements.
 - .2 Provide data of filter media, filter performance data, filter assembly, and filter frames.
 - .3 Provide fan curves with specified operating point clearly plotted.
 - .4 Submit sound power level data for both fan outlet and casing radiation at rated capacity.
 - .5 Submit electrical requirements for power supply wiring including wiring diagrams for interlock and control wiring, clearly indicating factory-installed and field-installed wiring.
- .4 Samples: Submit two of each type of replacement filter media with frame.
- .5 Manufacturer's Installation Instructions.
- .6 Maintenance Data: Include instructions for lubrication, filter replacement, motor and drive replacement, spare parts lists, and wiring diagrams.

1.4 QUALIFICATIONS

- .1 The units and major components shall be products of manufacturers regularly engaged in the production of such equipment and with a minimum of fifteen continuous years of proven production experience.
- .2 The manufacturer shall have a fully implemented and auditable quality assurance program, equal to the ISO-9002 Quality Standard.
- .3 AHRI Compliance:
 - .1 Comply with AHRI 210/240 and AHRI 340/360 for testing and rating energy efficiencies for RTUs.
 - .2 Comply with AHRI 270 for testing and rating sound performance for RTUs.
- .4 NFPA Compliance: Comply with NFPA 90A and NFPA 90B.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Transport, handle, store, and protect products.
- .2 Accept products on site in factory-fabricated protective containers, with factory-installed shipping skids and lifting lugs. Inspect for damage.
- .3 Store in clean dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures, and finish.

1.6 ENVIRONMENTAL REQUIREMENTS

- .1 Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

1.7 EXTRA MATERIALS

- .1 Provide one spare set for each fan in each unit of the following;
 - .1 fan belts
 - .2 filters

1.8 REGULATORY REQUIREMENTS

- .1 Products Requiring Electrical Connection: Listed and classified by Underwriters' Laboratories, Inc., as suitable for the purpose specified and indicated.

1.9 WARRANTY

- .1 Section 20 01 01: Submittals for project closeout.
- .2 Warranty Period:
 - .1 Manufacturer shall provide a warranty for a period of 12 months from the date of equipment start up or 18 months from the date of original equipment shipment from the factory, whichever is less.

1.10 MAINTENANCE SERVICE

- .1 Section 20 01 01: Submittals for project closeout.
- .2 Provide service and maintenance of packaged roof top units for one year from Date of Substantial Completion.
- .3 Provide maintenance service with a two month interval as maximum time period between calls. Provide 24-hour emergency service on breakdowns and malfunctions.
- .4 Include maintenance items as outlined in manufacturer's operating and maintenance data, including minimum of six filter replacements, minimum of one fan belt replacement, and controls check-out, adjustments, and recalibration.
- .5 Submit copy of service call work order or report, and include description of work performed.

2 PRODUCTS

2.1 MANUFACTURERS

- .1 Aaon
- .2 Alternates: Greenheck

2.2 GENERAL

- .1 Indoor air handling units shall include filters, supply fans, electric heaters, and unit controls.
- .2 Unit shall have a draw-through supply fan configuration and discharge air horizontally.
- .3 Unit shall be factory assembled and tested including and run testing of the supply fans and factory wired electrical system. Run test report shall be supplied with the unit.
- .4 Unit shall have decals and tags to indicate lifting and rigging, service areas and caution areas for

safety and to assist service personnel.

- .5 Unit components shall be labeled, including electrical and controls components.
- .6 Installation, Operation and Maintenance manual shall be supplied within the unit.
- .7 Laminated color-coded wiring diagram shall match factory installed wiring and shall be affixed to the interior of the control compartment's hinged access door.
- .8 Unit nameplate shall be provided in two locations on the unit, affixed to the exterior of the unit and affixed to the interior of the control compartment's hinged access door.

2.3 CONSTRUCTION

- .1 All cabinet walls, access doors, and roof shall be fabricated of double wall, impact resistant, rigid polyurethane foam panels.
- .2 Unit insulation shall have a minimum thermal resistance R-value of 6.25. Foam insulation shall have a minimum density of 2 pounds/cubic foot and shall be tested in accordance with ASTM D1929-11 for a minimum flash ignition temperature of 610°F.
- .3 Unit construction shall be double wall with G90 galvanized steel on both sides and a thermal break. Double wall construction with a thermal break prevents moisture accumulation on the insulation, provides a cleanable interior, prevents heat transfer through the panel and prevents exterior condensation on the panel.
- .4 Unit shall be designed to reduce air leakage and infiltration through the cabinet. Sealing shall be included between panels and between access doors and openings to reduce air leakage. Piping and electrical conduit through cabinet panels shall include sealing to reduce air leakage.
- .5 Access to filters shall be through hinged access door with quarter turn fasteners.
- .6 Access to external control panel shall be through hinged access door with tooled entry.
- .7 Access to supply fan shall be through an access door with removable pin hinges and lockable quarter turn handles.
- .8 Access doors shall be flush mounted to cabinetry.

2.4 ELECTRICAL

- .1 Unit shall be provided with an external control panel with separate low voltage control wiring with conduit and high voltage power wiring with conduit between the control panel and the unit. Control panel shall be field mounted.
- .2 Unit shall be provided with standard power block for connecting power to the unit.
- .3 Unit shall include a factory installed 24V control circuit transformer.
- .4 Unit shall be provided with phase and brown out protection which shuts down all motors in the unit if the electrical phases are more than 10% out of balance on voltage, the voltage is more than 10% under design voltage or on phase reversal.

2.5 SUPPLY FAN

- .1 Unit shall include direct drive, unhooded, backward curved, plenum supply fans.
- .2 Blower and motor assembly shall be dynamically balanced.
- .3 Motor shall be a high efficiency electronically commutated motor (ECM).
- .4 Blower and motor assembly shall utilize neoprene gasket.
- .5 ECM driven supply fan CFM setpoint shall be set with factory installed potentiometer within the control compartment.
- .6 ECM driven supply fan speed shall be controlled with the factory installed WattMaster controller.
- .7 Air handling unit and matching condensing unit shall be capable of operation as an R-410A split system air conditioner.

2.6 ELECTRIC HEATING

- .1 Unit shall include an electric heater consisting of electric heating coils, fuses, contactors, and a high temperature limit switch, with capacities as shown on the plans.
- .2 Electric heating coils shall be located in the reheat position downstream of the supply fan.
- .3 Electric heater shall have full modulation capacity controlled by an SCR (Silicon Controlled Rectifier).

Controller shall provide the heating control signal to control the amount of heating.

2.7 FILTERS

- .1 Unit shall include 2 inch thick, pleated panel filters with an ASHRAE efficiency of 30% and MERV rating of 10, upstream of the cooling coil.

2.8 CONTROLS

- .1 Unit shall be provided with an external control panel with separate low voltage control wiring with conduit and high voltage power wiring with conduit between the control panel and the unit. Control panel shall be field mounted.
- .2 Factory Installed and Factory Provided Controller
 - .1 Unit controller shall be capable of controlling all features and options of the unit. Controller shall be factory installed in the unit controls compartment and factory tested.
 - .2 Controller shall be capable of stand-alone operation with unit configuration, set point adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling available without dependence on a building management system.
 - .3 Controller shall have an onboard clock and calendar functions that allow for occupancy scheduling.
 - .4 Controller shall include non-volatile memory to retain all programmed values without the use of a battery, in the event of a power failure.
 - .5 Make Up Air Controller
 - .1 Unit shall modulate cooling with constant airflow to meet ventilation outside air loads. Cooling capacity shall modulate based on supply air temperature.
 - .2 Unit shall modulate heating with constant airflow to meet ventilation outside air loads. Heating capacity shall modulate based on supply air temperature.
 - .6 Unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling shall be accomplished with connection to interface module with LCD screen and input keypad, interface module with touch screen, or with connection to PC with free configuration software. Controller shall be capable of connection with other factory installed and factory provided unit controllers with individual unit configuration, setpoint adjustment, sensor status viewing, and occupancy scheduling available from a single unit. Connection between unit controllers shall be with a modular cable. Controller shall be capable of communicating and integrating with a LonWorks or BACnet network.

2.9 ACCESSORIES

1. Unit shall be provided with remote safety shutdown terminals for wiring to a field installed smoke detector, firestat, or building safety automatic shutdown system.

3 EXECUTION

3.1 INSTALLATION

- .1 Install unit where indicated, in accordance with manufacturer's instructions.
- .2 Install to AHRI 430.
- .3 Install damper actuators, control valves and control valve actuators supplied by the Owner.
- .4 Level units and secure to structure.
- .5 Align fans while in operation providing clearance in proportion to flexible duct connector length and ensuring that misalignment when fan is not in operation does not strain or damage the connector.
- .6 Control wiring and connections by the Owner.
- .7 Power wiring and connections by Division 26.

3.2 FIELD TESTING

- .1 Field test each unit in the presence of the Testing and Balancing Agency and record all tests on forms acceptable to the Consultant. Issue the test report in triplicate to the Consultant.
- .2 Start the fan and soap test all casing connections and openings to ensure that no leakage takes place. Inspect entire casing to ensure that no undue movements have taken place.
- .3 Close all drainage openings. Fill bottom of casings with water to the level of the waterproofing. Let stand for two (2) hours, no leakage allowed.
- .4 Start and stop each fan at least five (5) times. Ensure that each fan is free-wheeling and does not produce any abnormal vibration at any speed. Allow proper time integral between starts to motor manufacturer's requirements.
- .5 Check fan starting and stopping time against time recorded on shop drawings.
- .6 Bring each fan up to operating speed and determine actual rpm with tachometer.
- .7 Let each fan and drive run continuously for one (1) hour, check the motor temperature rise.
- .8 Check the working of all motor starters, remote pushbutton stations and all motor interlocks.
- .9 Ensure that when the fans run at maximum kilowatt consumption no overload occurs in any electrical circuit.
- .10 During commissioning, the design airflow shall be adjusted in real time utilizing keys on the constant volume control keypad to obtain the correct value.
- .11 Do these tests in conjunction with the Electrical Contractor, the fan manufacturer and the Owner.
- .12 Test the operation of all filters and auxiliaries. Generally check to see that the filter frames shall be sealed to prevent bypass air. Conduct these tests in conjunction with the filter manufacturer.

END OF SECTION

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 October 17, 2017 - 01:58pm Plotted by: VRM

ROOF TOP UNIT SCHEDULE

No.	RTU-1	RTU-2
MANUFACTURER AND MODEL NO.	AAON RN-011-4-0-E70S-7F2: GECD-D0A-DCF-AGO-000A0BD-00-COA0H05VB	AAON RQ-003-4-V-G70V-714: GEBC-DOB-PJC-AGO-00000BD-00-COA0H05VX
LOCATION SERVED	TOWN HALL	COUNCIL CHAMBERS
VOLTS/PHASE/HERTZ	575/3/60	575/3/60
UNIT TYPE	WATER-SOURCE/ GEOTHERMAL HEAT PUMP WITH ERV	WATER-SOURCE/ GEOTHERMAL HEAT PUMP WITH ERV
BASE UNIT LENGTH (IN)	128-1/4	116
BASE UNIT WIDTH (IN)	58-3/4	44-1/8
BASE UNIT HEIGHT (IN)	50-1/8	42-7/8
TOTAL OPER. WEIGHT (LB)	2,340	1,164
SUPPLY FAN		
AIRFLOW (CFM)	4,576	1,200
TOTAL STATIC PRESSURE (INCHES W.G.)	2.23	1.74
EXTERNAL STATIC PRESSURE (INCHES W.G.)	0.50	0.50
SUPPLY FAN SPEED (RPM)	1,873	1,337
SUPPLY FAN MOTOR HORSEPOWER (HP)	5	1
EXHAUST FAN		
AIRFLOW (CFM)	4,576	1,200
TOTAL STATIC PRESSURE (INCHES W.G.)	0.93	0.79
EXTERNAL STATIC PRESSURE (INCHES W.G.)	0.63	0.61
EXHAUST FAN SPEED (RPM)	1,458	1,142
EXHAUST FAN MOTOR HORSEPOWER (HP)	2	1
GEOTHERMAL COOLING		
ENTERING AIR DB TEMP. (°F)	75.52	76.17
LEAVING AIR DB TEMP. (°F)	53.04	52.07
GROSS COOLING CAPACITY (MBH)	135.14	39.37
GROSS SENSIBLE COOLING CAPACITY (MBH)	109.84	30.84
FLUID	25% GLYCOL/WATER	25% GLYCOL/WATER

ROOF TOP UNIT SCHEDULE CONT'D

No.	RTU-1	RTU-2
GEOTHERMAL HEATING		
ENTERING AIR DB TEMP. (°F)	72.6	69.6
LEAVING AIR DB TEMP. (°F)	93.4	92.4
GROSS HEATING CAPACITY (MBH)	165.1	54.4
OUTDOOR AIR DB TEMP. (°F)	-17	-17
RETURN AIR DB TEMP. (°F)	75	75
FLUID	25% GLYCOL/WATER	25% GLYCOL/WATER
AUXILIARY HEATING		
FUEL TYPE	PROPANE	PROPANE
ENTERING AIR DB TEMP. (°F)	72.6	69.6
LEAVING AIR DB TEMP. (°F)	104.2	107.1
HEATING CAPACITY (MBH)	156.0	48.6
PROPANE INPUT (MBH)	195.0	60.0
TURNDOWN RATIO	1.4:1	4.3:1
ELECTRICAL DATA		
MCA	23	10
MOP	25	15
FLA	21	9



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 Mechanical & Electrical Engineers
 London . Windsor . Ottawa
 www.vreng.ca | 613-563-2100

Project:
MCNAB BRAESIDE

Drawing Title:
RTU SCHEDULE

Drawn By:
 IF

Checked By:
 IF

Date:
 OCT 19, 2017

Scale:
 N.T.S

Drawing No.:

M001.1

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 October 17, 2017 - 01:59pm Plotted by: VRM

AHU SCHEDULE	
No.	AHU-1
MANUFACTURER AND MODEL NO.	AAON SB-010-4-A E70A-3GA: OE00- 0A0-ACE-AD0- 00COHBD-50- BCAU0BAAB
LOCATION SERVED	PERNEEL BUILDING
VOLTS/PHASE/HERTZ	575/3/60
UNIT TYPE	WATER-SOURCE/ GEOHERMAL HEAT PUMP WITH ERV
BASE UNIT LENGTH (IN)	131
BASE UNIT WIDTH (IN)	89
BASE UNIT HEIGHT (IN)	42-1/8
TOTAL OPER. WEIGHT (LB)	1,183
SUPPLY FAN	
AIRFLOW (CFM)	4,400
TOTAL STATIC PRESSURE (INCHES W.G.)	3.33
EXTERNAL STATIC PRESSURE (INCHES W.G.)	1.00
SUPPLY FAN SPEED (RPM)	2,250
SUPPLY FAN MOTOR HORSEPOWER (HP)	8
EXHAUST FAN	
AIRFLOW (CFM)	4,400
TOTAL STATIC PRESSURE (INCHES W.G.)	1.28
EXTERNAL STATIC PRESSURE (INCHES W.G.)	1.28
EXHAUST FAN SPEED (RPM)	1,458
EXHAUST FAN MOTOR HORSEPOWER (HP)	4
GEOHERMAL COOLING	
ENTERING AIR DB TEMP. (°F)	79.41
LEAVING AIR DB TEMP. (°F)	56.13
GROSS COOLING CAPACITY (MBH)	134.83
GROSS SENSIBLE COOLING CAPACITY (MBH)	108.59
FLUID	25% GLYCOL/WATER

AHU SCHEDULE CONT'D	
No.	AHU-1
GEOHERMAL HEATING	
ENTERING AIR DB TEMP. (°F)	54.7
LEAVING AIR DB TEMP. (°F)	77.0
GROSS HEATING CAPACITY (MBH)	108.6
OUTDOOR AIR DB TEMP. (°F)	-17
RETURN AIR DB TEMP. (°F)	75
FLUID	25% GLYCOL/WATER
AUXILIARY HEATING	
FUEL TYPE	ELECTRIC
ENTERING AIR DB TEMP. (°F)	54.7
LEAVING AIR DB TEMP. (°F)	89.9
HEATING CAPACITY (MBH)	167.2
POWER INPUT (KW)	49
ELECTRIC HEAT FLA	49.2
ELECTRICAL DATA	
MCA	70
MOP	70
FLA	56



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Project:
MCNAB BRAESIDE

Drawing Title:
AHU SCHEDULE

Drawn By: IF	Checked By: IF
Date: OCT 19, 2017	Scale: N.T.S
Drawing No.:	
M001.2	

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 October 17, 2017 - 02:58pm Plotted by: VRM

MUA SCHEDULE	
No.	MUA-1
MANUFACTURER AND MODEL NO.	AAON H3-CRB-4-0-0000-3ES: AABE-OEK-000-0A0-0000000-00-C00000000
LOCATION SERVED	PERNEEL BUILDING KITCHEN
VOLTS/PHASE/HERTZ	575/3/60
UNIT TYPE	ELECTRIC HEAT
BASE UNIT LENGTH (IN)	73-3/4
BASE UNIT WIDTH (IN)	60-1/4
BASE UNIT HEIGHT (IN)	27
TOTAL OPER. WEIGHT (LB)	725
SUPPLY FAN	
AIRFLOW (CFM)	1,300
TOTAL STATIC PRESSURE (INCHES W.G.)	0.69
EXTERNAL STATIC PRESSURE (INCHES W.G.)	0.50
SUPPLY FAN SPEED (RPM)	2,250
SUPPLY FAN MOTOR HORSEPOWER (HP)	1.34
ELECTRIC HEATING	
ENTERING AIR DB TEMP. (°F)	-17
LEAVING AIR DB TEMP. (°F)	67.9
HEATING CAPACITY (MBH)	119.5
POWER INPUT (KW)	35
ELECTRIC HEAT FLA	35.1
ELECTRICAL DATA	
MCA	46
MOP	50
FLA	36



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Date: OCT 19, 2017	Scale: N.T.S

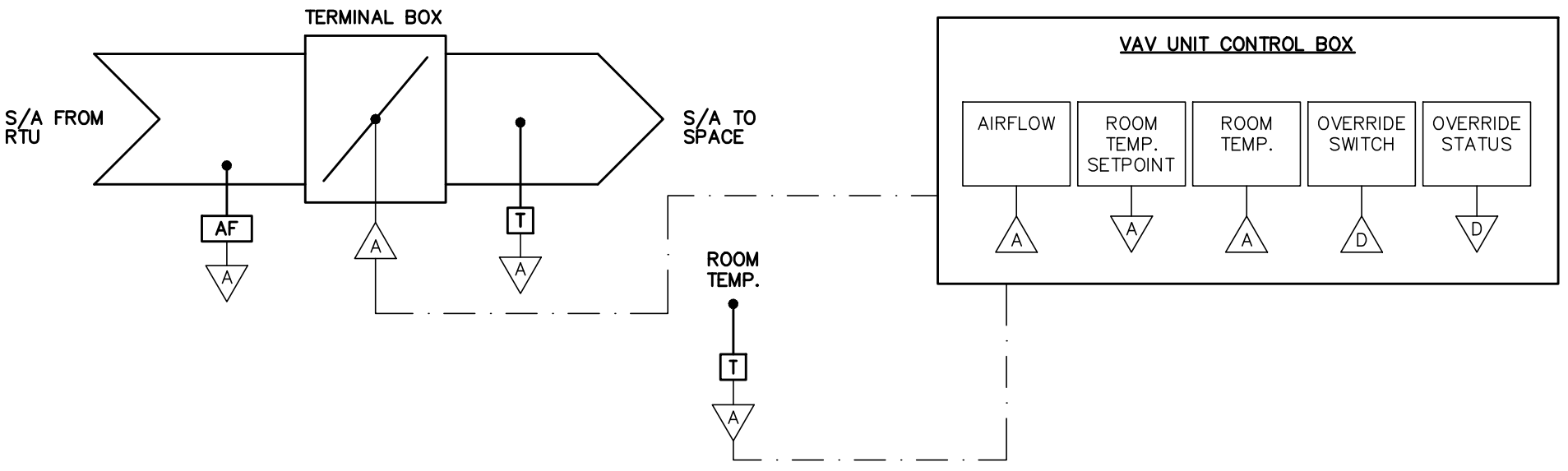
Project:
MCNAB BRAESIDE

Drawing Title:
MUA SCHEDULE

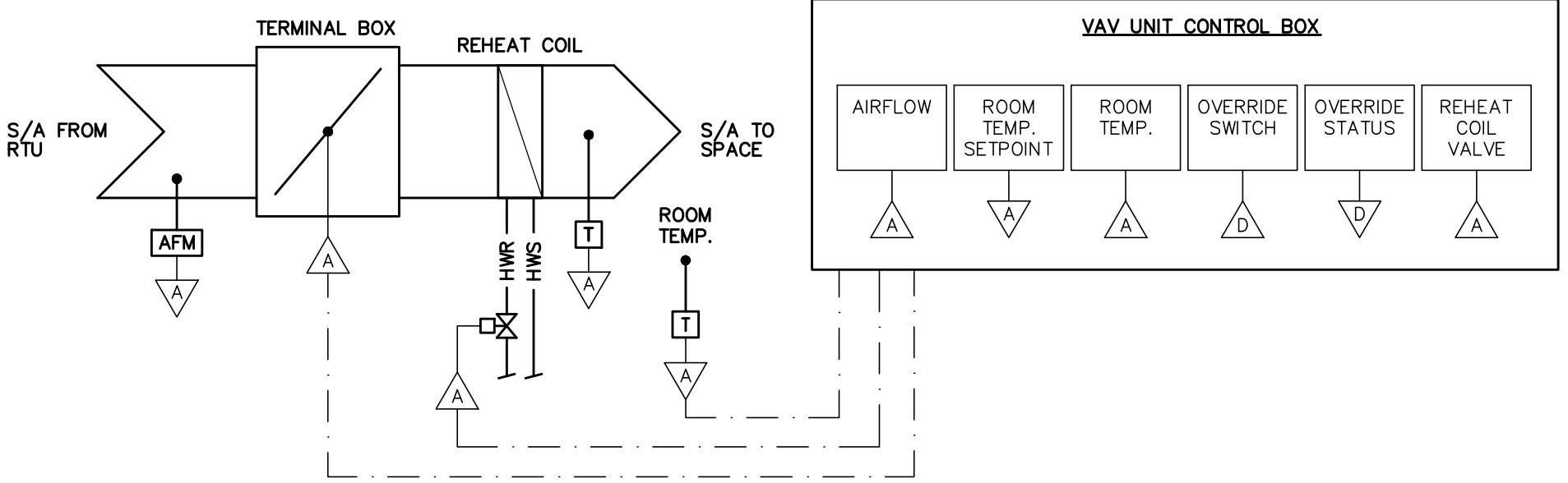
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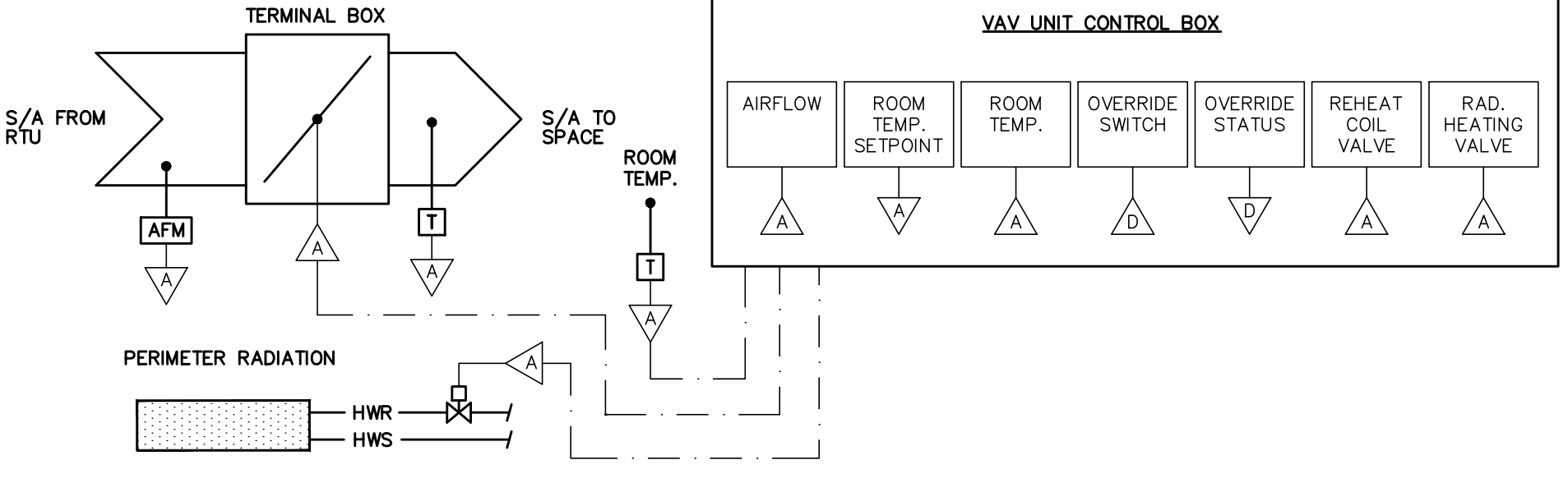
TOWN HALL - VAV CONTROLS



TOWN HALL - VAV C/W REHEAT COIL CONTROLS



TOWN HALL - VAV C/W PERIMETER RADIATION CONTROLS



 Vanderwesten & Rutherford Associates Inc. Mechanical & Electrical Engineers London, Windsor, Ottawa www.vreng.ca 613-563-2100	Drawn By: IF	Checked By: IF
	Date: OCT 19, 2017	Scale: N.T.S
Project: MCNAB BRAESIDE	Drawing Title: VAV & PERIMETER HTG. CONTROLS SCHEMATICS	
Drawing No.: M201.1		

FLOOR TYPE LEGEND		
TYPE:	DESIGN:	CONSTRUCTION:
F1		SLAB ON GRADE: FLOOR TYPE F1: 200MM CONCRETE SLAB VAPOUR BARRIER MEMBRANE TURNED UP AT SLAB EDGES RIGID INSULATION INSTALLED HORIZONTALLY BELOW THE CONCRETE SLAB FROM BUILDING TO MIN 1200mm INWARD GRANULAR FILL (REFER TO STRUCTURAL)

ROOF TYPE LEGEND		
TYPE:	DESIGN:	CONSTRUCTION:
R1		ROOF TYPE R1: STANDING SEAM METAL ROOF ICE AND WATER SHIELD MEMBRANE 13MM PROTECTION BOARD 50MM RIGID INSULATION 100MM RIGID INSULATION VAPOUR BARRIER MEMBRANE EXPOSED WOOD FRAME STRUCTURE GYP. BD. LAMINATED TO UNDERSIDE OF DECKING INT. FIN. (COORDINATE W/ RM. FIN. SCH.S)
R2		ROOF TYPE R2: ROOFING MEMBRANE 13MM PROTECTION BOARD TAPERED RIGID INSULATION 50MM RIGID INSULATION 100MM RIGID INSULATION VAPOUR BARRIER MEMBRANE METAL DECK STRUCTURAL JOIST (REFER TO STRUCTURE) 19MM STRAPPING GYP. BD. CEILING INT. FIN. - PAINT FINISH TO BE SELECTED BY ARCHITECT

CEILING TYPE LEGEND		
TYPE:	DESIGN:	CONSTRUCTION:
C1		CEILING TYPE C1: 92MM METAL SUSPENSION FRAMING SPACED AT 600 O/C 22MM FURRING CHANNEL RUNNING PERPENDICULAR TO METAL SUSPENSION FRAMING @ 600 O/C 16MM T&G WOOD PANELING
C2		CEILING TYPE C2: 92MM METAL SUSPENSION FRAMING SPACED AT 600 O/C 22MM FURRING CHANNEL RUNNING PERPENDICULAR TO METAL SUSPENSION FRAMING @ 600 O/C GYP. BD. INT. FIN. INT. FIN. - PAINT FINISH TO BE SELECTED BY ARCHITECT
C3		50MM LIGHT WEIGHT CONCRETE TOPPING C/W CHEMICAL WATERPROOFING APPLICATION 150MM PRECAST CONCRETE CORE SLAB INT. FIN. INT. FIN. - PAINT FINISH TO BE SELECTED BY ARCHITECT

WALL TYPE LEGEND		
TYPE:	DESIGN:	CONSTRUCTION:
1		EXTERIOR WALL: WALL TYPE 1: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. VAPOUR BARRIER MEMBRANE 140MM WOOD STUD, CAVITY FILLED WITH MINERAL WOOL BATT INSULATION. 16MM FIBERGLASS MAT GYPSUM SHEATHING. 50MM RIGID INSULATION AIR BARRIER MEMBRANE. 25MM AIR SPACE + WD. STRAPPING. 400 O/C 13MM BD. FORM CONC. VENEER.
2A		EXTERIOR WALL: WALL TYPE 2A: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. VAPOUR BARRIER MEMBRANE 140MM WOOD STUD, CAVITY FILLED WITH MINERAL WOOL BATT INSULATION. 16MM FIBERGLASS MAT GYPSUM SHEATHING. 50MM RIGID INSULATION. AIR BARRIER MEMBRANE. 25MM AIR SPACE + WD. STRAPPING. 400 O/C 16MM METAL SIDING.
2B		EXTERIOR WALL: WALL TYPE 2B: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. VAPOUR BARRIER MEMBRANE 140MM WOOD STUD, CAVITY FILLED WITH MINERAL WOOL BATT INSULATION. 16MM FIBERGLASS MAT GYPSUM SHEATHING. 50MM RIGID INSULATION. AIR BARRIER MEMBRANE. 25MM AIR SPACE + WD. STRAPPING. 400 O/C. 16MM WOOD SIDING.
2C		EXTERIOR WALL: WALL TYPE 2C: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. VAPOUR BARRIER MEMBRANE 140MM WOOD STUD, CAVITY FILLED WITH MINERAL WOOL BATT INSULATION. 16MM FIBERGLASS MAT GYPSUM SHEATHING. 50MM RIGID INSULATION. AIR BARRIER MEMBRANE. 25MM AIR SPACE + WD. STRAPPING. 400 O/C. 22MM ACM PANEL.
2D		EXTERIOR WALL: WALL TYPE 2D: 16MM WOOD SIDING. 25MM AIR SPACE + WD. STRAPPING. 400 O/C AIR BARRIER MEMBRANE. 50MM RIGID INSULATION. 16MM FIBERGLASS MAT GYPSUM SHEATHING. 140MM WOOD STUD, CAVITY FILLED WITH MINERAL WOOL BATT INSULATION. 16MM FIBERGLASS MAT GYPSUM SHEATHING. RIGID INSULATION. AIR BARRIER MEMBRANE. 25MM AIR SPACE + WD. STRAPPING. 400 O/C. 16MM METAL SIDING.
7		FOUNDATION WALL: WALL TYPE 7: 75mm RIGID INSULATION VARRIES CONCRETE FOUNDATION WALL. REFER TO STRUCTURAL DRAWINGS. WATER PROOFING MEMBRANE

GENERAL NOTES:	
1	FOR FIRE RATED WALLS REFER TO : ULC W301 (GA FILE No. WP3605) OR GA FILE No. WP3660 REFER TO DRAWINGS AO.2 FOR FIRE SEPERATING LOCATIONS
2	USE MOISTURE RESISTANT GYPSUM BOARD IN ALL "WET" AREAS
3	USE ABUSE RESISTANT GYPSUM BOARD IN CORRIDOR AND GENERAL USE.
4	USE TYPE X GYPSUM BOARD GOT ALL FIRE RATED WALLS AND CEILINGS
5	ALL INTERIOR GYPSUM BOARD EXTENDS TO U/S OF STRUCTURE UNLESS NOTES OTHERWISE

WALL TYPE LEGEND		
TYPE:	DESIGN:	CONSTRUCTION:
3A		INTERIOR PARTITION: WALL TYPE 3A: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. 140MM WOOD STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. 16MM GYP. BD. INT. FIN. (COORDINATE W/ RM. FIN. SCH.S)
3B		INTERIOR PARTITION: WALL TYPE 3B: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. 89MM WOOD STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. 16MM GYP. BD. INT. FIN. (COORDINATE W/ RM. FIN. SCH.S)
3C		INTERIOR PARTITION: WALL TYPE 3C: 89MM WOOD STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. 16MM GYP. BD. INT. FIN. (COORDINATE W/ RM. FIN. SCH.S)
3D		INTERIOR PARTITION: WALL TYPE 3D: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. 140MM WOOD STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. 16MM GYP. BD. 22MM FURRING CHANNEL 16MM WOOD PANELING
3E		INTERIOR PARTITION: WALL TYPE 3E: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. 89MM WOOD STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. 16MM GYP. BD. 22MM FURRING CHANNEL 16MM WOOD PANELING
3F		INTERIOR PARTITION: WALL TYPE 3F: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. 140MM WOOD STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. 16MM PLYWOOD SHEATHING. 41MM FURRING CHANNEL 16MM GYPSUM RECESSED WOOD WALL 16MM GYP. BD. 140MM WOOD STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. 16MM PLYWOOD SHEATHING. 16MM WOOD V GROVE SIDING
4A		INTERIOR PARTITION: WALL TYPE 4A: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. 280MM WOOD STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. (LOCATED CORRIDOR/ROOM SIDE) GYP. BD. INT. FIN. (COORDINATE W/ RM. FIN. SCH.S)
5A		INTERIOR PARTITION: WALL TYPE 5A: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 13MM BOARD FORMED CONCRETE VENEER. 16MM GYP. BD. 127MM METAL STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. 16MM GYP. BD. 13MM BOARD FORMED CONCRETE VENEER. (COORDINATE W/ RM. FIN. SCH.S)
5B		INTERIOR PARTITION: WALL TYPE 5B: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 13MM BOARD FORMED CONCRETE VENEER. 16MM GYP. BD. 57MM METAL STUD, CAVITY FILLED WITH SOUND ATTENUATION BATT INSULATION. 16MM GYP. BD. 13MM BOARD FORMED CONCRETE VENEER. (COORDINATE W/ RM. FIN. SCH.S)
6A		INTERIOR PARTITION: WALL TYPE 6A: 140 SEMI SOLID CONCRETE BLOCK.
6B		INTERIOR PARTITION: WALL TYPE 6B: INT. FIN. (COORDINATE W/ RM. FIN. SCH.S) 16MM GYP. BD. 22MM FURRING CHANNEL 140 SEMI SOLID CONCRETE BLOCK.

Revision Schedule

No.	Date	Particular
1	2017.10.11	ISSUE FOR BUILDING PERMIT & TENDER
2	2017.08.22	ISSUE FOR CLIENT REVIEW
3	2017.10.06	ISSUE FOR CLIENT REVIEW
4	2017.10.12	ISSUE FOR TENDER
5	2017.10.23	ISSUE FOR ADDENDUM #1

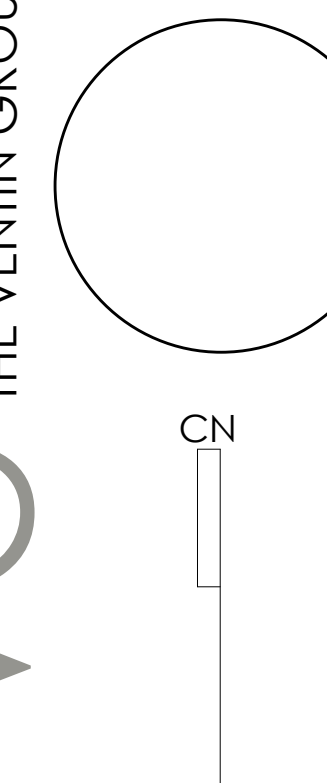
All dimensions and measurements must be checked and verified by the General Contractor.



Client:
Township of McNab Braeside

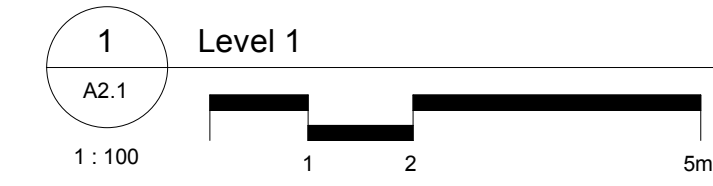
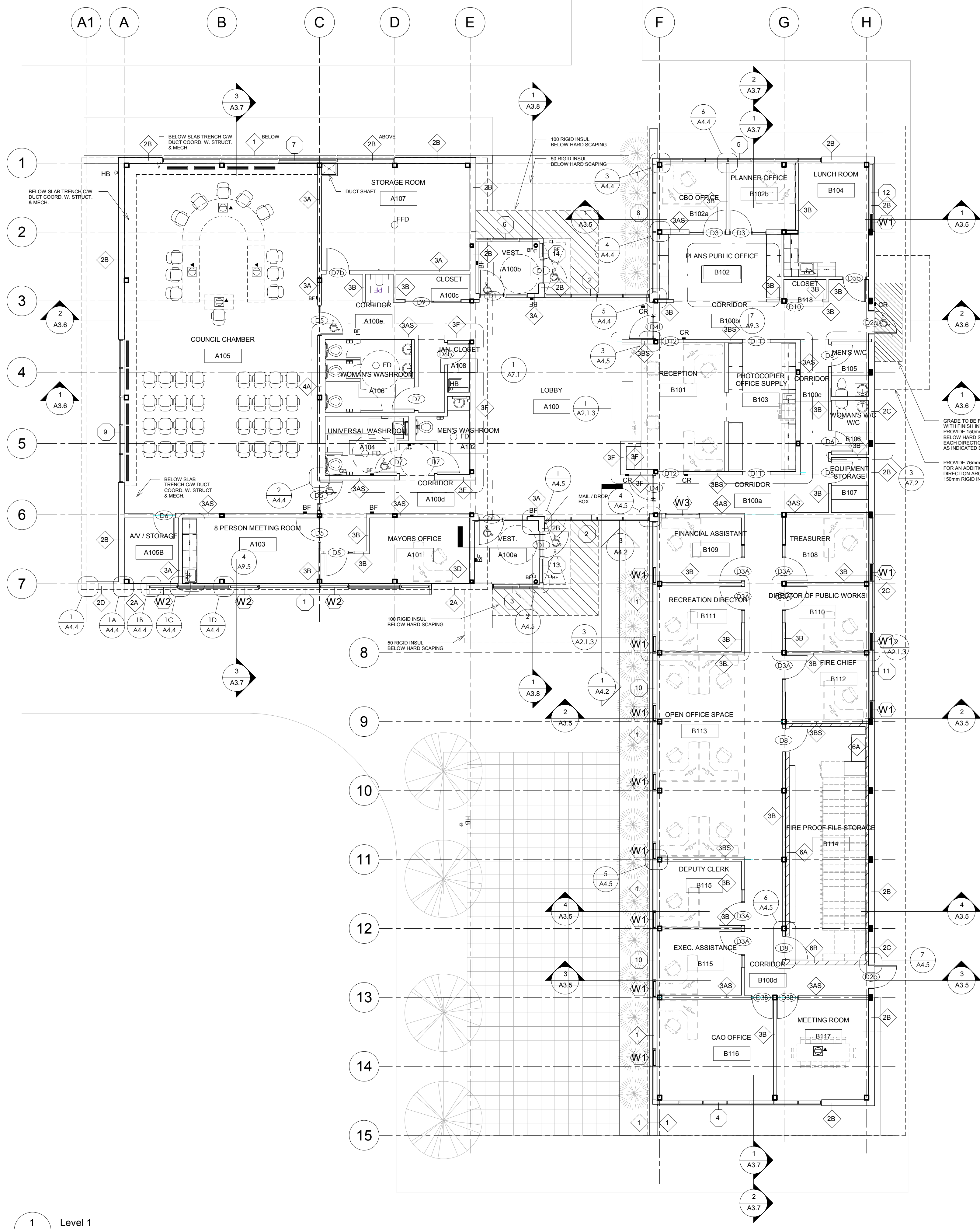
Project:
21688
McNab / Braeside Municipal Building
2473 RUSSETT DRIVE, ARNPRIOR,
ONTARIO K7S 3G8

+VVG ARCHITECTS
THE VENTIN GROUP LTD



CONSTRUCTION ASSEMBLIES

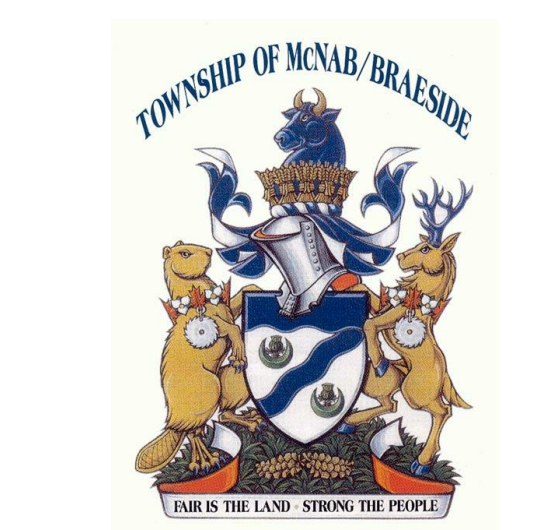
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- FLOOR PLAN LEGEND**
- ELEVATION REFERENCE
 - WALL SECTION REFERENCE
 - BUILDING SECTION REFERENCE
 - DATUM A/F/F LEVEL # (ABOVE FINISHED FLOOR)
 - GRID LINE
 - DOOR TYPE
 - DETAIL REFERENCE
 - EX. DOOR TO REMAIN
 - WINDOW #
 - CURTAIN WALL #
 - SCREEN #
 - ROOM NO.
 - WALL TYPE
 - FLR. TYPE
 - POWER DOOR OPENER
 - AREA OF REFUGE
- HATCH IDENTIFICATION MARKER LEGEND**
- 150mm INSUL. BELOW CONC. SLAB
 - OPEN TO ABOVE / BELOW
 - MILLWORK / FURNITURE NOT IN CONTRACT
 - LOWER MILLWORK / FURNITURE IN CONTRACT
 - UPPER MILLWORK / FURNITURE IN CONTRACT
 - CONCRETE FLR.
- WALL IDENTIFICATION MARKER LEGEND (COORD. W/ WALL TYPES)**
- EX. WALL SYSTEM TO REMAIN
 - NEW CONC. BLOCK WALL SYSTEM
 - NEW GYP. BD. ON METAL STUD WALL SYSTEM
 - NEW P/P CONC. WALL SYSTEM
 - NEW WD. STUD WALL SYSTEM
 - FIRE RATED SHAFT WALL SYSTEM
 - SCOPE OF WORK IN EX. AREAS
- WEeping TILE LEGEND**
- BELOW GRADE PERFORATED WEEPING TILE SYSTEM C/W FILTER FABRIC IN FREE DRAINING GRANULAR FILL (6m [20'] GRID TYP.) CONNECTED TO SUMP PIT W/ PUMP & DRAIN LINES (FILL ALL UNDERMINING W/ CONC. TYP.)
 - BELOW GRADE SOLID WEEPING TILE
- Legend for Symbols:**
- PUSH BUTTON FOR POWER DOOR OPERATOR: 610mm MIN. FROM THE DOOR SWING TOWARDS THE BUTTON TO 1500mm MAX. (925mm A/F/F TO CENTER OF BUTTON TYP.)
 - CARD READER (925mm A/F/F TO CENTER OF BUTTON TYP.)
 - EMERGENCY PUSH BUTTON (925mm A/F/F TO CENTER OF BUTTON TYP.) (450mm A/F/F TO CENTER OF BUTTON IN UNIV. WR. TYP.)
 - SECURITY KEYPAD (COORD. W/ ELEC. DWG.'S)
 - CALL BUTTON (925mm A/F/F TO CENTER OF BUTTON TYP.)
 - CONTROL PANEL (PROVIDE SHOP DWG.'S FOR REVIEW BY OWNER)
 - FIRE ANNUNCIATOR PANEL (COORD. FINAL RM. NAMES & #'S W/ OWNER)
 - FIRE EXTINGUISHER / FIRE EXTINGUISHER & CABINET (1500mm MAX. A/F/F TO TOP OF EXTINGUISHER FOR UNDER 18KG'S) VERIFY W/ LOCAL AUTHORITIES (1100mm MAX A/F/F TO TOP OF EXTINGUISHER OVER 18KG'S NOT EQUIP'D W/ WHEELS)
 - RECESSED FIRE HOSE CABINET (METAL STUD FRAME - INSTALL WALL THICKNESS TO ENSURE RECESS)
 - RECESSED CABINET HEATER (METAL STUD FRAME - INSTALL WALL THICKNESS TO ENSURE RECESS)
 - SURFACE CABINET HEATER
 - BASEBOARD HEATER
 - DATA SUPPLY (COORD. W. ELEC.)
 - EYE WASH STATION
 - RAIN WATER LEADER
 - HOSE BIB (800mm A/F GRADE)
 - FLR. DRAIN
 - DRINKING FOUNTAIN
 - LAVATORY (IN VANITY)
 - LAVATORY, WALL HUNG, BARRIER FREE
 - TOILET / WATER CLOSET / URINAL
 - MOP SINK W/ SHELF (HOSE BIB & 3/8" BACK SPLASH FULL HEIGHT (BOTH WALLS WHEN IN CORNER CONDITION) TO U/S MOP SHELF)
 - ROOF ACCESS LADDER HATCH
- SHOP DWG.'S TO BE IN DIMENSION UNITS AS ILLUSTRATED ON THIS DWG. OR THEY WILL BE REJECTED (IMPERIAL & METRIC BOTH SHOWN IS ACCEPTABLE)**

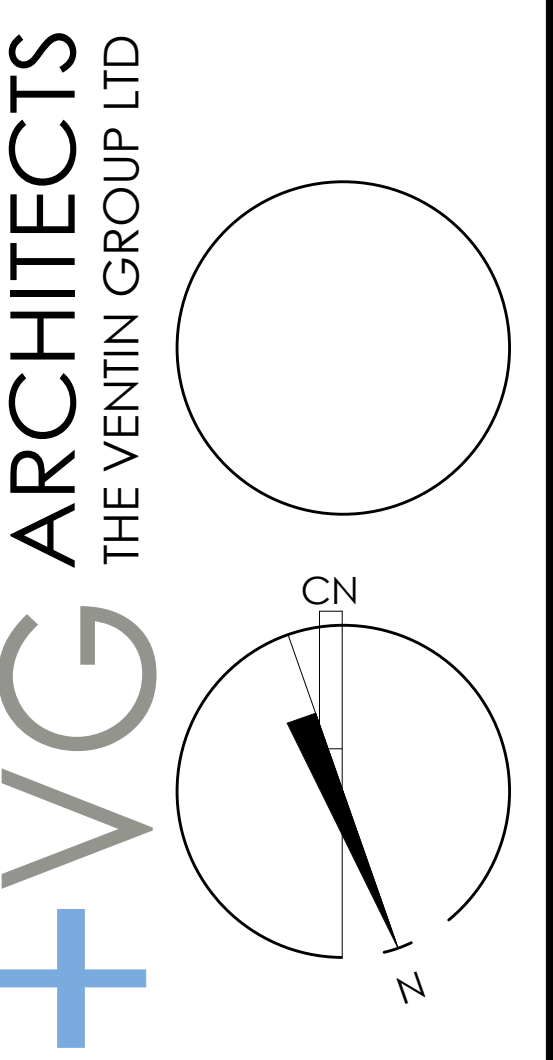
Revision Schedule		
No.	Date	Particular
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2	2017.08.22	ISSUE FOR CLIENT REVIEW
3	2017.10.06	ISSUE FOR CLIENT REVIEW
4	2017.10.12	ISSUE FOR TENDER
5	2017.10.23	ISSUE FOR ADDENDUM #1

All dimensions and measurements must be checked and verified by the General Contractor.



Client:
Township of McNab Braeside

Project:
21688
McNab / Braeside Municipal Building
2473 RUSSETT DRIVE, ARNPRIOR, ONTARIO K7S 3G8



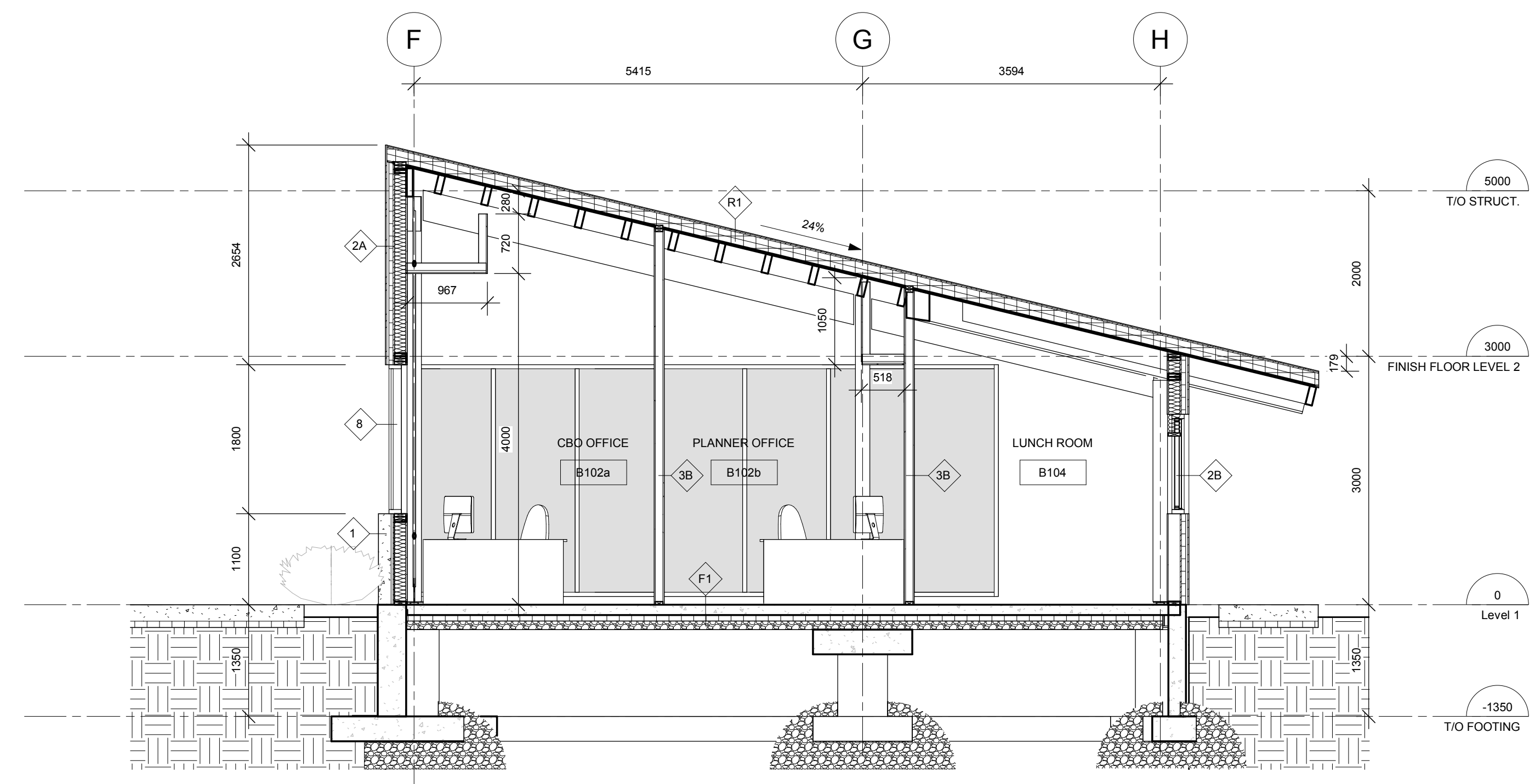
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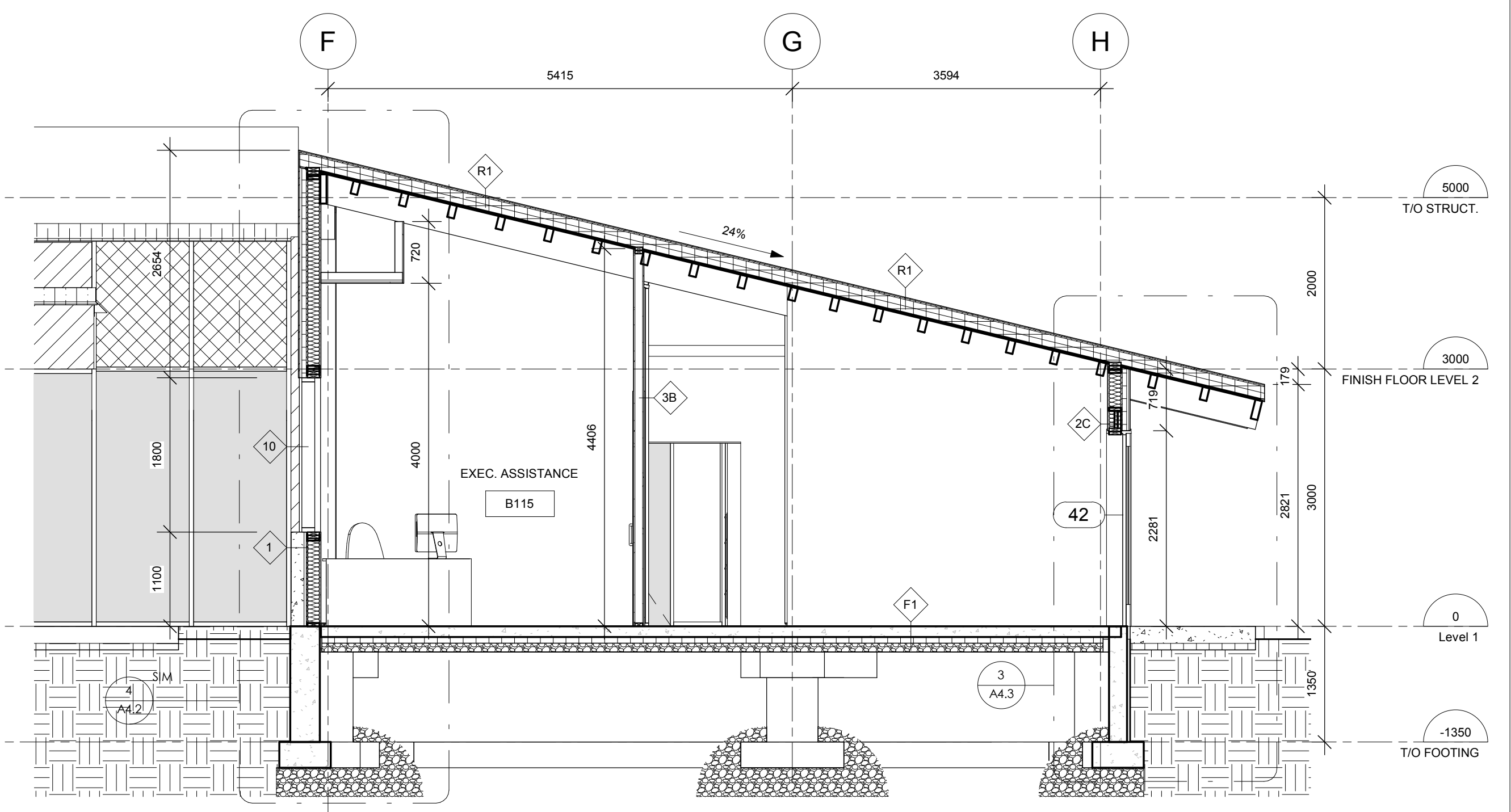
Revision Schedule

No.	Date	Particular
1	2017.10.11	ISSUE FOR BUILDING PERMIT & TENDER
2	2017.08.22	ISSUE FOR CLIENT REVIEW
3	2017.10.06	ISSUE FOR CLIENT REVIEW
4	2017.10.12	ISSUE FOR TENDER

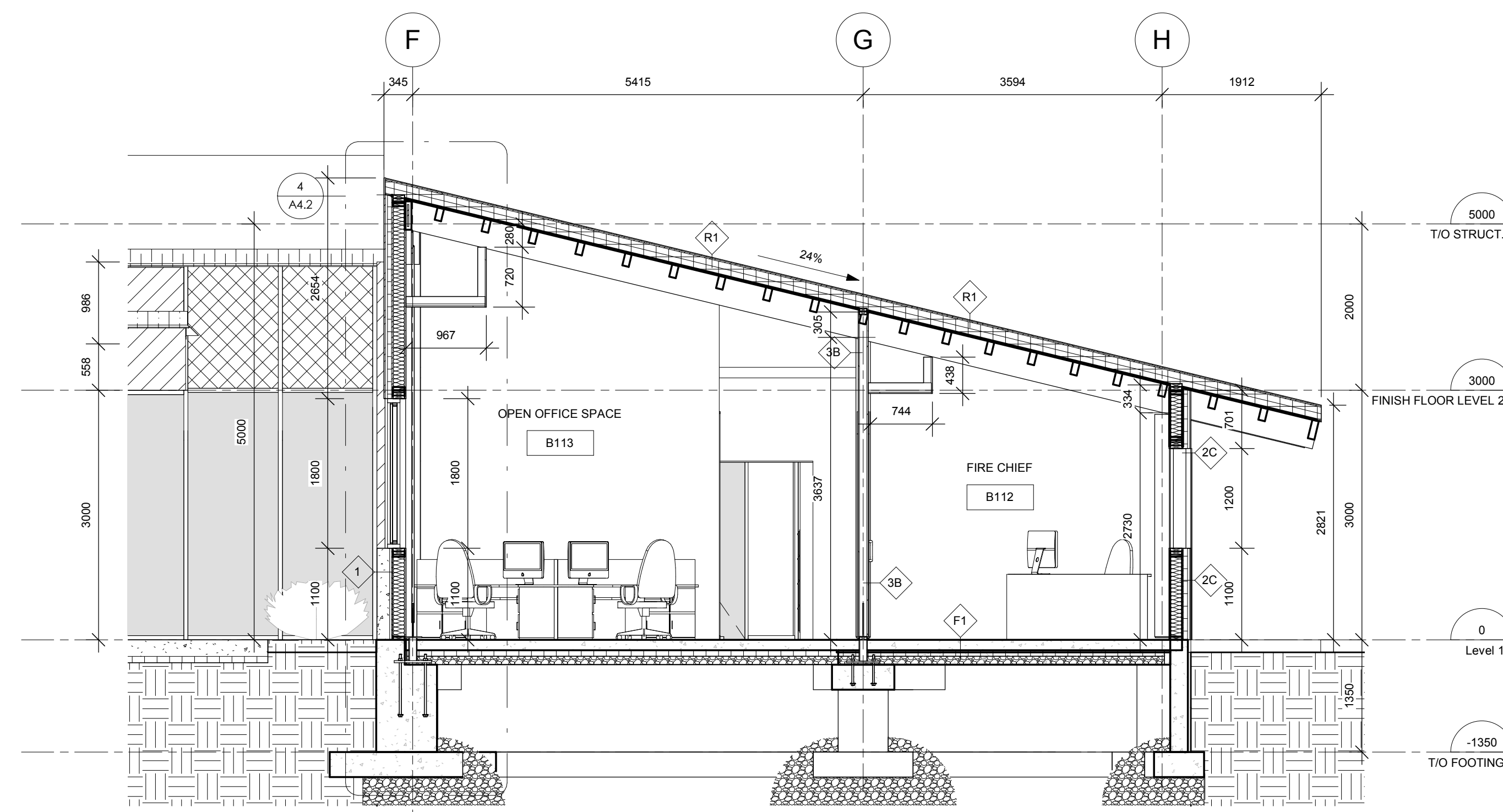
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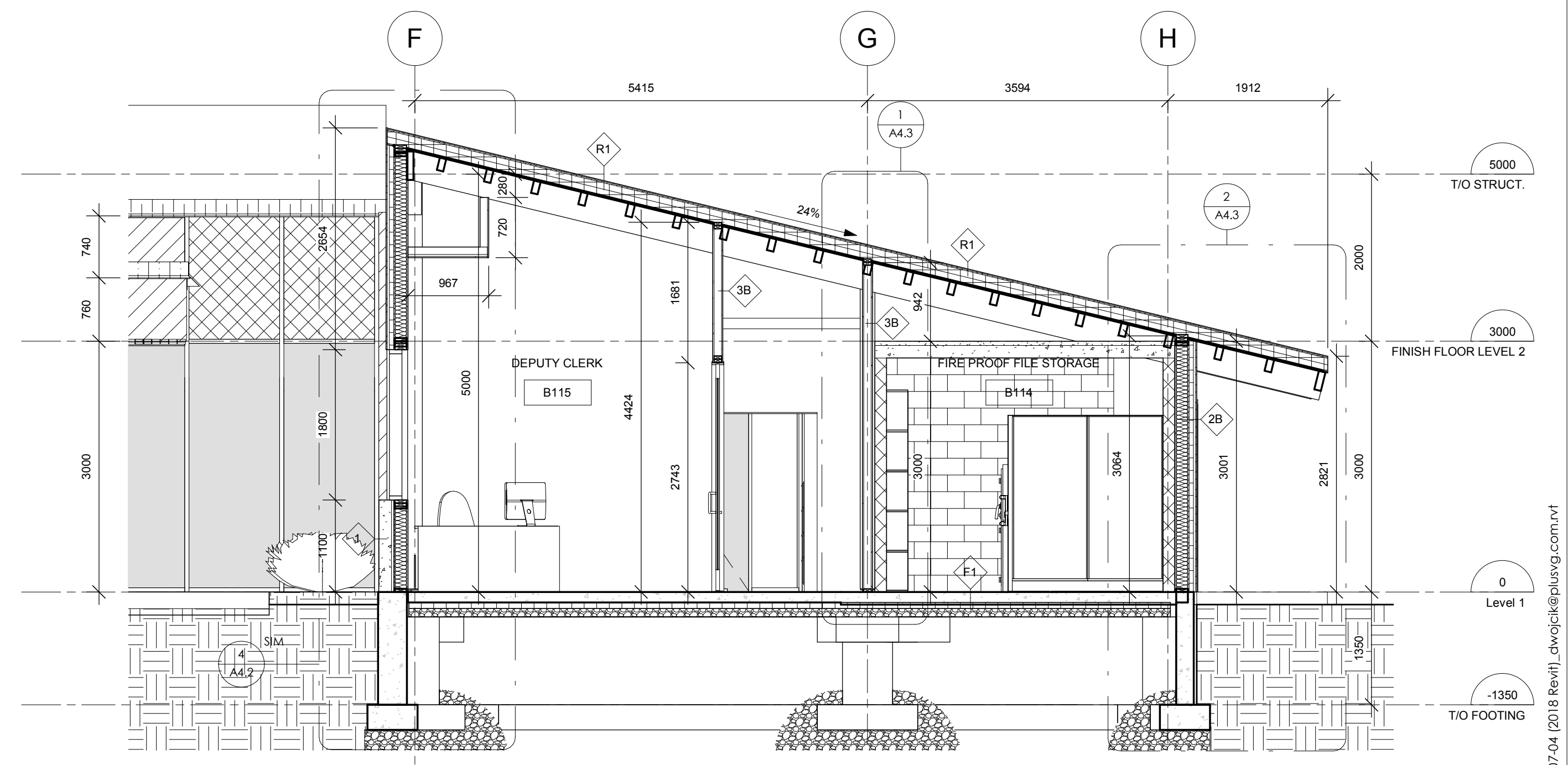
1 BUILDING SECTION 9
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3 BUILDING SECTION 8
1 : 50

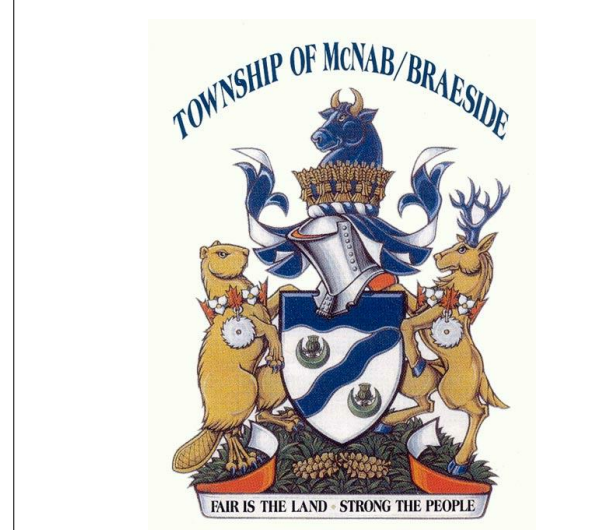


2 BUILDING SECTION 2
1 : 50



4 BUILDING SECTION 3
1 : 50

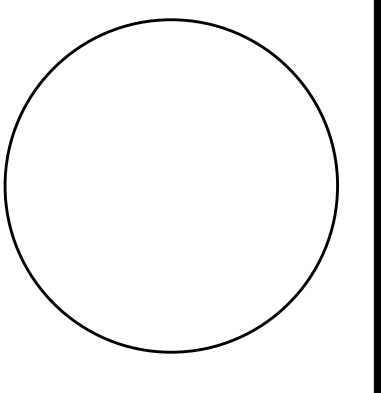
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Client:
Township of McNab Braeside

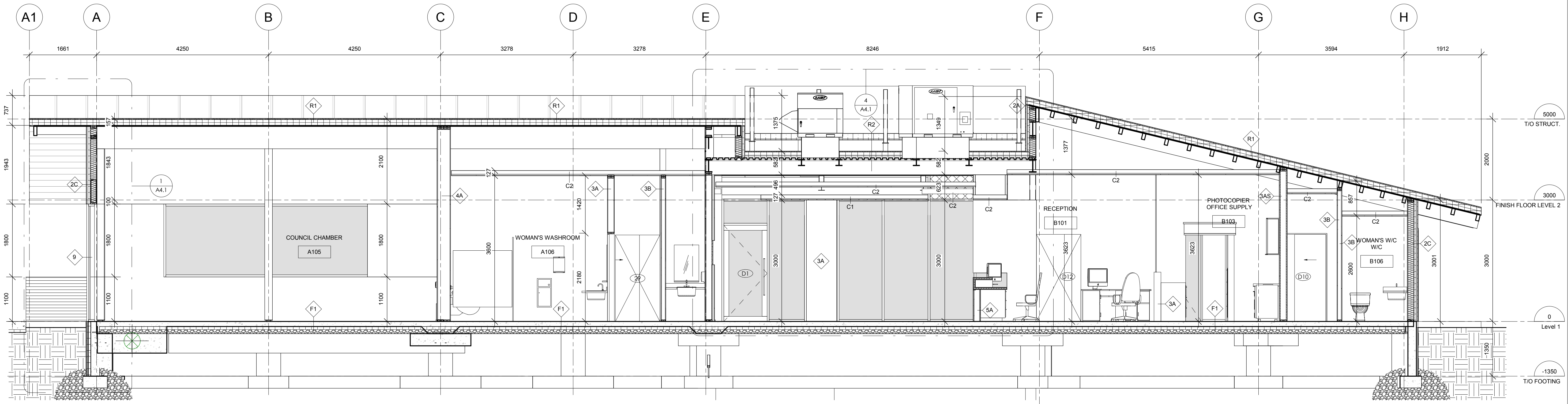
Project:
21688
McNab / Braeside Municipal Building
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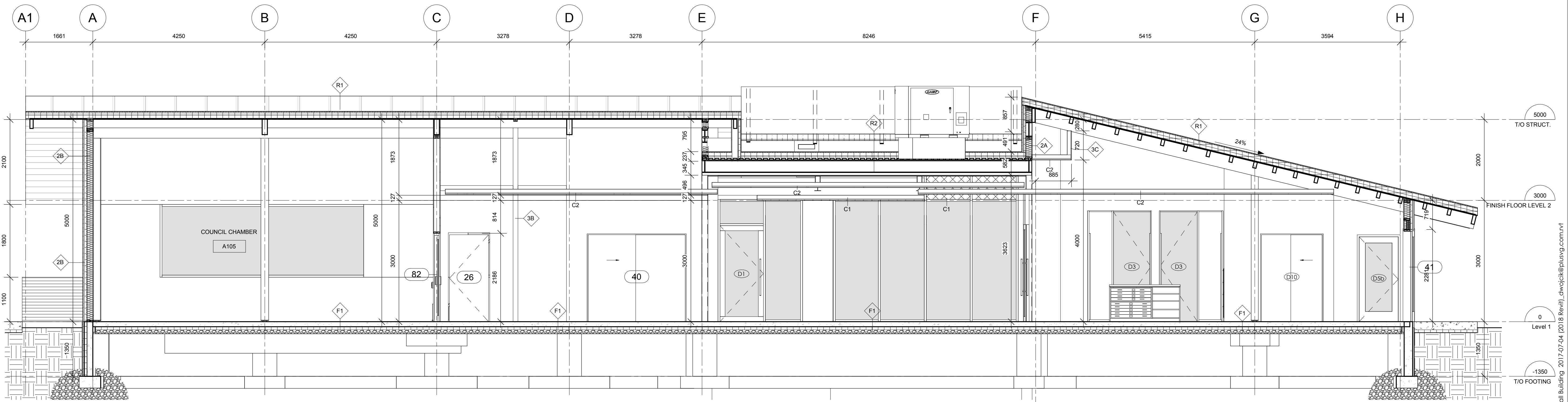


BUILDING SECTIONS

A3.5



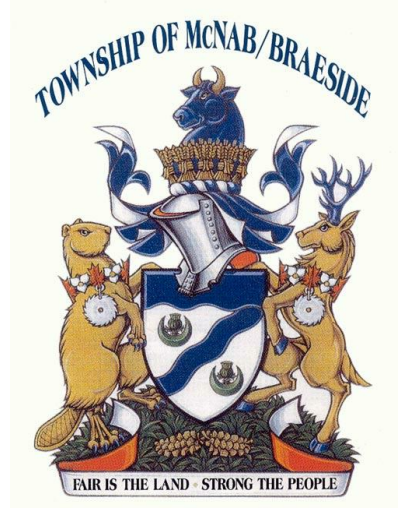
1 BUILDING SECTION 4
1 : 50



2 BUILDING SECTION 10
1 : 50

Revision Schedule		
No.	Date	Particular
1	2017.10.11	ISSUE FOR BUILDING PERMIT & TENDER
2	2017.08.22	ISSUE FOR CLIENT REVIEW
3	2017.10.06	ISSUE FOR CLIENT REVIEW
4	2017.10.12	ISSUE FOR TENDER

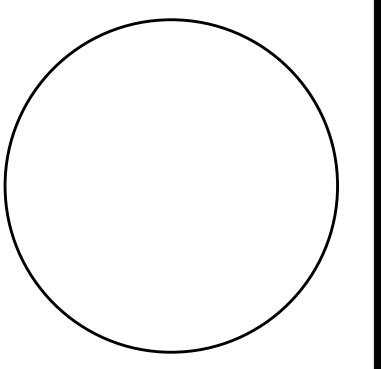
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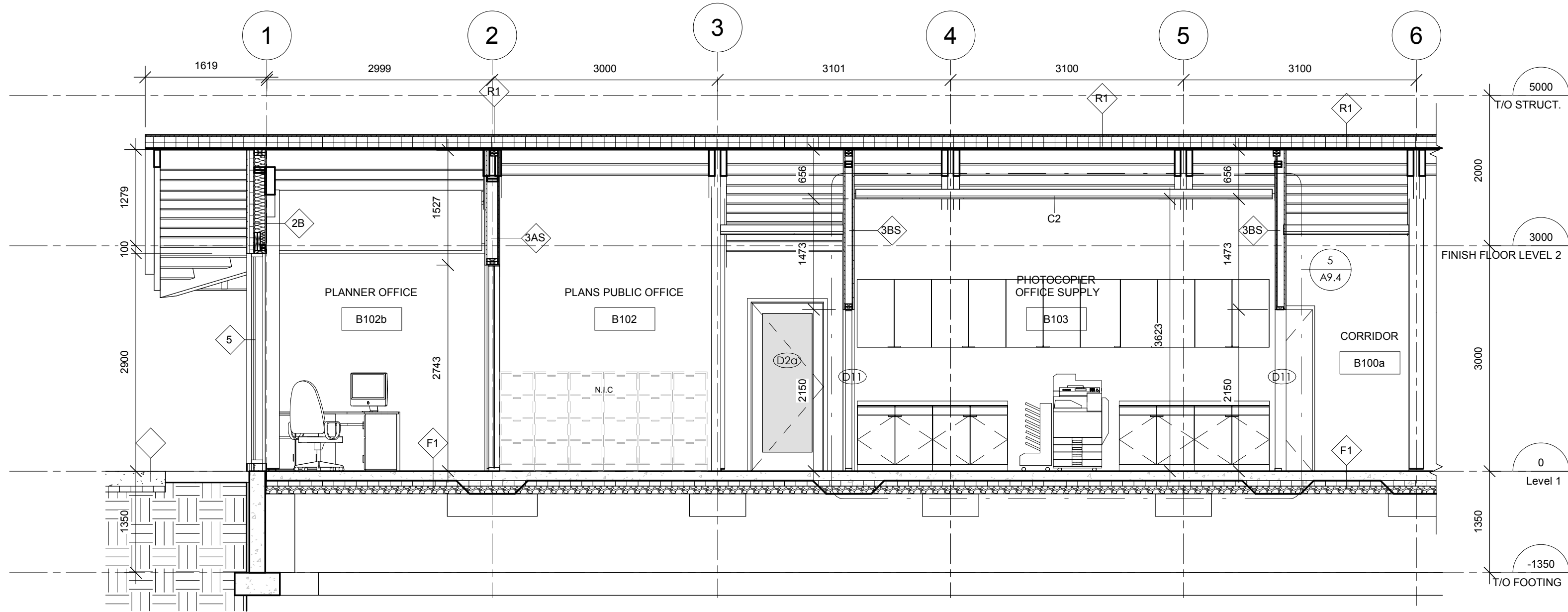
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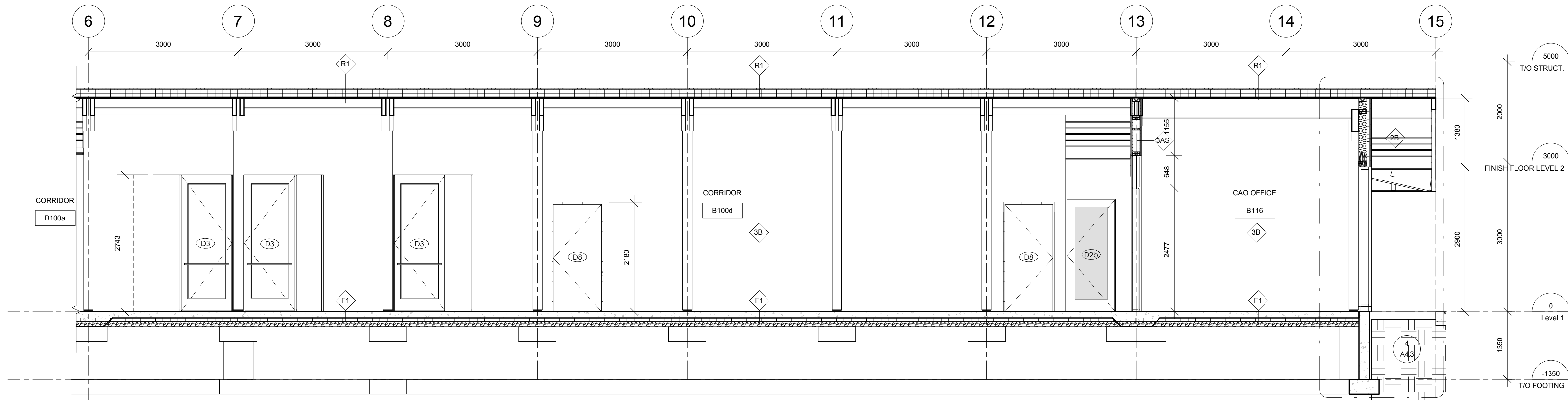


BUILDING SECTION

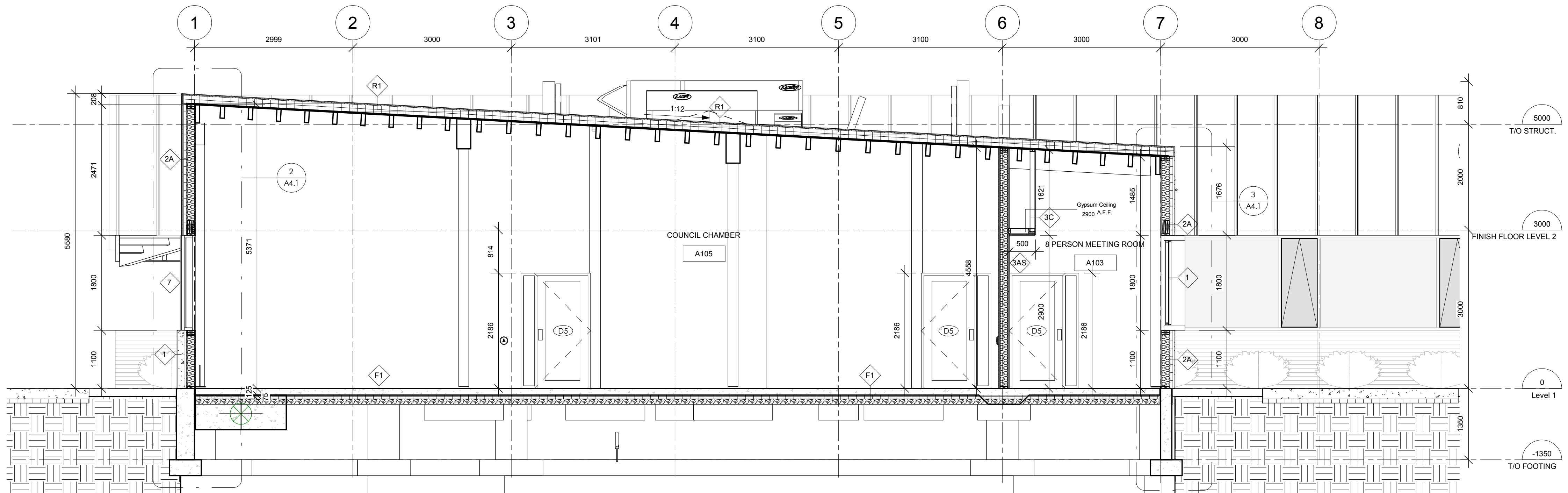
A3.6



1 BUILDING SECTION 6
1 : 50



2 BUILDING SECTION 6.2
1 : 50

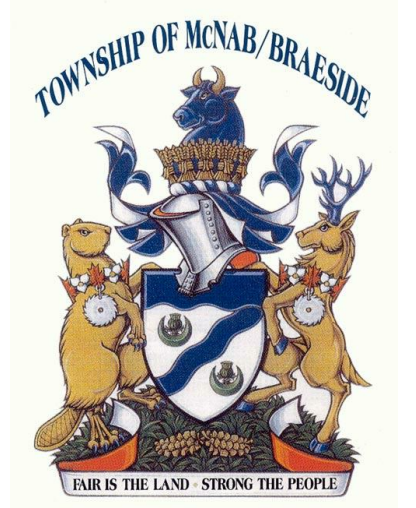


3 BUILDING SECTION 5
1 : 50

Revision Schedule

No.	Date	Particular
1	2017.10.11	ISSUE FOR BUILDING PERMIT & TENDER
2	2017.08.22	ISSUE FOR CLIENT REVIEW
3	2017.10.06	ISSUE FOR CLIENT REVIEW
4	2017.10.12	ISSUE FOR TENDER

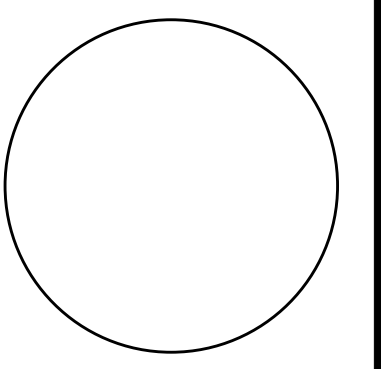
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Township of McNab Braeside

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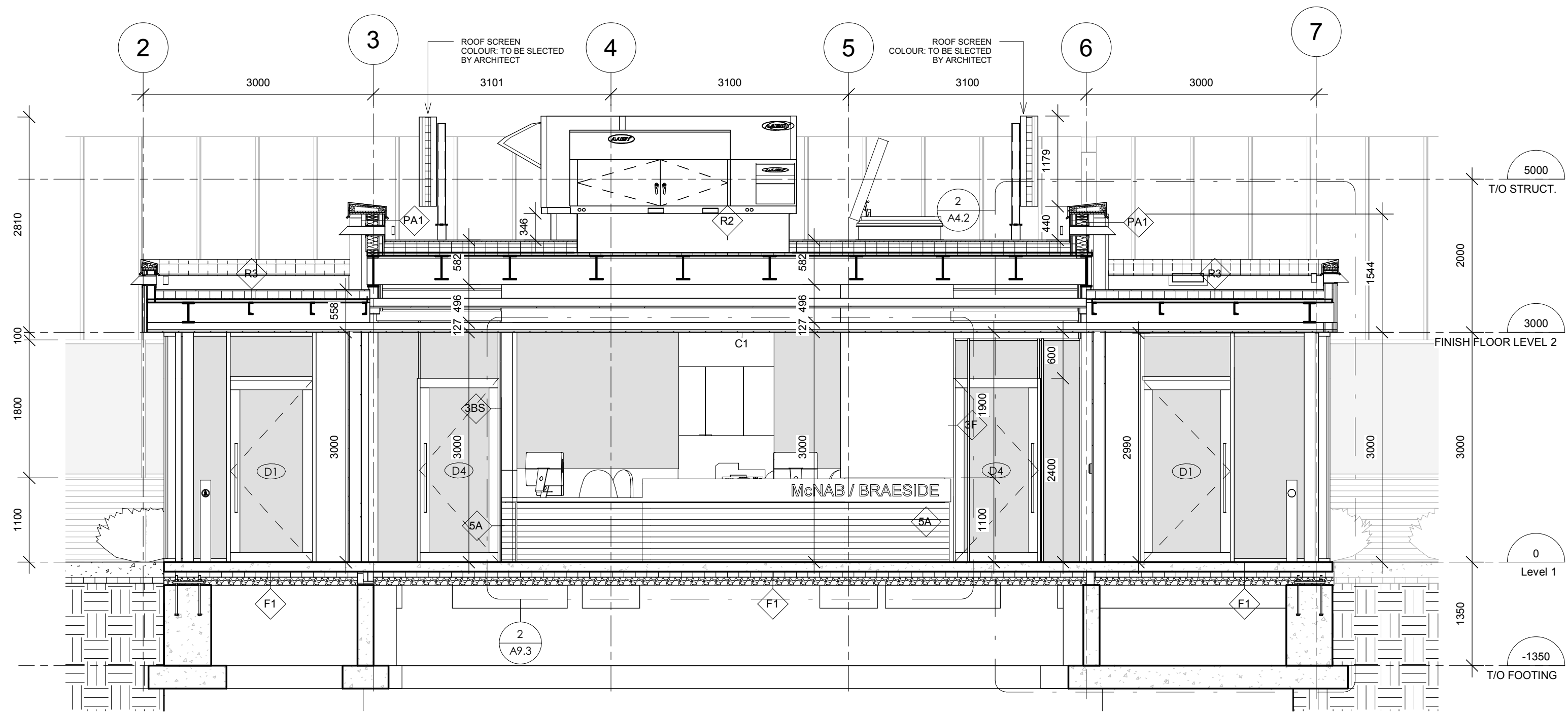
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BUILDING SECTION

A3.7

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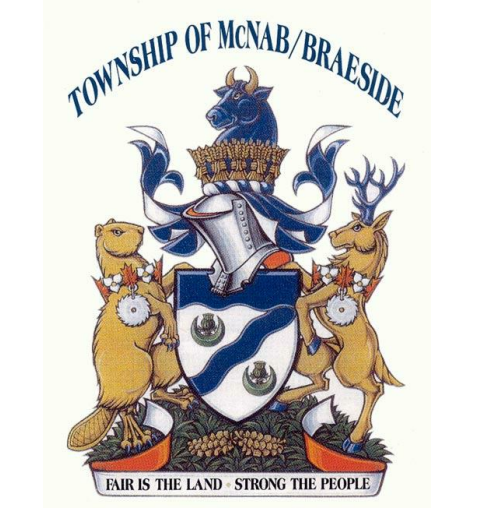


1 BUILDING SECTION 1
1 : 50

Revision Schedule

No.	Date	Particular
1	2017.10.11	ISSUE FOR BUILDING PERMIT & TENDER
2	2017.08.22	ISSUE FOR CLIENT REVIEW
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4	2017.10.12	ISSUE FOR TENDER

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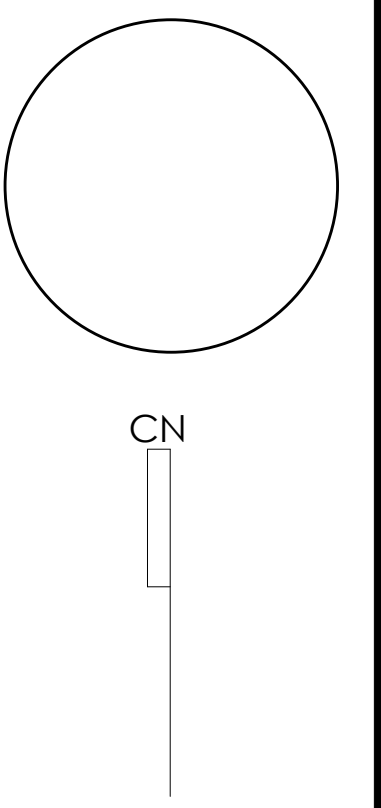


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A3.8

BUILDING SECTION

