

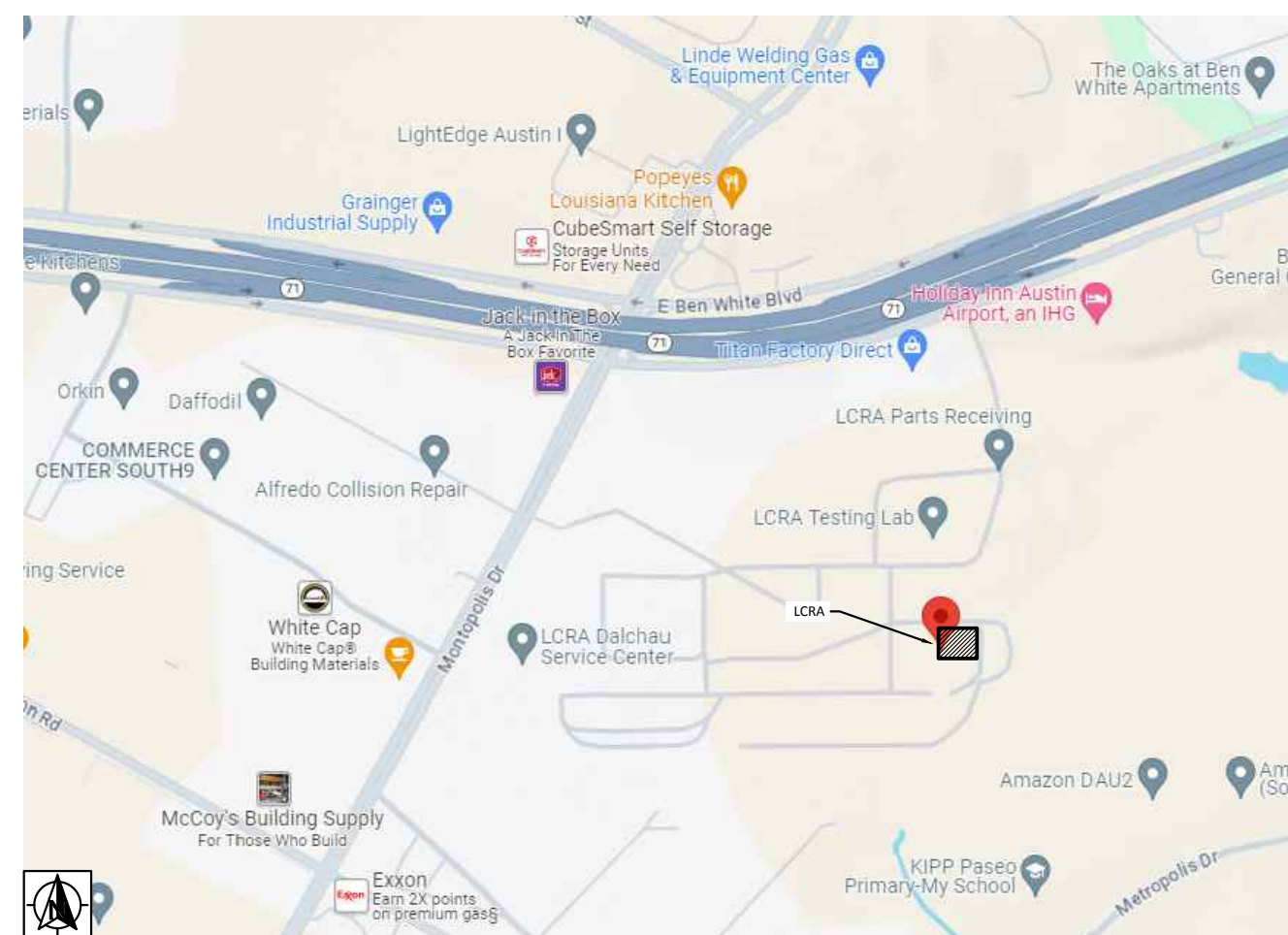


**LOWER COLORADO
RIVER AUTHORITY**

**DSC STORES BLDG. UPGRADES
LCRA PROJECT NO.: PLC 5472**

3505 MONTOPOLIS
AUSTIN, TEXAS 78744
100% CONSTRUCTION SET
DATE: FEBRUARY 23, 2024

PROJECT LOCATION MAP



DESIGN TEAM

MECHANICAL, ELECTRICAL ENGINEER



DESIGN DATA

BUILDING CODES:

- 2021 INTERNATIONAL BUILDING CODE
- 2021 INTERNATIONAL MECHANICAL CODE
- 2023 NATIONAL ELECTRICAL CODE
- 2021 INTERNATIONAL ENERGY CONSERVATION CODE

INDEX OF DRAWINGS

- - COVER SHEET
- M000 MECHANICAL GENERAL NOTES
- M001 MECHANICAL GENERAL NOTES
- M002 MECHANICAL SPECIFICATIONS
- M101 MECHANICAL FLOOR PLANS
- M500 MECHANICAL SCHEDULES, CONTROLS AND DETAILS
- E000 ELECTRICAL GENERAL NOTES
- E001 ELECTRICAL SPECIFICATIONS
- E002 ELECTRICAL SPECIFICATIONS
- E100 LIGHTING PLAN
- E200 ELECTRICAL SITE PLAN
- E201 ELECTRICAL POWER PLAN
- E500 ONE-LINE DIAGRAM
- E501 ELECTRICAL SCHEDULES

MECHANICAL ABBREVIATIONS (CONTINUED):

UC	UNDERCUT
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC.
UNO	UNLESS NOTED OTHERWISE
UTIL	UTILITY / UTILITIES
V	VOLTAGE / VOLTS
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (MANUAL)
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VRF	VARIABLE REFRIGERANT FLOW
VTAC	VERTICAL TERMINAL AIR CONDITIONER
VTR	VENT THROUGH ROOF
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER COLUMN
WCO	WALL CLEAN OUT
WG	WATER GAUGE
WH	WATER HEATER
WMS	WIRE MESH SCREEN
WPD	WATERSIDE PRESSURE DROP
WSHP	WATER SOURCE HEAT PUMP
WT	WEIGHT
XFMR	TRANSFORMER

MECHANICAL SYMBOLS:

	SH/CFM	SUPPLY AIR GRILLE
	RH/CFM	RETURN AIR GRILLE
	EH/CFM	EXHAUST AIR GRILLE
		SUPPLY DUCT UP
		SUPPLY DUCT DOWN
		EXHAUST / RETURN DUCT UP
		EXHAUST / RETURN DUCT DOWN
		THERMOSTAT
		HUMIDISTAT
		DUCT SMOKE DETECTOR
	FSD	COMBINATION FIRE/SMOKE DAMPER
	FD	FIRE DAMPER
	SD	SMOKE DAMPER
		FLEXIBLE DUCTWORK
		MANUAL DAMPER
		MOTORIZED DAMPER
		TAKEOFF WITH DAMPER
		TAKEOFF WITHOUT DAMPER
		SIDEWALL GRILLE OR LOUVER
		WALL CAP LOUVER
		CONNECT TO EXISTING
		DISCONNECT FROM EXISTING
	##/##	DUCT DIMENSIONS
	## Ø	DIAMETER OF ROUND DUCT
		EXISTING DUCTWORK, PIPING, ETC
		TRANSITION RECTANGULAR TO ROUND DUCT
		DOUBLE WALL SPIRAL DUCTWORK
		INCLINED RISE, IN DIRECTION OF AIRFLOW
		INCLINED DROP, IN DIRECTION OF AIRFLOW
	UC	1" UNDERCUT DOOR
		RECTANGULAR DUCT ELBOW
		RADIUS DUCT ELBOW

MECHANICAL DEMOLITION (DEMO) SYMBOLS LIST:

	DEMO AIR DEVICE
	DEMO (GENERAL) (DUCTWORK, PIPING, ETC)
	DEMO EQUIPMENT

MECHANICAL EQUIPMENT SYMBOLS

	MECHANICAL EQUIPMENT
	MECHANICAL EQUIPMENT WITH CLEARANCES SHOWN DASHED
	CONDENSING UNIT WITH CLEARANCES SHOWN DASHED
	TERMINAL UNIT

MECHANICAL CONTROLS SYMBOLS:

	CARBON DIOXIDE SENSOR
	CARBON MONOXIDE SENSOR
	HYDROGEN SENSOR
	TEMPERATURE SENSOR
	HUMIDITY SENSOR
	LIGHT SWITCH
	CONTROL PANEL
	PRESSURE SWITCH
	CURRENT SWITCH
	DIFFERENTIAL PRESSURE
	FLOW SWITCH
	LOW TEMPERATURE LIMIT SWITCH
	HIGH TEMPERATURE LIMIT SWITCH
	SINGLE POINT TEMPERATURE SENSOR
	AVERAGING TEMPERATURE SENSOR
	DUCT STATIC PRESSURE SENSOR
	MOTOR
	STARTER
	HAND-AUTO-OFF SWITCH
	FLOW CONTROL VALVE (2-WAY)
	FLOW CONTROL VALVE (3-WAY)
	DAMPER WITH BLADES (SEE SPEC FOR TYPE)
	FILTER
	COOLING COIL
	DIRECT EXPANSION COIL
	HEATING HOT WATER COIL
	ELECTRIC RESISTIVE HEATING COIL

MECHANICAL PIPING SYMBOLS:

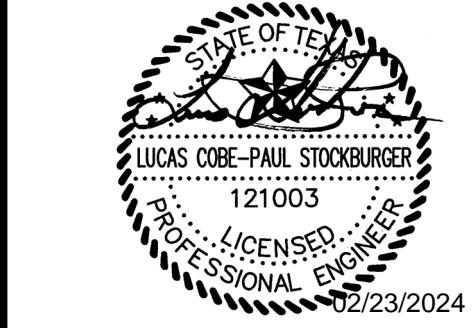
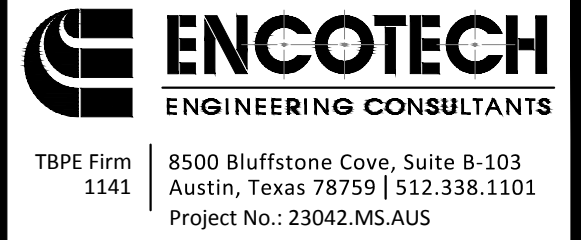
	EXISTING CHILLED WATER RETURN PIPE
	EXISTING CHILLED WATER SUPPLY PIPE
	EXISTING HEATING HOT WATER RETURN PIPE
	EXISTING HEATING HOT WATER SUPPLY PIPE
	EXISTING CONDENSATE DRAIN PIPE
	CHILLED WATER RETURN PIPE
	CHILLED WATER SUPPLY PIPE
	HEATING HOT WATER RETURN PIPE
	HEATING HOT WATER SUPPLY PIPE
	CONDENSATE DRAIN PIPE
	AUTOMATIC AIR VENT
	FLEXIBLE HOSE / FLEXIBLE CONNECTION
	BALL VALVE
	BUTTERFLY VALVE
	CHECK VALVE, SWING GATE
	DIRECTION OF FLOW
	FLOW METER
	FLOW SWITCH
	GATE VALVE
	GATE VALVE (OS&Y)
	PIPE UNION
	PRESSURE GAUGE ASSEMBLY
	PRESSURE RELIEF VALVE
	STRAINER
	PIPING UP
	PIPING DOWN
	PIPING TEE UP
	PIPING TEE DOWN
	THERMOMETER

HVAC EQUIPMENT TAGS:

	51/200	AIR DISTRIBUTION DEVICE
	AHU-1	AIR HANDLING UNIT
	VAV-1-1	SINGLE DUCT TERMINAL UNIT
	FPB-1-1	FAN POWERED BOX UNIT
	FCU-1-1	FAN COIL UNIT

DRAFTING SYMBOLS:

	SHEET NUMBER	SECTION MARK
	SECTION NUMBER	
	DIRECTION OF VIEW FOR SECTION CUT	
	DIRECTION OF VIEW FOR ELEVATION	ELEVATION MARK
	SHEET NUMBER	
	SECTION NUMBER	
	PLAN NAME/DETAIL NAME	PLAN DESIGNATION
	SCALE	
	VIEW NUMBER	
	DETAIL NUMBER	DETAIL DESIGNATION
	SHEET NUMBER	
	DETAIL REFERENCE	



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3505 MONTOPOLIS, AUSTIN TX 78744

No.	ISSUE	DATE
1	100% IFC	02/23/2024

PROJECT No: 23046.MS.AUS	
P.M.: LCS	DRAWN BY: KD
QA/QC BY: LCS	DATE: 02/23/2024

SHEET TITLE:
MECHANICAL GENERAL NOTES

SHEET NUMBER:

M001

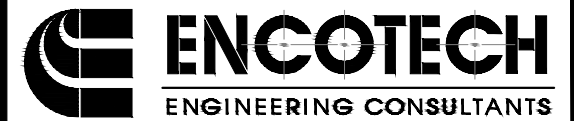
PART 6 - GAS DETECTION SYSTEM

THIS SECTION INCLUDES GAS DETECTION SYSTEM, MONITORS, AND NOTIFICATION APPLIANCES

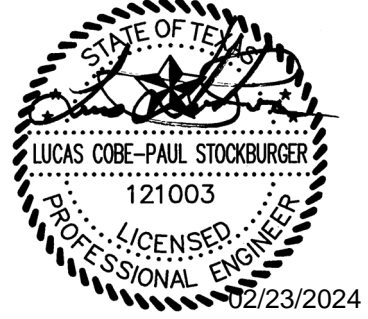
- 1.1 DEFINITIONS
 - A. LFL: LOWER FLAMMABILITY LIMIT
 - B. LEL: LOWER EXPLOSIVE LIMIT
- 1.2 ACTION SUBMITTALS
 - A. PRODUCT DATA:
 - A.1. FOR EACH TYPE OF GAS MONITOR INDICATED, INCLUDE SENSING RANGE IN PPM, TEMPERATURE AND HUMIDITY RANGE, ALARM OUTPUTS, DISPLAY RANGE, FURNISHED SPECIALTIES, INSTALLATION REQUIREMENTS, AND ELECTRIC POWER REQUIREMENT.
 - B. SHOP DRAWINGS:
 - B.1. AIR-SAMPLING TUBING: SIZE, ROUTING, AND TERMINATION INCLUDING ELEVATION ABOVE FINISHED FLOOR.
 - B.2. WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING.
- 1.3 INFORMATIONAL SUBMITTALS
 - A. FIELD QUALITY-CONTROL TEST REPORTS.
- 1.4 CLOSEOUT SUBMITTALS
 - A. OPERATION AND MAINTENANCE DATA.
- 1.5 WARRANTY
 - A. TWO YEAR PART AND LABOR WARRANTY.
- 2.1 SINGLE OR DUAL ZONE HAZARDOUS GAS MONITOR
 - A. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
 - A.1. ARMSTRONG MONITORING.
 - A.2. FEDERAL SIGNAL CORPORATION
 - B. GAS MONITOR: DUAL ZONE, ELECTRONIC GAS DETECTION PANEL.
 - B.1. BASIS OF DESIGN PRODUCT: ARMSTRONG AMC-1A
 - B.2. ENCLOSURE
 - B.2.1. MATERIAL: ASA 61 GRAY ENAMEL 16-GAUGE STEEL
 - B.3. RATING: NEMA 4X
 - B.4. POWER: 120 VAC, 1PH 60HZ.
 - B.5. OPERATING TEMPERATURES: 0 DEG F TO 100 DEG F
 - B.6. RELAY CONTACTS: 4 DPDT, 10A WITH 250 VAC RESOLUTION.
 - B.6 INDICATORS (PER ZONE)
 - B.6.1 ZONES: 1
 - B.6.2 RED LED: ALARM
 - B.6.3 YELLOW LED: WARNING
 - B.6.4 GREEN LED: RUN, FAULT, OFF
 - B.6.5 GAS DETECTION MODULES (PER ZONE): 8
 - C. FEATURES:
 - C.1. LARM DISABLE DURING WARMUP
 - C.2. SYSTEM TEST SWITCH
 - C.3. MINIMUM RUN TIMER
 - C.4. ACTIVATION DELAYS: FIVE MINUTES TO WARNING AND/OR ALARM SET POINTS.
 - C.5. 95 DBA AUDIO ALARM AND WARNING. ALARM SET POINTS.
 - C.6. LATCHING RELAYS WITH MANUAL RESET.
 - C.7. MANUALLY ACTIVATE RELAYS (PURGE EXHAUST) THROUGH MONITOR.
 - D. DESCRIPTION: SENSOR SHALL BE FACTORY TESTED, CALIBRATED, AND CERTIFIED TO CONTINUOUSLY MONITOR SPECIFIC GAS CONCENTRATION AND SHALL BE CAPABLE OF INDICATING, ALARMING AND ENABLING EXHAUST SYSTEMS. SYSTEM SHALL BE CAPABLE OF SAMPLING UP TO EIGHT (8) DETECTION MODULES PER ZONE.
 - E. HAZARDOUS GAS DETECTION REQUIREMENTS:
 - E.1. FOR THE FOLLOWING GAS TYPES: LIQUIFIED PETROLEUM GAS AND COMPRESSED NATURAL GAS
 - E.1.1. BASIS OF DESIGN PRODUCT: ARMSTRONG AMC-360
 - E.1.2. RANGE: 0% LEL TO 100% LEL
 - E.1.3. STANDARD TRIP POINTS: MINIMUM TWO.
 - E.1.3.1. LEVEL 1: 40% LEL
 - E.1.3.2. LEVEL 2: 60% LEL
 - E.1.4. OPERATING TEMPERATURE: 0 DEG F TO 100 DEG F
 - E.1.5. OPERATING HUMIDITY: 15% RH TO 90% RH
 - E.1.6. COVERAGE RADIUS: 25 FEET.
 - F. INPUT/OUTPUT FEATURES:
 - F.1. MAXIMUM POWER INPUT: 120-V AC, 60 HZ, 75 W.
 - F.2. NUMBER OF SAMPLING MODULES: UP TO 1 PER ZONE.
 - F.3. NUMBER OF SAMPLING ZONES: UP TO 1 ZONE
 - F.4. LED INDICATORS (PER ZONE)
 - F.4.1. RED LED: ALARM
 - F.4.2. YELLOW LED: WARNING
 - F.4.3. GREEN LED: RUN, FAULT, AND OFF INDICATION
 - F.5. RELAYS: FOUR DOUBLE POLE DOUBLE THROW 10A 250 VAC CONTACTS
 - F.6. SYSTEM TEST SWITCH
 - F.7. MINIMUM RUN TIMER
 - F.8. 95 DBA AUDIO ALARM WITH WARNING AND ALARM SET POINTS
 - F.9. HINGED DOOR
 - F.10. LATCHING RELAYS WITH MANUAL RESET.
 - F.11. AUDIBLE OUTPUT: MINIMUM 75 DB DB AT 10 FEET.
 - F.12. VISIBLE OUTPUT: STROBE LIGHT.
 - F.13. SENSOR ANALOG OUTPUT: 0- TO 10-V DC INTO 2K OHMS, OR 4- TO 20-MA INTO 1K OHMS.
 - F.14. ENCLOSURE: NEMA 250, TYPE 1, WITH LOCKING QUARTER-TURN LATCH AND KEY.
- 2.2 NOTIFICATION APPLIANCES
 - A. HORNS: COMPLY WITH UL 464; ELECTRIC-VIBRATING-POLARIZED TYPE, LISTED BY A QUALIFIED TESTING AGENCY WITH PROVISION FOR HOUSING THE OPERATING MECHANISM BEHIND A GRILLE. HORNS SHALL PRODUCE A SOUND-PRESSURE LEVEL OF 90 DBA, MEASURED 10 FEET FROM THE HORN.
 - A.1. GENERAL PURPOSE INDUSTRIAL RATED SIREN.
 - A.2. METAL HOUSING
 - A.3. RATED FOR 108 DB.
 - A.4. INCLUDE MOUNTING KIT FOR WALL MOUNT APPLICATIONS.
 - A.5. BASIS OF DESIGN PRODUCT: FEDERAL SIGNAL A-120 ELECTRIC SIREN
 - B. VISIBLE ALARM DEVICES: COMPLY WITH UL 1971; BLUE POLYCARBONATE LENS MOUNTED ON AN ALUMINUM FACEPLATE. THE WORDS "GAS DETECTION" PRINTED IN

MINIMUM 1/2-INCH-HIGH LETTERS ON THE LENS. RATED LIGHT OUTPUT IS 75 CANDELA.

- B.1. GENERAL PURPOSE "ELECTRAFLASH" STROBE WARNING LIGHT.
 - B.2. COLOR: BLUE LENS, STROBING.
 - B.3. INCLUDE MOUNTING KIT FOR WALL MOUNT APPLICATIONS.
 - B.4. ENCLOSURE: NEMA 3R
 - B.5. BASIS OF DESIGN PRODUCT: FEDERAL SIGNAL ELECTRAFLASH 141ST-120A
- 3.1 INSTALLATION
 - A. INSTALL WARNING SIGNS, LABELS, AND NAMEPLATES TO IDENTIFY DETECTION DEVICES ACCORDING TO SPECIFICATION SECTION IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT. LABELS SHALL BE LEGIBLE FROM 50FT.
 - B. AUDIBLE ALARM-INDICATING DEVICES: INSTALL AT EACH ENTRY DOOR TO EQUIPMENT ROOM, AND POSITION NOT LESS THAN 6 INCHES BELOW THE CEILING. INSTALL HORNS ON FLUSH-MOUNTED BACK BOXES WITH THE DEVICE-OPERATING MECHANISM CONCEALED BEHIND A GRILLE.
 - C. VISIBLE ALARM-INDICATING DEVICES: INSTALL ADJACENT TO EACH ALARM HORN AT EACH ENTRY DOOR TO EQUIPMENT ROOM, AND POSITION AT LEAST 6 INCHES BELOW THE CEILING.
 - D. INSTALL MONITOR PANEL AT 48" ABOVE FINISHED FLOOR.
 - E. WIRING SHALL BE INSTALLED IN METAL CONDUIT AND RACEWAYS ACCORDING TO SPECIFICATION SECTION CONTROL-VOLTAGE ELECTRICAL POWER CABLES AND PATHWAYS FOR COMMUNICATIONS SYSTEMS.
 - 3.2 INSTALLATION SCHEDULE
 - A. INSTALL MONITORS AND SENSORS FOR 100% COVERAGE ACCORDING TO MANUFACTURER LISTED COVERAGE AREAS. MOUNT TO WALL, COLUMNS AND CEILINGS ACCORDING TO MANUFACTURER REQUIREMENTS AND DIVISION 26 SPECIFICATIONS FOR RACEWAYS AND BOXES.
 - B. INSTALLATION OF SPECIFIC EQUIPMENT SHALL COMPLY AS FOLLOWS:
 - B.1. HYDROGEN GAS
 - B.1.1. WALL MOUNTED AT 28' ABOVE FINISHED FLOOR
 - B.1.2. PVC ENCLOSURE
 - C. GAS DETECTION CONTROL PANEL
 - C.1. WALL MOUNTED 48" AFF TO HIGHEST OPERABLE BUTTON.
 - D. HORN
 - D.1. WALL MOUNT 120" AFF.
 - D.2. 24VAC OR 120V SINGLE PHASE POWER WIRED THOUGH GAS MONITOR RELAY.
 - D.3. OPERATE HORN UPON LEVEL 2 ALARM
 - E. STROBE
 - E.1. WALL MOUNT 120" AFF.
 - E.2. 24VAC OR 120V SINGLE PHASE POWER WIRED THOUGH GAS MONITOR RELAY.
 - E.3. OPERATE HORN UPON LEVEL 2 ALARM
 - E.4. COLOR: BLUE STROBE
 - 3.3 FIELD QUALITY CONTROL
 - A. PERFORM TESTS AND INSPECTIONS AND PREPARE TEST REPORTS.
 - B. TESTS AND INSPECTIONS:
 - B.1. INSPECT FIELD-ASSEMBLED COMPONENTS, EQUIPMENT INSTALLATION, AND ELECTRICAL CONNECTIONS FOR COMPLIANCE WITH REQUIREMENTS.
 - B.2. TEST AND ADJUST CONTROLS AND SAFETIES.
 - B.3. TEST REPORTS: PREPARE A WRITTEN REPORT TO RECORD THE FOLLOWING:
 - B.3.1. TEST PROCEDURES USED.
 - B.3.2. TEST RESULTS THAT COMPLY WITH REQUIREMENTS.
 - B.3.3. TEST RESULTS THAT DO NOT COMPLY WITH REQUIREMENTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE COMPLIANCE WITH REQUIREMENTS.
 - C. DEMONSTRATION:
 - C.1. TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN INSTRUMENTATION AND CONTROL DEVICES.
 - C.2. COORDINATE VIDEO WITH OPERATION AND MAINTENANCE MANUALS AND CLASSROOM INSTRUCTION FOR USE BY OWNER IN OPERATING, MAINTAINING, AND TROUBLESHOOTING.
 - D. REPAIR OR REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.



8500 Bluffstone Cove, Suite B-103
Austin, Texas 78759 | 512.338.1101
Project No.: 23042.MS.AUS



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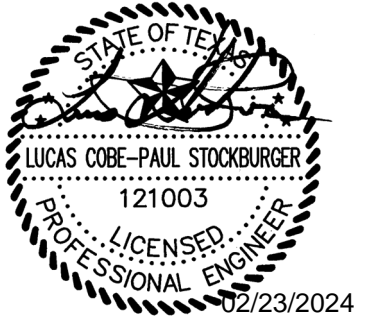
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PROJECT No.: 23046.MS.AUS
P.M.: LCS DRAWN BY: KD
QA/QC BY: LCS DATE: 02/23/2024

SHEET TITLE:
MECHANICAL SPECIFICATIONS

SHEET NUMBER:

M003



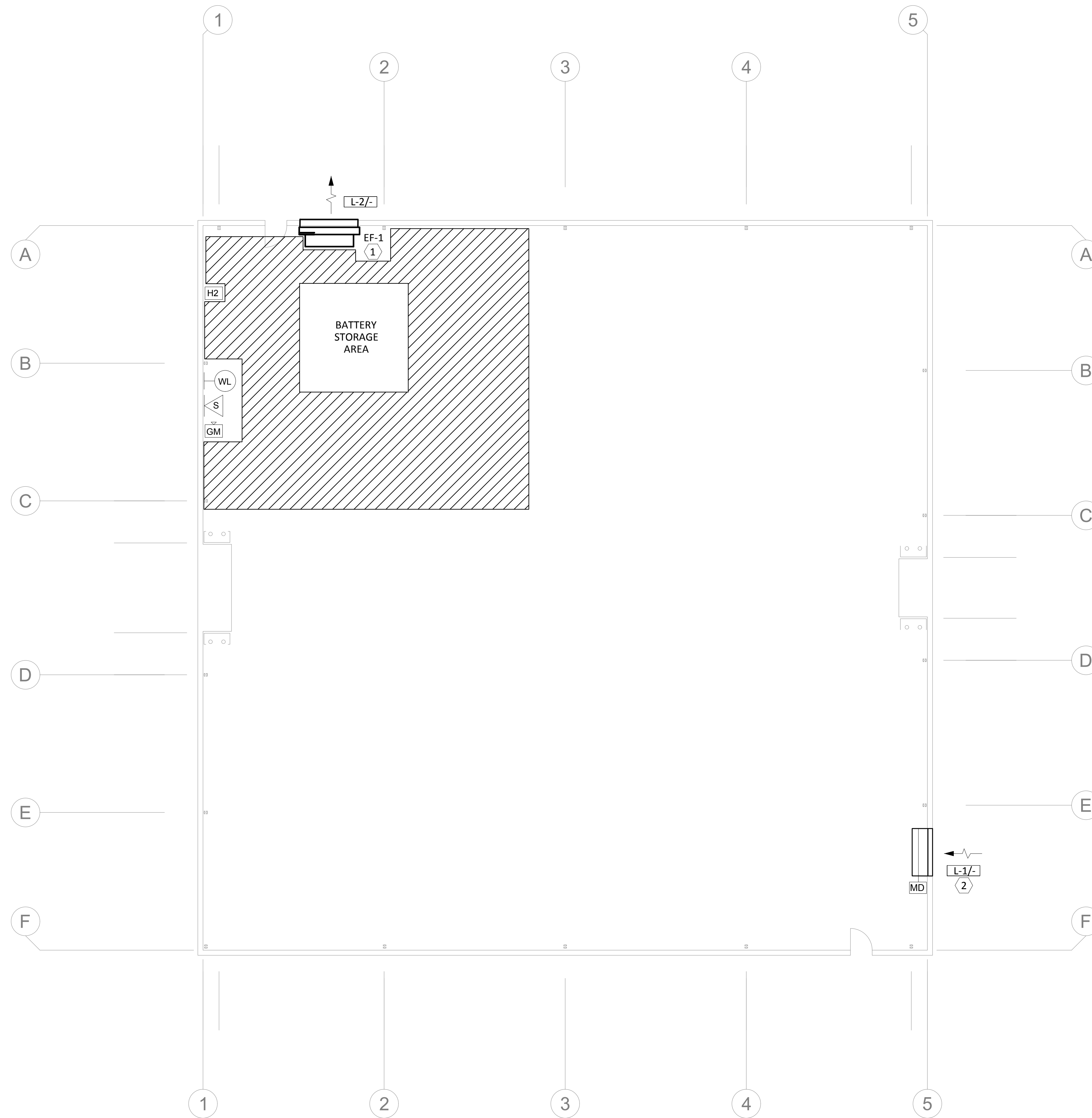
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GENERAL SHEET NOTES

- A. PROTECT ALL MECHANICAL EQUIPMENT FROM DAMAGE, DUST, AND DEBRIS PRIOR TO AND DURING CONSTRUCTION.
- B. MAINTAIN A MINIMUM OF 10'-0" BETWEEN ALL MECHANICAL AIR INTAKES AND ANY EXHAUST TERMINATIONS OR PLUMBING VENT.
- C. CONTRACTOR SHALL COORDINATE TO PROVIDE A MINIMUM 2'-0" CLEARANCE AROUND ANY NEW PENETRATIONS WHERE REQUIRED FOR THE PROJECT. IF CONFLICT WITH THIS REQUIREMENT ARISES, CONTRACTOR IS RESPONSIBLE FOR NOTIFYING A/E.

KEYNOTE LEGEND

- 1 PROVIDE PROPELLER EXHAUST FAN BOLTED TO LOUVER. INSTALL AS HIGH AS POSSIBLE, BUT BELOW STRUCTURE.
- 2 MOUNT LOUVER CENTERED IN WALL 12" AFF TO BOTTOM OF LOUVER.



GAS DETECTION SYSTEM SYMBOLS LEGEND

SYMBOL	MANUFACTURER/MODEL	MOUNTING HEIGHT	DESCRIPTION
	ARMSTRONG AMC-A1	4'-0" AFF	DUAL CHANNEL GAS DETECTION MONITOR WITH HIGH AND LOW ALARM. LED STATUS LIGHTS FOR LOW, HIGH, AND FAIL ALARM STATE. PROVIDE RELAYS TO, SIREN, STROBE LIGHT AND EF-1. INSTALL PER MANUFACTUER RECOMMENDATIONS.
	FEDERAL SIGNAL CORPORATION ELECTRAFLASH 1415T	10'-0" AFF	STROBE TYPE WARNING LIGHT. 0.1A, 120V, 1PH. PROVIDE WITH MOUNTING KIT. BLUE LENS COLOR.
	FEDERAL SIGNAL CORPORATION GENERAL ALARM MODEL A	10'-0" AFF	GENERAL INDUSTRIAL ELECTRO-MECHANICAL SIREN. 1.8A, 120V, 1PH. RATED AT 108dB AT 10'.
	AMC-360	28'-0" AFF	MOUNT HIGH, 2' FROM STRUCTURE. 24VAC LEL DETECTOR.

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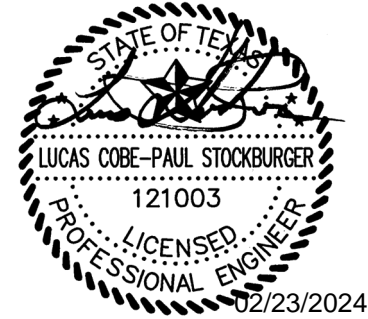
PROJECT No.: 23046.MS.AUS
 P.M.: LCS DRAWN BY: KD
 QA/QC BY: LCS DATE: 02/23/2024

SHEET TITLE:
MECHANICAL FLOOR PLANS - HVAC

SHEET NUMBER:

M101

1 MECHANICAL FLOOR PLAN
SCALE: 1/8"=1'-0"



FAN SCHEDULE																
MARK	AREAS SERVED	TYPE	AIRFLOW LOW/HIGH (CFM)	DRIVE TYPE	INTERLOCK	FAN/MOTOR DATA			ELECTRICAL DATA			OPERATING WEIGHT (LBS)	MFR	MODEL	NOTES	
						ESP (IN)	BHP	RPM	VOLTS	PHASE	HZ					FLA
EF-1	WAREHOUSE	SIDEWALL	250/750	DIRECT	GAS DETECTION	0.2	0.07	1025	208	1	60	2.1	60	GREENHECK	AER-20-02-0305-VG	1,2,3

REQUIREMENTS (APPLIES TO ALL ITEMS):
A. INSTALL WITH MANUFACTURE PROVIDED DISCONNECT.
B. FURNISH AND INSTALL VIBRATION ISOLATION.
C. INSTALL WITH MANUFACTURE PROVIDE WALL HOUSING.
D. FAN SHALL BE SPECIFIED TO BE EXPLOSION PROOF AND SPARK PROOF.

NOTES:
1. FURNISH WITH ADJUSTABLE EC MOTOR (DIRECT DRIVE ONLY)
2. PROVIDE WITH VARI-GREEN TWO SPEED CONTROL MODULE (OR APPROVED EQUAL).
3. PROVIDE WITH MANUFACTURE WALL CO/HR AND MOUNTING FLANGES FOR INSTALLATION.

LOUVER SCHEDULE								
MARK	SERVICE	NOMINAL SIZE (IN)	MINIMUM FREE AREA (SF)	AIRFLOW (CFM)	MAX. AIR VELOCITY (FPM)	MAX. PRESSURE DROP (IN H2O)	MFR	MODEL
L-1	INTAKE	22X28	1.6	750	480	0.04	GREENHECK	EHH-401
L-2	EXHAUST	32X20	1.5	750	488	0.04	GREENHECK	EHH-401

REQUIREMENTS (APPLIES TO ALL ITEMS):
A. COORDINATE EXACT LOCATION AND MOUNTING OF LOUVER WITH PREFABRICATED BUILDING ELEVATION.
B. COORDINATE FRAME TYPE WITH WALL CONSTRUCTION.
C. PROVIDE TRANSITION AS REQUIRED TO CONNECT DUCT TO LOUVERS.
D. PROVIDE MOTORIZED BACKDRAFT DAMPER AND 1/4" GALVANIZED BIRDSCREEN.

EXHAUST FANS EF-1 SEQUENCE OF OPERATION

SYSTEM DESCRIPTION
CONSTANT VOLUME EXHAUST FAN.

A. DETECTION LEVEL 1: SUSTAINED LEVEL 1 LEVELS DETECTED PER SENSOR SETTING. ILLUMINATE YELLOW LIGHT ON GAS DETECTION SYSTEM PANEL. CLOSE RELAY TO ENERGIZE PURGE EXHAUST SYSTEM. REFER TO MECHANICAL PLAN SEQUENCE OF OPERATION.

B. DETECTION LEVEL 2: ILLUMINATE RED LIGHT ON GAS DETECTION SYSTEM. SOUND ALARM HORNS AND CYCLE BLUE STROBE LIGHTS. VENTILATION SYSTEM SHALL CONTINUE TO OPERATE TO PURGE AIR FROM ROOM. REFER TO MECHANICAL PLAN SEQUENCE OF OPERATION. PROVIDE MANUAL RESET FOR THIS DETECTION LEVEL.

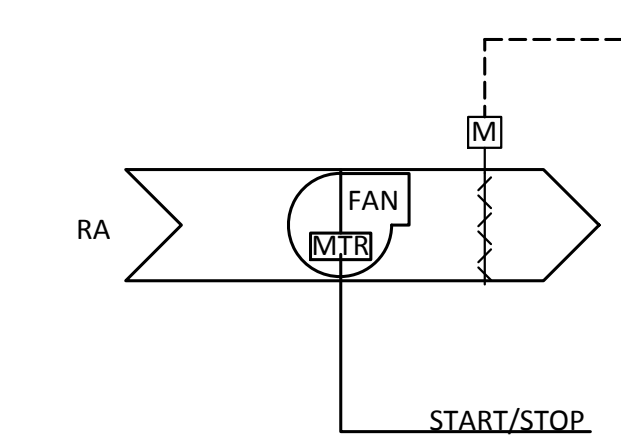
C. SENSOR FAULT/TROUBLE: ILLUMINATE TROUBLE LIGHT UPON FAULT DETECTION.

EXHAUST FAN CONTROL - EF-1
FAN MOTOR - ON/OFF CONTROL:

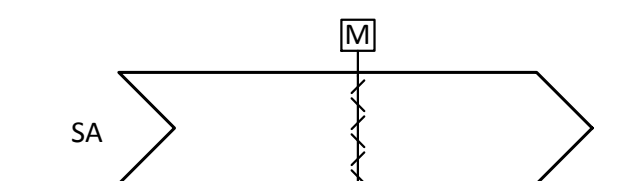
- THE EXHAUST FAN SHALL RUN CONTINUOUSLY AT 250 CFM "LOW" SPEED DURING NORMAL OPERATING CONDITIONS. INTAKE LOUVER DAMPER SHALL REMAIN FULLY OPEN WHILE EXHAUST FAN EF-1 IS ENERGIZED.
- FAN SHALL ENTER PURGE MODE AND RUN AT 750 CFM "HIGH" SPEED WHEN GAS DETECTION LOW AND HIGH LEVEL ALARM IS TRIGGERED AS A RESULT OF DETECTION OF HYDROGEN (H2) GAS.
- WHEN H2 LEVELS RETURN TO NORMAL CONDITIONS THE EXHAUST FAN, STROBE AND HORN SHALL RETURN TO NORMAL OPERATING CONDITIONS.

INTAKE LOUVER L-1 SEQUENCE OF OPERATION

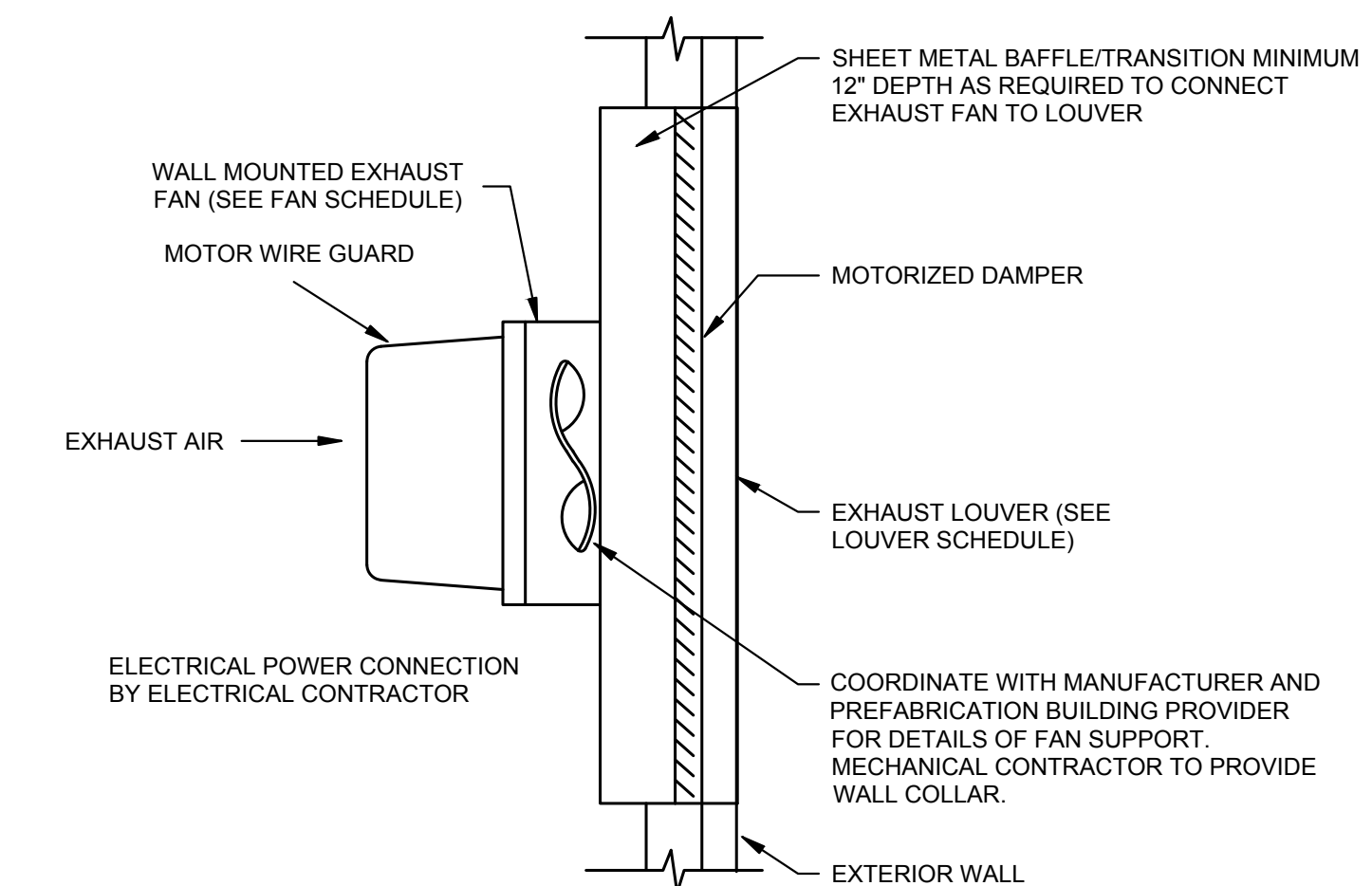
SYSTEM DESCRIPTION
LOUVER SHALL POSITION IN THE FULLY OPEN AT ALL TIMES WHILE EXHAUST FAN IS ENERGIZED.
LOUVER SHALL CLOSE WHEN EXHAUST FAN DEENERGIZES.



3 EF-1 CONTROL DIAGRAM
NOT TO SCALE



2 L-1 CONTROL DIAGRAM
NOT TO SCALE



1 PROPELLER EXHAUST FAN DETAIL
N.T.S.

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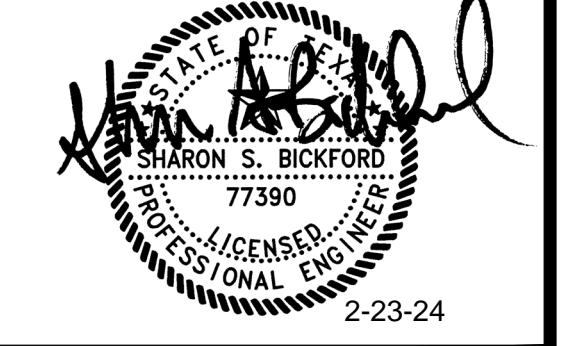
No.	ISSUE	DATE
1	100% IFC	02/23/2024

PROJECT No.: 23046.MS.AUS
P.M.: LCS DRAWN BY: KD
QA/QC BY: LCS DATE: 02/23/2024

SHEET TITLE:
MECHANICAL SCHEDULES, CONTROLS AND DETAILS

SHEET NUMBER:

M400



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- A. VERIFY THAT SUPPORTING SURFACES ARE READY TO RECEIVE WORK.
 - B. ELECTRICAL BOXES ARE SHOWN ON DRAWINGS, IN APPROXIMATE LOCATIONS, UNLESS DIMENSIONED. OBTAIN VERIFICATION FROM ARCHITECT FOR PRIOR TO ROUGH-IN.
- 5.6 INSTALLATION**
- A. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND TO PRESENT NEAT APPEARANCE. COORDINATE WITH ATTIC WALKWAY TO MAINTAIN ACCESS.
 - (i) ALL CONDUIT ROUTINGS, INCLUDING MC CABLE, SHALL BE PARALLEL AND PERPENDICULAR TO ADJACENT PIPING, BUILDING STRUCTURE AND LINES. CONDUITS SHALL BE CONCEALED, WHERE POSSIBLE, UNLESS NOTED OTHERWISE. AESTHETIC APPEARANCE IS VERY IMPORTANT FOR THE WORK OF THIS PROJECT. THE CONTRACTOR WILL BE REQUIRED TO REMOVE AND REPLACE WORK THAT IS NOT NEAT AND ACCURATE. UNDERGROUND ROUTINGS, IF ANY, BETWEEN BUILDINGS MAY TAKE MOST DIRECT ROUTE.
 - (ii) MAINTAIN MINIMUM 6" CLEARANCE TO PIPING AND 12" CLEARANCE TO HEAT SURFACES SUCH AS HEATING APPLIANCES.
 - (iii) MAINTAIN REQUIRED FIRE, ACOUSTIC, AND VAPOR BARRIER RATING WHEN PENETRATING WALLS, FLOORS, AND CEILINGS. USE NELSON "FLAMESEAL" FIRESTOP PUTTY OR CAULK TO RETAIN THE INTEGRITY OF THE FIRE AND SMOKE PARTITIONS.
 - (iv) ROUTE CONDUIT THROUGH ROOF OPENINGS FOR PIPING AND DUCTWORK WHERE POSSIBLE; OTHERWISE, ROUTE THROUGH ROOF JACK WITH ROOF FLASHING (PITCH POCKET) WITH CAULK TYPE COUNTERFLASHING SLEEVE. INSTALLATION SHALL BE WATERTIGHT.
 - (v) GROUP IN PARALLEL RUNS WHERE PRACTICAL. USE RACK CONSTRUCTED OF STEEL CHANNEL. MAINTAIN SPACING BETWEEN RACEWAYS OR DERATE CIRCUIT AMPACITIES TO NFPA 70 REQUIREMENTS.
 - (vi) USE CONDUIT HANGERS AND CLAMPS; DO NOT FASTEN WITH WIRE OR PERFORATED PIPE STRAPS.
 - (vii) USE CONDUIT BODIES TO MAKE SHARP CHANGES IN DIRECTION.
 - (viii) TERMINATE CONDUIT STUBS WITH INSULATED BUSHINGS.
 - (ix) USE SUITABLE CAPS TO PROTECT INSTALLED RACEWAY AGAINST ENTRANCE OF DIRT AND MOISTURE.
 - (x) PROVIDE 12 AWG INSULATED CONDUCTOR OR SUITABLE PULL STRING IN EMPTY RACEWAYS, EXCEPT SLEEVES AND NIPPLES.
 - (xi) IDENTIFY EACH JUNCTION, PULL AND TERMINATION POINT USING PERMANENT METALLIC TAGS OR PERMANENT MARKER. IDENTIFICATION SHALL INDICATE INTENDED USE OF CONDUIT, ORIGINATION, AND TERMINATION POINTS OF EACH INDIVIDUAL CONDUIT.
 - (xii) INSTALL EXPANSION JOINTS WHERE RACEWAY CROSSES BUILDING EXPANSION JOINTS.
 - (xiii) INSTALL PLASTIC CONDUIT AND TUBING IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - B. INSTALL AUXILIARY GUTTER AND WIREWAY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - C. FINAL CONNECTIONS TO MOTORS AND OTHER VIBRATING EQUIPMENT SHALL BE WITH LIQUID-TIGHT FLEX AND APPROVED FITTINGS. DO NOT SECURE CONDUITS, DISCONNECTS, OR DEVICES TO DUCTWORK OR MECHANICAL EQUIPMENT.
 - D. INSTALL ELECTRICAL BOXES AS SHOWN ON THE DRAWINGS, AND AS REQUIRED FOR SPLICES, TAPS, WIRE PULLING, EQUIPMENT CONNECTIONS AND REGULATORY REQUIREMENTS.
 - (i) USE CAST OUTLET BOX IN EXTERIOR LOCATIONS EXPOSED TO WEATHER AND WET LOCATIONS.
 - (ii) USE HINGED COVER ENCLOSURE FOR INTERIOR PULL AND JUNCTION BOX LARGER THAN 12" IN ANY DIMENSION.
 - (iii) LOCATE AND INSTALL ELECTRICAL BOXES TO ALLOW ACCESS. PROVIDE ACCESS PANELS IF REQUIRED.
 - (iv) LOCATE AND INSTALL ELECTRICAL BOXES TO MAINTAIN HEADROOM AND TO PRESENT NEAT MECHANICAL APPEARANCE.
 - (v) INSTALL PULL BOXES AND JUNCTION BOXES ABOVE ACCESSIBLE CEILINGS OR IN UNFINISHED AREAS.
 - (vi) PROVIDE KNOCKOUT CLOSURES FOR UNUSED OPENINGS.
 - (vii) ALIGN WALL-MOUNTED OUTLET BOXES FOR SWITCHES, THERMOSTATS, AND SIMILAR DEVICES.
 - (viii) COORDINATE MOUNTING HEIGHTS AND LOCATIONS OF OUTLETS ABOVE COUNTERS, ETC. WITH THE ARCHITECT.
 - (ix) SPLICES IN EXTERIOR PULLBOXES SHALL BE MADE WATERPROOF USING "SCOTCHCAST" SPLICE KIT OR APPROVED EQUAL. SEAL ENDS OF CONDUITS AND DUCTS WITH "DUCTSEAL" OR APPROVED EQUAL.
 - E. USE RECESSED OUTLET BOXES IN FINISHED AREAS AND WHERE INDICATED.
 - (i) SECURE BOXES TO INTERIOR WALL AND PARTITION STUDS, ACCURATELY POSITIONING TO ALLOW FOR SURFACE FINISH THICKNESS.
 - (ii) USE STAMPED STEEL STUD BRIDGES FOR FLUSH OUTLETS IN HOLLOW STUD WALL, AND ADJUSTABLE STEEL CHANNEL FASTENERS FOR FLUSH CEILING OUTLET BOXES.
 - (iii) DO NOT INSTALL BOXES BACK-TO-BACK IN WALLS. PROVIDE 6" SEPARATION, MINIMUM; EXCEPT PROVIDE 24" SEPARATION, MINIMUM IN ACOUSTIC-RATED WALLS.
 - (iv) DO NOT DAMAGE INSULATION.
 - F. INSTALL FLOOR BOXES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - (i) SET BOXES LEVEL AND FLUSH WITH FINISH FLOORING MATERIAL.
 - (ii) USE CAST FLOOR BOXES FOR INSTALLATIONS IN SLAB ON GRADE.
 - (iii) INSTALL SERVICE FITTINGS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - (iv) DRILL FLOOR OPENING AND INSTALL POKE-THROUGH FITTINGS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

PART 6 - WIRES AND CABLES

- 6.1 QUALITY ASSURANCE**
- A. PERFORM WORK IN ACCORDANCE WITH NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA) STANDARD OF INSTALLATION.
- 6.2 REGULATORY REQUIREMENTS**
- A. CONFORM TO REQUIREMENTS OF NFPA 70.
 - B. FURNISH PRODUCTS LISTED BY UL.
- 6.3 WIRING METHODS**
- A. CONCEALED INTERIOR LOCATIONS: BUILDING WIRE IN RACEWAY.
 - B. CONCEALED INTERIOR LOCATIONS (RESIDENTIAL): BUILDING WIRE IN RACEWAY FOR FEEDERS, BUILDING WIRE WITHOUT RACEWAY FOR BRANCH CIRCUITS.
 - C. EXPOSED INTERIOR LOCATIONS: BUILDING WIRE IN RACEWAY.
 - D. ABOVE ACCESSIBLE CEILINGS: BUILDING WIRE IN RACEWAY.
 - E. ABOVE ACCESSIBLE CEILINGS (RESIDENTIAL): BUILDING WIRE IN RACEWAY FOR FEEDERS, BUILDING WIRE WITHOUT RACEWAY FOR BRANCH CIRCUITS.
 - F. WET OR DAMP INTERIOR LOCATIONS: BUILDING WIRE IN RACEWAY.
 - G. EXTERIOR LOCATIONS: BUILDING WIRE IN RACEWAYS.
 - H. UNDERGROUND LOCATIONS: BUILDING WIRE IN RACEWAY.
 - I. USE NO WIRE SMALLER THAN 12 AWG FOR POWER AND LIGHTING CIRCUITS, AND NO SMALLER THAN 14 AWG FOR LINE VOLTAGE CONTROL WIRING. USE MINIMUM 18 GAUGE WIRE FOR LOW-VOLTAGE (LESS THAN 30 VAC) CONTROL WIRING. USE 10 AWG CONDUCTOR FOR 20 AMPERE, 120 VOLT BRANCH CIRCUIT HOME RUNS LONGER THAN 50'. VERIFY MINIMUM VOLTAGE DROP PER NEC FINE PRINT NOTES.
- 6.4 WIRE AND CABLE**

- A. MANUFACTURERS
 - (i) TRIANGLE, SOUTHWIRE, OR CABLEC.
 - B. BUILDING WIRE
 - (i) FEEDERS AND BRANCH CIRCUITS LARGER THAN 6 AWG: COPPER, STRANDED CONDUCTOR, 600 VOLT INSULATION, THHN/THWN.
 - (ii) FEEDERS AND BRANCH CIRCUITS 6 AWG AND SMALLER: COPPER CONDUCTOR, 600 VOLT INSULATION, THHN/THWN. 6 AND 8 AWG, STRANDED CONDUCTOR; SMALLER THAN 8 AWG, SOLID CONDUCTOR.
 - (iii) CONTROL CIRCUITS: COPPER, STRANDED CONDUCTOR, 600 VOLT INSULATION, AS REQUIRED BY CONTROLS MANUFACTURER AND NEC.
 - C. DWELLING UNIT WIRE
 - (i) FEEDERS: COPPER STRANDED CONDUCTOR, 600 VOLT INSULATION, THHN/THWN.
 - (ii) BRANCH CIRCUITS: NM CABLE, 600 VOLT INSULATION WITH GROUND WIRE.
 - D. REMOTE CONTROL AND SIGNAL CABLE
 - (i) CONTROL CABLE FOR CLASS 1 REMOTE CONTROL AND SIGNAL CIRCUITS: COPPER CONDUCTOR, 600 VOLT INSULATION, RATED 60 DEG C, INDIVIDUAL CONDUCTORS TWISTED TOGETHER, OR AS REQUIRED BY CONTROLS MANUFACTURER AND NEC.
 - (ii) CONTROL CABLE FOR CLASS 2 OR CLASS 3 REMOTE CONTROL AND SIGNAL CIRCUITS: COPPER CONDUCTOR, 300 VOLT INSULATION, RATED 60 DEG C, INDIVIDUAL CONDUCTORS TWISTED TOGETHER, OR AS REQUIRED BY CONTROLS MANUFACTURER AND NEC.
 - E. CORDS: OIL-RESISTANT THERMOSET INSULATED MULTICONDUCTOR FLEXIBLE CORD WITH IDENTIFIED EQUIPMENT GROUNDING CONDUCTOR, SUITABLE FOR HARD USAGE IN DAMP LOCATIONS.
- 6.5 WIRING DEVICES AND WALL PLATES (COMMERCIAL GRADE)**
- A. ALL WALL PLATES SHALL BE NYLON, COMMERCIAL GRADE OF THE SAME COLOR AS THE SWITCHES AND OUTLETS.
 - B. SINGLE POLE SWITCH: HUBBELL MODEL 1221-W (WHITE), OR APPROVED EQUIVALENT.
 - C. WALL SWITCH OCCUPANCY/VACANCY SENSORS: DUAL-RELAY, MULTI-TECHNOLOGY WALL SWITCH TYPE, 120/277V, ADJUSTABLE TIME DELAY UP TO THIRTY (30) MINUTES, 180-DEGREE FIELD OF VIEW, LEVITON MODEL OSSMT-MD, OR APPROVED EQUIVALENT.
 - D. CEILING MOUNT OCCUPANCY SENSORS: MULTI-TECHNOLOGY, 360-DEGREE, SELF-ADJUSTING, ADJUSTABLE TIME DELAY UP TO THIRTY (30) MINUTES, LEVITON MODEL OSC05-MOW, OR APPROVED EQUIVALENT.
 - E. DUPLEX CONVENIENCE RECEPTACLE: HUBBELL MODEL 5342-W (WHITE), OR APPROVED EQUIVALENT.
 - F. GFCI RECEPTACLE: HUBBELL MODEL GF-5362-W (WHITE), OR APPROVED EQUIVALENT.
 - G. TELEPHONE OUTLET: COORDINATE COMPATIBILITY WITH OWNER'S TELEPHONE SYSTEM.
- 6.6 EXAMINATION AND PREPARATION**
- A. VERIFY THAT INTERIOR OF BUILDING IS PHYSICALLY PROTECTED FROM WEATHER.
 - B. VERIFY THAT MECHANICAL WORK WHICH IS LIKELY TO INJURE CONDUCTORS HAS BEEN COMPLETED.
 - C. COMPLETELY AND THOROUGHLY SWAB RACEWAY SYSTEM BEFORE INSTALLING CONDUCTORS.
- 6.7 INSTALLATION**
- A. NEATLY TRAIN AND SECURE WIRING INSIDE BOXES, EQUIPMENT, AND PANELBOARDS.
 - B. USE WIRE PULLING LUBRICANT FOR PULLING 4 AWG AND LARGER WIRES.
 - C. SUPPORT CABLES ABOVE ACCESSIBLE CEILINGS TO KEEP THEM FROM RESTING ON CEILING TILES.
 - D. MAKE SPLICES, TAPS, AND TERMINATIONS TO CARRY FULL AMPACITY OF CONDUCTORS WITHOUT PERCEPTIBLE TEMPERATURE RISE.
 - E. PROVIDE DEDICATED NEUTRAL CONDUCTOR FOR EACH ISOLATED GROUND CIRCUIT INDICATED.
 - F. TERMINATE SPARE CONDUCTORS WITH ELECTRICAL TAPE.
 - G. INSTALL WIRING DEVICES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - (i) INSTALL WALL SWITCHES 48" ABOVE FLOOR, OFF POSITION DOWN.
 - (ii) INSTALL WALL DIMMERS 48" ABOVE FLOOR. DERATE GANGED DIMMERS AS INSTRUCTED BY MANUFACTURER. DO NOT USE COMMON NEUTRAL.
 - (iii) INSTALL CONVENIENCE RECEPTACLES 18" ABOVE FLOOR, GROUNDING POLE ON BOTTOM.
 - (iv) INSTALL SPECIFIC PURPOSE RECEPTACLES AT HEIGHTS SHOWN ON DRAWINGS.
 - (v) INSTALL CORD AND ATTACHMENT PLUG CAPS ON EQUIPMENT UNDER THE PROVISIONS OF GENERAL ELECTRICAL REQUIREMENTS. SIZE CORD FOR CONNECTED LOAD AND RATING OF BRANCH CIRCUIT OVERCURRENT PROTECTION.
 - (vi) INSTALL WALL PLATES FLUSH AND LEVEL.
 - (vii) INSTALL GALVANIZED STEEL PLATES ON OUTLET BOXES AND JUNCTION BOXES IN UNFINISHED AREAS.

PART 7 - SERVICE AND DISTRIBUTION

- 7.1 ACCEPTABLE MANUFACTURERS**
- A. SIEMENS, SQUARE D, WESTINGHOUSE, CHALLENGER, GENERAL ELECTRIC, OR APPROVED EQUIVALENT.
 - B. IT IS EMPHASIZED THAT THIS ACCEPTANCE IS FOR THE MANUFACTURER ONLY, AND NOT FOR ANY SPECIFIC PIECES OF EQUIPMENT. SUCH ACCEPTANCE DOES NOT RELIEVE THE CONTRACTOR FROM MEETING OR EXCEEDING ALL ELEMENTS OF THE DESIGN AND SPECIFICATION INTENT, INCLUDING APPEARANCE FOR THOSE ITEMS IN SPACES VISIBLE TO THE GENERAL PUBLIC, NOR DOES IT RELIEVE THE CONTRACTOR FROM VERIFYING ALL DIMENSIONS AND OTHER INSTALLATION REQUIREMENTS PRIOR TO PURCHASE.
 - C. IT SHOULD ALSO BE NOTED THAT SUBMITTALS MUST CLEARLY ILLUSTRATE ALL PERFORMANCE DATA, NOISE DATA, ACCESSORIES, OPTIONS, ELECTRICAL CHARACTERISTICS (AS APPLICABLE), AND OTHER RELATED INFORMATION. ANY DEVIATIONS FROM SCHEDULED OR SPECIFIED EQUIPMENT OR OPTIONS MUST ALSO BE CLEARLY LISTED.
- 7.2 ALL ELECTRICAL APPARATUS**
- A. WIRE TERMINATION PROVISIONS FOR PANELBOARDS, CIRCUIT BREAKERS, SAFETY SWITCHES, AND ALL OTHER ELECTRICAL APPARATUS SHALL BE LISTED AS SUITABLE FOR AT LEAST 75 DEG C (CU/AL) OR AS NOTED IN MANUFACTURER'S INSTRUCTIONS, WHICHEVER IS GREATER.
- 7.3 BRANCH CIRCUIT PANELBOARDS AND LOAD CENTERS**
- A. BRANCH CIRCUIT PANELBOARDS AND LOAD CENTERS SHALL BE OF THE DEAD-FRONT TYPE AND SHALL BE RECESS AND/OR SURFACE MOUNTED AS SHOWN AND SCHEDULED. THE PANELBOARDS AND LOAD CENTERS SHALL BE EQUIPPED WITH THE NUMBER OF BOLT-ON (FOR PANELBOARDS) OR STAB-IN (FOR LOAD CENTERS) SINGLE POLE AND MULTIPLE POLE CIRCUIT BREAKERS SHOWN BY THE SCHEDULES ON THE DRAWINGS AND OF THE AMPERE RATINGS INDICATED. PROVIDE CIRCUIT BREAKERS UL LISTED AS TYPE HACR FOR BRANCH CIRCUITS SERVING AIR CONDITIONING EQUIPMENT OR ICE MAKERS.
 - B. AS INDICATED BY THE SCHEDULES ON THE DRAWINGS, PANELBOARDS AND LOAD CENTERS SHALL HAVE EITHER MAIN LUGS ONLY OR MAIN CIRCUIT BREAKERS. BUSSES SHALL BE SIZED AS INDICATED ON THE SCHEDULES AND SHALL BE MADE OF COPPER. THE PANELBOARDS AND LOAD CENTERS SHALL BE BUSSED FOR THREE-PHASE, FOUR-WIRE SERVICE OR SINGLE-PHASE THREE-WIRE SERVICE AND EQUIPPED WITH COPPER GROUND BUS BONDED TO THE CABINET AND WITH INCOMING LINE LUG SIZED TO ACCOMMODATE GROUND SIZE SHOWN ON THE DRAWINGS. THEY SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST RULES OF THE NEC AND SHALL BEAR THE STAMPED APPROVAL OF UL. AN ENGRAVED MICARTA LABEL SHALL IDENTIFY EACH PANELBOARD. PROVIDE ISOLATED GROUND PROVISIONS WHEN REQUIRED.

- C. PANELBOARD, LOAD CENTER AND CIRCUIT BREAKER RATINGS.
 - (i) MINIMUM A.I.C. FAULT CURRENT RATING OF PANELBOARDS AND ENCLOSED CIRCUIT BREAKERS, BUSSES, ETC., SHALL BE 22,000 AMPERES, UNLESS OTHERWISE NOTED.
 - (ii) MINIMUM A.I.C. FAULT CURRENT RATING OF LOAD CENTERS AND ASSOCIATED CIRCUIT BREAKERS, BUSSES, ETC., SHALL BE 10,000 AMPERES, UNLESS OTHERWISE NOTED.
 - D. CABINET DOORS SHALL BE PROVIDED WITH HEAVY NON-SNAP LOCKS WITH KEYS, AND ALL LOCKS SHALL BE KEYED ALIKE. TRIMS AND CABINETS SHALL BE FINISHED WITH TWO (2) COATS OF GRAY LACQUER. A TYPED CIRCUIT DIRECTORY IDENTIFYING ALL BRANCH CIRCUITS OR FEEDERS SHALL BE PROVIDED IN A STEEL FRAME ON THE BACK OF THE DOOR OF EACH CABINET. THE DIRECTORY SHALL HAVE A NEATLY TYPED LIST OF WHAT EACH INDIVIDUAL CIRCUIT BREAKER IS SERVING AND WHAT ROOMS THAT BREAKER IS SERVING. PANELS SHALL BE MOUNTED AT A CONSISTENT HEIGHT THROUGHOUT THE PROJECT WITH TOP OF PANELS NOT EXCEEDING 6'-0" AFF.
 - E. ANY PANELBOARD DERIVING POWER FROM A "K-FACTOR" RATED TRANSFORMER SHALL HAVE A 200 PERCENT RATED NEUTRAL BUS.
 - F. PROVIDE ALL PANELBOARDS AND LOAD CENTERS WITH GROUND BUS SEPARATE FROM NEUTRAL BUS.
- 7.4 SAFETY SWITCHES**
- A. SAFETY SWITCHES SHALL BE UL APPROVED, HEAVY-DUTY, DESIGNED FOR QUICK-MAKE, QUICK-BREAK USE AND EQUIPPED WITH ARC-QUENCHING DEVICES. THE SWITCHES SHALL BE OF THE SIZES INDICATED ON THE DRAWINGS AND WHERE USED TO SERVE MOTORS SHALL BEAR THE HORSEPOWER RATING EQUAL TO OR EXCEEDING THAT OF THE MOTOR WHICH THEY SERVE REGARDLESS OF THE SIZE OR TYPE SPECIFIED ON THE DRAWINGS.
 - B. IF THE SWITCHES ARE TO BE MOUNTED WHERE WEATHERPROOF UNITS ARE REQUIRED BY CODE, THEY SHALL BE SO FURNISHED BY THE CONTRACTOR.
- 7.5 FUSES**
- A. FURNISH AND INSTALL FUSES IN EACH DEVICE REQUIRING SAME. UNLESS OTHERWISE SPECIFIED FUSES SHALL BE EQUAL TO BUSSMAN DUAL-ELEMENT "FUSETRON" OF THE SIZES SCHEDULED. ALL FUSES AT THE EXTERIOR DISCONNECTS SHALL BE CURRENT-LIMITING TYPE.
 - B. PROVIDE THREE (3) SPARE FUSES, INCLUDING CONTROL FUSES, FOR EACH FUSE SIZE USED. STORE FUSES IN A FUSE CABINET.
- 7.6 INSTALLATION**
- A. IN ANY SPACE ASSIGNED FOR THE INSTALLATION OF PANELBOARDS, CONTRACTOR SHALL VERIFY DIMENSIONS OF THE EQUIPMENT TO BE INSTALLED. SHOP DRAWING DATA SUBMITTED SHALL INCLUDE A DIMENSIONED DRAWING SHOWING PLACEMENT OF THE EQUIPMENT WITHIN THE ROOM (MAIN ELECTRICAL ROOM ONLY).
 - B. WHERE SAFETY SWITCHES ARE SHOWN SERVING ROOF MOUNTED OR PAD MOUNTED MECHANICAL EQUIPMENT, THEY SHALL BE MOUNTED SEPARATELY FROM THE EQUIPMENT ON UNISTRUT WHERE MOUNTING TO THE EQUIPMENT WILL OBSTRUCT AIR FLOW OR MAINTENANCE. PROVIDE DUPLEX OUTLET FOR SERVICING SUCH EQUIPMENT.
 - C. PROVIDE 4"-HIGH CONCRETE EQUIPMENT PADS BENEATH SWITCHBOARDS, TRANSFORMERS, ETC.

PART 8 - LIGHTING

- 8.1 SUBMITTALS**
- A. PRODUCT DATA: PROVIDE PRODUCT DATA FOR EACH LUMINAIRE AND LIGHTING UNIT.
 - B. OPERATING AND MAINTENANCE (O&M) INSTRUCTIONS: PROVIDE MAINTENANCE AND OPERATING INSTRUCTIONS FOR BATTERY POWERED LIGHTING UNITS.
- 8.2 REGULATORY REQUIREMENTS**
- A. CONFORM TO REQUIREMENTS OF ANSI / NFPA 70.
 - B. CONFORM TO REQUIREMENTS OF NFPA 101.
 - C. FURNISH PRODUCTS LISTED BY UL OR OTHER NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) TESTING FIRM ACCEPTABLE TO AHI.
- 8.3 EXAMINATION AND PREPARATION**
- A. EXAMINE ADJACENT SURFACES TO DETERMINE THAT SURFACES ARE READY TO RECEIVE WORK.
- 8.4 INSTALLATION**
- A. INSTALL LUMINAIRES AND ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 - (i) PROVIDE PENDANT ACCESSORY TO MOUNT SUSPENDED LUMINAIRES AND EXIT SIGNS AT HEIGHT INDICATED.
 - (ii) INSTALL LAMPS IN LUMINAIRES AND LAMPHOLDERS, UNLESS LAMPS ARE PRE-INSTALLED BY MANUFACTURER.
- 8.5 ADJUSTING AND CLEANING**
- A. ALIGN LUMINAIRES AND CLEAN LENSES AND DIFFUSERS AT COMPLETION OF WORK.
 - B. AIM ADJUSTABLE LUMINAIRES AND LAMPHOLDERS AS INDICATED OR AS DIRECTED.
 - C. CLEAN PAINT SPLATTERS, DIRT AND DEBRIS FROM INSTALLED LUMINAIRES.
 - D. TOUCH UP LUMINAIRES' FINISH AT COMPLETION OF WORK.
 - E. RE-LAMP LUMINAIRES WHICH HAVE FAILED LAMPS AT COMPLETION OF WORK.

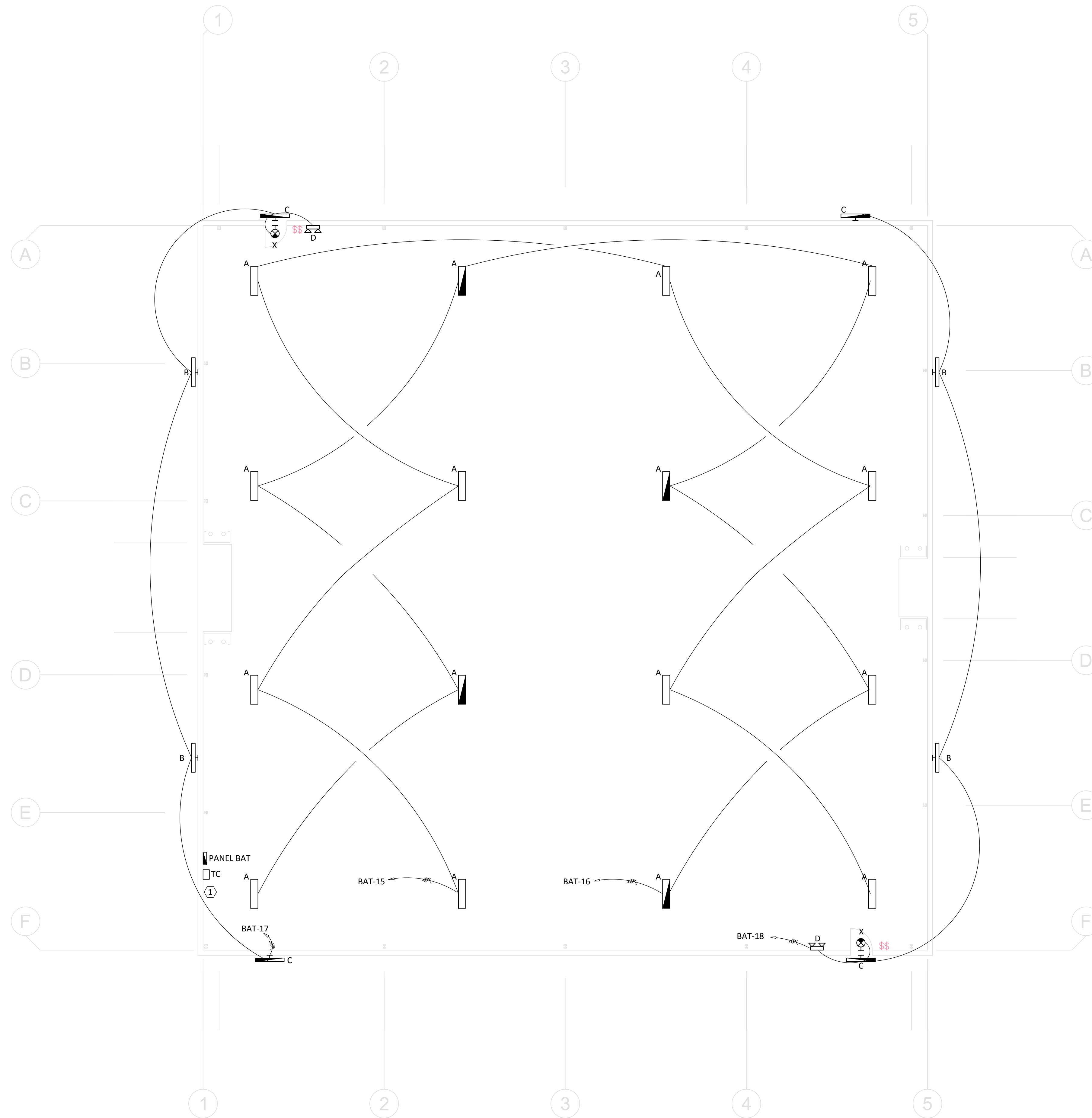
No.	ISSUE	DATE
1	100% IFC	02/23/2024

PROJECT No.: 23046.MS.AUS
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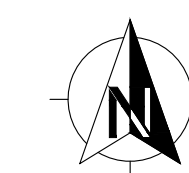
SHEET TITLE:
 SHEET SPECIFICATIONS

SHEET NUMBER:

E002



1 LIGHTING PLAN
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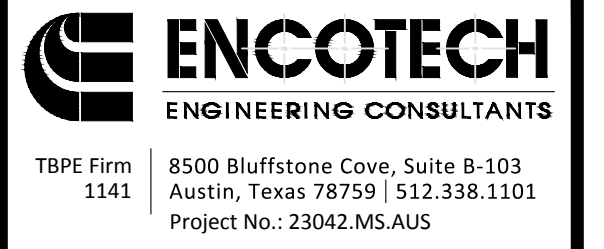


ELECTRICAL GENERAL NOTES

- A. BUILDING PRIMARY USE IS FOR STORAGE AND IS NOT CONDITIONED. STORAGE MATERIALS MAY PRODUCE EXHAUST GASES AND THUS VENTILATION IS REQUIRED AND SHOULD BE MAINTAINED.
- B. BUILDING IS EXPOSED TO STRUCTURE. ROUTE CONDUIT ALONG STRUCTURAL BEAMS AS MUCH AS POSSIBLE.
- C. PROVIDE FLEXIBLE SHOCK RESISTANT CONDUIT AT ALL PENDANT MOUNT LIGHT FIXTURE CONNECTIONS.
- D. ALL FIXTURES DESIGNATED AS "EMERGENCY" SHALL BE EQUIPPED WITH AN INTEGRAL BATTERY BACK UP IN THE EVENT OF POWER FAILURE TO MAINTAIN ILLUMINATED PATH OF EGRESS.

KEYED NOTES

- 1. PROVIDE DIGITAL TIME CLOCK TORK #DZS400BP, WITH NEMA 3R LOCKING ENCLOSURE.



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No.	ISSUE	DATE
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PROJECT No: 23046.MS.AUS
P.M.: LCS DRAWN BY: WU
QA/QC BY: SB DATE: 02/23/2024

SHEET TITLE:
LIGHTING PLAN

SHEET NUMBER:
E100



1 ELECTRICAL SITE PLAN
SCALE: 1"=100'-0"

ELECTRICAL GENERAL NOTES

- A. MATCH EXISTING UTILITY FEEDER SIZE.
- B. FIELD LOCATE EXISTING ELECTRICAL DISTRIBUTION GEAR FOR TIE-IN AND PROTECT FROM DAMAGE DURING CONSTRUCTION. COORDINATE ANY OUTAGES WITH OWNER.
- C. FIELD LOCATE AND IDENTIFY EXISTING UNDERGROUND UTILITIES ON SITE PRIOR TO TRENCHING FOR NEW ELECTRICAL FEEDER, UTILIZING LOCATOR SERVICE.
- D. PROVIDE TEMPORARY TREE PROTECTION FOR THOSE TREES WITHIN THE CONSTRUCTION LIMITS OR OTHERWISE FLAGGED BY THE OWNER TO REQUIRE PROTECTION.
- E. PROVIDE TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES TO PREVENT EROSION AND DISCHARGE OF SOIL-BEARING WATER RUNOFF OR AIRBORNE DUST TO ADJACENT BUILDINGS PER OWNER'S REQUIREMENTS.
- F. IDENTIFY PROPOSED ROUTING OF NEW ELECTRICAL FEEDER UTILIZING TEMPORARY FLAGS OR PAINT.
- G. ONCE ALL EXISTING UTILITIES HAVE BEEN LOCATED, TREE PROTECTION AND EROSION CONTROL MEASURES ARE IN PLACE, AND PROPOSED FEEDER ROUTING IS IDENTIFIED, CONTRACTOR SHALL HOLD PREINSTALLATION CONFERENCE WITH OWNER AND ENGINEER SO THAT PROPOSED ROUTING CAN BE REVIEWED AND ACCEPTED PRIOR TO EXCAVATION.
- H. HAND DIG CONDUIT TRENCHES WHERE TREE ROOTS ARE PRESENT SO AS NOT TO DAMAGE EXISTING ROOT SYSTEM.
- I. COORDINATE MARKING OF OPEN TRENCHES DURING CONSTRUCTION WITH OWNER AND PROVIDE TEMPORARY BARRICADES AS REQUIRED.
- J. CONTRACTOR SHALL NOT OBSTRUCT NORMAL FLOW OF VEHICULAR TRAFFIC ON SITE WITHOUT PERMISSION FROM OWNER.
- K. EXCAVATE TRENCH TO UNIFORM WIDTH AND DEPTH TO PROVIDE CLEARANCE ON EACH SIDE OF CONDUIT. EXCAVATE TRENCH BOTTOMS TO PROVIDE UNIFORM BEARING AND SUPPORT OF CONDUITS. REMOVE PROJECTING ROCKS LARGER THAN 2 INCHES IN DIAMETER FROM TRENCH BEFORE INSTALLING CONDUIT.
- L. PLACE AND COMPACT BACKFILL IN EXCAVATIONS. WHEN EXCAVATED MATERIALS INTENDED FOR BACKFILL INCLUDE UNSATISFACTORY SOIL MATERIALS AND ROCK, REPLACE WITH SATISFACTORY MATERIALS.
- M. PROVIDE CONTINUOUS UNDERGROUND LINE WARNING TAPE IN TRENCH DIRECTLY ABOVE CONDUIT. TAPE SHALL BE RED AND LABELED "CAUTION BURIED ELECTRIC LINE BELOW" WITH PERMANENT INK. TAPE SHALL BE DETECTABLE BY METAL DETECTOR WHEN BURIED UP TO 30 INCHES DEEP.
- N. UNIFORMLY GRADE AREAS TO SMOOTH SURFACE, FREE OF IRREGULAR SURFACE CHANGES, AND MATCHING ADJACENT EXISTING GRADES.

KEYED NOTES

- 1. PROVIDE CONNECTION TO EXISTING GEAR. REFER TO ON-LINE DIAGRAM 1/E500.
- 2. ROUTE FEEDER TO MAIN DISCONNECT SWITCH ON EXTERIOR OF NEW BUILDING. REFER TO ONE-LINE DIAGRAM 1/E500.
- 3. PROVIDE UNDERGROUND FEEDER FROM SC-9 TO NEW BUILDING. REFER TO ONE-LINE DIAGRAM 1/E500.

NEW DSC STORES BUILDING



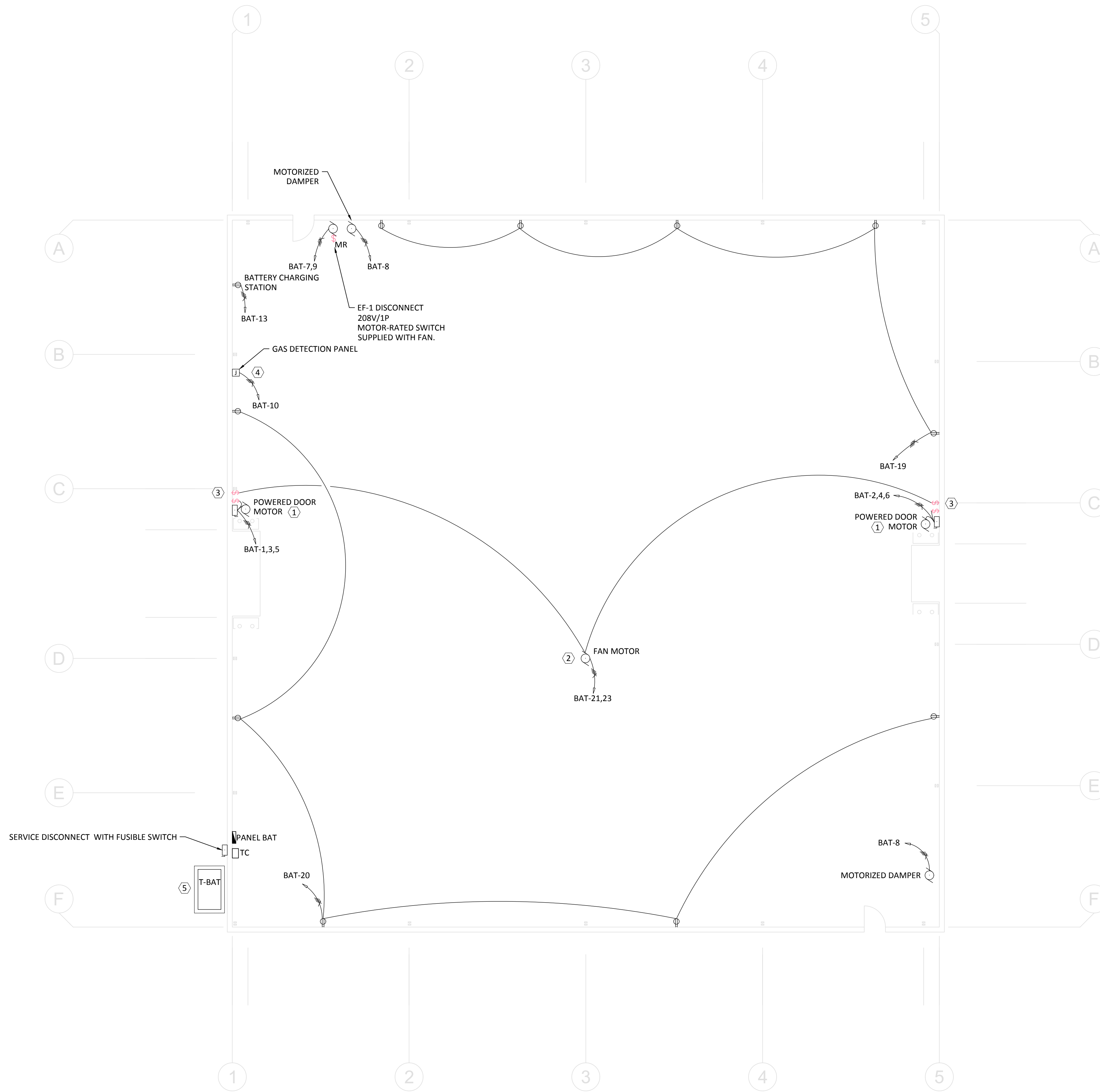
LCRA DSC Stores Bldg Upgrades
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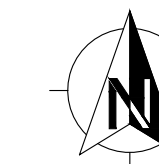
PROJECT No.: 23046.MS.AUS
P.M.: LCS DRAWN BY: WU
QA/QC BY: SB DATE: 02/23/2024

SHEET TITLE:
ELECTRICAL SITE PLAN

SHEET NUMBER:
E200



1 ELECTRICAL POWER PLAN
SCALE: 1/8"=1'-0"



ELECTRICAL GENERAL NOTES

- A. BUILDING PRIMARY USE IS FOR STORAGE AND IS NOT CONDITIONED. STORAGE MATERIALS MAY PRODUCE EXHAUST GASES AND THUS VENTILATION IS REQUIRED AND SHOULD BE MAINTAINED.
- B. BUILDING IS EXPOSED TO STRUCTURE. ROUTE CONDUIT ALONG STRUCTURAL GIRTS AS MUCH AS POSSIBLE. SIMILAR MOUNTING SHOWN FOR REFERENCE BELOW (FIGURES 2 & 3).

KEYED NOTES

- 1. POWER FOR MOTORIZED DOORS. CONNECT TO DOOR OPERATOR AND PROVIDE MOTOR RATED SAFETY SWITCH.
- 2. FAN MOUNTED TO EXPOSED STRUCTURE, PROVIDE MANUFACTURER RECOMMENDED MOUNTING EQUIPMENT AND CONTROLS. EXAMPLE PROVIDED IN FIGURE 1.
- 3. PROVIDE VFD CONTROL PAD FOR CEILING FAN.
- 4. DEDICATED CIRCUIT FOR GAS DETECTION EQUIPMENT AND ALARM DEVICES.
- 5. PROVIDE 4 INCH THICK CONCRETE PAD WITH MORE THAN 6 INCH CLEARANCE ON ALL SIDES.

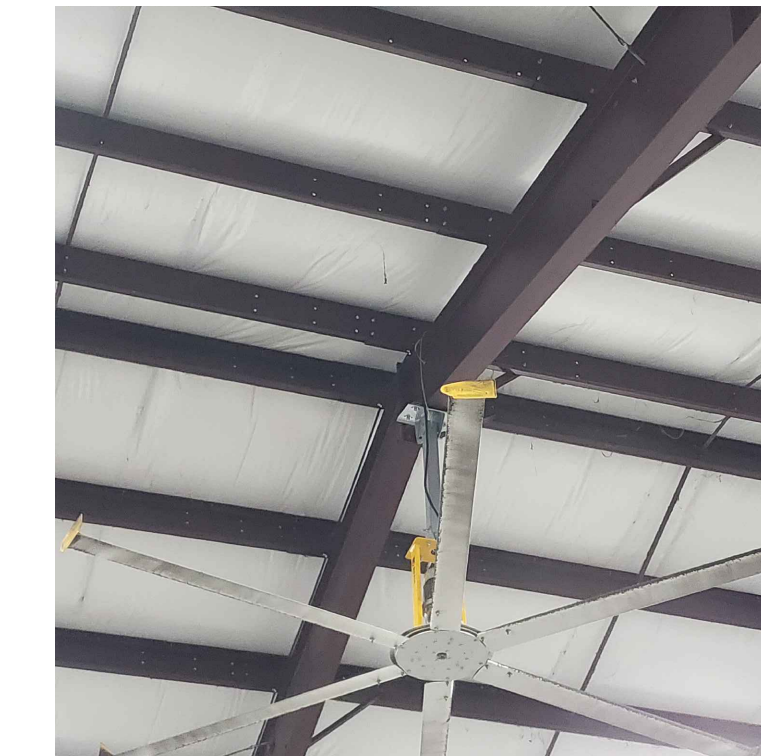


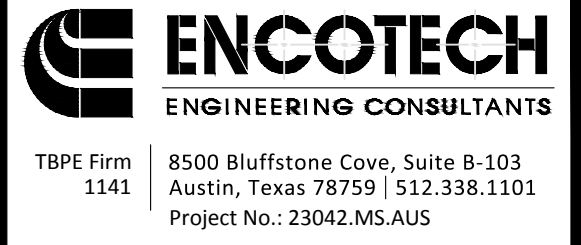
FIGURE 1 - CEILING FAN



FIGURE 2 - JUNCTION BOX



FIGURE 3 - OUTLET BOX



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 ELECTRICAL POWER PLAN
 SHEET NUMBER:
E201



2-23-24

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KEYED NOTES
Ⓢ COULD NOT VERIFY DURING MAPPING EFFORTS



1 ONE-LINE DIAGRAM
N.T.S.

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PROJECT No.: 23046.MS.AUS
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SHEET TITLE:
ONE-LINE DIAGRAM

SHEET NUMBER:
E500



2-23-24

LCRA DSC Stores Bldg Upgrades
3505 MONTOPOLIS, AUSTIN TX 78744

PANELBOARD SCHEDULE				BAT				LOCATION: BATTERY STORAGE C.B. RATING: 10 K.A.L.C.					
WIRE SIZE	TYPE	VOLTAGE	PHASE	WIRE	MOUNTING				BUS (A)	LUG	TYPE		WIRE SIZE
		208Y/120V	3	4	SURFACE				150	MCB	NEMA 1		
		USE and/or AREA SERVED	C/B POLE	CIR	8A	8B	8C	CIR	C/B POLE	USE and/or AREA SERVED			
		POWERED DOOR MOTOR	20/3	1 200				2 200	20/3	POWERED DOOR MOTOR			
				3 200				4 200					
				5 200				6 200					
		EF-1	15/2	7 218				8 350	20/1	MOTORIZED DAMPERS			
				9 218				10 100	20/1	GAS DETECTION PANEL			
		SPARE	20/1	11 -				12 -	20/1	SPARE			
		BATTERY CHARGING STATION	20/1	13 1200				14 300	20/1	SPARE			
		LIGHTING	20/1	15 1880				16 1880	20/1	LIGHTING			
		EXT LIGHTING	20/1	17 -				18 295	20/1	EXT LIGHTING			
		RECEPTACLES	20/1	19 500				20 500	20/1	RECEPTACLES			
				21 500				22 700	20/1	SPARE			
		FAN MOTOR	20/2	23 -				24 700	20/1	SPARE			
TOTAL LOAD PER PHASE				4868	5178	1690	5178 VA / 120 V = 43 A						
① GFCI ② AFCI ③ AFCI/GFCI ④ SHUNT TRIP ⑤ SWD ⑥ HACR ⑦ LOCKABLE										OPTIONS: NONE - REFER TO SPECIFICATIONS			

FEEDER OCPD AND CONDUCTOR CALCULATION						
LOAD DESCRIPTION (LOAD IN KVA)	CONNECTED LOAD	DEMAND FACTOR	DEMAND LOAD	LOAD MULTIPLIER	FEEDER LOAD	NOTES
LIGHTING	4.35	1.00	4.35	1.25	5.44	
RECEPTACLES	1.80	50%>10	1.80	1.00	1.80	
LARGEST MOTOR	1.40	1.00	1.40	1.25	1.75	
OTHER MOTOR(S)	1.64	1.00	1.64	1.00	1.64	
HEATING	0.00	1.00	0.00	1.25	0.00	
CONTINUOUS LOADS	1.30	1.00	1.30	1.25	1.63	
NONCONTINUOUS LOADS	0.35	1.00	0.35	1.00	0.35	
KITCHEN EQUIPMENT QTY = 0	0.00	1.00	0.00	1.00	0.00	
DIVERSIFIED LOAD	0.00	1.00	0.00	0.50	0.00	
TOTAL KVA	10.84	-	-	-	12.60	
TOTAL AMPS	30 A	-	-	-	35 A	

LIGHTING FIXTURE SCHEDULE									
MARK	MANUFACTURER	MODEL	VOLTAGE	LAMPING				MOUNTING	DESCRIPTION
				QTY	WATTAGE	TYPE	TEMP		
A	Lithonia	CPHB 36000LM SEF GCL MD MVOLT GZ10 40K	120V	16	235W	LED	4000K	PENDANT	HI-BAY PENDANT MOUNTED LED EMERGENCY BATTERY PACK
		80CRI CONTROLS DWH							
B	Lithonia	WPX3 LED 40K MVOLT OPTIONS FINISH	120V	4	69W	LED	4000K	WALL	EXTERIOR WALL PACK
C	Lithonia	WPX0 LED ALO SWW2 MVOLT PE DDBXD	120V	4	13W	LED	4000K	WALL	OVERHEAD LIGHT FOR DOORS EMERGENCY BATTERY PACK
D	Lithonia	ELM6L UVOLT LTP OPTIONS	120V	4	6W	LED	4000K	WALL	EGRESS LIGHTING BUG EYES
X	Lithonia	EXRG M6 EL	120V	2	5W	LED	4000K	WALL	EXIT SIGN

NOTES:
1. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF ALL FIXTURES.
2. PROVIDE ENERGY SAVING BALLASTS FOR ALL FIXTURES WHEREVER AVAILABLE.

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SHEET TITLE:
ELECTRICAL SCHEDULES

SHEET NUMBER:

E501