GENERAL NOTES

- 1. ALL REFERENCES HEREIN TO THE CONTRACTOR SHALL REFER TO THE PLUMBING CONTRACTOR UNLESS OTHERWISE NOTED.
- THE ENTIRE INSTALLATION SHALL BE COORDINATED WITH THE WORK OF ALL OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. THE CONTRACTOR SHALL VERIFY, IN THE FIELD, THE EXACT LOCATION OF ALL EXISTING PLUMBING SYSTEMS PRIOR TO MAKING NEW CONNECTIONS TO EXISTING LINES. THE CONTRACTOR SHALL PROVIDE ALL FITTINGS, OFFSETS, AND TRANSITIONS REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
- 3. DO NOT SCALE FROM THESE DRAWINGS.
- 4. DO NOT MAKE ANY CHANGES OR SUBSTITUTIONS WITHOUT SPECIFIC WRITTEN APPROVAL FROM THE ARCHITECT OR ENGINEER.
- ANY DISCREPANCIES OR INADEQUACIES WITHIN BID DOCUMENTS, BETWEEN THESE BID DOCUMENTS AND RELATED HVAC, FIRE PROTECTION, ELECTRICAL, STRUCTURAL, ARCHITECTURAL, INTERIOR DECOR, AND STRUCTURAL BID DOCUMENTS, OR BETWEEN THESE BID DOCUMENTS AND FIELD CONDITIONS MUST BE BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER PRIOR TO BID SUBMISSION.
- DRAWINGS INDICATING THE PRECISE LOCATION OF ALL SYSTEMS, EQUIPMENT, CONCEALED OR EMBEDDED PIPING, EXPOSED PIPING, PIPING CONNECTIONS, AND ACCESS PANELS/DOORS. THESE DRAWINGS SHALL INCLUDE ALL CHANGES AND DEVIATIONS FROM CONSTRUCTION DOCUMENTS. THESE DOCUMENT SHALL ALSO BE PROVIDED TO THE OWNER IN AN APPROVED AUTOCAD FORMAT.
- 7. THE CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS OF ALL PLUMBING EQUIPMENT WITH THE ELECTRICAL DRAWINGS AND ELECTRICAL CONTRACTOR. THE CONTRACTOR SHALL FURNISH PLUMBING EQUIPMENT WIRED FOR THE VOLTAGES SHOWN IN CONTRACT DOCUMENTS AND COORDINATED WITH ELECTRICAL CONTRACTOR.
- 8. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ALL APPLICABLE CODES. THE CONTRACTOR SHALL PROVIDE ALL FITTINGS, TRANSITIONS, VALVES, AND OTHER DEVICES REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
- 9. THE CONTRACTOR SHALL SUBMIT, PRIOR TO ANY FABRICATION OR INSTALLATION, ALL NECESSARY DRAWINGS, EQUIPMENT/MATERIAL PRODUCT DATA, DOCUMENTATION, AND CALCULATIONS REQUIRED TO COMPLETE THE WORK OUTLINED IN THE CONTRACT DOCUMENTS.
- 10. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION PRIOR TO ANY FABRICATION OR INSTALLATION. ALL FEES FOR PERMITS AND INSPECTIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR
- 11. ALL ABOVE GRADE PIPING SHALL BE PROPERLY SUPPORTED FROM THE BUILDING STRUCTURE. NO PIPING SHALL REST ON CEILING TILES OR CEILING STRUCTURE.
- 12. THE CONTRACTOR SHALL PROVIDE INSULATION ON ALL COLD WATER, HOT WATER, AND HOT WATER RECIRCULATION PIPING. THE CONTRACTOR SHALL PROVIDE INSULATION ON ALL HORIZONTAL STORM WATER PIPING.
- 13. THE CONTRACTOR SHALL PROVIDE REDUCING FITTING AT ALL CHANGES IN DIAMETER OF SANITARY, WASTE, AND STORM PIPING.
- 14. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SERVICE CONNECTIONS TO ALL EQUIPMENT AND FIXTURE INDICATED ON THE ARCHITECTURAL AND PLUMBING DRAWINGS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SERVICE CONNECTIONS TO HVAC AND FIRE PROTECTION EQUIPMENT.

DEMOLITION NOTES

- 1. THE CONTRACTOR SHALL INCLUDE IN THEIR PRICE ALL COSTS ASSOCIATED WITH REMOVALS AND RELOCATIONS OF PLUMBING WORK AS DESCRIBED ON THE DRAWINGS AND IN THE SPECIFICATIONS WITH ALLOWANCES FOR EXPECTED OR UNFORESEEN DIFFICULTIES WHEN CONCEALED WORK HAS BEEN OPENED. NO CLAIMS FOR ADDITIONAL WORK ASSOCIATED WITH DEMOLITION WILL BE ACCEPTED, EXCEPT IN CERTAIN CASES CONSIDERED JUSTIFIABLE BY THE ARCHITECT.
- 2. THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING PLUMBING WORK WHICH INTERFERES WITH THE NEW ARCHITECTURAL LAYOUTS. ALL SYSTEMS WHICH ARE NO LONGER REQUIRED TO FUNCTION SHALL BE REMOVED BACK TO ACTIVE LINES.
- 3. THE CONTRACTOR SHALL PERFORM DEMOLITION AND REMOVAL WORK WITH MINIMUM INTERFERENCE TO FUNCTIONING PLUMBING SYSTEMS. ALL AFFECTED SYSTEMS SHALL BE RECONNECTED AND RESTORED.
- 4. DEMOLITION AND REMOVAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER. THE CONTRACTOR SHALL PATCH, REPAIR OR OTHERWISE RESTORE ANY DAMAGED INTERIOR OR EXTERIOR BUILDING SURFACE TO ITS ORIGINAL CONDITION.
- THE CONTRACTOR SHALL REMOVE ALL PIPING SUPPORTS, ETC. FROM PARTITIONS
 THAT ARE TO BE REMOVED. WHERE THE REMOVAL OF THESE ITEMS DISRUPTS
 EXISTING PIPING THAT IS TO REMAIN, THE CONTRACTOR SHALL INSTALL AND PROVIDE
 BYPASS CONNECTIONS AS NECESSARY.
- 6. ALL PIPING WHICH BECOMES EXPOSED DURING THE ALTERATION WORK SHALL BE REMOVED AND REROUTED CONCEALED BEHIND FINISHED SURFACES.
- 7. PORTIONS OF MAINS TO BE REMOVED OR ABANDONED AS A RESULT OF DEMOLITION WORK, BUT WHICH ARE REQUIRED TO REMAIN ACTIVE, SHALL BE CUT AT CONVENIENT LOCATIONS, REROUTED AND RECONNECTED.
- 8. THE CONTRACTOR SHALL NOTIFY THE OWNER AT THE APPROPRIATE TIME OF THE PROJECTED DEMOLITION AND PHASING SCHEDULE SO THAT REMOVAL OR RELOCATION OF AFFECTED UTILITIES MAY BE CARRIED OUT IN COORDINATION WITH THE PROJECT REQUIREMENTS.
- 9. ALL EXISTING MATERIAL AND EQUIPMENT IN USABLE CONDITION, WHICH IS TO BE REMOVED UNDER THIS CONTRACT, SHALL REMAIN THE PROPERTY OF THE OWNER OR SHALL BE DISPOSED OF BY THE PLUMBING CONTRACTOR, AS DIRECTED BY THE
- 10. ARRANGE TO WORK CONTINUOUSLY, INCLUDING OVER TIME, IF REQUIRED, TO ASSURE THAT SYSTEMS WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE NECESSARY CONNECTIONS TO THE EXISTING SYSTEMS.
- 11. THE SHUTDOWN OF EXISTING BUILDING PLUMBING SERVICES SHALL BE COORDINATED WITH THE OWNER. MAKE ARRANGEMENTS AT LEAST 5 BUSINESS DAYS PRIOR TO A SHUTDOWN.

Δ	ABBREVIATIONS LIST
(NOT ALL ABBREVIATIO	ONS SHOWN ARE NECESSARILY USED ON THIS PROJECT)
BLDG	BUILDING
СО	CLEANOUT
CODP	CLEANOUT DECKPLATE
CLG	CEILING
CONN	CONNECT / CONNECTION
CONT	CONTINUE / CONTINUATION
CV	CHECK VALVE
CW	DOMESTIC COLD WATER
DIA	DIAMETER
DCV	DOUBLE CHECK VALVE BACKFLOW PREVENTER
DN	DOWN (PENETRATES FLOOR SLAB)
DW	DISHWASHER
DWG	DRAWING
EX	EXISTING
FD	FLOOR DRAIN
FT	FEET
FU	FIXTURE UNIT(S)
G	GAS
GV	GATE VALVE
GW	GREASE WASTE
	GALLONS
GAL	
GPM	GALLONS PER MINUTE
HW	DOMESTIC HOT WATER
HWR	DOMESTIC HOT WATER RECIRCULATION
IN	INCH .
JS 	JANITOR'S SINK
LAV	LAVATORY
LB	LAUNDRY BOX
MAX	MAXIMUM
MB	MANUFACTURED BY
MIN	MINIMUM
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
PSI	POUNDS PER SQUARE INCH — GAUGE
RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
S	SANITARY/SOIL
SK	SINK
SQFT	SQUARE FEET
ST	STORM
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UP	UP (PENETRATES FLOOR SLAB)
UR	URINAL
V	VENT
VB	VACUUM BREAKER
VTR	VENT THROUGH ROOF
W	WASTE
WC	WATER CLOSET

	(NOT ALL SYMBOLS
	s
	GW
	GW
	ST
	G
	c>
	X X
	
	 3
	
	
	-
	
	
	
	
	φ
	^
	0
	©
	JL
	‡
	N M
	•
	ā
	↓
	A
	凌 ② ※
	必
	×
	<u> </u>
	•
	<u>₽</u>
	$\stackrel{\otimes}{\Longrightarrow}$
	<u> </u>
	Alor III compare
	(NOT ALL SYMBOLS
_	<u> </u>

© X	GAS RISER DESIGNATION GRISER NUMBER STORM RISER DESIGNATION RISER NUMBER
X	RISER NUMBER
	SYMBOL LIST
(NOT ALL SYMBOLS S	HOWN ARE NECESSARILY USED ON THIS PROJECT)
——————————————————————————————————————	EXISTING SANITARY/SOIL PIPING
EX BURIED S	EXISTING BURIED SANITARY/SOIL PIPING
EX BURIED GW	EXISTING BURIED GREASE WASTE PIPING
EX BURIED ST	EXISITING BURIED STORM WATER PIPING
	EXISTING VENT PIPING
	EXISTING DOMESTIC COLD WATER PIPING
	EXISTING DOMESTIC HOT WATER PIPING
	DOMESTIC HOT WATER RECIRCULATION PIPING
———— EX G ————	EXISTING NATURAL GAS PIPING

SYMBOL LIST

(NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THIS PROJECT)

SANITARY/SOIL PIPING

GREASE WASTE PIPING

STORM WATER PIPING

NATURAL GAS PIPING

PIPE BREAK

P-TRAP

CAPPED OUTLET

PIPING TO BE DEMOLISHED

CLEANOUT / PLUGGED OUTLET

CLEANOUT DECK PLATE

PIPE DROP / DOWN

PIPE BOTTOM CONNECTION

PIPE TOP CONNECTION

PIPE SIDE CONNECTION

VACUUM BREAKER

SHOCK ARRESTOR

VENT THROUGH ROOF

WATERPROOF SLEEVE

CHECK VALVE

BALL VALVE

GATE VALVE

PLUG VALVE

WATER METER

MIXING VALVE

SOLENOID VALVE

GAS SHUTOFF

OUTSIDE SCREW & YOKE VALVE

PRESSURE REDUCING VALVE

GAS PRESSURE REGULATOR

PLUMBING RISER DESIGNATION

POINT OF DISCONNECTION FROM EXISTING PIPING

P RISER NUMBER

POINT OF CONNECTION TO EXISTING PIPING

DRAIN

PUMP

PIPE RISE / UP

VENT PIPING

BURIED SANITARY/SOIL PIPING

BURIED GREASE WASTE PIPING

DOMESTIC COLD WATER PIPING

DOMESTIC HOT WATER PIPING

DOMESTIC HOT WATER RECIRCULATION PIPING

ARROW REPRESENTS DIRECTION OF FLOW

CONNECTICUT STATE BUILDING CODES

- 2018 CONNECTICUT STATE BUILDING CODE
 2015 INTERNATIONAL EXISTING BUILDING CODE
 2015 INTERNATIONAL PLUMBING CODE
- 2015 INTERNATIONAL MECHANICAL CODE
 2017 NATIONAL ELECTRICAL CODE (NFPA 70)
- LOCAL FIRE DEPARTMENT/FIRE MARSHALALL OTHER LOCAL AUTHORITIES HAVING JURISDICTION

CONNECTICUT STATEENERGY CODES

2015 INTERNATIONAL ENERGY CONSERVATION CODE

REFERENCED STANDARDS

APPLICABLE REFERENCE STANDARDS SHALL BE AS REFERENCED BY ALL STATE AND LOCAL CODES. THE LIST BELOW IS FOR QUICK REFERENCE AND DOES NOT INCLUDE ALL APPLICABLE REFERENCE STANDARDS.

- 2013 NFPA 13 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
 2013 NFPA 14 STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE
- SYSTEMS
 2013 NFPA 20 STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE
- PROTECTION
 2015 NFPA 54 NATIONAL FUEL GAS CODE
- 2017 NFPA 70 NATIONAL ELECTRICAL CODE
 2013 NFPA 72 NATIONAL FIRE ALARM AND SIGNALING CODE

	PLUMBING DRAWING LIST
SHEET NUMBER	SHEET NAME
P-001	PLUMBING COVER PAGE
P-002	PLUMBING SCHEDULE SHEET
P-100a	PLUMBING BASEMENT WASTE & VENT PLAN
P-100b	PLUMBING BASEMENT DOM. WATER & GAS PLAN
P-101a	PLUMBING 1ST FLOOR WASTE & VENT PLAN
P-101b	PLUMBING 1ST FLOOR DOM. WATER & GAS PLAN
P-102	PLUMBING ATTIC PLAN
P-301	PLUMBING GAS RISER DIAGRAM
P-302	PLUMBING DOM. WATER RISER DIAGRAM
P-304	PLUMBING WASTE, VENT AND GREASE WASTE RISER DIAGRAMS
P-401	PLUMBING DETAILS
P-402	PLUMBING SCHEMATIC WATER DISTRIBUTION PLAN
P-501	PLUMBING SPECIFICATIONS

Mastroluca Engineering Associates, LLC

51 ZEPHYR RD TRUMBULL CT 06611

203-581-3838

JMASTROLUCA.MEA@GMAIL.COM

Revis	sions	
#	DATE	ISSUE/REVISION DESCRIPTION
PHA	ASE	
		ISSUED FOR



PERMIT/BID

OFFUTT EDUCATION CENTER

AT LACHAT FARM

106 GODFREY, ROAD
WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: NTS

PLUMBING COVER PAGE

DRAWING#

DRAWING TITLE

P-001

© 2022 MASTROLUCA ENGINEERING ASSOCIATES, LLC
These drawings, concepts, designs and ideas are the property of MASTROLUCA ENGINEERING
ASSOCIATES, LLC. They may not be copied, reproduced, disclosed to others, or used in
connection with any work other than the specified project for which they were prepared, in whole

or in part, without prior written consent of MASTROLUCA ENGINEERING ASSOCIATES, LLC

					V	VATE	R HEA	TER S	CHEDI	JLE					
								ELECTRI	CAL DATA			GAS DATA			
DESIGNATION	MANUFACTURER	MODEL NUMBER	WATER STORAGE TEMPERATURE (°F)	WATER STORAGE CAPACITY (GAL)	RECOVERY RATE	Temperature Rise (*f)	TOTAL KW LOAD IN SIMULTANEOUS USE	ELEMENT LOAD (KW)	VOLTAGE	PHASE	NATURAL GAS PROPANE FUEL OIL DUAL FUEL	LOAD (CFH)	MINIMUM OPERATING PRESSURE (IN WC)	GAS SERVICE CONNECTION (IN)	APPLICABLE AREAS
HTR-1	AERCO	INNOVATION - 1060	N/A	N/A	1224 GPH	100	-	_	120	1	•	1060	4-14 * WC	1"	PROVIDE MASTER MIXING VALVE (MB HOLBY) AND CONDENSATE NEUTRALIZER KIT 89025-2 MB:AERCO
HTR-2	NAVIEN	NPE-180S2	N/A	N/A	4.4 GPM	67	-	_	120	1	•	180	3-10.5*WC	3" 4	PROVIDE MASTER MIXING VALVE (MB: HOLBY) AND CONDENSATE NEUTRALIZER KIT (MB: NAVIEN MOD# GXX001322)

												DR	AIN	SC	HE	Dl	JLE															
					DRAIN	N B0[Y SP	ECIFIC	CATIO	N										STR	AINER	SPE	CIFICA	TION								
DESIGNATION	MANUFACTURER	MODEL NUMBER	BRONZE	CAST IRON	GALVANIZED	STAINLESS STEEL	CLAMPING DEVICE	SECONDARY CLAMP	SUMP RECEIVER	_ LE	PRIMER CC	ZE	CAST IRON		NICKEL BRONZE	٤		CHROME PLATED	POLISHED FINISH	SATIN FINISH	SECONDARY STRAINER	SEDIMENT BUCKET	LESS GRATE	HALF GRATE	FLUSH GRATE	TRACTOR GRATE	FLAT TOP	FUNNEL TOP	DOME	EXTENSION	ADJUSTABLE	APPLICABLE AREAS
FS-1	ZURN	Z-1750				•					•				•							•		•							•	KITCHEN AREA
FD-1	ZURN	ZN-550				•					•				•										•						•	KITCHEN AREA & BATHROOMS
FD-2	ZURN	ZN-320				•					•				•										•						•	CONDEN. DRAINS

- 1)ALL FLOOR DRAINS IN FINISHED AREAS AND ALL ROOF DRAINS SHALL BE LOCATED AS PER THE ARCHITECTURAL DRAWINGS.
- 2)ALL FLOOR DRAINS IN MECHANICAL EQUIPMENT ROOMS, BOILER ROOMS, FAN ROOMS ETC., SHALL BE LOCATED IN COORDINATION WITH THE MECHANICAL CONTRACTOR.
- 3)THE CONTRACTOR SHALL VERIFY THE COMPATIBILITY OF THE DRAINS WITH THE APPROVED ROOFING AND/OR WATER PROOFING SYSTEMS PRIOR TO SUBMITTING SHOP DRAWINGS.
- 4)THE TOP OF ALL FLOOR DRAINS SHALL BE FLUSH WITH THE ADJACENT FINISHED FLOOR.
- 5)PROVIDE TRAP PRIMER MOD# M-500 AS MANUFACTURED BY MIFAB ON ALL FLOOR DRAINS UNLESS OTHERWISE NOTED. PROVIDE DISTRIBUTION UNIT MI-DU WHEN APPLICABLE. PROVIDE 1/2" CW CONNECTION TO ALL TRAP PRIMERS.

							Р	UMP (SCHED	ULE					
		SIMPLEX SYSTEM	DUPLEX SYSTEM	TRIPLEX SYSTEM	EMERGENCY POWER	CAPACITY (EA	<u>, </u>		ELECTRICAL	DATA (EAC	·			I SPECIFICATION	
SERVICE	DESIGNATION	S	3		EM	FLOW RATE	HEAD	HP	RPM	V	PH	HZ	MANUFACTURER	MODEL NUMBER	REMARKS
SEWAGE EJECTOR PUMP	EP-1		•		•	28 GPM	25 FT	3 4	1725	208	3	60	LIBERTY PUMPS	1103/LE73M	PRE-PACKAGED DUPLEX UNIT WITH BASIN
DOMESTIC BOOSTER PUMP	DMB-1	•			•	25 GPM	25 FT	3	_	208	3	60	XYLEM/GOULDS	25GS30	AQUAVAR PRO PAK; LOCATED IN STORAGE TANK
WELL PUMP	_	•			•	7 GPM	380 FT	1	_	208	3	60	STA-RITE	S10P4HS10231 / L10P4EH / P43B0010A2	SIGNATURE SERIES, 10 GPM MODEL CATEGORY

			PIPE, FITTING, AND JOINT MAT	ERIAL SCHEDULE	
		(NOT	ALL PIPE, FITTING, AND JOINT MATERIALS SHOWN ARE N	IECESSARILY USED ON THIS PROJECT)	
PIPING SYSTEM	PIPING LOCATION	PIPING SIZE	PIPING SPECIFICATION	FITTING SPECIFICATION	JOINT SPECIFICATION
SANITARY/GREASE WASTE/ VENT/STORM	ALL	ALL	SERVICE WEIGHT HUBLESS CAST IRON	SERVICE WEIGHT HUBLESS CAST IRON	NEOPRENE RUBBER SEALING SLEEVE AND HEAVY DUTY STAINLESS STEEL CORRUGATED SHIELDS WITH A MINIMUM OF FOUR HEAVY DUTY BANDS
INDIRECT WASTE	ALL	ALL	TYPE DWV COPPER TUBING	WROUGHT COPPER WITH SOLDER ENDS	95.5 TIN / 4.0 COPPER / 0.5 SILVER SOLDER
COLD WATER/HOT WATER/ HOT WATER CIRCULATION	ALL	ALL	TYPE L HARD DRAWN COPPER TUBING	WROUGHT COPPER WITH SOLDER ENDS	95.5 TIN / 4.0 COPPER / 0.5 SILVER SOLDER
GAS	ALL	ALL	SCHEDULE 40 BLACK STEEL	MALLEABLE IRON WITH THREADED ENDS	THREADED

	OPENING / SLEEVE SCHI	EDULE
INSULATED DOMESTIC CO	OLD WATER, HOT WATER, AND HOT WATER RE	ECIRCULATION PIPING
PIPE DIAMETER	WALL / FLOOR SLEEVE DIAMETER	BEAM OPENING DIAMETER
1/2" & 3/4"	3"	4"
1"	4"	4½"
11/4"	4"	5"
1½"	4"	5"
2" & 21/2"	5"	6"
3"	6"	6½"
UNINSULATED SANITARY,	WASTE, VENT, STORM, AND GAS PIPING	
PIPE DIAMETER	WALL / FLOOR SLEEVE DIAMETER	BEAM OPENING DIAMETER
11/2"	3"	3"
2"	4"	3½"
21/2"	4"	4"
3"	5"	41/2"
4"	6"	5½"
5"	8"	61/2"
6"	8"	7½"

MASTROLUCA ENGINEERING ASSOCIATES, LLC

51 ZEPHYR RD TRUMBULL CT 06611

203-581-3838

JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION

ISSUED FOR PERMIT/BID



PROJECT NAME
OFFUTT EDUCATION CENT
AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

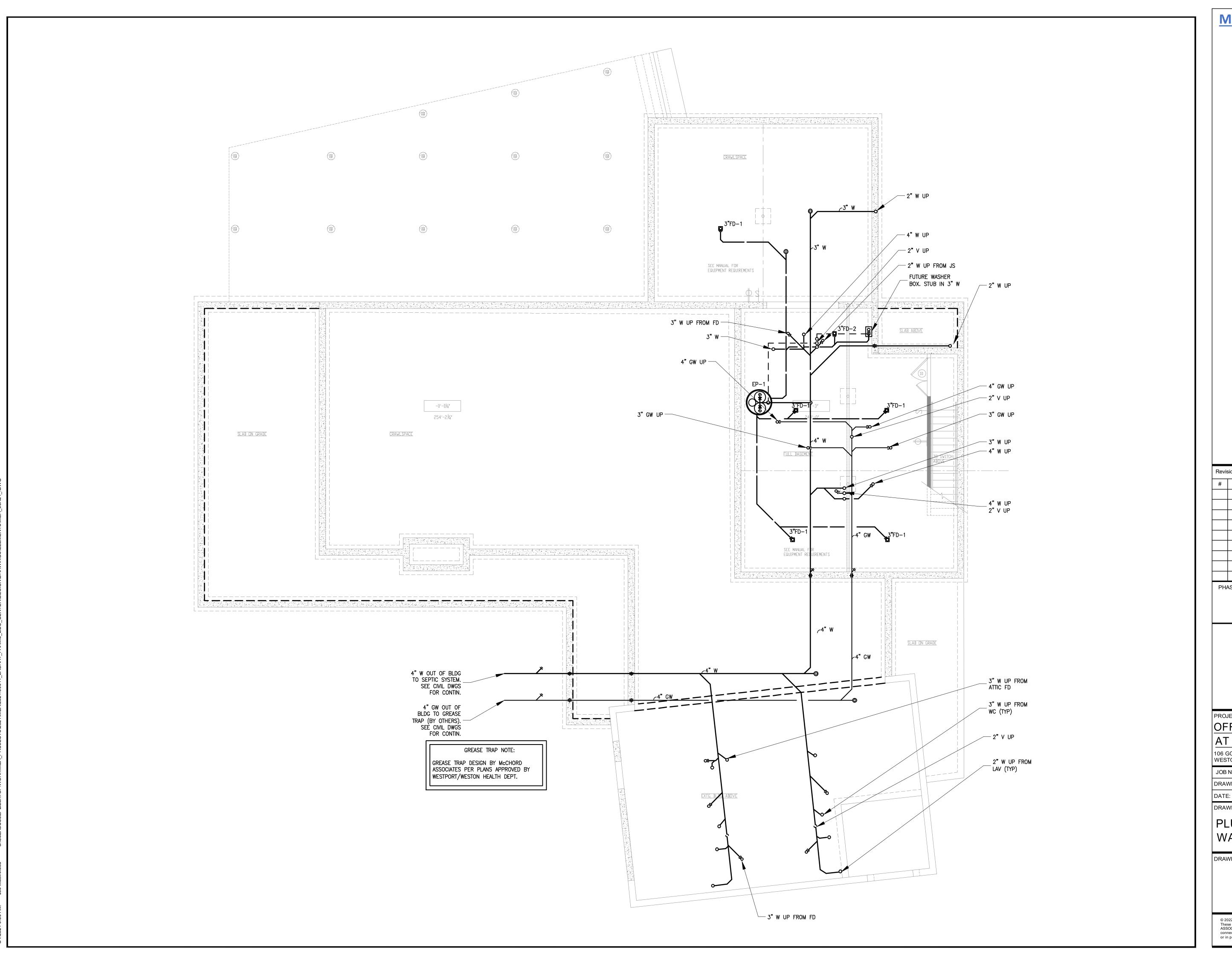
DATE: 02/16/2022 SCALE: NTS

DRAWING TITLE

PLUMBING SCHEDULE SHEET

DRAWING#

P-002





#	DATE	ISSUE/REVISION DESCRIPTION
DITA	CE	1
PHA	/OE	
		ISSUED FOR



PERMIT/BID

PROJECT NAME OFFUTT EDUCATION CENTER AT LACHAT FARM

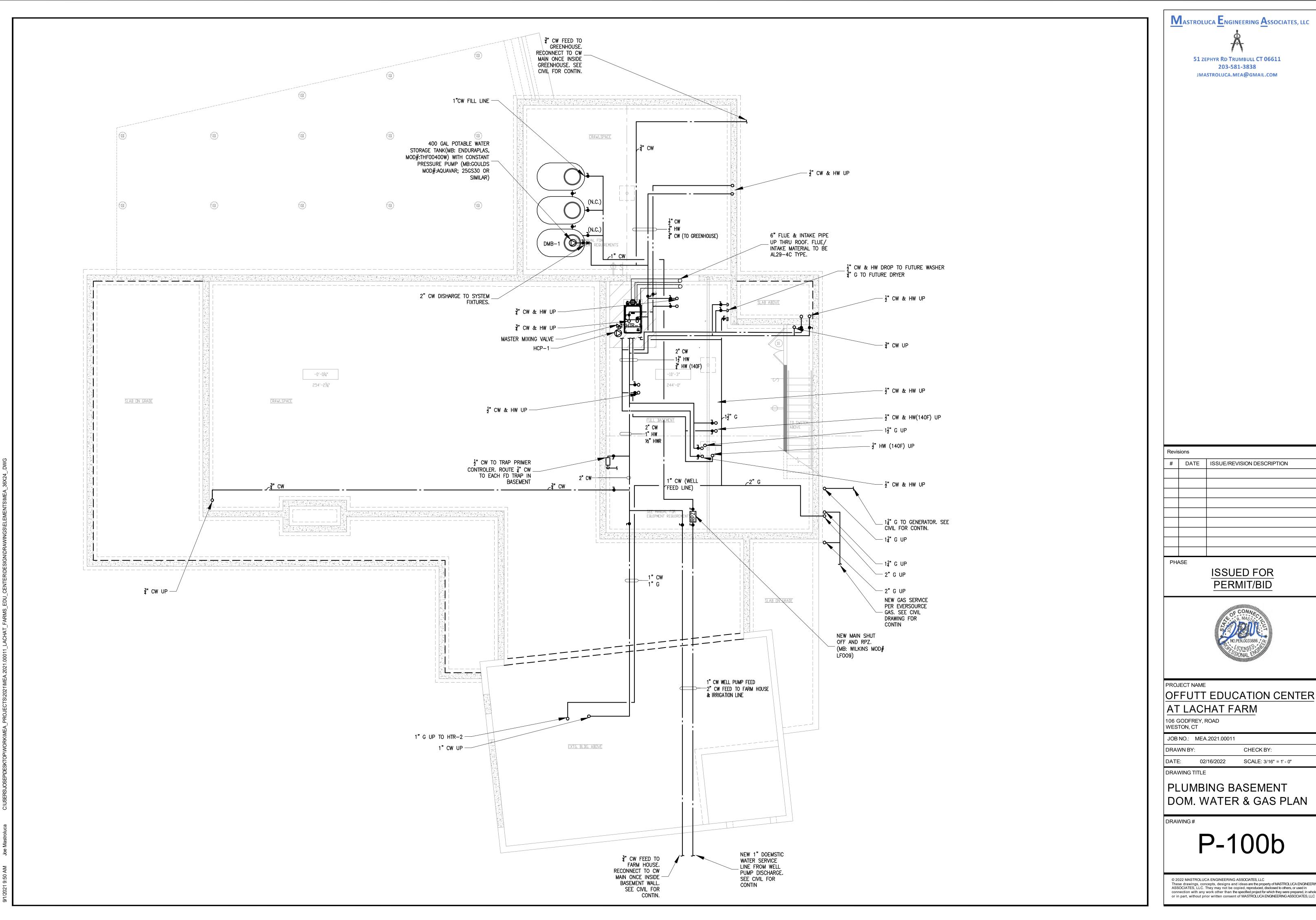
106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011 DRAWN BY: CHECK BY: SCALE: 3/16" = 1' - 0" DRAWING TITLE

PLUMBING BASEMENT WASTE & VENT PLAN

DRAWING#

P-100a



 $\underline{\mathbf{M}}_{\mathsf{ASTROLUCA}} \, \underline{\mathbf{E}}_{\mathsf{NGINEERING}} \, \underline{\mathbf{A}}_{\mathsf{SSOCIATES}}$ 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION	

PERMIT/BID

ISSUED FOR



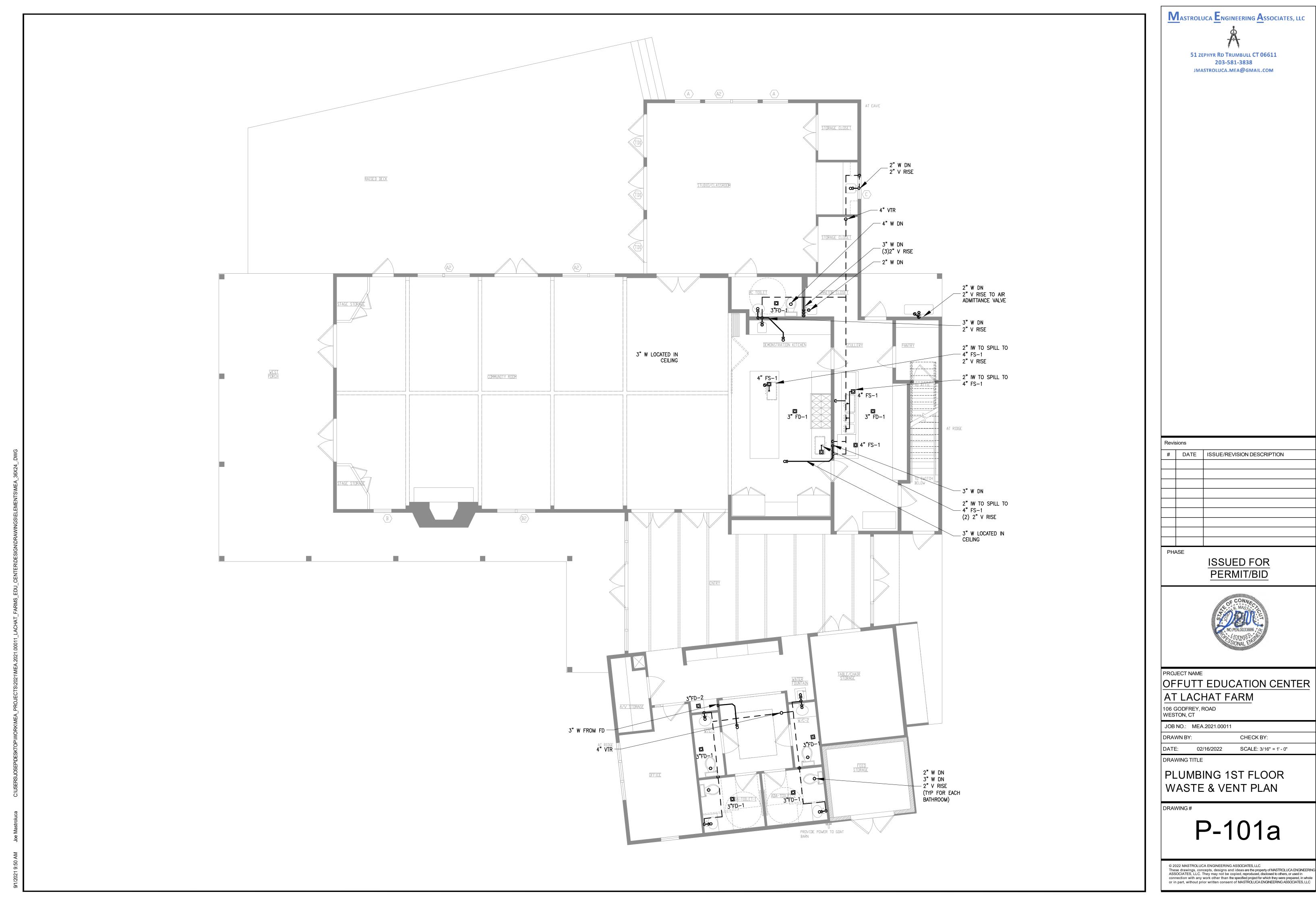
AT LACHAT FARM

106 GODFREY, ROAD

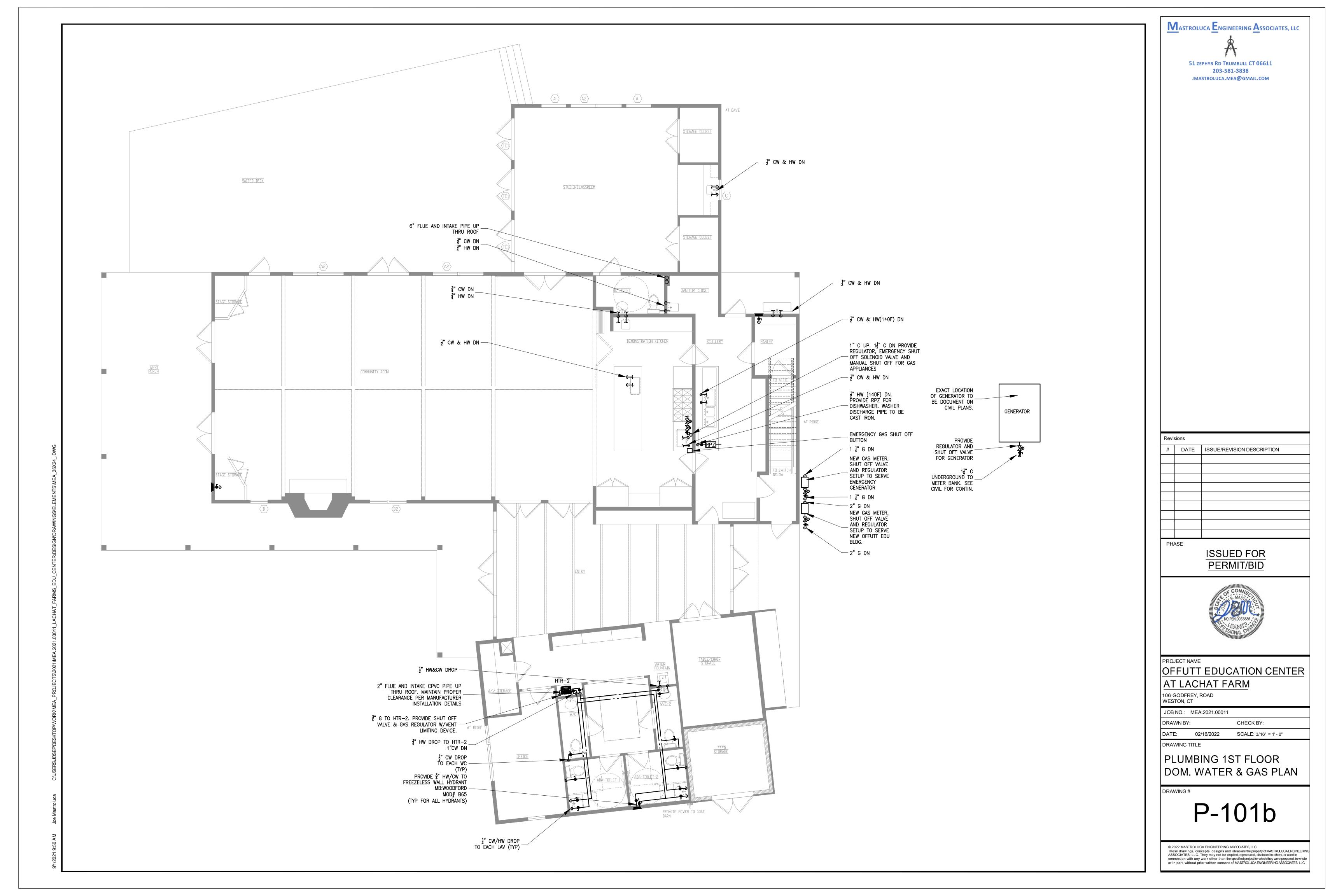
CHECK BY: SCALE: 3/16" = 1' - 0"

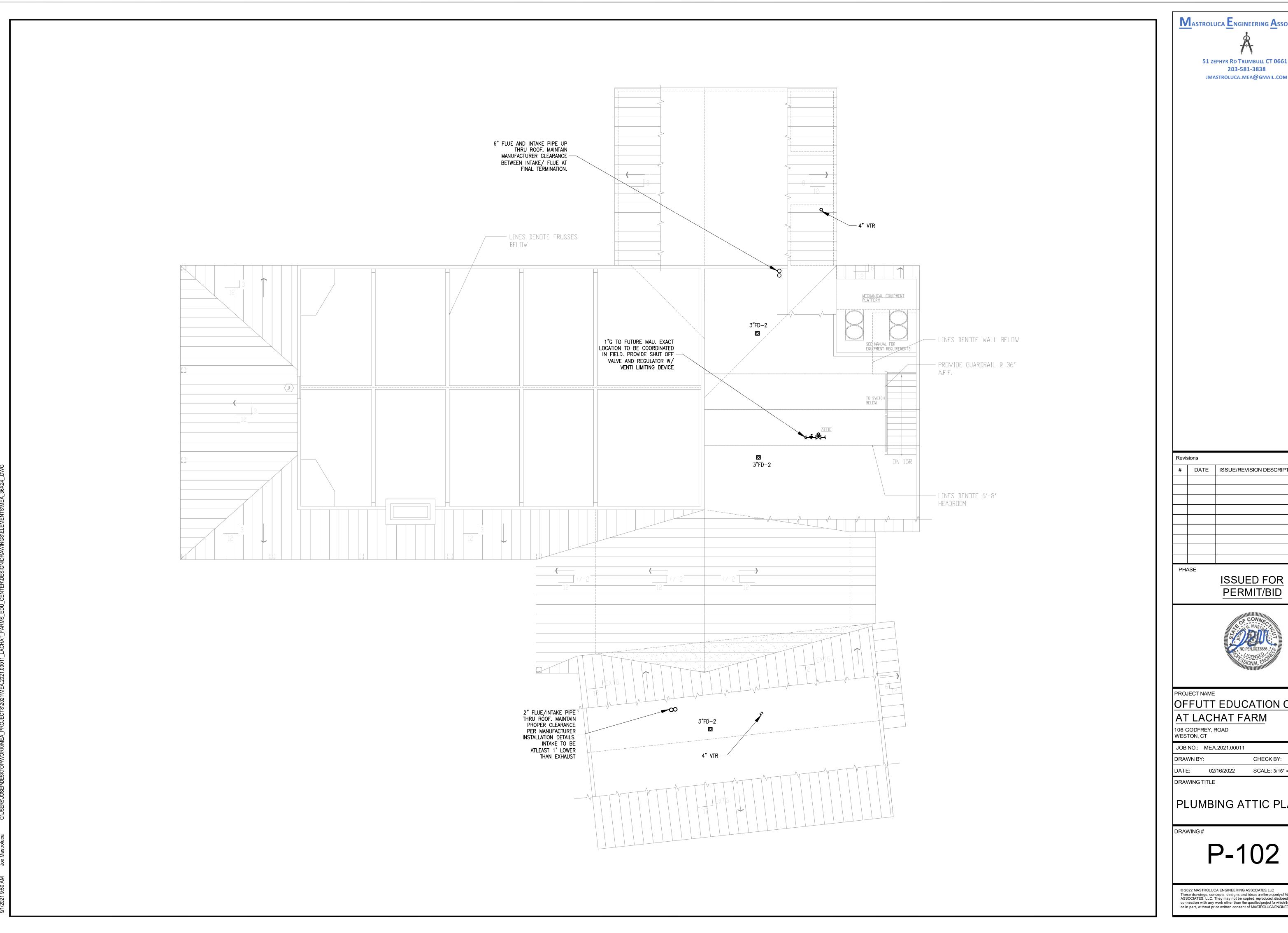
PLUMBING BASEMENT DOM. WATER & GAS PLAN

P-100b



#	DATE	ISSUE/REVISION DESCRIPTION





Mastroluca Engineering Associates, llc 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION

PERMIT/BID

OFFUTT EDUCATION CENTER AT LACHAT FARM

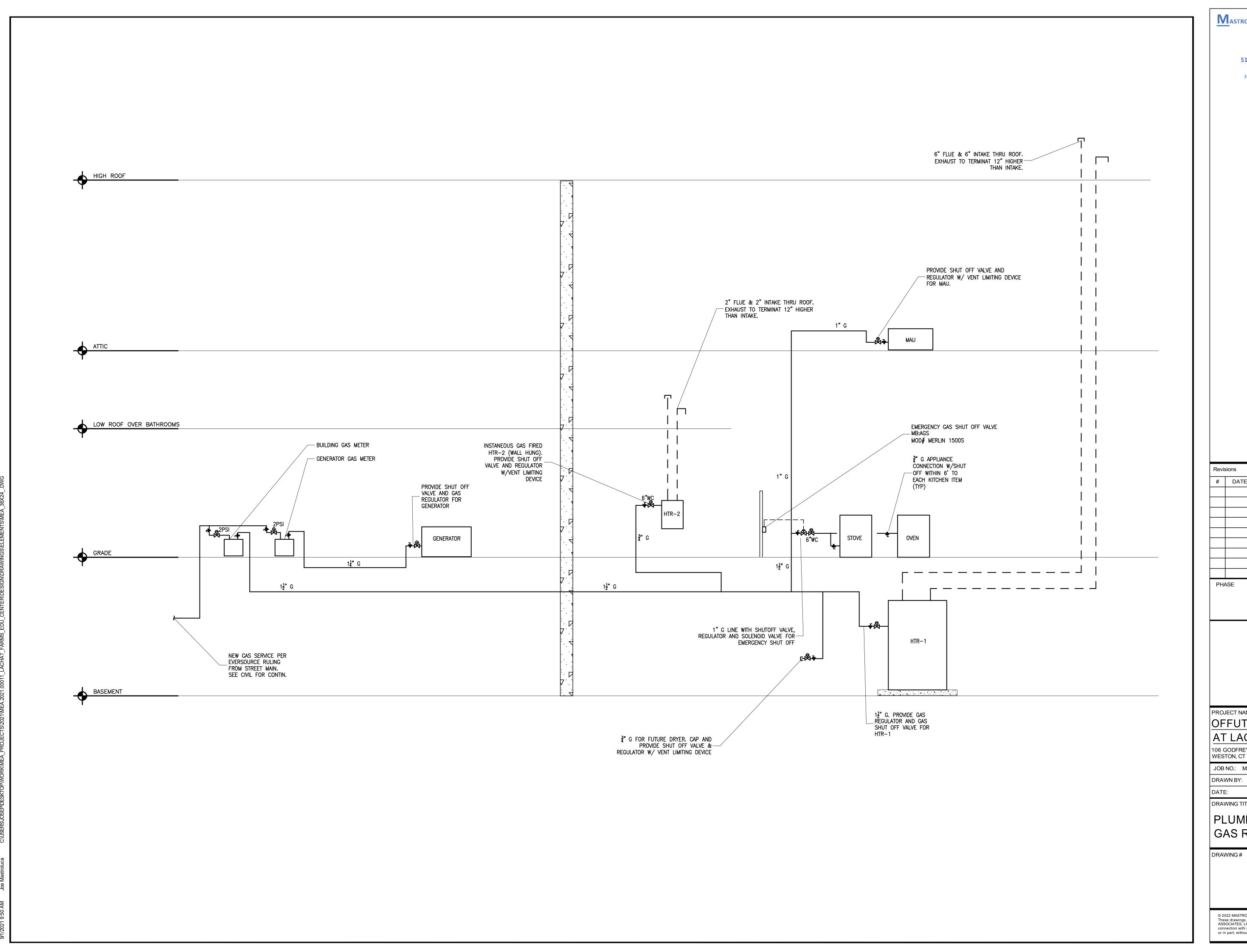
106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011 CHECK BY:

SCALE: 3/16" = 1' - 0"

PLUMBING ATTIC PLAN

P-102



 $\underline{\mathbf{M}}_{\mathsf{ASTROLUCA}} \, \underline{\mathbf{E}}_{\mathsf{NGINEERING}} \, \underline{\mathbf{A}}_{\mathsf{SSOCIATES}}$ 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION

PERMIT/BID

ISSUED FOR

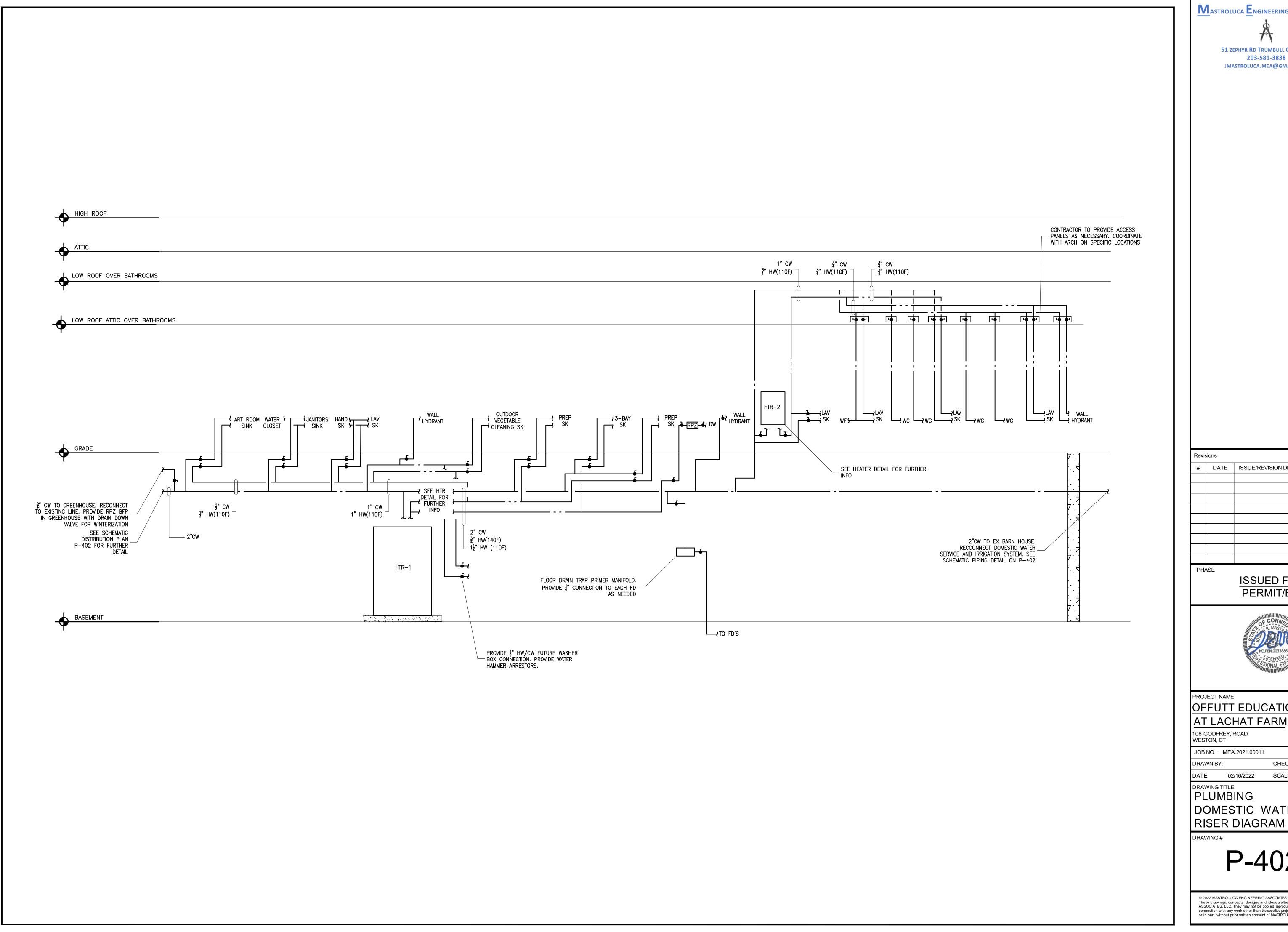
PROJECT NAME OFFUTT EDUCATION CENTER

AT LACHAT FARM 106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011 CHECK BY: DRAWN BY: SCALE: NTS

DRAWING TITLE

PLUMBING GAS RISER DIAGRAM



 $\underline{\mathbf{M}}$ astroluca $\underline{\mathbf{E}}$ ngineering $\underline{\mathbf{A}}$ ssociates, llc 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION	



ISSUED FOR

PERMIT/BID

PROJECT NAME OFFUTT EDUCATION CENTER AT LACHAT FARM

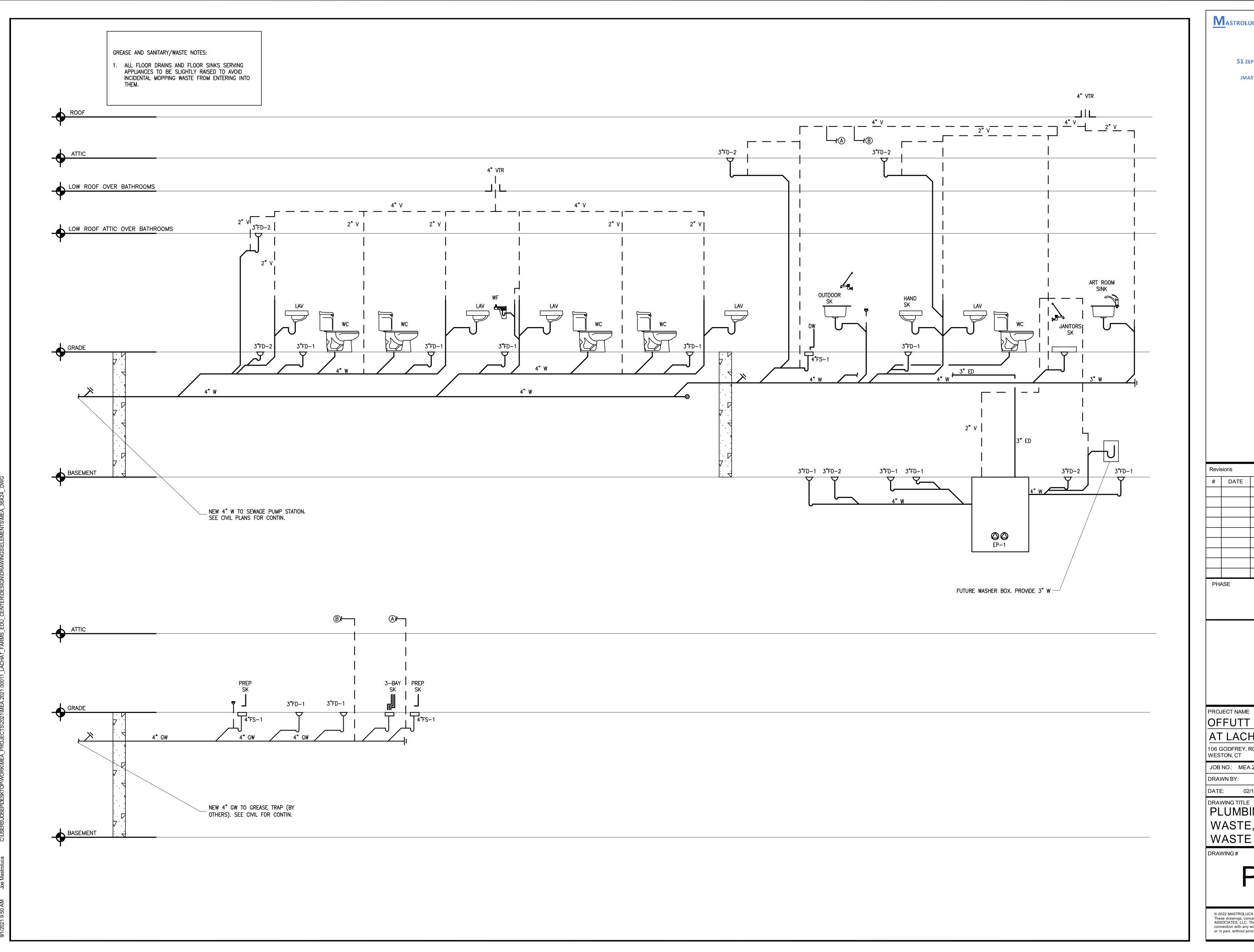
106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011 DRAWN BY:

CHECK BY: SCALE: NTS DATE: 02/16/2022

PLUMBING DOMESTIC WATER

DRAWING#



 $\underline{\mathbf{M}}$ astroluca $\underline{\mathbf{E}}$ ngineering $\underline{\mathbf{A}}$ ssociates, llc 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION

ISSUED FOR

PERMIT/BID



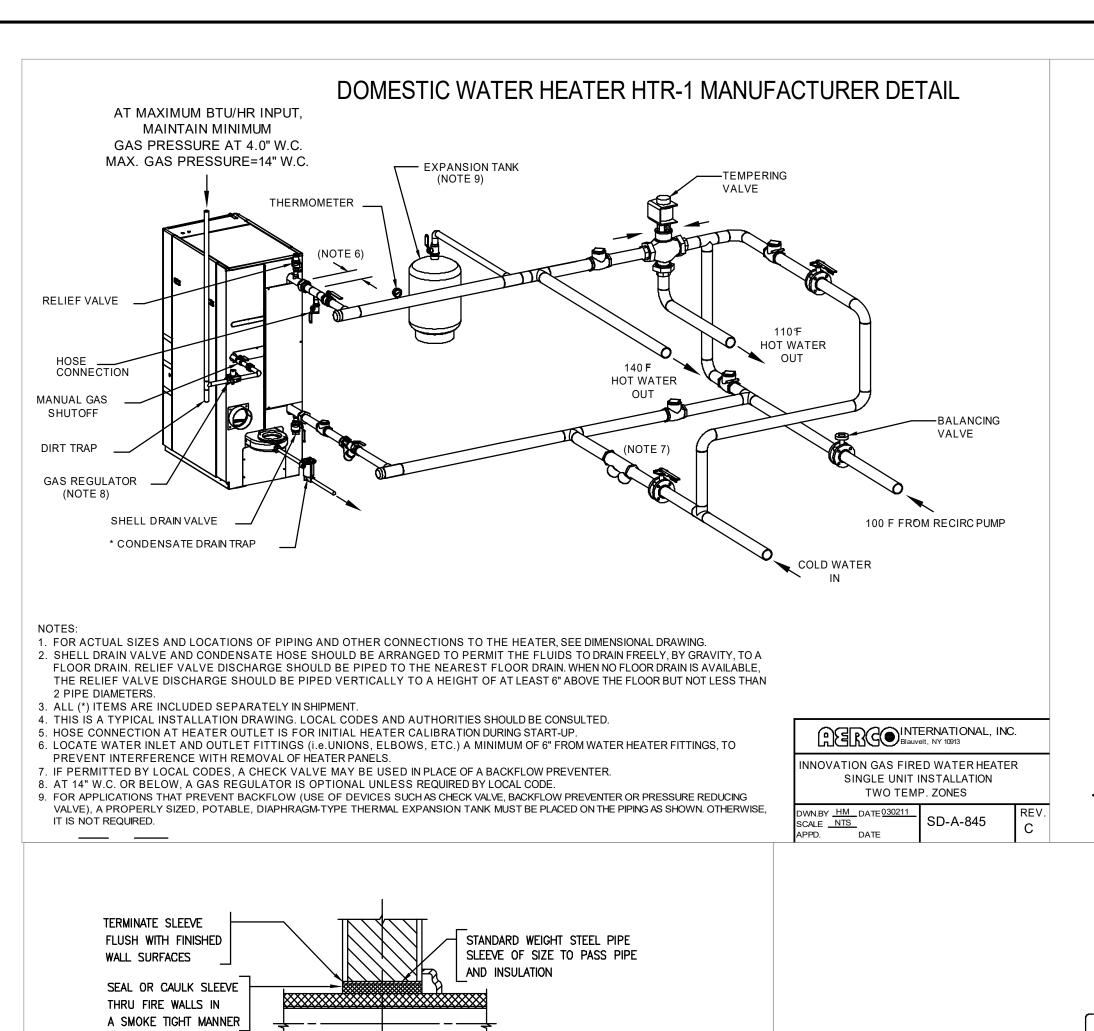
OFFUTT EDUCATION CENTER AT LACHAT FARM

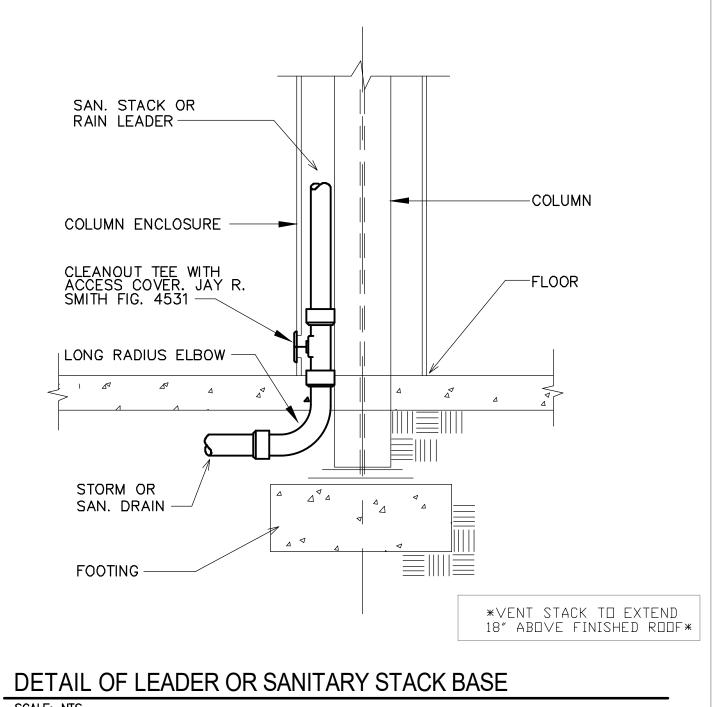
106 GODFREY, ROAD WESTON, CT

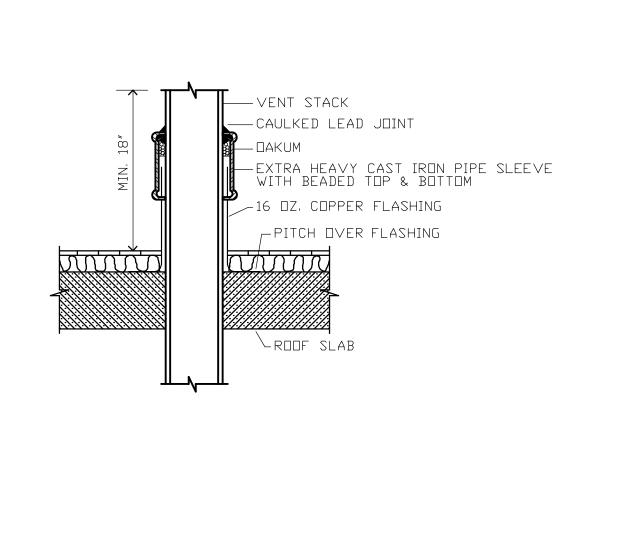
JOB NO.: MEA.2021.00011 DRAWN BY: CHECK BY: SCALE: NTS

PLUMBING

WASTE, VENT & GREASE WASTE RISER DIAGAMS

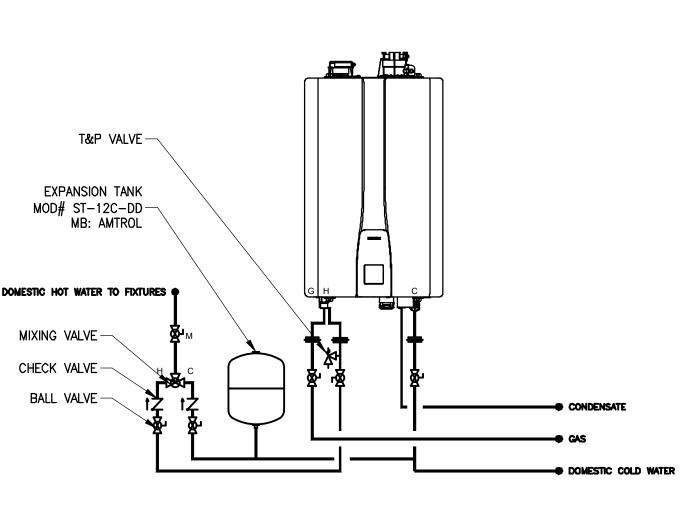




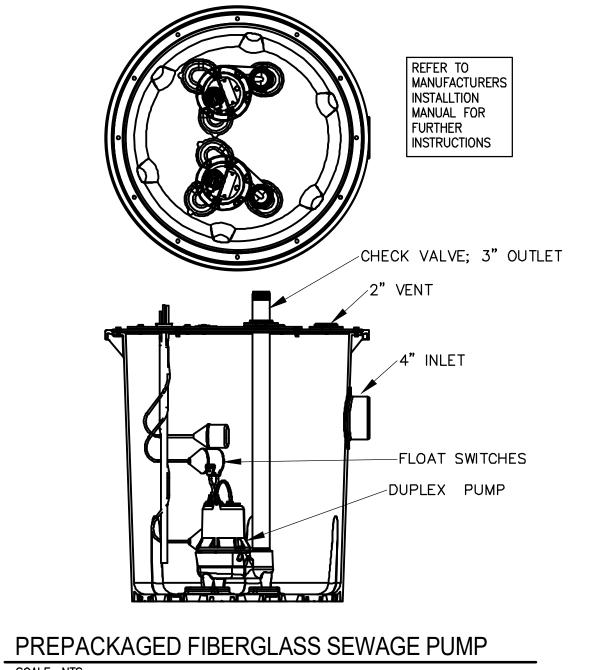


VENT THRU ROOF DETAIL

FINISHED ESCUTCHEON PLATE FLUSH PIPE AND INSULATION TO BE CENTERED IN SLEEVE — DO NOT AGAINST WALL AND OF SIZE TO COMPLETELY COVER OPENING SUPPORT PIPE FROM SLEEVE FINISHED WALL SURFACE CONCEALED PIPING --- PIPING EXPOSED TO VIEW INTERIOR WALLS FINISHED WALL SURFACE SEALING AND ANCHORING COLLAR -SEAL WATERTIGHT WITH -MASTIC OR ASPHALT - COAT EXTERIOR SURFACES WITH TAR COMPOUND CENTER PIPE IN SLEEVE -CONTINUOUS WELD -STANDARD WEIGHT STEEL PIPE SLEEVE INSTALLED DURING . PIPE SLEEVE FOR EXTERIOR WALL CONSTRUCTION WALL ABOVE OR BELOW GRADE.



DOMESTIC WATER HEATER DETAIL - HTR-2

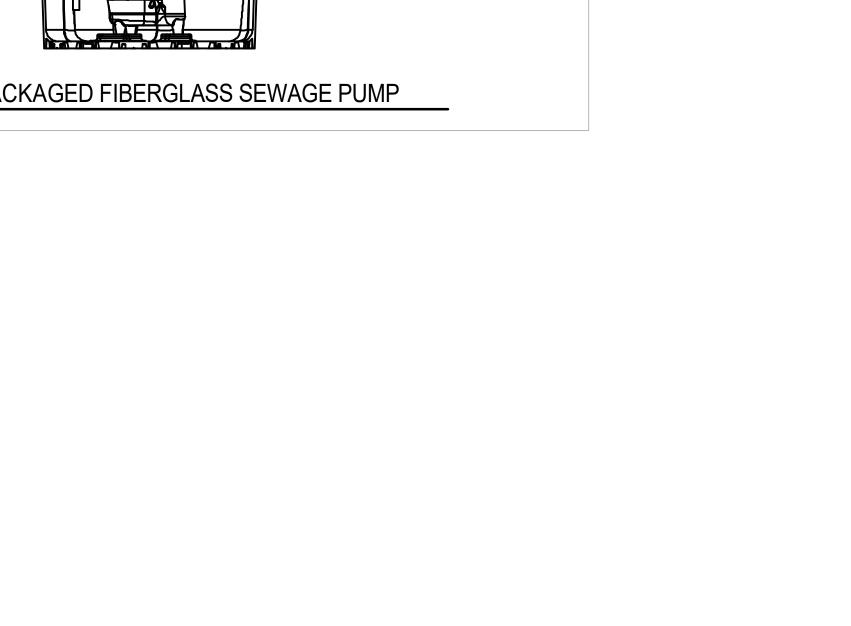


PIPE SLEEVES THRU WALL DETAIL

SCALE: NTS

SCALE: NTS AIR RELIEF VENT EXPANSION TANK MOD# ST-20VC-DD-MB: AMTROL ₹ 140°HW ——□>—— PRESSURE GAUGE FOR HTR-1 (TYP) FULL SIZE MIXING VALVE BYPASS WITH -NC SHUTOFF VALVE HTR-1 - THERMOMETER (TYP) PRESSURE RELIEF GAS SHUT OFF VALVE AND— VALVE (TYP) -HOLBY MIXING VALVE REGULATOR —BALL VALVE (TYP) HOSE DRAIN PER - MANUFACTURER -HEAT TRAP (TYP) FINISHED FLOOR → FLOOR DRAIN DOMESTIC WATER HEATER DETAIL - HTR-1

SCALE: NTS



51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

Mastroluca Engineering Associates, LLC

#	DATE	ISSUE/REVISION DESCRIPTION



PERMIT/BID

PROJECT NAME OFFUTT EDUCATION CENTER AT LACHAT FARM

106 GODFREY, ROAD

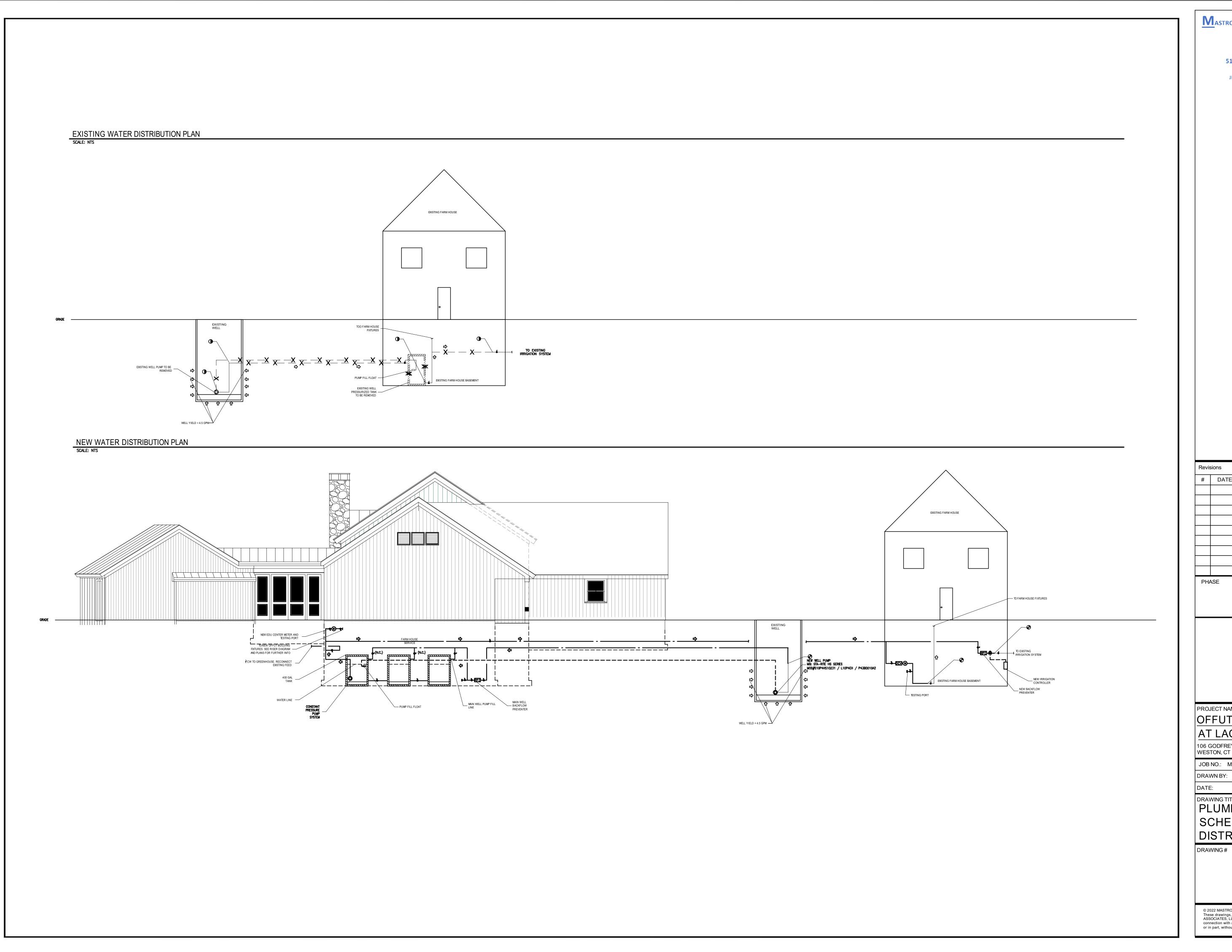
JOB NO.: MEA.2021.00011 DRAWN BY:

WESTON, CT

CHECK BY: SCALE: NTS DRAWING TITLE

PLUMBING DETAILS

DRAWING#



 $\underline{\mathbf{M}}$ astroluca $\underline{\mathbf{E}}$ ngineering $\underline{\mathbf{A}}$ ssociates, llc 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION
DLI	ASE	



PERMIT/BID

PROJECT NAME OFFUTT EDUCATION CENTER AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011 CHECK BY: DRAWN BY:

SCALE: NTS DRAWING TITLE

PLUMBING SCHEMATIC WATER DISTRIBUTION PLAN

1.01 <u>DESCRIPTION</u>

- A, THE PLUMBING CONTRACTOR SHALL BE A LICENSED INSTALLER OF PLUMBING SYSTEMS IN THE STATE OF CONNECTICUT.
- B. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE STATE OF CONNECTICUT BUILDING CODE.
- C. THE ARCHITECT'S SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
- D. THE CONTRACTOR IS ADVISED TO CLOSELY COORDINATE HIS WORK WITH THE BUILDING ENGINEER, SO THAT THE INTERRUPTION OF EXISTING BUILDING SERVICES, IN ORDER TO CONNECT NEW PIPING TO EXISTING SHALL BE MADE AT SUCH TIME AS TO CAUSE THE LEAST INTERFERENCE WITH ESTABLISHED BUILDING OPERATING PROCEDURE, CONTRACTOR SHALL NOT INTERRUPT THE SERVICES WITHOUT EXPRESS WRITTEN PERMISSION OF THE OWNER.
- E. WORK IN CEILING OF TENANT SPACE ON FLOOR BELOW MUST TAKE PLACE BEFORE OR AFTER TENANT'S NORMAL BUSINESS HOURS AND SHALL BE CONSIDERED OVERTIME WORK, ALL CEILINGS DAMAGED MUST BE RESTORED TO ORIGINAL CONDITION.

1.02 <u>VERIFYING CONDITIONS</u>

- A. EXAMINE ALL DRAWINGS COVERING THE WORK OF THIS SECTION AND REFER TO ALL OTHER DRAWINGS, INCLUDING ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS, WHICH MAY AFFECT THE WORK OF THIS SECTION OR REQUIRE COORDINATION BY SAME.
- B. BEFORE STARTING ANY WORK, EXAMINE EXISTING CONDITIONS, AND THOROUGHLY CHECK DRAWINGS, DIMENSIONS, SPECIFICATIONS, AND ADJOINING OR UNDERLYING CONDITIONS IN WHICH THE WORK OF THIS SECTION IS TO BE PERFORMED.
- C. REPORT, IN WRITING, TO THE ARCHITECT ANY AND ALL CONDITIONS WHICH MAY INTERFERE WITH OR OTHERWISE AFFECT OR PREVENT THE PROPER EXECUTION AND COMPLETION OF THE WORK OF THIS SECTION. DO NOT COMMENCE WORK UNTIL ANY AND ALL SUCH CONDITIONS HAVE BEEN CORRECTED BY THE TRADE OR TRADES RESPONSIBLE.
- D. FAILURE TO NOTIFY THE ARCHITECT OF UNSATISFACTORY CONDITIONS WILL BE CONSTRUED AS AN ACCEPTANCE OF ALL CONDITIONS.
- E. THE EXECUTION OF THE WORK OF THIS SECTION CONSTITUTES ACCEPTANCE OF THE BASE OR ADJOINING WORK AND OTHER CONDITIONS AS BEING SATISFACTORY IN EVERY RESPECT AND LATER CLAIMS OF DEFECTS IN SUCH CASES WILL NOT BE ALLOWED.
- F. THE DRAWINGS INDICATE AND THE SPECIFICATIONS DESCRIBE THE GENERAL ARRANGEMENT AND THE APPROXIMATE LOCATION OF EQUIPMENT, FIXTURES, PIPING, ETC. EXACT LOCATIONS MAY BE ADJUSTED IN THE FIELD TO SUIT EXISTING CONDITIONS.
- G. THE CONTRACTOR SHALL, WITHOUT EXTRA COST TO THE OWNER, MAKE ALL REASONABLE MODIFICATIONS IN THE WORK AS MAY BE REQUIRED TO PREVENT CONFLICT WITH THE WORK OF OTHER TRADES, OR FOR THE PROPER INSTALLATION OF THE WORK.

1.03 SHOP DRAWINGS AND SAMPLES

- A. SUBMIT SHOP DRAWINGS AND SAMPLES WITH ALL DETAILS AND INFORMATION, AS REQUIRED FOR THE WORK OF THIS SECTION AND IN ACCORDANCE WITH GENERAL CONDITIONS OR AS REQUESTED BY THE ARCHITECT OR ENGINEER.
- B. SUBMIT FOR APPROVAL; SAMPLES OF MATERIALS, AFFIDAVITS, CERTIFICATES, ETC., AS REQUIRED BY THE GENERAL CONDITIONS OR AS REQUESTED BY THE ARCHITECT OR ENGINEER.
- C. SUBMIT FOR APPROVAL SHOP DRAWINGS AND CATALOG CUTS OF THE FOLLOWING:
- 1. PLUMBING FIXTURES AND EQUIPMENT.
- 2. VALVES.
- 3. PIPE AND FITTINGS.
- 4. HANGERS.
- 5. INSULATION
- 6. WATER HEATER
- 7. VACUUM BREAKERS
- 8. PIPING LAYOUT
- 9. GREASE TRAPS
- 10. 'HWAT' HEAT MAINTENANCE TAPE11. PRV'S

1.04 <u>AS-BUILT DRAWINGS</u>

A. PREPARE AND SUBMIT "AS-BUILT" DRAWINGS AT THE COMPLETION OF THE PROJECT.

1.05 <u>TESTS</u>

A. THE PLUMBING SYSTEMS SHALL BE INSPECTED AND TESTED IN ACCORDANCE WITH REQUIREMENTS OF THE STATE OF CONNECTICUT BUILDING CODE.

1.06 <u>CLEANING</u>

- A. ALL PIPING, FIXTURES, EQUIPMENT, ETC., INSTALLED UNDER THIS CONTRACT SHALL BE THOROUGHLY CLEANED AND PROTECTED DURING CONSTRUCTION AND PUT INTO FIRST-CLASS OPERATING CONDITION BEFORE BEING OFFERED FOR ACCEPTANCE.
- B. UPON COMPLETION OF ALL WORK, THE PLUMBING CONTRACTOR SHALL THOROUGHLY CLEAN ALL PLUMBING FIXTURES, SINKS AND TRIM AND LEAVE ALL ITEMS READY FOR USE BY THE OWNER, ALL FLOOR DRAINS SHALL BE CLEANED AND MANUFACTURERS PROTECTIVE COVERINGS SHALL BE REMOVED.

1.07 LAWS, ORDINANCES, ETC.

A. THE WORK OF THIS CONTRACTOR MUST COMPLY WITH ALL LOCAL LAWS, ORDINANCES AND RULES. THIS CONTRACTOR MUST HAVE THE NECESSARY INSPECTIONS MADE BY THESE AUTHORITIES, PAY ALL THE REQUIRED FEES, AND FURNISH THE OWNER WITH CERTIFICATES OF APPROVAL BEFORE FINAL PAYMENT ON THIS CONTRACT IS MADE. HE SHALL APPLY, PAY FOR, AND OBTAIN ALL PERMITS.

1.08 SUPERVISION

A. THIS CONTRACTOR SHALL HAVE A COMPETENT FOREMAN IN RESPONSIBLE CHARGE OF THE WORK WHO SHALL BE ON THE SITE DURING THE INSTALLATION OF THE MATERIAL FURNISHED UNDER THIS SPECIFICATION UNTIL SAME HAS BEEN PUT IN COMPLETE OPERATIVE CONDITION AND ACCEPTED BY THE OWNER.

1.09 <u>CUTTING AND PATCHING</u>

A. THIS CONTRACTOR SHALL DO ALL CUTTING AND PATCHING FOR PLUMBING WORK AND SHALL COORDINATE SAME WITH ALL OTHER TRADES, ALL CUTTING SHALL BE SUBJECT TO TRADE REGULATIONS. NO CUTTING OF STRUCTURAL MEMBERS SHALL BE DONE WITHOUT THE APPROVAL OF THE ARCHITECT.

PART 2 - MATERIAL

2.01 GENERAL

- A. THE PLUMBING SYSTEMS SHALL BE COMPLETE WITH ALL PIPES, FITTINGS, TRAPS, SUPPLIES, VALVES, HANGERS AND SUPPORTS, INSULATION, ETC. AND ALL OTHER ITEMS NECESSARY FOR COMPLETE, SATISFACTORY OPERATING AND APPROVED TYPE SYSTEM.
- B. ALL PIPE FITTINGS, VALVES, FIXTURES, HANGERS, SUPPORTS, INSULATION, ETC. SHALL CONFORM TO THE REQUIREMENTS OF THE CONNECTICUT STATE BUILDING CODE.

2.02 <u>SDIL, WASTE, AND VENT PIPE AND FITTINGS</u>

- A. ALL ABOVE GROUND SOIL, WASTE, AND VENT PIPING SHALL BE "NO-HUB" CAST IRON PIPE AND FITTINGS EXCEPT AS NOTED OTHERWISE.
- B. ALL JOINTS AND CONNECTIONS SHALL BE ASSEMBLED BY MEANS OF SEALING SLEEVES AND STAINLESS STEEL CLAMPS AND SHIELD ASSEMBLIES.
- C. PIPE AND FITTINGS SHALL BE CENTRAL FOUNDRY COMPANY, TYLER PIPE COMPANY, EAST PENN FOUNDRY OR APPROVED EQUAL.

2.03 <u>SDIL, WASTE, VENT AND LEADER PIPE AND FITTINGS - UNDERGROUND AND WHERE INDICATED</u>

- A. ALL UNDERGROUND SOIL, WASTE, VENT AND LEADER PIPING SHALL BE APPROVED BELL AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS.
- B. ALL JOINTS AND CONNECTION SHALL BE MADE BY THE USE OF DOUBLE-SEAL NEOPRENE CAST IRON SOIL PIPE GASKETS,ALABAMA PIPE COMPANY "DUAL-TITE" APPROVED
- C. PIPE AND FITTINGS SHALL BE CENTRAL FOUNDRY COMPANY, ALABAMA PIPE COMPANY, EAST PENN FOUNDRY, OR APPROVED OTHER.

2.04 COLD WATER AND HOT WATER PIPE AND FITTINGS

- A. SEE PLUMBING PIPE & FITTING SCHEDULE ON P-002
- B. ALL SUPPLIES THROUGH WALLS TO FIXTURES SHALL BE 85% RED BRASS WITH THREADED BRASS FITTINGS. ALL EXPOSED PIPING IN FINISHED SPACES SHALL BE CHROME PLATED 85% RED BRASS.

2.05 EXPANSION JOINTS AND ANCHORS

- A. PROPER PROVISIONS SHALL BE MADE FOR EXPANSION AND CONTRACTION OF ALL PIPES AND THE PIPING SHALL BE ARRANGED WITH ALL NECESSARY PIPE EXPANSION LOOPS AND SWING JOINTS.
- B. MAINS AND BRANCHES MUST BE SO INSTALLED WITH SWING CONNECTIONS SO AS TO PERMIT FREE EXPANSION OF PIPING.

2.06 <u>HANGERS AND SUPPORTS</u>

- A. FURNISH ALL NECESSARY HANGERS, SUPPORTS, INSERTS, CLAMPS, ETC. AS REQUIRED. ALL HANGERS AND SUPPORTS SHALL BE OF HEAVY CONSTRUCTION AND SUITABLE FOR THE SIZE OF PIPE TO BE SUPPORTED. ALL INSERTS AND HANGERS SHALL BE INSTALLED TO CLEAR WORK OF OTHER TRADES.
- B. ALL HORIZONTAL CAST IRON PIPING SHALL BE SUPPORTED ON FIVE (5) FOOT CENTERS AND AT ALL JOINTS. ALL HORIZONTAL SCREWED PIPING SHALL BE SUPPORTED BY HANGERS SPACED NOT OVER TEN (10) FEET APART. ALL BRANCHES SHALL HAVE SEPARATE HANGERS. HANGERS SHALL BE CLEVIS TYPE, CONSTRUCTED OF HEAVY BAR STEEL STOCK, WITH PROPER SIZE SUSPENSION ROD AND LOCKNUTS. WHERE PIPING IS SUPPORTED FROM THE FLOOR, PROVIDE ADJUSTABLE PIPE SADDLE SUPPORT WITH U-BOLT.
- C. WHERE PIPES ARE TO BE INSULATED, THE HANGERS SHALL BE OF AMPLE SIZE TO PROVIDE FOR THE COVERING SPECIFIED AND BE PROVIDED WITH GALVANIZED STEEL INSULATION SHIELDS.
- D. ALL HANGERS, RODS, BEAM CLAMPS, ETC. SHALL BE SHOP ZINC COATED.
- E. ALL HORIZONTAL COPPER TUBING SHALL BE SUPPORTED BY HANGERS NOT OVER SIX (6) FEET APART FOR PIPING 1-1/4 INCH AND SMALLER AND NOT OVER TEN (10) FEET APART FOR PIPING 1-1/2 INCH AND LARGER. ALL BRANCHES SHALL HAVE SEPARATE HANGERS. HANGERS SHALL BE CLEVIS TYPE WITH COPPER BOTTOM SUPPORT. IF CHANNEL OR ANGLE IRON TRAPEZE HANGERS ARE USED, THE SPACE ON HANGERS FOR THE COPPER TUBING SHALL BE WRAPPED WITH LEAD SHIELDS TO ISOLATE TUBING.

F. IN AREAS OF STEEL CONSTRUCTION, PIPE HANGERS SHALL BE SUPPORTED BY BEAM CLAMPS. COORDINATE WITH ENGINEER FOR MAXIMUM LOADING. BEAM CLAMPS SHALL BE STEEL WITH BOLT, NUT AND SOCKET THREADED FOR ROD CONNECTION AND SHALL BE F & S MANUFACTURING COMPANY FIG. #45, CENTRAL IRON, GRINNELL COMPANY, OR APPROVED EQUAL.

2.07 <u>INSULATIO</u>N

- A. COVER ALL HOT WATER AND HOT WATER RECIRCULATION PIPE WITH 1 INCH THICK AND ALL COLD WATER PIPE WITH 1/2 INCH THICK MANVILLE MICRO-LOK AP-T PLUS FIBERGLASS INSULATION. FITTINGS AND VALVES SHALL BE INSULATED WITH MANVILLE ZESTON 2000 PVC INSULATED FITTING COVERS. INSTALL ALL INSULATION AS PER MANUFACTURERS MATERIAL SHALL COMPLY WITH ANSI / ASTM FLAME SPREAD SMOKE DEVELOP RATINGS.
- B. ALL HORIZTONAL SANITARY PIPING LOCATED IN BASEMENT SHALL HAVE 1" THICK INSULATION INSTALLED W/ PVC JACKET

2.08 VALVES

- A. STOP VALVES, EXCEPT FIXTURE STOPS, ON HOT AND COLD WATER LINES 2 IN. AND SMALLER SHALL BE FULL PORT 400 LB. NON-SHOCK BRONZE BALL VALVES, NIBCO T-595-Y FOR THREADED CONNECTIONS, AND NIBCO S-595-Y FOR COPPER TO COPPER, OR APPROVED OTHER.
- B. GLOBE VALVES UP TO AND INCLUDING 3 IN. SHALL BE SCREW-DVER BONNET, COMPOSITION DISC, BRASS, NIBCO T-211 FOR THREADED CONNECTIONS AND S-211 FOR SOLDER CONNECTIONS, OR APPROVED OTHER.
- C. CHECK VALVES SHALL BE OF THE SWING-TYPE, SIZES UP TO AND INCLUDING 3 IN. SHALL BE ALL BRASS, 125 LB. S.W.P., NIBCO T-413 FOR THREADED CONNECTIONS AND NIBCO S-413 FOR SOLDER CONNECTIONS, OR APPROVED OTHER.

2.09 VALVE TAGS AND CHART

- A. EACH VALVE, EXCEPT VALVES AT FIXTURES, SHALL HAVE A 2 INCH DIAMETER BRASS TAG WITH 1 INCH HIGH NUMERAL STAMPED THEREON, SECURED TO THE VALVE BY MEANS OF BRASS S HOOK OR BRASS CHAIN. EACH SYSTEM TO HAVE A LETTER DESIGNATION AS WELL.
- B. THE CONTRACTOR SHALL FURNISH AN APPROVED, NEATLY DRAWN VALVE CHART, PROPERLY FRAMED, SHOWING THE USE AND LOCATION OF EACH VALVE THAT IS TAGGED.

2.10 SHOCK ARRESTORS

A. SHOCK ARRESTORS SHALL BE JONESPEC MODEL #55000 SERIES, SEE PLANS FOR EXACT MODEL NO.

2.12 CONNECTION TO MISCELLANEOUS EQUIPMENT

- A. PROVIDE ALL NECESSARY PIPE, FITTINGS, VALVES, ETC.
 EXCEPT AS OTHERWISE SPECIFIED AND MAKE ALL FINAL
 PLUMBING PIPING CONNECTIONS, INCLUDING WASTE,
 VENT, HOT AND COLD WATER, ETC., TO ALL EQUIPMENT
 REQUIRING SAME, FURNISHED "UNDER ANOTHER SECTION
 OF THE SPECIFICATIONS".
- B. KITCHEN EQUIPMENT CONTRACTOR WILL PROVIDE, FOR INSTALLATION BY THE PLUMBING CONTRACTOR, ALL FAUCETS, OVERFLOW AND DRAIN ASSEMBLIES, VACUUM BREAKERS EXCEPT AS HEREIN SPECIFIED, COFFEE STATION WATER FILTERS, BOOSTER HEATER.

2.13 <u>DRAINS</u>

- A. IN GENERAL DRAINS SHALL BE JOSAM, ZURN, SMITH OR APPROVED OTHER.
- B. UNLESS OTHERWISE NOTED DRAINS SHALL BE DUCO COATED, CAST IRON, DOUBLE DRAINAGE PATTERNS, HUB AND SPIGOT, UNLESS OTHERWISE NOTED. DRAINS SHALL BE EQUIPMENT TO THE FIGURE NUMBERS SHOWN AND OF SIZE REQUIRED.
- C. FLOOR DRAINS SHALL BE JAY R. SMITH FIG. NO. 2005-A WITH SEDIMENT BUCKET, UNDER DECK CLAMP AND 8' DIAMETER NICKEL BRONZE TOP, WITH NO-HUB OUTLET
- D. INDIRECT WASTE FLOOR DRAINS SHALL BE J.R. SMITH FIG. 33510-F11-B WITH 8" ROUND TOP, AND SEDIMENT
- E. FLOOR SINK SHALL BE JAY R. SMITH FIG. 3430-13
 PORCELAIN ENAMELED INDIRECT WASTE FLOOR DRAIN WITH
 3/4 ACID RESISTANT PORCELAIN ENAMELED GRATING WITH
 FLASHING FLANGE AND BOTTOM DOME STRAINER. SET RIM
 1" ABOVE FINISHED FLOOR.

2.14 FILTERS

A. CUND "AQUA-PURE" MODEL SS1HA STAINLESS STEEL WITH AP117 CARTRIDGE - FURNISH ONE ADDITIONAL REPLACEMENT CARTRIDGE FOR EACH FILTER PROVIDED.

2.15 **GUARANTEE**

- A. THIS CONTRACTOR SHALL GUARANTEE FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE BY THE OWNERS, ALL MATERIALS, APPARATUS AND WORKMANSHIP WHETHER FURNISHED BY HIMSELF OR BY HIS SUBCONTRACTORS AND HE SHALL REPLACE OR REPAIR IN A MANNER APPROVED BY THE ARCHITECTS, WITHOUT COST TO THE OWNER, ANY PARTS OR PARTS OF THE WORK WHICH MAY PROVE DEFECTIVE OR UNSATISFACTORY WITHIN THE PERIOD OF THE GUARANTEE.
- B. WHERE SPECIAL GUARANTEES COVERING INSTALLATION,

 OPERATION OR PERFORMANCE OF ANY SYSTEMS OR

 APPLIANCES FURNISHED UNDER THIS CONTRACTOR ARE

 REQUIRED, THE FULL RESPONSIBILITY FOR THE

 FULFILLMENT OF SUCH GUARANTEES MUST BE ASSUMED BY

 THE CONTRACTOR, WHO SHALL OBTAIN WRITTEN

 GUARANTEES, IN TRIPLICATE, WHICH SHALL BE FILED

 WITH THE ARCHITECT BEFORE FINAL ACCEPTANCE.

C. CONTRACTOR WILL BE RESPONSIBLE FOR ALL LEAKS IN ALL PIPES FOR A PERIOD OF ONE YEAR FROM THE DATE OF COMPLETION OF WORK UNDER THIS CONTRACT. CONTRACTOR SHALL REPAIR AT NO COST TO THE OWNER, ALL SUCH LEAKS WHICH OCCUR AFTER COMPLETION OF THIS CONTRACT UPON 24 HOURS NOTICE THEREOF BY THE CONSTRUCTION MANAGER/GENERAL CONTRACTOR, LEAKS WHICH OCCUR PRIOR TO THE COMPLETION OF THIS CONTRACT SHALL BE REPAIRED AT ONCE, CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE CAUSED BY SUCH LEAKS AND THE REPAIR THEREOF AND WILL REIMBURSE THE CONSTRUCTION MANAGER/GENERAL CONTRACTOR FOR ALL EXPENSE INCURRED THEREBY.

D. DISINFECTION

THE POTABLE WATER SYSTEM SHALL BE DISINFECTED PRIOR TO USE BY A METHOD OF DISINFECTION IN ACCORDANCE WITH THE STATE OF CONNECTICUT BUILDING CODE.

2.16 HOSE BIBBS

A. HOSE BIBBS SHALL BE CHICAGO FAUCET CO., NO. 293-6, POLISHED CHROME, OR APPROVED OTHER, WITH WATTS REGULATOR CO. NO BAC, 3/4" HOSE END VACUUM BREAKER.

Mastroluca Engineering Associates, LLC

51 ZEPHYR RD TRUMBULL CT 06611

203-581-3838

JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION

ISSUED FOR



OFFUTT EDUCATION CENTER
AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: N/A

PLUMBING
SPECIFICATIONS

DRAWING#

P-501

© 2022 MASTROLUCA ENGINEERING ASSOCIATES, LLC
These drawings, concepts, designs and ideas are the property of MASTROLUCA ENGINEERING
ASSOCIATES, LLC. They may not be copied, reproduced, disclosed to others, or used in
connection with any work other than the specified project for which they were prepared, in whole

or in part, without prior written consent of MASTROLUCA ENGINEERING ASSOCIATES, LLC

- 1. ENTIRE INSTALLATION SHALL COMPLY WITH ALL LOCAL AND STATE CODES, INCLUDING ENERGY CODES, AND ALL OTHER AUTHORITIES HAVING JURISDICTION.
- 2. PROPER FIRE PROTECTION MEASURES, SATISFACTORY TO THE LOCAL FIRE DEPARTMENT, SHALL BE TAKEN WHEN WELDING OR CUTTING WITH TORCHES OR ELECTRIC ARC.
- 3. CONTRACTOR SHALL SECURE AND PAY FOR ALL REQUIRED PERMITS AND APPROVALS. ALL REQUIRED SPECIAL AND CONTROLLED INSPECTIONS SHALL BE BY THIS CONTRACTOR.
- 4. IT SHALL BE THE CONTRACTORS SOLE RESPONSIBILITY TO PROVIDE ALL REQUIRED DOCUMENTS, PAY ALL FEES AND TO SEPARATELY FILE AND OBTAIN ALL APPROVALS AND PERMITS REQUIRED FOR ALL WORK INVOLVED IN TEMPORARY HEATING SYSTEM(S) TO BE USED AT THE SITE. ALL WORK SHALL BE PROVIDED AND INSTALLED PER THE REQUIREMENTS OF THE NYC BUILDING CODE.
- 5. ALL SUPPORT SYSTEMS (SUPPORTS, HANGERS, ANCHORS, GUIDES, BRACING, FASTENERS, WELDS, ETC.) FOR EQUIPMENT AND SYSTEMS INSTALLED OR REVISED AS PART OF THIS CONTRACT SHALL BE DESIGNED, SELECTED AND INSTALLED BY THE CONTRACTOR TO RESIST ALL SEISMIC, WIND AND GRAVITY LOADS. UNDER CERTAIN CONDITIONS, THE APPLICABLE CODES REQUIRE THESE LOADS, OR A COMBINATION OF THESE LOADS, BE CONSIDERED AS "COINCIDENTAL". THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR CONFIRMING THAT THE COMPONENT OF THE BUILDING STRUCTURE WHERE THESE SUPPORT SYSTEMS ARE ATTACHED IS ABLE TO RESIST THE DESIGN LOADS TRANSFERRED TO THIS BUILDING COMPONENT.
- 6. ALL PENETRATIONS OF FLOORS (WHETHER OR NOT FIRE RESISTANCE RATED) AND ALL PENETRATIONS OF FIRE RATED WALLS AND FLOORS SHALL BE PROVIDED WITH A THROUGH—PENETRATION PROTECTION SYSTEM (FIRESTOPPING). EACH THROUGH—PENETRATION PROTECTION SYSTEM SHALL BE TESTED IN ACCORDANCE WITH ASTM E814 AND BE LISTED FOR THE TYPE OF FLOOR OR WALL ASSEMBLY PENETRATED AND THE TYPE OF PROTECTION SYSTEM.
- 7. ALL AIR MOVING DEVICES, INCLUDING BUT NOT LIMITED TO AIR HANDLING UNITS, AIR CONDITIONING UNITS, AND UNIT VENTILATORS, MUST COMPLY WITH AMCA STANDARD 210 AND ASHRAE STANDARD 62.1—2007.
- 9. DRAWINGS ARE INTENDED TO SHOW THE PROPER SIZE AND GENERAL LOCATIONS OF THE EQUIPMENT, PIPING, DUCTWORK, ETC. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN CONTRACT. DEVIATIONS FROM LAYOUT SHOWN MUST BE APPROVED BY THE ARCHITECT.
- 10. SHOP DRAWINGS SHALL BE PREPARED WITH COMPLETE DIMENSIONAL INFORMATION, INCLUDING COORDINATES TO BRANCH DUCT AND DIFFUSERS STUBS. ELEVATIONS TO THE UNDERSIDE OF DUCTS, SHALL BE CLEARLY INDICATED ON THE DRAWING SUBMITTED AND SHALL BE CAREFULLY CHECKED FOR CONFORMANCE WITH CEILING HEIGHT REQUIREMENTS. ALL CONFLICTS MUST BE FLAGGED ON THE SHOP DRAWINGS.
- 11. THE SHEET METAL SHOP DRAWINGS SHALL INDICATE ALL HUNG CEILING STARTING POINTS, ELEVATIONS AND BREAK LINES. WHERE PIPING, LIGHTS AND DUCTWORK CONFLICTS; DUCTWORK SHALL BE SET UP OR DOWN.
- 12. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR CONSTRUCTION PHASING REQUIREMENTS.
- 13. CONTRACTOR SHALL COORDINATE HIS WORK WITH THE WORK OF ALL OTHER TRADES.
- 14. CONTRACTOR SHALL COORDINATE WITH ALL ARCHITECTURAL DRAWINGS.
- 15. CONTRACTOR IS RESPONSIBLE TO COORDINATE AND INCLUDE IN HIS BID THE RELOCATION OF ALL PIPING, DUCTWORK, HANGERS, CONDUITS, ETC. REQUIRED TO INSTALL NEW EQUIPMENT, PIPING, DUCTWORK, ETC.
- 16. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING OF WALLS, CEILINGS, ROOFS AND FLOORS REQUIRED AS A RESULT OF HIS WORK.
- 17. DUCTWORK AND PIPING LAYOUTS ARE SCHEMATIC DIAGRAMS AND ARE INTENDED TO SHOW GENERAL ARRANGEMENT, SIZE AND CAPACITY AND DO NOT NECESSARILY INDICATE WHICH PIPE OR DUCT IS ABOVE OR BELOW THE OTHER. ALL OFFSETS ARE NOT NECESSARILY SHOWN. CONTRACTOR SHALL ARRANGE AND COORDINATE THE WORK, FURNISH NECESSARY OFFSETS, VALVES, VENTS AND FITTINGS TO AVOID CONFLICT WITH OTHER MECHANICAL AND ELECTRICAL SERVICES AND STRUCTURAL AND ARCHITECTURAL ELEMENTS WITHOUT ADDITIONAL COST TO THE OWNER. IF AREAS OF CONFLICT ARE ENCOUNTERED, THE ARCHITECT SHALL BE NOTIFIED AND CONTRACTOR'S RECOMMENDATIONS SHALL BE SUBMITTED TO THE ARCHITECT FOR APPROVAL BEFORE WORK HAS BEGUN.

- 18. CONTRACTOR SHALL PROVIDE ALL NECESSARY MISCELLANEOUS STEEL FOR THE SUPPORT OF ALL EQUIPMENT, PIPING, CONDUIT AND DUCTWORK. SUSPENDED FROM SLAB, STEEL, WALL, OR TRUSSWORK.
- 19. UNLESS OTHERWISE NOTED ON THE DRAWINGS, ALL MECHANICAL EQUIPMENT SHALL BE MOUNTED ON VIBRATION ISOLATORS TO PREVENT THE TRANSMISSION OF SOUND TO THE BUILDING STRUCTURE. VIBRATION ISOLATORS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND SHALL BE BASED ON ACTUAL WEIGHT DISTRIBUTION OF THE EQUIPMENT FURNISHED. DEFLECTIONS SHALL BE AS NOTED ON THE EQUIPMENT SHOP DRAWING SUBMITTALS.
- 20. CONTRACTOR SHALL ENSURE THAT ALL MECHANICAL DEVICES ARE INSTALLED IN A LOCATION WHICH AFFORDS ACCESSIBILITY FOR MAINTENANCE AND REPAIR. COORDINATE INSTALLATION AMONG ALL TRADES TO AVOID INTERFERENCES, AND LOCATE EQUIPMENT TO PROVIDE CLEARANCES WHICH EXCEED THOSE RECOMMENDED BY THE EQUIPMENT MANUFACTURER. PRIOR TO PROJECT COMPLETION, REPRESENTATIVES OF THE OWNER WILL REVIEW EACH INSTALLATION AND WILL DIRECT CHANGES WHENEVER ACCESS OR SERVICEABILITY IS, IN THEIR OPINION, UNACCEPTABLE.
- 21. ALL MECHANICAL CONTROLS (THERMOSTATS, SENSORS, ETC.) SHALL BE INSTALLED AT A HEIGHT OF 5'-0" ABOVE FLOOR. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT WITH ARCHITECT PRIOR TO INSTALLATION.
- 22. OWNER PROVIDED EQUIPMENT SHALL BE RECEIVED AND INSTALLED BY THE MECHANICAL CONTRACTOR. ALL COST ASSOCIATED WITH RIGGING, RECEIVING AND STORAGE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR
- 23. ALL ACCESS DOORS IN FINISHED WALLS AND CEILINGS SHALL BE SUPPLIED BY THIS CONTRACTOR AND SHALL BE FRAMELESS TYPE SUITABLE FOR THE CONSTRUCTION TYPE INDICATED ON THE ARCHITECTURAL DRAWINGS.

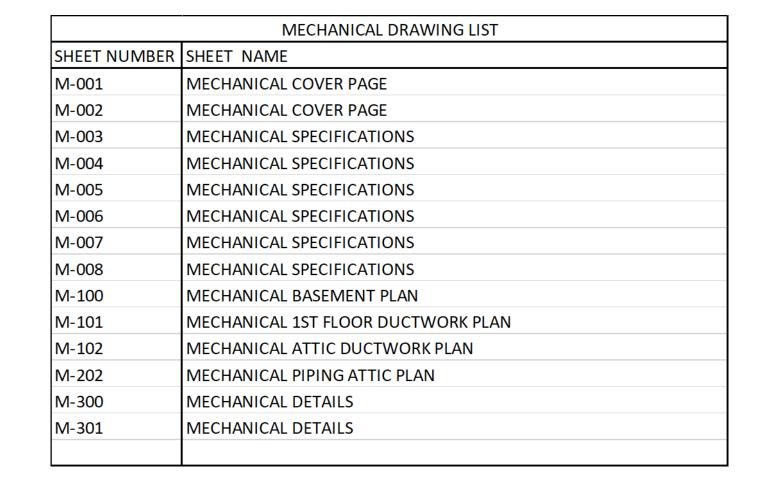
 COORDINATE ALL LOCATIONS OF ACCESS DOORS WITH ARCHITECTURAL DRAWINGS. LOCATE VALVES SO AS TO BE WITHIN ONE (1) FOOT OF AN ACCESS DOOR.
- 24. EXACT LOCATION OF DIFFUSERS, GRILLES AND REGISTERS TO BE COORDINATED WITH ARCHITECTURAL PLANS.
- 25. CONTRACTOR SHALL BE RESPONSIBLE FOR BALANCING OF AIR QUANTITIES AT ALL AIR CONDITIONING OUTLETS AND INLETS.
- 26. HVAC CONTRACTOR SHALL CHANGE FILTERS IN ALL AIR HANDLING UNITS PRIOR TO DELIVERY OF SYSTEM TO OWNER.
- 27. DUCT-MOUNTED SMOKE DETECTORS SHALL BE PROVIDED IN THE SUPPLY AND RETURN DUCTS OF ALL AIR HANDLING UNITS WITH A CAPACITY GREATER THAN 2,000 CFM. WHERE A RETURN AIR PLENUM IS SHARED BETWEEN MULTIPLE AIR HANDLING UNITS TOTALING GREATER THAN 2,000 CFM, A DUCT SMOKE DETECTOR SHALL BE PROVIDED IN THE RETURN DUCT OF EACH AIR HANDLING UNIT.
- 28. ALL ROTATING HVAC EQUIPMENT SHALL BE SUPPORTED OR SUSPENDED ON VIBRATION ISOLATORS. PROVIDE FLEXIBLE CONNECTORS AT ALL DUCT AND PIPE CONNECTIONS TO ROTATING EQUIPMENT.
- 29. DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.
- 30. PROVIDE DOUBLE THICKNESS TURNING VANES IN ALL SQUARE ELBOWS.
- 31. PROVIDE VOLUME DAMPER ON EACH BRANCH TAKE OFF FROM DUCT MAIN, AND ON EACH DIFFUSER TAKE OFF FROM BRANCH DUCT OR MAIN.
- 32. PROVIDE AND INSTALL COMBINATION FIRE AND SMOKE DAMPERS AND ACCESS DOORS IN ALL DUCTWORK PENETRATING FIRE RATED WALLS (2 HOURS OR MORE). FIRE DAMPERS AND ACCESS DOORS SHALL BE PROVIDED AND INSTALLED IN ALL DUCTWORK PENETRATING FIRE RATED WALLS 1-1/2 HOUR OR LESS. ALL ACCESS DOORS SHALL BE A MINIMUM OF 12"X 12" UNLESS OTHERWISE NOTED.
- 33. CONTRACTOR SHALL INCLUDE ALL LOW VOLTAGE WIRING FOR INTALLATION AND OPERATION OF VRF EVAPORATORS, CONDENSERS, BCC UNIT, THERMOSTATS, AND CENTRAL CONTROLLER.
- 34.
 35. ALL DUCT SYSTEMS SHALL BE LOW PRESS CLASS (2" PER SMACNA STANDARDS).

DUCTWORK SYMBOLS (CONT.)

SINGLE LINE	DOUBLE LINE	SINGLE LINE	DOUBLE LINE
SUPPLY, RETURN OR EXHAUST RO	UND ELBOW	SUPPLY DIFFUSER CONNECTION AT	END OF DUCT RUN
	ELBOW MAY TRANSITION IN "W" DIMENSION ONLY	⊢ ⊠——•	SECTION
SUPPLY, RETURN OR EXHAUST SQ		RETURN/EXHAUST GRILLE CONNEC	TION AT END OF DUCT RUN
	ELBOW MAY TRANSITION IN "W" DIMENSION ONLY	⊢	SECTION
SUPPLY, RETURN OR EXHAUST DU		SUPPLY DIFFUSER CONNECTION	
	4X X	≥	SECTION
SUPPLY DUCT VERTICAL SPLIT		SUPPLY REGISTER CONNECTION	
BT= WT= TT= TOP THROAT BT= BOTTOM THROAT	PLAN SECTION BT TI		
SUPPLY DUCT HORIZONTAL SPLIT			
	R=T-R=2T		

NOTES:

- 1. DIFFUSERS, REGISTERS, GRILLES AND DUCT SIZES ARE AS SHOWN ON FLOOR PLANS OR IN SCHEDULES.
- 2. DUCT SIZES ARE GIVEN AS INTERNAL DIMENSIONS. INTERNALLY LINED DUCTS SHALL BE INCREASED IN SIZE TO MAINTAIN THE SAME INTERNAL SIZE.



Mastroluca Engineering Associates, LLC

51 ZEPHYR RD TRUMBULL CT 06611

203-581-3838

JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION



ISSUED FOR

PERMIT/BID

PROJECT NAME
OFFUTT EDUCATION CENTE
AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: NTS

MECHANICAL COVER PAGE

DRAWING#

DRAWING TITLE

M-001

or in part, without prior written consent of MASTROLUCA ENGINEERING ASSOCIATES, LLC

© 2022 MASTROLUCA ENGINEERING ASSOCIATES, LLC
These drawings, concepts, designs and ideas are the property of MASTROLUCA ENGINEERING
ASSOCIATES, LLC. They may not be copied, reproduced, disclosed to others, or used in
connection with any work other than the specified project for which they were prepared, in whole

MAXIMUM

MECHANICAL SYMBOL LIST (CONT.)

FLOW BALANCING STATION

EXHAUST) UP

EXHAUST) DOWN

SLOPING RISE IN DUCTWORK

SLOPING DROP IN DUCTWORK

ACCESS DOOR IN DUCT

POSITIVE PRESSURE DUCT (SUPPLY) UP

NEGATIVE PRESSURE DUCT (RETURN OR

POSITIVE PRESSURE DUCT (SUPPLY) DOWN

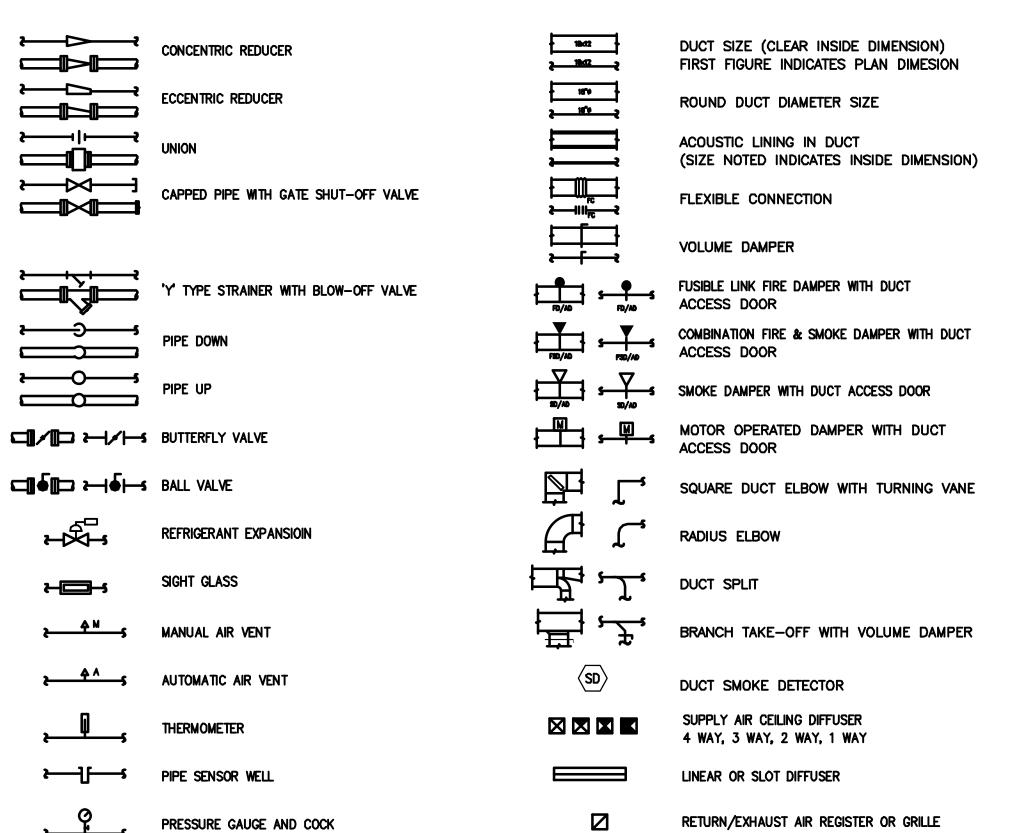
NEGATIVE PRESSURE DUCT (RETURN OR

DUCTWORK SYMBOLS

И

~ }}

2A0



DOOR LOUVER

UNDERCUT DOOR

SUPPLY AIR REGISTER OR GRILLE

TRANSFER AIR OPENING

FIRE RATED ENCASED DUCT

RETURN/EXHAUST AIR REGISTER OR GRILLE

TRG

CONTROL SYMBOLS

NSIDE DIMENSION

TES PLAN DIMESION

THERMOSTAT AND WIRING

THERMOSTAT AND

 $\langle co \rangle$

 $\left\langle \begin{array}{c} \mathsf{TX} \\ \mathsf{4} \end{array} \right\rangle$

CARBON MONOXIDE DETECTOR

RISER DESIGNATION RISER SERVICE
RISER NUMBER

Mastroluca Engineering Associates, LLC

51 ZEPHYR RD TRUMBULL CT 06611
203-581-3838
JMASTROLUCA.MEA@GMAIL.COM



ISSUED FOR

PERMIT/BID

PROJECT NAME
OFFUTT EDUCATION CENTER
AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: NTS

DRAWING TITLE

MECHANICAL COVER PAGE

DRAWING#

M-002

or in part, without prior written consent of MASTROLUCA ENGINEERING ASSOCIATES, LLC

© 2022 MASTROLUCA ENGINEERING ASSOCIATES, LLC

These drawings, concepts, designs and ideas are the property of MASTROLUCA ENGINEERING ASSOCIATES, LLC. They may not be copied, reproduced, disclosed to others, or used in connection with any work other than the specified project for which they were prepared, in whole

1. AIR COOLED CONDENSING UNITS SHALL BE CAPABLE OF ACHIEVING "ACTUAL" CONDITIONS LISTED AT SCHEDULED DESIGN CONDITIONS.

2. EQUIPMENT TO MEET 100%DESIGN CAPACITY WITH MINIMUM 5:1 TURNDOWN AT 25 °F AND 105°F AMBIENT AIR TEMPERATURE.

3. REFRIGERATION PIPE AND ALL ASSOCIATED SPECIALTIES BY CONTRACTOR. CONTRACTOR TO CONFIRM PIPE SIZES WITH VENDOR. ALL REFRIGERATION PIPING TO BE INSULATED.

6. PROVIDE FILTER KITS FOR ALL INDOOR UNITS. COORDINATE ORIENTATION OF FILTER KITS WITH TOP OR BOTTOM REMOVAL AS REQUIRED BY ACCESS PATHWAY.

7. EXHAUST AIR COLUMN SHOWN FOR BALANCING PURPOSES OF THE EXHAUST DUCT CONNECTED TO THE RETURN SIDE OF THE UNIT.

4. AIR COOLED CONENSING UNIT COMPRESSOR AND FAN TO HAVE VARIABLE FREQUENCY DRIVES.

5. ELECTRICAL CONTRACTOR TO PROVIDE DISCONNECT. 6. PROVIDE SNOW HOOD TO PROTECT AIR INTAKE.

7. PROVIDE LOW AMBIENT TEMPERATURE KIT TO MAINTAIN HEAT RECOVERY OPERATION DOWN TO -10°F AMBIENT.

8. PROVIDE SERVICE AND OPERATIONAL CLEARANCES PER MANUFACTURER RECOMMENDATIONS.

8. PROVIDE MASTER CONTROLLER SIMILAR TO TE-200A WITH TEMPERATURE SENSORS MOUNTED IN SPACE.

		VARIA	BLE	REF	R	IGE	R/	ANT	FLO	W - INI	000	OR (JNIT	S										
						C00	LING M	ODE		HEATING M	DDE	CETTING	FAN ESP		ELECTR	ICAL [ATA		SOUND		DIME	NSIONS	_	
UNIT			REFRIGERANT	RETURN	I AIR	SUPPLY	/ AIR	CAPACI	TY (BTUH)	CAPACITY (BTUH)	LDB(°F))							DATA					BASIS OF DESIGN
NUMBER	LOCATION	TYPE	TYPE	AIRFLOW (CFM)	EDB (°F)	AIRFLOW (CFM)	LDB (°F)	COOLING (TOTAL)	COOLING (SENSIBLE)	HEATING (NOMINAL)				VOLTS	PHASI	ΗZ	MCA	MFS	OPERATING RANGE (Dba)	H (IN)	W (IN)	D (IN)	WEIGHT (LBS)	MODEL (MITSUBISHI)
ACC-1	ATTIC	CEILING CONCEALED DUCTED	410A	1,215	75	1,215	55	30,036	21,603	23254	90	HIGH	0.6	208	1	60	2.88	15	33-43	8-3/16	43	28	34.2	TPEFYP030FM140A
ACC-2	ATTIC	CEILING CONCEALED DUCTED	410A	1,390	75	1,390	55	36,043	28,406	27358	90	HIGH	0.6	208	1	60	4.25	15	33-43	8-3/16	55	28	36.6	TPEFYP036FM140A
ACC-3	ATTIC	CEILING CONCEALED DUCTED	410A	1,390	75	1,390	55	36,043	28,406	27358	90	HIGH	0.6	208	1	60	4.25	15	33-43	8-3/16	55	28	36.6	TPEFYP036FM140A
ACC-4	ATTIC	CEILING CONCEALED DUCTED	410A	1,215	75	1,215	55	30,036	21,603	23254	90	HIGH	0.6	208	1	60	2.88	15	33-43	8-3/16	43	28	36.6	TPEFYP030FM140A
ACC-5	ATTIC	CEILING CONCEALED DUCTED	410A	700	75	700	55	18,021	12,123	13679	90	HIGH	0.6	208	1	60	2.94	15	33-43	8-3/16	35	28	36.6	TPEFYP018FM140A
ACC-6	ATTIC	CEILING CONCEALED DUCTED	410A	450	75	450	55	12,000	8,000	10000	90	HIGH	0.6	208	1	60	2.94	15	33-43	8-3/16	28	28	36.6	TPEFYP012FM140A
GENERAL NOTES																								
1. PROVIDE INTEGRA	AL CONDENSATE PUMP UNLESS OTHERWI	SE NOTED. MECHANICAL CONTRA	CTOR TO PROVIDE	E 1 1/4" CON	IDENS	ATE PIPE T	O NEAF	REST CLEAR	WATER WAST	E RECEIVER. REFER	TO PLUM	IBING DRAW	NGS FOR LO	CATIONS	8.									
2. REFRIGERANT SHA	ALL BE R410A.																							
3. PROVIDE AUXILIARY	Y DRAIN PAN AT EACH INDOOR UNIT. REF	ER TO DETAILS																						

VARIABLE REFRIGERANT FLOW -BRANCH CONTROL BOXES

4. PROVIDE SERVICE CLEARANCES PER MANUFACTURER RECOMMENDATIONS.

5. REFER TO PLANS FOR AIRFLOW RATES (CFM) AT EACH INDOOR UNIT.

UNIT	SERVICE	CONNECTED CAPACITY	NUMBER		ELECTRICA		ELECTRICAL DATA			BASIS OF DESIGN
NUMBER	SERVICE	(MBH)	OF PORTS	VOLTS	PHASE	HZ	MCA	MOCP	MODEL (MITSUBISHI)	
BCC-1	ACCU-1	170.0	12	208	1	60	0.97	15	TCMBM0108JA11N4	

1. REFER TO PLANS FOR LOCATIONS OF BRANCH SELECTOR BOXES. PROVIDE SERVICE CLEARANCES PER MANUFACTURER RECOMMENDATIONS.

		•			FA	N S	CHED	ULE							
			FAN S.P. (IN.			FAN CONTROL	OTOR DA	ATA @ 6	0 HZ		BASIS OF DESIGN				
UNIT NUMBER	LOCATION	SERVICE	CFM	WG.)	FAN RPM	TYPE	DRIVE DIRECT/BELT	VFD/ECM	ВНР	МНР	FLA	VOLTS	PHASE	MANUFACTURER & MODEL	SONES (INLET)
EF-1	STORAGE	GENERAL	175	0.6	1556	INLINE	DIRECT	VARIGREEN	0.12	1/4	-	120	1	SQ-97-VG	-
EF-2	BATHROOM	GENERAL	175	0.6	1556	INLINE	DIRECT	VARIGREEN	0.12	1/4	-	120	1	SQ-97-VG	-
EF-3	BATHROOM	GENERAL	175	0.6	1556	INLINE	DIRECT	VARIGREEN	0.12	1/4	-	120	1	SQ-97-VG	-
			_												

3. PROVIDE SUMMER WINTER SWITCH.

GENERAL NOTES

1. PROVIDE VARI-GREEN MOTOR WITH REMOTE DIAL FOR MANUAL ADJUSTMENT.

2. PROVIDE VIBRATION ISOLATORS.

AIR	OUTLETS S	CHEDU	LE	BA	SIS C	F DES	IGN:T	ITUS
TAG No.	FUNCTION	NECK SIZE	FACE SIZE	MAX. CFM	MAX Pd.	THROW(FT)	MAX NC	MODEL
CSXXxXX	SUPPLY	DWGS	DWGS	DWGS	DWGS	_	30	350RL
CRXXxXX	RETURN	DWGS	DWGS	DWGS	DWGS	_	30	300RL
	SUPPLY	6 " ø	24x24	100	0.02	2	10	TDC
	SUPPLY	8 " ø	24x24	250	0.06	5	13	
	SUPPLY	10 " ø	24×24	350	0.07	7	12	
CD-A	SUPPLY	12 " ø	24×24	450	0.08	8	10	
	SUPPLY	14 " ø	24x24	550	0.08	9	10	
	SUPPLY	15 " ø	24×24	650	0.10	10	11	
00.5	RETURN & EXHAUST	10x10	12x12	0-400				350 RL
CD-R	RETURN & EXHAUST	22x22	24x24	100-850				350 RL

DIFFUSERS TO BE SUPPLIED WITH OPPOSED BLADE DAMPERS.
 COORDINATE CEILING DIFFUSERS BORDER STYLE WITH LATEST ARCHITECTURAL REFLECTED CEILING LAYOUT TO

INSURE CORRECT MOUNTING COMPATIBILITY. SUPPLY FRAME TO MATCH CEILING CONSTRUCTION.

3. THE DIFFUSER NECK SHALL HAVE A MINIMUM OF 1 1/8" DEPTH FOR DUCT CONNECTION. 4. AIR OUTLETS TO BE STEEL, STD WHITE FINISH.

5. ALL DIFFUSERS/GRILLES MUST HAVE MEANS OF BALANCING, EITHER WITH VD IN DUCT OR DAMPER AT DIFFUSER/GRILLE.

ELECTRIC BASEBOARD SCHEDULE BASIS OF DESIGN MANUFACTURER & MODEL UNIT NUMBER LENGTH COLOR 3 FEET BY ARCHITECT 120V **RUNTAL EB3-120D** ER 4 FEET 120V **RUNTAL EB3-120D**

1. ELECTRIC BASEBOARD SHALL BE WALL MOUNTED. COORDINATE MOUNTING WITH ARCHITECT

2. PROVIDE LINE VOLTAGE THERMOSTAT FOR RADIATORS. BASEBOARD CAN BE WIRED IN PARALLEL. REFER TO ELECTRICAL DRAWINGS.` 3.PROVIDE RELAY FOR SWITCHING OFF RADIATOR WHEN NOT IN USE.

UNIT NUMBER	CAPACITY	BTU	ELEC	MOUNTIN G HEIGHT	BASIS OF DESIGN MANUFACTURER & MODEL
EH-1	3KW	10,200	208/3	8'	MODINE HER 30
ENERAL NOTES					

4. 14 GA STEEL CABINET, AUTOMATIC RESET, HIGH LIMIT TEMPERATURE PROTECTION, 380 CFM

Mastroluca Engineering Associates, LLC 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION
-		

ISSUED FOR PERMIT/BID



PROJECT NAME OFFUTT EDUCATION CENTER AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011 DRAWN BY: CHECK BY: SCALE: NTS

DRAWING TITLE

MECHANICAL SCHEDULE SHEET

DRAWING#

HVAC SPEC

1. GENERAL

- A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
- B. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
- C. INVESTIGATE EACH SPACE THROUGH WITH EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES. ASCERTAIN FROM BUILDING OWNER AT WHAT TIMES OF DAY EQUIPMENT MAY BE MOVED THROUGH ALL ADEAS
- D. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.
- E. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
- F. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- G. THIS CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR APPROVAL A PLAN INDICATING THE SIZE (MINIMUM 18 INCH X 18 INCH) AND LOCATION OF ALL ACCESS DOORS REQUIRED FOR OPERATION AND MAINTENANCE OF ALL CONCEALED EQUIPMENT, DEVICES, VALVES, DAMPERS AND CONTROLS. CONTRACTOR SHALL ARRANGE FOR FURNISHING AND INSTALLATION OF ALL ACCESS DOORS IN FINISHED CONSTRUCTION AND INCLUDE COSTS IN THE BID.
- H. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP THE WORK PROPOSAL.
- PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO ENSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.
- J. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.
- K. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
- L. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- M. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL.
- N. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.
- O. ALL PRESENT MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
- P. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- Q. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- R. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED,

- HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- S. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- T. REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.
- U. ALL EQUIPMENT SHALL HAVE AN MEA AND/OR BSA NUMBER. THIS INFORMATION MUST BE INCLUDED IN THE SUBMITTAL PACKAGE.
- V. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- W. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON—SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC.) AND CONDITIONS.
- X. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- Y. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.

Z. GUARANTEE:

- 1) ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THIS WORK. FINAL ACCEPTANCE SHALL BE DEFINED AS THE TIME AT WHICH THE MECHANICAL WORK IS TAKEN OVER AND ACCEPTED BY THE OWNER, AND IS UNDER CARE, CUSTODY, AND CONTROL OF THE OWNER. ENGAGE THE SERVICES OF VARIOUS MANUFACTURERS SUPPLYING THE EQUIPMENT FOR THE PROPER STARTUP AND OPERATION OF ALL SYSTEMS INSTALLED. INSTRUCT THE OWNERS PERSONNEL IN THE PROPER OPERATION AND SERVICING OF THE SYSTEM.
- 2) THE CONTRACTOR SHALL GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN THE GUARANTEE PERIOD. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL INCLUDE RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THIS CONTRACTOR.
- 3) THIS CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE AND OPERATION OF ALL SYSTEMS UNTIL THE FINAL ACCEPTANCE OF THE WORK.
- 4) ALL AIR CONDITIONING UNIT COMPRESSORS AND REFRIGERATION COMPONENTS SHALL HAVE A 5-YEAR WARRANTY.
- AA. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.

BB. DEFINITIONS:

- 1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
- 4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
- 5) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
- 6) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
- 7) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

2. SCOPE OF WORK

- A. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.
- B. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL

- BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
- C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS. REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.
- D. SPECIAL/CONTROLLED INSPECTION BY A LICENSED PROFESSIONAL ENGINEER TO BE HIRED BY THIS CONTRACTOR.
- E. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT PROVIDE COMPLETE SET OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, DUCTWORK, PIPING AND CONTROL SYSTEMS INDICATING CAPACITY DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.
- F. WITHIN 15 DAYS AFTER AWARD OF CONTRACT, SUBMIT FOR REVIEW, A LIST OF ALL MATERIAL AND EQUIPMENT MANUFACTURER'S PRODUCTS THAT ARE PROPOSED, AS WELL AS NAMES OF ALL SUBCONTRACTORS WHOM THIS TRADE PROPOSES TO UTRILIZE ON THIS PROJECT.

3. SHOP DRAWINGS

- A. INDICATE ON EACH SUBMISSION: PROJECT NAME AND LOCATION, ARCHITECT AND ENGINEER, ITEM IDENTIFICATION AND APPROVAL STAMP OF PRIME CONTRACTOR, SUBCONTRACTOR NAMES AND PHONE NUMBERS, REFERENCE TO THE APPLICABLE DESIGN DRAWING OR SPECIFICATION ARTICLE, DATE AND SCALE.
- B. THE WORK DESCRIBED IN ALL SHOP DRAWING SUBMISSION SHALL BE CAREFULLY CHECKED FOR ALL CLEARANCES (INCLUDING THOSE REQUIRED FOR MAINTENANCE AND SERVICING), FIELD CONDITIONS, MAINTENANCE OF ARCHITECTURAL CONDITIONS AND PROPER COORDINATION WITH ALL TRADES ON THE JOB.
- C. EACH SUBMITTED SHOP DRAWING IS TO INCLUDE A CERTIFICATION THAT ALL RELATED JOB CONDITIONS HAVE BEEN CHECKED AND VERIFIED AND THAT THERE ARE NO CONFLICTS.
- D. ALL SHOP DRAWINGS ARE TO BE SUBMITTED TO ALLOW AMPLE TIME FOR CHECKING IN ADVANCE OF FIELD REQUIREMENTS. ALL SUBMITTALS TO BE COMPLETE AND CONTAIN ALL REQUIRED AND DETAILED INFORMATION. SHOP DRAWINGS WITH MULTIPLE PARTS SHALL BE SUBMITTED AS A PACKAGE.
- E. IF SUBMITTALS DIFFER FROM THE CONTRACT DOCUMENT REQUIREMENTS, MAKE SPECIFIC MENTION OF SUCH DIFFERENCES IN A LETTER OF TRANSMITTAL, WITH REQUEST FOR SUBSTITUTION, TOGETHER WITH REASONS FOR SAME.

F. SUBMISSIONS:

- 1) PROVIDE ALL COORDINATION DRAWINGS, DUCTWORK AND PIPING SHOP DRAWINGS IN AUTOCAD FORMAT, VERSION COMPATIBLE WITH OWNER. ALL CATALOG CUTS AND SUBMITTALS TO BE PROVIDED IN ELECTRONIC "PDF" FORMAT THE ARCHITECT WILL FORWARD ALL SUBMISSIONS TO THE ENGINEER.
- 2) IF PAPER SUBMISSIONS ARE TO BE PROVIDED THE FOLLOWING SHALL BE ADHERED TO.
- A. SUBMISSIONS 11 INCH X 17 INCH OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND ONE COPY. OTHERWISE, THEY SHALL SUBMIT TWO COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.
- B. SUBMISSIONS LARGER THAN 11 INCH X 17 INCH: SUBMIT TWO COPIES TO THE ARCHITECT. THE ARCHITECT WILL FORWARD TO THE ENGINEER.
- G. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:
- 1) DUCTWORK LAYOUT AND SHEET METAL DESIGNS.
- A. SHEETMETAL SHOP STANDARDS SHALL BE COMPILED DIRECTLY FROM THE "SMACNA DUCT CONSTRUCTION STANDARDS— METAL AND FLEXIBLE " MANUAL. MODIFICATIONS FOR A SPECIFIC PROJECT, IF ANY, SHALL BE INDICATED DIRECTLY ON THE SMACNA TEMPLATES. MODIFIED SHOP STANDARDS NOT TAKEN DIRECTLY FROM THE SMACNA TEMPLATES WILL NOT BE ACCEPTED. ANY DEVIATIONS FROM SMACNA SHALL BE NOTED.
- 2) AIR OUTLETS.
- 3) AIR AND WATER BALANCE REPORT.
- 4) AC UNITS AND FANS.
- 5) VFD DRIVES
- 6) PIPING SHOP STANDARDS
-) VALVES
- 8) PIPING LAYOUT: DETAIL, AT 3/8 INCH SCALE PIPING LAYOUT WITH FITTINGS, VALVES AND EQUIPMENT, USE SINGLE LINE FOR PIPE SIZES 3 INCHES AND SMALLER, AND DOUBLE LINE FOR PIPE SIZES 4 INCHES AND GREATER. FABRICATION OF PIPE ANCHORS, HANGERS, SUPPORTS FOR MULTIPLE PIPES, ALIGNMENT GUIDES, EXPANSION JOINTS AND LOOPS, AND ATTACHMENTS OF THE SAME TO THE BUILDING STRUCTURE. DETAIL LOCATION OF ANCHORS, ALIGNMENT GUIDES, AND EXPANSION JOINTS AND LOOPS SUBMIT ALL WELDING CERTIFICATES.
- 9) OPERATING SEQUENCES.
- 10) VIBRATION AND SEISMIC ISOLATION.
- 11) DAMPER AND VALVE ACTUATORS.
- 12) AUTOMATIC CONTROL SYSTEMS AND DEVICES.

- 13) SEQUENCE OF OPERATIONS
- H. COORDINATION DRAWINGS: PLANS, DRAWN TO SCALE INDICATING COORDINATION BETWEEN THE TRADES USING INPUT FROM INSTALLERS OF THE ITEMS INVOLVED:
- 1) DUCT AND PIPING INSTALLATION INDICATING COORDINATION WITH GENERAL CONSTRUCTION, BUILDING COMPONENTS, AND OTHER BUILDING SERVICES. INDICATE LOCATIONS AND SIZES OF ALL OPENINGS IN FLOOR, WALLS AND ROOF THAT MAY BE REQUIRED.
- 2) COORDINATION WITH SUSPENDED CEILING COMPONENTS, STRUCTURAL MEMBERS TO WHICH DUCT WILL BE ATTACHED, SIZE AND LOCATION OF INITIAL ACCESS MODULES FOR ACOUSTICAL TILE, PENETRATIONS OF SMOKE BARRIERS AND FIRE—RATED CONSTRUCTION, LIGHTING FIXTURES, AIR OUTLETS AND INLETS., SPEAKERS., SPRINKLERS., ACCESS PANELS., PERIMETER MOLDINGS SHALL BE PERFORMED.

4. UNIT PRICES

A. GENERAL:

- 1) AMOUNTS INDICATED SHALL BE FOR WORK FULLY INSTALLED COMPLETE WITH ALL ASSOCIATED COMPONENTS. AMOUNTS INDICATED SHALL BE BINDING FOR THE DURATION OF THE PROJECT.
- 2) UNIT PRICES SHALL INCLUDE ALL RELATED GENERAL CONDITIONS, OVERHEAD, PROFIT, INSURANCES, LABOR ENGINEERING MATERIALS, SUPERVISION AND FRINGES REQUIRED. UNIT PRICES TO BE TAKEN EQUALLY FOR ALL ADDS AND DEDUCTS TO THE CONTRACT DOCUMENTS.
- 3) UNIT PRICES ARE TO BE A MAXIMUM PRICES, NOT TO EXCEED COST UNDER ANY CIRCUMSTANCES.
- B. LIST OF UNIT PRICES:
- 1) MECHANICAL
- A. PIPING:

SIMILAR FOR COPPER, SCHEDULE 80 (\$/LIN. FEET)
DESCRIPTION — 2 INCH TO 10 INCH LISTED
SEPARATELY.

___INCH (INSULATED) ___\$/LIN. FEET. ___INCH (UNINSULATED) ___\$/LIN. FEET.

B. VALVES (\$/EACH)

SIZE GATE GLOBE PLUG BALL CHECK BUTTERFLY VALVE* CONTROL VALVE

- 2 INCH TO 10 INCH LISTED SEPARATELY.
- *BALL VALVES FOR 2½ INCH AND SMALLER.
 *BUTTERFLY VALVES FOR 4 INCH AND LARGER
- C. INSULATION (\$/SQUARE FEET)

 DESCRIPTION
- DESCRIPTION
 PIPING (FIBERGLASS)
 DUCTWORK (FIBERGLASS)
 ACOUSTIC LINING (\$/SQUARE FEET)
- D. EQUIPMENT, DUCTWORK AND ACCESSORIES
- DESCRIPTION

 \$/LB OF DUCTWORK

 \$/DIFFUSER INSTALLED
 ELECTRIC MOTOR AND WIRING

 \$/VOLUME DAMPER INSTALLED

 \$/MOTORIZED DAMPER INSTALLED

 \$/VAV BOX INSTALLED
 - \$\footnote{AV BOX INSTALLED} \$\footnote{THERMOSTAT FOR VAV BOX INSTALLED} \$\footnote{VERTICAL WATER COOLED AC UNIT INSTALLED} \$\footnote{CEILING HUNG WATER COOLED AC UNIT INSTALLED} \$\footnote{VERTICAL AIR COOLED AC UNIT INSTALLED} \$\footnote{TRANSFER FAN}\$

5. AS-BUILTS AND EQUIPMENT OPERATION INSTRUCTIONS

- A. PROVIDE ALL COORDINATION DRAWINGS, DUCTWORK AND PIPING SHOP DRAWINGS IN AUTOCAD FORMAT, VERSION COMPATIBLE WITH OWNER. ALL CATALOG CUTS AND SUBMITTALS TO BE PROVIDED IN ELECTRONIC "PDF" FORMAT THE ARCHITECT WILL FORWARD ALL SUBMISSIONS TO THE ENGINEER.
- B. ON COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS, EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS
- C. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 INCH X 11 IN FORMAT. THE CONTRACTOR SHALL GIVE ONE COPY OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.
- D. THE INSTRUCTIONS SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.
- E. FINAL "AS-BUILT" DRAWINGS INDICATING AS INSTALLED CONDITIONS SHALL BE PROVIDED TO THE ARCHITECT AND ENGINEER AFTER COMPLETION OF THE INSTALLATION.

6. SUBSTITUTIONS

A. NO SUBSTITUTE MATERIAL OR MANUFACTURER OF EQUIPMENT SHALL BE PERMITTED WITHOUT A FORMAL WRITTEN SUBMITTAL TO THE ENGINEER WHICH INCLUDES ALL DIMENSIONAL, PERFORMANCE AND MATERIAL SPECIFICATIONS. ANY CHANGES IN LAYOUT, ELECTRICAL CHARACTERISTICS, STRUCTURAL REQUIREMENTS OR DESIGN DUE TO THE USE OF A SUBSTITUTION SHALL BE SUBMITTED TO THE ENGINEER AS PART OF THIS PROPOSAL. THE CONTRACTOR TAKES FULL RESPONSIBILITY FOR THE SUBSTITUTION AND ALL CHANGES RESULTING FROM THE SUBSTITUTION. ALL ITEMS SHALL BE SUBMITTED FOR REVIEW IN CONJUNCTION WITH THE SUBMITTAL OF THE SUBSTITUTION. ANY SUBSTITUTION MUST BE SUBMITTED WITH AN EXPLANATION WHY A SUBSTITUTION IS BEING UTILIZED. IF THE SUBSTITUTED ITEM DEVIATES FROM THE SPECIFIED ITEM. THOSE DEVIATIONS ARE TO BE IDENTIFIED ON A LINE BY LINE BASIS. IF THE SUBSTITUTE IS BEING UTILIZED FOR FINANCIAL REASONS. THE ASSOCIATED CREDIT MUST BE SIMULTANEOUSLY SUBMITTED.

- B. ALL SUBSTITUTED EQUIPMENT SHALL CONFORM TO SPACE REQUIREMENTS AND PERFORMANCE REQUIREMENTS SHOWN ON CONTRACT DOCUMENTS. CONTRACTOR SHALL REPLACE ANY EQUIPMENT THAT DOES NOT MEET THESE REQUIREMENTS AT HIS OWN EXPENSE. ANY MODIFICATIONS TO ASSOCIATED SYSTEMS OR ADDITIONAL COSTS ATTRIBUTED TO THIS SUBSTITUTION SHALL BE AT THIS CONTRACTOR'S EXPENSE.
- C. CONTRACTOR SHALL SUBMIT BID BASED ON SPECIFIED ITEMS AND SHALL SUPPLY AS AN ALTERNATE PRICE ANY SUBSTITUTIONS.
- 7. SERVICE AND WARRANTY (MAINTENANCE CONTRACT)
 A. THIS CONTRACTOR SHALL PROVIDE AS AN ADD
 ALTERNATE PRICE, A FULL ONE YEAR SERVICE OF ALL
 MECHANICAL COMPONENTS AND SYSTEMS, WITH PRICES
 FOR YEARS 2, 3 AND 4 FOLLOWING THIS FIRST YEAR.
 AT THE TIME OF ACCEPTANCE OF PROJECT, THE TENANT
 OR OWNER'S REPRESENTATIVE WILL DECIDE TO ACCEPT
 WHICH ALTERNATE, IF ANY. THIS IS IN ADDITION TO
 THE WARRANTY BEING PROVIDED AS PART OF THE BASE
 CONTRACT.
- 8. ACCESS DOORS IN GENERAL CONSTRUCTION
- A. THIS CONTRACTOR SHALL SUBMIT TO THE ARCHITECT FOR APPROVAL A PLAN INDICATING THE SIZE (MINIMUM 18 INCH X 18 INCH) AND LOCATION OF ALL ACCESS DOORS REQUIRED FOR OPERATION AND MAINTENANCE OF ALL CONCEALED EQUIPMENT, DEVICES, VALVES, DAMPERS AND CONTROLS. CONTRACTOR SHALL ARRANGE FOR FURNISHING AND INSTALLATION OF ALL ACCESS DOORS IN FINISHED CONSTRUCTION AND INCLUDE COSTS IN THE BID.

9. SHEET METAL WORK

- A. DUCT CONSTRUCTION, INCLUDING SHEET METAL THICKNESSES, SEAM AND JOINT CONSTRUCTION, REINFORCEMENTS, AND HANGERS AND SUPPORTS, SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE, LATEST EDITION" AND PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.
- B. EXCEPT AS OTHERWISE SHOWN OR NOTED, ALL DUCTWORK AND OTHER SHEET METAL WORK SHALL BE GALVANIZED SHEET STEEL
- C. DESCRIPTION OF DUCTWORK PRESSURE CLASS AND EQUIPMENT:
- 1) 4 INCH AND GREATER DUCT CLASS: ALL SUPPLY DUCTWORK FROM DISCHARGE OF FANS, AIR HANDLING UNITS OR AC UNITS TO INLETS OF TERMINAL BOXES ON FLOOR, ALL OUTDOOR DUCTWORK AND ALL DUCTWORK RUNNING THROUGH UNCONDITIONED SPACES. SEAL CLASS "A", LEAKAGE CLASS 6 (RECTANGULAR METAL) OR CLASS 3 (ROUND).
- 2) 4 INCH AND GREATER DUCT CLASS: ALL RETURN AIR DUCTWORK FROM SUCTION OF FANS, AIR HANDLING UNITS OR AC UNITS TO INLETS OF TERMINAL BOXES ON FLOOR. SEAL CLASS "A", LEAKAGE CLASS 6 (RECTANGULAR METAL) OR CLASS 3 (ROUND).
- 3) 3 INCH DUCT CLASS: ALL SUCTION AND DISCHARGE OF KITCHEN EXHAUST AND OTHER EXHAUST DUCTWORK. SEAL CLASS "B", LEAKAGE CLASS 12 *RECTANGULAR METAL OR CLASS 6 (ROUND).
- 4) 2 INCH DUCT CLASS AND LESS: ALL OTHER LOW PRESSURE DUCTOWORK. SEAL CLASS "C", LEAKAGE CLASS 24 (RECTANGULAR) OR CLASS 12 (ROUND).
- D. GENERAL FABRICATION REQUIREMENTS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE", LATEST EDITION, BASED ON INDICATED STATIC—PRESSURE CLASS UNLESS OTHERWISE
- 1) THE FOLLOWING FITTING CONNECTIONS AND DUCT CONSTRUCTION GAUGES ARE NOT ACCEPTABLE
- A. DRIVE SLIP [T-1, T-2] FITTING CONNECTIONS
- B. 26 GAUGE DUCTWORK.
- 2) TRANSVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE, "TRANSVERSE (GIRTH) JOINTS", FOR STATIC—PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT—SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE." FITTINGS AND/OR JOINTS OF TWO DIFFERENT GAUGES, CONNECTED JOINT RATING SHALL MEET MORE STRINGENT CONDITIONS.
- 3) USE THE FOLLOWING SMACNA TRANSVERSE (GIRTH)
- A. DUCT CONSTRUCTION AS FOLLOWS FOR 2 INCH W.G.
 - (1) UP TO 12 INCH WIDE USE T-6 OR T-7
 (2) 13 INCH TO 28 INCH WIDE USE T-11 OR T12
 (3) 29 INCH WIDE AND UP USE TDC OR TDF
- B. DUCT CONSTRUCTION AS FOLLOWS FOR 3 INCH W.G.
 - (1) UP TO 20 INCH WIDE USE T-6 OR T-7
 (2) 21 INCH TO 24 INCH WIDE USE T-11 OR T12
 (3) 25 INCH WIDE AND UP USE TDC OR TDF
- C. DUCT CONSTRUCTION AS FOLLOWS FOR 4 " W.G. CLASS:

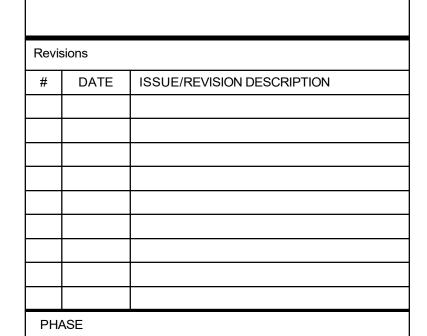
 (1) UP TO 12 INCH WIDE USE T-6 OR T-7

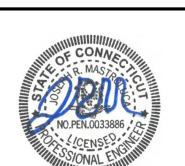
 (2) 13 INCH TO 18 INCH WIDE USE T-11 OR T12

 (3) 19 INCH WIDE AND UP USE TDC OR TDF
- E. VOLUME DAMPERS: GALVANIZED STEEL, PER SMACNA "LOW VELOCITY MANUAL," EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT, WITH LEVER AND LOCKSCREW AT OTHER END. FOR INSULATED DUCTS, QUADRANTS MOUNTED ON COLLAR TO CLEAR INSULATION. INSTALL WITH LEVERS ACCESSIBLE.
- 1) PROVIDE MANUAL VOLUME DAMPERS TO PROPERLY PROVIDE MANUAL BALANCING VOLUME DAMPERS AS REQUIRED TO PROPERLY BALANCE THE AIR DISTRIBUTION SYSTEM. IF THE LOCATION OF BALANCING DAMPERS ARE NOT DEFINED ON THE DRAWINGS, THE FOLLOWING MINIMUM STANDARDS SHALL GOVERN:

S1 ZEPHYR RD TRUMBULL CT 06611
203-581-3838

JMASTROLUCA.MEA@GMAIL.COM





ISSUED FOR

PERMIT/BID

PROJECT NAME
OFFUTT EDUCATION CENTER
AT LACHAT FARM

WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: NTS

MECHANICAL SPECIFICATIONS

DRAWING#

106 GODFREY, ROAD

M-004

- A. LOW PRESSURE: ALL SUPPLY AIR MAIN BRANCHES FROM TRUNK, EACH SPLIT, AND ALL SUB-BRANCHES FROM MAINS SHALL BE PROVIDED WITH BALANCING DAMPERS.
- B. LOW PRESSURE: ALL EXHAUST AND RETURN BRANCHES FROM TRUNK, EACH SPLIT AND ALL SUB-BRANCHES FROM MAINS SHALL BE PROVIDED WITH BALANCING DAMPERS.
- C. AS NOTED ON PLANS
- F. FLEXIBLE DUCTWORK SHALL NOT BE USED ON THIS PROJECT.
- G. ACCESS DOORS: INSULATED OR UNINSULATED, SAME AS DUCT.
- 1) PROVIDE MINIMUM 20 INCH X 14 INCH ON MAIN DUCTS, AND 12 INCH X 6 INCH ON BRANCH DUCTS, UNLESS OTHERWISE APPROVED, AT FIRE DAMPERS, AND AT ALL DUCT ACCESSORIES SUCH AS HUMIDIFIERS, DUCT SMOKE DETECTORS, AUTO DAMPERS, AND LOUVERS.
- 2) ALL ACCESS DOORS TO BE HINGED, WITH LATCH SIMILAR TO VENTLOCK NO. 100.
- H. FLEXIBLE CONNECTIONS: NEOPRENE—COATED GLASS FABRIC, 30 OZ PER SQUARE YD WITH SEWED AND CEMENTED SEAMS, SIMILAR TO VENT FABRICS. PROVIDE WITH METAL COLLARS. ALLOW MINIMUM MOVEMENT OF 1 INCH.
- I. TURNING VANES: GALVANIZED STEEL SMALL DOUBLE—THICKNESS VANES WITH 2 INCH INSIDE RADIUS.
- J. FIRE DAMPERS: DYNAMIC; RATED AND LABELED ACCORDING TO UL 555 BY AN NRTL GALVANIZED STEEL CONSTRUCTION, CURTAIN TYPE WITH BLADES OUT OF THE AIRSTREAM (TYPE B), SPRING LOADED, EQUIPPED WITH FUSIBLE LINK, CONFORMING TO NFPA STANDARD 90A AND APPROVED BY NEW YORK CITY, SIMILAR TO POTOROFF OR RUSKIN, RATED AS REQUIRED. PROVIDE FIRE DAMPERS AS NOTED ON THE PLANS AND IN DUCTS AND OPENINGS IN SHAFTS, FLOORS, FIRE WALLS, FIRE—RESISTANCE PARTITIONS, FIRE RATED CEILINGS., EXIT CORRIDOR WALLS. PROVIDE ACCESS DOOR IN DUCT ADJACENT TO EACH FIRE DAMPER. SEE INSTALLATION ON DRAWING.
- K. ALL DUCT DIMENSIONS INDICATED ON PLANS ARE INSIDE CLEAR DIMENSIONS.
- AUTOMATIC DAMPERS: COMPLETE WITH LINKAGE AND ELECTRIC OPERATOR. OPPOSED BLADE DAMPER OR GALVANIZED STEEL MIN. 4 INCH, MAX. 8 INCH WIDE WITH COMPRESSIBLE EDGE SEALS TO PREVENT LEAKAGE. FACTORY—ASSEMBLE STEEL LINKAGE AND SHAFT WITH NYLON OR OIL—IMPREGNATED BRONZE BEARINGS. MOTOR WITH SUFFICIENT POWER TO LIMIT LEAKAGE TO 10 CFM PER SQUARE FEET. LINKAGE TO WITHSTAND LOAD EQUAL TO TWICE MAXIMUM OPERATING FORCE WITHOUT DEFLECTION. DAMPER MOUNTED IN WELDED STEEL CHANNEL FRAME.
- M. EXTERIOR LOUVERS: 4 INCH WIDE STATIONARY LOUVER, EXTRUDED ALUMINUM, 0.081 INCH WALL THICKNESS, 6063T5 ALLOY BLADES AND FRAME WITH STAINLESS STEEL OR ALUMINUM FASTENERS. LOUVER TO INCORPORATE STRUCTURAL SUPPORT TO WITHSTAND WIND LOAD OF 20 LBS PER SQUARE FEET. PROVIDE REMOVABLE 3/4 INCH X 3/4 INCH ALUMINUM BIRDSCREEN IN AN ALUMINUM FRAME. AIR PERFORMANCE AND WATER PENETRATION LESS THAN OR EQUAL TO RUSKIN. COORDINATE ALL REQUIREMENTS WITH THE BUILDING MANAGEMENT AND ARCHITECT. LOUVER TO COMPLY WITH BASE BUILDING STANDARDS.
- N. WIRE MESH SCREEN (WMS): NO. 16 USSG, 3/4 SQUARE MESH, IN 1 INCH WIDE GALVANIZED STEEL ENCLOSING FRAME. FLANGED DUCT OPENING TO RECEIVE FRAME.
- O. EXISTING DUCTWORK TO BE REUSED:
- 1) THIS CONTRACTOR SHALL INSPECT, SEAL PER SMACNA REQUIREMENTS, LEAK TEST, AND INSULATE ALL EXISTING DUCTWORK TO BE REUSED. EXISTING DUCTWORK TO BE REUSED SHALL CONFORM TO SPECIFICATIONS FOR NEW DUCTWORK LISTED HEREIN. ALL REQUIRED WORK SHALL BE PART OF BID.
- P. EXPOSED DUCTWORK:
- 1) WHERE DUCTWORK IS INDICATED TO BE EXPOSED TO VIEW IN OCCUPIED SPACES, PROVIDE MATERIALS WHICH ARE FREE FROM VISUAL IMPERFECTIONS, INCLUDING PITTINGS, SEAM MARKS, STAINS, DISCOLORATIONS, AND OTHER IMPERFECTIONS. PROVIDE FINISHES WHICH WILL ALLOW PAINTING. PROVIDE FLAT TYPE SEAMS AND JOINTS FOR ALL EXPOSED DUCT CONSTRUCTION.
- Q. DOUBLE WALL ROUND OR FLAT OVAL DUCTWORK

 1) DUCTWORK SHALL BE DOUBLE WALL WITH INTERNAL ACOUSTICAL LINING AND PERFORATED METAL LINER AS PROVIDED BY MANUFACTURER. PROVIDED PERFORATED LINER ON DUCTWORK AND SOLID LINER ON ALL FITTINGS AS PER THE MANUFACTURER'S RECOMMENDATION.
- 2) ROUND DUCTWORK: FOR DUCTWORK, PROVIDE SPIRAL SEAM CONSTRUCTION, GALVANIZED STEEL OF GAUGES AS RECOMMENDED BY SMACNA HVAC DUCT CONSTRUCTION STANDARDS. PROVIDE SPIRAL SEAMS FOR ALL DUCTS AND FITTINGS.
- 3) FLAT-OVAL DUCTS: INDICATED DIMENSIONS ARE THE DUCT WIDTH (MAJOR DIMENSION) AND DIAMETER (DIAMETER OF THE ROUND SIDES CONNECTING THE FLAT PORTIONS OF THE DUCT) OF THE INNER DUCT.
- 4) LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE," SEAMS ROUND DUCT AND FITTINGS," FOR STATIC—PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT—SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE."
- A. FABRICATE ROUND DUCTS LARGER THAN 90 INCHES IN DIAMETER WITH BUTT-WELDED LONGITUDINAL SEAMS.
- B. FABRICATE FLAT-OVAL DUCTS LARGER THAN 72 INCHES IN WIDTH (MAJOR DIMENSION) WITH BUTT-WELDED LONGITUDINAL SEAMS.

- 5) TEES AND LATERALS: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE, 90 DEGREE TEES AND LATERALS," AND "CONICAL TEES," FOR STATIC—PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT—SUPPORT INTERVALS, AND OTHER PROVISIONS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE."
- 6) PERFORATED LINER WITH ACOUSTIC LINING

 A. INNER DUCT: MINIMUM 0.028 INCH [PERFORATED GALVANIZED SHEET STEEL HAVING 3/32 INCH DIAMETER PERFORATIONS, WITH OVERALL OPEN AREA OF 23 PERCENT] [SOLID SHEET STEEL].
- B. INTERSTITIAL INSULATION: FLEXIBLE ELASTOMERIC DUCT LINER COMPLYING WITH ASTM C 534, TYPE II FOR SHEET MATERIALS, AND WITH NFPA 90A OR NFPA 90B.
- R. LEAKAGE TESTING:
- 1) ALL DUCTWORK GREATER THAN 2 INCH CLASS AS DEFINED WITHIN IS TO BE TESTED. ALL TESTING SHALL BE DONE IN THE PRESENCE OF THE ENGINEER OR OWNER'S REPRESENTATIVE. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL COLLARS, CAPS, ELECTRIC POWER, ETC. NECESSARY TO PERFORM THE TESTS. THE CONTRACTOR IS ALSO RESPONSIBLE FOR SCHEDULING THE TEST NO LESS THAN THREE (3) BUSINESS DAYS PRIOR TO ITS INTENDED OCCURRENCE. LOW PRESSURE DUCTWORK (2 INCH CLASS) SHALL BE TESTED ON AN AS NEEDED BASIS AT THE ENGINEER'S DIRECTION. LEAKAGE TEST PROCEDURE SHALL FOLLOW THE OUTLINES AND CLASSIFICATIONS IN THE SMACNA HVAC DUCT LEAKAGE TEST MANUAL. IF SPECIMEN FAILS TO MEET ALLOTTED LEAKAGE LEVEL. THE CONTRACTOR SHALL MODIFY TO BRING IT INTO COMPLIANCE AND SHALL RETEST IT UNTIL ACCEPTABLE LEAKAGE IS DEMONSTRATED. TESTS AND NECESSARY REPAIR SHALL BE COMPLETED PRIOR TO CONCEALMENT OF DUCTS.

10. AIR OUTLETS

- A. GENERAL:
 - 1) MARGIN TYPES, COLORS, FINISH AND METHODS OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH ARCHITECTURAL CEILING AND WALL DETAILS AND SPECIFICATIONS. FINISH SHALL MATCH COLOR SAMPLE AS APPROVED:
- 2) FRAME TYPE SUITABLE FOR MOUNTING IN CEILING OR WALL CONSTRUCTION AS INDICATED ON ARCHITECTURAL PLANS.
- 3) EXACT LOCATION OF ALL AIR OUTLETS AS PER ARCHITECTURAL PLANS.
- 4) PROVIDE MOUNTING AND BLOCKING
- 5) SUITABLE FOR OPERATION AT 20% EXCESS AND 20% LESS THAN NOTED CAPACITY FOR CONSTANT VOLUME SYSTEMS AND AT 20% EXCESS AND 60% LESS THAN NOTED CAPACITY FOR VARIABLE VOLUME SYSTEMS.
- 6) MANUFACTURER RESPONSIBLE FOR EXAMINING APPLICATION OF EACH OUTLET AND GUARANTEE THAT EACH WILL PROVIDE REQUIRED NC LEVELS AND COMFORT SPACE CONDITIONS WITHOUT DRAFTS THROUGHOUT OPERATING RANGE.
- 7) ALL REGISTERS AND DIFFUSERS SHALL BE PROVIDED WITH OPPOSED BLADE VOLUME DAMPERS. DAMPER OPERATING LEVERS SHALL BE ACCESSIBLE AT THE FACE OF AIR OUTLETS.
- 8) ONLY FOUR (4) WAY DIFFUSERS SHALL BE PROVIDED. PROVIDE SHEETMETAL BLANK OFF AS REQUIRED FOR 1 WAY, 2 WAY OR 3 WAY DIFFUSERS.
- 9) PROVIDE BLANKING FOR PROPER COVERAGE AND BLOW WITHOUT PRODUCING OBJECTIONABLE NOISE OR AIR MOTION AT OCCUPIED LEVEL.
- 10) MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
- A. ANEMOSTAT PRODUCTS; A MESTEK COMPANY.
- B. TITUS.
- C. PRICE
- B. SQUARE DIFFUSERS: DIFFUSERS SHALL BE STEEL CONSTRUCTION PAINTED WHITE SUITABLE FOR THE TYPE OF CEILING.
- C. REGISTERS AND GRILLES:
- 1) RETURN AND EXHAUST REGISTERS: STEEL CONSTRUCTION WITH VOLUME DAMPER.
- 2) SUPPLY REGISTERS: STEELCONSTRUCTION
 ADJUSTABLE DOUBLE DEFLECTION STEEL AIRFOIL
 LOUVERS, WITH VOLUME DAMPER. . PROVIDE AIR
 EQUALIZING DEFLECTOR WHERE REGISTER COLLAR
 DUCT IS LESS THAN 2 FEET LONG.
- 3) TRANSFER GRILLES: STEEL CONSTRUCTION WITHOUT VOLUME DAMPER.

11. NOISE CONTROL

- A. ALL ROOM NC LEVELS SHALL BE 35 OR LESS.
- B. PROVIDE SOUNDLINING FOR THE FOLLOWING DUCTWORK:
- 1) ALL DUCTWORK WITHIN MECHANICAL ROOMS AND NOT LESS THAN 10 FEET ON EACH SIDE OF ALL FANS AND AC UNITS.
- 2) RETURN AIR STUB DUCTS AT MER WALLS AND SHAFT INTAKE OPENINGS FOR FULL LENGTH.

3) ALL MIXED AIR PLENUMS, EXCEPT WHERE MOISTURE CARRYOVER FROM OUTDOOR AIR LOUVER WILL OCCUR.

[ENGINEER NOTE: Not typically recommended due to moisture, etc. This would be considered if a single duct system serves both bathrooms to minimize cross—talk]

[ENGINEER NOTE: NC—35 or quieter spaces may need greater lining lengths. Consult with an acoustical engineer for CRITICAL spaces]

- A. EXPOSED SUPPLY DUCTWORK IN A SPACE THAT IS TO BE PAINTED SHALL BE ACOUSTICALLY LINED IN LIEU OF EXTERNAL INSULATION.
- C. SOUNDLINING IN DUCTWORK: FIBROUS GLASS, MINIMUM 3 LB DENSITY, 1 INCH THICKNESS, MAXIMUM 0.25 K FACTOR AT 75 DEG F MEAN TEMPERATURE WITH ACRYLIC COATED FINISH FACTORY APPLIED EDGE COATING AND STENCILED IN ACCORDANCE WITH NFPA 90. FLAMESPREAD SHALL BE A MAXIMUM OF 25. LINING SHALL NOT SUPPORT MICROBIAL GROWTH AND SHALL BE TESTED IN ACCORDANCE WITH ASTM C 1071 AND ASTM G21/G22. SIMILAR TO MANVILLE PERMACOTE LINACOUSTIC.
- D. ALL SOUNDLINING, ADHESIVES, FACES AND ACCESSORIES TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, EXCEPT AS OTHERWISE NOTED.

12. TESTING AND BALANCING

- A. ALL AIR AND WATER BALANCING SHALL BE BY AN INDEPENDENT CONTRACTOR NOT AFFILIATED WITH THE MECHANICAL CONTRACTOR AND IN ACCORDANCE WITH LOCAL STANDARDS. CONTRACTOR SHALL UTILIZE BASE BUILDING BALANCING CONTRACTOR OR APPROVED EQUAL, CONTACT BUILDING MANAGEMENT.
- B. CONTRACTOR TO BALANCE ENTIRE SYSTEM TO AIR AND/OR WATER QUANTITIES AS SHOWN ON ALL RELATED DRAWINGS FOR THIS JOB, AND AS DESCRIBED HEREIN. BALANCING MUST BE DONE IN THE PRESENCE OF A BUILDING ENGINEER.
- C. AIR BALANCING SHALL BE ACCOMPLISHED BY ADJUSTMENT OF FANS AND BRANCH DAMPERS FOR MAJOR ADJUSTMENTS. AIR SUPPLY OUTLETS TO BE BALANCED TO A UNIFORM SUPPLY ACROSS ENTIRE FACE. ADJUSTMENT OF TERMINAL DAMPERS AND DEVICES SHALL BE FOR TRIM OR MINOR ADJUSTMENT ONLY. THIS SHALL BE DONE TO PERMIT THE LEAST NOISE GENERATION IN THE TERMINAL AREAS AND UTILIZE MINIMUM FAN ENERGY.
- D. WATER BALANCING SHALL BE ACCOMPLISHED BY ADJUSTMENT OF BALANCING VALVES AT PUMPS FOR PROPER FLOW. ADJUST FLOW THROUGH COILS AS REQUIRED.
- E. UPON COMPLETION OF THE INSTALLATION, THE CONTRACTOR SHALL REBALANCE ANY EXISTING PORTIONS OF AIR DISTRIBUTION SYSTEM AND WATER DISTRIBUTION SYSTEM AFFECTED BY THE RENOVATION AND ALSO BALANCE ALL NEW WORK.
- F. IF DISCREPANCIES EXIST IN THE REPORT THAT REQUIRE FIELD VERIFICATION, THE TESTING AND BALANCING COMPANY IN THE PRESENCE OF THE ENGINEER SHALL VISIT THE JOBSITE FOR FIELD VERIFICATION OF THE REPORT.
- G. THE CONTRACTOR SHALL PROVIDE ALL LABOR, PRESSURE GAUGES, FLOW METERS, SHEAVES, AND BELTS REQUIRED TO BALANCE SYSTEMS.
- H. BALANCING REPORT SHALL BE PROVIDED ON NEBB OR AABC-TYPE FORMS.
- I. BALANCING AND TESTING SHALL BE PERFORMED AND SUPERVISED BY A CERTIFIED NEBB OR AABC TECHNICIAN.
- A. THE PERFORMANCE AND CAPACITY OF ALL SYSTEMS AND EQUIPMENT TO BE DEMONSTRATED BY THE CONTRACTOR.
- B. AFTER SUBMISSION OF THE FIELD VERIFIED BALANCING REPORT, THE AIR BALANCING COMPANY SHALL RETURN TO THE JOB SITE TO PERFORM TWO (2) OCCUPANT COMFORT BALANCES AS DIRECTED BY THE OWNER OR ENGINEER
- C. THE FINAL REPORT AFTER THE COMFORT BALANCE IS TO BE INCLUDED IN PROJECT OPERATING AND MAINTENANCE
- D. THE TESTING AND BALANCING AGENCY SHALL INCLUDE AS PART OF THEIR WORK AN EXTENDED WARRANTY OF 90 DAYS AFTER COMPLETION OF TEST AND BALANCE WORK. THE ENGINEER AT HIS DISCRETION DURING THE WARRANTY PERIOD MAY REQUEST A RECHECK, OR RESETTING OF ANY EQUIPMENT. THE MECHANICAL CONTRACTOR AND THE BALANCING CONTRACTOR SHALL PROVIDE THE NECESSARY TECHNICIANS TO FACILITATE THIS WORK.
- E. BALANCING AGENCY SHALL PERMANENTLY MARK ALL ADJUSTMENT DEVICES (VALVES, DAMPERS, ETC.) TO ENABLE THE SETTING TO BE RESTORED.

F. AIR BALANCING:

- 1) PRE-CONSTRUCTION AIR TESTING: MEASURE PRESSURE, TEMPERATURE, AND VOLUME OF AIR FROM EXISTING BASE BUILDING SYSTEM BEFORE STARTING WORK. TRAVERSE MAIN SUPPLY AND RETURN DUCTS BEFORE WORK TO OBTAIN TOTAL FLOW. SUBMIT REPORT TO ENGINEER IMMEDIATELY AFTER COMPLETION OF TEST.
- 2) HVAC CONTRACTOR SHALL ENSURE THAT A FIRST SET OF AIR FILTERS ARE IN PLACE, WHENEVER FANS ARE RUNNING AND REPLACED WITH A NEW CLEAN SET OF FILTERS BEFORE TESTING IS COMMENCED.
- 3) TEST, ADJUST, REPLACE SHEAVES, AND BALANCE ALL EQUIPMENT AND AIR DISTRIBUTION SYSTEMS TO PROVIDE AIR QUANTITIES INDICATED ON PLANS WITHIN PLUS OR MINUS 5 PERCENT.

- 4) TEST REPORT SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
- A. FLOW, LEAKAGE CLASS, TEMPERATURE, STATIC PRESSURE OF AIR AT ALL TRUNK DUCTS SERVING AREAS OF WORK.
- B. TEMPERATURE OF AIR LEAVING OUTLETS AT TWO (2) TYPICAL AIR OUTLETS.
- C. QUANTITY OF AIR AT EACH AIR INLET AND OUTLET AFTER BALANCING.
- D. PROVIDE FOR ALL FANS, FAN MOTOR HP, AMPS, VOLTS, FAN RPM, CFM, INLET AND DISCHARGE STATIC PRESSURE, SHEAVE POSITION.
- E. PROVIDE FOR ALL AIR CONDITIONING UNITS, SUPPLY CFM, OUTSIDE AIR CFM, RETURN AIR CFM, MIXED AIR CFM. PROVIDE OUTSIDE AIR, MIXED AIR AND SUPPLY AIR TEMPERATURES (DRY BULB COOLING AND HEATING, WET—BULB—COOLING.) INDICATE UNIT OPERATING MODE DURING TEST.
- F. CALIBRATE ALL NEW TERMINAL BOXES (VAV) AS REQUIRED TO MEET SPECIFIED MINIMUM/MAXIMUM CFM.
- G. LISTING OF DESIGN AND ACTUAL READINGS AS WELL AS ALL MANUFACTURER'S DATA FOR EQUIPMENT.

G. WATER BALANCING:

- 1) TEST, ADJUST, AND BALANCE NEW AND EXISTING TO BE REUSED DISTRIBUTION SYSTEMS TO PROVIDE FLOW QUANTITIES INDICATED ON THE DRAWINGS WITHIN PLUS OR MINUS 2 PERCENT.
- 2) PLACE SYSTEM IN FULL AUTOMATIC OPERATION, WITH AUTOMATIC CONTROLS SET IN ACCORDANCE WITH DESIGN CONDITIONS, AND ALLOW WATER TO REACH DESIGN TEMPERATURE AND PRESSURE.
- 3) ALL PIPE TESTING SHALL BE COMPLETED BEFORE COMMENCING BALANCING.
- 4) SET ZONE OR CIRCUIT BALANCING VALVES AT EACH PIECE OF EQUIPMENT (PUMP, AIR HANDLING UNIT, ETC.), TO HANDLE THE DESIGN FLOW.
- 5) AIR HANDLING UNITS CONTAINING COILS, CHECK AND ADJUST EACH UNIT TO INSURE THE PROPER VOLUME OF AIR IS PASSING THROUGH THE COILS, WHILE THE BALANCING PROCEDURE IS IN PROGRESS.
- 6) THE TEST REPORT SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
- A. THE PRESSURE DROP ACROSS AND FLOW AT EACH PIECE OF EQUIPMENT AND AT EACH RISER AND MAIN.
- B. TEST PUMPS AND BALANCE FLOW. RECORD THE FOLLOWING ON PUMP REPORT SHEETS:

OPERATING CONDITIONS.

- (1) PUMP IDENTIFICATION AND SYSTEM SERVED.
 (2) SUCTION AND DISCHARGE PRESSURE AT
- (3) RUNNING AMPS, AND BRAKE HORSEPOWER OF PUMP MOTOR UNDER FULL FLOW AND NO FLOW CONDITIONS.(4) PRESSURE DROP ACROSS PUMP IN FEET OF
- WATER OR PSIG AND TOTAL GPM PUMP IS HANDLING UNDER FULL FLOW CONDITIONS.

 (5) IF THE PUMPS HAVE VARIABLE FREQUENCY DRIVES FOR BALANCING OR OPERATE IN
- DIFFERENT MODES, THE BALANCING CONTRACTOR SHALL SET THE DRIVE TO PROVIDE REQUIRED FLOW AND COORDINATE WITH THE CONTROLS CONTRACTOR.
- 7) PROVIDE FLOW DIAGRAMS INDICATING PIPING LAYOUT, FLOW BALANCING VALVES AND WHERE THE READING OF EACH INDIVIDUAL PIECE OF EQUIPMENT HAS BEEN TAKEN.
- 8) MARK VALVE TAG AFTER BALANCING OF EACH BALANCING VALVE TO INDICATE POSITION OF VALVE.

2. VIBRATION ANALYSIS

- A. PROVIDE VIBRATION ANALYSIS WITH A FULL REPORT OF THE FINDINGS SUBMITTED FOR APPROVAL FOR ALL EQUIPMENT.
- B. THE VIBRATION READINGS SHOULD BE TAKEN IN BOTH ACCELERATION AND VELOCITY IN THE VERTICAL, HORIZONTAL AND AXIAL DIRECTION ON EACH BEARING.
- C. PROVIDE CRITICAL FREQUENCY LOCKOUTS FOR VARIABLE FREQUENCY DRIVES SYSTEMS. CRITICAL FREQUENCIES ARE TO BE ANALYZED AND PROGRAMMED OUT OF THE DRIVE WITH A FINALIZED REPORT OF THE CRITICAL SPEED'S REMOVED.
- 1) THE TEST FOR EQUIPMENT CONNECTED AND DRIVEN BY A VARIABLE FREQUENCY DRIVE SHALL INCLUDE NATURAL CRITICAL SPEED TESTING.
- 2) MEASUREMENTS SHALL BE TAKEN THROUGHOUT THE OPERATING RANGE OF THE EQUIPMENT STARTING FROM A COMPLETE STOP, RAMPING SLOWLY UP TO MAXIMUM SPEED AND PAUSING BRIEFLY AT ELECTRICAL AND MECHANICAL NATURAL FREQUENCIES OF THE EQUIPMENT/VFD FROM 0 TO 60 HZ.
- 3) PROGRAM CRITICAL FREQUENCIES INTO THE VFD ONSITE AND PROVIDE A DETAILED REPORT OF THE CRITICAL SPEED DATA.

3. INSULATION - GENERAL REQUIREMENTS

A. ALL INSULATION MATERIALS, INCLUDING JACKETS, FACING, ADHESIVE, COATINGS, AND ACCESSORIES ARE TO BE FIRE HAZARD RATED AND LISTED BY UNDERWRITERS LABORATORIES, INC. USING STEINER TUNNEL TEST METHOD

FOR FIRE HAZARD CLASSIFICATION OF BUILDING MATERIALS, STANDARD UL 723 (ASTM E-84), (ASA A2.5-1963). FLAMESPREAD: MAXIMUM 25. FUEL CONTRIBUTED AND SMOKE DEVELOPED: MAXIMUM 50. FLAMEPROOFING TREATMENTS SUBJECT TO DETERIORATION FROM MOISTURE OR HUMIDITY ARE NOT ACCEPTABLE.

- B. PRODUCTS SHALL NOT CONTAIN ASBESTOS, LEAD, MERCURY. OR MERCURY COMPOUNDS.
- C. DEFINITIONS:
- 1) EXPOSED: INDOOR DUCTS, PIPING OR EQUIPMENT LOCATED IN MECHANICAL EQUIPMENT ROOMS AND IN AREAS WHICH WILL BE VISIBLE WITHOUT REMOVING CEILINGS OR OPENING ACCESS PANELS.
- 2) CONCEALED: INDOOR DUCTS, PIPING OR EQUIPMENT WHICH IS NOT EXPOSED.
- 3) OUTDOOR: DUCTS, PIPING OR EQUIPMENT WHICH IS EXPOSED TO THE WEATHER.

4. DUCTWORK INSULATION

A. INSULATE ALL DUCTWORK IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.

INSULATION SCHEDULE - DUCTWORK SERVICE LOCATION THICKNESS MATERIAL FINISH CONCEALED 1-1/2 INCH D-1 VAPORSEAL RETURN RETURN CONCEALED IN 2 INCH VAPORSEAL UN-CONDITIONED SPACE EXPOSED 1-1/2 INCH D-1 VAPORSEAL RETURN RETURN EXPOSED IN VAPORSEAL 2 INCH UN-CONDITIONED SPACE

2 INCH

D-3

VAPORSEAL

B. NON-INSULATED DUCTWORK:

EXHAUST MER EXPOSED

- 1) WHERE SOUNDLINING IS OF MINIMUM THICKNESS SPECIFIED FOR INSULATION.
- 2) AIR CONDITIONING RETURN AIR DUCTWORK EXPOSED IN AIR CONDITIONED SPACES AND INSTALLED IN HUNG CEILINGS WHERE SPACE IMMEDIATELY ABOVE AND BELOW ARE BOTH AIR CONDITIONED.
- 3) OUTDOOR DUCTWORK
- A. FOR OUTDOOR DUCTWORK OR DUCTWORK EXPOSED TO THE ELEMENTS IN ADDITION TO INSULATION AND FINISHES SPECIFIED FOR INDOOR DUCTWORK, APPLY TWO (2) COATS OF WEATHERPROOF MASTIC AND EMBED INTO WET COAT TWO (2) LAYERS OF GLASS CLOTH OVER INSULATION JACKET. SMOOTH MEMBRANE TO AVOID WRINKLES AND OVERLAP ALL SEAMS AT LEAST 3". APPLY A SECOND COAT OF SAME COATING TO THE ENTIRE SURFACE. TOP CENTER OF RECTANGULAR DUCT SHALL PITCH TO EACH SIDE TO AVOID TRAPPING OF WATER IN THE CENTER.

C. MATERIAL:

- 1) TYPE D-1: MINIMUM 1-LB DENSITY FIBERGLASS
 BLANKET, MAXIMUM 0.28 K-FACTOR AT 75 DEG F MEAN
 TEMPERATURE WITH FACTORY-APPLIED
 FOIL-SKRIM-KRAFT FACING SIMILAR TO MANVILLE
 MICROLITE.
- 2) TYPE D-2: 3 LB. FIBERGLASS BOARD. THE MAXIMUM K FACTOR SHALL BE 0.23 AT 75 DEG F MEAN TEMPERATURE WITH A MINIMUM DENSITY OF 3 LB. THE INSULATION SHALL BE PROVIDED WITH A FACTORY-APPLIED ALL PURPOSE OR ALL SERVICE FACING. THE INSULATION SHALL BE EQUAL TO MANVILLE TYPE 814 SPIN-GLAS AP.
- 3) TYPE D-3: MINIMUM 6 LB FIBERGLASS BOARD.
 MAXIMUM 0.22 K-FACTOR AT 75 DEG F MEAN
 TEMPERATURE WITH FACTORY APPLIED ALL PURPOSE
 OR ALL SERVICE FACING. SIMILAR TO MANVILLE 817
 SPIN-GLAS AP.

D. INSTALLATION:

- 1) FIBERGLASS BLANKET: 2 INCH LAP STRIPS AT ALL SEAMS. SECURE BOTTOM OF ALL DUCTS OVER 24 INCH WIDE WITH MIN. 2 ROWS OF WELD PINS 12 INCH ON CENTER. SECURE ALL SEAMS WITH FOIL VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE.
- 2) FIBERGLASS BOARD: SEAL JOINTS AND BREAKS IN FACING WITH 3 INCH WIDE TAPE TO MATCH FACING AND ADHERE WITH VAPOR SEAL ADHESIVE. APPLY 5 INCH WIDE TAPE AT CORNERS, WELD PINS ON TOP, SIDES AND BOTTOM.

5. PIPING INSULATION

A. INSULATE ALL PIPING IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.

<u>SERVICE</u>	SIZE	THICKNESS	MATERIAL	<u>FINISH</u>
REFRIGERANTLIQUID & SUCTION LINES	ALL	1 INCH	P-6	VAPORSEAL
COLD WATER MAKEUP, COLD CONDENSATE, EQUIPMENT DRAINS BELOW 60 DEG F	ALL	1 INCH	P-1	VAPORSEAL

- B. PIPING, VALVES AND FITTINGS TO BE INSULATED:
- 1) LOW TEMPERATURE PIPING SYSTEMS 40 TO 100 DEG F INCLUDING:
- A. CHILLED WATER SUPPLY AND RETURN.
- B. CONDENSER WATER SUPPLY AND RETURN.

MASTROLUCA ENGINEERING ASSOCIATES, LLC

51 ZEPHYR RD TRUMBULL CT 06611

203-581-3838

JMASTROLUCA.MEA@GMAIL.COM

Revis	sions		
#	DATE	ISSUE/REVISION DESCRIPTION	



ISSUED FOR

PERMIT/BID

OFFUTT EDUCATION CENTER
AT LACHAT FARM

WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: NTS

DRAWING TITLE

MECHANICAL SPECIFICATIONS

DRAWING#

106 GODFREY, ROAD

M-005

- D. CONDENSATE DRAIN PIPING.
- 2) LOW TEMPERATURE HOT PIPING SYSTEMS 100 TO 250 DEG F INCLUDING:
- A. LOW TEMPERATURE HOT WATER SUPPLY AND RETURN.
- B. LOW PRESSURE STEAM SUPPLY TO 15 PSIG.
- C. LOW PRESSURE CONDENSATE RETURN, EXCEPT STEAM TRAPS AND TRAP ASSEMBLY AND RADIATION RUNOUTS CONCEALED IN RADIATION ENCLOSURES.
- D. PUMPED CONDENSATE DISCHARGE.
- 3) HIGH TEMPERATURE HOT PIPING SYSTEMS: 251 TO 450 DEG F INCLUDING:
- A. MEDIUM AND HIGH PRESSURE STEAM TO 225 PSIG.
- B. MEDIUM AND HIGH PRESSURE CONDENSATE RETURN.
- C. MATERIAL:
- 1) TYPE P-1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.23 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FIRE-RETARDANT FOIL-SKRIM-KRAFT FACING. ALL SERVICE JACKET. SIMILAR TO OWENS-CORNING 650 AS.I
- 2) TYPE P-4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.28 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO MANVILLE HI-LO TEMP INSULATION INSERTS.
- 3) TYPE P-6: MINIMUM 6 LB MOLDED FOAMED PLASTIC.
 MAXIMUM 0.27 K-FACTOR AT 75 DEG F MEAN
 TEMPERATURE. MAXIMUM 0.17 PERMEANCE. SIMILAR TO
 ARMSTRONG ARMAFLEX II.
- D. FINISH:
- 1) TYPE F-1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1, MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.
- 2) TYPE F-2: WHITE VAPOR BARRIER COATING WITH 10X10 OR 20X20 MESH WHITE GLASS, POLYESTER OR NYLON CLOTH REINFORCING MEMBRANE, MINIMUM 31 MIL DRY FILM THICKNESS, SIMILAR TO FOSTER TITE-FIT, UL LABEL.
- 3) TYPE F-4: ALUMINUM JACKETING WITH MINIMUM 0.016 INCH WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS.
- 4) TYPE F-6: WHITE FINISHING AND INSULATING CEMENT APPLIED OVER HEXAGONAL WIRE MESH. CEMENT SIMILAR TO KEENE SUPERSLICK.
- E. OUTDOOR PIPING:
- 1) FOR ALL PIPING, FITTINGS AND VALVES LOCATED OUTDOORS, INCREASE SCHEDULED INSULATION THICKNESS BY A MINIMUM OF 1 INCH AND PROVIDE F-4 FINISH. PROVIDE VAPORSEAL ON ALL OUTDOOR PIPES, VALVES AND FITTINGS SUBJECT TO CONDENSATION.
- 2) COORDINATE WITH ELECTRICAL CONTRACTOR FOR ALL HEAT TRACING REQUIREMENTS AND PIPING LENGTH REQUIREMENTS. ELECTRICAL TO PROVIDE CABLING AND THERMOSTAT.
- F. INDOOR PIPING EXPOSED IN KITCHENS:
 - 1) PROVIDE JACKETS OVER INDOOR PIPE MADE OF 0.016 INCH ALUMINUM HELD WITH A FRICTION TYPE, Z-LOCK AND ALUMINUM BANDS. PROVIDE A MOISTURE BARRIER LINING.
- G. INSTALLATION:
- 1) BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.
- 2) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 INCH LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED. REFRIGERANT PIPING INSULATION SHALL HAVE MITERED FITTINGS.
- 3) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION.
- 4) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.
- 6. EQUIPMENT INSULATION
- A. STEAM SYSTEMS: CONDENSATE PUMPS AND TANKS, FLASH TANKS, STEAM GENERATOR AND ALL OTHER EQUIPMENT AS RECOMMENDED BY THE MANUFACTURER.
- 1) TYPE D-3 INSULATION 2 INCH THICK WITHOUT FOIL SCRIM SCORED TO FIT EQUIPMENT. INSTALLATION SHALL ALLOW FOR REMOVAL AND REINSTALLATION WITHOUT DAMAGE TO INSULATION. PROVIDE COAT OF TYPE F-6 INSULATING CEMENT COVERED WITH TYPE F-2 FINISH.
- 7. FIRE-RATED INSULATION SYSTEMS
- A. FIRE-RATED BOARD: STRUCTURAL-GRADE, PRESS-MOLDED.

- XONOLITE CALCIUM SILICATE, FIREPROOFING BOARD SUITABLE FOR OPERATING TEMPERATURES UP TO 1700 DEG F. COMPLY WITH ASTM C 656, TYPE II, GRADE 6. TESTED AND CERTIFIED TO PROVIDE A 2-HOUR FIRE RATING BY A NRTL ACCEPTABLE TO AUTHORITY HAVING JURISDICTION. MANUFACTURERED BY JOHNS MANVILLE; SUPER FIRETEMP M.
- B. FIRE-RATED BLANKET: HIGH-TEMPERATURE, FLEXIBLE, BLANKET INSULATION WITH FSK JACKET THAT IS TESTED AND CERTIFIED TO PROVIDE A 2-HOUR FIRE RATING BY A NRTL ACCEPTABLE TO AUTHORITY HAVING JURISDICTION. MANUFACTURED BY JOHNS MANVILLE; FIRETEMP WRAP; FIREMASTER DUCT WRAP, 3M; FIRE BARRIER WRAP PRODUCTS, UNIFRAX CORPORATION; FYREWRAP
- C. NYC PROJECTS, PRODUCT TO HAVE AN MEA# AND LISTING FOR THE PARTICULAR APPLICATION
- 8. VIBRATION ISOLATION
- A. FURNISH AND INSTALL ALL NECESSARY VIBRATION ISOLATORS, VIBRATION HANGERS, MOUNTING PADS, RAILS, ETC., TO ISOLATE VIBRATION AND SOUND FROM BEING TRANSMITTED TO THE BUILDING STRUCTURE. ALL VIBRATION PRODUCTS SHALL BE SPECIFICALLY DESIGNED FOR THEIR INTENDED USE. PROVIDE ISOLATION FOR EQUIPMENT, PIPING AND DUCTWORK. ETC.
- B. MANUFACTURER OF THE VIBRATION ISOLATION EQUIPMENT SHALL HAVE THE FOLLOWING RESPONSIBILITIES
- 1) SUBMIT TYPE, SIZE, DEFLECTION, LOCATION AND DETAILS INCLUDING FREE HEIGHT FOR EACH ISOLATOR PROPOSED FOR ITEMS IN THE SPECIFICATION AND ON THE DRAWINGS.
- 2) SUBMIT DETAILS OF ALL STEEL FRAMES AND CONCRETE INERTIA BASES TO BE USED IN CONJUNCTION WITH THE ISOLATION IN THIS SPECIFICATION AND IN THE DRAWINGS.
- 3) CLEARLY OUTLINE THE PROCEDURES FOR INSTALLING AND ADJUSTING THE ISOLATORS OR HANGERS.
- 4) GUARANTEE THE SPECIFIED ISOLATION SYSTEMS
 DEFLECTION AND THAT A MINIMUM OF 90% EFFICIENCY
 WILL BE OBTAINED.
- C. PROVIDE INSTALLATION INSTRUCTIONS, DRAWINGS AND FIELD SUPERVISION TO ASSURE PROPER INSTALLATION AND PERFORMANCE.
- D. ISOLATION SYSTEMS SHALL BE MANUFACTURED BY MASON INDUSTRIES, VIBRATION ELIMINATOR COMPANY, AMBER BOOTH, VIBRATION MOUNTINGS AND CONTROLS.
- E. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS INCLUDING THE LOAD AND SPRING STATIC DEFLECTION FOR EACH FLOOR OR CEILING HUNG ISOLATOR.
- F. PROVIDE LEVELING DEVICES AND APPROVED RESILIENT DEVICES AS REQUIRED TO LIMIT EQUIPMENT AND PIPING MOTION IN EXCESS OF 1\4 INCH ISOLATORS SHALL HAVE CAPABILITY OF SUPPORTING EQUIPMENT AND PIPING AT A FIXED ELEVATION DURING INSTALLATION AND AT A SPECIFIED HEIGHT AFTER ADJUSTMENT.
- G. ALL SPRINGS SHALL HAVE AT LEAST 50% ADDITIONAL LOAD CAPACITY ABOVE DESIGN LOAD.
- H. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE EQUIPMENT CANNOT SUPPORT POINT LOADS.
- I. PROVIDE CORROSION PROTECTION FOR EQUIPMENT MOUNTED OUTDOORS.
- J. SPRING CORROSION RESISTANCE SHALL BE POWDER COATING OF THE SPRING WITH THE STEEL HOUSING HOT DIPPED GALVANIZED. ALL HARDWARE TO BE CADMIUM PLATED.
- K. EQUIPMENT BASES
- 1) TYPE B-1 STEEL BASE
- A. REINFORCED, AS REQUIRED TO PREVENT BASE FLEXING AT START UP AND MISALIGNMENT OF DRIVE AND DRIVEN UNITS. CENTRIFUGAL FAN BASES COMPLETE WITH MOTOR SLIDE RAILS ETC.MASON TYPE M, WF, OR AS APPROVED EQUAL.
- 2) EQUIPMENT STATIC DEFLECTIONS
- A. UP TO 300 RPM 3.5 INCHES STATIC DEFLECTION
- B. 300 TO 500 RPM 2.5 INCHES STATIC DEFLECTION
- C. 501 AND UP RPM 1.5 INCHES STATIC DEFLECTION
- L. SUPPORT OF PIPING IN EQUIPMENT ROOMS AND WHERE EXPOSED ON ROOF
- 1) ALL WATER PIPING OUTSIDE OF SHAFTS WITHIN 50 FEET OF CONNECTED ROTATING EQUIPMENT TO BE SUPPLIED WITH ISOLATORS.
- 2) HANGER ROD ISOLATORS (TYPE 30N) MOUNTINGS.
- 3) INDOOR SUPPORTED PIPING ISOLATORS (TYPE SLR).
- 4) VERTICAL RISER PIPING ANCHOR AND GUIDES (TYPE ADA).
- M. PROVIDE FLEXIBLE CONNECTIONS BETWEEN ALL FANS AND DUCTWORK (REFER TO DUCTWORK SECTION FOR SPECIFICATIONS).

- 9. PIPING GENERAL REQUIREMENTS
- A. COMPLETE WITH: PIPE, FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDE, SLEEVES, AND ACCESSORIES.
- B. ALL ITEMS SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS:
- 1) AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
- 2) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
- 3) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
- 4) MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY (MSS).
- C. GASKETS: ONE PIECE RING TYPE 1/16 INCH MINIMUM THICKNESS KLINGER C4400 ONLY (OR APPROVED EQUAL, SUBMIT FOR APPROVAL BEFORE USE).
- D. WELDING
- 1) ALL WELDING SHALL BE DONE IN ACCORDANCE WITH ALL CODES APPLICABLE TO THE PARTICULAR SERVICE. WELDING FILLER METALS: COMPLY WITH AWS D10.12/D10.12M FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND CHEMICAL ANALYSIS OF STEEL PIPE BEING WELDED.
- 2) COMPLY WITH SECTION II, PART C OF THE ASME BOILER AND PRESSURE VESSEL CODE FOR WELDING MATERIALS APPROPRIATE FOR WALL THICKNESS AND FOR CHEMICAL ANALYSIS OF PIPE BEING WELDED.
- 3) QUALIFY PROCESSES AND OPERATORS ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE: SECTION IX, "WELDING AND BRAZING QUALIFICATIONS". COMPLY WITH PROVISIONS IN ASME B31 SERIES, "CODE FOR PRESSURE PIPING."
- 4) WELDERS SHALL BE QUALIFIED FOR ALL REQUIRED PIPE SIZES, MATERIAL, WALL THICKNESS, AND POSITION IN ACCORDANCE WITH THE AMERICAN SOCIETY OF MECHANICAL ENGINEERING (ASME) SECTION IX, BOILER AND PRESSURE VESSEL CODE. CERTIFY THAT EACH WELDER HAS PASSED AWS QUALIFICATION TESTS FOR WELDING PROCESSES INVOLVED AND THAT CERTIFICATION IS CURRENT.
- 5) COPIES OF THE CERTIFIED WELDER QUALIFICATION REPORTS SHALL BE MAINTAINED BY THE RESPONSIBLE WELDING AGENCY AND THE COMPANY PERFORMING THE WELDING, AND SHALL BE SUBMITTED TO THE OWNER AND/OR ENGINEER UPON REQUEST.
- 6) ALL DEFECTIVE WELDS SHALL BE CHIPPED OUT AND REPAIRED AT NO COST TO THE OWNER, BASED ON PROCEDURE TO BE SPECIFIED AT THE TIME.
- E. COPPER TUBE BRAZING
 - 1) ALL BRAZING SHALL BE DONE IN ACCORDANCE WITH ALL CODES APPLICABLE TO THE PARTICULAR SERVICE. BRAZING FILLER METALS: AWS A5.8, BCUP SERIES, COPPER-PHOSPHORUS ALLOYS FOR JOINING COPPER WITH COPPER; OR BAG-1, SILVER ALLOY FOR JOINING COPPER WITH BRONZE OR STEEL.
 - 2) QUALIFY PROCESS AND OPERATORS IN ACCORDANCE WITH ASME BOILER AND PRESSURE VESSEL CODE, SECTION IX, "WELDING AND BRAZING QUALIFICATIONS
 - 3) BRAZERS SHALL BE QUALIFIED FOR ALL REQUIRED TUBE SIZES, MATERIAL, WALL THICKNESS, AND POSITION IN ACCORDANCE WITH THE AMERICAN SOCIETY OF MECHANICAL ENGINEERING (ASME), SECTION IX, BOILER AND PRESSURE VESSEL CODE.
- A. COPIES OF THE CERTIFIED BRAZER QUALIFICATION REPORTS SHALL BE MAINTAINED BY THE RESPONSIBLE BRAZING AGENCY AND THE COMPANY PERFORMING THE BRAZING, AND SHALL BE SUBMITTED TO THE OWNER AND/OR ENGINEER UPON REQUEST.
- B. ALL DEFECTIVE BRAZEMENTS SHALL BE CHIPPED OUT AND REPAIRED AT NO COST TO THE OWNER, BASED ON PROCEDURE TO BE SPECIFIED AT THE TIME.
- F. GASKETS
 - 1) PIPE-FLANGE GASKET MATERIALS: SUITABLE FOR CHEMICAL AND THERMAL CONDITIONS OF PIPING SYSTEM CONTENTS. ASME B16.21, NONMETALLIC, FLAT, ASBESTOS-FREE, 1/8-INCH MAXIMUM THICKNESS UNLESS THICKNESS OR SPECIFIC MATERIAL IS INDICATED.
- G. ALL PRESSURIZED PIPING TO BE TESTED
 HYDROSTATICALLY TO 150 PSI OR 150% OF OPERATING
 PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED
 TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO
 BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR
 TEMPERATURE CHANGE. REPAIR OR REPLACE LEAKS OR
 DEFECTS WITHOUT ADDITIONAL COST.
- 1) REFRIGERANT PIPING
- A. TEST REFRIGERANT PIPING FOR TIGHTNESS AND LEAKS UNDER PRESSURE OR VACUUM. THE DURATION OF EACH TEST SHALL BE TWENTY-FOUR (24) HOURS.
- B. TEST JOINTS IN ACCORDANCE WITH ASHRAE 15-LATEST EDITION. THERE SHALL BE NO OBSERVABLE LEAKS OR CHANGES IN PRESSURE. IF EITHER IS OBSERVED, SEAL LEAKS, AND REPEAT TEST PROCEDURES.

 2) HIGH PRESSURE STEAM PIPING
- A. ALL HIGH PRESSURE STEAM PIPING WELDS SHALL BE X-RAY TESTED IN ACCORDANCE WITH NEW YORK CITY CODE REQUIREMENTS. TESTING SHALL BE DONE BY AN INDEPENDENT TESTING LABORATORY. PROVIDE

CERIFICATION OF TEST AS WELL AS X-RAYS TO OWNER UPON COMPLETION.

- H. EXPANSION COMPENSATION:
 - 1) ALL PIPING SHALL BE INSTALLED TO COMPENSATE FOR EXPANSION TO PROTECT THE BUILDING, EQUIPMENT AND PIPING SYSTEMS. PROVIDE ALL GUIDES, ANCHORS, EXPANSION LOOPS, SUPPLEMENTAL STEEL AND APPROVED TYPE EXPANSION JOINTS AS INDICATED OR REQUIRED FOR CONTROL OF EXPANSION.
- I. SYSTEM FILLING:1) SYSTEMS OR PORTIONS OF SYSTEMS TO B
- 1) SYSTEMS OR PORTIONS OF SYSTEMS TO BE TESTED SHALL HAVE PROVISIONS FOR FILLING, VENTING (AIR REMOVAL), DRAINAGE AND TEST PRESSURE CONNECTION.
- 2) LIQUID USED FOR TESTING SHALL BE CLEAN CITY WATER MIXED WITH CHEMICALS SPECIFIED BY THE BASE BUILDING WATER TREATMENT CONTRACTOR. THE HVAC CONTRACTOR SHALL HIRE THE SERVICES OF THE BUILDING WATER TREATMENT CONTRACTOR AND PROVIDE ALL REQUIRED LABOR. PROVIDE TEMPORARY METERING AND MIXING DEVICES AS REQUIRED. THE HVAC CONTRACTOR SHALL OBTAIN ALL REQUIREMENTS FROM THE BUILDING MANAGEMENT.
- J. FLUSHING AND CLEANING AND TREATMENT:

 1) AFTER COMPLETION OF HYDROSTATIC TESTS AND EMPTYING, PROVIDE LABOR FOR INITIAL FLUSHING, CLEANING, AND PASSIVATING IN ACCORDANCE WITH THE OWNER'S WATER TREATMENT SPECIFICATION. THE HVAC CONTRACTOR SHALL HIRE THE SERVICES OF THE BASE BUILDING WATER TREATMENT CONTRACTOR AND PROVIDE ALL LABOR. COORDINATE WITH THE OWNER'S WATER TREATMENT COMPANY AND PROVIDE ALL SPECIFICATION REQUIREMENTS AND REQUIRED LABOR. COORDINATE ALL REQUIREMENTS WITH BASE BUILDING MANAGEMENT FOR BASE BUILDING VENDOR.
- A. PROVIDE ONE YEAR'S SUPPLY OF NECESSARY WATER TREATMENT CHEMICALS FOR NEW SYSTEM TO THE OWNER OR TENANT INCLUDING THE FOLLOWING:
- B. CLOSED SYSTEM TREATMENT (CHILLED WATER, SECONDARY WATER, CLOSED CONDENSER WATER AND HOT WATER). PROVIDE AGENTS TO REDUCE SCALE DEPOSITS, TO ADJUST PH AND TO INHIBIT CORROSION. TREATMENT SHALL NOT CONTAIN ANY CHROMATE'S OR OTHER TOXIC SUBSTANCES. USE PROPER CHEMISTRY TO PROVIDE BACTERIA COUNTS BELOW 10 ³ COLONIES PER MILLILITER (AEROBIC & NON AEROBIC). PH LEVELS TO BE BETWEEN 7.0 AND 9.0. CORROSION RATE TO BE LESS THAN 1/2 MILS/YEAR STEEL, 1/10 MILS/YEAR COPPER.
- C. OPEN SYSTEM TREATMENT (CONDENSER WATER)PROVIDE AGENTS TO REDUCE SCALE DEPOSITS, TO ADJUST PH AND TO INHIBIT CORROSION.TREATMENT SHALL NOT CONTAIN ANY CHROMATE'S OR OTHER TOXIC SUBSTANCES. USE PROPER CHEMISTRY TO PROVIDE BACTERIA COUNTS BELOW 10⁵ COLONIES PER MILLIMETER (AEROBIC AND NON-AEROBIC). PH TO BE BETWEEN 7.5 AND 8.5. CORROSION RATES TO BE LESS THAN 1 MILS/YEAR -STEEL AND 1/10 MILS/YEAR COPPER.
- K. PROVIDE DIELECTRIC FITTINGS WHERE DISSIMILAR METALS ARE TO BE JOINED.
- L. DRAIN DOWN FOR NEW PIPING CONNECTION INTO EXISTING:
- 1) CONTRACTOR TO OBTAIN SCHEDULE AND COORDINATE WITH BUILDING MANAGEMENT FOR SYSTEM DRAIN DOWN AND CONNECTION INTO EXISTING BUILDING PIPING. ALL COSTS ASSOCIATED WITH DRAIN DOWN ARE TO BE INCLUDED AS PART OF BID.
- M. ALL INSTRUMENTATION (PRESSURE GAUGES AND THERMOMETERS) SHALL BE RATED FOR THE SAME PRESSURE AND TEMPERATURE AS PIPING SYSTEM AND RATED SPECIFICALLY FOR THE SAME SERVICE AS THE PIPING, PRESSURE GAUGES ARE TO BE LIQUID FILLED WITH 1% ACCURACY. SELECT GAUGES AND THERMOMETERS SO THAT THE MID-POINT IS AT THE WORKING PRESSURE AND TEMPERATURE. INSTRUMENTS TO BE MANUFACTURED BY WEISS INSTRUMENTS OR APPROVED EQUAL.
- 1) PROVIDE THERMOMETERS IN PIPING AS INDICATED ON THE DRAWINGS AND AT THE INLET AND OUTLET OF EACH HYDRONIC COIL, HEAT EXCHANGER AND PIECE OF EQUIPMENT THAT INVOLVES A DIFFERENTIAL TEMPERATURE. THERMOMETERS TO BE ORGANIC LIQUID
- 2) PROVIDE PRESSURE GAUGES IN PIPING AS INDICATED ON THE DRAWINGS AND AT SUCTION AND DISCHARGE OF EACH PUMP AND AT INLETS AND OUTLETS OF EACH HYDRONIC COIL, HEAT EXCHANGER AND PIECE OF EQUIPMENT THAT INVOLVES A DIFFERENTIAL PRESSURE.
- N. PIPE SUPPORTS:
- 1) PROVIDE ADEQUATE SUPPORT FOR PIPE AND CONTENTS TO PREVENT SAGGING, VIBRATION, OR SWAYING AND ALLOW FOR EXPANSION AND CONTRACTION. PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE STRUCTURE CANNOT SUPPORT POINT LOADS.
- 2) HORIZONTAL PIPING TO BE SUPPORTED BY FORGED STEEL ADJUSTABLE CLEVIS TYPE HANGER. MAXIMUM SPACING AS FOLLOWS:
- A. STEEL 1 INCH AND SMALLER: 6 FEET.
- B. STEEL 1-1/4 INCH AND LARGER: 10 FEET.
- C. COPPER 1 INCH AND SMALLER: 5 FEET.
- D. COPPER 1-1/2 IN TO 2-1/2 INCH: 8 FEET.
- E. COPPER 3 INCH: 10 FEET.
- F. PROVIDE ADDITIONAL SUPPORTS AT CHANGES IN DIRECTION, BRANCH PIPING AND RUNOUTS OVER 5 FEET AND CONCENTRATE LOADS DUE TO VALVES, STRAINERS AND OTHER SIMILAR ITEMS.

 3) ROD SIZE
- A. PIPE 2 IN AND SMALLER: 3/8 IN
 B. PIPE 2-1/2 IN TO 3 IN: 1/2 IN
- C PIPE 4 TO 8 IN 3/4 IN

- D. PIPE 10 IN TO 12 IN: 7/8 IN
 4) VERTICAL PIPING:
- A. BASE ELBOW SUPPORT WITH BEARING PLATE ON STRUCTURAL SUPPORT.
- B. GUIDES AT EVERY SECOND FLOOR (SPACING NOT TO EXCEED 25 FEET).
- C. TOP SUPPORT HANGER OR SADDLE IN HORIZONTAL CONNECTION WITH PROVISIONS FOR EXPANSION.
- D. INTERMEDIATE STEEL RISER CLAMP SUPPORT BOLTED AND WELDED TO PIPE BEARING ON STRUCTURAL STEEL OR BEARING PLATE AT FLOOR.
- E. FOR MULTIPLE PIPES, COORDINATE GUIDES, BEARING PLATES AND ACCESSORY STEEL.
- O. VALVES GENERAL REQUIREMENTS
- 1) VALVE PRESSURE AND TEMPERATURE RATINGS: NOT LESS THAN INDICATED AND AS REQUIRED FOR SYSTEM PRESSURES AND TEMPERATURES.
- 2) VALVE SIZES: SAME AS UPSTREAM PIPING UNLESS OTHERWISE INDICATED.

3) VALVE-END CONNECTIONS:

- A. FLANGED: WITH FLANGES ACCORDING TO ASME B16.1 FOR IRON VALVES
- B. FLANGED: WITH FLANGES ACCORDING TO ASME B16.5 FOR STEEL VALVES
- C. FLANGED: WITH FLANGES ACCORDING TO ASME B16.24 FOR BRONZE VALVES.
- D. SOLDER JOINT: WITH SOCKETS ACCORDING TO ASME B16.18.
- E. THREADED: WITH THREADS ACCORDING TO ASME B1.20.1.
- F. VALVE BYPASS AND DRAIN CONNECTIONS: MSS SP-45.

4) GENERAL-DUTY VALVE APPLICATIONS: UNLESS

- OTHERWISE INDICATED, USE THE FOLLOWING VALVE TYPES:

B. SHUTOFF SERVICE, STEAM: GATE VALVES.

GATE VALVES.

PLUG VALVES.

C. THROTTLING SERVICE EXCEPT STEAM: BALL, BUTTERFLY,

A. SHUTOFF SERVICE EXCEPT STEAM: BALL, BUTTERFLY OR

D. THROTTLING SERVICE, STEAM: GLOBE VALVES.

FACILITATE SYSTEM BALANCING.

- 5) INSTALL SHUTOFF DUTY VALVES AT EACH BRANCH CONNECTION TO SUPPLY MAINS, AT SUPPLY CONNECTION TO EACH PIECE OF EQUIPMENT, UNLESS ONLY ONE PIECE OF EQUIPMENT IS CONNECTED IN THE BRANCH LINE. INSTALL THROTTLING DUTY VALVES AT EACH BRANCH CONNECTION TO RETURN MAINS, AT RETURN CONNECTIONS TO EACH PIECE OF
- 6) INSTALL CALIBRATED BALANCING VALVES IN THE RETURN WATER LINE OF EACH HEATING OR COOLING ELEMENT AND ELSEWHERE AS REQUIRED TO

EQUIPMENT, AND ELSEWHERE AS INDICATED.

- 7) INSTALL SPRING LOADED CHECK VALVES AT EACH PUMP DISCHARGE AND ELSEWHERE AS REQUIRED TO CONTROL FLOW DIRECTION.
- 8) THREADED CONNECTIONS ARE NOT TO BE USED FOR GLYCOL SYSTEMS.
- P. CONDENSATE DRAIN PIPING
- 1) PIPE: ASTM B88, HARD DRAWN COPPER TUBING TYPE
- 2) FITTINGS: SOLDERED JOINT FITTINGS, 95/5 SOLDER.
- 3) PITCH, EXCEPT AS NOTED:
- A. 1 INCH IN 4 FEET PREFERRED.
- B. 1 INCH IN 8 FEET MINIMUM.

10. REFRIGERANT SYSTEMS

- A. PROVIDE ALL REFRIGERANT PIPING REQUIRED FOR A COMPLETE REFRIGERATION SYSTEM, WITH ALL VALVES, FITTINGS AND SPECIALTIES NECESSARY FOR SATISFACTORY OPERATION IN ACCORDANCE WITH ASHRAE STANDARD 15—LATEST EDITION AND ALL AUTHORITIES HAVING JURISDICTION. REFRIGERATION SYSTEM SHALL INCLUDE ALL REQUIRED ITEMS FOR CHARGING, DRAINING AND PURGING THE SYSTEM.
- B. REFRIGERANT PIPING SHALL BE HARD COOPER, TYPE L OR ACR, ASTM B88 OR ASTM B 280, BRAZED.
- C. JOINTS IN REFRIGERATION PIPING SHALL BE BRAZED.
- D. REFRIGERANT PIPING SHALL BE OF THE SIZE AND NUMBER OF PIPES RECOMMENDED BY THE MANUFACTURER AND AS APPROVED BY THE ENGINEER.
- E. HORIZONTAL PIPING OF THE COMPRESSOR SUCTION AND DISCHARGE LINES AND THE CONDENSER DISCHARGE LINES SHALL BE PITCHED A MINIMUM OF ½ INCH IN 10 FEET, IN THE DIRECTION OF REFRIGERANT FLOW. EACH SUCTION GAS VERTICAL RISER SHALL BE TRAPPED AT ITS EVAPORATOR WITH A TRAP AS RECOMMENDED BY THE

MASTROLUCA ENGINEERING ASSOCIATES, LLC

51 ZEPHYR RD TRUMBULL CT 06611

203-581-3838

JMASTROLUCA.MEA@GMAIL.COM

Revisions

DATE ISSUE/REVISION DESCRIPTION

PHASE



OFFUTT EDUCATION CENTER
AT LACHAT FARM

106 GODFREY, ROAD
WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

SCALE: NTS

MECHANICAL SPECIFICATIONS

DRAWING#

© 2022 MASTROLUCA ENGINEERING ASSOCIATES, LLC
These drawings, concepts, designs and ideas are the property of MASTROLUCA ENGINEERING
ASSOCIATES LLC. They may not be copied reproduced disclosed to others or used in

connection with any work other than the specified project for which they were prepared, in whole

or in part, without prior written consent of MASTROLUCA ENGINEERING ASSOCIATES, LLC

COMPRESSOR MANUFACTURER.

- F. INSTALL REFRIGERANT PIPING TO PREVENT EXCESSIVE OIL FROM BEING TRAPPED IN THE SYSTEM. ANY ADDITIONAL RISERS OR EQUALIZER LINES REQUIRED BY THE MANUFACTURER OF EQUIPMENT FOR THE PROPER SYSTEM OPERATION SHALL BE INSTALLED AS PART OF THIS CONTRACT. PROVIDE A FULLY PIPED OIL SEPARATOR FOR EACH REFRIGERANT SYSTEM AS PER MANUFACTURER'S RECOMMENDATIONS.
- G. VALVES SHALL BE DESIGNED FOR REFRIGERANT SERVICE. SHUTOFF VALVES SHALL BE BRASS PACKLESS TYPE. UNIONS, FLANGED VALVES OR FITTINGS SHALL BE PROVIDED FOR DISCONNECTING EQUIPMENT, CONTROLS, ETC. FOR MAKING REPAIRS. PIPING SHALL BE RUN IN A SINGLE LAYER, WITH EACH LINE ISOLATED FROM ANOTHER TO PREVENT RUBBING. PROVISION SHALL BE MADE FOR EXPANSION AND CONTRACTION OF PIPING. ALL PIPING PASSING THROUGH WALLS, PARTITIONS, ETC., SHALL BE FURNISHED WITH SLEEVES AS REQUIRED.
- H. REFRIGERANT PIPING PASSING THROUGH RATED FLOORS OR DEMISING WALLS SHALL BE ENCLOSED IN A RIGID AND GAS-TIGHT CONTINUOUS FIRE-RESISTING PIPE DUCT OR SHAFT VENTED TO THE OUTSIDE, IN ACCORDANCE WITH ASHRAE STANDARD 15-LATEST EDITION. PIPE CONDUIT SHALL BE COPPER TUBE TYPE L WITH SOLDERED FITTINGS.

11. ELECTRICAL WORK

A. GENERAL:

- 1) ELECTRICAL POWER WIRING SHALL BE PROVIDED BY THE ELECTRICAL CONTRACT. CONTROL WIRING SHALL BE PROVIDED BY THE HVAC CONTRACT. CONTROL WIRING SHALL BE DEFINED AS ANY WIRING 120V AND BELOW INSTALLED FOR PURPOSES OTHER THAN PROVIDING PRIMARY ELECTRICAL POWER TO EQUIPMENT.
- 2) MOTOR STARTERS AND VARIABLE FREQUENCY DRIVES (VFD) SHALL BE FURNISHED BY THE HVAC CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. REFER TO EQUIPMENT SECTION FOR VARIABLE FREQUENCY DRIVE SPECIFICATIONS.
- 3) DUCT MOUNTED SMOKE DETECTORS, WHERE REQUIRED, SHALL BE PROVIDED BY AND WIRED BY THE ELECTRICAL CONTRACTOR, AND MOUNTED BY THE HVAC CONTRACTOR.
- A. THIS CONTRACTOR SHALL INSTALL THE SMOKE DETECTOR SAMPLING TUBES IN THE DUCT AS COORDINATED IN THE FIELD.
- B. THIS CONTRACTOR SHALL ASSIST THE ELECTRICAL CONTRACTOR IN TESTING THE DUCT—MOUNTED SMOKE DETECTION SYSTEM.
- 4) ALL ELECTRICAL CONTROL WIRING SHALL COMPLY WITH LOCAL ELECTRICAL CODE, ALL AUTHORITIES HAVING JURISDICTION AND THE PROJECT ELECTRICAL SPECIFICATIONS.
- 5) MECHANICAL CONTRACTOR TO OBTAIN QUANTITY OF CONTROLLERS REQUIRED AND COORDINATE WITH ELECTRICAL CONTRACTOR FOR ALL OPERATING REQUIREMENTS, INTERLOCKS AND CONNECTIONS FOR STARTERS.
- 6) THE MECHANICAL CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL POINT TO POINT, COMPLETELY COORDINATED WIRING DIAGRAMS AND INDICATE ALL SOURCE POWER REQUIREMENTS AND ALL FIELD WIRING TO BE PERFORMED BY THE ELECTRICAL CONTRACTOR.
- 7) WHERE EXISTING STARTERS ARE TO BE REUSED, THIS CONTRACTOR SHALL MAINTAIN ALL EXISTING CONTROL CONNECTIONS. WHERE NEW STARTERS ARE TO BE PROVIDED TO REPLACE EXISTING, THIS CONTRACTOR SHALL SURVEY THE EXISTING CONTROL CONNECTIONS AND PREPARE AN EXISTING CONTROL WIRING DIAGRAM PRIOR TO DEMOLITION FOR SUBMITTAL TO THE ENGINEER. THE NEW STARTERS SHALL BE PROVIDED WITH THE NECESSARY CONTACTS AND RELAYS REQUIRED TO RECONNECT THE EXISTING CONTROLS. PROVIDE ALL REQUIRED CONTACTS FOR START/STOP AND FIRE ALARM.

12. MOTORS:

- A. MOTORS SHALL HAVE THE ELECTRICAL CHARACTERISTICS AS LISTED ON THE DRAWINGS. COORDINATE ALL REQUIREMENTS WITH ELECTRICAL CONTRACTOR. ALL MOTORS SHALL COMPLY WITH NEMA MG-1 STANDARD AND SHALL BE OF THE HIGH EFFICIENCY TYPE AND MEET THE 1992 EPA ENERGY EFFICIENCY ACT AND UTILITY COMPANY REBATE REQUIREMENTS.
- B. MOTORS FOR VARIABLE FREQUENCY DRIVES (VFD) SHALL BE SUITABLE FOR USE WITH VARIABLE FREQUENCY DRIVES AND COMPLY WITH NEMA MG-1 PART 31.40.4.2. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS OF THE MOTOR AND VFD MANUFACTURER.
- C. IF CONTRACTOR ELECTS TO SUBSTITUTE OR INCREASE MOTOR HORSEPOWER OVER THAT SPECIFIED, THE COST OF MOTOR AND ELECTRICAL CHANGES SHALL BE BORNE BY THIS CONTRACTOR.
- D. MOTORS (UNDER HVAC WORK): IN ACCORDANCE WITH NEMA, IEEE AND ANSI C50 STANDARDS:
- 1) STANDARD EFFICIENCY UNLESS OTHERWISE NOTED.
- 2) 1.15 SERVICE FACTOR INCLUDING MOTORS SERVED FROM A VFD
- 3) SQUIRREL CAGE INDUCTION, OPEN DRIPPROOF TYPE, 1750 RPM, NEMA TYPE B INSULATION CLASS, CONTINUOUS DUTY, EXCEPT AS NOTED.
- 13. MOTOR CONTROLLERS

- A. SUPPLIED BY HVAC CONTRACTOR AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
- B. ENCLOSURES:
- 1) PROVIDE ENCLOSURES FOR STARTERS AND VFD'S SUITABLE FOR OPERATING ENVIRONMENT. ENCLOSURE'S SHALL BE NEMA 1 VENTILATED SHEETMETAL FOR INDOOR APPLICATION, NEMA 3R WITH ADDITIONAL GASKETING WEATHER-PROOF RAINTIGHT ENCLOSURE FOR EXPOSED OUTDOOR SERVICE OR INDOOR SERVICE EXPOSED TO MOISTURE.PROVIDE DISCONNECT SWITCH ON ENCLOSURE AS REQUIRED FOR SERVICE.
- C. WITH SOLID-STATE (ELECTRONIC) OVERLOAD PROTECTION. COORDINATE ALL MOTOR CONTROLLER TYPES AND SIZES WITH MOTOR TYPES AND SIZES.
- D. 1/3 HP AND SMALLER: PROVIDE MANUAL STARTER EXCEPT USE MAGNETIC TYPE WHERE AUTOMATICALLY CONTROLLED.
- 1) MANUAL TYPE: 2-POLE TOGGLE SWITCH WITH OVERLOAD PROTECTION AND PILOT LIGHT.
- E. 1/2 HP AND LARGER: PROVIDE MAGNETIC STARTER:
- 1) COMBINATION UNFUSED DISCONNECT SWITCH AND MAGNETIC STARTER EXCEPT AS NOTED.
- 2) SOLID-STATE (ELECTRONIC) OVERLOAD PROTECTION IN EACH PHASE LEG WITH RESET IN ENCLOSURE.
- 3) HOA SELECTOR SWITCH FOR AUTOMATICALLY OPERATED MOTORS. SAFETY CONTROLS COMMON TO BOTH CONTROLS.
- 4) RED, GREEN AND AMBER PILOT LIGHTS.
- 5) SWITCHES: HORSE-POWER-RATED, EXTERNAL PADLOCKING TYPE.
- 6) HOLDING COILS: 10 WATT, 120 VOLT.
- 7) CONTACTS: MAIN LINE AND MINIMUM (2) NORMALLY OPEN, (2) NORMALLY CLOSED 10 AMP AUXILIARIES, IN ADDITION TO CONTACTS
- 8) REQUIRED FOR CONTROLS SPECIFIED.
- 9) CONTROL TRANSFORMER: FOR MOTORS OVER 120 VOLTS, TO STEP DOWN CONTROL VOLTAGE TO 120 VOLTS; OF THE REQUIRED CAPACITY WITH FUSE AND GROUND CONNECTION ON VOLTAGE SIDE.
- 10) FUSES: SIMILAR TO BUSSMAN.
- 11) RELAYS: TO SUPPLEMENT AUXILIARY CONTACTS IN CONTROLLER. MINIMUM 10 WATT COIL AND TWO 10 AMP CONTACTS.
- 12) TERMINALS: SUITABLE FOR CONDUCTORS NOTED AND AS APPROVED.
- F. DISCONNECT SWITCHES ARE PROVIDED BY THE ELECTRICAL CONTRACTOR IF NOT INTEGRAL WITH EQUIPMENT.
- G. ACCEPTABLE MANUFACTURERS:
- 1) EATON/ CUTLER HAMMER.
- 2) SQUARE D.
- 3) ALLEN BRADLEY.
-) ALLEN

4) ABB

14. EQUIPMENT

- A. PROVIDE ALL EQUIPMENT AND ACCESSORIES OF THE SIZES AND CAPACITIES AS SCHEDULED AND AS INDICATED ON THE DRAWINGS.
- B. INSTALL EQUIPMENT IN ACCORDANCE WITH APPROVED SHOP DRAWINGS, MANUFACTURERS INSTRUCTIONS AND ALL CODES AND REGULATIONS WHICH APPLY.
- C. PROVIDE EQUIPMENT SUPPORTS AND/OR MOUNTINGS AS INDICATED ON THE DRAWING, IN VIBRATION SPECIFICATION AND AS FOLLOWS:
- 1) FLOOR MOUNTED EQUIPMENT PROVIDE DIMENSIONS FOR A 4 INCH CONCRETE HOUSEKEEPING PAD WITH ALL REQUIRED WATERPROOFING TO THE CONSTRUCTION MANAGER.
- 2) EQUIPMENT ON FLOOR STANDS PROVIDE FLOOR STAND OF STRUCTURAL STEEL OR STEEL PIPES AND FITTINGS ATTACHED TO FLOOR.
- 3) ROOF MOUNTED EQUIPMENT PROVIDE PREFABRICATED ISOLATED ROOF CURB WITH INTEGRAL VIBRATION ISOLATORS.
- 4) CEILING MOUNTED EQUIPMENT PROVIDE SUPPORTS WITH APPROVED SUITABLE ANCHORS SUSPENDED DIRECTLY FROM BUILDING STEEL STRUCTURE.
- 5) PROVIDE SUPPLEMENTAL STEEL AS REQUIRED TO ADEQUATELY SUPPORT THE EQUIPMENT LOAD.
- 6) EQUIPMENT SHALL BE INSTALLED WITH VIBRATION ISOLATION, REFER TO VIBRATION ISOLATION SECTION.
- D. PREPURCHASED EQUIPMENT
- 1) ASSIGNMENT:

- A. EQUIPMENT HAS BEEN PREPURCHASED BY THE OWNER FOR THIS PROJECT. THE MECHANICAL CONTRACTOR, BY BIDDING ON THIS PROJECT, ACCEPTS ASSIGNMENT OF THE PREPURCHASED EQUIPMENT DESCRIBED HEREIN WHICH SHALL BE RECEIVED, INSTALLED AND PUT INTO OPERATION BY THIS MECHANICAL CONTRACTOR.
- 2) COORDINATION:
- A. MECHANICAL CONTRACTOR SHALL PROVIDE COORDINATION BETWEEN INSTALLATION OF PREPURCHASED EQUIPMENT AND EQUIPMENT THAT IS NOT PREPURCHASED AND FURNISHED BY THIS CONTRACTOR. MECHANICAL CONTRACTOR TO OBTAIN ALL SUBMITTALS FROM PREPURCHASED EQUIPMENT MANUFACTURER AND SUBMIT SHOP DRAWING AS PART OF HIS WORK.
 - 3) DELIVERY:
- A. MECHANICAL CONTRACTOR SHALL ACCEPT DELIVERY OF PREPURCHASED EQUIPMENT AT A DESIGNATED LOCATION AND IN ACCORDANCE WITH THE DELIVERY SCHEDULE AS DIRECTED BY OWNER'S REPRESENTATIVE. BID SHALL INDICATE LOCATION OF DELIVERY
- 4) INSTALLATION:
- A. MECHANICAL CONTRACTOR SHALL PROVIDE ALL LABOR FOR AND SCHEDULE THE INSTALLATION OF PRE-PURCHASED EQUIPMENT IN A TIMELY MANNER, AS DIRECTED BY THE GENERAL CONTRACTOR OR OWNER'S REPRESENTATIVE. BID SHALL INDICATE LOCATION OF DELIVERY.
- B. PROVIDE MISCELLANEOUS APPURTENANCES AS REQUIRED TO MAKE PREPURCHASED EQUIPMENT A PROPERLY FUNCTIONING PART OF THE WORK OF THIS TRADE.
- C. PROVIDE PREPURCHASED EQUIPMENT INSTALLATION IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND THE CONTRACT DOCUMENTS.
- D. PROVIDE ALL TOOLS AND MATERIALS AS REQUIRED TO PROVIDE A COMPLETE INSTALLATION OF ALL PREPURCHASED EQUIPMENT.
- E. UP FRONT PURCHASE OF EQUIPMENT:
- 1) THE CONTRACTOR SHALL SUBMIT A LIST OF LONG LEAD TIME ITEMS THAT WILL AFFECT THE SCHEDULE OF THE PROJECT IF NOT PURCHASED IMMEDIATELY UP FRONT AT THE START OF THE PROJECT. THE MECHANICAL CONTRACTOR SHALL SUBMIT PROPOSED MANUFACTURER AND LEAD TIMES FOR ALL PROJECT EQUIPMENT AT TIME OF PROJECT AWARD.

F. RIGGING

- 1) THIS CONTRACTOR SHALL PROVIDE ALL REQUIRED RIGGING, HOISTING AND BRACING TO INSTALL THE EQUIPMENT AS INDICATED ON THE PLANS. THIS WORK SHALL BE PERFORMED BY AN INSURED CERTIFIED LICENSED RIGGING COMPANY THAT IS EXPERIENCED IN RIGGING EQUIPMENT OF THE TYPE INDICATED FOR THE AREAS SHOWN ON THE CONSTRUCTION DOCUMENTS. THIS CONTRACTOR SHALL SUBMIT RIGGING PLANS FOR APPROVAL PRIOR TO PROCEEDING WITH THE WORK.
- 2) ALL PERMITS REQUIRED FROM THE AUTHORITIES AND AGENCIES INVOLVED TO PERFORM THE RIGGING ARE THE RESPONSIBILITIES OF THIS CONTRACTOR.
- 3) ALL STRUCTURAL SUPPORTS, MODIFICATIONS OR ADDITIONS ARE TO BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO PROCEEDING WITH THE WORK. ALL SUPPLEMENTAL STRUCTURAL SUPPORTS, ELEVATOR CHARGES /MODIFICATIONS, BRACING AND PROTECTION REQUIRED FOR THE RIG IS THE RESPONSIBILITY OF THIS CONTRACTOR.
- 4) THE RIGGING CONTRACTOR SHALL HIRE AND PAY FOR ALL CHARGES AND SERVICES OF THE BUILDING ELEVATOR CONTRACTOR FOR THE RIGGING OF THE EQUIPMENT.

G. FANS:

- 1) GENERAL (APPLIES TO ALL FAN TYPES EXCEPT AS
- A. PROVIDE CENTRIFUGAL TYPE, NON-OVERLOADING DESIGN EXCEPT AS NOTED WITH MINIMUM CAPACITIES AS NOTED AND WITH CERTIFIED RATINGS BY AMCA. WHEEL SHALL BE FACTORY BALANCED STATICALLY AND DYNAMICALLY. BRAKE HORSEPOWER RATINGS SHALL NOT BE MORE THAN 5 PERCENT ABOVE WHAT IS NOTED ON DRAWINGS. DRIVES SHALL BE MATCHED, MULTIPLE V-BELT DRIVE UNLESS OTHERWISE NOTED WITH MINIMUM CAPACITY OF 1.4 TIMES RATED MOTOR HP. PULLEYS SHALL BE CAST
- B. MOTOR PULLEY SHALL BE VARIABLE PITCH DIAMETER EXCEPT FANS WITH VARIABLE FREQUENCY DRIVES SUPPLY AND INSTALL ONE FIXED PITCH PULLEY CHARGE AS REQUIRED PER FAN TO BALANCE SYSTEMS. COMPANION SHEAVES SHALL MAINTAIN BELTS PARALLEL. BELT GUARDS SHALL BE IN COMPLIANCE WITH OSHA REGULATIONS AND WITH TACHOMETER OPENING FOR FAN SPEED MEASUREMENTS. MANUFACTURER SHALL PROVIDE REPLACEMENT FIXED PITCHED SHEAVES WHERE NEEDED TO BALANCE SYSTEM.
- C. PROVIDE REMOVABLE FLANGED SCREENS AT INLETS OR OUTLETS WHERE NO CONNECTING DUCTWORK IS INDICATED.
- D. BEARINGS BALL ROLLER OR TAPER. PROVIDE PRESSURE TYPE LUBRICATING FITTINGS WITH PRESSURE RELIEF FITTINGS EXTENDED TO ACCESSIBLE LOCATIONS. MINIMUM L-10 LIFE RATING; 50,000 HOURS PER AFBMA STANDARD B-10 OR 250,00 HOURS AVERAGE (B-50) LIFE AT MAXIMUM CATALOG RATING.
- H. VARIABLE FREQUENCY DRIVES

- 1) DESCRIPTION: NEMA ICS 2, IGBT, PWM, VFC; LISTED AND LABELED AS A COMPLETE UNIT AND ARRANGED TO PROVIDE VARIABLE SPEED OF AN NEMA MG 1, DESIGN B, 3—PHASE INDUCTION MOTOR BY ADJUSTING OUTPUT VOLTAGE AND FREQUENCY.
- 2) VFD SHALL BE MANUFACTURED BY ABB MODEL ACH550 ECLIPSE BYPASS
- 3) PROVIDE UNIT SUITABLE FOR OPERATION OF PREMIUM-EFFICIENCY MOTOR AS DEFINED BY NEMA MG 1 SUITABLE FOR INVERTER USE INSULATION RATED 1600V
- 4) DESIGN AND RATING: MATCH LOAD TYPE SUCH AS FANS, BLOWERS, AND PUMPS; AND TYPE OF CONNECTION USED BETWEEN MOTOR AND LOAD SUCH AS DIRECT OR THROUGH A POWER-TRANSMISSION CONNECTION.
- 5) CONFIRM VFD RATED AMPERAGE WITH MOTOR AMPERAGE TO CONFIRM COMPATIBILITY.
- 6) DELIVER VFCS IN SHIPPING SPLITS OF LENGTHS
 THAT CAN BE MOVED PAST OBSTRUCTIONS IN
 DELIVERY PATH AS INDICATED
- 7) SETUP DRIVE SET POINTS TO LOCK OUT OPERATION AT FREQUENCIES THAT MAY PROVIDE MECHANICAL RESONANCE UP TO 3 INDEPENDENT BANDS OF INDEPENDENT RANGE.
- 8) PROVIDE VARIABLE FREQUENCY DRIVES FOR CONTROL OF FANS AND PUMPS AS SHOWN ON PLANS
- 9) THE VFD'S SHALL BE PROVIDED WITH THE FOLLOWING OPTIONS
- A. INPUT LINE CONDITIONING: <u>INTEGRAL</u> MINIMUM INPUT 5% IMPEDANCE LINE REACTORS PREWIRED AND INSTALLED WITHIN VFD ENCLOSURE. MANUFACTURER TO LIST VALUE TO BE PROVIDED IN PROJECT SUBMITTAL.
- B. UL/NEMA 1 ENCLOSURE OR PROVIDE ENCLOSURE FOR VFD'S SUITABLE FOR OPERATING ENVIRONMENT.
- C. MANUAL/AUTOMATIC SELECTABLE BYPASS CONTACTORS
- D. DRIVE INPUT SERVICE SWITCH AND FAST ACTING SEMI-CONDUCTER FUSES SPECIFIC TO DRIVE.
- E. CIRCUIT BREAKER DISCONNECT WITH DOOR INTERLOCKED SWITCH.
- F. UL RATED AND LABELED 100K AIC RATED DRIVE AND BYPASS ASSEMBLY.
- G. DRIVE SERVICE SWITCH
- H. CLASS 10/20/30 ADJUSTABLE OVERLOAD RELAY.
- I. PROVIDE BMS BACNET GATEWAY INTERFACE WHICH SHALL ALLOW ALL PARAMETER SETTINGS OF VFD TO BE PROGRAMMED VIA BMS CONTROL. PROVIDE CAPABILITY FOR VFD TO RETAIN THESE SETTINGS WITHIN THE NONVOLATILE MEMORY. THE VFD AND BYPASS MUST COMMUNICATE OVER THE BMS BACNET GATEWAY FOR SEAMLESS COMMUNICATIONS IN THE EVENT OF VFD FAILURE OR LOSS OF BMS COMMUNICATION. BYPASS SELECTION AND BYPASS MONITORING OF UP TO 45 POINTS SHALL BE AVAILABLE OVER THE BACNET COMMUNICATION NETWORK. BACNET SERIAL COMMUNICATION BYPASS CAPABILITIES SHALL INCLUDE, BUT NOT BE LIMITED TO; BYPASS RUN-STOP CONTROL; THE ABILITY TO FORCE THE UNIT TO BYPASS; AND THE ABILITY TO LOCK AND UNLOCK THE KEYPAD. THE BYPASS SHALL HAVE THE CAPABILITY OF ALLOWING THE DDC TO MONITOR FEEDBACK SUCH AS, BYPASS CURRENT (IN AMPS), BYPASS KILOWATT HOURS (RESETTABLE), BYPASS OPERATING HOURS (RESETTABLE), AND BYPASS LOGIC BOARD TEMPERATURE. THE DDC SHALL ALSO BE CAPABLE OF MONITORING THE BYPASS RELAYS OUTPUT STATUS. AND ALL DIGITAL INPUT STATUS. ALL BYPASS DIAGNOSTIC WARNING AND FAULT INFORMATION SHALL BE TRANSMITTED OVER THE SERIAL COMMUNICATIONS BUS. REMOTE BYPASS FAULT RESET SHALL BE POSSIBLE.
- J. THE BYPASS CONTROL SHALL MONITOR THE STATUS OF THE VFD AND BYPASS CONTACTORS AND INDICATE WHEN THERE IS A WELDED CONTACTOR CONTACT OR OPEN CONTACTOR COIL. THIS FAILED CONTACTOR OPERATION SHALL BE INDICATED ON THE BYPASS LCD DISPLAY AS WELL AS OVER THE SERIAL COMMUNICATIONS PROTOCOL.
- K. PROVIDE THREE ADJUSTABLE SET POINTS TO LOCK OUT OPERATION AT FREQUENCIES THAT MAY PROVIDE MECHANICAL RESONANCE.
- L. PROVIDE A SEPARATE TERMINAL STRIP FOR CONNECTION OF FREEZE, FIRE, SMOKE AND ALL DAMPERS CONTACTS AND EXTERNAL START COMMAND. ALL EXTERNAL SAFETY INTERLOCKS SHALL REMAIN FULLY FUNCTIONAL WHETHER THE SYSTEM IS IN HAND, AUTO, OR BYPASS MODES. THE REMOTE START/STOP CONTACT SHALL OPERATE IN AUTO AND BYPASS MODES.THE TERMINAL STRIP SHALL ALLOW FOR INDEPENDENT CONNECTION OF UP TO FOUR (4) UNIQUE SAFETY INPUTS.
- 10) EMI/RFI FILTERS. ALL VFDS SHALL INCLUDE EMI/RFI FILTERS. THE VFD SHALL COMPLY WITH STANDARD EN 61800-3 FOR THE FIRST ENVIRONMENT, RESTRICTED LEVEL WITH UP TO 100 FEET OF MOTOR CABLES. NO EXCEPTIONS. CERTIFIED TEST LAB TEST REPORTS SHALL BE PROVIDED WITH THE SUBMITTALS.
- 11) THE MANUFACTURER SHALL PROVIDE
- A. FACTORY STARTUP SERVICE, INCLUDING COMPONENT TESTING, FIELD CHECK OF CONTROL CONNECTIONS, DOCUMENTATION STATING THAT ALL WORK AND DRIVE FUNCTIONS ARE OPERATING PROPERLY
- B. PROGRAMMING OF ALL DRIVE PARAMETERS SPECIFIC TO THIS PROJECT
- C. TWO YEAR ON SITE WARRANTY FOR PARTS AND LABOR AFTER STARTUP.

- I. NEW IN-LINE FANS DIRECT DRIVE:
- 1) PROVIDE CABINET FANS OF SIZE AND ARRANGEMENT AS INDICATED, AND OF CAPACITIES AS SHOWN ON
- 2) FANS TO BE DIRECT DRIVE. SEE SCHEDULE FOR SPECIFIC APPLICATIONS.
- 3) FANS SHALL HAVE ACOUSTICALLY INSULATED HOUSINGS, INTEGRAL BACKDRAFT DAMPER SHALL BE CERTIFIED BY AMCA AND U.L.
- 4) PROVIDE VARIABLE SPEED SWITCH ADJACENT TO EACH FAN FOR BALANCING PURPOSES.
- 5) FANS SHALL BE MANUFACTURED BY LOREN COOK OR APPROVED EQUAL.
- J. COLD CONDENSATE PUMP:
 - 1) PUMP SHALL BE IN-LINE PUMPS SIMILAR TO LITTLE GIANT. PUMP SHALL BE CAPABLE OF OPERATION WITH 115V, SINGLE PHASE POWER. PUMPS SHALL BE RATED AT 1.75 GPM AT 22 FEET OF HEAD WITH 1/20 HP MOTOR WITH SINGLE POINT ELEDCTRICAL CONNECTION. PROVIDE PUMP FOR EACH SUPPLEMENTAL UNIT. PROVIDE DISCONNECT SWITCH AND CHECK VALVE AT PUMP DISCHARGE. PUMP SHALL HAVE A HARD WIRED ELECTRICAL CONNECTION. PROVIDE TRANSFORMER AS REQUIRED.
- 2) HIGH WATER LEVEL SWITCH IN RECEIVER SHALL SHUT DOWN AC UNIT AND TRANSMIT ALARM SIGNAL TO

15. AUTOMATIC CONTROLS - GENERAL REQUIREMENTS

A. WORK INCLUDED

- 1) FURNISH AND INSTALL AS HEREIN SPECIFIED, A COMPLETE AUTOMATIC TEMPERATURE CONTROL SYSTEM. MANUFACTURER SHALL BE SUBMITTED WITH BID AND APPROVED BY ENGINEER BEFORE BID AWARD. THE ATC CONTRACTOR SHALL BE AN INDEPENDENT CONTRACTOR NOT AFFILIATED WITH THE MECHANICAL CONTRACTOR:
- 2) PROVIDE A SUBMITTAL THAT MEETS THE REQUIREMENTS BELOW FOR APPROVAL.
- 3) PROVIDE POWER FOR PANELS AND CONTROL DEVICES FROM A SOURCE DESIGNATED BY THE ELECTRICAL CONTRACTOR.
- 4) COORDINATE INSTALLATION SCHEDULE WITH THE MECHANICAL CONTRACTOR AND GENERAL CONTRACTOR.
- 5) FURNISH, MOUNT, AND WIRE ALL ASSOCIATED PANELS AND DEVICES FOR THE SYSTEM TO BE COMPLETELY OPERATIONAL REGARDLESS OF FUNCTION OR VOLTAGE, UNLESS OTHERWISE STATED.

B. SUBMITTALS

- 1) PRODUCT DATA: INCLUDE MANUFACTURER'S TECHNICAL LITERATURE FOR EACH CONTROL DEVICE INDICATED, LABELED WITH SETTING OR ADJUSTABLE RANGE OF CONTROL. INDICATE DIMENSIONS, CAPACITIES, PERFORMANCE CHARACTERISTICS, ELECTRICAL CHARACTERISTICS, FINISHES FOR MATERIALS, AND INSTALLATION AND STARTUP INSTRUCTIONS FOR EACH
- 2) SHOP DRAWINGS: DETAIL EQUIPMENT ASSEMBLIES AND INDICATE DIMENSIONS, WEIGHTS, LOADS, REQUIRED CLEARANCES, METHOD OF FIELD ASSEMBLY, COMPONENTS, AND LOCATION AND SIZE OF EACH FIELD
- A. SCHEMATIC FLOW DIAGRAMS SHOWING FANS, COILS, DAMPERS, VALVES, AND CONTROL DEVICES.

TYPE OF PRODUCT INDICATED.

- B. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL
- C. DETAILS OF CONTROL PANEL FACES, INCLUDING

CONTROLS, INSTRUMENTS, AND LABELING.

C. QUALITY ASSURANCE

- 1) INSTALLER QUALIFICATIONS: A QUALIFIED INSTALLER WHO IS AN AUTHORIZED REPRESENTATIVE OF THE AUTOMATIC CONTROL SYSTEM MANUFACTURER FOR BOTH INSTALLATION AND MAINTENANCE OF UNITS REQUIRED FOR THIS PROJECT.
- 2) COMPLY WITH ALL CURRENT GOVERNING CODES, ORDINANCES, AND REGULATIONS INCLUDING UL, NFPA, THE LOCAL BUILDING CODE, NEC, ETC.
- 3) MATERIALS AND EQUIPMENT SHALL BE THE CATALOGUED PRODUCTS OF MANUFACTURERS REGULARLY ENGAGED IN PRODUCTION AND INSTALLATION OF AUTOMATIC TEMPERATURE CONTROL SYSTEMS AND SHALL BE MANUFACTURER'S LATEST STANDARD DESIGN THAT COMPLIES WITH THE

SPECIFICATION REQUIREMENTS. 1.01SYSTEM DESCRIPTION R2—SERIES (SIMULTANEOUS HEAT/COOL)

PER THE EQUIPMENT SCHEDULE, THE VARIABLE CAPACITY, HEAT PUMP HEAT RECOVERY AIR CONDITIONING SYSTEM BASIS OF DESIGN IS MITSUBISHI ELECTRIC CITY MULTI VRF (VARIABLE REFRIGERANT FLOW) ZONING SYSTEM(S).

ACCEPTABLE ALTERNATIVE MANUFACTURERS, ASSUMING COMPLIANCE WITH THESE EQUIPMENT SPECIFICATIONS, ARE DAIKIN, PANASONIC, AND HITACHI. CONTRACTOR BIDDING AN ALTERNATE MANUFACTURER DOES SO WITH FULL KNOWLEDGE THAT THAT MANUFACTURES PRODUCT MAY NOT BE ACCEPTABLE OR APPROVED AND THAT CONTRACTOR IS RESPONSIBLE FOR ALL SPECIFIED ITEMS AND INTENTS OF THIS DOCUMENT WITHOUT FURTHER COMPENSATION.

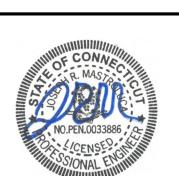
SIMULTANEOUS HEATING/COOLING (HEAT RECOVERY) SYSTEMS SHALL CONSIST OF AN OUTDOOR UNIT, BC (BRANCH CIRCUIT) CONTROLLER (OR COMPARABLE BRANCH DEVICES),

S1 ZEPHYR RD TRUMBULL CT 06611
203-581-3838
JMASTROLUCA.MEA@GMAIL.COM

Revisions

DATE ISSUE/REVISION DESCRIPTION

PHASE



ISSUED FOR

PERMIT/BID

PROJECT NAME
OFFUTT EDUCATION CENTER
AT LACHAT FARM

WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

106 GODFREY, ROAD

MECHANICAL

SPECIFICATIONS

DRAWING#

M-007

SCALE: NTS

NO ADDITIONAL BRANCH CIRCUIT CONTROLLERS (OR COMPARABLE BRANCH DEVICES) THAN SHOWN ON THE DRAWINGS/SCHEDULE MAY BE CONNECTED TO ANY ONE OUTDOOR UNIT. CONTRACTORS PROPOSING ALTERNATE SYSTEMS REQUIRING MORE BRANCH DEVICES THAN THOSE INCLUDED AS THE BASIS OF DESIGN ARE RESPONSIBLE FOR ADDITIONAL PIPING & ELECTRICAL COSTS AND ARE REQUIRED TO IDENTIFY ADDITIONAL COSTS & INSTALLATION TIME REQUIRED OF OTHER TRADES WITH THEIR BID

1.02QUALITY ASSURANCE

1. THE UNITS SHALL BE LISTED BY ELECTRICAL TESTING LABORATORIES (ETL) AND BEAR THE ETL LABEL.

2. ALL WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (N.E.C.).

3. THE UNITS SHALL BE MANUFACTURED IN A FACILITY REGISTERED TO ISO 9001 AND ISO14001 WHICH IS A SET OF STANDARDS APPLYING TO ENVIRONMENTAL PROTECTION SET BY THE INTERNATIONAL STANDARD ORGANIZATION (ISO).

4. ALL UNITS MUST MEET OR EXCEED THE 2010 FEDERAL MINIMUM EFFICIENCY REQUIREMENTS AND THE ASHRAE 90.1 EFFICIENCY REQUIREMENTS FOR VRF SYSTEMS. EFFICIENCY SHALL BE PUBLISHED IN ACCORDANCE WITH THE AIR—CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE (AHRI) STANDARD 1230.

5. SYSTEM START—UP SUPERVISION SHALL BE A REQUIRED SERVICE TO BE COMPLETED BY THE MANUFACTURER OR A DULY AUTHORIZED, COMPETENT REPRESENTATIVE THAT HAS BEEN FACTORY TRAINED IN SYSTEM CONFIGURATION AND OPERATION. THE REPRESENTATIVE SHALL PROVIDE PROOF OF MANUFACTURER CERTIFICATION INDICATING SUCCESSFUL COMPLETION WITHIN NO MORE THAN TWO (2) YEARS PRIOR TO SYSTEM INSTALLATION. THIS CERTIFICATION SHALL BE INCLUDED AS PART OF THE EQUIPMENT AND/OR CONTROLS SUBMITTALS.

1.03DELIVERY, STORAGE AND HANDLING

1. UNIT SHALL BE STORED AND HANDLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.

Part 2 — WARRANTY

THE CITY MULTI UNITS SHALL BE COVERED BY THE

MANUFACTURER'S LIMITED WARRANTY FOR A PERIOD OF ONE

(1) YEAR PARTS AND SEVEN (7) YEAR COMPRESSOR TO THE

ORIGINAL OWNER FROM DATE OF INSTALLATION.

INSTALLING CONTRACTOR SHALL MEET MANUFACTURER REQUIREMENTS TO OBTAIN EXTENDED MANUFACTURER'S LIMITED PARTS AND COMPRESSOR WARRANTY FOR A PERIOD OF TEN (10) YEARS TO THE ORIGINAL OWNER FROM DATE OF INSTALLATION. THIS WARRANTY SHALL NOT INCLUDE LABOR.

MANUFACTURER SHALL HAVE A MINIMUM OF FIFTEEN (15) YEARS CONTINUOUS EXPERIENCE PROVIDING VRF SYSTEMS IN THE U.S. MARKET.

ALL MANUFACTURER TECHNICAL AND SERVICE MANUALS MUST BE READILY AVAILABLE FOR DOWNLOAD BY ANY LOCAL CONTRACTOR SHOULD EMERGENCY SERVICE BE REQUIRED. REGISTERING AND SIGN—IN REQUIREMENTS WHICH MAY DELAY EMERGENCY SERVICE REFERENCE ARE NOT ALLOWED. THE CITY MULTI VRF SYSTEM SHALL BE INSTALLED BY A CONTRACTOR WITH EXTENSIVE CITY MULTI INSTALL AND SERVICE TRAINING. THE MANUATORY CONTRACTOR SERVICE AND INSTALL TRAINING SHOULD BE PERFORMED BY THE MANUFACTURER.

Part 3 - OUTDOOR UNITS

GENERAL:

3.01R2-SERIES HIGH EFFICIENCY (HEAT RECOVERY), AIR COOLED OUTDOOR UNITS

THE OUTDOOR UNIT MODULES SHALL BE AIR—COOLED, DIRECT EXPANSION (DX), MULTI—ZONE UNITS USED SPECIFICALLY WITH VRF COMPONENTS DESCRIBED IN THIS SECTION AND PART 5 (CONTROLS). THE OUTDOOR UNIT MODULES SHALL BE EQUIPPED WITH A SINGLE COMPRESSOR WHICH IS INVERTER—DRIVEN AND MULTIPLE CIRCUIT BOARDS——ALL OF WHICH MUST BE MANUFACTURED BY THE BRANDED VRF MANUFACTURER. EACH OUTDOOR UNIT MODULE SHALL BE COMPLETELY FACTORY ASSEMBLED, PIPED AND WIRED AND RUN TESTED AT THE FACTORY.

1. OUTDOOR UNIT SYSTEMS MAY BE COMPRISED OF MULTIPLE MODULES WITH DIFFERING CAPACITY IF A BRAND OTHER THAN BASIS OF DESIGN IS PROPOSED. ALL UNITS REQUIRING A FACTORY SUPPLIED TWINNING KITS SHALL BE PIPED TOGETHER IN THE FIELD, WITHOUT THE NEED FOR EQUALIZING LINE(S). IF AN ALTERNATE MANUFACTURER IS SELECTED, ANY ADDITIONAL MATERIAL, COST, AND LABOR TO INSTALL ADDITIONAL LINES SHALL BE INCURRED BY THE CONTRACTOR. CONTRACTOR RESPONSIBLE FOR ENSURING ALTERNATIVE BRAND COMPATIBILITY IN TERMS OF AVAILABILITY, PHYSICAL DIMENSIONS, WEIGHT, ELECTRICAL REQUIREMENTS, ETC.

2. OUTDOOR UNIT SHALL HAVE A SOUND RATING NO HIGHER THAN 68 DB(A) INDIVIDUALLY OR 70 DB(A) TWINNED. UNITS SHALL HAVE A SOUND RATING NO HIGHER THAN 52 DB(A) INDIVIDUALLY OR 55 DB(A) TWINNED WHILE IN NIGHT MODE OPERATION. UNITS SHALL HAVE 5 LEVELS SOUND ADJUSTMENT VIA DIP SWITCH SELECTABLE FAN SPEED SETTINGS. IF AN ALTERNATE MANUFACTURER IS SELECTED, ANY ADDITIONAL MATERIAL, COST, AND LABOR TO MEET PUBLISHED SOUND LEVELS SHALL BE INCURRED BY THE CONTRACTOR.

3. REFRIGERANT LINES FROM THE OUTDOOR UNIT TO THE INDOOR UNITS SHALL BE INSULATED IN ACCORDANCE WITH THE INSTALLATION MANUAL.

4. THE OUTDOOR UNIT SHALL HAVE THE CAPABILITY OF INSTALLING THE MAIN REFRIGERANT PIPING THROUGH THE BOTTOM OF THE UNIT.

5. THE OUTDOOR UNIT SHALL HAVE AN ACCUMULATOR WITH REFRIGERANT LEVEL SENSORS AND CONTROLS. UNITS SHALL ACTIVELY CONTROL LIQUID LEVEL IN THE ACCUMULATOR VIA LINEAR EXPANSION VALVES (LEV) FROM THE HEAT EXCHANGER.
6. THE OUTDOOR UNIT SHALL HAVE A HIGH PRESSURE SAFETY SWITCH, OVER—CURRENT PROTECTION, CRANKCASE HEATER AND DC BUS PROTECTION.

7. VRF SYSTEM SHALL MEET PERFORMANCE REQUIREMENTS PER SCHEDULE AND BE WITHIN PIPING LIMITATIONS & ACCEPTABLE AMBIENT TEMPERATURE RANGES AS DESCRIBED IN RESPECTIVE MANUFACTURERS' PUBLISHED PRODUCT CATALOGS.

NON-PUBLISHED PRODUCT CAPABILITIES OR PERFORMANCE DATA ARE NOT ACCEPTABLE.

8. THE OUTDOOR UNIT SHALL BE CAPABLE OF OPERATING IN HEATING MODE DOWN TO -25F AMBIENT TEMPERATURES OR COOLING MODE DOWN TO 23F AMBIENT TEMPERATURES, WITHOUT ADDITIONAL LOW AMBIENT CONTROLS. IF AN ALTERNATE MANUFACTURER IS SELECTED, ANY ADDITIONAL MATERIAL, COST.

AND LABOR TO MEET LOW AMBIENT OPERATING CONDITION AND PERFORMANCE SHALL BE INCURRED BY THE CONTRACTOR. 9. THE OUTDOOR UNIT SHALL HAVE A HIGH EFFICIENCY OIL SEPARATOR PLUS ADDITIONAL LOGIC CONTROLS TO ENSURE ADEQUATE OIL VOLUME IN THE COMPRESSOR IS MAINTAINED. OIL RETURN SEQUENCES MUST BE ENABLED ONLY DURING EXTENDED PERIODS OF REDUCED REFRIGERANT FLOW TO ENSURE NO DISRUPTION TO CORRECT REFRIGERANT FLOW TO INDIVIDUAL ZONES DURING PEAK LOADS. SYSTEMS WHICH MIGHT ENGAGE OIL RETURN SEQUENCE BASED ON HOURS OF OPERATION RISK OIL RETURN DURING INOPPORTUNE PERIODS ARE NOT ALLOWED. SYSTEMS WHICH RELY ON SENSORS (WHICH MAY FAIL) TO ENGAGE OIL RETURN SEQUENCE ARE NOT ALLOWED. 10. UNIT MUST DEFROST ALL CIRCUITS SIMULTANEOUSLY IN ORDER TO RESUME FULL HEATING MORE QUICKLY DURING EXTREME LOW AMBIENT TEMPERATURES (BELOW 23F). PARTIAL DEFROST, ALSO KNOWN AS HOT GAS DEFROST WHICH ALLOWS

REDUCED HEATING OUTPUT DURING DEFROST, IS PERMISSIBLE ONLY WHEN AMBIENT TEMPERATURE IS ABOVE 23F.

11. WHILE IN HOT GAS DEFROST THE SYSTEM SHALL SLOW THE INDOOR UNIT FAN SPEED DOWN TO MAINTAIN A HIGH DISCHARGE AIR TEMPERATURE, SYSTEMS THAT KEEP FAN RUNNING IN SAME STATE SHALL NOT BE ALLOWED AS THEY PROVIDE AN UNCOMFORTABLE DRAFT TO THE INDOOR ZONE DUE TO LOWER DISCHARGE AIR TEMPERATURES.

12. IN REVERSE DEFROST ALL REFRIGERANT SHALL BE BYPASSED IN THE MAIN BRANCH CONTROLLER AND SHALL NOT BE SENT OUT TO THE INDOOR UNITS, SYSTEMS THAT FLOW REFRIGERANT THROUGH INDOOR UNITS DURING REVERSE DEFROST SHALL NOT BE ALLOWED.

13. THE OUTDOOR UNIT SHALL BE CAPABLE OF OPERATING IN COOLING MODE DOWN TO -10F WITH OPTIONAL MANUFACTURER SUPPLIED LOW AMBIENT KIT.

LOW AMBIENT KIT SHALL BE PROVIDED WITH PREDESIGNED CONTROL BOX RATED FOR OUTDOOR INSTALLATION AND CAPABLE OF CONTROLLING KIT OPERATION AUTOMATICALLY IN ALL OUTDOOR UNIT OPERATION MODES.

LOW AMBIENT KIT SHALL BE LISTED BY ELECTRICAL LABORATORIES (ETL) AND BEAR THE ETL LABEL.
LOW AMBIENT KIT SHALL BE FACTORY TESTED IN LOW AMBIENT TEMPERATURE CHAMBER TO ENSURE OPERATION. FACTORY PERFORMANCE TESTING DATA SHALL BE

14. THE OUTDOOR UNIT SHALL BE PROVIDED WITH A MANUFACTURER SUPPLIED 20 GAUGE HOT DIPPED GALVANIZED SNOW /HAIL GUARD. THE SNOW/HAIL GUARD PROTECTS THE OUTDOOR COIL SURFACES FROM HAIL DAMAGE AND SNOW BUILD—UP IN SEVERE CLIMATES.

15. VRF FOUR-LEGGED OUTDOOR UNIT MOUNTING SYSTEMS
SHALL BE PROVIDED BY MANUFACTURER. STAND SHALL BE MADE
FROM 7 GAUGE PLATE STEEL WITH THERMALLY FUSED
POLYESTER POWDER COAT FINISH THAT MEETS ASTM D3451-06
STANDARDS. STANDS SHALL BE PROVIDED WITH GALVANIZED
MOUNTING HARDWARE AND MEETS ALL ASCE 7 OVERTURNING
SAFETY REQUIREMENT.

UNIT CABINET:

AVAILABLE WHEN REQUESTED.

THE CASING(S) SHALL BE FABRICATED OF GALVANIZED STEEL, BONDERIZED AND FINISHED.
 PANELS ON THE OUTDOOR UNIT SHALL BE SCRATCH FREE AT SYSTEM STARTUP IF A SCRATCH OCCURS THE SALT.

AT SYSTEM STARTUP. IF A SCRATCH OCCURS THE SALT SPRAY PROTECTION IS COMPROMISED AND THE PANEL SHOULD BE REPLACED IMMEDIATELY.

1. EACH OUTDOOR UNIT MODULE SHALL BE FURNISHED WITH DIRECT DRIVE, VARIABLE SPEED PROPELLER TYPE FAN(S) ONLY. FANS SHALL BE FACTORY SET FOR OPERATION AT O IN. WG. EXTERNAL STATIC PRESSURE, BUT CAPABLE OF NORMAL OPERATION WITH A MAXIMUM OF 0.32 IN. WG. EXTERNAL STATIC PRESSURE VIA DIPSWITCH.

2. ALL FAN MOTORS SHALL HAVE INHERENT PROTECTION, HAVE PERMANENTLY LUBRICATED BEARINGS, AND BE COMPLETELY VARIABLE SPEED.

3. ALL FANS SHALL BE PROVIDED WITH A RAISED GUARD TO PREVENT CONTACT WITH MOVING PARTS.

PREVENT CONTACT WITH MOVING PARTS.

REFRIGERANT AND REFRIGERANT PIPING:

1. R410A REFRIGERANT SHALL BE REQUIRED FOR SYSTEMS.
2. POLYOLESTER (POE) OIL—WIDELY AVAILABLE AND USED IN CONVENTIONAL DOMESTIC SYSTEMS—SHALL BE REQUIRED. PRIOR TO BIDDING, MANUFACTURERS USING ALTERNATE OIL TYPES SHALL SUBMIT MATERIAL SAFETY DATA SHEETS (MSDS) AND COMPARISON OF HYGROSCOPIC PROPERTIES FOR ALTERNATE OIL WITH LIST OF LOCAL SUPPLIERS STOCKING ALTERNATE OIL FOR APPROVAL AT LEAST TWO WEEKS PRIOR TO BIDDING.

REFRIGERANT PIPING SHALL BE PHOSPHORUS DEOXIDIZED COPPER (COPPER AND COPPER ALLOY SEAMLESS PIPES) OF SUFFICIENT RADIAL THICKNESS AS DEFINED BY THE VRF EQUIPMENT MANUFACTURER AND INSTALLED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

4. ALL REFRIGERANT PIPING MUST BE INSULATED WITH ½
CLOSED CELL, CFC-FREE FOAM INSULATION WITH
FLAME-SPREAD INDEX OF LESS THAN 25 AND A
SMOKE-DEVELOPMENT INDEX OF LESS THAN 50 AS TESTED BY
ASTM E 84 AND CAN / ULC S-102. R VALUE OF INSULATION
MUST BE AT LEAST 3.

5. REFRIGERANT LINE SIZING SHALL BE IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS. FUTURE CHANGES TO INDOOR UNIT STYLES OR SIZES MUST BE POSSIBLE WITHOUT RESIZING/REPLACING REFRIGERANT PIPING TO ANY OTHER BRANCH DEVICES OR INDOOR UNITS.

COIL:

1. OUTDOOR COIL SHALL BE CONSTRUCTED TO PROVIDE EQUAL AIRFLOW TO ALL COIL FACE SURFACE ARE BY MEANS OF A 4-SIDED COIL

2. OUTDOOR COIL SHALL BE ELEVATED AT LEAST 12 "FROM THE BASE ON THE UNIT TO PROTECT COIL FROM FREEZING AND SNOW BUILD UP IN COLD CLIMATES. MANUFACTURER'S IN WHICH THEIR COIL EXTENDS TO WITHIN A FEW INCHES FROM THE BOTTOM OF THEIR CABINET FRAME SHALL PROVIDE AN ADDITIONAL 12 "OF HEIGHT TO THEIR STAND OR SUPPORT STRUCTURE TO PROVIDE EQUAL PROTECTION FROM ELEMENTS AS MITSUBISHI ELECTRIC BASIS OF DESIGN. ANY ADDITIONAL SUPPORT COSTS, EQUIPMENT FENCING, AND TIE DOWNS REQUIRED TO MEET THIS ADDITIONAL HEIGHT SHALL BE RESPONSIBILITY

OF MECHANICAL CONTRACTOR TO PROVIDE.

3. THE OUTDOOR HEAT EXCHANGER SHALL BE OF ZINC COATED ALUMINUM CONSTRUCTION WITH TURBULATING FLAT TUBE CONSTRUCTION. THE COIL FINS SHALL HAVE A FACTORY APPLIED CORROSION RESISTANT FINISH. UNCOATED ALUMINUM COILS/FINS ARE NOT ALLOWED.

4. THE COIL SHALL BE PROTECTED WITH AN INTEGRAL METAL GUARD.

AREA TO SHED DEFROST CONDENSATE AWAY FROM COIL AND

5. REFRIGERANT FLOW FROM THE OUTDOOR UNIT SHALL BE CONTROLLED BY MEANS OF AN INVERTER DRIVEN COMPRESSOR.
6. UNIT SHALL HAVE PREWIRED PLUGS FOR OPTIONAL PANEL HEATERS IN ORDER TO PREVENT ANY RESIDUAL ICE BUILDUP FROM DEFROST. PANEL HEATERS ARE RECOMMENDED FOR OPERATING ENVIRONMENTS WHERE THE AMBIENT TEMPERATURE IS EXPECTED TO STAY BELOW —1F FOR 72 HOURS.
7. CONDENSER COIL SHALL HAVE ACTIVE HOT GAS CIRCUIT DIRECT FROM COMPRESSOR DISCHARGE ON LOWEST COIL FACE

HEAT PUMP OPERATION. WHILE IN HEAT PUMP OPERATION THIS LOWER SECTION OF THE OUTDOOR EVAPORATOR COIL SHALL CONTINUALLY RUN HOT GAS FROM THE COMPRESSOR DISCHARGE TO PROTECT THE COIL FROM ICE BUILDUP AND COIL RUPTURE. MANUFACTURERS WHO DO NOT HAVE AN ACTIVE HOT GAS CIRCUIT IN THE LOWER SECTION OF THE OUTDOOR COIL TO PROTECT COIL FROM FREEZING SHALL NOT BE ALLOWED TO BID ON PROJECT IN MARKETS WHERE THE OUTDOOR UNIT WILL SEE TEMPERATURES BELOW FREEZING.

COMPRESSOR:

1. EACH OUTDOOR UNIT MODULE SHALL BE EQUIPPED WITH ONLY INVERTER DRIVEN SCROLL HERMETIC COMPRESSORS, NON INVERTER—DRIVEN COMPRESSORS, WHICH MAY CAUSE INRUSH CURRENT (DEMAND CHARGES) AND REQUIRE LARGER GENERATORS FOR TEMPORARY POWER SHALL NOT BE ALLOWED.

2. EACH COMPRESSOR SHALL BE EQUIPPED WITH A MULTI-PORT DISCHARGE MECHANISM TO ELIMINATE OVER COMPRESSION AT PART LOAD. MANUFACTURER'S THAT RELY ON A SINGLE COMPRESSOR DISCHARGE PORT AND PROVIDE NO MEANS OF ELIMINATING OVER COMPRESSION AND ENERGY WASTE AT PART LOAD SHALL NOT BE

3. CRANKCASE HEAT SHALL BE PROVIDED VIA INDUCTION—TYPE HEATER UTILIZING EDDY CURRENTS FROM MOTOR WINDINGS. ENERGY—WASTING "BELLY—BAND" TYPE CRANKCASE HEATERS ARE NOT ALLOWED. MANUFACTURERS THAT UTILIZE BELLY—BAND CRANKCASE HEATERS WILL BE CONSIDERED AS ALTERNATE ONLY.
4. COMPRESSOR SHALL HAVE AN INVERTER TO MODULATE CAPACITY. THE CAPACITY FOR EACH COMPRESSOR SHALL BE VARIABLE WITH A MINIMUM TURNDOWN NOT GREATER THAN 15%.
5. THE COMPRESSOR SHALL BE EQUIPPED WITH AN INTERNAL THERMAL OVERLOAD.

6. FIELD-INSTALLED OIL EQUALIZATION LINES BETWEEN MODULES ARE NOT ALLOWED. PRIOR TO BIDDING, MANUFACTURERS REQUIRING EQUALIZATION MUST SUBMIT OIL LINE SIZING CALCULATIONS SPECIFIC TO EACH SYSTEM AND MODULE PLACEMENT FOR THIS PROJECT.

7. MANUFACTURERS THAT UTILIZE A COMPRESSOR SUMP OIL SENSOR TO EQUALIZE COMPRESSOR OIL VOLUME WITHIN A SINGLE MODULE SHALL NOT BE ALLOWED UNLESS THEY ACTIVELY SHUT DOWN THE SYSTEM TO PROTECT FROM COMPRESSOR FAILURE.

CONTROLS:

8. OUTDOOR UNIT SHALL INCLUDE VARIABLE EVAPORATOR TEMPERATURE OR COMPARABLE METHOD OF VARYING SYSTEM EVAPORATOR (REFRIGERANT) TEMPERATURE II ORDER TO REDUCE COMPRESSION RATIO AND POWER CONSUMPTION DURING LIGHT LOAD OR MILD AMBIENT TEMPERATURES. MULTIPLE EVAPORATOR REFRIGERANT TEMPERATURE SETTINGS SHALL BE REQUIRED IN ORDER TO OPTIMIZE EFFICIENCY WITHIN REQUIRED SYSTEM-SPECIFIC PERFORMANCE AND INSTALLATION CONSTRAINTS. SYSTEM SHALL REDUCE COMPRESSION RATIO ONLY WHEN/IF ALL INDOOR UNITS ARE WITHIN 1.8F OF SETPOINT; REDUCING COMPRESSION RATIO BASED SOLELY ON AMBIENT TEMPERATURE RISKS DISCOMFORT AND IS NOT ALLOWED. VARIABLE EVAPORATOR TEMPERATURE OR COMPARABLE METHOD SHALI INCORPORATE OVERRIDE OR DISABLE CAPABILITY BASED ON EXTERNAL SIGNAL TO ALLOW FOR SPACE HUMIDITY CONTROL OR LOAD DEMAND. THE UNIT SHALL BE AN INTEGRAL PART OF THE SYSTEM & CONTROL NETWORK DESCRIBED IN PART 5 (CONTROLS) AND REACT TO HEATING/COOLING DEMAND AS COMMUNICATED FROM CONNECTED INDOOR UNITS OVER THE CONTROL CIRCUIT. REQUIRED FIELD-INSTALLED CONTROL VOLTAGE TRANSFORMERS AND/OR SIGNAL BOOSTERS SHALL BE PROVIDED BY THE MANUFACTURER.

9. EACH OUTDOOR UNIT MODULE SHALL HAVE THE CAPABILITY
OF 4 LEVELS OF DEMAND CONTROL BASED ON EXTERNAL INPUT.
ELECTRICAL:

1. THE OUTDOOR UNIT ELECTRICAL POWER SHALL BE 208/230 VOLTS, 3—PHASE, 60 HERTZ OR 460 VOLTS, 3—PHASE, 60 HERTZ PER EQUIPMENT SCHEDULE.

2. THE OUTDOOR UNIT SHALL BE CONTROLLED BY INTEGRAL

MICROPROCESSORS.

3. THE CONTROL CIRCUIT BETWEEN THE INDOOR UNITS, BC CONTROLLER AND THE OUTDOOR UNIT SHALL BE 24VDC COMPLETED USING A 2—CONDUCTOR, TWISTED PAIR SHIELDED

CABLE TO PROVIDE TOTAL INTEGRATION OF THE SYSTEM.

3.02 BRANCH CIRCUIT (BC) CONTROLLERS AS REQUIRED FOR SIMULTANEOUS HEAT/COOL SYSTEMS

GENERAL

1. BC (BRANCH CIRCUIT) CONTROLLERS (OR COMPARABLE BRANCH DEVICES) SHALL INCLUDE MULTIPLE BRANCHES TO ALLOW SIMULTANEOUS HEATING AND COOLING BY ALLOWING EITHER HOT GAS REFRIGERANT TO FLOW TO INDOOR UNIT(S) FOR HEATING OR SUBCOOLED LIQUID REFRIGERANT TO FLOW TO INDOOR UNIT(S) FOR COOLING. REFRIGERANT USED FOR COOLING MUST ALWAYS BE SUBCOOLED FOR OPTIMAL INDOOR UNIT LEV PERFORMANCE; ALTERNATE BRANCH DEVICES WHICH DO NOT INCLUDE CONTROLLED REFRIGERANT SUBCOOLING RISK BUBBLES IN LIQUID SUPPLIED TO INDOOR UNIT LEVS AND ARE NOT ALLOWED.

2. BC CONTROLLERS (OR COMPARABLE BRANCH DEVICES) SHALL BE EQUIPPED WITH A CIRCUIT BOARD THAT INTERFACES TO THE CONTROLS SYSTEM AND SHALL PERFORM ALL FUNCTIONS NECESSARY FOR OPERATION. THE UNIT SHALL HAVE A GALVANIZED STEEL FINISH AND BE COMPLETELY FACTORY ASSEMBLED, PIPED AND WIRED. EACH UNIT SHALL BE RUN TESTED AT THE FACTORY. THIS UNIT SHALL BE MOUNTED INDOORS, WITH ACCESS AND SERVICE CLEARANCE PROVIDED FOR EACH CONTROLLER. BC CONTROLLERS (OR COMPARABLE BRANCH DEVICES) SHALL BE SUITABLE FOR USE IN PLENUMS IN ACCORDANCE WITH UL1995 ED 4.

BC UNIT CABINET:

1. THE CASING SHALL BE FABRICATED OF GALVANIZED

STEEL.

2. EACH CABINET SHALL HOUSE A LIQUID-GAS SEPARATOR AND MULTIPLE REFRIGERATION CONTROL VALVES.

3. THE UNIT SHALL HOUSE TWO TUBE-IN-TUBE HEAT EXCHANGERS.

REFRIGERANT PIPING (SPECIFICATIONS IN ADDITION TO THOSE FOR OUTDOOR UNIT):

ALL REFRIGERANT PIPE CONNECTIONS SHALL BE BRAZED.
 FUTURE CHANGES TO INDOOR UNIT QUANTITIES OR SIZES SERVED BY BC CONTROLLER OR COMPARABLE BRANCH DEVICE MUST BE POSSIBLE WITH NO PIPING CHANGES EXCEPT BETWEEN THE BRANCH DEVICE AND INDOOR UNIT(S) CHANGING. SYSTEMS WHICH MIGHT REQUIRE FUTURE PIPING CHANGES BETWEEN BRANCH DEVICE AND OUTDOOR UNIT—IF CHANGES TO INDOOR UNIT QUANTITIES OR SIZES ARE MADE—ARE NOT CONSIDERED EQUAL AND ARE NOT ALLOWED.

REFRIGERANT VALVES:

1. SERVICE SHUT-OFF VALVES SHALL BE
FIELD-PROVIDED/INSTALLED FOR EACH BRANCH TO
ALLOW SERVICE TO ANY INDOOR UNIT WITHOUT FIELD
INTERRUPTION TO OVERALL SYSTEM OPERATION.

FUTURE USE BRANCH:

1. EACH VRF SYSTEM SHALL INCLUDE AT LEAST ONE (1)

UNUSED BRANCH OR BRANCH DEVICE FOR FUTURE USE

FUTURE-USE BRANCHES OR BRANCH DEVICES SHALL BE FULLY INSTALLED & WIRED IN CENTRAL LOCATION WITH CAPPED SERVICE SHUTOFF VALVE & SERVICE PORT.

CONDENSATE MANAGEMENT:

1. BC CONTROLLER (OR COMPARABLE BRANCH DEVICE) MUST HAVE INTEGRAL RESIN DRAIN PAN OR INSULATE REFRIGERATION COMPONENTS WITH REMOVABLE INSULATION THAT ALLOWS EASY ACCESS FOR FUTURE SERVICE NEEDS. CABINETS FILLED WITH SOLID FOAM INSULATION DO NOT ALLOW FOR FUTURE SERVICE AND ARE NOT ALLOWED.

ELECTRICAL:

1. THE UNIT ELECTRICAL POWER SHALL BE 208/230 VOLTS 1 PHASE, 60 HERTZ. THE UNIT SHALL BE CAPABLE OF SATISFACTORY OPERATION WITHIN VOLTAGE LIMITS OF 187-228 (208V/60HZ) OR 207-253 (230/60HZ).

2. THE BC CONTROLLER SHALL BE CONTROLLED BY

INTEGRAL MICROPROCESSORS

3. THE CONTROL CIRCUIT BETWEEN THE INDOOR UNITS AND OUTDOOR UNITS SHALL BE 24VDC COMPLETED USING A 2—CONDUCTOR, TWISTED PAIR SHIELDED CABLE TO PROVIDE TOTAL INTEGRATION OF THE SYSTEM.

Part 4 - INDOOR UNITS

4.01MEDIUM STATIC CEILING—CONCEALED DUCTED INDOOR UNIT GENERAL:

1. THE CEILING-CONCEALED DUCTED INDOOR UNIT SHALL BE FACTORY ASSEMBLED, WIRED AND RUN TESTED. CONTAINED WITHIN THE UNIT SHALL BE ALL FACTORY WIRING, PIPING, ELECTRONIC MODULATING LINEAR EXPANSION DEVICE, CONTROL CIRCUIT BOARD AND FAN MOTOR. THE UNIT SHALL HAVE A SELF-DIAGNOSTIC FUNCTION, 3-MINUTE TIME DELAY MECHANISM, AND AN AUTO RESTART FUNCTION. INDOOR UNIT AND REFRIGERANT PIPES SHALL BE CHARGED WITH DEHYDRATED AIR BEFORE SHIPMENT FROM THE FACTORY. THE UNIT SHALL BE SUITABLE FOR USE IN PLENUMS IN ACCORDANCE WITH UL1995 ED 4.

1. THE UNIT SHALL BE CEILING—CONCEALED, DUCTED——WITH A 2—POSITION, FIELD ADJUSTABLE RETURN AND A FIXED HORIZONTAL DISCHARGE SUPPLY.

2. THE CABINET PANEL SHALL HAVE PROVISIONS FOR A FIELD INSTALLED FILTERED OUTSIDE AIR INTAKE.

1. INDOOR UNIT SHALL FEATURE MULTIPLE EXTERNAL STATIC PRESSURE SETTINGS RANGING FROM 0.14 TO 0.60

2. THE INDOOR UNIT FAN SHALL BE AN ASSEMBLY WITH STATICALLY AND DYNAMICALLY BALANCED SIROCCO FAN(S) DIRECT DRIVEN BY A SINGLE MOTOR WITH PERMANENTLY LUBRICATED BEARINGS.

3. THE INDOOR FAN SHALL CONSIST OF THREE (3) SPEEDS, HIGH, MID, AND LOW PLUS THE AUTO—FAN FUNCTION

 RETURN AIR SHALL BE FILTERED BY MEANS OF A STANDARD FACTORY INSTALLED RETURN AIR FILTER.
 OPTIONAL RETURN FILTER BOX (REAR OR BOTTOM PLACEMENT) WITH HIGH-EFFICIENCY FILTER AS NOTED ON EQUIPMENT SCHEDULE.

OPTIONAL FILTER FRAME AND FILTER:

1 FILTER FRAME SHALL BE CONSTRUCTED OF 20 GAUGE G-60 GALVANIZED STEEL. KNURLED THUMB SCREWS ON ACCESS DOOR ALLOW FILTER REPLACEMENT. FOAM GASKET PROVIDES AIR-TIGHT CONNECTION TO INDOOR UNIT AND ACCESS DOOR. FILTER FRAME SHALL BE

CONFIGURABLE FOR REAR OR BOTTOM RETURN.

2. FILTER SHALL BE RATED MERV 13 WHEN TESTED IN ACCORDANCE WITH ANSI/ASHRAE 52.2 STANDARD RATED CLASS 2 UNDER U.L. STANDARD 900.

COIL:

1. THE INDOOR COIL SHALL BE OF NONFERROUS
CONSTRUCTION WITH SMOOTH PLATE FINS ON COPPER
TUBING. THE TUBING SHALL HAVE INNER GROOVES FOR
HIGH EFFICIENCY HEAT EXCHANGE. ALL TUBE JOINTS
SHALL BE BRAZED WITH PHOS—COPPER OR SILVER
ALLOY.

2. THE COILS SHALL BE PRESSURE TESTED AT THE

3. COIL SHALL BE PROVIDED WITH A SLOPED DRAIN PAN.
UNITS WITHOUT SLOPED DRAIN PANS WHICH MUST BE INSTALLED
COCKEYED TO ENSURE PROPER DRAINAGE ARE NOT ALLOWED.
4. THE UNIT SHALL BE PROVIDED WITH AN INTEGRAL
CONDENSATE LIFT MECHANISM ABLE TO RAISE DRAIN WATER 27
INCHES ABOVE THE CONDENSATE PAN.

ELECTRICAL:

1. THE UNIT ELECTRICAL POWER SHALL BE 208/230 VOLTS,
1-PHASE, 60 HERTZ.

2. THE SYSTEM SHALL BE CAPABLE OF SATISFACTORY OPERATION WITHIN VOLTAGE LIMITS OF 187-228 VOLTS (208V/60HZ) OR 207-253 VOLTS (230V/60HZ). CONTROLS:

1. INDOOR UNIT SHALL COMPENSATE FOR THE HIGHER TEMPERATURE SENSED BY THE RETURN AIR SENSOR COMPARED TO THE TEMPERATURE AT LEVEL OF THE OCCUPANT WHEN IN HEAT MODE. DISABLING OF COMPENSATION SHALL BE POSSIBLE FOR INDIVIDUAL UNITS TO ACCOMMODATE INSTANCES WHEN COMPENSATION IS NOT REQUIRED.

2. CONTROL BOARD SHALL INCLUDE CONTACTS FOR CONTROL

OF EXTERNAL HEAT SOURCE. EXTERNAL HEAT MAY BE ENERGIZED AS SECOND STAGE WITH 1.8°F — 9.0°F ADJUSTABLE DEADBAND FROM SET POINT.

3. INDOOR UNIT SHALL INCLUDE NO LESS THAN FOUR (4) DIGITAL INPUTS CAPABLE OF BEING USED FOR CUSTOMIZABLE

CONTROL STRATEGIES.

4. INDOOR UNIT SHALL INCLUDE NO LESS THAN THREE (3)
DIGITAL OUTPUTS CAPABLE OF BEING USED FOR CUSTOMIZABLE
CONTROL STRATEGIES.

1. CONTROL BOARD SHALL INCLUDE CONTACTS FOR CONTROL OF NO LESS THAN TWO STAGES OF EXTERNAL HEAT. THE FIRST STAGE OF EXTERNAL HEAT MAY BE ENERGIZED WHEN THE SPACE TEMPERATURE IS 2.7°F FROM SET POINT FOR BETWEEN 10-25 MINUTES (USER ADJUSTABLE). THE SECOND STAGE OF EXTERNAL HEAT MAY BE ENERGIZED WHEN THE FIRST STAGE HAS BEEN ACTIVE FOR NO LESS THAN 5 MINUTES AND THE SPACE TEMPERATURE HAS NOT RISEN BY MORE THAN 0.9°F.
2. INDOOR UNIT SHALL INCLUDE NO LESS THAN FOUR (4)

CUSTOMIZABLE CONTROL STRATEGIES.

3. INDOOR UNIT SHALL INCLUDE NO LESS THAN THREE (3)
DIGITAL OUTPUTS CAPABLE OF BEING USED FOR CUSTOMIZABLE
CONTROL STRATEGIES.

DIGITAL INPUTS CAPABLE OF BEING USED FOR

5.010VERVIEW

Part 5 - CONTROLS

THE CONTROL SYSTEM SHALL CONSIST OF A LOW VOLTAGE COMMUNICATION NETWORK AND A WEB-BASED INTERFACE. THE CONTROLS SYSTEM SHALL GATHER DATA AND GENERATE WEB PAGES ACCESSIBLE THROUGH A CONVENTIONAL WEB BROWSER ON EACH PC CONNECTED TO THE NETWORK. OPERATORS SHALL BE ABLE TO PERFORM ALL NORMAL OPERATOR FUNCTIONS THROUGH THE WEB BROWSER INTERFACE.

FURNISH ENERGY CONSERVATION FEATURES SUCH AS OPTIMAL START, REQUEST—BASED LOGIC, AND DEMAND LEVEL ADJUSTMENT OF OVERALL SYSTEM CAPACITY AS SPECIFIED IN THE SEQUENCE.

SYSTEM SHALL BE CAPABLE OF FMAIL GENERATION FOR

SYSTEM SHALL BE CAPABLE OF EMAIL GENERATION FOR REMOTE ALARM ANNUNCIATION.

5.02 ELECTRICAL CHARACTERISTICS

1. CONTROLLER POWER AND COMMUNICATIONS SHALL BE VIA A COMMON NON-POLAR COMMUNICATIONS BUS AND SHALL OPERATE AT 30VDC.

1. CONTROL WIRING SHALL BE INSTALLED IN A DAISY CHAIN CONFIGURATION FROM INDOOR UNIT TO INDOOR UNIT, TO THE BC CONTROLLER (MAIN AND SUBS, IF APPLICABLE) AND TO THE OUTDOOR UNIT. CONTROL WIRING TO REMOTE CONTROLLERS SHALL BE RUN FROM THE INDOOR UNIT TERMINAL BLOCK TO THE CONTROLLER ASSOCIATED WITH THAT UNIT.

2. CONTROL WIRING FOR CENTRALIZED CONTROLLERS SHALL BE INSTALLED IN A DAISY CHAIN CONFIGURATION FROM OUTDOOR UNIT TO OUTDOOR UNIT, TO THE SYSTEM CONTROLLERS (CENTRALIZED CONTROLLERS AND/OR INTEGRATED WEB BASED INTERFACE), TO THE POWER SUPPLY.

WIRING TYPE:

1. WIRING SHALL BE 2-CONDUCTOR (16 AWG), TWISTED,
STRANDED, SHIELDED WIRE AS DEFINED BY THE DIAMOND

SYSTEM BUILDER OUTPUT.

2. NETWORK WIRING SHALL BE CAT-5 WITH RJ-45 CONNECTION.

5.03 CITY MULTI CONTROLS NETWORK

1. THE CITY MULTI CONTROLS NETWORK (CMCN) CONSISTS OF REMOTE CONTROLLERS, CENTRALIZED CONTROLLERS, AND/OR INTEGRATED WEB BASED INTERFACE COMMUNICATION OVER A HIGH-SPEED COMMUNICATION BUS. THE CITY MULTI CONTROLS NETWORK SHALL SUPPORT OPERATION MONITORING, SCHEDULING, OCCUPANCY, ERROR EMAIL DISTRIBUTION, PERSONAL WEB BROWSERS, TENANT BILLING, ONLINE MAINTENANCE SUPPORT, AND INTEGRATION WITH BUILDING MANAGEMENT SYSTEMS (BMS) USING EITHER LONWORKS ® OR BACNET® INTERFACES. THE BELOW FIGURE ILLUSTRATES A SAMPLE CMCN SYSTEM CONFIGURATION.

CMCN SYSTEM CONFIGURATION
5.04 CMCN: REMOTE CONTROLLERS

SMART/SIMPLE ME REMOTE CONTROLLER:

1. THE SMART ME REMOTE CONTROLLER SHALL BE CAPABLE OF CONTROLLING UP TO 16 INDOOR UNITS (DEFINED AS 1 GROUP).

2. THE ME REMOTE CONTROLLER SHALL ONLY BE USED IN SAME GROUP WITH OTHER ME REMOTE CONTROLLERS WITH A MAXIMUM OF TWO ME REMOTE CONTROLLERS PER GROUP.

5.05 CENTRALIZED CONTROLLER (WEB-ENABLED)

ASTER CENTRALIZED CONTROLLER.

MASTER CENTRALIZED CONTROLLER: 1. THE MASTER CENTRALIZED CONTROLLER SHALL BE CAPABLE OF CONTROLLING A MAXIMUM OF TWO HUNDRED (200) INDOOR UNITS ACROSS MULTIPLE CITY MULTI OUTDOOR UNITS WITH THE USE OF THREE EXPANSION CONTROLLERS. THE MASTER CENTRALIZED CONTROLLER SHALL BE APPROXIMATELY 11-5/32 " X 7-55/64" X 2-17/32 IN SIZE AND SHALL BE POWERED WITH AN INTEGRATED 100-240 VAC POWER SUPPLY. THE MASTER CENTRALIZED CONTROLLER SHALL SUPPORT SYSTEM CONFIGURATION, DAILY/WEEKLY SCHEDULING, MONITORING OF OPERATION STATUS, NIGHT SETBACK SETTINGS, FREE CONTACT INTERLOCK CONFIGURATION AND MALFUNCTION MONITORING. WHEN BEING USED ALONE WITHOUT THE EXPANSION CONTROLLERS, THE MASTER CENTRALIZED CONTROLLER SHALL HAVE FIVE BASIC OPERATION CONTROLS WHICH CAN BE APPLIED TO AN INDIVIDUAL INDOOR UNIT, A COLLECTION OF INDOOR UNITS (UP TO 50 INDOOR UNITS). OR ALL INDOOR UNITS (COLLECTIVE BATCH OPERATION). THIS BASIC SET OF OPERATION CONTROLS FOR THE MASTER CENTRALIZED CONTROLLER SHALL INCLUDE ON/OFF, OPERATION MODE SELECTION (COOL, HEAT, AUTO (R2/WR2-SERIES ONLY), DRY, SETBACK (R2/WR2-SERIES ONLY) AND FAN), TEMPERATURE SETTING, FAN SPEED SETTING, AND AIRFLOW DIRECTION SETTING. SINCE THE MASTER PROVIDES CENTRALIZED CONTROL IT SHALL BE ABLE TO ENABLE OR DISABLE OPERATION OF LOCAL REMOTE CONTROLLERS. IN TERMS OF SCHEDULING, THE MASTER CENTRALIZED CONTROLLER SHALL ALLOW THE USER TO DEFINE BOTH DAILY AND WEEKLY SCHEDULES (UP TO 24 SCHEDULED EVENTS PER DAY) WITH OPERATIONS CONSISTING OF ON/OFF, MODE SELECTION, TEMPERATURE SETTING, AIR FLOW (VANE) DIRECTION, FAN SPEED, AND PERMIT/PROHIBIT OF REMOTE CONTROLLERS.

2. ALL MASTER CENTRALIZED CONTROLLERS SHALL BE EQUIPPED WITH TWO RJ-45 ETHERNET PORTS TO SUPPORT INTERCONNECTION WITH A NETWORK PC VIA A CLOSED/DIRECT LOCAL AREA NETWORK (LAN) OR TO A NETWORK SWITCH FOR IP COMMUNICATION TO UP TO THREE EXPANSION CONTROLLERS FOR DISPLAY OF UP TO TWO HUNDRED (200) INDOOR UNITS ON THE MAIN MASTER CENTRALIZED CONTROLLER INTERFACE.

3. THE MASTER CENTRALIZED CONTROLLER INTERFACE.

9. THE MASTER CENTRALIZED CONTROLLER SHALL BE CAPABLE OF PERFORMING INITIAL SETTINGS VIA THE HIGH—RESOLUTION, BACKLIT, COLOR TOUCH PANEL ON THE CONTROLLER OR VIA A PC BROWSER USING THE INITIAL SETTINGS.

4. STANDARD SOFTWARE FUNCTIONS SHALL BE AVAILABLE SO THAT THE BUILDING MANAGER CAN SECURELY LOG INTO EACH MASTER CENTRALIZED CONTROLLER VIA THE PC'S WEB BROWSER TO SUPPORT OPERATION MONITORING, SCHEDULING, ERROR EMAIL, INTERLOCKING AND ONLINE MAINTENANCE DIAGNOSTICS. ADDITIONAL OPTIONAL SOFTWARE FUNCTIONS OF PERSONAL BROWSER FOR PCS AND MACS AND ENERGY SHALL BE AVAILABLE BUT ARE NOT INCLUDED. THE ENERGY APPORTIONMENT FUNCTION SHALL REQUIRE A LIC—CHARGE SOFTWARE LICENSE

S1 ZEPHYR RD TRUMBULL CT 06611
203-581-3838
JMASTROLUCA ENGINEERING ASSOCIATES, LLC

Revis	sions	
#	DATE	ISSUE/REVISION DESCRIPTION
	_	
PHA	\SE	



ISSUED FOR

PERMIT/BID

OFFUTT EDUCATION CENTER
AT LACHAT FARM

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

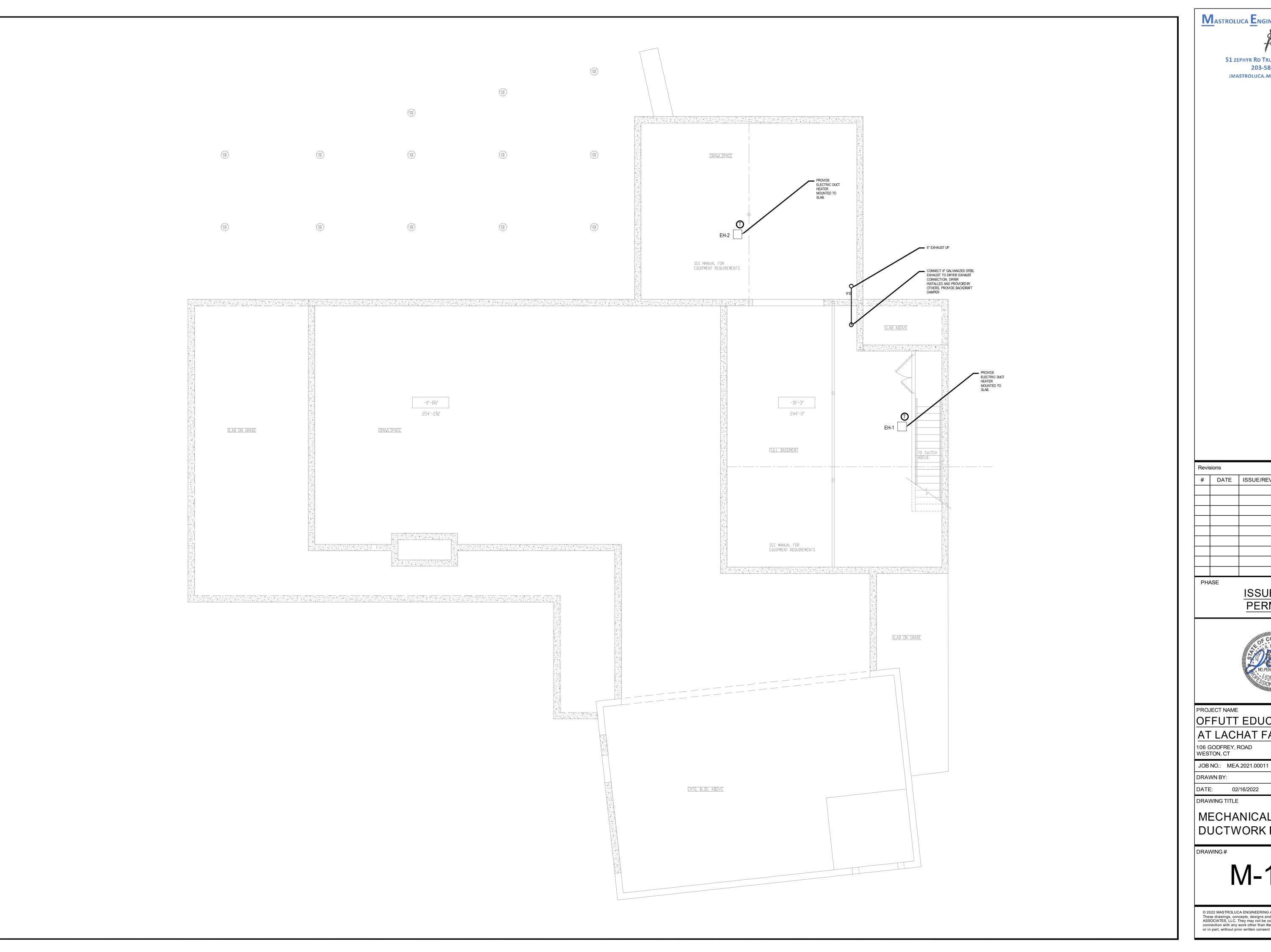
DATE: 02/16/2022 SCALE: NTS

DRAWING TITLE

MECHANICAL SPECIFICATIONS

DRAWING#

M-008





# D	ATE	ISSUE/REVISION DESCRIPTION
PHASE		
		ISSUED FOR

PERMIT/BID



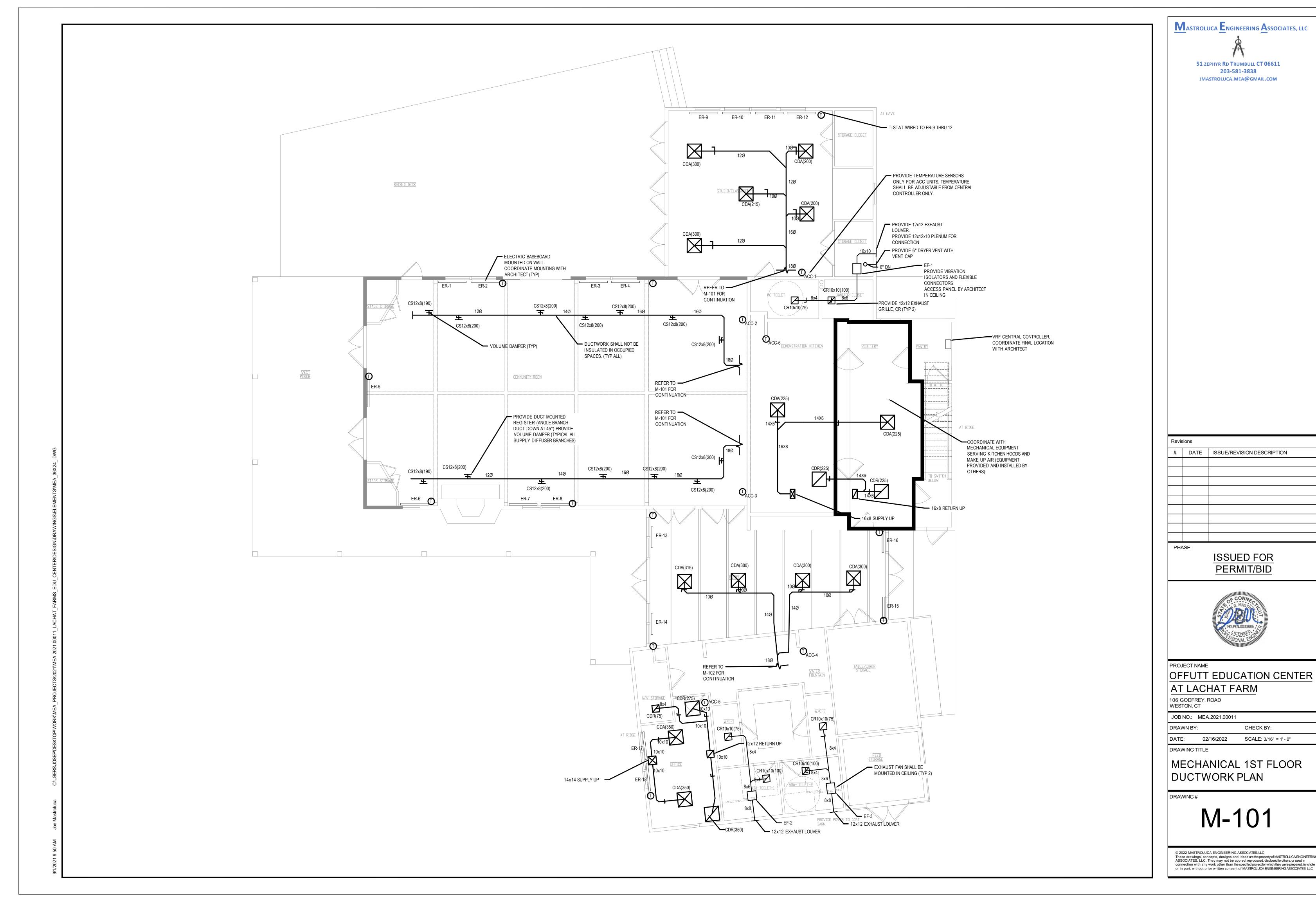
OFFUTT EDUCATION CENTER AT LACHAT FARM

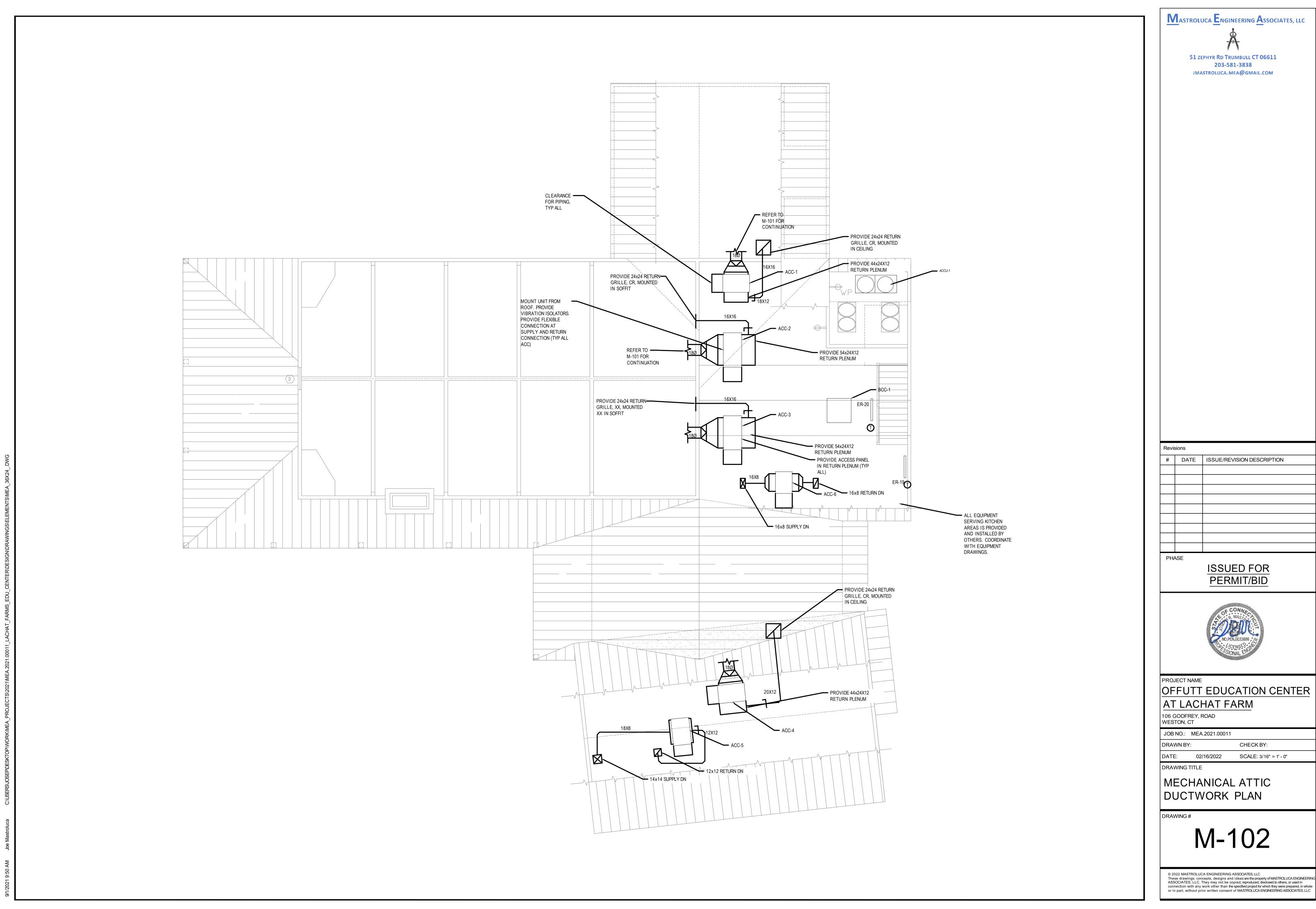
106 GODFREY, ROAD WESTON, CT

CHECK BY: DRAWN BY: SCALE: 3/16" = 1' - 0"

MECHANICAL BASEMENT DUCTWORK PLAN

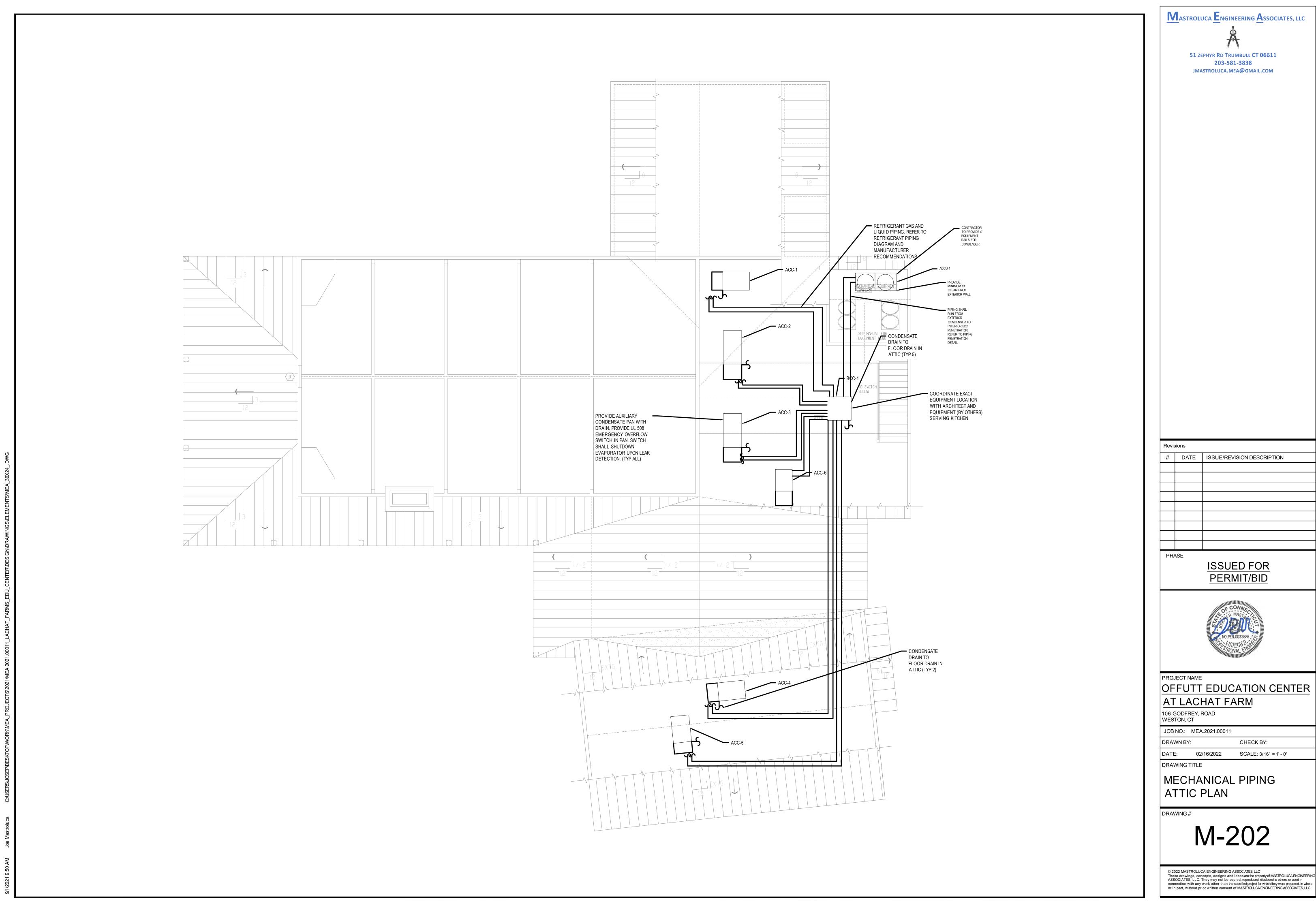
M-100



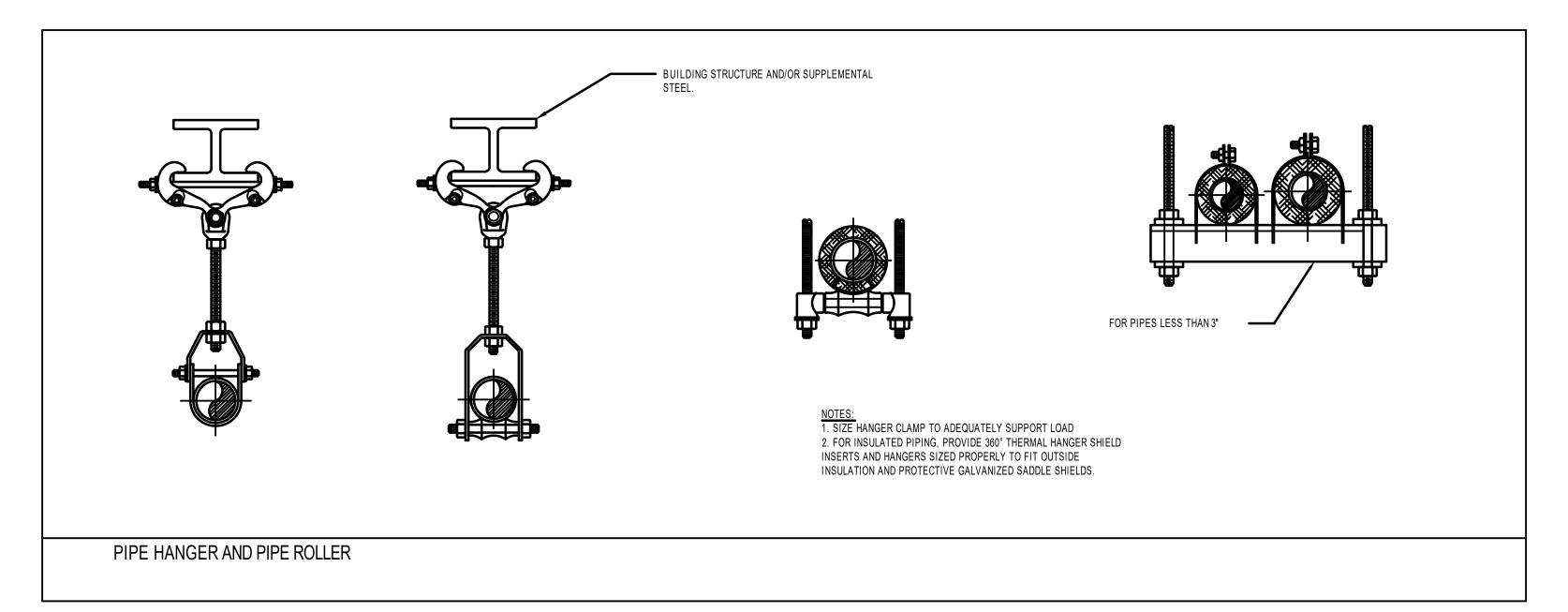


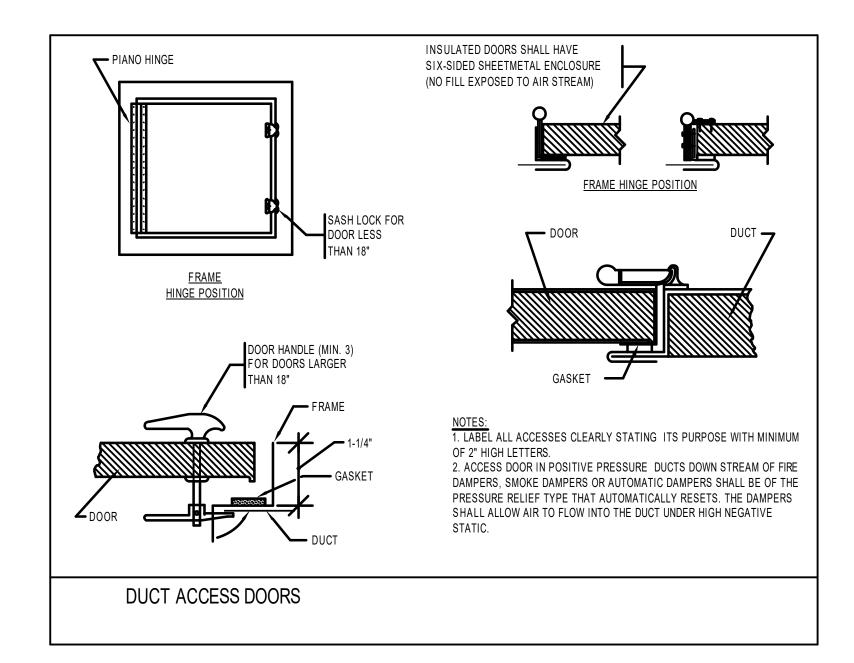
 $\underline{\mathbf{M}}$ astroluca $\underline{\mathbf{E}}$ ngineering $\underline{\mathbf{A}}$ ssociates, llc 51 ZEPHYR RD TRUMBULL CT 06611 JMASTROLUCA.MEA@GMAIL.COM

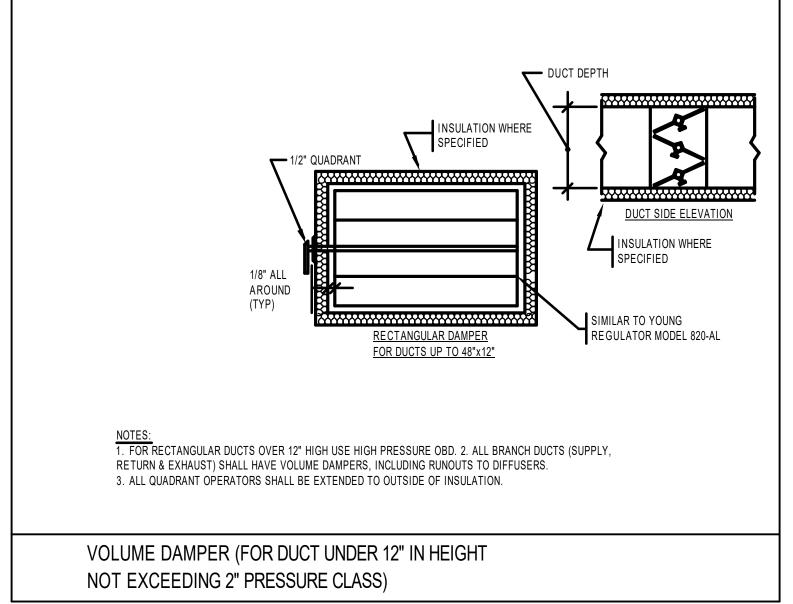
CHECK BY: SCALE: 3/16" = 1' - 0"

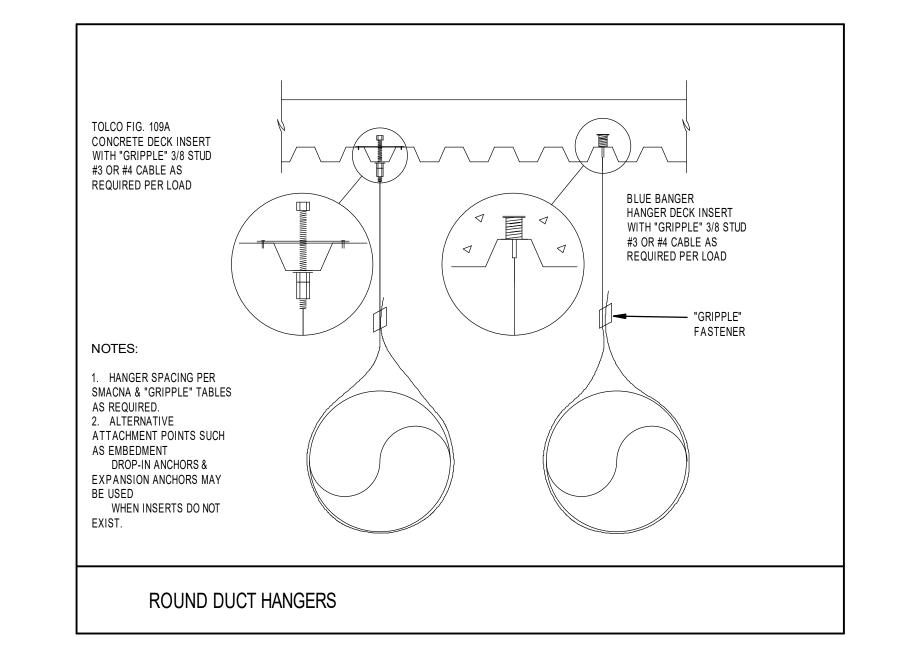


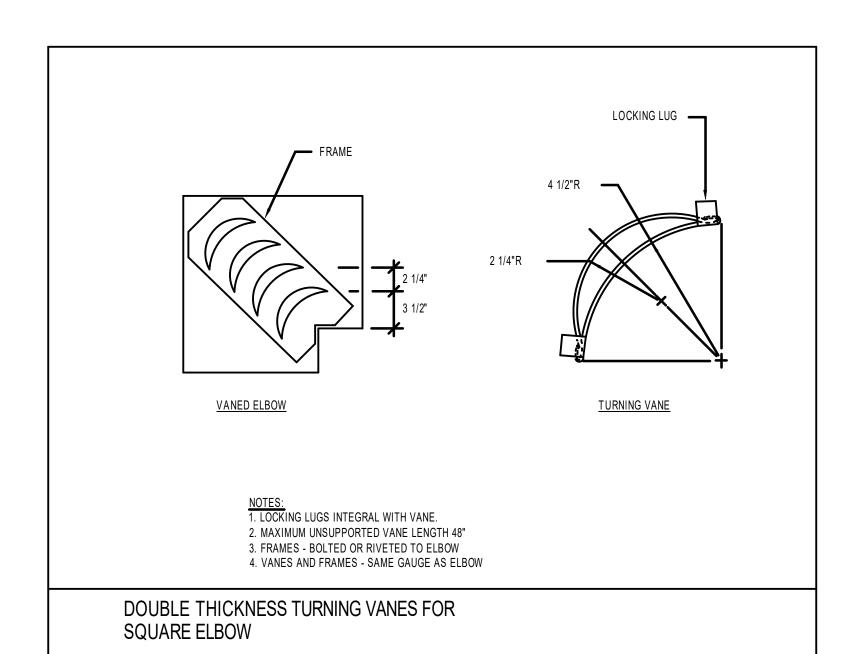
#	DATE	ISSUE/REVISION DESCRIPTION

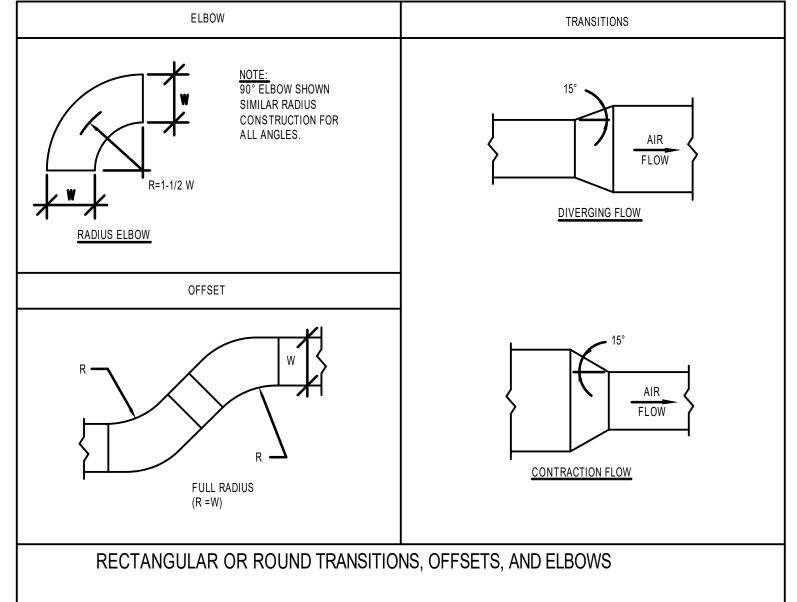


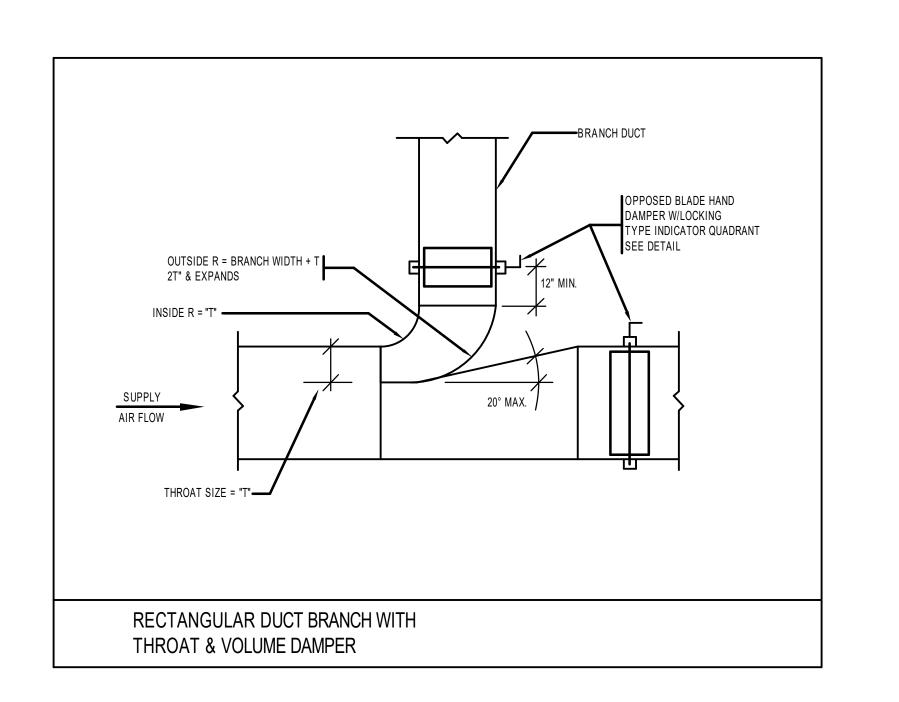












Mastroluca Engineering Associates, LLC

51 ZEPHYR RD TRUMBULL CT 06611
203-581-3838
JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION
PHA	NSE	



PERMIT/BID

PROJECT NAME
OFFUTT EDUCATION CENTER
AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

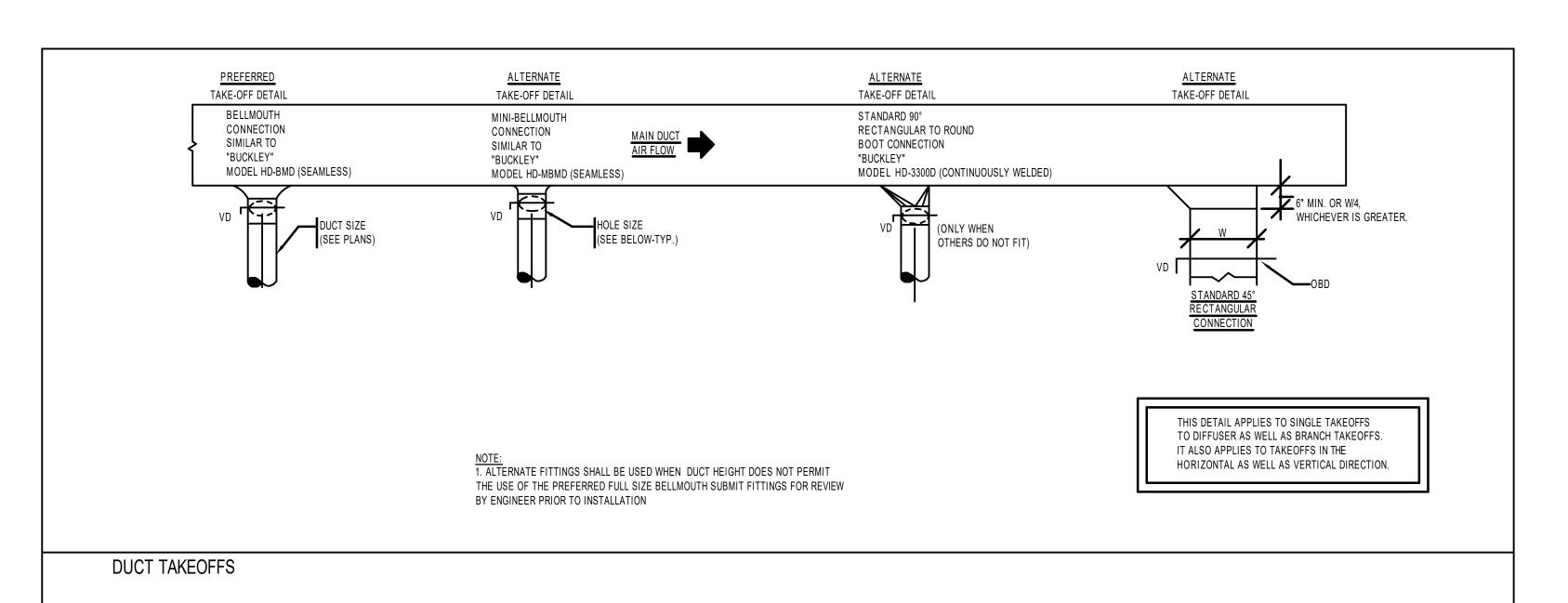
DATE: 02/16/2022 SCALE: 3/16" = 1' - 0"

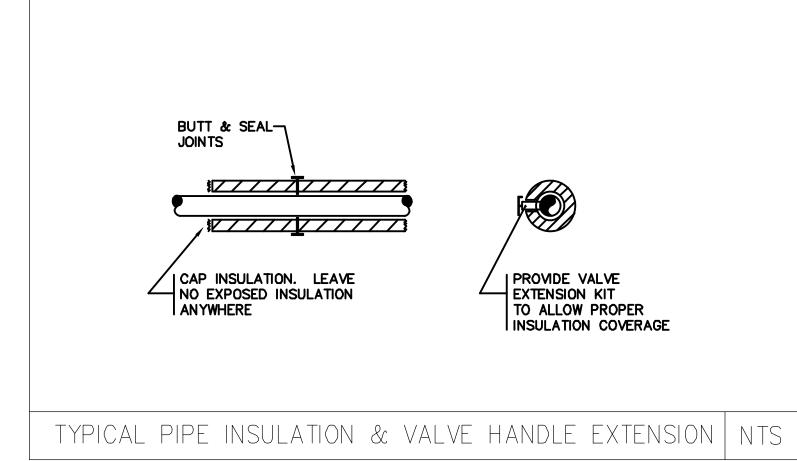
DRAWING TITLE

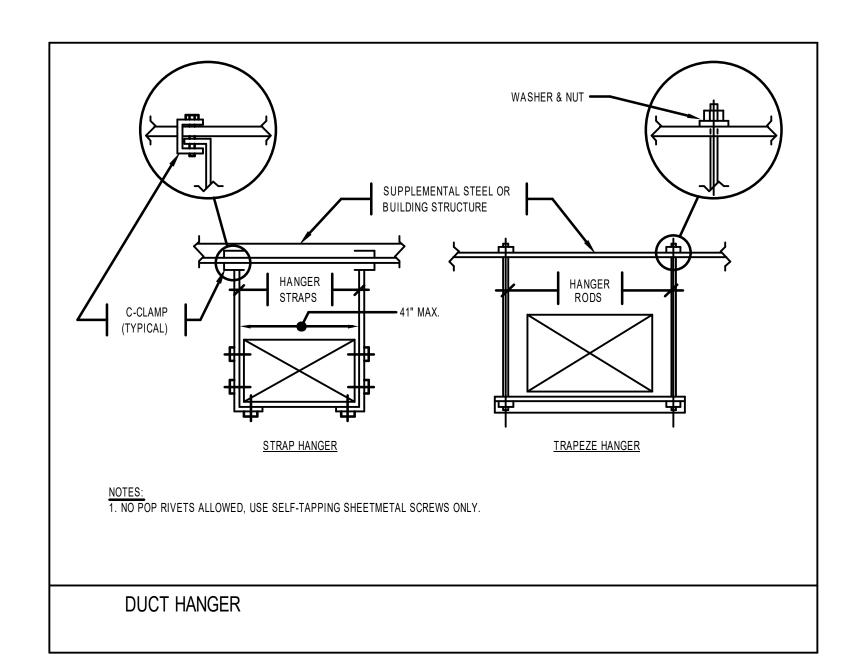
MECHANICAL DETAILS

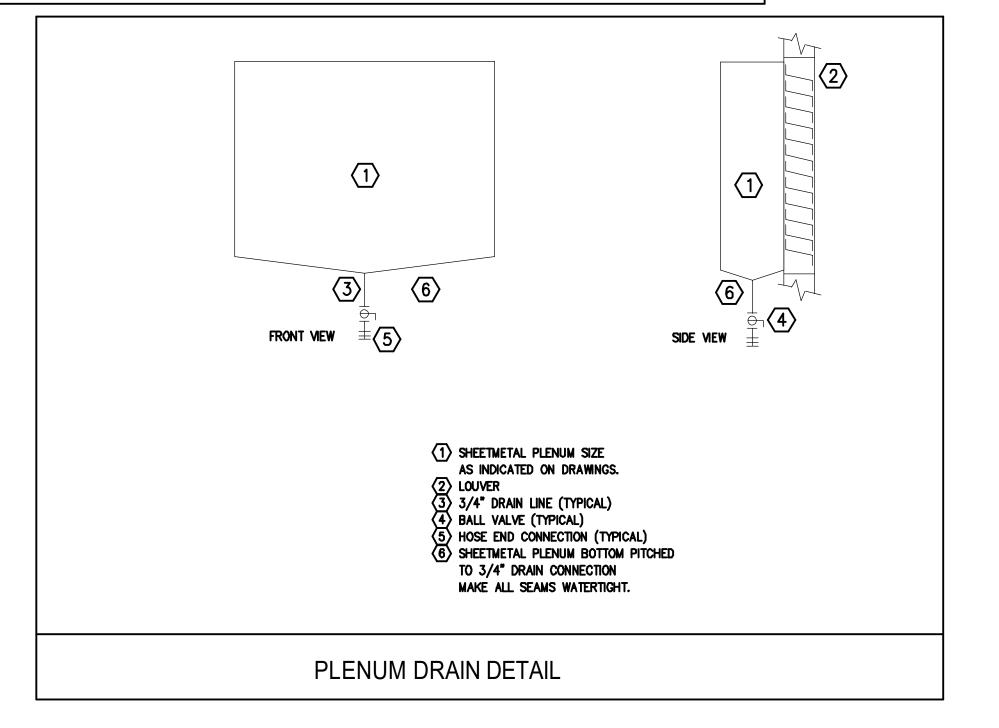
DRAWING#

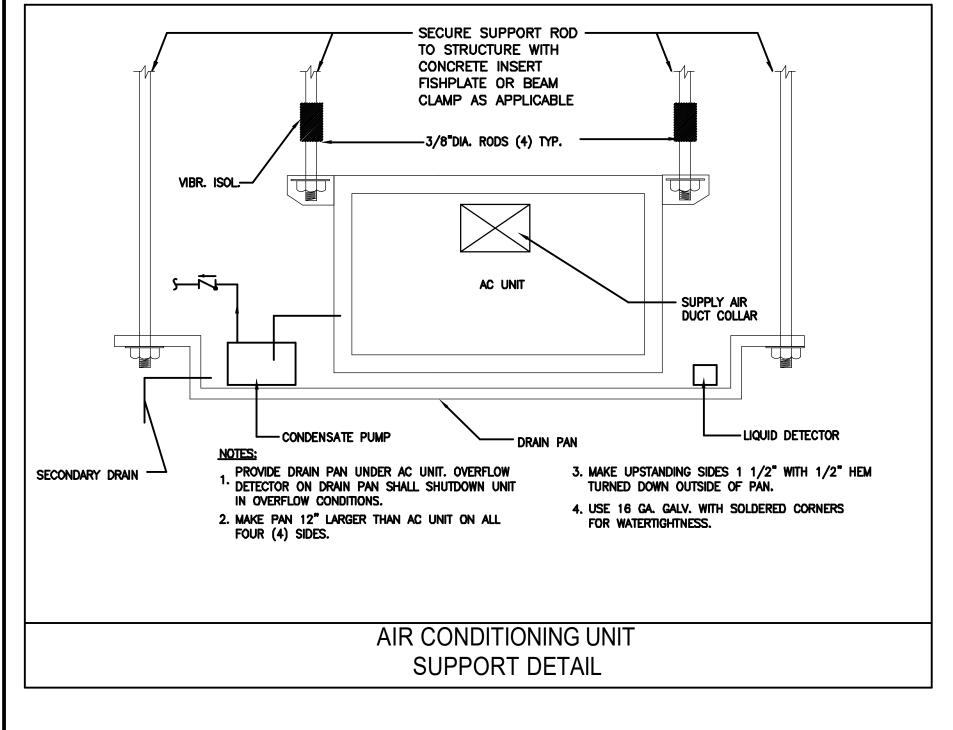
M-300











Mastroluca Engineering Associates, LLC

51 ZEPHYR RD TRUMBULL CT 06611
203-581-3838
JMASTROLUCA.MEA@GMAIL.COM



PERMIT/BID

PROJECT NAME
OFFUTT EDUCATION CENT
Λ TI Λ CH Λ T E Λ D M

AI LACHAI FARM

106 GODFREY, ROAD
WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: 3/16" = 1' - 0"

DRAWING TITLE

MECHANICAL DETAILS

DRAWING#

M-301

	ELECTRICAL SYMBOL LIST
	(NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THIS PROJECT)
SYMBOL	DESCRIPTION
Ф	20A, 125V DECORA STYLE DUPLEX RECEPTACLE — FLUSH WALL MOUNTED
♠ usb	20A, 125V DECORA STYLE DUPLEX RECEPTACLE WITH DUAL USB PORTS
Φ	20A, 125V SINGLE RECEPTACLE - FLUSH WALL MOUNTED
**	20A, 125V DECORA STYLE QUADRUPLEX RECEPTACLE - FLUSH WALL MOUNTED
Ф GFI	20A, 125V DECORA STYLE GFCI TYPE DUPLEX RECEPTACLE - FLUSH WALL MOUNTED
WP∰ GFI	20A, 125V GFCI TYPE WEATHER RESISTANT DUPLEX RECEPTACLE IN WEATHER PROOF ENCLOSURE
•	SPECIAL PURPOSE RECEPTACLE — FLUSH WALL MOUNTED
•	20A, 125V DEDICATED SINGLE RECEPTACLE - FLUSH WALL MOUNTED
PV	FLUSH FLOOR MOUNTED COMBINATION VOICE/DATA & POWER OUTLET
()	CEILING MOUNTED JUNCTION BOX WITH FINAL EQUIPMENT CONNECTION
<u> </u>	FLUSH WALL MOUNTED JUNCTION BOX WITH FINAL EQUIPMENT CONNECTION
® ©	CEILING MOUNTED COMBINATION VOICE/DATA & POWER OUTLET
	UNFUSED DISCONNECT SWITCH - 30A, 3P, U.O.N.
□ 100A 60A	FUSED DISCONNECT SWITCH — 100 AMP SWITCH, 60 AMP FUSE, UNFUSED (EXCEPT WHERE FUSE SIZE IS INDICATED) 3—POLE (EXCEPT WHERE NOTED)
⊠ ¹	COMBINATION MOTOR CONTROLLER AND DISCONNECT SWITCH FURNISHED BY MECHANICAL CONTRACTOR INSTALLED BY ELECTRICAL CONTRACTOR. COOR. LOCATION W/MECH. CONT.
CB 100A 60A	CIRCUIT BREAKER 100A FRAME/60A TRIP, 3 POLE, U.O.N. ST — SHUNT TRIP
VFD	VARIABLE FREQUENCY DRIVE (VFD), FURNISHED BY MECHANICAL CONTRACTOR INSTALLED BY ELECTRICAL CONTRACTOR. COORD. LOCATION WITH MECH. CONTRACTOR
TVSS	SURGE SUPPRESSER, LIEBERT ACCUVAR #ACV-120-Y-111-RKE FED WITH 30A/3P C/B MOUNT WITHIN 3ft OF TOTAL WIRE LENGTH FROM SOURCE
FSD	COMBINATION FIRE/SMOKE DAMPER — COORD. LOCATION WITH MECH. CONTRACTOR INTERCONNECT TO FIRE ALARM SYSTEM
M	MOTOR
	PULLBOX, SIZED PER NEC
T	DRY TYPE 480-208V TRANSFORMER DELTA-WYE WITH GROUNDED SECONDARY SIDE, UON.
_	FLUSH MOUNTED PANELBOARD
_	SURFACE MOUNTED PANELBOARD
GND	GROUND BAR
	2#12+1#12G-3/4"C FOR ONE CKT. HOMERUN, U.O.N.
	3#12+1#12G-3/4"C FOR TWO CKT. HOMERUN, U.O.N.
	4#12+1#12G-3/4°C FOR THREE CKT. HOMERUN, U.O.N.
	3#12+1#12G-3/4"C HOMERUN, U.O.N.
	CONCEALED CONDUIT
	CONDUIT TURNING UP
	CAPPED CONDUIT
	FLEXIBLE EQUIPMENT CONNECTION
j	GROUND CONNECTION
	CIRCUIT BREAKER — MOLDED CASE TYPE
→←→>	DRAW OUT TYPE CIRCUIT BREAKER
	FUSED SWITCH, TYPE 'FA' FUSE
	FUSE
	UNFUSED SWITCH - 100 AMP SWITCH
	UTITLITY METER WITH CT. COMPARTMENT
SUB	DIGITAL SUB-METER E-MON D-MON 2000 CLASS #208400D KIT, PROVIDE A
CHIME DB / DB T	20A/3-POLE BREAKER IN LOCAL POWER PANEL DOOR BELL PUSH BUTTON / DOOR BELL CHIME AND ASSOCIATED TRANSFORMER
	WALL MOUNTED TELEVISION OUTLET WITH 3/4" EMPTY CONDUIT & DRAG
$lackbox{lackbox{}}{lackbox{lackbox{}}{lackbox{}}}$	LINE TERMINATED IN A 90° BEND 6" INTO NEAREST ACCESSIBLE CEILING VOICE & DATA OUTLET LOCATION WITH 1" EMPTY CONDUIT & DRAG LINE TERMINATED IN
	A 90 DEG. BEND 6" INTO NEAREST ACCESSIBLE CEILING ADA "CALL FOR ASSISTANCE" PULL CORD SWITCH, HORN/STROBE & 24V TRANS.,
\$	EST EDWARDS KIT MODEL #6538-G5 MANUAL STARTER - TOGGLE TYPE WITH THERMAL ELEMENT - 250V HP RATED,
⊗ ⊗ ⊗	FURNISHED BY ELEC CONTRACTOR CEILING MOUNTED EDGE-LIT LED EXIT SIGN WITH EMERGENCY BATTERY BACKUP,
	COOPER LIGHTING — SURE-LITES LPX SERIES WALL MOUNTED EDGE-LIT LED EXIT SIGN WITH EMERGENCY BATTERY BACKUP, COOPER
	LIGHTING - SURE-LITES LPX SERIES WALL MOUNTED EMERGENCY LIGHTING UNIT
	COOPER LIGHTING — SURE-LITES APEL SERIES EVENLITE APERION EMERGENCY LIGHT, #APR-25-NC-UI-CC (S FOR SURFACE
	MOUNTED IF REQUIRED) EMERGENCY POWER OFF PUSH BUTTON. SEE DETAIL "EMERGENCY POWER SHUTDOWN
EPO	DETAIL" ON DRAWING E-501. CEILING MOUNTED RECESSED LENSED LED 2'X2' LIGHTING FIXTURE, COOPER LIGHTING
⊠ _K	METALUX, 2GR-LD1-32-A-UNV-L835-CD1-U-3500K, 0-10V DIMMING, EM PER PLANS RECESSED LED DOWNLIGHT - HALO LT4 DIRECT MOUNT, 4", 600 LUMEN,
o ^N ⊕F	120V POWER, PHASE DIMMING COMPACT FLUORESECENT KITCHEN HOOD LIGHT. REFER TO ARCHITECT/HKITCHEN HOOD
•	DRAWINGS FOR DETAILS. FIXTURE TO BE 120V POWER, CEILING MOUNTED RECESSED LENSED LED 2'X4' LIGHTING FIXTURE, COOPER LIGHTING

CEILING MOUNTED RECESSED LENSED LED 2'X4' LIGHTING FIXTURE, COOPER LIGHTING METALUX, 2-GR8-3-32-A-UNV, 96W.

	LIGHTING CONTROL SYMBOL LIST
	(NOT ALL SYMBOLS SHOWN ARE NECESSARILY USED ON THIS PROJECT)
SYMBOL	DESCRIPTION
\$	SINGLE POLE LINE VOLTAGE SWITCH
\$ ³	3-WAY LINE VOLTAGE SWITCH
\$ ^K	KEY ACTIVATED LINE VOLTAGE SWITCH
回	LUTRON NOVA T SERIES DIMMER SWITCH, U.O.N., EXACT DEVICE SPEC SHALL BE COORDINATED WITH LIGHT FIXTURE DIMMING CAPABILITIES
PP	POWER PACK MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING LUTRON #RMJS-16R-DV-B
PPEM	POWER PACK MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING LUTRON #RMJS-16R-DV-B-EM
DM	O-10V DIMMING MODULE MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING, LUTRON #RMJS-8T-DV-B
DMEM	0-10V EMERGENCY DIMMING MODULE MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING, LUTRON #RMJS-8T-DV-B-EM
LC	CFL/LED PLENUM RATED MAESTRO WIRELESS DIMMER MOUNTED IN JUNCTION BOX LOCATED ABOVE FINISHED CEILING, LUTRON #MRF2S-6CL-GR
WS	WIRELESS OCCUPANCY SENSOR, CEILING MOUNTED, LUTRON #LRF2-OCR2B-P-WH
\$ ^{0S}	DUAL TECHNOLOGY OCCUPANCY SENSOR, WALL MTD. LUTRON #MS-B102
\$ ^{VS}	DUAL TECHNOLOGY VACANCY SENSOR, WALL MTD. LUTRON #MS-B102
DS	WIRELESS DAYLIGHT SENSOR, CEILING MOUNTED, LUTRON #LRF2-DCRB-WH
WS	WALL MTD WIRELESS OCCUPANCY SENSOR, LUTRON #LRF2-O-W-LB-P-WH
\$ ^{WS}	WIRELESS 2-BUTTON SWITCH, LUTRON #PJ2-2B-GWH-L01 + #CW-1-WH
\$ ^{DS}	WIRELESS 3-BUTTON RAISE/LOWER SWITCH, LUTRON #PJ2-3BRL-GWH-L01 + #CW-1-WH
\$ ^{VS}	COMBINATION DUAL TECH VACANCY SENSOR SWITCH, WALL MOUNTED
\$ ^{OR}	REMOTE TIMED OVERRIDE SWITCH TORK #SSA200R-24
TC	DIGITAL TIME CLOCK TORK DLC SERIES #DLC400BP
©	SINGLE FIXTURE GENERATOR TRANSFER DEVICE, PHILLIPS BODINE #GTD
BLCD	SINGLE CIRCUIT GENERATOR TRANSFER DEVICE WITH OVERRIDE, PHILLIPS BODINE #BLCD-20B
GTD	SINGLE CIRCUIT GENERATOR TRANSFER DEVICE WITH DIMMING CONTROL AND OVERRIDE, PHILLIPS BODINE #GTD-20A

	(NOT ALL SYMBOLS SHOWN ARE	NECESSARILY US	SED ON THIS PROJECT)
4	AMPERE	KCM	THOUSAND CIRCULAR MILS
AC .	ABOVE COUNTER	KV	KILOVOLT
AFF	ABOVE FINISHED FLOOR	KVA	KILOVOLT AMPERE
AIC	AMP INTERRUPTING CAPACITY	KW	KILOWATT
ATS	AUTOMATIC TRANSFER SWITCH	KWH	KILOWATT HOUR
AUTO	AUTOMATIC	LTG	LIGHTING
AWG	AMERICAN WIRE GAUGE	MAX	MAXIMUM
BLDG	BUILDING	мсв	MAIN CIRCUIT BREAKER
C	CONDUIT	мсс	MOTOR CONTROL CENTER
СВ	CIRCUIT BREAKER	MIN	MINIMUM
CCTV	CLOSED CIRCUIT TELEVISION	MTD	MOUNTED
CKT	CIRCUIT	N	NEUTRAL
CO	CARBON MONOXIDE	NIC	NOT IN CONTRACT
СОММ	COMMUNICATION	NTS	NOT TO SCALE
CT	CURRENT TRANSFORMER	ОС	ON CENTER
CU	COPPER	Р	POLE
DEG	DEGREE	ø or PH	PHASE
DGP	DATA GATHERING PANEL	PNL	PANEL
DISC	DISCONNECT	PWR	POWER
DN	DOWN	R	RELOCATED
DWG	DRAWING	RECEPT	RECEPTACLE
E/EX	EXISITNG TO REMAIN	TEL	TELEPHONE
EC	ELECTRICAL CONTRACTOR	TOS	TOP OF SHAFT
ЕМ	EMERGENCY	TV	TELEVISION
ER	EXISTING TO BE REMOVED	TYP	TYPICAL
FA	FIRE ALARM	UON	UNLESS OTHERWISE NOTED
FACP	FIRE ALARM CONTROL PANEL	٧	VOLT OR VOLTAGE
FL	FLOOR	VA	VOLT AMPERE
-T	FEET OR FOOT	VIF	VERIFY IN FIELD
GRD	GROUND	w	WATT
GFI	GROUND FAULT INTERRUPTER	WP	WEATHERPROOF
HID	HIGH INTENSITY DISCHARGE	WT	WATERTIGHT
1 P	HORSE POWER	XP	EXPLOSION PROOF
ΗZ	HERTZ		
JB	JUNCTION BOX		

CONNECTICUT STATE CODES & STANDARDS

- 2018 CONNECTICUT STATE BUILDING CODE
- 2018 SUPPLEMENT TO CONNECTICUT BUILDING CODE
- 2015 INTERNATIONAL EXISTING BUILDING CODE 2015 INTERNATIONAL PLUMBING CODE
- 2015 INTERNATIONAL MECHANICAL CODE
- 2017 NATIONAL ELECTRICAL CODE (NFPA 70)
- LOCAL FIRE DEPARTMENT/FIRE MARSHAL ALL OTHER LOCAL AUTHÓRITIES HAVING JURISDICTION

CONNECTICUT STATE ENERGY CODES

2015 INTERNATIONAL ENERGY CONSERVATION CODE

REFERENCED STANDARDS

APPLICABLE REFERENCE STANDARDS SHALL BE AS REFERENCED BY ALL STATE AND LOCAL CODES. THE LIST BELOW IS FOR QUICK REFERENCE AND DOES NOT INCLUDE ALL APPLICABLE REFERENCE STANDARDS.

- 2013 NPFA 13 STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
- 2013 NFPA 14 STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS
- 2013 NFPA 20 STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION 2015 NFPA 54 - NATIONAL FUEL GAS CODE
- 2017 NFPA 70 NATIONAL ELECTRICAL CODE 2013 NFPA 72 - NATIONAL FIRE ALARM AND SIGNALING CODE

ELECTRICAL DRAWING LIST

E-001 ELECTRICAL SYMBOLS, ABBREVIATIONS AND DRAWING LIST

ELECTRICAL GENERAL NOTES

E-002 E-010 ELECTRICAL SITE PLAN

E-101a

E-100 ELECTRICAL BASEMENT PLAN

ELECTRICAL 1ST FLOOR POWER PLAN

E-101b ELECTRICAL 1ST FLOOR LIGHTING PLAN

E-102 ELECTRICAL ATTIC PLAN

E-401

ELECTRICAL RISER DIAGRAM & PANEL SCHEDULES

E-501 ELECTRICAL DETAILS (SHEET 1 OF 3)

E-502 ELECTRICAL DETAILS (SHEET 2 OF 3)

E-503 ELECTRICAL DETAILS (SHEET 3 OF 3)

ELECTRICAL SPECIFICATIONS (SHEET 1 OF 2) E-601

E-602 ELECTRICAL SPECIFICATIONS (SHEET 2 OF 2) Mastroluca Engineering Associates, LLC 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

Revis	ions	
#	DATE	ISSUE/REVISION DESCRIPTION
PHA	SE	
		ISSUED FOR



PERMIT/BID

PROJECT NAME OFFUTT EDUCATION CENTER AT LACHAT FARM

106 GODFREY, ROAD

WESTON, CT JOB NO.: MEA.2021.00011

CHECK BY: DRAWN BY: SCALE:NTS

DRAWING TITLE ELECTRICAL SYMBOLS, ABBREVIATIONS & DRAWING LIST

DRAWING#

E-001

- 2. PRIOR TO SUBMISSION OF BID, THIS CONTRACTOR SHALL VISIT THE JOB SITE TO ASCERTAIN THE ACTUAL FIELD CONDITIONS AS THEY RELATED TO THE WORK AS INDICATED ON THE DRAWINGS AND DESCRIBED HEREIN. DISCREPANCIES, IF ANY, SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION PRIOR TO SUBMISSION OF BID, AND, IF NOT RESOLVED TO SATISFACTION, SHALL BE SUBMITTED AS A WRITTEN QUALIFICATION OF THE BID. SUBMISSION OF A BID SHALL BE EVIDENCE THAT SITE VERIFICATION HAS BEEN PERFORMED AS DESCRIBED ABOVE.
- 3. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF WORK AND APPROXIMATE LOCATION OF EQUIPMENT. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS AND COORDINATE FINAL LOCATIONS OF SWITCHES, LIGHT FIXTURES, RECEPTACLES, ETC. WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID CONFLICTS. IF A CONFLICT OCCURS IN THE SPECIFICATIONS AND/OR ON THE DRAWINGS, THE MORE STRINGENT SITUATION SHALL APPLY.
- 4. PRIOR TO SUBMISSION OF BID, THIS CONTRACTOR SHALL REVIEW ALL DRAWINGS OF THE ENTIRE PROJECT INCLUDING GENERAL CONSTRUCTIONS, DEMOLITION, ARCHITECTURAL, MECHANICAL, ELECTRICAL, TELECOM/AV/SECURITY, PLUMBING, AND FIRE PROTECTION AND SHALL INCLUDE ANY WORK REQUIRED IN THE BID WHICH IS INDICATED OR IMPLIED TO BE PERFORMED BY THIS TRADE IN OTHER SECTIONS OF THE WORK.
- 5. ANY EQUIPMENT, PARTS, MATERIALS, ACCESSORIES, OR LABOR THAT IS NECESSARY FOR PROPER PERFORMANCE OF THE ELECTRICAL WORK, ALTHOUGH NOT SPECIFICALLY MENTIONED HEREIN, OR SHOWN ON THE DRAWINGS, SHALL BE FURNISHED AND INSTALLED AS IF CALLED FOR IN DETAIL WITHOUT ADDITIONAL COST.
- OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THIS WORK. FINAL ACCEPTANCE SHALL BE DEFINED AS THE TIME AT WHICH THE ELECTRICAL WORK IS TAKEN OVER AND ACCEPTED BY THE OWNER, AND IS UNDER CARE, CUSTODY, AND CONTROL OF THE OWNER. ENGAGE THE SERVICES OF VARIOUS MANUFACTURER'S SUPPLYING THE EQUIPMENT FOR THE PROPER STARTUP, OPERATION, AND SERVICING OF EQUIPMENT.
- . CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, AND CONTRACTOR'S SERVICES NECESSARY FOR THE COMPLETE AND SAFE INSTALLATION OF ALL ELECTRICAL WORK. THE SCOPE OF WORK SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
 - ELECTRICAL REQUIREMENTS SHALL BE IN CONFORMANCE WITH ENGINEERING BID DOCUMENTS AS WELL AS DOCUMENTS
 (SPECIFICATIONS & DRAWINGS) PREPARED BY LOCAL UTILITY COMPANY AND REFERENCED DRAWINGS IN THE UTILITY COMPANY DOCUMENTS NOT INCLUDED SHALL BE PART OF THIS CONTRACT.
 CONTRACTOR SHALL COORDINATE AND ARRANGE TO RECEIVE AND/OR PICK UP SPECIFIC EQUIPMENT OUTLINED PRE—PURCHASE
 - ITEMS.

 REMOVAL AND RELOCATION OF EQUIPMENT AS REQUIRED WHEN
 - INTERFERING WITH NEW WORK.

 INSTALLATION OF NEW RACEWAY AND CONDUCTORS.
 - CUTTING, CHANNELING, CHASING, AND ROUGH PATCHING REQUIRED TO ACCOMMODATE THE ELECTRICAL INSTALLATION.
 - ADDITION OR MODIFICATION OF EXISTING ELECTRICAL DISTRIBUTION EQUIPMENT.
 INSTALLATION OF CONDUIT, JUNCTION BOXES, PULL BOXES, ETC.,
 - REQUIRED FOR THE AFOREMENTIONED EQUIPMENT.

 MAINTENANCE AND PROPER OPERATION OF EXISTING BASE BUILDING SYSTEMS WITHIN THE CONTRACT AREA IN ACCORDANCE WITH THE REQUIREMENTS OF BUILDING MANAGEMENT.
 - TEMPORARY LIGHT AND POWER DURING CONSTRUCTION.
 GROUNDING OF ALL EQUIPMENT AS REQUIRED BY CODE AND SPECIFIED.
- 8. THIS CONTRACTOR IS TO OBTAIN A COPY OF THE BUILDING RULES AND REGULATIONS PRIOR TO BID SUBMISSION TO DETERMINE REQUIREMENTS AND THE EXTENT OF PREMIUM TIME WORK REQUIRED BY BUILDING MANAGEMENT. FOR THE PURPOSE OF BID, ASSUME ANY NOISY WORK (E.G., CHOPPING, CORE DRILLING, ETC.) AND BASE BUILDING SYSTEM INTERRUPTIONS ARE TO BE PERFORMED OUTSIDE NORMAL BUSINESS HOURS.
- 9. "THE GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION" AIA DOCUMENT A201 LATEST EDITION, OR AS REQUIRED BY THE ARCHITECTS DOCUMENTS AND/OR THE STRUCTURAL ENGINEERS DOCUMENTS, AS APPLICABLE, ARE PART OF THIS DOCUMENT.
- 10. SUBMIT SHOP DRAWINGS CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT ALL CERTIFIED EQUIPMENT CUTS WITH CONSTRUCTIONS WIRING DIAGRAMS. PROVIDE DIGITAL COPIES OF ALL DRAWINGS. SPECIFIC JOB REQUIREMENTS MAY BE MORE STRINGENT AND CONTRACTOR IS RESPONSIBLE TO OBTAIN REQUIREMENTS FROM CONSTRUCTION MANAGER, GENERATOR CONTRACTOR, OR ARCHITECT.
- 11. SUBMIT (4) LOOSE—LEAF BOUND OPERATING AND MAINTENANCE MANUALS WITH INDEX AND INDEX TABS TO INCLUDE ALL SHOP DRAWINGS AND OPERATING AND MAINTENANCE INSTRUCTIONS ON ALL SYSTEMS.
- 12. CONTRACTOR SHALL REVISE SHIP DRAWINGS TO CONFORM TO RECORD DRAWINGS AND SUBMIT AN AS-BUILT CONDITION (DEVICES, EQUIPMENT, CIRCUITRY, ETC.) DRAWINGS UPON COMPLETION OF THE PROJECT. FINAL SUBMISSION OF REPRODUCIBLE AS-BUILT DRAWINGS ARE TO BE SIGNED AND CERTIFIED BY THE INSTALLING CONTRACTOR THAT THIS IS AS-BUILT CONDITION OF THE WORK.
- 13. NO SUBSTITUTE MATERIAL OR MANUFACTURER OF EQUIPMENT SHALL BE PERMITTED WITHOUT A FORMAL WRITTEN SUBMITTAL TO THE ENGINEER WHICH INCLUDES ALL DIMENSION, PERFORMANCE, AND MATERIAL SPECIFICATIONS. ANY CHANGES IN LAYOUT, ELECTRICAL CHARACTERISTICS, STRUCTURAL REQUIREMENTS, OR DESIGN DUE TO THE USE OF A SUBSTITUTION SHALL BE SUBMITTED TO THE ENGINEER AS PART OF THIS PROPOSAL. THE CONTRACTOR TAKES FULL RESPONSIBILITY FOR THE SUBSTITUTION AND ALL CHANGES RESULTING FROM SUBSTITUTION.
- 14. THIS CONTRACTOR SHALL SUBMIT FOR APPROVAL, A PLAN INDICATING THE SIZE AND LOCATION OF ALL ACCESS DOORS REQUIRED FOR OPERATION AND MAINTENANCE OF ALL CONCEALED EQUIPMENT, DEVICES, JUNCTION BOXES, PULL BOXES, ETC. THIS CONTRACTOR SHALL ARRANGE FOR FURNISHING AND INSTALLATION OF ALL ACCESS DOORS IN FINISHED CONSTRUCTION AND INCLUDE COSTS IN THE BID.

ELECTRICAL GENERAL NOTES (CONTINUED)

- 15. REMOVAL, TEMPORARY CONNECTIONS, AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE INSTALLATION OF THE NEW SYSTEMS. ALL EXISTING CONDITIONS ARE NOT COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND MAKE ALL NECESSARY CHANGES REQUIRED BASED ON EXISTING CONDITIONS FOR PROPER INSTALLATION OF NEW WORK.
- 16. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE ORGANIZED WITH BUILDING MANAGEMENT. PROVIDE TEMPORARY FEEDERS, CIRCUITRY, ETC., AS REQUIRED TO MINIMIZE DOWNTIME.
- 17. DISCONNECTS SHALL BE 'QUICK-BREAK' HEAVY DUTY TYPE IN NEMA 1 ENCLOSURE FUSED OR UN-FUSED AS INDICATED ON THE DRAWINGS. FUSES FOR SWITCHES SHALL BE CURRENT LIMITING TYPE WITH AN INTERRUPTING CAPACITY OF 200,000 RMS AMPERES AND OF THE CONTINUOUS CURRENT RATING AS SHOWN ON THE DRAWINGS.
- 18. CIRCUIT BREAKERS SHALL BE 'THERMAL MAGNETIC' TYPE, QUICK-MAKE, QUICK-BREAK WITH NON-WELDING CONTACTS COMPENSATED FOR AMBIENT TEMPERATURES AND SHALL HAVE A MINIMUM SHORT CIRCUIT RATING OF 10,000 AMPERES SYMMETRICAL FOR 120/208V PANELS AND 14,000 AMPERES SYMMETRICAL FOR 277/480V PANELS OR HIGHER WHERE NOTES.
- 19. CONDUIT SHALL BE RIGID THREADED REGARDLESS OF SIZE.
- 20. ALL CONDUCTORS SHALL BE COPPER, TYPE THHN/THWN INSULATED. ALL CONDUCTORS SHALL HAVE 600 VOLT RATED INSULATION, UNLESS OTHERWISE NOTED. UNLESS SPECIFIED ALL WIRE #10 AWG AND SMALLER SHALL BE SOLID CONDUCTORS AND 8 AWG AND LARGER SHALL BE STRANDED.
- 21. BRANCH CIRCUIT WIRE SIZE: THE MINIMUM WIRE SIZE FOR BRANCH CIRCUITS SHALL BE NO. 12 AWG EXCEPT 120V CIRCUITS OVER 80 FEET IN LENGTH SHALL BE 10 AWG.
- 22. PULL BOXES, JUNCTION BOXES, AND OUTLET BOXES SHALL BE MANUFACTURED FROM GALVANIZED INDUSTRY STANDARD SHALL STEEL.
- 23. PROVIDE PULL BOXES AND JUNCTION BOXES IN LONG STRAIGHT RUNS OF RACEWAY TO ASSURE THAT CABLES ARE NOT DAMAGED WHEN THEY ARE PULLED, TO FULFILL REQUIREMENTS AS TO THE NUMBER OF BENDS PERMITTED IN RACEWAY BETWEEN CABLE ACCESS POINTS, THE ACCESSIBILITY OF CABLE JOINTS AND SPLICES, AND THE APPLICATION OF CABLE SUPPORTS.
- 24. PULL BOXES AND JUNCTION BOXES SHALL BE SIZED SO THAT THE MINIMUM BENDING RADIUS CRITERIA SPECIFIED FOR THE WIRES AND CABLE ARE MAINTAINED.
- 25. ALL EQUIPMENT, DEVICE BOXES, JUNCTION BOXES, PULL BOXES, AND OUTLET BOXES SHALL BE INSTALLED SO AS TO ALLOW ACCESS TO THE BOX. IF NECESSARY AND APPROVED BY OWNER/ENGINEER, PROVIDE ACCESS DOOR OR COVER PLATES IN AREAS WHERE UNOBSTRUCTED ACCESS IS NOT POSSIBLE.
- 26. OPENINGS AROUND ELECTRICAL PENETRATION THROUGH FIRE RESISTANCE RATED WALL, PARTITIONS, FLOOR OR CEILING SHALL BE FIRE STOPPED USING APPROVED METHODS. SEALANT SHALL BE RATED FOR THREE (3) HOURS.
- 27. HEIGHTS OF OUTLETS FROM FINISHED FLOOR TO CENTERLINE OF OUTLET:
 - RECEPTACLES AND TELEPHONES
 GENERALLY
 OVER WORK BENCHES
 WALL SWITCHES
 1' 6"
 4' 0"

6'0"

- MOTOR CONTROLLERS
 FIRE ALARM PULL STATIONS
 FIRE ALARM HORN/SPEAKER/STROBES
 5' 0"
 4' 0"
 6' 8" AFF OR 6"
- BELOW CEILING (WHICHEVER IS GREATER)

 EXCEPTIONS: AT JUNCTION BOXES OF DIFFERENT WALL FINISH MATERIALS,
 ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE
- 28. PROVIDE WEIGHTS, LOCATIONS, AND DIMENSIONS OF EQUIPMENT IN EXCESS OF 200 LBS. SUPPORTED ON FLOOR OR HUNG FROM BUILDING STRUCTURE TO BASE BUILDING STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO
- INSTALLATION.

 29. THE ELECTRICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH HVAC, PLUBMING, FIRE PROTECTION, TELECOM/AV/SECURITY, AND OTHER TRADES FOR EXACT LOCATION OF ALL MOTOR AND CONTROL DEVICES, BACK BOXES, AND CONDUIT REQUIREMENTS. LOCATIONS AS SHOWN ON ELECTRICAL
- 30. PROVIDE PRICING FOR EXTENDED WARRANTIES (2-5 YEARS) FOR THE SYSTEMS NOTED ON THE ELECTRICAL DRAWINGS AND SPECIFICATIONS. PROVIDE PRICING FOR WARRANTIES BEYOND 5-YEARS WHERE POSSIBLE.
- 31. EXTERIOR RECEPTACLES SHALL BE PROVIDED WITH WEATHERPROOF "WHILE IN USE" COVERS.
- 32. COORDINATION WITH BUILDING MANAGEMENT

DRAWINGS ARE APPROXIMATE.

WALL FIXTURES

REQUIREMENTS, AS NOTED OR DIRECTED.

- THIS CONTRACTOR IS TO OBTAIN A COPY OF THE BUILDING RULES AND REGULATIONS PRIOR TO BID SUBMISSION TO DETERMINE THE REQUIREMENTS AND THE EXTENT OF PREMIUM TIME WORK REQUIRED BY THE BUILDING.
- THIS CONTRACTOR IS RESPONSIBLE FOR ADHERING TO THE BUILDING OWNER'S RULES AND REGULATIONS. ANY DISCREPANCIES BETWEEN THE CONTRACT DOCUMENTS AND THE BUILDING RULES AND REGULATIONS SHALL BE SUBMITTED IN
- WRITING TO THE ARCHITECT/ENGINEER FOR REVIEW WITH BID SUBMISSION.
 COORDINATE WITH BUILDING OWNER FOR ANY SERVICE INTERRUPTION OF EXISTING SYSTEMS AND GIVE NOTICE AS REQUIRED BY BUILDING RULES AND REGULATIONS, OR CONTRACTOR TO PROVIDE A MINIMUM OF TWO (2) DAYS NOTICE PRIOR TO ANY WORK BEING PERFORMED, WHICHEVER IS THE MORE STRINGENT. CONTRACTOR IS TO PERFORM WORK ON PREMIUM TIME, IF SO DIRECTED BY BUILDING OWNER,
- SO AS NOT TO DISTURB EXISTING TENANTS ON OTHER FLOORS.

 ALL NEW ELECTRICAL DEVICES SHALL MATCH THE BASE BUILDING STANDARD.

ELECTRICAL POWER NOTES

- A. CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL DRAWINGS AND ARCHITECT IN FIELD FOR EXACT LOCATION, QUANTITY AND ELEVATION OF POWER AND TELEPHONE/DATA OUTLETS PRIOR TO INSTALLATION.
- B. RECEPTACLES SHALL BE CIRCUITED IN ACCORDANCE WITH CIRCUIT NUMBER INDICATED ADJACENT TO EACH DEVICE. CIRCUITRY MAY BE SHOWN IN CERTAIN INSTANCES.
- C. ALL RECEPTACLES SPECIFIED FOR PERSONAL COMPUTERS, LASER PRINTERS AND SIMILAR TYPES OF EQUIPMENT SHALL BE PROVIDED WITH A SEPARATE NEUTRAL AND GROUND CONDUCTOR. THIS IS TO COMPENSATE FOR HARMONIC CURRENTS. SHARED NEUTRAL CONDUCTORS FOR THESE HOME RUNS ARE NOT PERMITTED, UNLESS OTHERWISE NOTED.
- D. THE ELECTRICAL CONTRACTOR SHALL CONFIRM THE CONFIGURATION TYPE FOR ALL SPECIAL RECEPTACLES FOR COPIERS, DATA PROCESSING EQUIPMENT. ETC. WITH OWNER AND ENGINEER PRIOR TO ORDERING.
- E. CIRCUIT NUMBERS ARE INDICATED FOR INTENT ONLY. THE ELECTRICAL CONTRACTOR SHALL ADJUST ACCORDINGLY IN THE FIELD, TO BALANCE THE CIRCUITS EVENLY ON ALL PHASES.
- MECHANICAL EQUIPMENT IS LOCATED ABOVE THE HUNG CEILING UNLESS OTHERWISE NOTED. EXACT LOCATION SHALL BE DETERMINED FROM MECHANICAL DRAWINGS.
- G. COORDINATE LOCATION FOR ALL MOTORIZED DAMPERS, DUCT MOUNTED SMOKE DETECTORS & MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR.
- H. WHERE APPLICABLE, RUN 1" EMPTY CONDUIT TO NEAREST ACCESSIBLE HUNG CEILING WITH GROMMET END FITTINGS FOR TELEPHONE/DATA & PROVIDE DRAG LINES FOR PULLING CABLE
- I. COORDINATE THE HARDWARE REQUIREMENTS FOR THE DOORS WITH THE ARCHITECT & SECURITY CONSULTANT PRIOR TO INSTALLATION (I.E. ELECTRIC HINGES, CARD READERS, ELECTRIC STRIKES, MAGNETIC SWITCHES, POWER SUPPLIES, ETC.)
- J. ALL BRANCH CIRCUIT HOME RUNS SHALL BE 2#12 & 1#12 GND IN 3/4" CONDUIT OR MC CABLE TO PANEL & CIRCUIT INDICATED. MAXIMUM OF THREE HOME RUNS PER CONDUIT.
- MULTIWIRE BRANCH CIRCUITS SUPPLYING POWER TO FURNITURE PARTITIONS SHALL BE PROVIDED WITH MEANS TO DISCONNECT POWER SIMULTANEOUSLY.
- L. ALL POWER AND LIGHTING CIRCUITS, AND LOW VOLTAGE CABLING (VOICE/DATA, FIRE ALARM, LIGHTING CONTROLS, AUDIO/VISUAL, HVAC CONTROLS, ETC.) ROUTED THROUGH EXPOSED CEILINGS SHALL BE IN EMT CONDUIT. COORDINATE INSTALLATION WITH OTHER TRADES. REFER TO ARCHITECTURAL AND INTERIOR DESIGNER DRAWINGS FOR LOCATIONS OF EXPOSED CEILINGS.

ELECTRICAL LIGHTING NOTES

- A. FOR EXACT LOCATION, QUANTITY AND ELEVATION OF LIGHTING FIXTURES AND SWITCHES REFER TO ARCHITECTURAL DRAWINGS AND COORDINATE WITH ARCHITECT IN THE FIELD.
- B. LIGHTING FIXTURES SHALL BE CIRCUITED IN ACCORDANCE WITH CIRCUIT NUMBER INDICATED ADJACENT TO EACH FIXTURE. CIRCUITRY MAY BE SHOWN IN CERTAIN INSTANCES.
- C. ALL JUNCTION OR OUTLET BOXES SHALL BE INSTALLED SO AS TO ALLOW ACCESS TO COVER PROVIDE ARCHITECT APPROVED ACCESS DOORS OR PLATES AS REQUIRED IN AREAS WHERE UNOBSTRUCTED ACCESS TO BOX OR OUTLET IS NOT POSSIBLE.
- D. PRIOR TO ORDERING LIGHTING FIXTURES, COORDINATE WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS. IF DISCREPANCIES EXIST BETWEEN ARCHITECTURAL AND ENGINEERING INFORMATION OBTAIN CLARIFICATION PRIOR TO PROCEEDING.
- E. CIRCUIT NUMBERS ARE INDICATED FOR INTENT ONLY. THE ELECTRICAL CONTRACTOR SHALL ADJUST ACCORDINGLY IN THE FIELD TO BALANCE THE CIRCUITS EVENLY ON ALL PHASES.
- F. MULTIPLE SWITCHES SHOWN IN SAME LOCATION SHALL BE GANGED TOGETHER WITH A COMMON FACEPIATE
- FACEPLATE.
- G. ALL LIGHTING FIXTURES UTILIZING ELECTRONIC BALLASTS SHALL BE PROVIDED WITH A DEDICATED NEUTRAL OR AN OVERSIZED NEUTRAL WHEN SHARED.
- H. ALL LIGHTING FIXTURES CONTROLLED BY DIMMER SWITCHES SHALL BE PROVIDED WITH DEDICATED NEUTRAL CONDUCTOR.
- I. ELECTRICAL CONTRACTOR SHALL PROVIDE 0-10V CONVERTERS FOR LIGHTING FIXTURES WITHOUT 0-10V DIMMING DRIVERS. COORDINATE WITH LIGHTING CONTROLS MANUFACTURER FOR EXACT REQUIREMENTS.
- J. ALL NIGHT LIGHTS AND STAIR LIGHTS SHALL BE UNSWITCHED AND CIRCUITED DIRECTLY TO ASSOCIATED ELECTRICAL PANELS, U.O.N.
- K. BRANCH CIRCUIT BREAKERS FEEDING STAIR LIGHTS SHALL BE LOCKED IN "ON" POSITION.
- L. ALL LIGHT FIXTURES DESIGNATED WITH "EM" OR "EM/NL" SHALL BE PROVIDED WITH EMERGENCY
 BATTERY BACKUP CAPABLE OF FULL LIGHT OUTPUT FOR MINIMUM 90 MINUTES. PROVIDE UNSWITCHED
 HOT CONDUCTOR TO EACH LIGHTING FIXTURE FOR EMERGENCY OPERATION.

ELECTRICAL DEMOLITION NOTES

1. GENERAL

- 1.1. SEE ARCHITECTURAL DEMOLITION DRAWINGS FOR NUMBER OF LIGHTING FIXTURES AND DEVICES TO BE REMOVED AND OR RELOCATED.
- 1.2. SEE HVAC DRAWINGS FOR HVAC EQUIPMENT TO BE REMOVED. REMOVE ALL ASSOCIATED CONDUIT, WIRE, SWITCHES, BOXES ASSOCIATED WITH EQUIPMENT TO BE REMOVED.
- 1.3. SEE PLUMBING DRAWINGS FOR PLUMBING EQUIPMENT TO BE REMOVED.
- 1.4. FOR EQUIPMENT TO BE REMOVED DISCONNECT POWER AND REMOVED CONDUIT/WIRING BACK TO PANEL.
- 1.5. REMOVE ALL DRYWALL MOUNTED DUPLEX RECEPTACLES AND ASSOCIATED CIRCUITING. WHERE OUTLETS ARE REMOVED AND THROUGH CIRCUITING SERVE OTHER OUTLETS BEYOND THE DEMOLITION AREA, RESTORE OR MAINTAIN THROUGH CIRCUITING.
- 1.6. CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS AS REQUIRED TO BUNDLE, NEATEN, AND CLEAN UP EXISTING LOOSE CABLING INCLUDING BUT NOT LIMITED TO LOW VOLTAGE CABLING, FIRE ALARM CABLING, MC CABLING, ETC. WHERE CEILINGS ARE EXPOSED, CONTRACTOR SHALL REINSTALL ALL EXISTING CABLING IN EMT CONDUIT AS CLOSE TO UNDERSIDE OF STRUCTURE
- 1.7. REMOVE ALL CLIPS AND HANGERS FROM CEILING SLAB AND REPAIR IF REQUIRED.
- 2. FLOOR OUTLETS POWER

AS POSSIBLE.

- 2.1. ALL FLOOR OUTLETS SERVICE FITTINGS SHALL BE REMOVED WITH WIRE, REMOVED BACK TO THE ELECTRIC PANEL FROM WHICH THEY ARE SERVED.
- 2.2. REMOVE FLOOR AFTERSET INSERT, PROVIDE SHEETMETAL "PENNY" AND PATCH BY FILLING WITH CONCRETE. FLUSH WITH FLOOR SLAB.
- 3. FLOOR OUTLETS LOW TENSION
- 3.1. ALL FLOOR OUTLET SERVICE FITTINGS SHALL BE REMOVED WITH DATA/TELEPHONE CABLE. REMOVED BACK TO TELEPHONE CLOSET TERMINAL STRIPS.
- 3.2. REMOVE FLOOR AFTERSET INSERT, PROVIDE SHEETMETAL "PENNY" AND FILL WITH CONCRETE FLUSH WITH FLOOR SLAB.

4. EXISTING CONDUIT

- 4.1. THIS CONTRACTOR SHALL REMOVE ALL WALL CONDUITS, BOXES, CEILING CONDUITS LEFT AFTER WALL DEMOLITION. REMOVE ALL WIRING BACK TO EXISTING PANELS.
- 5. EXISTING ELECTRICAL PANELS
- 5.1. CONTRACTOR SHALL USE CARE IN DISCONNECTING WIRING FROM PANELS AND CIRCUIT BREAKERS. CAREFULLY STORE ALL PANEL COVERS AS CONTRACTOR WILL BE RESPONSIBLE FOR COMPLETE USABLE PANEL INSTALLATION.
- 6. EXISTING HEADERDUCT
- 6.1. CLEAN OUT EXISTING HEADERDUCT FROM ALL EXISTING WIRING, TAKING CARE NOT TO DISCONNECT ANY LIGHTING CIRCUITS.
- 6.2. CONTRACTOR SHALL BE RESPONSIBLE FOR TRENCHHEADER ACCESS COVER PLATES, GASKETS AND SCREW WHICH WILL HAVE TO BE REPLACED IF LOST AS PART OF THIS WORK.
- 6.3. ELECTRICAL CONTRACTOR SHALL REMOVE ALL EXISTING TELEPHONE AND ELECTRICAL CABLING FROM FLOOR CELLS AND HEADERDUCT BACK TO THEIR RESPECTIVE TELEPHONE AND ELECTRIC CLOSETS. REPLACE AND SECURE ALL COVER PLATES.
- 7. EXISTING LIGHTING FIXTURES
- 7.1. REMOVE AND/OR RELOCATE LIGHTING FIXTURES AND DETERMINED IF BALLAST CONTAIN PCB. AS DIRECTED TURN OVER TO OWNER/TENANT ALL FIXTURES OR DISPOSE OF THEM IN AN APPROVED MANNER. IF FIXTURES CONTAIN BALLASTS WITH PCB REMOVE BALLASTS FROM FIXTURES AND DISPOSE OF IN AN APPROVED MANNER.
- 7.2. CONTRACTOR SHALL PULL OUT ALL WIRING AND REMOVE ALL CONDUIT. FOR OVERHEAD LIGHTING CIRCUITS RUN IN CELLULAR DECK REMOVE WIRING AND PROPERLY BLANK OFF
- 7.3. REMOVE ALL ASSOCIATED CONDUIT, WIRE, SWITCHES, BOXES ASSOCIATED WITH EQUIPMENT TO
- 7.4. DISCONNECT POWER AND REMOVE CONDUIT/WIRING BACK TO PANEL FOR EQUIPMENT TO BE
- 8. EXISTING FIRE ALARM

BE REMOVED.

- 8.1. NO EXISTING SMOKE DETECTOR, PUBLIC ADDRESS SPEAKER, FIRE ALARM BOX OR SIMILAR SERVICES INCLUDING THE ASSOCIATED WIRING SHALL BE DAMAGE DURING DEMOLITION AND SUBSEQUENT CONSTRUCTION.
- 8.2. NO ACTIVE SMOKE DETECTOR SHALL BE COVERED OR OTHERWISE RENDERED INEFFECTIVE FOR ITS INTENDED PURPOSE.
- 8.3. ALL ACTIVE SMOKE DETECTION, PUBLIC ADDRESS AND FIRE ALARM SYSTEM SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION. ANY DAMAGES TO THESE SYSTEMS AS A RESULT OF CONSTRUCTION, SHALL BE REPAIRED BY THE CONTRACTOR IMMEDIATELY. REPAIRS SHALL BE MADE TO THE SATISFACTION OF THE BUILDING MANAGEMENT.
- 8.4. DURING DEMOLITION WORK CONTRACTOR IS TO PROTECT FIRE ALARM DEVICES AGAINST DUST AND OTHER PARTICLES.
- 9. TEMPORARY LIGHTING AND POWER
- 9.1. FURNISH AND INSTALL WIRING FOR ADEQUATE LIGHT AND SMALL POWER TOOLS FOR THE
- 9.2. MAINTAIN THE SYSTEM IN GOOD AND ADEQUATE WORKING CONDITIONS AT ALL TIMES.
- 9.3. FURNISH AND INSTALL ALL LAMPS, BREAKERS, AND FUSING, AS IS NECESSARY.
- 9.4. REPLACE BURNED OUT LAMPS, DEFECTIVE BREAKERS, OR BLOWN FUSES.
- 9.5. TEMPORARY MAINTENANCE FOR THE ABOVE SHALL BE BASED ON OPERATION 1/2 HOUR BEFORE START OF FIRST TRADE THROUGH 1/2 HOUR AFTER END OF LAST TRADE NORMAL WORK DAY.
- 9.6. TEMPORARY LIGHT AND POWER SHALL BE INSTALLED IN ACCORDANCE WITH CODES AND AUTHORITIES HAVING JURISDICTION.

MASTROLUCA ENGINEERING ASSOCIATES, LLC

51 ZEPHYR RD TRUMBULL CT 06611
203-581-3838
JMASTROLUCA.MEA@GMAIL.COM

Revis	sions	
#	DATE	ISSUE/REVISION DESCRIPTION



ISSUED FOR

PERMIT/BID

OFFUTT EDUCATION CENTER

AT LACHAT FARM

106 GODFREY, ROAD
WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE:NTS

DRAWING TITLE

ELECTRICAL GENERAL NOTES

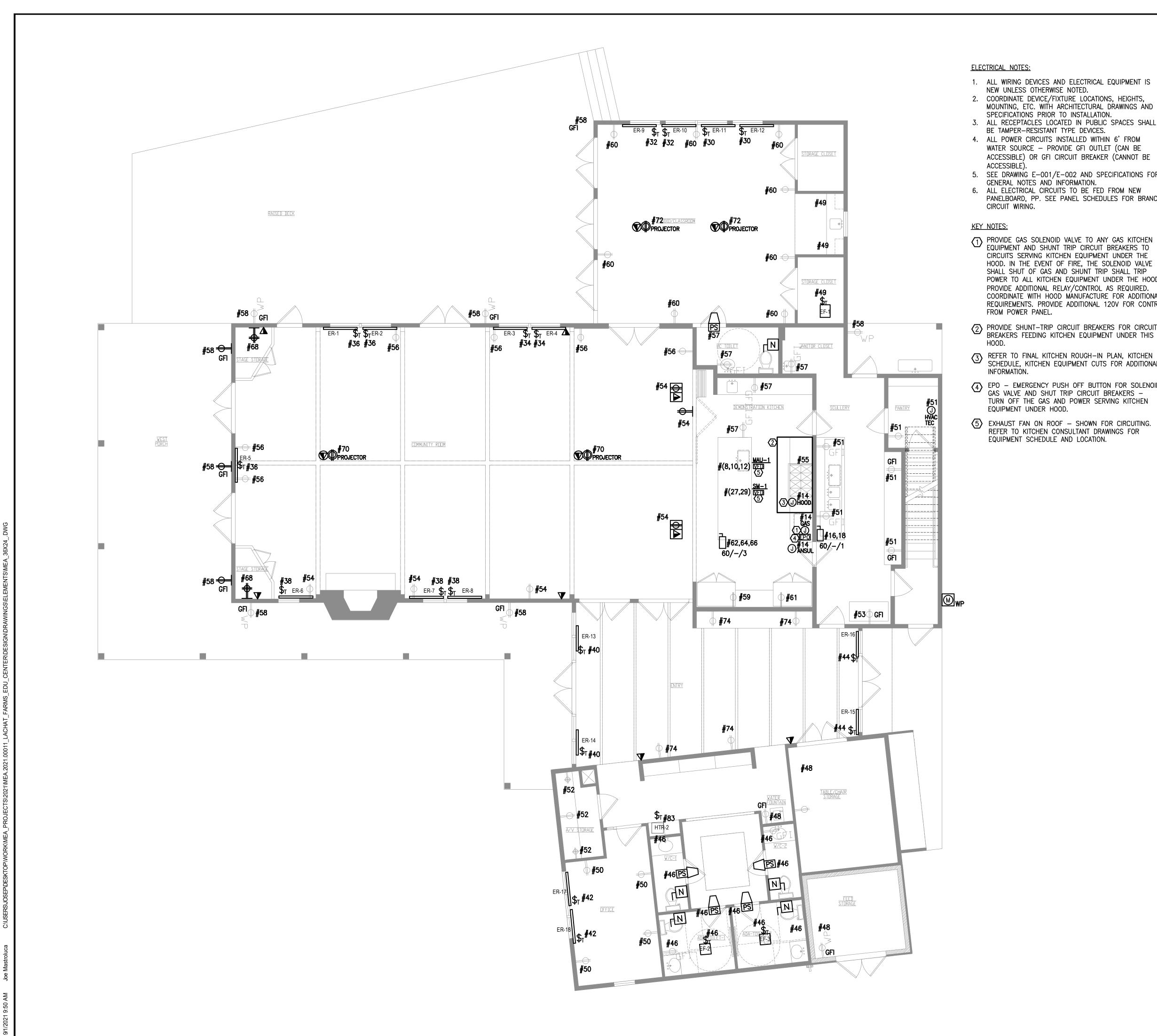
DRAWING#

PHASE

E-002







- 1. ALL WIRING DEVICES AND ELECTRICAL EQUIPMENT IS
- 2. COORDINATE DEVICE/FIXTURE LOCATIONS, HEIGHTS, MOUNTING, ETC. WITH ARCHITECTURAL DRAWINGS AND
- 3. ALL RECEPTACLES LOCATED IN PUBLIC SPACES SHALL
- 4. ALL POWER CIRCUITS INSTALLED WITHIN 6' FROM WATER SOURCE - PROVIDE GFI OUTLET (CAN BE ACCESSIBLE) OR GFI CIRCUIT BREAKER (CANNOT BE
- 5. SEE DRAWING E-001/E-002 AND SPECIFICATIONS FOR
- 6. ALL ELECTRICAL CIRCUITS TO BE FED FROM NEW PANELBOARD, PP. SEE PANEL SCHEDULES FOR BRANCH
- CIRCUITS SERVING KITCHEN EQUIPMENT UNDER THE HOOD. IN THE EVENT OF FIRE, THE SOLENOID VALVE SHALL SHUT OF GAS AND SHUNT TRIP SHALL TRIP POWER TO ALL KITCHEN EQUIPMENT UNDER THE HOOD. PROVIDE ADDITIONAL RELAY/CONTROL AS REQUIRED. COORDINATE WITH HOOD MANUFACTURE FOR ADDITIONAL REQUIREMENTS. PROVIDE ADDITIONAL 120V FOR CONTROL
- PROVIDE SHUNT-TRIP CIRCUIT BREAKERS FOR CIRCUIT BREAKERS FEEDING KITCHEN EQUIPMENT UNDER THIS
- REFER TO FINAL KITCHEN ROUGH-IN PLAN, KITCHEN SCHEDULE, KITCHEN EQUIPMENT CUTS FOR ADDITIONAL
- EPO EMERGENCY PUSH OFF BUTTON FOR SOLENOID GAS VALVE AND SHUT TRIP CIRCUIT BREAKERS TURN OFF THE GAS AND POWER SERVING KITCHEN
- (5) EXHAUST FAN ON ROOF SHOWN FOR CIRCUITING. REFER TO KITCHEN CONSULTANT DRAWINGS FOR

Mastroluca Engineering Associates, LLC 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

Revis	SIOLIS	
#	DATE	ISSUE/REVISION DESCRIPTION
PHA	\SE	
		ISSUED FOR



PERMIT/BID

PROJECT NAME OFFUTT EDUCATION CENTER AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT

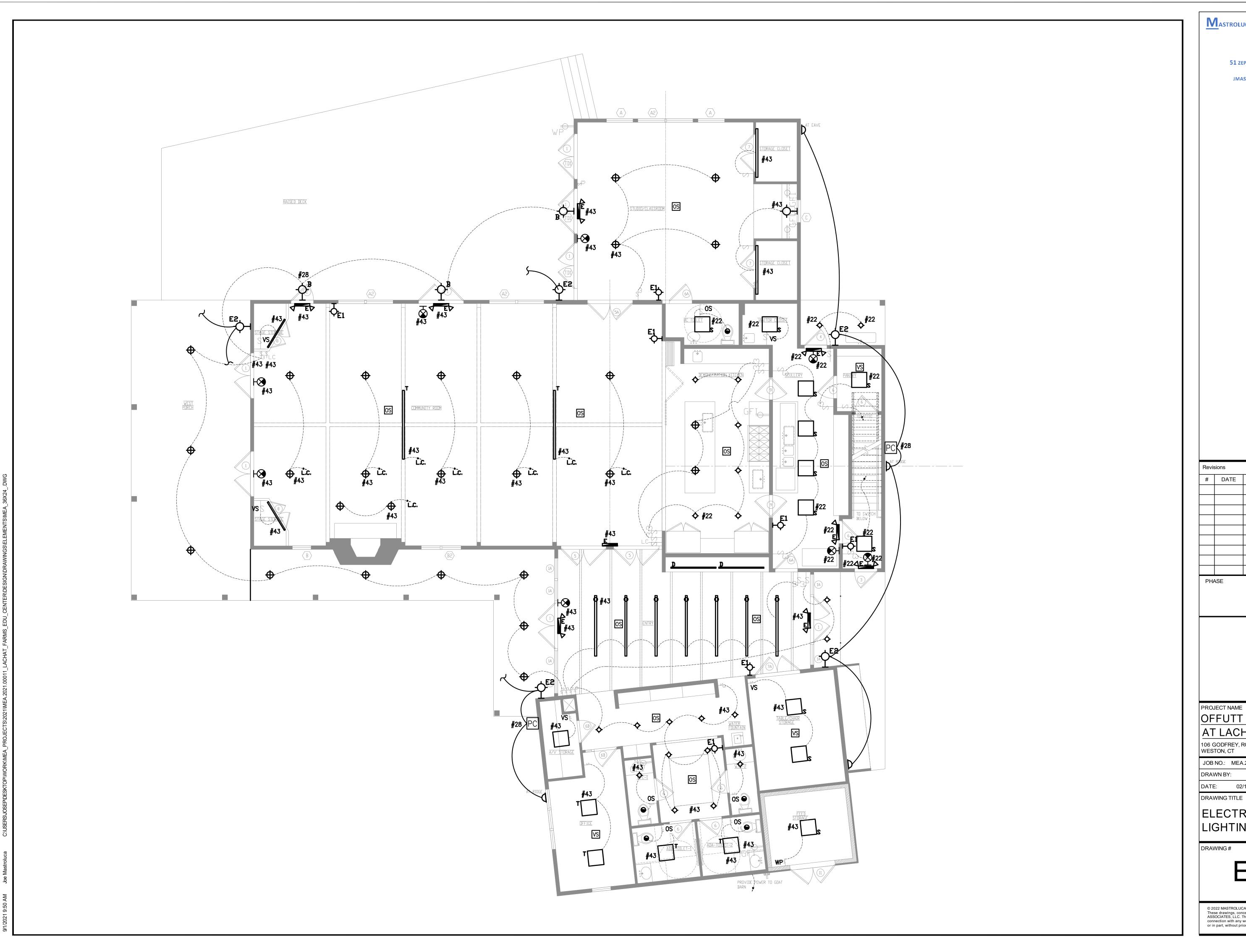
JOB NO.: MEA.2021.00011 CHECK BY: DRAWN BY: SCALE: 3/16" = 1' - 0" DRAWING TITLE

> ELECTRICAL 1ST FLOOR POWER PLAN

DRAWING#

E-101a

© 2022 MASTROLUCA ENGINEERING ASSOCIATES, LLC



 $\underline{\mathsf{M}}_{\mathsf{ASTROLUCA}} \, \underline{\mathsf{E}}_{\mathsf{NGINEERING}} \, \underline{\mathsf{A}}_{\mathsf{SSOCIATES}}$ 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION

ISSUED FOR PERMIT/BID



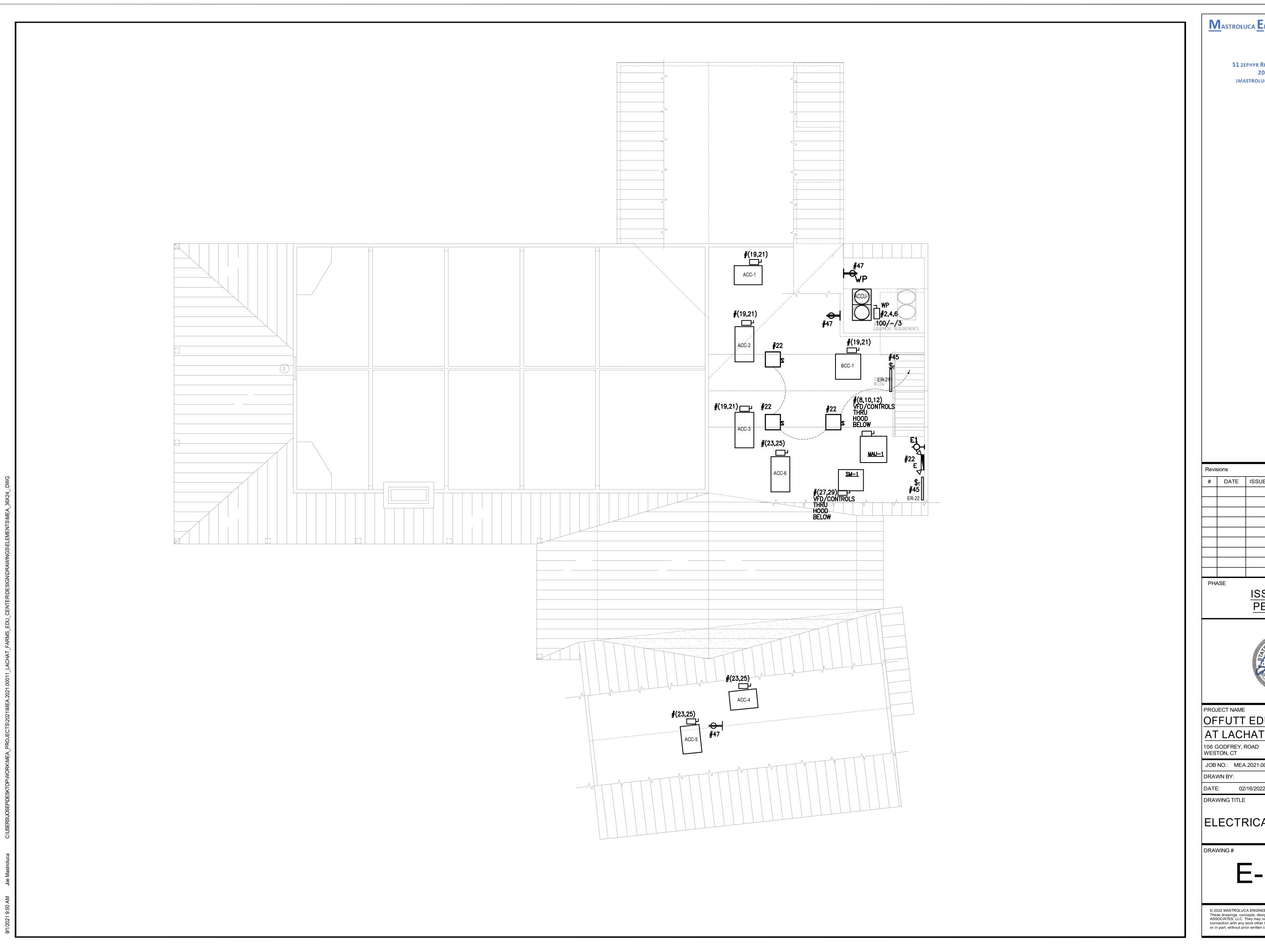
OFFUTT EDUCATION CENTER AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT

JOB NO.: MEA.2021.00011 CHECK BY: SCALE: 3/16" = 1' - 0"

ELECTRICAL 1ST FLOOR LIGHTING PLAN

E-101b



 $\underline{\mathsf{M}}_{\mathsf{ASTROLUCA}} \, \underline{\mathsf{E}}_{\mathsf{NGINEERING}} \, \underline{\mathsf{A}}_{\mathsf{SSOCIATES}}$ 51 ZEPHYR RD TRUMBULL CT 06611 203-581-3838 JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION
PHA	ASE	

ISSUED FOR PERMIT/BID

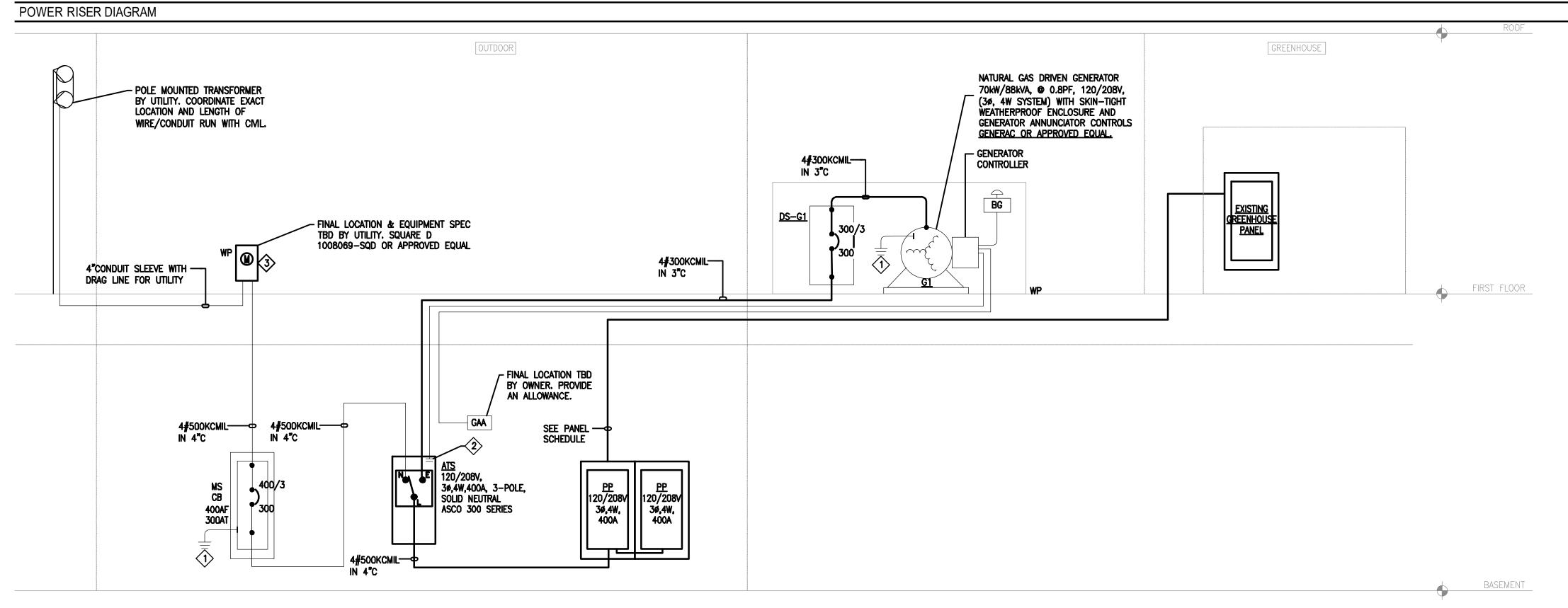


OFFUTT EDUCATION CENTER AT LACHAT FARM

JOB NO.: MEA.2021.00011 CHECK BY: SCALE:3/16" = 1' - 0"

ELECTRICAL ATTIC PLAN

E-102



PANEL: SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER:	PP 2-SECTION (S 208/120V, 3 Ø, 4W 400 A 42KAIC SEE RISER DIAGRAM	ENCLOSURE: NEM A 1 MOUNTING: SURFACE LOCATION: BASEMENT			CE			MAIN RATING: M.L.O.						OPTIONS: DOOR-IN-DOOR BONDED GROUND BUS ISOLATED GROUND BUS 200% NEUTRAL BUS FEED THROUGH LUGS		
BRANCH FEEDER	LOAD DESCRIPTION		OT. DEV		ØA	OAD (VA) ØB ØC	POLE	ES	ØA	OAD (V øB	/A) øC		OT. DEV		LOAD DESCRIPTION	BRANCH FEEDER
3#6,#10G IN 1"C	RE-FEED EXISITING GREENHOUSE	3P	100A	60A	1,500	1,500	1 3 5	2 4 6	4,708	4,708	4,708	3P	100A	80A	ACCU-1	3#6,#10G IN 1"C
3#10,#10G IN 3/4"C	WELL PUMP	3P	100A	30A	1,500	1,500	7 9 11	10 12	1,800	1,800	1,800	3P	100A	30A	MAU-1	3#10,#10G IN 3/4"C
3#12,#12G IN 3/4"C	EJECTOR PUMP	3P	100A	20A	736	736 1,000	13 15 17	14 16 18	500	3,300	3,300	1P 2P	100A 100A	20A 40A	DISHWA SHER	2#12,#12G IN 3/4"C 3#8, #10G IN 1"C
2#12,#12G IN 3/4"	BCC-1, ACC-1, ACC-2, ACC-3	2P	100A	20A	1,500	1,500	19 21	20 22	1,000	650		1P 1P	100A 100A	20A 30A	RE-FEED GOAT SHED BASEMENT REC/LTG	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
2#12,#12G IN 3/4"	ACC-4, ACC-5	2P	100A	20A	400	400	23 25	24 26	720		800	1P 1P	100A 100A	20A 20A	WATER HEATER EPO, BASEMENT REC.	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
2#12,#12G IN 3/4"	SM-1	2P	100A	20A		800 800	27 29	28 30		300	1,000	1P 1P	100A 100A	20A 20A	EXTERIOR LTG ER-11, ER-12	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
3#12,#12G IN 3/4"C	SEWA GE PUMPS (2HP)	3P	100A	20A	675	675 675	31 33 35	32 34 36	1,000	1,000	1,000	1P 1P 1P	100A 100A 100A	20A 20A 20A	ER-9, ER-10 ER-3, ER-4 ER-1, ER-4, ER-5	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
3#10,#10G IN 3/4"C	SUMP PIT PUMPS (4HP)	3P	100A	30A	1,333	1,333	37 39	38 40	1,000	1,000		1P 1P	100A 100A	20A 20A	ER-6, ER-7, ER-8 ER-13, ER-14	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
I						1,333	41	42			1,000	1P	100A	20A	ER-17, ER-18	2#12,#12G IN 3/4"C
PANEL:	PP 2-SECTION (S	SEC. 2)) ENCLO	SURE:	NEW A		41	42	MAIN I	RATING	#	1P	100A	20A	OPTIONS:	2#12,#12G IN 3/4°C
	PP 2-SECTION (S 208/120V, 3ø, 4W 400 A	SEC. 2)			NEM A	1	41	42			#	1P	100A	20A	,	2#12,#12G IN 3/4°C
SERVICE VOLTAGE:	208/120V, 3ø, 4W		ENCLO	ΓING:		1 CE	41	42			#	1P	100A	20A	,	2#12,#12G IN 3/4°C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING	AM	ENCLO MOUNT LOCAT	TING: TION:	SURFA	1 CE IENT	43	44			#	1P	100A	20A	OPTIONS: ER-15, ER-16	2#12,#12G № 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22	AM 1P 1P	ENCLO MOUNT LOCAT	20A 20A	SURFA(1 CE IENT	43 45	44 46	M.L.O.		3	1P 1P	100A 100A	20A 20A	OPTIONS: ER-15, ER-16 EF-2, EF-3, TLT REC.	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC.	1P 1P 1P	ENCLO MOUNT LOCAT 100A 100A	20A 20A 20A 20A	BA SEM	1 CE IENT	43 45 47	44 46 48	M.L.O.		#	1P 1P	100A 100A 100A	20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC.	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1	1P 1P 1P 1P	100A 100A 100A 100A	20A 20A 20A 20A 20A	SURFA(1 CE IENT 1,000	43 45 47 49	44 46 48 50	M.L.O.	900	3	1P 1P 1P 1P	100A 100A 100A 100A	20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC.	2#12,#12G N 3/4"C 2#12,#12G N 3/4"C 2#12,#12G N 3/4"C 2#12,#12G N 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1 KITCHEN REC.	1P 1P 1P 1P 1P	100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A	BA SEM	1 CE IENT 1,000 540	43 45 47 49 51	44 46 48 50 52	M.L.O.		360	1P 1P 1P 1P	100A 100A 100A 100A	20A 20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC. AV STROAGE REC.	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1 KITCHEN REC. KITCHEN REC.	1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A	1,200 500	1 CE IENT 1,000	43 45 47 49 51 53	44 46 48 50 52 54	M.L.O.	900	3	1P 1P 1P 1P 1P	100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC. AV STROAGE REC. ENTRY/COMM REC.	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1 KITCHEN REC. KITCHEN REC.	1P 1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A	BA SEM	1 CE IENT 1,000 540 720 300	43 45 47 49 51 53 55	44 46 48 50 52 54 56	M.L.O.	900	360	1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC. AV STROAGE REC. ENTRY/COMM REC. COMM RM. REC.	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1 KITCHEN REC. KITCHEN REC. KITCHEN REC. KITCHEN REC.	1P 1P 1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A 20A	1,200 500	1 CE IENT 1,000 540 720 300	43 45 47 49 51 53 55 57	44 46 48 50 52 54 56 58	M.L.O.	900	360	1P 1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC. AV STROAGE REC. ENTRY/COMM REC. COMM RM. REC. EXTERIOR REC.	2#12,#12G N 3/4"C 2#12,#12G N 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1 KITCHEN REC. KITCHEN REC.	1P 1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A	1,200 500	1 CE IENT 1,000 540 720 300	43 45 47 49 51 53 55	44 46 48 50 52 54 56	M.L.O.	900	360 720 900	1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC. AV STROAGE REC. ENTRY/COMM REC. COMM RM. REC.	2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C 2#12,#12G IN 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1 KITCHEN REC. KITCHEN REC. KITCHEN REC. KITCHEN REC. BOOSTER PUMP BP-1	1P	100A 100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A 20A	1,200 500	1 CE IENT 1,000 720 300 720 300 1,200 1,000 1,000	43 45 47 49 51 53 55 57 59 61 63	44 46 48 50 52 54 56 58 60 62 64	1,000 720	900	360 720 900	1P 1P 1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC. AV STROAGE REC. ENTRY/COMM REC. COMM RM. REC. EXTERIOR REC. CLASSROOM REC.	2#12,#12G N 3/4"C 2#12,#12G N 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C 3#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1 KITCHEN REC. KITCHEN REC. KITCHEN REC. KITCHEN REC. BOOSTER PUMP BP-1 (3HP)	1P 1P 1P 1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A 20A	1,200 500 300 1,200	1 CE IENT 1,000 720 300 720 300 1,200 1,000 1,000 1,000	43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75	44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76	1,000 720 720 2,800	900	360 720 900 2,800	1P 1P 1P 1P 1P 1P 1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC. AV STROAGE REC. ENTRY/COMM REC. COMM RM. REC. EXTERIOR REC. CLASSROOM REC. COMBI OVEN AV STROAGE REC. PROJECTOR REC. PROJECTOR REC. SPARE	2#12,#12G N 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C 3#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1 KITCHEN REC. KITCHEN REC. KITCHEN REC. KITCHEN REC. BOOSTER PUMP BP-1 (3HP) EH-1	1P 1P 1P 1P 1P 1P 1P 1P 1P 3P	100A 100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A 20A	1,200 500 300 1,200 1,000	1 CE IENT 1,000 1,000 720 300 720 300 1,200 1,000 1,000 1,000	43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75	44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78	1,000 720 720 2,800	900	360 720 900 2,800	1P 1P 1P 1P 1P 1P 1P 1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC. AV STROAGE REC. ENTRY/COMM REC. COMM RM. REC. EXTERIOR REC. CLASSROOM REC. COMBI OVEN AV STROAGE REC. PROJECTOR REC. PROJECTOR REC. SPARE SPARE	2#12,#12G N 3/4"C
SERVICE VOLTAGE: MAIN BUS RATING: AIC RATING: PANEL FEEDER: 2#12,#12G IN 3/4"C 3#12,#12G IN 3/4"C	208/120V, 3ø, 4W 400 A 42 KA REFER TO RISER DIAGRA LIGHTING ER-21, ER-22 ATTIC LTG/REC. COMM RM REC. & EF-1 KITCHEN REC. KITCHEN REC. KITCHEN REC. KITCHEN REC. BOOSTER PUMP BP-1 (3HP) EH-1	1P 1P 1P 1P 1P 1P 1P 1P 1P 3P	100A 100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A 20A	1,200 500 300 1,200	1 CE IENT 1,000 720 300 720 300 1,200 1,000 1,000 1,000	43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75	44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76	1,000 720 720 2,800	900	360 720 900 2,800	1P 1P 1P 1P 1P 1P 1P 1P 1P 1P 1P 1P	100A 100A 100A 100A 100A 100A 100A 100A	20A 20A 20A 20A 20A 20A 20A 20A 20A 20A	ER-15, ER-16 EF-2, EF-3, TLT REC. STORAGE REC. OFFICE REC. AV STROAGE REC. ENTRY/COMM REC. COMM RM. REC. EXTERIOR REC. CLASSROOM REC. COMBI OVEN AV STROAGE REC. PROJECTOR REC. PROJECTOR REC. SPARE	2#12,#12G N 3/4"C

TOTAL CONNECTED LOAD:

TOTAL DEMAND LOAD:

94,910 VA

80,348 VA

223.0 A

NOTES: BASIS OF DESIGN IS SQUARE D

(G) DENOTES GROUND FAULT EQUIPMENT PROTECTION TYPE CIRCUIT BREAKER

(ST) DENOTES SHUNT TRIP TYPE CIRCUIT BREAKER FOR POWER SHUTDOWN THRU HOOD CONTROLS

ALL LOADS ARE NEW AND SHALL BE PROVIDED WITH NEW WIRES, CONDUIT AND CIRCUIT BRAKERS AS SHOWN IN SCHEDULES

NOTES

- 1. FOR GENERAL NOTES, ABBREVIATIONS AND ELECTRICAL SYMBOL LIST, REFER TO DWG. E-001.
- 2. SELECT ELECTRICAL DISTRIBUTION EQUIPMENT TO BE ADEQUATE FOR THE MAXIMUM AVAILABLE FAULT CURRENT AT THEIR POINT OF APPLICATION AS REQUIRED FOR A FULLY RATED SYSTEM. HAVE APPROVED MANUFACTURER SUBMIT SHORT CIRCUIT STUDY IDENTIFYING 3-PHASE AND LINE-TO-GROUND FAULT CURRENTS & ARC FAULT FOR APPROVAL.
- 3. ALL OVERCURRENT PROTECTION DEVICES SHALL BE SELECTIVELY COORDINATED. HAVE APPROVED MANUFACTURER SUBMIT OVERCURRENT PROTECTION COORDINATION STUDY FOR APPROVAL.
- 4. METAL RACEWAYS AND METAL ENCLOSURES FOR CONDUCTORS SHALL BE TIGHTLY JOINED TO CREATE A CONTINUOUS ELECTRIC CIRCUIT AND SO ASSURE A PROPERLY GROUNDED SYSTEM. FITTINGS FOR JOINTS AND TERMINATIONS SHALL BE LISTED FOR GROUNDING INSTALLATION. PROVIDE BONDING JUMPERS WITH APPROVED FITTINGS OF SIZE REQUIRED FOR EQUIPMENT GROUNDING.
- 5. ALL DISTRIBUTION BOARDS SHALL BE PROVIDED WITH COPPER BUS BARS WHICH SHALL MEET NEMA AND UL STANDARDS FOR TEMPERATURE RISE. PROVIDE NEUTRAL BAR AND GROUND BAR AS WELL.
- 6. REFER TO ELECTRICAL DETAILS ON DWG E-500 AND E-501.
- 7. REFER TO ELECTRICAL SPECIFICATIONS ON DWG E-600 AND E-601.

KEY NOTES

- PROVIDE A GROUNDING ELECTRODE SYSTEM FOR THE ELECTRICAL SERVICE AS INDICATED IN DETAIL
- CONTACTOR AND CONTROL WIRING FOR GENERATOR START/STOP SIGNAL. PROVIDE 1" EMPTY CONDUIT.
- METER CABINET SHALL BE APPROVED AS PER EVERSOURCE CONNECTICUT POWER AND LIGHTING STANDARDS

LINE TYPES

- DARK CONTINUOUS LINE INDICATES NEW WORK BY
 - ELECTRICAL CONTRACTOR
 - CENTER LINE INDICATES NEW WORK BY ELECTRICAL CONTRACTOR
 - LIGHT CONTINUOUS LINE INDICATES EXISTING TO REMAIN

- DASHED LINE INDICATES DEMOLITION WORK BY CONTRACTOR

Revisions

DATE ISSUE/REVISION DESCRIPTION

Mastroluca Engineering Associates, llc

51 ZEPHYR RD TRUMBULL CT 06611

203-581-3838

JMASTROLUCA.MEA@GMAIL.COM

ISSUED FOR PERMIT/BID



PROJECT NAME

PHASE

OFFUTT EDUCATION CENTER

AT LACHAT FARM

106 GODFREY, ROAD
WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: NONE

DRAWING TITLE

ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE

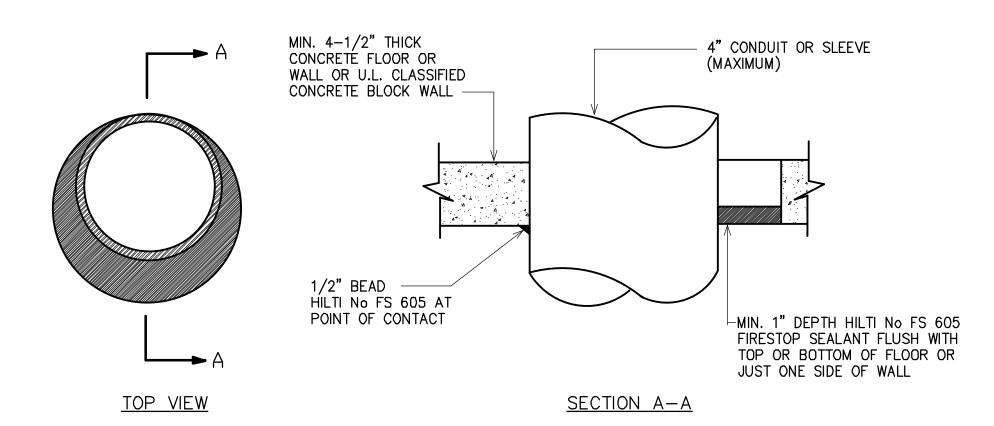
DRAWING#

 Ξ -401

EMERGENCY POWER SHUTDOWN DETAIL

NOTES:

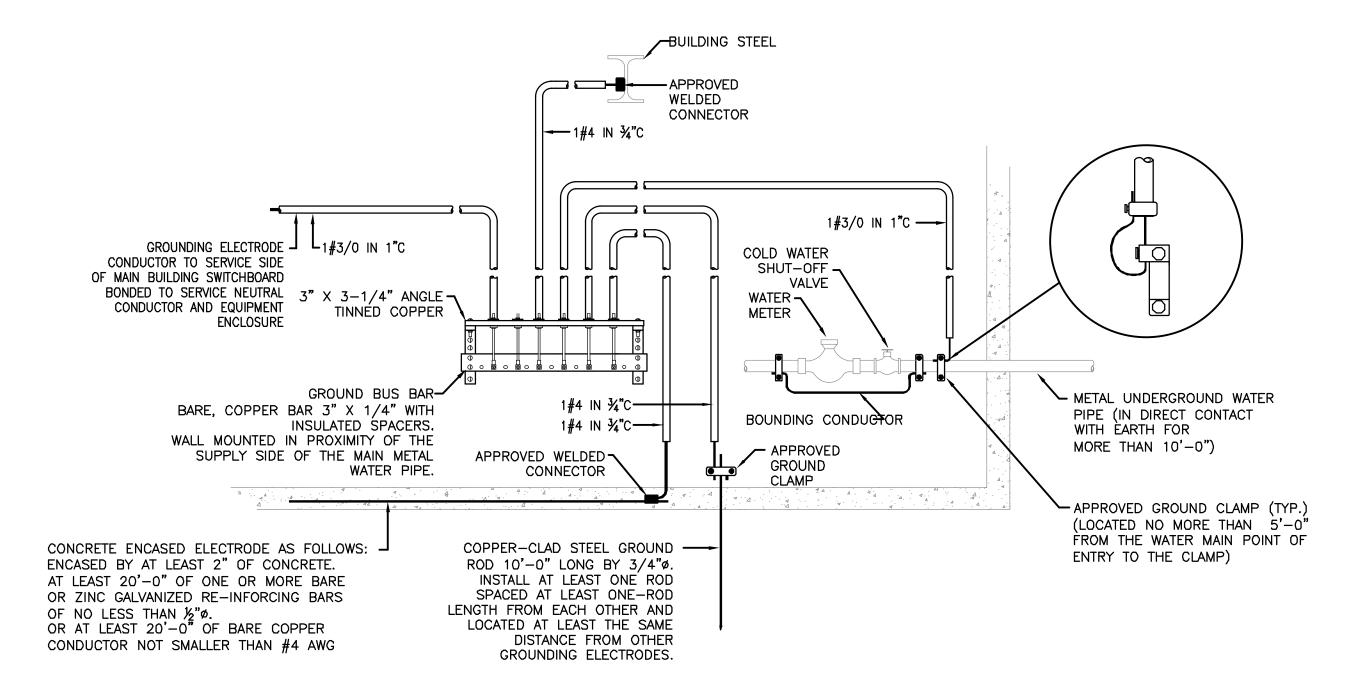
- 1. PROVIDE ALL WIRING AS PER APPROVED MANUFACTURES SHOP DRAWINGS.
- 2. ALL WIRING SHALL BE IN CONDUIT, U.O.N.
- 3. PROVIDE QUANTITY OF ASCO 917 RELAYS WITH REQUIRED NUMBER OF RELAY CONTACTS AS REQUIRED PLUS FOUR (4) SPARE.
- 4. PROVIDE ENGRAVED BAKELITE (RED WITH WHITE LETTERS) MOUNTED ABOVE EPO MARKED AS FOLLOWS "LAN ROOM EMERGENCY POWER SHUTDOWN".



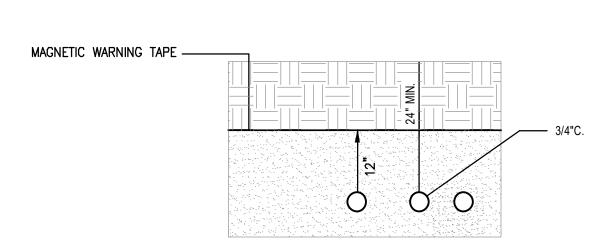
DETAIL OF CONDUIT THROUGH CONCRETE FLOOR/WALL OR BLOCK WALL N.T.S.

NOTES:

- 1. CONDUIT MAY BE CENTERED OR OFFSET IN HOLE. MAXIMUM DIAMETER OF HOLE OPENING IS 14 INCHES.
- 2. TEMPORARY FORMS MAY BE REQUIRED TO SUPPORT THE FIRESTOP SEALANT WHILE IT CURES.
- 3. FOR CONDUIT SLEEVE INSTALATIONS PROVIDE AROUND CONDUCTORS WITHIN SLEEVE.



GROUNDING ELECTRODE SYSTEM DETAIL



INSTALLATION IN TRENCH

- ALL CONDUIT SHALL BE INSTALLED AT A DEPTH OF AT LEAST 24" IN THE FOLLOWING ORDER:

- ENSURE THAT THE BOTTOM OF THE TRENCH IS WELL—TAMPED AND FREE OF ROCKS.
 INSTALL THE CONDUIT,
- 3. BACKFILL WITH 12 INCHES OF SAND.
- 5. INSTALL CABLE WARNING TAPE 12 INCHES OVER THE CONDUIT.
- 6. FILL IN THE REMAINDER OF THE TRENCH WITH NATIVE BACKFILL.

TRENCH DETAIL

Mastroluca Engineering Associates, LLC

51 ZEPHYR RD TRUMBULL CT 06611

203-581-3838

JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION



PERMIT/BID

PROJECT NAME
OFFUTT EDUCATION CENT
AT LACHAT FARM

106 GODFREY, ROAD WESTON, CT JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: NONE

DRAWING TITLE

ELECTRICAL DETAILS (SHEET 1 OF 3)

DRAWING#

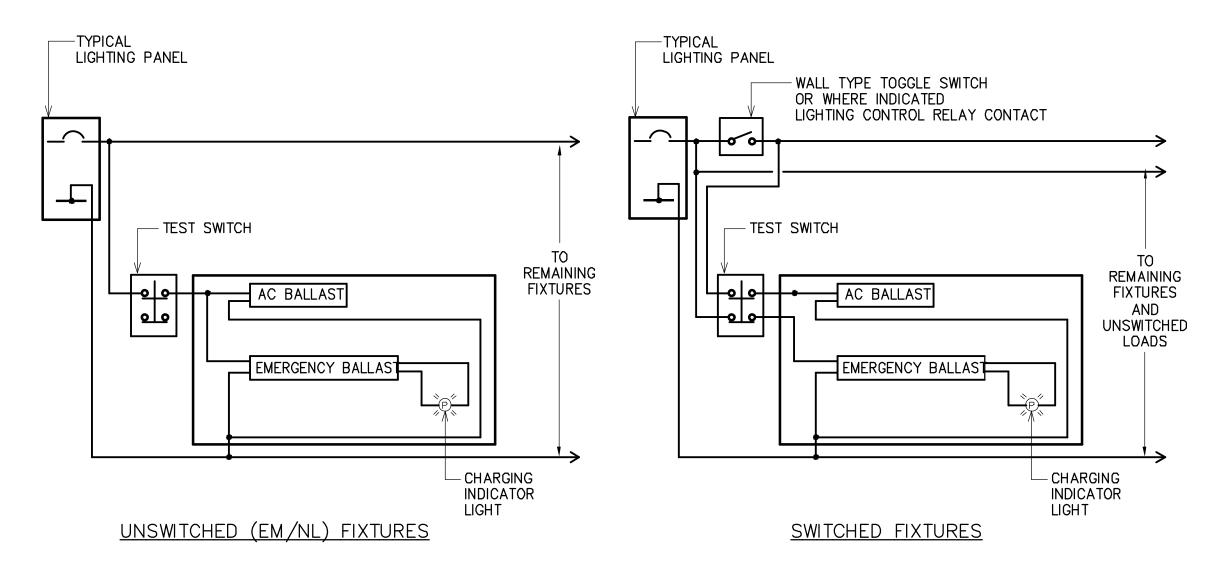
E-501

TYPICAL LIGHTING FIXTURE CIRCUITING DETAIL

N.T.S.

NOTE:

- LIGHTING FIXTURES SHALL BE CIRCUITED IN ACCORDANCE WITH CIRCUIT NUMBER INDICATED ADJACENT TO EACH FIXTURE ON THE LIGHTING DRAWINGS.
- 2. ARMORED CABLE MAYBE PROPOSED AS AN ALTERNATE TO CONDUIT. REFER TO SPECIFICATION.

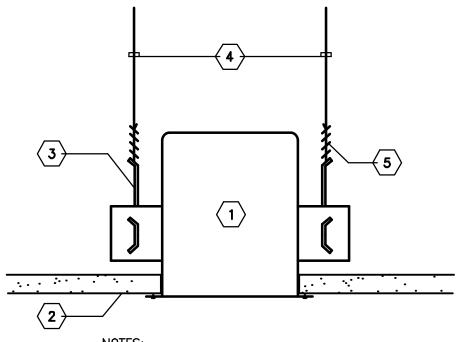


TYPICAL EMERGENCY LIGHTING FIXTURE WIRING DIAGRAM

N.T.S.

NOTES:

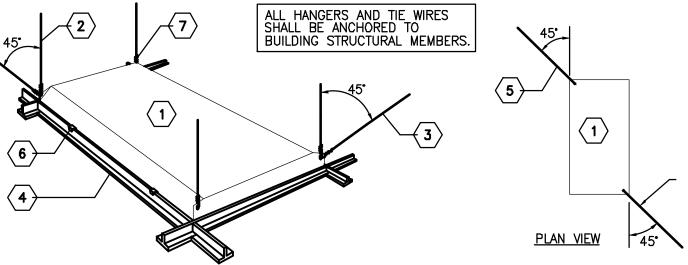
- 1. WIRING DIAGRAMS ARE APPLICABLE TO 'T-5', 'T-8' AND COMPACT FLUORESCENT TYPE EMERGENCY BALLAST AS MODIFIED BY FOLLOWING NOTES.
- 2. FOR FIXTURES WITH COMPACT FLUORESCENT TYPE LAMPS, CHARGEING INDICATOR LIGHT IS WIRED ADJACENT TO FIXTURE, WITH TEST BUTTON ON COMMON FACEPLATE.
- 3. ALL WIRING INDICATED EXTERNAL TO FIXTURE IS BRANCH CIRCUIT WIRING TO BE RUN IN CONDUIT. TEST SWITCH AND CHARGEING INDICATOR LIGHT SHALL BE WIRED IN ACCORDANCE WITH MANUFACTURERS WIRING DIAGRAMS.
- 4. EMERGENCY BALLAST SHALL BE BODINE CAT.#B30 FOR T-8 AND T-12 LAMPS, BODINE CAT.# B426 FOR 2 PIN COMPACT LAMPS, BODINE CAT.# B413 FOR 2 PIN TWIN TUBE AND QUAD LAMPS, AND BODINE CAT.# 94C FOR 4 PIN LAMPS W/O STARTER.



NOTES:

- 1 RECESSED DOWNLIGHT FIXTURE
- $\langle \mathbf{2}
 angle$ gypsum board or tile ceiling
- 3 FIXTURE MOUNTING BRACKET
- #12 AWG HANGER WIRE CONNECTED TO BUILDING STRUCTURAL MEMBER
- 5 MINIMUM 4 TURNS WITHIN 1-1/2" OF FIXTURE (TYPICAL)

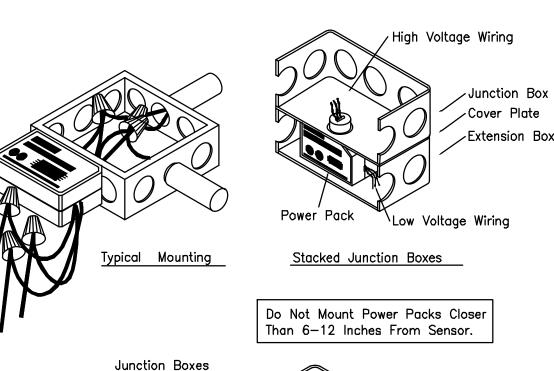
RECESSED DOWNLIGHT SEISMIC BRACING

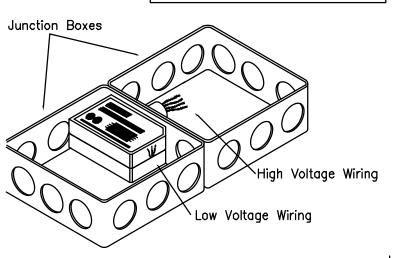


NOTES:

- 1 RECESSED FLUORESCENT LIGHT FIXTURE
- 2 #12 AWG HANGER WIRE (VERTICAL AT FOUR CORNERS)
- $\boxed{3}$ #12 AWG TIE WIRE (45° DIAGONAL AT OPPOSITE CORNERS)
- 4 T-BAR GRID (TYPICAL)
- $\overline{\left\langle 5\right\rangle}$ TIE WIRE
- 6 CADDY T-BAR CLIP FOR SECURING FIXTURE TO T-BAR GRID (4/FIXT.)
- 7 MINIMUM 4 TURNS WITHIN FIRST 1-1/2" (VERTICAL)

RECESSED LAY-IN FIXTURE SEISMIC BRACING
N.T.S.





Side by Side Junction Boxes

Power Pack Installed in J—Box

POWER PACK INSTALLATION DETAIL
N.T.S.

Mastroluca Engineering Associates, LLC

51 ZEPHYR RD TRUMBULL CT 06611
203-581-3838
JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION
PHA		1



PERMIT/BID

PROJECT NAME
OFFUTT EDUCATION CENT
AT LACHAT FARM

WESTON, CT

JOB NO.: MEA.2021.00011

106 GODFREY, ROAD

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE:NONE

DRAWING TITLE

ELECTRICAL DETAILS (SHEET 2 OF 3)

DRAWING#

E-502

1.1 SCOPE OF WORK:

FURNISH ALL REQUIRED LABOR, MATERIALS, EQUIPMENT AND CONTRACTOR'S SERVIC—ES NECESSARY FOR THE COMPLETE INSTALLATION OF ELECTRICAL ITEMS AS INDI—CATED ON THE DRAWINGS, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:

- A. DEMOLITION AND REMOVAL OF ELECTRICAL EQUIPMENT AS REQUIRED INCLUDING ALL CONDUCTORS AND CONDUIT BACK TO ITS SOURCE.
- B. INSTALLATION OF LIGHT FIXTURES AND LAMPS INCLUDING EXIT AND EMERGEN—CY LIGHTING.
- C. INSTALLATION OF WALL SWITCHES, RECEPTACLES, TELEPHONE OUTLETS, ETC.
- D. INSTALLATION OF NEW RACEWAY AND CONDUCTORS FOR LIGHTING AND POWER.
- E. CUTTING, CHANNELLING AND CHASING REQUIRED TO ACCOMMODATE THE INSTALLATION OF ELECTRICAL WORK AND ROUGH PATCHING.
- F. ADDITION AND/OR MODIFICATION OF EXISTING ELECTRICAL DISTRIBUTION EQUIP-
- G. INSTALLATION OF HVAC POWER WIRING AND FINAL CONNECTIONS TO HVAC
- H. INSTALLATION OF CONDUIT, JUNCTION BOXES, PULL BOXES, ETC. REQUIRED FOR THE AFOREMENTIONED EQUIPMENT.
- . MAINTENANCE OF PROPER OPERATION OF EXISTING BASE BUILDING SYSTEMS WITHIN THE CONTRACT AREA IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING.
- J. TEMPORARY LIGHT AND POWER DURING CONSTRUCTION.
- K. GROUNDING OF ALL EQUIPMENT AS REQUIRED BY CODE.
- L. MODIFICATION OF EXISTING FIRE ALARM SYSTEM.

1.2 INTERPRETATION OF DOCUMENTS:

EQUIPMENT.

- A. AS USED IN THE DRAWINGS AND SPECIFICATIONS FOR ELECTRICAL WORK, CERTAIN NON-TECHNICAL WORDS SHALL BE UNDERSTOOD TO HAVE SPECIFIC MEANINGS AS FOLLOWS REGARDLESS OF INDICATIONS TO THE CONTRARY IN THE GENERAL CONDITIONS OF OTHER DOCUMENTS GOVERNING THE ELECTRICAL WORK.
 - 1. "ELECTRICAL CONTRACTOR," "THIS CONTRACTOR," THE PARTY OR PARTIES WHO HAVE BEEN DULY AWARDED THE CONTRACT FOR AND ARE THEREBY MADE RESPONSIBLE FOR THE ELECTRICAL WORK AS DESCRIBED HEREIN.
- 2. "THIS CONTRACT," "THE CONTRACT" THE AGREEMENT COVERING THE WORK TO BE PERFORMED BY "THIS CONTRACTOR."
- 3. "EQUAL," "SATISFACTORY," "ACCEPTED," "ACCEPTABLE" "EQUIVALENT"

 ACCEPTABLE FOR USE ON THE PROJECT, AS DETERMINED BY THE ENGINEER BASED ON DOCUMENTS PRESENTED FOR SUCH DETERMINATION.
- 4. "THESE SPECIFICATIONS," "THIS SECTION, PART, DIVISION" (OF THE SPECIFICATION) THE DOCUMENT SPECIFYING THE WORK TO BE PERFORMED BY "THIS CONTRACTOR."
- 5. "THE ELECTRICAL WORK," "THIS WORK" ALL LABOR MATERIALS, EQUIPMENT APPARATUS, CONTROLS, ACCESSORIES, AND OTHER ITEMS REQUIRED FOR A PROPER AND COMPLETE INSTALLATION BY THE ELECTRICAL CONTRACTOR.
- 6. "ARCHITECT," "ENGINEER," "OWNER'S REPRESENTATIVE" THE PARTY OR PARTIES RESPONSIBLE FOR INTERPRETING, ACCEPTING AND OTHER—WISE RULING ON THE PERFORMANCE UNDER THIS CONTRACT.
- 7. "FURNISH" PURCHASE AND DELIVER TO THE PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT, ALL AS PART OF THE ELECTRICAL WORK.
- 8. "INSTALL" UNLOAD AT THE DELIVERY POINT AT THE SITE AND PERFORM EVERY OPERATION NECESSARY TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT, ALL AS PART OF THE ELECTRICAL WORK.
- 9. "PROVIDE" "FURNISH" AND "INSTALL."
- 10. "NEW" MANUFACTURED WITHIN THE PAST TWO YEARS AND NEVER BEFORE USED.

1.3 GENERAL REQUIREMENTS:

- A. DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES, REGULATIONS, BUILDING STANDARDS AND THE BEST PRACTICES OF THE TRADE FOR INSTALLATION OF ELECTRICAL WORK.
- B. THE ELECTRICAL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE, LOCAL CODES/REQUIRMENTS, STANDARD OF THE NATIONAL BOARD OF UNDERWRITERS, OSHA AND ALL AUTHORITIES HAVING JURISDICTION. WORK SHALL ALSO COMPLY WITH APPLICABLE BUILDING RULES AND REGULATIONS. THE BUILDING RULES AND REGULATIONS WHERE MORE STRINGENT THAN THIS SPECIFICATION, SHALL TAKE PRECEDENCE OVER THE SPECIFICATION UNLESS OTHERWISE NOTED. THIS CONTRACTOR IS RESPONSIBLE TO OBTAIN A COPY OF THE REGULATIONS PRIOR TO SUBMISSION OF BID. THE CONTRACTOR SHALL SECURE ALL CERTIFICATES OF REQUIRED ORDINANCES, AND DELIVER THEM TO THE OWNER'S REPRESENTATIVE.
- C. THE CONTRACTOR SHALL VISIT AND EXAMINE CAREFULLY THE AREAS AFFECTED BY THIS WORK TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. THE CONTRACTOR SHALL PERFORM THIS PRIOR TO SUBMITTING HIS PROPOSAL. THIS WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
- D. UPON REVIEW OF ELECTRICAL DRAWINGS AND PRIOR TO SUBMITTING HIS PROPOSAL, THE ELECTRICAL CONTRACTOR SHALL INFORM THE ARCHITECT AND/OR ENGINEER OF ANY DISCREPANCIES OR REQUEST CERTIFICATION, IF NECESSARY, CONCERNING THE INTENT OF THE PLANS AND SPECIFICATIONS TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION. WHERE ANY INFORMATION OR DIRECTION IS CONFLICTING BETWEEN THIS SPECIFICATION AND THE DRAWINGS OR BETWEEN DIFFERENT SPECIFICATION SECTIONS, OR BETWEEN DIFFERENT DRAWINGS AND CLARIFICATION CANNOT BE OBTAINED, THE MORE EXPENSIVE AND STRINGENT REQUIREMENT OR DIRECTION SHALL BE ADHERED TO. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS SHOULD THIS PROCEDURE NOT BE FOLLOWED.
- E. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS WHOSE WORK MIGHT AFFECT THIS INSTALLATION. CONTRACTOR SHALL ARRANGE ALL PARTS OF THIS WORK AND EQUIPMENT IN PROPER RELATION TO THE WORK AND EQUIPMENT OF OTHERS AND WITH BUILDING CONSTRUCTION AND ARCHITECTURAL FINISH SO THAT IT WILL HARMONIZE IN SERVICE AND APPEARANCE.

- F. THE DRAWINGS INDICATE SIZE AND GENERAL LOCATION OF WORK. SCALED DIMENSIONS SHALL NOT BE USED. THE EXACT LOCATION AND ELEVATION OF ALL LIGHTING FIXTURES, RECEPTACLES, ETC., SHALL BE DETERMINED FROM THE ARCHITECTURAL DRAWINGS.
- G. THE CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR, THE ARCHITECT AND THE OWNER PRIOR TO SUBMISSION OF BID TO DETERMINE WHAT WORK MUST BE PERFORMED AFTER NORMAL BUSINESS HOURS. UNLESS OTHER—WISE DIRECTED ANY NOISY WORK (CHOPPING, CORE DRILLING, HAMMERING, ETC.) AND BUILDING POWER INTERRUPTIONS SHALL BE PERFORMED OUTSIDE OF NORMAL BUSINESS HOURS. CONFIRM NORMAL BUSINESS HOURS WITH BUILDING
- H. WHERE PANELBOARDS, SWITCHES, CIRCUIT BEAKERS, TRANSFORMERS, ETC. ARE EXISTING TO BE REUSED THE CONTRACTOR SHALL CLEAN AND REFURBISH THE EQUIPMENT. THIS SHALL INCLUDE TIGHTENING ALL CONNECTIONS, REPLACING DEFECTIVE MECHANISMS, EXERCISING MECHANISMS AND PROVIDING ANY MISCELLANEOUS COMPONENTS SO THE EQUIPMENT IS IN FIRST CLASS WORKING ORDER. ALL TRANSFORMER WINDINGS SHALL BE MEGGER TESTED.

PART 2 - PRODUCTS

2.1 PANELBOARDS:

- A. PANELBOARD BOX SHALL BE MADE OF SHEET STEEL "BENT-UP" OR RIVETED OR BOLTED TOGETHER WITH EXTERIOR ANGLE IRON FRAME. BOX SHALL BE OF SUFFICIENT SIZE TO ALLOW A GUTTER AT LEAST 5-3/4" IN WIDTH ENTIRELY SURROUNDING EACH SECTION OF BOARD. INCREASE SIZE TO ACCOMMODATE FEEDER SIZE. PANELBOARDS SHALL BE SURFACE OR FLUSH TYPE AS NOTED ON THE DRAWINGS. PANEL BOXES SHALL BE GIVEN TWO COATS OF GREY ENAMEL PAINT.
- B. PROVIDE CODE GAUGE STEEL DOORS AND TRIMS (DOOR WITHIN A DOOR) FOR ALL PANELBOARD BOXES.
- C. TRIMS SHALL BE ATTACHED DIRECTLY TO BOX BY A FULL LENGTH PIANO HINGE. PROVIDE LOCKS AND KEYS.
- PANEL BUS BARS SHALL BE COPPER PROPORTIONED FOR A CURRENT DENSITY OF 1000 AMPERES PER SQUARE INCH OF CROSS—SECTIONAL AREA. PROVIDE A COPPER GROUND BAR IN EACH PANEL. PROVIDE AN ISOLATED GROUND BAR IN PANELS AS INDICATED ON PANEL SCHEDULES.
- E. PANELS SHALL BE PROVIDED WITH NEUTRAL BARS SIZED AT 200% OF THE PHASE BUS BARS AS CALLED FOR ON PANEL SCHEDULES.
- F. A TYPEWRITTEN LIST OF CIRCUITS SHOWING CLEARLY THE LOADS SUPPLIED BY EACH CIRCUIT SHALL BE INSTALLED ON THE INSIDE OF EACH PANELBOARD DOOR. THIS LIST SHALL BE MOUNTED IN A STEEL FRAME UNDER A PLASTIC WINDOW. EACH PANEL SHALL BE EXTERNALLY TAGGED WITH PERMANENT LAMACOID PLATE INDICATING PANEL IDENTIFICATION AND VOLTAGE.
- G. PHASE LEGS OF ALL PANELS SHALL BE BALANCED AT SUPPLY POINT. ANY PANEL FOUND WITH UNBALANCED LOADS SHALL HAVE ITS CIRCUITS REARRANGED AS REQUIRED TO BALANCE PHASE LEGS WITHIN 10%.
- H. PANELS SHALL BE AS MANUFACTURED BY WESTINGHOUSE, GENERAL ELECTRIC OR SQUARE "D" OR APPROVED EQUAL.

2.2 DISCONNECT SWITCHES:

- A. UNLESS OTHERWISE NOTED, DISCONNECT SWITCHES SHALL BE "QUICK—MAKE, QUICK—BREAK," HEAVY DUTY TYPE IN NEMA 1 ENCLOSURES FUSED OR UNFUSED AS INDICATED ON THE DRAWINGS. PROVIDE ALL FUSES AS REQUIRED. PROVIDE WEATHERPROOF DISCONNECT SWITCHES WHERE INSTALLED OUTDOORS OR AS INDICATED ON DRAWINGS.
- B. DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY ITE, WESTINGHOUSE, GENERAL ELECTRIC, OR SQUARE 'D'.

2.3 CIRCUIT BREAKERS:

- A. CIRCUIT BREAKERS SHALL BE BOLTED TO THE PANELBOARD BUS BARS. WHERE CIRCUIT BREAKERS ARE INSTALLED IN EXISTING PANELBOARDS. BREAKERS SHALL BE OF THE SAME MANUFACTURER AND BE COMPATIBLE WITH EXISTING PANELBOARD.
- B. CIRCUIT BREAKERS SHALL BE QUICK-MAKE, QUICK-BREAK WITH NON-WELDING CONTACTS COMPENSATED FOR AMBIENT TEMPERATURES AND SHALL HAVE A MINIMUM SHORT CIRCUIT RATING OF 10,000 AMPERES SYMMETRICAL FOR 120/280V PANELS AND 14,000 AMPERES SYMMETRICAL FOR 277/480V PANELS OR HIGHER WHERE NOTED.
- C. CIRCUIT BREAKERS SHALL BE OF THE "THERMAL—MAGNETIC" TYPE HAVING A BIMETALLIC ELEMENT FOR TIME DELAY OVERLOAD PROTECTION AND A MAGNETIC ELEMENT FOR SHORT CIRCUIT PROTECTION.
- D. THE CIRCUIT BREAKER SHALL BE CONTAINED IN AN INDIVIDUAL CASE ENCLOS—ING ONLY THE NUMBER OF POLES REQUIRED FOR THE PARTICULAR BREAKER.
- . ANY CIRCUIT BREAKER MADE AVAILABLE DUE TO DEMOLITION SHALL BE DESIGNATED AS SPARE ON PANELBOARD DIRECTORIES.
- CIRCUIT BREAKERS SHALL BE AS MANUFACTURED BY ITE, WESTINGHOUSE, GENERAL ELECTRIC, OR SQUARE "D".

2.4 FUSES:

- A. FUSES SHALL BE CURRENT LIMITING TYPE WITH A MINIMUM INTERRUPTING CAPACITY OR 200,000 RMS AMPERES AND OF THE CONTINUOUS CURRENT RATINGS AS SHOWN ON THE DRAWINGS.
- B. THEY SHALL HAVE AVERAGE MELTING TIME—CURRENT CHARACTERISTICS TO MEET THE UNDERWRITERS' LABORATORIES REQUIREMENTS FOR "CLASS K" 0—600 AMP FUSES AND "CLASS L" OVER 600 AMP FUSES. FUSES SHALL BE AS MANUFACTURED BY BUSSMAN OR SHAWMUTT.

2.5 RACEWAYS:

- A. ALL WRES SHALL BE RUN IN CONDUIT AS SPECIFIED HEREINAFTER, EACH LENGTH OF CONDUIT SHALL BEAR THE MAKER'S TRADEMARK OR STAMP. THE PLANS INDICATE THE GENERAL LOCATION OF OUTLET BOXES AND CIRCUITING. THE CONDUIT RUNS FOR THESE CIRCUITS MAY BE MODIFIED AT THE TIME OF INSTALLATION TO ADAPT SAME TO BUILDING CONSTRUCTION.
- B. FOR ALL SIZES OF CONDUIT LARGER THAN 1-1/2", USE STANDARD ELBOWS; IN SMALLER SIZES, FIELD BENDS WILL BE PERMITTED INSTEAD OF USING MANUFACTURED ELBOWS BUT CARE MUST BE TAKEN NOT TO DAMAGE THE CONDUIT. THE RADIUS OF THE INNER CURVE OF ANY BEND SHALL NOT BE ANY LESS THAN THAT PERMITTED BY CODE.
- C. CONDUIT SHALL BE SECURELY FASTENED IN PLACE AND HANGERS, SUPPORTS OR FASTENINGS SHALL BE PROVIDED AT EACH ELBOW AND AT EACH END OF EACH STRAIGHT RUN TERMINATED AT A BOX OR CABINET. WHERE RISER CONDUITS PIERCE FLOOR SLABS, THEY SHALL REST ON EACH FLOOR WITH APPROVED BEAM CLAMPS, PIPE STRAPS OR HEAVY IRON TIES WIRED TO THE STRUCTURAL MEMBERS SUPPORTING EQUIPMENT. SIZE AND TYPE OF ANCHOR SHALL BE BASED ON THE COMBINED WEIGHTS OF CONDUIT, HANGER AND CABLES. ALL HANGERS AND RODS SHALL BE PAINTED WITH ONE COAT OF ENAMEL.

- D. INSTALL CONDUIT EXPANSION FITTINGS IN EACH CONDUIT RUN WHEREVER IT CROSSES AN EXPANSION JOINT AND WHEREVER THE CONDUIT LENGTH EXCEEDS 200 FEET. EXPANSION FITTINGS AS MANUFACTURED BY OZ/GEDNEY.
- E. RUNNING THREADS SHALL NOT BE USED. WHERE CONDUIT WITH TAPERED THREADS CANNOT BE COUPLED WITH STANDARD CONDUIT COUPLINGS, O.Z./GED-NEY SPLIT COUPLINGS, OR ERICKSON COUPLINGS SHALL BE USED.
- F. LAY OUT AND INSTALL ALL CONDUIT RUNS TO AVOID PROXIMITY TO STEAM AND HOT WATER PIPES. DO NOT RUN CONDUIT WITHIN THREE INCHES OF SUCH PIPES EXCEPT WHERE CROSSINGS ARE UNAVOIDABLE, THEN THE CONDUIT SHALL BE KEPT AT LEAST 1 INCH FROM THE COVERING OF THE PIPE CROSSING.
- G. FEEDERS AND BRANCH CIRCUITRY ABOVE HUNG CEILING AND IN PARTITIONS SHALL BE RUN IN ELECTRICAL METALLIC TUBING (EMT) UNLESS OTHERWISE NOTED. FINAL CONNECTIONS TO MOTORS, LIGHT FIXTURES, ETC. MAY BE DONE WITH FLEXIBLE METALLIC CONDUIT (NO LONGER THAN SIX FEET).
- H. ALL CONDUIT IN MECHANICAL ROOMS, ELECTRICAL CLOSETS AND WHERE CONCEALED IN CONCRETE SHALL BE RIGID THREADED REGARDLESS OF SIZE.
- ELECTRIC METALLIC TUBING SHALL BE INDUSTRY STANDARD THIN WALL CONDUIT, EMT SHALL BE HOT DIPPED GALVANIZED STEEL ONLY. IT SHALL NOT BE LESS THAN 3/4" TRADE SIZE. IT SHALL BE USED FOR TRADE SIZE UP TO 4" UNLESS OTHERWISE NOTED.
- J. FLEXIBLE METALLIC CONDUIT SHALL BE OF THE GROUNDING TYPE. IT SHALL CONSIST OF GALVANIZED STEEL TAPS FORMED INTO AN INDUSTRY STANDARD INTERLOCKING COIL. IT SHALL NOT BE LESS THAN 3/4" TRADE SIZE.
- K. RIGID METAL CONDUIT SHALL BE INDUSTRY STANDARD STEEL CONDUIT. IT SHALL NOT BE LESS THAN 3/4" TRADE SIZE. STEEL CONDUIT SHALL BE HOT DIPPED GALVANIZED. IT SHALL BE USED FOR TRADE SIZE GREATER THAN 4" UNLESS OTHERWISE NOTED.
- L. THREADED FITTINGS SHALL BE USED WITH RIGID CONDUIT. SET SCREW OR COMPRESSION FITTINGS SHALL BE USED WITH EMT.
- M. EMPTY CONDUIT FOR NEW TELEPHONE AND DATA OUTLETS IN PARTITIONS SHALL BE 1" THIN WALL RUN CONCEALED IN WALLS, TERMINATED AND BUSHED 6" IN ACCESSIBLE HUNG CEILING AND DIRECTED TOWARDS PARTICULAR TELE—PHONE/DATA ROOM OR CLOSET. FURNISH DRAG LINE.
- N. RACEWAY SHALL BE MANUFACTURED BY NATIONAL WIRE PRODUCTS, TRIANGLE OR REPUBLIC.

2.6 WIRE AND CABLE:

- A. METAL CLAD CABLE (TYPE MC) FOR CONCEALED BRANCH CIRCUITRY MAYBE USED WHEN AN ALTERNATE PRICE IS SUBMITTED FOR ITS USE AND WHEN WRITTEN APPROVAL IS GIVEN TO THE CONTRACTOR FROM THE BUILDING OWNER AND ENGINEER. IT SHALL ONLY BE INSTALLED WHERE PERMITTED BY CODE. ARMORED CABLE SHALL BE AS MANUFACTURED BY AFC OR APPROVED EQUAL.
- B. ALL CONDUCTORS SHALL BE COPPER, TYPE THHN/THWN INSULATED. ALL CONDUCTORS SHALL HAVE 600 VOLT RATED INSULATION UNLESS OTHERWISE NOTED.
- C. THE MINIMUM WIRE SIZE FOR BRANCH CIRCUITS SHALL BE NO. 12 AWG EXCEPT 120 VOLT CIRCUITS OVER 100' IN LENGTH SHALL BE NO. 10 AWG.
- D. UNLESS SPECIFIED OTHERWISE, ALL WIRES #10 AWG AND SMALLER SHALL BE SOLID, CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED.
- E. FACTORY COLOR CODING SHALL BE AS FOLLOWS:
- 120/208 VOLT SYSTEM: PHASE 'A' BLACK, PHASE 'B' RED, PHASE 'C' BLUE, NEUTRAL WHITE , EQUIPMENT GROUND GREEN.
- 277/480 VOLT SYSTEM: PHASE 'A' BROWN, PHASE 'B' YELLOW, PHASE 'C' ORANGE, NEUTRAL WHITE, EQUIPMENT GROUND GREEN.
- F. INSTALL AND CONNECT UP COMPLETE CONDUCTORS FOR ALL CIRCUITS AND WIRING SYSTEMS (NOT MORE THAN A SINGLE 3 CIRCUIT HOMERUN IN A CONDUIT) UNLESS OTHERWISE NOTED.
- G. NO CONDUCTORS SHALL BE PULLED INTO ANY CONDUIT RUN BEFORE ALL CONDUIT JOINTS ARE MADE UP TIGHTLY, AND THE ENTIRE RUN IS SECURED IN PLACE. WHEN REQUIRED TO EASE THE PULLING OF WIRES INTO CONDUIT, USE POWDERED SOAPSTONE, MINERALLAC #100 OR APPROVED EQUAL BY THOMAS AND BETTS.
- H. TAG ALL FEEDERS IN ALL PULL BOXES, GUTTER SPACES, AND WIREWAYS THROUGH WHICH THEY PASS.
- I. LEAVE ALL WIRES WITH SUFFICIENT SLACK AT TERMINAL ENDS FOR CONVENIENT LOCATIONS TO DEVICES AND FOR CONVENIENT SERVICING.
- J. MAKE SPLICES IN FEEDER TAPS IN PANEL BOX GUTTERS WITH PRESSURE TYPE CONNECTORS BURNDY, NEPCO, OR O.Z./GEDNEY WITH COMPOSITION INSULAT—ING COVERS.
- K. SPLICES IN BRANCH WIRING SHALL BE TWISTED AND MADE MECHANICALLY TIGHT; THEN SECURED WITH 3M, SCOTCHLOCK OR THOMAS AND BETTS PIGTAIL CONNECTORS, CRIMP TYPE CONNECTORS SHALL NOT BE USED.
- L. SUPPORT CONDUCTORS IN VERTICAL RACEWAYS AT THE TOP OF ANY RACEWAY LONGER THAN 20 FEET. INCLUDE ADDITIONAL SUPPORTS SPACED AT INTER-VALS WHICH ARE NOT GREATER THAN 40 FEET. SUPPORT SHALL BE 0.Z./GED-NEY TYPE R.
- M. WRE AND CABLE SHALL BE MANUFACTURED BY ROME, PHELPS DODGE, GENERAL CABLE, SIMPLEX, GENERAL ELECTRIC CO. OR ANACONDA.

2.7 DEVICES:

- A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE NOTED.
 ALL DEVICES SHALL BE FLUSH MOUNTED UNLESS OTHERWISE NOTED. REFER TO SYMBOL LIST.
- 3. SINGLE POLE SWITCHES SHALL BE 120/277 VOLTS, RATED AT 20 AMPERES, QUIET OPERATION TYPE. FINISH OF TOGGLE AND DEVICE PLATE AS DIRECT—ED BY ARCHITECT.
- C. THREE WAY SWITCHES SHALL BE 120/277 VOLT, 20 AMPERES.
- D. DIMMER SWITCHES SHALL BE LUTRON NOVA T STAR SERIES OR APPROVED EQUAL. UTILIZE NT SERIES FOR STANDARD INCANDESCENT AND NTLV SERIES FOR LOW VOLTAGE LIGHTING WHICH UTILIZE TRANSFORMERS. DIMMERS SHALL BE RATED AT 120 VOLT, WATTAGE SIZE AS REQUIRED. FINISH AS DIRECTED BY ARCHITECT. WHERE DIMMER SWITCHES ARE LOCATED NEXT TO SINGLE POLE LOCK AND TOGGLE TYPE SWITCHES, THE SINGLE POLE SWITCH SHALL MATCH THE DIMMING SWITCH STYLE.
- E. SWITCH AND RECEPTACLE PLATES SHALL BE PLUMB AND SHALL FIT FLAT AGAINST THE WALL.
- F. ALL SWITCH AND RECEPTACLE MOUNTING HEIGHTS AND LOCATIONS SHALL BE TAKEN FROM ARCHITECT'S DRAWING UNLESS OTHERWISE NOTED.
- G. MULTIPLE DEVICES AT A COMMON LOCATION SHALL BE INSTALLED IN A COMMON MULTIGANG BOX WITH A COMMON FACEPLATE. DERATE DIMMER SWITCHES PER MANUFACTURER'S REQUIREMENTS WHEN GANGED.

2.8 PULLBOXES, JUNCTION BOXES AND OUTLET BOXES:

- A. PULLBOXES, JUNCTION BOXES AND OUTLET BOXES SHALL BE MANUFACTURED FROM GALVANIZED INDUSTRY STANDARD GAUGE SHEET STEEL.
- B. PROVIDE PULL BOXES AND JUNCTION BOXES IN LONG STRAIGHT RUNS OF RACEWAY TO ASSURE THAT CABLES ARE NOT DAMAGED WHEN THEY ARE PULLED, TO FULFILL REQUIREMENTS AS TO THE NUMBER OF BENDS PERMITTED IN RACEWAY BETWEEN CABLE ACCESS POINTS, THE ACCESSIBILITY OF CABLE JOINTS AND SPLICES, AND THE APPLICATION OF CABLE SUPPORTS.
- C. PULLBOXES AND JUNCTION BOXES SHALL BE SIZED SO THAT THE MINIMUM BENDING RADIUS CRITERIA SPECIFIED FOR THE WIRES AND CABLE ARE
- D. SWTCH, RECEPTACLE AND WALL OUTLET BOXES SHALL BE A NOMINAL 4 INCH SQUARE, 1-1/2 INCH OR 2-1/8 INCH DEEP AS REQUIRED BY CODE WITH A RAISED COVER, UNLESS OTHERWISE INDICATED ON THE DRAWING. PROVIDE 3/8 INCH FIXTURE STUD AS REQUIRED. GANGED OUTLET BOXES SHALL BE SUFFICIENT LENGTH TO SUIT CONDITIONS.
- E. LIGHTING FIXTURE BOXES SHALL BE 4 INCH OCTAGON WITH 3/8 INCH FIXTURE STUD. FOR SUSPENDED CEILING WORK, PROVIDE A 4 INCH OCTAGON BOX WITH REMOVABLE BACKPLATE WHERE REQUIRED.
- F. INCLUDE ALL REQUIRED JUNCTION/PULL BOXES AND OUTLET BOXES REGARDLESS OF INDICATIONS ON THE DRAWINGS (WHICH DUE TO SYMBOLIC METHODS OF NOTATION, MAY NOT SHOW ALL THAT ARE ACTUALLY REQUIRED).
- G. WHERE BOXES HAVE ANY SINGLE HORIZONTAL DIMENSION LARGER THAN 36", THEY SHALL BE FITTED WITH CABLE SUPPORT RACKS CONSISTING OF 3/4" DIAMETER STEEL PIPES WITH FLANGED ENDS BOLTED TO THE SIDES OR FRAME OF THE PULL BOXES. EACH PIPE SUPPORT SHALL BE FITTED WITH A CONTIN—UOUS FIBER INSULATING SLEEVE. THE PIPE SUPPORTS SHALL BE ARRANGED IN TIERS CORRESPONDING TO THE CABLES ENTERING AND LEAVING THE BOX. SUFFICIENT PIPE SUPPORT RACKS WILL BE INCLUDED WITH THE PULL BOX SO THAT NO CABLE SHALL REMAIN UNSUPPORTED FOR A HORIZONTAL DISTANCE GREATER THAN 36". IN NO CASE SHALL CABLE SUPPORT PIPE RACKS BE MOUNTED SO THAT THEY INTERFERE WITH THE REMOVAL OF SCREW COVERS.
- H. WHERE THE WIRES AND CABLES FOLLOWING THE SAME ROUTING ARE INDICATED AS RUNNING IN SEPARATE PULL BOXES, IT SHALL BE UNDERSTOOD THAT A SEGREGATION OF THE WIRES AND CABLES IS REQUIRED.
- I. BARRIERS SHALL BE PROVIDED FOR SYSTEMS AS FOLLOWS:
 - 1. BETWEEN WIRING WITH DIFFERENT VOLTAGE INSULATION RATINGS.
 - 2. BETWEEN NORMAL AND EMERGENCY WIRING.
- 3. BETWEEN 277 VOLT WIRING CONNECTED TO DIFFERENT PHASES WITHIN THE SAME LIGHT SWITCH OUTLET BOX.
- J. BARRIERS IN JUNCTION AND PULL BOXES SHALL BE OF NON-CURRENT CARRYING MATERIAL OF ADEQUATE THICKNESS FOR MECHANICAL STRENGTH BUT IN NO CASE LESS THAN 1/4". EACH BARRIER SHALL HAVE AN ANGLE IRON FRAMING SUPPORT ALL AROUND.
- K. ALL EQUIPMENT, DEVICE BOXES, JUNCTION BOXES, PULLBOXES AND OUTLET BOXES SHALL BE INSTALLED SO AS TO ALLOW ACCESS TO THE COVER. IF NECESSARY AND APPROVED BY ARCHITECT, PROVIDE ACCESS DOOR OR COVERPLATES IN AREAS WHERE UNOBSTRUCTED ACCESS IS NOT POSSIBLE.
- L. BOXES SHALL BE MANUFACTURED BY APPLETON ELECTRIC, CROUSE HINDS OR O.Z./GEDNEY CO.

2.9 SLEEVES AND INSERTS

GAI VANI7FD.

- A. FURNISH AND INSTALL SLEEVES AND INSERTS AS INDICATED ON DRAWINGS.
 ALL CONDUITS AND BOXES PENETRATING WATERPROOF CONSTRUCTION SHALL BE FLASHED AND MADE WATERTIGHT.
- B. SLEEVES FOR INTERIOR PARTITIONS AND FLOORS SHALL BE 16-GAUGE AND
- C. SLEEVES THROUGH FLOORS SHALL EXTEND TWO (2) INCHES ABOVE FINISHED

FLOOR EXCEPT AS NOTED. ALL FUTURE SLEEVES SHALL BE CAPPED.

- D. ALL SLEEVES SHALL BE SECURELY ANCHORED IN PLACE AND PROPERLY CAPPED TO PREVENT SEEPAGE OF CONCRETE INTO SLEEVE.
- E. SLEEVES SHALL BE SEALED WITH AN APPROVED FIREPROOF MATERIAL AFTER INSTALLATION OF FEEDERS.

2.10 SUPPORTS AND FASTENINGS

- A. ALL SUPPORTS AND FASTENINGS NECESSARY FOR THE SUPPORT OF ELECTRICAL EQUIPMENT SHALL BE IN ACCORDANCE WITH THE BEST INDUSTRY PRACTICE AND AS SPECIFIED HEREIN.
- B. FURNISH AND INSTALL ALL STEEL SUPPORTING MEMBERS, HANGERS, BRACKETS OR OTHER SPECIAL DETAILS REQUIRED AND NECESSARY FOR THE PROPER INSTALLATION OF ELECTRIC EQUIPMENT.
- C. ALL CHANNELS, JOINERS, HANGERS AND CAPS, NUTS AND BOLTS AND ASSOCI-ATED PARTS SHALL BE PLATED ELECTROLYTICALLY WITH ZINC OR SHALL BE DIPPED GALVANIZED.
- D. SUPPORT LESS THAN 2" TRADE SIZE, VERTICALLY RUN CONDUIT AT INTERVALS NO GREATER THAN 8 FEET. SUPPORT SUCH CONDUITS 2" TRADE SIZE OR LARGER, AT INTERVALS NO GREATER THAN THE STORY HEIGHT, OR 15 FT. WHICHEVER IS SMALLER.
- . WHERE THEY ARE NOT EMBEDDED IN CONCRETE, SUPPORT LESS THAN 1" TRADE SIZE, HORIZONTALLY RUN CONDUITS AT INTERVALS NO GREATER THAN 7 FT. SUPPORT SUCH CONDUITS, 1" TRADE SIZE OR LARGER, AT INTERVALS NO GREATER THAN 10 FT.
- F. INCLUDE SUPPORTING FRAMES OR RACKS EXTENDING FROM SLAB TO SLAB FOR WORK INDICATED AS BEING SUPPORTED FROM WALLS WHERE THE WALLS ARE INCAPABLE OF SUPPORTING THE WEIGHT.

G. INCLUDE SUPPORTING FRAMES OR RACKS FOR EQUIPMENT, INTENDED FOR

VERTICAL SURFACE MOUNTING, WHICH IS REQUIRED IN A FREE STANDING POSITION.

H. EXCEPT FOR BRANCH CIRCUITRY INSTALL ALL CONDUIT IN HUNG CEILING SPACE ON ACCEPTABLE HANGERS AND INSERTS. CONDUIT OR ARMORED CABLE

FOR BRANCH CIRCUITRY SHALL BE SUPPORTED BY CLAMPS OR PIPE STRAPS

SECURED TO THE CEILING SUPPORT SYSTEM (BLACK IRON) OR FROM STRUCTUR-

AL MEMBERS OR FROM THE DECK. 2.11 INSULATING BUSHINGS

A. ALL METAL CONDUIT AND ELECTRIC METALLIC TUBING 3/4" AND LARGER TERMINATING IN CABINETS, PULL BOXES AND SIMILAR BOXES SHALL HAVE INSULATED BUSHINGS. TYPE "B" OR TYPE "BLDG" (FOR GROUNDING BUSHING) AS MANUFACTURED BY O.Z./GEDNEY CO.

Mastroluca Engineering Associates, LLC

51 ZEPHYR RD TRUMBULL CT 06611

203-581-3838

JMASTROLUCA.MEA@GMAIL.COM

Revis	sions	
#	DATE	ISSUE/REVISION DESCRIPTION
PH	\CE	<u> </u>



ISSUED FOR

PERMIT/BID

OFFUTT EDUCATION CENTER
AT LACHAT FARM

WESTON, CT

JOB NO.: MEA.2021.00011

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE: NONE

DRAWING TITLE
ELECTRICAL
SPECIFICATIONS
(SHEET 1 OF 2)

106 GODFREY, ROAD

DRAWING#

E-601

2.12 GROUNDING:

- A. PROVIDE A GREEN GROUND CONDUCTOR IN CIRCUIT CONDUITS AS INDICATED.
- B. PROVIDE SUPPLEMENTARY GROUND BONDING WHERE METALLIC CONDUITS TERMINATE AT METAL CLAD EQUIPMENT (OR AT THE METAL PULL BOX OF EQUIPMENT) FOR WHICH A GROUND BUS IS SPECIFIED. ACCOMPLISH THIS BY EQUIPPING THE CONDUITS WITH A BUSHING OF THE GROUNDING TYPE CONNECTED INDIVIDUALLY TO GROUND BUS.
- C. ALL GROUND WIRES SHALL BE SUITABLY PROTECTED FROM MECHANICAL INJURY.

2.13 TEMPORARY LIGHTING AND POWER

- A. FURNISH AND INSTALL WIRING FOR ADEQUATE LIGHT AND SMALL TOOLS POWER FOR THE PROJECT. THIS SHALL INCLUDE INSTALLING ALL LAMPS, BREAKERS, AND FUSING, AS IS NECESSARY.
- B. TEMPORARY MAINTENANCE FOR THE ABOVE SHALL BE BASED ON OPERATION 1/2 HOUR BEFORE START OF FIRST TRADE THROUGH 1/2 HOUR AFTER END OF LAST TRADE'S NORMAL WORK DAY.
- C. TEMPORARY LIGHT AND POWER SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH CODES AND AUTHORITIES HAVING JURISDICTION.

2.14 FIRE ALARM SYSTEM:

- A. THE ELECTRICAL CONTRACTOR SHALL FURNISH NEW FIRE ALARM EQUIPMENT AS SHOWN AND CONNECT TO THE EXISTING FIRE ALARM SYSTEM. COORDINATE WITH BUILDING MANAGEMENT AND FIRE ALARM SYSTEM VENDOR PRIOR TO ANY WORK. THE CONTRACTOR'S BID SHALL INCLUDE ANY FIRE ALARM VENDOR'S COST FOR TIE-IN'S, PROGRAMMING, PARTS, ETC.
- B. WHERE CONSTRUCTION INTERFERES WITH EXISTING FIRE ALARM EQUIPMENT, OR IT IS LOCATED ON EXISTING WALLS TO BE DEMOLISHED, IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO NOTIFY THE BUILDING OWNER AND RELOCATE AT OWNER'S DIRECTION.
- C. IT IS THIS CONTRACTOR'S RESPONSIBILITY TO MAINTAIN FIRE ALARM SPEAKERS, STROBES, SMOKE DETECTORS, FIRE WARDEN STATIONS AND OTHER FIRE SAFETY DEVICES IN OPERATION AT ALL TIMES.
- D. AT THE COMPLETION OF THE LIFE SAFETY SYSTEM INSTALLATION THE CONTRACTOR SHALL TEST ALL FIRE ALARM DEVICES AND EMERGENCY LIGHTING DEVICES AND SUBMIT A REPORT TO THE ENGINEER VERIFYING THAT THE SYSTEMS ARE FULLY OPERATIONAL.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS THAT INCLUDE MANUFACTURER'S CUT SHEETS THAT INCLUDE EQUIPMENT MODEL NUMBERS, BATTERY CALCULATIONS, CONDUCTOR TYPE AND SIZES, AND VOLTAGE DROP CALCULATIONS.

2.15 LIGHT FIXTURES

- A. ALL LIGHT FIXTURE MOUNTING HARDWARE SHALL MATCH AND BE COORDINATED WITH THE NEW OR EXISTING CEILING SYSTEM TYPE.
- B. NOT USE
- C. ELECTRONIC BALLASTS SHALL BE HIGH-FREQUENCY, FULL OUTPUT TYPE FOR USE ON 265 MA RAPID START T-8 LAMPS. THEY SHALL HAVE A 'A' SOUND RATING OR BETTER. ALL ELECTRONIC BALLASTS SHALL HAVE LESS THAN 20 PERCENT TOTAL HARMONIC DISTORTION (THD). BALLASTS SHALL MEET OR EXCEED FCC REGULATIONS PART 18. ELECTRONIC BALLASTS FOR 1, 2, 3, OR 4 LAMP COMBINATIONS SHALL BE USED AS REQUIRED TO ACCOMMODATE THE FIXTURE DESCRIBED IN THE FIXTURE SCHEDULE.
- D. PROVIDE LAMPS SUITABLE FOR LIGHTING FIXTURES IN WHICH THEY ARE USED AND AS INDICATED ON THE DRAWINGS. FLUORESCENT LAMPS SHALL BE "RAPID START" AND SHALL DELIVER NOT LESS THAN 3150 LUMENS. COLOR SHALL BE WARM WHITE UNLESS OTHERWISE NOTED. INCANDESCENT LAMPS SHALL BE INSIDE FROSTED AND RATED AT 130 VOLTS UNLESS OTHERWISE SPECIFIED. LAMPS SHALL BE AS MANUFACTURED BY G.E., SYLVANIA, PHILIPS UNLESS OTHERWISE SPECIFIED ON DRAWINGS.
- E. REFER TO LIGHTING FIXTURE SCHEDULE FOR TYPES.

2.16 TRANSFORMERS

- A. THREE PHASE TRANSFORMERS SHALL BE 480 VOLT DELTA PRIMARY AND 208/120 VOLT WYE SECONDARY UNLESS OTHERWISE NOTED. TRANSFORMERS SHALL HAVE A MINIMUM OF TWO 2-1/2% FULL CAPACITY PRIMARY TAPS ABOVE AND FOUR 2-1/2% FULL CAPACITY PRIMARY TAPS BELOW NORMAL PRIMARY VOLTAGE.
- B. TRANSFORMERS 15 KVA AND ABOVE SHALL BE 115 DEGREE CENTIGRADE TEMPER-ATURE RISE ABOVE 40 DEGREES CENTIGRADE AMBIENT. ALL INSULATING MATERIALS TO BE IN ACCORDANCE WITH NEMA
- C. ALL COILS SHALL BE OF CONTINUOUS WOUND COPPER CONSTRUCTION AND IMPREGNATED WITH NON—HYDROSCOPIC, THERMO—SETTING VARNISH. ALL CORES TO BE CONSTRUCTED OF HIGH GRADE, NON AGING SILICON STEEL WITH HIGH MAGNETIC PERMEABILITY AND LOW HYSTERESIS AND EDDY CURRENT LOSSES.
- D. THE TRANSFORMERS SHALL BE IN A HEAVY GAUGE, SHEET METAL VENTILATED ENCLOSURE.
- E. IN ADDITION TO THE ABOVE TRANSFORMERS SUPPLYING PERSONAL COMPUTERS, LASER PRINTERS AND SIMILAR TYPE OF EQUIPMENT SHALL HAVE THE FOLLOW-ING CHARACTERISTICS TO COMPENSATE FOR NON-LINEAR LOAD CONDITIONS:
- 1. THE TRANSFORMER SHALL HAVE A U.L. K-FACTOR RATING OF NOT LESS THAN K-13
- 2. AN ELECTROSTATIC SHIELD SHALL BE INSERTED BETWEEN THE PRIMARY AND SECONDARY WINDING TO ATTENUATE HIGH FREQUENCY HARMONICS.
- 3. THE SECONDARY NEUTRAL SHALL BE 200% RATED WITH DOUBLE LUGS.
- F. TRANSFORMERS SHALL BE MANUFACTURED BY ITE, WESTINGHOUSE, GENERAL ELECTRIC OR SQUARE 'D'.

PART 3 - EXECUTION

3.1 GENERAL

- A. ALL CONTROL WIRING ASSOCIATED WITH MECHANICAL EQUIPMENT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.
- B. ALL DATA/VOICE/COMMUNICATION WIRING SHALL BE INSTALLED BY OTHERS. COORDINATE WITH THE RESPECTIVE INSTALLER.
- C. OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RESISTANCE RATED WALLS, PARTITIONS, FLOORS, OR CEILINGS SHALL BE FIRE STOPPED USING APPROVED METHODS. ALL SLEEVES SHALL HAVE BUSHINGS. SEALANT SHALL BE 3 HOUR.

- D. PREPARE "AS-BUILT" TRACINGS SHOWING ALL CHANGES IN WIRE SIZE, CIRCUIT NUMBERING, CIRCUIT ROUTING, EQUIPMENT LOCATIONS AND ELECTRICAL WORK AS ACTUALLY INSTALLED SUBMIT "AS-BUILTS" ALONG WITH THREE (3) COPIES OF ALL APPROPRIATE MAINTENANCE AND OPERATIONS MANUALS TO THE OWNER.
- E. ALL WORK SHALL BE GUARANTEED AGAINST DEFECTS FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE INSTALLATION.
- F. FURNISH 480 VOLT DANGER SIGNS AT ALL 480/277 VOLT EQUIPMENT PER
- G. AT COMPLETION OF ELECTRICAL WORK ALL "IN SLAB" TRENCH DUCT COVERS
- H. COORDINATE WITH BUILDING MANAGER FOR ANY SERVICE INTERRUPTION OF EXISTING LIGHTING OR POWER PANELS AND GIVE NOTICE TWO (2) DAYS PRIOR TO ANY WORK. ELECTRICAL CONTRACTOR TO DO WORK ON PREMIUM TIME SO AS NOT TO DISTURB EXISTING TENANTS ON OTHER FLOORS.
- I. ALL PANELBOARD COVERS SHALL BE REPLACED AT THE COMPLETION OF EACH DAYS WORK.
- J. MAINTAIN GROUND CONTINUITY THROUGHOUT ALL SYSTEMS.
- K. THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ANY EXISTING ELECTRICAL WORK WHICH INTERFERES WITH THE NEW INSTALLATION. ALL EXPOSED ABANDONED CONDUIT AND WRING SHALL BE REMOVED. THE CONTRACTOR SHALL CUT BACK ALL ABANDONED CONDUIT AND WRING TO FLOOR, WALL, OR HUNG CEILING. THIS WORK MAY NOT BE REPRESENTED ON THE DRAWINGS, BUT SHOULD BE TAKEN INTO ACCOUNT BY THE CONTRACTOR IN HIS PROPOSAL.
- L. INSULATION RESISTANCE TESTS SHALL BE PERFORMED ON ALL EXISTING CONDUCTORS AND EQUIPMENT DESIGNATED TO REMAIN. MEASURED INSULATION RESISTANCE SHALL CONFORM TO REQUIREMENTS OF THE LATEST EDITION OF THE CODE.
- M. ELECTRICAL CONTRACTOR SHALL MAINTAIN CONTINUITY OF CIRCUITRY FOR EXISTING EQUIPMENT AND DEVICES THAT ARE TO REMAIN. WHERE OUTLETS ARE REMOVED AND ARE NOT AT THE CIRCUIT DEAD END, EXTEND CIRCUITRY AS REQUIRED TO MAINTAIN INTEGRITY OF ORIGINAL CIRCUIT. WHERE A WIRING DEVICE IS TO BE REMOVED AND THAT WALL IS TO REMAIN THE ELECTRICAL CONTRACTOR SHALL REMOVE BRANCH CIRCUITRY FROM ITS SOURCE AND FILL—IN OUTLET BOX. BLANK PLATES WILL NOT BE PERMITTED.
- N. PRIOR TO ANY CHASING, CHOPPING, OR CORE DRILLING IS PERFORMED, THE CONTRACTOR SHALL FIELD INVESTIGATE CONDITIONS AND COORDINATE WITH ALL APPROPRIATE TRADES TO ENSURE THAT WORK WILL BE IN HARMONY WITH OTHER WORK AND NOT AFFECT ANY EXISTING BUILDING SYSTEMS. THIS WORK MUST BE APPROVED BY BUILDING MANAGEMENT PRIOR TO PROCEEDING.

3.2 SHOP DRAWINGS

- A. SUBMIT SIX (6) SETS OF SHOP DRAWINGS FOR THE FOLLOWING:
- 1. PANELBOARDS
- LIGHTING FIXTURES.
- 3. DEVICES.4. FIRE ALARM SYSTEM EQUIPMENT.

3.3 IDENTIFICATION OF EQUIPMENT

- A. ALL PANELBOARDS, CONTROL PANELS, AND CABINETS SPECIFIED HEREIN SHALL BE CLEARLY IDENTIFIED WITH THE EQUIPMENT DESIGNATION, VOLTAGE AND AMPERE RATING, EQUIPMENT SERVED AND ORIGIN OF THE INCOMING FEED. CONTROL PANELS SHALL BE IDENTIFIED WITH SYSTEM NAME. IDENTIFICATION SHALL BE BY WHITE ON BLACK PLASTIC NAMEPLATE WITH 1/2" MINIMUM LETTERING ATTACHED BY SCREWS.
- B. JUNCTION BOXES, SPLICE BOXES, ETC., SHALL BE IDENTIFIED WITH PANEL AND CIRCUIT NUMBERS, FOR CIRCUITS CONTAINED THEREIN. FACEPLATE OF SWITCHES FOR EQUIPMENT SUCH AS PANTRY EXHAUST FANS, MOTORIZED SCREENS, ETC., SHALL BE IDENTIFIED WITH THE NAME OF THE DEVICE CONTROLLED. IDENTIFICATION SHALL BE BY INDELIBLE MARKER IN CONCEALED LOCATIONS AND ADHESIVE ('P' TOUCH TYPE) LABELS IN EXPOSED LOCATIONS. EMERGENCY DEVICES SHALL BE IDENTIFIED IN RED AND UPS DEVICES IN BLUE.
- C. EMPTY CONDUITS SHALL BE IDENTIFIED WITH TAGS AT BOTH ENDS INDICATING THE LOCATION OF TERMINATION OF THE OPPOSITE END.
- D. FIRE ALARM SYSTEM JUNCTION BOXES SHALL BE PAINTED FIRE DEPARTMENT RED. APPROVED IDENTIFICATION CARDS SHALL BE FURNISHED ADJACENT TO ALL CONTROL PANELS AND MANUAL STATIONS.

MASTROLUCA ENGINEERING ASSOCIATES, LLC

51 ZEPHYR RD TRUMBULL CT 06611
203-581-3838
JMASTROLUCA.MEA@GMAIL.COM

#	DATE	ISSUE/REVISION DESCRIPTION

ISSUED FOR PERMIT/BID



AT LACHAT FARM
OFFUTT EDUCATION CENTE
PROJECT NAME

WESTON, CT

JOB NO.: MEA.2021.00011

106 GODFREY, ROAD

DRAWN BY: CHECK BY:

DATE: 02/16/2022 SCALE:NONE

DRAWING TITLE
ELECTRICAL
SPECIFICATIONS
(SHEET 2 OF 2)

DRAWING#

E-602

© 2022 MASTROLUCA ENGINEERING ASSOCIATES, LLC
These drawings, concepts, designs and ideas are the property of MASTROLUCA ENGINEERING
ASSOCIATES, LLC. They may not be copied, reproduced, disclosed to others, or used in
connection with any work other than the specified project for which they were prepared, in whole

or in part, without prior written consent of MASTROLUCA ENGINEERING ASSOCIATES, LLC