

NOTES

F-2

F-2

F-2

F-2

F-2

ACTUAL VENTILATION PROVISION RATES

EXHAUST

RATE

(CFM)

VENT

RATE

(CFM)

30

80

210

40

400

6

MECHANICAL SPECIFICATIONS . WORK SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH WISCONSIN MECHANICAL CODE, HEALTH 1.0 DESCRIPTION OF WORK

> GENERAL CONDITIONS AND GENERAL NOTES INDICATED WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS SHALL GOVERN WHERE APPLICABLE.

WORK INDICATED ON DRAWINGS SHALL BE CONSIDERED NEW AND IN-CONTRACT UNLESS NOTED OTHERWISE.

COMPLETELY OPERATIONAL HEATING, VENTILATING, AIR CONDITIONING AND EXHAUST SYSTEMS READY FOR USE AS ITEMIZED BUT

7 4 9 8 0 7 7 4 9 8

DEMOLITION, REMOVAL, AND ALTERATIONS OF EXISTING SYSTEMS AND EQUIPMENT AS REQUIRED THOUGH NOT SPECIFICALLY INDICATED ACCOMMODATING PROPOSED WORK.

FURNACES AND CONDENSING UNITS 1.03C DUCTWORK AND AIR DEVICES.

VENTILATORS, AND DAMPERS 1.03E THERMAL INSULATION AND DUCT LINING

1.03F CONTROLS, SENSORS, CONTROL WIRING, AND INTERLOCKS. 1.03G GAS PIPING WITH CONNECTION TO EQUIPMENT REQUIRING NATURAL GAS

RELATED WORK BY OTHER TRADES

ELECTRIC POWER WIRING ELECTRIC TELECOMMUNICATION WIRING

3.0 RELATED WORK BY OTHERS

APPLIANCES

MECHANICAL INSTALLATION NOTES

WORK SHALL BE PERFORMED IN ACCORDANCE WITH CODES AND AUTHORITIES HAVING JURISDICTION, INCLUDING ADA GUIDELINES AND ENERGY COMPLIANCE.

WORK AND INSTALLATIONS SHALL BE PERFORMED IN FIRST-CLASS NEAT WORKMANLIKE MANNER. REMOVE DEBRIS ON REGULAR BASIS AND CLEAN EQUIPMENT DURING PROJECT COMPLETION.

4.03 APPLY, PROCURE, AND PAY FOR REQUIRED PERMITS AND INSPECTIONS.

FIELD VERIFY PROJECT CONSTRUCTION CONDITIONS AND PROJECT SITE CONDITIONS PRIOR TO SUBMITTING BID.

THIS TRADE SHALL DO ITS OWN CUTTING AND PATCHING, TRENCHING AND BACKFILLING. PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES SHALL BE FILLED WITH FIRESTOP PRODUCT. SUBMIT FIRESTOP PRODUCT MATERIAL SPECIFICATIONS TO LOCAL AUTHORITIES HAVING JURISDICTION.

CONFER WITH THE OTHER TRADES IN COORDINATION OF THIS WORK FOR REQUIRED CLEARANCES, CHASES, RECESSES AND

PROPOSAL PRICE SHALL INCLUDE SPECIFIED MATERIALS ONLY. SHOULD CONTRACTOR WISH TO SUBSTITUTE MATERIALS, EQUIPMENT OR MANUFACTURERS, IT SHALL BE DONE BY STATING EACH SUBSTITUTION AND ITS PRICE ADJUSTMENT.

DRAWINGS SHALL BE FOR BIDDING ONLY. ROUGH-IN AND FINAL CONNECTION SHALL BE MADE FROM APPROVED EQUIPMENT DRAWINGS ONLY

GUARANTEE WORK AND EQUIPMENT TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR PERIOD OF ONE (1) YEAR FROM DATE OF FINAL CERTIFICATE OF OCCUPANCY. ANY REPAIRS OR REPLACEMENT DURING THIS PERIOD SHALL BE MADE WITHOUT GAS PIPING SHALL BE SCHEDULE 40 ASTM A53 TYPE B BLACK STEEL WITH METALLIC FITTINGS. PROVIDE GAS VALVE, UNION, AND DIRT

LEG (AND REGULATOR AS REQUIRED) AT EACH CONNECTION. GAS PIPING IN CONCEALED LOCATIONS SHALL NOT HAVE REMOVABLE FITTINGS. PIPING LARGER THAN 4" OR EXCEEDING 5 PSI SHALL BE WELDED. TEST GAS PIPING AT 1-1/2 TIMES MAXIMUM PRESSURE, BUT NOT LESS THAN 3 PSIG, AND REPAIR LEAKS AS REQUIRED, AND RETEST. GAS PIPING SHALL BE PAINTED YELLOW COLOR AND MARKED "GAS" WITH BLACK COLOR.

REFRIGERATION PIPING SHALL BE DEHYDRATED AND CAPPED ACR COPPER WITH WROUGHT COPPER FITTINGS. JOINTS SHALL BE MADE WITH SILFOS, EXCEPT AT VALVES AND OTHER EQUIPMENT DAMAGED BY HIGH TEMPERATURES WHERE 95-5 SOLDER SHALL BE

INTERNALLY INSULATE (LINE) SPIRAL SUPPLY AIR AND RETURN AIR DUCTS WITH FIBER GLASS ANTI-MICROBIAL DUCT LINER INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. INSULATION SHALL HAVE FLAME SPREAD RATING NOT TO EXCEED 25 AND SMOKE DEVELOPED RATING NOT TO EXCEED 50, PER ASTM E84. PLAN DIMENSIONS INDICATE CLEAR-INSIDE DIMENSIONS.

EXTERNALLY INSULATE (WRAP) SUPPLY, RETURN, AND OUTSIDE AIR INTAKE DUCTS. DUCTS INSIDE BUILDING SHALL HAVE EXTERNAL WRAP BLANKET TYPE FIBERGLASS INSULATION WITH FACTORY APPLIED FIBERGLASS REINFORCED ALUMINUM FOIL FACING AND THERMAL VALUE OF R-6 OR GREATER AT 75 DEG F (CONDITIONED SPACES). DUCTS OUTSIDE BUILDING SHALL HAVE EXTERIOR RIGID FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR-RETARDANT FACING, PROVIDING THERMAL VALUE R-12 OR GREATER AT 0 DEG F (UNCONDITIONED SPACES). INSULATION SHALL BE WRAPPED TIGHT WITH JOINTS ABUTTED AND SEALED AND BE SECURED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. INSULATION SHALL HAVE FLAME SPREAD RATING NOT TO EXCEED 25 AND SMOKE DEVELOPED RATING NOT TO EXCEED 50, PER ASTM E84.

4.14 DUCTS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH RECOMMENDATIONS SET FORTH IN SMACNA MANUAL. DUCTS SHALL BE SEALED TO PRESSURE CLASS A, WITH MECHANICAL JOINTS AND ADHESIVE SEALANT. FIRE DAMPERS SHALL BE TYPE B UNLESS NOTED OTHERWISE ON DRAWINGS.

4.15 FLEXIBLE RUNOUTS SHALL NOT EXCEED 5'-0" AND SHALL BE INSULATED WITH VAPOR BARRIER. NO PVC SHALL BE PERMITTED.

PROVIDE MANUALLY OPERATED VOLUME CONTROL AND/OR SPLITTER DAMPERS IN DUCT BRANCHES FOR PROPER BALANCING OF AIR HANDLING SYSTEMS. DAMPERS ABOVE INACCESSIBLE CEILINGS SHALL HAVE EXTENDED ARMS OR REMOTE OPERATORS. DAMPERS SPECIFIED WITH AIR DEVICES SHALL NOT REPLACE DAMPERS IN BRANCH DUCTWORK.

4.17 LOUVERS SHALL BE RUSKIN ELF375DX WITH OPENING SIZES AS INDICATED ON DRAWINGS. PAINTED AND FINISH (KYNAR 500 OR HYLAR 5000) SHALL BE SELECTED BY ARCHITECT.

CONTROL DAMPERS SHALL BE RUSKIN CD356 GALVANIZED STEEL LOW LEAKAGE TYPE WITH OPENING SIZES AS INDICATED ON THE DRAWINGS. PROVIDE MANUAL OPERATORS OR MOTORIZED ACTUATORS AS INDICATED OR REQUIRED.

4.19 GAS VENTING FLUES FOR BOILERS, FURNACES, UNIT HEATERS, AND WATER HEATERS SHALL BE TYPE "B" GALVANIZED FOR STANDARD EFFICIENCY UNITS, SCHEDULE 40 PVC FOR HIGH EFFICIENCY UNITS, AND TYPE "B" STAINLESS STEEL FOR INSTANTANEOUS UNITS. TYPE "B" VENTS SHALL PENETRATE ROOF WITH TALL FLASHING CONE, STORM COLLAR, AND TERMINATION CAP. PVC VENTS SHALL PENETRATE ROOF/WALL WITH CONCENTRIC KITS. VERIFY MANUFACTURER RECOMMENDATIONS AND REQUIREMENTS FOR MATERIALS TYPE, FITTINGS TYPE, AND TERMINATIONS TYPE.

4.20 AIR DEVICES SHALL BE COORDINATED WITH ARCHITECTURAL REFLECTED CEILING PLANS. VERIFY LAYIN CEILING GRID TYPE WITH ARCHITECTURAL DRAWINGS.

IDENTIFY EACH EQUIPMENT UNIT WITH 4" HIGH X 3/4" THICK LETTERS WITH UNIT NUMBERS AS INDICATED ON DRAWINGS. PROVIDE 3/4" HIGH WHITE-FACED MICARTA WITH BLACK LETTERS AT EACH UNIT THERMOSTAT WITH UNIT NUMBERS AS INDICATED ON

4.22 ROOF CURBS AND ROOF EQUIPMENT SUPPORTS SHALL BE FULLY INSULATED AND INSTALLED WITH 18-GAUGE GALVANIZED STEEL SHELLS, SEALED NAILERS, AND COUNTERFLASHING.

FASTENERS, CONTINUOUSLY WELDED CONSTRUCTION, 1/2" MESH BIRDSCREEN, AND BOLTED SUPPORT FRAMING ONTO ROOF CURB. 4.24 PIPING SHALL PENETRATE ROOF THROUGH PORTAL CURB WITH INSULATED EPDM PORTAL WITH 3-1/2" PIPE PENETRATION SLEEVES

OUTDOOR AIR INTAKE GRAVITY VENTILATORS SHALL BE LOREN COOK PR 16-GAUGE SPUN ALUMINUM. CORROSION RESISTANT

AND EPDM BOOTS WITH ADJUSTABLE STAINLESS STEEL BANDS. ACCESS PANELS SHALL BE INSTALLED WHERE REQUIRED FOR SERVICING DEVICES AND EQUIPMENT. COORDINATE EXACT SIZES,

LOCATIONS, AND COLORS WITH ARCHITECT. 4.26 ELECTRONIC CONTROL OF HEATING, VENTILATION, AND AIR CONDITION SYSTEMS, AS INDICATED ON SEQUENCE OF OPERATION, INCLUDING CONTROLLERS, VFD, STARTERS, SENSORS, INTERLOCKS, STRUCTURED CABLING (CABLING SHALL BE IN EMT CONDUIT WHERE WITHIN CONCEALED WALLS/CEILINGS), CONTROLS OPERATIONS MANUALS, AND TWO-

INTERLOCK RESPECTIVE HVAC EQUIPMENT. VERIFY OCCUPIED AND UNOCCUPIED SETPOINTS WITH USER. UNIT VENTILATION OUTSIDE AIR DAMPER SHALL OPERATE DURING OCCUPIED TIMES. UNIT SHALL CLOSE OUTSIDE AIR DAMPER DURING UNOCCUPIED TIMES.

HOUR MINIMUM TRAINING SESSION. UNITS SHALL BE CONTINUOUSLY ENERGIZED AND

AIR TEST AND BALANCE REPORT FOR SUPPLY, RETURN, OUTDOOR AIR INTAKE, AND EXHAUST SYSTEMS TO QUANTITIES INDICATED, WITHIN 10% TOLERANCE. SUBMIT THREE (3) REPORTS FROM INDEPENDENT TESTING AGENCY STATING EACH SYSTEM COMPLIANCE AND APPROVAL

SUBMITTALS (DIGITAL PDF FILES)

DUCTWORK INSTALLATION DRAWINGS TO SCALE.

FURNACES AND CONDENSING UNITS. DUCTWORK AND AIR DEVICES. 5.03

VENTILATORS AND DAMPERS. THERMAL INSULATION AND DUCT LINING.

CONTROLS, SENSORS, CONTROL WIRING, AND INTERLOCKS.

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MECHANICAL SYMBOLS LIST

ABOVE FINISHED FLOOR CUBIC FEET PER MINUTE CONDENSING UNIT EXHAUST AIR EXHAUST FAN FURNACE GAS PIPING — GAS ——

NOT APPLICABLE NOT REQUIRED OUTDOOR AIR INTAKE

OPPOSED BLADE DAMPER

UNDERCUT (DOOR)

SUPPLY OPENING RETURN/EXHAUST OPENING TEMPERATURE SENSOR

THERMOSTAT CONNECT TO EXISTING

ENERGY NOTES

MINIMUM UNITARY (PACKAGED ROOFTOP UNITS) EQUIPMENT AIR COOLED EFFICIENCY SHALL BE 14.0 SEER (LESS THAN 65 MBH), 11.0 EER (65 MBH - 135 MBH), 10.8 EER (135 MBH - 240 MBH), 9.8 EER (240 MBH AND GREATER), AND 9.5 EER (760 MBH AND GREATER). MINIMUM DX COOLING STAGING SHALL BE 3 STAGES (65 MBH - 240 MBH) AND 4 STAGES (240 MBH AND GREATER).

2. MINIMUM EQUIPMENT AIR HEATED EFFICIENCY SHALL BE 80%.

3. ROOFTOP UNITS/SPLIT SYSTEMS, 54 MBH AND GREATER (COOLING) SHALL HAVE ECONOMIZERS.

4. FAN SYSTEM MOTOR NAMEPLATE HORSEPOWER/BRAKEHORSEPOWER SHALL NOT EXCEED ALLOWABLE NAMEPLATE MOTOR HORSEPOWER/BRAKEHORSEPOWER.

5. LOAD CALCULATIONS BASED ON ASHRAE FUNDAMENTALS HANDBOOK.

THERMOSTATS SHALL HAVE 5 DEGREE DEAD BAND, 7-DAY/WEEK PROGRAMMABLE CLOCK, 2-HOUR TEMPORARY OVERRIDE, SET POINT OVERLAP RESTRICTION, 10 HOUR BACKUP AND SETBACK CAPABLE OF 55 DEGREE HEATING AND 85 DEGREE COOLING (EXCEPT CONTINUOUS OPERATING ZONES), AUTOMATIC START (OPTIMAL START, ADAPTIVE RECOVERY), OUTSIDE AIR 0% CLOSED DURING UNOCCUPIED OR WARM UP

7. DEMAND CONTROL VENTILATION SHALL BE PROVIDED FOR SPACES LARGER THAN 500 SQUARE FEET AND AVERAGE OCCUPANT LOAD OF 25 PEOPLE PER 1000 SQUARE FEET, FOR SYSTEMS WITH AIR-SIDE ECONOMIZERS, AUTOMATIC MODULATING OUTSIDE AIR DAMPERS, OR OUTSIDE AIRFLOW GREATER THAN

8. DUCTWORK INSULATION SHALL HAVE MINIMUM VALUE OF R-6 FOR UNCONDITIONED SPACES AND R-12 FOR OUTSIDE BUILDING. EXCEPT SPACES WHERE TEMPERATURE DIFFERENCE DOES NOT EXCEED 15 DEGREES.

9. DUCTWORK SHALL BE SECURELY FASTENED AND SEALED WITH WELDS, GASKETS, MASTICS (ADHESIVES). EXCEPT LOCKING-TYPE LONGITUDINAL JOINTS AND SEAMS ON DUCTWORK OPERATING AT STATIC PRESSURE LESS THAN 2" WATER GAUGE.

10. AIR BALANCE SYSTEM AND PROVIDE AIR TEST AND BALANCE REPORT.

1-THRU-10

11. HVAC EQUIPMENT OPERATION AND MAINTENANCE MANUALS PROVIDED TO BUILDING OWNER

NATURAL GAS EQUIPMENT SCHEDULE GAS INPUT (MBH) PIPING SIZE EXISTING 100 (EX) UH 100 **EXISTING** (EX) UH 100 EXISTING (EX) F-1 100 FXISTING

F-2 100 3/4" (EXISTING) 1" PIPING TOTAL (2 PSI. MEDIUM PRESSURE)

VENTILATION SCHEDULE

F-2: 2000 CFM TOTAL WITH 400 CFM OAI (20% OF TOTAL).

AIR DEVICE SCHEDULE

COLOR TO MATCH CEILING OF AREA SERVED.

REFERENCE PLAN FOR NECK AND FACE SIZES.

PROVIDE DRYWALL CEILING TRIM FRAMING.

PROVIDE INSULATED AIR DEVICE.

MODEL

OMNI-24X24

300RL-12X6

350RL-24X24

350RL-14X14

REFERENCE ARCHITECTURAL DRAWINGS FOR LAYIN GRID STYLE.

PI AN NAME

(CLASSIFICATION)

FOYER/RECEPTION

OFFICE

CONFERENCE ROOM

COMMUNITY ROOM

SECURE STORAGE

MEZZANINE STORAGE

TAG MANUFACTURER

S2

R1

R2

TITUS

TITUS

TITUS

TITUS

INTAKE/RELIEF VENTILATOR SCHEDULE TAG MANUFACTURER MODEL NUMBER AREA SERVED CFM TYPE NOTES 1/10" 125 1,2,3 IV-1 LOREN COOK PR-24 2000 GRAVITY F-2 OAI PR-24 RV-1 F-2 RELIEF 1/10" 125 1,2,3 LOREN COOK 2000 GRAVITY

ORDINANCE MINIMUM VENTILATION REQUIRED RATES

PER

PERSON

(MIN 7.5)

7.5

7.5

7.5

7.5

FRAME

LAYIN

SURFACE

LAYIN

SURFACE

VENT

RATE

(CFM)

7.5

165

DAMPER

OBD

OBD

NOTES

1, 2, 5

1, 3, 4, 5

1, 3

1, 3, 4

EXHAUST

RATE

(CFM/SF)

NR

NR

NR

EXHAUST

RATE

(CFM)

SUPPLY

RATE

(CFM)

200

150

1050

200

2000

NUMBER

PERSONS

10

22

OF

OCCUPANT

DENSITY

(P/1000SF)

50

NA

NA

ARCHITECTURAL

DIFFUSER

DUAL DEFLECTION

DIFFUSER

GRILLE

GRILLE

AREA

(SF)

197

104

193

1438

100

629

PROVIDE FULLY INSULATED ROOF CURB WITH SLOPE TO MATCH PITCH AS REQUIRED.

PROVIDE ALUMINUM BIRDSCREEN.

			L												J			
_ N	ACE / CONDENS	SING UNIT	SCHEDI	ULE														
	MANUFACTURER	FURNACE	AIR RATE	FAN	ESP	HTG IN	HTG OUT	HEATING	VOLTAGE	MCA MOCB	WEIGHT	AFUE	CONDENSING	COOLING	COOLING	VOLTAGE	MCA MOCB	WEIC

TAG

F-2 / CU-2

PROVIDE UPFLOW NATURAL GAS FURNACE WITH VARIABLE SPEED HIGH-EFFICIENCY BLOWER MOTOR AND DUAL-STAGE GAS ASSEMBLY. PROVIDE FURNACE UNIT FLOOR MOUNTING PADS.

PROVIDE OUTSIDE AIR AND RETURN AIR CONTROL DAMPER (WITH ECONOMIZER OPERATION) INTERLOCKED WITH SYSTEM CONTROLLER.

PROVIDE THREADED SCHEDULE 40 PVC CONDENSATE DRAIN PIPING AND CONDENSATE PUMP ROUTED TO ABOVE FLOOR DRAIN. PROVIDE SEAL-COMBUSTION FLUE/VENTING WITH SCHEDULE 40 PVC VENTING TO EXTERIOR CONCENTRIC TERMINATION.

PROVIDE HUMIDIFIER WITH VALVE WATER CONNECTION AND INTERLOCK CONTROL. PROVIDE UPBLAST CONDENSING UNIT.

CARRIER

PROVIDE CONDENSING UNIT GRADE MOUNTING PAD AND COMPACTED GRAVEL BASE.

PROVIDE RETURN AIR FILTER SLEEVE FRAMING WITH MINIMUM 2" DISPOSABLE MERV-8 FILTER.

59TP6A100

11. PROVIDE ELECTRONIC PROGRAMMABLE THERMOSTAT WITH INTEGRAL MULTI-STAGE TEMPERATURE AND HUMIDITY CONTROL AND WIRELESS-COMMUNICATION ACCESS CAPABILITY.

HVAC CONTROLS SEQUENCE OF OPERATIONS

PROVIDE COMPLETE ELECTRONIC CONTROL OF HEATING, VENTILATION, AND AIR CONDITION SYSTEMS, AS INDICATED ON SEQUENCE OF OPERATION, INCLUDING CONTROLLERS, SENSORS. INTERLOCKS, STRUCTURED CABLING (CABLING SHALL BE IN EMT CONDUIT WHERE WITHIN CONCEALED WALLS/CEILINGS). CONTROLS OPERATIONS MANUALS, AND TWO-HOUR MINIMUM TRAINING SESSION. FOR EQUIPMENT AS FOLLOWS.

OCCUPIED AND UNOCCUPIED SETPOINTS WITH USER.

UNIT SHALL BE CONTINUOUSLY ENERGIZED AND INTERLOCK RESPECTIVE F, CU, OAI, RELIEF CONTROL DAMPERS. TEMPERATURE AND HUMIDITY SHALL BE CONTROLLED VIA WALL MOUNTED PROGRAMMABLE THERMOSTAT WITH AUTOMATIC HEATING/COOLING CHANGEOVER. SYSTEM SHALL OPERATE HEATING AND COOLING STAGES. UNIT VENTILATION OUTSIDE AIR DAMPER SHALL BE AT MINIMUM-OPEN-POSITION DURING OCCUPIED TIMES, CLOSED-POSITION DURING UNOCCUPIED TIMES, AND MODULATING-OPEN-POSITION DURING ECONOMIZER TIMES. VERIFY

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JOHN P. SEATON

E-38803

WEST DUNDEE

4. COORDINATE WITH OTHER TRADES LOCATIONS OF DUCTWORK, PIPING, AND EQUIPMENT TO REQUIRED CLEARANCES AND TO AVOID ANY INTERFERENCE.

GENERAL NOTES

REGULATIONS, AND LOCAL ORDINANCES.

9. PROVIDE TURNING VANES AT EACH DUCTWORK ELBOW.

10. FLEXIBLE DUCTS SHALL NOT EXCEED 5'-0" IN LENGTH.

2. WORK INCLUDES PERMIT FEES, UTILITY TAP FEES, AND INSPECTION FEES AS REQUIRED.

8. PROVIDE ADJUSTABLE VOLUME DAMPER AT EACH BRANCH DUCT AND EACH AIR DEVICE.

COORDINATE LOCATION OF ROOFING EQUIPMENT (UNITS, DUCTS, PIPING, DRAINS, ETC) AND CONNECTION

7. PROVIDE SHOP DRAWINGS AND EQUIPMENT SUBMITTALS PRIOR TO INSTALLING, OR FABRICATING ANY

11. SHEET METAL DUCTWORK SHALL BE IN ACCORDANCE WITH SMACNA AND INTERNATIONAL MECHANICAL

POINTS WITH GENERAL CONTRACTOR. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING BID AND

5. COORDINATE INSTALLATION OF DUCTS WITH STRUCTURE. WORK SHALL BE IN COMPLIANCE WITH LOCAL CODES AND ORDINANCES. HORSEPOWER

RETURN AIR

ROUND SUPPLY AIR

WATER COLUMN

MANUAL VOLUME DAMPER

CO2 SENSOR

STAGES

PHASE

208

33.5

50

(LBS)

250

13.4

(TONS)

24SCA460

PROVIDE ALUMINUM MOTORIZED BACKDRAFT DAMPER.

MOCP STAGES PHASE 220

VARIABLE

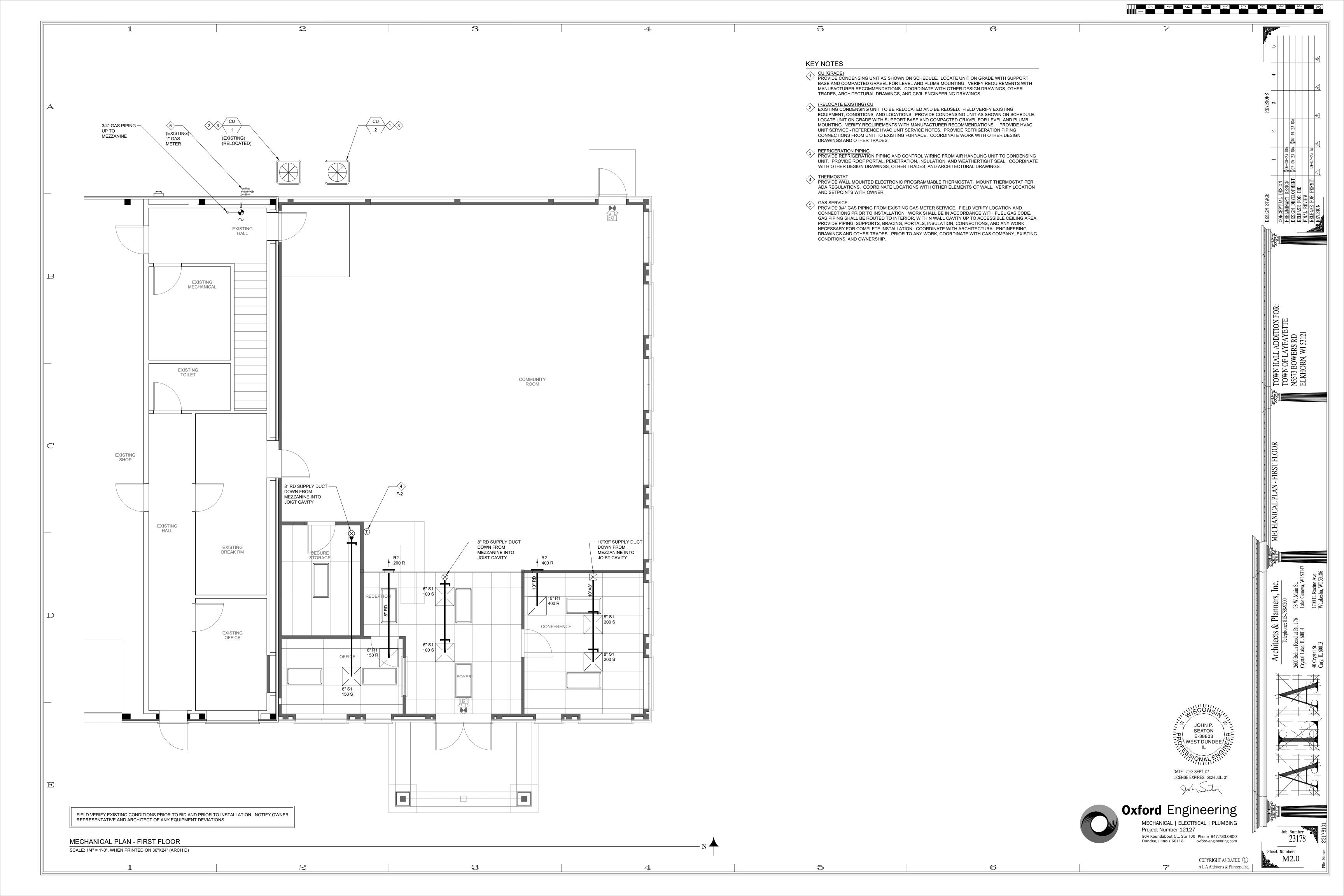
PROVIDE CASED EVAPORATOR COIL WITH GASKETED SEALED FURNACE UNIT CONNECTION AND THREADED SCHEDULE 40 PVC CONDENSATE DRAIN PIPING TO ABOVE FLOOR DRAIN.

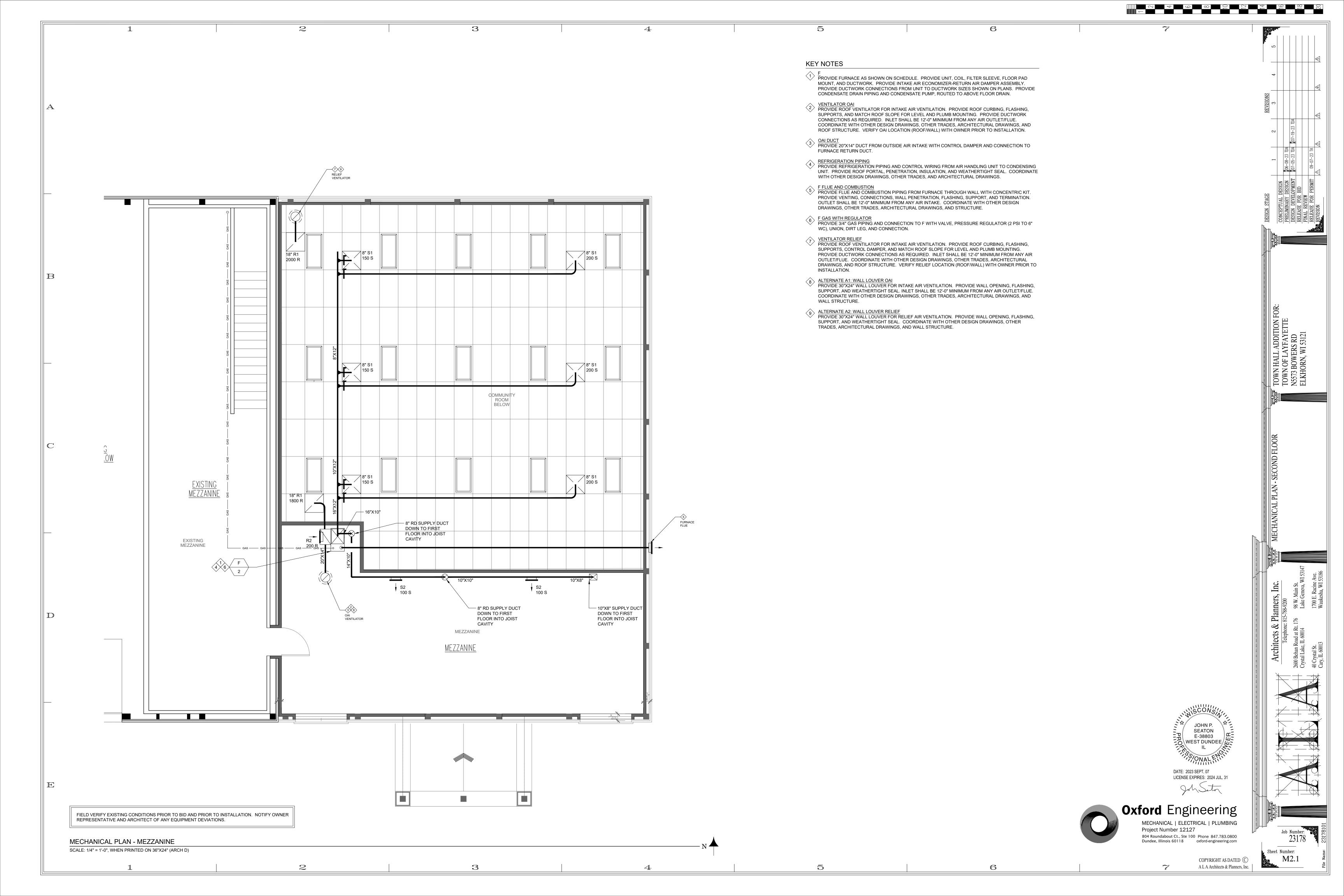
3

5

6

8





LIGHTING FIXTURE SCHEDULE											
TAG	MANUFACTURER	MODEL NUMBER	TYPE	LUMENS	COLOR TEMPERATURE	LAMP	VA'S	NOTES			
F1	TBD	TBD	2X4 LAYIN	4914	3500	LED	39	5, 6, 7			
F2	TBD	TBD	6"RD DOWN	3000	3500	LED	30	6, 7			
F3	TBD	TBD	5" RD DOWN	2700	3500	LED	25	6, 7			
F4	TBD	TBD	CANOPY LIGHT	4000	4000	LED	35	6, 7			
F5	TBD	TBD	SCONCE	3000	4000	LED	30	6, 7			
⊗	DUAL-LITE	EVE SERIES	EXIT	-	-	LED	2	1, SELF-POWERED			
	DUAL-LITE	CU2HL SERIES	BATT	88	-	LED	5	2, 3			
200	DUAL-LITE	CC SERIES	EXIT/BATT	88	-	LED	3	1, 2, 3, SELF-POWERED			
∞WP	DUAL-LITE	OCR (or EC) SERIES (REMOTE DUAL HEADS)	BATT	88	-	LED	6	2, 3, 4			
	_										

3

PROVIDE FACES, MOUNTING, AND ARROWS AS REQUIRED. PROVIDE AT LEAST 90 MINUTES OF EMERGENCY POWER. PROVIDE MOUNTING AND AT LEAST (2) LAMP HEADS. PROVIDE AT LEAST 90 MINUTES OF EMERGENCY POWER.

CONNECT TO LIGHTING CIRCUIT OF ROOM SERVED AHEAD OF LOCAL CONTROL DEVICE UNLESS NOTED OTHERWISE.

PROVIDE BATTERY POWER SOURCE WITHIN INTERIOR (CONDITIONED) ACCESSIBLE SPACE AND CONNECTIONS AS REQUIRED.

PROVIDE FIXTURE SUPPORT AS REQUIRED BY NEC 410.36.

PROVIDE LOCKING DEVICE ON CIRCUIT BREAKER.

VERIFY REQUIREMENTS WITH APPROVED EQUIPMENT SPECIFICATIONS.

PROVIDE SEPARATE GROUND CONDUCTOR. PROVIDE 200% RATED NEUTRAL CONDUCTOR.

PROVIDE HACR CIRCUIT BREAKER.

LED MODULES DRIVEN WITH UNIVERSAL CONSTANT CURRENT LED DRIVER. MINIMUM COLOR RENDERING INDEX OF 80, AND MINIMUM POWER FACTOR OF 90%. VERIFY MOUNTING WITH ARCHITECTURAL PLANS PRIOR TO INSTALLATION.

CEILING FAN SCHEDULE									
TAG	MANUFACTURER	MODEL NUMBER	AREA SERVED	FAN (WATTS)	VOLTAGE PHASE	WEIGHT (LBS)	NOTES		
CF-1,2,3,4	TBD	TBD 60" DIAMETER	COMMUNITY ROOM	110 W	120 V 1 PH	35	1, 2, 3, 4		

PROVIDE STABILIZATION SUPPORT TETHER AND ATTACHMENT HARDWARE. PROVIDE ELECTRICAL CABLE WITH ATTACHMENT HARDWARE.

PROVIDE FAN SPEED CONTROLLER REMOTELY MOUNTED (COMMUNITY ROOM WALL) TO SIMULTANEOUSLY CONTROL

VERIFY CEILING FAN DIRECTIONAL ORIENTATION WITH OWNER.

ELECTRICAL SYMBOLS LIST

ABOVE FINISHED FLOOR

CONVENIENCE RECEPTACLE

GROUND (GREEN)

GROUND FAULT INTERRUPT

ISOLATED GROUND (ORANGE)

MAIN CIRCUIT BREAKER

MAIN LUG ONLY

OCCUPANCY SENSOR - NOTE B

RECEPTACLE SPECIAL RECEPTACLE

WEATHER PROOF

CONDUIT STUB UP FROM UNDER SLAB

RECEPTACLE - SPECIAL AS CALLED OUT ON PLANS

RECEPTACLE - DUPLEX

RECEPTACLE - DEDICATED DUPLEX

RECEPTACLE - DUPLEX AND USB RECEPTACLE - QUAD

WALL MOUNTED DATA OUTLET - NOTE A

WALL MOUNTED TELEPHONE OUTLET - NOTE A

WALL MOUNTED DATA/TELEPHONE OUTLET - NOTE A $\langle \mathcal{O} \rangle$ MOTOR CONNECTION

DISCONNECT - NON-FUSED, F = FUSED

COMBINED MOTOR STARTER WITH DISC AND HOA, F = FUSED

SINGLE-POLE SWITCH, D=DIMMABLE, OS=OCCUPANCY SENSOR, OS(D)=DIMMABLE OCCUPANCY SENSOR

MULTI-WAY SWITCH AND/OR SWITCH LEG a (LETTER) BRANCH PANELBOARD

AUDIO/VISUAL ALARM

MANUAL (DOUBLE ACTION) STATION WITH CLEAR PLASTIC COVER

CEILING SMOKE DETECTOR

DUCT SMOKE DETECTOR - INTERLOCK TO SHUT DOWN UNIT REMOTE INDICATION AND TEST IS REQUIRED

TAMPER SWITCH WITH IAM

NOTE A: PROVIDE 4" BOX, 1-GANG COVER, AND (1) 3/4" CONDUIT FOR DATA AND (1) 3/4" CONDUIT FOR TELEPHONE OUTLET, AND TERMINATE 6" ABOVE ACCESSIBLE CEILING

NOTE B: PROVIDE OCCUPANCY-VACANCY SENSOR (WALL MOUNTED) WITH INTEGRAL MANUAL OVERRIDE SWITCH AND 15 MINUTE OFF FOR UNOCCUPIED MODE.

GENERAL NOTES

1. WORK SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH LOCAL ELECTRICAL CODE, HEALTH REGULATIONS, AND LOCAL ORDINANCES.

2. WORK SHALL INCLUDE PERMIT FEES, UTILITY TAP FEES, AND INSPECTION FEES AS REQUIRED

3. COORDINATE LOCATION OF ROOFING EQUIPMENT (DISCONNECTS, JUNCTION BOXES, CONDUITS, CONDUCTORS, ETC) AND CONNECTION POINTS WITH GENERAL CONTRACTOR.

4. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING BID AND PRIOR TO INSTALLATION.

5. COORDINATE WITH OTHER TRADES IN EQUIPMENT TO REQUIRED CLEARANCES AND TO AVOID

6. REFERENCE ARCHITECTURAL DRAWINGS FOR ANY ADDITIONAL EQUIPMENT INFORMATION.

7. GENERAL CONTRACTOR SHALL COORDINATE REQUIRED SUBMITTALS TO FIRE DEPARTMENT FOR FIRE ALARM SYSTEM.

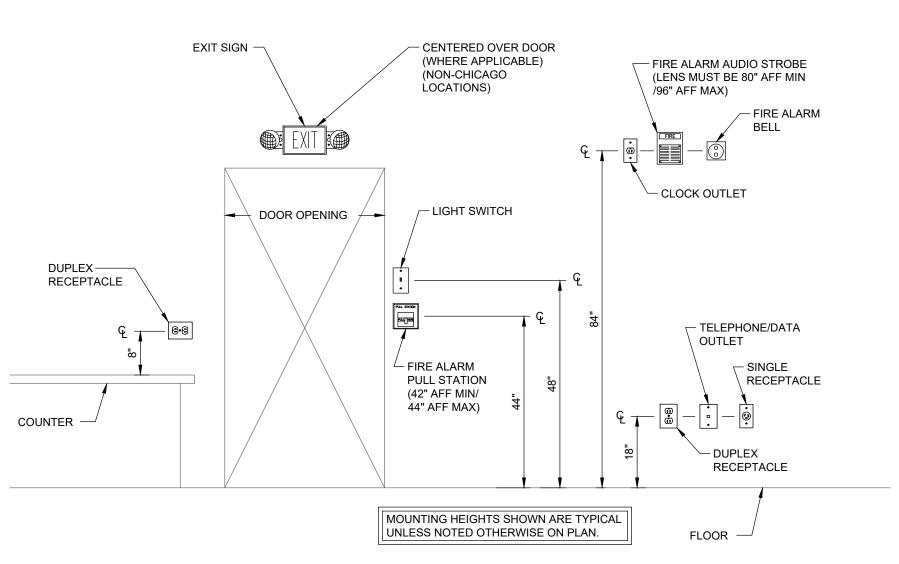
8. GENERAL CONTRACTOR SHALL COORDINATE REQUIRED SUBMITTALS TO FIRE DEPARTMENT FOR AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.

9. BELOW GRADE CONDUIT OR EXTERIOR CONDUIT SHALL BE RIGID GALVANIZED STEEL (RGS) WITH COMPRESSION FITTINGS.

10. ABOVE GRADE INTERIOR CONDUIT SHALL BE ELECTRICAL METALLIC TUBING (EMT) OR INTERMEDIATE METALLIC CONDUIT (IMC).

11. CONDUCTORS SHALL BE INSTALLED IN METAL CONDUIT AND SHALL BE SOLID OR STRANDED

LOW VOLTAGE WIRING SHALL BE INSTALLED IN CONDUIT WHERE CONCEALED BEHIND WALLS, INACCESSIBLE BY FINISH MATERIALS, OR SUBJECT TO PHYSICAL DAMAGE.



TYPICAL MOUNTING HEIGHT DETAIL

NOT TO SCALE

5

ELECTRICAL SPECIFICATIONS

6

1.0 <u>DESCRIPTION OF WORK</u>

GENERAL CONDITIONS AND GENERAL NOTES INDICATED WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS SHALL

GOVERN WHERE APPLICABLE.

1.02 WORK INDICATED ON DRAWINGS SHALL BE CONSIDERED NEW AND IN-CONTRACT UNLESS NOTED OTHERWISE.

COMPLETELY OPERATIONAL ELECTRICAL SYSTEMS READY FOR USE AS ITEMIZED BUT NOT LIMITED TO AS FOLLOWS:

1.03A DEMOLITION, REMOVAL, AND ALTERATIONS OF EXISTING SYSTEMS AND EQUIPMENT AS REQUIRED THOUGH NOT SPECIFICALLY INDICATED ACCOMMODATING PROPOSED WORK.

1.03B PANELS, BREAKERS, CONDUIT, WIRING, AND BRANCH CIRCUITS CONNECTING EACH FIXTURE, DEVICE AND EQUIPMENT. 1.03C MECHANICAL EQUIPMENT CONNECTIONS.

1.03D LIGHTING FIXTURES AND LAMPS.

1.03E FUSES, DISCONNECTS, STARTERS, DEVICES, PLATES, AND OTHER REQUIRED EQUIPMENT 1.03F CONTACTORS, RELAYS, TIMECLOCKS, LIGHTING SENSORS, AND LIGHTING CONTROLS. 1.03G EMPTY CONDUIT SYSTEM FOR TELEPHONE/DATA COMMUNICATIONS.

2.0 RELATED WORK BY OTHER TRADES

TEMPERATURE CONTROL AND INTERLOCK WIRING. 2.02 TELEPHONE AND DATA WIRING, DEVICES, AND TERMINATIONS.

3.0 RELATED WORK BY OTHERS

3.01 APPLIANCES.

4.0 <u>ELECTRIC INSTALLATION NOTES</u>

WORK SHALL BE PERFORMED IN ACCORDANCE WITH CODES AND AUTHORITIES HAVING JURISDICTION, INCLUDING ADA GUIDELINES AND ENERGY COMPLIANCE.

4.02 WORK AND INSTALLATIONS SHALL BE PERFORMED IN FIRST-CLASS NEAT WORKMANLIKE MANNER. REMOVE DEBRIS ON REGULAR BASIS AND CLEAN EQUIPMENT DURING PROJECT COMPLETION.

4.03 APPLY, PROCURE, AND PAY FOR REQUIRED PERMITS AND INSPECTIONS.

PERIOD SHALL BE MADE WITHOUT COST TO OWNER.

4.04 FIELD VERIFY PROJECT CONSTRUCTION CONDITIONS AND PROJECT SITE CONDITIONS PRIOR TO SUBMITTING BID.

4.05 THIS TRADE SHALL DO ITS OWN CUTTING AND PATCHING, TRENCHING AND BACKFILLING. PENETRATIONS THROUGH FIRE-RATED ASSEMBLIES SHALL BE FILLED WITH FIRESTOP PRODUCT. SUBMIT FIRESTOP PRODUCT MATERIAL SPECIFICATIONS TO LOCAL AUTHORITIES HAVING JURISDICTION.

4.06 CONFER WITH OTHER TRADES IN COORDINATION OF THIS WORK FOR REQUIRED CLEARANCES, CHASES, RECESSES AND

4.07 PROPOSAL PRICE SHALL INCLUDE SPECIFIED MATERIALS ONLY. SHOULD CONTRACTOR WISH TO SUBSTITUTE MATERIALS, EQUIPMENT OR MANUFACTURERS, IT SHALL BE DONE BY STATING EACH SUBSTITUTION AND ITS PRICE

4.08 DRAWINGS SHALL BE FOR BIDDING ONLY. ROUGH-IN AND FINAL CONNECTION SHALL BE MADE FROM APPROVED EQUIPMENT DRAWINGS ONLY. 4.09 SIZE AND TYPE OF EQUIPMENT BRANCH OVERCURRENT PROTECTIVE DEVICE(S) SHALL BE AS RECOMMENDED BY

EQUIPMENT MANUFACTURER. FIELD VERIFY EACH REQUIRED DEVICE PRIOR TO INSTALLATION. 4.10 GUARANTEE WORK AND EQUIPMENT TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR PERIOD OF ONE (1) YEAR FROM DATE OF FINAL CERTIFICATE OF OCCUPANCY. ANY REPAIRS OR REPLACEMENT DURING THIS

4.11 WIRE SHALL HAVE 600 VOLT INSULATION, NOT LESS THAN #12 EXCEPT FOR CONTROLS, BE SOLID COPPER TYPE THHN OR THWN FOR #12 AND SMALLER, AND BE STRANDED COPPER TYPE THHN OR THWN FOR WIRE #10 AND LARGER.

4.12 CONDUIT IN GROUND FOR EXTERIOR FIXTURES AND EQUIPMENT MAY BE PVC (IF PERMITTED BY LOCAL AUTHORITIES). CONDUIT EXPOSED TO WEATHER, IN SLABS ON GRADE, AND WHERE REQUIRED BY CODE SHALL BE RIGID GALVANIZED STEEL WITH WATERPROOF FITTINGS AND APPROVED COMPOUND. CONDUIT ELSEWHERE SHALL BE EMT WITH COMPRESSION OR SET SCREW FITTINGS.

4.13 DEVICES AND PLATES IN FINISHED AREAS SHALL HAVE COLOR SELECTED BY ARCHITECT. DEVICES IN UNFINISHED AREAS SHALL BE WHITE WITH GALVANIZED PLATES.

4.14 DEVICES SHALL BE, UNLESS NOTED OTHERWISE ON DRAWINGS: HUBBELL HBL-1221-OW (SINGLE POLE SWITCHES, HUBBELL HBL-1223-OW (THREE WAY SWITCHES), HUBBELL HBL-5362-W (RECEPTACLES 20A), HUBBELL HBL-GF-5362-W (GFI RECEPTACLES 20A), HUBBELL HBL-IG-5362 (ORANGE IG

4.15 DEVICES LOCATED OUTDOORS, KITCHENS, TOILETS, FOOD SERVICE AREAS, OR WITHIN 6' OF PLUMBING FIXTURES SHALL BE GROUND-FAULT INTERRUPT TYPE.

RECEPTACLES 20A), HUBBELL SERIES (WALL OCCUPANCY/VACANCY) HUBBELL SERIES (CEILING OCCUPANCY SENSOR).

4.16 LIGHTING FIXTURES SHALL HAVE CONTROLS WITH OCCUPANCY SENSORS, VACANCY SENSORS, DAYLIGHTING SENSORS, TIMECLOCKS, PHOTOCELLS, AND MANUAL OVERRIDES, INCLUDING MODULES, CONTACTORS, RELAYS, DEVICES, INTERLOCKS, SWITCHES, PROGRAMMING, AND WIRING. IDENTIFY CONTROLS WITH TYPE-PRINTED LABELING.

4.17 MOUNTING HEIGHTS SHALL BE, UNLESS NOTED OTHERWISE ON DRAWINGS: SWITCHES AT 4'-0" ABOVE FINISHED FLOOR (3'-6" ADA), RECEPTACLES AT 1'-6" ABOVE FINISHED FLOOR (INDOOR) INCLUDING COMMUNICATION RECEPTACLES, 2'-0" ABOVE FINISHED FLOOR (OUTDOOR), AND 4" ABOVE COUNTERTOP

4.18 IDENTIFY DISCONNECTS, STARTERS, PANELS, SWITCHBOARDS, DIMMERS, AND SWITCHES WITH 3/4" HIGH WHITE-FACED MICARTA WITH 1/4" BLACK LETTERS. DIMMERS AND SWITCHES IN GROUPS OF 2 OR LESS DO NOT REQUIRE

4.19 STARTERS SHALL BE ELECTRICALLY OPERATED WITH OVERLOAD PROTECTION ON EACH PHASE LINE, HAND-OFF-AUTO

OR START-STOP CONTROL, CONTROL TRANSFORMERS, AND RED PILOT. SWITCHES SHALL BE SQUARE D QMB GENERAL DUTY (240V) OR HEAVY DUTY (480V) WITH BUSSMAN DUAL ELEMENT FUSES AS REQUIRED. PROVIDE 2 SPARE SETS OF FUSES FOR EACH FUSE SIZED AT 100A OR LARGER.

4.20 PROVIDE ACCURATE AND TYPE-PRINTED PANEL SCHEDULE FOR EACH PANEL.

4.21 ELECTRICAL EQUIPMENT SHALL HAVE MINIMUM OF 65.000 AMP INTERRUPTING CAPACITY UNLESS NOTED OTHERWISE ON DRAWINGS, OR EQUIPMENT MANUFACTURER SUPPLIES DETAILED MINIMUM AIC CALCULATIONS JUSTIFYING RATINGS

4.22 BALANCE LOAD ACROSS PHASES FOR CIRCUITS. TEST EACH PHASE AND PROVIDE REPORT DOCUMENT OF CONDITIONS.

4.23 ELECTRICALLY SUPERVISED AUTOMATIC FIRE ALARM SYSTEM INCLUDING WIRING TO INDOOR BELL, OUTDOOR BELL, OUTDOOR VISUAL, WATER FLOW ALARM(S), TAMPER SWITCHES, AND LOCAL AUTHORITY CONNECTION(S). DUCT DETECTORS SHALL HAVE REMOTE INDICATION/TEST AND SHUT DOWN EACH ASSOCIATED MECHANICAL EQUIPMENT. 4.24 COMMUNICATION OUTLETS SHALL BE INSTALLED WITH 4" BOX AND SINGLE GANG COVER, AND 3/4" CONDUIT ROUTED

4.25 EXTERIOR AND KITCHEN EQUIPMENT SHALL BE NEMA 3R AND WEATHERPROOF LIQUIDTIGHT FLEXIBLE METAL CONDUIT

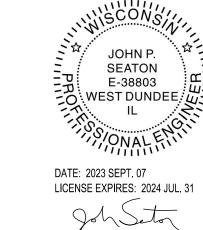
SUBMITTALS (DIGITAL PDF FILES)

INTO ACCESSIBLE SPACE.

LIGHTING FIXTURES. 5.02

CONTACTORS, RELAYS, TIMECLOCKS, LIGHTING SENSORS, AND LIGHTING CONTROLS. 5.03 PANELS AND BREAKERS.

5.04 DISCONNECT SWITCHES.





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6

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