

## Addendum 02

Project: New Fire Station No. 1

RFT# T-FD-22-01

Highlands Boulevard, Millbrook, ON

**Date:** June 01, 2022

Owner: Township of Cavan Monaghan

**Greenview File:** 164.21.005

This Addendum forms part of the Tender Documents and shall supersede all prior issued tender documentation and/or Addenda as noted, and specifically applicable.

This Addendum consists of 1 page(s), and the following attachments:

- Pre-Bid Site Meeting Attendance Record.
- IFT Mechanical Drawings (24x36").
- IFT Electrical Drawings (24x36").

## 1. General Clarification(s):

- .1 Pre-Bid Site Meeting.
  - .1 Attached is a scanned copy of the attendees of the mandatory, pre-bid site meeting attendance record held on May 31, 2022.

## 2. Drawings:

- .1 Mechanical & Electrical Drawings.
  - .1 Attached are tender-issued mechanical and electrical drawings sized to Arch D (24"x36") in PDF format. No technical revisions to these drawings have been made.

### End of Addendum 02





## **Pre-Bid Site Meeting Attendance Record**

Project Name: New Fire Station No. 1

RFT #: T-FD-22-01

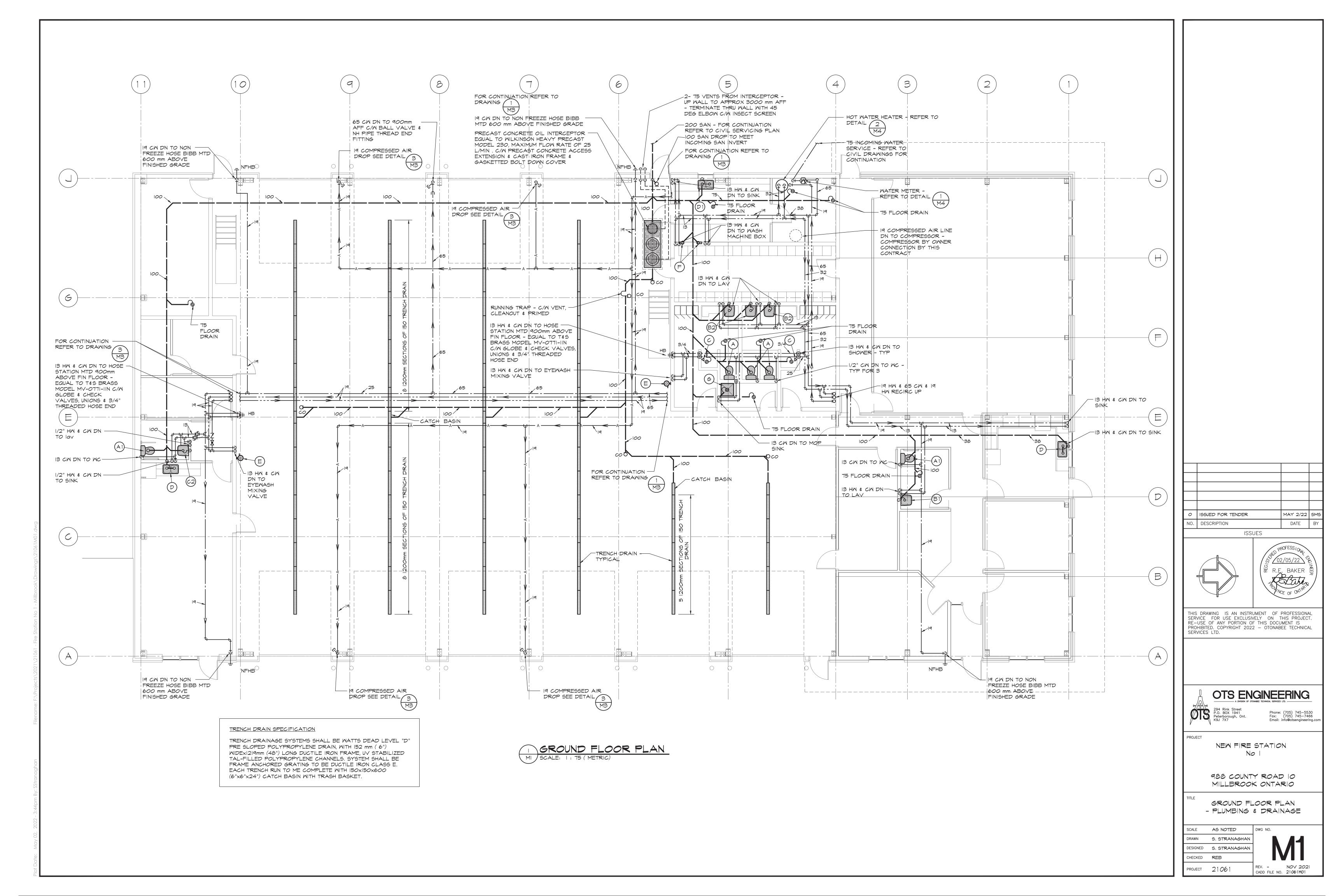
Location: Project Site (Via 988 County Road 10, Millbrook, Ontario)

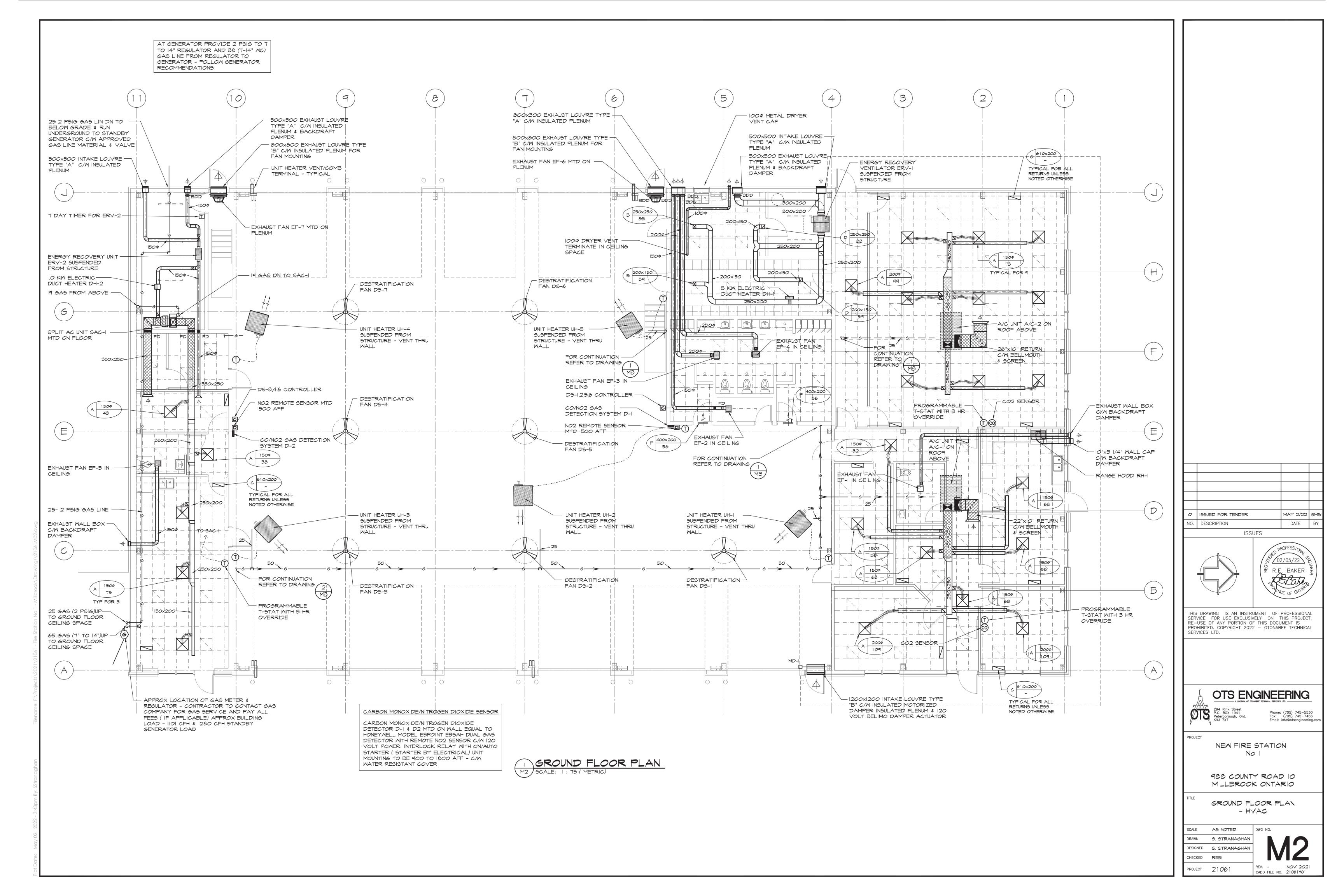
Date: May 31, 2022 @ 10:00am

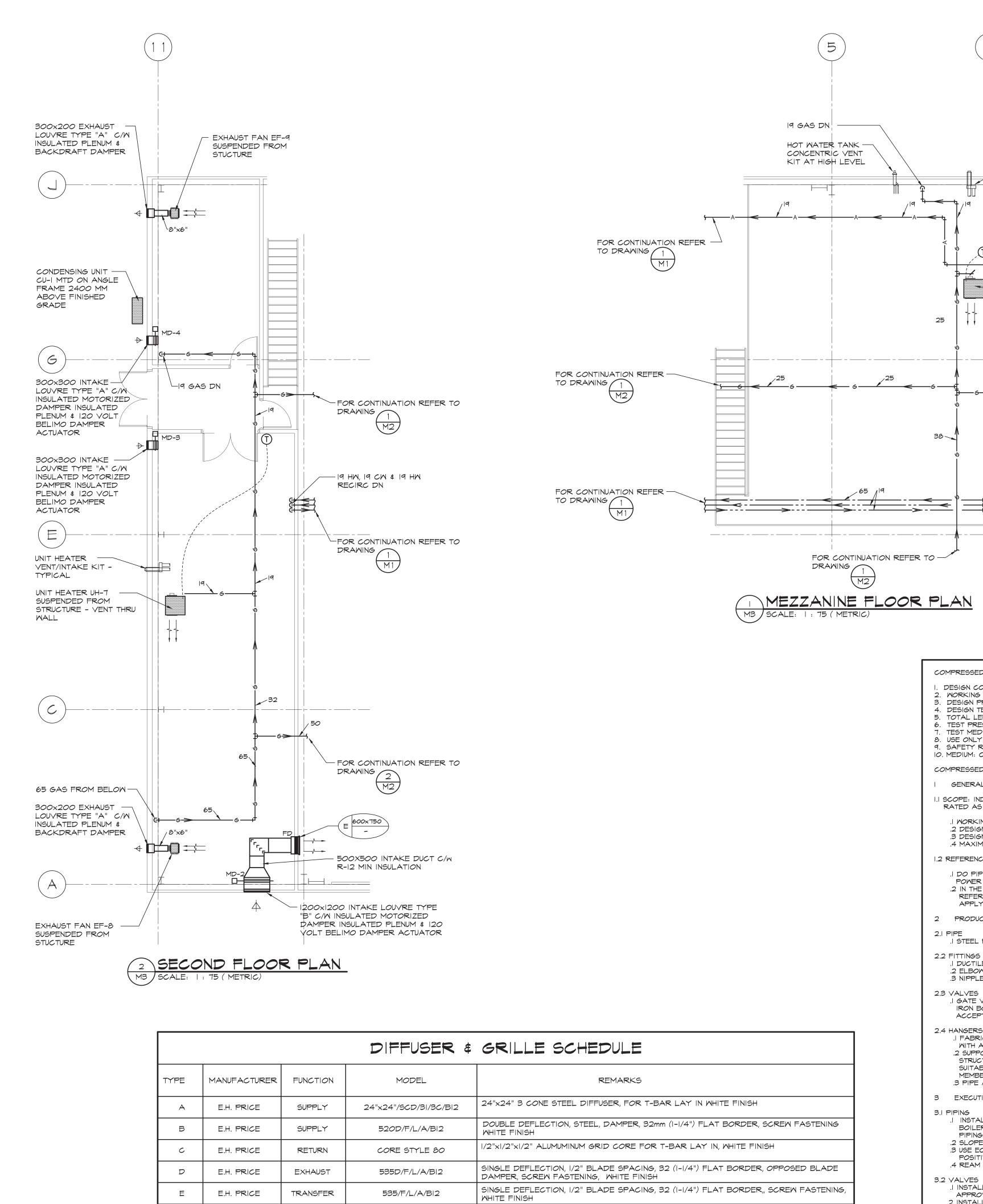
Company Name	Print Name / Signature	Contact Information
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Gay Company	Casandra Kelly	Tel: 905-623-3234
Cary Chipolity	Casely Kells	Email: C Icelly eggy company Limited com
Century Group	Nimer Sabboubeh Sabbout	Tel: 416-518-5727 Email: Estimating@ cgigc.com
PRE-ENC CONTRACTING	RUTUI Sattapantly	Tel: 905 -738 - 6866
	48.	Email: info@fre.eng.com
Silver Birch Contracting	Connor Methwrin	Tel: 905 - 952 - 3656
Salver Out ou monther line	-lull/	Email: Connorm@bitch con. Cl

Company Name	Print Name / Signature	Contact Information
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Norkway Carotroction	Tor Towards	Tel: 46821 8012 Email: ton @ northway. CC
		Tel:  Email: 12 attendees

May 2022







TRANSFER

E.H. PRICE

ALTERNATES : METALAIRE, NAILOR

STGI/BF/BI5

HEAVY DUTY STEEL DOOR GRILLE, I 1/5/16" FLAT BORDER BOTH SIDES, SCREW

FASTENING, ALUMINUM POWDER COAT FINISH

COMPRESSED AIR DESIGN NOTES: 3.3 HANGERS DESIGN CODE: ANS/ASME B31.1 2. WORKING PRESSURE: 90 PSI 3. DESIGN PRESSURE: 150 PSI 4. DESIGN TEMPERATURE: 120F 5. TOTAL LENGTH OF PIPE: SEE DRAWING 6. TEST PRESSURE: PNEUMATIC, 150 PSI 7. TEST MEDIUM: COMPRESSED AIR AND SOAP 8. USE ONLY REGISTERED FITTINGS AND VALVES. 9. SAFETY RELIEF VALVE: LOCATED AT AIR COMPRESSOR 10. MEDIUM: COMPRESSED AIR COMPRESSED AIR SPECIFICATIONS: .I SCOPE: INDUSTRIAL QUALITY STEEL PIPING SYSTEMS FOR COMPRESSED AIR RATED AS FOLLOWS: .I WORKING PRESSURE 90 PSIG 620 KPA .2 DESIGN PRESSURE 150 PSIG 1034 KPA .3 DESIGN TEMPERATURE 120°F .4 MAXIMUM PIPE S NPS 2 50MM 1.2 REFERENCE STANDARDS .I DO PIPING SYSTEM WORK IN ACCORDANCE WITH ANSI/ASME B31.I-1993 POWER PIPING CODE .2 IN THE EVENT OF DISAGREEMENT BETWEEN THIS SPECIFICATION AND REFERENCE PUBLICATIONS, THE MORE STRINGENT REQUIREMENTS SHALL 2 PRODUCTS .I STEEL PIPE: TO ASTM A53-84, SCHEDULE 40, GRADE B, TYPE E .I DUCTILE IRON THREADED .2 ELBOWS: DUCTILE IRON THREADED .3 NIPPLES, SCHEDULE, SCHEDULE 40: TO ASTM A53-86A 2.3 VALVES .I GATE VALVES: TO NPS 6, CODE APPROVED, CLASS 125 FLANGED ENDS, IRON BODY, OSBY BRONZE MOUNTED ACCEPTED MATERIAL: JENKINS FIG. 454 2.4 HANGERS, SUPPORTS AND SWAY BRACES I FABRICATE HANGERS, SUPPORTS AND SWAY BRACES IN ACCORDANCE WITH ANS B31.1 1993 AND MSS-SP58-1983. .2 SUPPORT FROM TOP OF STRUCTURAL MEMBERS WHERE POSSIBLE. WHERE STRUCTURAL BEARING DOES NOT EXIST OR INSERTS ARE NOT IN SUITABLE LOCATIONS, PROVIDE SUPPLEMENTARY STRUCTURAL STEEL MEMBERS. .3 PIPE ATTACHMENT: ADJUSTABLE CLEVIS TO MSS-SP58, TYPE I. 3 EXECUTION I INSTALL COMPRESSED AIR PIPING IN ACCORDANCE WITH THE ONTARIO BOILER & PRESSURE VESSEL CODE AND ANSI/ASME B31.1Y1993 POWER .2 SLOPE PIPING DOWN IN DIRECTION OF FLOW TO LOW POINTS.
.3 USE ECCENTRIC REDUCERS OF PIPE SIZE CHANGE INSTALLED TO PROVIDE POSITIVE DRAINAGE. .4 REAM PIPES, CLEAN SCALE AND DIRT, INSIDE AND OUT.

.I INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL UNLESS OTHERWISE

.2 INSTALL VALVES AT ALL BRANCH TAKE-OFFS TO ISOLATE EACH PIECE

APPROVED OTHERWISE.

OF EQUIPMENT, AND AS INDICATED.

- UNIT HEATER VENT/INTAKE

KIT - TYPICAL

- 19 AIR LINE DN

MALL

DRAWING /

-UNIT HEATER UH-6

SUSPENDED FROM

STRUCTURE - VENT THRU

FOR CONTINUATION REFER TO

- 19 HM, 65 CM FROM BELOW \$

19 HW RECIRC DN

3.4 TESTING

J HAVE ENGINEER WITNESS TEST. NOTIFY ENGINEER MINIMUM OF ONE WORKING
DAY PRIOR TO TEST.

3.5 MARKING
J IDENTIFY AND MARK PIPING.

III COMPRESSED AIR PIPING

QUICK DISCONNECT
ARO-HANSON
SERIES
210

FIN. FLOOR

COMPRESSED AIR PIPING DROP

MAXIMUM SPACING STEEL

3.0M

3.6M

3.6M

I SPACING AND MIDDLE ATTACHMENT (ROD) DIAMETER WITHIN 300MM OF

ROD DIAMETER

.2 OFFSET HANGER SO THAT ROD IS VERTICAL IN OPERATING POSITION.

IOMM

EACH HORIZONTAL ELBOW AND AS SPECIFIED IN TABLE BELOW:

PIPE SIZE: NPS

2 1/2

.3 ADJUST HANGERS TO EQUALIZE LOAD.

M3 / SCALE: NTS

O ISSUED FOR TENDER MAY 2/22 SMS
NO. DESCRIPTION DATE BY
ISSUES



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PROFESS/

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NEW FIRE STATION

NEW FIRE STATION No 1

> 988 COUNTY ROAD 10 MILLBROOK ONTARIO

SECOND & MEZZANINE FLOOR
PLANS - MECHANICAL

SCALE AS NOTED

DRAWN S. STRANAGHAN

DESIGNED S. STRANAGHAN

CHECKED REB

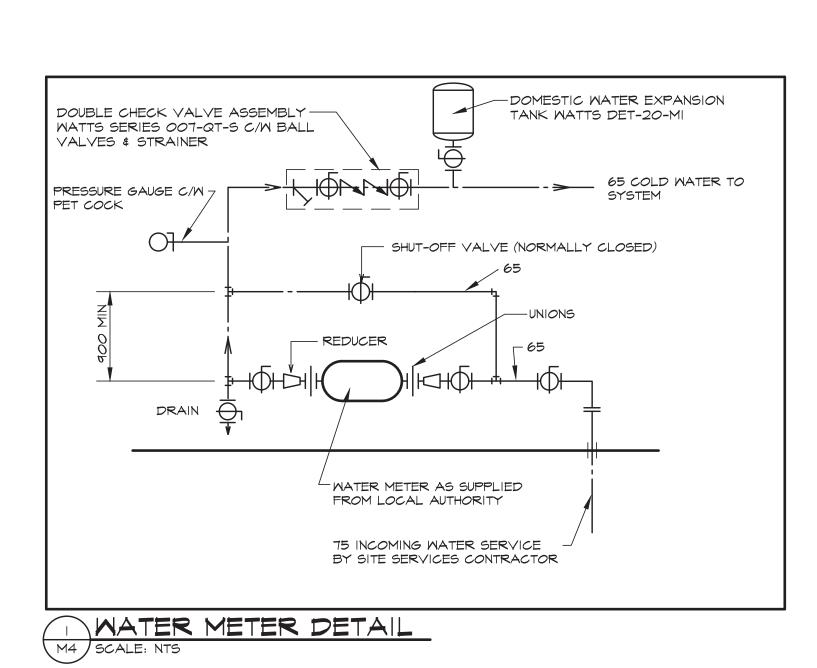
PROJECT 21061

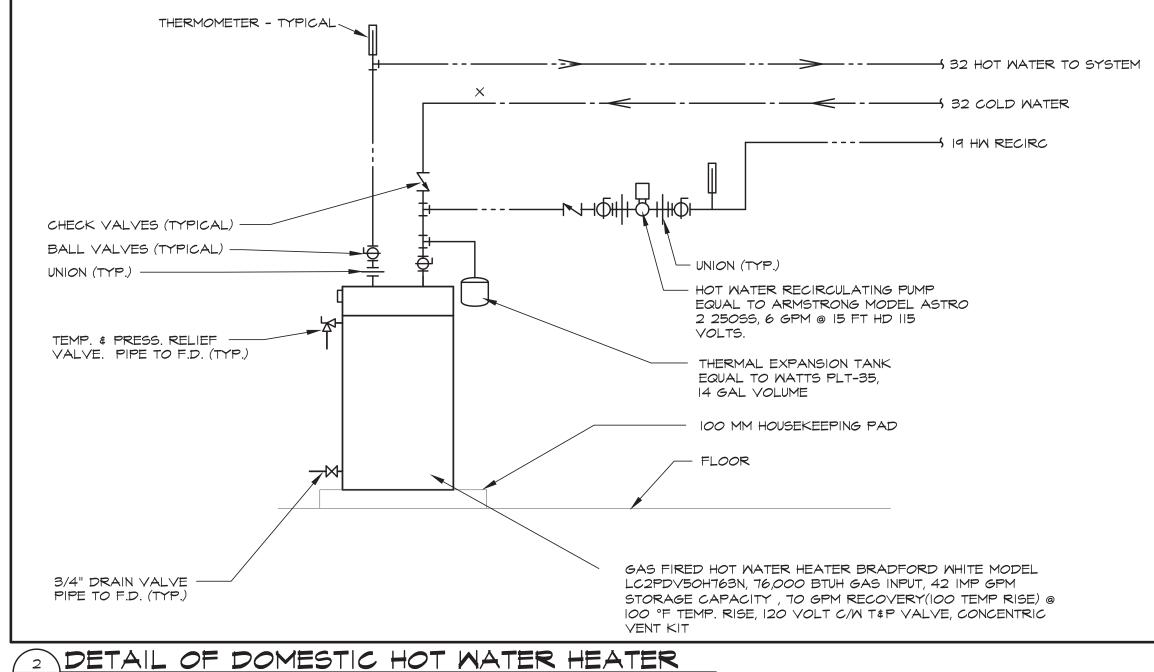
REV. - NOV 2021 CADD FILE NO. 21061M03

						F	LUMBING FIXTURE SCHEDULE	APPROVED ALTERNATES: ZURN, DELTA,	
NO.	DESCRIPTION	HOT WATER	TEMP WATER	COLD WATER	DRAIN	VENT	FIXTURE MAKE & MODEL	TRIM MAKE & MODEL	REMARKS
A	WATER CLOSET	-	-	13	<b>3</b> "	38	AMERICAN STANDARD "CADET PRO" RIGHT HEIGHT 215AA.154 FLOOR MTD VITREOUS CHINA, ELONGATED, 54 mm (2 1/8") GLAZED TRAPWAY, LINED FLUSH TANK, 4.8L (1.07 GAL) FLUSH, 4188A-174 ( TANK COVER LOCKING DEVICE) CHROME FINISH HANDLE		C/W MCGUIRE CHROME PLATED RIGID TOILET SUPPLY & ESCUTCHEONS
Al	WATER CLOSET - BARRIER FREE	-	-	13	<b>3</b> "	38		CENTOCO 820STS.001 HEAVY DUTY, OPEN FRONTED FRONT WITH COVER FOR ELONGATED BOWL STAINLESS STEEL CHECK HINGES, METAL WASHERS & STAINLESS STEEL POSTS AND NUTS	C/W MCGUIRE CHROME PLATED RIGID TOILET SUPPLY & ESCUTCHEONS
В	LAVATORY	13	-	13	32	32		MOEN 8425 SINGLE HANDLE DECK FAUCET, ALL METAL CONST, CHROME PLATED, 4" LEVER, DURALAST CARTRIDGE, 1.2 GPM, OPEN GRID STRAINER	C/W FLEXIBLE SUPPLIES & ESCUTCHEONS
BI	LAVATORY - BARRIER FREE ( PUBLIC)	13	-	13	32	32	TRIFICALIDAN STANDARD MUNKO CHISA COALO	MOEN CA8301 ELECTRONIC (AC POWER), BRASS CONST., CHROME PLATED, 4" CENTRESET, VANDAL RESISTANT AERATOR, I.9 L/MIN (0.5 GPM), OPEN GRID STAINER C/W ADJUSTABLE THERMOSTATIC MIXING VALVE & CONNECTOR & TRANSFORMER	C/W FLEXIBLE SUPPLIES & ESCUTCHEONS
B2	LAVATORY - BARRIER FREE	13	-	13	32	32		MOEN 8425 SINGLE HANDLE DECK FAUCET, ALL METAL CONST, CHROME PLATED, 4" LEVER, DURALAST CARTRIDGE, I.2 GPM, OPEN GRID STRAINER	C/W FLEXIBLE SUPPLIES & ESCUTCHEONS
C	SHOWER	13	-	13	50	32	BY GENERAL CONTRACTOR	MOEN SINGLE HANDLE POSI TEMP PRESSURE BALANCING VALVE, T8375EPI5 VALVE, I.5 GPM, CHROME FINISH C/M ROUGH-IN VALVE, SHOWER ARM & SHOWER HEAD	
D	SINK - 2 COMP.	13	-	13	38	32	FRANKE LBD6808P-I, 20 GAUGE, TYPE 302 18-8 SS, 8" (200mm) CENTRE SET, SATIN FINISH ON EXPOSED SURFACES, 3 1/2" (89mm) CRUMB CUP STRAINER	MOEN 8701 SINGLE HANDLE DECK FAUCET, ALL BRASS CONST, CHROME PLATED, DECK PLATE, 9" LONG SWING SPOUT., 8" CENTRES, DURALAST CARTRIDGE, 5/7 L/min (1.5 GPM),	C/W FLEXIBLE SUPPLIES & ESCUTCHEONS
ום	SINK - 2 COMP.	13	-	13	38	32	FRANKE LBD6808P-I, 20 GAUGE, TYPE 302 18-8 SS, 8" (200mm) CENTRE SET, SATIN FINISH ON EXPOSED SURFACES, 3 1/2" (89mm) CRUMB CUP STRAINER	MOEN 8298 TWO HANDLE DECK FAUCET, ALL BRASS CONST, CHROME PLATED, DECK PLATE, 216mm LONG GOOSENECK SPOUT., 200mm (8") CENTRES, NON METALLIC CARTRIDGE, 5.7 L/min (1.5 GPM),	C/W FLEXIBLE SUPPLIES & ESCUTCHEONS
E	EMERGENCY EYE/ FACE WASH	13	13	13	38	32	HAMS 7360BT-7460BT STAINLESS STEEL BOWL,EYE/ FACE WASH, ABS SHOWER HEAD, PRESURE ACTIVATED PLASTIC POP OFF 3.7 USGPM FLOW CONTROL	HAMS 920IEW THERMOSTATIC MIXING VALVE WITH THE FLOW OF 10 USGPM	1/2" HOT & COLD WATER TO MIXING VALVE - VALVE LOCATED IN HIGH ON WALL
F	LAUNDRY BOX	13	-	13	50	38	PPP MM-500MLB, STEEL BOX WITH WHITE POWDER COATED FINISH, 50mm DRIAN PIPE CONNECTION WATER HAMMER ARRESTORS, , QUARTER TURN BALL VALVES		
G	MOP SINK	13	-	13	75	38	STONE, STAINLESS STEEL STRAINER WITH DRAIN	FIAT 830 WALL MOUNTED TWO HANDLE UTILITY FAUCET, CHROME PLATED FINISH, WALL MOUNTED, 204mm (8") CENTRESET, INTEGRAL STOPS, HOSE OUTLET, I52mm (6") SPOUT WITH VACUUM BRAKER AND BUCKET HOOK.	

M4 SCALE: NTS

APPROVED ALTERNATES: CRANE, MAAX, MOEN, MIROLIN, KHOLER





SYMBOL DESCRIPTION SANITARY ABOVE GROUND SANITARY BELOW GROUND \_\_\_\_ DOMESTIC COLD WATER DOMESTIC HOT WATER \_\_\_\_\_ DOMESTIC HOT WATER RECIRCULATING LINE \_\_\_\_\_ \_\_\_\_\_ SANITARY VENT ----A COMPRESSED AIR LINE BALL VALVE PLUMBING FIXTURE DESIGNATION NATURAL GAS PIPING —— 6 —— NATURAL GAS PIPING ON ROOF CLEANOUT (BELOW GROUND & ABOVE GROUND DRAINAGE) co**a**— ——∥ NFHB NON FREEZE HOSE BIBB SUPPLY DIFFUSER RETURN OR EXHAUST GRILLE SIDEWALL SUPPLY OR RETURN GRILLE 10"x8" TRANSFER SHEET METAL SLEVE IN WALL ABOVE CEILING ( 2" WIDER THAT WALL THICKNESS) RETURN OR EXHAUST DUCT DOWN OR AWAY SUPPLY DUCT DOWN OR AWAY SUPPLY DUCT UP OR TOWARDS RETURN OR EXHAUST UP OR TOWARDS METAL FLEXIBLE DUCTWORK MAXIMUM LENGTH 10'-0" (SIZE AS DIFFUSER NECK) INDICATES SPIN ON COLLAR C/W VOLUME DAMPER (SIZE AS DIFFUSER NECK) I" ACOUSTIC DUCT INSULATION (THICKNESS NOT INCLUDED IN DUCT SIZE SHOWN) DUCT SILENCER TYPE A S'++ SIZE FLOW (CFM) DIFFUSER DESIGNATION

TYPE - REFER TO SCHEDULE

SIZE - DIFFUSER NECK OR GRILLE SIZE FLEXIBLE CONNECTION TURNING VANES (DOUBLE THICKNESS) TYPE "B" FIRE DAMPER IN HORIZONTAL OR VERTICAL DUCT BACKDRAFT DAMPER VOLUME DAMPER THERMOSTAT (MTD AT 5'-6" AFF UNLESS OTHERWISE NOTED) T TS TEMPERATURE SENSOR (MTD AT 5'-6" AFF UNLESS OTHERWISE NOTED) THERMOSTAT CONTROL LINE 7 DAY TIME CLOCK

LEGEND

O ISSUED FOR TENDER MAY 2/22 SMS
NO. DESCRIPTION DATE BY
ISSUES

R.E. BAKER FROM ONLY OF ONLY

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NEW FIRE STATION

988 COUNTY ROAD 10 MILLBROOK ONTARIO

SCHEDULES & DETAILS
MECHANICAL

DRAWN S. STRANAGHAN

DESIGNED S. STRANAGHAN

CHECKED REB

PROJECT 21061

REV. -

REV. - NOV 2021 CADD FILE NO. 21061M03

### SPLIT AIR CONDITIONING SYSTEM SCHEDULE ALTERNATES : LENNOX, YORK INDOOR UNIT OUTDOOR UNIT - HEAT PUMP HEATING CAPACITY FAN CAPACITY ELECTRICAL REMARKS ELECTRICAL SYSTEM NO. LOCATION MANUFACTURER MODEL NO. NOM. HEAT PUMP | GAS INPUT | GAS OUTPUT HP R.P.M. EXT STATIC PRESS MANUFACTURER MODEL NO AMBIENT REFRIGERANT CONTROL KW MBH KW MBH KW MBH KW MBH PA INCH VOLTS PH AMPS MOCP VOLTS PH MCA MOCP INDOOR UNITS C/M MATCHING COOLING COIL, SYSTEM COMPLETE MITH REFRIGERANT PIPING, \$ 59TN5040VI4-I0 | FURNACE | 5.2 309 655 CU-1 208 | 1 | 17.1 | 20 | SAC-I SERVICE CARRIER 18 NA NA 11.7 40 11.4 39 1 240 O.II NA CARRIER 24AHA418 YES REFRIGERANT, - PIPE CONDENSATE TO NEAREST DRAIN - OUTDOOR UNIT C/W LOW AMBIENT KIT, CRANKCASE HTR, FREEZE STAT, WIND BAFFLE COMPRESSOR START ASSIST, MOTOR MASTER CONTROLLER & WALL MOUNT KIT

	AIR CONDITIONING UNIT SCHEDULE																					
				SENS	COOLING					NAT GAS	HEATING (	CAP.			FAN	1			ELECTRIC	AL	OPERAT	
UNIT NO.	LOCATION	MANUFACTURER	MODEL NO.	CA	PACITY	CAF	PACITY	REFRIG. S	IEER OR	INPUT	0	JTPUT	AIR	FLOW	BHP	R.P.M.	EXT.	SP VOLTS	PH MC	A MOO	MEIGHT	REMARKS
				KM	I MBH	KM	MBH		K	N MBI	ł KM	MBH	L/S	CFM			Pa	INCH			KG L	35
A/C-I	ROOF	CARRIER	48GCEM04E2A5	7.5	25.59	10.2	35.14	410A	16.1 32	.2 110	25.8	88	566	1200	0.46	1850	149	0.5 208	3 22	2 30	257 5	
A/C-2	ROOF	CARRIER	486CEM05E2A5	10.8	3 37.06	14.6	49.96	410A	16.1 32	.2 110	25.8	88	566	1200	0.46	1850	149	0.5 208	3 2	7 30	279 6	DISCONNECT SWITCH  5

NO.	MFR	MODEL	NΑ	T GAS H	EATING C	AP.		FAN				ELEC	TRICAL					RATING	
			INF	PUT	00	ITPUT	AIR	FLOW			√ <i>o</i> LTS	P.H	= 4	MOCP	FLUE	COMB AIR DIA-	MEIGH	HT	REMARKS
			KM	MBH	KM	MBH	L/S	CFM		K.F.W.	VOLIS	ГП		POCE	INCH	INCH	KG	LBS	
UH-I	REZNOR	UDZ-150	44	150	14.6	124.5	906	1921	1/30	1050	115	I	3.9	15	5"	6"	77	173	C/W THERMOSTAT, HANGING HARDWARE, HORIZONTAL VENT/COMITERMINATION KIT (CC6), VENT THRU WALL
JH-2	REZNOR	UDZ-100	30.8	105	14.6	87.15	363	769	1/30	1050	115	I	3.9	15	4"	4"	44	97	C/W THERMOSTAT, HANGING HARDWARE, HORIZONTAL VENT/COM TERMINATION KIT (CC6), VENT THRU WALL
JH-3	REZNOR	UDZ-150	44	150	14.6	124.5	906	1921	1/30	1050	115	I	3.9	15	5"	6"	77	173	C/W THERMOSTAT, HANGING HARDWARE, HORIZONTAL VENT/COM TERMINATION KIT (CC6), VENT THRU WALL
JH-4	REZNOR	UDZ-150	44	150	14.6	124.5	906	1921	1/30	1050	115	I	3.9	15	5"	6"	77	173	C/W THERMOSTAT, HANGING HARDWARE, HORIZONTAL VENT/COM TERMINATION KIT (CC6), VENT THRU WALL
JH-5	REZNOR	UDZ-150	44	150	14.6	124.5	906	1921	1/30	1050	115	I	3.9	15	5"	6"	77	173	C/W THERMOSTAT, HANGING HARDWARE, HORIZONTAL VENT/COM TERMINATION KIT (CC6), VENT THRU WALL
JH-6	REZNOR	UDZ-30	8.8	30	7.2	24.6	215	456	0.06	1550	115	I	3.9	15	4"	4"	26	58	C/W THERMOSTAT, HANGING HARDWARE, HORIZONTAL VENT/COM TERMINATION KIT (CC6), VENT THRU WALL
ルーフ	REZNOR	UDZ-30	8.8	30	7.2	24.6	215	456	0.06	1550	115	I	3.9	15	4"	4"	26	58	C/W THERMOSTAT, HANGING HARDWARE, HORIZONTAL VENT/CON TERMINATION KIT (CC6), VENT THRU WALL

		HEAT RECOVERY SCHEDULE															OUTDOOR TEMPERATURE CONDITIONS: SUMMER 87°F db/74°F WINTER : -13 °F db
TA.6	AREA	MANUFACTURER	MODEL		OUTSIDE AIR	3	EXHA	AUST AIR		ı	SUMMER		ELECT	RICAL		OPERATING WEIGHT IN	PEMARKS
I AG	TAG SERVED	MANUFACTURER	NO.	FLOW, L/S (CFM)	ESP PA (IN)	FAN (hp)	FLOW, L/S (CFM,	ESP PA (IN)	FAN (hp)	TEMP.	SUPPLY TEMP.		PH	AMP	MOCP	LBS	REMARKS
ERV-I	PPE ROOMS	GREENTEC	LCH-4E	141 (300)	99.6 (0.4)	-	141(300)	99.6(0.4)	-	36°F	78°F	120	I	4.7	15	1 17/	C/W ALUMINUM CORE, ADJUSTABLE MOTORS, THREADED ROD HANGERS & FILTERS
ERV-2	PCCP	GREENTEC	PE 7.15 ERV	38 (80)	62 (0.25)	-	38(80)	62(.25)	-	36°F	78°F	120	I	1.5	15		c/w ALUMINUM CORE, ADJUSTABLE MOTORS, THREADED ROD HANGERS & FILTERS

FAN		_, _,			MODEL	CAPA	ACITY	EXT. STA	TIC PRESS	FAN		MO	TOR		MEI	GHT	REMARKS
NO.	LOCATION	FUNCTION	MANUFACTURER	FAN TYPE	NO.	L/S	CFM	ра	inch	R.P.M.	HP OR W	VOLTS	PHASE	RPM	KG	LBS	- REMARKS
EF-I	UMR-106	EXHAUST	GREENHECK	CEILING EXHAUST	SP-80-VG	38	80	62	0.25	935	6 M	120	I	935	5.4	12	0.6 SONES C/W "VG" MOTOR DIAL ON FAN, 2 SPEED, BACKDRAFT DAMPER
EF-2	OII-NAL	EXHAUST	GREENHECK	CEILING EXHAUST	SP-80-VG	38	80	62	0.25	935	6 M	120	1	935	5.4	12	0.6 SONES C/W "VG" MOTOR DIAL ON FAN, 2 SPEED, BACKDRAFT DAMPER
EF-3	WR-109	EXHAUST	GREENHECK	CEILING EXHAUST	SP-A390-VG	71	150	62	0.25	924	18 M	120	1	924	10.9	24	2 SONES, C/W "VG" EC MOTOR, DIAL ON FAN, VIBRATION ISOLATION, BACKDRAFT DAMPER
EF-4	WR-108	EXHAUST	GREENHECK	CEILING EXHAUST	SP-A390-VG	106	225	62	0.25	1015	18 M	120	1	1015	10.9	24	3 SONES, C/W "VG" EC MOTOR, DIAL ON FAN, VIBRATION ISOLATION, BACKDRAFT DAMPER
EF-5	MR-125	EXHAUST	GREENHECK	CEILING EXHAUST	SP-80-VG	38	81	31	0.125	935	6 M	120	I	935	5.4	12	0.6 SONES C/W "VG" MOTOR DIAL ON FAN, 2 SPEED, BACKDRAFT DAMPER
EF-6	APPARATUS	EXHAUST	GREENHECK	SIDEMALL EXHAUST	SEI-18-429-VG	1265	2680	31	0.125	1092	3/4 HP	208	1	1725	17.2	38	8.3 SONES C/W "VG" EC MOTOR, MOTOR DIAL ON FAN, BACKDRAFT DAMPER
<b>E</b> F-7	APPARATUS	EXHAUST	GREENHECK	SIDEMALL EXHAUST	SEI-18-429-VG	1265	2680	31	0.125	1092	3/4 HP	208	1	1725	17.2	38	8.3 SONES C/W "VG" EC MOTOR, MOTOR DIAL ON FAN, BACKDRAFT DAMPER
EF-8	STOR	EXHAUST	GREENHECK	INLINE CABINET	CSP-AI25	55	117	31	0.125	980	54 M	120	1	980	7.7	17	O.3 SONES C/W ISOLATION KIT, BACKDRAFT DAMPER
EF-9	STOR	EXHAUST	GREENHECK	INLINE CABINET	CSP-AI25	55	117	31	0.125	980	54 M	120	1	980	7.7	17	O.3 SONES C/W ISOLATION KIT, BACKDRAFT DAMPER
5-1 TO 7	APP BAY	DESTRAT	CANARM	CEILING PROPELLER	CP60 DWIIN	4221	8944	-	-	-	-	120	I	-	8.4	18.5	WHITE C/W 450 MM (16" DOWNROD) RREMDCQO14-W SPEED CONTROLLER TO CONTRO THE 3 FANS C/W WITH REVERSE
RH-A	SUITE KITCHEN	EXHAUST	BROAN	RANGE HOOD	BU33055	52	110	62	0.25	-	-	120	I	-	-	-	750 mm (30") WIDE STAINLESS STEEL C/W BACK DRAFT DAMPER SPEED CONTROLLER & LIGHTS

	EXHAUST & INTAKE LOUVRE SCHEDULE												
TYPE	MANUFACTURER	MODEL	THICKNESS	REMARKS									
Α	VENTEX	2225	2"	6063-T5, EXTRUDED ALUMINUM, STATIONARY 45° BLADE, 2" DEEP, STORMPROOF LOUVRE SYSTEM, 1/2"x1/2" GALVANIZED 19 GAUGE BIRDSCREEN, COLOUR TO BE SELECTED BY ARCHITECT.,									
В	VENTEX	2455	4"	6063-T5, EXTRUDED ALUMINUM, STATIONARY 30° BLADE, 4" DEEP, STORMPROOF LOUVRE SYSTEM, 1/2"x1/2" GALVANIZED 19 GAUGE BIRDSCREEN, COLOUR TO BE SELECTED BY ARCHITECT.,									

REQUIRED	OPTIONS:

NO.

I BUILT-IN DISCONNECT SMITCH

MANUFACTURER

THERMOLEC

THERMOLEC

- 2 SCR PROPORTIONAL CONTROLLER
- 7 PILOT LIGHTS 3 SCREENS BOTH SIDES 8 FULL BREAK CONTRACTORS

MODEL

TER-6-1-120

- 4 ELECTRONIC AIR FLOW SENSOR 5 SOLID STATE RELAY (TRIAC)
- 9 ELECTRONIC ROOM THERMOSTAT RT 10 MODULATING DUCT THERMOSTAT - 0 DEG F TO 100 DEG F

6 LOAD FUSES, HRC TYPE

DIMENSIONS (MM)

MIDTH HEIGHT

150Φ | 150Φ

250

250

II 24 VOLT CONTROL CIRCUIT - FOR CONNECTION

TO BY-PASS BOX CONTROLS

kΜ

ELECTRIC DUCT HEATER SCHEDULE

VOLTS/

PHASES

208

STAGES

SCR

120/1 SCR

AIR FLOW AT TEMP

52

34

300

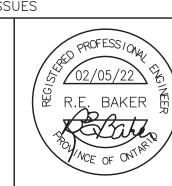
47

OPTIONS

C/W AIR FLOW SENSOR, TEMPERATURE CONTROLLER AND SENSOR

C/W OPTION 1, 2, 3, 4, 5, 10

	0	ISSUED FOR TENDER		MAY 2/22	SMS
	NO.	DESCRIPTION	·	DATE	BY
		ISSU	JES		
1		i i			



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NEW FIRE STATION No I

988 COUNTY ROAD 10

MILLBROOK ONTARIO

SCHEDULES MECHANICAL

AS NOTED DRAWN S. STRANAGHAN DESIGNED S. STRANAGHAN CHECKED REB PROJECT 21061

REV. - NOV 2021 CADD FILE NO. 21061M03

ALTERNATES : E.H. PRICE

## GENERAL SPECIFICATION

- PROVIDE ALL EQUIPMENT, MATERIALS, LABOUR AND SERVICES, ETC. NECESSARY TO COMPLETE THE WORK. ALL MATERIALS AND EQUIPMENT USED ARE TO BE NEW AND ARE TO HAVE C.S.A. APPROVAL. MATERIALS AND EQUIPMENT ARE SPECIFIED BY NAME TO ESTABLISH A STANDARD OF QUALITY AND WORKMANSHIP. USE ONLY SPECIFIED EQUIPMENT OR ALTERNATES NOTED.
- .2 VISIT AND EXAMINE THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AFFECTING THE WORK, PRIOR TO SUBMITTING TENDER. NO ALLOWANCES IN COST WILL BE MADE BY THE OWNER FOR ANY DIFFICULTIES ENCOUNTERED IN THE WORK ARISING OUT OF CONDITIONS EXISTING AT THE TIME OF TENDERING.
- .3 OBEY ALL APPLICABLE CODES AND REGULATIONS OF ALL GOVERNING AUTHORITIES HAVING JURISDICTION OVER THE WORK.
- .4 WHERE THE SUPPLY OF AN ITEM IS SPECIFIED GENERALLY ONLY WITHOUT EXTENSIVE DETAIL, THIS IMPLIES THE ITEM AND/OR WORK SHALL CONFORM WITH THE REQUIREMENTS OF THE GOVERNING AUTHORITY AND/OR MANUFACTURER'S RECOMMENDATIONS.
- .5 CONFORM TO THE BEST PRACTICES APPLICABLE TO THIS TYPE OF WORK. INSTALL ALL EQUIPMENT AND SYSTEMS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION BUT CONSISTENT WITH THE GENERAL REQUIREMENTS OF THIS
- .6 ARRANGE AND PAY FOR ALL PERMITS, INSPECTION FEES, CERTIFICATES, ETC. CONNECTED MITH THE MORK
- .7 OBTAIN FROM THE CONSULTANT TWO EXTRA SETS OF WHITE PRINTS ON WHICH TO NOTE AND CLEARLY MARK ANY APPROVAL DEVIATIONS FROM THE WORK SHOWN ON THE PLANS AS THE JOB PROGRESSES. THESE SETS OF PRINTS SHALL BE KEPT UP TO DATA AND RETURNED TO THE OWNER FOR RECORD PURPOSES AT THE COMPLETION OF THE JOB.
- .8 PERFORM ALL TESTS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION, SUPPLYING THEREFORE ALL NECESSARY EQUIPMENT AND LABOUR.
- .9 GUARANTEE ALL WORK FOR A PERIOD OF ONE YEAR. IT SHALL BE UNDERSTOOD THAT IF ANY DEFECTS BECOME EVIDENT WITHIN THE GUARANTEE PERIOD, ALL NECESSARY REPAIRS AND REPLACEMENTS TO THE WORK SHALL BE MADE WITHOUT COST TO THE OWNER. ALSO PAY FOR MAKING GOOD ANY OTHER WORK DAMAGED THROUGH DEFECTS IN THE WORK OF THIS CONTRACT DURING BOTH CONSTRUCTION AND GUARANTEE PERIODS.
- .IO PROVIDE HANGERS FOR ALL PIPES AND DUCTS AND AVOID ANY DIRECT CONTACT OF DISSIMILAR METALS. SPACE HANGERS TO PREVENT SAGGING OR LOADING JOINTS.
- .II HANGERS SHALL ONLY BE SUSPENDED FROM STRUCTURAL BEARINGS SUCH AS STEEL BEAMS OR TOP CHORD OF JOISTS. WHERE SUCH BEARINGS DO NOT EXISTS, USE NECESSARY
- .12 PROVIDE SUPPORTS FOR EQUIPMENT INSTALLED IN THIS CONTRACT, INCLUDING HANGER RODS AND SPRING VIBRATION ISOLATORS.
- .13 PROVIDE MOTORS AND DRIVES FOR ALL POWERED EQUIPMENT OF CANADIAN MAKE AND LOCALLY SERVICEABLE MANUFACTURE.
- .14 SUBMIT SIX (6) COPIES OF SHOP DRAWINGS OF EACH PIECE OF MANUFACTURED EQUIPMENT TO CONSULTANT FOR REVIEW.
- .15 RUN IN ADJUST AND BALANCE THE SYSTEMS FOR PROPER OPERATION.
- .16 ALL EQUIPMENT, PIPING, DUCTWORK, ETC. IS NEW UNLESS NOTED AS BEING EXISTING.
- .17 VERIFY EXACT LOCATION AND ELEVATION OF ALL EXISTING SERVICES PRIOR TO COMMENCING ANY WORK
- .18 MAINTAIN ALL NECESSARY INSURANCE TO PROTECT THE OWNER AND ALL TRADES FROM ALL POSSIBLE CLAIMS DURING THE CONSTRUCTION PERIOD.
- .19 DO ALL NECESSARY REQUIRED CUTTING AND PATCHING AS MAY BE REQUIRED TO PERFORM THE WORKS OF THIS CONTRACT. CUTTINGS SHALL BE KEPT TO A MINIMUM, AND SHALL BE PERFORMED WITH CLEAN CUT STRAIGHT EDGES. PATCHING SHALL BE NEAT AND CLEAN AND RESTORE TO ORIGINAL FINISH CONDITIONS USING SIMILAR TYPES TO MATERIALS. USE ONLY TRADES PERSONNEL SKILLED IN THE VARIOUS TYPES OF WORK REQUIRED (ie. MASONS, ROOFERS, ETC.).
- .20 UPON COMPLETION, REMOVE ALL WASTES, MATERIAL, ETC. AND LEAVE SITE IN CLEAN
- .21 AT PROJECT COMPLETION AND PRIOR TO FINAL INSPECTION DELIVER TO THE CONSULTANT THREE (3) COMPLETE SETS OF OPERATION AND MAINTENANCE DATA FOR ALL EQUIPMENT SUPPLIED. SUBMIT THREE (3) VINYL HARD COVERED LOOSE LEAF BINDERS. INFORMATION REQUIRED IN THESE MANUALS IS DATA PERTAINING TO EFFICIENT OPERATING AND MAINTAINING OF EQUIPMENT, INCLUDING EQUIPMENT INSTALLATION INSTRUCTIONS SUPPLIED BY MANUFACTURER. INCLUDE FINAL REVIEWED SHOP DRAWINGS THAT HAVE BEEN SUBMITTED. COMPLETED SUBMISSION MUST BE INDEXED AND DIVIDED BETWEEN INDIVIDUAL COMPONENTS.
- .22 PROVIDE & PAY FOR SERVICES OF FULLY EXPERIENCED TECHNICIAN TO INSTRUCT PERSONNEL DESIGNATED BY THE OWNER IN THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT INCLUDING CONTROLS, THERMOSTATS ETC.

## SYSTEM FLUSHING AND CLEANING

- I FLUSH AND CLEAN FLUID-CARRYING SYSTEMS AFTER COMPLETION WITH CLEAR WATER AT HIGHEST OBTAINABLE PRESSURE AND VELOCITY, DISCHARGE FLUSHING WATER THROUGH STRAINERS AND OUT THROUGH SYSTEM DRAINS WITH HOSE END OF EAN STRAINERS REPEAT FLUSHING OPERATION TO SATISFACTION OF CONSULTANT UNTIL NO FOREIGN MATTER COLLECTS IN STRAINERS. DRAIN AND CLEAN TANKS AND INSPECT TUBING AND PASSAGEWAYS IN MAJOR EQUIPMENT AND CLEAN AS NECESSARY.
- .2 ENSURE THAT VALVES INCLUDING CONTROL VALVES ARE FULLY OPEN DURING FLUSHING.
- .3 PRIOR TO STARTING FANS AND AIR HANDLING EQUIPMENT INSPECT AND CLEAN THE OUTSIDE AND INSIDE OF THE AIR HANDLING SYSTEMS INCLUDING FANS, DUCTS, COILS, AND TERMINAL UNITS TO ENSURE THAT THEY ARE COMPLETELY FREE FROM DUST AND DEBRIS. INSTALL CLEAN FILTERS IN SYSTEMS REQUIRING FILTERS.
- .4 CLEAN POLISHED, PAINTED AND PLATED WORK. CLEAN ALL FIXTURES. REMOVE DEBRIS, SURPLUS MATERIAL AND ALL TOOLS FROM SITE.
- .5 CARRY OUT ADDITIONAL CLEANING OPERATIONS AND CHEMICAL TREATMENT ON SYSTEMS SPECIFIED IN OTHER SECTIONS OF THIS DIVISION. REFER ALSO TO GENERAL REQUIREMENTS FOR GENERAL CLEANUP OF SITE.

## ACCESS PANELS AND DOORS

- INSTALL CONCEALED MECHANICAL EQUIPMENT REQUIRING ADJUSTMENT OR MAINTENANCE IN LOCATIONS EASILY ACCESSIBLE THROUGH ACCESS PANELS OR DOORS. INSTALL SYSTEMS AND COMPONENTS TO RESULT IN A MINIMUM NUMBER OF ACCESS PANELS. INDICATE ACCESS PANELS AND DOORS ON 'AS BUILT' DRAWINGS.
- .2 PROVIDE OTHER RESPECTIVE DIVISIONS WITH PANELS, DOORS OR FRAMES TOGETHER WITH PERTINENT INSTALLATION INFORMATION. ENSURE ACCESS PANELS AND DOORS ARE INSTALLED IN A MANNER TO MATCH BUILDING MATERIAL AND GRIDS WHERE APPLICABLE.
- .3 IN WALLS, CEILINGS, ETC. USE ACCESS DOORS CONSTRUCTED OF 12 GAUGE STEEL WITH FRAME STYLE COMPATIBLE WITH BUILDING SURFACE IN WHICH IT IS MOUNTED, EQUIPPED WITH CONTINUOUS PIANO HINGES AND SCREWDRIVER OPERATED LATCHES. USE ULC LISTED DOORS IN FIRE RATED WALLS AND CEILINGS. USE ACCESS DOORS MANUFACTURED BY ACUDOR, MIFAB OR LEHAGE. PROVIDE ACCESS DOORS AS FOLLOWS UNLESS OTHERWISE NOTED:
  - FOR ACCESS TO VALVES, BALANCING DAMPERS AND ITEMS REQUIRING ONLY HAND ACCESS USE 225mm X 225mm (9"x9").
- FOR ACCESS TO EQUIPMENT REQUIRING PERSONNEL ENTRY USE 600mm X 600mm (24"x24"). .4 INSTALL AT EACH FIRE DAMPER AN ACCESS DOOR IN DUCT TO ALLOW FOR INSPECTION AND RESETTING OF RELEASE DEVICE. IF DUCT IS ENCLOSED IN AN ARCHITECTURAL FINISH, ALSO PROVIDE AN ACCESS DOOR IN FINISH AS DESCRIBED ABOVE FOR DAMPER ACCESS

## PIPE IDENTIFICATION

.I ON ALL PIPING APPLY MANUFACTURED PIPE MARKERS OF CYLINDRICALLY COILED PRINTED PLASTIC SHEETS THAT SNAP AROUND PIPE. TO MEET ANSI/ASME AI3.I-2007 WITH EITHER WHITE OR BLACK LETTERING. INDICATING PIPE SERVICE AND DIRECTION OF FLOW EQUAL TO - SETON

## PLUMBING & DRAINAGE

- I SANITARY DRAINAGE AND VENT PIPING AND FITTINGS ABOVE FLOOR SHALL BE PVC DWV CERTIFIED TO CSABI81.2. AND SHALL BE LISTED TO STANDARD CAN/ULC SIO2.2 STANDARD CLEARLY MARKED WITH CERTIFICATION LOGO INDICATING FLAME SPREAD RATING NOT EXCEEDING 25. EQUAL TO IPEX SYSTEM IS
- .2 SANITARY DRAINAGE AND VENT PIPING IN PLENUM SPACE SHALL BE PVC CERTIFIED TO CSA BIBI.2 AND TESTED AND LISTED IN ACCORDANCE WITH CAN/ULC SIO2.2 AND CLEARLY MARKED WITH CERTIFICATION LOGO INDICATING FLAME SPREAD RATING NOT MORE THAN 25 AND SMOKE-DEVELOPED CLASSIFICATION NOT EXCEEDING 50. PIPING EQUAL TO IPEX SYSTEM XFR 15-50 DWV
- .3 SANITARY DRAINAGE AND VENT PIPING BELOW FLOOR SHALL BE ABS-DWV PIPING WITH SOLVENT WELD JOINTS FOR SIZES UP TO 75mm (3"). FOR SIZES 4" AND LARGER USE PVC PIPING WITH RING TITE COUPLINGS TO CSAI82.1 (DR35 OR 28).
- .4 HOT AND COLD WATER PIPING SHALL BE TYPE 'L' HARD DRAWN COPPER TUBE WITH WROUGHT COPPER SOLDER FITTINGS (USE 95/5 SOLDER).
- .5 DOMESTIC WATER PIPING BELOW FLOOR SHALL BE TYPE 'K' SOFT DRAWN COPPER TUBE WITH BRONZE FLARE FITTINGS FOR SIZES UP TO 50mm (2").

.I COVER COLD WATER PIPING AND ABOVE HORIZONTAL STORM PIPING WITH 25mm (I") THICK JOHNS MANVILLE MICROLOK GLASS FIBRE DUAL TEMPERATURE INSULATION WITH FACTORY APPLIED FIRE RESISTANT GLASS FIBRE REINFORCED KRAFT PAPER AND ALUMINUM FOIL VAPOUR BARRIER, AND ALL SERVICE JACKET. USE PRESSURE SENSITIVE LAP SEALING SYSTEM. INSTALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS

INSULATION THICKNESS ON HOT WATER PIPE SIZES										
TEMPERATURE		NOMI	NAL PIPE S	IZE						
RANGE DEG F	3/4"	I" TO I 1/4"	1/2"   TO 3"	1 1/2" TO 3"	4" TO 6"					
105° TO 140°	1.0"	1.0"	1.5"	1.5"	1.5"					

.2 ALL EXPOSED INSULATIONS SHALL BE COVERED WITH WHITE PVC INSULATED FITTING COVERS AND JACKETING SYSTEM EQUAL TO JOHNS MANVILLE ZESTON 2000. INSTALL AS PER MANUFACTURERS RECOMMENDATIONS

- .I BALL VALVES SHALL BE EQUAL TO NEWMAN HATTERSLEY FIG 1979 , FULL PORT, PTFE SEATS,O-RING STEM SEAL, SELF CLEANING CHROME PLATED BRASS BALL, VINYL GRIP ON CADMIUM PLATED STEEL HANDLE, SOLDER ENDS WITH PRESSURE RATING OF 600 LBS. ALTERNATES: WATTS, TOYO
- .2 GATE VALVES SHALL BE EQUAL TO NEWMAN HATTERSLEY FIG A41, BRONZE BODY, SOLID WEDGE DISC, INTEGRAL SEATS, SCREW OVER BONNET, SOLDER JOINT ENDS. ALTERNATES: MATTS TOYO . KITZ.

## PIPELINE SPECIALTIES

- I TRAP PRIMERS SHALL BE WITH BRONZE BODY, 16mm (5/8") SWEAT CONNECTIONS FOR WATER SUPPLY LINE AND 16mm (5/8") FEMALE IPS OUTLET CONNECTION TO DRAIN. CONNECT TO NEAREST PLUMBING FIXTURE WATER SUPPLY. ALTERNATES: WATTS, J.R.SMITH, ZURN
- .2 ELECTRONIC TRAP PRIMING MANIFOLD SHALL BE EQUAL TO PPP INC MODEL PT SERIES (SIZE AS NUMBER OF TRAPS) 120 VOLT - INSTALL AS PER MANUFACTURES RECOMMENDATIONS
- .3 PIPELINE SHOCK ABSORBERS SHALL BE WITH 18-8 STAINLESS STEEL CONSTRUCTION, AIR CHARGED BELLOWS AND THREADED MALE OUTLETS.

## NON-FREEZE HOSE BIBB

ALTERNATES: WATTS, J.R.SMITH, ZURN

.I NON-FREEZE HOSE BIBB SHALL BE AUTOMATIC DRAINING WALL HYDRANT, FLUSH INSTALLATION, NON-FREEZE INTEGRAL BACKFLOW PREVENTER, COPPER CASING, ALL BRONZE INTERIOR PARTS CERAMIC DISC CARTRIDGE, NICKEL BRONZE BOX, HINGED COVER WITH OPERATING KEY LOCK. ALTERNATES: WATTS, J.R.SMITH, ZURN

- UNFINISHED AND FINISHED AREA CLEANOUTS SHALL BE WITH BOLTED CLEANOUT PLUG, NICKEL BRONZE FRAME, ROUND FULL OPENING NICKEL BRONZE ACCESS COVER, EXTENDED FERRULE, NEOPRENE GASKETS AND VANDAL PROOF SCREMS. EQUALS: WATTS, J.R.SMITH, ZURN.
- .2 CONCEALED STACK CLEANOUTS SHALL BE ZURN ZSS-1445-1 CAST IRON CLEANOUT TEE AT BASE OF CONCEALED STACKS, AND ROUND STAINLESS STEEL ACCESS COVER. EQUALS: WATTS, J.R.SMITH, ZURN.

## FLOOR AND ROOF DRAINS

I FLOOR DRAINS IN CONC FLOOR TYPE "A" SHALL BE WITH CAST IRON BODY, TRAP PRIMER, I3mm (1/2") THICK 125mm (5") DIAMETER NICKEL BRONZE, STRAINER AND GRATE. EQUALS: WATTS, J.R. SMITH, ZURN.

## PLUMBING INSTALLATION

- PROVIDE A COMPLETE DOMESTIC HOT AND COLD WATER DRAINAGE AND VENT TO SERVE FIXTURES AND ITEMS SPECIFIED AND SHOWN ON PLANS. INSTALL AS PER OBC PART 7 AND AUTHORITY HAVING JURISDICTION.
- .2 ROUTE ABOVE GROUND PIPING IN CEILING SPACE OR WALL INTERIORS FOR CONCEALMENT WHERE EVER POSSIBLE UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS. CO-ORDINATE PIPE INSTALLATION IN WALLS WITH MASON AND OR DRYWALLER OR APPROPRIATE TRADE INVOLVED
- .4 INSTALL ISOLATION VALVES IN EACH BRANCH LINES FROM MAINS AND AT BASE OF EACH RISER. PROVIDE A FIRE RATED ACCESS DOOR AT EACH CONCEALED VALVE.
- .5 INSTALL PIPING STRAIGHT PARALLEL AND CLOSE TO WALLS AND CEILINGS, WITH APPROPRIATE PITCH. USE STANDARD FITTINGS FOR DIRECTION CHANGES.
- .6 INSTALL FLANGES OR UNIONS TO PERMIT REMOVAL OF EQUIPMENT WITHOUT DISTURBING
- .7 PROVIDE COMPLETE DRAINAGE AND VENT SYSTEMS TO SERVE FIXTURES AND ITEMS SPECIFIED AND AS SHOWN ON PLANS.
- .8 INSTALL PIPING PASSING THROUGH FIRE SEPARATIONS WITH NON-COMBUSTIBLE MATERIAL ONE SIDE OF SEPARATION OR PROVIDE APPROVED FIRE STOPPING DEVICE
- .9 WHERE EXPOSED PIPES PASSES THROUGH FINISHED FLOORS, WALLS OR CEILINGS, PROVIDE CHROME PLATED ESCUTCHEON WITH SET SCREW.
- .IO GRADE HORIZONTAL DRAINAGE AND VENT PIPING LARGER THAN 75mm (3") AT I.O% OR AS NOTED ON DRAWINGS AND SLOPE 75mm (3") AND SMALLER AT 2.0 % MIN
- II WHEN PIPE LAYING NOT IN PROGRESS, CLOSE OFF OPEN ENDS OF PIPE WITH WATER TIGHT PLUG OR CAP.
- .12 INSTALL CLEANOUTS AS PER THE PLUMBING CODE AND/OR AS SHOWN ON DRAWINGS. ENSURE CLEAN OUTS ARE MADE ACCESSIBLE. WHERE PIPING RUNS CONCEALED IN WALL INSTALL EXTENDED TYPE CLEANOUTS WHERE NECESSARY SO THAT COVER IS LOCATED ON EXPOSED WALL SURFACE.
- .13 INSTALL FLOOR DRAINS SO THAT STRAINER IS FLUSH WITH FINISHED FLOOR AND WITH TRAP PRIMER PIPED TO NEAREST PLUMBING FIXTURE WATER SUPPLY.

## INSTALLATION OF PLUMBING FIXTURES

- CONNECT FIXTURES COMPLETE WITH SUPPLIES AND DRAINS, TRAPPED, SUPPORTED, SANITARY LEVEL AND SQUARE WITH HOT WATER FAUCETS ON THE LEFT.
- .2 PROVIDE CHROME PLATED FLEXIBLE SUPPLIES TO FIXTURES WITH SCREWDRIVER STOPS, REDUCERS AND ESCUTCHEONS.
- .3 PROVIDE CHROME PLATED TRAPS & PIPING EXPOSED TO VEIW UNDER LAVATORIES

- .I INSTALL GAS PIPING IN ACCORDANCE WITH LATEST EDITION OF CAN/CSA BI49.I-00 NATURAL GAS & PROPANE INSTALLATION CODE INCLUDING LATEST AMENDMENTS AND LOCAL AUTHORITY HAVING JURISDICTION.
- .2 PROVIDE COMPLETE DISTRIBUTION SYSTEM AS SHOWN ON DRAWINGS AND CONNECT TO ALL GAS APPLIANCES. PROVIDE UNION SYSTEM & SHUT OFF VALVES AT ISOLATION POINTS, AS INDICATED AND AT GAS APPLIANCES.
- .3 TEST PIPING BEFORE APPLIANCES ARE CONNECTED AS REQUIRED BY THE GAS AUTHORITY.
- .4 IDENTIFY PIPING AS PER CODE.
- .5 GAS PIPE ON ROOF SHALL BE SUPPORTED BY PRE MANUFACTURED BLOCKING SYSTEM EQUAL TO A BETTER IDEA INC. "QUICK BLOCK" POLYPROPYLENE SUPPORT SHELL AND TYPE 3 20 PSI EXTRUDED POLYSTYRENE NON MARRING BASE.
- .6 VENTING FOR DIRECT VENT APPLIANCES SHALL CONFORM TO CSA 149.1 AND ULC 5636NATURAL GAS AND PROPANE INSTALLATION CODE. PIPING TO BE EQUAL TO IPEX SYSTEM 636.

## DUCTWORK AND ACCESSORIES

.I UNLESS NOTED OTHERWISE CONSTRUCT LOW PRESSURE RECTANGULAR DUCTWORK OF LOCK FORMING PRIME QUALITY GALVANIZED SHEET STEEL WITH ZINC COATING ASTM 525M-80 GUARANTEED TO BEND 180° AND FLATTEN WITHOUT FRACTURE OF GALVANIZATION OR METAL. ENSURE DUCT MATERIAL IS FREE FROM BLISTERS, PITS AND IMPERFECTLY COATED SPOTS, AND IS IN ACCORDANCE WITH ASHRAE AND SMACNA STANDARDS FOR DUCT DESIGN AND METAL GAUGES.

## CONSTRUCT DUCTS IN ACCORDANCE WITH FOLLOWING:

LOW PRESSURE

MAX. DUCT DIMENSION	U.S. GAU
UP TO 600mm (12")	26
325mm (13") TO 750mm (30")	24

775mm (31") TO 1350mm (54")

.2 CONSTRUCT ROUND GALVANIZED DUCTWORK USING SAME MATERIAL AS RECTANGULAR DUCTWORK EXCEPT DUCT TO BE WOUND HELICOIDALLY TO VARIOUS DIAMETERS REQUIRED, WITH FOUR PLY LOCKSEAM TIGHTLY CLOSED TO PROVIDE A SMOOTH INTERIOR. PROVIDE FITTINGS FOR ROUND DUCTWORK DIE STAMPED, SEAM WELDED, CALIBRATED AND HOT DIPPED GALVANIZED TYPE, NO JOB MADE FITTINGS WILL BE PERMITTED. CONSTRUCT ROUND DUCTS IN ACCORDANCE WITH FOLLOWING:

200mm (4") TO 400mm (8") DIAMETER - 26 GAUGE 225mm (9") TO 600mm (24") DIAMETER - 24 GAUGE

- .3 CONSTRUCT MANUAL BALANCING DAMPERS OF 18 GAUGE GALVANIZED STEEL WITH 4" WIDE OPPOSED BLADES WITH 3/8" DIAMETER TIE BARS AND DURO DYNE UNXLD QUADRANT SET WITH HEAVY GAUGE INDICATING QUADRANT, LEVER ARM AND WING TYPE LOCKING NUT.
- .4 INSTRUMENT TEST PORTS SHALL BE DURO DYNE MODEL IP-4 I8mm (3/4") DIAMETER WITH NEOPRENE GASKETS, SCREW IN CAP AND MOUNTED WITH 2 SCREWS.
- .5 ACOUSTIC INSULATION FOR DUCTWORK SHALL BE JOHNS MANVILLE PERMACOTE LINACOUSTIC, 245mm (I" )THICK INTERNAL ACOUSTIC INSULATION RIGID COATED DUCT LINER. INSTALL AS RECOMMENDED BY MANUFACTURER.
- .6 FIRE DAMPERS IN THE HORIZONTAL & VERTICAL DUCTS SHALL BE EQUAL TO RUSKIN DIBD20 TYPE "B" (DYNAMIC SYSTEMS). FIRE DAMPER SHALL BE CONSTRUCTED AND TESTED IN ACCORDANCE WITH UL SAFETY STANDARD 555. DAMPER SHALL HAVE I I/2 HOUR FIRE RATING, 212 ° F FUSIBLE LINK AND INCLUDE UL LABELS.
- .7 FLEXIBLE THERMAL INSULATION FOR DUCTWORK SHALL BE EQUAL TO JOHNS MANVILLE MICROLITE FIBRE GLASS DUCT WRAP WITH FOIL, SCRIM, KRAFT FACING.
  - -APPLY | 1/2" THICKNESS TO: - ALL MECHANICAL DUCTS UNCONDITIONED SPACES (UNLESS ACOUSTICALLY LINED)
  - ALL EXHAUST DUCT FROM ROOF DOWN TO 10'-0" OR TILL FAN)

## INSULATED MOTORIZED DAMPER

I INSULATED DAMPER SHALL BE EQUAL TO TAMCO SERIES 9000 THERMALLY BROKEN, ALUMINUM FRAME, 100mm(4 ") DEEP, INSULATED WITH POLYSTYREN. BLADES TO BE EXTRUDED ALUMINUM, INTERNALLY INSULATED WITH EXPANDED POLYURETHANE FOAM & THERMALLY

## INSTALLATION OF DUCTWORK AND ACCESSORIES

- PROVIDE COMPLETE SYSTEM OF DUCTWORK, DAMPERS, GRILLES, AND REGISTERS, ETC. REQUIRED FOR COMPLETE AIR HANDLING SYSTEMS.
- .2 DETAILS OF CONSTRUCTION AND MATERIALS NOT SPECIFIED HEREIN MUST CONFORM TO RECOMMENDATIONS OF ASHRAE HANDBOOK, AND SMACNA STANDARDS (LATEST EDITION).
- .4 PRIOR TO ORDERING OR FABRICATING DUCTS, CHECK EXACT SIZES OF OPENINGS AND LOCATIONS FOR ALL DUCTS.
- .5 PROVIDE ELBOWS WITH MINIMUM CENTER LINE RADIUS OF 1 1/2 TIMES DUCT WIDTH. WHERE THIS IS NOT POSSIBLE FIT ELBOWS WITH DOUBLE THICKNESS TURNING VANES. SHORT RADIUS ELBOWS ARE NOT ACCEPTABLE.
- .6 EXPOSED ANGLES MUST BE CLEANED AND PAINTED WITH ONE COAT OF RUST RESISTANT PAINT PRIOR TO INSTALLATION.
- .7 RECTANGULAR DUCTS OVER 450mm (18") WIDE MUST HAVE CROSS BREAKS ON FLAT SECTIONS BETWEEN JOINTS OR JOINTS AND REINFORCING.
- .8 PATTERN LONGITUDINAL SEAM JOINT AFTER PITTSBURGH OR LOCK-GROOVE TYPE LOCK.
- .9 TRANSVERSE JOINTS IN ROUND DUCTS MUST BE CRIMPED AND BEADED SLIP JOINT. TRANSVERSE JOINTS MAY BE CONSIDERED AS REINFORCING.
- .IO INSTALL TRANSVERSE JOINTS WITH THE FOLLOWING MINIMUM CHARACTERISTICS:

## MAX. DUCT TYPE OF JOINT AND MAX.

MAX. DUCT DIMENSION	TYPE OF JOINT AND MAX. SPACING	REQUIREDAND MAX. SPACING
UP TO 600mm (12")	DRIVE OR FLAT SLIP AT 2400mm (96")	NONE
325mm (13") TO 600mm (24")	25mm (I") STANDING S, BAR OR POCKET ANGLELOCK AT 2400mmm (96")	" X  " X  "AT  200mm (48")
625mm (25") TO 1200mm (48")	38mm (1 1/2") STANDING ANGLE BAR OR POCKET LOCK AT 2400mm (96")	1/2" X   1/2" X  /8"AT  200mm (48")

## .II USE STRAP HANGERS FOR DUCT SUPPORT.

.12 UNLESS NOTED OR DETAILED OTHERWISE SUPPORT HORIZONTAL DUCTS AS FOLLOWS:

MAX. DUCT WIDTH OR HEIGHT	MAX. CENTER DISTANCE	TYPE OF SUPPORT
UP TO 600mm (12")	1800mm (72")	TRAPEZE FORMED BY ANGLE 25x25x3mm, 6mm THREADED ROD WITH WASHERS AND LOCKNUTS
325mm (I3") TO 600mm (24")	1200mm (48")	TRAPEZE FORMED BY ANGLE 40×40×3mm, I3mm THREADED ROD WITH WASHERS AND LOCKNUTS
625mm (25") TO 1200mm (48")	1200mm (48")	AS ABOVE

## UNLESS NOTED OTHERWISE SUPPORT ROUND DUCTS AS FOLLOWS:

DUCT DIAMETER	MAX. CENTER DISTANCE	TYPE OF SUPPORT
UP TO 450mm (18")	AS PER MANUFACTURER	"GRIPPLE" WIRE HANGING SYSTEM

- .13 DO NOT HANG DUCTS FROM ROOF DECK.
- .14 ALL DUCT JOINTS (TRAVERSE) SHALL BE CLASS "C" AND SEALED WITH APPROVED DUCT SEALANT ON EXTERIOR.
- .15 INSTALL FIRE DAMPERS TO SUIT NFPA-90A STANDARD AND MANUFACTURERS INSTRUCTIONS WITH FRAME RIGIDLY SECURED TO WALLS AND OR FLOORS. PROVIDE STEEL SLEEVES, ANGLES, & ALL REQUIRED MATERIALS TO SUIT UL TESTING. PROVIDE BREAKAWAY JOINT AT DUCTS

## INSTALLATION OF AIR HANDLING EQUIPMENT

- I INSTALL AIR HANDLING EQUIPMENT, COMPLETE WITH MOTORS, BELT DRIVES GUARDS VIBRATION ISOLATORS ETC., AS DESCRIBED AND SHOWN ON DRAWINGS. SET EQUIPMENT PLUMB, LEVEL. AND ARRANGE FOR MAXIMUM SERVICABLILITY.
- .2 FOR ROOF MOUNTED EQUIPMENT PROVIDE PREFABRICATED ROOF CURBS, PROVIDE GENERAL CONTRACTOR WITH EXACT LOCATION AND DIMENSIONS REQUIRED FOR CURBS
- .3 AT INLET AND OUTLET OF EACH PIECE OF AIR HANDLING EQUIPMENT, PROVIDE FLEXIBLE CONNECTIONS: WHERE CONNECTIONS ARE EXPOSED TO OUTSIDE BUILDING , PROVIDE WEATHERPROOF FLEXIBLE CONNECTIONS.
- .4 PROVIDE NECESSARYSTRUCTURAL STEEL MEMBERS, RODS, BRACKETS, BOLTS, NUTS ETC TO SUPPORT AIR HANDLING EQUIPMENT

- I THE CONTRACTOR IS TO INCLUDE ALL MECHANICAL SYSTEM CONTROLS CALLED FOR OR IMPLIED BY THE DRAWINGS AND SPECIFICATIONS, TOGETHER WITH ALL NECESSARY INCIDENTALS WHETHER REFERRED TO OR NOT TO ALLOW ALL SYSTEMS TO FUNCTION COMPLETELY TO THE FULL INTENT OF THE DRAWINGS AND SPECIFICATIONS
- .2 LOW VOLTAGE WIRING (< 50 VOLTS) TO BE BY MECHANICAL CONTRACTOR
- .3 LOW VOLTAGE WIRING TO BE SUITABLE FOR THE USE IN THE RETURN AIR PLENUM (PLENUM RATED LOW VOLTAGE WIRE)
- .4 WIRING IN THE MECHANICAL ROOM, SERVICE ROOMS AND ANY OTHER AREAS WHERE WIRING IS EXPOSED TO VIEW SHALL RUN IN EMT CONDUIT.

## CONTROL EQUIPMENT

- .I UNIT HEATER THERMOSTATS SHALL BE BY UNIT HEATER MANUFACTURER
- .2 THERMOSTATS SHALL BE HONEYWELL TB8220 COMMERCIAL VISION PRO PROGRAMMABLE THERMOSTAT. THERMOSTAT TO BE TOUCH SCREEN, CAPABILITY OF 2 HEAT \$ 2 COOL STAGES, AUTOMATIC CHANGE OVER, CONTINOUS FAN OPERATION DURING OCCUPIED TIMES, CAPABILE OF OPERATING SYSTEMS AT OCCUPIED/UNOCCUPIED TIMES, CAPABILITY TO HAVE REMOTE TEMPERATURE SENSOR (S), TEMPORARY OCCUPIED SETTINGS (O-4 HRS DURATION)
- .3 MOTORIZED DAMPER BY BELIMO 120 VOLT
- .4 CARBON MONOXIDE & NITROGEN DIOXIDE SYSTEM AS SPECIFIED ON DRAWINGS
- .5 DESTRATIFICATION FANS CONTROLLER BY UNIT MANUFACTURER.
- .6 7 DAY 24 HR TIMER SHALL BE EQUAL TO INTERMATIC ETITO5C

## CONTROL DESCRIPTION

- .I A/C UNITS AC-I TO A/C-2 SHALL BE OPERATED BY ELECTRONIC PREOGRAMMABLE THERMOSTAT THERMOSTAT SET POINTS SHALL AS DIRECTED BY OWNER. FAN SHALL RUN CONTINUOUSLY DURING BUILDING OCCUPIED TIMES.
- .2 SAC UNITS SAC-I SHALL BE OPERATED BY ELECTRONIC PREOGRAMMABLE THERMOSTAT THERMOSTAT SET POINTS SHALL AS DIRECTED BY OWNER. FAN SHALL RUN CONTINUOUSLY DURING BUILDING OCCUPIED TIMES.
- .3 EXHAUST FAN EF-I SHALL START/STOP BY LIGHTING CONTROL ( BY ELECTRICAL)
- .4 EXHAUST FAN EF-2 SHALL START/STOP BY LIGHTING CONTROL ( BY ELECTRICAL) .5 EXHAUST FAN EF-3 SHALL START/STOP BY LIGHTING CONTROL ( BY ELECTRICAL)
- .6 EXHAUST FAN EF-4 SHALL START/STOP BY LIGHTING CONTROL ( BY ELECTRICAL)
- .7 EXHAUST FAN EF-5 SHALL START/STOP BY LIGHTING CONTROL ( BY ELECTRICAL) .8 EXHAUST FAN EF-6 SHALL BE INTERLOCKED WITH CO/NO2 DETECTOR D-I \$ MOTORIZED MOTORIZED DAMPER MD-I - ON RISE OF EITHER CO OR NO2 TO MIN SET POINTS EF-6 STARTS MD-I OPENS - ON DROP BELOW SET POINT EF-6 FANS STOP AND DAMPER MD-I CLOSES
- ELECTRICAL TO PROVIDE HOA STARTER SEE ELECTICAL DRAWINGS FOR INTERLOCKS .9 EXHAUST FAN EF-7 SHALL BE INTERLOCKED WITH CO/NO2 DETECTOR D-2 & MOTORIZED MOTORIZED DAMPER MD-2 - ON RISE OF EITHER CO OR NO2 TO MIN SET POINTS EF-7 STARTS MD-2 OPENS - ON DROP BELOW SET POINT EF-7 FAN STOP AND DAMPER MD-2 CLOSES
- ELECTRICAL TO PROVIDE HOA STARTER SEE ELECTICAL DRAWINGS FOR INTERLOCKS
- .IO EXHAUST FAN EF-8 SHALL START/STOP BY LIGHTING CONTROL ( BY ELECTRICAL )
- .II EXHAUST FAN EF-9 SHALL START/STOP BY LIGHTING CONTROL ( BY ELECTRICAL)
- .12 UNIT HEATERS UH-1 THRU UH-5 SHALL OPERATE BY THERMOSTAT .13 DESTRATIFICATION FANS DS-1 THRU DS-7 TO BE CONTROLLED BY SPEED CONTROLLERS
- .14 ENERGY RECOVERY VENTILATOR ERV-I SHALL START/STOP BY LIGHTING CONTROL
- ( BY ELECTRICAL) .15 ENERGY RECOVERY VENTILATOR ERV-2 SHALL START/STOP 7 DAY 24 HR TIMER
- .I6 CARBON MONOXIDE/CARBON DIOXIDE DETECTION SYSYEM DI SHALL START/STOP EXHAUST FAN EF-6 AND OPEN MOTORIZED DAMPER MD-1 THRU HAND/OFF/AUTO STARTER ( STARTER BY ELECTRICAL)
- .I7 CARBON MONOXIDE/CARBON DIOXIDE DETECTION SYSYEM D2 SHALL START/STOP EXHAUST FAN

## EF-7 AND OPEN MOTORIZED DAMPER MD-2 THRU HAND/OFF/AUTO STARTER ( STARTER BY ELECTRICAL) .18 HOT WATER RECIRCULATING PUMP SHALL START/STOP 7 DAY 24 HR TIMER

## BALANCING OF AIR SYSTEM

- BALANCING OF SYSTEMS MUST BE DONE BY A REPUTABLE QUALIFIED FIRM EXPERIENCED IN THIS TYPE OF WORK.
- .2 RUN-IN COMPLETE HEATING AND VENTILATING SYSTEM. AFTER CLEANING SYSTEM REMOVE FILTERS AND RE-INSTALL. LUBRICATE SHAFTS, SHEAVES, BEARINGS, ETC. IN
- ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. .3 BALANCE, ADJUST AND PUT PARTS OF SYSTEM INTO PROPER WORKING ORDER, ADJUST, DAMPERS, CONTROLS, FAN SPEEDS, ETC., IN ORDER THAT PROPER DISTRIBUTION AND FLOW QUANTITIES ARE OBTAINED SO THAT COMPLETE JOB WILL BE LEFT READY FOR REGULAR OPERATION, ALL TO SATISFACTION OF CONSULTANT. SETTING UP AND BALANCING OF COMPLETE HEATING AND VENTILATING SYSTEMS TO BE DONE BY A TECHNICIAN
- EXPERIENCED IN THIS TYPE OF WORK. .4 BALANCE AIR SYSTEMS TO OBTAIN AIR FLOW CONDITIONS SPECIFIED AND GIVEN ON DRAWINGS. AFTER BALANCING HAS BEEN COMPLETE PREPARE AN AIR BALANCE REPORT
- INDICATING THE FOLLOWING. THREE COPES TO BE SUBMITTED TO CONSULTANT.

## .5 BALANCING OF AIR SYSTEM

- FANS AND MOTORS:
- MOTOR RPM

- STATIC PRESSURE AT FAN DISCHARGE

- MOTOR CURRENT FOR ALL PHASES - MOTOR VOLTAGE FOR ALL PHASES - STATIC PRESSURE AT FAN INLET

## - AIR CAPACITY

- FRESH AND RETURN AIR VOLUMES

- DIFFUSERS AND GRILLES
- AIR CAPACITY AT EACH OUTLET

O ISSUED FOR TENDER MAY 2/22 SM NO. | DESCRIPTION DATE ISSUES

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RE-USE OF ANY PORTION OF THIS DOCUMENT IS



NEW FIRE STATION

988 COUNTY ROAD 10

No I

MILLBROOK ONTARIO

SPECIFICATION MECHANICAL AS NOTED DWG NO.

S. STRANAGHAN DESIGNED S. STRANAGHA CHECKED REB PROJECT 21061

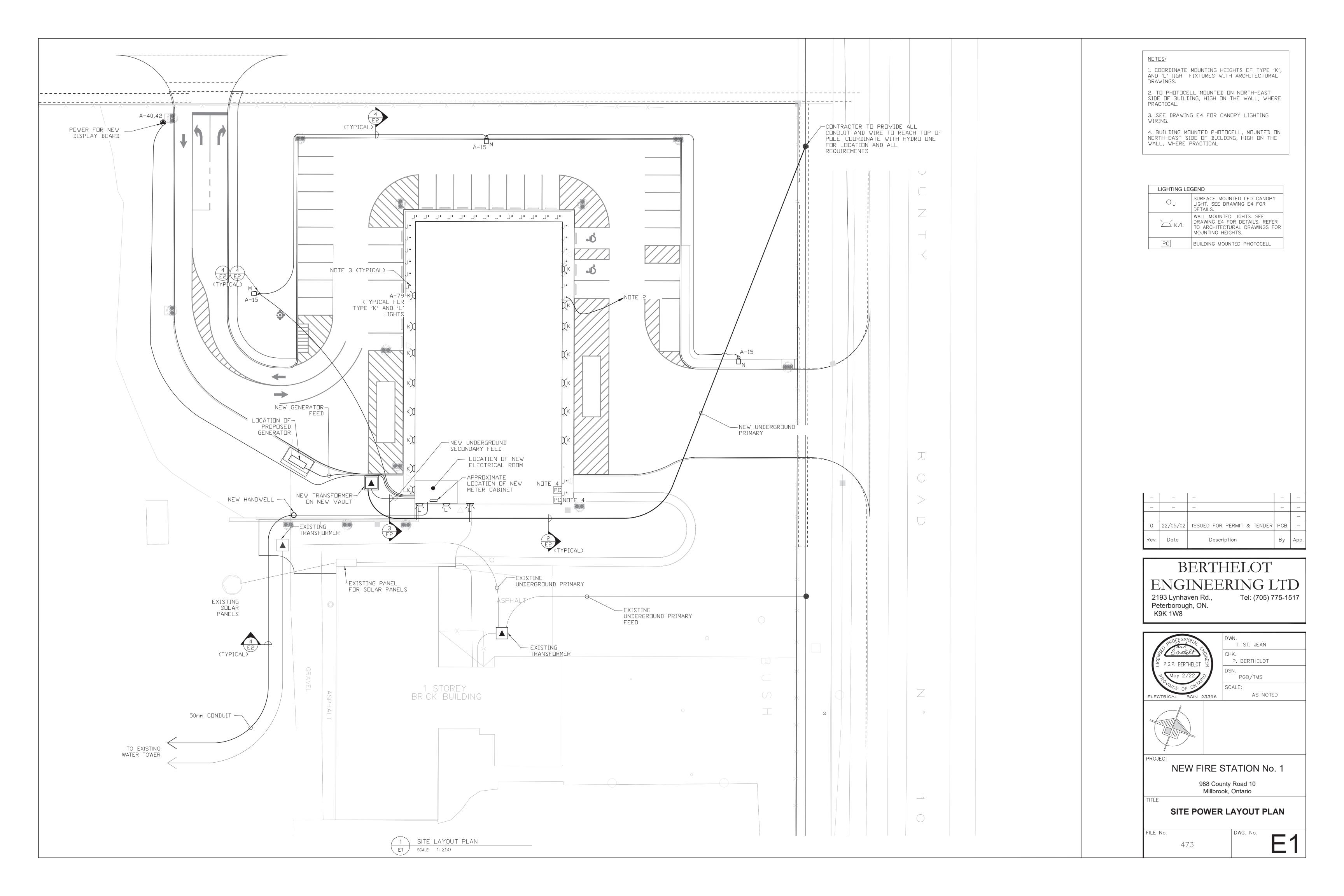
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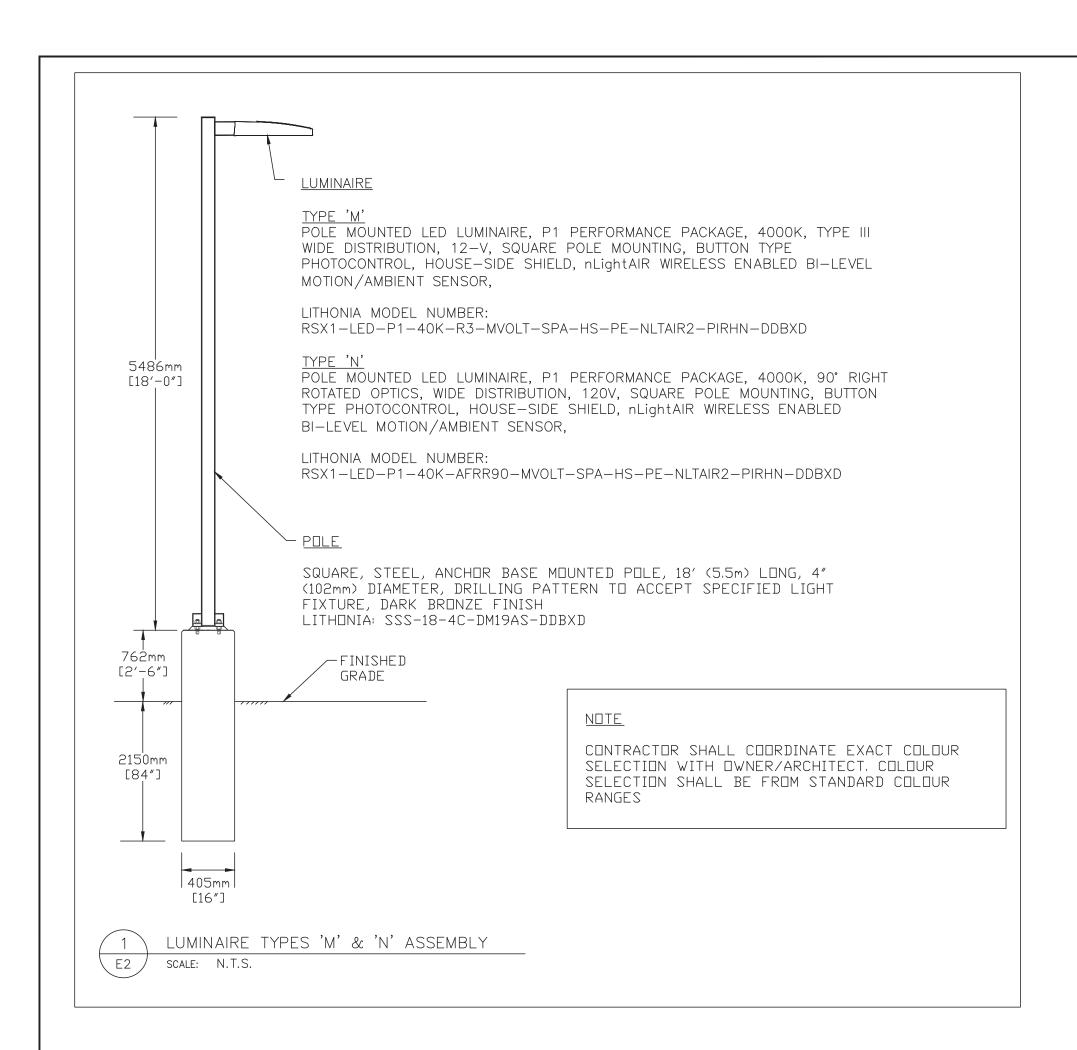
R.E. BAKER

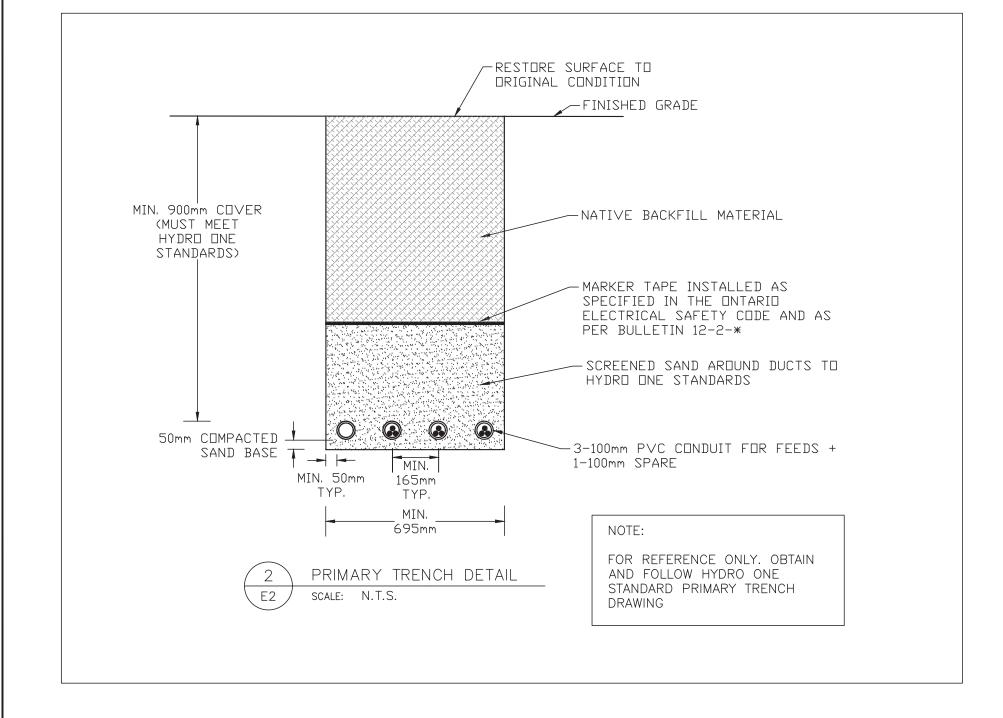
Email: info@otsengineering.

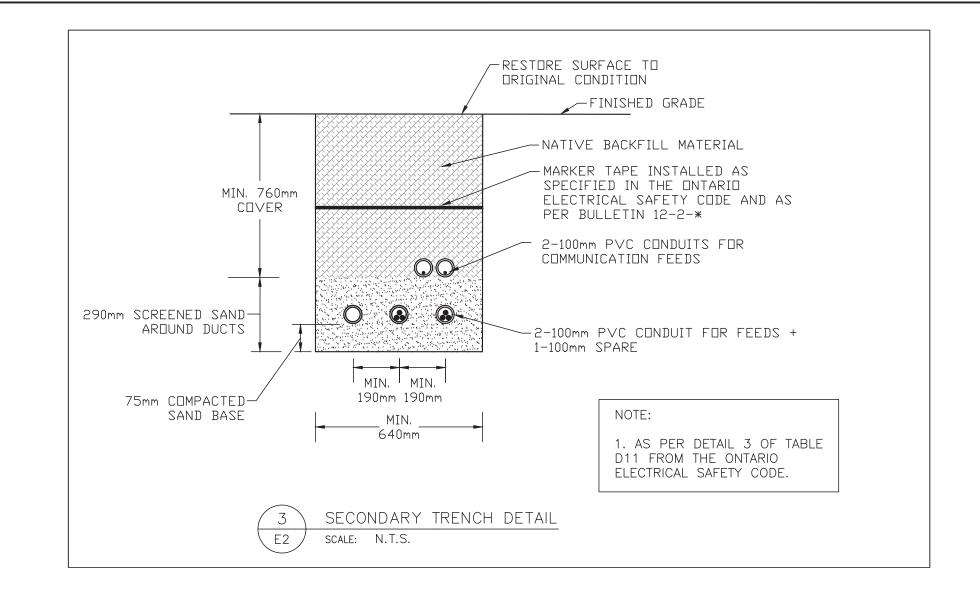
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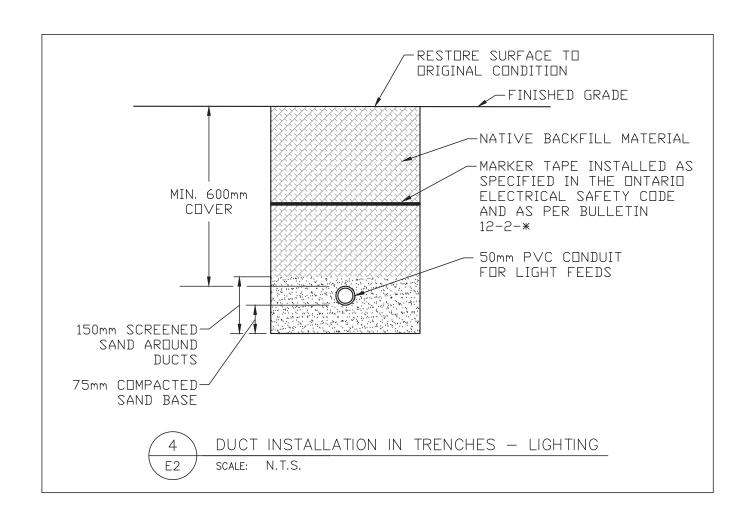


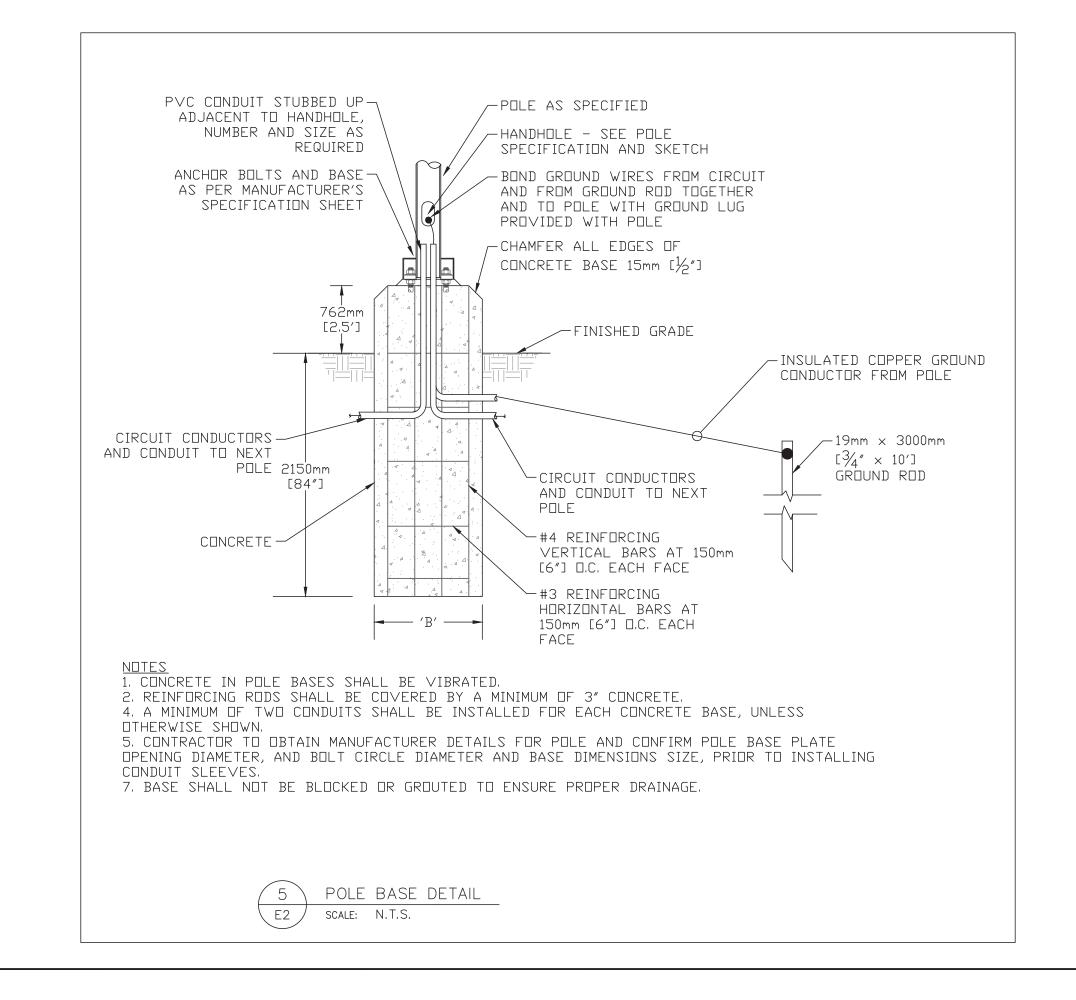


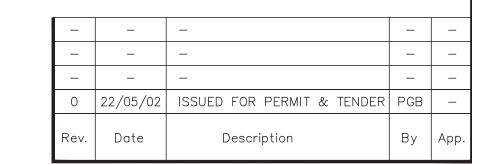












## BERTHELOT ENGINEERING LTD

2193 Lynhaven Rd., Peterborough, ON. K9K 1W8

DWN.
T. ST. JEAN

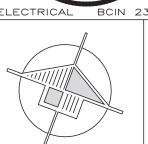
CHK.
P. BERTHELOT

DSN.
PGB/TMS

SCALE:

Tel: (705) 775-1517

AS NOTED



JECT
NEW FIRE STATION No. 1

988 County Road 10

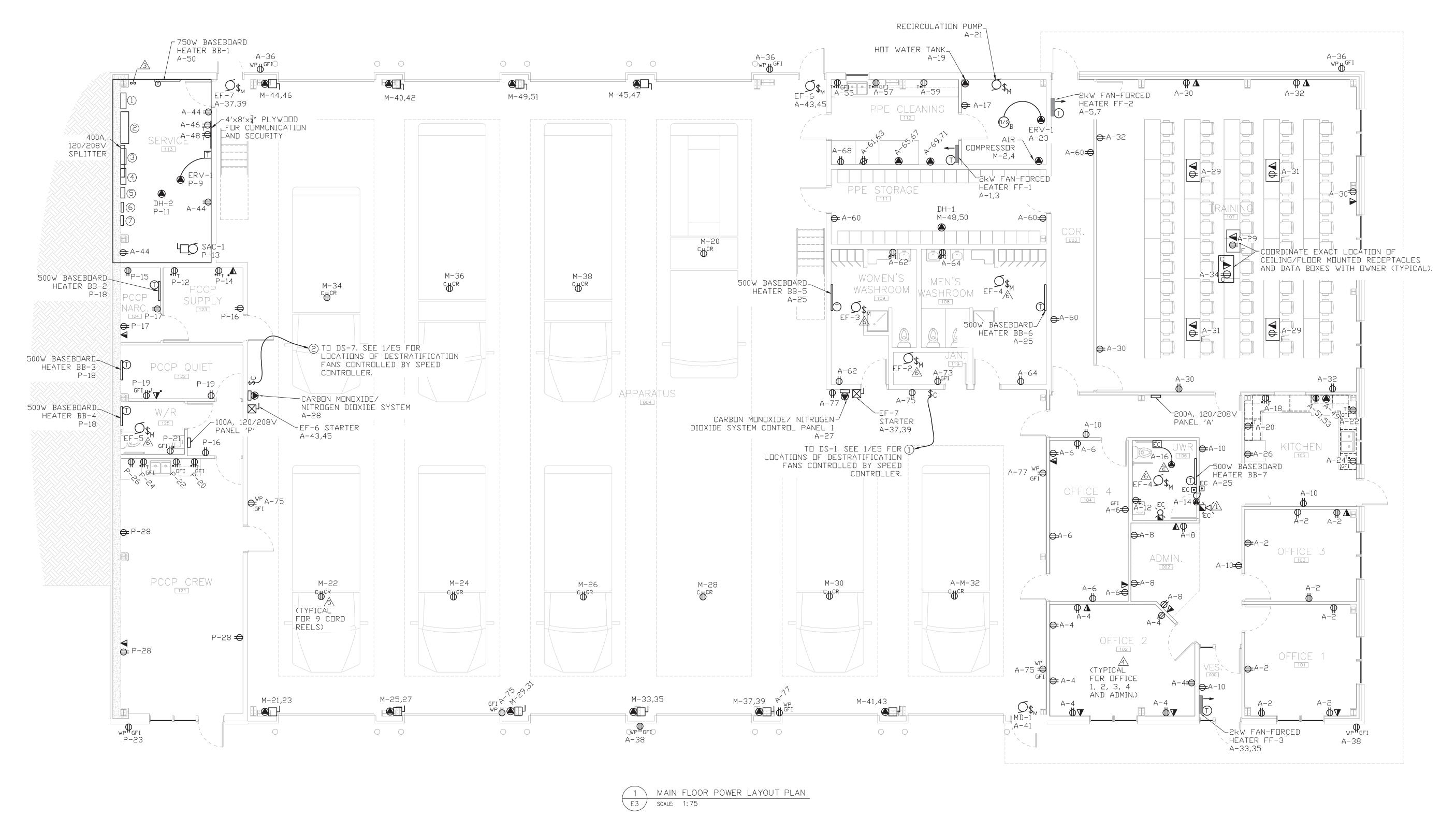
DWG. No.

Millbrook, Ontario

SITE LIGHTING DETAILS

FILE No. 473

E2



SERVICE ROOM EQUIPMENT LAYOUT LIST

1 400A, 120/208V SERVICE ENTRANCE RATED DISCONNECT SWITCH

- 2 4'x4' METER CABINET
- (3) 400A, 120/208V DISCONNECT SWITCH
- 400A, 120/208V SERVICE ENTRANCE RATED DISCONNECT SWITCH FOR FUTURE SOLAR
- 5 400A, 120/208V AUTOMATIC TRANSFER SWITCH
- 6 400A, 120/208V DISTRIBUTION PANEL 'DP'
- VEHICLE BAY CORD REEL

	VEHICLE BAY CORD REEL			
SYMBOL	MODEL No.	MANUFACTURER	DESCRIPTION	
с ф <sup>CR</sup>	L4545 123 3A	REELCRAFT	PROVIDE RECEPTACLE ON RETRACTABLE CORD REEL FOR POWER FOR DIESEL ENGINE BLOCK HEATER. RECEPTACLE SHALL BE 20A, 120V, ON SPRING DRIVEN CORD REEL, C/W 9.1m (30) OF #12-3 COPPER CABLE, RATED 90°C, AND BALL STOP	

## NUTES:

EMERGENCY CALL SYSTEM VISUAL AND AUDIBLE

ALARM OVER DOOR, SEE DETAIL 2 ON DRAWING E1
FOR EMERGENCY CALL SYSTEM SINGLE LINE DIAGRAM.

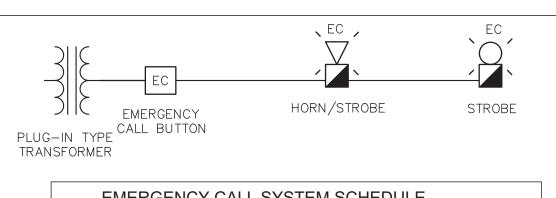
EMERGENCY CALL SYSTEM TRANSFORMER

SUPPLY AND INSTALL 2-3" EMPTY CONDUITS FROM SERVICE ROOM TO ROOF FOR FUTURE SOLAR SYSTEM AND 2-3" CONDUITS TO MAIN SERVICE AREA

COORDINATE EXACT LOCATIONS OF RECEPTACLES AND DATA BOXES WITH FURNITURE LAYOUTS ON ARCHITECTURAL DRAWINGS.

EXACT LOCATION OF CORD DROP SHALL BE COORDINATED WITH OWNER DURING CONSTRUCTION.

EXHAUST FANS EF-1, EF-2, EF-3, EF-4, & EF-5 ARE CONTROLLED BY ROOM LIGHT SWITCH.



EMERGENCY CALL SYSTEM SCHEDULE			
MODEL NUMBER	PROVIDER	DESCRIPTION	
NC-P24VDC	MIRCOM	120:24V TRANSFORMER, PLUG-IN TYPE	
EC-116	MIRCOM	EMERGENCY PUSH BUTTON STATION	
P2W-P	MIRCOM	EMERGENCY HORN/STROBE	

PUSHBUTTON SHALL BE MOUNTED AT A HEIGHT BETWEEN 900mm AND 1100mm.

2 EMERGENCY CALL SYSTEM SINGLE LINE DIAGRAM

83 SCALE: N.T.S.

ELECTRIC HEATING EQUIPMENT SCHEDULE				
SYMBOL	MODEL NUMBER	MANUFACTURER	DESCRIPTION	
<b>↑</b> (T) FF-4	OAC01502-T	OUELLET OR APPROVED EQUAL	1.5kW COMMERCIAL FAN-FORCED HEATER, WHITE, 120V, C/W INTEGRAL TAMPERPROOF THERMOSTAT, RECESSED	
<b>↑ ⊤</b> FF-1/FF-3	OAC02000-T	OUELLET OR APPROVED EQUAL	2kW COMMERCIAL FAN-FORCED HEATER, WHITE, 208V, C/W INTEGRAL TAMPERPROOF THERMOSTAT, RECESSED	
<b>↑</b> ① FF-2	OACO2OOO-T C/W KIT-OAC-BS1	OUELLET OR APPROVED EQUAL	2kW COMMERCIAL FAN-FORCED HEATER, WHITE, 208V, C/W INTEGRAL TAMPERPROOF THERMOSTAT, COMPLETE WITH SURFACE MOUNTING BOX	
	ODB0502 C/W KIT-ODB-TB6	OUELLET OR APPROVED EQUAL	500W BASEBOARD HEATER, WHITE, 120V, C/W INTEGRAL THERMOSTAT	
	ODB0752 C/W KIT-ODB-TB6	OUELLET OR APPROVED EQUAL	750W BASEBOARD HEATER, WHITE, 120V, C/W INTEGRAL THERMOSTAT	
<b>●</b> UH-8	OAE2000AM- EO-TB6	OUELLET OR APPROVED EQUAL	1.5kW UNIT HEATER, 208V, C/W INTEGRAL THERMOSTAT, CEILING OR WALL MOUNTED	

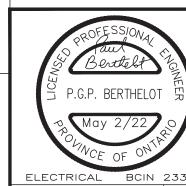
POWER LEGEND		
1	DATA/PHONE OUTLET	
	DIRECT CONNECTION	
\$ <sub>M</sub>	MOTOR RATED SWITCH	
$\bigcirc$	SINGLE PHASE MOTOR	
$\bigcirc$	THREE PHASE MOTOR	
	DISCONNECT SWITCH	
$\square$	MOTOR STARTER	
Τ	24H, 7-DAY TIMER	
•	AUTOMATIC DOOR PUSHBUTTONS	
	LOCK BUTTON	
\$ <sub>sc</sub>	SPEED CONTROLLER SWITCH	
\$ <sub>MB</sub>	MASTER GARAGE DOOR OPENER SWITCH	
-WW	ELECTRICAL PANEL	
	DESTRATIFICATION FAN	

RECEPTACLE LEGEND

	_
	_
	_
0 22/05/02 ISSUED FOR PERMIT & TENDER PGB	_
Rev. Date Description By	Арр

## BERTHELOT ENGINEERING LTD

2193 Lynhaven Rd., Tel: (705) 775-1517 Peterborough, ON. K9K 1W8

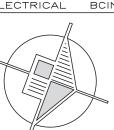


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PGB/TMS

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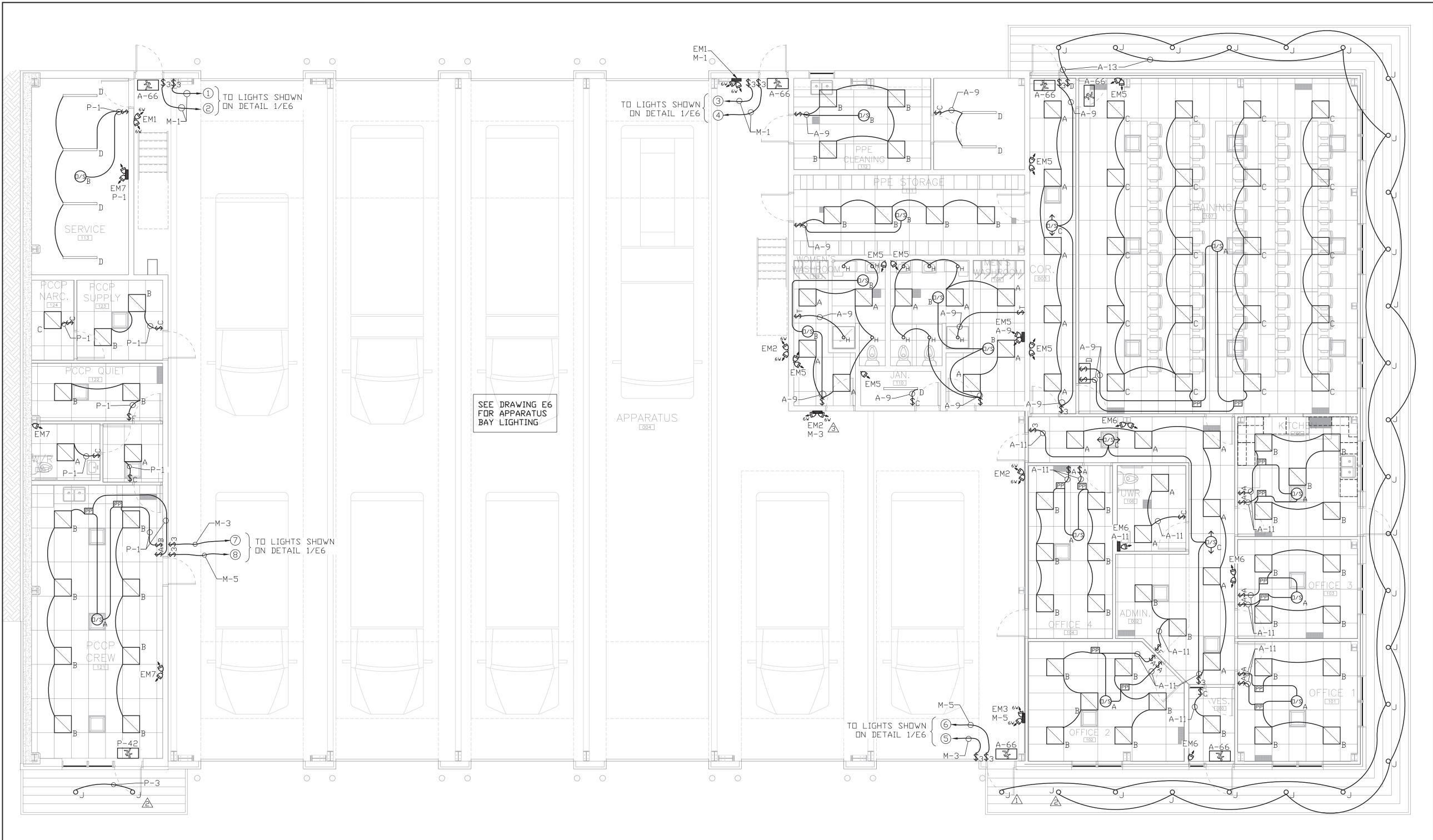
NEW FIRE STATION No. 1

988 County Road 10 Millbrook, Ontario

MAIN FLOOR POWER LAYOUT PLAN

o. 473

E



MAIN FLOOR LIGHTING LAYOUT PLAN E4 SCALE: 1:75

	LIGHTING SCHEDULE				
SYMBOL	MODEL NUMBER	MANUFACTURER	DESCRIPTION		
A	22FP2140C	EATON-METALUX OR APPROVED EQUAL	2'x2' LED FLAT PANEL, 2494 LUMENS (20.7W), 4000K, 120V		
В	22FP3240C	EATON-METALUX OR APPROVED EQUAL	2'x2' LED FLAT PANEL, 3560 LUMENS (30W), 4000K, 120V		
C	22FP4240C	EATON-METALUX OR APPROVED EQUAL	2'x2' LED FLAT PANEL, 4465 LUMENS (38.3W), 4000K, 120V		
D	4SNLED-LD5-56SL-LN- UNV-L840-CD1-U	EATON-METALUX OR APPROVED EQUAL	4' SURFACE MOUNTED STRIP LIGHT, SEMI-FROST LENS, 5708 LUMENS (46W), 120V, 4000K, 0-10V DIMMING DRIVER		
F	4SNLED-LD5-64SL-LN- UNV-L840-CD1-U	EATON-METALUX OR APPROVED EQUAL	4' SURFACE MOUNTED STRIP LIGHT, SEMI-FROST LENS, 6435 LUMENS (55W), 120V, 4000K, 0-10V DIMMING DRIVER		
G	4ILED-LD5-14-W-FL- UNV-L840-CD2-U C/W CHAIN SET (SEE DESCRIPTION)	EATON-METALUX OR APPROVED EQUAL	4' INDUSTRIAL LED LINEAR BAY FIXTURE, WIDE DISTRIBUTION, FROSTED ACRYLIC LENS AND FRAME, ~14000 LUMENS, 98W, 120V, 4000K C/W CHAIN SET TO MOUNT LIGHTS AT ~20' A.F.F. IN A SLOPED CEILING		
Он	SLD405840WH C/W 4" COMPATIBLE HOUSING	EATON—HALO OR APPROVED EQUAL	4" SURFACE LED DOWNLIGHT, 80CRI, 120V, WHITE, 4000K, 800 LUMENS (12.2W), WET LOCATION LISTED		
OJ	SMD4R69SWH- SMD4RTRMxx C/W 4" COMPATIBLE HOUSING	EATON—HALO OR APPROVED EQUAL	4" SURFACE LED DOWNLIGHT, 90CRI, 120V, WHITE, 4000K, 600 LUMENS (9W), WET LOCATION LISTED		

	LIGHTING SCHEDULE				
SYMBOL	MODEL NUMBER	MANUFACTURER	DESCRIPTION		
K	WDGE2-LED-P1-40K- 80CRI-TFTM-MVOLT- SRM-PIRH1FC3V- DBLXD	LITHONIA LIGHTING	WALL MOUNTED LED FIXTURE, P1 LUMEN PACKAGE (1,133 LUMENS, 11W), 80CRI, FORWARD THROW MEDIUM DISTRIBUTION, 120V, SURFACE MOUNT BRACKET, BI-LEVEL MOTION SENSOR FOR 15-30' MOUNTING HEIGHTS WITH PHOTOCELL PRE-PROGRAMMED FOR DUSK TO DAWN OPERATION, BLACK IN COLOUR		
	WDGE1-LED-P1-40K- 80CRI-VF-MVOLT- SRM-PE-DBLXD	LITHONIA LIGHTING	WALL MOUNTED LED FIXTURE, P1 LUMEN PACKAGE (1,200 LUMENS, 10W), 80CRI, VISUAL COMFORT FORWARD THROW, 120V, SURFACE MOUNT BRACKET, BUTTON TYPE PHOTOCELL, BLACK IN COLOUR		

	LIGHTING CONTROLS SCHEDULE				
SYMBOL	MODEL NUMBER	MANUFACTURER	DESCRIPTION		
\$ <sub>A</sub>	LVS-M-1-PL-WH	HUBBELL	MANUAL ON/OVERRIDE OFF LOW VOLTAGE MOMENTARY SWITCH, WHITE IN COLOUR		
\$ <sub>B</sub>	LVS-L-1-PL-WH	HUBBELL	AUTO ON/OVERRIDE OFF LOW VOLTAGE LATCHING SWITCH, WHITE IN COLOUR		
\$c	LHMTS1	HUBBELL	PASSIVE, DUAL TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR, 120V, WHITE IN COLOUR, PROGRAMMED AUTO—ON (WALL PLATE NOT INCLUDED)		
\$ T			TIMER SWITCH COMPATIBLE WITH LED LIGHTING		
\$\$ <sub>D</sub>	LVSD-ML-4-WH	HUBBELL OR APPROVED EQUAL	MANUAL ON/OVERRIDE OFF LOW VOLTAGE MOMENTARY/LATCHING DIMMING SWITCH, WHITE IN COLOUR		
PP	UVPP/UVPPM/MPSA	HUBBELL	UNIVERSAL VOLTAGE POWER PACK/AUXILIARY PACK		
0/S A	OMNIDT2000BP1277	HUBBELL	DUAL TECHNOLOGY, 360° CEILING MOUNTED SENSOR, LINE VOLTAGE, WHITE IN COLOUR		
(0/S)	OMNIDT2000	HUBBELL	DUAL TECHNOLOGY, 360° CEILING MOUNTED SENSOR, LOW VOLTAGE, WHITE IN COLOUR C/W MANUAL ON/OFF POWER PACK		
<b>←</b> 0/9→	PIR1000H	HUBBELL	PASSIVE INFRARED CEILING HALLWAY SENSOR, 16'x18' LINEAR FEET		

CANDPY LIGHTING IS CONNECTED TO AND CONTROLLED BY A DIMMING LIGHT SWITCH AND BUILDING MOUNTED PHOTOCELL.

CANDPY LIGHTING IS CONNECTED TO AND CONTROLLED BY BUILDING MOUNTED PHOTOCELL.

MERGENCY LIGHTS IN APPARATUS BAY SHALL BE MOUNTED AT 9' A.F.F.

CONTRACTOR SHALL CONFIRM LIGHT FIXTURE COLOURS WITH OWNER/ARCHITECT WHERE COLOURED FASCIA, SIDING, ETC, EXIST.
COLOURS WILL BE SELECTED FROM STANDARD
COLOUR RANGE.

LIGHTING LEGEND \$ TOGGLE SWITCH \$3 3-WAY TOGGLE SWITCH

## EMERGENCY LIGHTING & EXIT SCHEDULE

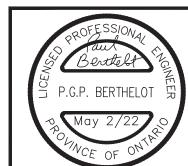
SYMBOL	MODEL No.	MANUFACTURER	DESCRIPTION
EM1	12ESLxx/xxx	EMERGILITE OR APPROVED EQUAL	EMERGENCY LIGHTING UNIT, BATTERY CAPACITY AS LISTED IN TABLE ON THIS DRAWING, 12VDC, 10 YEAR BATTERY, C/W MR16 LED HEADS AS LISTED AND MOUNTING SHELF
	EF9DM-LI	EMERGILITE OR APPROVED EQUAL	DUAL REMOTE HEAD, 12VDC, 5W, MR16 LED
\$	EF9M-LI	EMERGILITE OR APPROVED EQUAL	SINGLE REMOTE HEAD, 12VDC, 5W, MR16 LED
6W 6W	EF9DM-LJ	EMERGILITE OR APPROVED EQUAL	DUAL REMOTE HEAD, 12VDC, 6W, MR16 LED
\$ 6W	EF9M-LJ	EMERGILITE OR APPROVED EQUAL	SINGLE REMOTE HEAD, 12VDC, 6W, MR16 LED
Ž	EA1WIIDN	EMERGILITE OR APPROVED EQUAL	SELF POWERED RUNNING EXIT SIGN, SINGLE FACE, WALL OR CEILING MOUNT AS INDICATED, ARROWS AS INDICATED, LED LAMPS FOR 120VAC, CSA-C860-96 LISTED & CERTIFIED
	EA2WIIDN	EMERGILITE OR APPROVED EQUAL	SELF POWERED RUNNING EXIT SIGN, DOUBLE FACE, WALL OR CEILING MOUNT AS INDICATED, ARROWS AS INDICATED, LED LAMPS FOR 120VAC, CSA-C860-96 LISTED & CERTIFIED

	EMERG	ENCY LIGHTIN	G BATTERY F	PACKS
PACK #	SIZE	CIRCUIT	# OF 5W HEADS	# OF 6W HEADS
EM1	72W	M-1	-	2
EM2	72W	M-3	_	2
ЕМЗ	36W	M-5	-	2
EM4	36W	P-3	1	_
EM5	100W	A-9	2	_
EM6	72W	A-11	1	_
EM7	36W	P-1	2	_

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# BERTHELOT

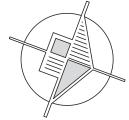
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	DWN. T. ST. JEAN
	CHK. P. BERTHELOT
	DSN. PGB/TMS
	SCALE:
96	AS NOTED

Tel: (705) 775-1517



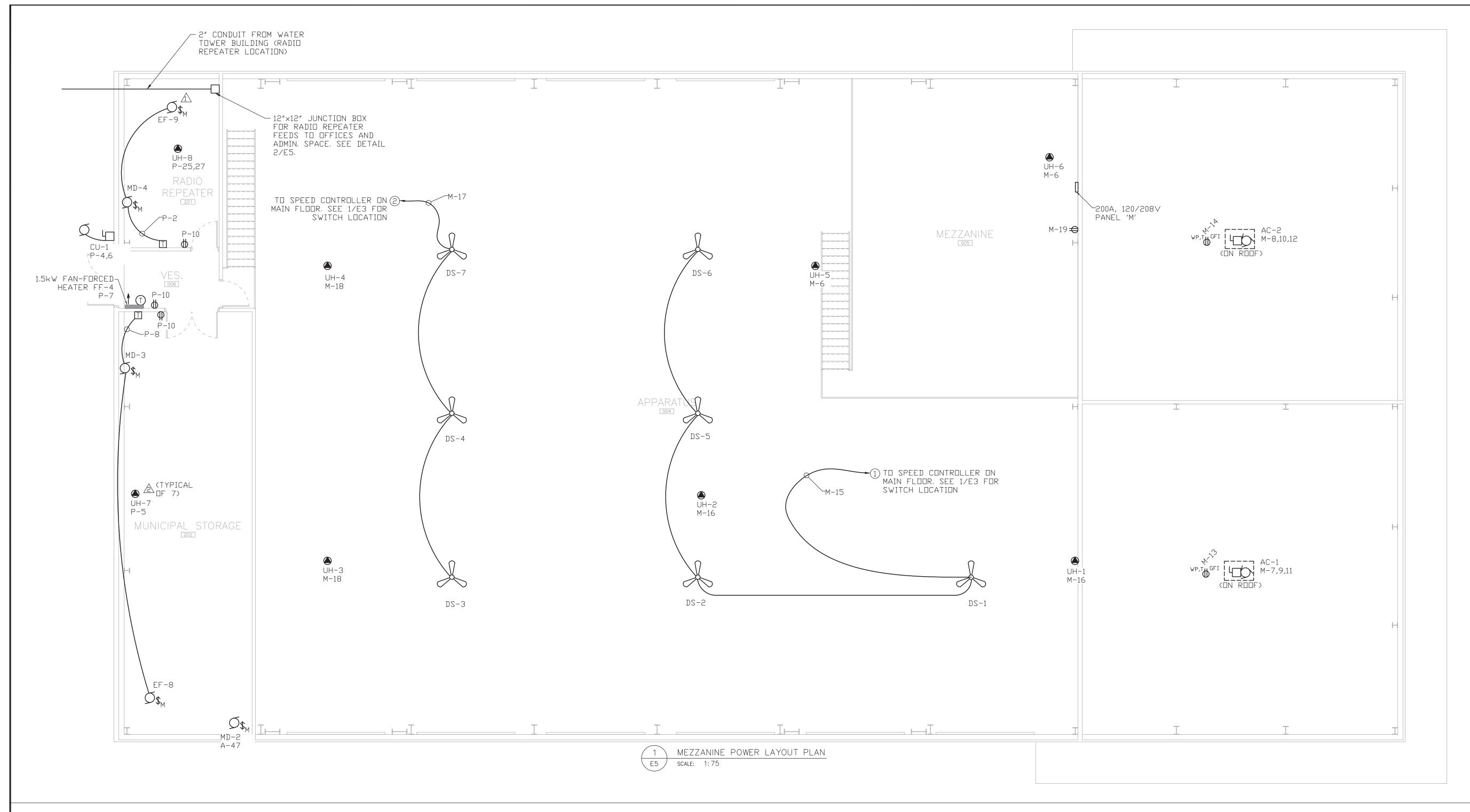


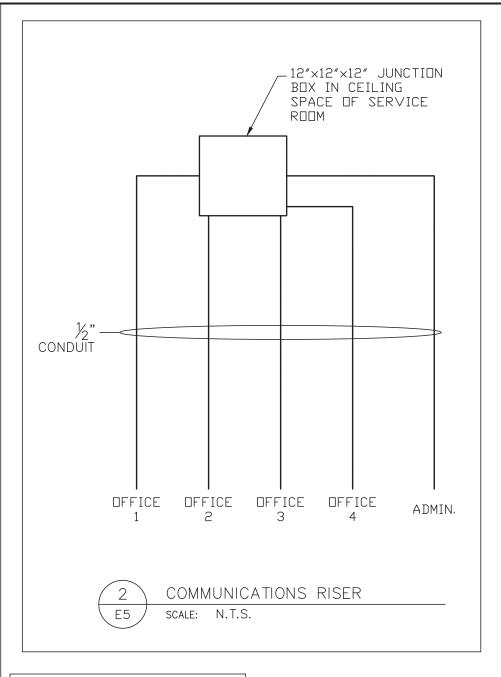
NEW FIRE STATION No. 1

988 County Road 10 Millbrook, Ontario

MAIN FLOOR LIGHTING LAYOUT PLAN

FILE No. 473



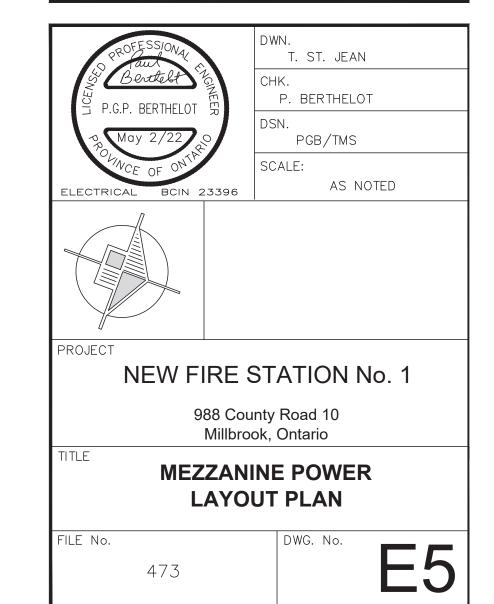


PO\	WER LEGEND		
<b>T</b>	DATA/PHONE OUTLET	RECE	PTACLE LEGEND
<u> </u>	DIRECT CONNECTION	Ф	RECEPTACLE
\$ <sub>M</sub>	MOTOR RATED SWITCH	Ф	240V RECEPTACLE
$\overline{\bigcirc}$	SINGLE PHASE MOTOR	WP	WEATHERPROOF
$\frac{\mathcal{L}}{\mathcal{L}}$	THREE PHASE MOTOR	Т	20A T-SLOT
	DISCONNECT SWITCH	С	CEILING MOUNTED
<u> </u>	MOTOR STARTER	CR	RETRACTABLE CORD REEL
	AUTOMATIC DOOR	GFI	GROUND FAULT INTERUPTED
•	PUSHBUTTONS	•	MOUNTED ABOVE COUNTER
	LOCK BUTTON		
\$ <sub>sc</sub>	SPEED CONTROLLER SWITCH		
\$ <sub>MB</sub>	MASTER GARAGE DOOR OPENER SWITCH		
V////	ELECTRICAL PANEL		
	DESTRATIFICATION FAN		

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## BERTHELOT ENGINEERING LTD

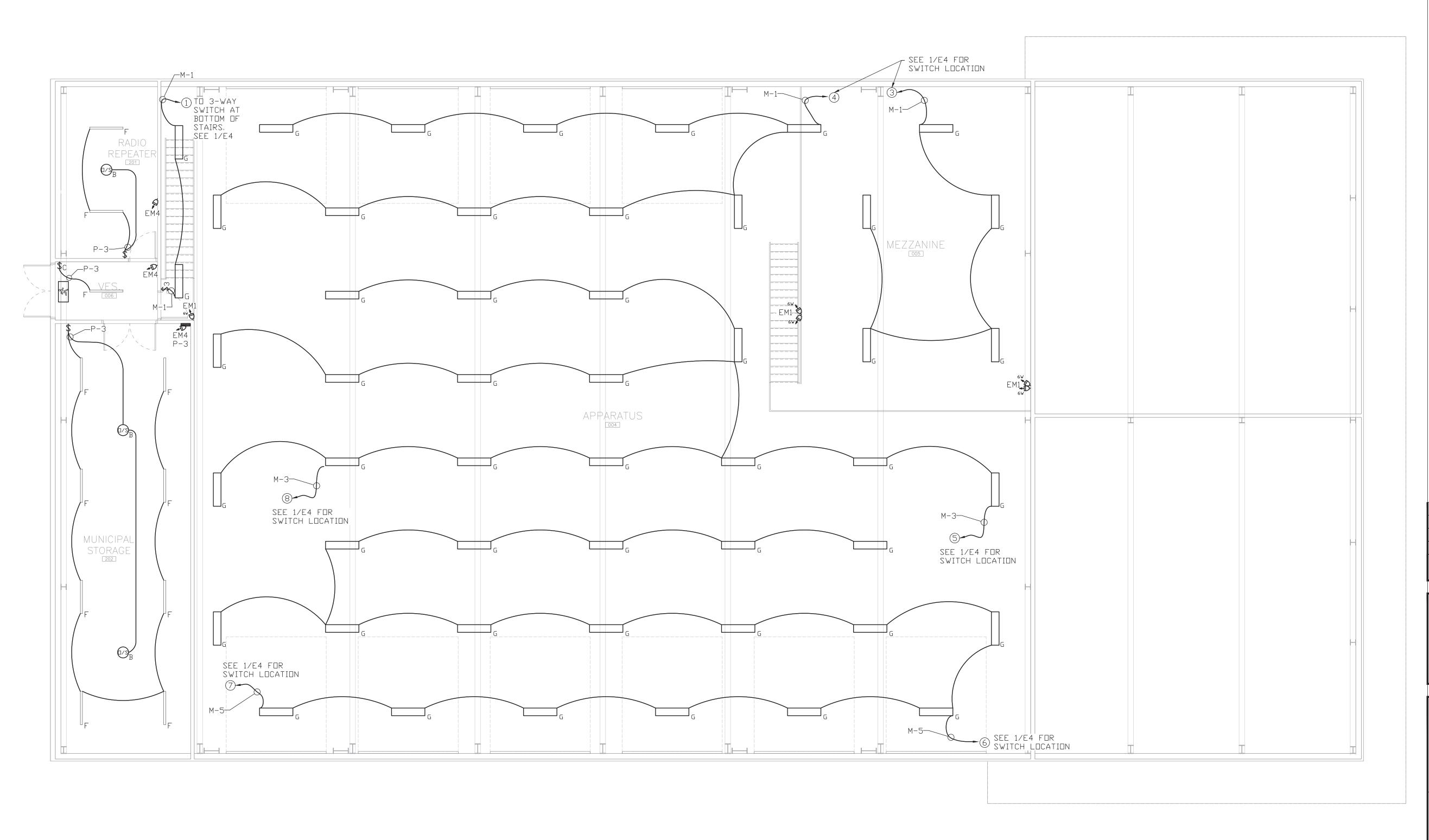
2193 Lynhaven Rd., Tel: (705) 775-1517 Peterborough, ON. K9K 1W8



NOTES:

 $\stackrel{\frown}{1}$  UH-8 IS SUPPLIED AND INSTALLED BY ELECTRICAL.

UH-1, UH-2, UH-3, UH-4, UH-5, UH-6, & UH-7 ARE SUPPLIED AND INSTALLED BY MECHANICAL, WIRED BY ELECTRICAL.

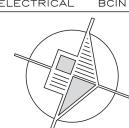


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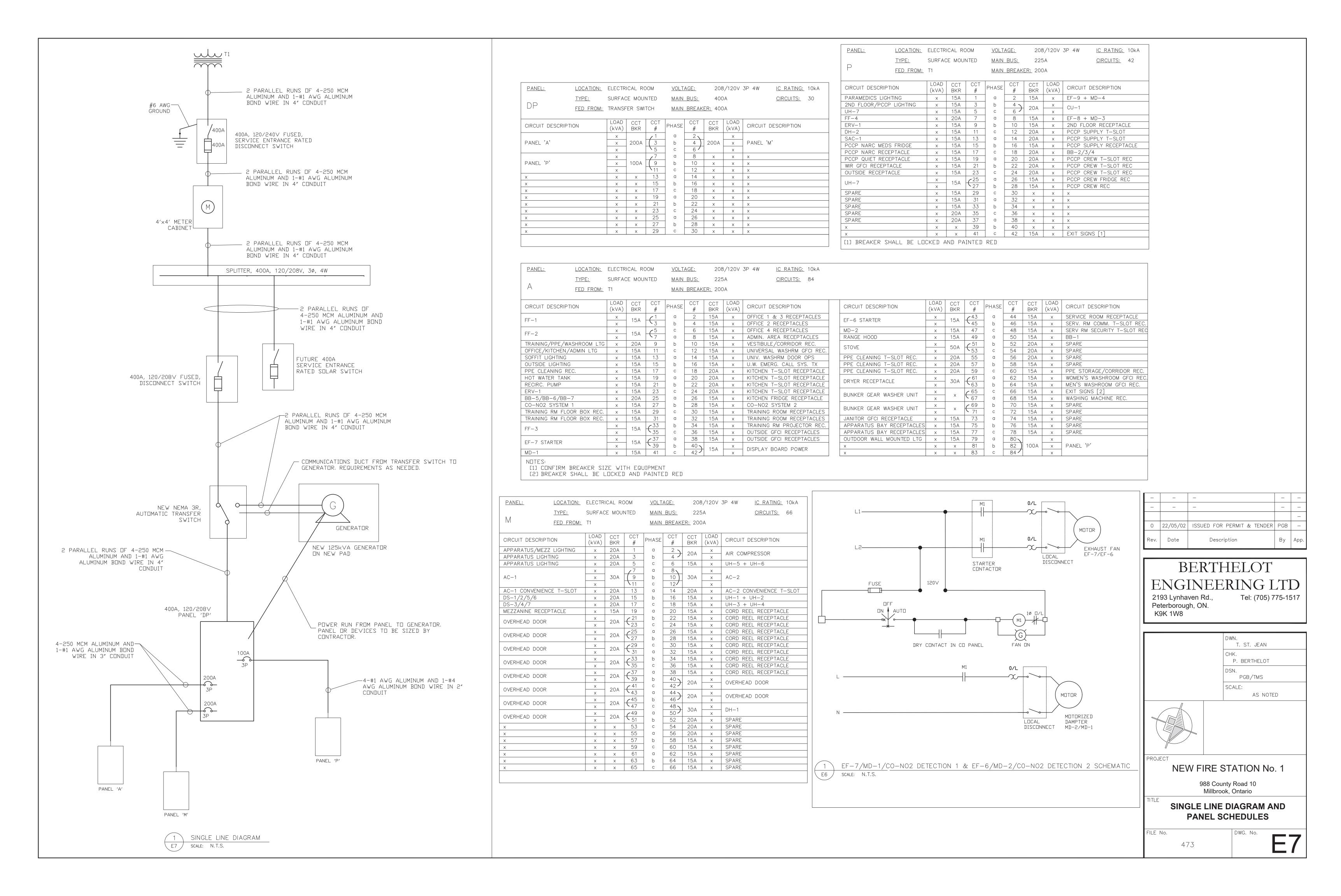
NEW FIRE STATION No. 1

988 County Road 10 Millbrook, Ontario

MEZZANINE LIGHTING LAYOUT PLAN

FILE No. 473

DWG. NO.



## <u>Part 1 — General</u>

## <u>1.1. General</u>

1.1.1. This section covers the general requirements for the electrical work. Read all divisions of the contract documents.

## 1.1.2. All equipment shall be CSA approved.

1.1.3. All equipment, materials and installation methods shall conform to the best commercial standard practice, and in accordance with the Ontario Electrical Safety Code and all bulletins.

## 1.2. Outline Scope

1.2.1. The following major items of work shall be supplied and installed under the electrical contract:

1.2.1.1.Provide all labour, materials, equipment and services to complete the work of the electrical division as further specified and as shown on the drawings:

a.Provide main service power to the building as detailed on the drawings.

b.Supply and install light fixtures as detailed on the drawings.

c.Supply and install distribution panels as detailed on the drawings.

d.Supply and install exit, emergency lights, and receptacles as detailed on drawings.

e. Supply and Install generator and transfer switch. f.Miscellaneous removals as required.

## 1.3. Contract Drawings

1.3.1. Drawings for electrical work are performance drawings, diagrammatic, intended to convey scope of work and indicate general arrangement and approximate location of apparatus, fixtures and wiring. Drawings do not show all conduits. Those shown are diagrammatic only.

1.3.2. Additional money over the contract price shall not be paid unless an approved change order is issued by the architect. Claims for extras shall be submitted with a complete breakdown of material, labour, hourly rates, etc.

## 1.4. Shop Drawings

1.4.1 Submit four reproducible copies of manufacturer's detailed shop drawings, which indicate clearly the materials and/or equipment actually being supplied, all details of construction, accurate dimensions, capacity, operating characteristics and performance for each piece of manufactured equipment and for items listed under each section for review.

1.4.2. Shop drawings submitted for approval that are not stamped and signed in accordance with the preceding requirements will be returned for resubmittal.

1.4.3. Installation of any equipment shall not commence until after shop drawings have been reviewed by the consultant.

1.4.4. Bind one set of approved shop drawings in each operating and maintenance instruction manual.

## 1.5. Co-Operation with Other Trades

1.5.1. The contractor shall co-operate fully with other trades in such a manner as not to interfere with other work being carried out at the job site. Where other work and equipment has to be installed along with work pertaining to this division, arrange with other trades to install this work to best suit the needs for the particular condition.

## 1.6. Warranty

1.6.1. The contractor shall guarantee all work for a period of one year after the date of issue of the final certificate by the engineer and for longer periods where specified. If any defects become evident within the guarantee periods all necessary repairs and replacements to the work shall be made without cost to the owner. The contractor shall pay for making good any other work damaged through defects in the work of this section during both construction and guarantee periods.

## 1.7. Insurance

1.7.1. The contractor shall maintain all necessary insurance to protect the owner and all trades from all possible claims.

## 1.8. Liability 1.8.1. The contractor shall assume full responsibility for layout of work and

for any damage caused by improper location or carrying out of work of these sections.

## 1.9. Cutting and Patching

1.9.1. The contractor shall complete all required cutting and patching to perform the work of this contract. Cuttings shall be kept to a minimum and be performed with clean cut straight edges. Patching shall be neat, clean and restore to original finish conditions using similar types of materials. Use only trades personnel skilled in the various types of work required. Cutting of structural members shall not be permitted without written approval by the owner.

## 1.10. Record Drawings

1.10.1 The contractor shall maintain accurate records of changes to the drawings on the job site. These shall include: all changes included in addenda to the tender documents; site instructions; and contract change notices. Upon project completion, the contractor shall forward to the consultant the set of drawings indicating the as—built conditions.

## 1.11. Existing Conditions

1.11.1. The contractor shall visit and examine the site and become familiar with all existing conditions affecting the work prior to submitting tender. No allowances in cost will be made by the owner for any difficulties encountered in the work arising out of conditions existing at the time of tendering.

## 1.12. Product Delivery, Storage and Handling

1.12.1. Inspect products delivered to the site and before acceptance, ensure that the product is: new; free from defects; is as specified; and is as per reviewed shop drawings, all in accordance with the contract documents. Store materials only in designated areas and protect as necessary to maintain materials in new condition.

## 1.13. Operations and Maintenance Instructions

1.13.1. Three (3) copies of complete operating and maintenance instructions for all electrical equipment and systems, bound in hard covered manuals shall be supplied.

## 1.14. Instructions to Owner

1.14.1. Instruct the owner's representative(s) in all respects of the operation and maintenance of systems and equipment. Obtain from the consultant a list of the owner's representative(s) qualified to receive instructions.

## 1.15. <u>Clean-Up</u>

1.15.1. At all times keep the premises free from accumulations of waste material or rubbish caused by employees or work. At the completion 2.4. Outlet, Conduit Boxes and Fittings of the work, remove all rubbish and all tools, equipment and surplus materials from and about the work and leave the work "broom clean" or its equivalent, unless more exactly specified. All lighting fixtures, light switches, and other operable electrical devices shall be cleaned at the completion of work.

## 1.16. Codes and Standards

1.16.1. Provide equipment and materials, and do the work, in accordance with the following, and comply with relevant sections as adopted or amended by authorities having jurisdiction:

- a. Canadian electrical code (Canada) b. National Fire Protection Association
- c. CAN/ULC Standards
- d. Ontario Electrical Safety Code, including current bulletins and
- amendments. e. Ontario Building Code
- f. Worker's Compensation Board Regulations g. Governing Fire Codes in the Province Of Ontario
- 1.17. Permit, Fees and Inspection

1.17.1 The contractor shall apply for, obtain and pay all permits, licenses, inspections, examinations and fees required. The contractor shall arrange for inspection of all work by the authorities having jurisdiction over the work. On completion of the work, present to the owner the final unconditional certificate of approval by the inspection authorities.

1.17.2 Before starting any work, submit the required number of copies of drawings and specifications to the authorities for their approval and comments. Comply with any changes requested as part of the contract, but notify the owner immediately of such changes, for proper processing of these requirements.

## <u>Part 2 - Basic Materials and Methods</u>

## 2.1. Conduits, Conduit Fastenings and Conduit Fittings

2.1.1. Conduit systems shall be electrical metallic tubing, intermediate metal conduit, galvanized rigid steel conduit, or polyvinyl chloride. Minimum size shall be 1/2". Use EMT above—grade for indoor construction except where rigid conduit is required. Where galvanized rigid steel conduit is required, provide lock—nuts and bushing at terminations.

2.1.2. Type BX -90 flexible armoured cable may be used only for final connections to lighting fixtures. Use flexible conduit for final connections to motors and sensors. Lengths should not exceed 18". Use liquid tight PVC jacketed flexible conduit for connections to equipment outdoors or in damp locations.

2.1.3. Conduits shall be of sufficient size to permit easy removal of the conductors at any time. Use one hole steel straps to secure surface conduits 2" and smaller, and two hole steel straps for conduits larger than 2". Use beam clamps to secure conduits to expose steel work. Install fittings manufactured for use with the conduit supplied. Watertight connectors and couplings are required for EMT. Set screws are not acceptable.

2.1.4. Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass. Conduits shall be run exposed in service areas, but shall be concealed in finished rooms. Exposed conduits shall be installed parallel and perpendicular to walls and ceilings. Wherever conduits cross building expansion joints, approved means, such as conduit expansion joints or flexible conduit loops shall be provided as necessary to take care of the movement. Conduit shall not be run horizontally in partitions.

2.1.5. All conduits shall be properly supported with spacing not to exceed C.E.C. requirements. Approved electrical hardware, hangers, structural shapes, etc. Shall be used. Perforated strap handlers shall not be permitted. Where run exposed on concrete or masonry walls, conduits shall be supported using conduit clamps and lead anchors or approved preset concrete inserts and where run on building steel, beam clamps shall be used. Conduit clamps shall be heavy duty galvanized malleable iron. Factory "ells" shall be used where 90° bends are required for 1" or larger conduits. Make bends and offsets with a hickey or power bender without flattening or denting the conduits. Bend conduit cold. Replace conduit if kinked or flattened more than 1/10th of its original diameter. Connect conduit lengths with only approved couplings or conduit unions.

2.1.6. Install conduits so that there is no interference with access openings in ceilings or access to equipment in the ceiling space. Install conduit to avoid proximity to water or heating pipes. Do not run within 6" of such pipes. Where crossings are unavoidable, maintain a minimum distance of 1" from the pipe covering.

2.1.7. Square—cut all conduit ends, ream and file to remove all burrs before installation and properly clean and cap all empty conduits. Install fish cord in empty conduits.

## 2.2. Wires and Cables

2.2.1. All conductors shall be copper unless otherwise noted. Conductors shall be stranded for #8AWG and larger with 1000v insulation of chemically cross—linked thermo setting polyethylene. 600v insulation can be used for conductors smaller than #8AWG. Base the 600 volt RW 90 conductor ampacities on published CEC 90°C. Rating. Cables shall be loaded to not more than 75% (70% to 80%) of this rating. Minimum #12AWG wiring shall be used.

2.2.2.Neutrals of power systems, although connected to a common ground at the source, shall be electrically separated and isolated from each other beyond this point of origination. Feeders to two or more switches or panels and the tapoffs to same shall all be run using the same size conductors throughout.

2.2.3. All wires shall be carried full size from source to the load. Neutral wires shall be the same size as phase wires. Equipment Ground wires shall be one size smaller than phase wire, except that the conductor shall not be larger than a 4/0 and shall be no. 10 for 30 amp circuits and no. 12 for circuits less than 30 amps. Insulation shall be type RW 90. Multi-circuit branch circuits in same conduit require only one equipment ground wire.

## 2.3. Junction and Pullboxes

2.3.1. Junction and pullboxes should be of welded steel construction with screw—on flat covers for surface mounting. Install pullboxes in inconspicuous but accessible locations. Install junction and pullboxes so as not to exceed 30m of conduit run between pullboxes. All junction and pullboxes should be labelled to identify equipment or circuit numbers.

2.4.1. Size boxes in accordance with CSA C22.1. 100 mm square or larger outlet boxes as required for special devices. Gang boxes where wiring devices are grouped. Provide blank cover plates for boxes without wiring devices. Support boxes independently of connecting conduits. Conduit boxes shall be cast FS boxes with factory threaded hubs and mounting feet for surface wiring. Provide correct size of opening in boxes for conduit and cables. Reducing washers are not allowed.

## 2.5. Wiring Devices

## <u>Switches</u>

2.5.1. Locate light switches as shown on the drawings and on the latch side of doors. Install single throw switches with handle in "up" position when switch closed.

2.5.2 Install switches in gang type outlet box when more than one switch is required in one location.

2.5.3 Provide 20A, 125V single pole specification grade light switches as shown on the contract drawings. <u>Receptacles</u>

2.5.4.Install receptacles in gang type outlet box when more than one receptacle is required in one location. Combination boxes with barriers shall be used where outlets for more than one system are grouped.

2.5.5 Provide 15A, 120V specification grade duplex convenience outlets as shown on the contract drawings.

2.5.6 Do not install outlets back to back in wall. Allow a minimum 150 mm horizontal clearance between boxes. Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm and information is given before installation.

## <u>Telephone/Cable T.V./Computer Raceway System, (etc.)</u>

2.5.7.Empty conduit systems shall be provided for telephone from outlet box to accessible ceiling space, or as shown on the drawings.

2.5.8.Contractor is responsible for providing and/or coordinating the size, type and location of the incoming telephone conduit with the telephone company or the building owner.

2.5.9. All interior building raceways shall be EMT.

finished floor.

2.5.10.2 long radius 90 degree bends shall be the maximum allowed between pull boxes.

2.5.11. Pole cords shall be provided in each conduit for future pulling of

2.5.12. Contractor shall provide necessary boxes and associated cover plates as required for the above systems.

## Mounting Heights

2.5.13 Mounting heights for wiring devices shall be as follows unless otherwise indicated and shall be from centre line of outlet box to 2.5.13.1. Duplex receptacles shall be mounted 300mm above finished

floor or 150mm above counter top.

2.5.13.2.Light switches shall be mounted at no less than 900mm

and no more than 1100mm above finished floor. 2.5.13.3.Disconnect switches shall be mounted 1200mm above

2.5.13.4.Exit lights shall be mounted 300mm above door trim.

2.5.13.5.Emergency lights shall be mounted 2100mm to 2200mm above finished floor unless otherwise stated.

2.5.13.6.Panelboards shall be mounted 1200mm above finished floor. <u>Cover Plates</u>

2.5.14.Cover plates from one manufacturer shall be used throughout the project and supplied for all wiring devices and any pullboxes.

## <u>Equipment Nameplates</u>

2.5.15.Nameplates shall be provided for all pieces of electrical equipment including panelboards, junction boxes, pull boxes, splitters, control panels, disconnect switches and motor starters. Nameplates shall be black laminated rigid plastic with 0.25 inch high white engraved letters. Nameplates shall be fastened to equipment in a conspicuous location on equipment. A list of the exact engraving of nameplates shall be submitted for approval prior to fabrication. Nameplates for disconnect switches shall indicate name of equipment being controlled and circuit and panel from which they are fed.

## <u>Part 3 — Distribution</u>

## 3.1. Disconnect Switches

3.1.1. Disconnect switches shall be horsepower rated, quick—make, quick break, with handle interlocked so that switch door cannot be opened unless switch is in de-energized position. Disconnect Switches shall be fusible and nonfusible as indicated on the drawings. Switches shall be heavy duty having visible blade construction, positive pressure fuse clips, and silverplated current carrying parts. Provision shall be made for padlocking switch in "OFF" position. Switches shall have on-off switch position indication on switch enclosure cover.

## 3.2. Panelboards

3.2.1. Use panelboards of one manufacturer throughout the project. The supplier shall install circuit breakers in panelboards before shipment. Sequence phase bussing shall have odd numbered breakers on left and even on right with each breaker identified by permanent number identification as to circuit number. All panelboards shall have a copper bus. Single phase lighting and distribution panelboards shall have a solid neutral of same ampere rating as mains. Mains shall be suitable for bolt-on breakers. Enclosures shall be EEMAC type 1 surface mounted with trim and floor finish grey.

3.2.2.Complete circuit directory with typewritten legend showing location and load of each circuit. The directory shall be updated from the contract drawings to include all addenda, site instructions, contract change orders and any other circuit changes. Supply two keys for each panelboard and key panelboards alike.

3.2.3. Main breaker shall be separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker. Lock on devices for certain breakers shall be provided for items such as exit, emergency and night light circuits.

3.2.4.Locate panelboards as indicated and mount securely, plumb, true and square to adjoining surfaces. Install surface mounted panelboards on steel angle or channel framing or on fire rated painted plywood backboards.

## <u> Part 4 — Lighting Equipment</u>

4.1. Locate and install luminaires as indicated on contract drawings and connect luminaires to lighting circuits.

## <u>Lighting Control</u>

4.2. Locate and install lighting control devices as indicated on the contract drawings, and in accordance with ASHRAE Standard 90.1-2010, Section 9, Lighting.

4.3. Contractor shall provide functional testing of the lighting control system as per Section 9.4.4. (Functional Testing), of ASHRAE Standard 90.1-2010.

> 4.3.1. Lighting control devices and control systems shall be tested to ensure that control hardware and software are calibrated, adjusted, programmed, and in proper working condition.

> 4.3.2. When occupant sensors, time switches, programmable schedule controls, or photosensors are installed, at a minimum, the following procedures shall be performed:

> > adjustments for occupancy sensors yield acceptable performance, lights turn off only after space is vacated and do not turn on unless space is occupied. b. Confirm that the time switches and programmable schedule controls are programmed to turn the lights

a. Confirm that the placement, sensitivity, and time—out

c. Confirm that photosensor controls reduce electric light levels based on the amount of usable daylight in the space as specified.

4.3.3. The party responsible for the functional testing shall not be directly involved in either the design or construction of the project and shall provide documentation certifying that the installed lighting controls meet or exceed a documented performance criteria. Certification shall be specific enough to verify conformance.

## Emergency lighting

4.4. Install unit equipment and remote mounted fixtures as indicated.

4.5. Emergency lighting shall be installed in such a manner that it will be automatically actuated upon failure of the power supply to the normal lighting in the area covered by that unit equipment.

4.6. Emergency lighting shall have a supply voltage of 120VAC, and an output voltage of 12VDC, and be able to assume the electrical load automatically for a minimum of 30 minutes.

## <u>Exit signs</u>

4.7. Install exit signs as per the contract drawings.

4.8. Exit signs shall consist of a green pictogram and white graphic symbol meeting the visibility specifications referred to in ISO 3864-1.

4.9. Exit signs shall be continuously illuminated.

## <u>Part 7 - Mechanical Equipment</u>

7.1. Provide power and connections to all mechanical equipment as detailed on the drawings.

7.2. Ensure all equipment is properly protected with disconnect switches.

7.3. Confirm with mechanical trade for exact locations of equipment and connection points.

7.4. Verify all motor connections for proper phase rotation.

Part 9 — Generator Specification

9.1. Supply and Install 100kW, 120/208 Volt, three phase, 4-wire, backup generator. The Generator is to be installed on a pad as shown in location on the drawings.

9.3. Generator Requirements:

a) Generator Size: 100kW

b) Voltage: 120/208V, three phase, complete with 400 Amp

main line circuit breaker c) Fuel: Natural Gas

d) Enclosure: Provide Weather protected, Level 2 Aluminum Sound Attenuation enclosure that meets all emissions standards. e) Engine system: Provide engine block heater and 10Amp

battery charger. f) Connect to gas supply.

g) Load Centre: Provide all necessary feeds to generator as required. Specify

Load Centre or provide individual feeds as required. h) Provide 2 Year extended warranty.

i) Generator base specs as per Generac model SG-100 j) Acceptable alternate generator suppliers include Generac,

Cummins, Kohler, Gal Power, and Somers

9.4 Transfer Switch: Automatic type, 120/208V, three phase, 400A

a) Enclosure: Type 3R Secure, wall mounted. b) Transfer switch shall be complete with a bypass switch c) Transfer switch base line specs based on ASCO ATC-300

controller and Cuttler Hammer L—frame wall mounted switch

9.5. All Equipment shall be CSA approved.

9.6. Install transfer switch and generator in accordance with manufacturer's instructions and in locations as shown on the drawings.

9.7. Generator Pad: The concrete pad shall be constructed as per manufacturer's specifications.

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