NIAGARA FALLS SERVICE CENTRE IMPROVEMENTS FOR CITY OF NIAGARA FALLS

3200 STANLEY AVENUE



	DRAWING SCHEDULE
DWG NO	DRAWING TITLE
	ARCHITECTURAL
A0-100	ASSEMBLIES + LEGENDS, ROOM FINISH SCHEDULE AND EXISTING SITE PLANS
A0-200	OBC, EXITS + FRR PLANS
A2-100	FLOOR PLAN - EX. OFFICE, MECH. MEZZ & ROOF
A2-101	FLOOR PLAN - EX. SERVICE AREAS
A2-102	FLOOR PLAN — EX. EAST MEZZANINE
A2-103	FLOORING FINISH PLAN AND NOTES
A2-104	SHELVING LAYOUT
A2-105	SHELVING LAYOUT - MEZZ
A5-100	TYP. SECTION DETAILS
A7-100	DOOR + FRAME SCHEDULES & MECH. PENTHOUSE SECTION
A8-100	TYP. REPAIR PHOTOS
-	

A8-101	TYP. REPAIR PHOTOS
	STRUCTURAL
S1	FOUNDATION PLAN SECTION NOTES
S2	GROUND FLOOR PLAN — LOADS
S3	MEZZANINE PLAN JOIST ELEVATION, SECTIONS AND DETAILS
S4	CONDENSER UNIT PLAT. FRAMING PLAN, OFFICE ROOF & MECH PLANS, GENERATOR PAD AND SECTIONS
S5	TYPICAL DETAILS
SP1	PLAN VIEW SECTIONS AND DETAILS, SPECIFICATIONS
	MECHANICAL
M-100	LEGENDS AND SCHEDULES
M-101	SCHEDULES 2
M-102	DETAILS
M-103	CONTROLS 1
M-104	CONTROLS 2

M-105	SPECIFICATIONS 1
M-106	SPECIFICATIONS 2
M-200	NATURAL GAS SCHEMATIC
M-201	DEMOLITION PLUMBING SERVICE CENTRE
M-202	DEMOLITION PLUMBING EAST GROUND FLOOR AND MEZZANINE
M-210	WASTE OIL PLUMBING PLAN
M-211	REVISED PLUMBING SERVICE CENTRE
M-212	REVISED PLUMBING EAST GROUND FLOOR AND MEZZANINE
M-300	DEMOLITION HVAC GROUND FLOOR AND MECHANICAL MEZZANINE
M-301	DEMOLITION HVAC SERVICE CENTRE
M-302	DEMOLITION HVAC EAST GROUND FLOOR AND MEZZANINE
M-303	DEMOLITION HVAC WEST ROOF
M-304	DEMOLITION HVAC ROOF CENTRAL
M-305	DEMOLITION HVAC EAST ROOF

M-310	REVISED HVAC GROUND FLOOR AND MECHANICAL MEZZANINE
M-311	REVISED HVAC SERVICE CENTRE
M-312	REVISED HVAC EAST GROUND FLOOR AND MEZZANINE
M-313	REVISED HVAC WEST ROOF
M-314	REVISED HVAC CENTRAL ROOF
M-315	REVISED HVAC EAST ROOF
M-320	REVISED HVAC EAST GROUND FLOOR AND MEZZANINE SECTIONS
	ELECTRICAL
E000	GENERAL NOTES, DRAWING LIST, LEGEND ND FIXTURE SCHEDULE
E100	SITE PLAN
E200	DEMOLITION LIGHTING — GROUND FLOOR AND MECHANICAL MEZZANINE
E201	DEMOLITION LIGHTING — SERVICE CENTRE
E202	DEMOLITION LIGHTING — EAST GROUND FLOOR AND MEZZANINE
E300	REVISED LIGHTING — GROUND FLOOR AND MECHANICAL MEZZANINE

E301	REVISED LIGHTING — SERVICE CENTRE
E302	REVISED LIGHTING — EAST GROUND FLOOR AND MEZZANINE
E400	DEMOLITION POWER & SYSTEMS — GROUND FLOOR AND MECHANICAL MEZZANINE
E401	DEMOLITION POWER & SYSTEMS - SERVICE CENTRE
E402	DEMOLITION POWER & SYSTEMS — EAST GROUND FLOOR AND MEZZANINE
E403	DEMOLITION POWER & SYSTEMS - WEST ROOF
E404	DEMOLITION POWER & SYSTEMS — CENTRAL ROOF
E405	DEMOLITION POWER & SYSTEMS — EAST ROOF
E406	DEMOLITION POWER & SYSTEMS — MUNICIPAL TRUCK WASH AND SMALL ENGINE BUILDING
E500	REVISED POWER & SYSTEMS — GROUND FLOOR AND MECHANICAL MEZZANINE
E501	REVISED POWER & SYSTEMS — SERVICE CENTRE
E502	REVISED POWER & SYSTEMS — EAST GROUND FLOOR AND MEZZANINE
E503	REVISED POWER & SYSTEMS - WEST ROOF
E504	REVISED POWER & SYSTEMS - CENTRAL ROOF

REVISED POWER & SYSTEMS — EAST ROOF
REVISED POWER & SYSTEMS — MUNICIPAL TRUCK WASH AND SMALL ENGINE BUILDING
DEMOLITION SINGLE LINE DIAGRAM
NEW SINGLE LINE DIAGRAM
ELECTRICAL DETAILS
PANEL SCHEDULES

GENERAL NOTES RAIMONDO + ASSOCIATES

ARCHITECTS INC Electrical Engineering

4	ISSUED FOR CONSTRUCTION	MAY 07, 2021	P.G.
3	ISSUED FOR TENDER	FEB. 26, 2021	P.G.
2	RE-ISSUED FOR PERMIT	DEC. 03, 2020	P.G.
1	RE-ISSUED FOR PERMIT	NOV 06, 2020	P.G.
0	ISSUED FOR PERMIT	SEPT 4, 2020	P.G.
No.	DESCRIPTION	DATE	BY
	REVISIONS	3	



1100 South Service Rd., #417 Stoney Creek ON L8E 0C5 T ● (905) 643-8530 F ● (905) 643-8510

www.arcengineering.ca contact@arcengineering.ca

PROJECT:

NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

2020 03 24	M.B.	P.G.
0000 00 04		D 0
START DATE:	DRAWN BY:	DESIGNED BY:

DRAWING TITLE:

COVER SHEET

SCALE:	DRAWING No.:
N.T.S.	
DDO IECT:	H G-000
PROJECT:	
20-201-010	
I	

19 Existing Carpentry/Construction Crew Lunchroom

24 Existing Meter Testing

25 Existing Enviro. Shop

61 Existing Maintenance Garage

61a Existing Garage Storage

42 Existing Lunchroom

49 Locker Room

63 Existing Welding

64 Existing Carpentry

65 New Parts Counter

66 Existing Exit Stair #

73 Existing Washroom

74 Existing Stores

76 Existing Stores

100 Existing Office

102A Existing Office

104 Existing Office

101 Existing Corridor

103 New Mech. Room

67 New Carpentry Office

78 Existing Stores Office

L1a	- 3 1/2" concrete	C01	5/8" type x gypsum board
	- 1 1/2" metal decking		7/8" furring channel
	- 3/4 hour intumescent paint, refer to spec's		5/8" type x gypsum board
5 No 4 5 7 1 5 7 1 4 1	Refer to structural drawings.		5/8" type x gypsum board
	Relef to structural drawings.		- 1 coat prime plus 2 coats of paint, colour TBD by owner - Refer to spec's & room finish schedule for locations
-VALUE		R-VALUE	
TIRE RATING 3/4		FIRE RATING 1 HR	
STC RATING		STC RATING	
LC LISTING		ULC LISTING	(OBC SB-2 TABLE 2.3.12)
Floor Type Legen	<u>d</u>	Ceiling Type Lege	end_
Ex.	Existing construction to remain, patch and repair as	Ex.	Existing construction to remain, patch and repair as
	required, report any issues to architect.		required and maintain fire rating.
			Report any issues to architect (site verify)
	- 1 coat prime plus 2 coats of paint, colour TBD by owner - Refer to spec's & room finish schedule for locations		- 1 coat prime plus 2 coats of paint, colour TBD by owner
	(site verify)		- Refer to spec's & room finish schedule for locations
	(=== :5:;)		
R-VALUE		R-VALUE	
IRE RATING		FIRE RATING 3/4	
TC RATING		STC RATING	
ILC LISTING		ULC LISTING	
x.	Existing 7-1/2" concrete block to remain, patch and repair to maintain fire rating. (site verify)	P01	New construction to match existing (site verify)
	- Block filer, paint and high glazed coating, colour TBD by		5/8" type x gypsum board
	owner.		3 5/8" metal studs at 16" o/c fill w/stone wool insulation
	- Refer to spec's & room finish schedule for locations		5/8" type x gypsum board
	(OBC SB-2 T-2.1.1)		- 1 coat prime plus 2 coats of paint, colour TBD by owner - Refer to spec's & room finish schedule for locations
R-VALUE	(OBC 3B-2 1-2.1.1)	R-VALUE	- Relet to spec's a room initial schedule for locations
FIRE RATING 2		FIRE RATING 3/4	
STC RATING		STC RATING	
JLC LISTING		ULC LISTING W407	
N 1	New 7-1/2" concrete block to match existing and maintain fire rating. (site verify)	P02	5/8" type x gypsum board 3 5/8" metal studs at 16" o/c fill w/stone wool insulation
	- Block filer, paint and high glazed coating, colour TBD by		5/8" type x gypsum board
	owner.		- 1 coat prime plus 2 coats of paint, colour TBD by owner
	- Refer to spec's & room finish schedule for locations	[XXXXXXX]_YXXXXXXXX]_XXXXXX	- Refer to spec's & room finish schedule for locations
	Refer to structural drawings		(provide P.Eng shop drawings with seismic reinforcement)
R-VALUE	(OBC SB-2 T-2.1.1)	R-VALUE	Note:
FIRE RATING 2		FIRE RATING 1	New partition in existing location, refer to floor plan notes
STC RATING		STC RATING	
JLC LISTING		ULC LISTING W407	
N2	New 7-1/2" concrete block	P03	5/8" type x gypsum board 6" metal studs at 16" o/c fill w/stone wool insulation
	Refer to structural drawings		5/8" type x gypsum board
	- Block filer, paint and high glazed coating, colour TBD by		- 1 coat prime plus 2 coats of paint, colour TBD by owner
×××××××	owner Refer to spec's & room finish schedule for locations		- Refer to spec's & room finish schedule for locations
	The te appear a room milest serious for locations		(provide P.Eng shop drawings with seismic reinforcement)
R-VALUE	OBC SB-2 T-2.1.1)	R-VALUE	
IRE RATING 2	·	FIRE RATING 1	
STC RATING		STC RATING	
JLC LISTING		ULC LISTING W453	
W3	New vertical pre-finished metal siding to match existing. (provide sample for approval)		
	- 8" metal studs at 24" o/c fill w/3" (R-18) spray foam		
 	insulation		
	- 1/2" cement board		
7.77	Note:		
	Match existing construction, site verify		
R-VALUE	Refer to structural drawings.		
IDE DATINO	I	1	

North Wall

North Wall Finish

Paint

Paint

Paint

Ex. Paint / New Paint

N/A.

Paint

Paint

Paint

Paint

N/A.

N/A.

Paint

Paint

Paint

Paint

Paint

Paint

Paint

Paint

N/A.

N/A.

N/A.

N/A.

N/A.

N/A.

N/A.

Paint

Paint

Paint

N/A.

N/A.

Paint

North Wall Material

Ex. Con. Block

Ex. Con. Block

Ex. Con. Block

Ex. GWB / New GWB

Ex. Con. Block & New Con. Board

Ex. Con. Block & New Con. Board

Ex. Con. Block & New Con. Board

Ex. Con. Block

Ex. Con. Block

Ex. Con. Block

Ex. Con. Block

Ex. Con. Block & New Con. Board

Ex. GWB / New GWB

Ex. GWB

Ex. GWB / New GWB

Ex. GWB / New GWB

New GWB

N/A.

N/A.

New GWB

Floor Finish

Cash Allowance

Existing

Existing

Cash Allowance

Cash Allowance

Existing

Existing

Cash Allowance

Cash Allowance

N/A.

Cash Allowance

Cash Allowance

Cash Allowance

Cash Allowance

Existing / Repair as Required

N/A.

N/A.

Conc.

N/A.

N/A.

Existing

FIRE RATING

STC RATING

ULC LISTING

Wall Type Legend

Refer to spec's

Cash Allowance

Existing / New Match Existing | Existing / Repair as Required

Existing / New Match Existing | Existing / Repair as Required

N/A

Existing / New Match Existing

Existing / New Match Existing

Paint

- REFER TO STRUCTURAL DWGS FOR REINFORCEMENT. ALL WALLS EXTEND TO U/S OF ROOF DECK OR FLOOR STRUCTURE
- ABOVE UNLESS NOTED OTHERWISE ALL GWB MATERIALS TO RECIEVE 1 COAT PRIME + 2 COATS OF
- PAINT UNLESS NOTED OTHERWISE.

Existing Truck Wash Bay,

Existing

Service

Centre

APPROX. location of trench for new

electrical services, patch and repair

existing asphalt/fill/granular for new work.

Site verify and refer to electrical drawings

Existing power operated gate, coordinate

with underground ducts.

Ex. elec. transformer and pad to be removed and

infill to match existing. Refer to ele. drawings

APPROX. 750' of temp. fencing,

coordinate with overhead doors and

emergency exits, refer to spec's.

(site verify and coordinate with owner)

Existing Fire Truck and Snow Equipment

ROUTE to be keep clear at all times

Existing Fire Route

Small Engine & Office

WALL TYPE ASSEMBLY NOTES

May 7, 2021 Issued for Construction

Remarks

Repair walls/ceiling for new paint finish

Repair walls/ceiling for new paint finish Report any issues to Architect.

Repair walls/ceiling for new paint finish

Repair walls/ceiling for new paint finish

Repair walls/ceiling for new paint finish

Patch and repair for new work

Report any issues to Architect.

Patch and repair for new work

Patch and repair for new work Report any issues to Architect.

Patch and repair for new work

Patch and repair for new work

Report any issues to Architect.

Repair walls/ceiling for new paint finish

Repair walls/ceiling for new paint finish

Repair walls/ceiling for new paint finish

Existing Storage & Bays -

Revisions

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RAIMONDO + ASSOCIATES

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City of Niagara Falls **Municipal Service Centre** 3200 Stanley Ave, Niagara Falls

DRAWN BY: CHECKED:

Assemblies + Legends,

Room Finish Schedule and **Existing Site Plan**

SCALE: As indicated PROJECT NO.: 20-055

5/5/2021 8:51:50 AM

A0-100

FOR ALL MECHANICAL SERVICES REFER TO MECHANICAL PLANS FOR ALL STRUCTURAL SERVICES REFER TO STRUCTURAL PLANS FOR ALL ELECTRICAL SERVICES REFER TO ELECTRICAL PLANS. EXTERIOR WALL DIMENSIONS SHOWN ARE TAKEN TO THE EXPOSED FACE OF MASONRY VENEER, INSIDE FACE OF CONCRETE BLOCK AND THE CENTERLINE OF OPENING UNLESS NOTED OTHERWISE. INTERIOR DIMENSIONS SHOWN ARE TAKEN TO THE FACE OF METAL STUD, CONCRETE BLOCK AND THE CENTERLINE OF PLUMBING FIXTURES UNLESS NOTED OTHERWISE ALL EXPOSED INTERIOR GWB FINISHES SHALL BE TAPED, FILLED, SANDED AND MADE GOOD FOR FINISH UNLESS NOTED OTHERWISE. REFER TO DRAWINGS A0-200 FOR REQUIRED FIRE SEPARATIONS AND FIRE RESISTANCE RATINGS OF FLOORS AND SUPPORTING ASSEMBLIES REFER TO FLOOR PLANS FOR ALL DOOR AND SCREEN NUMBERS & LOCATIONS. ALL DIMENSIONS TO BE SITE VERIFIED. SCAN/X-RAY ALL PENETRATIONS THROUGH WALLS OR FLOORS.

West Wall

West Wall Finish

Paint

Paint

Existing

Ex. Paint / New Paint

Paint

Paint

Paint

N/A.

Paint

Paint

Paint

Paint

Paint

Paint

Ceiling Material

Ex. Con Slab

Ex. Con Slab

Ex. Con Slab

Existing

Ex. Con Slab

Ex. Con Slab / Metal Deck

Ex. Con Slab

Ex. / Metal Deck

Metal Deck

Ex.T-Bar

Ex.T-Bar

Open

Ex.T-Bar

FR GWB

Ceiling Finish

Paint

Paint

Existing

Ceiling Tile

Open

Ceiling Tile

Paint

West Wall Material

Ex. Con. Block

Ex. Con. Block

Ex. Con. Block & New Con. Block

Existing

Ex. Con. Block

N/A.

Ex. Con. Block & New Con. Block

Ex. Con. Block & New Con. Block

Ex. Con. Block & New Con. Block

Ex. Con. Block & New Con. Block & GWB

Ex. Con. Block & New Con. Block

N/A.

Ex. GWB / New GWB

Ex. GWB / New GWB

Ex. GWB

N/A.

N/A.

N/A.

Ex. Con. Block

Ex. Con. Block

Ex. Con. Block

N/A.

N/A.

Ex. GWB

ALL DRAWINGS AND SPEC'S ARE TO BE READ AS A COMPLETE

Specified OR Specification Sprinkler or Speaker Stainless Steel Sound Transmission Coefficient

Structure or Structural Tongue And Groove Top Of Concrete Top Of Steel Toilet Paper Dispenser Telephone/Data

T&G TO TOC TOS TPD T/D TYP UNO U/S VIF

Unless Noted Otherwise Verify In Field With Wood

Room Finish Schedule

Ex. Paint / New Paint | Ex. Con. Block & New Con. Block / Board

South Wall

South Wall Finish

Paint

Existing

N/A.

Paint

N/A.

N/A.

Paint

Paint

Paint

N/A.

N/A.

Paint

OVERALL PROJECT GENERAL NOTES:

Paint / New Paint

South Wall Material

Ex. Con. Block

Ex. Con. Block & New Con. Block

Ex. Con. Block

Ex. Con. Block & New Con. Block / Board

Ex. Con. Block

Ex. GWB / New GWB

Ex. GWB

Ex. GWB / New GWB

Ex. GWB

Ex. GWB

New GWB

New Con. Board

N/A.

N/A.

Ex. GWB

Con. Block and New Con. Board

East Wall

East wall Finish

Paint

Paint

Ex. Paint / New Paint

Paint

N/A.

Paint

Paint

Paint

Paint

Paint

N/A

Paint

N/A

N/A.

Paint

East Wall Material

Ex. Con. Block

Ex. Con. Block & New Con. Block

Ex. Con. Block & New Con. Block

Ex. Con. Block

Ex. Con. Block

Ex. Con. Block & New Con. Block

Ex. Con. Block & New Con. Block

Ex. Con. Block

Ex. Con. Block & New Con. Block

Ex. Con. Block & New Con. Block

New GWB

New GWB

Ex. GWB

Ex. GWB

New GWB

N/A

N/A.

Ex. GWB

1 Ex. Site Plan A0-100 scale: 1" = 60'-0"

New ele. transformer,

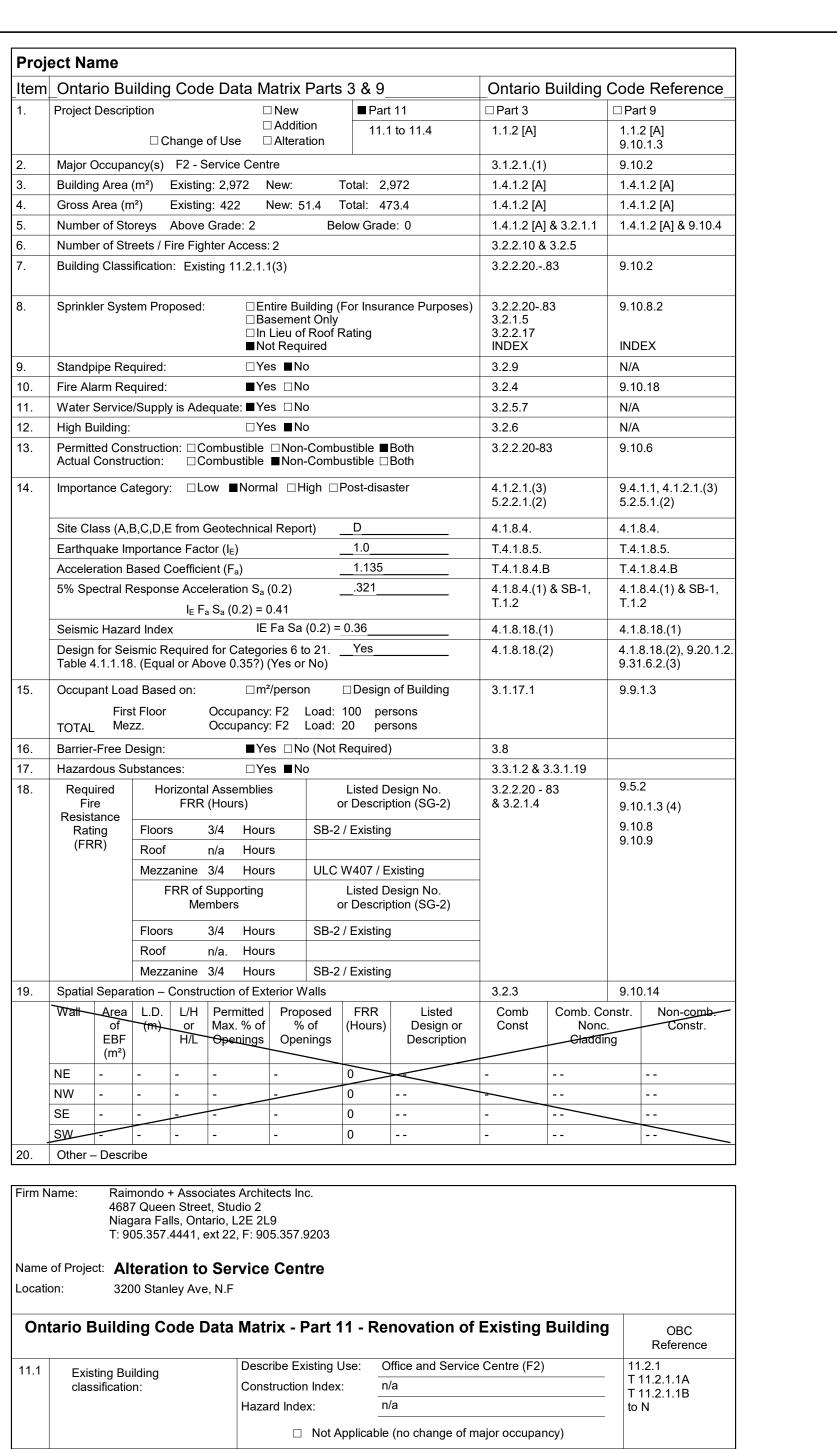
refer to ele. drawings

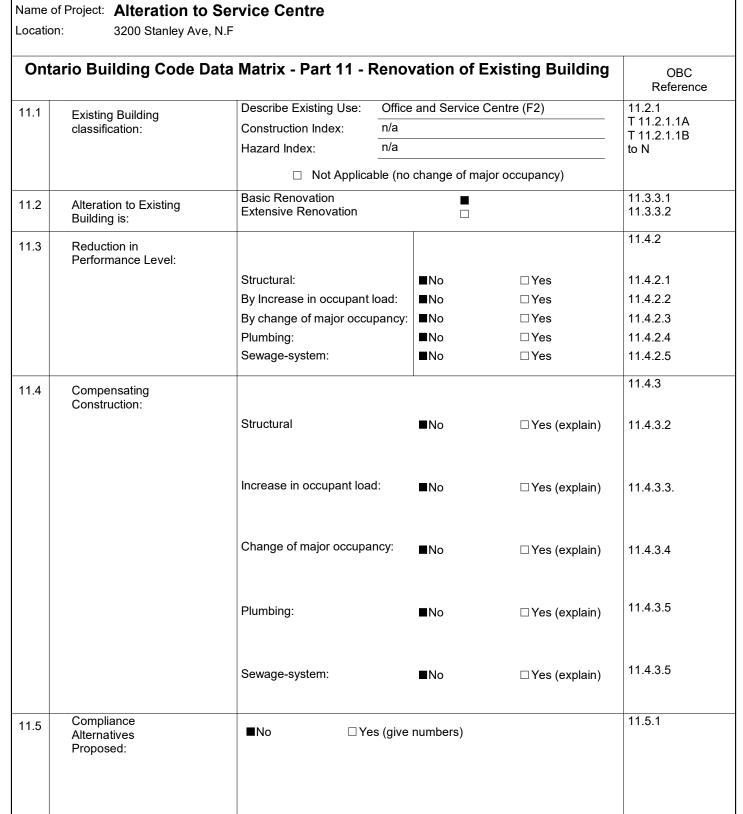
New generator, refer

to ele. drawings /

Provide City of Niagara Falls with 10 business days prior to work starting in areas where staff may have to be relocated. (Hydro Upgrades)

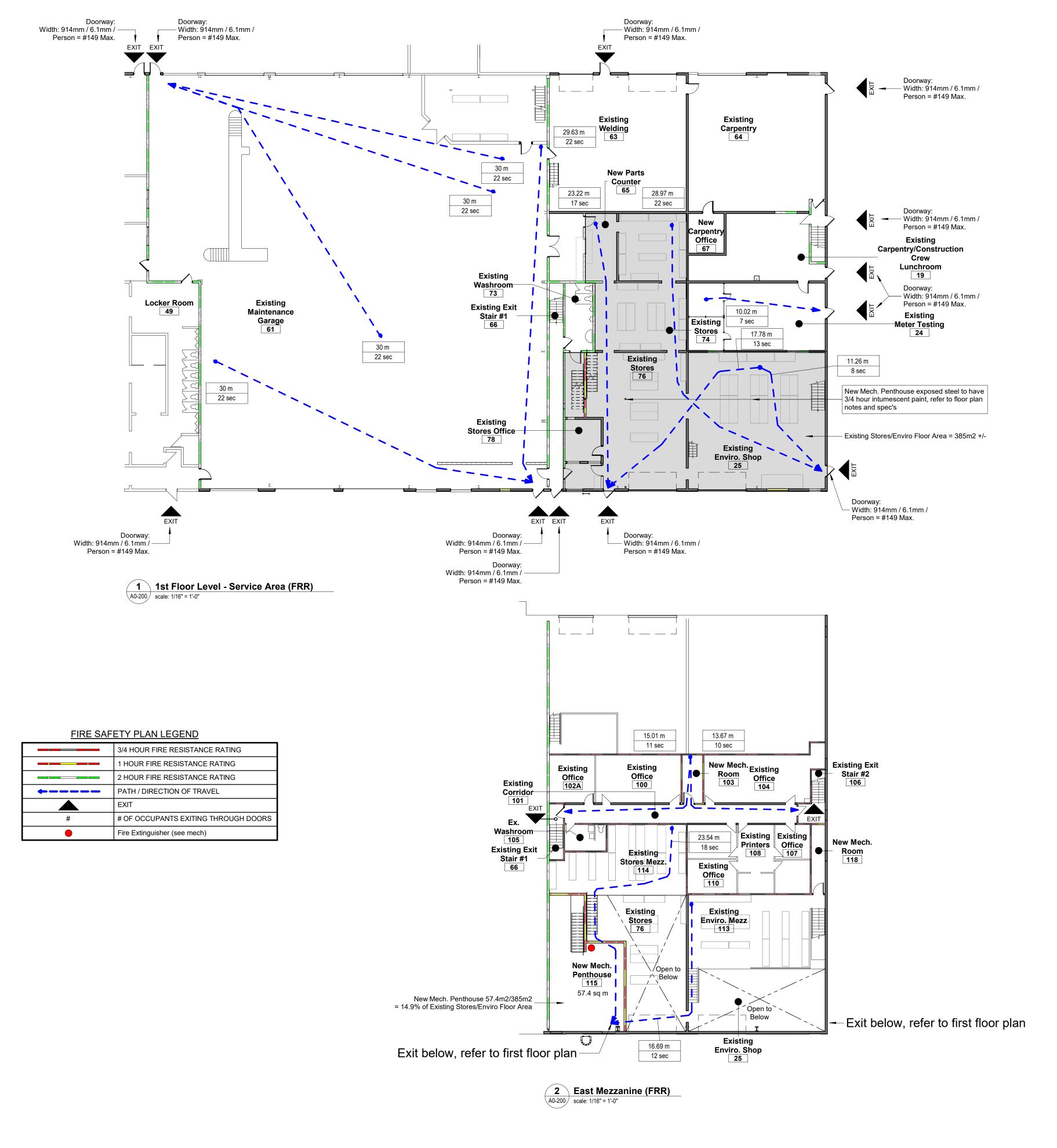






NOVEMBER, 2007

ONTARIO ASSOCIATION OF ARCHITECTS



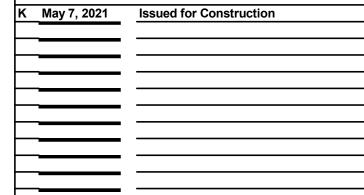
General Notes

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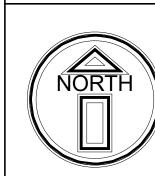
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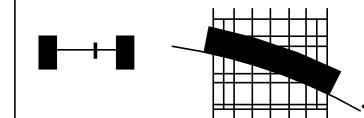
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Kev Plai



Revisions





RAIMONDO + ASSOCIATES ARCHITECTS INC.

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City of Niagara Falls Municipal Service Centre 3200 Stanley Ave, Niagara Falls

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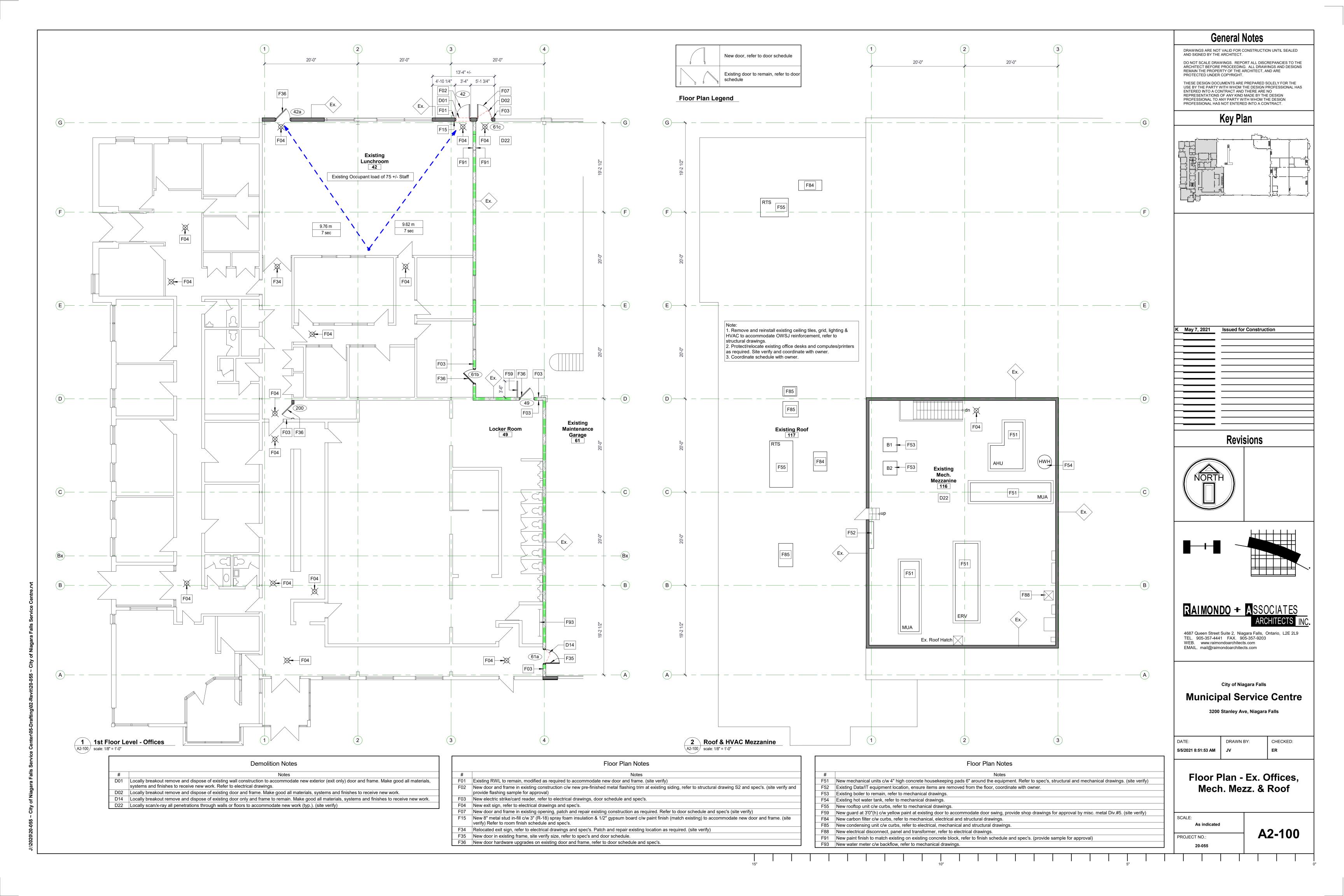
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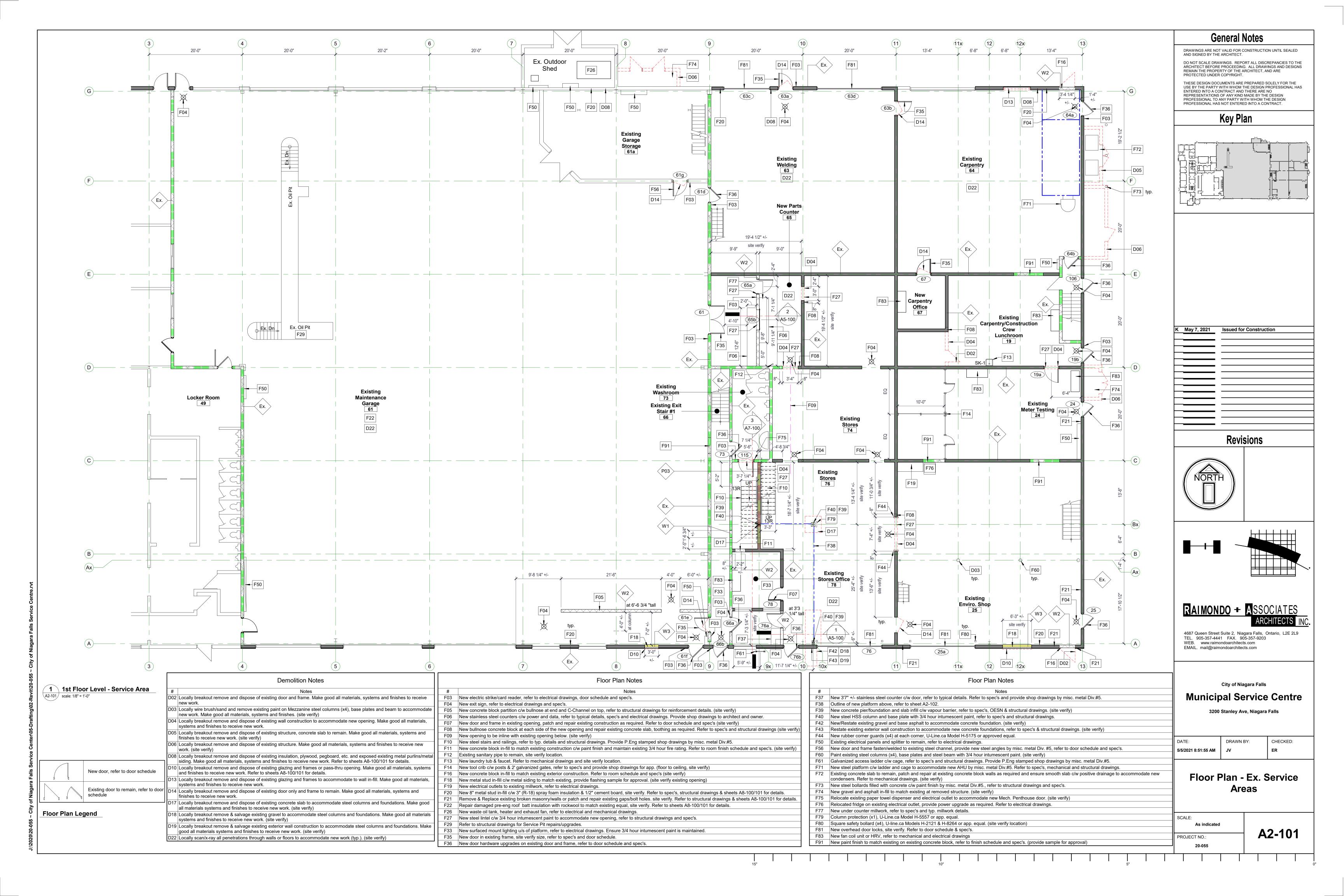
OBC, Exits + FRR Plans

PROJECT NO.: 20-055

A0-200

CHECKED:





D09 Locally breakout remove and dispose of existing t-bar ceiling system and lighting. Make good all materials, systems and finishes to receive new work. D20 Locally breakout remove and dispose of existing wall construction to accommodate new exterior HVAC louvers. Make good all materials, systems and finishes to receive new work. Refer to mechanical and structural drawings.

D21 Locally breakout remove and dispose of existing rigid insulation and pegboard, plywood, etc. Make good all materials, systems and finishes to receive new work. Refer to sheets A8-100/101 for details.

D22 Locally scan/x-ray all penetrations through walls or floors to accommodate new work (typ.). (site verify)

D23 Locally breakout remove and dispose of existing wall construction to accommodate new interior door and frame. Make good all materials, systems and finishes to receive new work. Refer to electrical drawings.

Floor Plan Notes

F03 New electric strike/card reader, refer to electrical drawings, door schedule and spec's.

F04 New exit sign, refer to electrical drawings and spec's. F07 New door and frame in existing opening, patch and repair existing construction as required. Refer to door schedule and spec's (site verify)

F10 New steel stairs and railings, refer to typ. details and structural drawings. Provide P.Eng stamped shop drawings by misc. metal Div.#5. F17 Existing guards to be extended to 3' 6 1/8" and toe guards to be extended to 5" c/w yellow paint. Refer to typical details and structural drawings. Provide P.Eng

stamped shop drawings by misc. metal Div.#5. F20 New 8" metal stud in-fill c/w 3" (R-18) spray foam insulation & 1/2" cement board, site verify. Refer to spec's, structural drawings & sheets A8-100/101 for

F23 New fire rated ceiling on existing partitions c/w with new lighting, refer to spec's, ceiling assemblies (CO1) and electrical drawings. F24 New partition in-fill to match existing construction and maintain existing 3/4 hour fire rating, refer to room finish schedule and spec's. (site verify)

F25 Patch and repair as required to match existing construction and maintain existing 3/4 hour fire rating, refer to room finish schedule and spec's. (site verify)

F28 New removable guard and tie-off at existing guardrail location, refer to typ, details and structural drawings. (site verify) Provide P.Eng stamped shop drawings by misc. metal Div.#5.

F30 Repair existing pre-eng roof framing at overhead jib crane location by misc. metal Div.#5. Refer to spec's, structural drawings & sheets A8-100/101 for details. F31 New concrete slab and steel deck c/w new guard rails to accommodate new HVAC units. Refer to typ. details, structural, electrical and mechanical drawings.

F32 Existing guards to be extended to 3' 6 1/8" and toe guards to be extended to 5" c/w yellow paint to accommodate new stairs, site verify. Provide P.Eng stamped

shop drawings by misc. metal Div.#5. F36 New door hardware upgrades on existing door and frame, refer to door schedule and spec's.

F45 Existing mezzanine flooring to remain, ensure new construction is level with existing.

F46 New guard rail c/w yellow paint finish, refer to typical details and structural drawings. Provide P.Eng stamped shop drawings by misc. metal Div.#5. F47 New mechanical louver c/w birdscreen, new c-channels and metal flashing. Refer to spec's, mechanical and structural drawings. (site verify)

F48 New furnace and HRV, refer to mechanical drawings.

F49 New electrical panels c/w 15.9mm fire retardant plywood, refer to electrical drawings

F51 New mechanical units c/w 4" high concrete housekeeping pads 6" around the equipment. Refer to spec's, structural and mechanical drawings. (site verify) F57 New partitions in existing location c/w rubber base to match existing (provide sample for approval), patch and repair existing flooring & walls to accommodate new work. Remove and reinstall ceiling tiles and grid as required.

New guard at existing guardrail location, refer to typ, details and structural drawings. (site verify) Provide P.Eng stamped shop drawings by misc. metal Div.#5.

F61 Galvanized access ladder c/w cage, refer to spec's and structural drawings. Provide P.Eng stamped shop drawings by misc. metal Div.#5.

F63 Existing pre-engineered roof to remain, report any issues to architect. F64 Galvanized platform c/w railings and grating, refer to structural and mechanical drawings. Provide P.Eng stamped shop drawings by misc. metal Div.#5.

F65 EPDM/Silicone universal round base pipe flashing at existing metal roof/new column locations. (site verify)

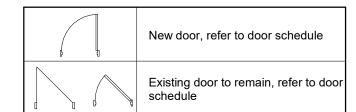
F70 New AHU on existing steel mezzanine, refer to structural and mechanical drawings F87 New Skyline non-penetrating (or app. equal) "4003 Series Walkway with Guardrail" w/ S-5 clamps on existing pre-eng roof, refer to structural & mechanical

drawings for layout. (provide P.Eng shop drawings by misc. metal Div.#5)

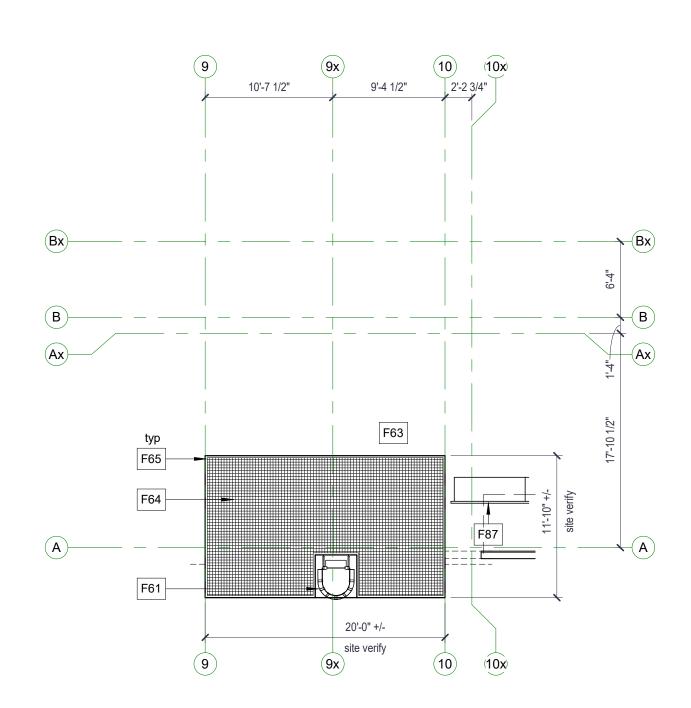
F89 New communications board c/w 15.9mm fire retardant plywood, refer to electrical drawings. F90 New electrical panel and data rack c/w 15.9mm fire retardant plywood, refer to electrical drawings.

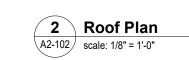
F94 New door and frame in existing partition, refer to door hardware schedule.

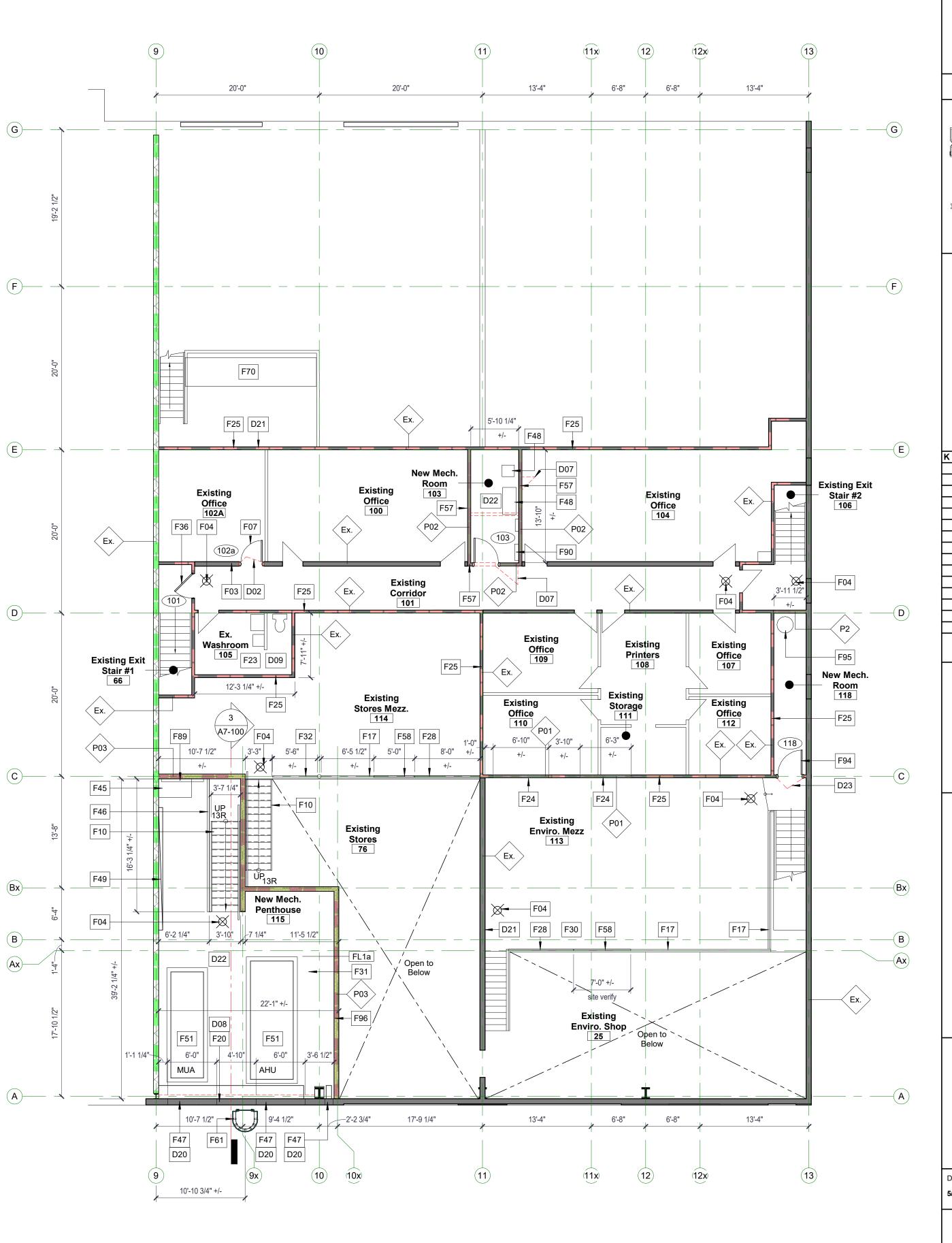
F95 New hot water tank, refer to mechanical drawings F96 Install HVAC Equipment prior to installation of fire rated partitions, coordinate with HVAC sub-trade.



Floor Plan Legend



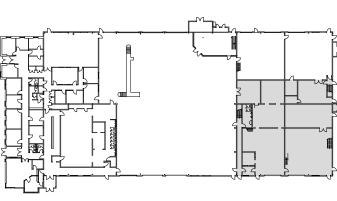




General Notes

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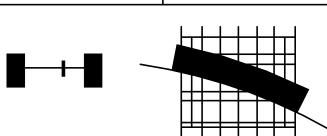
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Issued for Construction May 7, 2021

Revisions





RAIMONDO + ASSOCIATES

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City of Niagara Falls **Municipal Service Centre** 3200 Stanley Ave, Niagara Falls

5/5/2021 8:51:57 AM

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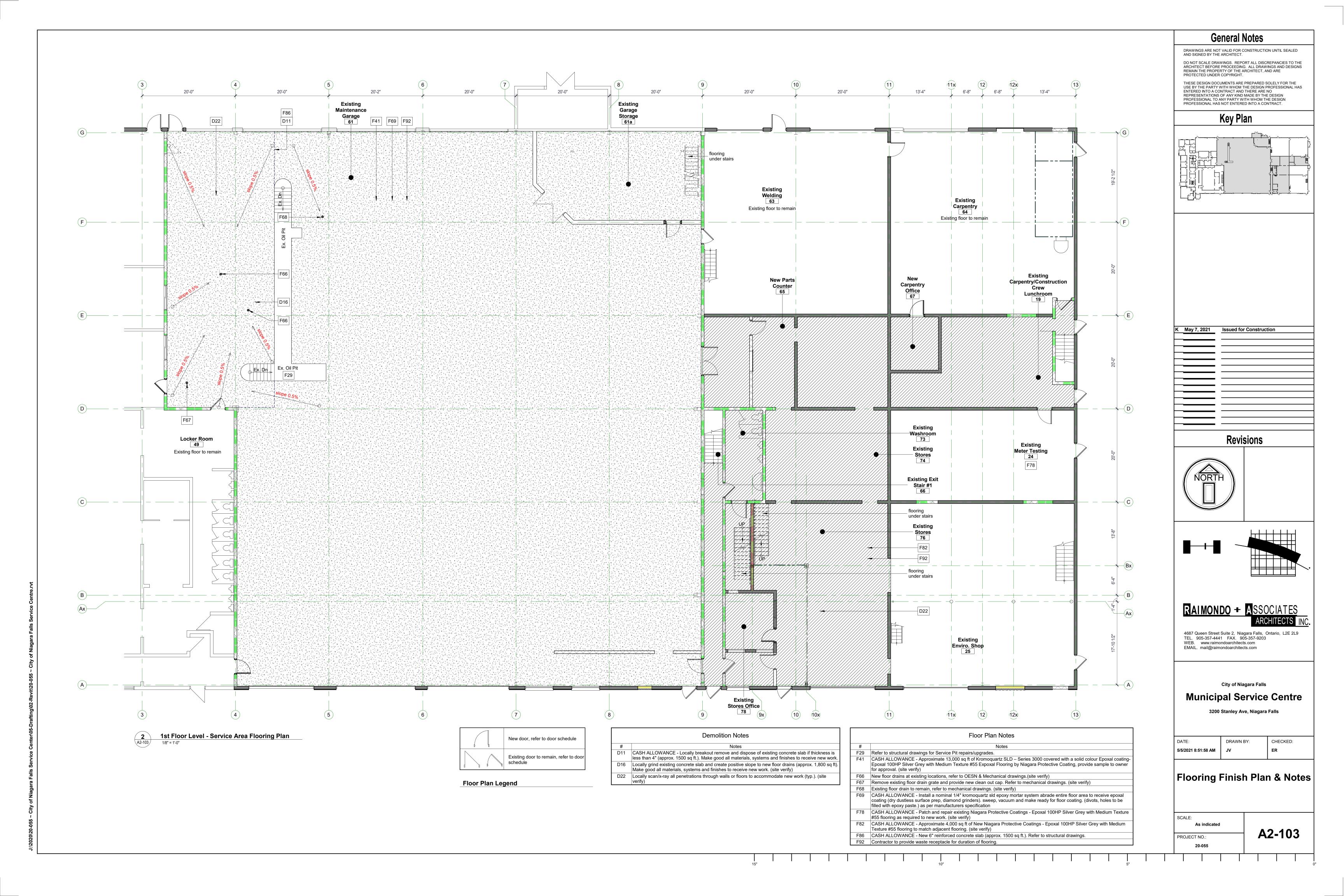
Floor Plan - Ex. East Mezzanine

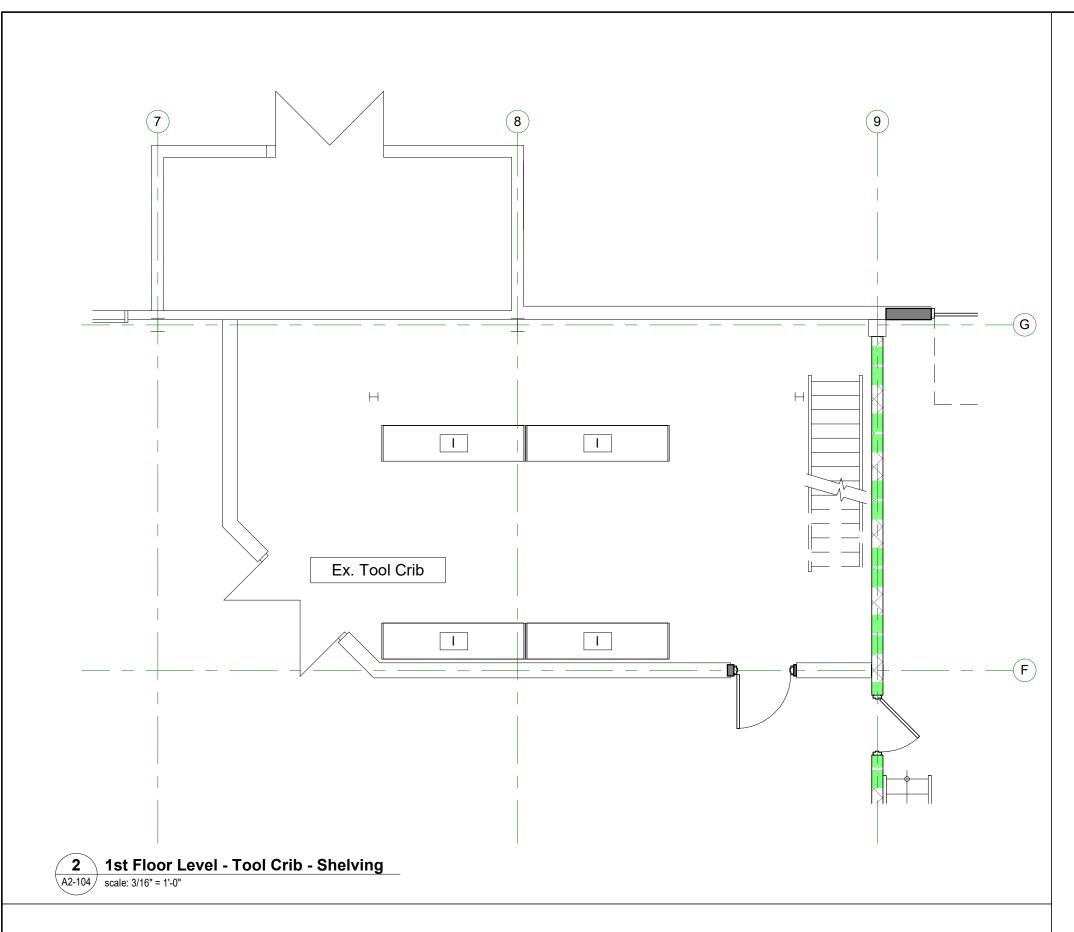
SCALE: As indicated PROJECT NO.:

20-055

A2-102

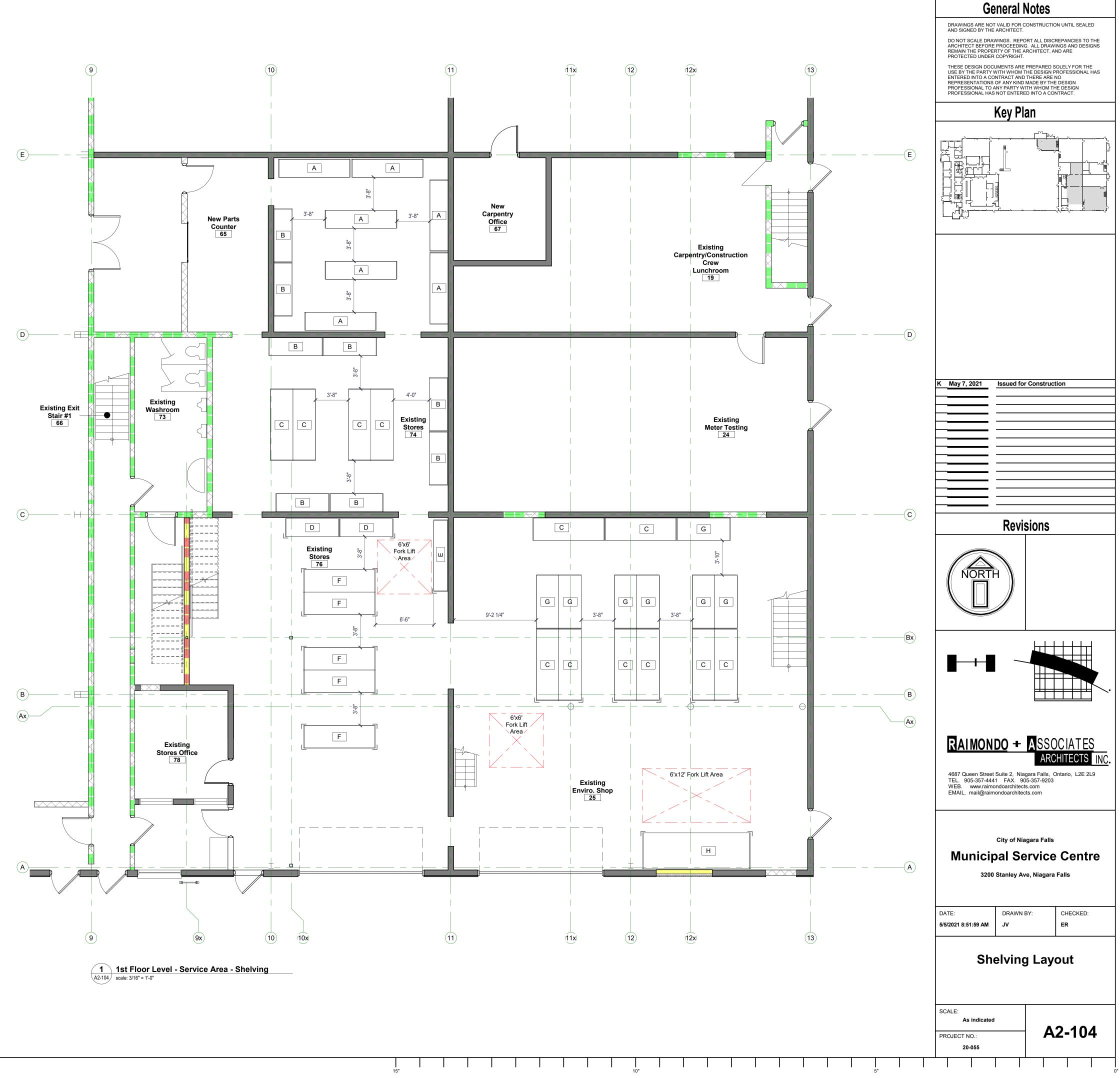
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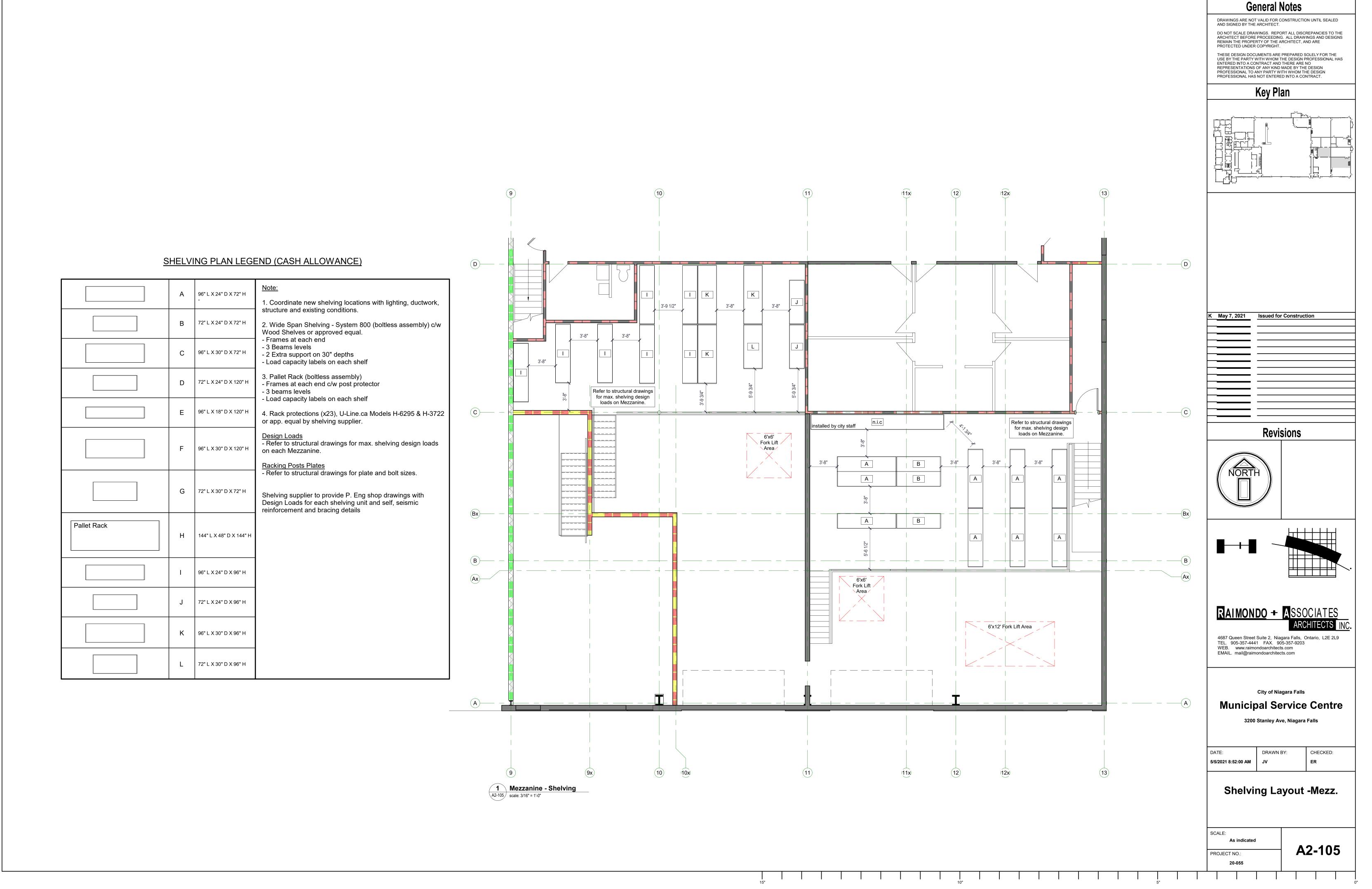


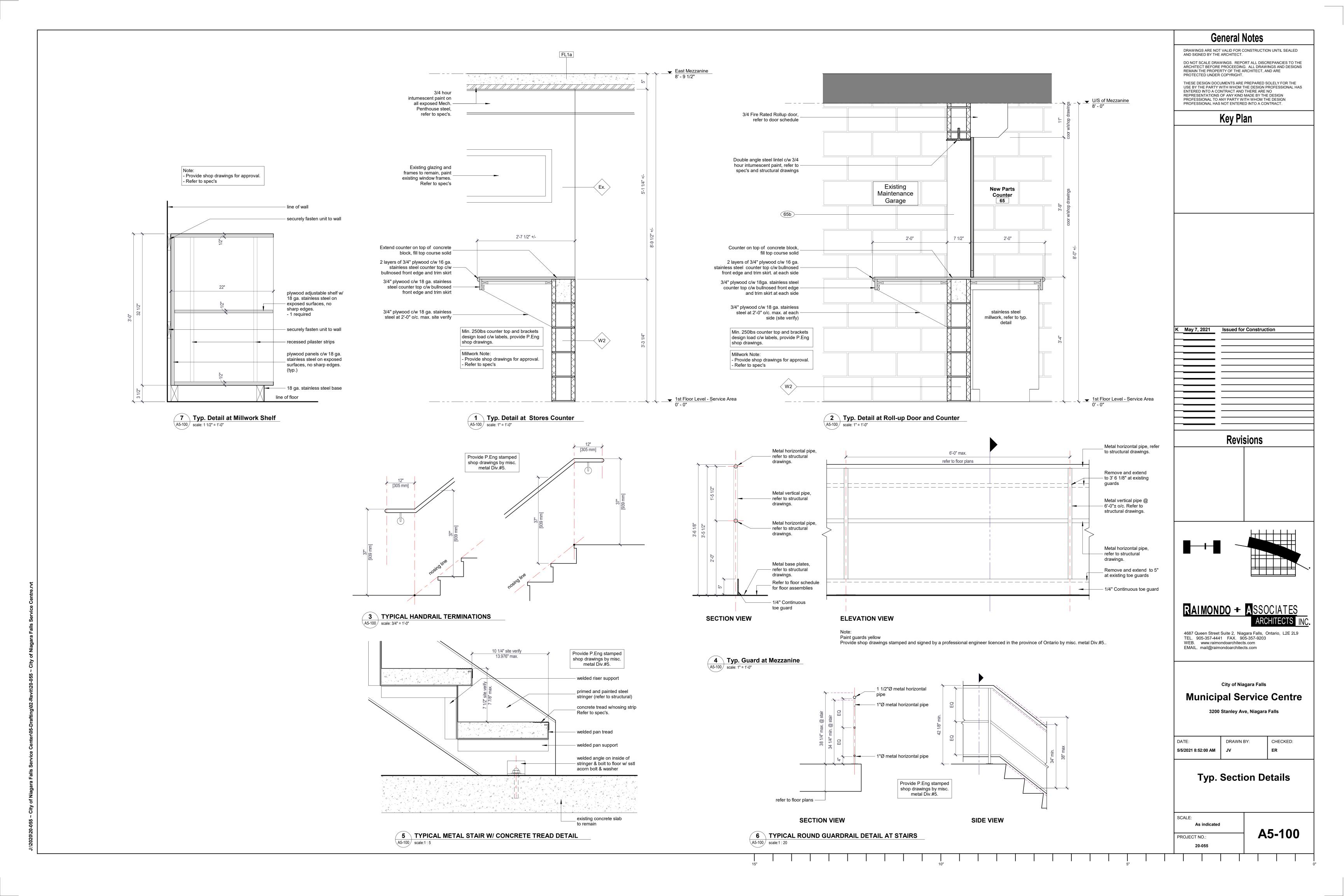


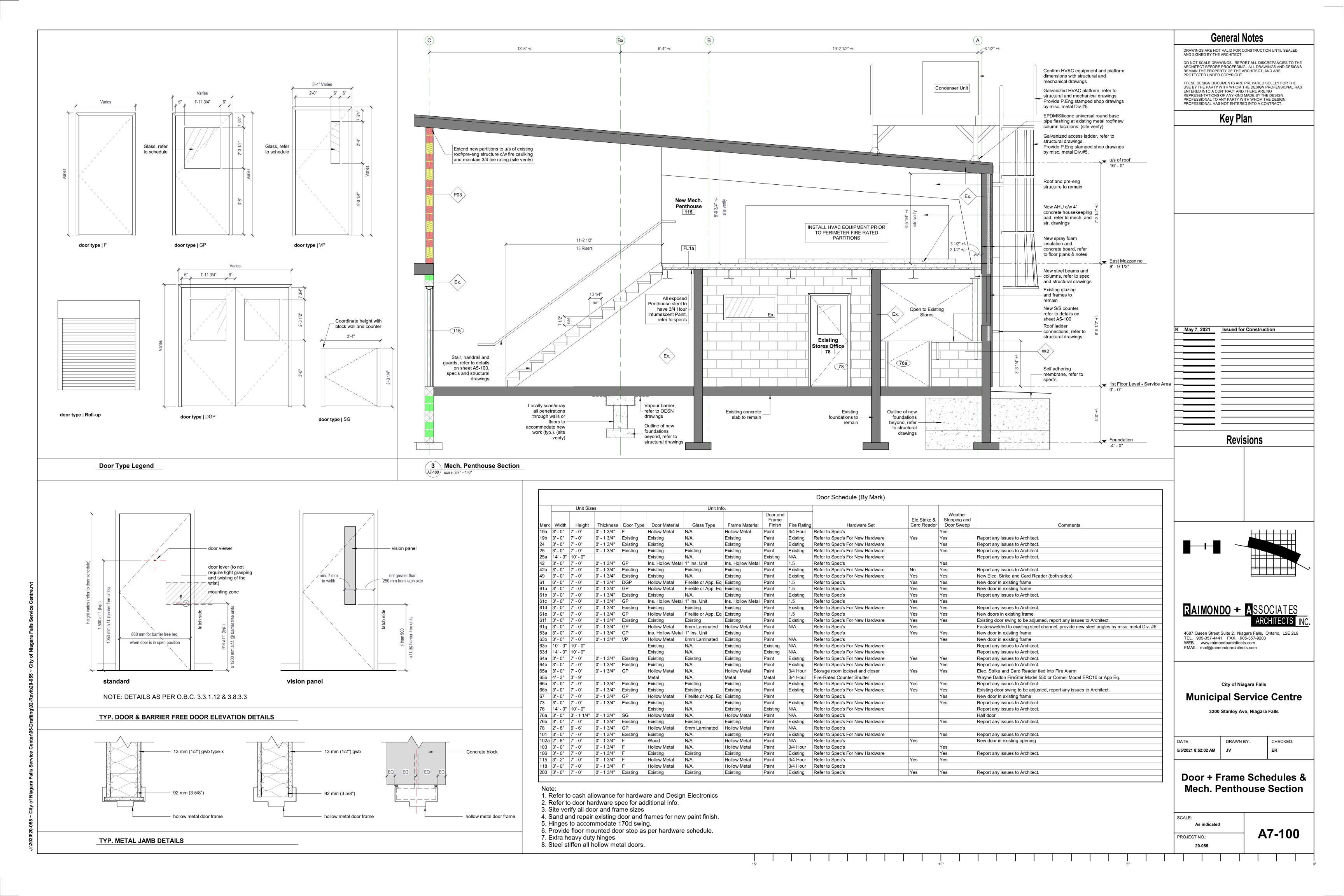
SHELVING PLAN LEGEND (CASH ALLOWANCE)

	Α	96" L X 24" D X 72" H -	Note: 1. Coordinate new shelving locations with lighting, ductwork,
	В	72" L X 24" D X 72" H	structure and existing conditions. 2. Wide Span Shelving - System 800 (boltless assembly) c/w
	С	96" L X 30" D X 72" H	Wood Shelves or approved equal Frames at each end - 3 Beams levels - 2 Extra support on 30" depths - Load capacity labels on each shelf
	D	72" L X 24" D X 120" H	3. Pallet Rack (boltless assembly)- Frames at each end c/w post protector- 3 beams levels- Load capacity labels on each shelf
	Е	96" L X 18" D X 120" H	4. Rack protections (x23), U-Line.ca Models H-6295 & H-3722 or app. equal by shelving supplier.
	F	96" L X 30" D X 120" H	<u>Design Loads</u> - Refer to structural drawings for max. shelving design loads on each Mezzanine.
			Racking Posts Plates - Refer to structural drawings for plate and bolt sizes.
	G	72" L X 30" D X 72" H	Shelving supplier to provide P. Eng shop drawings with Design Loads for each shelving unit and self, seismic reinforcement and bracing details
Pallet Rack	Н	144" L X 48" D X 144" H	
	I	96" L X 24" D X 96" H	
	J	72" L X 24" D X 96" H	
	K	96" L X 30" D X 96" H	
	L	72" L X 30" D X 96" H	



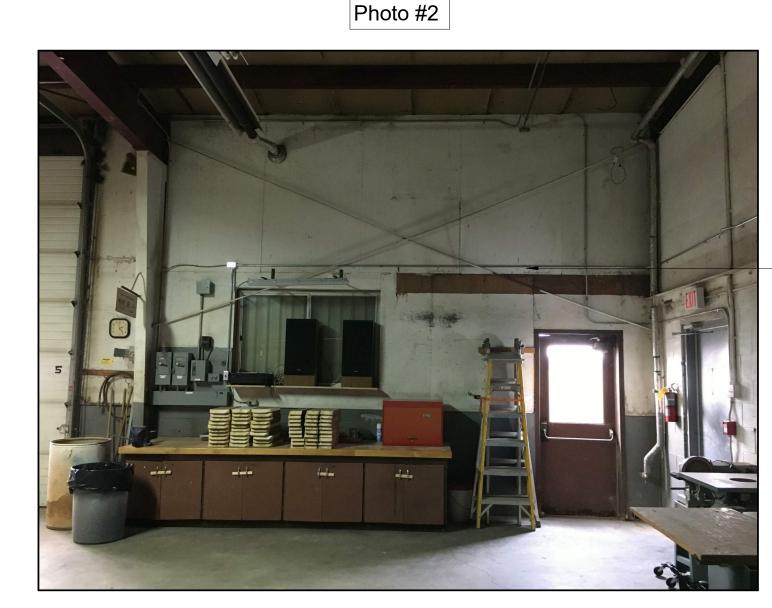






Approx. 350sq ft of new metal stud in-fill c/w spray foam insulation & cement board at existing plywood locations, site

Refer to floor plan notes.



Approx. 350 sq ft of new metal stud in-fill c/w spray foam insulation & cement board at existing plywood locations, site Refer to floor plan notes. Photo #3



Approx. 240 sq ft of new metal stud in-fill c/w spray foam insulation & cement board at existing exposed insulation and pegboard, site verify. Refer to floor plan notes.

New metal stud in-fill c/w metal siding to match

General Notes

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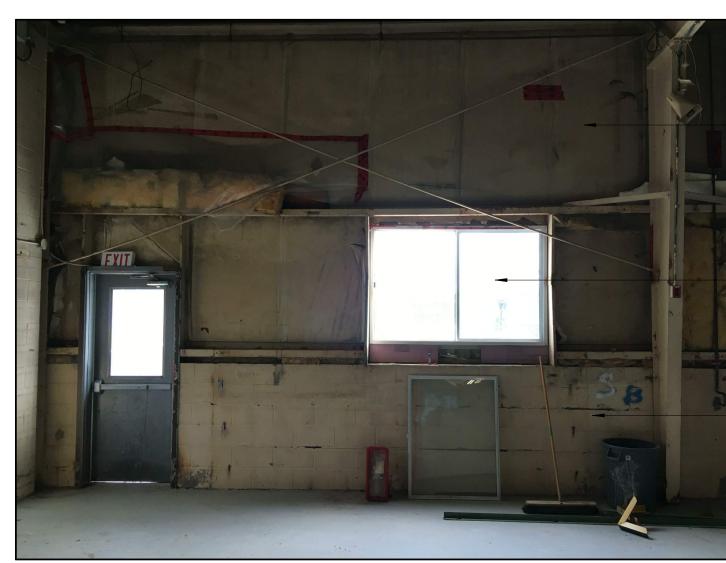
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Refer to floor plan notes.

existing at existing door.

Photo #4

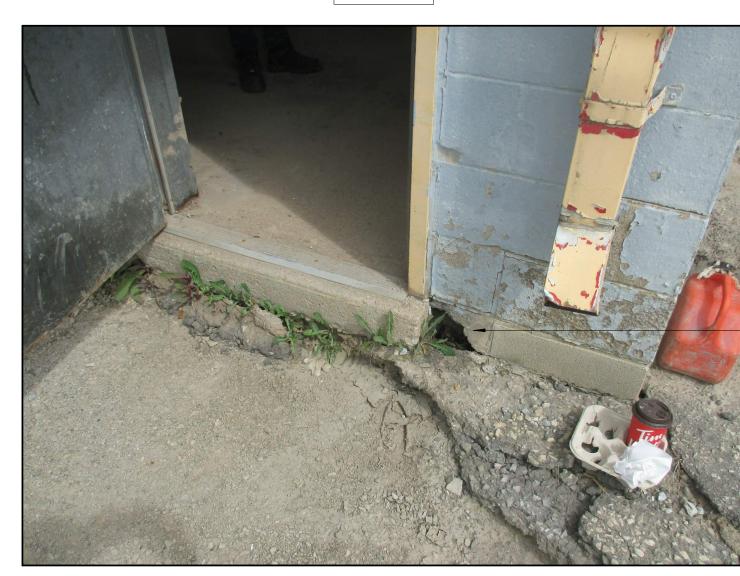


Approx. 300 sq ft of new metal stud in-fill c/w spray foam insulation & cement board at existing insulation, site verify. Refer to floor plan notes.

New metal stud in-fill c/w metal siding to match existing at existing door. Refer to floor plan notes.

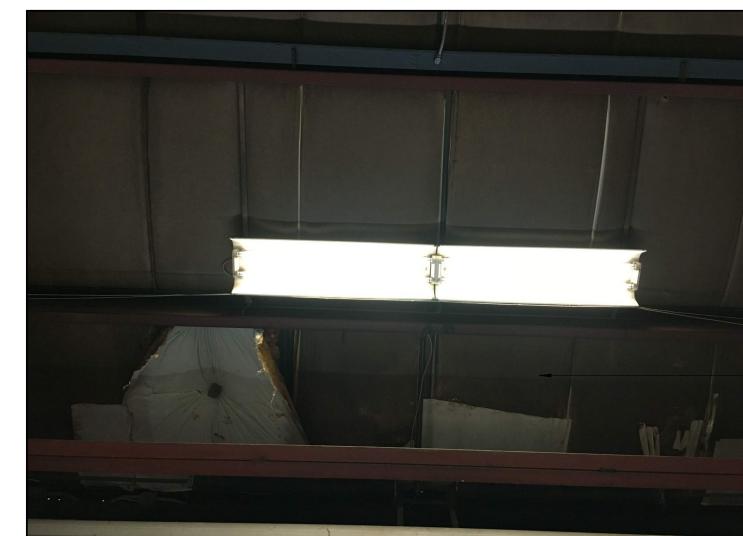
Approx. 100 sq ft, remove and replace concrete masonry, refer to structural drawings. Refer to floor plan notes.

Photo #5



Repair existing cracked foundation with new

Photo #6



Approx. 100 sq ft of stonewool insulation to match existing at damaged pre-eng roof, site verify. Refer to floor plan notes.

Revisions

May 7, 2021

Issued for Construction

RAIMONDO + ASSOCIATES

ARCHITECTS IN

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City of Niagara Falls **Municipal Service Centre**

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Typ. Repair Photos

As indicated PROJECT NO.:

3200 Stanley Ave, Niagara Falls

A8-100

Photo #7

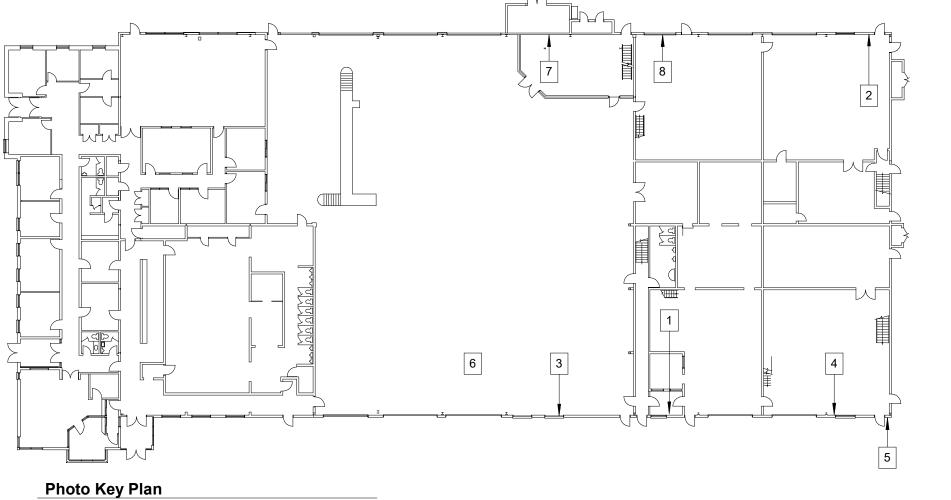


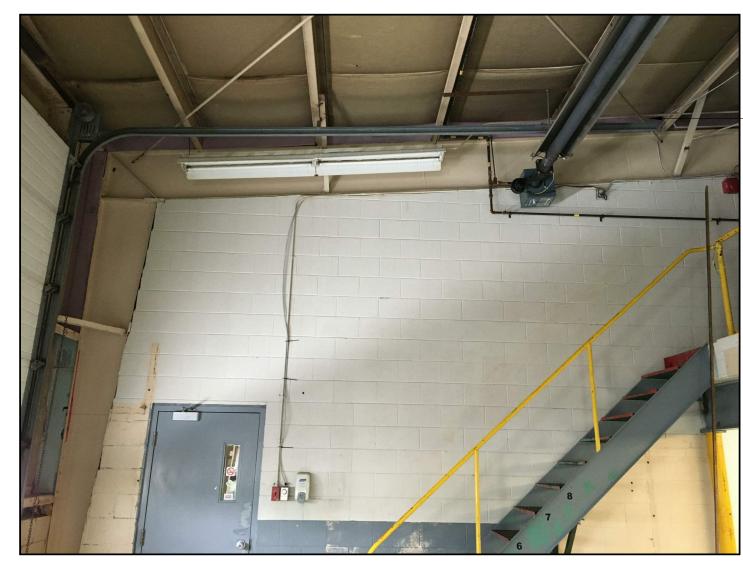
Approx. 120sq ft of new metal stud in-fill c/w spray foam insulation & cement board at existing insulation, site verify. Refer to floor plan notes.



Photo #8

Approx. 220sq ft of new metal stud in-fill c/w spray foam insulation & cement board at existing insulation, site verify. Refer to floor plan notes.



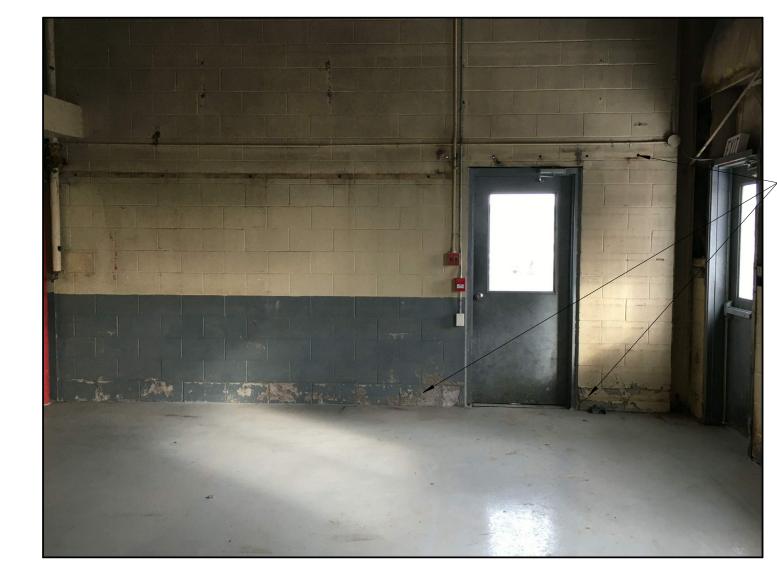


Remove all exposed rigid insulation, site verify all locations Refer to floor plan notes.



Approx. 15 sq ft, remove and replace concrete masonry, refer to structural drawings. Refer to floor plan notes.





Approx. areas of repairs at mortar/holes joints at concrete blocks locations, site verify. Approx. 15 sq ft, remove and replace base course, refer to structural drawings.

Refer to floor plan notes.

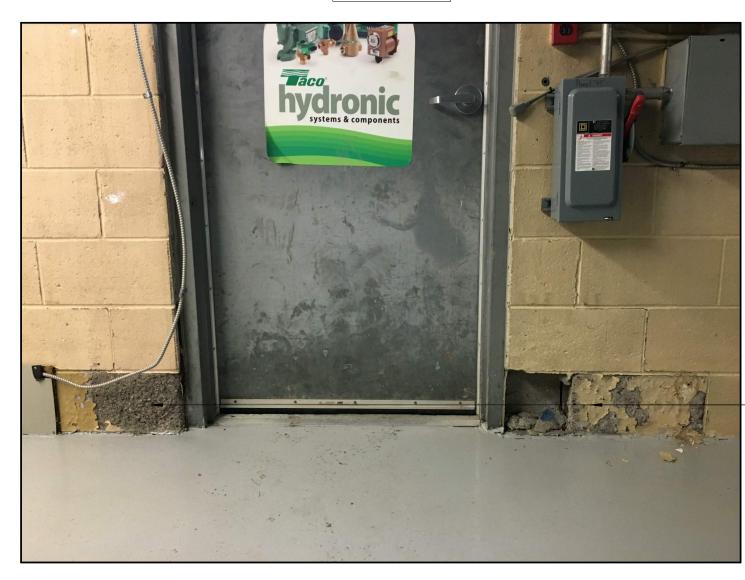
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Photo #12



Approx. 5 sq ft, remove and replace base course, refer to structural Refer to floor plan notes.



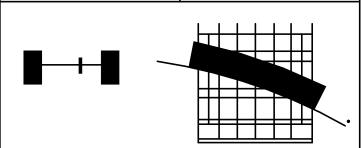
Approx. 5 sq ft, remove and replace base course, refer to structural drawings. Refer to floor plan notes.



Repair existing pre-eng roof framing. (site verify) Refer to floor plan notes.

May 7, 2021 Issued for Construction

Revisions



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City of Niagara Falls **Municipal Service Centre** 3200 Stanley Ave, Niagara Falls

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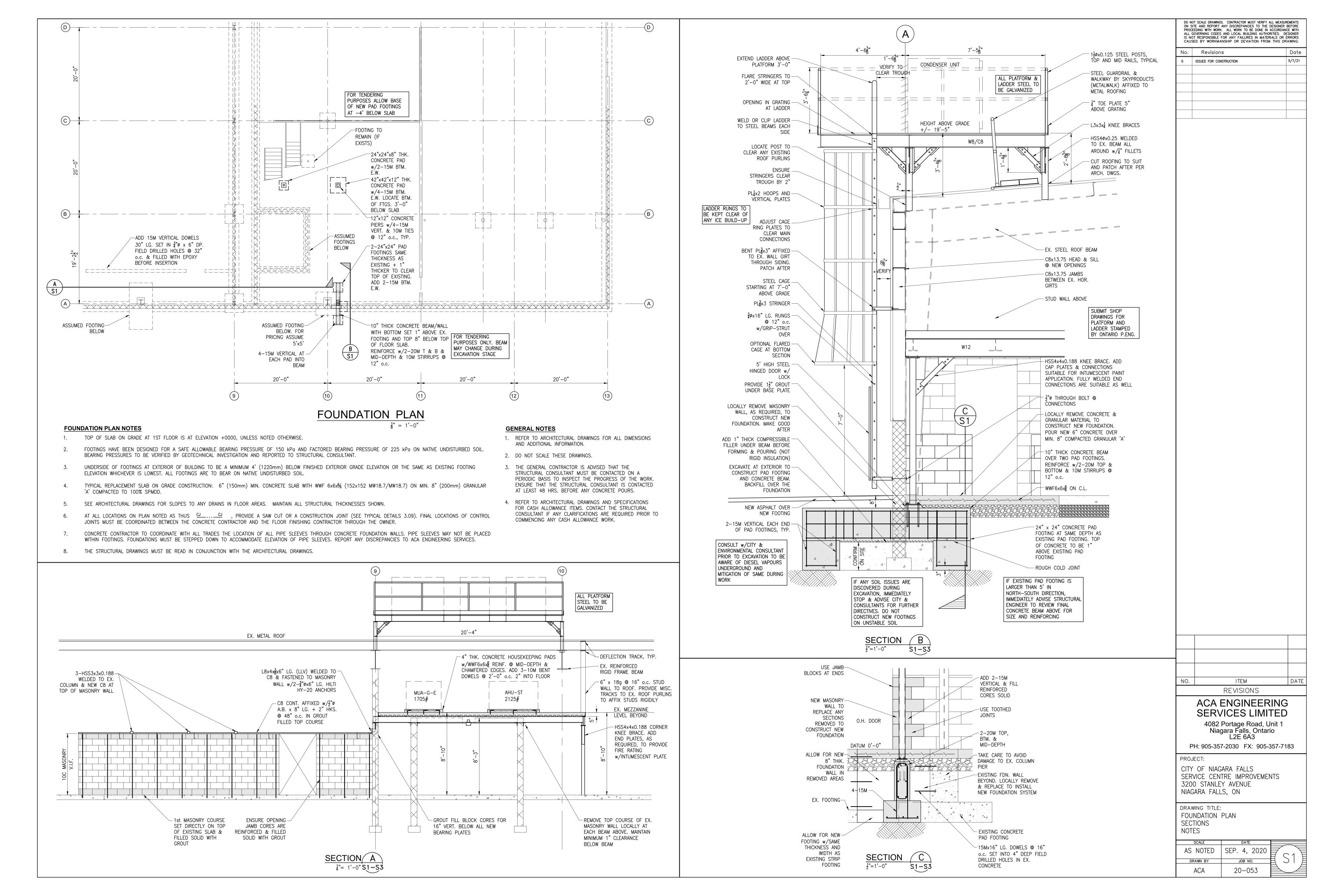
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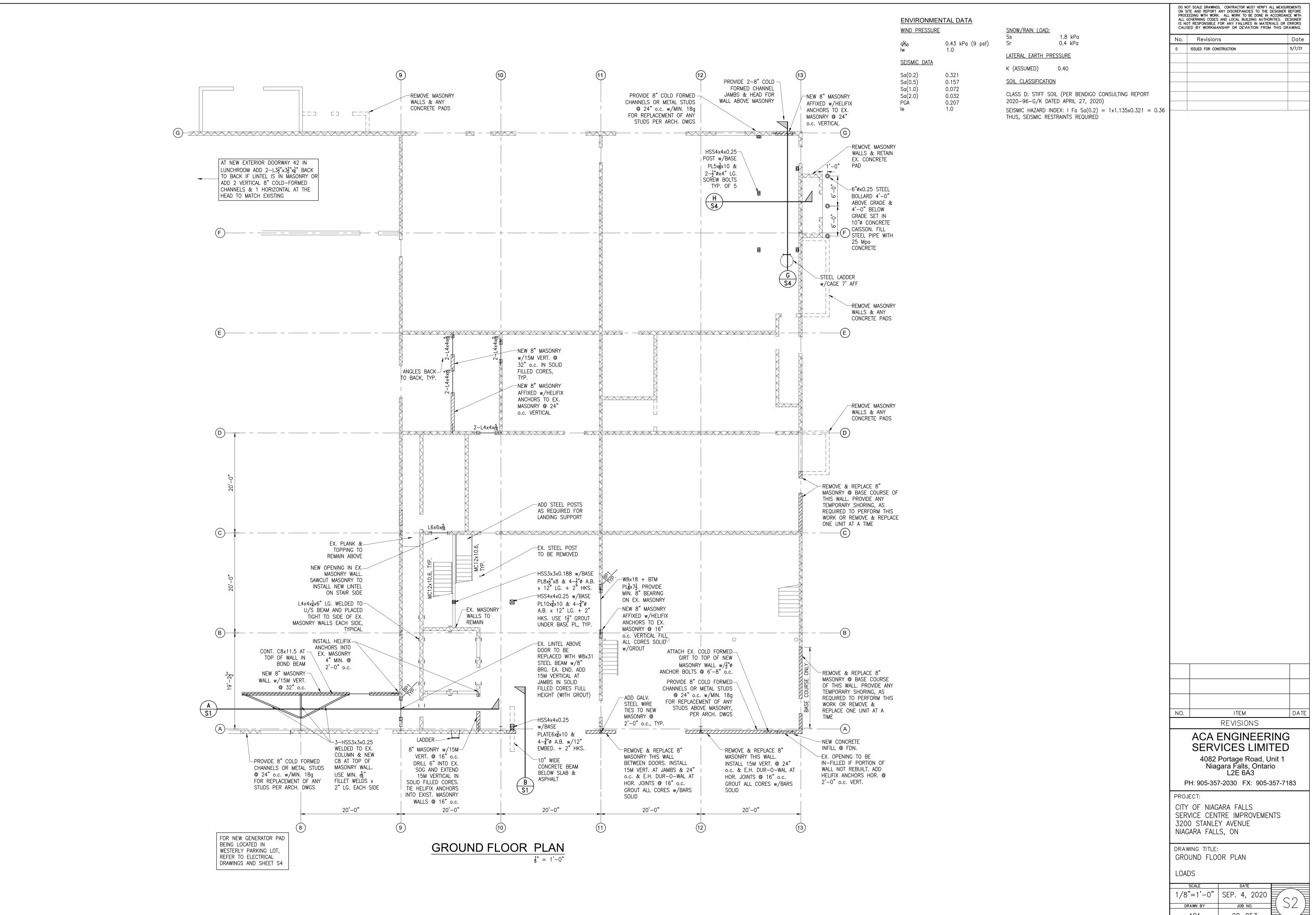
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20-055

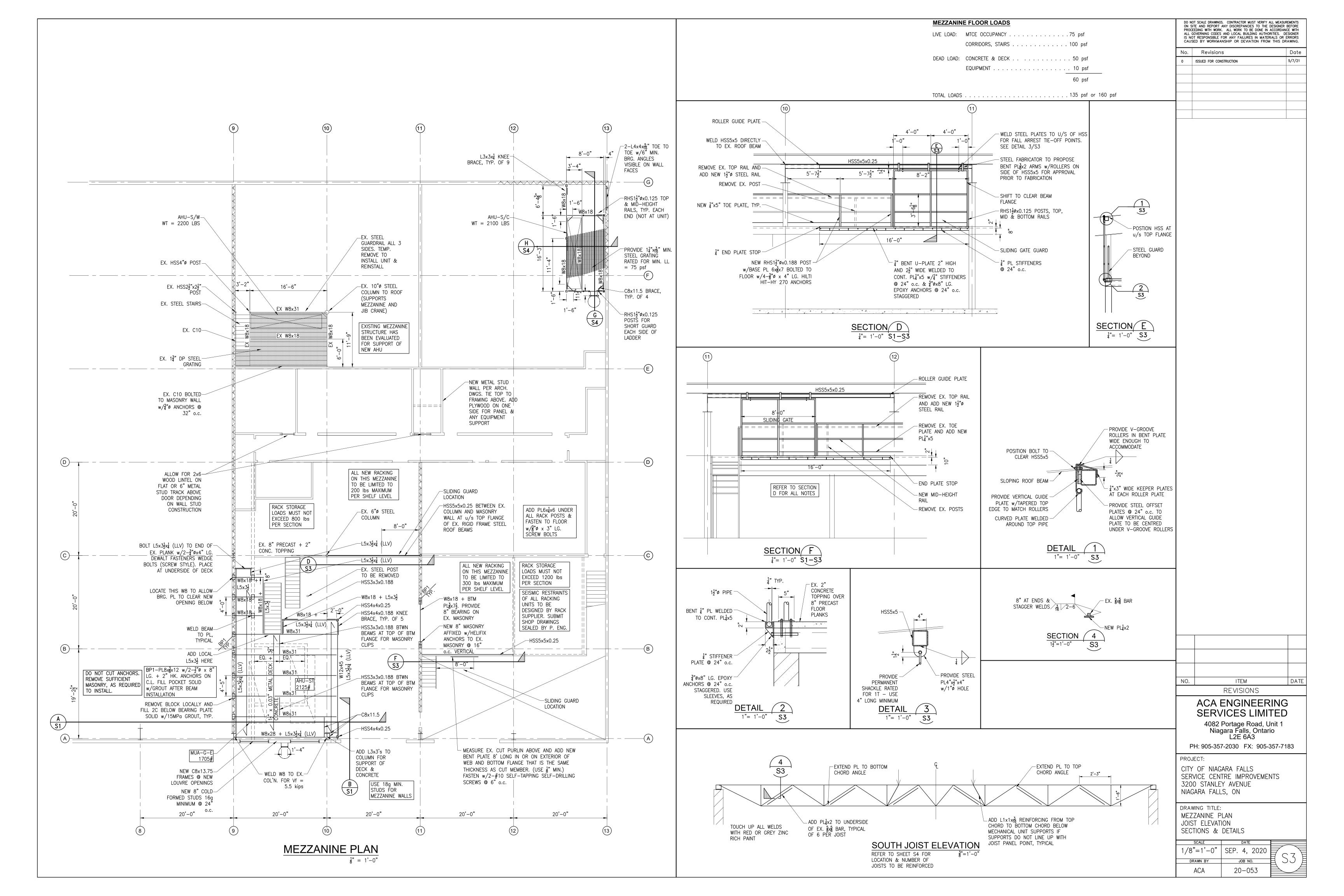
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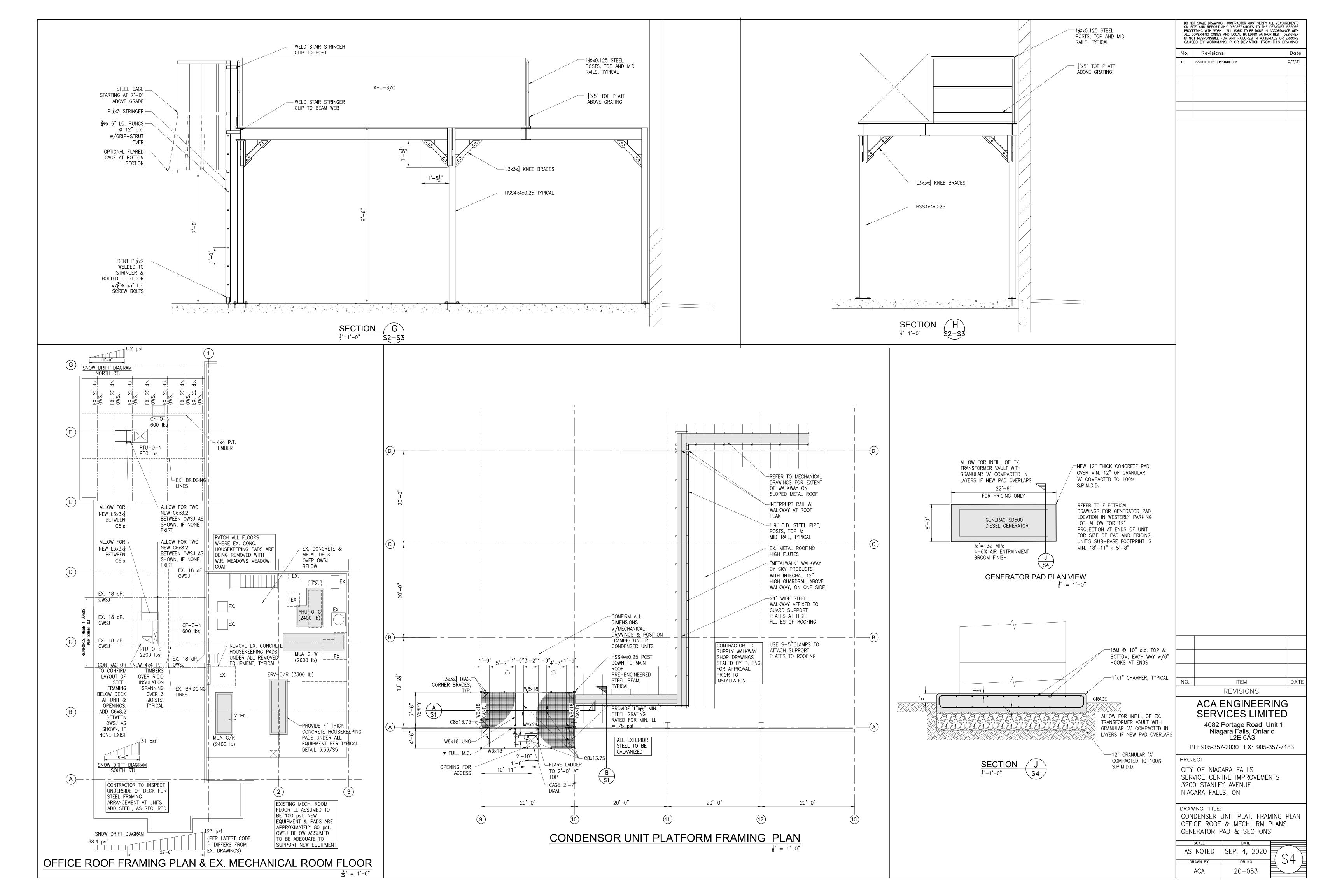
Photo Key Plan

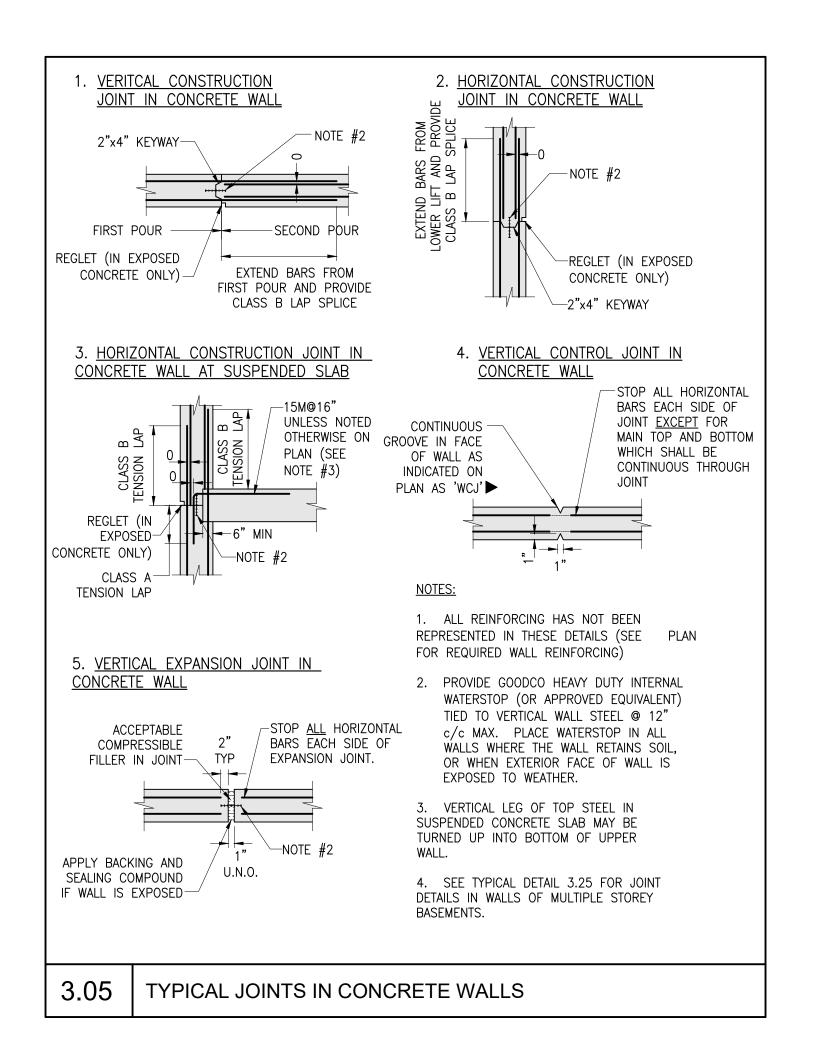


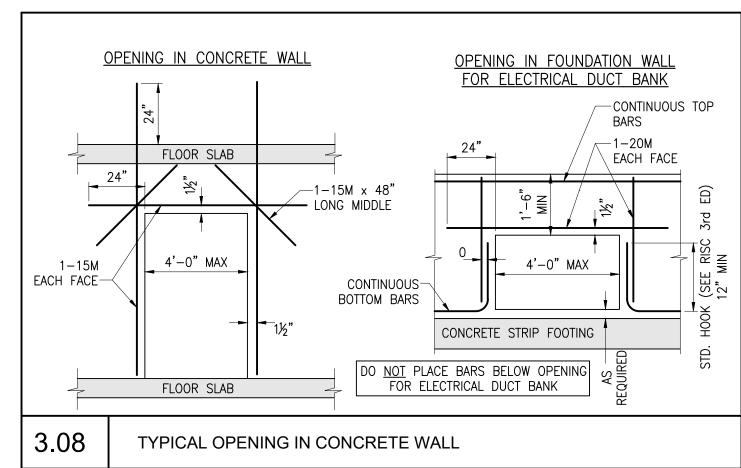


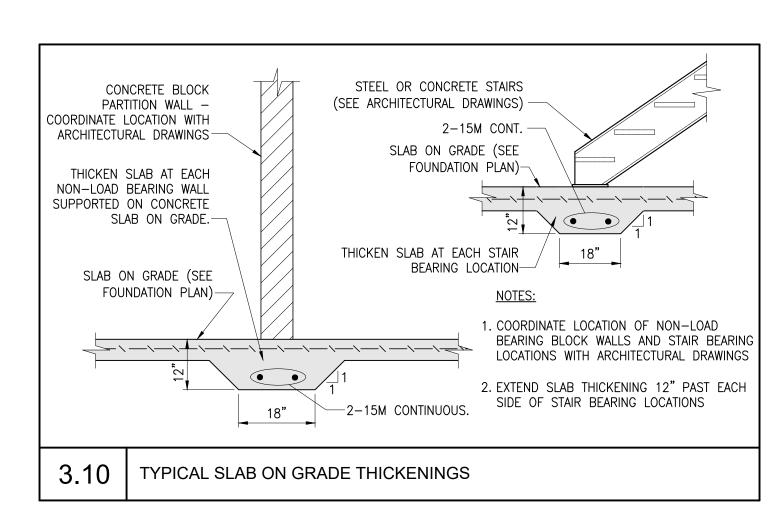
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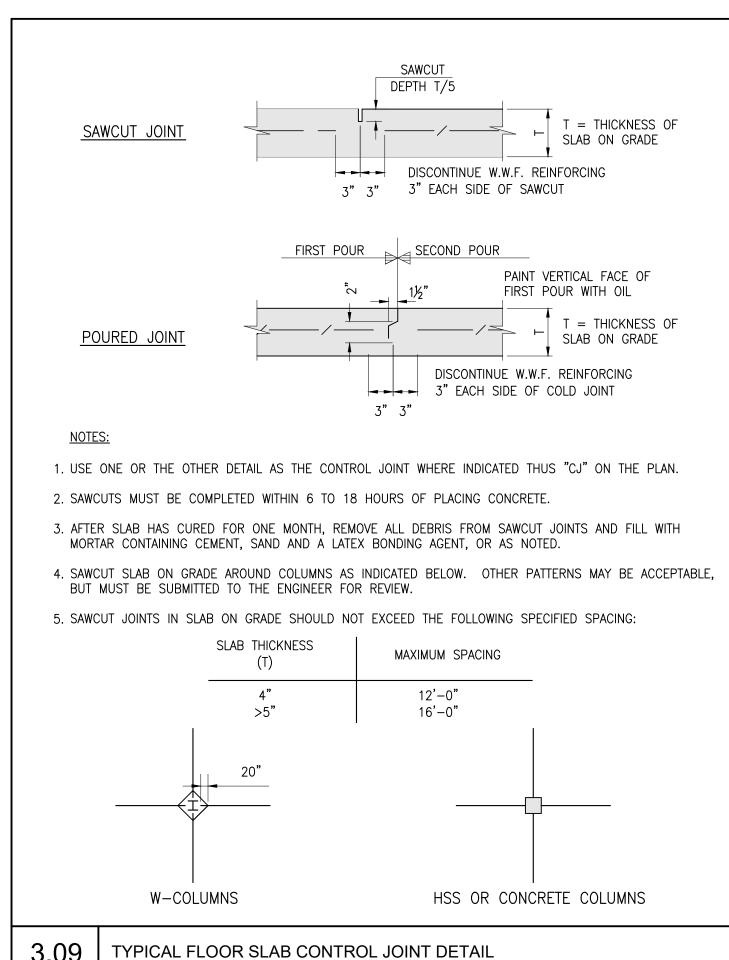


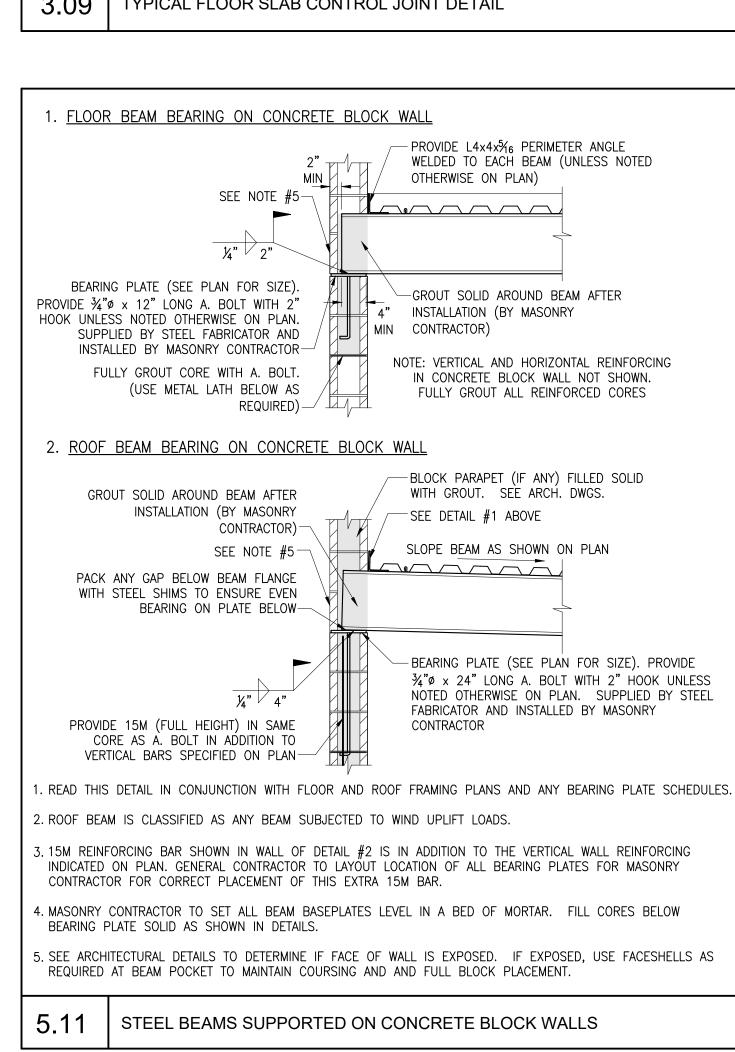


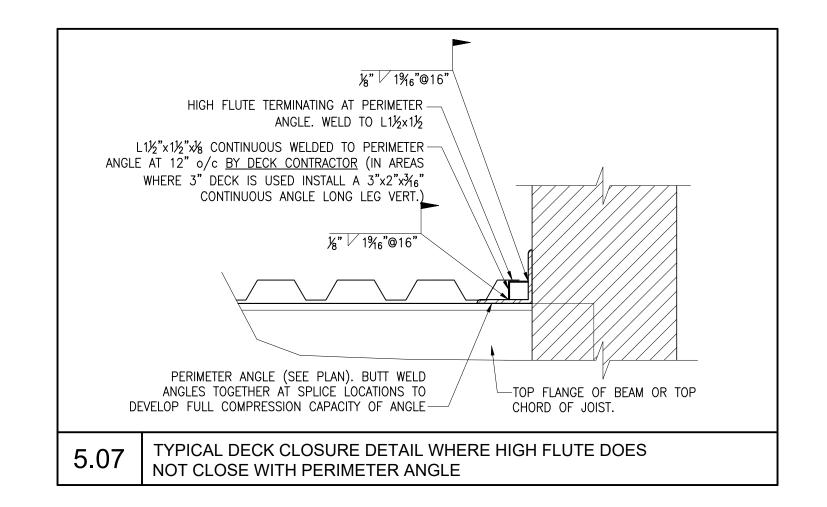


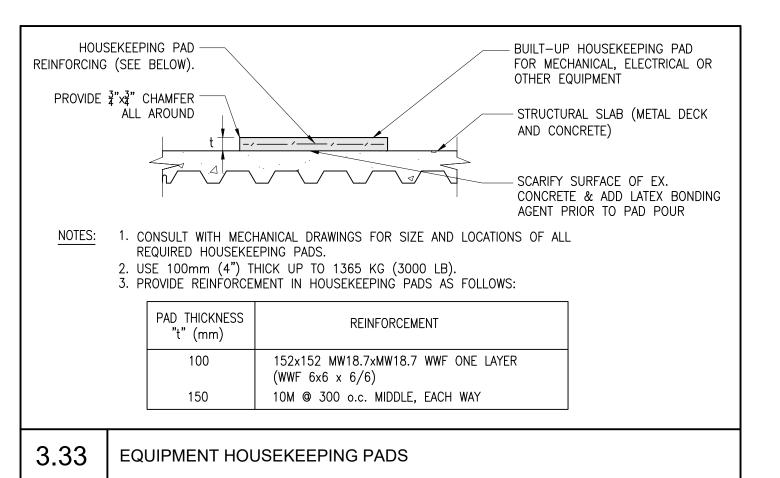












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10.	ITEM	DATE
	REVISIONS	

ACA ENGINEERING **SERVICES LIMITED** 4082 Portage Road, Unit 1

Niagara Falls, Ontario L2E 6A3

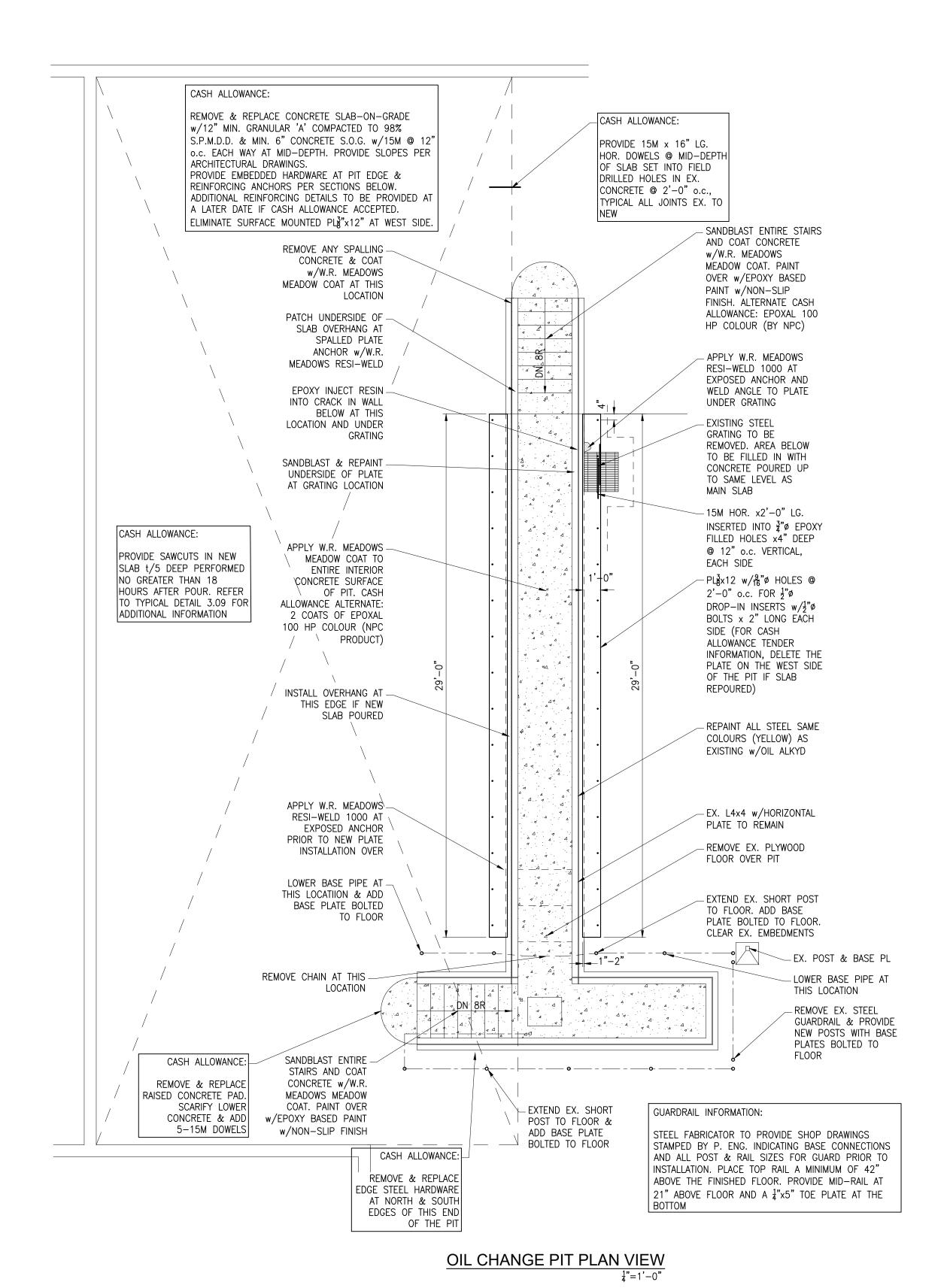
PH: 905-357-2030 FX: 905-357-7183

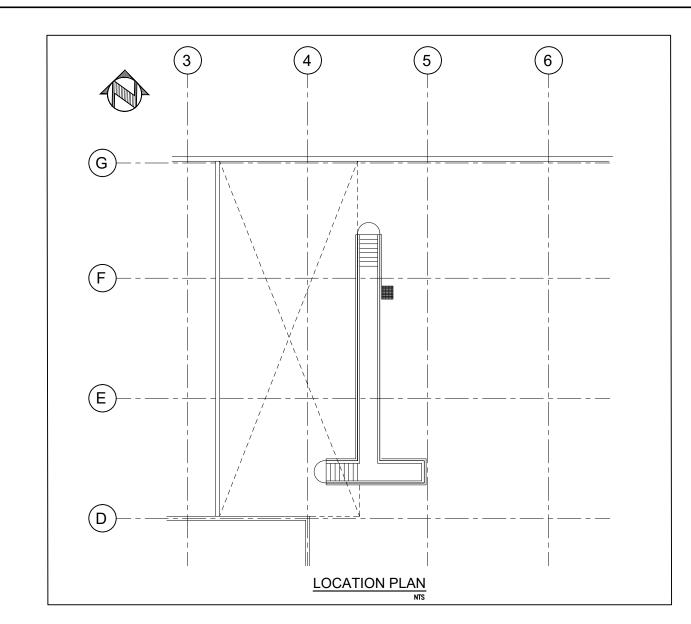
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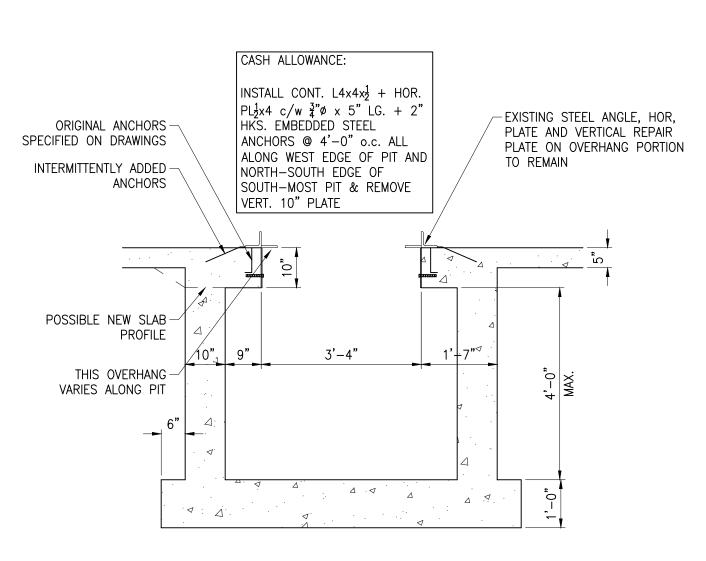
CITY OF NIAGARA FALLS SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE NIAGARA FALLS, ON

DRAWING TITLE: TYPICAL DETAILS

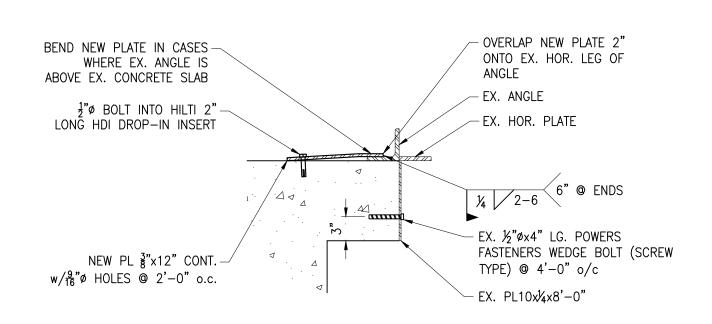
SCALE	DATE	
NTS	SEP. 4, 2020	
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ACA	20-053	







EXISTING PIT SECTION



REPAIR PLATE DETAIL

SPECIFICATIONS

- INSPECT ENTIRE PIT CONCRETE PRIOR TO COMMENCEMENT OF WORK. DO NOT SCALE THIS DRAWING.
- SANDBLAST EACH STAIRWAY AND ALL INTERIOR SURFACES OF OIL PIT.
- APPLY W.R. MEADOWS MEADOW COAT PRODUCT TO ANY SPALLED AREAS AT CONCRETE STAIRS, WALLS AND BASE SLAB.
- INSTALL NEW STEEL PLATE ALONG TWO LONG SIDES OF PIT TO PREVENT ROLLOVER OR PULLOUT OF EXISTING EMBEDDED ANCHORS OR STEEL ANGLES AT PIT EDGE.
- REMOVE AND REPLACE STEEL GUARDRAIL AND POSTS AT SOUTH END OF PIT. PROVIDE NEW STEEL POSTS WITH BASE PLATES BOLTED TO THE CONCRETE FLOOR. DESIGN THE POST, BASE PLATES AND CONNECTIONS TO RESIST ALL OBC GUARD LOADS. SUBMIT STAMPED SHOP DRAWINGS TO THE CONSULTANTS FOR REVIEW PRIOR TO ANY FABRICATION...
- PAINT ALL NEW CONCRETE PATCHED SURFACES AND EXISTING SURFACES ALONG ENTIRE PIT WITH WHITE, EPOXY BASED PAINT.
- PROVIDE EPOXY BASED PAINT WITH NON-SLIP FINISHES AT BASE OF PIT AND EACH STAIRWAY.
- REMOVE PLYWOOD FLOOR SPANNING BETWEEN PIT EDGES.
- CONCRETE COMPRESSIVE STRENGTH @ 28 DAYS TO BE 32 MPa MIN. ADD 4-6% AIR ENTRAINMENT. SLUMP TO BE 4"+/-1".
- 9. STEEL REINFORCING TO HAVE MINIMUM 400 MPa TENSILE GRADE.

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0	ISSUED FOR CONSTRUCTION	5/7/21

NO.	ITEM	DAT
	REVISIONS	

ACA ENGINEERING **SERVICES LIMITED**

4082 Portage Road, Unit 1 Niagara Falls, Ontario L2E 6A3 PH: 905-357-2030 FX: 905-357-7183

PROJECT:

CITY OF NIAGARA FALLS SERVICE CENTRE OIL PIT REPAIRS 3200 STANLEY AVENUE NIAGARA FALLS, ON

DRAWING TITLE: PLAN VIEWS SECTIONS & DETAILS SPECIFICATIONS

SCALE	DATE	
AS NOTED	SEP. 15, 2020	
DRAWN BY	JOB NO.	eta O I
ACA	20-053	

			GENERAL NOTES
LEGEND — GENERAL	LEGEND — HVAC	CONDENSING UNITS DRAWING SCHEDULE	ALL EQUIPMENT TO BE PROVIDED WITH SEISMIC CURB OR
SYMBOL DESCRIPTION SYMBOL DESCRIPTION	SYMBOL DESCRIPTION SYMBOL DESCRIPTION	TAG SYSTEM MODEL # COOLING ELECTRICAL WEIGHT REMARKS DWG NO DRAWING TITLE	RESTRAINTS. SEE SPECIFICATIONS FOR DETAILS
ISOLATION VALVE ————————————————————————————————————	HEATED WATER SUPPLY SINGLE LINE RIGID DUCT	BUTH VOLTAGE MCA LBS M-100 LEGENDS AND SCHEDULES	SAVE ON ENERGY PROGRAM DETAILS
GLOBE VALVE PIPE DOWN	HWR —— HEATED WATER RETURN ————————————————————————————————————	CU-ST AHU-ST 0EZ-090-1H1-8 121,700 575/3/60 44.1 465 C/W LOW AMBIENT KIT AND CRANKCASE HEATER M-101 SCHEDULES 2	THE FOLLOWING ARE MANDATORY REQUIREMENTS OF THE PROGRAM. FAILURE TO DOCUMENT AND PROVIDE ANY OF THE
LOCKABLE FLOW CONTROL VALVE CAPPED PIPE	RADIATION WATER SUPPLY — SINGLE LINE FLEXIBLE DUCT	CU-O/C AHU-O/C 0EZ-110-1H1-8 121,700 575/3/60 44.1 465 C/W LOW AMBIENT KIT AND CRANKCASE HEATER	INFORMATION BELOW WILL VOID THE PROGRAM AND MAKE THE APPLICATION INTELLIGIBLE FOR THE INCENTIVE REBATE. ROOI TOP RTU-N AND RTU-S ARE ELIGIBLE AND PARTICIPATE IN
BALL VALVE	RADIATION WATER RETURN	CU-G-E MUA-G-E 0EZ-075-1H1-8 78,820 575/3/60 35.93 615 C/W LOW AMBIENT KIT AND CRANKCASE HEATER M-103 CONTROLS 1	THE INCENTIVES.
CHECK VALVE PIPE SLEEVE FLOAT VALVE CONTINUOUS PIPE	CHWS —— CHILLED WATER SUPPLY SUPPLY AIR DIFFUSER	CU-G-W MUA-G-W 0EZ-075-1H1-8 78,820 575/3/60 35.93 615 C/W LOW AMBIENT KIT AND CRANKCASE HEATER	2. THE CONTRACTOR SHALL INCLUDE PHOTOGRAPHIC DOCUMENTATION OF THE EXISTING ROOFTOPS INCLUDING
O TESTI WELL (CONTINUES THE	CHWR — CHILLED WATER RETURN RETURN AIR GRILLE	CU-C/R MUA-C/R 0EZ-150-1H1-8 148,200 575/3/60 35.93 940 C/W LOW AMBIENT KIT AND CRANKCASE HEATER	MODEL, SERIAL NUMBER. THIS INFORMATION IS TO BE NEA' ARRANGED, LABELED AND ORGANIZED IN A PDF DOCUMENT SUBMIT A COPY TO THE OWNER AND CONSULTANT FOR
HOSE-END DRAIN VALVE METER	CWS — CONDENSER WATER SUPPLY CWS — CONDENSER WATER SUPPLY DIFF TYPE/SUPPLY AIR CFM CWS — CONDENSER WATER SUPPLY	CULO M E O M 24APR3604001 60 000 575/3/60 21.4 330 C/W LOW AMBIENT KIT, CRANKCASE HEATER, EVAPOTATOR FREEZE THERMOSTAT, LOW	APPROVAL.
VALVED AND CAPPED PROVISION ————————————————————————————————————	CWR — CONDENSER WATER RETURN — FD FIRE DAMPER	NOTES: PRESSURE SWITCH, WINTER START CONTROL, AND WIND BAFFLE M-200 NATURAL GAS SCHEMATIC	3. THE CONTRACTOR IS TO PROVIDE A RECEIPT AND LETTER STATING THAT THE ROOFTOPS HAVE BEEN DISPOSED OF.
GATE VALVE AND FLOW SWITCH STRAINER	S STEAM MAIN (PRESSURE AS INDICATED) SMOKE DAMPER	1. CU—ST AND CU—OC SPECIFICATIONS BASED ON MAMMOTH, CU—GE, CU—GW, AND CU—CR SPECIFICATIONS BASED ON EFI CONCEPTS, CU—O—M SPECIFICATIONS BASED ON CARRIER 2. ALL UNITS TO BE BACNET COMPATIBLE, MS/TP NIAGARA 4 PLATFORM 3. TX VALVE TO MATCH ASSOCIATED COIL M 202 DEMOLITION PLUMBING SERVICE CENTRE M—201 DEMOLITION PLUMBING SERVICE CENTRE DEMOLITION PLUMBING SERVICE CENTRE M—202 DEMOLITION PLUMBING EAST GROUND FLOOR AND	4. THE CONTRACTOR IS TO PROVIDE RECEIPTS FOR THE NEW ROOFTOPS (RTU-N AND RTU-S). THE RECEIPTS SHALL
SHUT-OFF VALVE AND ACCESS PANEL BFP BACKFLOW PREVENTER	C CONDENSATE RETURN MOTORIZED DAMPER	M-202 MEZZANINE	INDICATE MODEL NUMBER AND SERIAL NUMBER. THIS INFORMATION IS USED TO VALIDATE THE INCENTIVES
BUTTERFLY VALVE WFA WATER FEEDER ASSEMBLY	FOS — FUEL OIL SUPPLY — BD MANUAL BALANCING DAMPER	RETURN FANS M-210 WASTE OIL PLUMBING PLAN	APPLICATION. PRICING CAN BE BLACKED OUT. THIS SHALL SUBMITTED TO THE OWNER AND THE CONSULTANT FOR APPROVAL.
LOCKSHIELD VALVE Connection Connection	FOR —— FUEL OIL RETURN ———BDD BACK DRAFT DAMPER REFRIGERANT LIQUID ——— FS MOTORIZED COMBINATION FIRE AND SMOKE DAMPER	TAG SERVING TYPE MODEL CAPACITY ESP VOLTAGE MOTOR WEIGHT REMARKS M-211 REVISED PLUMBING SERVICE CENTRE	, , , , , , , , , , , , , , , , , , ,
I♥I PLUG VALVE PUMP	D'ANI LIX	L/S CFM Pa in.w. KW HP BHP LBS KW HP BHP LBS	
PRESSURE REDUCING VALVE PRESSURE GAUGE WITH COCK	REFRIGERANT DISCHARGE FIRE DAMPER (IN RISER)	RF-ST AHU-ST CENTRIFUGAL QSL 1,982 4200 150 0.6 575/3/60 1.12 1.5 0.74 440 -	
FLOW SWITCH U THERMOMETER	REFRIGERANT SUCTION SMOKE & FIRE DAMPER (IN RISER)	NOTES: 1. SPECIFICATIONS BASED ON TWIN CITY FANS	
FLOW METER, VENTURI STARTER	GS — GLYCOL SUPPLY — BALANCING DAMPER IN (IN RISER)	M-302 DEMOLITION HVAC EAST GROUND FLOOR AND MEZZANINE	
SOLENOID VALVE \$ FAN SPEED CONTROLLER	GR — GLYCOL RETURN — MOTORIZED DAMPER (IN RISER)	OUTSIDE AIR FANS	
⊗ CIRCUIT BALANCING VALVE STB SLEEVE THROUGH BEAM	SUPPLY OR OUTSIDE AIR DUCT THERMOSTAT	TAG SYSTEM LOCATION TYPE MODEL CAPACITY ESP VOLTAGE MOTOR REMARKS M-304 DEMOLITION HVAC ROOF CENTRAL	
BALANCING VALVE (PLUG) STW SLEEVE THROUGH WALL	RETURN OR EXHAUST DUCT	L/S CFM Pa in.w. KW HP BHP M-305 DEMOLITION HVAC EAST ROOF M-305 REVISED HVAC GROUND FLOOR AND MECHANICAL	
NEEDLE VALVE DTF DOWN THROUGH FLOOR	SUPPLY DUCT DOWN UC DOOR UNDERCUT	SF-S/W WELDING SHOP SUPPLY AIR WELDING SHOP SQUARE INLINE CENTRIFUGAL BSI 590 1,250 795 3.20 575/3/60 1.12 1.50 1.34 C/W MOTOR COVER, VARIABLE SPEED V-BELT DRIVE, 1.5 SF, DISC SWITCH M=310 MEZZANINE MEZZANI	
PRESSURE DIFFERENTIAL VALVE CTE CONNECT TO EXISTING	RETURN DUCT DOWN DG DOOR GRILLE	SF-S/C CARPENTRY SHOP SUPPLY AIR CARPENTRY SHOP SUPPLY AIR CARPENTRY SHOP CENTRIFUGAL BSI 590 1,250 60 0.25 115/1/60 1.12 1.50 1.34 (C/W MOTOR COVER, VARIABLE SPEED V-BELT DRIVE, 1.5 SF, DISC SWITCH M-311 REVISED HVAC SERVICE CENTRE	
AP ACCESS PANEL SAFETY RELIEF VALVE	ROUND DUCT UP OA OUTDOOR AIR	SF-EMR EAST MECHANICAL ROOM VENTILATION AIR SQUARE INLINE CENTRIFUGAL DSI 236 500 95 0.38 575/3/60 0.25 0.33 0.31 C/W ALUMINUM BACKDRAFT DAMPER, PERFORMANCE BAFFLE WITH 5.73 IN DIAMETER, DISC SWITCH-UNFUSED (NEMA 1)	
T AD ACCESS DOOR	ROUND DUCT DOWN RA RETURN AIR	SF-WMR WEST MECHANICAL ROOM VEST MECHANICAL ROOM VEST MECHANICAL SQUARE INLINE ROOM CENTRIFUGAL DSI 354 750 95 0.38 575/3/60 0.25 0.33 0.31 C/W ALUMINUM BACKDRAFT DAMPER, PERFORMANCE BAFFLE WITH 5.73 IN DIAMETER, DISC SWITCH—UNFUSED (NEMA 1)	
AUTOMATIC CONTROL VALVE	DUCT WITH ACOUSTIC LINING RF RELEIF AIR	NOTES: 1. SPECIFICATIONS BASED ON TWIN CITY	
MOTORIZED BUTTERFLY VALVE	DOUBLE LINE DUCT SA SUPPLY AIR	M-315 REVISED HVAC EAST ROOF	
VALVE IN RISER	SOUND ATTENUATOR	M-320 REVISED HVAC EAST GROUND FLOOR AND MEZZANINE SECTIONS	
			4 ISSUED FOR CONSTRUCTION MAY 07, 2021
	MAKE	P AIR UNITS (GAS FIRED)	3 ISSUED FOR TENDER FEB. 26, 202
TAG SYSTEM LOCATION TYPE MODEL # AIRFLOW MIN	O.A. HEATING COOLING	FAN MOTOR (SUPPLY) VOLTAGE MCA FILTER WEIGHT REMARKS	2 RE-ISSUED FOR PERMIT DEC. 03, 2020
L/S CFM S	& LIEATING AID OAS LIEAT COOLING AID EAT LAT	PRE-FILTER ODOUR	1 RE-ISSUED FOR PERMIT NOV 06, 2020
	HEATING AIR GAS HEAT COOLING AIR TOTAL SEN	POWER ESP L	0 ISSUED FOR PERMIT SEPT 4, 2020
	DB WB DB WB	MERV IYPE MEDIA IYPE L	No. DESCRIPTION DATE
JA-G-W GARAGE WEST WEST MECHANICAL INDOOR Tec-ESL-36x45 1,652 3500 10	L/S CFM CFH MBH L/S CFM MBH MBH C F C F C F C F C F C F C F C F C C F C C F C C F C C F C	KW HP Pa in.w.c. LBS 3.73 5 250 1 575/3/60 - 8 PLEATED MM-9000 CARTRIDGE 2600 COMPLETE WITH S/A VFD, MERV 8 FILTER, CONTROLS BY THE VENDOR, REMOTE CONTROL PANEL, AND DRAIN CONNECTION	REVISIONS
TACT MECHANICAL	00 826 1750 175 140 826 1750 72 42 34 93 24 75 21.1 70.0 17.4 63.3 00 826 1750 175 140 826 1750 72 42 34 93 24 75 21.1 70.0 17.4 63.3		
IVA_C /P CHANCEPOON WEST MECHANICAL INDOOR Too ECL 70:/36 1 133 2400 14	00 1,133 2400 300 240 1,133 2400 160 90 33 92 24 75 13.4 56.2 12.4 54.3		
DTES: SPECIFICATIONS BASED ON ENVIRO-TEC			
ALL UNITS TO BE BACNET COMPATIBLE, MS/TP NIAGARA 4 PLATFORM CIRCUL—AIRE CARBON FILTERS FOR ODOUR CONTROL.			
		IR HANDLING UNITS	
TAG SYSTEM LOCATION MAKE MODEL # AIRFLOW	SUPPLY FAN RETURN FAN COOLING	HEATING STEAM HUMIDIFICATION FILTER WEIGHT REMARKS	
	POWER ESP POWER ESP DX	GAS HEAT HYDRONIC HEAT LOAD PRE-FILTER ODOUR	
			ARC
L/S CFM VOLTA		G GAS T OUTPUT SEFF CAP EWT LWT EAT LAT PD Kg/hr Ib/hr MERV TYPE MEDIA TYPE LBS	HILL
	AMP AMP TW HE FU III.W.C. VOLTAGE AMP TW HE FU III.W.C. MBH MBH DB WB DB WB CF) (°F) (°F) (°F) (°F) C		
J-ST STORES EAST MECHANICAL ROOM ENVIRO-TEC Tec-ESL-36x63 1,982 4,200 575/3/	60 17.4 30.0 3.7 5 385 1.54 - - - - - 95 66 77.7 64.6 62.7 57.0 2	185 80 8 PLEATED MM-9000 CARTRIDGE 3000 COMPLETE WITH S/A VFD, MERV 8 FILTER, CONTROLS BY THE VENDOR, REMOTE CONTROL PANEL, AND DRAIN CONNECTION. INTERLOCK WITH RETURN FAN RT-ST.	ARC Engineering In
I-O/C OFFICE/ CAF WEST MECHANICAL ROOM ENVIRO-TEC Tec-ESL-36x45 1,321 2,800 575/3/			
		COMPLETE WITH C/A VED MEDV 9 FILTED MM 0000 CARRON FILTED CONTROL BY THE VENDOR REMOTE CONTROL DANEL AND DRAIN CONNECTION INTERLOCK WITH CURRY FAN	Creating Solutions Through Engineering Exce
U-S/W WELDING EAST MEZZANINE ENVIRO-TEC Tec-ESL-30x45 755 1,600 575/3/	60 - - 1.5 2 185 0.75 - - - - - - 74 46 89.5 73 62.2 58.9 2	160 80 8 PLEATED MM-9000 CARTRIDGE 1/00 SF-S/W AND EF-S/W.	1100 South Service Rd., #417 Stoney Creek ON L8E 0C5
J-S/C CARPENTRY EAST MEZZANINE ENVIRO-TEC Tec-ESL-30x45 774 1,640 575/3/	60 - 1.5 2 185 0.75 - - - - - 40 31 77 64 59.3 55.7 10	80 80 8 PLEATED MM-9000 CARTRIDGE 1700 COMPLETE WITH S/A VFD, MERV 8 FILTER, MM-9000 CARBON FILTER, CONTROLS BY THE VENDOR, REMOTE CONTROL PANEL, AND DRAIN CONNECTION. INTERLOCK WITH SUPPLY FAN SF-S/C AND EF-S/C.	T ● (905) 643-8530 F ● (905) 643-8510
<u>ITES:</u> SPECIFICATIONS BASED ON ENVIRO—TEC			www.arcengineering.ca
ALL UNITS TO BE BACNET COMPATIBLE, MS/TP NIAGARA 4 PLATFORM CIRCUL—AIRE CARBON FILTERS FOR ODOUR CONTROL.			contact@arcengineering.ca
			PROJECT:
		EVAPORATOR	
	FURNACES		MINCADA ENTIC
TIO 000TELL 1000TELL 1000TE		WEIGHT BUIENGIAN TAG ADE:	NIAGARA FALLS SERVICE CENTRE
TAG SYSTEM LOCATION MODEL # SIZE SUPPLY AIR RETURN AIR	OUTDOOR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC	D x W x H SERVE AIRFLOW E.S.P. TOTAL WEIGH CAPACITY T	NIAGARA FALLS SERVICE CENTRE IMPROVEMENTS
	OUTDOOR AIR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC INPUT OUTPUT NET SENSIBLE	D x W x H SERVE AIRFLOW DB WB DB WB E.S.P. TOTAL CAPACITY T	SERVICE CENTRE IMPROVEMENTS
L/S CFM L/S CFM	OUTDOOR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC	D x W x H	SERVICE CENTRE
L/S CFM L/S CFM	OUTDOOR AIR L/S CFM KW HP Pa in.w.c. EER GAS HEATING COOLING REFRIGERANT INPUT OUTPUT NET SENSIBLE WHEN MBH MBH MBH MBH MBH MBH VOLTAGE MCA	D x W x H	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO
L/S CFM L/S CFM MEZZ. OFFICES EAST EAST MECH. ROOM 103 59TP6A120E2422 120 850 1,800 715 1,515	OUTDOOR AIR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC INPUT OUTPUT NET SENSIBLE L/S CFM KW HP Pa in.w.c. MBH MBH MBH MBH WBH VOLTAGE MCA	D x W x H	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO START DATE: DRAWN BY: DESIGNED
L/S CFM L/S CFM D-M MEZZ. OFFICES EAST EAST MECH. ROOM 103 59TP6A120E2422 120 850 1,800 715 1,515	OUTDOOR AIR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC L/S CFM KW HP Pa in.w.c. MBH MBH MBH MBH VOLTAGE MCA 135 285 0.7 1 150 0.60 11 120 117 56.26 42.26 PURON 115/1/60 14.7	D x W x H D x W x H D D B W B D B D B W B D B W B D B W B D B D B W B D B D B D B W B D B	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO START DATE: DRAWN BY: DESIGNED 2020 03 24 M.B. P.G.
L/S CFM L/S CFM O-M MEZZ. OFFICES EAST EAST MECH. ROOM 103 59TP6A120E24—22 120 850 1,800 715 1,515 OTES: SPECIFICATIONS BASED ON CARRIER	OUTDOOR AIR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC INPUT OUTPUT NET SENSIBLE VOLTAGE MCA 135 285 0.7 1 150 0.60 11 120 117 56.26 42.26 PURON 115/1/60 14.7	Noce Les In Serve Airflow Dis Wish Dis Dis Wish Dis	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO START DATE: DRAWN BY: DESIGNED
L/S CFM L/S CFM O-M MEZZ. OFFICES EAST EAST MECH. ROOM 103 59TP6A120E2422 120 850 1,800 715 1,515	OUTDOOR AIR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC INPUT OUTPUT NET SENSIBLE VOLTAGE MCA 135 285 0.7 1 150 0.60 11 120 117 56.26 42.26 PURON 115/1/60 14.7	D x W x H D x W x H D D B W B D B D B W B D B W B D B W B D B D B W B D B D B D B W B D B	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO START DATE: DRAWN BY: DESIGNED 2020 03 24 M.B. P.G.
L/S CFM L/S CFM O-M MEZZ. OFFICES EAST EAST MECH. ROOM 103 59TP6A120E24—22 120 850 1,800 715 1,515 OTES: SPECIFICATIONS BASED ON CARRIER	OUTDOOR AIR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC L/S CFM KW HP Pa in.w.c. MBH MBH MBH MBH MBH WBH VOLTAGE MCA 135 285 0.7 1 150 0.60 11 120 117 56.26 42.26 PURON 115/1/60 14.7 ENERGY RECOVERY UNITS HEAT RECOVERY WINTER CONDITIONS FAN MOTOR (SUPPLY) FAN MOTOR (RETURN) ELECTRIC	D x W x H SERVE D	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO START DATE: DRAWN BY: DESIGNED 2020 03 24 M.B. P.G. DRAWING TITLE:
L/S CFM L/S CFM O-M MEZZ. OFFICES EAST EAST MECH. ROOM 103 59TP6A120E24—22 120 850 1,800 715 1,515 TES: SPECIFICATIONS BASED ON CARRIER TAG SYSTEM LOCATION MODEL # AIRFLOW HEAT RECOVERY SUMMER CONDITIONS	OUTDOOR AIR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC L/S CFM KW HP Pa in.w.c. MBH MBH MBH MBH MBH WBH VOLTAGE MCA 135 285 0.7 1 150 0.60 11 120 117 56.26 42.26 PURON 115/1/60 14.7 ENERGY RECOVERY UNITS HEAT RECOVERY WINTER CONDITIONS FAN MOTOR (SUPPLY) FAN MOTOR (RETURN) ELECTRIC	Noch LBS IN Noch LBS IN Noch LBS IN Noch LBS Noch Noch LBS Noch Noch LBS Noch Noch LBS Noch	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO START DATE: DRAWN BY: DESIGNED 2020 03 24 M.B. P.G. DRAWING TITLE: LEGENDS AND
L/S CFM L/S CFM D-M MEZZ. OFFICES EAST EAST MECH. ROOM 103 59TP6A120E2422 120 850 1,800 715 1,515 TES: SPECIFICATIONS BASED ON CARRIER TAG SYSTEM LOCATION MODEL # AIRFLOW HEAT RECOVERY SUMMER CONDITIONS OUTSIDE AIR RETURN AIR SUPPLE	OUTDOOR AIR FAN POWER ESP EER GAS HEATING COOLING REFRIGERANT ELECTRIC L/S CFM KW HP Pa in.w.c. MBH MBH MBH MBH WBH VOLTAGE MCA 135 285 0.7 1 150 0.60 11 120 117 56.26 42.26 PURON 115/1/60 14.7 ENERGY RECOVERY WINTER CONDITIONS FAN MOTOR (SUPPLY) FAN MOTOR (RETURN) ELECTRIC Y AIR OUTSIDE AIR RETURN AIR SUPPLY AIR POWER ESP POWER ESP	D x W x H	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO START DATE: DRAWN BY: DESIGNED 2020 03 24 M.B. P.G. DRAWING TITLE: LEGENDS AND
L/S CFM L/S CFM L/S CFM	OUTDOOR AIR FAN POWER ESP EER INPUT GAS HEATING UTPUT COOLING NET SENSIBLE REFRIGERANT ELECTRIC L/S CFM KW HP Pa in.w.c. MBH MBH MBH MBH MBH WBH WBH MBH MBH MBH WBH WBH MBH MBH <td> D x W x H</td> <td>SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO BY DESIGNED M.B. P.G. DRAWING TITLE: LEGENDS AND SCHEDULES BY DRAWING No.: N.T.S.</td>	D x W x H	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO BY DESIGNED M.B. P.G. DRAWING TITLE: LEGENDS AND SCHEDULES BY DRAWING No.: N.T.S.
L/S CFM L/S	OUTDOOR AIR FAN POWER ESP EER INPUT GAS HEATING OUTPUT COOLING NET SENSIBLE REFRIGERANT ELECTRICE L/S CFM KW HP Pa in.w.c. MBH MBH MBH MBH MBH WBH WBH MBH MBH MBH WBH WBH MBH MBH MBH MBH WBH MBH MBH MBH WBH MBH MBH<	MOCP LBS IN SERVE DB WB DB WB DB WB LBS CAPACITY TO THE PQ IN. LVS CFM TC TF TC TF TC TF PQ IN. LWW MBH LBS TEXT TO THE PART TO THE PART TO THE PROPRIES THE CONTRACTOR TO INSTALL THE LISTED ERV AS SPECIFIED AND PROVIDE ALL MECHANICAL MATERIALS AND THE PROVIDE ALL MECHANICAL MATERIAL	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO START DATE: DRAWN BY: DESIGNED P.G. DRAWING TITLE: LEGENDS AND SCHEDULES SCALE: N.T.S. PROJECT: DRAWING No.: M-100
L/S CFM L/S CFM L/S CFM	OUTDOOR AIR FAN POWER ESP EER INPUT GAS HEATING OUTPUT COOLING NET SENSIBLE REFRIGERANT ELECTRICE L/S CFM KW HP Pa in.w.c. MBH MBH MBH MBH MBH WBH WBH MBH MBH MBH WBH WBH MBH MBH MBH MBH WBH MBH MBH MBH WBH MBH MBH<	MOCP LBS IN SERVE DB WB DB WB DB WB LBS CAPACITY TO THE PQ IN. LVS CFM TC TF TC TF TC TF PQ IN. LWW MBH LBS TEXT TO THE PART TO THE PART TO THE PROPRIES THE CONTRACTOR TO INSTALL THE LISTED ERV AS SPECIFIED AND PROVIDE ALL MECHANICAL MATERIALS AND THE PROVIDE ALL MECHANICAL MATERIAL	SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO START DATE: DRAWN BY: DESIGNED P.G. DRAWING TITLE: LEGENDS AND SCHEDULES SCALE: DRAWING No.:

						+EXI	HAU'	اد	<u>FAN</u>	N SCHE	<u> </u>	<u>.</u>		
TAG	SYSTEM	SERVING	TYPE	MAKE	MODEL	CAP/	ACITY	<u> </u>	SP	VOLTAGE		MOTOR	<u> </u>	REMARKS
		'	'	<u> </u>		L/S	CFM	Pa	in.w.		KW	HP	ВНР	
EF-O-N	SANITARY EXHAUST	WASHROOMS	ROOF	S&P	LPD081AS	<u> </u>	['	'	- '		-		'	- EXISTING TO REMAIN
EF-0-S	SANITARY EXHAUST	OFFICE SOUTH WASHROOMS	ROOF	S&P	LPD081AS		-	<u> </u>	-				'	- EXISTING TO REMAIN
EF−0−BR	GENERAL EXHAUST		INLINE CABINET FAN	GREENHECK	CSP-A390-VG	94	200	100	0.400	0 115/1/60	0.05	0.067	7 0.050	- UL/cul Listed - Electric fan - Flat Roof Flashing Flange (Pn: RFC-7) Shipped Loose - Round Duct Connector, (Pn:RDC-8) Shipped Loose 0 - Isolation Kit (Pn: VI Kit-SP/CSP), Shipped Loose - Adjustable Easy Installation Mounting Bracket - Energy Star Certified - Polypropylene Wheel Material
:F-C/R	GENERAL EXHAUST	RM 113 MECHANICAL MEZZANINE	CENTRIFUGAL INLINE FAN	GREENHECK	SQ-160-VG	1,133	3 2,400	160	0.65	5 115/1/60	0.56	0.75	5 0.51	- NO UL LISTING - SWITCH, NEMA-1, TOGGLE, SHIPPED WITH UNIT - SEISMIIC RATED TO DESIGN CATEGORY F PER IBC-2012 & ASCE 7-05 STANDARDS - OSHPD SEISMIC CERTIFIED, #OSP-0113-10
EF-G-N	GENERAL EXHAUST	RM 61 MAINTENANCE GARAGE	ROOF	GREENHECK	AE-16-428-A5	1,100	2,330	100	0.40	0 115/1/60	0.37	0.50	0 0.36	-UL/cul 705 LISTED - "POWER VENTILATORS"
EF-G-S	GENERAL EXHAUST	RM 61 MAINTENANCE GARAGE	ROOF	GREENHECK	AE-16-428-A5	1,100	2,330	100	0.40	0 115/1/60	0.37	0.50	0 0.36	-UL/cul 705 Listed - "Power Ventilators" - SWITCH NEMA-1. TOGGLE, SHIPPED WITH UNIT - ALUMINUM BIRDSCREEN MATERIAL - SOLID STATE SPEED CONTROL, 10 AMP, SHIPPED LOOSE
EF-G-P	GARAGE PIT EXHAUST	MAINTENANCE GARAGE PIT	ROOF	GREENHECK	GB-101HP-4	101	1 215	150	0.60	0 115/1/60	0.19	0.25	0.08	- SPARK B CONSTRUCTION - UL/cUL 705 LISTED - "POWER VENTILATORS" - SWITCH, NEMA-7 AND 9, TOGGLE, SHIPPED WITH UNIT, DIVISION 1 WIRING - SEISMIC RATED TO DESIGN CATEGORY F PER IBC-2015 & ASCE 7-10 STANDARDS 8 - OSHPD SEISMIC CERTIFIFED, #OSP-0148-10 - HINGED CURB CAP KIT W/ CABLES (PN 851018)(SHIPPED LOOSE) - FOAM CURB SEAL (ATTACHED) - BIRDSCREEN: GALVANIZED, NOM. 84% FREE AREA - BEARINGS WITH GREASE FITTINGS, L10 LIFE OF 100,000 HRS (L50 AVERAGE LIFE 500,000 HRS
EF-G-VE	VEHICLE EXHAUST	RM 61 MAINTENANCE GARAGE	ROOF	GREENHECK	FJI-BI-X	1,699	3,600	795	5 3.20	0 575/3/60	3.73	5.00		-COATED WITH PERMATECTOR, CONCRETE GRAY-RAL 7023, FAN AND ATTACHED ACCESSORIES -CURB MOUNTED WITH PANEL -UL LISTED FOR UL/CUL-705 - "POWER VENTILATORS" -DIRECT MOUNT ISOLATORS, ISOLATOR-SPRING, RESTRAINED, 1 INCH -ACCESS DOOR - HINGED -DRAIN CONNECTION - 1" PIPE THREAD W/PLUG -INLET CONNECTION - SLIP FIT -OUTLET CONNECTION - SLIP FIT -VFD MOUNTING BRACKET -MOTOR COVER, STEEL -FASTENERS - STANDARD -VFD
EF-G-GS	GENERAL EXHAUST	RM 61A GARAGE STORAGE	ROOF	GREENHECK	G-080-VG	142	2 300	100	0.40	0 115/1/60	0.07	0.10	0 0.06	- UL/cul 705 Listed - "Power Ventilators" - SWITCH, NEMA-1, TOGGLE, SHIPPED WITH UNIT - SEISMIC RATED TO DESIGN CATEGORY F PER IBC-2015 & ASCE 7-10 STANDARDS - OSHPD SEISMIC CERTIFIED, #OSP-0148-10 - HINGED CURB CAP KIT W/ CABLES (PN 851018)(SHIPPED LOOSE) - FOAM CURB SEAL (ATTACHED) - BIRDSCREEN: GALVANIZED, NOM. 84% FREE AREA - ALUMINUM WHEEL MATERIAL
<u>:</u> F−0− M	SANITARY EXHAUST	RM 105 WASHROOM	CEILING MOUNTED	GREENHECK	SQ-60-VG	47	7 100	85	5 0.35	5 115/1/60	0.37	0.50	0 0.36	-NO UL LISTING -SWITCH, NEMA-1, TOGGLE, SHIPPED WITH UNIT -SEISMIC RATED TO DESIGN CATEGORY F PER IBC-2012 & ASCE 7-05 STANDARDS
EF-WR	SANITARY EXHAUST	EAST BLOCK WASHROOM	ROOF	GREENHECK	G-095-VG	142	2 300	125	0.50	0 115/1/60	0.12	0.17	7 0.06	- UL/cul 705 Listed - "Power Ventilators" - Switch, Nema-1, Toggle, Shipped with Unit - Seismic Rated to Design Category F per IBC-2015 & ASCE 7-10 STANDARDS
EF-S/W	SQUARE INLINE CENTRIFUGAL	WELDING SHOP	CEILING MOUNTED	TWIN CITY	DSI	165	350	60	0.25	5 115/1/60	0.09	0.13	0.04	4 C/W DISK SWITCH (NEMA 1)
EF-S/C	CENTRIFUGAL			TWIN CITY	DSI	165	350	125	0.50	0 115/1/60	0.12	0.17	0.06	6 C/W SPEED CONTROLLER MOTOR MOUNTED, 0-10 VDC LEAD, DISK SWITCH (NEMA 1)
FE-S/W	CENTRIFUGAL	WELDING SHOP FUME EXHAUST	CEILING MOUNTED	PLYMOVENT	FUA-3000	425	900	1,745	7.00	0 230/3/50	1.49	2	<u>.</u> '	C/W MOTOR STARTER
EF-WO	GENERAL EXHAUST	WASTE OIL STORAGE	PROPELLER WALL	TWIN CITY	TCPE	94	200	30	0.13	3 115/1/60	0.12	0.17	/ 0.02	2 COMPLETE WITH BACK DRAFT DAMPENER

					·			S	SPLIT SY	'STEMS				
TAG	LOCATION				II	NDOOR	UNIT				OUTDO	OR UNIT		REMARKS
		MODEL #	NOM A	NRFLOW	MIN.	A. 0		L CAPACITY BTUH)	ELECTRICAL	MODEL #		ELECTRIC	CAL	
			L/S	CFM	L/S	CFM	HEATING	COOLING	VOLTAGE		MCA	MOCP	VOLTAGE	
HP-S-0/HP-E	STORES OFFICE	40MBFQ123	132	280	0	0	7,639	10,917	230/1/60					
HP-MT/HP-E	METER TESTING	40MBFQ183	260	550	71	150	11,459	16,375	230/1/60	- - 38MGRQ48E3	35	50	208/230	-FLOOR CONSOLE FAN COIL UNIT C/W FILTER, DX COIL, SELECTABLE AIR SWEEP OPERATION, AUTOMATIC RESTART AFTER POWER FAILURE, CONDENSATE
HP-CO/HP-E	CARPENTRY OFFICE	40MBFQ123	132	280	24	50	7,639	10,917	230/1/60	7 JOMUNU40E3	, JS	30		PUMP, WALL MOUNT WIRED REMOTE BACNET THERMOSTAT. CONDENSING UNIT C/W SNOW STAND, WIND BAFFLES.
HP-C-LR/HP-E	CARPENTRY LUNCHROOM	40MBFQ123	132	280	47	100	7,639	10,917	230/1/60					

NOTES: 1. SPECIFICATIONS BASED ON CARRIER

											F	₹00	F T	OP	U	NITS							
TAG	SYSTE	LOCATION	MODEL #			COOLING	;			HE	ATING	AIDE	LOW	MIN	^ ^	ES	,D	ELEC	TDICA	1	WEI	∩⊔т	REMARKS
	M			GROSS	SENSIBLE		1			INPUT	OUTPUT	AIR	LOW	MIIN	O.A.	13)F	ELEC	IRICA	iL	WEN	σпі	
				МВН	MBH	MBH	SEER	IEER	EER	мвн	мвн	L/S	CFM	L/S	CFM	Pa	in.w.	VOLTAGE	MCA	MOC P	KG	lbs	
RTU-O-N	OFFICE NORTH	LOWER WEST ROOF	48LCR004A0M1 -1E3C0	34.33	25.21	9.12	17.10	-	1	115	93	472	1000	61	130	185	0.75	575/3/60	24	30	408	900	C/W STANDARD ELECTRIC DRIVE, LOUVERED HAIL GUARDS, RTU OPEN CONTROLLER, ENTHALPY ECONOMIZER WITH BAROMETRIC RELIEF, HINGED ACCESS PANEL, NON-FUSED DISCONNECT, CO2 SENSOR, AND 24 IN TALL SEISMIC ROOK CURB.
RTU-0-S	OFFICE SOUTH	LOWER WEST ROOF	48LCE008E2M5— 1E3F0	89.82	69.56	20.26	-	19.4	12.80	180	146	1,416	3000	189	400	225	0.90	575/3/60	43	50	998	2200	C/W STATIC BELT DRIVE (WITH VFD CONTROLLER), LOUVERED HAIL GUARDS, RTU OPEN MULTI PROTOCOL CONTROLLER, STANDARD LEAK ENTHALPY ECONOMIZER WITH BAROMETRIC RELIEF, HINGED ACCESS PANELS, CO2 SENSOR, AND 24 IN TALL SEISMIC ROOF CURB. 12" CARTRIDGE CARBON FILTER & HOOD BY RTU VENDOR.

NOTES: SPECIFICATIONS BASED ON CARRIER

							CARBON	I FILTER	UNITS								
TAG	SYSTEM	LOCATION	MODEL #	AIRF	LOW	FILTERS					SP	ELECTRICAL			WEI	GHT	REMARKS
				L/S	CFM	PRE	TYPE	OUDR CONTROL	TYPE	Pa	in.w.c.	VOLTAGE	МОСР	HP	KG	lbs	
CF-O-N	OFFICE NORTH	LOWER WEST ROOF		61	130	8	PLEATED	MM-9000	CARTRIDGE	60	0.25	115/1/60	15	1 8	272	600	
CF-O-S	OFFICE SOUTH	LOWER WEST ROOF		189	400	8	PLEATED	MM-9000	CARTRIDGE	80	0.32	115/1/60	15	1 8	272	600	INTERLOCK WITH ASSOCIATED
CF-O-M	OFFICE MEZZ	EAST ROOF		138	292	8	PLEATED	MM-9000	CARTRIDGE	90	0.36	115/1/60	15	1 8	272	600	HVAC EQUIPMENT
CF-MR	METER ROOM	EAST ROOF		138	292	8	PLEATED	MM-9000	CARTRIDGE	90	0.36	115/1/60	15	1 8	272	600	
NOTES: SPEC	IFICATIONS BASED O	N TWIN CITY/ CIRCUL -	-AIRE														

						UNIT	HEATER			
TAG	SYSTEM	MODEL #	AIRF	AIRFLOW		WER	VOLTAGE	WEIGHT		REMARKS
			L/S	CFM	WATTS	BTU/H		KG	lbs	
UH- W O	WASTE OIL ROOM HEATING	ARUH5TCHAR	94	200	3,750	12,798	208/1/60	9	20	BUILT IN THERMOSTAT

NOTES:
1. SPECIFICATIONS BASED ON OXFORD

UNIT HEATER (GAS)										
TAG	SYSTEM	MODEL #	AIRF	LOW	PO	WER	VOLTAGE	WEIGHT		REMARKS
			L/S	CFM	WATTS	вти/н		KG	lbs	
	ENVIRO SHOP HEATING	UDAS-150	907	1921	44,000	150,000	208/1/60	78	173	-

NOTES:

1. SPECIFICATIONS BASED ON REZNOR

			MOI	URIZE	D DAMP	EKS	
TAG	SYSTEM	LOCATION	SIZE	MODEL	AIRF	FLOW	REMARKS
					L/S	CFM	
MD-S/C	CARP. SHOP SUPPLY AIR	CARPENTRY SHOP	10"x10"	9000	590	1,250	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-S/W	WELDING SHOP SUPPLY AIR	WELDING SHOP	16"x16"	9000	590	1,250	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-CR-I	ERV-C/R INTAKE AIR	WEST MECH. MEZZ	26"x10"	9000	1,133	2,400	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-CR-O	ERV-C/R SUPPLY AIR	WEST MECH. MEZZ	26"x10"	1000	1,133	2,400	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-CR-E	GENERAL EXHAUST	WEST MECH. MEZZ	20"x18"	1000	1,133	2,400	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-CR-R	GENERAL EXHAUST	WEST MECH. MEZZ	20"x18"	1000	1,133	2,400	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-CR-B	ERV-C/R BYPASS	WEST MECH. MEZZ	26"x10"	9000	1,133	2,400	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-ST-RL	AHU-ST RELIEF AIR	EAST MECH. ROOM	32"x16"	9000	1,982	4,200	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-0/C-RL	AHU-O/C RELIEF AIR	WEST MECH. ROOM	26"x16"	9000	1,321	2,800	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-EMR-RA	SF-EMR RETURN AIR	EAST MECH. ROOM	20"x10"	1000	236	500	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-EMR-OA	SF-EMR OUTSIDE AIR	EAST MECH. ROOM	14"x12"	9000	236	500	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-EMR-RL	SF-EMR RELIEF AIR	EAST MECH. ROOM	12"x10"	9000	236	500	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-WMR-RA	SF-WMR RETURN AIR	WEST MECH. ROOM	24"x18"	1000	354	750	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-WMR-OA	SF-WMR OUTSIDE AIR	WEST MECH. ROOM	12"x8"	9000	354	750	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR
MD-WMR-RL	SF-WMR RELIEF AIR	WEST MECH.	16"x10"	9000	354	750	COORDINATE WITH CONTROLS CONTRACTOR FOR ACTUATOR

NOTES: 1. SPECIFICATIONS BASED ON TAMCO

	PLUMBING EQUIPMENT LIST
ITEM	DESCRIPTION
BFP-1	BACKFLOW PREVENTER - LEAD FREE - DOUBLE CHECK VALVE ASSEMBLY - WATTS LF757 BFG: 3 LEAD FREE - DOUBLE CHECK VALVE ASSEMBLY - TWO INDEPENDENT, REMOVABLE AND SERVICEABLE TRI-LINK CHECK MODULES WITHIN A SINGLE HOUSING, DRIP TIGHT CLOSURE AGAINST REVERSE FLOW, 304 SCHEDULE 40 STAINLESS STEEL HOUSING AND SLEEVE, STAINLESS STEEL SPRINGS, REVERSIBLE ELASTOMERIC DISCS, SLEEVED ACCESS PORT, TWO DRIP TIGHT SHUT-OFF VALVES UL/FM GROOVED GEAR OPERATED BUTTERFLY VALVES WITH TAMPER SWITCH, 3"Ø (50 MM) PIPE CONNECTION, FOUR LEAD FREE, BRONZE BODY, NICKEL PLATED TEST COCKS.

WATTS #FD-103-C-A5-1-7 FLOOR DRAIN - EPOXY COATED CAST IRON BODY, REVERSIBLE FLASHING CLAMP WITH FD-1 PRIMARY AND SECONDARYWEEPHOLES, TRAP PRIMER CONNECTION WITH PLUG, 3"Ø (76 MM) NO HUB OUTLET 5" (127 MM) DIAMETER, NICKEL BRONZE, ADJUSTABLE ROUND STRAINER.

ZURN Z-645 12" [305] X 12" [305] EXTRA-HEAVY-DUTY SIDE OUTLET BODY, INTERNAL TRAP AND CLEANOUT, FD-2 | SEEPAGE PAN AND COMBINATION HEAVY-DUTY MEMBRANE FLASHING CLAMP AND FRAME FOR CAST IRON HINGED EXTRAHEAVY-DUTY SLOTTED GRATE, WITH SUSPENDED SEDIMENT BUCKET. 3"0 PIPE SIZE, NO HUB OUTLET, TRAP PRIMER CONNECTION.

FIAT #SF-1-F SINGLE BOWL LAUNDRY SINK, 2 HOLES 4" (102 MM) CENTER, 508 MM (20") WIDE X 587 MM (23-1/8") LONG X 856 MM (33-11/16") HIGH DEEP, FLOOR MOUNTED, MANUFACTURED FROM A MOLDED, FINE CELLED, STRUCTURAL PLASTIC POLYMER, WHITE BAKED ENAMEL STEEL LEGS, INTEGRAL MOLDED DRAIN AND PLASTIC STOPPER AND TAIL PIECE NUT WITH WASHER. CHICAGO FAUCETS #891-ABCP TWO HANDLES FAUCET, CHROME PLATED FINISH, ECAST CONSTRUCTION LEAD FREE (EQUAL OR LESS THAN 0.25%) CAST BRASS BODY, QUATURN COMPRESSION OPERATING CARTRIDGE, 8.3 LPM (2.2 GPM) PRESSURE COMPENSATING SOFTFLO AERATOR OUTLET,

152 MM (6") S TYPE SWING SPOUT, 60 MM (2-3/8") METAL VANDAL PROOF LEVER HANDLES WITH BLUE AND RED INDEX BUTTONS. LAWLER #TMM-1070, BELOW DECK MECHANICAL WATER MIXING VALVE, BRONZE BODY, TEMPERATURE ADJUSTING DIAL, 10 MM (3/8") INLETS AND OUTLET COMPRESSION FITTINGS, HIGH TEMPERATURE THERMOSTATIC LIMIT STOP. NOTE : PROVIDE TEE, ADAPTORS AND FLEX. COPPER TUBING TO SUIT INSTALLATION. PROVIDE TEMPERED WATER TO HOT SIDE OF FAUCET. MCGUIRE #LFBV170 FAUCET SUPPLIES, CHROME PLATED FINISH POLISHED BRASS, COMMERCIAL DUTY 1/4 TURN BALL VALVE ANGLE STOPS, 13 MM (1/2") I.D. INLET X 127 MM (5") HORIZONTAL EXTENSION TUBES, CONVERTIBLE 1/4 TURN/LOOSE KEY HANDLES, ESCUTCHEON AND FLEXIBLE COPPER RISERS. PROVIDE P-TRAP, ADJUSTABLE ALL METAL CONSTRUCTION, 38 MM (1.5") SIZE, AND ESCUTCHEON.

- WATTS DRAINAGE FD-100-DD3T-1 EPOXY COATED CAST IRON 3"0 OUTLET FLOOR DRAIN WITH ANCHOR FLANGE, REVERSIBLE CLAMPING COLLAR WITH PRIMARY & SECONDARY WEEPHOLES, ADJUSTABLE CAST IRON HUB FUNNEL, AND THREADED NICKEL BRONZE HUB OUTLET.

-GUARDIAN #G1750-T, WALL MOUNTED, 292 MM (11-1/2") DIA BOWL, STAINLESS STEEL BOWL, EYE/FACE WASH. PROVIDE SHUT-OFFS AT EMERGENCY MIXING VALVE. EYEWASH/FACEWASH FIXTURE SHOULD BE INSTALLED 4 TO 10 FEET FROM THE MIXING VALVE. - LAWLER #911E/F, 'EMERGENCY TEMPERED WATER MIXER', FOR EMERGENCY THERMOSTATIC MIXING VALVE FOR EYEWASH OR EYE/FACE WASH.

EXPANSION TANKS										
TAG	SYSTEM	LOCATION	MODEL SHIPPING WEIGHT			CONNECTION		VOLUME		REMARKS
				kg	lbs	mm	in	L	USGAL	
ET-1	DCW MAIN	WATER SERVICE ROOM	ST-30V	11.4	25	20	3/4"	53	14	_
ET-2	HOT WATER TANK	HWT ROOM	ST-12	4.1	9	20	3/4"	79	21	_

NOTES: 1. SPECIFICATIONS BASED ON AMTROL

EYE/FACE WASH-WALL MOUNTED

DOMESTIC HOT WATER HEATERS											
TAG	AREA SERVED	MANUFACTUR ER	MODEL #	CAPA	CITY	INPUT	ELECTRI	CAL	WEIG	HT	REMARKS
	SERVED	EIX		L	USGAL	MBH	VOLTAGE	AMPS	KG	LBS.	
HWT-1	EAST	A.O. SMITH	GPDT50	189.3	50	50	120/1/60	-	87.1	192	C/W 3" COMBUSTION AIR AND 3" FLUE VENT
NOTES: 1. SPECIFICATIONS BASED ON A.O. SMITH											

DUST EXTRACTION EQUIPMENT LIST KUA-200/4H FLEX. EXTRACTION ARM C/W FLEXMAX-45/200 EXTENSION CRANE - PLYMOVENT • Wall mounted extraction arm with extension crane (wall bracket included) • KUA-200 Working range from 1.62m to 4.13m
• Extension Crane length of 4.55m

 200Ø Aluminum tubing with 340mm Hood
 PVC Flex Tubing
 Max recommended airflow of 940 cfm KUA-200/3H FLEX. EXTRACTION ARM C/W FLEXMAX-45/200 EXTENSION CRANE - PLYMOVENT

• Wall mounted extraction arm with extension crane (wall bracket included) • KUA-200 Working range from 1.45m to 3.44m (EA-S/W-2) • Extension Crane length of 4.55m 200ø Aluminum tubing with 340mm Hood PVC Flex Tubing
 Max recommended airflow of 940 cfm

KUA-200/3H FLEX. EXTRACTION ARM - PLYMOVENT • Wall mounted extraction arm (wall bracket included) KUA-200 Working range from 1.45m to 3.44m
 200¢ Aluminum tubing with 340mm Hood

PVC Flex Tubing
 Max recommended airflow of 940 cfm.

EXHAUST HOSE REEL 865 (ELECTRIC MOTOR DRIVEN) - NEDERMAN • Model No. 20803965 • Voltage 100/230 V, Frequency 50/60Hz ER-G | Voltage 100/230 V, Frequency 30/30072 NR-CP Hose, 150% Diameter, 10 m length • c/w Extraction Trolley Reel on rail, pendant control, transmitter with wall bracket, fan stand, transformers (x2) 230/250V to 24V/75VA and 24V/25VA, bridge hose clamp, flex noz 6" with 8"/9" opening, arm bracket, stainless steel 5" nozzle, NFC-4.2 Hose Ex. 100mm/5m

EXHAUST HOSE REEL 865 (ELECTRIC MOTOR DRIVEN) - NEDERMAN ER-G-EX CONTRACTOR TO RELOCATE EXISTING HOSE REELS

		DIEELIGEE	S /CBILLES						
DIFFUSERS/GRILLES									
TAG	S TYPE MANUFACTURE MODEL			REMARKS					
S1	INDUSTRIAL DISPLACEMENT DIFFUSER	E.H PRICE	DXFI	SIZE OF FLOOR MOUNTED DIFFUSER IS 24"x24"x36", INLET SIZE 16"Ø.					
S2	LOUVERED FACE SUPPLY	E.H PRICE	520D/SDF/L/F/D/B1 2	REFER TO DRAWINGS FOR SIZE					
S3	ROUND CONE DIFFUSER	E.H. PRICE	RCD/B12	REFER TO DRAWINGS FOR SIZE					
S4	RESERVED	_	_	_					
S5	LOUVERED FACE SUPPLY	E.H. PRICE	520D/L/F/D/B12	REFER TO DRAWINGS FOR SIZE					
S6	LOUVERED FACE SUPPLY	E.H. PRICE	520D/L/TB/B12	REFER TO DRAWINGS FOR SIZE					
R1	LOUVERED FACE RETURN	E.H. PRICE	530D/L/F/D/B12	REFER TO DRAWINGS FOR SIZE					
R2	LOUVERED FACE RETURN	E.H. PRICE	530D/L/TB/B12	REFER TO DRAWINGS FOR SIZE					
R3	EGG CRATE RETURN	E.H. PRICE	80/F	REFER TO DRAWINGS FOR SIZE					
E 1	LOUVERED FACE EXHAUST	E.H. PRICE	530D/L/F/D/B12	REFER TO DRAWINGS FOR SIZE					
E2	LOUVERED FACE EXHAUST	E.H. PRICE	530D/L/TB/B12	REFER TO DRAWINGS FOR SIZE					

NOTES:
1. SPECIFICATIONS BASED ON E.H. PRICE

	PUMPS														
TAG	SERVICE	LOCATION	MANUFAC TURER	MODEL	FLUID	TYPE	CONTROL	FLO	W	HE	EAD	ELECTRIC	AL DA	TA	REMARKS
			TOILL					L/S	USG PM	М	ft.	VOLTAGE	KW	HP	
P-DHWR	DOMESTIC HOT WATER RECIRC	HWT ROOM	ARMSTRON G	ASTRO 210CL	WATER	INLINE	-	0.1	2	1.5	5	120/1/60	0.22	0.3	3 SPEED CIRCULATOR

NOTES: SPECIFICATIONS BASED ON ARMSTRONG

	ROOF HOOD SCHEDULE										
TAG	SYSTEM	LOCATION	SIZ	ZE	MODEL	AIRF	LOW	REMARKS			
			HOOD	THROAT		L/S	CFM				
RHD-1	WELDING/CARPENT	ROOF	60"x36"	36"x24"	ESV	755	1,600	GALVANIZED HOOD COMPLETE WITH BIRD SCREEN, CURB CAP.			

NOTES:

1. SPECIFICATIONS BASED ON ABI BY MESTEK COMPANY

			·		HE	AT F	RECOVE	RY	UN	IT			
TAG	LOCATION	MODEL #	AIRF	LOW	E:	SP	ELECT	ELECTRICAL		WEIGHT		DIMENSIONS L x H x D	REMARKS
			L/S	CFM	Pa	in.w.c.	VOLTAGE	MCA	моср	KG	lbs	IN	
HRV-O-M	EAST MEZZANINE	NU500HRV	138	292	100	0.4	115/1/60	4	15	23	50	36 x 23 x 17	C/W INTELLIGENT DEFROST CYCLE, FAN SPEED CONTROL, DRAIN, HANGER KIT, AND AIR FILTERS
HRV-MR	METER ROOM	NU500HRV	142	300	100	0.4	115/1/60	_	_	_	-	-	-

NOTES: SPECIFICATIONS BASED ON CARRIER

		-		LOUVRES			
TAG	SYSTEM	LOCATION	SIZE	MODEL	AIRFLOW		REMARKS
					L/s	CFM	
LV-1	MAINTENANCE GARAGE MUA	EAST MECH. ROOM	72"x60"	DE439	3,634	7,700	-
LV-2	EAST MEZZANINE RELIEF AIR	EAST MECH. ROOM	72"x24"	DE439	1,982	4,200	-
LV-3	EAST MECH. ROOM COMB. AIR	EAST MECH. ROOM	12"x12"	DE439	-	-	-
LV-4	CARPENTRY SUPPLY AIR	CARPENTRY SHOP	18"x16"	DE439	165	350	-
LV-5	WELDING SUPPLY AIR	WELDING SHOP	24"x36"	DE439	590	1,250	-
LV-6	HRV-MR EXHAUST AIR	METER ROOM	18"x16"	DE439	142	300	-

NOTES:

1. SPECIFICATIONS BASED ON EH PRICE 2. STATIONARY DRAINABLE LOUVRE, 4" ALUMINUM, 53.6% FREE AREA, COORDINATE COLOR WITH ARCHITECT PRIOR TO ORDERING. GENERAL NOTES

ALL EQUIPMENT TO BE PROVIDED WITH SEISMIC CURB OR RESTRAINTS. SEE SPECIFICATIONS FOR DETAILS.

SAVE ON ENERGY PROGRAM DETAILS

THE FOLLOWING ARE MANDATORY REQUIREMENTS OF THE PROGRAM. FAILURE TO DOCUMENT AND PROVIDE ANY OF THE INFORMATION BELOW WILL VOID THE PROGRAM AND MAKE THE APPLICATION INTELLIGIBLE FOR THE INCENTIVE REBATE. ROOF TOP RTU-N AND RTU-S ARE ELIGIBLE AND PARTICIPATE IN

2. THE CONTRACTOR SHALL INCLUDE PHOTOGRAPHIC DOCUMENTATION OF THE EXISTING ROOFTOPS INCLUDING MODEL, SERIAL NUMBER. THIS INFORMATION IS TO BE NEATLY ARRANGED, LABELED AND ORGANIZED IN A PDF DOCUMENT. SUBMIT A COPY TO THE OWNER AND CONSULTANT FOR

3. THE CONTRACTOR IS TO PROVIDE A RECEIPT AND LETTER STATING THAT THE ROOFTOPS HAVE BEEN DISPOSED OF.

4. THE CONTRACTOR IS TO PROVIDE RECEIPTS FOR THE NEW ROOFTOPS (RTU-N AND RTU-S). THE RECEIPTS SHALL INDICATE MODEL NUMBER AND SERIAL NUMBER. THIS INFORMATION IS USED TO VALIDATE THE INCENTIVES APPLICATION. PRICING CAN BE BLACKED OUT. THIS SHALL BE SUBMITTED TO THE OWNER AND THE CONSULTANT FOR

4	ISSUED FOR TENDER	FEB. 26, 2021	P.G				
3	ISSUED FOR PLUMBING PERMIT	FEB. 26, 2021	P.G				
2	RE-ISSUED FOR PERMIT	DEC. 03, 2020	P.G				
1	RE-ISSUED FOR PERMIT	NOV 06, 2020	P.G				
0	ISSUED FOR PERMIT	SEPT 4, 2020	P.G				
No.	DESCRIPTION	DATE	BY				
	REVISIONS						

1100 South Service Rd., #417 Stoney Creek ON L8E 0C5 T • (905) 643-8530 F • (905) 643-8510

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PROJECT:

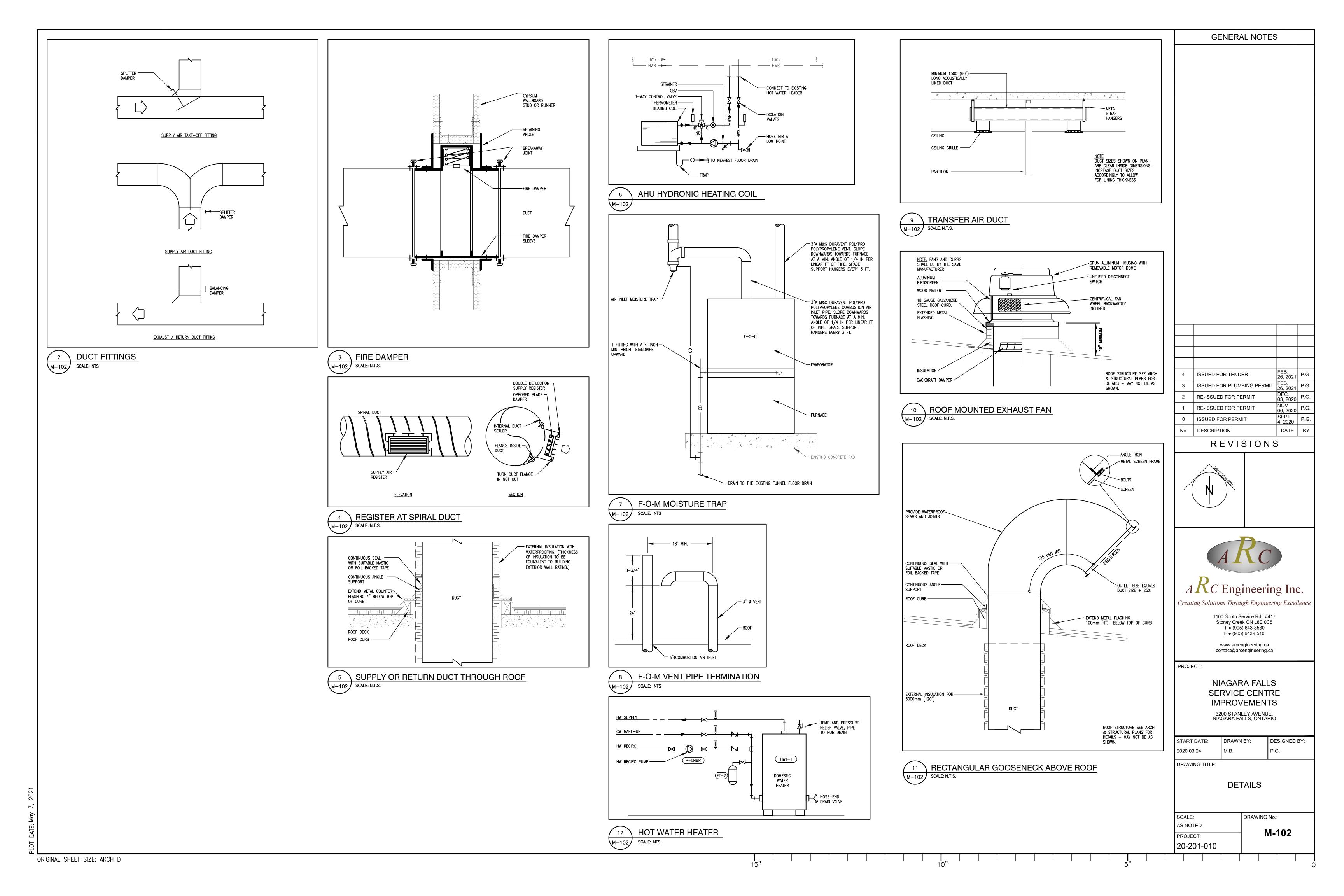
NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

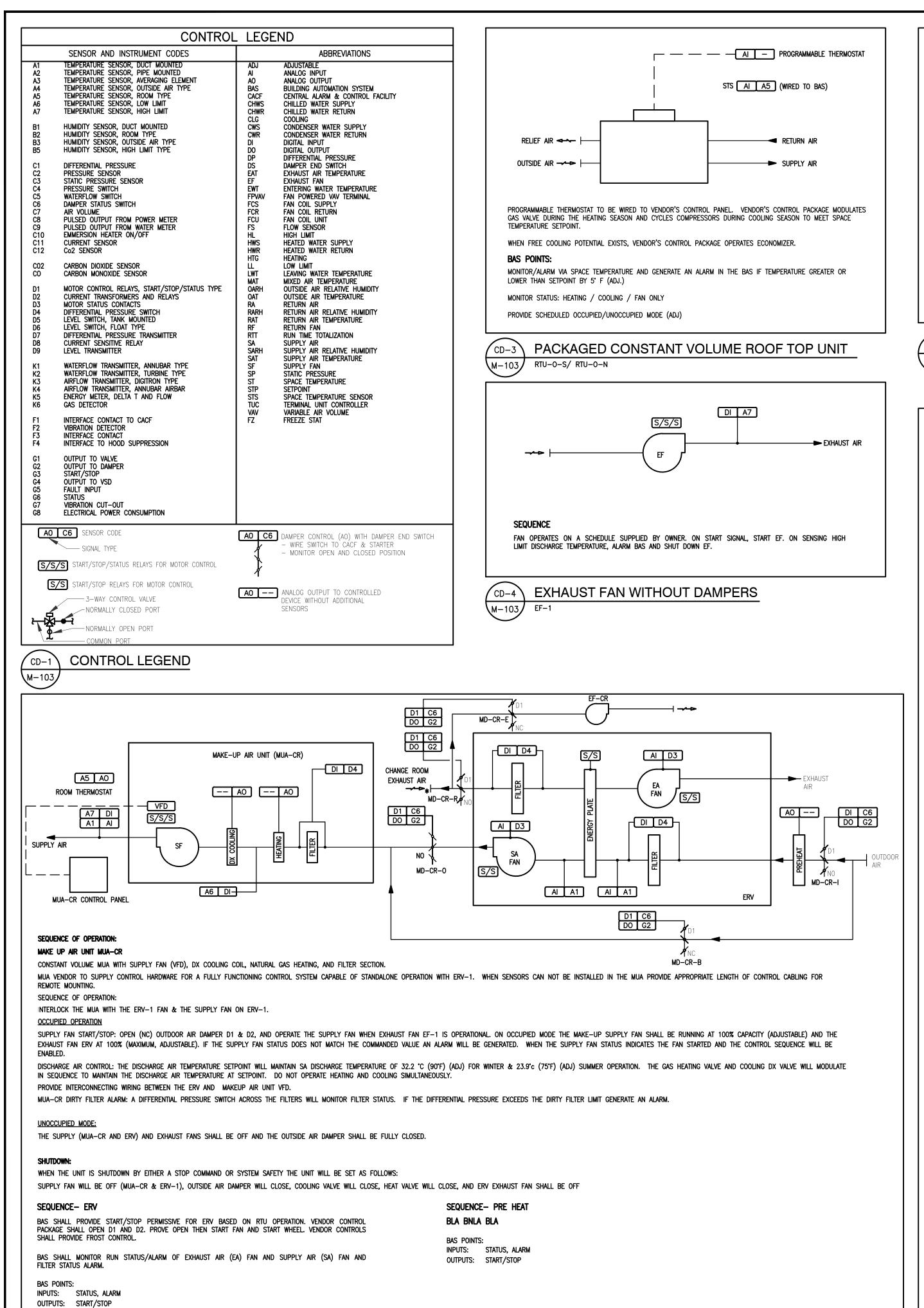
START DATE:	DRAWN BY:	DESIGNED BY:
2020 03 24	M.B.	P.G.

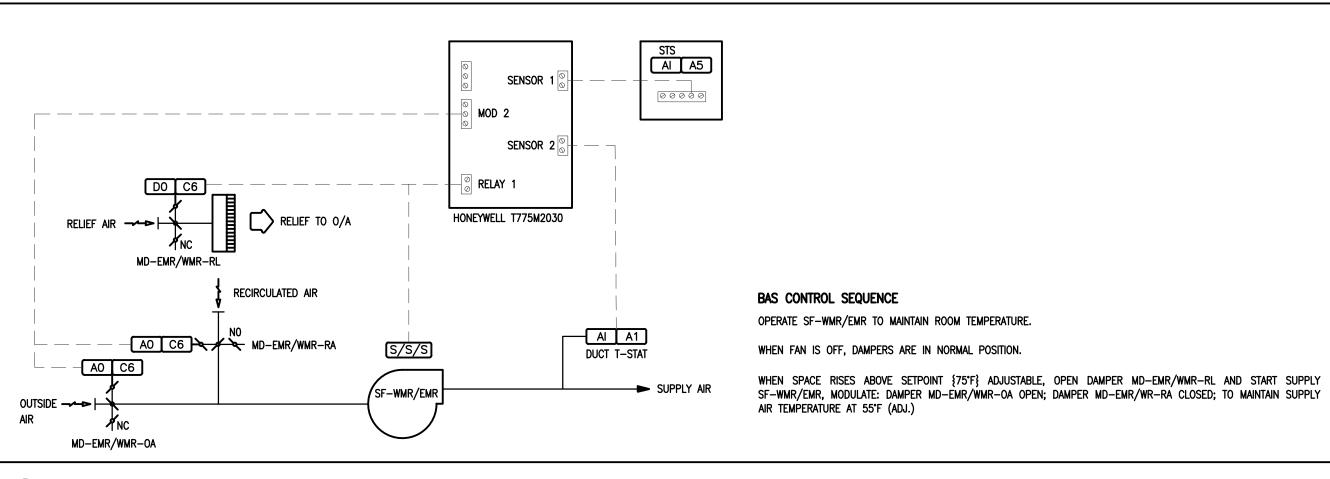
DRAWING TITLE:

SCHEDULES 2

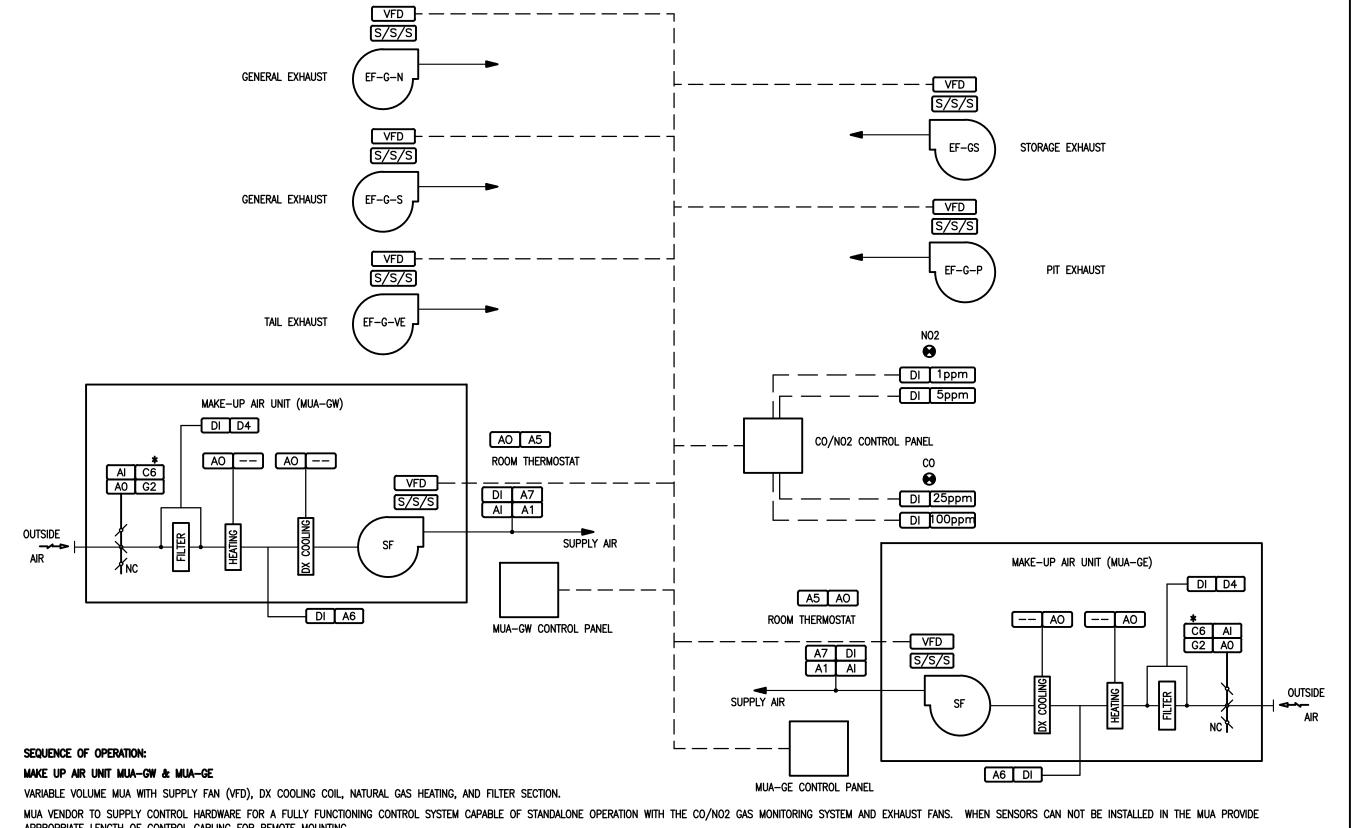
SCALE:	DRAWING No.:
N.T.S.	
	M-101
PROJECT:	141-101
20-201-010	







SUPPLY FAN WITH DAMPERS SF-WMR/ SF-EMR (Mechanical Room)



APPROPRIATE LENGTH OF CONTROL CABLING FOR REMOTE MOUNTING.

SEQUENCE OF OPERATION: INTERLOCK THE MUA SUPPLY FAN WITH GENERAL EXHAUST FANS EF-A & EF-B, AND TAIL EXHAUST SYSTEM.

OCCUPIED OPERATION

SUPPLY FAN START/STOP: OPEN (NC) OUTDOOR AIR DAMPER, AND OPERATE THE SUPPLY FAN WHEN EXHAUST FAN EF-1 IS OPERATIONAL. ON OCCUPIED MODE THE MAKE-UP SUPPLY FAN SHALL BE RUNNING AT 50% CAPACITY- 1750 CFM EACH (ADJUSTABLE) AND THE EXHAUST FAN EF-A AND EF-B OFF AND EF-2 3600 CFM (MAXIMUM, ADJUSTABLE). IF THE SUPPLY FAN STATUS DOES NOT MATCH THE COMMANDED VALUE AN ALARM WILL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STATUS AND THE CONTROL SEQUENCE WILL BE ENABLED.

DISCHARGE AIR CONTROL: THE DISCHARGE AIR TEMPERATURE SETPOINT WILL MAINTAIN SA DISCHARGE TEMPERATURE OF 21.1 °C (70°F) (ADJ) FOR WINTER/SUMMER OPERATION. THE GAS HEATING VALVE AND COOLING DX VALVE WILL MODULATE IN SEQUENCE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE AT SETPOINT. DO NOT OPERATE HEATING AND COOLING SIMULTANEOUSLY.

PROVIDE INTERCONNECTING WIRING BETWEEN THE GENERAL EXHAUST FAN (EF-A AND EF-B) VFD, MAKEUP AIR UNIT VFD, TAIL EXHAUST FAN AND THE CO/NO2 CONTROL PANEL (CP).

MUA-GW AND MUA-GE UNIT DIRTY FILTER ALARM: A DIFFERENTIAL PRESSURE SWITCH ACROSS THE FILTERS WILL MONITOR FILTER STATUS. IF THE DIFFERENTIAL PRESSURE EXCEEDS THE DIRTY FILTER LIMIT GENERATE AN ALARM. OCCUPIED OPERATION CO/NO2 ALARM

SPACE CO AND NO2 LEVELS SHALL BE MONITORED. UPON A "LOW LEVEL ALARM" (25ppm CO AND /OR 0.72 ppm NO2) OF EITHER CO OR NO2, AN ALARM SHALL BE GENERATED, EXHAUST FAN (EF-A AND EF-B) SHALL SWITCH TO HIGH SPEED (1700 CFM EACH, ADJUSTBLE) AND THE MAKE-UP AIR UNIT SHALL SWITCH TO HIGH SPEED (3500 CFM EACH) AND EF-2 FAN SHALL EXHAUST 3600 CFM. FREE COOLING

THE ECONOMIZER SHALL BE ENABLED WHENEVER THE OUTSIDE AIR TEMPERATURE IS LESS THAN 18.5°C (65°F ADJ), THE OUTSIDE AIRE TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE, AND THE SUPPLY FAN IS ON

THE ECONOMIZER SHALL CLOSE WHENEVER THE SUPPLY TEMPERATURE DROPS FROM 4.5°C TO 1.5°C (40°F TO 34.7°F ADJ)

UNOCCUPIED MODE:

THE SUPPLY FAN SHALL BE OFF, AND THE OUTSIDE AIR DAMPER SHALL BE FULLY CLOSED. THE SPACE TEMPERATURE SHALL BE MAINTAINED BY THE UNIT HEATERS / RADIANT HEATERS.

IN CASE OF HIGH CO OR NO2 LEVEL, THE UNIT SHALL GO INTO ALARM CONDITION AS DESCRIBED IN THE OCCUPIED MODE.

WHEN THE UNIT IS SHUTDOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY THE UNIT WILL BE SET AS FOLLOWS: SUPPLY FAN WILL BE OFF

OUTSIDE AIR DAMPER WILL CLOSE COOLING VALVE WILL CLOSE

HEAT VALVE WILL CLOSE EF-1 FAN SHALL BE OFF EF (SOURCETEC) FAN SHALL BE OFF. SEQUENCE- GAS DETECTION

ON ANY CO SENSOR DETECTING A CONCENTRATION OF 25ppm OR NO2 SENSOR DETECTING A CONCENTRATION OF 1ppm, ALL OF THE EXHAUST FANS IN THAT DETECTION ZONE SHALL START ON ANY CO SENSOR DETECTING A CONCENTRATION OF 100ppm CO OR NO2 SENSOR DETECTING A CONCENTRATION

ON FIRE ALARM, ALL FANS SHUT DOWN AND THEIR MOTORIZED DAMPERS CLOSE.

OF 5ppm, AN ALARM IS SOUNDED IN THE WAREHOUSE AND ANNUNCIATED.

ALL SETPOINTS ARE ADJUSTABLE THROUGH THE BAS.

ALL GAS DETECTORS ARE CO MONITORING ONLY UNLESS OTHERWISE NOTED ON DRAWINGS.

4	ISSUED FOR CONSTRUCTION	MAY 07, 2021	P.G.	
3	ISSUED FOR TENDER	FEB. 26, 2021	P.G.	
2	RE-ISSUED FOR PERMIT	DEC. 03, 2020	P.G.	
1	RE-ISSUED FOR PERMIT	NOV 06, 2020	P.G.	
0	ISSUED FOR PERMIT	SEPT 4, 2020	P.G.	
No.	DESCRIPTION	DATE	BY	
	REVISIONS			

GENERAL NOTES



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PROJECT:

NIAGARA FALLS

SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

START DATE:	DRAWN BY:	DESIGNED BY:
2020 03 24	M.B.	P.G.

DRAWING TITLE:

CONTROLS 1

SCALE:	DRAWING No.:
AS NOTED	
DDO ICCT.	M-103
PROJECT:	
20-201-010	

MAKE-UP AIR SYSTEM MUA-G-W, MUA-G-E

MAKE-UP AIR SYSTEM CD-2 M-103 MUA-C/R

SEQUENCE OF OPERATION:

(ADJUSTABLE). ALARMS SHALL BE PROVIDED AS FOLLOWS:

AIR HANDLING UNIT AHU-OC THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

THE UNIT SHALL MAINTAIN A 23.5°C (ADJUSTABLE) COOLING SETPOINT AND A 21°C (ADJUSTABLE) HEATING SETPOINT. CARBON DIOXIDE (CO2) CONTROL: THE CONTROLLER SHALL MEASURE THE RETURN AIR CO2 LEVELS AND MODULATE THE OUTSIDE AIR

- HIGH RETURN AIR CARBON DIOXIDE CONCENTRATION: THE RETURN AIR CO2 CONCENTRATION IS >1000PPM (ADJUSTABLE). <u>UNOCCUPIED MODE (NIGHT SETBACK):</u>

DAMPERS OPEN ON RISING CO2 CONCENTRATIONS, OVERRIDING NORMAL DAMPER OPERATION TO MAINTAIN A CO2 SETPOINT OF 750 PPM

THE UNIT SHALL MAINTAIN A 29.5°C (ADJUSTABLE) COOLING SETPOINT AND A 13°C (ADJUSTABLE) HEATING SETPOINT.

<u>DEMAND LIMITING — ZONE SETPOINT OPTIMIZATION:</u> TO LOWER POWER CONSUMPTION, THE ZONE SETPOINTS SHALL AUTOMATICALLY RELAX WHEN THE FACILITY POWER CONSUMPTION EXCEEDS DEFINABLE THRESHOLDS. THE AMOUNT OF RELAXATION SHALL BE INDIVIDUALLY CONFIGURABLE FOR EACH ZONE. THE CONSUMPTION DROPS BELOW THE THRESHOLDS.

ZONE SETPOINT ADJUST: THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR.

THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THE ALGORITHM SHALL MINIMIZE THE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MADE OF AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN

ZONE UNOCCUPIED OVERRIDE:

THE FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED OR OPTIMAL START MODES AND O AN AS NEEDED BASIS FOR NIGHT SET BACK OPERATION, UNLESS SHUTDOW ON SAFETIES. TO PREVENT SHORT CYCLING, TH ERETURN FAN SHALL HAVE AN ADJUSTABLE MINIMUM RUNTIME. ALARMS SHALL BE PROVIDED AS FOLLOWS:

- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON
- SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE (ADJUSTABLE) LIMIT.

<u>return fan</u>

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THE FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED OR OPTIMAL START MODES AND ON AN AS NEEDED BASIS FOR NIGHT SET BACK OPERATION, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE RETURN FAN SHALL HAVE AN ADJUSTABLE MINIMUM RUNTIME. ALARMS SHALL BE PROVIDED AS FOLLOWS:

- RETURN FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF
- RETURN FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON

AIR HANDLING UNIT

- RETURN FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE (ADJUSTABLE) LIMIT.

THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND STAGE THE COOLING TO MAINTAIN ITS COOLING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE AN ADJUSTABLE DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE A USER DEFINABLE

THE COOLING SHALL BE ENABLED WHENEVER THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 15.5°C (ADJUSTABLE), THE ECONOMIZER IS DISABLED OR FULLY OPEN, THE ZONE TEMPERATURE IS ABOVE THE COOLING SETPOINT, AND THE SUPPLY FAN STATUS IS ON.

THE CONTROLLER SHALL MEASURE THE SUPPLY AIR TEMPERATURE AND MODULATE THE HEATING COIL VALVE TO MAINTAIN ITS HEATING THE HEATING SHALL BE ENABLED WHENEVER THE OUTSIDE AIR TEMPERATURE IS LESS THAN 18.5°C (ADJUSTABLE), THE SUPPLY FAN STATUS IS ON AND THE COOLING IS NOT ACTIVE.

THE HEATING COIL VALVE SHALL OPEN WHEN THE SUPPLY AIR TEMPERATURE DROP FROM 4.5°C TO 1.5°C (ADJUSTABLE) OR THE FREEZESTAT IS ON.

FREEZE PROTECTION

THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A FREEZESTAT STATUS.

THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE ECONOMIZER DAMPERS IN SEQUENCE TO MAINTAIN A SETPOINT 1°C LESS THAN THE ZONE COOLING SETPOINT. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM ADJUSTABLE POSITION

THE ECONOMIZER SHALL BE ENABLED WHENEVER THE OUTSIDE AIR TEMPERATURE IS LESS THAN 18.5°C (ADJUSTABLE), THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE, AND THE SUPPLY FAN STATUS IS ON.

THE ECONOMIZER SHALL CLOSE WHEN THE MIXED AIR TEMPERATURE DROPS FROM 8°C TO 4.5°C (ADJUSTABLE), THE SUPPLY FAN STATUS SWITCHES OFF, OR THE FREEZESTAT IS TURNED ON. THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF. DURING

OPTIMAL START UP OR NIGHT SET BACK HEATING, THE MIXED AIR DAMPER SHALL OPERATE AS DESCRIBED IN THE OCCUPIED MODE EXCEPT THAT THE OUTSIDE AIR DAMPER SHALL MODULATE TO FULLY CLOSED. MIXED AIR TEMPERATURE: THE CONTROLLER SHALL MONITOR THE MIXED AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER

CONTROL. ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH MIXED AIR TEMP: THE MIXED AIR TEMPERATURE IS >33°C (ADJUSTABLE) - LOW MIXED AIR TEMP: THE MIXED AIR TEMPERATURE IS <8°C (ADJUSTABLE)

RETURN AIR TEMPERATURE: THE CONTROLLER SHALL MEASURE THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER CONTROL ALARMS SHALL BE PROVIDED AS FOLLOWS:

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AHU-S/W

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- HIGH RETURN AIR TEMP: THE RETURN AIR TEMPERATURE IS >33°C (ADJUSTABLE) - LOW RETURN AIR TEMP: THE RETURN AIR TEMPERATURE IS <8°C (ADJUSTABLE)

SEQUENCE OF OPERATION:

AIR HANDLING UNIT AHU-ST THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:

THE UNIT SHALL MAINTAIN A 23.5°C (ADJUSTABLE) COOLING SETPOINT AND A 21°C (ADJUSTABLE) HEATING SETPOINT. CARBON DIOXIDE (CO2) CONTROL: THE CONTROLLER SHALL MEASURE THE RETURN AIR CO2 LEVELS AND MODULATE THE OUTSIDE AIR DAMPERS OPEN ON RISING CO2 CONCENTRATIONS, OVERRIDING NORMAL DAMPER OPERATION TO MAINTAIN A CO2 SETPOINT OF 750 PPM (ADJUSTABLE). ALARMS SHALL BE PROVIDED AS FOLLOWS:

 HIGH RETURN AIR CARBON DIOXIDE CONCENTRATION: THE RETURN AIR CO2 CONCENTRATION IS >1000PPM (ADJUSTABLE). <u>UNOCCUPIED MODE (NIGHT SETBACK):</u>

THE UNIT SHALL MAINTAIN A 29.5°C (ADJUSTABLE) COOLING SETPOINT AND A 13°C (ADJUSTABLE) HEATING SETPOINT. <u>DEMAND LIMITING — ZONE SETPOINT OPTIMIZATION:</u>

EXHAUST AIR

TO LOWER POWER CONSUMPTION, THE ZONE SETPOINTS SHALL AUTOMATICALLY RELAX WHEN THE FACILITY POWER CONSUMPTION EXCEEDS DEFINABLE THRESHOLDS. THE AMOUNT OF RELAXATION SHALL BE INDIVIDUALLY CONFIGURABLE FOR EACH ZONE. THE CONSUMPTION DROPS BELOW THE THRESHOLDS.

ZONE SETPOINT ADJUST: THE OCCUPANT SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR.

THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THE ALGORITHM SHALL MINIMIZE THE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD. ZONE UNOCCUPIED OVERRIDE:

A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MADE OF AN ADJUSTABLE PERIOD OF TIME. AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN

THE FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED OR OPTIMAL START MODES AND O AN AS NEEDED BASIS FOR NIGHT SET BACK OPERATION, UNLESS SHUTDOW ON SAFETIES. TO PREVENT SHORT CYCLING, TH ERETURN FAN SHALL HAVE AN ADJUSTABLE MINIMUM RUNTIME. ALARMS SHALL BE PROVIDED AS FOLLOWS:

- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF
- SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON - SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE (ADJUSTABLE) LIMIT.

<u>return fan</u>

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WIRE THE PROGRAMMABLE THERMOSTAT TO AHU CONTROL PANEL AND CONDENSING UNIT CONTROLLER. VENDOR'S CONTROL PACKAGE STAGES GAS BURNERS DURING THE HEATING SEASON

DURING OCCUPIED MODE RUN SF CONTINUOUSLY. WHEN SF ID PROVEN ON, OPEN MD-S/W, THEN ENERGIZE SF-S/W AT LOW SPEED [350CFM] TO PROVIDE MINIMUM O.A.. WHEN SF-S/W

AHU-ST

THE FAN SHALL RUN CONTINUOUSLY DURING OCCUPIED OR OPTIMAL START MODES AND ON AN AS NEEDED BASIS FOR NIGHT SET BACK OPERATION, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE RETURN FAN SHALL HAVE AN ADJUSTABLE MINIMUM RUNTIME. ALARMS SHALL BE PROVIDED AS FOLLOWS:

- RETURN FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF - RETURN FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON

AIR HANDLING UNIT

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- LOW MIXED AIR TEMP: THE MIXED AIR TEMPERATURE IS <8°C (ADJUSTABLE) RETURN AIR TEMPERATURE: THE CONTROLLER SHALL MEASURE THE RETURN AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER

- HIGH RETURN AIR TEMP: THE RETURN AIR TEMPERATURE IS >33°C (ADJUSTABLE)

- RETURN FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE (ADJUSTABLE) LIMIT.

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THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND STAGE THE COOLING TO MAINTAIN ITS COOLING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE AN ADJUSTABLE DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE A USER DEFINABLE

THE COOLING SHALL BE ENABLED WHENEVER THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 15.5°C (ADJUSTABLE), THE ECONOMIZER IS DISABLED OR FULLY OPEN, THE ZONE TEMPERATURE IS ABOVE THE COOLING SETPOINT, AND THE SUPPLY FAN STATUS IS ON.

THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND STAGE THE HEATING TO MAINTAIN ITS HEATING SETPOINT. TO PREVENT SHORT CYCLING, THERE SHALL BE A USER DEFINABLE (ADJUSTABLE) DELAY BETWEEN STAGES, AND EACH STAGE SHALL HAVE AN

THE HEATING SHALL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE IS LESS THAN 18.5°C (ADJUSTABLE), THE ZONE TEMPERATURE IS BELOW THE HEATING SETPOINT, THE SUPPLY FAN STATUS IS ON, AND THE COOLING IS NOT ACTIVE.

THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A FREEZESTAT STATUS.

HEATING

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THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE ECONOMIZER DAMPERS IN SEQUENCE TO MAINTAIN A SETPOINT 1°C LESS THAN THE ZONE COOLING SETPOINT. THE OUTSIDE AIR DAMPERS SHALL MAINTAIN A MINIMUM ADJUSTABLE POSITION OF 20% (ADJUSTABLE) OPEN WHENEVER OCCUPIED.

THE ECONOMIZER SHALL BE ENABLED WHENEVER THE OUTSIDE AIR TEMPERATURE IS LESS THAN 18.5°C (ADJUSTABLE), THE OUTSIDE AIR TEMPERATURE IS LESS THAN THE RETURN AIR TEMPERATURE, AND THE SUPPLY FAN STATUS IS ON.

THE ECONOMIZER SHALL CLOSE WHEN THE MIXED AIR TEMPERATURE DROPS FROM 8°C TO 4.5°C (ADJUSTABLE), THE SUPPLY FAN STATUS SWITCHES OFF, OR THE FREEZESTAT IS TURNED ON. THE OUTSIDE AND EXHAUST AIR DAMPERS SHALL CLOSE AND THE RETURN AIR DAMPER SHALL OPEN WHEN THE UNIT IS OFF. DURING OPTIMAL START UP OR NIGHT SET BACK HEATING, THE MIXED AIR DAMPER SHALL OPERATE AS DESCRIBED IN THE OCCUPIED MODE

MIXED AIR TEMPERATURE: THE CONTROLLER SHALL MONITOR THE MIXED AIR TEMPERATURE AND USE AS REQUIRED FOR ECONOMIZER

CONTROL. ALARMS SHALL BE PROVIDED AS FOLLOWS:

- HIGH MIXED AIR TEMP: THE MIXED AIR TEMPERATURE IS >33°C (ADJUSTABLE)

CONTROL ALARMS SHALL BE PROVIDED AS FOLLOWS:

- LOW RETURN AIR TEMP: THE RETURN AIR TEMPERATURE IS <8°C (ADJUSTABLE)



ISSUED FOR CONSTRUCTION

REVISIONS

DATE BY

RE-ISSUED FOR PERMIT

RE-ISSUED FOR PERMIT

ISSUED FOR PERMIT

DESCRIPTION

GENERAL NOTES

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1100 South Service Rd., #417

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PROJECT:

NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

START DATE:	DRAWN BY:	DESIGNED BY:
2020 03 24	M.B.	P.G.
DRAWING TITLE:		

CONTROLS 2

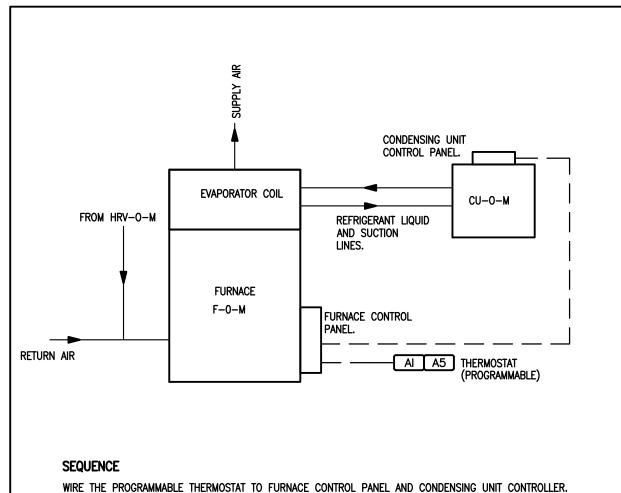
DRAWING No.: SCALE: AS NOTED M-104

THERMOSTAT CU-S/C AHU-S/C OUTSIDE AIR → -> |-- DI - H DI D4 _____Al __A1 MD-S/C S/S/S **SEQUENCE** WIRE THE PROGRAMMABLE THERMOSTAT TO AHU CONTROL PANEL AND CONDENSING UNIT CONTROLLER. VENDOR'S CONTROL PACKAGE STAGES GAS BURNERS DURING THE HEATING SEASON AND CYCLES CONDENSING UNIT DURING COOLING SEASON TO MAINTAIN SPACE TEMPERATURE SETPOINT. OCCUPANCY SHALL BE TIME- AND DAY-BASED SCHEDULED FROM THERMOSTAT. [7:00 AM TO 6:00 PM ADJ]

DURING OCCUPIED MODE RUN SF CONTINUOUSLY. WHEN SF ID PROVEN ON, OPEN MD-S/C, THEN ENERGIZE SF-S/C [350CFM] TO PROVIDE MINIMUM O.A.. WHEN SF-S/C IS PROVEN ON, START GENERAL EXHAUST FAN EF-S/C.

DURING UNOCCUPIED MODE, MD-S/C SHALL REMAIN CLOSED AND SF-S/C AND EF-S/C OFF. CYCLE AHU SF FOR HEATING AND COOLING

CARPENTRY SHOP AIR HANDLING EQUIPMENT AHU-S/C, EF-S/C, SF-S/C \M−104,



VENDOR'S CONTROL PACKAGE STAGES GAS BURNERS DURING THE HEATING SEASON AND CYCLES CONDENSING UNIT DURING COOLING SEASON TO MAINTAIN SPACE TEMPERATURE SETPOINT.

OCCUPANCY SHALL BE TIME- AND DAY-BASED SCHEDULED FROM THERMOSTAT.

DURING OCCUPIED MODE, ENERGIZE HRV-0-M

DURING UNOCCUPIED MODE, D1 SHALL REMAIN CLOSED.

PACKAGED FURNANCE WITH CONDENSING UNIT M-104

WELDING SHOP AIR HANDLING EQUIPMENT CD-4

AND CYCLES CONDENSING UNIT DURING COOLING SEASON TO MAINTAIN SPACE TEMPERATURE SETPOINT.

OCCUPANCY SHALL BE TIME— AND DAY—BASED SCHEDULED FROM THERMOSTAT. [7:00 AM TO 6:00 PM ADJ]

WHEN FE-S/W IS ENERGIES BY USER OPERATED WALL SWITCH, INCREASE SF-S/W TO HIGH SPEED [1250CFM]

DURING UNOCCUPIED MODE, MD-S/W SHALL REMAIN CLOSED AND SF-S/W AND EF-S/W OFF. CYCLE AHU SF FOR HEATING AND COOLING

AHU-S/W, EF-S/W, FE-S/W, SF-S/W

IS PROVEN ON, START GENERAL EXHAUST FAN EF-S/W.

CU-S/W

OUTSIDE AIR ----

SEQUENCE

ORIGINAL SHEET SIZE: ARCH D

PROJECT:

20-201-010

Perform all mechanical work detailed on these drawings to provide a complete and fully functional operating system to the satisfaction of the owner and mechanical consultant.

Where there is discrepancy between specified, or scheduled equipment, and information indicated elsewhere on the drawings, the most stringent shall apply.

Where there is apparent discrepancy of any kind, between any drawings, equipment tables, schedules, specifications, or other bid documents, notify the Consultant, for direction and clarification during the

Consideration will not be granted for misunderstanding the intent of the contractual documents, the extent of work to be performed, or the intent required to provide complete and fully operational and

Specified work described or indicated on drawings does not delegate function to any specified subcontractor or identify absolute contractual limits between mechanical or subcontractors. Arrange for milestone inspections. Contact ARC Engineering Tel: (905) 643-8530 E-mail:

contractor to remove portions for inspection. As a minimum, base building standards shall form the basis for this construction. Comply with

Landlord's requirements for system shutdown and connection. Coordinate all work with base building work. Refer to base building drawings and specifications.

1.10. Codes and bylaws shall be strictly adhered to. Obtain necessary permits, approvals and inspections from the authorities having jurisdiction.

Permits and fees required by the authorities having jurisdiction shall be obtained and paid for by this contractor. Include all applicable taxes.

1.12. Existing site conditions affecting the work of this trade shall be reviewed prior to tender submission. Contractor shall conduct ongoing reviews during demolition and construction and immediately notify the consultants of any deviations from drawing dimensions/details/schematics. Failure to do so shall not relieve contractor of full contract responsibility

1.13. Cutting, patching and core drilling required by this trade shall be paid for by this contractor. Provide details of new opening through structural components for engineer's approval. Incur all costs related

1.14. Fire stop shall be ULC listed for the required separation and provided at all pipe and duct penetrations through rated assemblies. Premium time costs shall be included for work outside of normal working hours. Comply with

construction schedule prepared by Management. 1.16. Flashing and counter flashing for exterior penetrations or water-proofed floors shall be provided

Shop drawings shall be complete with contractors reviewed stamp. Submit four (4) copies and/or one (1) electronic copy of all shop drawings. Allow one (1) week for consultant's review.

1.18. Base bid equipment and suppliers in Base Building Mechanical Specifications shall apply to thi

1.19. If the Contractor chooses to submit alternates

1.19.1. Contractor to submit alternates in addition to base bid products, and show savings by utilizing alternates. Where modifications to the work of Other Trades are required as a result or part of the alternative offered, include the cost of said modifications in the alternative price offered.

1.19.2. Contractor responsible for ensuring alternate equipment meets physical requirements of existing site conditions to remain and proposed design with respect to but not limited to: size, weight, service access clearances, duct connection arrangement, & air intake clearances. 1.19.3. Contractor responsible for ensuring alternate equipment meets functions and performance

specifications specified in schedule and/or shown on Drawings. Equipment substitutions after award of contract will not be considered without written explanation and consultant's written authorization. The quality and performance characteristics of substituted product shall be equivalent to the specified product. All substitute products shall be approved by consultants. Any additional costs incurred by all trades for substituted equipment installation must be incurred by

1.21. Control wiring and devices shall be provided under this contract.

1.22. Electrical devices shall be provided for all Division 15 equipment, including load side wiring, starters, disconnect, etc. Verify and coordinate voltage, phase, and short circuit interrupting capacity with the electrical contractor prior to ordering equipment. Provide conduit and wiring materials and methods in strict accordance with Division 16 requirements.

Access doors shall be provided for all inaccessible mechanical equipment and services requiring inspection or service. Finish shall suit architect/designers requirements. Access doors shall be recessed as required to suit wall finish (e.g., tile).

1.24. Architect/Designer/Owner approval of air terminal, thermostat, and access door locations must be

1.25. One (1) year written warranty shall be provided for the complete mechanical installation from date 1.26. CAD as-built drawings shall be completed utilizing AutoCAD. Record accurately installed work on white

prints transferring to AutoCAD. Submit both copies. reports, equipment data sheets, written warranty, operating instructions and maintenance procedures shall be submitted to consultant for review. Manuals shall be separated with dividers in appropriat

sections. Make all corrections requested by consultant and resubmit for review. 1.28. Provide, at minimum, one (1) hard copy and one (1) electronic copy of the operating and maintenance manuals referenced in section 1.27 to the building owner.

Change Notice Quotations shall be submitted complete with cost breakdown of labour and materials. Failure to provide will result in rejection. All Mechanical Change Notices shall be priced in accordance with "MECHANICAL CONTRACTORS ASSOCIATION" (MCA) labour units strictly for labour.

DEMOLITION

2.1. Provide labour, materials, products, equipment and services required to complete the demolition work

Dispose, off site, of all debris in accordance with the jurisdictional authorities. 2.3. Removal and storage of salvageable items as directed by this specification section and the Owner of

Mechanical demolition work associated with this building is indicated on the demolition drawings and generally consists of the following:

HVAC systems and equipment

 Hydronic systems and equipmen - Building Control Systems

Disposed materials which have not been designated for salvage from the demolition shall become the property of the Contractor. Remove all material and debris from the site as quickly as possible and dispose of legally. Burning of debris or selling of materials on the site will not be permitted. Present to the Owner exisiting equipment removed but not identified for salvage on site. Acceptance of removed equipment is at the discretion of the Owner. Remove such items from site when

Conform to requirements of municipality's Works Department regarding disposal of waste materials.

2.8. Materials prohibited from municipality waste management facilities shall be removed from site and disposed to recycling companies specializing in recyclable materials.

Contractor shall be responsible for all fees required for the disposal of demolished materials,

equipment, etc Salvageable items are to be carefully disconnected, removed and turned over to the owner. The list

- Radiant tube heaters Exhaust far

2.11. Store materials only in areas designated by the Owner and as permitted by the local jurisdictional

HVAC PIPING SYSTEMS

3.1. Piping material for hydronic hot water heating and chilled water and glycol radiant systems to 2068 kPa [300 psiq] operating pressure use ASTM A-53 or A-106 schedule 40 black carbon steel, seamless or ERW with the following fittings:

3.1.1. For small bore, 50 mm [2 in.] and under to [1034 kPa]150 psi use 1034 kPa [150 psi] screwed black malleable iron or 125# cast iron fittings. 3.1.2. For large bore 65 mm [2-1/2 in.] and over to 1034 kPa [150 psi] use schedule 40 black carbon

3.1.3. For small bore 50 mm [2 in.] and under to 2068 kPa [300 psi] use 300# screwed black malleable iron or 250# fittings cast iron fittings.

3.1.4. For large bore 65 mm [2-1/2 in.] and over to 2068 kPa [300 psi] schedule 40 black carbon steel

3.2. Use of grooved systems (Victaulic or equal) installed in accordance with the manufacturer instructions, may be acceptable subject to approval by the owner and the engineer. Upon request

3.3. Use of copper piping for small branches and run-outs is acceptable for 20mm [3/4 in.] and below,

with type L pipe, wrought copper fittings, and soldered joints for pressures up to 100 psig and

silver soldering for higher pressures. Valves: (part numbers listed):

3.4.1. To 1379 kPa [200 psi] working pressure, up to 50mm [2 in.] - soldered or threaded 3.4.1.1. Gate Valves - 125S/200 W.O.G. rated, bronze body to ASTM-B62, solid wedge disc, bronze trim, rising stem. (Soldered - Kitz 44, Threaded - Kitz 24)

Globe Valves - 125S/200 W.O.G. rated, bronze body to ASTM-B62, bronze trime, rising stem. (Soldered - Kitz 12, Threaded - Kitz 11)

3.4.1.3. Ball Valves - 150/600 W.O.G. rated, two piece full port brass body (C37700), solid chrome plated brass ball, PTFE seats, double o-ring stem seals, lever operated. (Soldered - Kitz 59, Threaded -

3.4.1.4. Check Valves - 125S/200 W.O.G. rated, bronze body to ASTM B62 , bronze trim, Y pattern. (Soldered - Kitz 23, Threaded - Kitz 22)

3.4.2. To 1379 kPa [200 psi], 65mm [2-1/2 in.] and larger - flanged 3.4.2.1. Gate Valves - 125S/200 W.O.G. rated, cast iron body to ASTM A126 class B, bronze trim, OS&Y

3.4.2.2. Globe Valves - 125S/200 W.O.G. rated, cast iron body to ASTM A126 class B, bronze trim, OS&Y

(Kitz 76) Ball Valves - 125S/200 W.O.G. rated, two piece full port, cast iron ASTM 126 class B body, epoxy coated to NSF 61, teflon fused ball, RPTFE seats, seals, and packing, lever or gear operated. Butterfly Valves - 200 psi rated, ductile iron body, aluminum bronze disc, stainless steel stem

moulded or cartridge style seats (EPDM). Valve to be rated for full dead end service with the

downstream flanged removed. Lever operated to 6", gear operated 8" and over, LUG pattern.

(Lever operated — Kitz 6122EL, Gear operated — Kitz 6122EG) 3.4.2.5. Check Valves - 125S/200 W.O.G. rated, cast iron body to ASTM A126, bronze trim, bolted bonnet. (Flanged - Kitz 78)

3.4.3. To 2068 kPa [300 psi] working pressure, up to 50mm [2 in.] — socket welded or threaded

3.4.3.1. Gate Valves - ANSI class 800, forged steel A105N body, bolted bonnet, 1/2 stellite (trim #8), araphite packing, OS&Y

3.4.3.2. Globe Valve - ANSI class 800, forged steel A105N body, bolted bonnet, 1/2 stellite (trim #8), graphite packing, OS&Y

3.4.3.3. Ball Valves - 150/600 W.O.G. rated, two piece full port brass body (C37700), solid chrome plated brass ball, PTFE seats, double o-ring stem seals, lever operated. (Threaded - Kitz 58)

3.4.3.4. Check Valves - ANSI class 800, forged steel A105N body, bolted bonnet, 1/2 stellite (trim #8). graphite gasket 3.4.4. To 2068 kPa [300 psi] working pressure, 65mm [2-1/2 in.] and larger - flanged

3.4.4.1. Gate Valves - ANSI class 150, carbon steel A216WCB body, bolted bonnet, OS&Y, 1/2 stellite (trim #8), graphite packing (Kitz 150 SCLS)

3.4.4.2. Globe Valves - ANSI class 150, carbon steel A216WCB body, bolted bonnet, OS&Y, 1/2 stellite (trim #8), graphite packing (Kitz 150 SCJS)

3.4.4.3. Butterfly Valves - ANSI class 150, lug style, carbon steel body, 1704 shaft, stainless steel disc, RPTFE packing and seat. Valve shall be fully bi-directional, rated for full dead end service. Lever or gear operated 3.4.4.4. Check Valves - ANSI class 150, carbon steel A216WCB body, bolted bonnet, 1/2 stellite (trim #8),

stainless steel inserted flexible graphite gasket (Kitz 150 SCOS) Butterfly valves are to be molded or cartridge style only.

3.6. Ball valves are to be solid ball style only.

Provide ball or butterfly valves for all shut-off requirements. Gate valves will not be approved

3.8. Provide 20 mm [3/4" in.] hose end drain valves with cap and chain at all system low points

Provide di-electric couplings for connection of dissimilar piping materials. Provide circuit balancing valves as required to balance water flow. Circuit balancing valves shall be Armstrong Model CBVI - Y pattern style, all metal, with soldered or screwed connections, built-in drain connection with shut off valve and protective caps and integral valve insulation. Provide for

Vernier type handwheel settings for precision flow balancing.

- Positive shut off valve with no drip seat and plug type stem with Teflon disc.

Positive shut off metering valves with connections for portable meter. Provide one (1) portable meter

Select circuit balancing valve size to give a pressure drop at 100% open between 3.0 kPa [1 ft.] and 21 kPa [7 ft.]. Select valves location remote from the pumps in the circuit near minimum pressure drop and those located near the pumps at higher pressure drops.

3.13. Provide safety and relief valves for all closed water systems. Pipe relief to nearest floor drain. Provide Watts 174A valves rated at 1035 kPa [150 psiq] at 99°C [210°F] ASTM rated, cast iron body bronze disc and seat, steel spindle assembly, carbon steel spring.

3.14. Provide strainers upstream of each pump and where indicated on drawings. Strainers shall be bronze body type with screwed connections, stainless steel screens with 1.6 mm [1/16 in.<-] perforations and capable of system pressure of 860 kPa [125 PSI].

Automatic air vents and collecting chambers Spirax 13W shall be provided at all high points of piping system. Ensure ratings are compatible with system pressure.

Insulation shall be provided to match base building standards or refer to insulation section. 3.17. Provide 50% glycol solution for radiant heating systems.

the flushing process. After flushing process, clean all strainers and check all low points to ensure removal of all loose dirt. Chemically clean all piping systems utilizing low foaming chemical detergents which shall not adversely affect system components. After flushing and cleaning, pressure

Provide ULC classified firestopping products by 3M or Hilti which have been tested in accordance with CAN4-S115, install firestopping systems in accordance with the appropriate ULC system number for the products and type of penetration

3.20. Ensure that fire ratings of floors and walls are maintained, fill spaces between openings and pipes passing through fire separations.

CHEMICAL TREATMENT

Perform cleaning and water treatment services under the supervision of a Water Treatment Specialist who shall have a minimum of five (5) years continuous local experience in the supply and

After completion of flush cleaning and pressure testing, chemically clean all piping systems utilizing

low foaming chemical detergents which shall not adversely affect system components Provide each closed system with a 7.6 Litre [2 US Gal.] capacity by-pass chemical feeder. Pipe across pumping system and locate not more than (1m) [3 ft.] above floor. Pipe to floor drain, using 20mm [3/4"] pipe c/w ball valves. Provide feeders with pressure rating suitable for the

4.4. To compensate for initial losses of chemicals and water during startup of system, provide twice as much corrosion inhibitor and biocide as are necessary to treat systems

Maintain chemical levels from the time the system is filled after cleaning, up to Substantial Performance of the Contract. The water treatment specialist shall supply all necessary supervision during installation and shall check the systems during construction.

Provide a service program from a specialist with the water treatment supplier/contractor for a period of one year from Substantial Completion. Include initial water analysis and recommendations,

service startup training of operating personnel and laboratory and technical assistance. Provide service visits as required to stabilize and commission the systems and a minimum of one visit per month by the Water Treatment Specialist for the year following Substantial Completion to ensure that a proper treatment program is maintained. Perform corrosion tests to verify performance requirements are being achieved. Document recommendations and submit a written report to the Owner's representative after each visit.

GAS PIPING SYSTEMS

Provide all labour, materials, products, equipment and services to supply and install the natural gas piping system indicated on the Drawings and specified in this Section of the Specifications.

Install natural gas system only with fitters certified to Natural Gas and Propane Installation Code

If necessary, arrange and pay for a gas service to the building, including regulating station gas Provide all equipment and materials required for the building natural gas distribution systems in

Provide complete natural gas system, to CSA and CGA requirements.

Provide gas pressure reducing station(s) where noted on Drawings and where required to reduce building Distribution system pressures to appliance operating pressure ranges. Pressure reaulators shall be spring-loaded self-operated design and shall be tight closing with

accordance with the requirements of the current version of Natural Gas and Propage Installation

replaceable orifices and discs and concealed accessible manual adjustment. Valve bodies shall be cast iron rated for {1034 kPa} [150 psig] gas pressure and all valve materials shall be epoxy painted to resist corrosive ambient conditions Provide gas pressure relief stations downstream of all pressure reducing stations where required.

surges. Valve bodies shall be cast iron rated for {1034 kPa} [150 psig] gas pressure with replaceable orifices and discs and concealed accessible manual adjustment. All valve materials shall be epoxy painted to resist corrosive ambient conditions. Install natural gas service to meet Natural Gas and Propane Installation Code and all authorities

Provide relief valves of spring-loaded design with throttling characteristics to reduce system pressure

5.12. Provide 25mmø [1"ø] opening at the top and bottom of any chase containing a gas pipe.

5.13. Distribute gas within the building at 7"w.c.

Select pressure reducing valves to maintain downstream pressures within +5% range of setting. Submit sizing data for each valve with Shop Drawings. Select pressure relief valves for the maximum capacity of the pressure reducing station served plus

not less than 25%. Submit sizing data for each valve with Shop Drawings. 5.16. Pipe all relief vents individually to outdoors. Size piping for a maximum pressure drop of 10% of the pressure reducing valve setpoint gauge pressure with a 25% capacity safety factor.

Provide upstream and downstream isolating valves and pressure gauges complete with gauge cocks at all pressure reducing stations. Connect relief valves so that they cannot be isolated from the

appliances which they serve. Provide supports (roof supports Dura Block or pressure treated wood blocks complete with rigid insulation at bottom of block) at maximum spacing as follows: 20mm [3/4 in.] - 25mm [1 in.] : 2.4m [8 ft.]

30mm [1-1/4 in.] - 65mm [2-1/2 in.] : 3m [10 ft.] Anchor gas piping supports as per OBC, CSA, and seismic requirements.

5.20. Connect gas piping to all gas fired equipment.

Paint gas service piping to meet code requirements.

5.22. BASE BUILDING Gas components and equipment removed shall be turned over to the landlord/owner

PLUMBING SYSTEM

5.21.

EXISTING SANITARY DRAIN locations and invert elevations shall be verified on site prior to commencement of work. PIPING MATERIALS

Domestic hot and cold water piping - type "L" copper with copper fittings use 95/5 tin/antimony solder. Provide type "K" soft copper piping without joints below ground.

6.2.2. Drainage and Vent Piping (60mm [2-1/2] and smaller): 6.2.2.1. Sanitary piping, above ground - DWV copper pipe with drainage fittings and 50/50 solder joints.

6.2.2.2. Sanitary piping, below ground - Type L copper with 50/50 solder joints 6.2.2.3. Vent piping, above ground - DWV copper pipe with drainage fittings, 50/50 solder joints.

Vent piping, below ground - Type L copper pipe with wrought copper fittings and 50/50 solde

6.2.3. Drainage and Vent Piping (75mm [3"] and larger): Sanitary piping, above ground — CSA class 4000 cast iron soil pipe and fittings, with mechanical Sanitary piping, below ground - CSA class 4000 cast iron soil pipe and fittings, with mechanical

Vent piping, below ground — CSA class 4000 cast iron soil pipe and fittings, with mechanical

Ball valves are to be solid ball style only.

Provide ball or butterfly valves for all shut-off requirements. Gate valves will not be approved. Provide all bronze ball type shut off valves on main and branch lines and isolating valves for each

individual plumbing fixture served Plumbing fixtures shall be new, of first quality, in perfect condition and installed in best workmanlike manner. Verify plumbing fixture quantities and locations with Architect's/Designer's drawings. Reuse of

Provide di-electric couplings for connection of dissimilar piping materials.

Provide ULC classified firestopping products by 3M or Hilti which have been tested in accordance with CAN4-S115, install firestopping systems in accordance with the appropriate ULC system number for the products and type of penetration 6.10. Ensure that fire ratings of floors and walls are maintained, fill spaces between openings and pipes passing through fire separations

Trap seal primer must be provided on all new Floor Drains, Funnel Floor Drains and Hub Drains.

Provide all labour, materials, products, equipment and services to supply and install thermal insulation, vapour barriers and finishes for mechanical work as indicated on the drawings and specified in this section of these specifications.

PIPING INSULATION:

7.2.1. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics and

7.2.2. Insulation materials must be manufactured at facilities certified and registered with an approved Registrar to conform a ISO 9000 quality standard. 7.2.3. All insulation pertaining to Division 15 shall be carried out by one firm specializing in insulation work

7.2.4. Acceptable insulation manufacturers are Owens Corning Canada, Johns Manville, Manson Insulation Inc. Knauf Fiber Glass and Certainteed 7.2.5. Provide insulation and covers in strict accordance with authorities governing combustibility and

fireproofing of materials and in accordance with manufacturer's recommendations. 7.2.6. Provide non-combustible insulation, jackets and finishes having a Flame Spread/Smoke Developed

rating of 25/50 or less. 7.2.7. Provide insulation materials with a minimum thermal conductivity of 0.24BTU.in/(hr. sq.ft°F) at 100°F mean temperature.

7.2.8. On hot piping applications, hold insulation in place with flare type staples (outward clinch). 7.2.9. Apply pipe insulation over 1-1/2" thickness in two layers with joints staggered. 7.2.10. Insulate fittings with fabricated mitered or preformed sections of specified insulation

7.2.11. Insulate over flanges and mechanical couplings with specified insulation and thickness, sized to suit flange diameters. Fill spaces between insulation and adjoining pipe insulation with similar material. 7.2.12. Insulate valves and inline components with flexible insulation density (3/4 lbs./cu.ft.) compressed not more than 50% of original thickness. Build up to specified thickness with approved asbestos free

7.2.13. Do not insulate terminal unit automatic control valves installed in hot piping.

7.2.14. Under all domestic cold water, provide an insert between support shield and piping for piping 7.2.15. Provide the following pipe insulation type as indicated in the pipe insulation table below. 'Type P1' - Owens Corning Fiberglas Pipe Insulation, Johns Manville Micro-Lok Pipe Insulation

Manson Alley—K Pipe Insulation or Knauf Earthwool 1000° Pipe Insulation with factory applied al purpose vapour barrier jacket where scheduled. 'Type P2' - Armacell AC Accoflex fiber-free piping insulation, painted with WB Finish where installed

DUTY	INSULATION TYPE	THICKNESS	VAPOUR BARRIER
HOT WATER			
Less than 1-1/2"	P-1	1-1/2"	No
1-1/2" and larger	P-1	2"	No
HORIZONTAL CONDENSATE DRAINS			
all pipe sizes	P-1	1/2"	Yes
REFRIGERANT SUCTION PIPE	<u> </u>		
Less than 1"	P-2	1"	Yes
1" and above	P-1	1"	Yes

7.2.16. Provide Johns Manville Zeston PVC jacketing or Knauf Proto PVC jacketing for all exposed areas and

DUCTWORK INSULATION

Provide insulation with a minimum thermal resistance of 0.25 BTU.in/hr. sq.ft *F at 75*F mean

Apply vapour barrier over insulation on cold temperature ductwork.

Ductwork and casings lined with acoustic insulation 1" or more in thickness need not be externally

7.3.5. Provide the following ductwork insulation type as indicated in the ductwork insulation table below.

with FSK Facing, Manson AK Board with FSK facing, or Knauf Earthwool Insulation Board with FSK facing. Density shall be not less than 3lbs./cu.ft. Impale on mechanically fastened pins located at not greater than 12" centers. Secure with speed washers. Butt joints tightly together and seal washers, breaks and ioints with self-adhering 4" wide plain aluminum tape, or adhere foil with Childers CP82 or Bakor 230-38 adhesive. Type D2: Owens Corning SOFTR Duct Wrap FRK, Johns Manville Microlite EQ FSK Duct Wrap, Manson Alley Wrap with FSK facing or Knauf Atmosphere Duct Wrap with FSK facing, 12kg/cubic metre [3/4lb./cu.ft.] density with factory applied reinforced foil facing. Adhere insulation to duct surface with Childers CP82 or Bakelite 230-39 adhesive, which shall be applied in strips 150mm [6"] wide at not greater than 300mm [12"] centres. Butt edges of insulation tightly together, and seal breaks and joints of facing with self—adhering 100mm [4"] wide aluminum tape or adhere foil

DUTY	insulation Type	THICKNESS	VAPOUR BARRIER	
Outside air plenums				
and ducts	D1	2"	Yes	
Outside air supply fans	D1	2"	Yes	
Relief and exhaust air plenums	D1	1-1/2"	Yes	
Final 3m (10') of exhaust duct before exiting building or up to motorized damper if distance exceeds 3m (10')	D1	1"	Yes	
ii distance exceeds 5iii (10)	DI	ı	165	
Exposed ductwork in mechanical room	D1	1"	Yes	
Ductwork outside of Building	D1	o"	V	
or in garage area	D1	2"	Yes	
Concealed supply air	D2	1"	Yes	

Recover insulation and insulation finishes outside the building or exposed to the weather with one {1.5mm} [1/16"] thick layer of Childers Encacel X or Bakor 110-26 fire retardant black mastic vapour barrier coating. Embed a layer of woven glass reinforcing fabric into the wet coating lapping ends and edges at least {75mm} [3"]. Apply a top coating of {1.5mm} [1/16"] thick Encacel X or Bakor 110-26 over the entire surface of the fabric. Seal the entire covering to achieve a watertiaht assembly

7.3.7. In lieu of above recovering of insulation and insulation finishes outside the building, aluminum jacket with aluminum fittings may be substituted (VentureClad Plus or similar product). Band all transverse seams with waterproof mastic tape and caulk all longitudinal seams with silicone caulking. Seal the 7.3.8. Protect the work of this trade from being defaced by other trades. Make good any damage and

leave in perfect condition, ready for final painting. 7.3.9. Apply insulation over clean dry surfaces, firmly butting all sections together. 7.3.10. Recover all exposed insulation and insulation finishes with minimum {0.20kg/squaremetre} [6oz.<-

Provide all labour, materials, products, equipment and services to supply and install the sheet meta and ductwork systems as indicated on the Drawings and specified in this Section of the

Meet Standards described in the latest Edition of HVAC Duct Construction Standards handbook from Sheet Metal and Air Conditioning Contractors National Association (SMACNA).

8.4.1. Fabricate ductwork from galvanized sheet metal with a minimum coating of 1.83 grams/m² (G60

8.4.2. Ductwork shall be smooth on the inside and free of obstructions, vibration and rattle 8.4.3. Fabricate ductwork, except as described in the next item, according to the following classifications:

> maximum velocities of 13m/s shall be constructed in accordance with SMACNA construction standards for 250 Pa duct Class 2: All ducting subject to positive or negative static pressure of more than 250 Pa up to

8.4.4. Provide Class 2 pressure duct construction for: - Ductwork between variable volume air handling units and air terminal control units.

- Ductwork between air flow Venturi's and fans. 8.4.5. Provide duct transformation with expansion fittings having slopes not exceeding 1 to 7 and contraction fittings having slopes not exceeding 1 to 4.

assembled in top and bottom rails in square elbows. 8.4.7. Provide balancing dampers free to move in either direction without binding and rattling. Construct dampers in ductwork from 1.2 mm galvanized sheet metal. Use manual quadrants on small ducts. On dampers longer than 375mm use push rods with DuroDyne Model SRP ball joints. Use two push

rods on ducts wider than 600 mm. Provide OBD balancing dampers where shown on the drawings.

8.4.8. Isolate equipment with DuroDyne neoprene 0.8 mm thick flexible connectors with finished fabric width 8.4.9. Provide 50mm insulated sheet metal blank off panels behind unused portions of exterior louvers. 8.4.10. Seal all joints in low, medium and high pressure ductwork with Transcontinental MP for low and

Static Pressure Construction Class Sealing Required All transverse joints, longitudinal {1000 Pa} [4" w.g. and up]

All transverse joints and longitudinal $\{500-750 \text{ Pa}\}$ [2"-3" w.a.<-]

Up to {500 Pa} [2" w.g.<-]

Provide Flexmaster T/L-A, flexible ductwork upstream and downstream of air terminal control units and/or other locations indicated on the Drawings

continuous secure air joint without the use of adhesives for pressures up to 3000 Pa. 8.5.3. Conform to the requirements of NFPA 90 and Underwriters Laboratories classification for round duct Provide flexible ductwork in minimum lengths of 1500 mm and maximum lengths of 3600 mm

ACOUSTIC DUCT LINING

8.6.1. Provide 25 mm thick acoustic duct liner where shown on drawings and as follows: 8.6.1.1. Rectangular Duct Liner: Permacote Linacoustic meeting ASTM C 1071 with air surface coated with acrylic coating treated with EPA registered anti-microbial agent proven to resist microbial growth as determined by ASTM G 21 and G 22.

8.6.1.4. Fasteners: Duct liner galvanized steel pins, welded or mechanically fastened. 8.6.2. Round Duct Liner: Permacote Spiracoustic, rigid preformed round liner, or Spiracoustic Plus with air

surface coated with acrylic coating treated with EPA register anti-microbial agent proven to resist microbial growth as determined by ASTM G 21 and G 22. 8.6.2.1. Noise Reduction Coefficient of .70 as per ASTM C 423. (Type A mounting)

accordance with the UL listing. Use hangers, support rods and firestopping in accordance with the 8.7.2. All fire dampers shall be Type-B or Type-C, unless otherwise noted. Type-A fire dampers are not

Provide acoustic insulation on supply air ductwork from discharge side of mechanical air volume

control boxes and attenuators as follows:

- 3000mm [10ft. - 0in.] for straight duct run box or

- 1500mm [5ft. - 0in.] downstream of 1st elbow or - 1500mm [5ft. - 0in.] for each branch downstream of 1st tee.

- From fan powered VAV box to last flexible duct connection 8.8.2. Frame and install motorized dampers. Unless shown otherwise, attached each motorized damper

8.8.3. Provide frames in ductwork airflow stations. 8.8.4. Make provisions in ductwork and plenums for installation of duct type smoke detectors and other

8.8.5. Provide neoprene isolation gaskets and nylon bolts at connections required for dissimilar metals.

8.8.6. Seal watertight the bottom and sides of intake and exhaust ducts connected to exterior louvres as - Intake: from louvre to air handling unit

- Exhaust: from louvre to {2 metres} [6'-6"] upstream of louvre 8.9. ACOUSTIC DUCT LINING INSTALLATION

sealing compound similar to Johns-Manville Superseal. 8.9.2. Provide a tapered sheet metal nose piece to hold the leading edge of acoustic duct liner and direct

8.9.1. Seal all leading and trailing edges and repair all rips or tears of acoustic duct liner with a suitable

8.10.1. Pressure test ductwork in accordance with the outlines and classification described in the SMACNA, HVAC Duct Leakage Test manual. 8.10.2. All supply air ductwork shall be pressure tested.

8.10.3. Random testing of approximately 15% of other ductwork shall be conducted when requested by 8.10.4. Failed joints shall be repaired and retested.

8.10.5. Additional testing will be required if random testing reveals failures. 8.10.6. The leakage amount shall not exceed the allotted amount for the pressure class. The test pressures shall be based on the static pressure for each fan.

8.10.7. Repair duct and retest where air leakage exceeds the specified limits 8.10.8. Make good all audible leakage, whether test is within limit specified or not 8.10.9. Provide calibrated tester, connection hoses, temporary plugs, etc., as required

8.11.1. Vacuum clean the inside of all air handling systems, including fans, plenums, ducts, coils and terminal units to ensure that they are free from debris and dust.

TESTING. ADJUSTING. AND BALANCING Balancing contractor shall be qualified by the following:

9.1.2. National Balancing Council (NBC) Certified Air Balancing Specifications and Certified Hydronic Balancing

9.1.3. National Environmental Balancing Bureau (NEBB) TABES Proceedural Standard for Testing, Adjusting,

9.1.1. Associated Air Balance Council (AABC) National Standards for Total System Balancing, NM-1

and Balancing Environmental Systems 9.1.4. Sheet Metal and Air Conditioning Contractors National Association (SMACNA) HVAC TAB HVAC Systems

9.3. List selected balancing contractor on tender form. Balancing scope of work shall include water and air side balancing of all equipment, ductwork and terminal devices provided as part of this contract,

Troup Engineering Services Inc

as well as base building equipment revised by this contract. 9.4. Balance as listed on mechanical drawings 9.5. Balance to the following tolerances of design values:

Air Audit

9.5.1. HVAC systems: +/-5%9.5.2. Hydronic System: +/- 10%

9.5.3. Refrigeration Systems: +/- 10%

9.2. Balancing contractor shall be one of

9.5.4. Measured volumes to be accurate to with 2% of actual volumes. 9.6.1. Prior to balancing, submit to owner representation a list of instruments to be used together with

9.6.2. Calibrate instruments in accordance with requirements of most stringent of referenced standard for applicable system. 9.6.3. Calibrate instruments with (3) months of balancing and provide certificate of calibration to owner's

measured flow rates.

<u>VALVE_TAGS</u> Provide 40 mm dia., 1 mm thick lamacoid tags with 10mm high die-stamped black letters, except for fire and sprinkler systems, provide red lamacoid tags with white letters in lieu of brass tags.

Submit balancing report in triplicate to the consultant and the owner, indicating terminal design and

Tag all valves except for small valves isolating a single piece of equipment such as a unit heater, fan coil unit, terminal reheat coil and radiation section

Attach to valves with 100 mm long brass chains.

EQUIPMENT NAMEPLATES Identify equipments, starters, and, remote control devices in a manner consistent with the Drawings. 11.2. Use solid black capitalized lettering 100 mm high.

11.3. Where equipment size does not permit stencil identification, use lamacoid labels, engraved white on

black, mechanically fastened to the equipment. Minimum lettering size 10 mm.

Full details of design criteria.

12.15. SRS to restrain seismic forces in all directions

Drilled or power driven anchors not permitted.

SEISMIC RESTRAINT SYSTEMS 12. 12.1. This building is considered Site Class D - (Stiff Soil) for Seismic design in accordance with Table 4.1.8.4.B of the Ontario Building Code. Consider the facility's importance category as {Normal} from 4.1.8.5 of the Ontario Building Code.

12.3. The contractor's seismic specialist shall establish final restraint locations and restraint design The contractor's seismic specialist to be a Professional Engineer specializing in the design of seismic restraint systems (SRS) and registered in the province of Ontario.

12.2. The contractor is responsible for complying with the required seismic codes and standards.

12.6. This section governs design, supply, and installation of complete SRS for all mechanical systems and equipment specified for installation on this project. This includes fire protection, plumbing & utility piping, mechanical equipment and systems, both vibration isolated and statically supported.

12.5. One only seismic restraint system to be used for all systems and equipment

Seismic Restraint System (SRS) to be fully integrated into, compatible with:

- Noise and vibration controls specified elsewhere in this project specification. Structural, mechanical, electrical design of project. During seismic event, SRS to prevent systems and equipment from causing personal injury and from

Each contractor (fire protection, plumbing, and ventilation contractor) shall be responsible for

coordinating their respective discipline as it relates to Seismic restraints system to ensure a single 12.10. Submittals and shop drawings, certified by a Professional Engineer specializing in the design of seismic restraint systems (SRS) and registered in the province of Ontario, to include:

- Full written description of scope of work. Calculations - Detail Drawings

12.11. Submit additional copy of shop drawings and product data to Structural Engineer for review of

connection points to building structure. 12.12. Provide maintenance data including monitoring requirements for Owner 12.13. SRS to be from one manufacturer regularly engaged in production of same.

12.14. SRS to provide gentle and steady cushioning action and avoid high impact loads.

12.20. Ensure seismic control measures not to interfere with integrity of firestopping.

12.16. Fasteners and attachment points to resist same load as seismic restraints. 12.17. SRS of piping systems to be compatible with expansion, anchoring and guiding requirements, equipment vibration isolation and equipment SRS.

CALE: 12.18. SRS utilizing cast iron, threaded pipe, other brittle materials not permitted

DRAWING No.: S NOTED ROJECT:

ORIGINAL SHEET SIZE: ARCH D

Provide pressure reducing, regulating and relief valving required for compatibility between equipment

7.3.3. Circular silencers and acoustic plenums need not be externally insulated.

Type D1: Owens Corning 703 Fiberglas Insulation with FRK facing, John Mansville 814 Spin-Glas

with Childers CP82 or Bakor 230-38 adhesive.

canvas, and two applications of Childers CP50A-HV2 or Bakor 120-18 white fire resistant coating. An acceptable alternative recovering will be PVC fitting covers and jacketing, installed as per manufacturer's instructions, and conforming to the specified Flame Spread/Smoke Developed Rating.

Duct dimensions shown on Drawings are net, inside insulation and acoustic duct lining.

coating) unless other materials are specifically named.

Class 1: All ducting subject to positive or negative static pressure of 250 Pa or less with

500 Pa with maximum velocity of 13 m/s shall be constructed in accordance with SMACNA construction standards for 500 Pa duct

Provide full radius tees, bends, and elbows for changes in direction except where square elbows are required due to space restrictions. Provide DuroDyne double thickness 0.8 mm turning vanes

medium pressure or DuroDyne S2 duct sealer for high pressure. Joints shall be sealed to conform to the following SMACNA standards:

seams and duct wall penetrations

8.4.11. Seal joints in exhaust ducting where fan intake is further than 25 m from furthest intake in

Construct ductwork from a tape of soft annealed aluminum sheet, spiral wound into a tube and spiral corrugated to provide strength and flexibility. Provide a triple mechanical lock to form a

Class 1 pressure systems. For Class 2 and higher pressure systems restrict minimum and maximum

8.6.1.2. Noise Reduction Coefficient: .70 or higher based on "Type A mounting" and tested in accordance to ASTM C 423. 8.6.1.3. Adhesive: meeting ASTM C 916.

8.7. FIRE RATED DUCTING AND ENCLOSURES 8.7.1. Fabricate and install the ductwork according to the manufacturers written instructions and in

SHEET METAL INSTALLATION

ISSUED FOR CONSTRUCTION SSUED FOR TENDER 2020 P.G. **RE-ISSUED FOR PERMIT** NOV 06, 2020 P.G **RE-ISSUED FOR PERMIT** ISSUED FOR PERMIT DATE BY DESCRIPTION REVISIONS

GENERAL NOTES

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F • (905) 643-8510

www.arcengineering.ca contact@arcengineering.ca

PROJECT:

TART DATE:

020 03 24

NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE.

NIAGARA FALLS, ONTARÍO

DESIGNED BY:

P.G.

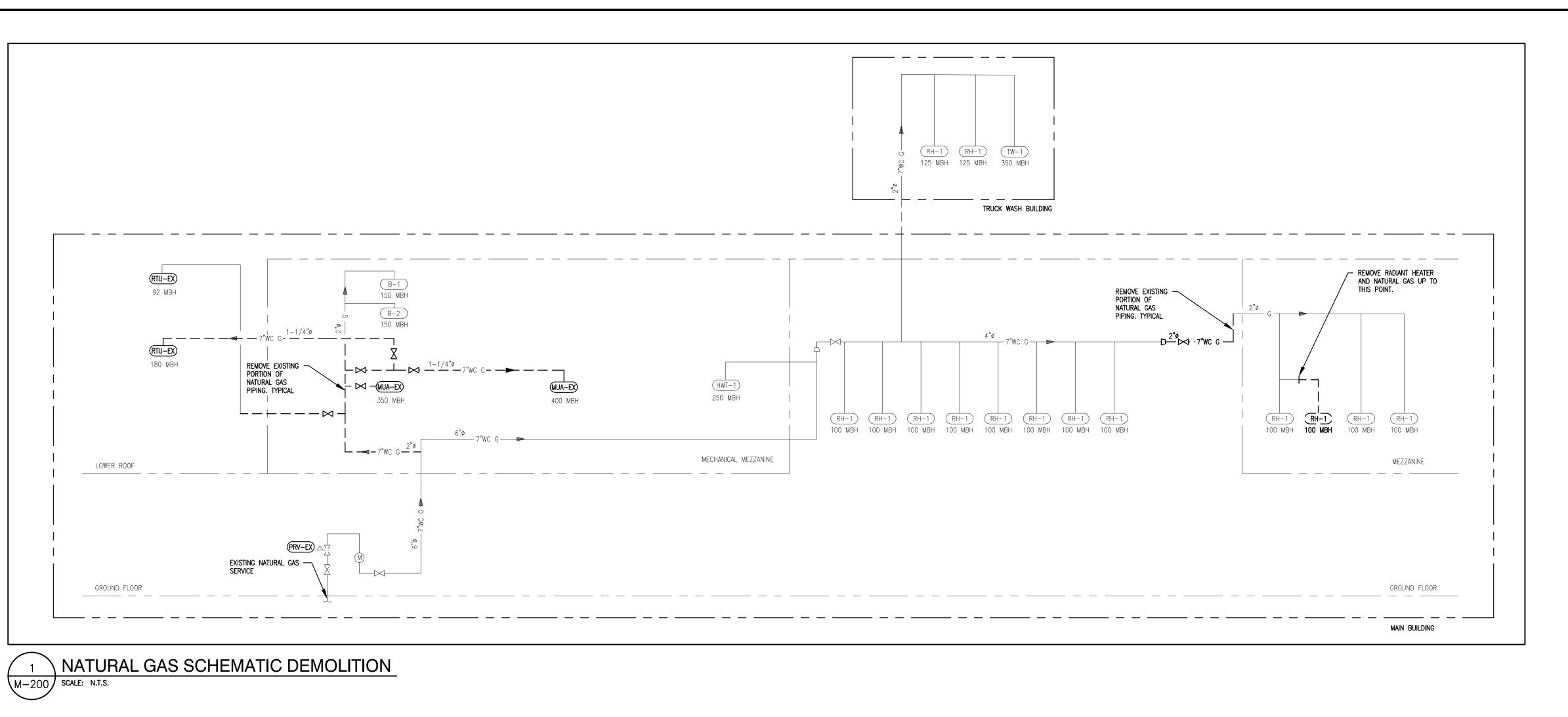
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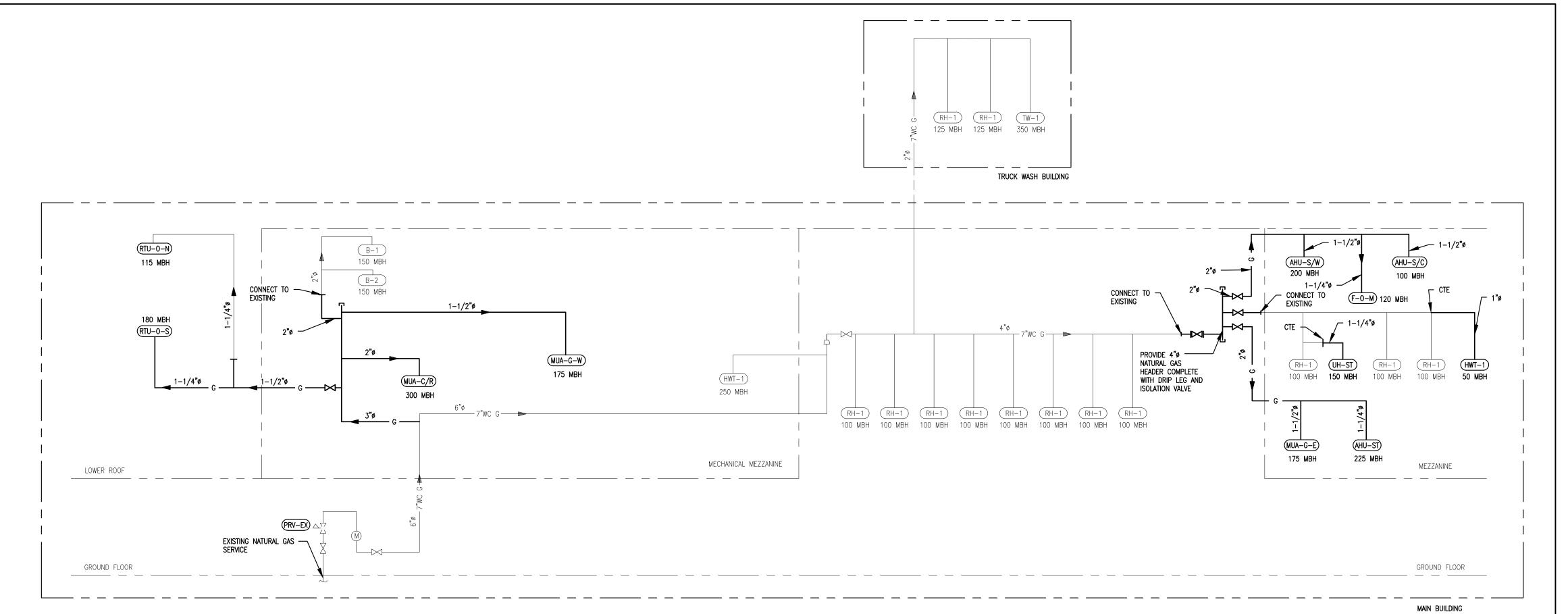
RAWING TITLE

SPECIFICATIONS 1

12.19. Attachments to reinforced concrete structure to use high strength mechanical expansion anchors. 20-201-010

			GENERAL NOTES
12.21. SRS for static floor—mounted equipment and systems: 12.21.1. Anchor equipment to equipment supports.			GLINEIVAL NOTES
12.21.2. Anchor equipment supports to structure. 12.21.3. Use size of bolts scheduled in approved shop drawings.			
12.22. SRS for static suspended equipment, systems: 12.22.1. Use one or combination of following methods:			
 Install tight to structure. Cross-brace in all directions. 			
- Brace back to structure			
— Slack cable restraint systems. 12.22.2. SCS to prevent sway in horizontal plane, "rocking" in vertical plane, sliding and buckling in axial			
direction. 12.22.3. Hanger rods to withstand compressive loading and buckling.			
12.23. SRS for vibration isolated floor mounted equipment and systems: 12.23.1. Use one or combination of following methods:			
 Vibration isolators with built—in snubbers. Vibration isolators and separate snubbers. 			
 Built—up snubber system approved by seismic specialist, consisting of structural elements and elastomeric layer. 			
12.23.2. SRS to resist complete isolator unloading.			
12.23.3. SRS not to jeopardize noise and vibration isolation systems. Provide 4–8 mm clearance between seismic restraint snubbers and equipment during normal operation of equipment and systems.			
12.23.4. Cushioning action to be gentle and steady by utilizing elastomeric material or other means in order to avoid high impact loads. 12.24. SRS for suspended isolated floor mounted equipment and systems:			
12.24.1. Use one or combination of following methods:			
 Slack cable restraint system. Brace back to structure via vibration isolators and snubbers 			
12.25. Attachment points and fasteners to withstand same maximum load that seismic restraint is to resist and in all directions.			
12.26. Install SRS at least 25 mm from all other equipment, systems, services. 12.27. Miscellaneous equipment not vibration—isolated to be bolt through house—keeping pad to structure.			
12.28. Co-ordinate connections with all disciplines.			
12.29. Anchor vertical tanks through house—keeping pad to structure and provide steel bands above centre of gravity.			
12.30. Provide at least two (2) straps with anchor bolts fastened to structure for horizontal tanks. 12.31. SRS to be inspected and certified by Manufacturer upon completion of installation.			
12.32. Provide written report to Engineer with certificate of compliance from seismic specialist. 12.33. Upon completion and acceptance of certification, hand over to Engineer complete set of construction			
12.33. Upon completion and acceptance of certification, hand over to Engineer complete set of construction documents, revised to show "as-built" conditions.			
			MAY
			4 ISSUED FOR CONSTRUCTION MAY 07, 2021 P.G.
			26, 2021 1.G.
			1 RE-ISSUED FOR PERMIT NOV P.G. 2020 P.G.
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			2 RE-ISSUED FOR PERMIT DEC. 03, 2020 P.G. 1 RE-ISSUED FOR PERMIT NOV 06, 2020 P.G. 0 ISSUED FOR PERMIT SEPT 4, 2020 P.G. No. DESCRIPTION DATE BY
			REVISIONS
			D
			ARC Engineering Inc.
			Creating Solutions Through Engineering Excellence
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			1100 South Service Rd., #417 Stoney Creek ON L8E 0C5 T ● (905) 643-8530 F ● (905) 643-8510
			www.arcengineering.ca contact@arcengineering.ca
			PROJECT:
			NIAGARA FALLS
			SERVICE CENTRE
			IMPROVEMENTS
			3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO
			START DATE: DRAWN BY: DESIGNED BY:
			2020 03 24 M.B. P.G.
			DRAWING TITLE:
			SPECIFICATIONS 2
7, 207			
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ATE: A			AS NOTED M. 106
			PROJECT: M-106
ODICINAL SHEET SIZE, ADOLL D			20-201-010
ORIGINAL SHEET SIZE: ARCH D	15"	10" 5"	





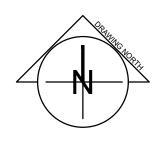
GENERAL NOTES

1. NATURAL GAS PIPING TO EXISTING EQUIPMENT TO BE VERIFIED.

MECHANICAL DRAWING FOR REFERENCE, GENERAL CONTRACTOR TO ENGAGE AND COORDINATE MECHANICAL SCOPE WITH REFRIGERATION ENERGY SOLUTIONS LTD.

4	ISSUED FOR CONSTRUCTION	MAY 07, 2021	P.G.
3	ISSUED FOR TENDER	FEB. 26, 2021	P.G.
2	RE-ISSUED FOR PERMIT	DEC. 03, 2020	P.G.
1	RE-ISSUED FOR PERMIT	NOV 06, 2020	P.G.
0	ISSUED FOR PERMIT	SEPT 4, 2020	P.G.
No.	DESCRIPTION	DATE	BY

REVISIONS





1100 South Service Rd., #417 Stoney Creek ON L8E 0C5 T ● (905) 643-8530 F ● (905) 643-8510

www.arcengineering.ca contact@arcengineering.ca

PROJECT:

NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

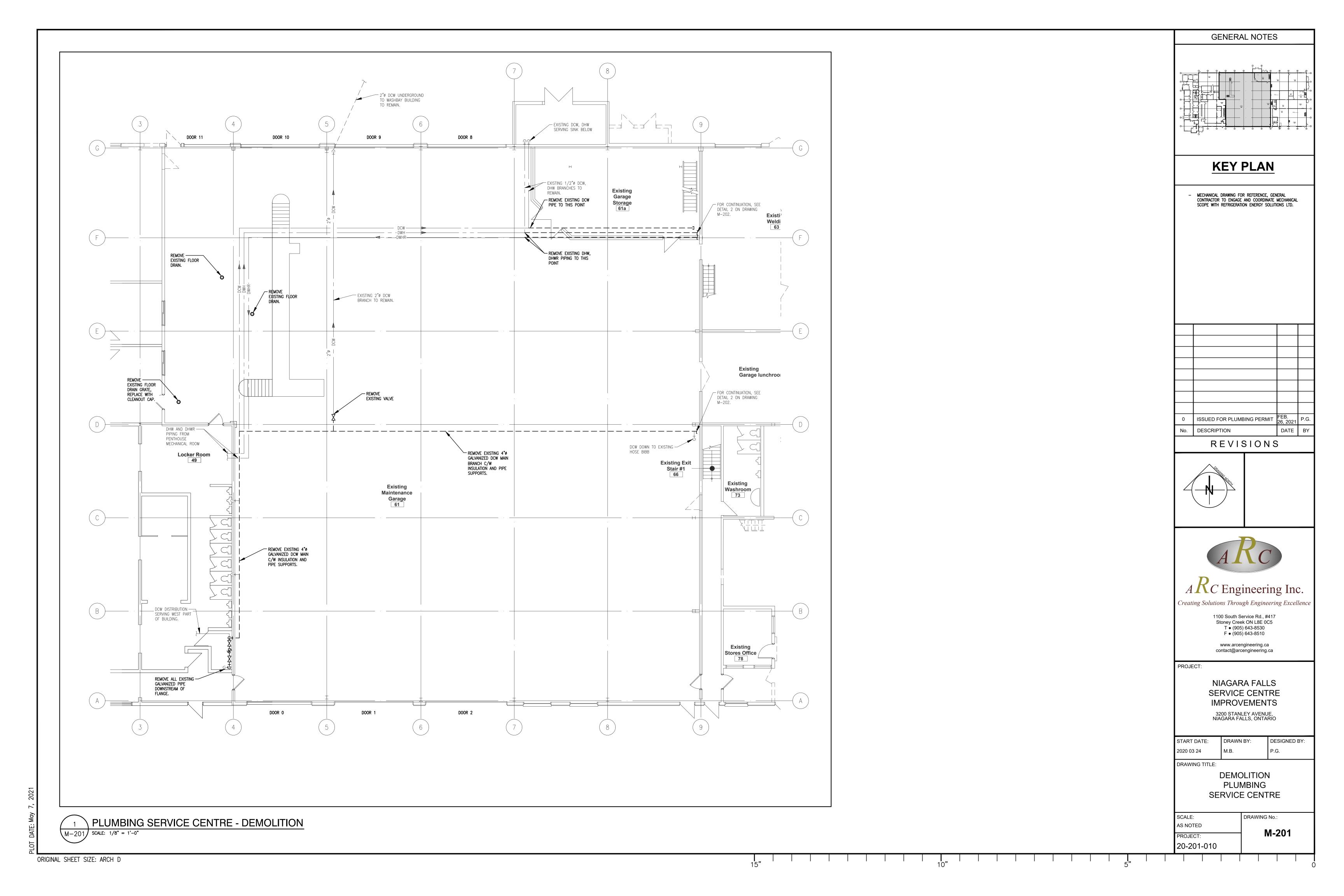
2020 03 24	M.B.	P.G.

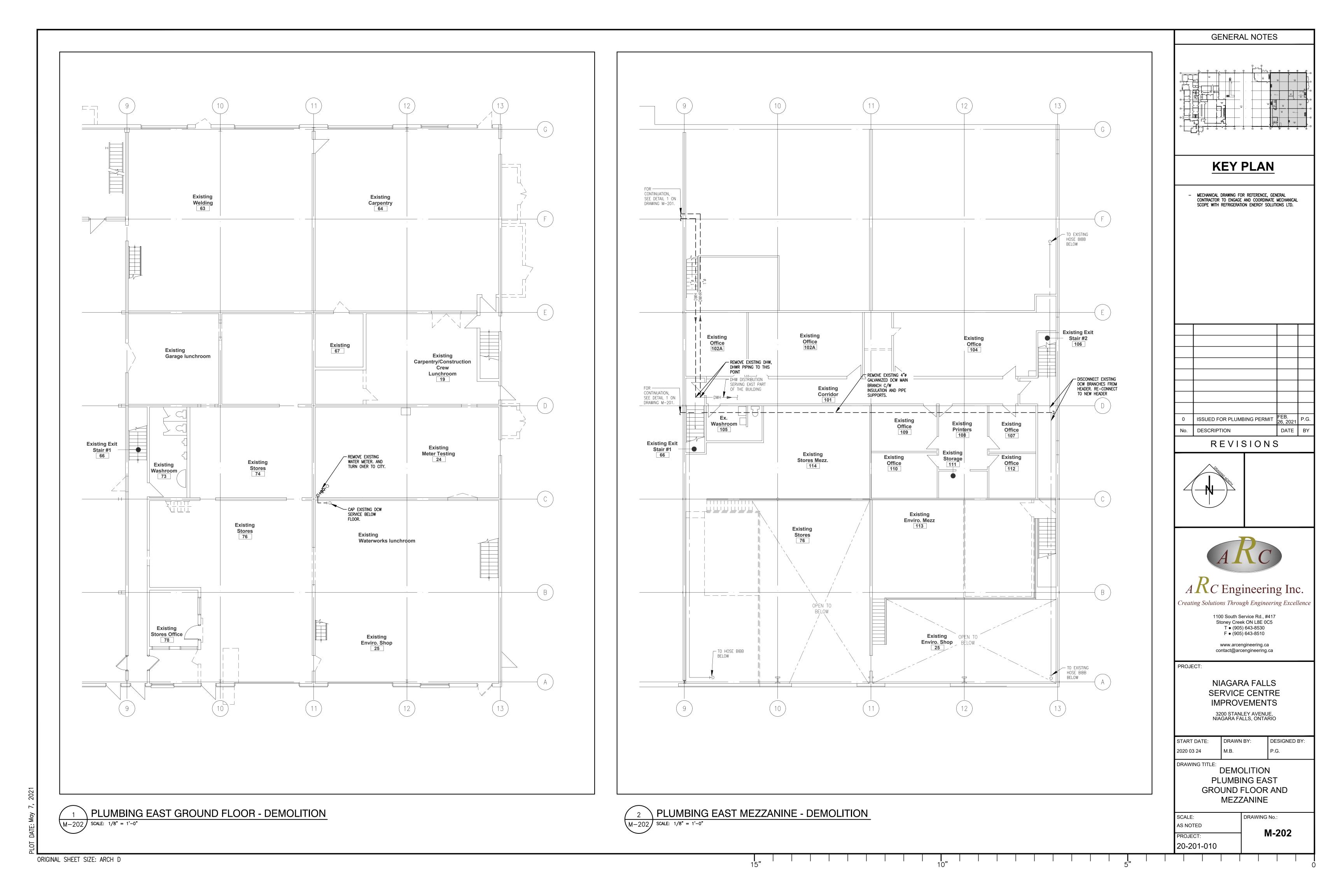
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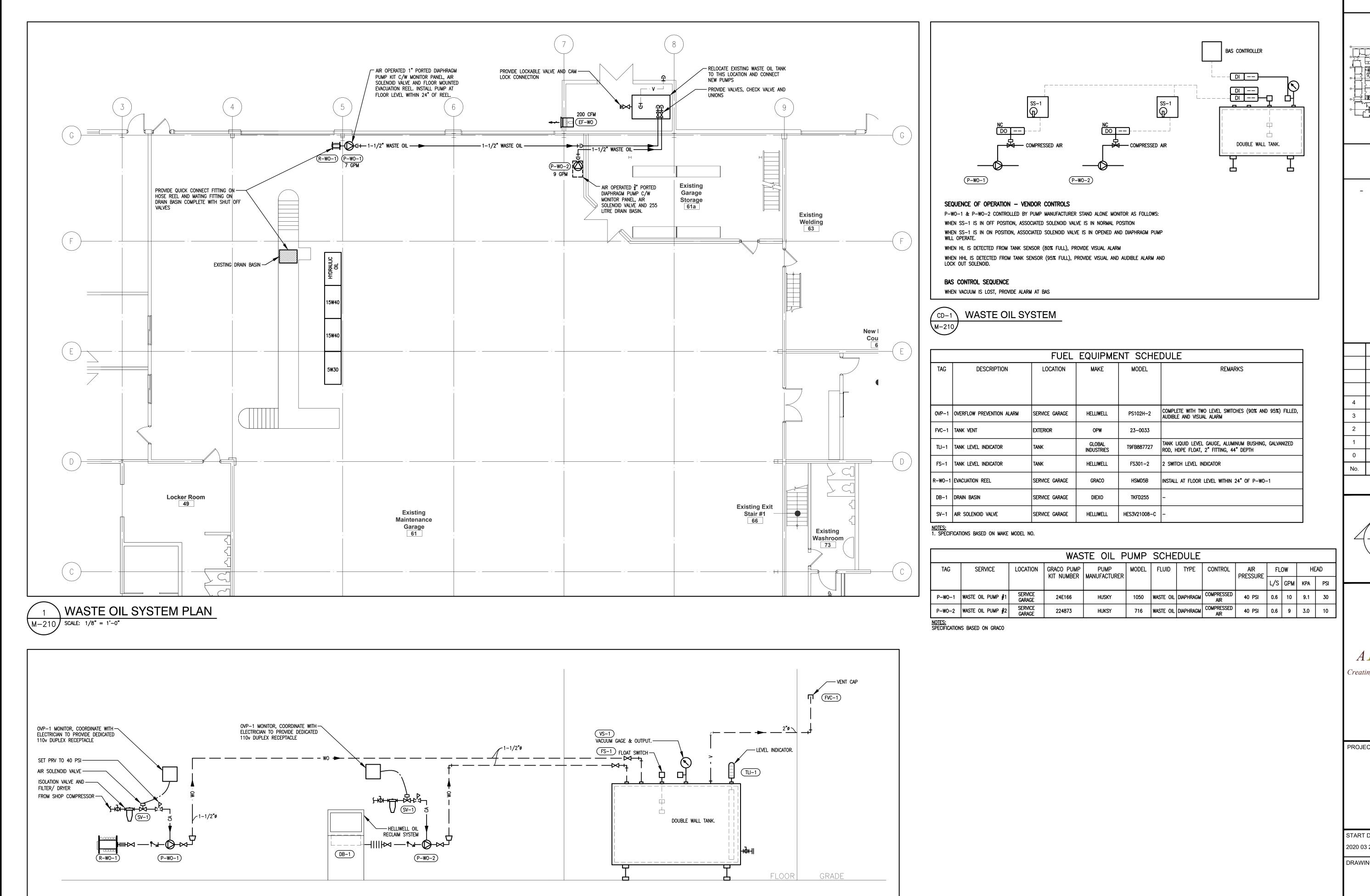
NATURAL GAS SCHEMATIC

SCALE: AS NOTED	DRAWING No.:
PROJECT:	M-200
20-201-010	

NATURAL GAS SCHEMATIC REVISED







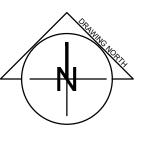
GENERAL NOTES

KEY PLAN

MECHANICAL DRAWING FOR REFERENCE, GENERAL CONTRACTOR TO ENGAGE AND COORDINATE MECHANICAL SCOPE WITH REFRIGERATION ENERGY SOLUTIONS LTD.

4	ISSUED FOR TENDER	FEB. 26, 2021	P.G.
3	ISSUED FOR PRICING	JAN. 04, 2021	P.G.
2	RE-ISSUED FOR PERMIT	DEC. 03, 2020	P.G.
1	RE-ISSUED FOR PERMIT	NOV 06, 2020	P.G.
0	ISSUED FOR PERMIT	SEPT 4, 2020	P.G.
No.	DESCRIPTION	DATE	BY

REVISIONS





ARC Engineering Inc. Creating Solutions Through Engineering Excellence

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PROJECT:

NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

2020 03 24	M.B.	P.G.

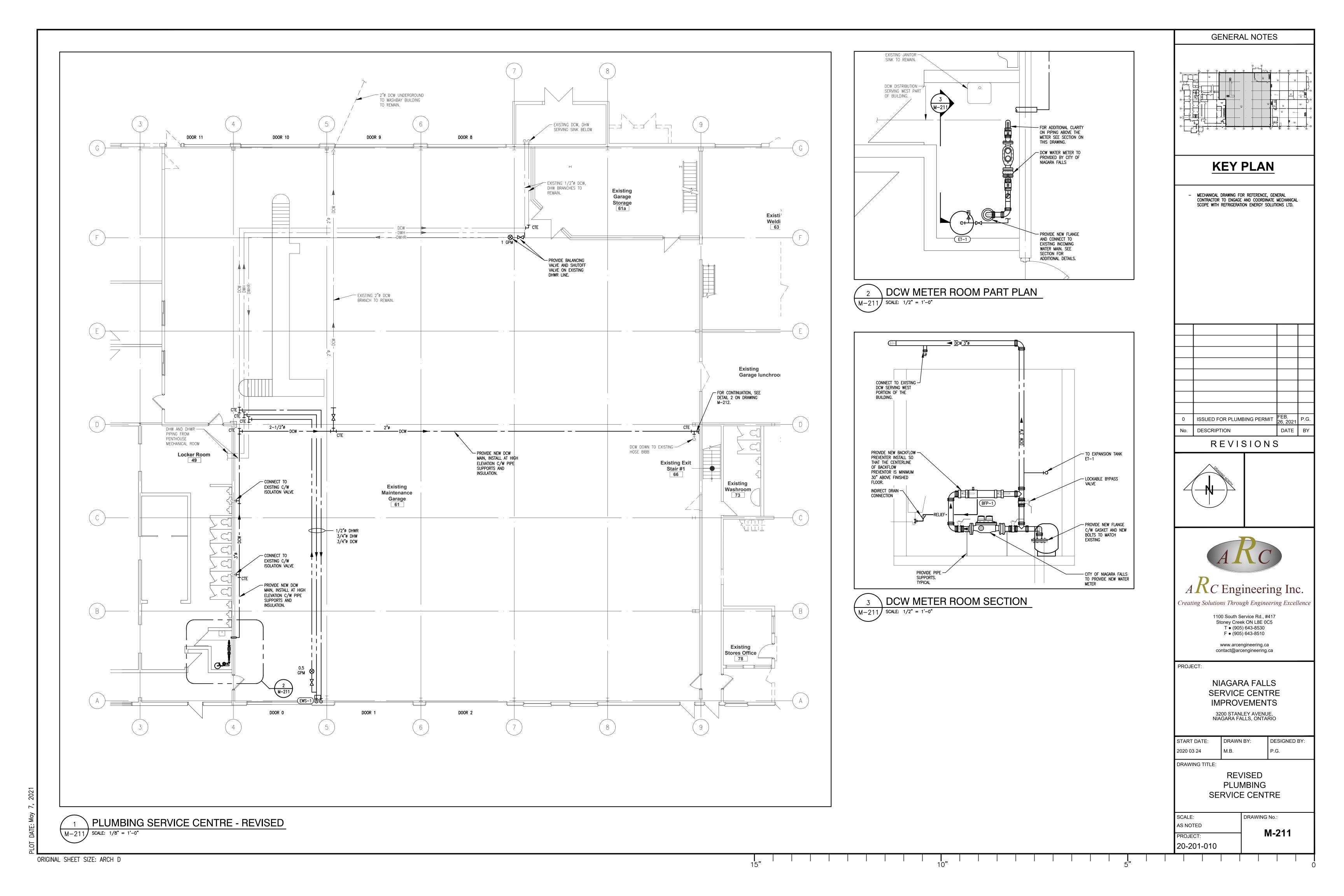
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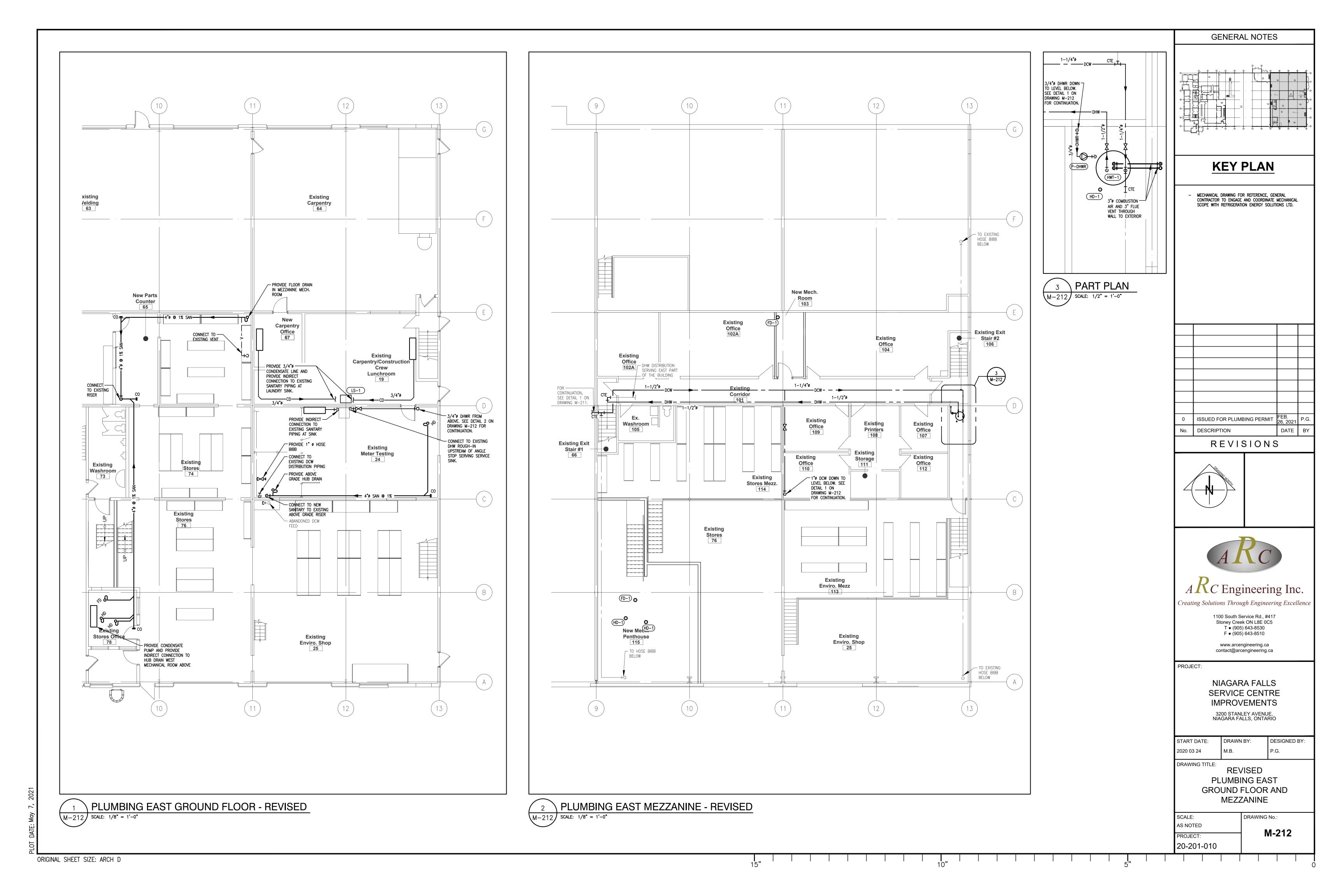
WASTE OIL PLUMBING PLAN

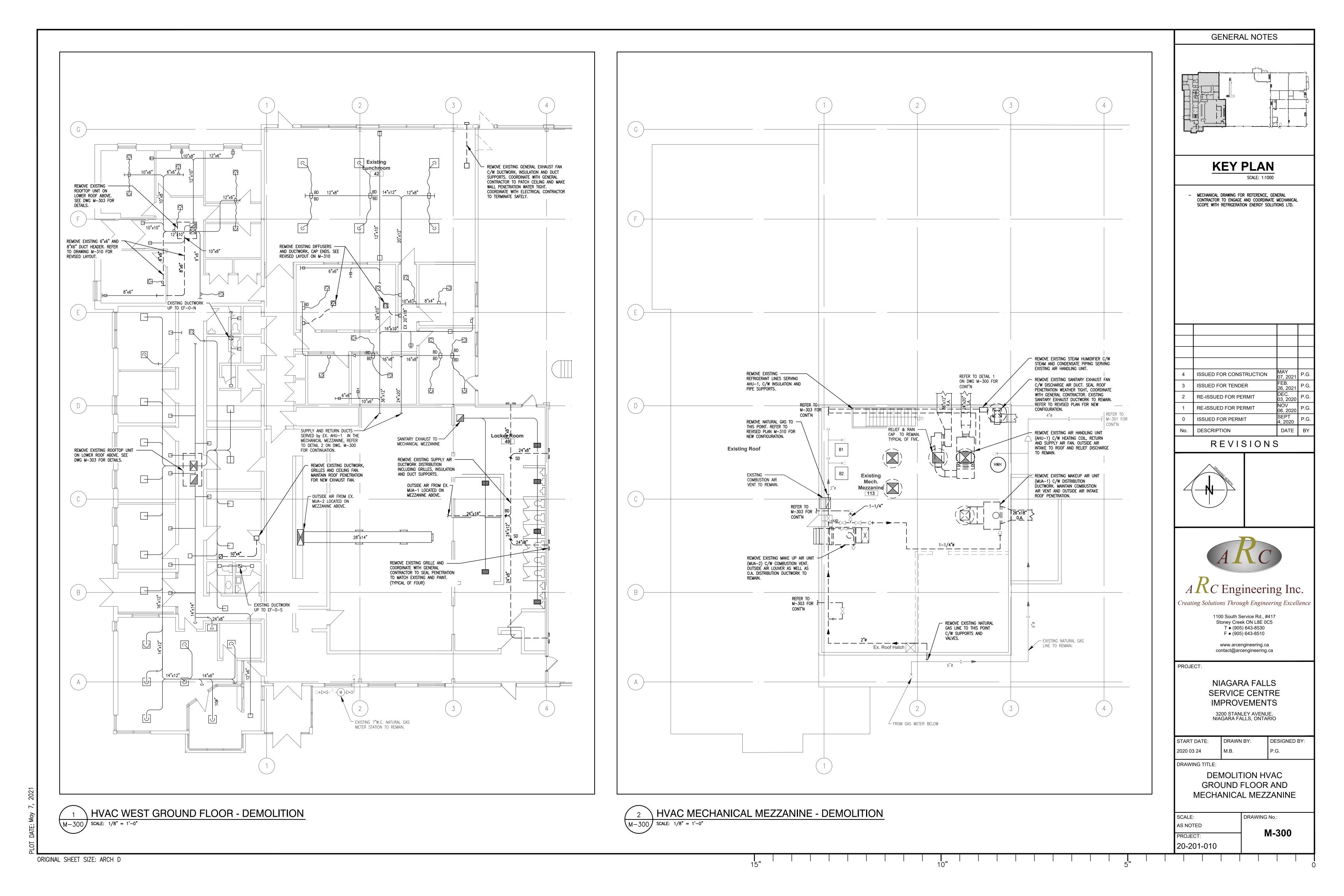
SC	ALE:			DRAWING No.:				
AS	NOTED							
PROJECT:				M-210				
20)-201-	-010						

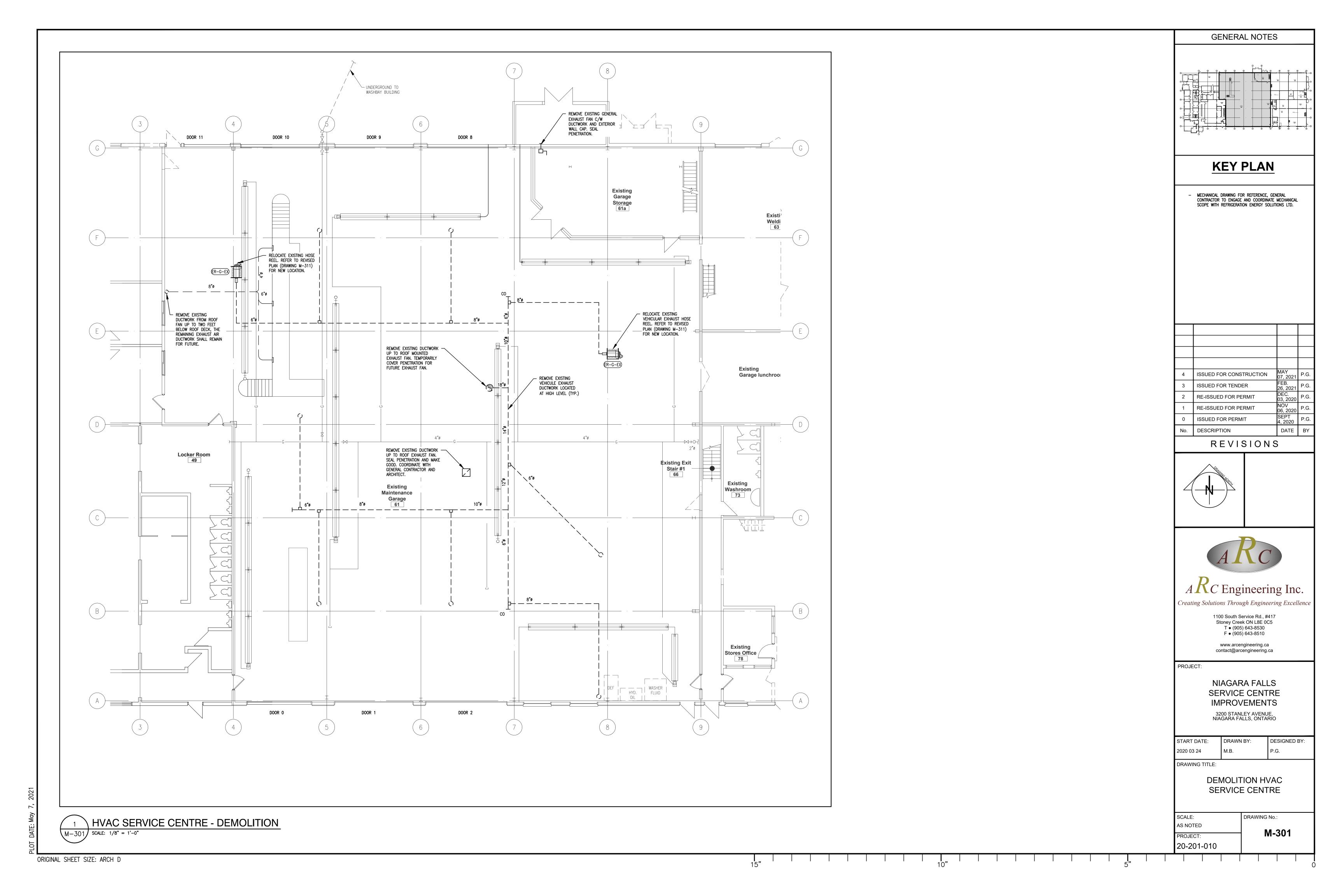
ORIGINAL SHEET SIZE: ARCH D

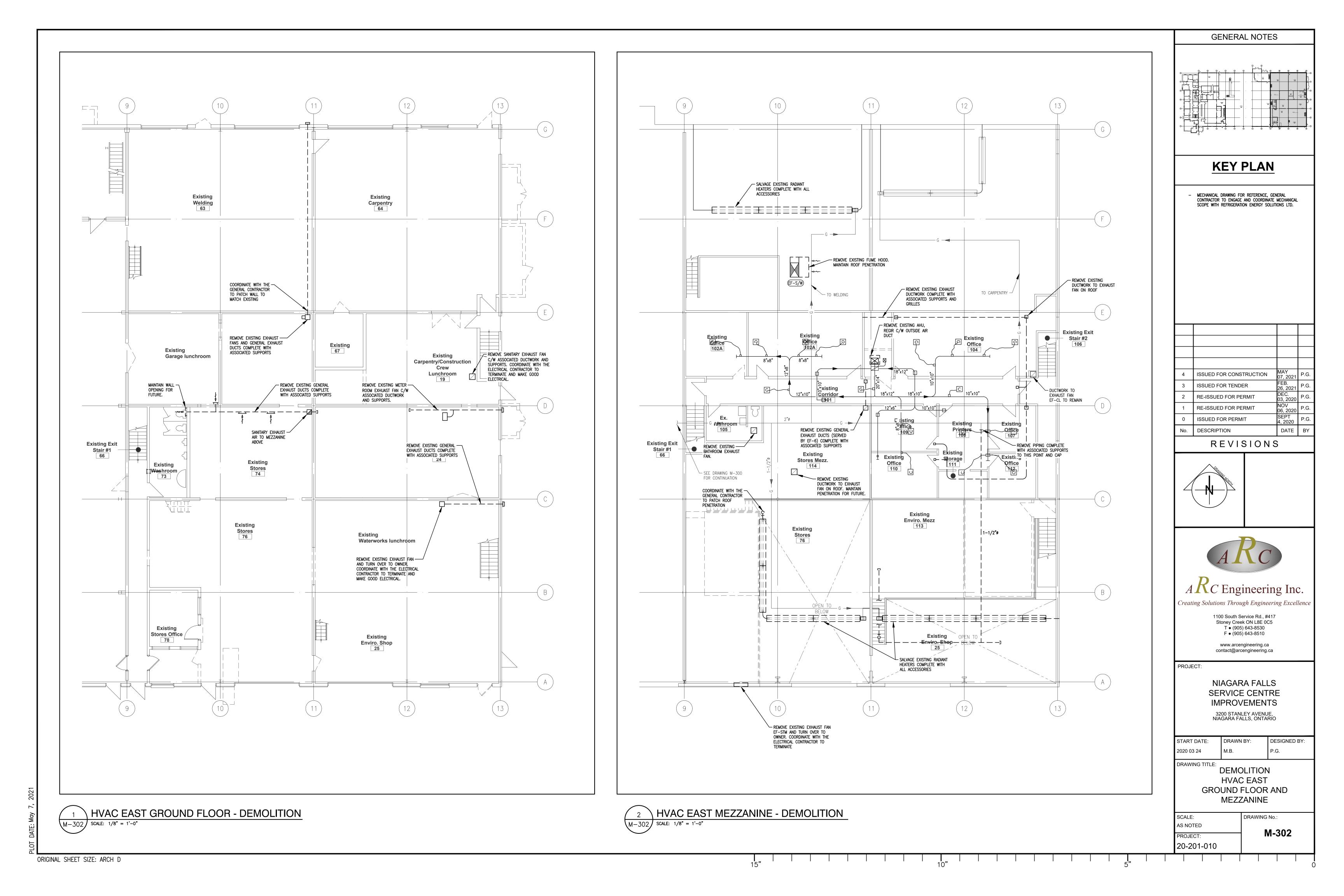
WASTE OIL SCHEMATIC

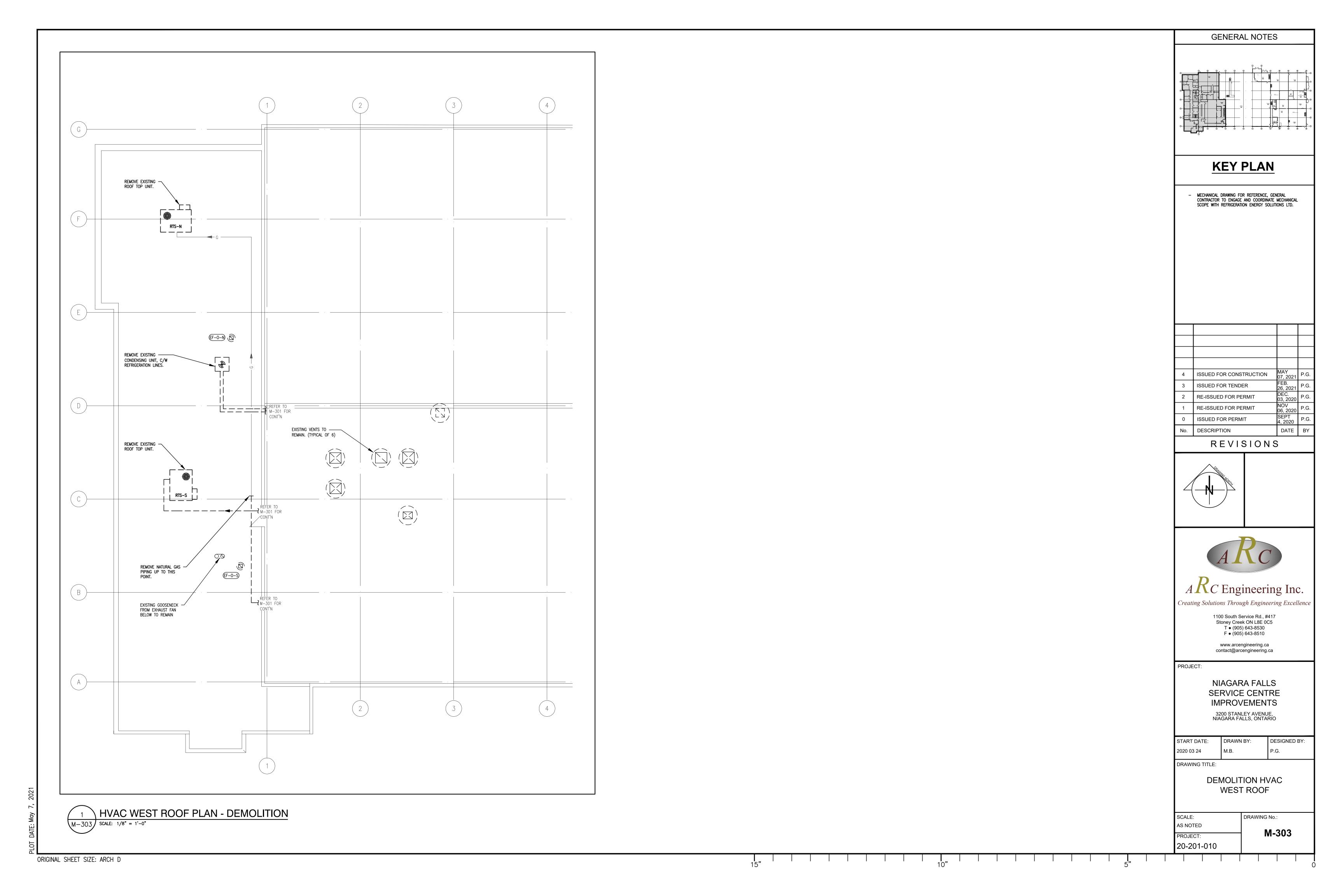


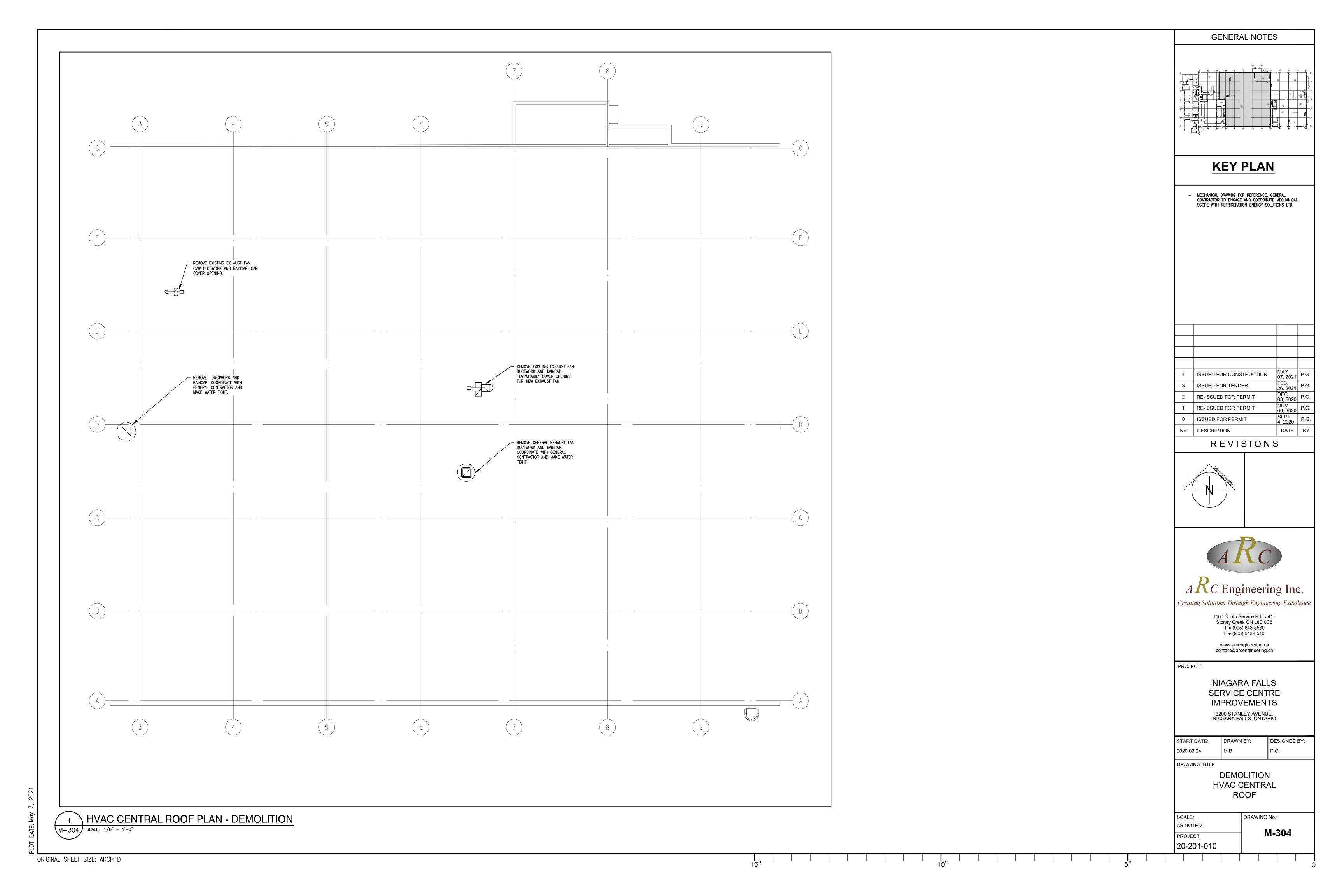


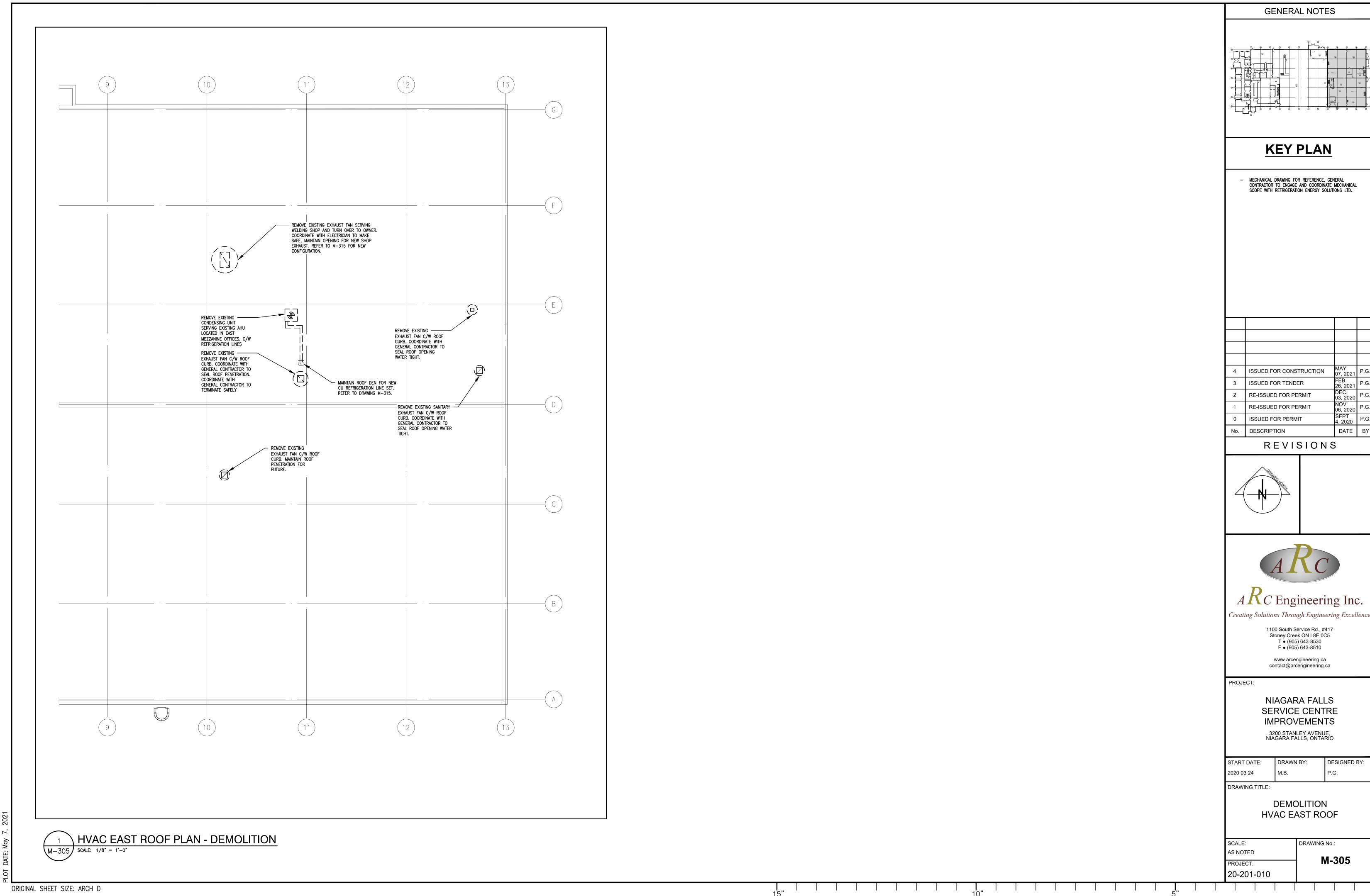








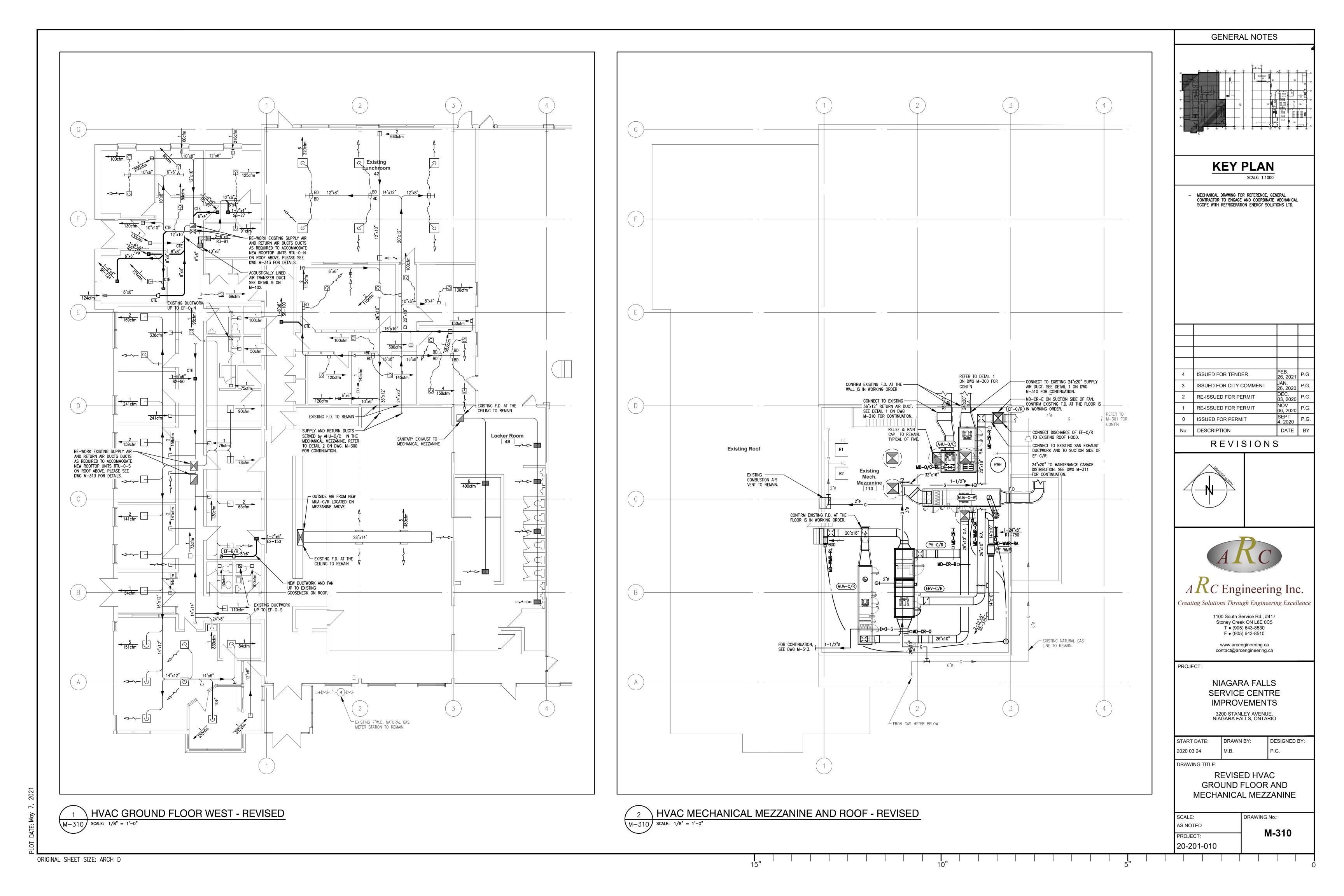


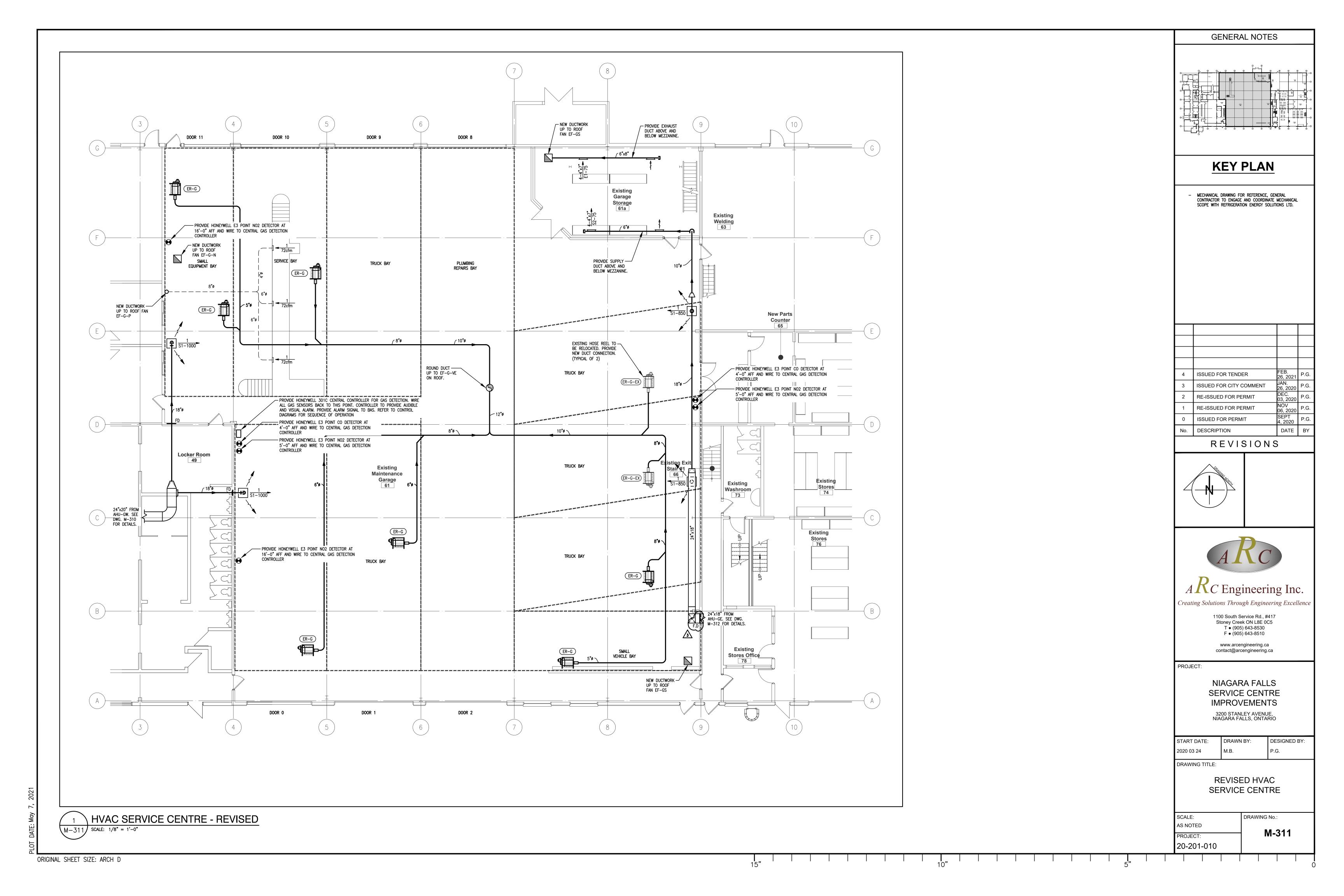


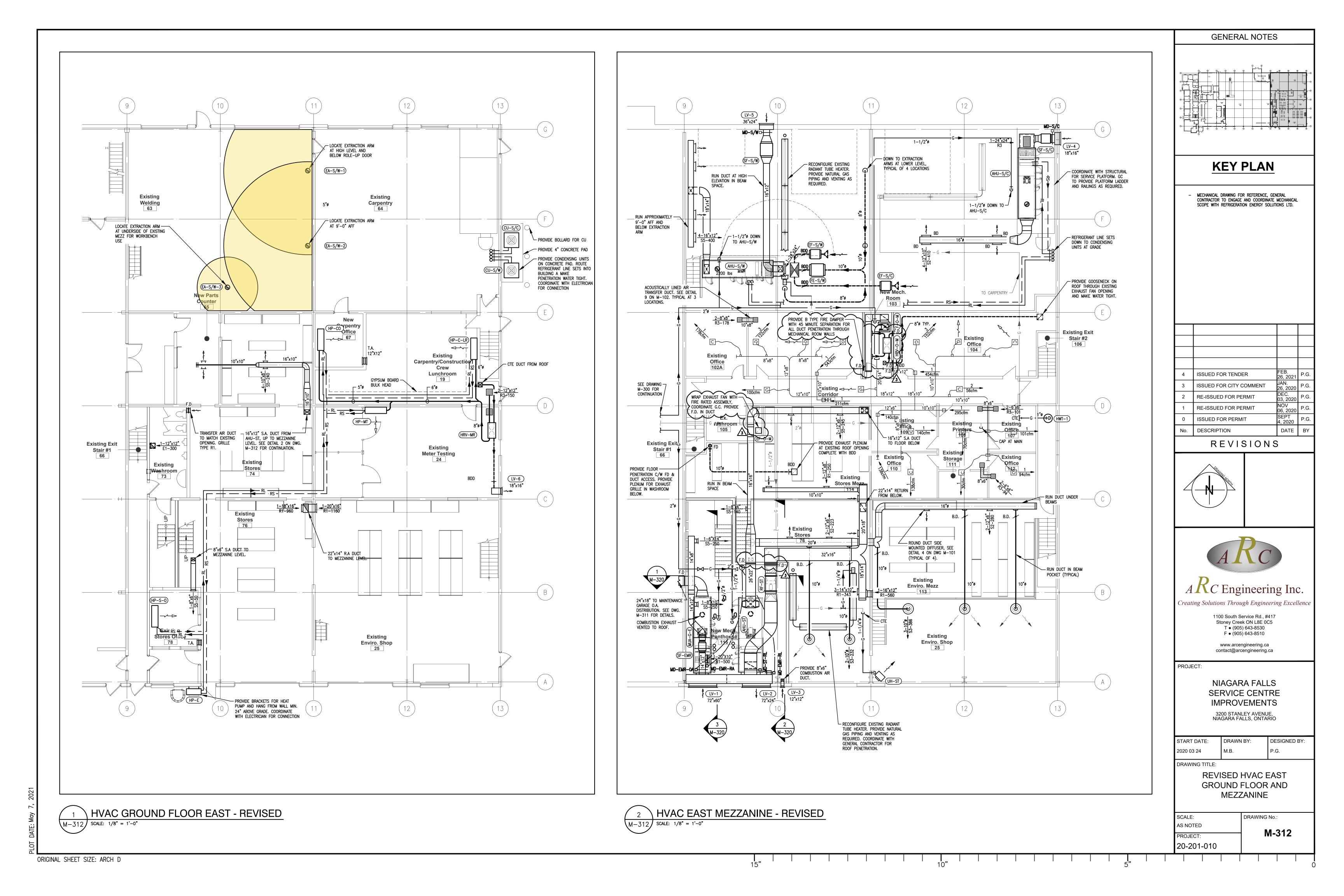
DATE BY

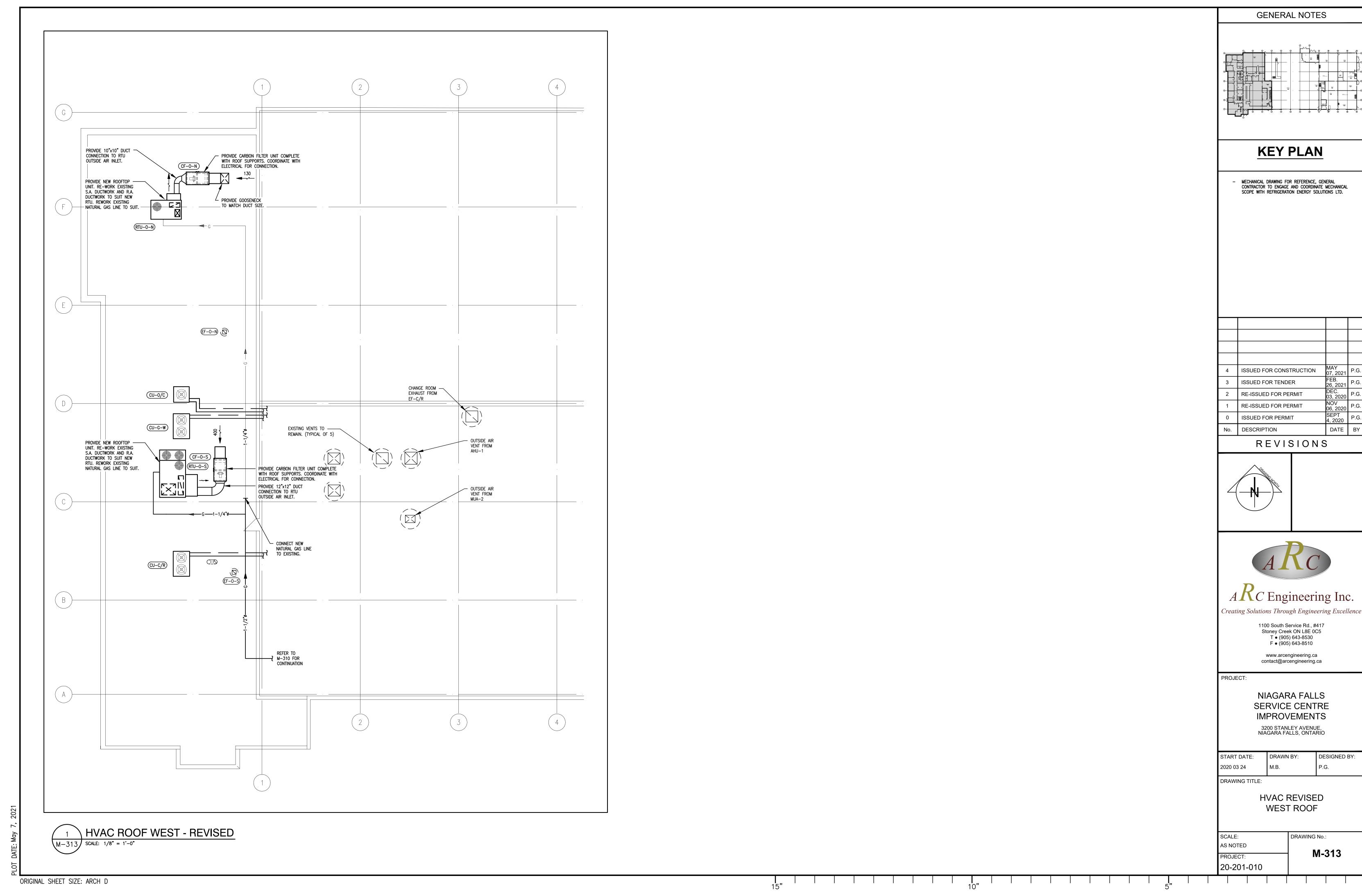
DESIGNED BY:

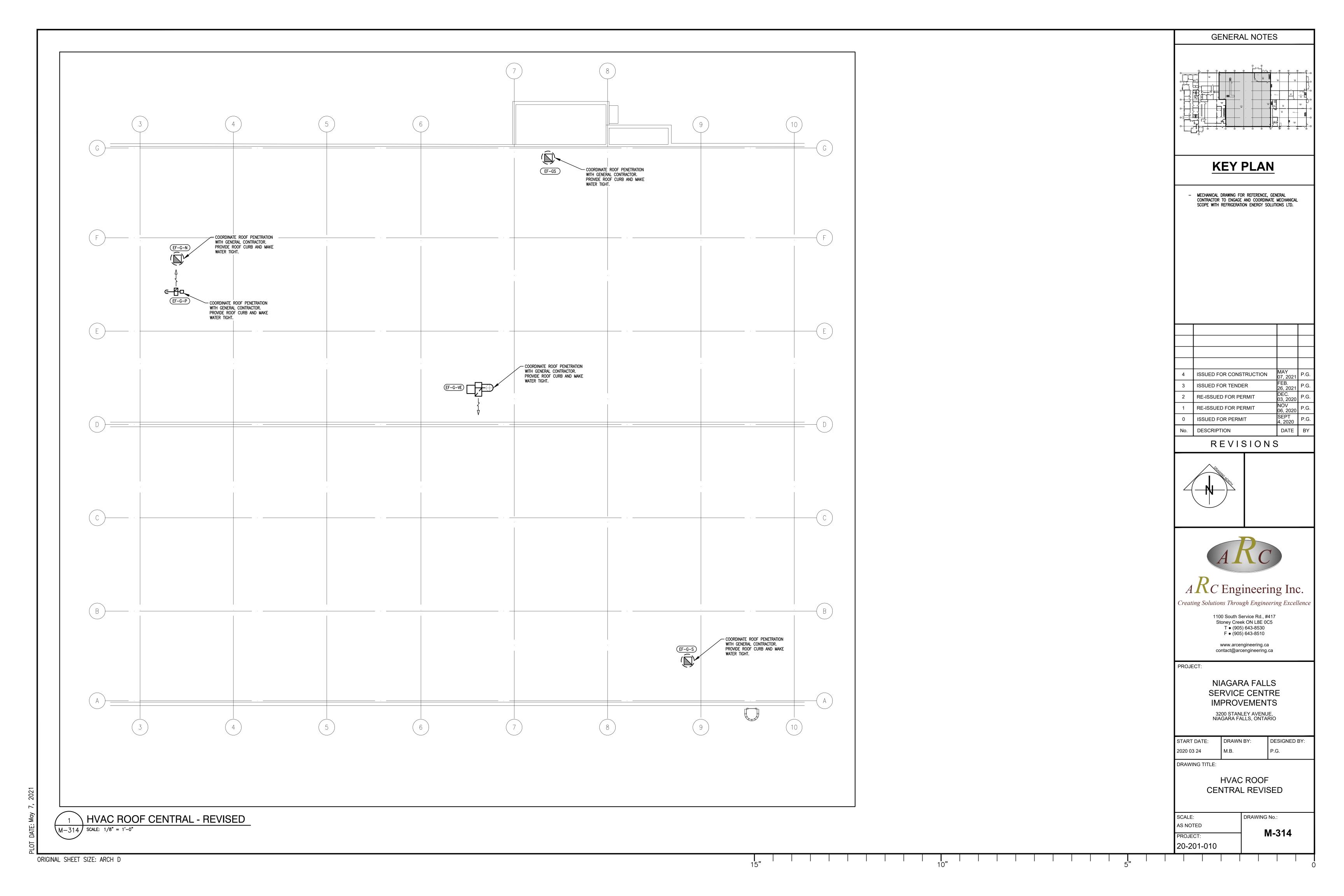
M-305

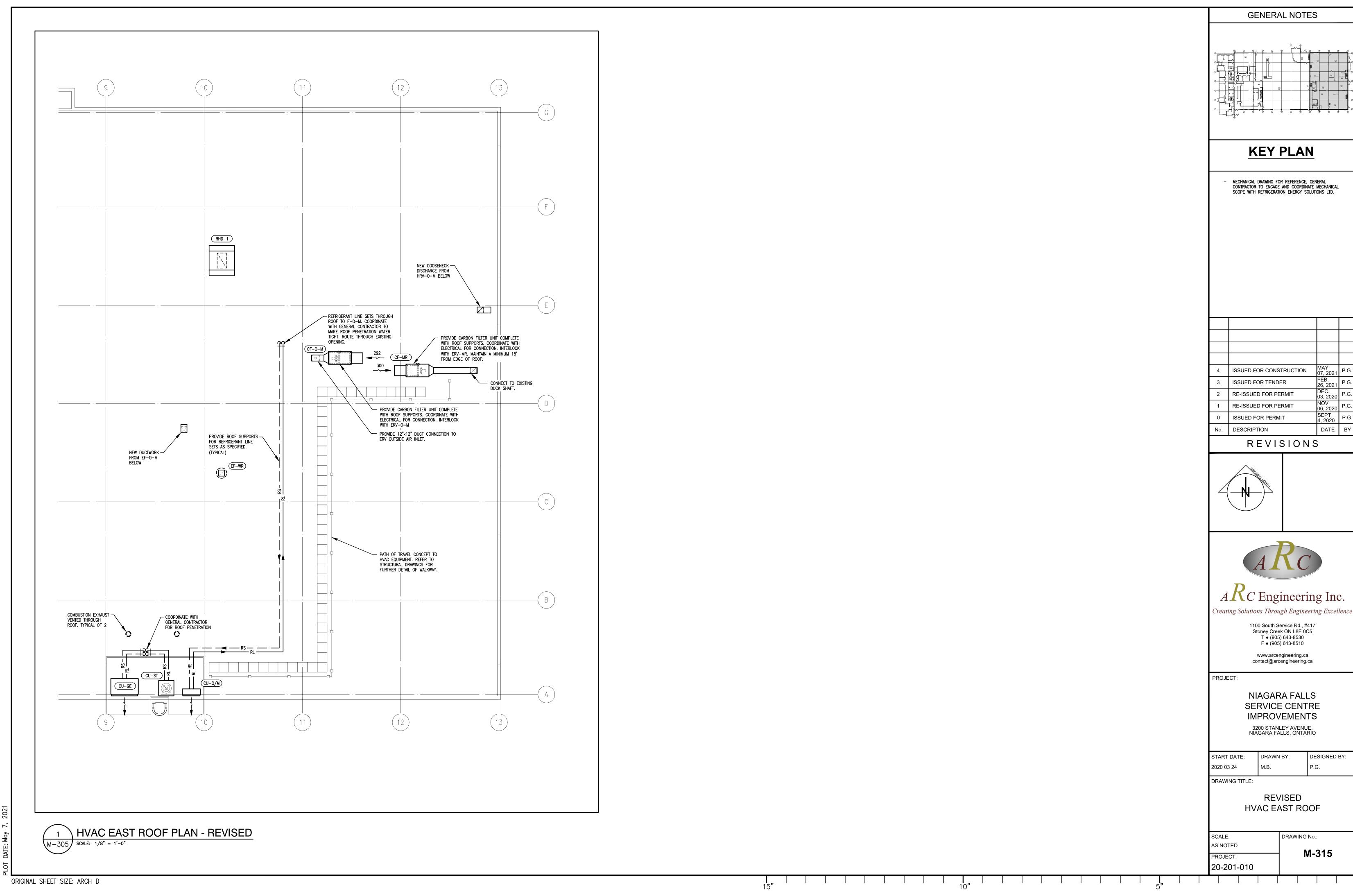


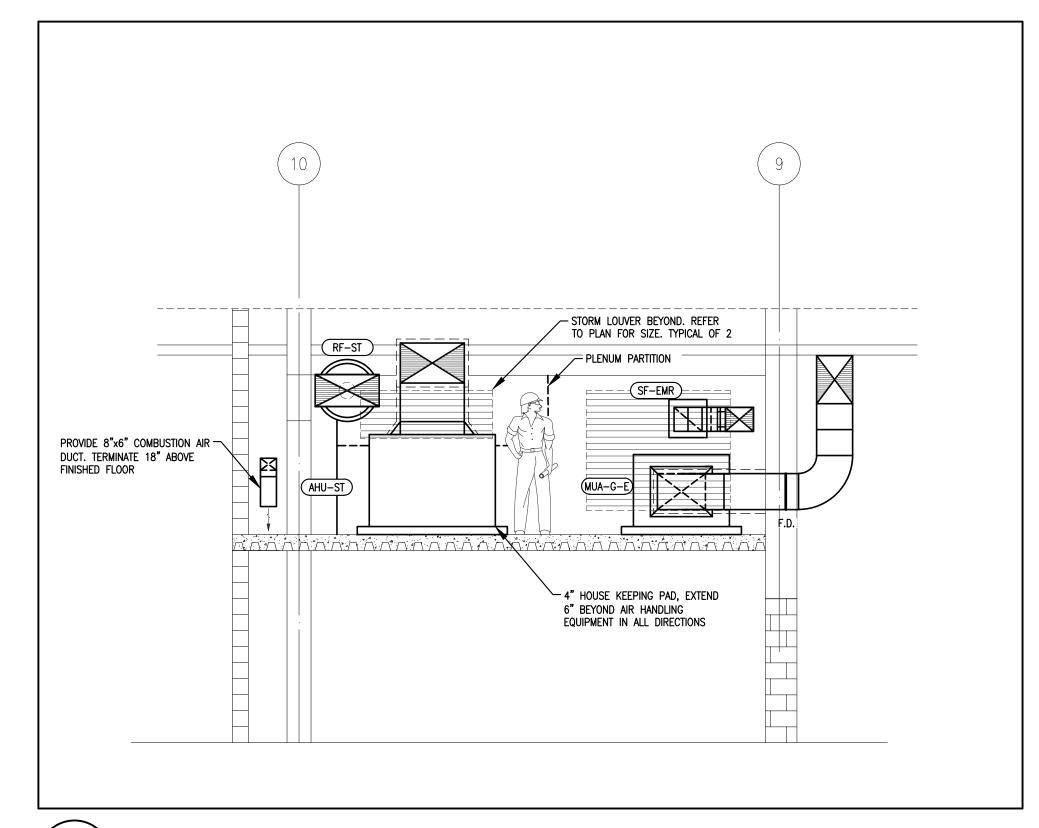


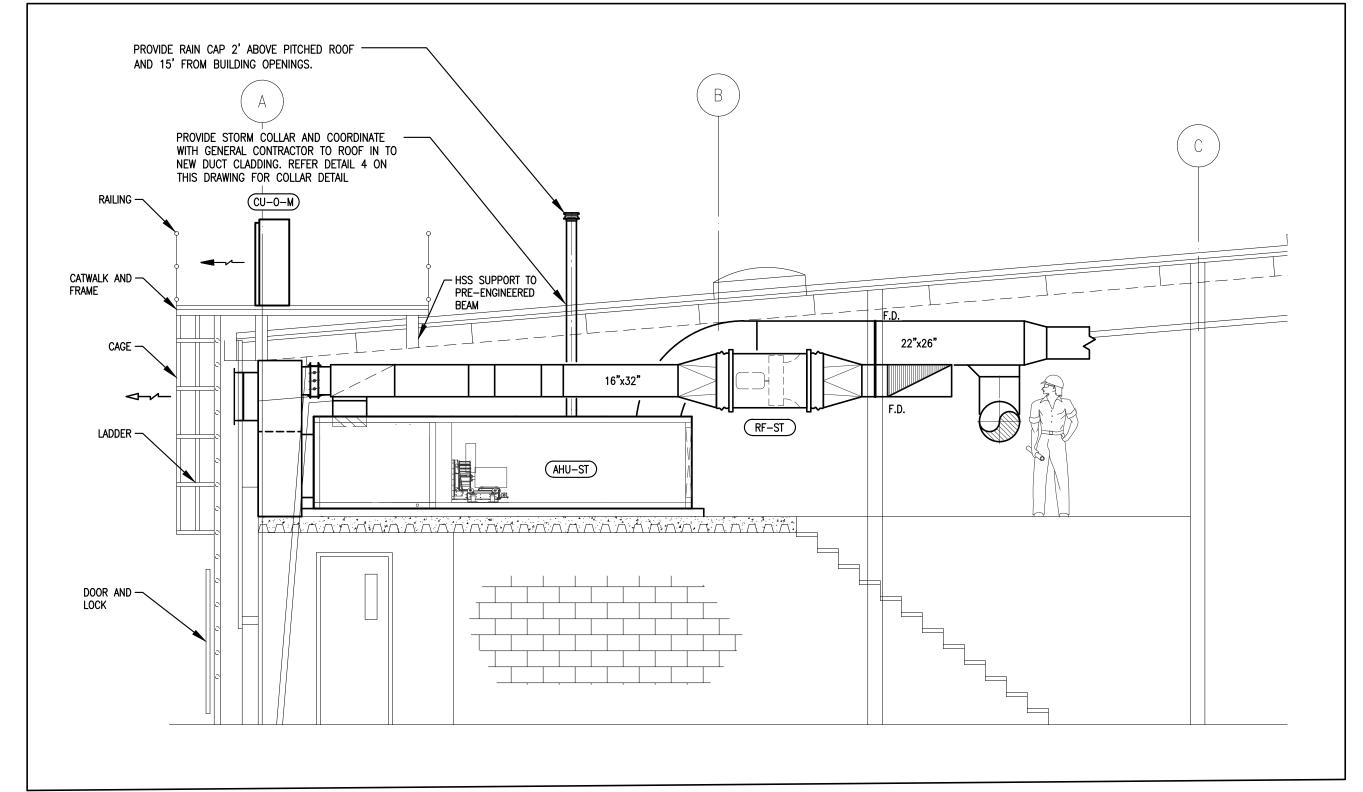








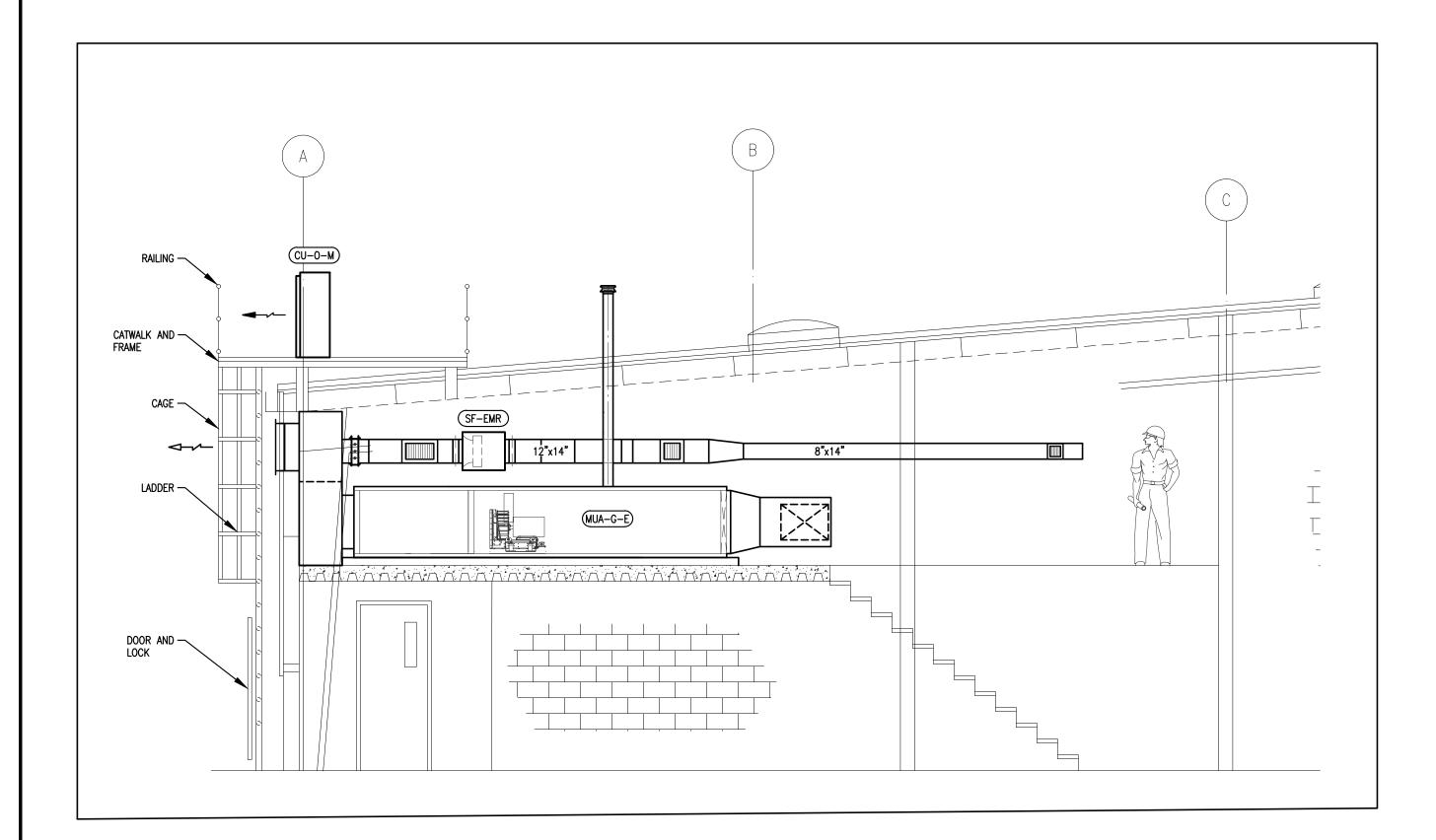




SECTION

SCALE: 1/4" = 1'-0"

SCALE: 1/4" = 1'-0"



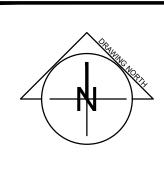


 MECHANICAL DRAWING FOR REFERENCE, GENERAL CONTRACTOR TO ENGAGE AND COORDINATE MECHANICAL SCOPE WITH REFRIGERATION ENERGY SOLUTIONS LTD.

GENERAL NOTES

4	ISSUED FOR CONSTRUCTION	MAY 07, 2021	P.G.
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0	ISSUED FOR PERMIT	SEPT 4, 2020	P.G.
No.	DESCRIPTION	DATE	BY
	·		

REVISIONS





1100 South Service Rd., #417 Stoney Creek ON L8E 0C5 T • (905) 643-8530 F • (905) 643-8510

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PROJECT:

NIAGARA FALLS SERVICE CENTRE IMPROVEMENTS 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

2020 03 24	M.B.	P.G.
START DATE:	DRAWN BY:	DESIGNED BY:

DRAWING TITLE:

REVISED HVAC EAST GROUND FLOOR AND MEZZANINE

SCALE:			DRAWING No.:					
AS	NOTED			M-320				
PR	OJECT:				IVI –	3 Z U		
20)-201-	-010						

ORIGINAL SHEET SIZE: ARCH D

| 15"

GENERAL NOTES:

ITEM

- CONTRACTOR IS TO INCLUDE FOR ALL ACCESSORIES AS REQUIRED FOR A FULL AND COMPLETE INSTALLATION. PARTS NUMBERS SHOWN ARE GENERALLY FOR FIXTURE ONLY. REFER TO ARCHITECTURAL CEILING SCHEDULE FOR CEILING TYPES.
- INSTALLATION OF EMERGENCY LIGHTING AND UNIT EQUIPMENT SHALL BE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS AND ACCORDING TO CODE REQUIREMENTS.
- 3. EMERGENCY BATTERIES SHALL BE SIZED TO MAINTAIN CONNECTED LOAD FOR MINIMUM 1/2 HOUR.
- 4. FOR ALL EXIT SIGNS REFER TO FLOOR PLANS FOR SINGLE OR DOUBLE FACE, CEILING RECESSED OR WALL MOUNTED.
- 5. ALL EMERGENCY LIGHTING AND EQUIPMENT ARE TO HAVE SHOP DRAWINGS SUBMITTED TO THE CONSULTANT PRIOR TO ORDERING FOR APPROVAL. CONTRACTOR MUST INCLUDE SHOP DRAWINGS FOR ALL LAMPS BEING INSTALLED WITH FIXTURES.
- . EQUIPMENT BEING SUBMITTED AS AN APPROVED EQUAL ARE TO BE SUBMITTED TO THE CONSULTANT FOR APPROVAL NO LESS THAN 5 BUSINESS DAYS BEFORE CLOSING, SUBMITTALS SHALL BE CLEARLY LABELED AND INCLUDE COMPLETE FIXTURE CUTS STATING INCLUDED OPTIONS AND ACCESSORIES. SUBMITTALS NOT MEETING THIS CRITERIA

DESCRIPTION

. THE CONTRACTOR SHALL INCLUDE FOR TWO (2) SPARE EXIT SIGNS TO BE INSTALLED AS DIRECTED BY OWNER/ENGINEER/BUILDING OFFICIAL. UNUSED SPARE SIGNS SHALL BE TURNED OVER TO OWNER IF NOT REQUIRED.

EXIT	SELF-POWERED EMERGENCY RUNNING MAN EXIT SIGN C/W DIRECTIONAL PICTOGRAMS FOR ON-SITE DIRECTION SELECTION. 1-1.5W LED 120VAC, 12VDC. REFER TO FLOOR PLANS FOR SINGLE OR DOUBLE FACE, CEILING RECESSED OR WALL MOUNT.
SIGN	AIMLITE 'RPALW' SERIES RPALW-x-M-WHT-BAT STANPRO 'RMXL' SERIES RMXLUWH-IB LUMACELL 'LA' SERIES LAXWS OR APPROVED EQUAL
EMER BATTE UNIT	(2-6W MR16LED), 120VAC, 12VDC. UNIT TO BE C/W AUTO-TEST AND
C/W EMER HEAD	AIMLITE EDST SERIES EDST-12-200-25M3WLJ-WIT-ATD-BTD
EMERG. REMOTE HEADS	AIMLITE 'RMSM1-6-12-3WLJ-WHT' & 'RMSM2-6-12-3WLJ-WHT'
COMB EXIT, EMER	SELF-POWERED & C/W AUTO-TEST.
LIGHT	

SENSOR NOTES AND SCHEDULE

OR APPROVED ËQUAL

GENERAL NOTES:

- ALL DEVICES AND SENSORS ARE TO HAVE SHOP DRAWINGS SUBMITTED TO THE CONSULTANT FOR REVIEW AND COMMENT PRIOR TO ORDERING.
- ALL SENSORS ARE TO BE IN COMPLIANCE WITH NEMA WD 7-2011. ANY SENSORS NOT IN COMPLIANCE WILL BE REJECTED.
- 3. PROVIDE ALL SENSORS, POWER PACKS AND RELAY UNITS AS REQUIRED FOR A COMPLETE INSTALLATION. PASSIVE INFRARED SENSOR, ULTRASONIC AND MULTI TECHNOLOGY OCCUPANCY SENSORS SHALL BE AS NOTED BELOW (REFER TO PLANS FOR DEVICE LAYOUT). PART NUMBERS SHOWN ARE GENERAL, FOR DEVICE ONLY.
- 4. THIS CONTRACTOR SHALL ALLOW FOR ON SITE ADJUSTMENTS OF TIME DELAY, AIMING AND SENSITIVITY.
- . FINAL PLACEMENT OF SENSORS SHALL BE CONFIRMED ON SITE WITH ALL PIPING, DUCTWORK, EQUIPMENT, ETC. PRIOR TO ROUGH-IN, TO ENSURE CLEAR VIEW OF THE ENTRANCE DOOR AND THE OVERALL SPACE. THIS CONTRACTOR TO REFER TO AND FOLLOW MANUFACTURERS SPECIFICATIONS AND INSTALLATION INSTRUCTIONS FOR PLACEMENT LOCATIONS AND SENSOR
- CEILING MOUNTED SENSORS SHALL BE AT AT CEILING LEVEL WHERE CEILING EXISTS. WHERE CEILING IS NOT PRESENT SENSORS TO BE MOUNTED AT HEIGHT OF PARTITIONS. WALL/CORNER MOUNTED SENSORS SHALL BE MOUNTED 8'-0" A.F.F. WALL STATION SENSORS SHALL BE AS PER SPECIFICATIONS AND STANDARD SWITCH LOCATIONS. ALL MOUNTING HEIGHTS ARE TO BE CONFIRMED ON SITE AND ADJUSTED ACCORDINGLY TO ENSURE PROPER COVERAGE.
- SENSORSWITCH. SENSORS BEING SUBMITTED AS EQUALS SHALL MEET SPECIFIED CAPABILITIES, COVERAGE(S), SENSITIVITY ADJUSTMENT, TIME DELAYS, ETC. AS OUTLINED ABOVE AND AS PER SPECIFICATIONS. SHALL AN ALTERNATE FAIL TO MEET INTENT OF DESIGN, CONTRACTOR WILL BE RESPONSIBLE TO PROVIDE ADDITIONAL SENSORS AND OR PARTS TO MEET INTEND OF DESIGN AND FUNCTIONALITY.

APPROVED ALTERNATE BY: WATTSTOPPER, LUTRON, H-MOSS,

- 8. ELECTRICAL CONTRACTOR SHALL ALLOW FOR TRAINING AND EXPLANATION OF CONTROLLED SYSTEMS TO END USER.
- 9. ELECTRICAL CONTRACTOR TO ENGAGE THIRD PARTY FOR FUNCTIONAL TESTING OF LIGHTING CONTROL DEVICES AND CONTROL SYSTEM AND PROVIDE CERTIFICATE OF ACCEPTANCE TO ENGINEER UPON COMPLETION PRIOR TO OCCUPANCY.

WITH MANUAL 'ON' VIA WALL SWITCH AND AUTOMATIC 'OFF' AFTER PRESET TIME. COMES WITH 0-10V DIMMER SWITCH/SLIDER AND POWEI PACK. LUTRON#LOS-CDT-1000-WH C/W DVTV-WH & PP-DV	ITEM	DESCRIPTION
AREAS SHOWN AND CONNECTED TO LIGHTS WITH 30 MINUTE TIME DELAY (1000 SQ. FT. MAX). SENSOR TO BE SET FOR VACANCY MODE WITH MANUAL 'ON' VIA WALL SWITCH AND AUTOMATIC 'OFF' AFTER PRESET TIME. COMES WITH 0-10V DIMMER SWITCH/SLIDER AND POWEI PACK. LUTRON#LOS-CDT-1000-WH C/W DVTV-WH & PP-DV	OS-1	MOUNTED IN AREAS AS SHOWN AND CONNECTED TO LIGHTS WITH 30 MINUTE TIME DELAY (1000 SQ.FT.MAX.) SENSOR TO BE SET TO VACANCY MODE. COOPER #ONW-D-1001-DMV-N-W
	0S-2	AREAS SHOWN AND CONNECTED TO LIGHTS WITH 30 MINUTE TIME DELAY (1000 SQ. FT. MAX). SENSOR TO BE SET FOR VACANCY MODE WITH MANUAL 'ON' VIA WALL SWITCH AND AUTOMATIC 'OFF' AFTER PRESET TIME. COMES WITH 0-10V DIMMER SWITCH/SLIDER AND POWEI PACK.

LIGHTING FIXTURE SCHEDULE

GENERAL NOTES:

- CONTRACTOR IS TO INCLUDE FOR ALL ACCESSORIES AS REQUIRED FOR A FULL AND COMPLETE INSTALLATION. PARTS NUMBERS SHOWN ARE GENERALLY FOR FIXTURE ONLY. REFER TO ARCHITECTURAL CEILING SCHEDULE FOR CEILING TYPES AND PROVIDE REQUIRED ACCESSORIES (IE DRYWALL FLANGE KIT, ETC). DISCREPANCIES BETWEEN THE DESCRIPTION AND PART NUMBER SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO SUBMITTING A BID.
- THE CONTRACTOR IS TO ALLOW FOR NORMAL DELIVERY ON FIXTURES (6-8 WEEKS FROM ACCEPTANCE OF SHOP DRAWINGS). FIXTURES FROM A QUICK SHIP PROGRAM WILL BE NOTED WHERE APPLICABLE. CONTRACTOR II TO SUBMIT SHOP DRAWINGS FOR FIXTURES AS SOON AS POSSIBLE TO AVOID DELAY OF THE PROJECT. ALTERNATES WILL NOT BE ACCEPTED TO EXPEDITE A SCHEDULE.
- PENDANT AND LINEAR FIXTURES SHOWN AS END TO END ARE TO BE ORDERED AS CONTINUOUS RUN FIXTURES UNLESS SPECIFICALLY NOTED OTHERWISE. FIXTURES ARE GENERALLY LISTED AS A MODULE TO CLARIFY THE LUMENS OR THE BALLAST AND LAMP REQUIRED FOR EACH MODULE. FIXTURE RUN LENGTHS SHALL BE AS SHOWN ON THE PLANS. DISCREPANCIES BETWEEN THE FIXTURE DESCRIPTION AND PLAN SHALL BE
- BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO SUBMITTING A BID. CONTRACTOR SHALL SUPPLY TO OWNER AND/OR CONSULTANT ANY

DOCUMENTATION AS REQUIRED FOR OWNER TO APPLY FOR ENERGY

NCENTIVES INCLUDING BUT NOT LIMITED TO BILLS OF SALE, ETC.

- ALL FIXTURES ARE TO HAVE SHOP DRAWINGS SUBMITTED TO THE CONSULTANT PRIOR TO ORDERING FOR GENERAL REVIEW. CONTRACTOR MUST INCLUDE SHOP DRAWINGS FOR ALL LAMPS BEING INSTALLED WITH
- DIMMERS SHALL BE (0-10V) UNLESS SPECIFIED OTHERWISE. DIMMERS SHALL BE COMPLETE WITH ON/OFF BUTTON AND SEPERATE SLIDER TO ALLOW THE DIMMING LEVEL TO REMAIN. DIMMERS INCORPORATING SLIDE TO OFF ARE NOT ACCEPTABLE UNLESS NOTED. ELV TYPE DIMMER WHERE REQUIRED SHALL COMPATIBLE WITH LIGHT FIXTURE AND BE CAPABLE OF 0-100% OPERATION. DIMMER SHALL BE BY LUTRON OR APPROVED EQUAL.
- FIXTURES BEING SUBMITTED AS AN APPROVED EQUAL ARE TO BE SUBMITTED TO THE CONSULTANT FOR APPROVAL NO LESS THAN 5 BUSINESS DAYS BEFORE CLOSING. SUBMITTALS SHALL BE CLEARLY LABELLED AND INCLUDE COMPLETE FIXTURE CUTS STATING INCLUDED OPTIONS. ACCESSORIES AND FIXTURE EFFICIENCY. SUBMITTALS NOT MEETING THIS CRITERIA WILL BE REJECTED. IES FILES FOR FIXTURES MUST HAVE AN IES LAB CERTIFICATION.

	ITEM	DESCRIPTION
	А	SURFACE MOUNT 4' LED UTILITY WRAP LUMINAIRE, DIE FORMED COLE ROLLED STEEL CONSTRUCTION, FROST ACRYLIC PRISMATIC LENS, 120-277V, 3200 LUMENS, 4000K, ELECTRONIC DIMMING DRIVER (0-10V)
		COOPER# 4WNLED-LD4-32SL-F-UNV-L840-CD-1-U

OR APPROVED EQUAL

- ED 4'STRIP LIGHT, 120-277V ELECTRONIC DIMMING DRIVER (0-10V), 4000K, 6500 LUMENS, FULL FROST LENS, WIDE DISTRIBUTION. FIXTURE TO BE INSTALLED WITH TWIST LOCK RECEPTACLE PER LIGHT WITH ADEQUATE CORD LENGTH. COOPER# 4SNLED-LD5-65HL-LW-UNV-L840-CD-1-U OR APPROVED EQUAL
- " RECESSED LED DOWNLIGHT, 1000 LUMENS, 120V ELECTRONIC DIMMING DRIVER (0-10V), 80CRI, 4000K, WIDE BEAM DISTRIBUTION, WHITE PAINTED SELF-FLANGED TRIM, SPECULAR CLEAR FINISH.
- OR APPROVED EQUAL LED 4' STRIP LIGHT, 120-277V ELECTRONIC DIMMING DRIVER (0-10V), 4000K, 3000 LUMENS, FULL FROST LENS, WIDE DISTRIBUTION.
- COOPER# 4SNLED-LD5-30SL-LW-UNV-L840-CD-1-U OR APPROVED EQUAL LED 4' STRIP LIGHT, 120-277V ELECTRONIC DIMMING DRIVER (0-10V),

COOPER# LD4B10D010-EU4B10208040-4LB2LI

- D2 COOPER# 4SNLED-LD5-50SL-LW-UNV-L840-CD-1-U OR APPROVED EQUAL
- 'X4' RECESS LED SPECIFICATION GRADE TROFFER, 120-277V. ELECTRONIC DIMMING DRIVER (0-10V), 3000 LUMENS, 4000K, CODE GAUGE PRIME COLD ROLLED STEEL HOUSING, RIBBED FROSTED ACRYLIC

4000K, 5000 LUMENS, FULL FROST LENS, WIDE DISTRIBUTION.

- OR APPROVED EQUAL 'X4' RECESS LED SPECIFICATION GRADE TROFFER, 120-277V, ELECTRONIC DIMMING DRIVER (0-10V), 3200 LUMENS, 4000K, CODE SAUGE PRIME COLD ROLLED STEEL HOUSING, RIBBED FROSTED ACRYLIC
- COOPER# 14CZ-32-UNV-L840-CD1-U OR APPROVED EQUAL

COOPER# 24CZ-30-UNV-L840-CD1-U

SAVE ON ENERGY PROGRAM DETAILS

- THE FOLLOWING ARE MANDATORY REQUIREMNTS OF THE PROGRAM. FAILURE TO DOCUMENT AND PROVIDE ANY OF THE INFORMATION BELOW WILL VOID THE PROGRAM AND MAKE THE APPLICATION INELLIGBLE FOR THE INCENTIVE REBATE. FIXTURES DENOTED AS "DLC LISTED" ARE ELIGIBLE AND PARTICIPATING IN THE INCENTIVE.
- THE CONTRACTOR SHALL INCLUDE TO TAKE PHOTOGRAPHIC DOCUMENTATION OF ALL EXISTING FIXTURE TYPES. THEY SHALL INCLUDE A PHOTO OF THE LUMINARIES, A PHOTO OF THE MODEL NUMBER ON THE LUMINAIRE, A PHOTO OF THE LAMPS, AND A PHOTO OF ANY BALLAST INFORMATION (AS APPLICABLE). THIS INFORMATION IS TO BE NEATLY ARRANGED, LABELLED AND ORGANIZED IN A PDF DOCUMENT. SUBMIT A COPY TO THE OWNER AND CONSULTANT FOR APPROVAL.
- ALL FIXTURES REMOVED ARE TO BE DISPOSED OF; NO EXCEPTIONS. FIXTURES ARE NOT TO BE DISPOSED OF TILL THE OWNER AND CONSULTANT HAVE REVIEWED AND APPROVED THE DOCUMENTATION OF THE EXISTING FIXTURES. THE CONTRACTOR IS TO PROVIDE A RECEIPT AND LETTER STATING THAT THEY HAVE BEEN DISPOSED OF.
- THE CONTRACTOR IS TO PROVIDE RECEIPTS FOR THE NEW LUMINARIES. RECEIPTS SHALL INDICATE QUANTITIES AND PART NUMBERS FOR FIXTURES. THIS INFORMATION IS USED TO VALIDATE THE INCENTIVE APPLICATION. PRICING CAN BE BLACKED OUT. THIS SHALL BE SUBMITTED TO THE OWNER AND CONSULTANT FOR APPROVAL.

WIRING DEVICES LIGHTING FIX					
WIRING L			LIGH HING	1	
O:	SPECIAL RECEPTACLE. REFER TO NOTES OR DESCRIPTION FOR TYPE			SUR FIXT	
Θ	125 VOLT, 2—POLE, 3—WIRE, STRAIGHT BLADE RECEPTACLE. 15 AMP SIMPLEX UNO.			SUR	
+	125 VOLT, 2-POLE, 3-WIRE, STRAIGHT BLADE RECEPTACLE. 15 AMP DUPLEX UNO.			FIXT	
⊕	125 VOLT, 2-POLE, 3-WIRE, STRAIGHT BLADE RECEPTACLE. 15 AMP DUPLEX CONTROLLED BY OCCUPANCY SENSOR (AUTO ON/OFF)		ДД	SUR FIXT SUR	
#	2x 125 VOLT, 2-POLE, 3-WIRE, STRAIGHT BLADE RECEPTACLE. 15 AMP DUPLEX UNO.		Ø Ø	FIXT	
	125/250 VOLT, 3-POLE, 4-WRE, STRAIGHT BLADE RECEPTACLE, AMPERAGE AS NOTED		#XI(t)	WAL FIXT	
Ö	125 VOLT, 2-POLE, 3-WIRE, STRAIGHT BLADE RECEPTACLE. 15 AMP DUPLEX UNO ON EMERGENCY OR UPS POWER		HØ E B	WAL FIXT CIRC	
-	125 VOLT, 2-POLE, 3-WIRE, STRAIGHT BLADE HALF-SWITCHED RECEPTACLE. 15 AMP DUPLEX		<u> </u>	SUR	
	CONTROLLED VIA LOCAL SWITCH		B-1-2	LIGH 1-B	
#	VERTICAL LINE THROUGH ANY RECEPTACLE SYMBOL INDICATES A NON-STANDARD MOUNTING HEIGHT THAT MUST BE FIELD DETERMINED.		₩	SWIT	
			RC	ROO	
₽	125 VOLT, 2-POLE, 3-WIRE, STRAIGHT BLADE RECEPTACLE. 15 AMP DUPLEX FOR SYSTEMS FURNITURE		•	CEIL	
	125 VOLT, 2-POLE, 3-WIRE, STRAIGHT BLADE		•	WAL	
=	RECEPTACLE. 15 AMP DUPLEX FOR SYSTEMS FURNITURE CONTROLLED BY OCCUPANCY SENSOR (AUTO ON/OFF)		₩.B-1-2	TYPI B-P (SWI P-P	
=	125 VOLT, 2-POLE, 3-WIRE, STRAIGHT BLADE RECEPTACLE. 15 AMP DUPLEX FOR SYSTEMS FURNITURE ON EMERGENCY OR UPS POWER			os-	
	RECEPTACLES MOUNTED IN 2 CHANNEL		FIRE ALA	RM	
# (1)	RACEWAY	 	\$ _₽	PHO	
⊕ _{xx} B−1	TYPICAL RECEPTACLE NOTES. CIRCUITING: B-PANELBOARD I.D., 1-BRANCH CIRCUIT. SUBSCRIPT: XX-CURRENT RATING (IF NOTED).		S _r	PHO REL/	

SUBSCRIPT: XX-CURRENT RATING (IF NOTED).

POWER L	POWER LAYOUT			
ㅁ	DISCONNECT SWITCH (DS)			
₩	COMBINATION STARTER (CS)			
\boxtimes	MAGNETIC STARTER (MG)			
·	MANUAL STARTER (MS)			
	POWER PANEL - EXISTING			
	POWER PANEL - NEW			
M	POWER TRANSFORMER			
	ELECTRIC HEATING EQUIPMENT			
\bigcirc	EQUIPMENT SUPPLIED BY OTHERS REQUIRING ELECTRICAL POWER CONNECTION REFER TO EQUIPMENT SCHEDULE			
\bigcirc	EQUIPMENT SUPPLIED BY OWNER REQUIRING ELECTRICAL POWER CONNECTION REFER TO OWNER EQUIPMENT SCHEDULE			
0	MECHANICAL EQUIPMENT/MOTOR REQUIRING ELECTRICAL POWER			
₩	ALL MODES OF OPERATION OF EQUIPMENT SO NOTED TO BE SHUT DOWN BY THE ALARM CONDITION OF THE FIRE ALARM CONTROL PANEL.			
•	PUSH BUTTON			
•••	PUSH BUTTON STATION			
Û	THERMOSTAT			
T	TIME CLOCK			
J	JIFFY POLE			
(A)	120V HARDWIRE CONNECTION			
	208V, 1ø HARDWIRE CONNECTION			
	208V, 3ø HARDWIRE CONNECTION			
	600V, 3ø HARDWIRE CONNECTION			
JB	JUNCTION BOX			
H	HAND DRYER			
B	FLOOR BOX			

SECURITY, ACCESS CONTROL, CCTV			
\blacksquare	AREA TYPE BREAK GLASS DETECTOR		
	SINGLE-PANE TYPE BREAK GLASS DETECTOR		
••	DOOR CONTACT		
••	ROLL-UP OR OVERHEAD DOOR DOOR CONTACT		
<u>D-</u>	MOTION DETECTOR		
C.	PHOTO-ELECTRIC BEAM SOURCE		
0	PHOTO-ELECTRIC BEAM REFLECTOR		
R	SECURITY SYSTEM ALARM SIGNAL		
□□□	VIDEO MONITORING CAMERA		
舍	POWER DOOR PUSH BUTTON OPERATOR		
ADO	AUTOMATIC DOOR OPENER		
C	CARD READER		
ES	ELECTRIC STRIKE		
K	ELECTRONIC KEY PAD		
MAG	MAGNETIC LOCK		
OCC	OCCUPIED LIGHT CAMDEN LED ANNUNCIATOR CM-AF-500		
PTR	PUSH TO RELEASE		
PTL	PUSH TO LOCK CAMDEN PUSHBUTTON CM-400/8		
REX	REQUEST TO EXIT		
SP	SCRAMBLE PAD		
W	HANDS FREE SWITCH CAMDEN SUREWAVE CM-324/3		

	LIGHTING	FIXTURES
~		SURFACE OR RECESS MOUNTED LIGHTING FIXTURES. LETTER DENOTES TYPE
NDE NDE		SURFACE OR RECESS MOUNTED LIGHTING FIXTURES ON AN EMERGENCY OR NIGHT LIGHT CIRCUIT. LETTER DENOTES TYPE.
ADE D	ДД	SURFACE OR RECESS MOUNTED LIGHTING FIXTURES. LETTER DENOTES TYPE.
BLADE	Ø Ø	SURFACE OR RECESS MOUNTED LIGHTING FIXTURES ON AN EMERGENCY OR NIGHT LIGHT CIRCUIT. LETTER DENOTES TYPE.
Г	な下か	WALL OR COLUMN MOUNTED LIGHTING FIXTURES. LETTER DENOTES TYPE.
\DE	₩Ø£Ø-	WALL OR COLUMN MOUNTED LIGHTING FIXTURES ON AN EMERGENCY OR NIGHT LIGHT CIRCUIT. LETTER DENOTES TYPE.
NDE IPLEX	ш	SURFACE MOUNTED STRIP FLUORESCENT LIGHTING FIXTURE.
PLEX	B-1-2	LIGHTING CIRCUITING NOTE. B-PANELBOARD I.E 1-BRANCH CIRCUIT, 2-LOCAL (SWITCH) CIRCUIT
INTING	I U	SWITCH. SINGLE-POLE, SINGLE-THROW
	RC	ROOM CONTROLLER FOR LIGHTING CONTROLS
NDE MS	•	CEILING MOUNTED OCCUPANCY SENSOR
	•	WALL MOUNTED OCCUPANCY SENSOR
NDE MS ENSOR	₩ <mark>.</mark> B-1-2	TYPICAL SWITCH NOTES. CIRCUITING: B-PANELBOARD I.D., 1-BRANCH CIRCUIT,2-LOC (SWITCH) CIRCUIT. XX-SUBSCRIPT(S): D-DIMMIN P-PILOT LIGHT, 3-THREE WAY, 4-FOUR WAY,
NDE MS		OS-OCCUPANCY SENSOR, VS-VACANCY SENSOR
	FIDE AL	A DM

S} _p	PHOTOELECTRIC TYPE SMOKE DETECTOR
S) _R	PHOTOELECTRIC TYPE SMOKE DETECTOR WITH A RELAY BASE.
(S)	PHOTOELECTRIC TYPE SMOKE ALARM, 120VAC WITH BATTERY BACKUP, INTERCONNECTED AS SHOWN
S _{ID}	PHOTOELECTRIC TYPE DUCT SMOKE DETECTOR
\bigcirc_{R}	RATE OF RISE AND 57°C FIXED TEMPERATURE HEAT DETECTOR
⊕ _F	92°C FIXED TEMPERATURE HEAT DETECTOR
F	MANUAL PULL STATION
ESV	ELECTRIC SUPERVISED VALVE
FS	FLOW SWITCH
PS	PRESSURE SWITCH
F _{ss}	FIRE ALARM SIGNALLING APPLIANCE - BELL
Ĕ,	FIRE ALARM SIGNALLING APPLIANCE - HORN
丞	FIRE ALARM SIGNALLING APPLIANCE - STROBE
∑	FIRE ALARM SIGNALLING APPLIANCE — COMBINATION HORN AND STROBE WALL/COLUMN MOUNT
∇ ⊠ _c	FIRE ALARM SIGNALLING APPLIANCE — COMBINATION HORN AND STROBE CEILING MOUNT
	FIRE ALARM DOOR RELEASE DEVICE
S	FIRE ALARM SPEAKER - WALL/COLUMN MOUNT
Šc	FIRE ALARM SPEAKER — CEILING MOUNT
E	FIRE FIGHTERS HANDSET
FAA	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
Δ_{co}	FIRE ALARM — CARBON MONOXIDE DETECTOR
△ _{CO₂}	FIRE ALARM — CARBON DIOXIDE DETECTOR

THIS LEGEND REPRESENTS THE SYMBOLS COMMONLY USED.

SHOULD A SYMBOL BE FOUND ON THE DRAWING AND NOT

NOT ALL SYMBOLS MAY APPEAR ON THE DRAWINGS.

AN ADDENDUM PRIOR TO SUBMITTING A BID.

ABBREVIATIONS

APPEARING ON THE LEGEND, THE CONTRACTOR SHALL

SUBMIT A QUESTION TO HAVE THE SYMBOL CLARIFIED IN

ADDINE VI	71110110
20A	DENOTES 5-20R DEVICE
AC	ABOVE COUNTER
ADO	AUTOMATIC DOOR OPENER
AE	APPROVED EQUAL
AFF	ABOVE FINISHED FLOOR
AN	FIRE ALARM ANNUNCIATOR
BED	RECEPTACLE DEDICATED FOR PATIENT BED
ВН	BASEBOARD HEATER
СВ	CIRCUIT BREAKER
ER	EXISTING TO BE RELOCATED
EX	EXISTING TO REMAIN
FH	FORCED-AIR HEATER
GFI	EQUIPMENT SO NOTED TO BE SUPPLIED WITH A GROUND FAULT CIRCUIT INTERRUPTER
HSKP	HOUSEKEEPING
JB	JUNCTION BOX
PD	POWER DOOR
R	RELAY WITH AUXILIARY CONTACTS
REL	RELOCATED ITEM IN NEW LOCATION
REM	EXISTING TO BE REMOVED IN IT'S ENTIRETY
Т	TRANSFORMER
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
W	WALL MOUNT - VERIFY HEIGHT
WP	EQUIPMENT SO NOTED TO BE SUPPLIED WITH THI MANUFACTURER'S WEATHER-PROOFING OPTION(S)

DEMOLITION NOTES THE CONTRACTOR SHALL ARRANGE TO TOUR THE FACILITY WITH MAINTENANCE STAFF PRIOR TO SUBMITTING A BID ON THE PROJECT. DURING THE CONTRACTORS SITE TOUR THEY SHALL

CONSTRUCTION AND THE LOCATIONS OF THE EXISTING

COMMUNICATION CLOSETS, LOCAL POWER PANELS, FIRE

ALARM AND OTHER SYSTEMS BEING WORKED ON AS PART OF THIS CONTRACT. THE CONTRACTOR AND MAINTENANCE STAFF SHALL OPEN EXISTING PANELS AND SYSTEMS TO BECOME FAMILIAR WITH THE EXISTING SYSTEMS AND TO DETERMINE THE FULL SCOPE OF WORK REQUIRED TO CARRY OUT THE PROJECT. THE CONTRACTOR SHALL PROVIDE NEW BREAKERS, DATA/VOICE COMPONENTS. FIRE ALARM DEVICES, LIGHTING SYSTEM COMPONENTS, ETC TO FACILITATE A COMPLETE AND FUNCTIONING

BECOME FAMILIAR WITH THE EXISTING BUILDING

- SYSTEM AT PROJECT COMPLETION. THE CONTRACTOR SHALL MEASURE OFF ANY DISTANCES NOT INDICATED FOR HOME RUNNING NEW SERVICES (POWER. FIRE ALARM, SECURITY ETC) AND INCLUDE MATERIALS AND LABOUR REQUIRED IN THEIR
- COORDINATE ALL DEMOLITION WITH GENERAL CONTRACTOR. EVERY EFFORT HAS BEEN MADE TO OUTLINE THE DEMOLITION SCOPE OF WORK, HOWEVER THE DEMOLITION DRAWINGS REPRESENT ONLY THE GENERAL LOCATION AND NUMBER OF FITTINGS. FIXTURES, DEVICES, EQUIPMENT ETC. TO ASSIST IN EVALUATING THE DEMOLITION SCOPE OF WORK. DRAWINGS ARE BASED ON PREVIOUS AS-BUILTS OR FIELD EVALUATIONS.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE SITE DURING THE TENDER PERIOD TO DETERMINE THE EXACT SCOPE OF DEMOLITION WORK, QUANTITIES AND THOROUGHLY UNDERSTAND THE SITE CONDITIONS FOR CARRYING OUT THE SAME. REQUESTS FOR EXTRAS DUE TO FAILURE TO PROPERLY EVALUATE THE CONDITIONS THAT AFFECT DEMOLITION SCOPE OF WORK WILL NOT BE CONSIDERED.

- SHOULD THE CONTRACTOR ENCOUNTER ANY ASBESTOS DURING THE WORK, THEY SHALL STOP WORK AND NOTIFY THE OWNER IMMEDIATELY.
- THE CONTRACTOR SHALL PATCH, REPAIR AND RESTORE FIRE-SEPARATIONS AS REQUIRED FOR INSTALLATION OF ELECTRICAL RACEWAYS AND OUTLETS IN WALLS AND EXTERIOR WALLS.
- THE CONTRACTOR SHALL SUBMIT QUESTIONS IN WRITING 5 DAYS PRIOR TO TENDER CLOSING TO ALLOW FOR QUESTIONS TO BE FORMALLY ANSWERED IN AN
- UNLESS EXISTING CIRCUITS NUMBERS ARE INDICATED ON THE DEMOLITION PLANS, ALL CIRCUITS SHOWN ON THE NEW LAYOUTS ARE NEW CIRCUITS. EXCEPTIONS TO THIS INCLUDE CIRCUITS SHOWN ON THE DEMOLITION PLAN AND AGAIN ON THE NEW LAYOUT. THE CIRCUIT SHOWN BOTH TIMES IS EXISTING AND LOCALIZED IN THE AREA OF WORK. THE CONTRACTOR SHALL PROVIDE THE FOLLOWING FOR ALL NEW CIRCUITS: NEW CONDUIT, WIRING, BREAKERS, SUPPORTS, BACKBOXES, FACEPLATES, RECEPTACLES, ETC FOR A COMPLETE
- 10. EXISTING CIRCUITS BEING REUSED WILL BE INDICATED BY A CIRCUIT NUMBER (IE 2A15) OR A GENERIC NUMBER (IE CCT7). CCT 7 INDICATES THAT THE LIGHTING OR DEVICE IS TO BE CONNECTED TO 1 OF 7 EXISTING CIRCUITS IN THE AREA THAT HAS BECOME FREE AFTER DEMOLITION. THE CONTRACTOR SHALL BALANCE LOADS AND SHUFFLE BREAKERS AFTER THE PANEL LOADS HAVE BEEN CONNECTED TO EQUALLY LOAD EACH PHASE.
- WHERE EXISTING LIGHTING CIRCUITS HAVE BEEN REUSED, CONTRACTOR SHALL VERIFY EXISTING VOLTAGE OF CIRCUITS PRIOR TO SUBMITTING ANY SHOP DRAWINGS OR ORDERING OF FIXTURES, SENSORS, CONTROLS, ETC. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES IN FIXTURE VOLTAGE AND EXISTING CIRCUIT VOLTAGE.

FIRE ALARM

- . ALL NEW FIRE ALARM DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH CAN/ULC S524.
- FIRE ALARM DEVICES SHALL BE REVERIFIED IN ACCORDANCE WITH CAN/ULC S537.
- FIRE ALARM GRAPHIC SHALL BE UPDATED IN ALL LOCATIONS TO REFLECT THE UPDATED LAYOUT OF THE FIRE ALARM SYSTEM.
- CONNECT ALL ASSOCIATED ALARM, SUPERVISORY ZONE WIRING, AND SIGNAL CIRCUIT WIRING ETC TO FIRE
- ALL WIRING TO BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND THE ONTARIO ELECTRICAL SAFETY CODE.

COMMUNICATIONS

- TELEPHONE OUTLET IN CONDUIT C/W DATA CABLING (SEE SPECS) AND RJ11 OUTLET COMPUTER OUTLET IN CONDUIT C/W DATA CABLING (SEE SPECS) AND RJ45 OUTLET COMBINATION TELEPHONE AND COMPUTER OUTLE IN CONDUIT C/W 2x DATA CABLING
- (SEE SPECS). 1x RJ45 AND 1x RJ11 OUTLETS WIRELESS ACCESS POINT | BACKBOX, FACEPLATE, CONDUIT C/W DATA CABLING (SEE SPECS) AND RJ45 OUTLET
- COMMUNICATION DEVICES MOUNTED IN 2 CHANNEL RACEWAY

DC-X

COMMUNICATION NOTES: NUMBER BESIDE THE OUTLET DENOTES NUMBER OF OUTLETS

	LOVELLOUTING AND EVIT CLONG
EMERGEN	NCY LIGHTING AND EXIT SIGNS
φ Q ρ	SURFACE MOUNTED EMERGENCY LIGHTING FIXTURE
0	RECESSED EMERGENCY LIGHTING FIXTURE
X	EXIT/'RUNNING MAN' PICTOGRAM SIGN
∃⊨	BATTERY
	EMERGENCY LIGHTING FIXTURE AND BATTERY
200	EMERGENCY LIGHTING FIXTURE, BATTERY, AND EXIT SIGN

DC - DENOTES A SOURCE OF DC POWER

DC POWER CIRCUITING NOTE. X - DC POWER

SOURCE IDENTIFICATION, 2 - BRANCH CIRCUIT

X - DC POWER SOURCE IDENTIFICATION

GENERAL NOTES

- THE ELECTRICAL DRAWINGS REPRESENT A PORTION OF THE CONTRACT. THE CONTRACTOR IS TO FAMILIARIZE THEMSELVES WITH ALL OF THE DRAWINGS IN THE PACKAGE AS SOME WORK MAY BE SHOWN ON OTHER DRAWINGS IN THE PACKAGE. CONTRACTOR IS TO DETERMINE FULL EXTENT OF PROJECT PRIOR TO SUBMITTING BID.
- THE DRAWINGS ARE NOT TO BE SCALED FOR INSTALLATION PURPOSES. ALL MEASUREMENTS ARE TO BE OBTAINED FROM ARCHITECTURAL PLANS, ELEVATIONS, SHOP DRAWINGS OR BE OBTAINED FROM FIELD MEASUREMENTS.
- CONTRACTOR IS TO REVIEW ARCHITECTURAL DRAWINGS AND PROVIDE ALL NECESSARY PARTS AND ACCESSORIES AND FIRESTOPPING AS REQUIRED TO CONFORM WITH ARCHITECTURAL FIRE RATINGS.
- CONTRACTOR IS TO REMOVE ALL EXISTING DEAD AND ABANDONED CONDUIT AND WIRING BACK TO SOURCE WHERE NOT POSSIBLE TO REMOVE EXISTING CONDUIT CONDUIT IS TO BE LEFT BEHIND AND EXISTING WIRE IS TO BE REMOVED AND REPLACED WITH A PULL ROPE.
- CONTRACTOR IS TO PROVIDE ELECTRONIC CAD 'AS-BUILT' DRAWINGS IN DWG AND PDF FORMAT AT THE COMPLETION OF THE PROJECT. CAD FILES ARE TO BE AUTOCAD 2010.
- UNLESS NOTED OTHERWISE ALL WIRING SHALL BE IN CONDUIT AND CONCEALED IN WALLS AND CEILING SPACES. BX IS PERMITTED IN SPECIAL CIRCUMSTANCES AND SHORT DROPS FROM JUNCTION BOXES TO LIGHT FIXTURES, REFER TO SPECIFICATIONS. CONDUIT RUNS ARE TO BE PARALLEL TO WALL STUDS AND DROP FROM JUNCTION BOXES MOUNTED IN THE CEILING SPACE. HORIZONTAL RUNS IN WALLS WILL ONLY BE ACCEPTED UNDER SPECIAL CIRCUMSTANCES (IE OFFSET TO AVOID STRUCTURAL ABOVE) WITH WRITTEN APPROVAL FROM THE OWNER/CONSULTANT.
- UNLESS SPECIFICALLY NOTED AS "CABLING BY OTHERS", THE CONTRACTOR SHALL INCLUDE FOR ALL CABLING TO DEVICES, OUTLETS, ETC AS SHOWN FOR A COMPLETE AND FUNCTIONING SYSTEM(S).
- CONTRACTOR IS TO MAINTAIN POWER AND COMMUNICATION CIRCUITS IN AREAS OUTSIDE OF THE CONSTRUCTION AREA. PROVIDE TEMPORARY CONNECTIONS AS REQUIRED, COORDINATE WITH OWNER.
- EQUIPMENT BEING REMOVED AND NOT BEING REUSED REMAIN THE PROPERTY OF THE OWNER AND IS TO BE STORED ON SITE. ANY EQUIPMENT THE OWNER DEEMS NO INTEREST IN IS TO BE DISPOSED OF IN A LAWFUL AND SAFE MANNER BY THIS TRADE
- 10. CONTRACTOR IS TO REFER TO ARCHITECTURAL PLANS AND CEILING LAYOUTS TO VERIFY THAT NO INTERFERENCES EXIST PRIOR TO THE INSTALLATION OF FIXTURES AND DEVICES IN WALLS AND CEILINGS.
- . COORDINATE PENETRATION LOCATIONS WITH GENERAL CONTRACTOR FOR SCANNING OF MASONRY WALLS AND CONCRETE FLOORS.

DRAW	ING LIST
E000	GENERAL NOTES, DRAWING LIST, LEGEND AND FIXTURE SCHEDULE
E100	SITE PLAN
E200	DEMOLITION LIGHTING — GROUND FLOOR AND MECHANICAL MEZZANINE
E201	DEMOLITION LIGHTING - SERVICE CENTRE
E202	DEMOLITION LIGHTING — EAST GROUND FLOOR AND MEZZANINE

E300 REVISED LIGHTING - GROUND FLOOR AND MECHANICAL MEZZANINE REVISED LIGHTING - SERVICE CENTRE REVISED LIGHTING — EAST GROUND FLOOR AND

MEZZANINE DEMOLITION POWER & SYSTEMS - GROUND FLOOR AND MECHANICAL MEZZANINE DEMOLITION POWER & SYSTEMS - SERVICE

DEMOLITION POWER & SYSTEMS - EAST GROUND FLOOR AND MEZZANINE DEMOLITION POWER & SYSTEMS - WEST ROOF

DEMOLITION POWER & SYSTEMS - CENTRAL DEMOLITION POWER & SYSTEMS - EAST ROOF

DEMOLITION POWER & SYSTEMS - MUNICIPAL TRUCK WASH AND SMALL ENGINE BUILDING REVISED POWER & SYSTEMS - GROUND FLOOR AND MECHANICAL MEZZANINE REVISED POWER & SYSTEMS - SERVICE CENTRE

REVISED POWER & SYSTEMS - EAST GROUND FLOOR MEZZANINE REVISED POWER & SYSTEMS — WEST ROOF REVISED POWER & SYSTEMS - CENTRAL ROOF

REVISED POWER & SYSTEMS - EAST ROOF REVISED POWER & SYSTEMS - MUNICIPAL TRUCK WASH AND SMALL ENGINE BUILDING DEMOLITION - SINGLE LINE DIAGRAM

NEW - SINGLE LINE DIAGRAM E700 ELECTRICAL DETAILS

PANEL SCHEDULES

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GENERAL NOTES

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_{7,2021} | K.S. ISSUED FOR CONSTRUCTION 2<u>6, 20</u>21 K.S. 2 ISSUED FOR TENDER $\frac{1}{3,20}$ 20 K.S. 1 RE-ISSUED FOR PERMIT 0 ISSUED FOR PERMIT 6, 2020 No. DESCRIPTION DATE BY REVISIONS



PROJECT:

NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARÍO

DRAWN BY: DESIGNED BY: START DATE: JULY 2020 P.S. DRAWING TITLE: GENERAL NOTES,

LEGENDS,

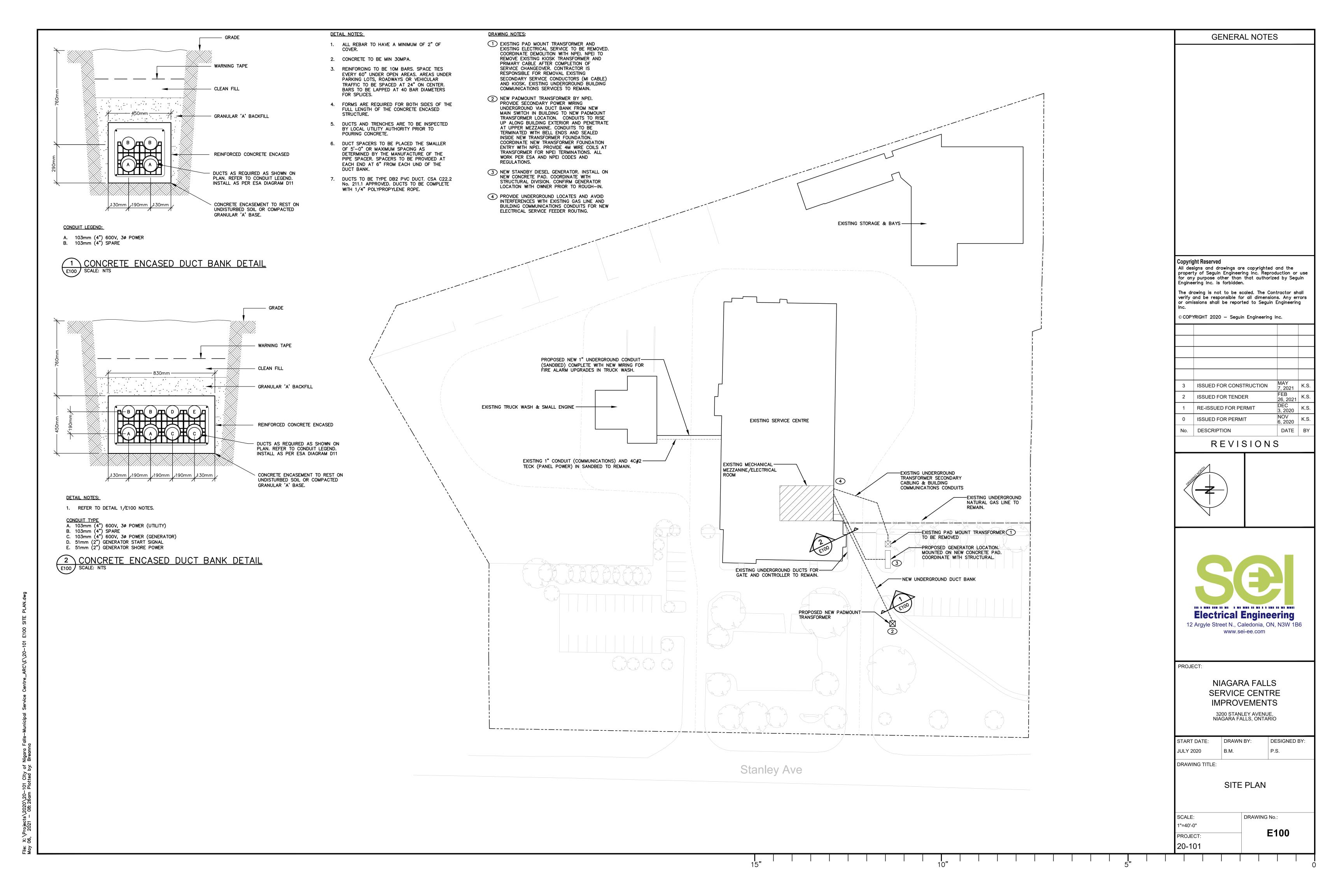
DRAWING LIST, & SCHEDULE SCALE: DRAWING No.:

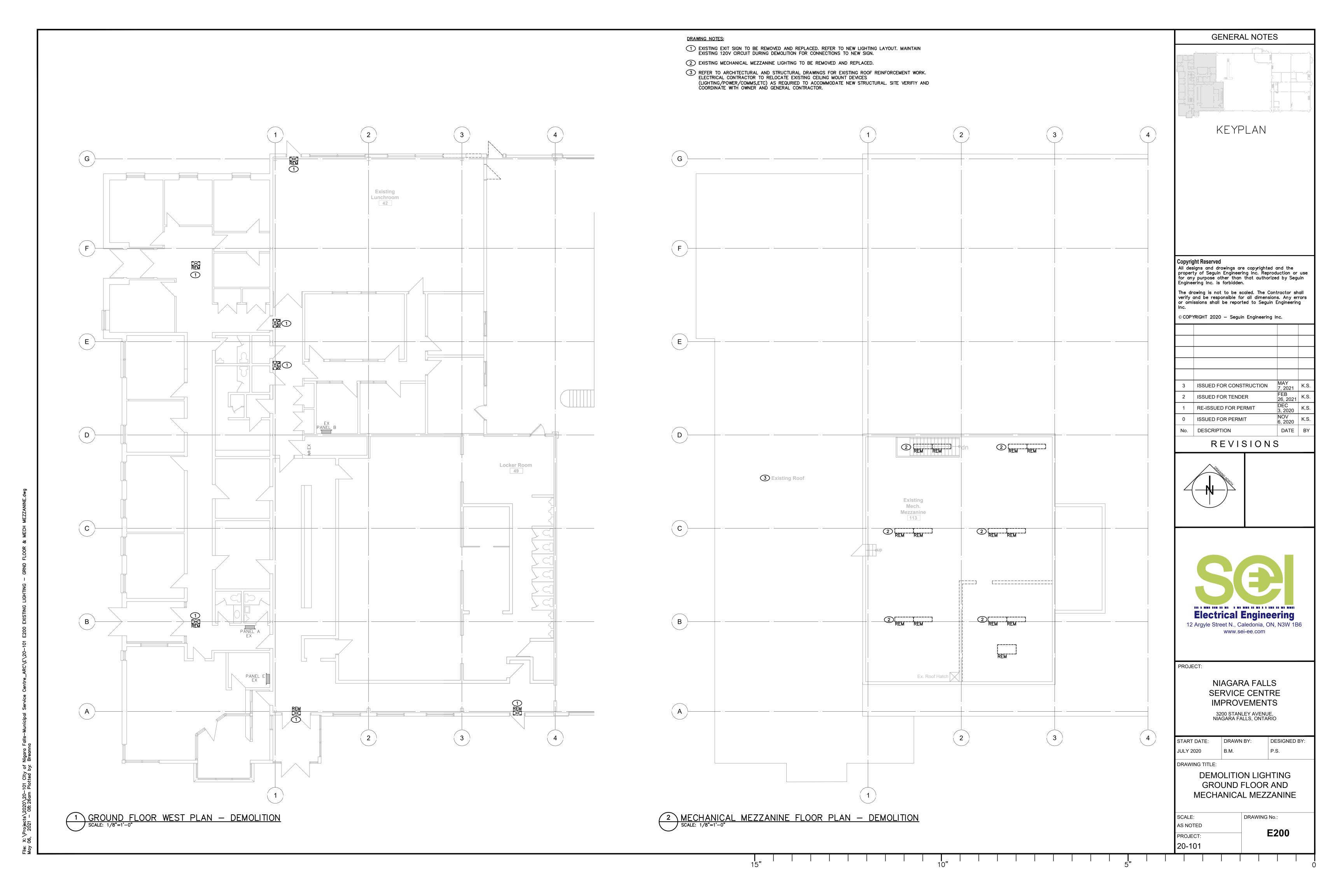
E000 PROJECT: 20-101

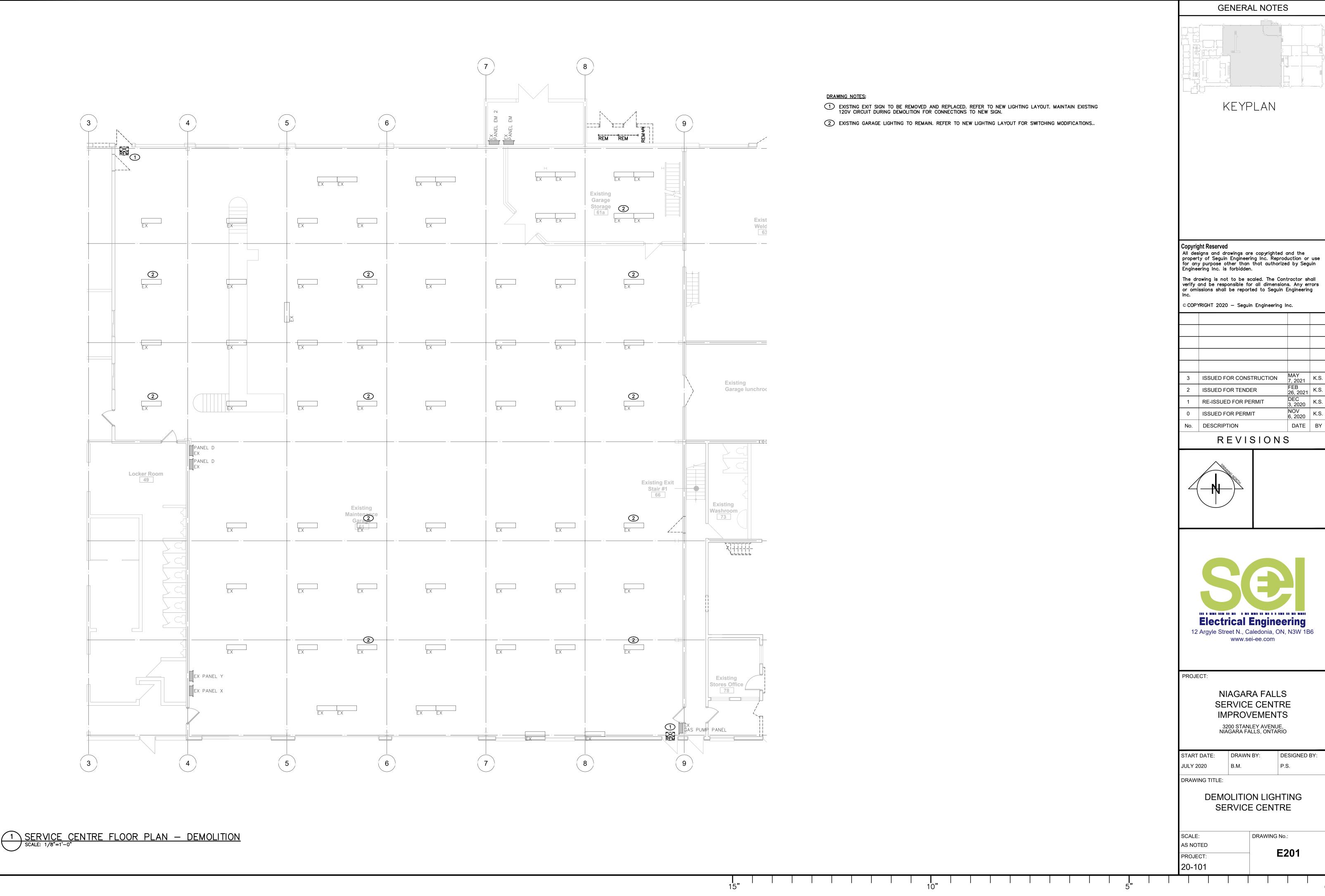
KEYNOTE - SEE KEYNOTE No. 3 ON DRAWINGS

3 KEYNOTE - SEE KEYNOTE No. 3 ON DRAWINGS

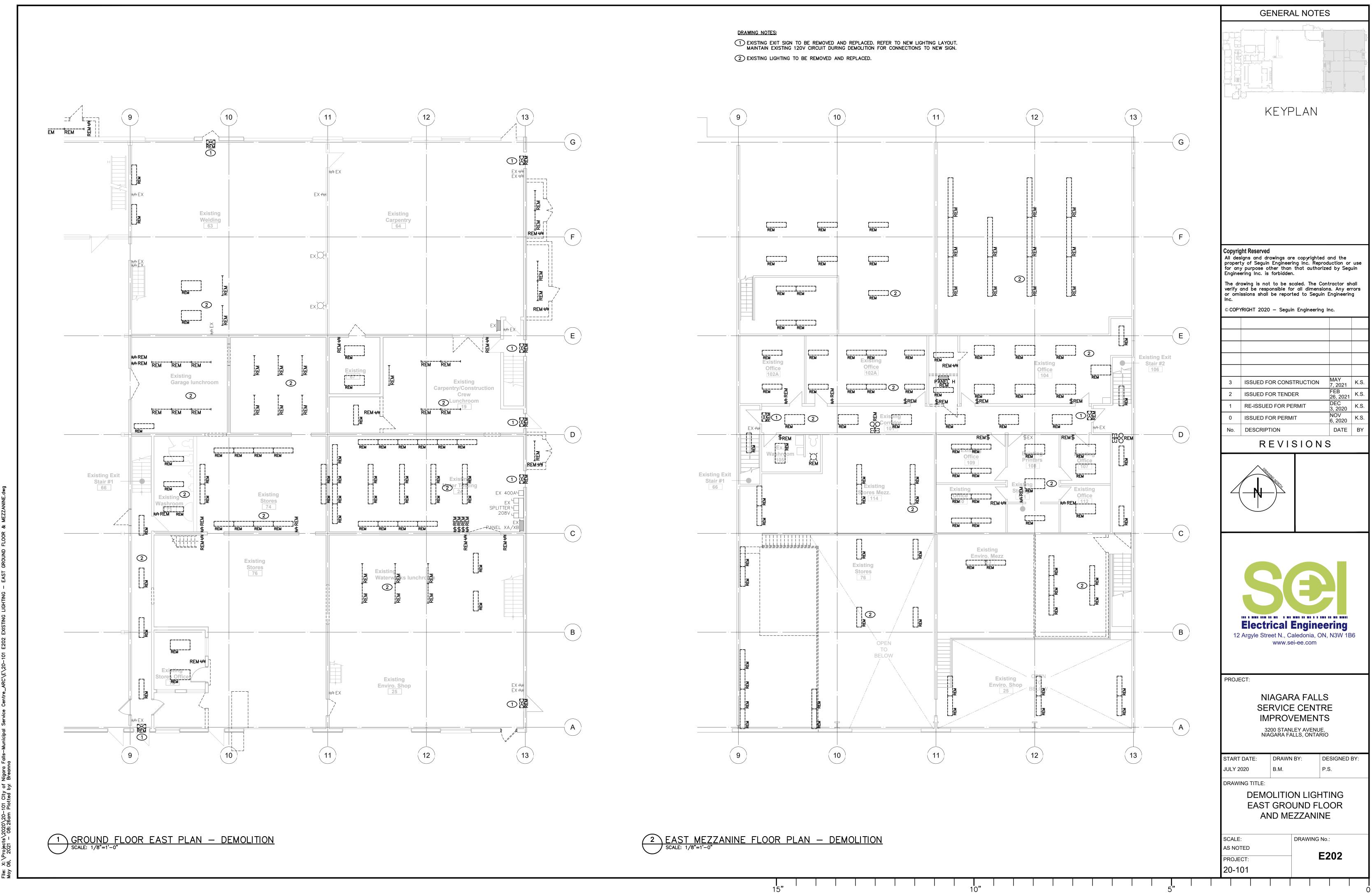
E800

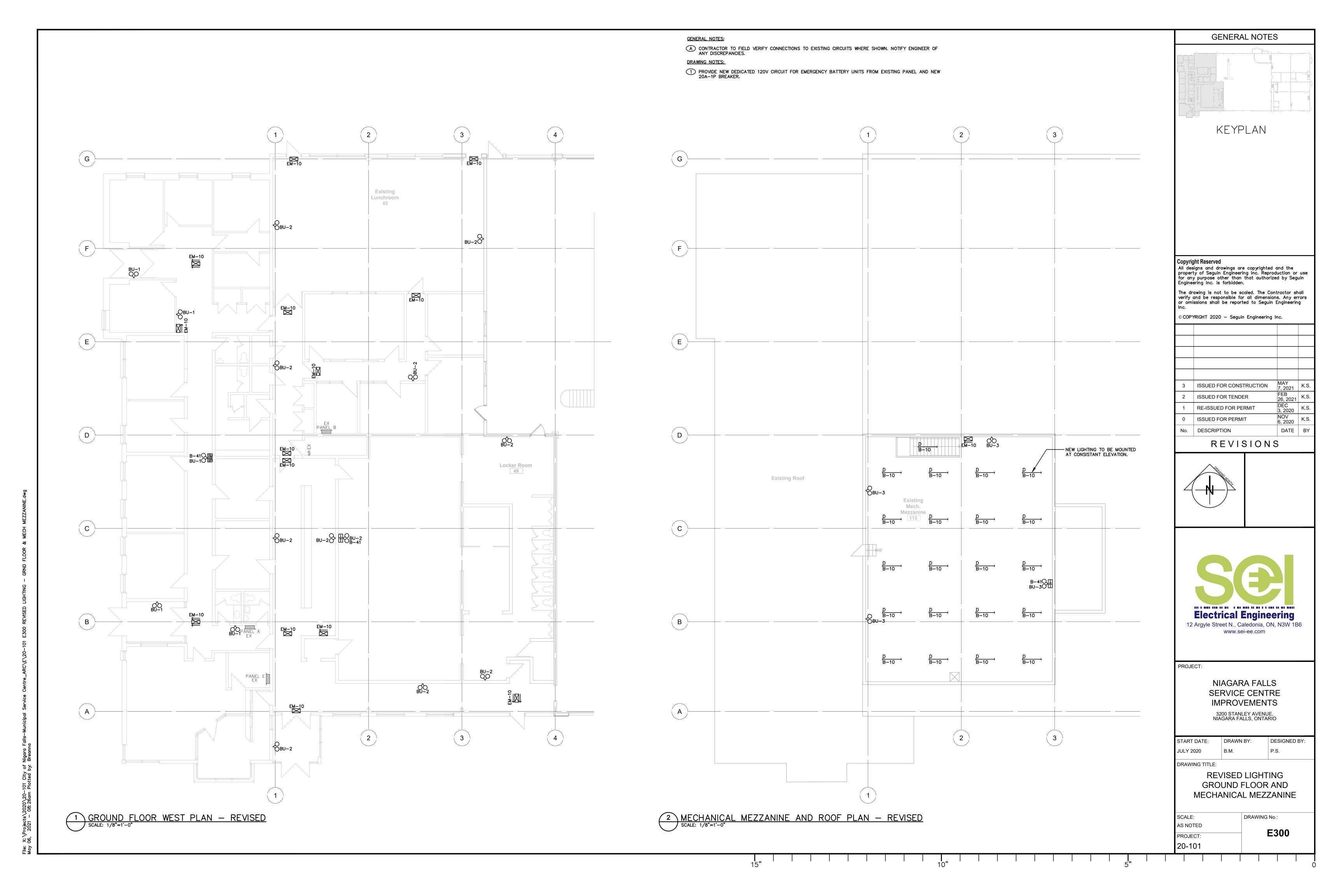


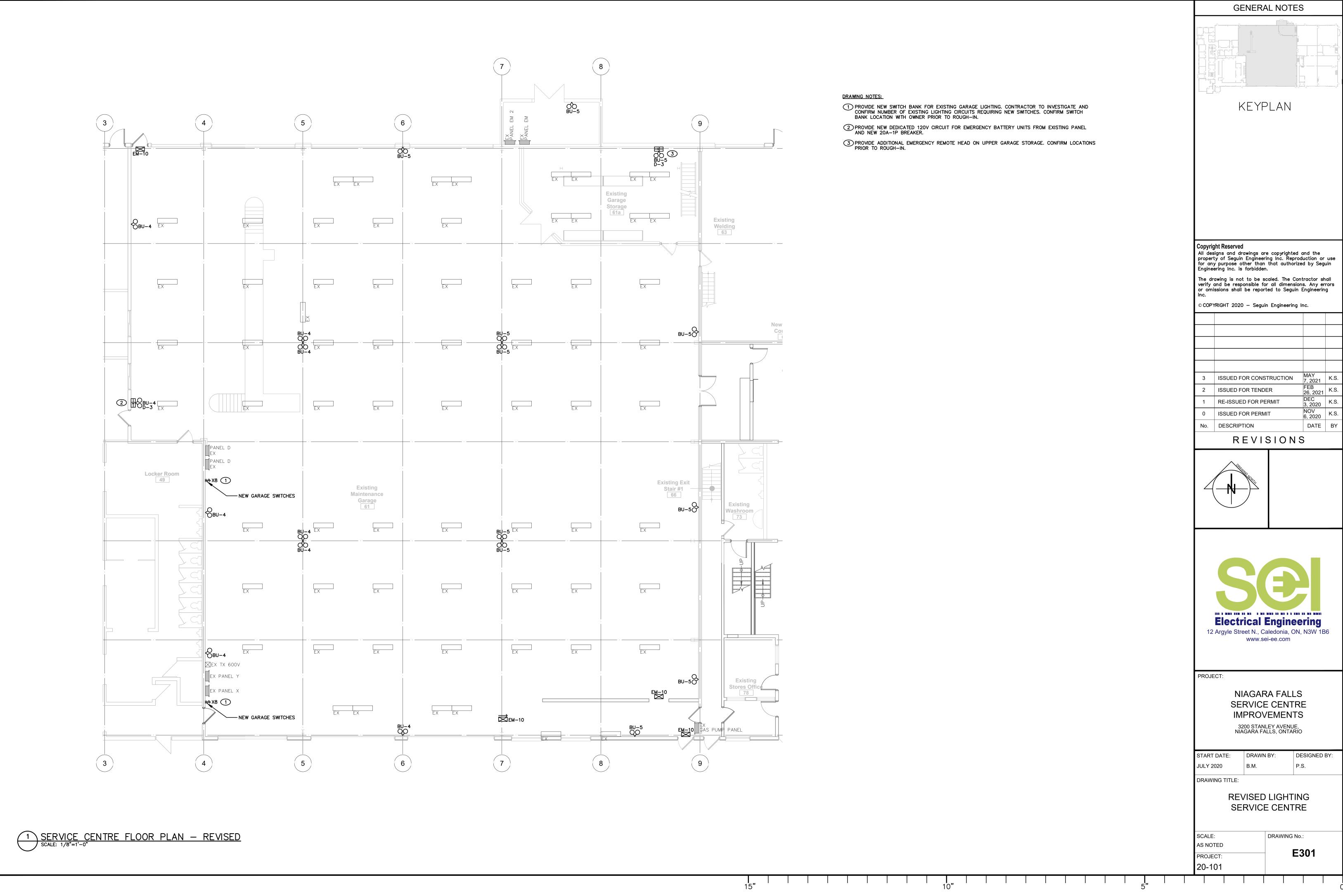


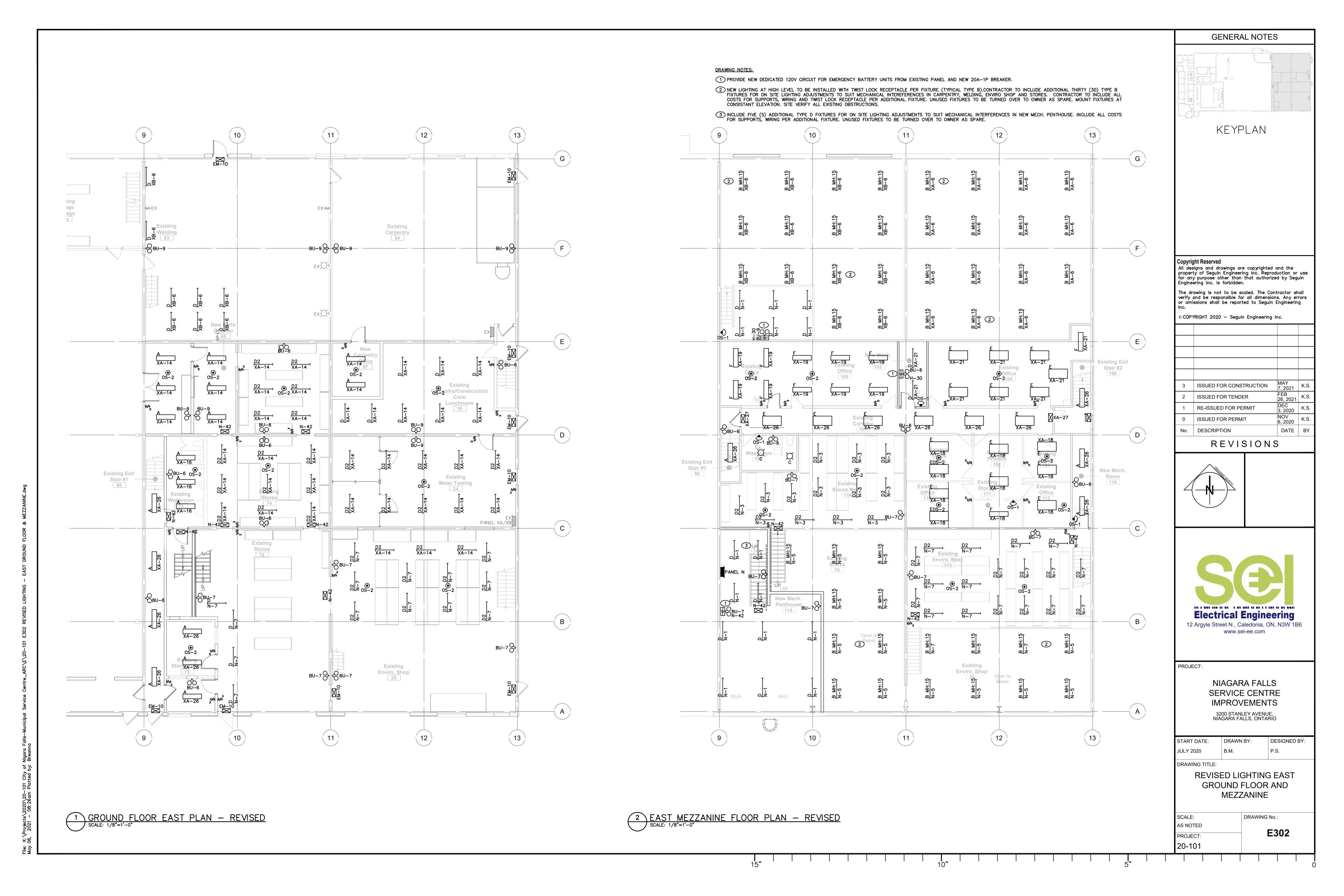


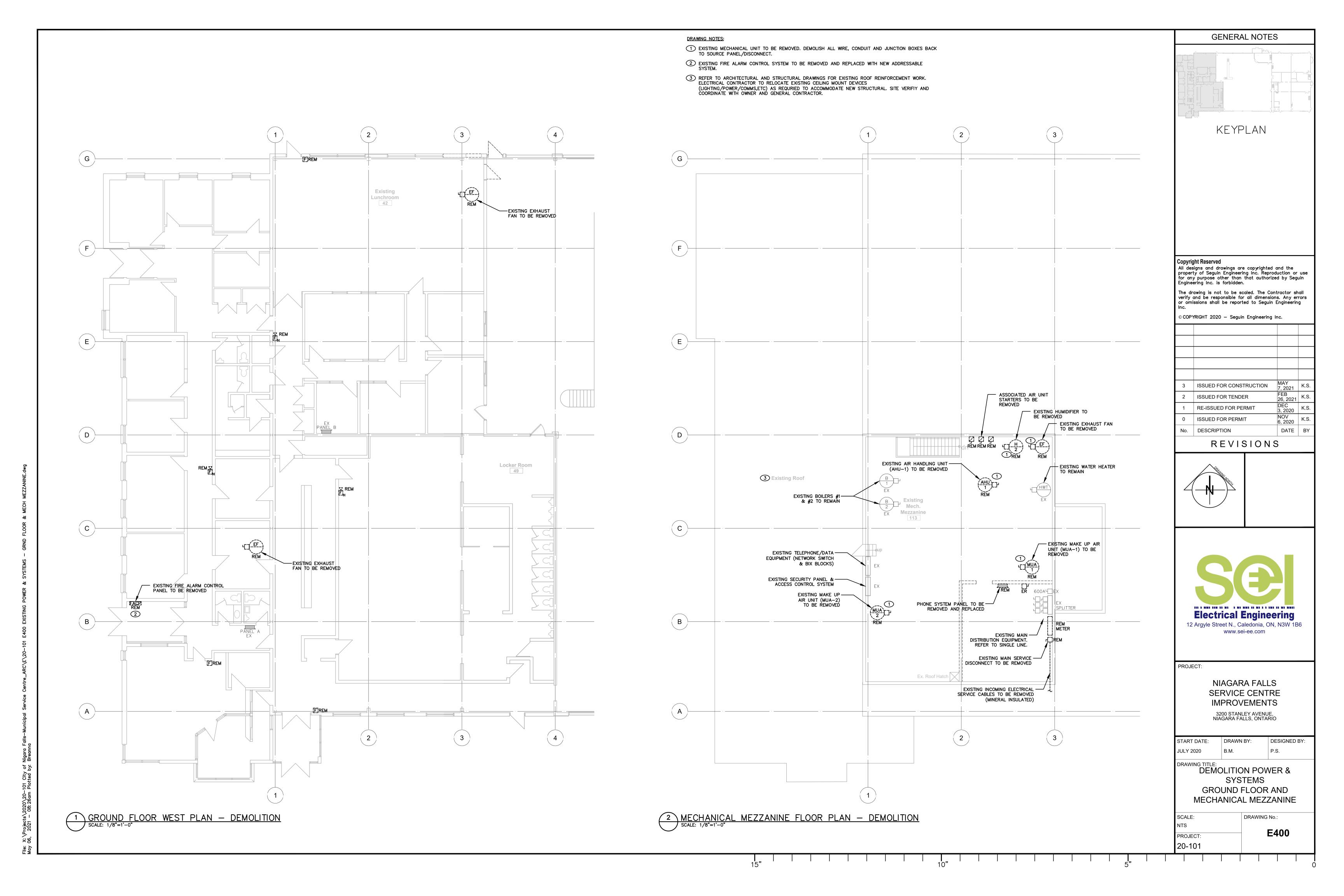
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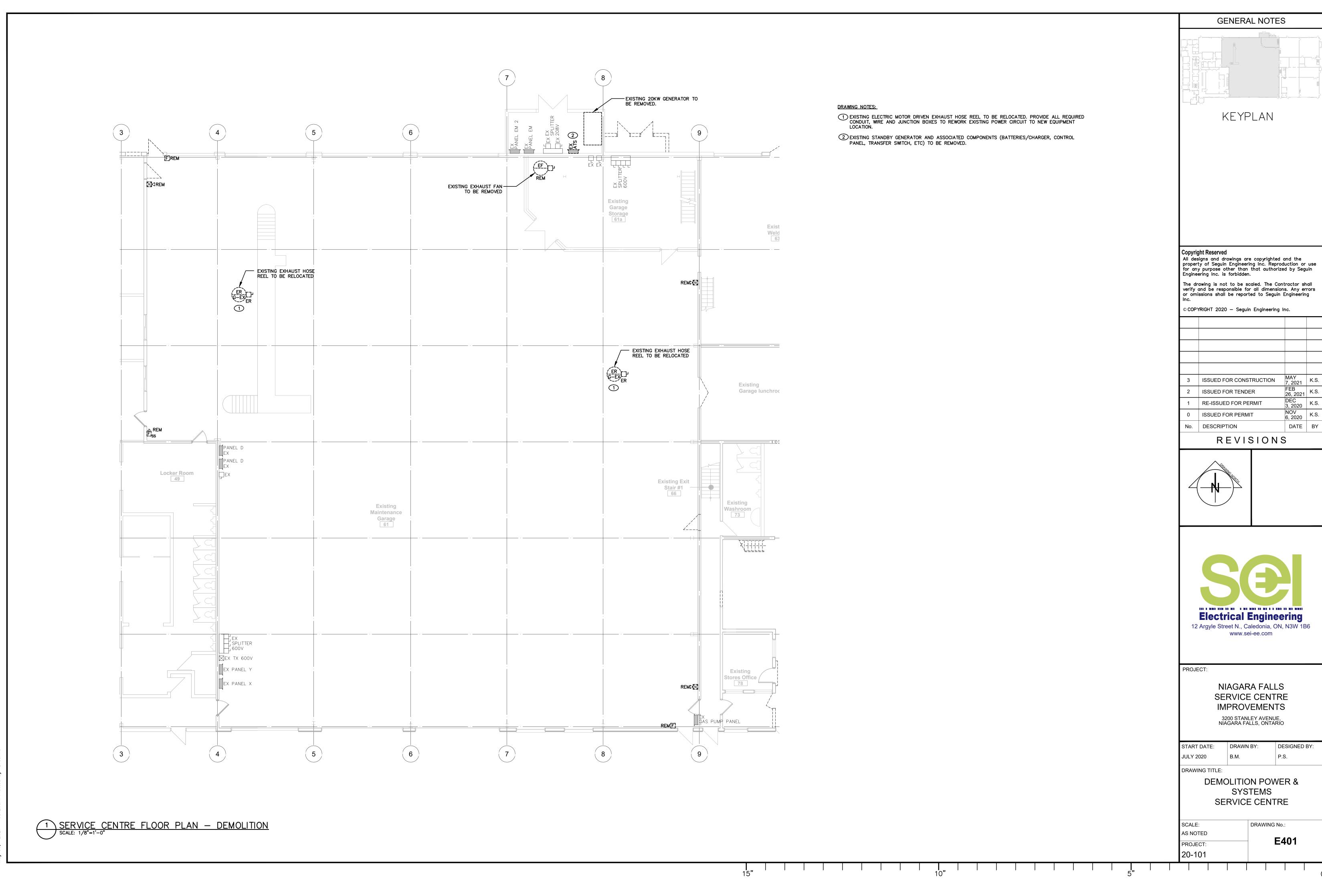




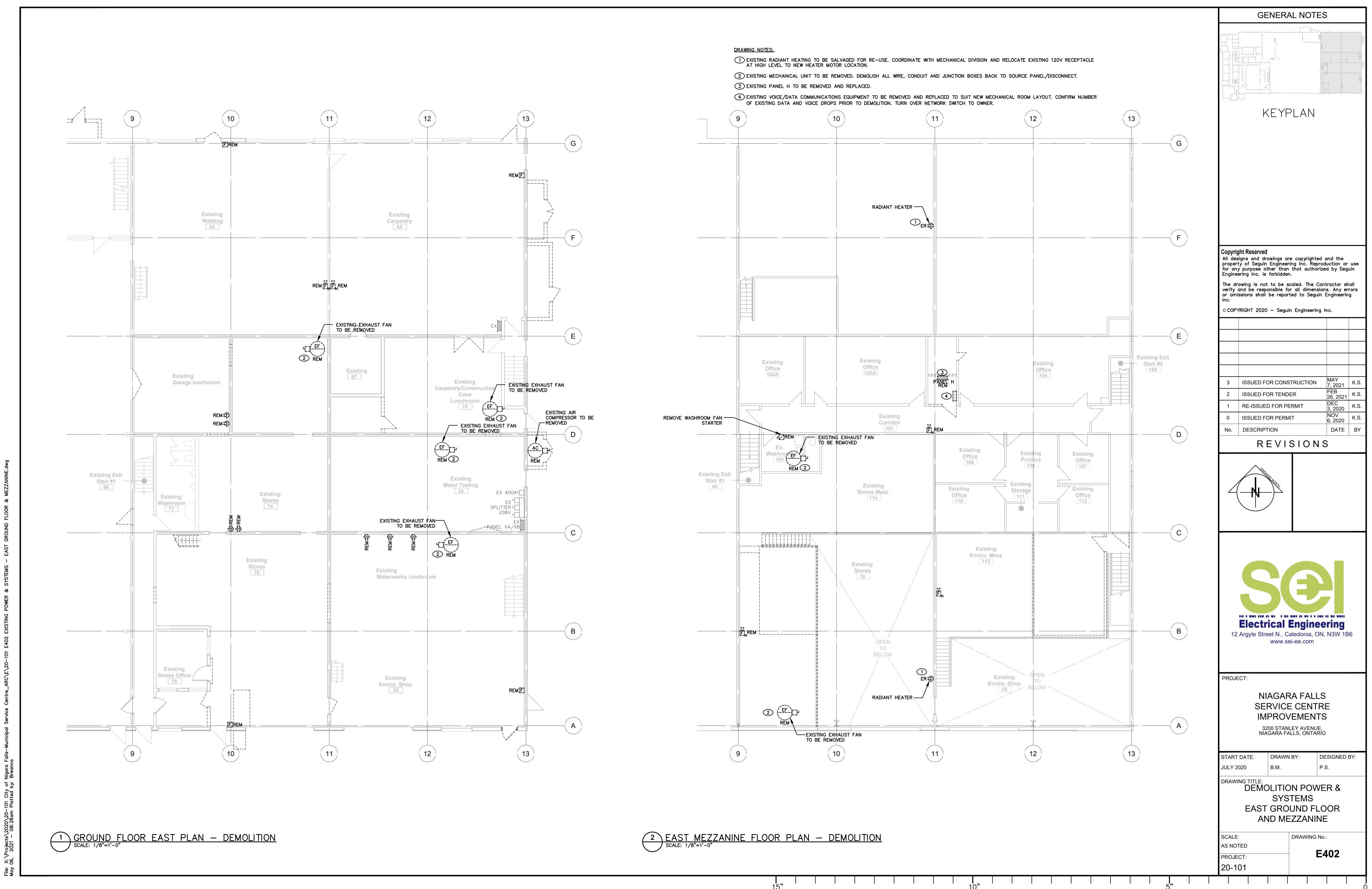


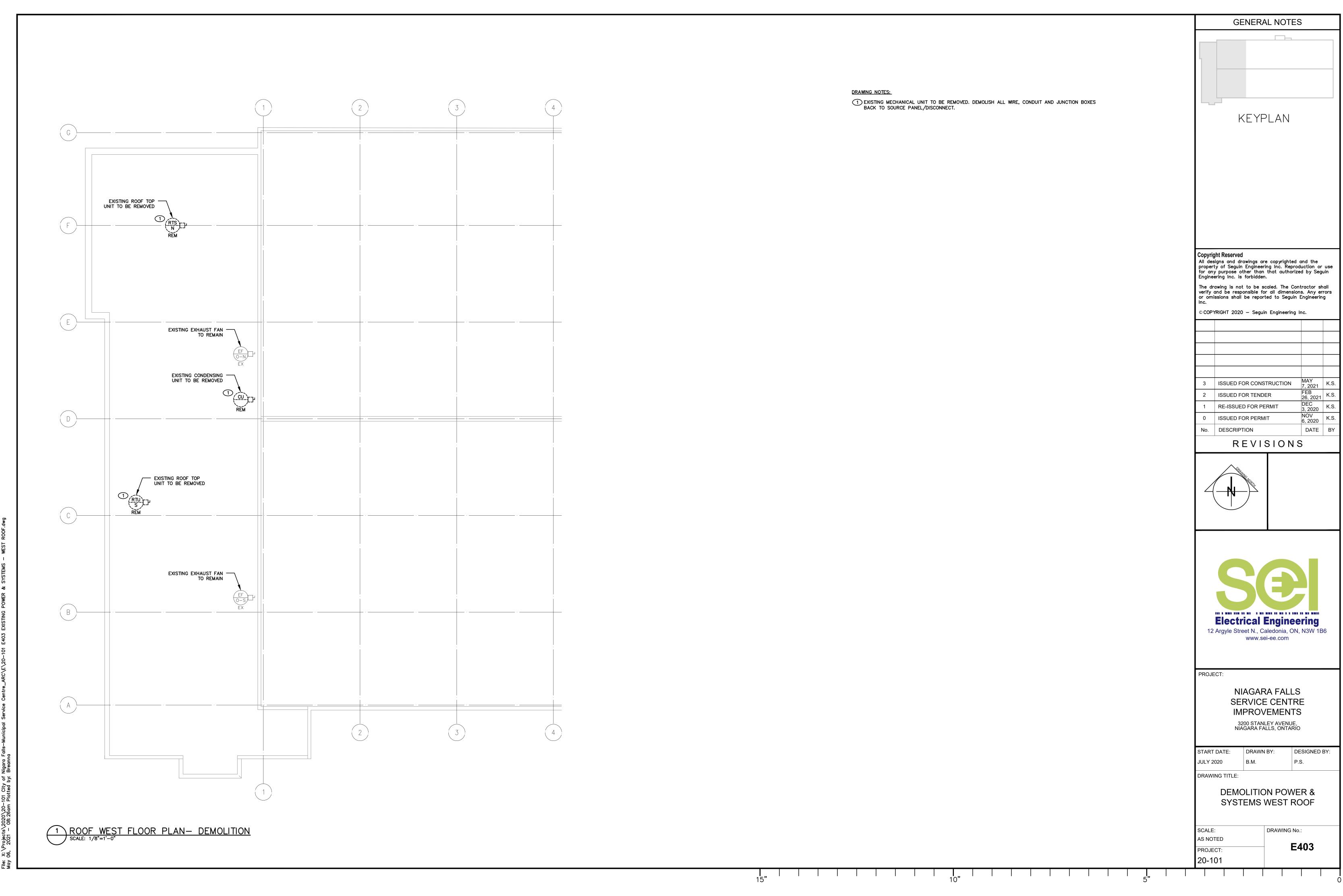


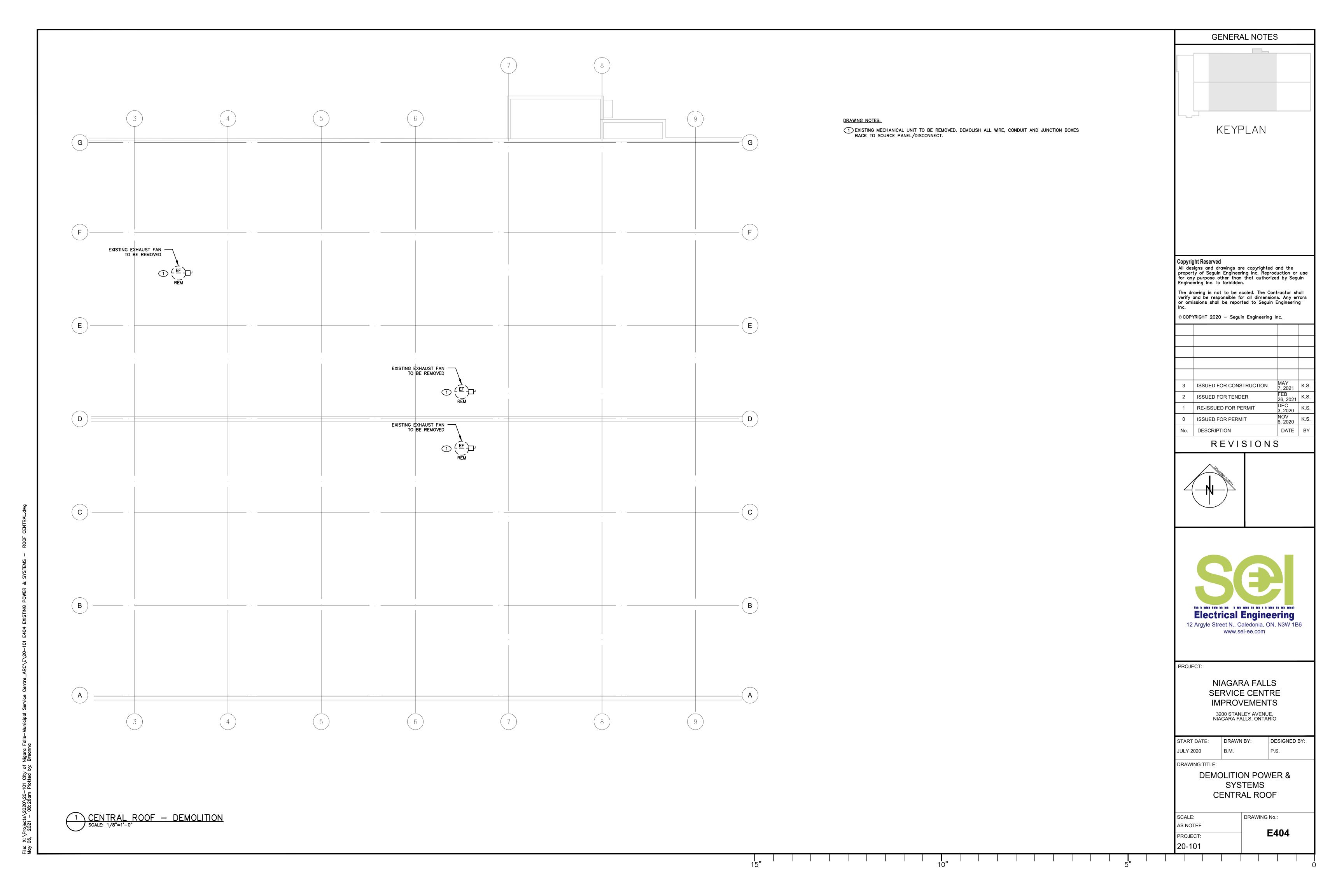


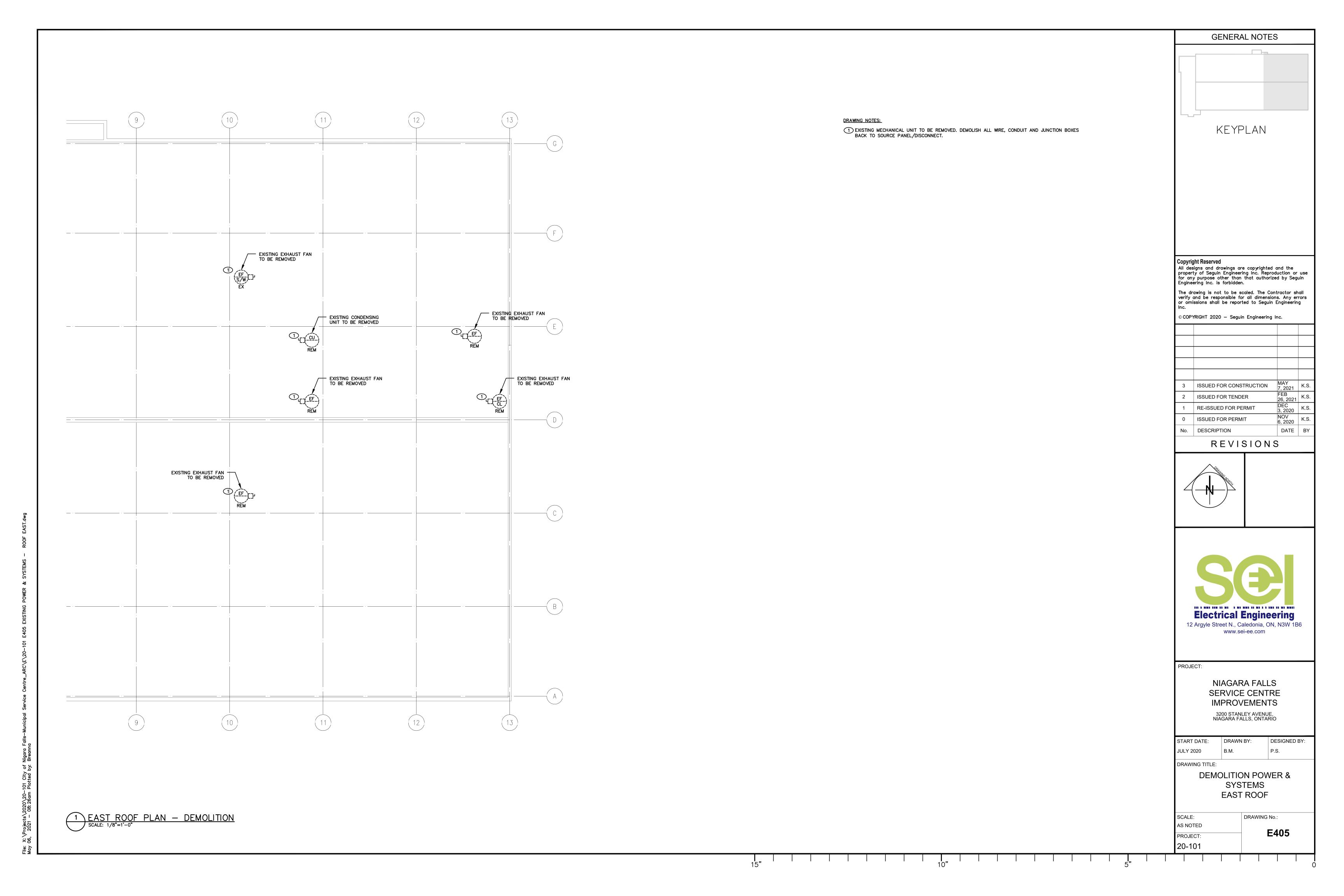


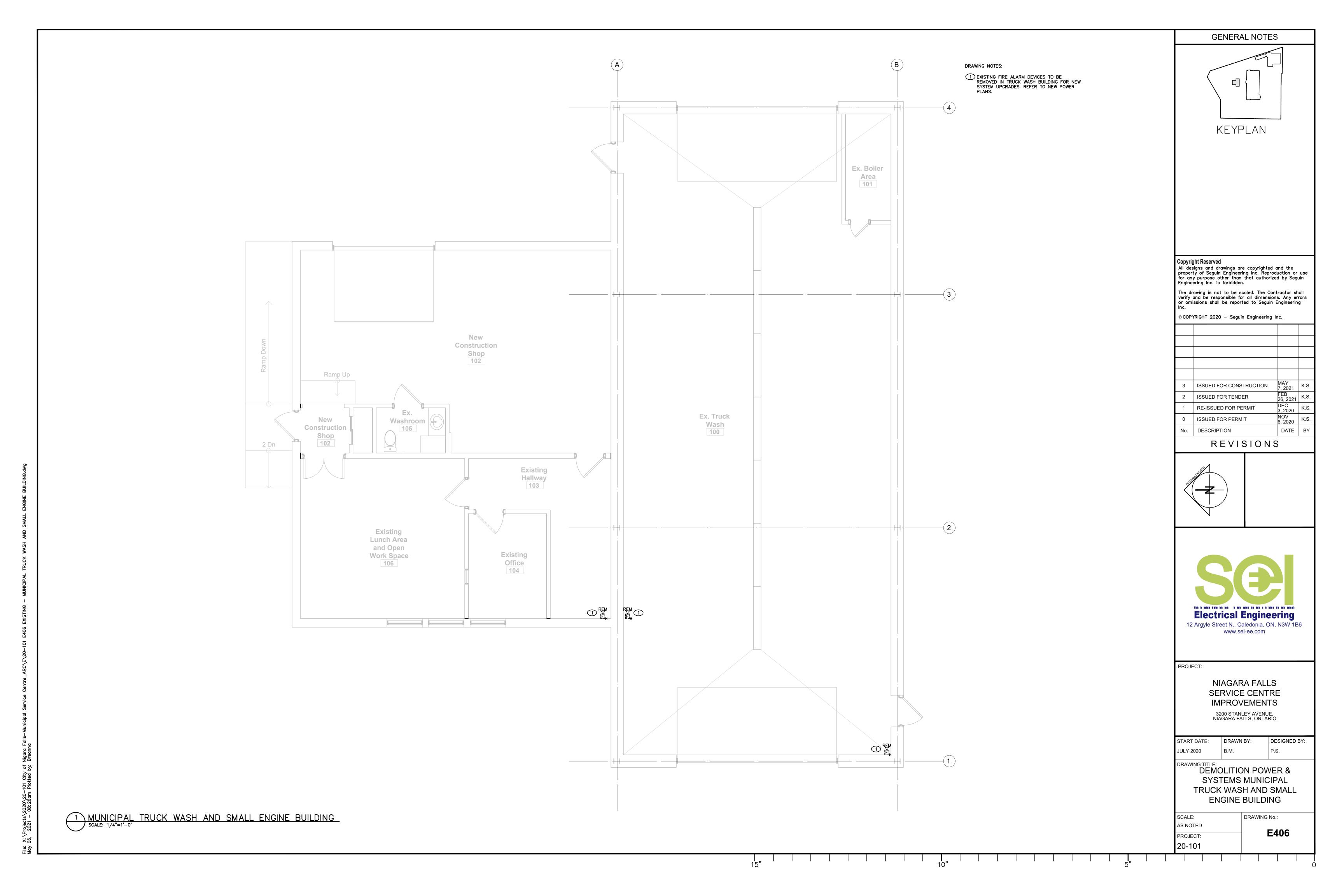
s\2020\20-101 City of Nigara Falls-Municipal Service Centre_ARC\E\20-101 E401 EXISTING POWER & SYSTE - 08:26am Plotted by: Breanna

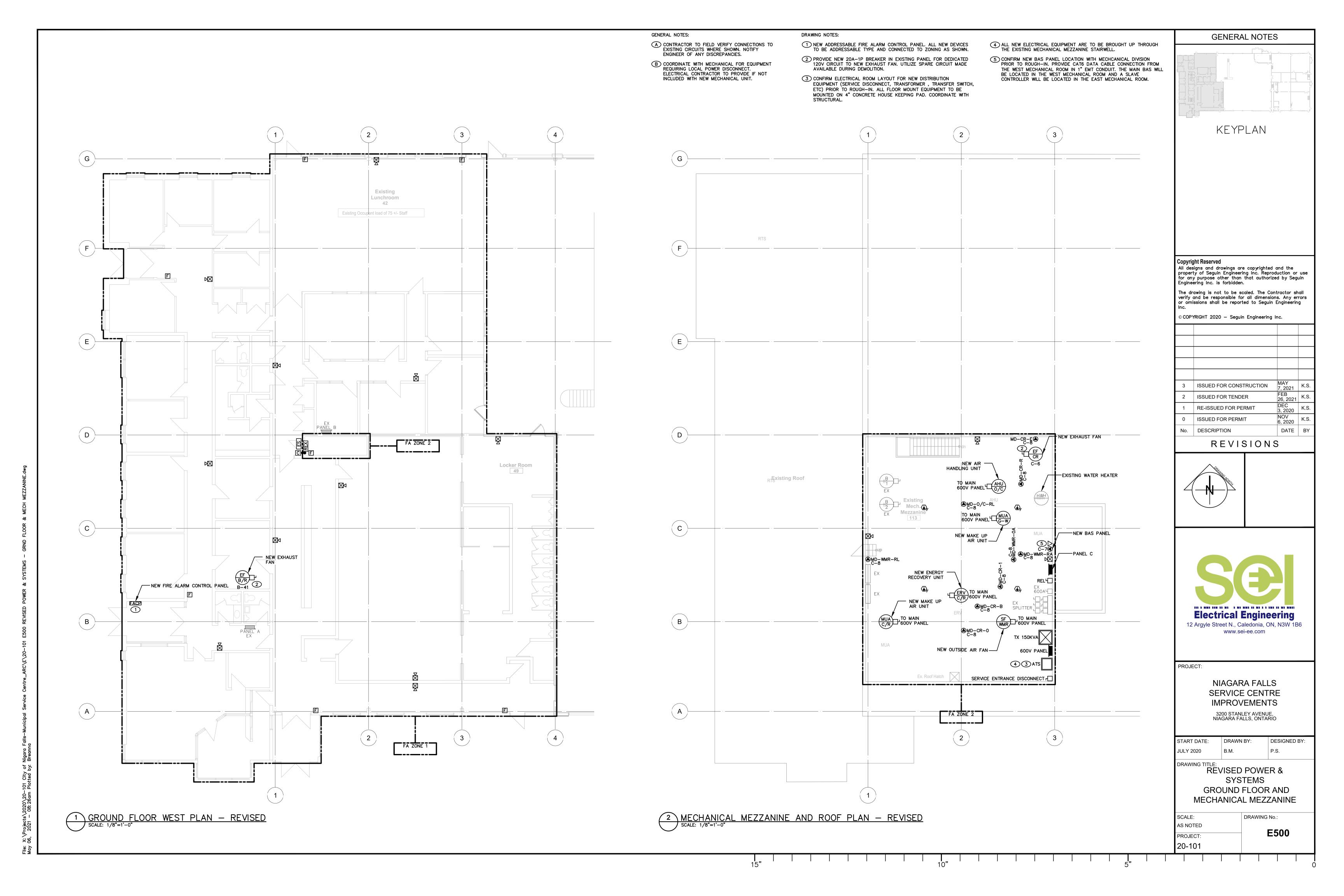


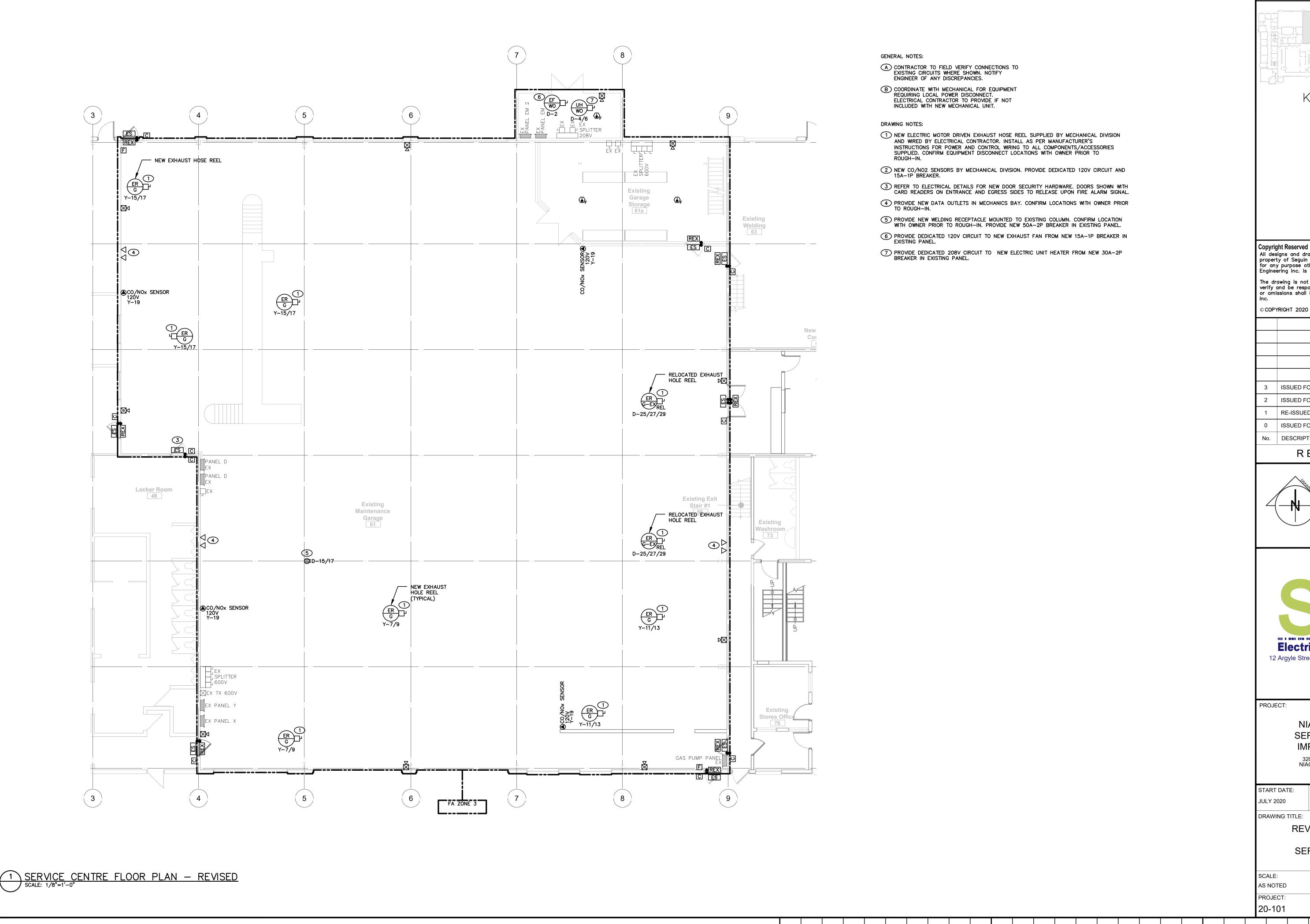












GENERAL NOTES

KEYPLAN

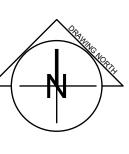
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No.	DESCRIPTION	DATE	
0	ISSUED FOR PERMIT	NOV 6, 2020	ŀ
1	RE-ISSUED FOR PERMIT	DEC 3, 2020	ł
2	ISSUED FOR TENDER	FEB 26, 2021	ł
3	ISSUED FOR CONSTRUCTION	MAY 7, 2021	ł

REVISIONS



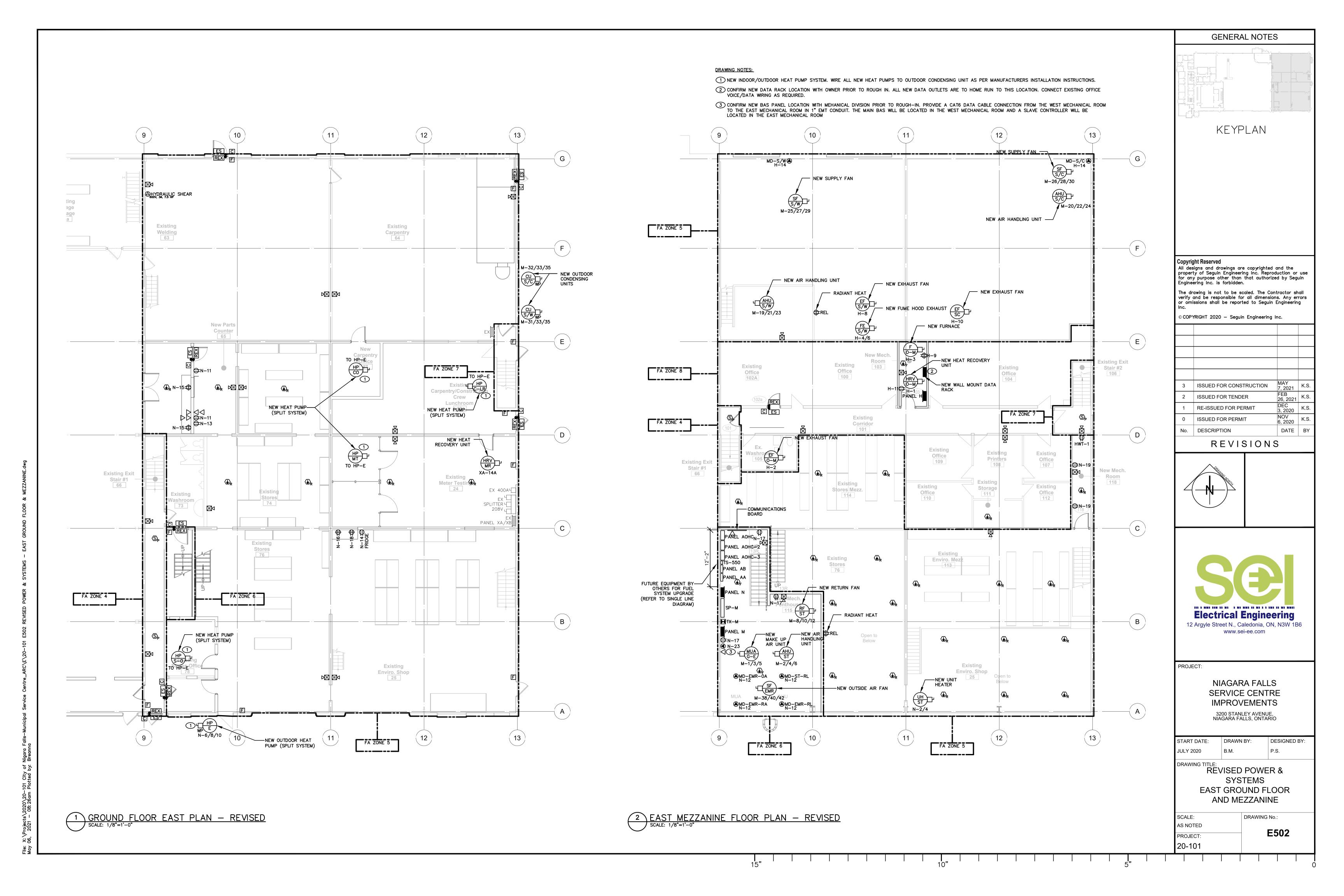


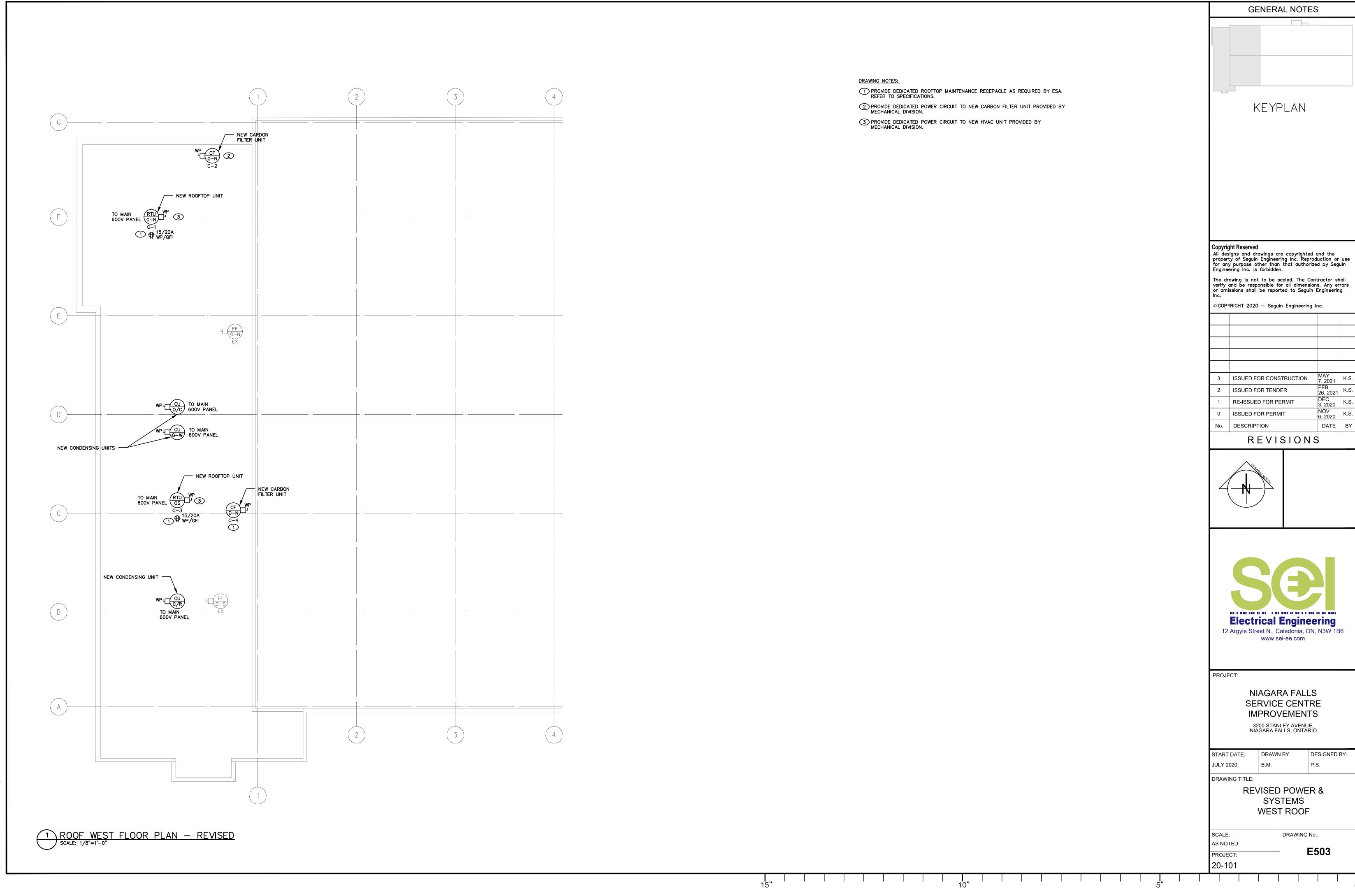
NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

JULY 2020	B.M.	P.S.
START DATE:	DRAWN BY:	DESIGNED BY:

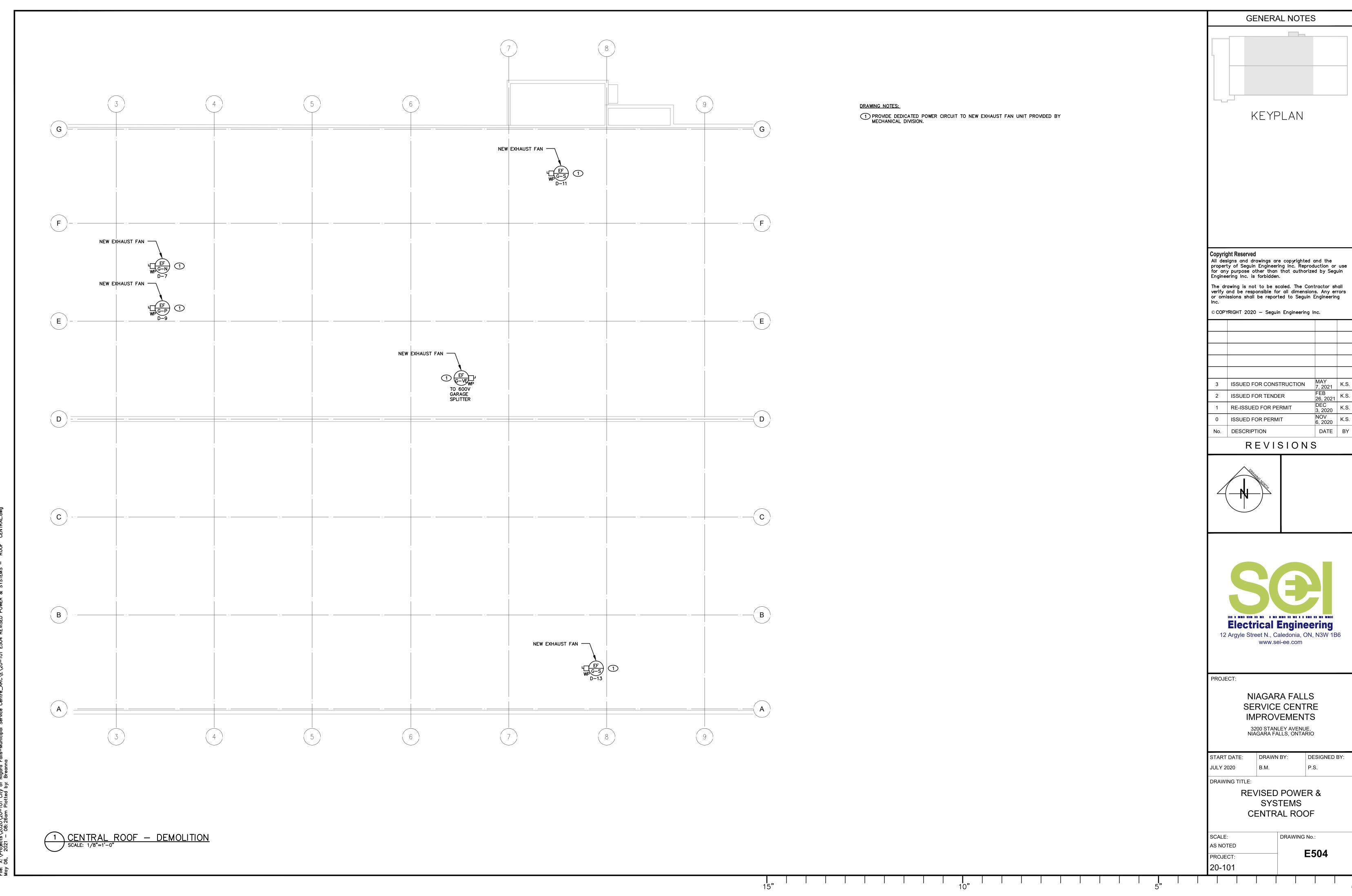
REVISED POWER & SYSTEMS SERVICE CENTRE

SCALE:	DRAWING No.:
AS NOTED	
PROJECT:	E501
20-101	

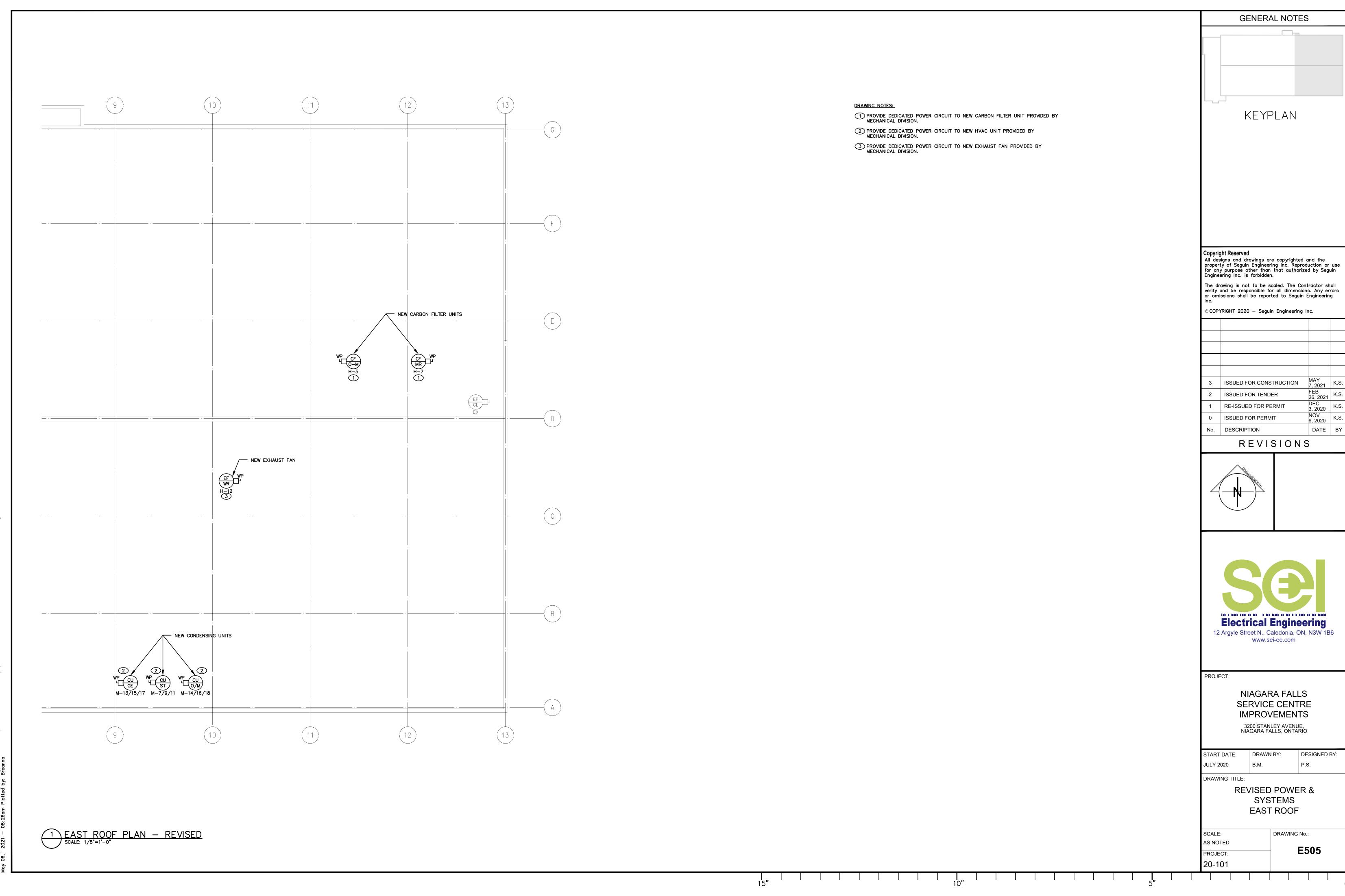




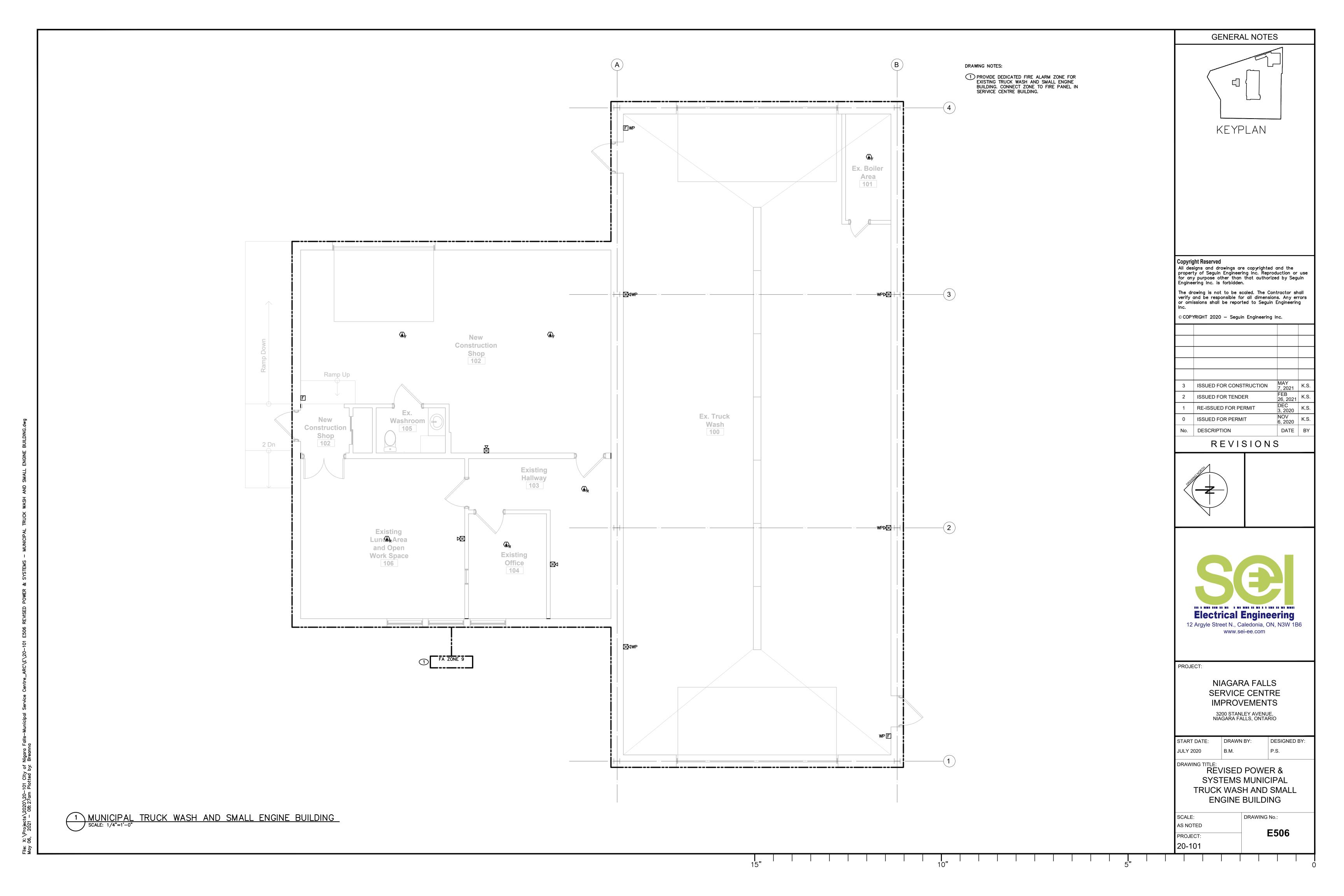
ts/2020/20—101 city of nigara rails—municipal service centre_ARC/E/20—101 E303 REVISED MOWER & STSTEMS — WE. — 08:26am Plotted by: Breanna

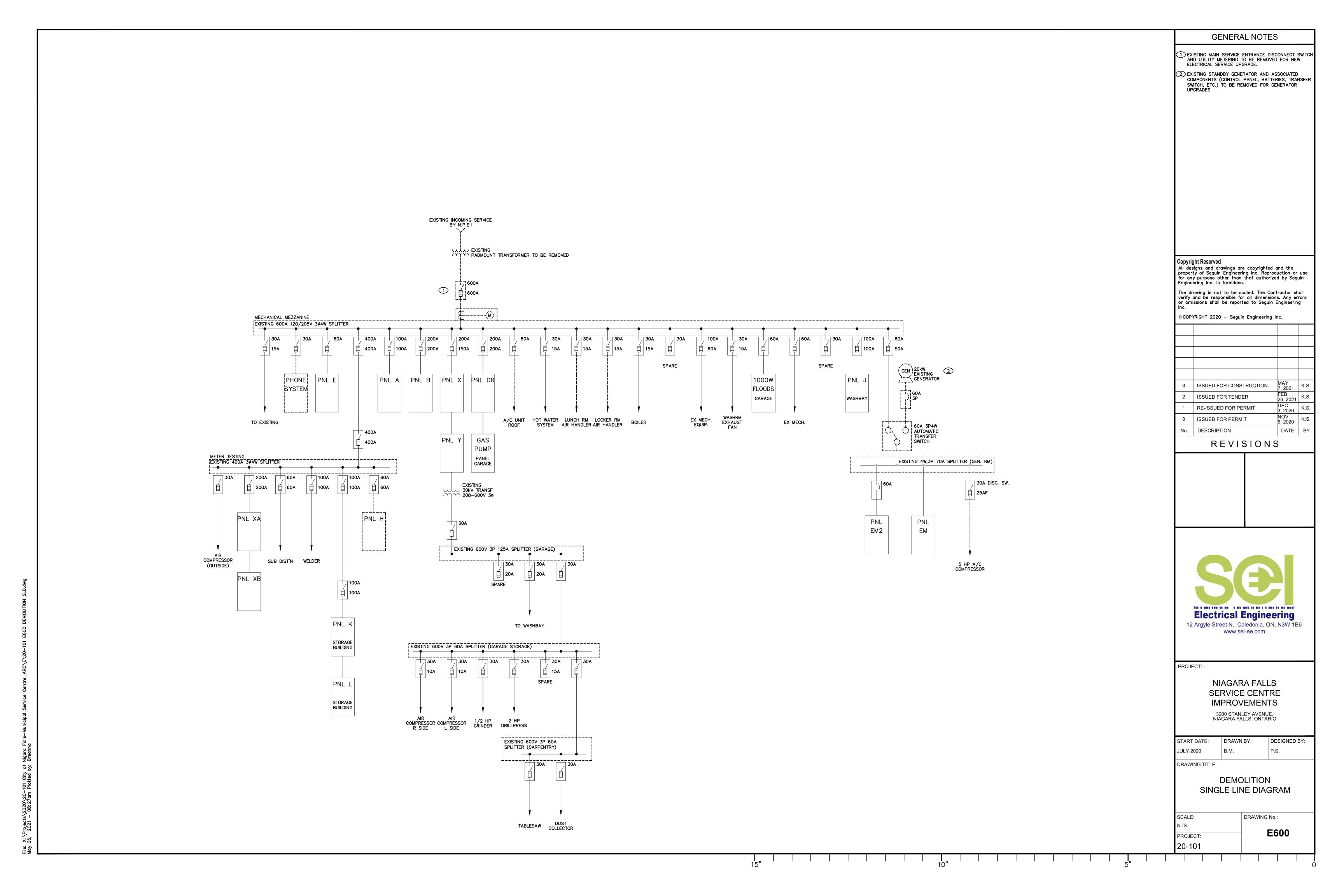


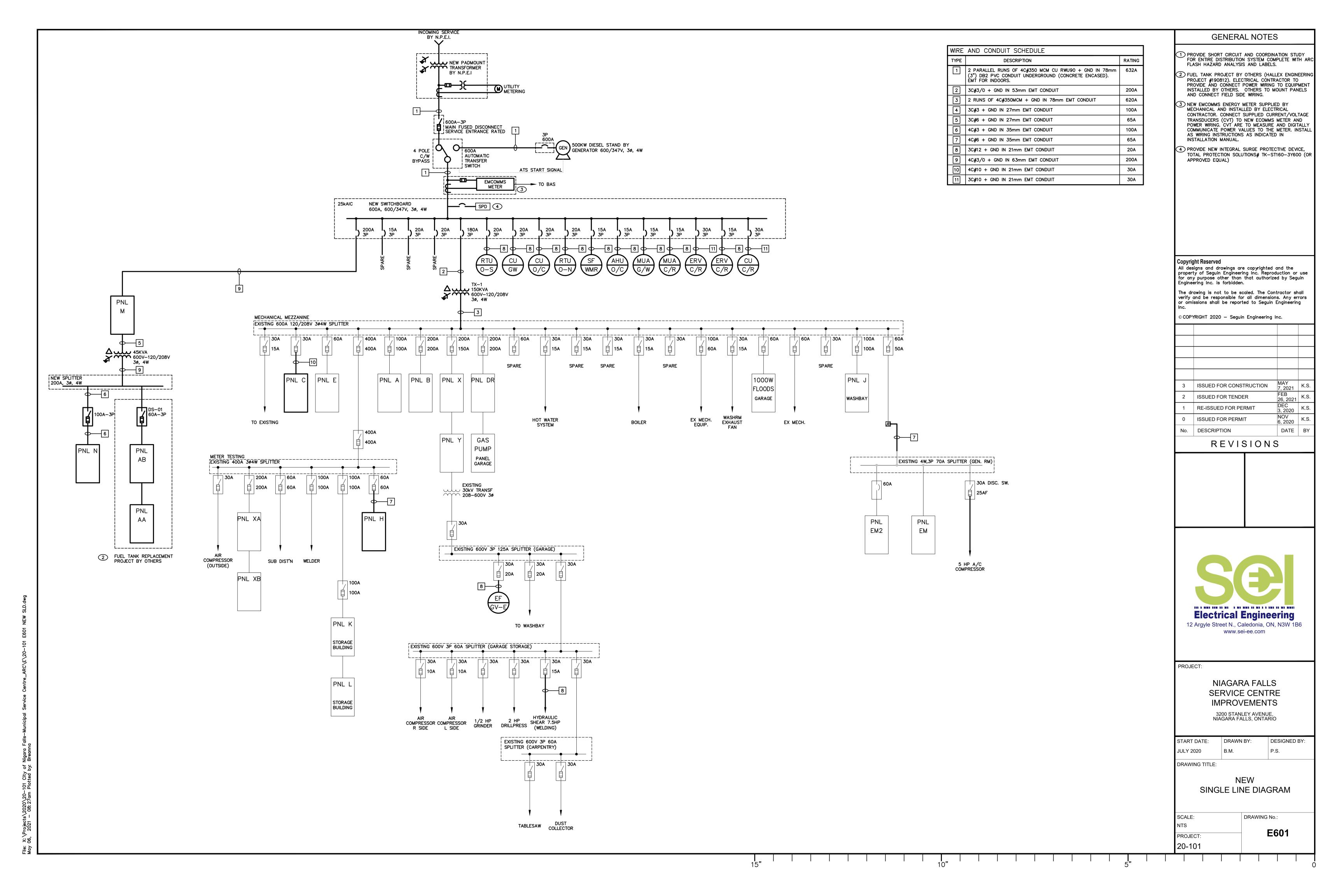
-101 City of Nigara Falls-Municipal Service Centre_ARC\E\20-101 E504 REVISED POWER & SYS

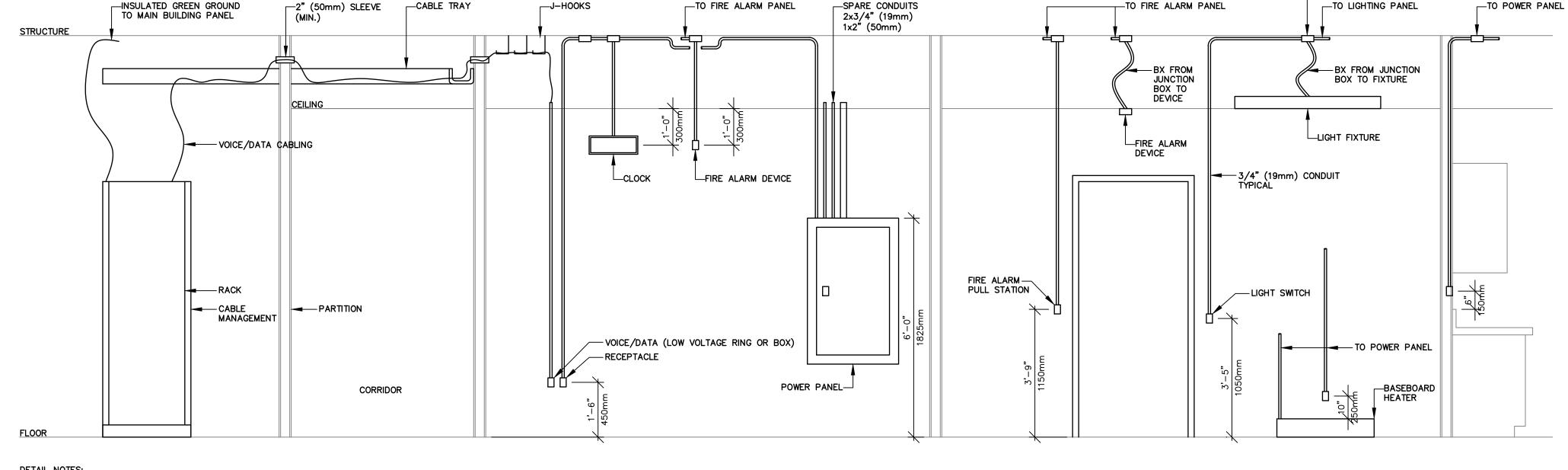


)jects\2020\20-101 City of Nigara Falls-Municipal Service Centre_ARC\E\20-101 E505 REVISED POWER & SYSTEMS 021 - 08:26am Plotted by: Breanna









DETAIL NOTES:

- A. DETAIL IS APPLICABLE FOR DEVICES SHOWN ON PLANS. ALL THE DEVICES INDICATED IN THE DETAIL MAY NOT OCCUR ON THE PLANS.
- B. CONDUIT SHALL BE PROVIDED IN ALL CASES UNLESS DENOTED AS BX OR AS ALLOWED IN THE SPECIFICATIONS.
- C. ALL CONDUITS FOR LOW VOLTAGE CABLING AND WIRING SHALL HAVE BUSHINGS INSTALLED TO PREVENT CHAFFING OF WIRE(S).
- D. ALL CONDUITS ARE TO GO DIRECTLY FROM THE OUTLET BOX UP THE WALL INTO THE CEILING SPACE. NO HORIZONTAL RUNS OF CONDUIT, OR GROUPING OF CONDUITS WITH OTHER SERVICES IN CLOSE PROXIMITY.
- E. CONDUITS ARE TO HAVE PULL ROPES INSTALLED AND LEFT BEHIND TO ALLOW THE PULLING OF ADDITIONAL SERVICES IN THE FUTURE.

SZ-2 GENERATOR TROUBLE

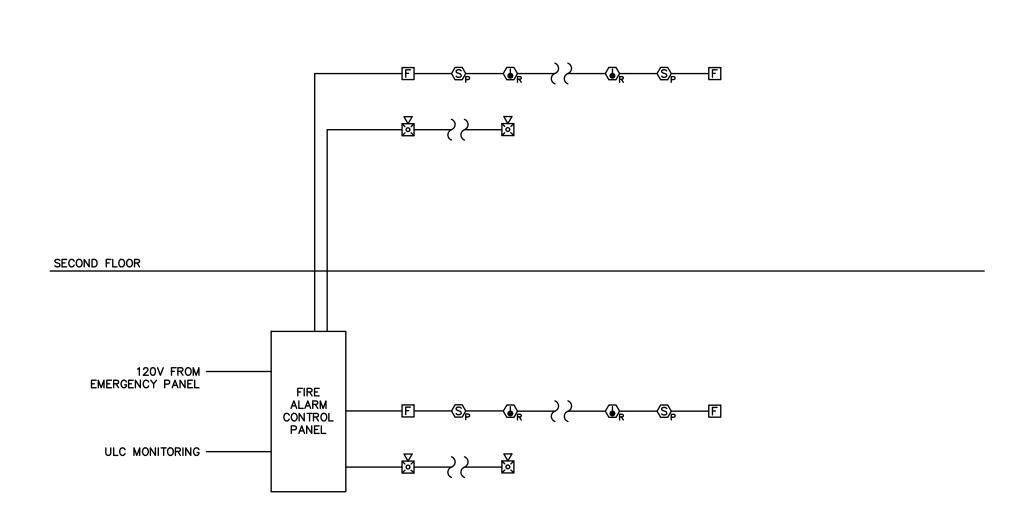
F. ALL BREACHES IN WALLS ARE TO BE FIRESTOPPED TO MAINTAIN THE FIRE SEPARATIONS.

--INSULATED GREEN GROUND

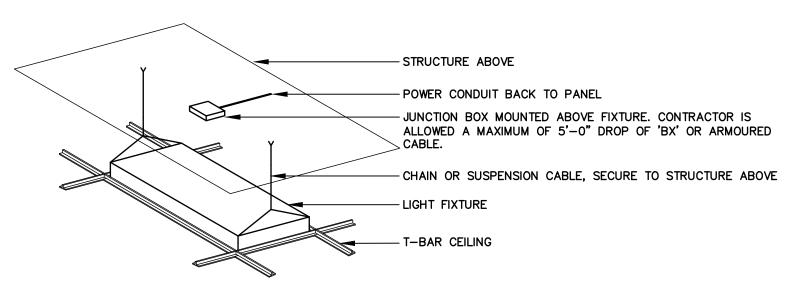
G. PROVIDE SUPPORTS FOR ALL CEILING MOUNTED ELEMENTS (IE CHAIN HANGERS FOR FIXTURES ETC.) DEVICES SHALL NOT BE SUPPORTED BY A CEILING TILE.

1 TYPICAL MOUNTING HEIGHTS/INSTALLATION DETAIL E700 SCALE: NTS

	FIRE ALARM ZONES		
ZONE	DESCRIPTION	ALARM	TROUBLE
FZ-1	GROUND FLOOR OFFICES	Х	Х
FZ-2	MECHANICAL MEZZANINE	Х	Х
FZ-3	GARAGE	Х	Х
FZ-4	STAIRWELL A	Х	Х
FZ-5	GROUND FLOOR SHOPS	Х	Х
FZ-6	MECHANICAL PENTHOUSE	Х	Х
FZ-7	STAIRWELL B	Х	Х
FZ-8	SECOND FLOOR OFFICES	Х	Х
FZ-9	TRUCK WASH/SMALL ENGINE BUILDING	Х	Х
FZ-10	SPARE		
SZ-1	GENERATOR RUNNING		Х



GROUND FLOOR

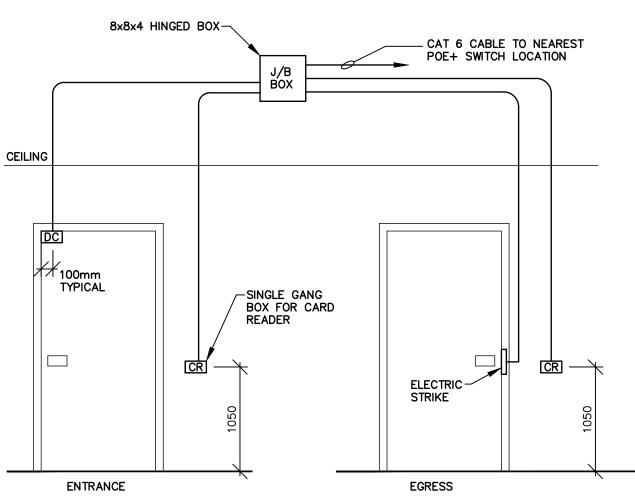


DETAIL NOTES:

A. BX OR ARMOURED CABLE IS TO BE RUN NEAT AND TIDY IN CEILING SPACE. PROVIDE CABLE TIES TO AFFIX TO SUSPENSION CHAINS. CLIP ENDS OF TIES.

B. JUNCTION BOXES ARE TO BE LOCATED CLOSE TO FIXTURES. PROVIDE P-TOUCH TYPE LABEL ON COVER PLATE WITH CIRCUIT NUMBER.

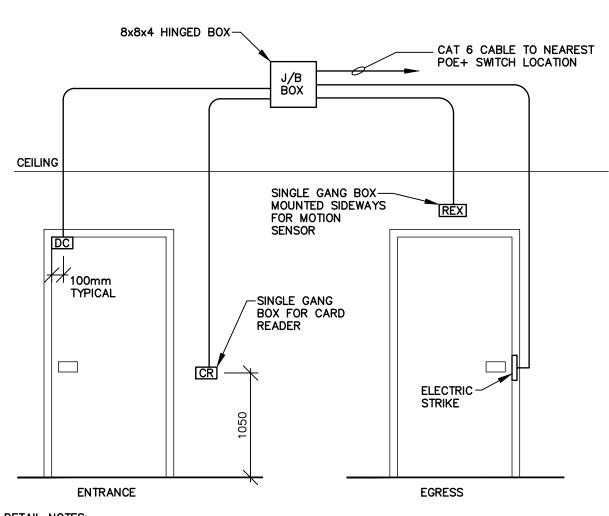
2 INSTALLATION OF RECESSED FIXTURE IN 'T' BAR CEILING SCALE: NTS



DETAIL NOTES:

A. THE CONTRACTOR SHALL PROVIDE ALL ROUGH-INS REQUIRED FOR THE SECURITY WORK. THE CONTRACTOR SHALL PULL ALL ASSOCIATED CABLES. TERMINATIONS WILL BE BY OTHERS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK LISTED BY OTHERS. THE DOORS SHALL BE FULLY FUNCTIONING AND COMMISSIONED AS PART OF THIS

- B. ALL CONDUIT IS TO BE CONCEALED IN THE WALL. CONDUIT SHALL BE 1" UNLESS NOTED OTHERWISE. SURFACE RACEWAY WILL ONLY BE ALLOWED UNDER SPECIAL CIRCUMSTANCES AND MUST HAVE WRITTEN APPROVAL FROM THE OWNER AND
- C. PROVIDE A 120V CIRCUIT FROM LOCAL PANEL TO POWER SECURITY DEVICES.
- D. DOORS SHOWN WITH BOTH CARD READERS ON ENTRANCE AND EGRESS SIDES TO RELEASE UPON FIRE ALARM SIGNAL.
- E. REFER TO CASH ALLOWANCE FOR DESIGN ELECTRONICS (ACCESS CONTROL).
- 4 TYPICAL SECURITY DOOR DETAIL E700 SCALE: NTS



DETAIL NOTES:

A. REFER TO DETAIL 4/E700 NOTES.

5 TYPICAL SECURITY DOOR DETAIL
E700 SCALE: NTS

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GENERAL NOTES

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3	ISSUED FOR CONSTRUCTION	MAY 7, 2021	K.S.
2	ISSUED FOR TENDER	FEB 26, 2021	K.S.
1	RE-ISSUED FOR PERMIT	DEC 3, 2020	K.S.
0	ISSUED FOR PERMIT	NOV 6, 2020	K.S.
No.	DESCRIPTION	DATE	BY
	REVISION	S	

REVISIONS



PROJECT:

NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

JULY 2020	B.M.	P.S.
START DATE:	DRAWN BY:	DESIGNED BY:

DRAWING TITLE:

ELECTRICAL DETAILS

SCALE:	DRAWING No.:
NTS	
PROJECT:	E700
PROJECT.	
00 404	

20-101

PANEL C

LOAD	DESCRIPTION	CCT		ľľ		(CCT	DESCRIPTION	LOAD
	MAKE UP AIR MUA-G/E	1	20A	\sqcup	20	尐	2	AIR HANDLER AHU-ST	
		3	<u> </u> -	\vdash	44	Ţ	4		
		5			20	ᆉ	6		
	CONDENSING UNIT CU-ST	7	20A 1	+	$+\tilde{1}$	Ή⊢	8	RETURN FAN RE-ST	
		9	┟ᢚ	+	十1	ᅩ	10 12		
	CONDENSING CU-GE	13	20Ā		20	ᅲ	14	CONDENSING UNIT CU-O/M	
	331721131113 33 32	15	江		ナユ	-	16	CONDENSING ONLY GO COM	
		17			\perp	乁	18		
	AIR HANDLER AHU-SW	19	20A	\Box	20	₹Ţ	20	AIR HANDLER AHU-S/C	
		21	<u> </u>	\sqcup	4	_	22		
		23			1,1		24		
	SUPPLY FAN SF-SW		20A	+	20			SUPPLY FAN	
		27	☆	+	+1	ᅩ	28		
	CONDENSING UNIT	29 31	15A	\vdash	15	汁	30 32	CONDENSING UNIT	
	CU-S/W	33	行	 	十1		34	CU-S/C	
	55 37 W	35	江	1 1	1〕		36	30 370	
	SPARE	37	15A		15	╌┖	38	OUTSIDE AIR FAN	
		39			\perp	ᅮ	40	EF-SMR	
		41	<u> </u> _	Ш	┵┸		42		
	SPARE	43	154	$\downarrow \downarrow$	15	<u> </u>	44	SPARE	
		45	<u>-</u> -	\vdash	44	ᅮ	46		
		47	20A	\vdash	120	╌	48		
	SPARE	49 51		+	$+\tilde{1}$	-L	50 52	SPARE	
		53	┟ᢚ	+	十1	т_	52 54		
	SPARE	55	20A		60	╌	56	SPLITTER TRANSFORMER	
	OF AIRE	57	丌		ナゴ	_	58	OF EFFER TRANSFORMER	
		59			\perp	\neg -	60		

PANEL M

LOAD	DESCRIPTION	ССТ	1	ľl	Ĺ	,	CCT	DESCRIPTION	LOAD
20718	LIGHTING - NEW PENTHOUSE	1	20A			20A	2	UNIT HEATER UH-ST	
	LIGHTING - NEW LIGHTING SE LIGHTING - STORES MEZZANINE	'	20A	┪		<u>-</u> _	4	ONIT FIEATER OIT—31	
	LIGHTING - STORES	5	20A			50A	6	SPLIT SYSTEM OUTDOOR UNIT HP-E	
	LIGHTING — ENVIRO, MEZZANINE	$\frac{1}{7}$	20A	П	\Box		8	SI EIT STSTEM COTDOOK CIVIT TII	
	LIGHTING - ENVIRO SHOP	9	20A	┪			10		
	PARTS COUNTER RECEPTACLES	11	15A	Ħ		15A	12	MOTORIZED DAMPERS	
	PARTS COUNTER RECEPTACLES	13	15A		\Box	15A	14	ENVIRO SHOP FRIDGE	
	PARTS COUNTER RECEPTACLES	15	15A			15A	16	ENVIRO SHOP RECEPTACLE	
	MECH PENTHOUSE RECEPTACLES	17	15A			15A	18	ENVIRO SHOP RECEPTACLE	
	MECH ROOM RECEPTACLES	19	15A	П		15A	20	SPARE	
	MECH ROOM WATER HEATER	21	[15A]			15A	22	SPARE	
	BAS PANEL	23	[15A]			15A	24	SPARE	
	SPARE	25	[15A]			15A	26	SPARE	
	SPARE	27	15A			15A	28	SPARE	
	SPARE	29	15A	Ш		15A	30	SPARE	
	SPARE	31	[15A]	Ш		[15A	32	SPARE	
	SPARE	33	15A			<u> 15</u> A_	34	SPARE	
	SPARE	35	⊢ –	Ш		15A_	36	SPARE	
	-	37	15A			15A		-	
	ı	39	⊢ –	\sqcup		15A	ן יי ו	_	
	ı	41	_15A_	Ш	\Box	20A	42	EMERGENCY LIGHTING	

PANEL N

120,	/208 VOLTS			<u> </u> -		7		60 AMP MAIN BREA	\KER
LOAD	DESCRIPTION	ССТ		ľ	ľ	ĺ	ССТ	DESCRIPTION	LOAD
	HEAT RECOVERY HRV-D/M	1	20A	•—		20A	2	EXHAUST FAN EF-O/M	
	FURNACE F-O/M	3	20A	_		20A	4	EXHAUST FAN FE-S/W	
	CARBON FILTER CF-O/M	5	15A	_	L,	$\perp \perp$	6		
	CARBON FILTER CF-MR	7	15A_			20A	8	EXHAUST FAN EF-S/W	
	SERVER RECEPTACLES	9	20A	_		15A	10	EXHAUST FAN EF-S/C	
	MECH. ROOM RECEPTACLE	11	15A	-	L,	20A	12	EXHAUST FAN EF-WR	
	SPARE	13				15A	14	MOTORIZED DAMPERS	
	SPARE	15		_		15A	16	SPARE	
	SPARE	17	15A	-	L,	15A	18	SPARE	
	SPARE	19		_		15A	20	SPARE	
	SPARE	21	15A_	—		15A	22	SPARE	
	SPARE	23		_	L,	15A	24	SPARE	
	_	25		_		[15A	26	-	
	_	27	15A_			15A	, —	-	
	-	29	[15A]		L,	15A	30	-	
	SURFACE FLUSH PANEL LOCATION: NEW MECH ROOM		-	-	-	-			

PANEL H

GENERAL NOTES

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PROJECT:

NIAGARA FALLS SERVICE CENTRE **IMPROVEMENTS** 3200 STANLEY AVENUE, NIAGARA FALLS, ONTARIO

JULY 2020	B.M.	P.S.
START DATE:	DRAWN BY:	DESIGNED BY:

DRAWING TITLE:

PANEL SCHEDULES

SCALE:	DRAWING No.:			
NTS	E800			
PROJECT:	EOUU			
20-101				