

CMS MYRTLE GROVE EXHAUST FAN REPLACEMENT

FOR
UNIVERSITY OF NORTH CAROLINA WILMINGTON

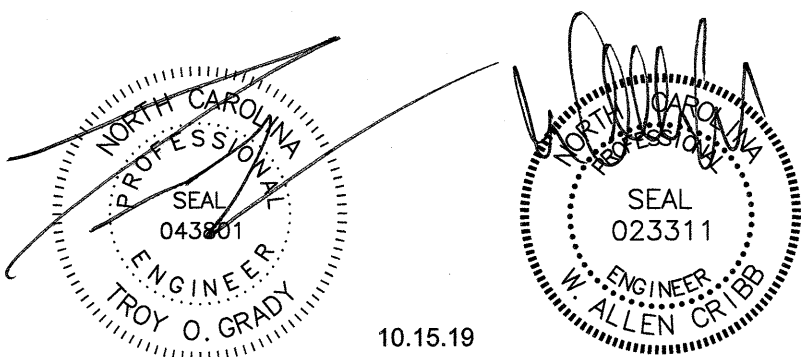
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POWER VENTILATOR SCHEDULE

DRAWING CODE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALTERNATE APPROVED MANUFACTURERS	FAN TYPE	SERVICE	CAPACITIES		DRIVE ARRANGEMENT	FAN RPM	MOTOR RPM	ELECTRICAL		SONES	WEIGHT (LBS.)	NOTES	ACCESSORIES			
						AIRFLOW (CFM)	ESP (IN. WG.)				MOTOR TYPE	MOTOR SIZE (HP)	V/PH/Hz	MCA	MOCp				
EF13	GREENHECK	USF-40	TWIN CITY, PENNBARRY	SINGLE WIDTH CENTRIFUGAL FANS	EXHAUST	23,000	6.07	DIRECT	1024	1221	ECM	40	460/3/60	65	70	56	2442	1,2	A,B,C,D,E
EF14	GREENHECK	USF-40	TWIN CITY, PENNBARRY	SINGLE WIDTH CENTRIFUGAL FANS	EXHAUST	23,000	6.07	DIRECT	1024	1221	ECM	40	460/3/60	65	70	56	2442	1,2	A,B,C,D,E
EF15	GREENHECK	USF-40	TWIN CITY, PENNBARRY	SINGLE WIDTH CENTRIFUGAL FANS	EXHAUST	23,000	6.07	DIRECT	1024	1221	ECM	40	460/3/60	65	70	56	2442	1,2	A,B,C,D,E

NOTES:
1. REFER TO SPECIFICATION SECTION 233423 - HVAC POWER VENTILATORS FOR FURTHER INFORMATION.
2. CONTRACTOR MUST MEASURE OPENING PRIOR TO ORDERING FAN.

ACCESSORIES:
A. BACKWARD INCLINED WHEEL
B. ISOLATORS - SPRING BASE
C. VFD RATED MOTOR
D. 1" DRAIN CONNECTION
E. HI-PRO POLY COATING

DAMPER SCHEDULE

DRAWING CODE	SERVICE	DESIGN BASIS MFR	MODEL	AIRFLOW (MAX. CFM)	SIZE (IN.W x IN.H)	CONFIGURATION	MOUNT TYPE	BLADE ACTION	DESCRIPTION	DAMPER DEPTH (INCHES)	PERFORMANCE REQUIREMENTS S.P. LOSS (INCHES WG) (48"x48" @1000FPM)	NOTES	ACCESSORIES
D1	INTAKE	TAMCO	1500 SW	23,000	48X48	1F	FLANGED TO DUCT	PARALLEL	SALT WATER RESISTANT AIR-FOIL DAMPER	4	1,000	1, 2	-
D2	INTAKE	TAMCO	1500 SW	23,000	48X48	1F	FLANGED TO DUCT	PARALLEL	SALT WATER RESISTANT AIR-FOIL DAMPER	4	1,000	1, 2	-
D3	INTAKE	TAMCO	1500 SW	23,000	48X48	1F	FLANGED TO DUCT	PARALLEL	SALT WATER RESISTANT AIR-FOIL DAMPER	4	1,000	1, 2	-

NOTES:
1. CONTRACTOR SHALL FIELD VERIFY REPLACEMENT DAMPER SIZES.
2. PROVIDE AND INSTALL REPLACEMENT PNEUMATIC DAMPER ACTUATOR HONEYWELL MP918A. PROVIDE ACTUATOR ACCESSORIES FOR A COMPLETE INSTALLATION

ACCESSORIES:
N/A

MECHANICAL LEGEND

(X)	EXISTING
EF#	EXHAUST FAN NUMBER
M	MOTORIZED DAMPER
	EXTENT OF DEMOLITION
	CONNECTION POINT - NEW TO EXISTING

MECHANICAL GENERAL NOTES

1. ALL MECHANICAL WORK SHALL BE IN STRICT COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS.

2. ALL DIMENSIONS AND ELEVATIONS FOR NEW EQUIPMENT, DUCTWORK, PIPING AND APPARATUS ARE APPROXIMATE AND ARE ONLY FOR CONTRACTOR'S GUIDANCE. CONTRACTOR SHALL SUBMIT DIMENSIONS AND ELEVATIONS VERIFIED IN THE FIELD. DUCTWORK AND PIPING INDICATED ON THE DRAWINGS, SECTIONS AND PROSPECTIVE VIEWS ARE SHOWN DIAGRAMMATICALLY. DUCT AND PIPE ELEVATIONS IN EXACT LOCATIONS SHALL BE DETERMINED BY THE INSTALLING CONTRACTOR AND DETAILED ON THE SHOP DRAWINGS.

3. ALL DUCT DIMENSIONS INDICATED ON PLAN ARE CLEAR INSIDE DIMENSIONS. CONTRACTOR MUST ACCOUNT FOR THE THICKNESS OF EXTERIOR INSULATION WHEN DETERMINING INSTALLATION CLEARANCES.

4. THE CONTRACTOR SHALL TEMPORARILY COVER ALL EXPOSED DUCT AND PIPE OPENINGS WITH A NON-COMBUSTIBLE MATERIAL, AND SEAL THEM AIR TIGHT TO PREVENT CONTAMINATION OF THE RESPECTIVE SYSTEMS DURING CONSTRUCTION.

5. CONTRACTOR SHALL REMOVE AND DISPOSE OF OFFSITE ALL DEMOLISHED WORK IN ACCEPTABLE AND SAFE MANNER AND SHALL KEEP ALL NON-WORK AREAS CLEAN AND SAFE.

6. ALL EXISTING EQUIPMENT AND CONNECTIONS THAT NEED TO BE TEMPORARILY DEMOLISHED FOR RIGGING AND / OR INSTALLATION SHALL BE REINSTALLED AND BROUGHT BACK TO ORIGINAL CONDITIONS PRIOR TO TEMPORARY REMOVAL.

7. 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.

MECHANICAL DEMOLITION NOTES

1. THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS FOR DEMOLITION REQUIREMENTS AND LAYOUT HIS WORK IN A COMPATIBLE AND COMPLEMENTARY MANNER. REMOVE ALL EQUIPMENT, DUCTWORK, SUPPORTS, CONTROLS, ACCESSORIES, ETC., AND MECHANICAL ITEMS MADE OBSOLETE BY THESE ALTERATIONS AS SHOWN IN THE MECHANICAL DRAWINGS. ALL ITEMS TO BE REMOVED OR MODIFIED MAY NOT BE SHOWN, HOWEVER, THIS CONTRACTOR SHALL REMOVE ANY MECHANICAL WORK AS REQUIRED BY THE CONSTRUCTION OR AS DIRECTED BY THE GOVERNMENT CONTRACTING OFFICER. SURVEY THE AFFECTED AREAS BEFORE SUBMITTING A BID.

2. SCHEDULING OF DEMOLITION - COORDINATE SCHEDULING OF MECHANICAL DEMOLITION WORK WITH THE CONTRACTING OFFICER SO AS TO MINIMIZE DISRUPTION OF THE GOVERNMENT'S USE OF THE FACILITIES AND MAINTAIN THE CONSTRUCTION SEQUENCE. SEE DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INSTRUCTIONS CONCERNING PHASING AND SEQUENCE OF WORK.

3. DEMOLISHED MATERIALS - UNLESS SPECIFICALLY REQUESTED BY THE GOVERNMENT, ALL DEMOLISHED MECHANICAL MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.

4. CUTTING AND PATCHING - PERFORM CUTTING AND PATCHING FOR MECHANICAL WORK SO AS TO MINIMIZE DAMAGE TO CEILINGS, FLOORS AND WALLS.

5. THESE DRAWINGS ARE COMPILED BY THE ENGINEER FROM THE GOVERNMENT'S AS-BUILT RECORD DRAWINGS AND LIMITED FIELD VERIFICATION OF EXISTING CONDITIONS FOR THE PURPOSE OF INDICATING THE WORK REQUIRED AND ARE BELIEVED TO BE CORRECT. NOTWITHSTANDING, THE CONTRACTOR SHALL VERIFY ALL DUCTWORK, EQUIPMENT LOCATIONS, DIMENSIONS AND ALL FIELD CONDITIONS AFFECTING HIS WORK.

6. WHERE MECHANICAL SYSTEMS PASS THROUGH THE DEMOLITION AREAS TO SERVE OTHER PORTIONS OF THE PREMISES, THEY SHALL REMAIN OR BE SUITABLY RELOCATED AND THE SYSTEM RESTORED TO NORMAL OPERATION. ADVISE THE CONTRACTING OFFICER IMMEDIATELY IF SUCH CONDITIONS ARE UNCOVERED BEFORE PROCEEDING WITH ADDITIONAL WORK.

7. PROTECT ALL EXISTING LIFE SAFETY SYSTEMS, FIRE ALARM AND PUBLIC ADDRESS SYSTEMS AND MAINTAIN THEM IN OPERATION THROUGHOUT THE PROGRESS OF THE WORK. NOTIFY THE CONTRACTING OFFICER IN WRITING OF SHUTDOWNS ARE REQUIRED PRIOR TO ANY OUTAGE OF SERVICE. WHERE THE DURATION OF A PROPOSED OUTAGE CANNOT BE TOLERATED BY THE GOVERNMENT, PROVIDE TEMPORARY CONNECTIONS AS REQUIRED MAINTAINING SERVICE.

8. SURVEY THE AFFECTED AREAS BEFORE STARTING DEMOLITION AS ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DEPICTED ON THE DRAWINGS AND SOME UNUSUAL CONDITIONS EXIST.

9. IF ANY UNUSUAL STRUCTURAL OR ARCHITECTURAL CONDITIONS ARE ENCOUNTERED DURING DEMOLITION, CONTACT THE CONTRACTING OFFICER FOR ASSISTANCE.

ABBREVIATIONS

TERM	ABBREVIATION	TERM	ABBREVIATION
ABOVE FINISHED FLOOR	AFF	INCH OF WATER GAUGE	INWG
ABOVE GROUND	AG	INDOOR UNIT	IDU
ABOVE SEA LEVEL	ASL	IRON PIPE SIZE	IPS
ACROSS THE LINE	ACL	KILOVOLT-AMP	KVA
AIR ADMITTANCE VALVE	AAV	KILOWATT	KW
AIR CONDITION(-ING, -ED)	AIR COND	KILOWATT HOUR	KWH
AIR-HANDLING UNIT	AHU OR AH	LEAVING AIR TEMPERATURE	LAT
AIR FLOW MEASURING STATION	AFMA	LEAVING WATER TEMPERATURE	LWT
AMBIENT	AMB	LENGTH	LG
AMPERE (AMP, AMPS)	AMP	LINEAR FEET	LF
ANALOG INPUT	AI	MAXIMUM	MAX
ANALOG OUTPUT	AO	MAXIMUM OVERCURRENT PROTECTION	MOCp
AND	&	MEDIUM-PRESSURE STEAM	MPS
APPARATUS DEW POINT	ADP	MILES PER HOUR	MPH
APPROXIMATE	APPROX	MINIMUM	MIN.
ARCHITECT	ARCH	MINIMUM CIRCUIT AMPERES	MCA
ATMOSPHERE	ATM	MINUTE	MIN
AVERAGE	AVG	MANUFACTURER	MFR
BRAKE HORSEPOWER	BHP	MOTOR CONTROL CENTER	MCC
BROWN & SHARPE WIRE GAGE	B&S	NOISE CRITERIA	NC
BRITISH THERMAL UNIT	BTU	NON-STANDARD PART LOAD	NPLV
BRITISH THERMAL UNIT PER HOUR	BTUH	NORMALLY OPEN	NO
1000 BRITISH THERMAL UNIT	MBH	NORMALLY CLOSED	NC
BUILDING	BLDG	NOT APPLICABLE	N/A
BUILDING AUTOMATION SYSTEM	BAS	NOT IN CONTRACT	N I C
CELSIUS	°C	NOT TO SCALE	NTS
CHILLED WATER RETURN	CHWR	NUMBER	NO
CHILLED WATER SUPPLY	CHWS	ON CENTER	OC
COEFFICIENT, VALVE FLOW	CV	OUNCE	OZ
COEFFICIENT OF PERFORMANCE FACTOR	COP	OUTDOOR UNIT	ODU
COMPRESSOR	COMP	OUTSIDE AIR	OA
CONCRETE	CONC	PACKAGE UNIT	PU
CONDENS(-ER, -ING, -ATION)	COND	PACKAGE TERMINAL AIR CONDITIONER	PTAC
CONNECTION	CONN	PARTS PER MILLION	PPM
CONTINUATION	CONT	PERCENT	%
COOLING LOAD	CLG LOAD	PHASE	PH
CUBIC FEET	CU FT	POUNDS	LBS
CUBIC INCH	CU IN	POUNDS PER SQUARE FOOT	PSF
CUBIC FEET PER MINUTE	CFM	POWER VENTILATOR	PV
CFM, STANDARD CONDITIONS	SCFM	PRESSURE	PRESS
DECIBEL	dB	PRESSURE REDUCING VALVE	PRV
DEGREE	DEG OR °	PRESSURE SAFETY VALVE	PSV
DEDICATED OUTDOOR AIR SYSTEM	DOAS	PUMPED CONDENSATE	PC
DEGREES FAHRENHEIT	DEG, F	QUANTITY	QTY
DETAIL	DET	RATED LOAD AMPS	RLA
DEW-POINT TEMPERATURE	DPT	RECIRCULATE	RECIRC
DIAMETER	DIA	REDUCED PRESSURE BACKFLOW PREVENTER	RPZ
DIAMETER, INSIDE	ID	REFRIGERANT (12, 22, ETC.)	R22, R410
DIAMETER, OUTSIDE	OD	REFRIGERANT LIQUID	RL
DIFFERENCE OR DELTA	DIFF	REFRIGERANT SUCTION	RS
DIGITAL INPUT	DI	REQUIRED	REQD OR REQ'D
DIGITAL OUTPUT	DO	RELATIVE HUMIDITY	RH
DOMESTIC HOT WATER	DHW	RETURN AIR	RA
DOMESTIC HOT WATER RECIRCULATION	DHWR	REVOLUTIONS PER MINUTE	RPM
DRY-BULB TEMPERATURE	DBT	REVOLUTIONS PER SECOND	RPS
DUCTLESS SPLIT SYSTEM AIR HANDLER	DAH	ROOF VENTILATOR	RV
DUCTLESS SPLIT SYSTEM HEAT PUMP	DHP	ROOF TOP UNIT	RTU
ENERGY EFFICIENCY RATING	ERR	SAFETY FACTOR	SF
EFFICIENCY	EFF	SEASONAL ENERGY EFFICIENCY RATIO	SEER
ELECTRIC UNIT HEATER	EUH	SECOND	S
ELEVATION	EL	SHADING COEFFICIENT	SC
ENTERING	ENT	SPECIFICATION	SPEC
ENTERING WATER TEMPERATURE	EWT	SQUARE	SQ
ENTERING AIR TEMPERATURE	EAT	STANDARD	STD
EXISTING	(X)	STATIC PRESSURE	SP
EXTERNAL AMBIENT TEMPERATURE	EAT	SUPPLY	SPLY
EXTERNAL STATIC PRESSURE	ESP	SUPPLY AIR	SA
EXHAUST AIR	EA	TEMPERATURE	TEMP
EXHAUST FAN	EF	TEMPERATURE DIFFERENCE	TD
FACE VELOCITY	FVEL	THERMOSTAT	T STAT
FAHRENHEIT	°F	TONS OF REFRIGERATION	TONS
FEET PER MINUTE	FPM	TO BE DETERMINED	TBD
FEET PER SECOND	FPS	TOP OF STEEL	TOS
FLOOR	FLR	TOTAL DYNAMIC HEAD	TDH
FOOT OR FEET	FT	TYPICAL	TYP
FULL LOAD AMPS	FLA	U-FACTOR	U
GAGE OR GAUGE	GA	UNDER GROUND	UG
GALLONS	GAL	UNLESS OTHERWISE NOTED	UON
GALLONS PER HOUR	GPH	UNIT HEATER - ELECTRIC	UH
GALLONS PER MINUTE	GPM	VARIABLE AIR VOLUME	VAV
GALLONS PER DAY	GPD	VARIABLE FREQUENCY DRIVE	VFD
GAS UNIT HEATER	GUH	VELOCITY	VEL
GRAINS	GR	VENTILATION, VENT	VENT
HEAD	HD	VENT THRU ROOF	VTR
HEAT EXCHANGER	HX	VERTICAL	VERT
HEATING AND VENTILATION UNIT	HV	VOLT	V
HEATING, VENTILATION AND AIR CONDITIONING	HVAC	VOLT AMPERE	VA
HEIGHT	HGT	VOLUME	VOL
HERTZ	Hz	WATER PRESSURE DROP	WPD
HIGH DENSITY POLYPROPYLENE	HDPE	WATER GAUGE	WG
HIGH-PRESSURE STEAM	HPS	WATT	W
HORSEPOWER, HEAT PUMP	HP	WATT-HOUR	WH
HOT WATER COIL	HWC	WITH	W/
HOURL(S)	HR	WEIGHT	WT
HUMIDITY, RELATIVE	RH	WET BULB	WB
INTEGRATED PART LOAD VALUES	IPLV	YARD	YD
INCH	IN.	YEAR	YR

NOTE: ALL ABBREVIATIONS MAY NOT BE USED IN PROJECT.

UNIVERSITY OF NORTH CAROLINA WILMINGTON
CMS MYRTLE GROVE EXHAUST FAN REPLACEMENT
5600 MARVIN K. MOSS LANE, WILMINGTON, NORTH CAROLINA
STATE ID#

MECHANICAL
ABBREVIATIONS, NOTES, LEGEND AND SCHEDULES

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DRAWN: GAS
DESIGNED: GAS
CHECKED: TOG

DRAWING NO:
M-001

REVISION:
0

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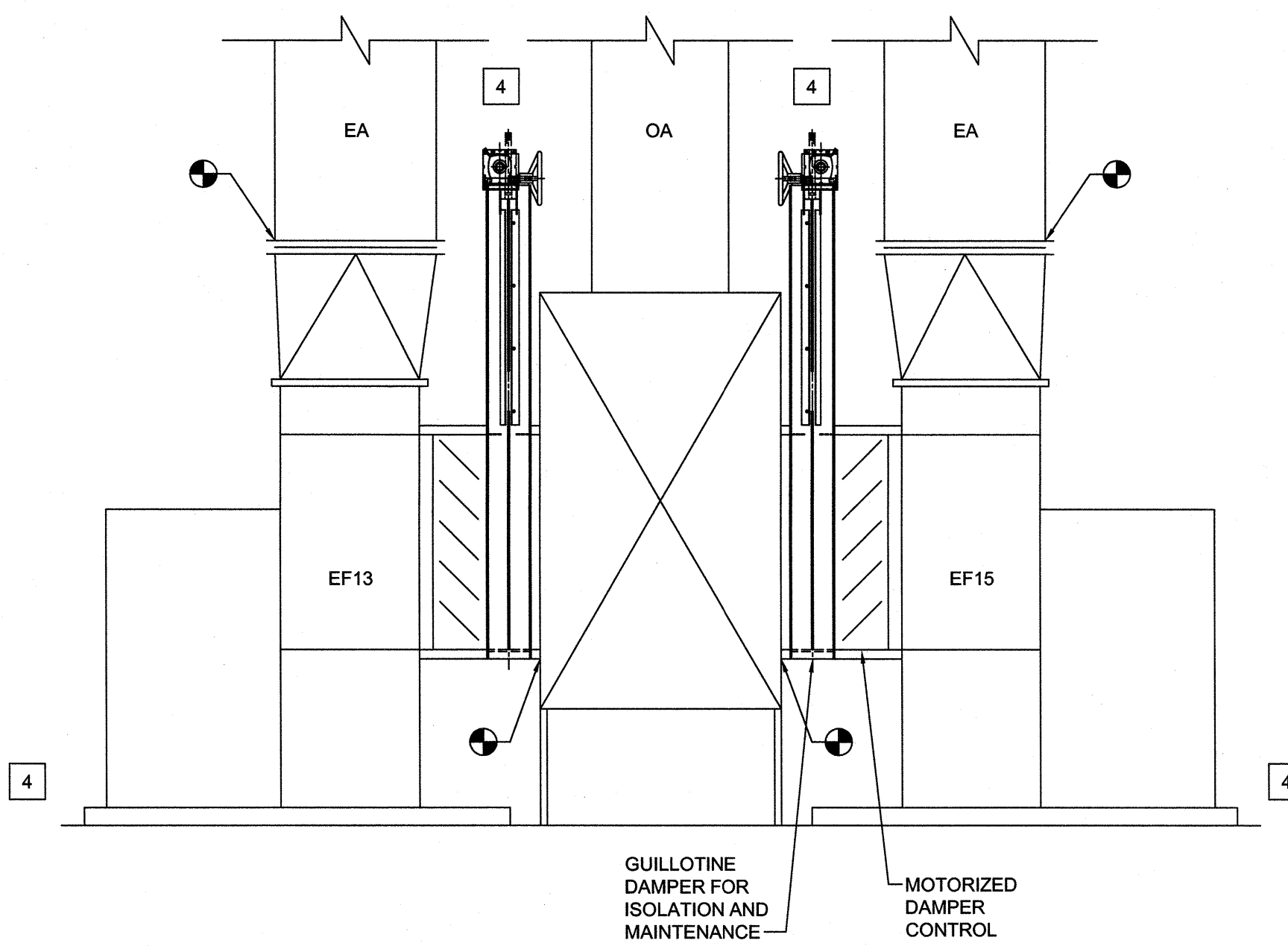
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PROFESSIONAL

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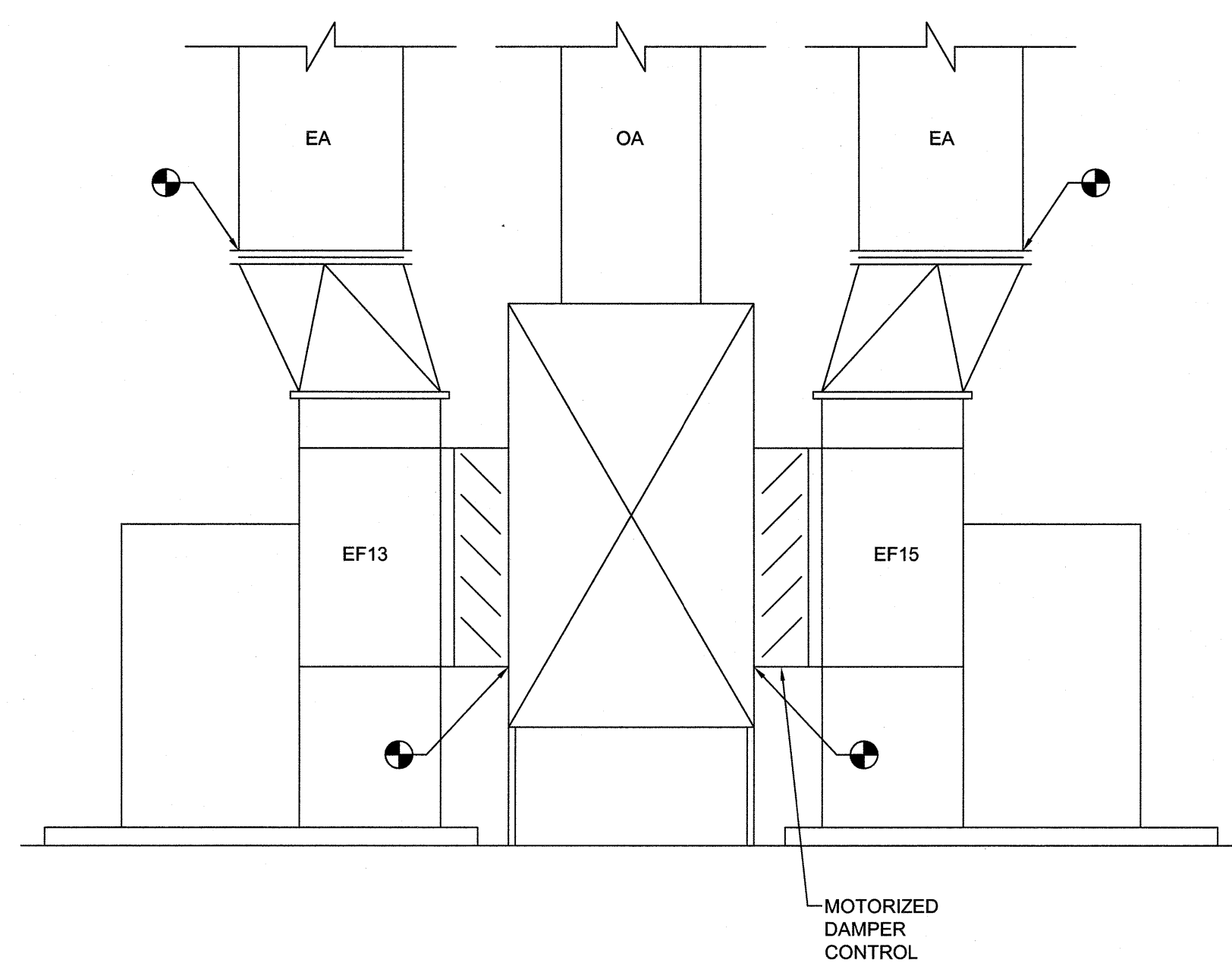
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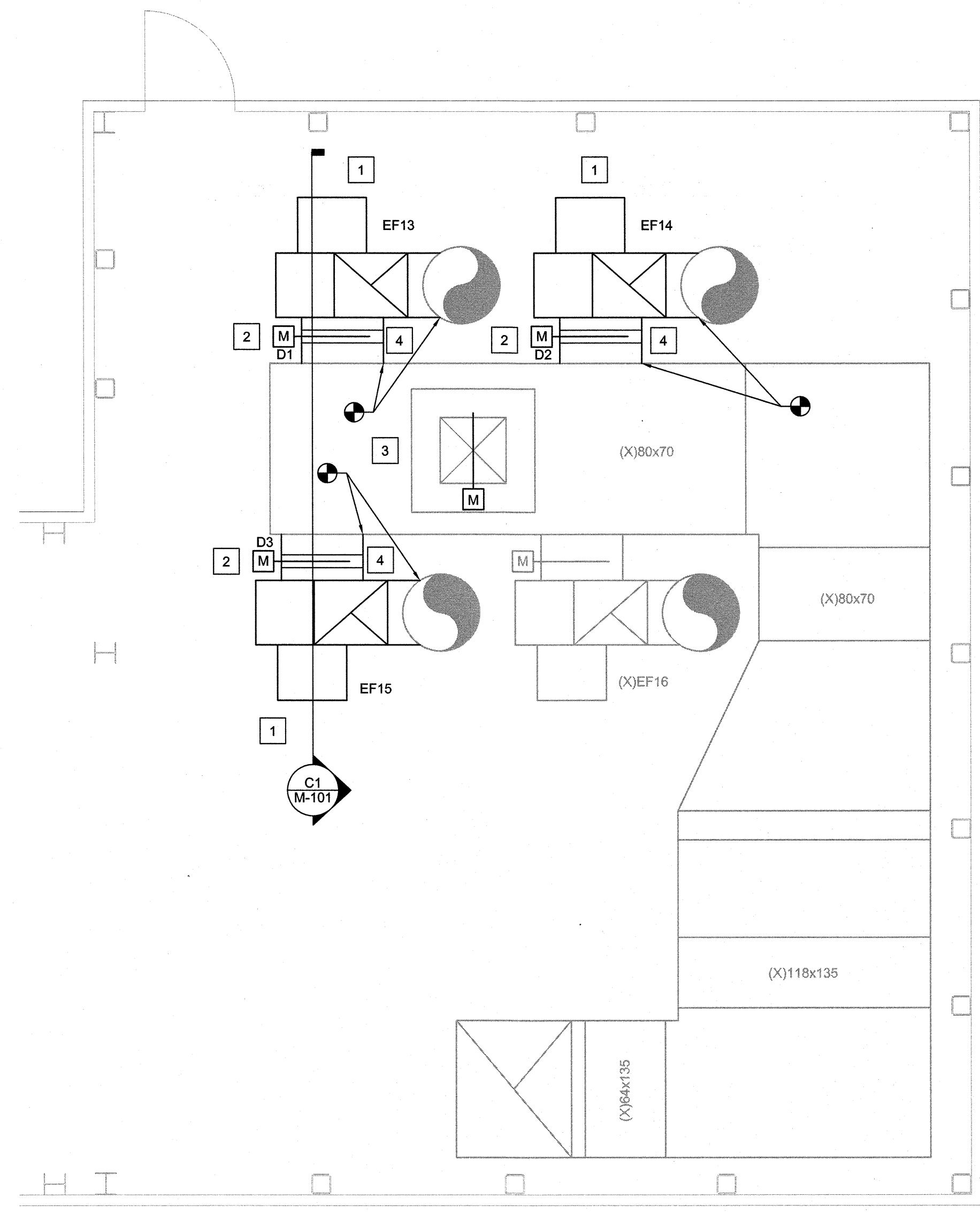
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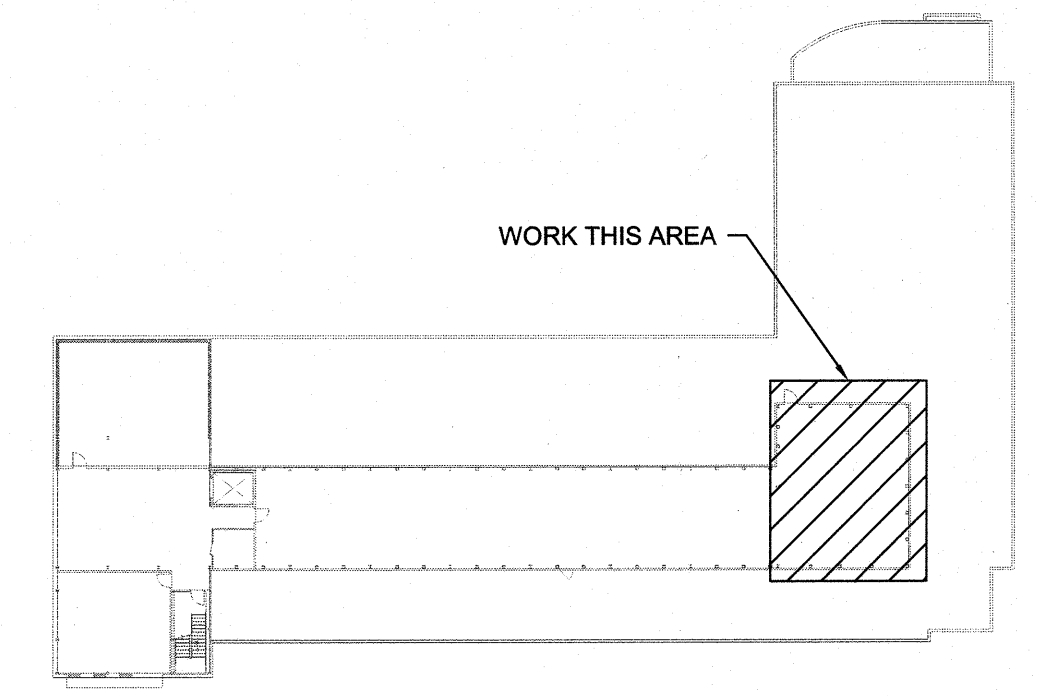
C1 ALTERNATE EXHAUST FAN AND DAMPER ASSEMBLY SECTION
NOT TO SCALE



A1 EXHAUST FAN AND DAMPER ASSEMBLY SECTION
NOT TO SCALE



A3 MECHANICAL PENTHOUSE PLAN
1/4" = 1'-0"



A5 KEYPLAN
NOT TO SCALE

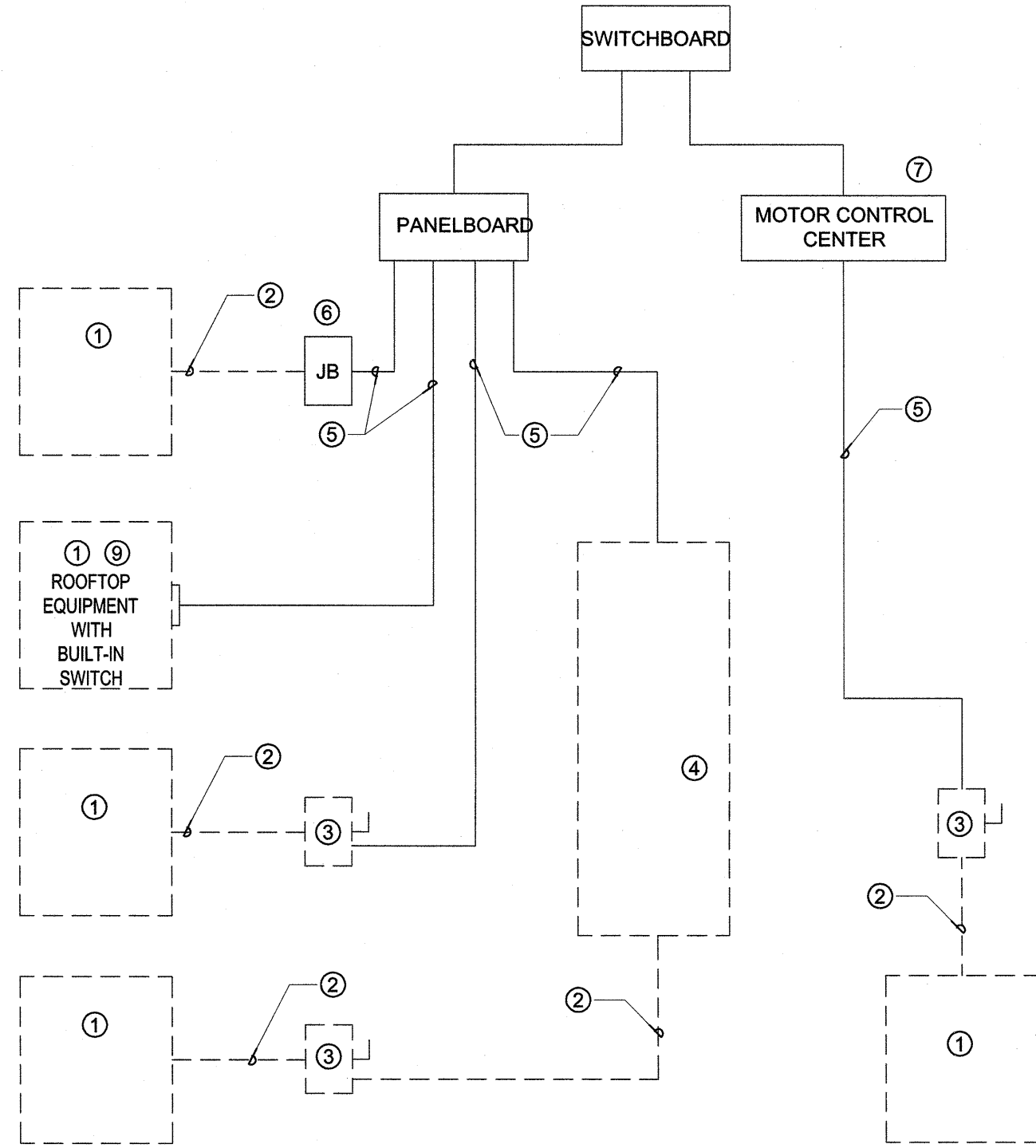
MECHANICAL KEYED NOTES

- 1 PROVIDE AND INSTALL EXHAUST FAN. CONNECT TO EXISTING EXHAUST DUCT AND EXISTING VERTICAL EXHAUST STACK.
- 2 INSTALL NEW ISOLATION DAMPER. CONTROLS CONTRACTOR MUST REPLACE PNEUMATIC ACTUATOR WITH ELECTRONIC ACTUATOR AND INTEGRATE INTO EXISTING CONTROLS.
- 3 CONTROLS CONTRACTOR MUST REPLACE EXISTING PNEUMATIC AIR DAMPER ACTUATOR WITH ELECTRONIC.
- 4 (ALTERNATE #1) PROVIDE MANUAL GUILLotine DAMPER CONSTRUCTED OF GALVANIZED METAL WITH A FLANGED FRAME TO BE PLACED UPSTREAM OF MOTORIZED DAMPER AND SIZED TO MATCH MOTORIZED DAMPER. REWORK/EXTEND CONCRETE EQUIPMENT PAD AS NEEDED.

MECHANICAL GENERAL NOTES

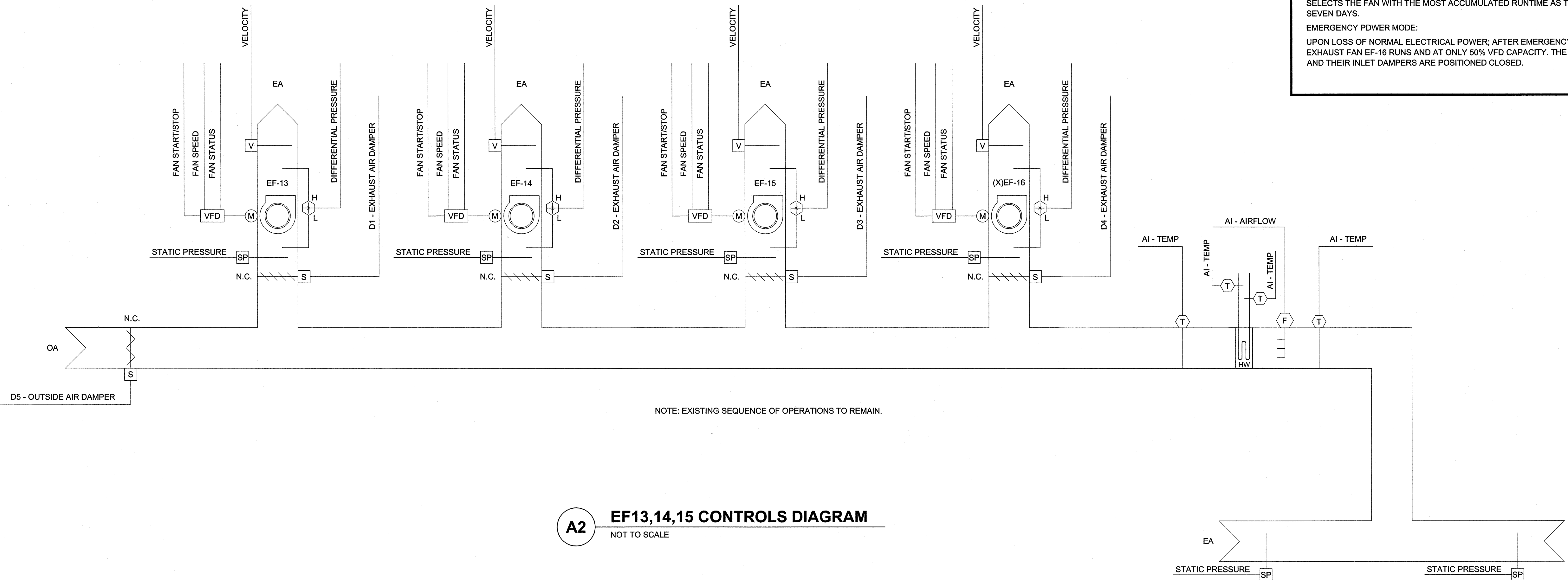
1. CONTRACTOR MUST TEST AND BALANCE EXHAUST SYSTEM AND VERIFY SYSTEM OPERATES PER EXISTING SEQUENCE OF OPERATIONS ON SHEET M-601.

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UNIVERSITY OF NORTH CAROLINA WILMINGTON CMS MYRTLE GROVE EXHAUST FAN REPLACEMENT 5600 MARVIN K. MOSS LANE, WILMINGTON, NORTH CAROLINA STATE ID# MECHANICAL PENTHOUSE PLAN		JOB NO.: 19113 DRAWN: GAS DESIGNED: GAS CHECKED: TOG
DRAWING NO: M-101		REVISION: 0



- MECHANICAL NOTES**
- EQUIPMENT OF TRADES OTHER THAN ELECTRICAL.
 - CONDUIT AND WIRING BY HVAC, PLUMBING CONTRACTOR OR OTHER TRADES.
 - IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC, IT SHALL BE PROVIDED AND INSTALLED BY THE EQUIPMENT CONTRACTOR.
 - A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER. LOCATE ADJACENT TO EQUIPMENT.
 - FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK. SEE PANELBOARD SCHEDULES FOR WIRE AND BREAKER SIZES.
 - JUNCTION BOX MAY BE SHOWN ON ELECTRICAL PLANS FOR SOME EQUIPMENT. IF NO STARTER OR DISCONNECT IS SUPPLIED, A JUNCTION BOX SHALL BE INSTALLED ADJACENT TO EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LINE SIDE WIRING TO THE JUNCTION BOX. LOAD SIDE WIRING WILL BE PROVIDED BY MECHANICAL CONTRACTOR OR OTHER TRADES.
 - PROJECTS UTILIZING AN MCC, THE STARTER CB, OR VFD IN THE MCC ARE PROVIDED BY THE ELECTRICAL CONTRACTOR.
 - IN ALL CASES THE EQUIPMENT CONTRACTOR SHALL MAKE FINAL CONNECTIONS, START UP AND TEST EQUIPMENT.
 - IF THE ROOF TOP FAN IS NOT PROVIDED WITH BUILT IN SWITCH, THE ELECTRICAL CONTRACTOR SHALL PROVIDE A DISCONNECT SWITCH.
 - IN A SINGLE PRIME CONTRACT, IT IS THE RESPONSIBILITY OF THE PRIME CONTRACTOR TO COORDINATE BETWEEN THE ELECTRICAL AND OTHER TRADES.

C1 MECHANICAL EQUIPMENT CONNECTION DETAIL
NOT TO SCALE



A2 EF13,14,15 CONTROLS DIAGRAM
NOT TO SCALE

SEQUENCE OF OPERATIONS

MANIFOLD EXHAUST SYSTEM SEQUENCE OF OPERATION:

THE MANIFOLD EXHAUST FAN SYSTEM CONSISTS OF EXHAUST FANS EF-13, EF-14, EF-15 AND EF-16 AND THEIR RESPECTIVE EXHAUST INLET DAMPERS, D-1 THROUGH D-4, AND OUTSIDE AIR INTAKE DAMPER D-5. THE FANS ARE STARTED AND STOPPED BY THE DMS CONTROLLER. THEY ARE STARTED ON DEMAND VIA A LEAD-LAG SEQUENCE WITH A MINIMUM OF ONE FAN AND A MAXIMUM OF THREE FANS OPERATING AT ANY ONE TIME. WHEN TWO OR MORE FANS ARE RUNNING, THE DMS CONTROLLER MODULATES THEIR VFD CONTROLLERS IN UNISON IN ORDER TO MAINTAIN A PRESET EXHAUST DUCT STATIC PRESSURE, AS SENSED BY ESP-1 AND ESP-2. THE DMS SELECTS THE LOWER OF THE TWO STATIC SIGNALS AS ITS CONTROLLING INPUT. WHEN ANY FAN IS STARTED ITS RESPECTIVE MOTORIZED INLET DAMPER IS OPENED. CONVERSELY, WHEN ANY FAN IS STOPPED, ITS INLET DAMPER IS CLOSED.

EXHAUST DUCT STATIC PRESSURE CONTROL:

WITH ONE EXHAUST FAN RUNNING, THE DMS CONTROLLER MODULATES THE FAN'S VFD IN ORDER TO MAINTAIN SETPOINT OF THE EXHAUST DUCT STATIC PRESSURE. AS THE STATIC PRESSURE DIFFERENTIAL FALLS BELOW SETPOINT (I.E. EXHAUST DUCT STATIC APPROACHES BUILDING SPACE STATIC), THE DMS CONTROLLER SIGNALS THE FAN'S VFD CONTROLLER TO GRADUALLY INCREASE RPM. SIMILARLY, AS THE EXHAUST STATIC PRESSURE DIFFERENTIAL INCREASES, THE REVERSE OCCURS.

IF THE REQUIRED EXHAUST DUCT STATIC PRESSURE CANNOT BE MAINTAINED WITH ONE FAN OPERATING AT ITS MAXIMUM RPM, THE DMS CONTROLLER STARTS A SECOND EXHAUST FAN (THAT WITH THE LOWEST ACCUMULATED RUNTIME). THE VFD OF THE SECOND FAN IS GRADUALLY RAMPED UP TO 50% SPEED WHILE AT THE SAME TIME THE VFD OF THE FIRST FAN IS GRADUALLY RAMPED DOWN TO 50% SPEED. WHEN BOTH VFD'S REACH 50%, THE DMS CONTROLLER THEREON MODULATES BOTH VFD'S IN UNISON AS REQUIRED TO MAINTAIN EXHAUST DUCT STATIC AT SETPOINT. IF THE REQUIRED EXHAUST DUCT STATIC PRESSURE CANNOT BE MAINTAINED WITH TWO FANS OPERATING AT THEIR MAXIMUM RPM, THE DMS CONTROLLER STARTS A THIRD EXHAUST FAN (THAT WITH THE LOWER ACCUMULATED RUNTIME OF THE TWO REMAINING FANS). THE VFD OF THE THIRD FAN IS GRADUALLY RAMPED UP TO 66.6% SPEED WHILE AT THE SAME TIME THE FIRST TWO FAN VFD'S ARE GRADUALLY RAMPED DOWN TO 66.6% SPEED. WHEN ALL THREE VFD'S REACH 66.6%, THE DMS CONTROLLER THEREON MODULATES THE THREE VFD'S IN UNISON AS REQUIRED TO MAINTAIN EXHAUST DUCT STATIC AT SETPOINT. SIMILARLY, WHEN IT IS DETERMINED THAT THE REQUIRED DUCT STATIC PRESSURE CAN BE MAINTAINED WITH LESS FANS OPERATING, THE REVERSE SEQUENCE OCCURS. THUS, WHEN THREE FANS OPERATE AT LESS THAN 66% FOR FIFTEEN MINUTES OR LONGER, THE DMS CONTROLLER SELECTS THE FAN WITH THE HIGHER ACCUMULATED RUN TIME AND THEN GRADUALLY RAMP'S ITS VFD DOWN TO ZERO WHILE AT THE SAME TIME RAMPING UP THE OTHER TWO VFD'S PROPORTIONATELY. WHEN THE SELECTED VFD REACHES ZERO, ITS FAN IS STOPPED. THE TWO OPERATING FANS CONTINUE TO HAVE THEIR VFD'S MODULATED IN UNISON. TYPICALLY, THE SAME RAMP DOWN SEQUENCE OCCURS WHEN SHIFTING FROM TWO OPERATING FANS TO ONE. WHEN TWO FANS OPERATE AT LESS THAN 50% FOR FIFTEEN MINUTES OR LONGER, THE DMS CONTROLLER SELECTS THE FAN WITH THE HIGHER ACCUMULATED RUNTIME AND THEN GRADUALLY RAMP'S ITS VFD DOWN TO ZERO WHILE AT THE SAME TIME RAMPING UP THE OTHER OPERATING FAN VFD PROPORTIONATELY. WHEN THE SELECTED FAN VFD REACHES ZERO, IT IS STOPPED.

EXHAUST STACK AIR VELOCITY CONTROL:

THE DMS CONTROLLER MONITORS THE EXHAUST AIR VELOCITY THROUGH THE EXHAUST STACK OF EACH EXHAUST FAN. WHEN THE OPERATING FANS' EXHAUST AIR VELOCITY STAYS BELOW 2500 FPM FOR THREE MINUTES OR LONGER, THE DMS CONTROLLER GRADUALLY OPENS OUTSIDE AIR INTAKE DAMPER D-5. THEREON, D-5 IS MODULATED AS REQUIRED TO MAINTAIN THE EXHAUST STACK VELOCITY BETWEEN 2500 AND 3500 FPM. WHEN THE DMS CONTROLLER IS IN THE PROCESS OF SHIFTING TO A LOWER OR A HIGHER NUMBER OF OPERATING FANS, DAMPER D-5 IS POSITIONED CLOSED.

FAN FAILURE MODE:

IF ANY EXHAUST FAN FAILS TO START OR SHUTS DOWN DUE TO A MECHANICAL OR ELECTRICAL MALFUNCTION, THE DMS CONTROLLER STOPS THE FAULTY FAN AND STARTS THE STANDBY FAN. ROTATION OF THE STANDBY FAN IS DONE WEEKLY. ON TUESDAY OF EACH WEEK THE DMS CONTROLLER SELECTS THE FAN WITH THE MOST ACCUMULATED RUNTIME AS THE NEW STANDBY FAN FOR THE NEXT SEVEN DAYS.

EMERGENCY PDWER MODE:

UPON LOSS OF NORMAL ELECTRICAL POWER; AFTER EMERGENCY POWER SWITCHES ON, ONLY EXHAUST FAN EF-16 RUNS AND AT ONLY 50% VFD CAPACITY. THE OTHER THREE FANS ARE SHUT DOWN AND THEIR INLET DAMPERS ARE POSITIONED CLOSED.

UNIVERSITY OF NORTH CAROLINA WILMINGTON
CMS MYRTLE GROVE EXHAUST FAN REPLACEMENT
5600 MARVIN K. MOSS LANE, WILMINGTON, NORTH CAROLINA
STATE ID#

MECHANICAL
CONTROLS

JOB NO.: 19113
DRAWN: GAS
DESIGNED: GAS
CHECKED: TOG

DRAWING NO:
M-601

REVISION:
0

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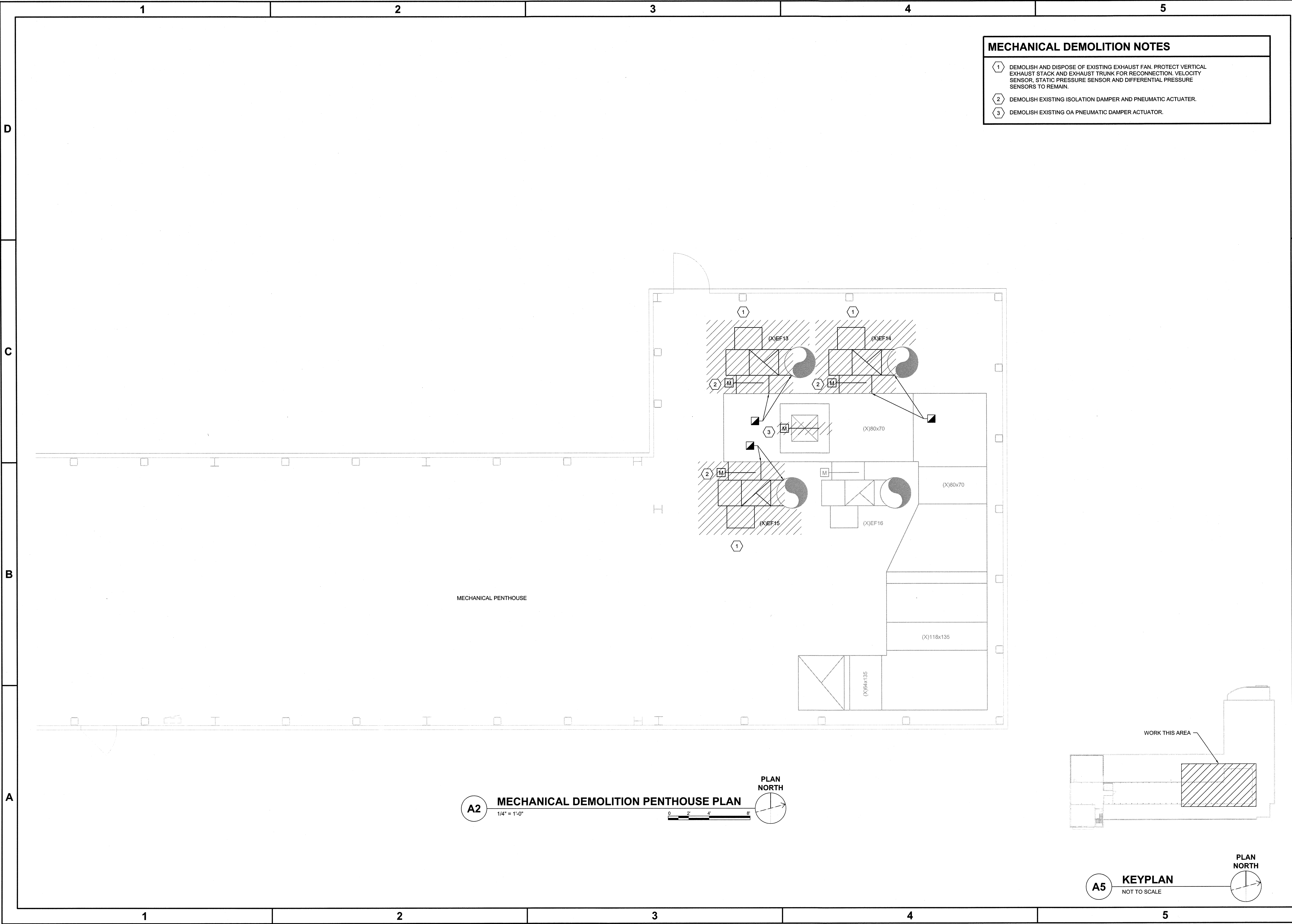
PROFESSIONAL
SEAL
043801
ENGINEER
TROY O. GRADY

10.15.19

ISSUED FOR CONSTRUCTION
Revision No. 0
Description:

REVISIONS

10.15.19
Date:



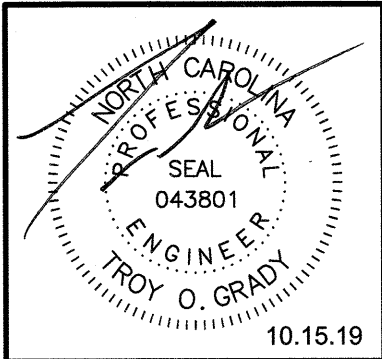
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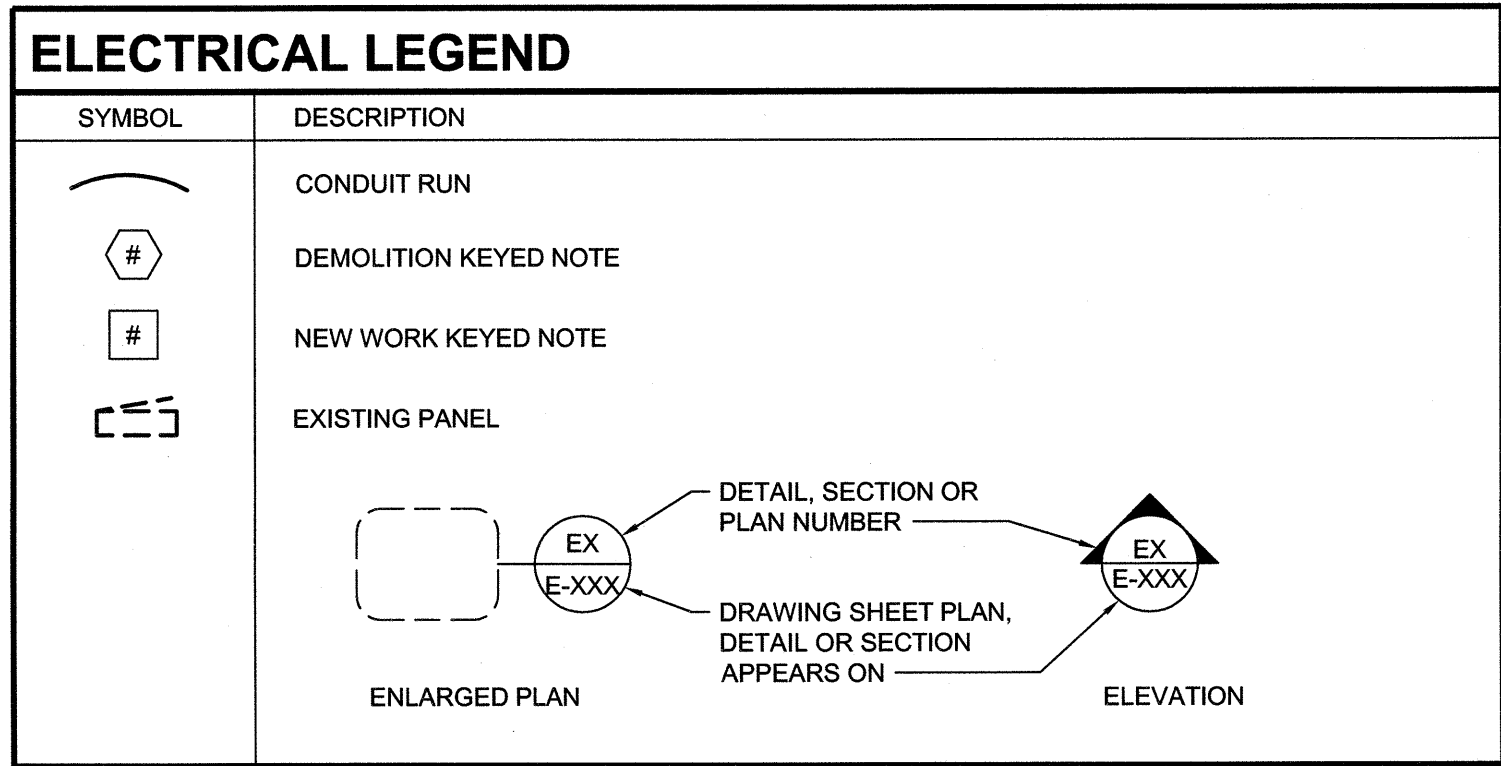
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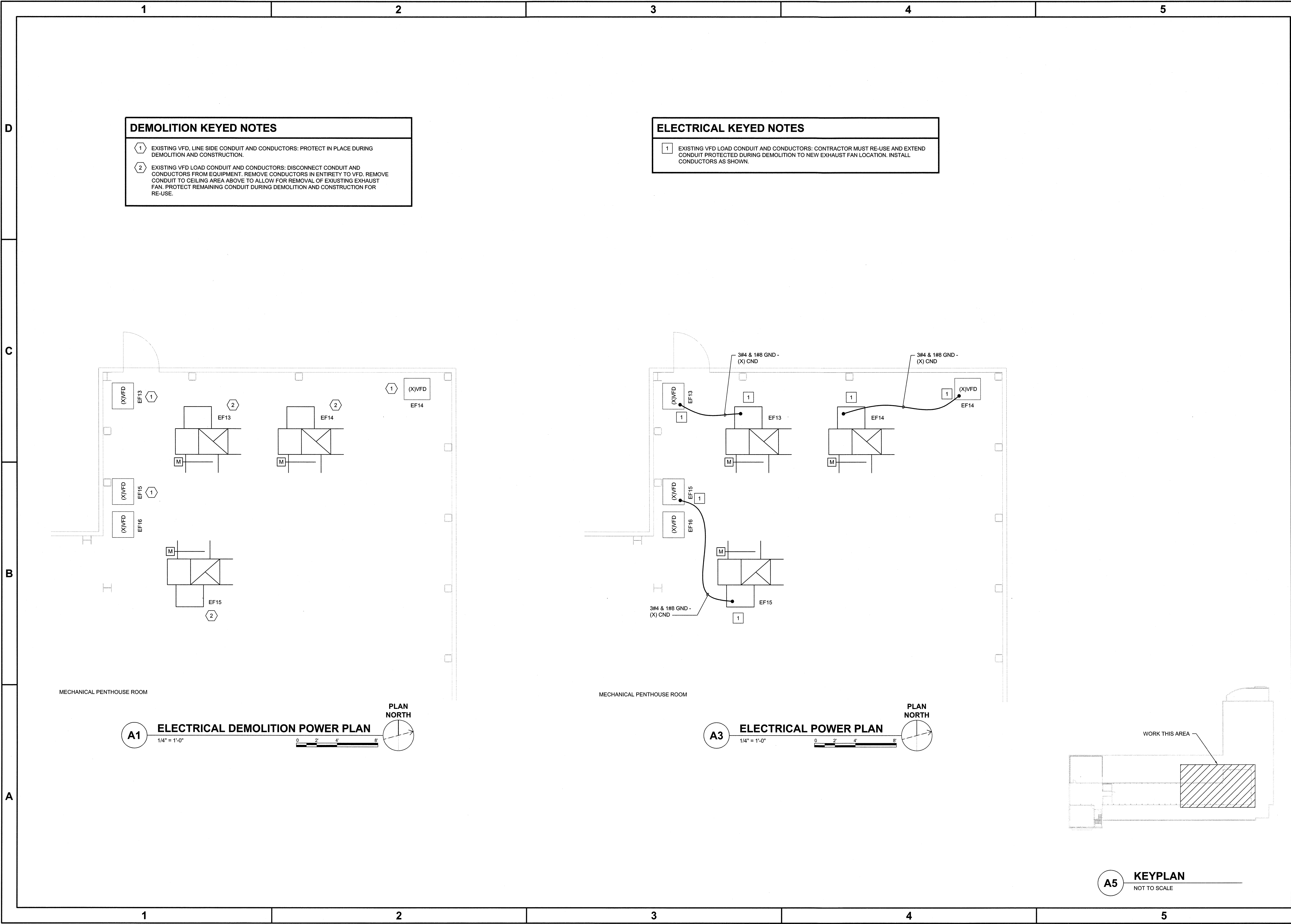


UNIVERSITY OF NORTH CAROLINA WILMINGTON
CMS MYRTLE GROVE EXHAUST FAN REPLACEMENT
5600 MARVIN K. MOSS LANE, WILMINGTON, NORTH CAROLINA
STATE ID#

**MECHANICAL
PENTHOUSE DEMOLITION PLAN**

JOB NO.:	19113
DRAWN:	GAS
DESIGNED:	GAS
CHECKED:	TOG
DRAWING NO.:	
MD101	
REVISION:	0





DEMOLITION KEYED NOTES

1 EXISTING VFD, LINE SIDE CONDUIT AND CONDUCTORS: PROTECT IN PLACE DURING DEMOLITION AND CONSTRUCTION.

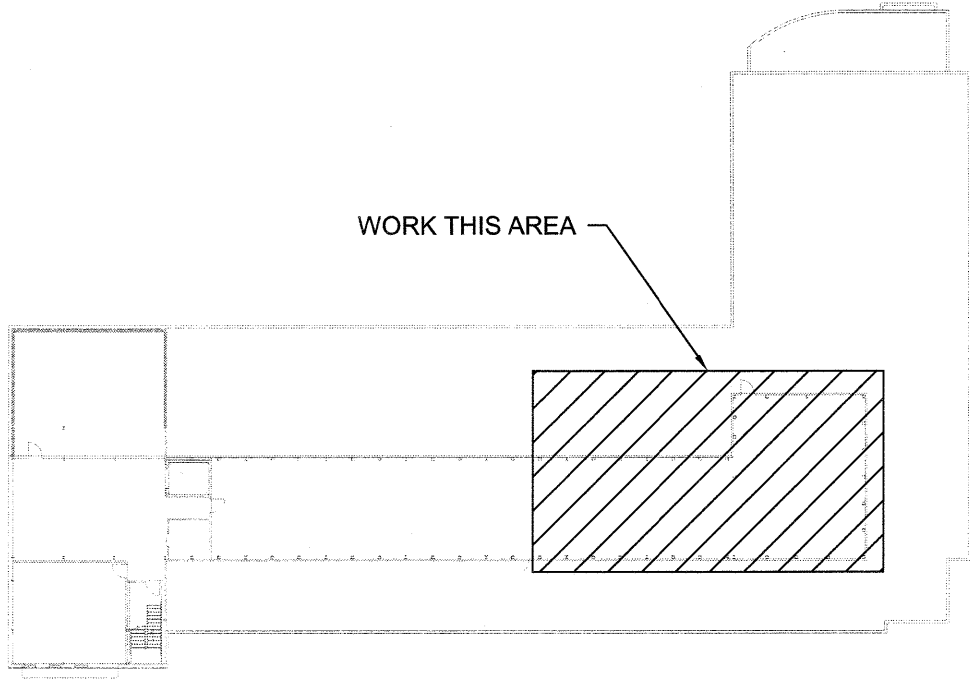
2 EXISTING VFD LOAD CONDUIT AND CONDUCTORS: DISCONNECT CONDUIT AND CONDUCTORS FROM EQUIPMENT. REMOVE CONDUCTORS IN ENTIRETY TO VFD. REMOVE CONDUIT TO CEILING AREA ABOVE TO ALLOW FOR REMOVAL OF EXISTING EXHAUST FAN. PROTECT REMAINING CONDUIT DURING DEMOLITION AND CONSTRUCTION FOR RE-USE.

ELECTRICAL KEYED NOTES

1 EXISTING VFD LOAD CONDUIT AND CONDUCTORS: CONTRACTOR MUST RE-USE AND EXTEND CONDUIT PROTECTED DURING DEMOLITION TO NEW EXHAUST FAN LOCATION. INSTALL CONDUCTORS AS SHOWN.

A1 ELECTRICAL DEMOLITION POWER PLAN
1/4" = 1'-0"
0 2 4 8
PLAN NORTH

A3 ELECTRICAL POWER PLAN
1/4" = 1'-0"
0 2 4 8
PLAN NORTH



A5 KEYPLAN
NOT TO SCALE

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		10.15.19
UNIVERSITY OF NORTH CAROLINA WILMINGTON CMS MYRTLE GROVE EXHAUST FAN REPLACEMENT 5600 MARVIN K. MOSS LANE, WILMINGTON, NORTH CAROLINA STATE ID#		
ELECTRICAL PENTHOUSE POWER		
JOB NO.:	19113	
DRAWN:	GAS	
DESIGNED:	GAS	
CHECKED:	WAC	
DRAWING NO.:		
EP101		
REVISION:		
0		