

GENERAL NOTES

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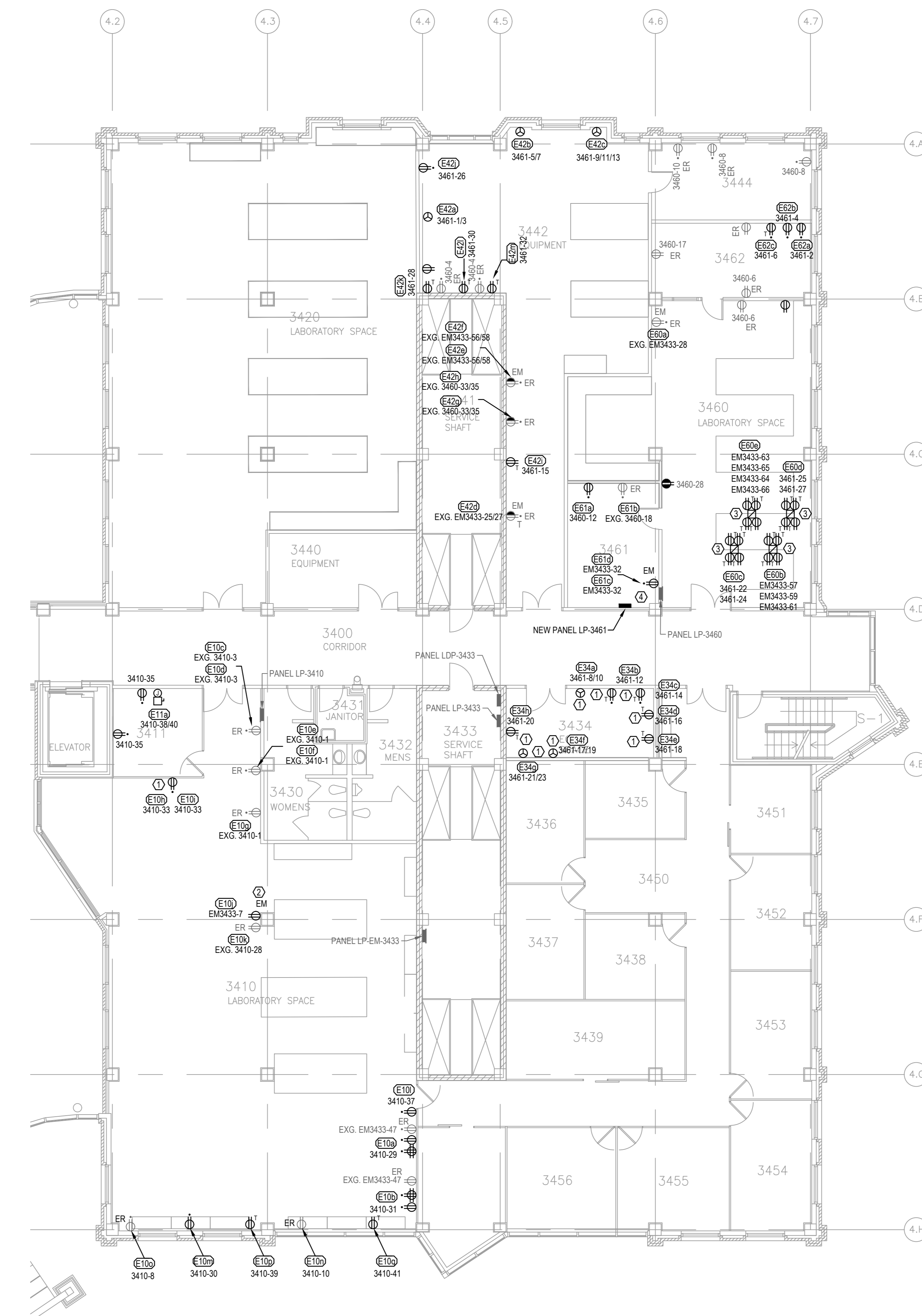
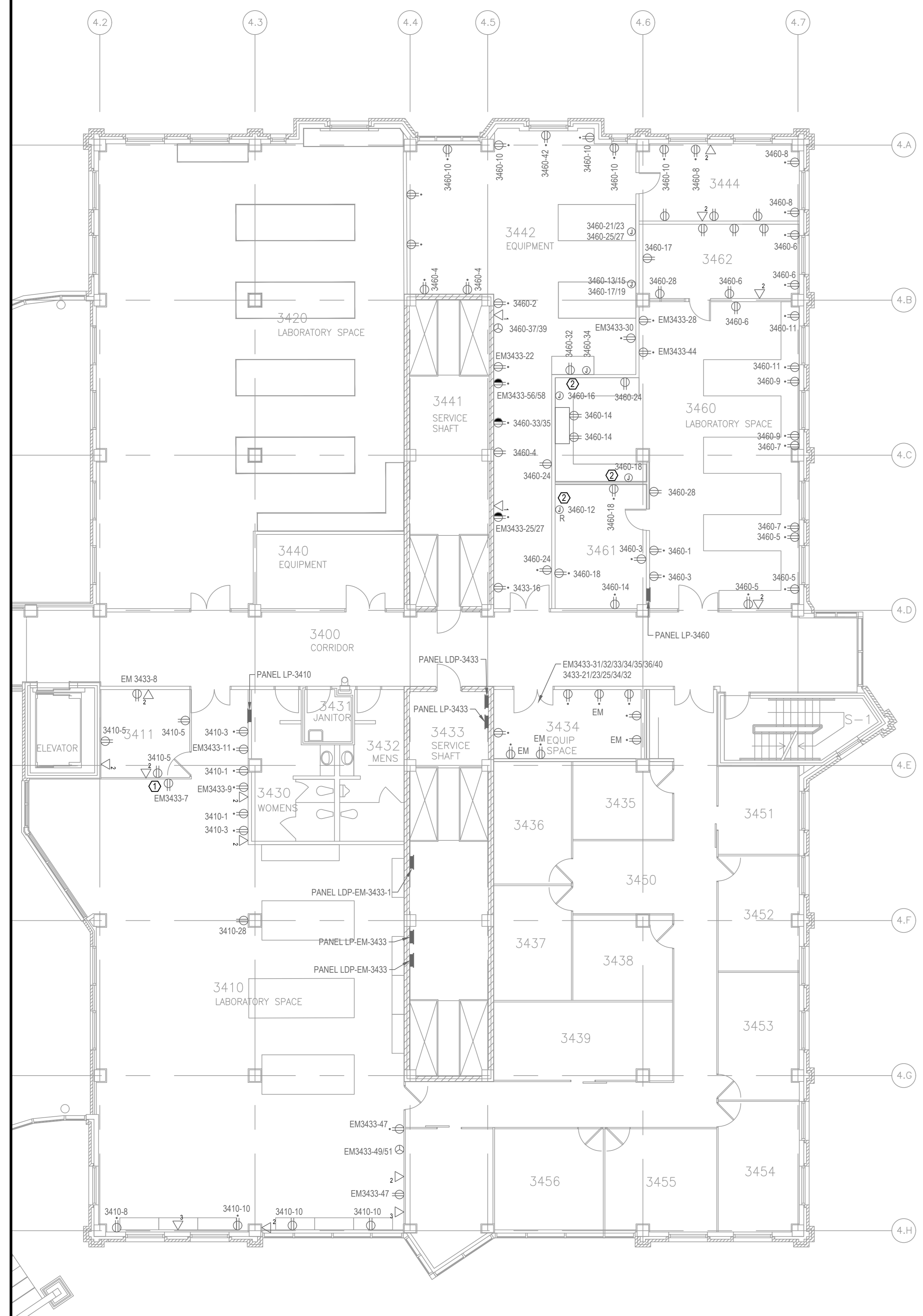


PROJECT MANAGER:

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PROJECT#: 11896

ELECTRICAL SYMBOL LEGEND	
NOTE: SOME SYMBOL REFERENCES MAY NOT BE A PART OF THIS PROJECT	
LIGHTING	
LINE VOLTAGE SWITCH	RECESSED MOUNTED LIGHT FIXTURE
WALL MOUNT OCCUPANCY SENSOR SWITCH	SURFACE MOUNTED LIGHT FIXTURE
CEILING MOUNT OCCUPANCY SENSOR	SUSPENDED LIGHT FIXTURE
LOW VOLTAGE SWITCH - # INDICATES BUTTONS	STRIP LIGHT
CEILING MOUNT EXIT SIGN, LINE DEMOTES FACE	WALL MOUNTED LINEAR LIGHT FIXTURE
WALL MOUNTED EXIT SIGN	WALL MOUNTED LIGHT FIXTURE
EXIT SIGN CW SELF POWERED EM LIGHTING	SURFACE MOUNTED LIGHT FIXTURE
REMOTE EMERGENCY HEADS	RECESSED DOWNLIGHT
BATTERY PACK CW EMERGENCY HEADS	PENDANT MOUNTED LIGHT FIXTURE
EMERGENCY LIGHT FIXTURE	TRACK LIGHT, NO. OF HEADS AS PER PLANS
FIXTURE TYPE TAG	UNDERCABINET / COVE LIGHT FIXTURE
CCT CONTROL ZONE / SWITCH I.D.	ILLUMINATED BOLLARD
LV LOW VOLTAGE	POLE MOUNTED EXTERIOR LIGHT FIXTURE
LIGHTING SYMBOL ANNOTATIONS:	
PEC PHOTOELECTRIC CELL	D DIMMER
TC TIMECLOCK	DT DUAL TECHNOLOGY
NL NIGHTLIGHT (UN-SWITCHED)	VAC VACUANCY SENSOR (MANUAL ON, AUTO OFF)
3 3-WAY	EM EMERGENCY LIGHT FIXTURE
LV LOW VOLTAGE	EMM EMERGENCY BATTERY UNIT I.D.
POWER	
DUPLEX RECEPTACLE	SPECIAL RECEPTACLE
QUAD RECEPTACLE	JUNCTION BOX
GFI RECEPTACLE	PAC POLE
SPLIT FED RECEPTACLE	MOTOR
HALF SWITCHED RECEPTACLE	DISCONNECT SWITCH
ISOLATED GROUND RECEPTACLE	MAGNETIC STARTER / VFD
PEDESTAL MOUNTED RECEPTACLE	SURGE PROTECTION DEVICE
POWER SYMBOL ANNOTATIONS:	
T T-SLOT (20A)	TR TAMPER RESISTANT
WP WEATHERPROOF	U USB CHARGER
DISTRIBUTION	
SURFACE MOUNTED PANELBOARD	LOW TENSION PANEL
RECESSED MOUNTED PANELBOARD	UTILITY METER STACK
TELEPHONE/TELEVISION BACKBOARD	UTILITY METER
TRANSFORMER	SAFETY DISCONNECT
DISTRIBUTION SYMBOL ANNOTATIONS:	
MDP MAIN DISTRIBUTION PANEL	LVRC LOW VOLTAGE RELAY PANEL
COP CENTRAL DISTRIBUTION PANEL	TBB TELEPHONE / TELEVISION BACKBOARD
MCC MOTOR CONTROL CENTER	TX TRANSFORMER
LOW TENSION	
DATA NETWORK JACK	WIRELESS ACCESS POINT
TELEPHONE JACK	PROVIDE DATA DROP IN CLG SPACE
COMBINATION TEL/DATA JACK	PUSHBUTTON
TELEVISION COAX OUTLET	UP/DOWNSTOP BUTTON
HDMI OUTLET	CEILING MOUNTED SPEAKER
DOORBELL BUZZER / DOORBELL CHIME	WALL MOUNTED SPEAKER
THERMOSTAT	COMO, SENSORS
LOW TENSION SYMBOL ANNOTATIONS:	
# NUMBER INDICATES QUANTITY OF CABLES / DROPS FOR EACH LOCATION	
FIRE ALARM	
HORN	HEAT DETECTOR - FIXED TEMPERATURE
HORN STROBE	HEAT DETECTOR - RATE OF RISE
STROBE	SMOKE DETECTOR
MANUAL STATION	SMOKE ALARM (120V)
SPEAKER	DUCT SMOKE DETECTOR
SPEAKER STROBE	END OF LINE RESISTOR
ELECTROMAGNETIC DOOR HOLD OPEN	FIRE ALARM MODULE
FIRE ALARM PANEL	FIRE PHONE
FIRE ALARM SYMBOL ANNOTATIONS:	
CANDELA RATING FOR STROBE	MM MONITORING MODULE
FACP FIRE ALARM CONTROL PANEL	CM CONTROL MODULE
FAAP FIRE ALARM ANNUNCIATOR PANEL	FS FLOW SWITCH
ISOLATOR MODULE	TS TAMPER SWITCH
SECURITY	
WALL MOUNTED MOTION SENSOR	SECURITY DEVICE
CEILING MOUNTED MOTION SENSOR	SECURITY CAMERA (CAT6 OUTLET)
SECURITY SYMBOL ANNOTATIONS:	
CR CARD READER	KP KEY PAD
ES ELECTRIC STRIKE	GB GLASS BREAK SENSOR
DC DOOR CONTACT / DOOR POSITION SWITCH	ML MAGNETIC LOCK
X REQUEST TO EXIT	EC ELECTRONIC CLOSER
ANNOTATIONS	
UNDERGROUND / UNDERSLAB CONDUIT	DOT ABOVE ANY SYMBOL INDICATES ABOVE COUNTER MOUNTING HEIGHT
OVERHEAD OR SURFACE CONDUIT	ANY SYMBOL WITHIN CIRCLE INDICATES CEILING MOUNT DEVICE
CONDUIT SUB	ANY SYMBOL WITHIN SQUARE INDICATES FLOOR MOUNT DEVICE
KEY NOTE REFERENCE	
DRAWING REFERENCE	
DEMOLITION ANNOTATIONS	
R REMOVE DEVICE. REMOVE ALL WIRING BACK TO SOURCE. REMOVE CONDUIT FROM WALLS BEING DEMOLISHED. ALL EXISTING TO REMAIN DOWNSTREAM DEVICES TO HAVE A CONTINUITY CIRCUIT.	
ER EXISTING ELECTRICAL DEVICE TO REMAIN. ALL WIRING AND SWITCHING (IF APPLICABLE) TO REMAIN UNLESS OTHERWISE NOTED.	
RL EXISTING DEVICE TO BE RELOCATED. ALLOW FOR REMOVAL AND RE-INSTALLATION. EXTEND WIRING AND CONDUIT TO NEW LOCATION.	
RP REPLACE EXISTING DEVICE WITH NEW. UTILIZE EXISTING CONDUIT AND WIRING. INCLUDE NEW COVERPLATE, LABELING, ETC. AS APPLICABLE.	



1 LEVEL 3 PARTIAL PLAN - EXISTING
SCALE: 1:100
0 1250 2500 5000

EXISTING KEYNOTES

1	CONTRACTOR TO DISCONNECT AND REMOVE EXISTING RECEPTACLE AT THIS LOCATION. LEAVE EXISTING OUTLET BOX AND CONDUIT WIRE FOR CONNECTION TO NEW RECEPTACLE. EXISTING RECEPTACLE TO BE RE-USED
2	CONTRACTOR TO DISCONNECT AND REMOVE EXISTING PLUGMOLD CIRCUIT TO BE RE-USED.

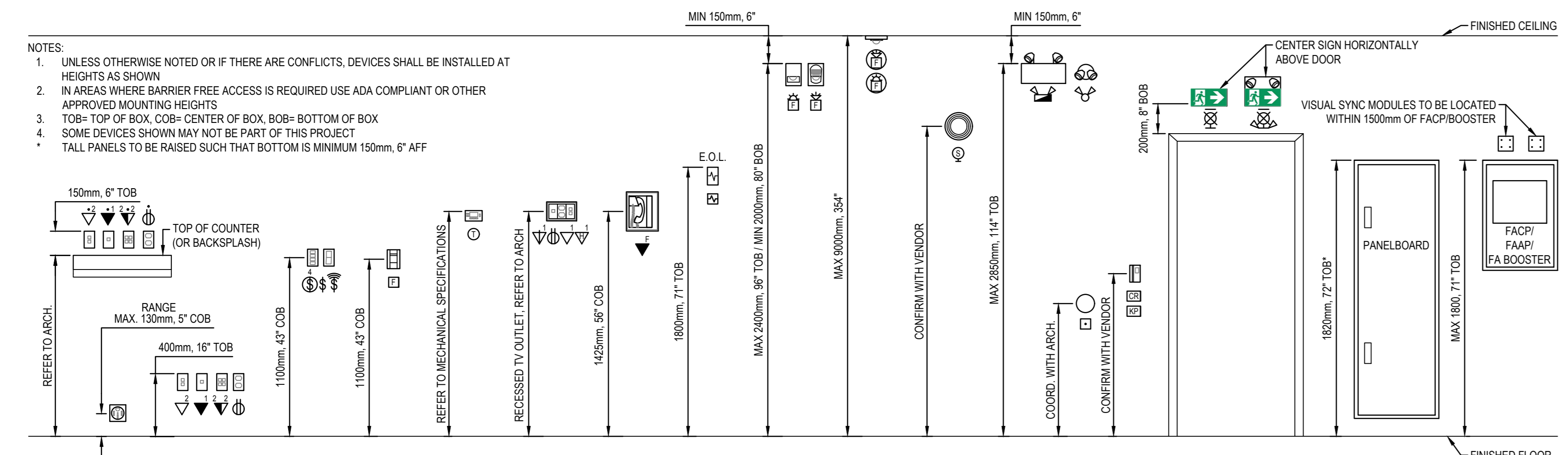
2 LEVEL 3 PARTIAL PLAN
SCALE: 1:100
0 1250 2500 5000

KEYNOTES

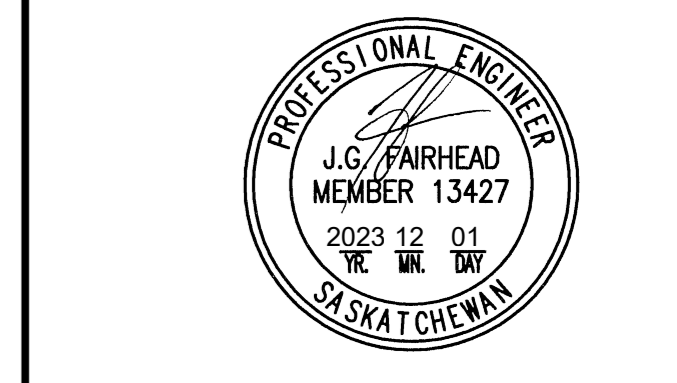
1	CONTRACTOR SHALL USE EXISTING CONDUIT AND/OR WIRING TO EXISTING OUTLET BOX FOR THE NEW RECEPTACLE AT THIS LOCATION AS APPLICABLE. INSTALL NEW WIRING AND BOX IF EXISTING IS UNUSABLE.
2	CONTRACTOR TO REUSE EXISTING RECEPTACLE REMOVED DURING DEMO PHASE. EXISTING WIRING TO BE EXTENDED TO THIS LOCATION.
3	CONTRACTOR TO SUPPLY AND INSTALL NEW PAC POLE WITH 4 DUPLEX T-SLOT RECEPTACLES AS SHOWN. COORDINATE EXACT MOUNTING LOCATION WITH OWNER PRIOR TO INSTALL. WIREMOLD TELE-POWER POLES OR EQUIVALENT. 10 FOOT 5 INCH HEIGHT CW ADD ON ACCESSORIES AS REQUIRED TO PROVIDE THE CORRECT NUMBER OF DEVICES.
4	CONTRACTOR SUPPLY AND INSTALL NEW PANEL AS SHOWN. DISCONNECT EXISTING FEEDER FOR PANEL LP-3460 INSIDE LDP-3453. SHORTEN FEEDER AND RE-ROUTE TO BE CONNECTED TO THE NEW BREAKER IN NEW PANEL LP-3461. SUPPLY AND INSTALL A NEW 35C-443 AWG FEEDER FROM THE EXISTING 100A3P BREAKER IN EXISTING PANEL LDP-3453 TO NEW PANEL LP-3461.

GENERAL NOTES

- ALL NEW CONDUIT AND CABLING TO BE CONCEALED IF POSSIBLE.
- ALL NEW DEVICES TO BE RECESSED IF POSSIBLE.
- ALL NEW SURFACE MOUNTED WIRING AND DEVICES SHALL BE INSTALLED NEAT AND PARALLEL TO BUILDING LINES.



TYPICAL MOUNTING HEIGHTS
SCALE: N.T.S.



Association of Professional Engineers, and Geoscientists of Saskatchewan
ARROW ENGINEERING, A DIVISION OF ENGLOBE CORP.
Permitted to Practice in the Province of Saskatchewan
Electrical - 13427

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No.	Date	Revision	By	Check
1	30 11 2023	RE - ISSUED FOR TENDER	JF	
2	31 03 2023	ISSUED FOR TENDER	JF	
3	23 03 2023	REVISED	JF	

Verify all dimensions and site conditions and be responsible for same.
Vérifier toutes les dimensions et les conditions et être responsable pour cela.

A	A Detail no.	A
B	B Location drawing no.	B
C	C Drawing no.	C

PROJECT: **ACRO LABORATORY MODIFICATIONS**

110 GYMNASIUM PLACE

LEVEL 3 & LEVEL 4
ELECTRICAL PLANS
- EXISTING & NEW

designed	checked	date	date
JF		MARCH/2023	
drawn	designed	scale	tabular
EW		AS SHOWN	
checked	verified	sheet	of/total
JF		1	2
approved	approved	W.O.No.	D.T.No.
JF			
dep.no.	sheet no.	sheet no.	sheet no.
C-E01			

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Association of Professional Engineers and Geoscientists of Saskatchewan
CORPORATE MEMBER SINCE 2006
ARROW ENGINEERING, A DIVISION OF ENGLOBE CORP.
NUMBER: C110
Permitted to Sign and Seal By:
Electrical 13427

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1	30 11 2023	RE - ISSUED FOR TENDER	JF
0	31 03 2023	ISSUED FOR TENDER	JF
A	23 03 2023	REVIEW	JF

Date Printed: _____ Date Issued: _____

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- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité

A	A Detail no. No. du détail	A
B	B Location drawing no. No. de dessin	B
C	C Drawing no. No. de dessin	C

project: _____ project: _____

ACRD LABORATORY MODIFICATIONS

110 GYMNASIUM PLACE

drawing: _____ dessin: _____

LEVEL 3 & LEVEL 4
ELECTRICAL PLANS

designed: JF con'ty: _____ date: MARCH/2023 date: _____

drawn: EW dessin: _____ scale: AS SHOWN tabule: _____

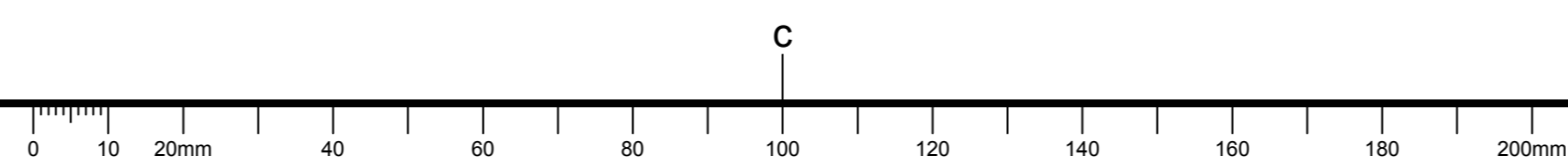
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approved: JF approuvé: _____ W.O.no.: _____ D.T.no.: _____

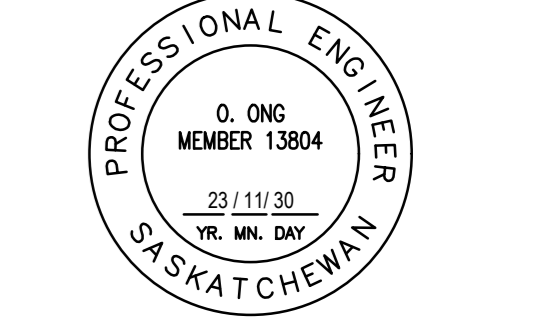
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NRC EQUIPMENT SCHEDULE

Tag	Name	Location	Voltage	Load	Emergency	Connection	Breaker	Circuit	Scope of work
E11a	Memmert	Room 3411	208V/1PH	2.53 KW	No	Hardware	40A2P	3410-38/40	New breaker and feeder to new JB with 60A2P disconnect
E10a	Agilent LC 1200 Quaternary System Autosampler	Room 3410	120V/1PH	200 W	No	Receptacle	15A1P	3410-29	Existing spare 15A1P breaker, new feeder, new receptacles
E10b	Agilent LC 1260 Binary System LC 1200 System	Room 3410	120V/1PH	210 W	No	Receptacle	15A1P	3410-31	Existing spare 15A1P breaker, new feeder, new receptacles
E10c	Agilent LC 1260 Binary System Thermostatted Column	Room 3410	120V/1PH	150 W	No	Receptacle	15A1P	3410-3	Existing breaker, feeder, and receptacle
E10d	Agilent LC 1260 Binary System Micro Degasser	Room 3410	120V/1PH	30 W	No	Receptacle	15A1P	3410-3	Existing breaker, feeder, and receptacle
E10e	Agilent LC 1260 Binary System Binary Pump SL	Room 3410	120V/1PH	160 W	No	Receptacle	15A1P	3410-3	Existing breaker, feeder, and receptacle
E10f	Agilent LC 1260 Binary System Diode Array Detector	Room 3410	120V/1PH	160 W	No	Receptacle	15A1P	3410-3	Existing breaker, feeder, and receptacle
E10g	Agilent LC 1260 Binary System Autosampler	Room 3410	120V/1PH	200 W	No	Receptacle	15A1P	3410-3	Existing breaker, feeder, and receptacle
E10h	Agilent LC 1260 Binary System Computer Equipment	Room 3410	120V/1PH	600 W	No	Receptacle	15A1P	3410-3	Existing breaker, feeder, and receptacle
E10i	Agilent LC 1260 Binary System Frigidaire Fridge	Room 3410	120V/1PH	500 W	No	Receptacle	15A1P	3410-3	Existing breaker, feeder, and receptacle
E10j	Agilent LC 1260 Binary System Danby Fridge	Room 3410	120V/1PH	500 W	No	Receptacle	15A1P	3410-3	Existing breaker, feeder, and receptacle
E10k	Agilent LC 1260 Binary System Fridge	Room 3410	120V/1PH	500 W	No	Receptacle	15A1P	3410-1	Existing breaker, feeder, and receptacle
E10l	Agilent LC 1260 Binary System Kenmore Fridge	Room 3410	120V/1PH	500 W	No	Receptacle	15A1P	3410-1	Existing breaker, feeder, and receptacle
E10m	Agilent LC 1260 Binary System Nabco Fridge	Room 3410	120V/1PH	500 W	No	Receptacle	15A1P	3410-33	Existing spare 15A1P breaker, new feeder, new receptacle, existing outlet box
E10n	Agilent LC 1260 Binary System Frigidaire Freezer	Room 3410	120V/1PH	500 W	No	Receptacle	15A1P	3410-33	Existing spare 15A1P breaker, new feeder, new receptacle, existing outlet box
E10o	Agilent LC 1260 Binary System Wood's Freezer	Room 3410	120V/1PH	500W	Yes	Receptacle	15A1P	EM3433-7	Existing breaker, feeder, extend feeder to new location, existing relocated receptacle, new outlet box
E10p	Agilent LC 1260 Binary System Danby Freezer	Room 3410	120V/1PH	500 W	No	Receptacle	15A1P	Existing 3410-1	Existing breaker, feeder, and receptacle
E10q	Agilent LC 1260 Binary System Laminar Flow Hood V6-MW-99-C30	Room 3410	120V/1PH	1440 W	No	Receptacle	15A1P	3410-37	Existing spare 15A1P breaker, new feeder, new receptacle, new outlet box
E10r	Agilent LC 1260 Binary System Laminar Flow Hood H6-MW-99-IT	Room 3410	120V/1PH	960 W	No	Receptacle	15A1P	3410-30	Existing spare 15A1P breaker, new feeder, new receptacle, new outlet box
E10s	Agilent LC 1260 Binary System Laminar Flow Hood H4-MW-99-IT	Room 3410	120V/1PH	960 W	No	Receptacle	15A1P	Existing 3410-10	Existing breaker, feeder, and receptacle
E10t	Agilent LC 1260 Binary System Biosafety Cabinet BK-2-4	Room 3410	120V/1PH	1440 W	No	Receptacle	15A1P	Existing 3410-8	Existing breaker, feeder, and receptacle
E10u	Agilent LC 1260 Binary System Forma Orbital Shaker 480	Room 3410	120V/1PH	1872 W	No	Receptacle	20A1P	3410-39	New breaker, feeder, and receptacle
E10v	Agilent LC 1260 Binary System New Brunswick Scientific M1353-0004	Room 3410	120V/1PH	1500 W	No	Receptacle	20A1P	3410-41	New breaker, feeder, and receptacle
E42a	Avant Centrifuge JXN-26	Room 3442	208V/1PH	4 KW	No	Receptacle 6-30R	30A2P	3461-1/3	New breaker, feeder, and receptacle
E42b	Allegra Centrifuge X-15R	Room 3442	208V/1PH	2 KW	No	Receptacle 6-15R	15A2P	3461-5/7	New breaker, feeder, and receptacle
E42c	ATS Microfluidics LM-20	Room 3442	208V/1PH	2 KW	No	Receptacle 15-20R	20A2P	3461-9/11/13	New breaker, feeder, and receptacle
E42d	Thermo Scientific Ultra Model 884000463 Freezer	Room 3442	120V/1PH	2 KW	Yes	Receptacle	20A1P	Existing EM3433-25/27 (split wired receipt)	Existing breaker, feeder, and receptacle
E42e	Danby Fridge 146134	Room 3442	120V/1PH	500 W	Yes	Receptacle	15A1P	Existing EM3433-56/58 (split wired receipt)	Existing breaker, feeder, and receptacle
E42f	Kenmore -20 Freezer 148566	Room 3442	120V/1PH	500 W	Yes	Receptacle	15A1P	Existing EM3433-56/58 (split wired receipt)	Existing breaker, feeder, and receptacle
E42g	Frigidaire -20 Freezer 600058	Room 3442	120V/1PH	500 W	No	Receptacle	15A1P	Existing 3460-33/35 (split wired receipt)	Existing breaker, feeder, and receptacle
E42h	VWR Chromatography fridge	Room 3442	120V/1PH	550 W	No	Receptacle	15A1P	Existing 3460-33/35 (split wired receipt)	Existing breaker, feeder, and receptacle
E42i	Innova 43 floor shaker 3019414	Room 3442	120V/1PH	1.5 KW	No	Receptacle	20A1P	3461-15	New breaker, feeder, and receptacle
E42j	Laminar Flow Hood H4-MW-99-1	Room 3442	120V/1PH	960 W	No	Receptacle	15A1P	3461-26	New breaker, feeder, and receptacle
E42k	New Brunswick innova 4230	Room 3442	120V/1PH	1500 W	No	Receptacle	20A1P	3461-28	New breaker, feeder, and receptacle
E42l	New Brunswick innova 4230	Room 3442	120V/1PH	1500 W	No	Receptacle	20A1P	3461-30	New breaker, feeder, and receptacle
E42m	VWR Shaking Incubator 1575R	Room 3442	120V/1PH	1380 W	No	Receptacle	15A1P	3461-32	New breaker, feeder, and receptacle
E62a	Fermenter	Room 3462	120V/1PH	240 W	No	Receptacle	15A1P	3461-2	New breaker, feeder, and receptacle
E62b	Fermenter	Room 3462	120V/1PH	1.2 KW	No	Receptacle	15A1P	3461-4	New breaker, feeder, and receptacle
E62c	Fermenter Chiller (ThermoNESLAB RTE7)	Room 3462	120V/1PH	1.5 KW	No	Receptacle	20A1P	3461-6	New breaker, feeder, and receptacle
E61a	Danby Freezer	Room 3461	120V/1PH	500 W	No	Receptacle	15A1P	3460-12	Existing breaker, new feeder, new receptacle
E61b	Danby Fridge	Room 3461	120V/1PH	500 W	No	Receptacle	15A1P	Existing 3460-18	Existing breaker, feeder, and receptacle
E61c	Zero Air Generator	Room 3461	120V/1PH	240 W	Yes	Receptacle	15A1P	EM3433-32	Existing breaker, new feeder, new receptacle
E61d	Hydrogen Generator	Room 3461	120V/1PH	640 W	Yes	Receptacle	15A1P	EM3433-32	Existing breaker, new feeder, new receptacle
E34a	Thermo Scientific Forma Model 995 Freezer	Room 3434	208V/1PH	2 KW	No	Receptacle 6-15R	15A2P	3461-8/10	New breaker, feeder, and receptacle, existing outlet box
E34b	Thermo Scientific Forma Model 993 Freezer	Room 3434	120V/1PH	2 KW	No	Receptacle	20A1P	3461-12	New breaker, feeder, and receptacle, existing outlet box
E34c	Thermo Scientific Forma Model 993 Freezer	Room 3434	120V/1PH	2 KW	No	Receptacle	20A1P	3461-14	New breaker, feeder, and receptacle, existing outlet box
E34d	Thermo Scientific Forma Model 993 Freezer	Room 3434	120V/1PH	2 KW	No	Receptacle	20A1P	3461-16	New breaker, feeder, and receptacle, existing outlet box
E34e	Thermo Scientific Forma Model 990 Freezer	Room 3434	120V/1PH	2 KW	No	Receptacle	20A1P	3461-18	New breaker, feeder, and receptacle, existing outlet box
E34f	Thermo Scientific Non-CFC Model 917 Freezer	Room 3434	208V/1PH	2.5 KW	No	Receptacle	15A2P	3461-17/19	New breaker, feeder, and receptacle, existing outlet box
E34g	Thermo Scientific Forma Model 995 Freezer	Room 3434	208V/1PH	2 KW	No	Receptacle 6-15R	15A2P	3461-21/23	New breaker, feeder, and receptacle, existing outlet box
E34h	VWR Scientific Model 5704 Freezer	Room 3434	120V/1PH	2 KW	No	Receptacle	20A1P	3461-20	New breaker, feeder, and receptacle, existing outlet box
E60a	Danby Fridge	Room 3460	120V/1PH	500 W	No	Receptacle	15A1P	Existing EM3433-28	Existing breaker, feeder, and receptacle
E60b	GC-FID Model 7890A	Room 3460	120V/1PH	2 KW	Yes	Receptacle	20A1P	EM3433-57	New breaker, feeder, and receptacle
E60c	Injector Model 768380	Room 3460	-	-	-	-	-	-	-
E60d	MSD Model 5975C	Room 3460	120V/1PH	1.5 KW	Yes	Receptacle	20A1P	EM3433-59	New breaker, feeder, and receptacle
E60e	Pump Model G3870-80055	Room 3460	-	-	-	-	-	-	-
E60f	Computer Equipment GC-C	Room 3460	120V/1PH	600 W	Yes	Receptacle	20A1P	EM3433-61	New breaker, feeder, and receptacle
E60g	GC-FID Model 6890N	Room 3460	120V/1PH	2 KW	No	Receptacle	20A1P	3461-22	New breaker, feeder, and receptacle
E60h	Injector Model 76838	Room 3460	-	-	-	-	-	-	-
E60i	Computer Equipment GC-E	Room 3460	120V/1PH	600 W	No	Receptacle	20A1P	3461-24	New breaker, feeder, and receptacle
E60j	GC-FID Model 7890A	Room 3460	120V/1PH	2 KW	No	Receptacle	20A1P	3461-25	New breaker, feeder, and receptacle
E60k	Injector Model G4514A	Room 3460	-	-	-	-	-	-	-
E60l	Computer Equipment GC-F	Room 3460	120V/1PH	600 W	No	Receptacle	20A1P	3461-27	New breaker, feeder, and receptacle
E60m	GC-FID Model 6890N	Room 3460	120V/1PH	2 KW	Yes	Receptacle	20A1P	EM3433-63	New breaker, feeder, and receptacle
E60n	Injector Model 7683	Room 3460	-	-	-	-	-	-	-
E60o	MSD Model 5973	Room 3460	120V/1PH	1.5 KW	Yes	Receptacle	20A1P	EM3433-65	New breaker, feeder, and receptacle
E60p	Pump Model Edwards E2M1.5	Room 3460	120V/1PH	1.5 KW	Yes	Receptacle	20A1P	EM3433-64	New breaker, feeder, and receptacle
E60q	Computer Equipment	Room 3460	120V/1PH	600 W	Yes	Receptacle	20A1P	EM3433-66	New breaker, feeder, and receptacle



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 - INSTALLATION OF ALL SYSTEMS SHALL BE IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS.
 - CONTRACTOR TO BE RESPONSIBLE FOR REINSTATEMENT AND REPAIR OF ANY DAMAGE CAUSED BY WORK.
 - CONTRACTOR SHALL PREVENT THE SPREAD OF DUST AND DEBRIS BEYOND AREA OF WORK AND CLEAN ALL SURFACES AT COMPLETION.



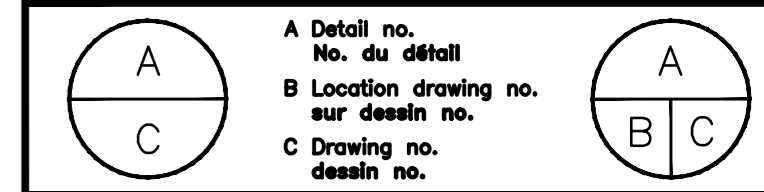
Association of Professional Engineers and Geoscientists of Saskatchewan
 DIVISION OF MEMBERSHIP
 ARROW ENGINEERING, A DIVISION OF ENGLOBE CORP.
 NUMBER C1158
 Permit to Conduct Reg. Eng.
 Discipline: Mech. Reg. No.: 15494
 Issue Date: 1984

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No.	Date	Revision	By	Appr.
2	30 11 2023	RE - ISSUED FOR TENDER		OO
1	28 10 2023	RE - ISSUED FOR TENDER		MA
0	31 03 2023	ISSUED FOR TENDER		MA

Date Printed: 08/01/2024 Date Issued: _____

- Verify all dimensions and site conditions and be responsible for same.
- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité.



PROJECT: **ACRD LABORATORY MODIFICATIONS**

110 GYMNASIUM PLACE

LEVEL 3 MECHANICAL PLANS

designed	MA	compu	MA	date	MARCH/2023	date
drawn	MA	designed	MA	scale	AS SHOWN	scale
checked	OO	verified	OO	sheet	1 of 2	feuille
approved	OO	approved	OO	W.O.no.		D.T.no.

dep.no. C-M01

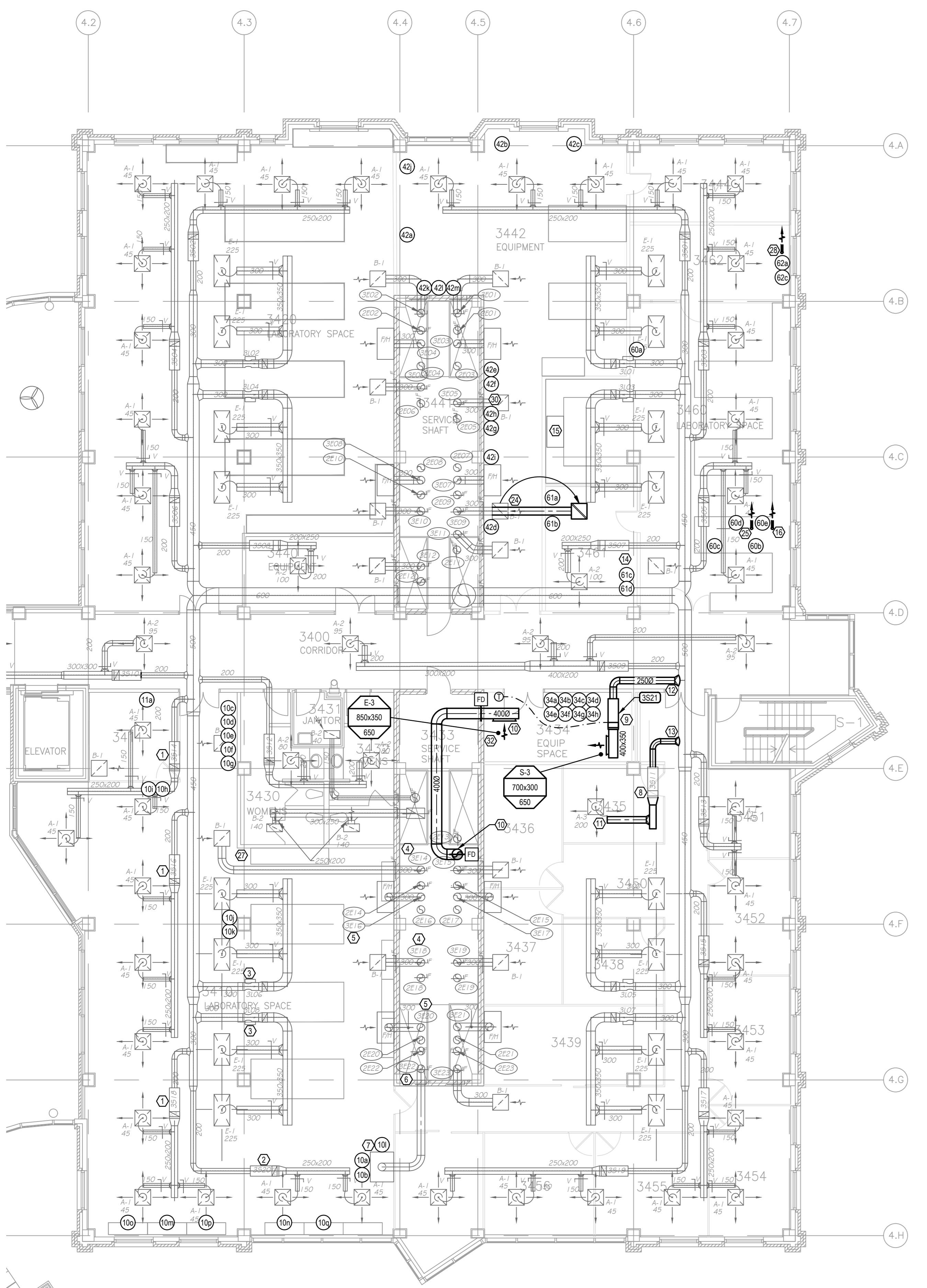
EQUIPMENT SCHEDULE (REFER TO DRAWING M01)

TAG	EQUIPMENT LIST	LOCATION	NITROGEN	HELIUM	HYDROGEN	OXYGEN	N.GAS	COMPRESSED AIR	EXHAUST CAPACITY	DISSIPATED HEAT (BTU)	DRAIN REQUIRED	NOTES
10	MEMBERT	ROOM 3411	-	-	-	-	-	-	-	-	X	
10	AGILENT LC 1200 QUATERNARY SYSTEM		-	-	-	-	-	-	-	-	-	
A	AUTOSAMPLER		-	-	-	-	-	-	-	683	-	
B	QUATERNARY PUMP		-	-	-	-	-	-	-	188	-	
C	DEGASSER		-	-	-	-	-	-	-	210	-	INSTALL UNDER EXISTING HOOD. HOOD TO BE LOWERED TO 60" AFF. OWNER TO PROVIDE BENCH FOR EQUIPMENT.
D	THERMOSTATED COLUMN	ROOM 3410	-	-	-	-	-	-	-	512	-	
E	DIODE ARRAY DETECTOR		-	-	-	-	-	-	-	546	-	
F	FRACTION COLLECTOR		-	-	-	-	-	-	-	614	-	
10	AGILENT LC 1200 QUATERNARY SYSTEM		-	-	-	-	-	-	-	-	-	
A	LC 1200 SYSTEM		-	-	-	-	-	-	-	-	-	
B	THERMOSTATED COLUMN		-	-	-	-	-	-	-	512	-	INSTALL UNDER EXISTING HOOD. HOOD TO BE LOWERED TO 60" AFF. OWNER TO PROVIDE BENCH FOR EQUIPMENT.
C	MICRO DEGASSER	ROOM 3410	-	-	-	-	-	-	-	102	-	
D	BINARY PUMP SL		-	-	-	-	-	-	-	253	-	
E	DIODE ARRAY DETECTOR		-	-	-	-	-	-	-	546	-	
F	AUTOSAMPLER		-	-	-	-	-	-	-	717	-	
10	FRIGIDAIRE FRIDGE	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	DANBY FRIDGE	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	DANBY FRIDGE	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	FRIDGE	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	KENMORE FRIDGE	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	NABCO FRIDGE	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	FRIGIDAIRE FREEZER	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	WOOD'S FREEZER	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	DANBY FREEZER	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	LAMINAR FLOW HOOD	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	LAMINAR FLOW HOOD	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	BIOSAFETY CABINET	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	BIOSAFETY CABINET	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	REFRIGERATED SHAKER	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	SHAKER COLD	ROOM 3410	-	-	-	-	-	-	-	-	-	
10	AVANT CENTRIFUGE JXN-26	ROOM 3442	-	-	-	-	-	-	-	5120	-	
10	ALLEGRA CENTRIFUGE X-15R	ROOM 3442	-	-	-	-	-	-	-	6800	-	
10	ATS MICROFLUIDIZER LM-20	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	THERMO SCIENTIFIC ULTRA MODEL 8840043 FREEZER	ROOM 3442	-	-	-	-	-	-	-	5090	-	
10	DANBY FRIDGE 146134	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	KENMORE -20 FREEZER 148566	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	FRIGIDAIRE -20 FREEZER 60068	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	VWR CHROMATOGRAPHY FRIDGE	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	INNOVA 43 FLOOR SHAKER 3019414	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	LAMINAR FLOW HOOD	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	INNOVA 4230 INCUBATOR	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	INNOVA 4230 INCUBATOR	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	REFRIGERATED SHAKING INCUBATOR 157SR	ROOM 3442	-	-	-	-	-	-	-	-	-	
10	FERMENTER	ROOM 3462	-	-	-	-	-	X	-	-	X	CONNECT TO AIR/OIL SEPARATOR
10	FERMENTER CHILLER (THERMO/SLAB RTE)	ROOM 3462	-	-	-	-	-	-	-	-	X	PROVIDE 150W CONNECTION
10	DANBY FREEZER	ROOM 3461	-	-	-	-	-	-	-	-	-	
10	DANBY FRIDGE	ROOM 3461	-	-	-	-	-	-	-	-	-	
10	ZERO AIR GENERATOR	ROOM 3461	-	-	-	-	-	X	-	-	-	
10	HYDROGEN GENERATOR	ROOM 3461	-	-	-	-	-	-	-	-	-	
10	THERMO SCIENTIFIC FORMA MODEL 995 FREEZER	ROOM 3434	-	-	-	-	-	-	-	5090	-	
10	THERMO SCIENTIFIC FORMA MODEL 993 FREEZER	ROOM 3434	-	-	-	-	-	-	-	5090	-	
10	THERMO SCIENTIFIC FORMA MODEL 993 FREEZER	ROOM 3434	-	-	-	-	-	-	-	5090	-	
10	THERMO SCIENTIFIC FORMA MODEL 990 FREEZER	ROOM 3434	-	-	-	-	-	-	-	5090	-	
10	THERMO SCIENTIFIC NON-CFC MODEL 911 FREEZER	ROOM 3434	-	-	-	-	-	-	-	5090	-	
10	THERMO SCIENTIFIC ULTRA MODEL 8840043 FREEZER	ROOM 3434	-	-	-	-	-	-	-	5090	-	
10	VWR SCIENTIFIC MODEL 5104 FREEZER	ROOM 3434	-	-	-	-	-	-	-	5090	-	
10	DANBY FRIDGE	ROOM 3460	-	-	-	-	-	-	-	-	-	
10	GC-B		-	-	-	-	-	-	-	-	-	
A	GC-FID MODEL 7890A		-	-	-	-	-	-	-	-	-	
B	INJECTOR MODEL 7883B0		-	-	-	-	-	-	-	-	-	
C	MSD MODEL 5975C		-	X	-	-	-	-	-	-	-	
D	PUMP MODEL G3870-80055		-	-	-	-	-	-	-	-	-	
E	COMPUTER EQUIPMENT		-	-	-	-	-	-	-	-	-	
10	GC-C		-	-	-	-	-	-	-	-	-	
A	GC-FID MODEL 6890N		X	X	X	X	-	-	-	-	-	
B	INJECTOR MODEL 7883B		-	-	-	-	-	-	-	-	-	
C	COMPUTER EQUIPMENT		-	-	-	-	-	-	-	-	-	
10	GC-E		-	-	-	-	-	-	-	-	-	
A	GC-FID MODEL 7890A		X	-	X	X	-	-	-	-	-	
B	INJECTOR MODEL G4514A		-	-	-	-	-	-	-	-	-	
C	COMPUTER EQUIPMENT		-	-	-	-	-	-	-	-	-	
10	GC-F		-	-	-	-	-	-	-	-	-	
A	GC-FID MODEL 6890N		-	-	-	-	-	-	-	-	-	PROVIDE 250mm CLEARANCE AT REAR OF UNIT. 100mm EIA CONNECTION
B	INJECTOR MODEL 7883		X	X	-	-	-	-	-	-	-	
C	MSD MODEL 5973		-	-	-	-	-	-	-	-	-	
D	PUMP MODEL EDWARDS E2M1.5		-	-	-	-	-	-	-	-	-	
E	COMPUTER EQUIPMENT		-	-	-	-	-	-	-	-	-	

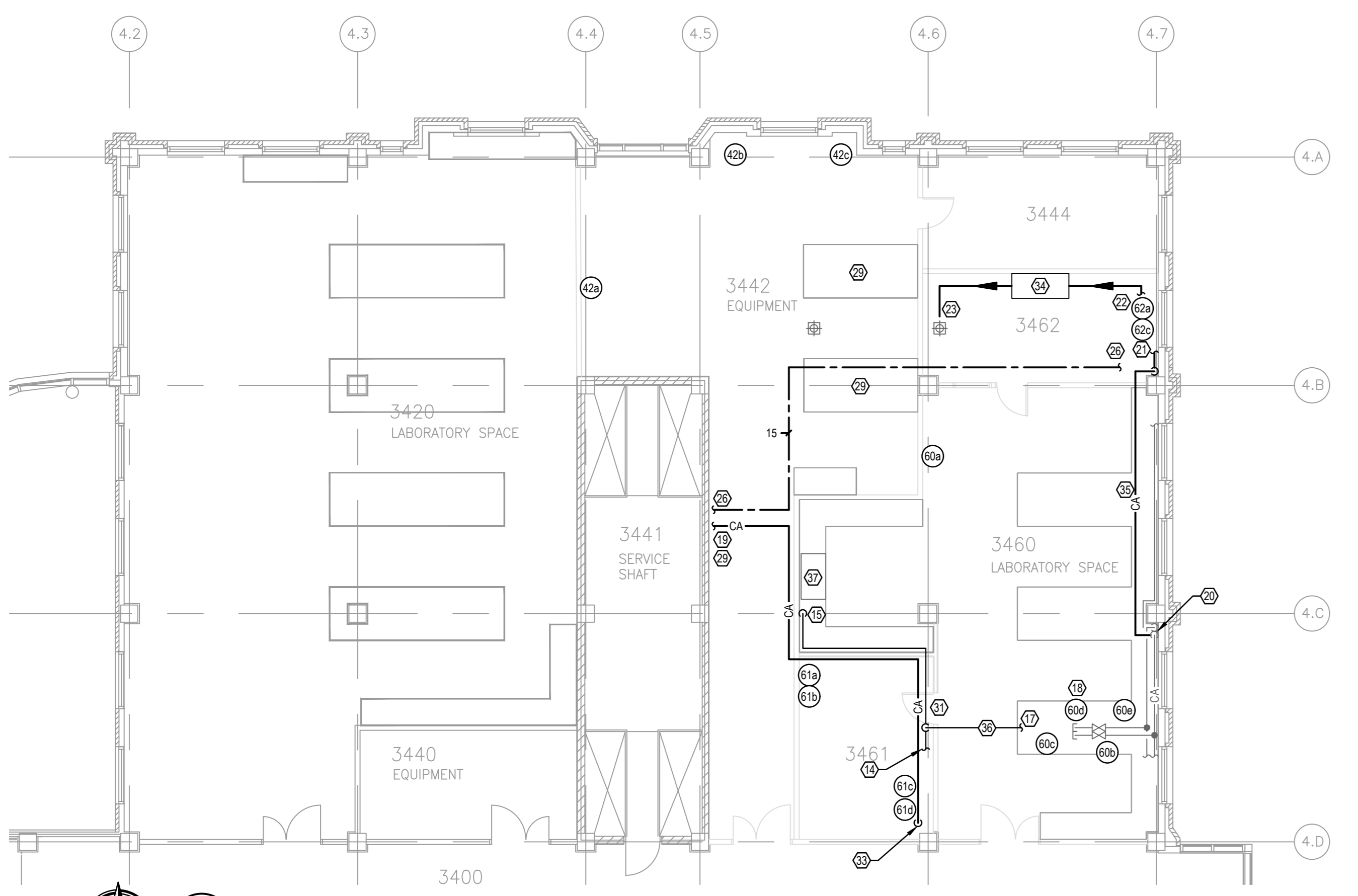
NOTES:
 1. THIS SCHEDULE MUST BE READ IN CONJUNCTION WITH EQUIPMENT SUPPLIER(S), SPECIFICATIONS, INSTRUCTIONS, AND MANUFACTURERS RECOMMENDATIONS, FOR THIS PROJECT. SPECIFIC CUTS MUST BE SUPPLIED FOR PROPER INSTALLATION DETAILS, BY THE END USER, PRIOR TO STARTING ANY WORK. NO EXTRAS WILL BE ALLOWED FOR FAILURE OF THIS NOTE.
 2. CONFIRM ALL SERVICE CONNECTIONS WITH EQUIPMENT.

KEYNOTES

- BALANCE VENTURI VALVES 3514, 3516, 3518, TO 135 L/s.
- BALANCE EXISTING VENTURI VALVE 3520 TO 90 L/s.
- BALANCE EXISTING VENTURI VALVES 3L06, 3L08 TO 450 L/s.
- BALANCE EXISTING VENTURI VALVES 3E14, 3E18 TO 225 L/s.
- BALANCE EXISTING VENTURI VALVES 3E16, 3E20 TO 180 L/s.
- BALANCE EXISTING VENTURI VALVE 3E22 TO 543 L/s.
- FIELD LOCATE & VERIFY EXACT LOCATION. EXISTING HOOD TO BE RE-POSITIONED 1.8m AFF. MODIFY EXISTING EIA DUCTWORK AS REQUIRED TO SUIT NEW LOCATION.
- FIELD LOCATE & VERIFY EXACT LOCATION. RE-LOCATE EXISTING VAV BOX 3511 AND REMOVE EXISTING DUCTWORK BACK TO SIA MAIN. TIE-IN NEW SIA DUCT FROM SIA MAIN TO NEW LOCATION. VAV BOX 3511 TO BE BALANCED AT = 142 L/s.
- FIELD LOCATE & VERIFY EXACT LOCATION. NEW VAV BOX 3522 TO BE BALANCED AT = 450 L/s.
- FIELD LOCATE & VERIFY EXACT LOCATION. RUN NEW 4000 EIA DUCTWORK THROUGH WALL AND UP THROUGH CHASE C/W FIRE DAMPERS. TIE-IN TO EXISTING EIA DUCTWORK MAIN. PROVIDE NEW VAV BOX 3E13 (ON 4TH LEVEL MECHANICAL ROOM) BALANCE NEW VAV BOX 3E13 TO 550 L/s.
- FIELD LOCATE & VERIFY EXACT LOCATION. TIE-IN NEW SIA DUCTWORK TO EXISTING SIA DIFFUSERS.
- FIELD LOCATE & VERIFY EXACT LOCATION. TIE-IN NEW 2500 SIA DUCTWORK FROM EXISTING SIA MAIN TO NEW VAV BOX 3522.
- FIELD LOCATE & VERIFY EXACT LOCATION. TIE-IN NEW 2000 SIA DUCTWORK FROM EXISTING SIA MAIN TO RELOCATED VAV BOX 3511.
- GAS TANKS AND GENERATORS TO BE LOCATED ALONG WALL. REFER TO DRAWING M03 WALL LAYOUT DETAIL.
- RUN NITROGEN GAS TUBING FROM NITROGEN TANK IN ROOM 3461 C/W SHUT-OFF VALVE. RUN TUBING TO CLOSEST WALL TO FUME HOOD C/W FINE TUNING PRESSURE VALVE. ANCHOR TUBING INSIDE FUME HOOD WALL C/W COILED TUBING FOR DRYING MANIFOLD CONNECTION.
- FIELD LOCATE & VERIFY EXACT LOCATION. 1000 EIA UP TO CEILING SPACE. OPEN ENDED DUCT C/W 18 GAUGE WIRE MESH AND ANGLE FRAME.
- FIELD LOCATE & VERIFY EXACT LOCATION. RUN STAINLESS STEEL GAS PIPING IN CEILING SPACE FROM TANKS AND GENERATORS IN ROOM 3461.
- GAS PIPING DN TO WORKSPACE ANCHORED TO PROVIDED UNISTRUT OR EQUIVALENT SUPPORT AND ALONG PROVIDED C-CHANNEL TO GAS CONNECTIONS. COORDINATE EQUIPMENT LOCATIONS WITH OWNER. REFER TO DRAWING M03 WORKBENCH GAS SCHEMATIC.
- FIELD LOCATE & VERIFY EXACT LOCATION. GC-B AND GC-C PUMPS LOCATED IN CENTER DRAWER.
- FIELD LOCATE & VERIFY EXACT LOCATION. TIE-IN NEW COMPRESSED AIR PIPING TO EXISTING CAPPED IN CEILING SPACE.
- FIELD LOCATE & VERIFY EXACT LOCATION. TIE-IN NEW COMPRESSED AIR PIPING BEHIND CABINET.
- CONNECT COMPRESSED AIR PIPING TO FERMENTER C/W ISOLATION VALVE. COORDINATE LOCATION WITH OWNER.
- FIELD LOCATE & VERIFY EXACT LOCATION. DRAIN PIPING FROM FERMENTER TO OIL/WATER SEPARATOR.
- FIELD LOCATE & VERIFY EXACT LOCATION. RUN INDIRECT SAN CONNECTION FROM OIL/WATER SEPARATOR TO EXISTING FLOOR DRAIN.
- FIELD LOCATE & VERIFY EXACT LOCATION. RELOCATE EXISTING EIA GRILLE AND EXTEND EIA DUCTWORK AS REQUIRED TO SUIT NEW LOCATION.
- FIELD LOCATE & VERIFY EXACT LOCATION. PROVIDE 150W EIA DUCT FROM CEILING TO CABINET FOR PUMP COOLING.
- FIELD LOCATE & VERIFY EXACT LOCATION. RUN NEW 150 DOW PIPING FROM EXISTING TO CHILLER.
- FIELD LOCATE & VERIFY EXACT LOCATION. REMOVE EXISTING EMERGENCY SHOWER HEAD AND PLUG TEE. EMERGENCY DRYASH TO REMAIN.
- FIELD LOCATE & VERIFY EXACT LOCATION. PROVIDE SNORKEL VENTILATION PLYMOUTH MMH-75-15 W UP IN CEILING SPACE FROM FERMENTER.
- FIELD LOCATE & VERIFY EXACT LOCATION. REMOVE EXISTING N GAS CONNECTIONS AND PIPING BACK TO SHUT OFF VALVE.
- RELOCATE NATURAL GAS ISOLATION VALVE. PIPING AND VALVE NEAR EQUIPMENT 42N ON PLANS TO BE RELOCATED ABOVE CEILING TO MAKE WAY FOR EQUIPMENT INSTALLATION SUPPLY AND INSTALL NEW DOOR FOR ROOM 3461. DOOR SHALL BE SOLID WOOD DOOR 800X150 WITH LOCKABLE DOOR HARDWARE TO MATCH EXISTING ON SITE. CONTRACTOR TO CONFIRM DOOR SIZE.
- FIRE STOP ALL PIPE PENETRATIONS IN ROOM 3434 TO THE SERVICE SHAFT 3433.
- COMPRESSED AIR DOWN TO ZERO AIR GENERATOR.
- OIL/WATER SEPARATOR RELOCATED FROM ROOM 3013.
- COMPRESSED AIR LINE INSTALLED BEHIND EXISTING CABINETS.
- NATURAL GAS PIPING ABOVE CEILING.
- EXISTING FUME HOOD.



1 LEVEL 3 PARTIAL HVAC PLAN
 SCALE: 1:100



2 LEVEL 3 PARTIAL PIPING PLAN
 SCALE: 1:100

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Association of Professional Engineers and Geoscientists of Saskatchewan
Division of Engineering
ARROW ENGINEERING, A DIVISION OF ENGLOBE CORP.
NUMBER C1158
Permitted to Conduct and Sign
Mechanical Engineering
MESH 1384

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A	A Detail no. No. du détail	A
B	B Location drawing no. No. de dessin de localisation	B
C	C Drawing no. No. de dessin	C

project: 110 GYMNASIUM PLACE
drawing: MECHANICAL SCHEDULES AND DETAILS

designed	compu	date	date
MA		MARCH/2023	
drawn	desainé	scale	échelle
MA		AS SHOWN	
checked	vérifié	sheet	feuille
OO		2 of 2	2
approved	approuvé	W.O. no.	D.T. no.
OO			
dep. no.	deposé no.		
C-M02			

TAG	MAKE	MODEL	SIZE	ROOM SERVED	NOMINAL AIRFLOW (L/s)	PD (Pa)	INLET DUCT SIZE (mm)	OUTLET DUCT SIZE (mm)	AIR HANDLING UNIT	REHEAT COILS (WATER)							NOTES	
										CAPACITY (kW)	EAT (°C)	LAT (°C)	FLUID FLOW (L/s)	EWT (°C)	LWT (°C)	FLUID PD (kPa)		COIL ROWS
3S11	EXISTING		8	EXISTING	142		EXISTING		AHU-2									5.6
3S14	EXISTING		7	EXISTING	135		EXISTING		AHU-2									6
3S16	EXISTING		7	EXISTING	135		EXISTING		AHU-2									6
3S18	EXISTING		7	EXISTING	135		EXISTING		AHU-2									6
3S20	EXISTING		5	EXISTING	90		EXISTING		AHU-2									6
3S21	PRICE	SDV	10	3434	650	2.5	250	350x313	AHU-2									1.2,3.4
4S10	EXISTING		5	4411, 4412	187		EXISTING		AHU-2									1

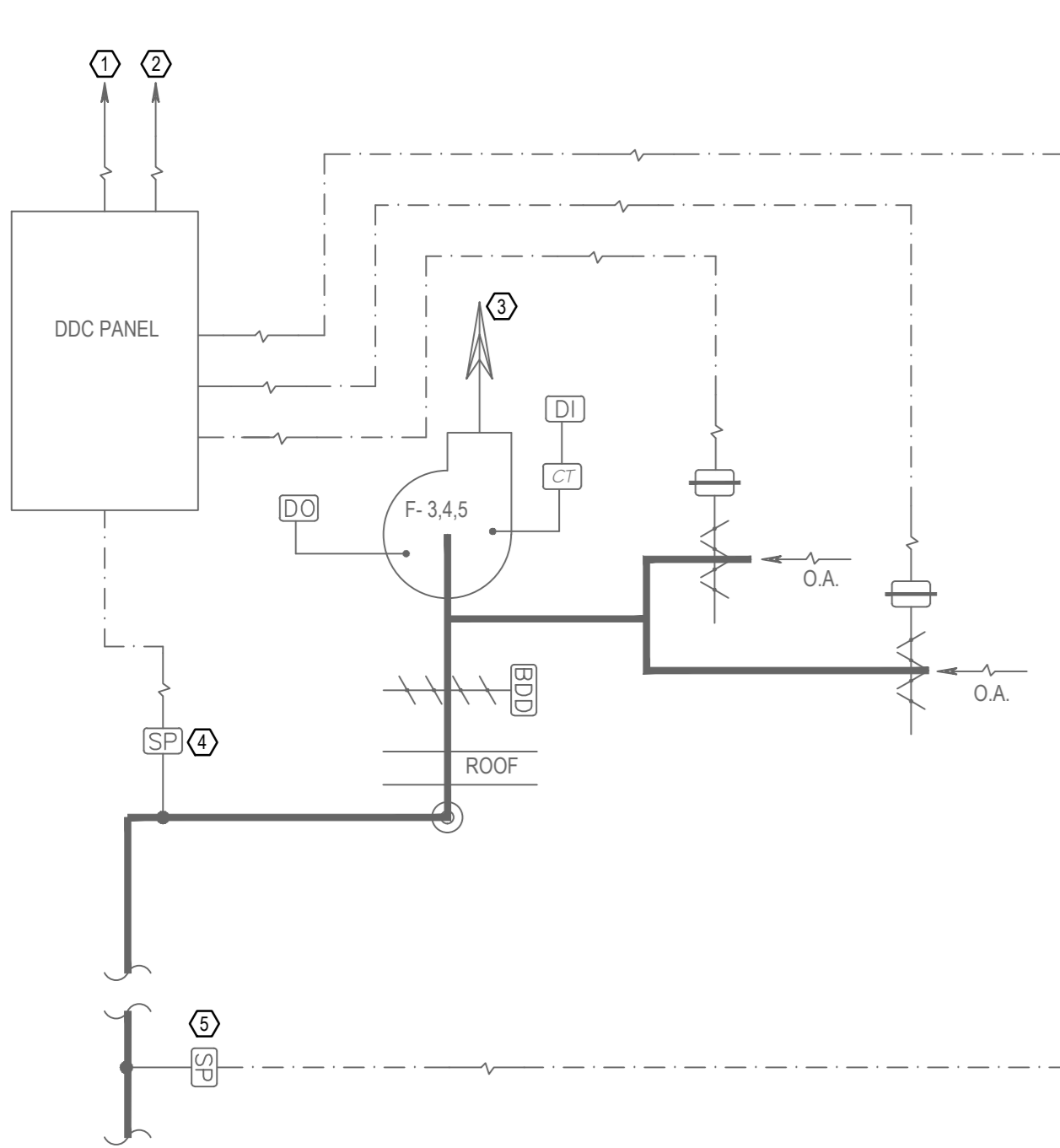
- NOTES:
1. VAV BOXES TO BE CW DIGITAL CONTROLS
2. BOXES TO BE SUPPLIED WITH 24V POWER. LOW VOLTAGE TRANSFORMERS SUPPLIED AND FIELD INSTALLED BY CONTROLS CONTRACTOR
3. BOXES TO BE CAPABLE OF OPERATING AT 1 IN W.C. STATIC PRESSURE AT INLET AND 0.25 IN W.C. STATIC PRESSURE AT OUTLET
4. BOXES TO BE SELECTED TO OPERATE AT MAXIMUM 85% OF DESIGN MAXIMUM FLOW RATE PER SUPPLIER'S STATED VALUES
5. EXISTING TO BE RELOCATED
6. EXISTING TO BE RE-BALANCED

TAG	SIZE	ROOM SERVED	AIRFLOW RANGE (L/s)	INLET DUCT SIZE (m)	AIR HANDLING UNIT	REHEAT COIL (ROWS)	SYSTEM TYPE	NOTES									
									3L06	12	3410	42-700	200	AHU-2	-	S	2.3
									3L08	12	3410	42-700	200	AHU-2	-	S	2.3
3E13	12	3434	42-700	200	AHU-2	-	GEX	1.2,3.4									
3E14	12	3411, 3410	42-700	200	AHU-2	-	GEX	2.3									
3E16	12	3410	42-700	200	AHU-2	-	FH	2.3									
3E18	12	3410	42-700	200	AHU-2	-	GEX	2.3									
3E20	12	3410	42-700	200	AHU-2	-	FH	2.3									
3E22	12	3410	42-700	200	AHU-2	-	GEX	2.3									
4E22	12	4412	42-700	200	AHU-2	-	GEX	1.2,3.4									

- NOTES:
1. BOXES TO BE SUPPLIED WITH 24V POWER. LOW VOLTAGE TRANSFORMERS SUPPLIED AND FIELD INSTALLED BY CONTROLS CONTRACTOR
2. AIR VALVE SIZE BASED ON PHOENIX CONTROL AIR VALVES
3. TO BE BALANCED AS NOTED ON MECHANICAL PLANS
4. BOXES PROVIDED BY MECHANICAL CONTRACTOR

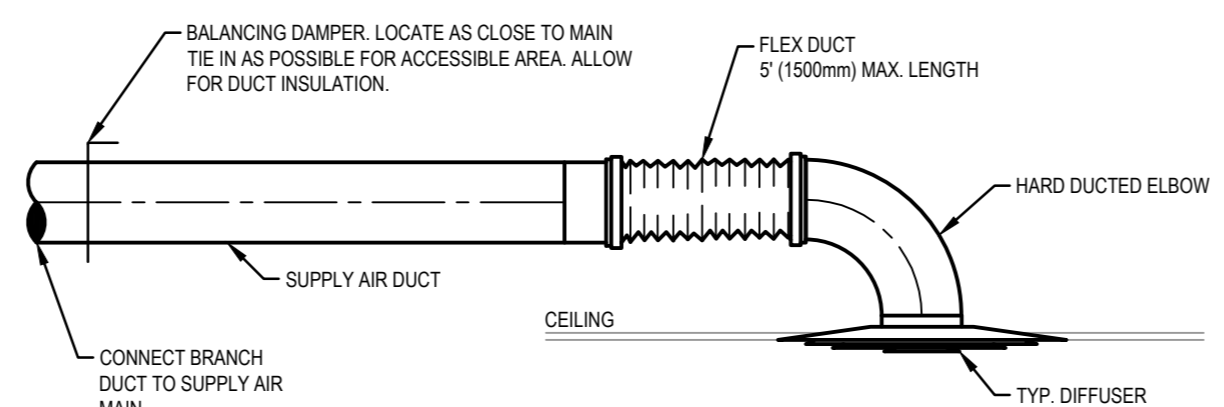
TAG	MAKE	MODEL	FUNCTION	MOUNTING	DESCRIPTION	NOTES
S-2	PRICE	SCD	SUPPLY	CEILING	SQUARE CONE DIFFUSER	2
S-3	PRICE	S20	SUPPLY	DUCT	LOUVERED FACE SUPPLY - DOUBLE DEFLECTION	2.3
R-1	EXISTING		RETURN	CEILING	EGG CRATE RETURN	1
R-2	PRICE	80	RETURN	CEILING	EGG CRATE RETURN	2
R-3	PRICE	S30	RETURN	DUCT	LOUVERED FACE RETURN	2.3
E-1	EXISTING		EXHAUST	CEILING	EGG CRATE RETURN	1
E-2	PRICE	80	EXHAUST	CEILING	EGG CRATE RETURN	2
E-3	PRICE	S30	EXHAUST	DUCT	LOUVERED FACE RETURN	2.3

- NOTES:
1. EXISTING TO BE RE-BALANCED AS INDICATED ON DRAWINGS
2. COLOR TO MATCH EXISTING
3. CW OPPOSED BLADE DAMPER

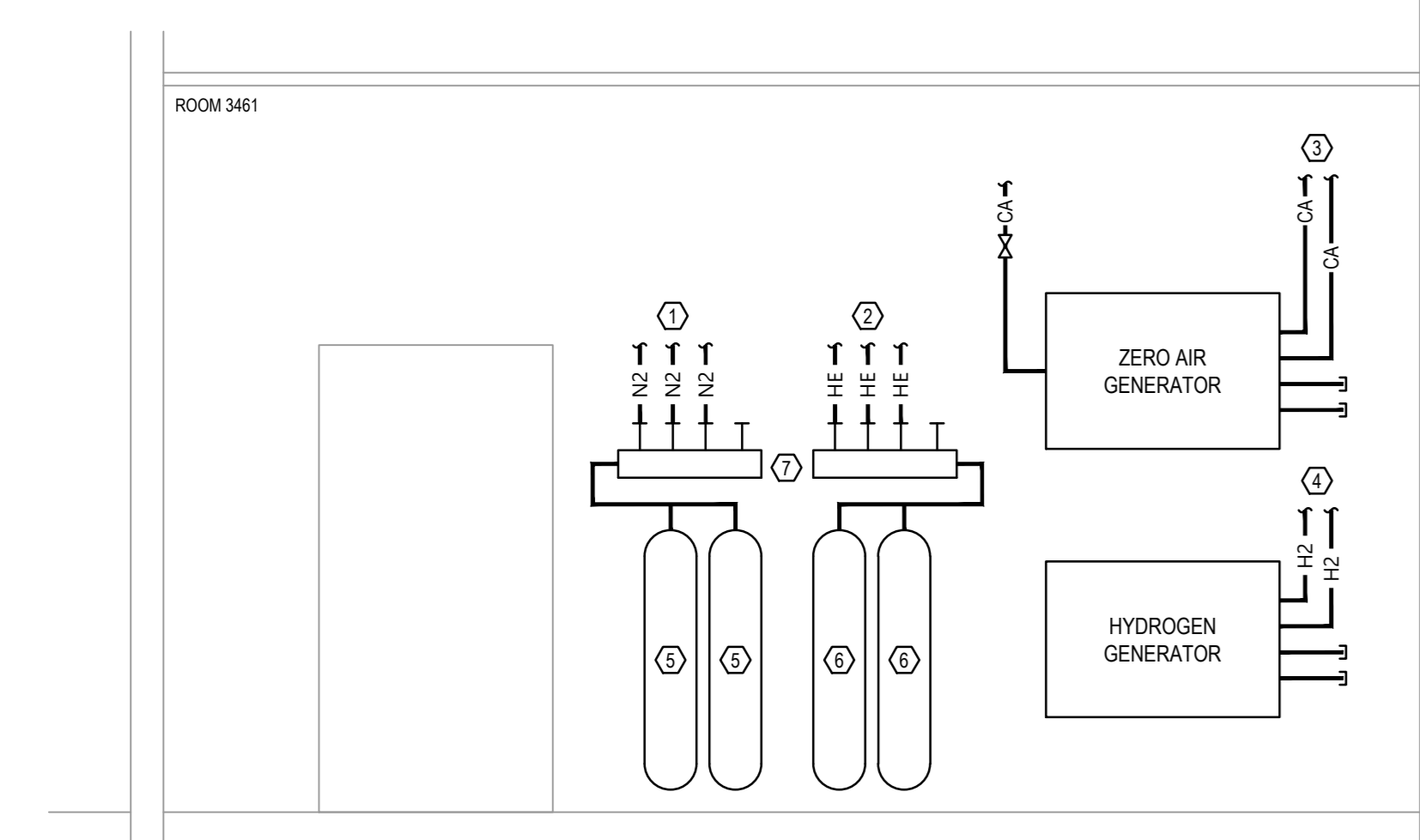


EXISTING LABORATORY EXHAUST CONTROL SEQUENCE
SCALE: N.T.S.

- NOTES**
- FAN F-4.5.6, OUTSIDE AIR DAMPERS TO MODULATE AS REQUIRED TO MAINTAIN REMOTE STATIC PRESSURE SETPOINT.
 - BACKDRAFT DAMPER TO CLOSE ON FAN SHUT DOWN
 - IF FAN IS UNABLE TO MAINTAIN REMOTE STATIC PRESSURE SETPOINT, SYSTEM SHALL ALARM
 - FAN SHALL SHUT DOWN ON HIGH SUCTION PLENUM NEGATIVE STATIC PRESSURE
 - ALL MONITORED CONDITIONS SHALL GENERATE ALARMS WHEN CONDITIONS ARE OUTSIDE OF ALLOWABLE RANGE AS SET. ALL RANGES SHALL BE ADJUSTABLE
 - ALL INPUTS TO DDC PANELS SHALL BE AVAILABLE THROUGH BUILDING AUTOMATION SYSTEM IN GRAPHICAL FORMAT
 - BUILDING AUTOMATION SYSTEM SHALL TOTALIZE THE EXHAUST FLOW RATE FROM ALL NEW PHOENIX EXHAUST AIR VALVE FOR MONITORING PURPOSES
 - MONITOR FAN STATUS WITH CURRENT TRANSFORMER RELAYS
 - OUTSIDE AIR INTAKE DAMPERS TO HAVE MINIMUM SET OPEN POSITION WITH PHYSICAL LOCK 1 TO BE ADJUSTABLE, INITIALLY SET FOR TOTAL OF 30% FOR EACH FAN
- KEYNOTES**
- START/STOP FAN F-4.5.6
 - TO BUILDING AUTOMATION SYSTEM
 - 2 SETS OF MODULATING O.A. DAMPERS BY FAN MANUFACTURER
 - STATIC PRESSURE SENSOR
 - STATIC PRESSURE SENSOR WITH APPROPRIATE RANGE

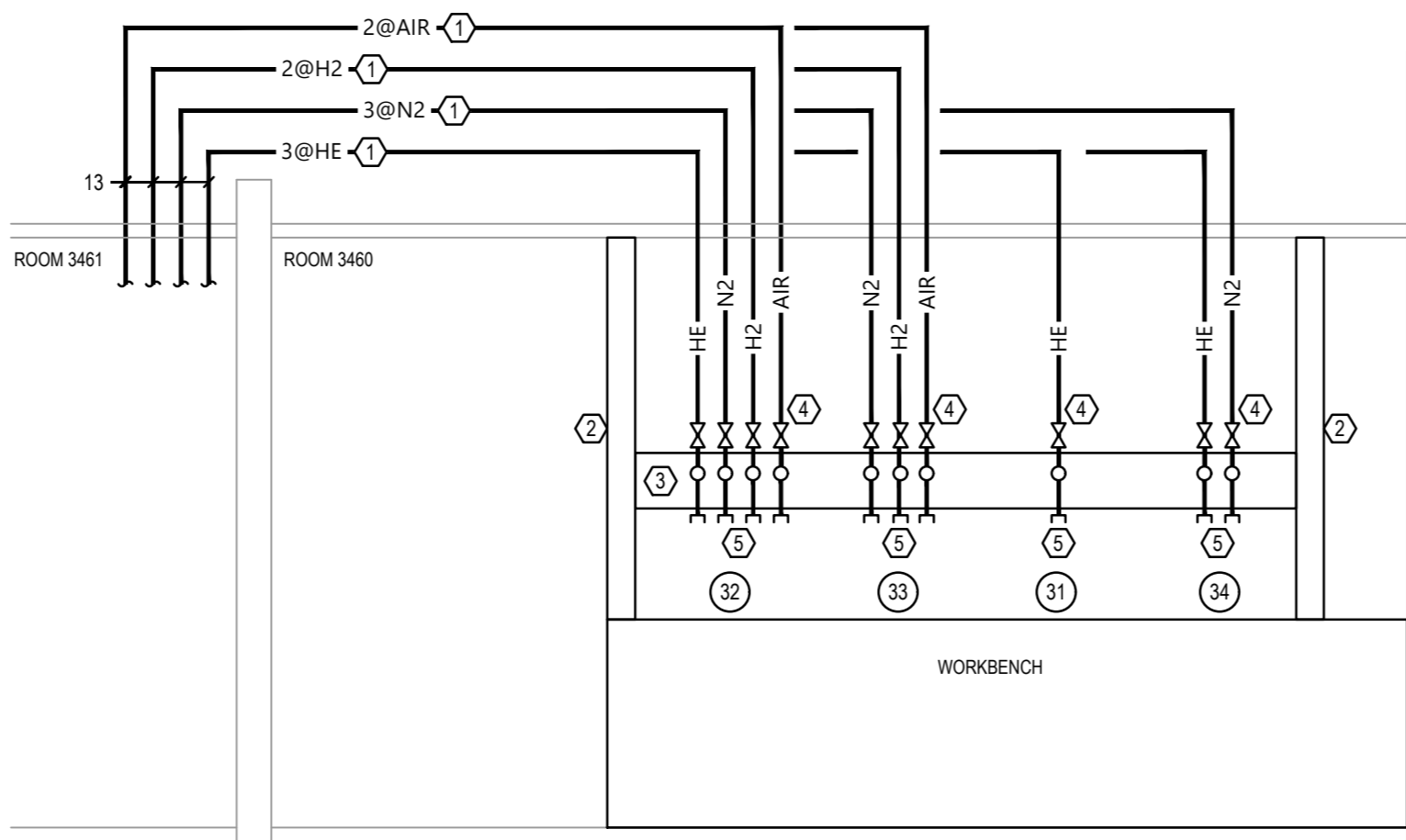


SUPPLY AIR DIFFUSER DETAIL
SCALE: N.T.S.



GAS EQUIPMENT APPROXIMATE WALL LAYOUT
SCALE: N.T.S.

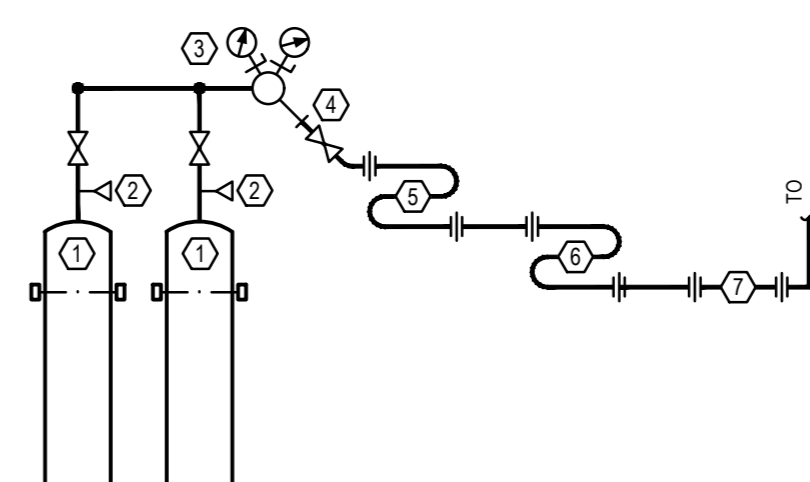
- KEYNOTES**
- HE TO INSTRUMENTS. REFER TO REGULATOR GENERAL LAYOUT.
 - N2 TO INSTRUMENTS. REFER TO REGULATOR GENERAL LAYOUT.
 - AIR TO INSTRUMENTS.
 - HE TO INSTRUMENTS.
 - HELIUM TANKS
 - NITROGEN TANKS
 - TANK MANIFOLDS. REFER TO GAS REGULATOR GENERAL LAYOUT.



WORKBENCH GAS SCHEMATIC
SCALE: N.T.S.

- KEYNOTES**
- 1/4" STAINLESS STEEL PIPING. CW 1/8" SWAGelok REDUCER FITTINGS (TYPICAL). 80 PSI WORKING PRESSURE
 - UNISTRUT SUPPORT OR EQUIVALENT
 - CROSS BAR CHANNEL
 - INSTRUMENT CONNECTIONS CW SHUT OFF VALVES ANCHORED TO CROSS BAR TYPICAL
 - PROVIDE SWAGelok COMPRESSION FITTING FOR CONNECTION TO OWNER EQUIPMENT TYPICAL

- KEYNOTES**
- MAIN GAS SUPPLY
 - MAIN SUPPLY ON/OFF VALVE
 - 2 STAGE REGULATOR MANIFOLD (SET AT 50 PSI)
 - ON/OFF VALVE
 - MOISTURE TRAP
 - HYDROCARBON TRAP
 - OXYGEN TRAP



GAS REGULATOR GENERAL LAYOUT
SCALE: N.T.S.