ELECTRICAL SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS OR ABBREVIATIONS ARE USED.

STANDARD MOUNTING HEIGHTS

ANNUNCIATOR PANELS (DISPLAY)	60"
CONTROLS (CENTER OF DEVICE)	48"
EXIT SIGNS (SEE DRAWINGS)	105"
FIRE ALARM ANNUNCIATOR PANEL (DISPLAY)	60"
FIRE ALARM BELL (EXTERIOR) (CENTERLINE)	120"
FIRE ALARM CONTROL PANEL/UNIT (DISPLAY)	60"
PULL STATIONS (TOP OF DEVICE)	48"
RECEPTACLES (TO CENTER)	16"
RECEPTACLES (EXTERIOR)	24"
RECEPTACLES (GARAGES)	24"
RECEPTACLES (POOLS)	27"
RECEPTACLES (ABOVE COUNTER)	42"
RECEPTACLES IN EQUIPMENT ROOMS	44"
REMOTE INDICATING LIGHT (EQUIPMENT ROOMS)	48"
REMOTE INDICATING LIGHT (FINISHED AREAS)	CEILING
SAFETY SWITCHES (TOP OF DEVICE)	60"
STARTERS (TOP OF DEVICE)	60"
SWITCHES (TOP OF DEVICE)	48"
TELEPHONE, DATA OUTLETS	SAME AS ADJACENT DEVICE, UNO
TELEPHONE TERMINAL BOARD (BOTTOM)	6"
TELEVISION OUTLETS	REFER TO ARCH DRAWINGS
FIRE ALARM DEVICES (CENTERLINE)	84"

USE THE DEFAULT MOUNTING HEIGHTS SHOWN ABOVE UNLESS NOTED OTHERWISE IN THE CONSTRUCTION DOCUMENTS. MOUNTING HEIGHTS LISTED ARE ABOVE FINISHED FLOOR (AFF) OR ABOVE FINISHED GRADE (AFG) TO BOTTOM OF OUTLET BOX. ALL DEVICES SHALL BE INSTALLED IN COMPLIANCE WITH CURRENT ADA AND LOCAL REQUIREMENTS.

ABBREVIATIONS

AF	AMPERE FRAME SIZE
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
AS	AMPERE SWITCH
AT	AMPERE TRIP SETTING
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO VISUAL
BAS	BUILDING AUTOMATION SYSTEM
BKR	BREAKER
C	CONDUIT
CAT	CATEGORY
CATV	CABLE TELEVISION SYSTEM
CCTV	CLOSED CIRCUIT TELEVISION
CD	CANDELA
CKT	CIRCUIT
CODE	APPLICABLE CODE ADOPTED BY JURISDICTION
CT	CURRENT TRANSFORMER
CTR	CENTER
CVD	CUMULATIVE VOLTAGE DROP
DEMO	DEMOLITION
DPDT	DOUBLE-POLE, DOUBLE-THROW
DPST	DOUBLE-POLE, SINGLE-THROW
(E)	EXISTING
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FCA	FAULT CURRENT AMPS AVAILABLE
FCU	FAN COIL UNIT
FF	FINISHED FLOOR
FLA	FULL LOAD AMPS
FLR	FLOOR
GC	GENERAL CONTRACTOR
GEC	GROUNDING ELECTRODE CONDUCTOR
GES	GROUNDING ELECTRODE SYSTEM
GFR	GROUND FAULT RELAY
G	GROUND
IG	ISOLATED GROUND
ISC	SHORT CIRCUIT CURRENT
JB/J-BOX	JUNCTION BOX
LF	LINEAR FEET
LRA	LOCKED ROTOR AMPS
LTG/LTS	LIGHTING/LIGHTS
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MFR	MANUFACTURER
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVERCURRENT PROTECTION
MTD	MOUNTED
N/A	NOT APPLICABLE
NF	NON-FUSED
NL	NIGHT LIGHT (24HR ON)
NRTL	NATIONALLY RECOGNIZED TESTING LABORATORY (CSA,ETL,NSF,UL)
OS	OCCUPANCY SENSOR
P	POLE
PART	PARTIAL CIRCUIT
PH/Ø	PHASE
PNL	PANEL
PNLBD	PANELBOARD
PROVIDE	FURNISH AND INSTALL
PT	POTENTIAL TRANSFORMER
QTY	QUANTITY
RCPT	RECEPTACLE
RELO	RELOCATE
RLA	RUNNING LOAD AMPS
RTU	ROOFTOP UNIT
SCCR	SHORT-CIRCUIT CURRENT RATING
SD	SMOKE DUCT DETECTOR
SF	SQUARE FEET
SPDT	SINGLE-POLE, DOUBLE-THROW
SPST	SINGLE-POLE, SINGLE-THROW
ST	SHUNT TRIP
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TBB	TELECOMMUNICATIONS BONDING BACKBONE
TBD	TO BE DETERMINED
TGB	TELECOMMUNICATIONS GROUND BUS BAR
TL	TWISTLOCK
TMGB	TELECOMMUNICATIONS MAIN GROUND BUS BAR
TX	TRANSFORMER
TYP	TYPICAL
U/F	UNDERFLOOR
U/G	UNDERGROUND
U/S	UNDERSLAB
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
VD	VOLTAGE DROP
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE
W/	WITH
WP	WEATHER PROOF
WR	WEATHER RESISTANT
WT	WATERTIGHT
XP	EXPLOSION-PROOF

ANNOTATION

- 1 — ELECTRICAL OR FIRE ALARM PLAN NOTE CALLOUT
- 1 — PLUMBING EQUIPMENT DESIGNATION. (CONTRACTOR FURNISHED AND INSTALLED). REFER TO PLUMBING FIXTURE OR EQUIPMENT SCHEDULES
- 1 — EQUIPMENT DESIGNATION (OWNER FURNISHED, CONTRACTOR INSTALLED)
- CU / 1 — MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- 1 / E1 — DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- 1 / E1 — SECTION CUT DESIGNATION

CIRCUITING & WIRING

- P1-3,5,7 — HOMERUN TO PANELBOARD. INFORMATION AT ARROWS ARE CIRCUIT NUMBERS AND PANELBOARD FOR TERMINATION. REFER TO PANELBOARD SCHEDULES FOR BRANCH CIRCUIT CONDUCTOR SIZES.
- CIRCUIT CONTINUATION OR PARTIAL CIRCUIT
- CONDUIT CONCEALED
- CONDUIT IN/UNDER FLOOR/GROUND CONSTRUCTION
- EXPOSED CONDUIT
- LOW VOLTAGE CABLE
- CONDUIT TURNING DOWN
- CONDUIT TURNING UP

LINETYPE LEGEND

THROUGHOUT THE DRAWINGS DIFFERENT LINETYPES ARE USED IN COMBINATION WITH THE SYMBOLS TO INDICATE THE STATUS OF ITEMS AS EXISTING, TO BE DEMOLISHED, TO BE INCLUDED AS PART OF NEW WORK AND/OR ITEMS WHICH ARE ANTICIPATED TO BE PROVIDED IN THE FUTURE. THE STATUS OF ITEMS USING THESE LINETYPES ARE RELATIVE TO THE VIEW IN WHICH THEY APPEAR. PHASING SHOWN IN DRAWINGS IS NOT INTENDED TO FULLY DESCRIBE ALL NECESSARY CONSTRUCTION PHASING, WHICH IS DETERMINED BY THE CONTRACTOR AS PART OF THEIR RESPONSIBILITIES. ANY SUCH PHASES DESCRIBED IN THE CONSTRUCTION DOCUMENTS ARE GENERAL AND ONLY INTENDED TO INDICATE A BROAD ORDER FOR THE SAKE OF DESCRIBING THE PROJECT. THE FOLLOWING LINETYPES MAY BE USED ON ANY DEVICE, EQUIPMENT, NOTE, LINE, SHAPE, ETC.

EXISTING	NEW
DEMOLISH	FUTURE

LIGHTING CONTROL DEVICES

- S — SINGLE POLE SWITCH (NO LETTER DESIGNATION)
- S3 — SWITCH DESIGNATIONS INDICATED ON PLANS ARE AS FOLLOWS:
  - 2 = TWO POLE
  - 3 = THREE-WAY
  - 4 = FOUR-WAY
  - D = DIMMER
  - DO = DIMMING OCCUPANCY SENSOR
  - F = FAN SPEED CONTROL
  - K = KEYED
  - LV = LOW VOLTAGE
  - OS# = OCCUPANCY SENSOR (# = BUTTONS)
  - P = SPST PILOT LIGHT
  - V = VACANCY SENSOR
  - WP = WEATHER PROOF
- ALC — AUTOMATIC LOAD CONTROL RELAY
- ELI — EMERGENCY LIGHTING INVERTER
- R## — RELAY OR CONTACTOR (# = QUANTITY OF RELAYS)
- LIGHTING CONTROL PHOTOCELL (SHADE INDICATES AIMING)
- TS — TIME SWITCH
- C — CEILING OCCUPANCY SENSOR DESIGNATIONS:
  - IR = INFRARED
  - DT = DUAL-TECH
  - US = ULTRASONIC
  - MP = MICROPHONE

LOWER CASE LETTERS DESIGNATE ZONE TO BE CONTROLLED.

POWER EQUIPMENT & DEVICES

- ELECTRICAL PANELBOARD (SURFACE OR FLUSH MOUNT)
- CONTROL SYSTEM CABINET (CONTROLS, SECURITY, A/V)
- PLYWOOD TERMINAL BOARD FOR TELEPHONE SYSTEM, UNO, SIZE AS NOTED
- SWITCHBOARD OR MOTOR CONTROL CENTER ON HOUSEKEEPING PAD
- ELECTRICAL DISTRIBUTION PANELBOARD
- T — TRANSFORMER
- MOTOR
- 200/3/150/3R — DISCONNECT SWITCH - "200/3/150/3R" DENOTES AMPERES/POLE/FUSE/NEMA ENCLOSURE RATING. NF= NON-FUSED, CB= CIRCUIT BREAKER (200/3/CB), NO VALUE (200/3/150) FOR NEMA ENCLOSURE MEANS STANDARD NEMA 1 RATING
- 30/3/3/1/3R — COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER "30/3/1S1/3R" DENOTES AMPERES/POLE/FUSE/NEMA STARTER SIZE/NEMA ENCLOSURE RATING. NF= NON-FUSED, CB= CIRCUIT BREAKER (30/3/CB/1), NO VALUE (200/3/150/1) FOR NEMA ENCLOSURE MEANS STANDARD NEMA 1 ENCLOSURE RATING
- 2 — MAGNETIC MOTOR STARTER, NEMA SIZE AS NOTED. 3-POLE, UNO
- M — MANUAL MOTOR STARTER DISCONNECT
- VFD — VARIABLE FREQUENCY DRIVE
- LOW-VOLTAGE PUSH-BUTTON (AUTO-OPENER / SECURITY)
- STOP-START PUSH BUTTON CONTROL STATION
- EMERGENCY POWER OFF BUTTON
- OVERHEAD PADDLE FAN

LIGHTING (REFER TO LIGHT FIXTURE SCHEDULE FOR MORE INFO)

- A / B — LIGHT FIXTURE
  - a = SWITCHED BY SWITCH "a"
  - A = LIGHT FIXTURE TYPE "A"
- NL — = NIGHT LIGHT FITURE
- = WALL MOUNT
- = ARROW INDICATES AIMING DIRECTION
- LIGHT FIXTURE CIRCUITED ON BACK-UP POWER (NOT EGRESS)
- EMERGENCY LIGHT FIXTURE WITH EMERGENCY LIGHTING BATTERY PACK OR CONNECTED TO LIFE-SAFETY GENERATOR CIRCUIT NL = NIGHT LIGHT FIXTURE
- LIGHT FIXTURE WITH DUAL BALLASTS CIRCUITED SEPARATELY (SHADING IMPLIES EMERGENCY LIGHT FIXTURE)
- LIGHTING TRACK WITH LIGHT FIXTURE TYPES AS INDICATED
- EXTERIOR SITE PARKING LOT LIGHT FIXTURE
- EXTERIOR PEDESTRIAN POST TOP LIGHT FIXTURE
- EXTERIOR LIT BOLLARD LIGHT FIXTURE
- EXIT SIGN - CEILING / WALL MOUNTED, ARROWS AS INDICATED, FACE HATCHED
- EMERGENCY LIGHTING UNIT EQUIPMENT WITH BATTERY PACK - CEILING/WALL MOUNTED

ADDITIONAL LETTER DESIGNATIONS AS FOLLOWS:

- D = DEMOLISHED
- E = EXISTING
- EM = EMERGENCY POWER
- ER = EXISTING TO BE RELOCATED
- R = RELOCATED, NEW LOCATION

WIRING DEVICES & BOXES

- SIMPLEX RECEPTACLE - NEMA 5-20R, UNO
- DUPLEX RECEPTACLE - NEMA 5-20R, UNO
- DOUBLE DUPLEX RECEPTACLE - NEMA 5-20R, UNO
- SPECIAL RECEPTACLE - NEMA TYPE AS NOTED
- GFCI TYPE RECEPTACLE*
- ISOLATED GROUND TYPE RECEPTACLE*
- EMERGENCY RECEPTACLE*
- RECEPTACLE INSTALLED ABOVE COUNTER OR BACKSPLASH*
- RECEPTACLE INSTALLED IN CEILING*
- RECEPTACLE INSTALLED IN FLOOR*
- RECEPTACLE INSTALLED VIA DROP CORD*
- WR/WP — RECEPTACLE LETTER DESIGNATIONS AS FOLLOWS:
  - C = AUTOMATICALLY CONTROLLED
  - D = DEMOLISHED
  - E = EXISTING
  - EM = EMERGENCY POWER
  - ER = EXISTING TO BE RELOCATED
  - GFCI = GROUND-FAULT CIRCUIT INTERRUPTER
  - H = HORIZONTALLY MOUNTED
  - IG = ISOLATED GROUND
  - R = RELOCATED, NEW LOCATION
  - S = MANUALLY SWITCHED
  - TR = TAMPER RESISTANT
  - TV = TELEVISION
  - USB = USB/DUPLEX
  - WP = IN-USE WEATHER PROOF COVER
  - WR = WEATHER RESISTANT
- J / JB — JUNCTION BOX/OUTLET BOX

*SYMBOL DEMONSTRATED WITH DUPLEX RECEPTACLE, WHEN USED IN COMBINATION WITH OTHER DEVICES MEANING IS SIMILAR FOR THOSE DEVICE TYPES.

TECHNOLOGY DEVICES & BOXES

- MULTI-OUTLET ASSEMBLY
- TELEPHONE OUTLET
- DATA OUTLET
- MULTI-SERVICE OUTLET; TELEPHONE AND DATA
  - ABOVE COUNTER, TYP
  - WALL, TYP (W - HANGING PHONE)
  - FLOOR, TYP
- A — MULTI-SERVICE POWER POLE WITH TELEPHONE, DATA AND POWER OUTLETS A = TYPE, REFER TO PLANS, SCHEDULES AND SPECIFICATIONS
- A — MULTI-SERVICE FLOOR BOX WITH TELEPHONE, DATA AND POWER OUTLETS A = TYPE, REFER TO PLANS, SCHEDULES AND SPECIFICATIONS
- A — POKE THROUGH. A = TYPE, REFER TO PLANS, SCHEDULES AND SPECIFICATIONS
- T — THERMOSTAT
- D / JB — DATA/TECHNOLOGY JUNCTION BOX/OUTLET BOX
- L / JB — LOW-VOLTAGE CABLE JUNCTION BOX/OUTLET BOX
- LTL — LOW-VOLTAGE CONTROL PANEL

A NUMBER ADJACENT TO ANY TECHNOLOGY SYMBOL INDICATES TOTAL QUANTITY OF CABLES AND PORTS TO BE INSTALLED AT THAT LOCATION.

IF A HOME-RUN IS USED ON ANY FLOOR-BOX OR MULTI-OUTLET ASSEMBLY, IT INDICATES THAT POWER IS ALSO TO BE INSTALLED IN THIS DEVICE.

ELECTRICAL ONE-LINE

- SWITCH (RATING AS INDICATED)
- FUSED SWITCH (RATING, POLES AND FUSE TYPE AS INDICATED)
- CIRCUIT BREAKER (RATINGS AS INDICATED)
- PANELBOARD, SINGLE OR MULTI-SECTION (REFER TO SCHEDULES)
- ISOLATED POWER PANELBOARD W/ INTEGRAL TRANSFORMER (REFER TO SCHEDULES)
- TX — TRANSFORMER (TYPE AND RATINGS AS INDICATED)
- TX — SHIELDED TRANSFORMER (TYPE AND RATINGS AS INDICATED)
- ATS — AUTOMATIC TRANSFER SWITCH (RATINGS AS INDICATED)
- ATS — AUTOMATIC TRANSFER SWITCH WITH BYPASS (RATINGS AS INDICATED)
- GENERATOR (RATINGS AS INDICATED)
  - NON-SEPARATELY DERIVED SOURCE
  - OR
  - SEPARATELY DERIVED SOURCE
- MDP — SWITCHGEAR, SWITCHBOARD AND/OR DISTRIBUTION PANELBOARD (TYPE, RATING, DEVICES AND ACCESSORIES AS INDICATED)
- COMBINATION DIGITAL VOLT METER/AMMETER
- ### — CIRCUIT IDENTIFICATION (REFER TO CIRCUIT SCHEDULE)
- GFR — GROUND FAULT RELAY
- PFR — PHASE FAILURE RELAY
- KO — KIRK-KEY INTERLOCK
- ST — SHUNT-TRIP RELAY
- AM — AMMETER, RANGE AS SPECIFIED OR REQUIRED
- VM — VOLTMETER, RANGE AS SPECIFIED OR INDICATED
- UTILITY METER — UTILITY METER (AS REQUIRED BY UTILITY)
- CURRENT TRANSFORMER RATING AS SPECIFIED OR REQUIRED
- POTENTIAL TRANSFORMER RATING AS SPECIFIED OR REQUIRED
- TVSS — TRANSIENT VOLTAGE SURGE SURPRESSOR
- GROUND CONNECTION
- GROUND CONNECTION WITH TEST WELL
- GROUND CONNECTION AND GROUND ROD
- OPEN / CLOSED CONTACTORS
- HEATER
- MOTOR
- ## — BLOCK LOAD KW OR KVA
- F# — FAULT POINT REFERENCED IN SHORT CIRCUIT CURRENT AND VOLTAGE DROP SPREADSHEET
- CONNECTION POINT OR EQUIPMENT TERMINATION

LINE TYPES INDICATED ON THIS COVER SHEEET ALL APPLY TO THE ONE-LINE DIAGRAM

GENERAL NOTES

1. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC IN NATURE AND AND REPRESENT THE GENERAL SCOPE OF THE WORK AS IT PERTAINS TO THE ENGINEERED SYSTEMS AT HAND.
2. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY THE ENGINEER OF ANY CONFLICTS OR DISCREPANCIES AND FOR EXACT LOCATION OF ANY SYSTEM COMPONENTS.
3. FULLY COORDINATE ALL WORK WITH ALL GENERAL CONTRACTORS AND ALL SUBCONTRACTORS ON PROJECT.
4. PROVIDE ALL SUB-CONTRACTORS A COMPLETE SET OF FULL-SIZE BID DOCUMENTS.
5. PRIOR TO SUBMITTING PROPOSAL, BIDDER SHALL EXAMINE ALL GENERAL CONSTRUCTION DRAWINGS AND SHALL HAVE VISITED THE CONSTRUCTION SITE, BIDDER SHALL BE FAMILIAR WITH THE EXISTING CONDITIONS UNDER WHICH THEY WILL HAVE TO OPERATE AND WHICH MAY AFFECT THE WORK.
6. ALL WORK SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE, AND NATIONAL CODES AND ORDINANCES. DRAWINGS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE REQUIREMENTS.
7. DRAWINGS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE REQUIREMENTS. IF DISCREPANCIES EXIST BETWEEN DRAWINGS AND SPECIFICATIONS, COMPLETE WHICHEVER IS MORE STRINGENT
8. PROVIDE A MINIMUM OF (3) SPARE 1" CONDUITS FROM RECESSED PANELBOARD TO ACCESSIBLE CEILING SPACE.
9. RIGIDLY ATTACH ALL JUNCTION BOXES TO STRUCTURE OR MILLWORK. COORDINATE CONDUIT AND LIGHT FIXTURE INSTALLATION WITH STRUCTURAL ELEMENTS, ARCHITECT, AND ENGINEER.
10. VERIFY ALL LIGHT FIXTURE, WIRING DEVICE, AND COVER PLATE FINISHES WITH ARCHITECT PRIOR TO ORDERING REGARDLESS OF REQUIREMENTS STATED IN PROJECT SPECIFICATIONS.
11. PROVIDE A SEPARATE CODE SIZED GREEN EQUIPMENT GROUND CONDUCTOR IN ALL CONDUITS AND RACEWAYS CONTAINING LINE VOLTAGE CIRCUITS. FOR ALL 20A AND 30A CIRCUITS, EQUIPMENT GROUND CONDUCTOR SIZE SHALL MATCH PHASE CONDUCTOR SIZE. FOR CIRCUITS UPSIZED VOLTAGE DROP INCREASE EQUIPMENT GROUNDING CONDUCTOR SIZE PER CODE.
12. THE CONTRACTOR SHALL EMPLOY QUALIFIED AND EXPERIENCED STAFF FOR THIS WORK.
13. FIRE ALARM DESIGN AND INSTALLATION SHALL BE COMPLETED AS A DEFERRED SUBMITTAL BY AN EXPERIENCED AND QUALIFIED FIRE CONTRACTOR. THE DEFERRED SUBMITTAL DRAWINGS SHALL TAKE PRECEDENCE OVER ANY FIRE ALARM REQUIREMENTS INDICATED ON THESE DRAWINGS.

DISCLAIMER

842 EAST ISABELLA AVE.,
MESA, AZ, 85204
WWW. OPTIMIZED-LED.COM
| 602-699-6224
PROJECT: DSP190018
EOR: BRETT LORENZEN
brett.lorenzen@optimized-led.com
AZ: 53437 FIRM: 21458 | CA: 22600 | CO: 55367

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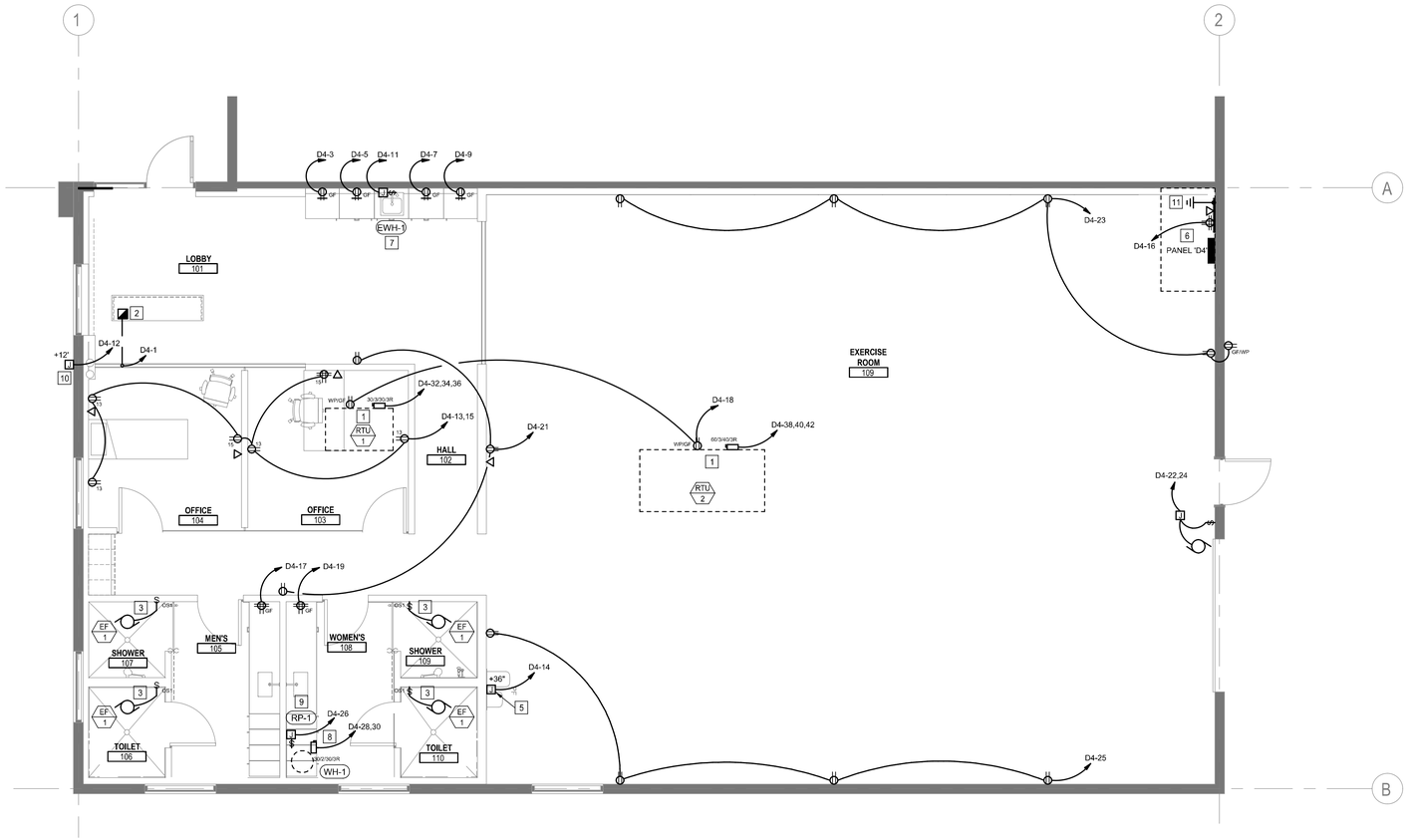

1 ELECTRICAL POWER FLOOR PLAN
1/4" = 1'

SHEET NOTES

A. RECEPTACLES MARKED WITH 'WP' SHALL BE SUPPLIED WITH AN IN-USE WATER-PROOF COVER.

B. SEE SHEET E-300 FOR ONE-LINE DIAGRAM, PANELBOARD SCHEDULE, AND LOAD CALCULATION.

C. FOR ALL ROOF PENETRATIONS PROVIDE PROPER ROOF MANUFACTURER PENETRATION ACCESSORY AND INSTALL PER ARCHITECTURAL SPECIFICATIONS AND MANUFACTURER INSTALLATION INSTRUCTIONS.

KEYED NOTES

1. AIR-CONDITIONING UNIT LOCATED ON ROOF. PROVIDE NEW DISCONNECT SWITCH AND MAINTENANCE RECEPTACLE ON UNI-STRUT ASSEMBLY AND PROVIDE FINAL CONNECTION TO EQUIPMENT.
2. SAW-CUT AND EXCAVATE FLOOR FOR INSTALLATION OF NEW POWER/DATA FLOORBOX (WIREMOLD - RATCHET-PRO 881, 881DIV, RP4CTCBK. ROUTE NEW CONDUIT TO WALL AND CONCEAL HOME-RUN BACK TO ELECTRICAL PANEL INDICATED.
3. RESTROOM EXHAUST FAN SHALL OPERATE WITH LOCKER ROOM LIGHTING. CONNECT TO LIGHTING CONTROL SWITCH LEG AND POWER CIRCUIT. SEE SHEET E200 FOR MORE INFORMATION.
4. HVAC EXHAUST FAN LOCATED ON ROOF. PROVIDE NEW MOTOR RATED SWITCH WITH LOCK-OFF AND MAINTENANCE RECEPTACLE ON UNIT-STRUT ASSEMBLY AND PROVIDE FINAL CONNECTION TO EQUIPMENT.
5. WALL MOUNTED DRINKING FOUNTAIN AND BOTTLE FILLER. PROVIDE JUNCTION BOX AND DIRECT POWER CONNECTION TO EACH EQUIPMENT. CONCEAL CONDUIT AND WIRING WITHIN WALL CAVITY.
6. EXISTING ELECTRICAL PANELBOARD EQUIPMENT LCOATION. PROVIDE NEW 4' X 8' VERTICAL TELEPHONE MOUNTING BOARD WITH QUADPLEX RECEPTACLE AND GROUNDING BUS-BAR AS INDICATED.
7. PROVIDE MOTOR RATED SWITCH AND JUNCTIN BOX FOR FINAL UNDER SINK FOR FINAL CONNECTION TO INSTANTANEOUS POINT OF USE HOT-WATER HEATER.
8. PROVIDE DISCONNECT SWITCH INSIDE LOCKER ROOM CASEWORK FOR FINAL CONNECTION TO TANK TYPE HOT-WATER HEATER
9. PROVIDE MOTOR RATED SWITCH INSIDE LOCKER ROOM CASEWORK FOR FINAL CONNECTION TO CIRCULATION PUMP.
10. PROVIDE NEW JUNCTION BOX AND MOTOR RATED DISCONNECT SWITCH OR RE-FEED EXISTING AT 12' AFF FOR FINAL CONNECTION TO EXTERIOR TENANT PROVIDED SIGNAGE.
11. PROVIDE #8CU GROUNDING CONDUCTOR TO GROUNDING ELECTRODE SYSTEM. SEE ONE-LINE DIAGRAM ON SHEET E300 FOR MORE INFORMATION.

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842 EAST ISABELLA AVE.,
MESA, AZ, 85204
WWW. OPTIMIZED-LED.COM
| 602-699-6224
PROJECT: DSP190018
EOR: BRETT LORENZEN
brett.lorenzen@optimized-led.com
AZ: 53437 FIRM: 21458 | CA: 22600 | CO: 55367

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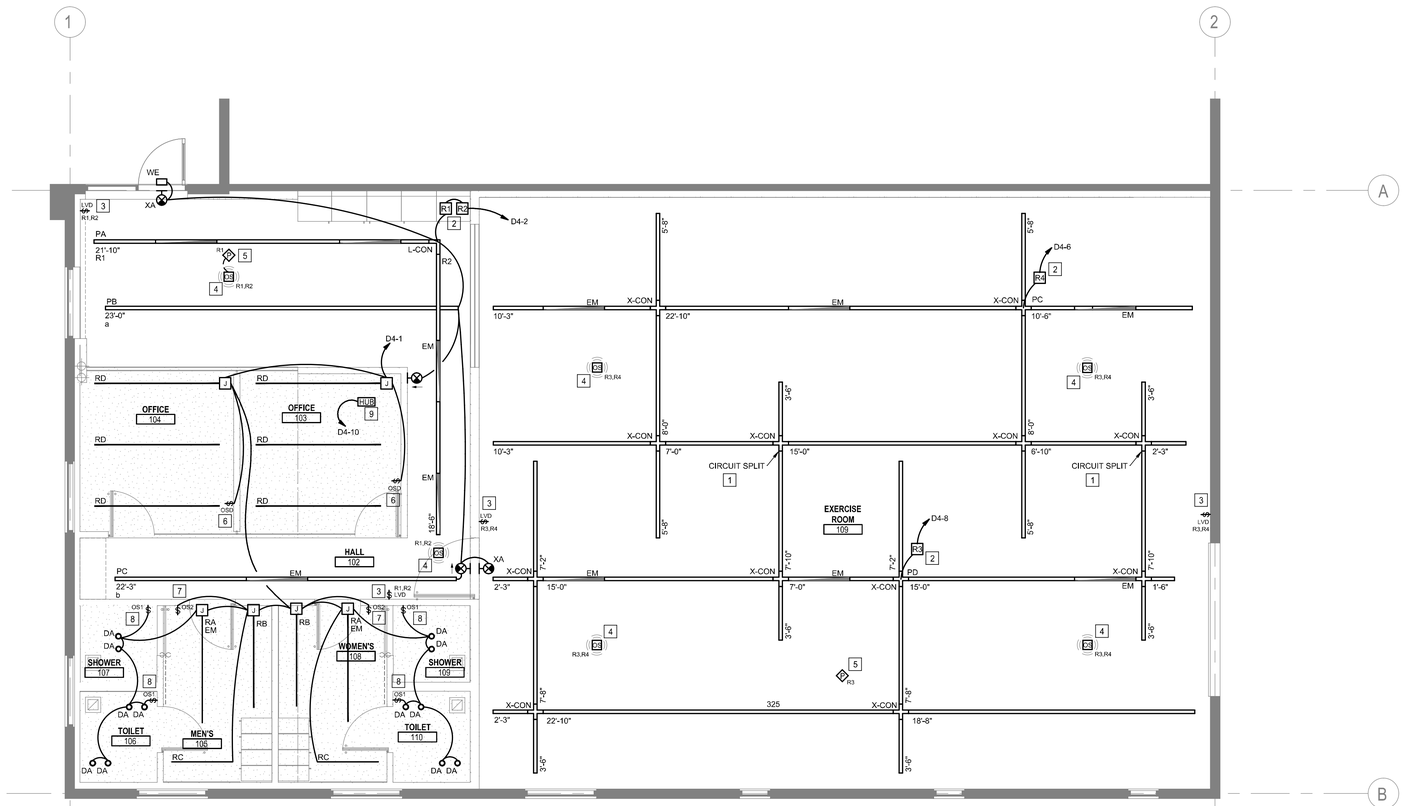
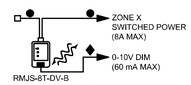


1 ELECTRICAL POWER FLOOR PLAN

1/4" = 1'



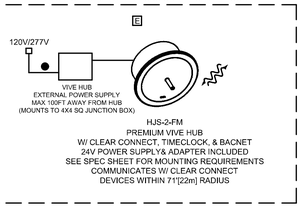
RMJS-8T-DV-B
POWPAK DIMMING MODULE
120/277V~, 50/60 Hz
W/ 0-10 V CONTROL
DIMENSIONS:
3.42"(H) X 2.82"(W) X 1.25"(D)
(87mm X 72mm X 32mm)

PJ2-3BRL-GWH-XXX
434 MHZ PICO WIRELESS, LIGHT
3 BUTTON CONTROL WITH RAISE/LOWER
SHOWN WITH CW-1-WH
CLARO WALLPLATE
*SEE SPECIFICATION SHEET FOR
DIMENSIONS, ENGRAVING OPTIONS,
& MOUNTING INSTRUCTIONS

PJ2-3BRL-GWH-XXX
434 MHZ PICO WIRELESS, LIGHT
3 BUTTON CONTROL WITH RAISE/LOWER
SHOWN WITH CW-1-WH
CLARO WALLPLATE
*SEE SPECIFICATION SHEET FOR
DIMENSIONS, ENGRAVING OPTIONS,
& MOUNTING INSTRUCTIONS

LRF2-DCRB-WH
434MHZ WIRELESS
DAYLIGHT SENSOR
1.6"[40.6mm] (DIA) X 0.7"[17.8mm] (D)
*DEVICE IS SURFACE-MOUNTED AND
BATTERY POWERED, DOES NOT
REQUIRE POWER FEED

TYPICAL HUB
FLUSH MOUNT AND SURFACE MOUNT OPTIONS AVAILABLE
BACNET INTEGRATION AVAILABLE ON CERTAIN MODELS
MINIMUM OF 10' BETWEEN HUBS ON THE SAME FLOOR



HJS-2-FM
PREMIUM VIVE HUB
W/ CLEAR CONNECT, TIMECLOCK, & BACNET
24V POWER SUPPLY& ADAPTER INCLUDED
SEE SPEC SHEET FOR MOUNTING REQUIREMENTS
COMMUNICATES W/ CLEAR CONNECT
DEVICES WITHIN 71'[22m] RADIUS

2 LIGHTING CONTROL DETAILS

1/4" = 1'

LIGHT FIXTURE SCHEDULE

TYPE	LOCATION	DESCRIPTION	BASIS OF DESIGN ALTERNATE MANUFACTURER AND MODEL NUMBER	MOUNTING	LIGHT ENGINE TYPE QTY	LIGHT ENGINE TEMP CRI	LIGHT ENGINE LUMENS EM LUMENS	DRIVER TYPE	DRIVER VOLTAGE	DRIVER WATTS
DA	TOILET AND SHOWER ROOMS	2.25" APERATURE WET-LOCATION LED DOWNLIGHT WITH MUD-UP FLANGE AND SPRING CLIPS	ZANIBONI - D2-ALBA2-13-40-A-3-S-WK-Z-0-W USAI - P2RDF-15L2-40K-F-WH-NC-120-D2	RECESSED WITHIN GYPSUM BOARD CEILING, USE SPRING CLIPS AND MUD-UP FLANGE TO PROVIDE A TRIMLESS APPEARANCE	INTEGRAL LED	4000K 80CRI	1190LM	STANDARD 0-10V DIMMING DRIVER (1%)	120	13
PA	LOBBY 101, HALL 102	1" APERATURE EXTRUDED ALUMINIUM LED FIXTURE WITH CONNECTORS TO MAKE CUSTOM SHAPE. PROVIDE BATTERY AT SECTIONS LABELED 'EM'	PINNACLE - EX1-A-8405500-M-AC48ST-U-OL1-M-(E)-W AXIS - STFC-NO-DSO-400-80-40-AL(-)-W-120-MD-2-CTS(48)-RC-B(4)	PENDANT MOUNTED TO 10' AFF. SUPPORT AT MAXIMUM DISTANCE ALLOWED BY MANUFACTURER RECOMMENDATIONS. CONFIRM FINAL LOCATION WITH ARCHITECT.	INTEGRAL LED	4000K 80CRI	500LMFT 250LMFT	STANDARD 0-10V DIMMING DRIVER (10%)	120	400
PB	CHECK-IN COUNTER	1" APERATURE EXTRUDED ALUMINIUM LED FIXTURE CUSTOM 23' LONG LENGTH	PINNACLE - EX1-A-8405500-23-AC48ST-U-OL1-1-W AXIS - STFC-NO-DSO-400-80-40-AX(-)-W-120-MD-2-CTS(48)-RC	PENDANT MOUNTED TO 8' AFF. SUPPORT AT MAXIMUM DISTANCE ALLOWED BY MANUFACTURER RECOMMENDATIONS. CONFIRM FINAL LOCAITON WITH ARCHITECT	INTEGRAL LED	4000K 80CRI	500LMFT 250LMFT	STANDARD 0-10V DIMMING DRIVER (10%)	120	125
PC	GYM NORTH	1" APERATURE EXTRUDED ALUMINIUM LED FIXTURE WITH CONNECTORS TO MAKE CUSTOM SHAPE. PROVIDE BATTERY AT SECTIONS LABELED 'EM'	PINNACLE - EX1-A-8405500-M-AC48ST-U-OL1-M-(E)-W AXIS - STFC-NO-DSO-400-80-40-AX(-)-WH-120-MD-2-CTS(48)-RC-B(3)	PENDANT MOUNTED TO 10' AFF. SUPPORT AT MAXIMUM DISTANCE ALLOWED BY MANFUACTURER. PROIDE CONNECTION TO FIXTURE 'PD' AND COORDINATE WITH ARCHITECT.	INTEGRAL LED	4000K 80 CRI	500LMFT 250LMFT	STANDARD 0-10V DIMMING DRIVER (10%)	120	850
PD	GYM SOUTH	1" APERATURE EXTRUDED ALUMINIUM LED FIXTURE WITH CONNECTORS TO MAKE CUSTOM SHAPE. PROVIDE BATTERY AT SECTIONS LABELED 'EM'	PINNACLE - EX1-A-8405500-M-AC48ST-U-OL1-M-(E)-W AXIS - STFC-NO-DSO-400-80-40-AX(-)-WH-120-MD-2-CTS(48)-RC-B(3)	PENDANT MOUNTED TO 10' AFF. PROVIDE CONNECTORS TO JOIN WITH FIXTURE 'PC' AT TWO LOCATIONS. COORDINATE FINAL LOCATION WITH ARCHITECT.	INTEGRAL LED	4000K 80CRI	500LMFT 250LMFT	STANDARD 0-10V DIMMING DRIVER (10%)	120	800
RA	LOCKER ROOMS EGRESS	1-1/4" APERATURE, 5/8" DEPTH, WHITE LINEAR LED STRIPLIGHT WITH SPRING CLIPS POWERED VIA REMOTE POWER SUPPLY AND BATTERY BACK-UP	PINNACLE - EV1-A-840500-84"-SF-U-ND-1-1E-W AXIS - BRLED-400-80-40-FL-7-W-120-DP-1-DS-B	SURFACE MOUNTED TO SUB-SURFACE, CUT OR SLOT GYPSUM BOARD TO ABUT WITH FIXTURE MOUNTING CLIPS AND TRIM HOUSING TO PRODUCE A TRIMLESS APPEARANCE	INTEGRAL LED	4100K 80CRI	400LMFT	STANDARD NON-DIMMING DRIVER	120	38.5
RB	LOCKER ROOMS	1-1/4" APERATURE, 5/8" DEPTH, WHITE LINEAR LED STRIPLIGHT WITH SPRING CLIPS POWERED VIA REMOTE POWER SUPPLY	PINNACLE - EV1-A-840500-60"-SF-U-ND-1-0-W AXIS - BRLED-400-80-40-FL-6-W-120-DP-1-DS	SURFACE MOUNTED TO SUB-SURFACE, CUT OR SLOT GYPSUM BOARD TO ABUT WITH FIXTURE MOUNTING CLIPS AND TRIM HOUSING TO PRODUCE A TRIMLESS APPEARANCE	INTEGRAL LED	4100K 80CRI	400LMFT	STANDARD NON-DIMMING DRIVER	120	33
RC	LOCKER ROOMS	1-1/4" APERATURE, 5/8" DEPTH, WHITE LINEAR LED STRIPLIGHT WITH SPRING CLIPS POWERED VIA REMOTE POWER SUPPLY	PINNACLE - EV1-A-840500-48"-SF-U-ND-1-0-W AXIS - BRLED-400-80-40-FL-4-W-120-DP-1-DS	SURFACE MOUNTED TO SUB-SURFACE, CUT OR SLOT GYPSUM BOARD TO ABUT WITH FIXTURE MOUNTING CLIPS AND TRIM HOUSING TO PRODUCE A TRIMLESS APPEARANCE	INTEGRAL LED	4100K 80CRI	400LMFT	STANDARD NON-DIMMING DRIVER	120	22
RD	OFFICES	1-1/4" APERATURE, 5/8" DEPTH, WHITE LINEAR LED STRIPLIGHT WITH SPRING CLIPS POWERED VIA REMOTE POWER SUPPLY AND MINI INVERTER	PINNACLE - EV1-A-840500-96"-SF-U-OL1-1-0-W AXIS - BRLED-400-80-40-FL-8-W-120-DP-1-DS	SURFACE MOUNTED TO SUB-SURFACE, CUT OR SLOT GYPSUM BOARD TO ABUT WITH FIXTURE MOUNTING CLIPS AND TRIM HOUSING TO PRODUCE A TRIMLESS APPEARANCE	INTEGRAL LED	4100K 80CRI	400LMFT	OSRAM 0-10V DIMMING DRIVER (10%)	120	44
XA	EXIT SIGN	SURFACE WALL MOUNTED EDGE-LIT LED EXIT SIGN WITH BATTERY BACK-UP	ISOLITE - ELT-EM-R-1C-WH-SW LITHONIA - EDG-W-1-R-EL	SURFACE WALL MOUNTED TO GYPSUM BOARD ABOVE DOOR MOUNT 6" TO BOTTOM OF FIXTURE FROM TOP OF GLAZING	INTEGRAL RED LED	N/A	N/A	STANDARD EXIT SIGN DRIVER AND BACK-UP	120	5
XB	EXIT SIGN - CHEVRON	SURFACE WALL MOUNTED EDGE-LIT LED EXIT SIGN WITH WITH LEFT CHEVRON AND BATTERY BACK-UP	ISOLITE - ELT-EM-R-1C-WH-SW-AL LITHONIA - EDG-W-1-R-EL	SURFACE WALL MOUNTED TO GYPSUM BOARD ABOVE DOOR MOUNT 6" TO BOTTOM OF FIXTURE FROM TOP OF GLAZING	INTEGRAL RED LED	N/A	N/A	STANDARD EXIT SIGN DRIVER AND BACK-UP	120	5
XC	EXIT SIGN - END MOUNT	END MOUNT EDGE-LIT LED EXIT SIGN WITH LEFT CHEVRON AND BATTERY BACK-UP	ISOLITE - ELT-EM-R-1C-WH-SE-AL LITHONIA - EDG-W-1-R-EL	SURFACE WALL MOUNTED TO GYPSUM BOARD ABOVE DOOR MOUNT 6" TO BOTTOM OF FIXTURE FROM TOP OF GLAZING	INTEGRAL RED LED	N/A	N/A	STANDARD EXIT SIGN DRIVER AND BACK-UP	120	5
WE	EXTERIOR EGRESS	DIE-CAST ALUMINUM WET-LOCATION EGRESS LIGHTING FIXTURE WITH POLYCARBONATE LENS, PHOTOCELL, AND BATTERY BACK-UP	ISOLITE - ELED-EM-WH LITHONIA - AFF-PEL-__-UVOLT-LTP-SDRT-WT	SURFACE WALL MOUNTED ABOVE EXTERIOR EGRESS DOOR 6" TO BOTTOM OF FIXTURE FROM TOP OF MULLION	INTEGRAL LED	4000K 80CRI	1050LM	STANDARD EGRESS DRIVER AND BACK-UP	120	5

GENERAL NOTES:

A. BASIS-OF-DESIGN AND ALTERNATE SPECIFICATIONS MAY BE PRICED AND SUPPLIED BY THE APPROVED REGIONAL VENDOR.
B. VERIFY QUANTITIES, MODEL NUMBERS AND DESCRIPTIONS WITH MANUFACTURER PRIOR TO PLACING ORDER.
C. VERIFY FINISH AND COLOR PRIOR TO PLACING ORDER.
D. CATALOG NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND CATALOG NUMBERS ONLY. FIRST READ THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS IN CONJUNCTION WITH THE CATALOG NUMBER TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURES LISTED ARE THE BASIS FOR THE DESIGN.
E. CONTRACTOR SHALL PROVIDE ALL LIGHT FIXTURES UNLESS NOTED OTHERWISE.
F. VENDOR SHALL ENSURE ALL PARTS, COMPONENTS, WIRING, AND SPECIAL REQUIREMENTS ARE ORDERED TO DELIVER AND INSTALL A FULLY OPERATIONAL AND CODE COMPLIANT SYSTEM
G. CONTRACTOR SHALL VERIFY AND INSTALL ALL LIGHITNG COMPONENTS TO DELILVER A FULLY OPERATIONAL SYSTEM THAT MEETS ALL LOOCAL, REGIONAL, AND FEDERAL CODE REQUIREMENTS.

SHEET NOTES

A. SEE SHEET E300 FOR PANELBOARD SCHEDULES AND LOAD CALCUALTIONS.

B. PROVIDE CONSTANT HOT CONDUCTOR TO ALL EMERGENCY EGRESS LIGHTING SECTIONS, EXIT SIGNS, AND EGRESS LIGHTS.

C. LIGHTING CONTROL OPERATION:
- C.A. LOBBY AND HALL:
  - C.A.A. MANUAL-ON
  - C.A.B. HOLD LIGHTS ON DURING BUSINESS HOURS
  - C.A.C. ACTIVATE OCCUPANCY SENSORS WITH A 15MIN DELAY DURING AFTER HOURS
  - C.A.D. PHOTOCELL SHALL BE PROGRAMMED TO HAVE A DEADBAND BETWEEN 40 AND 60FC.
- C.B. GYM:
  - C.B.A. MANUAL-ON
  - C.B.B. HOLD LIGHTS ON DURING BUSINESS HOURS
  - C.B.C. ACTIVATE OCCUPANCY SENSORS WITH A 15MIN DELAY DURING AFTER HOURS
  - C.B.D. PHOTOCELL SHALL BE PROGRAMMED TO HAVE A DEADBAND BETWEEN 40 AND 60FC.
- C.C. OFFICES:
  - C.C.A. MANUAL-ON
  - C.C.B. MANUAL DIMMING AFTER ACTIVATION
  - C.C.C. AUTOMATIC OFF AFTER 15 MIN TIME DELAY
  - C.C.D. PHOTOCELL HOLD-OFF IF LIGHT LEVEL IS ABOVE 80FC
- C.D. LOCKER ROOMS:
  - C.D.A. AUTO-ON
  - C.D.B. OPERATION OF LIGHTING AND EXHAUST FAN
  - C.D.C. AUTOMATIC OFF AFTER 15MIN TIME DELAY
- C.E. SHOWER AND TOILET ROOMS:
  - C.E.A. AUTO-ON
  - C.E.B. AUTOMATIC OFF AFTER 15MIN TIME DELAY

KEYED NOTES

1. TWO CIRCUITS FEED CONTINUOUS CUSTOM LIGHT FIXTURE ASSEMBLY IN 'GYM'. CIRCUITS SHALL NOT CROSS THIS POINT, ONE SHALL FEED THE NORTH FIXTURES AND ONE SHALL FEED THE SOUTH FIXTURES.
2. PROVIDE 0-10V LIGHTING CONTROL DIMMING RELAY POWER PACK MODULE (LUTRON - FCJS-010 OR EQUAL). INSTALL TIGHT TO STRUCTURE AND CONCEAL BEHIND STRUCTURAL MEMBER.
3. PROVIDE WIRELESS LIGHTING CONTROL DIMMING SWITCH (LUTRON - PJ2-2BRL-GWH-L01 OR EQUAL) INCLUDE FLUSH SURFACE MOUNTING PLATE FOR SWITCH.
4. PROVIDE WIRELESS LIGHTING CONTROL OCCUPANCY SENSOR (LUTRON - LRF2-OCR2B-P-WH OR EQUAL) INCLUDE TRIM PLATE FOR EXPOSED JUNCTION BOX MOUNTING.
5. PROVIDE WIRELESS LIGHTING CONTROL PHOTOCELL (LUTRON - LRF2-DCRB-WH OR EQUAL) INCLUDE TRIMPLATE FOR EXPOSED JUNCTION BOX MOUNTING.
6. PROVIDE WIRELESS IN-WALL LIGHTING CONTROL OCCUPANCY SENSOR WITH INTEGRATED 0-10V DIMMING CONTROL (LUTRON - MRF2S-8SD010-WH OR EQUAL). INSTALL RECESSED WITHIN SWITCH BACK-BOX.
7. PROVIDE WIRELESS IN-WALL LIGHTING CONTROL OCCUPANCY SENSOR WITH INTEGRATED SINGLE POLE RELAY (LUTRON - MRF2S-8SS-WH OR EQUAL). INSTALL RECESSED WITHIN SWITCH BACK-BOX. ROUTE SWITCH LEG TO OPERATE LIGHTING AND EXHAUST FAN SIMULTANEOUSLY. SEE POWER PLAN FOR EXHAUST FAN SPECIFICATIONS AND CONNECTION.
8. PROVIDE WIRELESS IN-WALL LIGHTING CONTROL OCCUPANCY SENSOR WITH INTEGRATED SINGLE POLE RELAY (LUTRON - MRF2S-8SS-WH OR EQUAL). INSTALL RECESSED WITHIN SWITCH BACK-BOX.
9. PROVIDE AND INSTALL WIRELESS LIGHTING CONTROL COMMUNICATION HUB (LUTRON - HJS-0 OR EQUAL). INSTALL FLUSH TO CEILING AT LOCATION SHOWN.

DISCLAIMER

842 EAST ISABELLA AVE.,
MESA, AZ, 85204
WWW. OPTIMIZED-LED.COM
| 602-699-6224
PROJECT: DSP190018
EOR: BRETT LORENZEN
brett.lorenzen@optimized-led.com
AZ: 53437 FIRM: 21458 | CA: 22600 | CO: 55367

7/2/2019 11:10:00 AM

DATE: ISSUE:
02.12.2019 FIRST CITY SUBMITTAL
06.24.2019 PERMIT R1

STAMP:

TITLE: ELECTRICAL LIGHTING PLAN

SCALE: ON-SHEET

SHEET: E200

PANELBOARD: D4 (EXISTING)

EQUIPMENT GROUND BUS

BUS AMPS: 225A
MAIN SIZE/TYPE: MLO
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

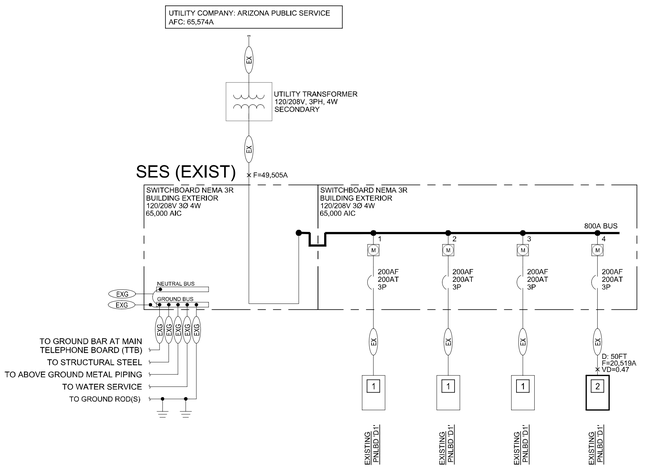
AIC RATING: 22000 FULLY RATED
SERVES: SUITE D4
MOUNTING: SURFACE
LOCATION: SUITE D4, ROOM#:GYM

	CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.	
	1	FLOORBOX - LOBBY 101	360			12	20	1	1	20	12	525			LTG - LOBBY 101, HALL 102	2	
	3	PWR - KITCHENETTE APP.		900		12	20	1	1	20	12		1,470		LTG - RMS 103 - 110	4	
	5	PWR - KITCHENETTE APP.			900	12	20	1	1	20	12			850	LTG - GYM NORTH	6	
	7	PWR - KITCHENETTE APP.	900			12	20	1	1	20	12	800			LTG - GYM SOUTH	8	
	9	PWR - KITCHENETTE APP.		900		12	20	1	1	20	12		360		LIGHTING CONTROL HUB	10	
GF	11	WH-2 (UNDER SINK)			3,500	8	40	1	1	20	12			1,200	TENANT SIGNAGE	12	
	13	REC - OFF 103, 104	720			12	20	1	1	20	12	900			PWR - DRINKING FOUNTAIN	14	GF
	15	REC - OFF 103, 104		540		12	20	1	1	20	12		720		REC - TELECOMM BOARD	16	
	17	REC - MENS 105			900	12	20	1	1	20	12			360	REC - ROOF MAINTENANCE	18	
	19	REC - WOMENS 108	900			12	20	1	1	20					SPARE	20	
	21	REC - GEN 101, 102, 109		540		12	20	1	2	20	12		900		PWR - ROLL-UP DOOR	22	
	23	REC - GYM 109 NORTH			900	12	20	1	1					900		24	
	25	REC - GYM 109 SOUTH	720			12	20	1	1	20	12	360			RECIRCULATION PUMP	26	GF
	27	SPARE				12	20	1	2	30	10		3,000		WH-1 (CASEWORK WOM 108)	28	GF
	29	SPARE						1			10G			3,000		30	
	31	SPACE						1				2,640				32	
	33	SPACE						1	3	30	10		2,640		RTU-1 (ON ROOF)	34	
	35	SPACE						1			10G			2,640		36	
	37	SPACE						1				3,720				38	
	39	SPACE						1	3	40	8		3,720		RTU-2 (ON ROOF)	40	
	41	SPACE						1			10G			3,720		42	
		SUBTOTAL	3,600	2,880	6,200							8,945	12,810	12,670	SUBTOTAL		

			LOAD	CONN. VA	DF		LOAD	CONN. VA	DF
TOTAL PHASE A - VA	12,545		COOLING	19,080	1.00		REFRIG		1.00
AMPS	105		HEATING	0	1.00		SIGN/DISP	1,200	1.25
TOTAL PHASE B - VA	15,690		LIGHTING	3,285	1.25		KITCHEN		1.00
AMPS	131		RECEPTACLES	7,560	1.0/.5		EXISTING		1.00
TOTAL PHASE C - VA	18,870		MOTORS	720	1.00		LRG MOTOR		1.25
AMPS	157		SUPP HEAT		1.00		SHOW WNDW		1.25
TOTAL PNLBD - VA	47,105		MISC EQUIP	15,260	1.00		LTG TRACK		1.00
AMPS	131								

TOTAL DEMAND
48,226 VA
134 A

PANELBOARD NOTES
RENAME PANELBOARD TO MATCH THAT INDICATED ON THIS SCHEDULE
CONTRACTOR MAY REUSE EXISTING BREAKERS WHERE PROVIDED WITH PROPER AMPACITY AND POLES
PANELBOARD LOAD SHALL ACT AS TENANT TOTAL LOAD APPLIED TO TENANT METER AND MAIN BREAKER
GF GROUND FAULT CIRCUIT BREAKER



1 ELECTRICAL ONE-LINE DIAGRAM
N.T.S.

Short-Circuit and Voltage Drop Calculations

Distances are for calculation purposes only and shall not be used for contractor takeoffs nor bidding - Contractor shall notify Engineer of any field condition that results in a change of 10% or greater circuit distance

The following calculations are based on the "Point-by-Point" method where:
$ISC_{(2)} = ISC_{(1)} \times M_{(1)}$ M= 1/(1+f)
$ISC_{(1)}$ = short circuit current at fault point 1
$ISC_{(2)}$ = short circuit current at fault point 2

Feeder: $f_{(3\varnothing)} = \frac{1.732 \times L \times Isc}{C \times E}$ XFMR: $f_{(3\varnothing)} = \frac{IP(sca) \times Vp \times 1.73 \times \%Z}{100,000 \times KVA}$ $IS_{(sca)} = \frac{Vp \times M \times IP_{(sca)}}{Vs}$

Feeder: $f_{(1\varnothing)} = \frac{2 \times L \times Isc}{C \times E}$ XFMR: $f_{(1\varnothing)} = \frac{IP(sca) \times Vp \times \%Z}{100,000 \times KVA}$

VOLTAGE DROP (3Ø):
%VD= ((R x cos(arccos(pf)) + X x sin (arccos(pf))) x L/# x I x 1.73) / E
VOLTAGE DROP (1Ø):
%VD= ((R x cos(arccos(pf)) + X x sin(arccos(pf))) x 2 x L/# x I) / E

IP = Primary short circuit current
Vp = Primary voltage
IS= Secondary short circuit current
Vs= Secondary voltage
L = Length of circuit
E = Line to line volts
C = "C" Factor from Bussman table where "C" = 1 / impedance per linear foot

%VD CUM= Cumulative Voltage Drop from Fault Point 1 to Fault Point #
R= resistance in ohms per LF
X= reactances in ohms per LF

Feeder Types =
NM - Non Magnetic Conduit, M - Magnetic Conduit, FB - Feeder Busway, PB - Plug-in Busway, TX - Transformer

Fault Point (F#)	Bus/Feeder Description	Source (Fault Point)	Phase	Source Isc (amps)	Feeder: Conduit Type/ TX	Material	Quantity of Parallel Sets and Bus/ Phase & Neutral Size	Conductor 'C' Value	Busway 'C' Value	L-L Voltage (E)	Circuit Length (L)	Load Power Factor (pf)	Circuit Load (Amperage)	Conductor: Resistance (R)	Reactance (X)	Arccos (pf) (Radians)	Transformer: Type	Degree Rise	kVA	New Xfmr Z	Existing Xfmr Z	Secondary Voltage	Tap Setting	f	M	Fault Current (amps)	Voltage Drop (%VD)	Cumulative Voltage Drop (%VD)	Fault Point (F#)
1	Utility Service Point			49,505 at the Service Entrance Switch																									1
	Motor Contribution			600 The connected full load motor amps (includes compressors) on the system																						Source Isc + 6X Motor Contribution =		53105			
2	PANEL 'D4'	1	3	53105	NM	CU	1 Set(s) of	3/0	AWG	13923	--	208	50	0.9	130	0.000077	0.000042	0.451027								1.588	0.39	20519	-0.47%	-0.47%	2

GENERAL NOTES

A. SEE SHEET E100 FOR POWER DEVICE LOCATIONS.
B. SEE SHEET E200 FOR LIGHTING FIXTURE LOCATIONS, LIGHTING CONTROLS, AND LIGHTING FIXTURE SCHEDULE.
C. THOROUGHLY READ ALL SPECIFICATIONS PRIOR TO ROUGH-IN.

FEEDER SCHEDULE

EX EXISTING FEEDER TO REMAIN
EXG EXISTING GROUND TO REMAIN

KEYED NOTES

1. EXISTING PANELBOARD TO REMAIN.
2. EXISTING TENANT PANELBOARD FOR THIS SCOPE OF WORK. PROVIDE NEW MELAMINE LABEL WHICH MEETS SPECIFICATION REQUIREMENTS FOR NEW PANELBOARD NAME INDICATED.

COMcheck Software Version 4.1.1.0
Interior Lighting Compliance Certificate

Section 1: Project Information

Energy Code: **2009 IECC**
Project Title: SOURCE PERFORMANCE
Project Type: New Construction

Construction Site:
2980 NORTH HAYDEN ROAD
SCOTTSDALE, AZ 85251

Owner/Agent:
Devan Porter
DSP Design
AZ

Designer/Contractor:
Brett Lorenzen
Optimized Lighting Engineering and Design
842 East Isabella Ave
Suite 102
Mesa, AZ 85204
602-699-6224

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Workout Facility (Exercise Center)	2880	1	2880
		Total Allowed Watts =	2880

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Workout Facility (Exercise Center 2880 sq.ft.)				
LED 1: TYPE 'DA': DOWNLIGHTS: Other:	1	12	13	156
LED 2: TYPE 'PA': PENDANT: Other:	1	1	400	400
LED 3: TYPE 'PB': PENDANT: Other:	1	1	125	125
LED 4: TYPE 'PC': PENDANT: Other:	1	1	850	850
LED 5: TYPE 'PD': PENDANT: Other:	1	1	800	800
LED 6: TYPE 'RA': RECESSED. Other:	1	2	38.5	77
LED 7: TYPE 'RB': RECESSED. Other:	1	2	33	66
LED 8: TYPE 'RC': RECESSED. Other:	1	2	22	44
LED 9: TYPE 'RD': RECESSED. Other:	1	6	44	264
		Total Proposed Watts =		2782

Section 4: Requirements Checklist

Interior Lighting PASSES: Design 3% better than code.

Lighting Wattage:

☒ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
2880	2782	YES

Controls, Switching, and Wiring:

☐ 2. Daylight zones under skylights more than 15 feet from the perimeter have lighting controls separate from daylight zones adjacent to vertical fenestration.
☒ 3. Daylight zones have individual lighting controls independent from that of the general area lighting.

Exceptions:
☐ Contiguous daylight zones spanning no more than two orientations are allowed to be controllec by a single controlling device.
☐ Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.

☒ 4. Independent controls for each space (switch/occupancy sensor).

Exceptions:
☐ Areas designated as security or emergency areas that must be continuously illuminated.
☐ Lighting in stairways or corridors that are elements of the means of egress.

☐ 5. Master switch at entry to hotel/motel guest room.
☐ 6. Individual dwelling units separately metered.
☐ 7. Medical task lighting or an'history display lighting daimed to be exempt from compliance has a control device independent of the control of the nonexempl lighting.
☒ 8. Each space required to have a manual control also allows for reducing the connected lighting load by at least 50 percent by either controlling all luminaires, dual switching of alternate rows of luminaires, alternate luminaires, or alternate lamps, switching the middle lamp luminaires independently of other lamps, or switching each luminaire or each lamp.

Exceptions:
☐ Only one luminaire in space.
☐ An occupant-sensing device controls the area.
☐ The area is a corridor, storeroom, restroom, public lobby or sleeping unit.
☐ Areas that use less than 0.6 Watts/sq.ft.

☐ 9. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.

Exceptions:
☐ Sleeping units patient care areas; and spaces where automatic shutof would endanger safety or security.

☒ 10. Photocell/astronomical time switch on exterior lights.

Exceptions:
☐ Lighting intenced for 24 hour use.

☐ 11. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).

Exceptions:
☐ Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.

Section 5: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2009 IECC requirements in COMcheck Version 4.1.1.0 and to comply with the mandatory requirements in the Requirements Checklist.

Brett Lorenzen - President — Name - Title
Signature
6/28/2019 — Date

Project Title: SOURCE PERFORMANCE — Report date: 06/28/19
Data filename: D:\OneDrive - optimized-led.com\4 Project\2019\0620 DSP190018 - Source Performance\2 Schedules and Calcs\Energy Calculation\Source Performance Com-Check.cck — Page 1 of 2

Project Title: SOURCE PERFORMANCE — Report date: 06/28/19
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842 EAST ISABELLA AVE.,
MESA, AZ. 85204
WWW. OPTIMIZED-LED.COM
| 602-699-6224
PROJECT: DSP190018
EOR: BRETT LORENZEN
brett.lorenzen@optimized-led.com
AZ: 53437 FIRM: 21458 | CA: 22600 | CO: 55367

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TITLE:
ELECTRICAL ONE-LINE DIAGRAM, PANEL SCHEDULES, AND CALCULATIONS

SCALE: N.T.S.

SHEET:
E400

7/2/2019 11:10:45 AM

IECC COMPLIANCE:

1. DESIGN HEATING AND COOLING LOADS FOR THE BUILDING MUST BE DETERMINED USING PROCEDURES IN THE ASHRAE HANDBOOK OF FUNDAMENTALS OR AN APPROVED EQUIVALENT CALCULATION PROCEDURE.

2. ALL EQUIPMENT AND SYSTEMS MUST BE SIZED TO BE NO GREATER THAN NEEDED TO MEET CALCULATED LOADS. A SINGLE PIECE OF EQUIPMENT PROVIDING BOTH HEATING AND COOLING MUST SATISFY THIS PROVISION FOR ONE FUNCTION WITH THE CAPACITY FOR THE OTHER FUNCTION AS SMALL AS POSSIBLE, WITHIN AVAILABLE EQUIPMENT OPTIONS.
   - EXCEPTION: THE EQUIPMENT AND/OR SYSTEM CAPACITY MAY BE GREATER THAN CALCULATED LOADS FOR STANDBY PURPOSES. STANDBY EQUIPMENT MUST BE AUTOMATICALLY CONTROLLED TO BE OFF WHEN THE PRIMARY EQUIPMENT AND/OR SYSTEM IS OPERATING.
   - EXCEPTION: MULTIPLE UNITS OF THE SAME EQUIPMENT TYPE WHOSE COMBINED CAPACITIES EXCEED THE CALCULATED LOAD ARE ALLOWED IF THEY ARE PROVIDED WITH CONTROLS TO SEQUENCE OPERATION OF THE UNITS AS THE LOAD INCREASES OR DECREASES.

3. EACH HEATING OR COOLING SYSTEM SERVING A SINGLE ZONE MUST HAVE ITS OWN TEMPERATURE CONTROL DEVICE.

4. EACH HUMIDIFICATION SYSTEM MUST HAVE ITS OWN HUMIDITY CONTROL DEVICE.

5. THE SYSTEM OR ZONE CONTROL MUST BE A PROGRAMMABLE THERMOSTAT OR OTHER AUTOMATIC CONTROL MEETING THE FOLLOWING CRITERIA: A) CAPABLE OF SETTING BACK TEMPERATURE TO 55 DECREES F DURING HEATING AND SETTING UP TO 85 DEGREES F DURING COOLING B) CAPABLE OF AUTOMATICALLY SETTING BACK OR SHUTTING DOWN SYSTEMS DURING UNOCCUPIED HOURS USING 7 DIFFERENT DAY SCHEDULES C) HAVE AN ACCESSIBLE 2-HOUR OCCUPANT OVERRIDE D) HAVE A BATTERY BACK UP CAPABLE OF MAINTAINING PROGRAMMED SETTINGS FOR AT LEAST 10 HOURS WITHOUT POWER.
   - EXCEPTION: A SETBACK OR SHUTOFF CONTROL IS NOT REQUIRED ON THERMOSTATS THAT CONTROL SYSTEMS SERVING AREAS THAT OPERATE CONTINUOUSLY.
   - EXCEPTION: A SETBACK OR SHUTOFF CONTROL IS NOT REQUIRED ON SYSTEMS WITH TOTAL ENERGY DEMAND OF 2 KW (6,826 BTU/H) OR LESS.

6. THE SYSTEM MUST SUPPLY OUTSIDE VENTILATION AIR AS REQUIRED BY CHAPTER 4 OF THE INTERNATIONAL MECHANICAL CODE. IF THE VENTILATION SYSTEM IS DESIGNED TO SUPPLY OUTDOOR AIR QUANTITIES EXCEEDING MINIMUM REQUIRED LEVELS, THE SYSTEM MUST BE CAPABLE OF REDUCING OUTDOOR AIR FLOW TO THE MINIMUM REQUIRED LEVELS.

7. AIR DUCTS MUST BE INSULATED TO THE FOLLOWING LEVELS: A) SUPPLY AND RETURN AIR DUCTS FOR CONDITIONED AIR LOCATED IN UNCONDITIONED SPACES (SPACES NEITHER HEATED NOR COOLED) MUST BE INSULATED WITH A MINIMUM OF R --6. UNCONDITIONED SPACES INCLUDE ATTICS, CRAWL SPACES, UNHEATED BASEMENTS, AND UNHEATED GARAGES. B) SUPPLY AND RETURN AIR DUCTS AND PLENUMS MUST BE INSULATED TO A MINIMUM OF R-8 WHEN LOCATED OUTSIDE THE BUILDING. C) WHEN DUCTS ARE LOCATED WITHIN EXTERIOR COMPONENTS (E.G. FLOORS OR ROOFS), MINIMUM R-8 INSULATION IS REQUIRED ONLY BETWEEN THE DUCT AND THE BUILDING EXTERIOR.
   - EXCEPTION: DUCT INSULATION IS NOT REQUIRED ON DUCTS LOCATED WITHIN EQUIPMENT. EXCEPTION: DUCT INSULATION IS NOT REQUIRED WHEN THE DESIGN TEMPERATURE DIFFERENCE BETWEEN THE INTERIOR AND EXTERIOR OF THE DUCT OR PLENUM DOES NOT EXCEED 15 DEGREES F.
   - EXCEPTION: CONTINUOUSLY WELDED AND LOCKING TYPE LONGITUDINAL JOINTS AND SEAMS ON DUCTS OPERATING AT STATIC PRESSURES LESS THAN 2 INCHES W.G. PRESSURE CLASSIFICATION.

8. MECHANICAL FASTENERS AND SEALS, MASTICS, OR CASKETS MUST BE USED WHEN CONNECTING DUCTS TO FANS AND OTHER AIR DISTRIBUTION EQUIPMENT, INCLUDING MULTIPLE ZONE TERMINAL UNITS.

9. ALL JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS, AND CONNECTIONS IN DUCTWORK MUST BE SECURELY SEALED USING WELDMENTS; MECHANICAL FASTENERS WITH SEALS; CASKETS; OR MASTICS; MESH AND MASTIC SEALING SYSTEMS; OR TAPES. TAPES AND MASTICS MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A AND SHALL BE MARKED '181A-P' FOR PRESSURE SENSITIVE TAPE,'181A -- M' FOR MASTIC OR '181 A --H' FOR HEAT-- SENSITIVE TAPE. TAPES AND MASTICS USED TO SEAL FLEXIBLE AIR DUCTS AND FLEXIBLE AIR CONNECTORS SHALL COMPLY WITH UL 181B AND SHALL BE MARKED '181B-- FX' FOR PRESSURE-- SENSITIVE TAPE OR'181B-- M' FOR MASTIC. UNLISTED DUCT TAPE IS NOT PERMITTED AS A SEALANT ON ANY METAL DUCTS.

10. OPERATION AND MAINTENANCE DOCUMENTATION MUST BE PROVIDED TO THE OWNER THAT INCLUDES AT LEAST THE FOLLOWING INFORMATION: A) EQUIPMENT CAPACITY (INPUT AND AND REQUIRED MAINTENANCE ACTIONS B) EQUIPMENT OPERATION AND MAINTENANCE MANUALS C) HVAC SYSTEM CONTROL MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTION S; DESIRED OR FIELD-DETERMINED SET POINTS MUST BE PERMANENTLY RECORDED ON CONTROL DRAWINGS, AT CONTROL DEVICES, OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTED) COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE.

11. OUTDOOR AIR SUPPLY AND EXHAUST SYSTEMS MUST HAVE MOTORIZED DAMPERS THAT AUTOMATICALLY SHUT WHEN THE SYSTEMS OR SPACES SERVED ARE NOT IN USE. DAMPERS MUST BE CAPABLE OF AUTOMATICALLY SHUTTING OFF DURING PRE-OCCUPANCY BUILDING WARM-UP, COOL-DOWN, AND SETBACK, EXCEPT WHEN VENTILATION REDUCES ENERGY COSTS (E.G., NIGHT PURGE) OR WHEN VENTILATION MUST BE SUPPLIED TO MEET CODE REQUIREMENTS. BOTH OUTDOOR AIR SUPPLY AND EXHAUST AIR DAMPERS MUST HAVE A MAXIMUM LEAK ACE RATE OF 3 CFM/FT2 AT 1. 0 IN W. 6. WHEN TESTED IN ACCORDANCE WITH AMCA STANDARD 500.
   - EXCEPTION: GRAVITY (NON-MOTORIZED) DAMPERS ARE ACCEPTABLE IN BUILDINGS LESS THAN THREE STORIES IN HEIGHT.
   - EXCEPTION: SYSTEMS WITH A DESIGN OUTSIDE AIR INTAKE OR EXHAUST CAPACITY OF 300 CFM (140 L/S) OR LESS THAT ARE EQUIPPED WITH MOTOR OPERATED DAMPERS THAT OPEN AND CLOSE WHEN THE UNIT IS ENERGIZED AND DE-- ENERCIZED, RESPECTIVELY.

12. BALANCING DEVICES PROVIDED IN ACCORDANCE WITH IMC 603.17

13. STAIR AND ELEVATOR SHAFT VENTS ARE EQUIPPED WITH MOTORIZED DAMPERS

GENERAL NOTES:

1. PRIOR TO SUBMITTING BID, MECHANICAL CONTRACTOR SHALL VISIT THE JOB SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS OF THE PROJECT. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND OTHER DRAWINGS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.

2. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.

3. COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL DUCTWORK AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF DUCTWORK TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR AT NO EXTRA COST TO THE OWNER.

4. AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN FOR NEW INSTALLATION DURING WORK. REPAIR DAMAGE CAUSED DURING CONSTRUCTION AT NO EXTRA COST TO THE OWNER.

5. ALL MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL PLANS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED.

6. NEW MECHANICAL EQUIPMENT AND DUCTWORK ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.

7. REFER TO ARCHITECTURAL DRAWINGS FOR RELATED CONSTRUCTION DETAILS AS APPLICABLE TO THE HVAC SYSTEM. VERIFY CHASES AND PENETRATIONS SHOWN ON ARCHITECTURAL DRAWINGS THAT ARE INTENDED FOR DUCTWORK AND PIPING MEET REQUIREMENTS.

8. COORDINATE LOCATION OF ROOF MOUNTED HVAC EQUIPMENT AND ROOF PENETRATIONS WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.

9. INDOOR AIR QUALITY MEASURES: PROTECT INSIDE OF (INSTALLED AND DELIVERED) DUCTWORK AND HVAC UNITS FROM EXPOSURE TO DUST, DIRT, PAINT AND MOISTURE. REPLACE INSULATION THAT HAS GOTTEN WET AT ANY TIME DURING CONSTRUCTION, DRYING THE INSULATION IS NOT ACCEPTABLE. SEAL ANY TEARS OR JOINTS OF INTERNAL FIBERGLASS INSULATION. REMOVE DEBRIS FROM CEILING/RETURN AIR PLENUM INCLUDING DUST. AN INDEPENDENT, PROFESSIONAL DUCT CLEANING COMPANY SHALL VACUUM CLEAN ANY DUCTWORK CONNECTED TO HVAC UNITS THAT WERE OPERATED DURING THE CONSTRUCTION PERIOD BEFORE NEW FILTERS ARE INSTALLED AND PRIOR TO TURNING SYSTEM OVER TO THE OWNER.

10. INSTALL DUCTWORK PARALLEL TO BUILDING COLUMN LINES UNLESS OTHERWISE SHOWN OR NOTED.

11. OVERHEAD HANGERS AND SUPPORTS FOR EQUIPMENT, DUCTWORK SHALL BE FASTENED TO BUILDING JOISTS OR BEAMS. DO NOT ATTACH HANGERS AND SUPPORTS TO THE ABOVE FLOOR SLAB OR ROOF.

12. COORDINATE LOCATION OF EQUIPMENT SUPPORTS WITH LOCATION OF EQUIPMENT ACCESS PANELS/DOORS TO ENABLE SERVICE OF EQUIPMENT AND/OR FILTER REPLACEMENT.

13. SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.

14. COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL AND DUCT INSTALLATION REQUIREMENTS.

15. ADJUST LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES AS REQUIRED TO ACCOMMODATE FINAL CEILING GRID AND LIGHTING LOCATIONS.

16. LOCATE AND SET TEMPERATURE AND HUMIDITY SENSORS AT LOCATIONS SHOWN ON PLANS. VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL DEVICES 48" AFT TO MEET ADA REQUIREMENTS UNLESS NOTED OTHERWISE ON PLANS. PROVIDE INSULATED BACKING FOR THERMOSTATS MOUNTED ON EXTERIOR BUILDING WALLS. INSTALL WIRING IN CONDUIT PROVIDED BY DIVISION 16.

17. COORDINATE THE LOCATION AND ELEVATION OF WALL-MOUNTED DEVICES WITH PRESENTATION BOARDS, DISPLAY CABINETS, SHELVES OR OTHER COMPONENTS SHOWN ON THE ARCHITECTURAL DRAWINGS THAT ARE TO BE INSTALLED UNDER OTHER DIVISIONS. CONTRACTOR WILL NOT BE REIMBURSED FOR RELOCATION OF WALL-MOUNTED DEVICES CAUSED BY A LACK OF COORDINATION.

18. PROVIDE A MANUAL BALANCING DAMPER IN EACH BRANCH DUCT TAKEOFF FROM MAIN SUPPLY, RETURN, OUTDOOR AND EXHAUST AIR DUCTS.

19. PROVIDE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY, RECTANGULAR/ROUND BRANCH DUCT TAKEOFF FITTING WITH MANUAL BALANCING DAMPER AND LOCKING QUADRANT FOR BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS AND GRILLES.

20. BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS OTHERWISE NOTED.

21. RIGID DUCTWORK INSULATION: PROVIDE 3/4 LB DENSITY, 1" (R-6) THICK, INSULATION WRAP ON RIGID ROUND, CONCEALED (NON-CONDITIONED SPACE), SUPPLY AND RETURN AIR DUCTS AND ON OUTSIDE AIR DUCTS. FURNISH AND INSTALL 1-1/2 LB DENSITY, 1" (R-6) INTERNAL DUCT LINER ON ROUND SUPPLY AND RETURN AIR DUCTS WITHIN 10'-0" OF ROOFTOP UNIT DUCT DROP. FURNISH AND INSTALL 1-1/2 LB DENSITY, 2" (R-8) THICK INTERNAL DUCT LINER ON RECTANGULAR CONCEALED (NON-CONDITIONED SPACE), SUPPLY AND RETURN AIR DUCTS. DUCT SIZES ON MECHANICAL PLANS INDICATE CLEAR INSIDE AIRFLOW DIMENSIONS, INCREASE SHEET METAL SIZES ACCORDINGLY.

22. PROVIDE THERMAFLEX TYPE M-KE OR G-KM, FLEXMASTER TYPE 8, OR APPROVED EQUAL FLEXIBLE DUCTWORK. FLEXIBLE DUCTWORK SHALL BE LISTED UNDER UL 181 AS CLASS 1 AIR DUCT AND BE PROVIDED WITH INTEGRAL R-8, 3/4 LB DENSITY FIBERGLASS INSULATION. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORTED TO AVOID SHARP BENDS AND SAGGING.

23. PROVIDE EQUIPMENT VENTS PER EQUIPMENT MANUFACTURERS RECOMMENDATIONS AND EQUIPMENT SPECIFICATIONS. KEEP PENETRATIONS THROUGH ROOF A MINIMUM OF 10'-0" FROM HVAC EQUIPMENT FRESH AIR INLETS AND 2'-0" FROM ROOF PARAPETS.

26. PROVIDE A NEW SET OF AIR FILTERS IN UNITS PRIOR TO TESTING, ADJUSTING AND BALANCING. AND BEFORE TURNING SYSTEM(S) OVER TO OWNER.

27. PLACEMENT, DUCTING AND STARTUP OF THE MECHANICAL UNITS SHALL BE BY THE MECHANICAL CONTRACTOR.

28. ALL EXPOSED DUCT WORK SHALL BE INSTALLED AS TIGHT TO ROOF STRUCTURE AS POSSIBLE.

29. EITHER WHEN STORED OR MOVED INTO ROUGH FRAME, HVAC EQUIPMENT OPENINGS AND DUCTS SHALL BE PROTECTED AND PROTECTION MAINTAINED UNTIL FINAL STARTUP OF THE SYSTEM.

30 ALL HVAC UNITS INSTALLED AND OPERATIONAL DURING CONSTRUCTION AND UP TO THE POINT OF OCCUPANCY SHALL BE INSTALLED WITH MERV 8 FILTERS.

31. REFER TO OUTDOOR AIR SCHEDULE, ON SHEET M100, FOR VENTILATION INFORMATION.

MECHANICAL SYMBOLS

NOTE: THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS, ETC. ARE NECESSARILY USED ON THE DRAWINGS.

PIPING

- CD — CONDENSATE DRAIN (CD)
- ACD — AUXILIARY CONDENSATE DRAIN (ACD)
- RL — REFRIGERANT LIQUID (RL)
- RD — REFRIGERANT DISCHARGE (HOT GAS) (RD)
- RS — REFRIGERANT SUCTION (RS)
- HWS — HEATING HOT WATER SUPPLY (HWS)
- HWR — HEATING HOT WATER RETURN (HWR)
- CWS — CHILLED WATER SUPPLY (CWS)
- CWR — CHILLED WATER RETURN (CWR)
- HS — HEAT PUMP SUPPLY (HS)
- HR — HEAT PUMP RETURN (HR)
- LPS — LOW PRESSURE STEAM SUPPLY (LPS)
- LPC — LOW PRESSURE STEAM CONDENSATE (LPC)
- EXISTING PIPING TO BE REMOVED
- EXISTING PIPING TO REMAIN
- DIRECTION OF FLOW
- BALL VALVE
- CONTROL VALVE
- THREE-WAY CONTROL VALVE
- SHUTOFF VALVE
- CHECK VALVE
- BALANCING VALVE WITH PRESSURE PORTS
- TRIPLE DUTY VALVE WITH PRESSURE PORTS
- WATER METER
- STRAINER
- SOLENOID VALVE
- PRESSURE GAUGE
- THERMOMETER
- PRESSURE AND TEMPERATURE TEST PLUG
- UNION
- FLANGE CONNECTION
- ELBOW UP
- ELBOW DOWN
- TEE UP
- TEE DOWN
- REDUCER

HVAC EQUIPMENT & DUCTWORK

NOTE: ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE INSIDE DIMENSIONS. SEE SECTION 15250 OF THE SPECIFICATION FOR DUCTWORK TO RECEIVE INSULATION OR LINER.

- EXISTING DUCTWORK OR EQUIPMENT TO REMAIN
- EXISTING DUCTWORK OR EQUIPMENT TO BE REMOVED
- BRANCH DUCT WITH 45° RECTANGLE-ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER
- ELBOW WITH TURNING VANES
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT UP
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT DOWN
- SUPPLY AIR DUCT UP
- SUPPLY AIR DUCT DOWN
- EQUIPMENT WITH FLEXIBLE DUCT CONNECTION
- 10" CSD-1 300 CFM — NECK SIZE, TYPE, CFM OF SUPPLY DIFFUSER OR REGISTER
- MANUAL VOLUME DAMPER
- SQUARE TO ROUND TRANSITION
- RD — DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY/RD=RETURN)
- FD — FIRE DAMPER
- FSD — FIRE SMOKE DAMPER
- SD — SMOKE DAMPER
- VD — VOLUME DAMPER
- MD — MOTORIZED DAMPER
- BD — BACKDRAFT DAMPER
- AS — AVERAGING SENSOR
- CO2 — CARBON DIOXIDE SENSOR
- HS — HUMIDITY SENSOR
- PS — PULL STATION
- TS — TEMPERATURE SENSOR
- H — HUMIDISTAT
- T — THERMOSTAT

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AVG	AVERAGE	NC	NOISE CRITERIA
BAS	BUILDING AUTOMATION SYSTEM	OA	OUTSIDE AIR
BD	BACKDRAFT DAMPER	RA	RETURN AIR
CFM	CUBIC FEET PER MINUTE	SA	SUPPLY AIR
DDC	DIRECT DIGITAL CONTROL	SD	SMOKE DUCT DETECTOR
DX	DIRECT EXPANSION	TFA	TO FLOOR ABOVE
EA	EXHAUST AIR	TFB	TO FLOOR BELOW
FFA	FROM FLOOR ABOVE	TYP	TYPICAL
FFB	FROM FLOOR BELOW	UC	UNDERCUT
IN WC	INCHES OF WATER COLUMN	UNO	UNLESS NOTED OTHERWISE
MAX	MAXIMUM	W/	WITH
MBH	1000 BTU PER HOUR	W/O	WITHOUT
MC	MECHANICAL CONTRACTOR		

STANDARD MOUNTING HEIGHTS

MECHANICAL	(AFF, AFG, UNLESS NOTED OTHERWISE)
THERMOSTATS/AVERAGING SENSORS	48"
CONTROLS (CENTERLINE)	48"

ANNOTATION

- 1 — MECHANICAL PLAN CALLOUT
- CU 1 — MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- CONNECTION POINT OF NEW WORK TO EXISTING
- 1 / M1 — DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- 1 / M1 — SECTION CUT DESIGNATION

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MECHANICAL NOTES AND SYMBOLS

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HEAT PUMP ROOFTOP UNIT SCHEDULE

MARK	MANUFACTURER	MODEL	SUPPLY FAN				COOLING COIL						HEAT PUMP HEATING COIL					MIN	ELECTRICAL				WEIGHT	NOTES
			CFM	ESP (IN)	NOM HP	VFD (Y/N)	TH (MBH)	SH (MBH)	EAT (°F DB)	EAT (°F WB)	LAT (°F DB)	LAT (°F WB)	REFR TYPE	MIN EFF (SEER)	MIN OUT (MBH)	AMBIENT (DB)	EAT (°F DB)	LAT (°F DB)	MIN EFF (HSPF)	O/A CFM	V/PH	MCA	MOCP	DISC TYPE	(LBS)	
RTU-1	LENNOX	KHB036H4E	1,200	0.5	0.5	NO	28.7	28.1	83.1	64.5	61.0	57	410A	16	25.3	32	67.15	86.7	8.5	90	208/3	22	30	FUSED	650	ALL
RTU-2	LENNOX	KHB060H4E	2,000	0.5	1.0	NO	49.1	49.1	85.7	65.5	63.0	57	410A	16	44.5	32	62.6	85.3	8	390	208/3	31	45	FUSED	850	ALL

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFAC

NOTES:

A. EQUIPMENT SIZED FOR 115°F AMBIENT TEMPERATURE.
B. PROVIDE 2 INCH MERV 8, EFFICIENT PLEATED THROWAWAY AIR FILTERS.
C. PROVIDE FACTORY MOUNTED DISCONNECT INSTALLED ON SERVICE SIDE OF UNIT.
D. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
E. PROVIDE SINGLE POINT POWER CONNECTION.
F. COORDINATE SIZE OF CONDUCTOR TERMINATION LUGS WITH CONDUCTOR SIZES SHOWN ON ELECTRICAL DRAWINGS.
G. SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.
H. COOLING COIL LAT IS LEAVING AIR TEMPERATURE OF COIL.
J. SELECT EQUIPMENT FOR ELEVATION OF 1100 FEET ABOVE SEA LEVEL.

FAN SCHEDULE

MARK	SERVICE DESCRIPTION	MANUFACTURER	MOUNTING	MODEL	CFM	ESP (IN)	MOTOR WATTS	DRIVE (BELT/DIRECT)	ELECTRICAL			WEIGHT (LBS)	NOTES
									V/PH	DISC TYPE	STARTER TYPE		
EF-1	TOILET	BROAN	CEILING	L150	140	0.25	100	DIRECT	120/1	FUSED	MAGNETIC	24	ALL

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND SPECIFICATIONS TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

A. PROVIDE BIRDSCREEN AND GRAVITY BACKDRAFT DAMPER.
B. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.
C. DIVISION 26 CONTRACTOR TO FURNISH STARTER.
D. INTERLOCK FAN OPERATION WITH MANUFACTURER PROVIDED FAN SWITCH.
E. PROVIDE WITH MANUFACTURER'S ELECTRONICALLY COMMUTATED (EC) MOTOR.
F. PROVIDE WITH FACTORY ROOF CAP.

GRILLE, REGISTER AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	SERVICE	MODEL	CONSTRUCTION TYPE	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN)	MAX. NC	MAX. PRESS. DROP (IN. W.C.)	NOTES
SD-1	TITUS	SUPPLY	TMS-AA	ALUMINUM	PLAQUE	CEILING	REFER TO PLANS	25	0.1	A-F
SD-2	TITUS	SUPPLY	R-OMNI	STEEL	PLAQUE	DUCT	REFER TO PLANS	25	0.1	A-F
RG-1	TITUS	RETURN	350RLF	STEEL	PLAQUE	DUCT	REFER TO PLANS	25	0.1	A-F,H
LS-1	TITUS	SUPPLY	FT-10	STEEL	PLAQUE	CEILING	48" L	25	0.1	A-G

MODEL NUMBERS SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND MODEL NUMBERS ONLY. REVIEW THE COMPLETE DESCRIPTION, NOTES AND DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE MANUFACTURERS LISTED ARE THE BASIS FOR THE DESIGN.

NOTES:

A. NECK SIZE SHOWN ON DRAWINGS. PROVIDE BRANCH DUCT TO MATCH NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
B. BAKED ENAMEL FINISH, COLOR TO BE SELECTED BY ARCHITECT.
C. FRAME TYPE TO MATCH CEILING/WALL CONSTRUCTION, COORDINATE WITH ARCHITECTURAL REFLECTED CEILING/WALL PLAN.
D. PROVIDE BORDER TYPE TO MATCH CEILING CONSTRUCTION WITH CONCEALED BORDER MOUNTING, AND INSULATED PLENUM BOX WITH NECK.
E. PROVIDE DIFFUSERS, LINEAR SLOTS, AND GRILLES WITH NO EXPOSED MOUNTING SCREWS.
F. PAINT ALL INTERIOR SURFACES SLOTS, GRILLES AND PLENUMS FLAT BLACK.
G. SUPPLY PLENUM SHALL BE PURCHASED FROM THE SLOT DIFFUSER MANUFACTURER. PROVIDE 1/4" CLOSED CELL INSULATION ON THE INTERIOR OF THE SUPPLY PLENUM.
H. PROVIDE WITH 1" THROW AWAY FILTER.

OUTSIDE AIR REQUIREMENTS, IMC-2018 (IP)

SYSTEM DESIGNATION	SYSTEM TAB NAME OR LIST 'SINGLE'	MULTI-ZONE SYSTEMS ONLY SYSTEM VENTILATION EFFICIENCY [Ev]	FLOOR AREA SERVED BY SYSTEM [As] (SF)	SYSTEM AVERAGED AREA-BASED OUTDOOR AIR RATE (CFM/SF)	SYSTEM POPULATION [Ps] (PEOPLE)	SYSTEM AVERAGED PEOPLE-BASED OUTDOOR AIR RATE (CFM/P)	REQUIRED OA INTAKE FLOW [Vot] (CFM)	DESIGN OA INTAKE FLOW [Vot] (CFM)
RTU-1	MZ (RTU1)	0.74	493	0.060	6.38	5.00	83	90
RTU-2	SINGLE ZONE	-	1,840	0.060	10	20.00	388	390
						TOTALS	471	480

GENERAL NOTES:
1. VENTILATION CALCULATIONS BASED ON IMC-2018.
2. SYSTEM POPULATIONS BASED ON MAX SEATING AND/OR CODE MAXIMUM VALUES.
3. SINGLE ZONE SYSTEMS (Vot = Voz): SYSTEM VENTILATION EFFICIENCY CALCULATION IS NOT REQUIRED FOR SINGLE ZONE SYSTEMS. WORST CASE AIR DISTRIBUTION EFFECTIVENESS BETWEEN HEATING AND COOLING MODES OF OPERATION IS SHOWN IN TABLE.
4. 100% OA SYSTEMS (Vot = $\sum_{all\ zones}$ Voz): WHEN ONE AIR HANDLER SUPPLIES ONLY OUTDOOR AIR TO ONE OR MORE ZONES. EACH ZONE IS INDIVIDUALLY CALCULATED WITH ITS WORST CASE ZONE AIR DISTRIBUTION EFFECTIVENESS (HEATING/COOLING).
5. MULTI-ZONE RECIRCULATING SYSTEMS: CALCULATOR USED TO DETERMINE VENTILATION AIRFLOW IN COMPLIANCE WITH IMC-2015 VRP AND ASHRAE 62.1-2013 APPENDIX A. VENTILATION RATE SHOWN IS ACTUAL CALCULATED WITH CORRECTION FACTORS INCLUDED. EACH ZONE IS CALCULATED WITH ITS WORST CASE ZONE AIR DISTRIBUTION

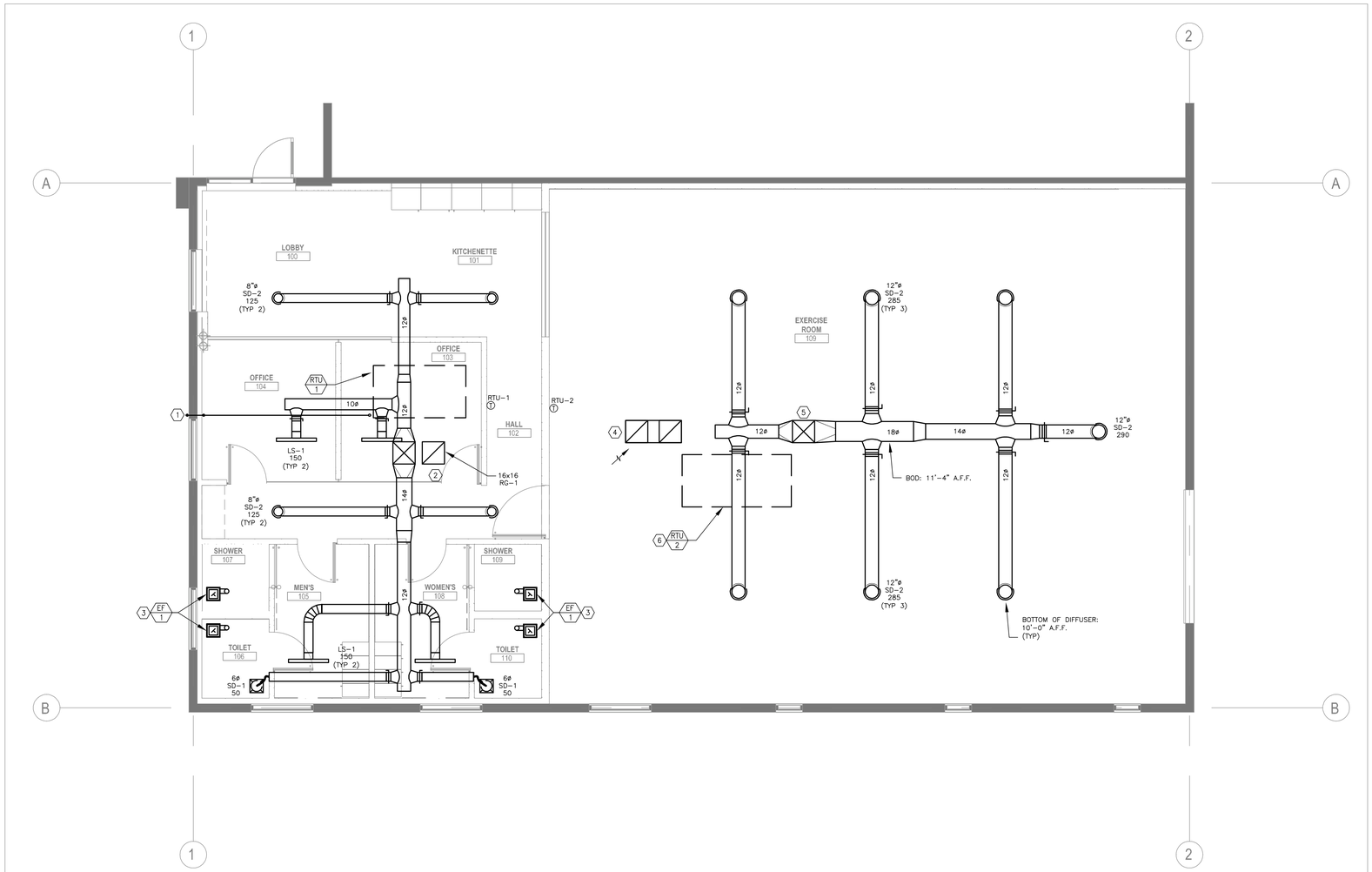
DATE: ISSUE:
02.12.2019 FIRST CITY SUBMITTAL
06.24.2019 PERMIT R1

STAMP:

TITLE: MECHANICAL SCHEDULES

SCALE: 1/8" = 1'-0"

SHEET: M101



1 MECHANICAL FLOOR PLAN
SCALE: 1/4"=1'-0"

N

SHEET NOTES

1. 3/4" CONDENSATE FROM RTU-1 TO LANDSCAPE AREA. TURN OUT AND ELBOW DOWN 6" ABOVE FINISHED GRADE.
2. CONNECT RETURN GRILLE TO 16X16 DUCT UP TO ROOF. PROVIDE 2" ACOUSTICAL LINER IN RETURN DUCT.
3. ROUTE 4" EXHAUST DUCT UP THROUGH ROOF TO FACTORY PROVIDED ROOF CAP. MAINTAIN EXHAUST DISCHARGE AND FLUE TERMINATIONS A MINIMUM OF 10'-0" AWAY FROM ANY FRESH AIR INTAKES.
4. REMOVE EXISTING RETURN GRILLE AND TURN NEW DUCT UP, WITH ELBOW MINIMUM 12" FOR RETURN INTAKE. PROVIDE 2" ACOUSTICAL LINER AND WIRE MESH SCREEN SECURELY FASTENED TO OPEN-ENDED DUCT.
5. REMOVE EXISTING SUPPLY DUCTWORK BACK TO DROP FROM ROOF AND INSTALL NEW DUCTWORK AS SHOWN.
6. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDENSATE DISCHARGE LOCATION FOR RTU-2 ABOVE. IF REQUIRED, REROUTE EXISTING CONDENSATE DRAIN TO NEW MOP SINK.

GENERAL NOTES

1. ALL CURBS AND/OR PLATFORMS SHALL BE PROVIDED AS SCHEDULED ON SHEET M1.0.
2. ALL FRESH AIR INTAKES SHALL BE 10'-0" MIN. AWAY OR 3'-0" BELOW ANY EXHAUST OUTLET.
3. PROVIDE TEST AND BALANCE REPORT TO INSPECTOR AT OR PRIOR TO FINAL INSPECTION.
4. IF REQUIRED, REROUTE EXISTING CONDENSATE DRAINS FROM HEAT PUMPS TO NEW MOP SINK. FIELD VERIFY EXISTING CONDENSATE DRAIN ROUTING.

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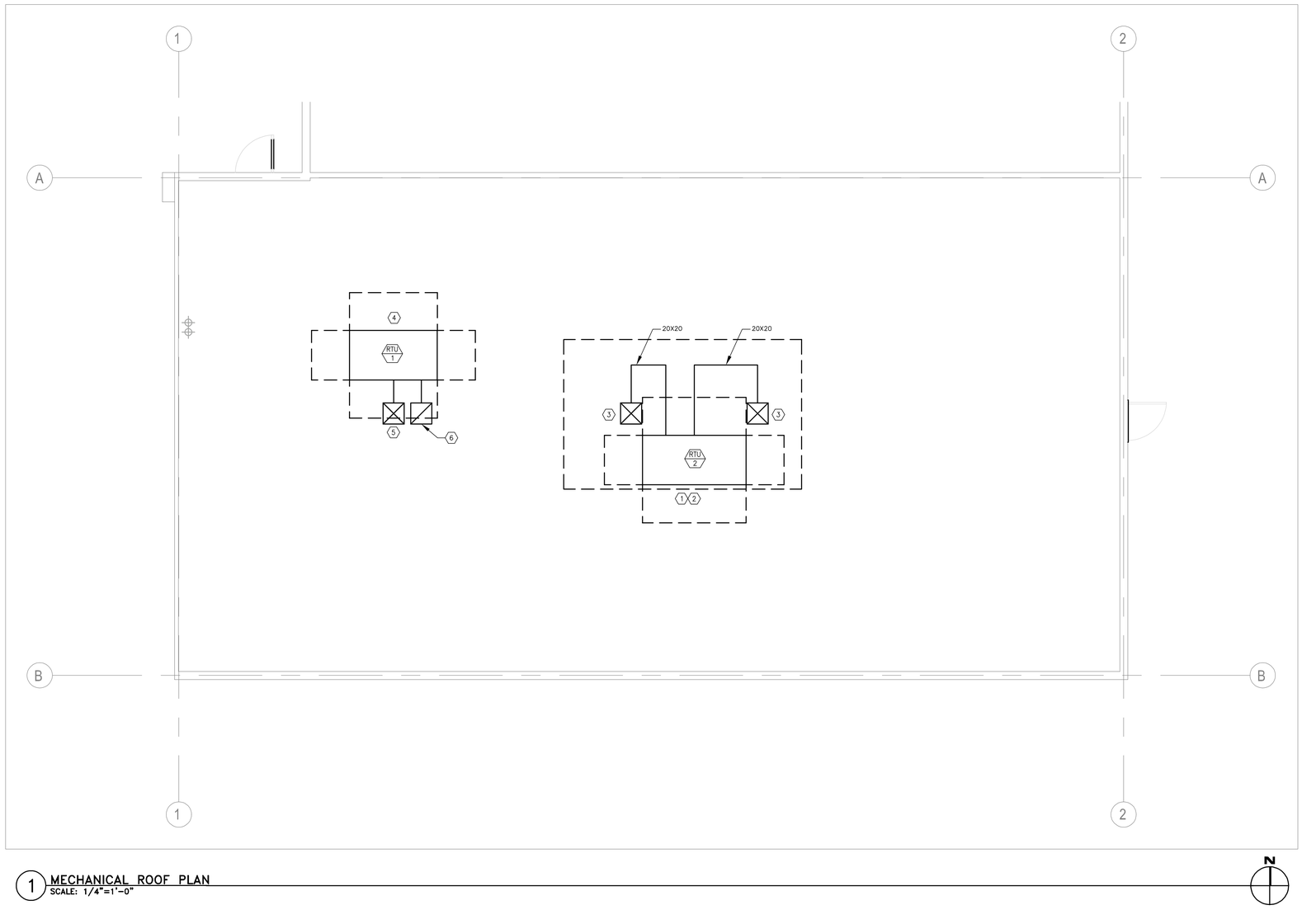
STAMP:

TITLE: MECHANICAL FLOOR PLAN

SCALE: 1/4" = 1'-0"

SHEET: M200



1 MECHANICAL ROOF PLAN
SCALE: 1/4"=1'-0"

N

SHEET NOTES

1. DEMO EXISTING 5-TON HEAT PUMP ROOF TOP UNIT AND REPLACE WITH NEW HEAT PUMP ROOF TOP UNIT AS SCHEDULED ON SHEET M001. INSTALL NEW ROOF TOP UNIT ON 4X4 REDWOOD SLEEPERS AND PER MANUFACTURER'S RECOMMENDATIONS. CONNECT ROOF TOP UNIT CONDENSATE TO EXISTING CONDENSATE DRAIN.
2. PRIOR TO ORDERING NEW ROOF TOP UNIT CONTRACTOR SHALL VERIFY THAT THE NEW UNIT CAN BE INSTALLED WITHIN THE EXISTING SCREENED AREA AND MAINTAIN REQUIRED EQUIPMENT CLEARANCES AND ACCESS. NOTIFY THE ARCHITECT IF ANY ADJUSTMENTS NEED TO BE MADE TO EXISTING SCREENS.
3. EXISTING 20X20 OPENINGS IN ROOF SHALL BE REUSED. ROUTE NEW DUCTWORK FROM ROOF TOP UNIT ABOVE THE ROOF AND TO THE EXISTING OPENINGS. INSULATE EXTERIOR DUCTWORK PER DETAILS AND SPECIFICATIONS. SEAL OPENING THROUGH ROOF WATER TIGHT AND TO MATCH EXISTING CONDITIONS.
4. INSTALL NEW 3-TON HEAT PUMP ROOF TOP UNIT ON 4X4 REDWOOD SLEEPERS AND PER MANUFACTURER'S RECOMMENDATIONS. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND COORDINATION WITH NEW SCREEN WALLS.
5. 14X14 SUPPLY DUCT THROUGH ROOF. ROUTE NEW DUCTWORK FROM ROOF TOP UNIT ABOVE THE ROOF. INSULATE EXTERIOR DUCTWORK PER DETAILS AND SPECIFICATIONS. SEAL OPENING THROUGH ROOF WATER TIGHT AND TO MATCH EXISTING CONDITIONS.
6. 16X16 RETURN DUCT THROUGH ROOF. ROUTE NEW DUCTWORK FROM ROOF TOP UNIT ABOVE THE ROOF. INSULATE EXTERIOR DUCTWORK PER DETAILS AND SPECIFICATIONS. SEAL OPENING THROUGH ROOF WATER TIGHT AND TO MATCH EXISTING CONDITIONS.

GENERAL NOTES

1. ALL CURBS AND/OR PLATFORMS SHALL BE PROVIDED AS SCHEDULED ON SHEET M001
2. ALL FRESH AIR INTAKES SHALL BE 10'-0" MIN. AWAY OR 3'-0" BELOW ANY EXHAUST OUTLET.

DATE: ISSUE:
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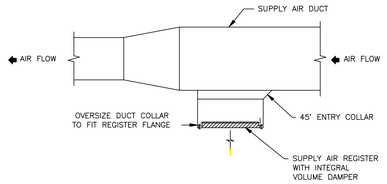
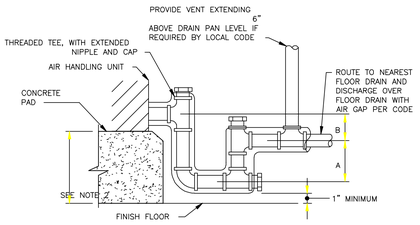
TITLE: MECHANICAL ROOF PLAN

SCALE: 1/4" = 1'-0"

SHEET: M300



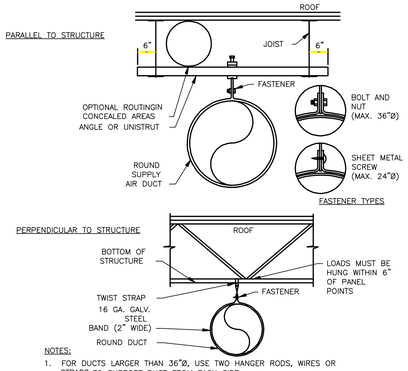
5 DUCT MOUNTED REGISTER DETAIL
NO SCALE



A = GREATER OF 4" OR 1/2" PLUS UNIT TOTAL PRESSURE IN INCHES-WATER COLUMN.
BLOWTHRU:
B = 1"
DRAWTHRU:
B = 1" PLUS FAN SUCTION PRESSURE IN INCHES WATER COLUMN

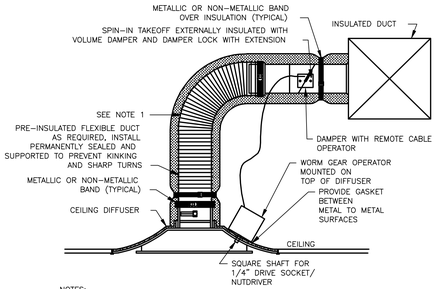
NOTES:
1. 1" Ø MINIMUM PIPE SIZE OR SIZE PER DRAIN TAP IN AIR HANDLING UNIT. INSULATE FOR CONDENSATE CONTROL WHERE UNIT IS INSTALLED IN OR ABOVE FINISHED SPACES.
2. PAD HEIGHT 4" MINIMUM OR AS DETERMINED BY SPACE REQUIRED TO INSTALL TRAP.

4 CONDENSATE DRAIN TRAP
NO SCALE



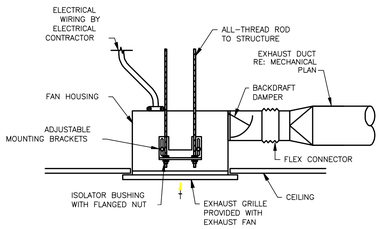
NOTES:
1. FOR DUCTS LARGER THAN 36"Ø, USE TWO HANGER RODS, WIRES OR STRAPS TO SUPPORT DUCT FROM EACH SIDE.

3 ROUND DUCT SUPPORT DETAIL
NO SCALE

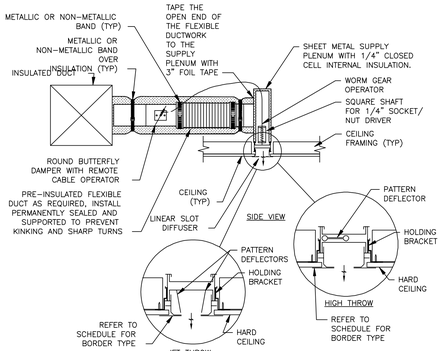


NOTES:
1. EXTEND HARD METAL DUCT SO THAT MAXIMUM FLEXIBLE DUCT LENGTH DOES NOT EXCEED 5'-0". PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITHIN 5'-0" LENGTH LIMITATION.
2. PROVIDE WORM GEAR OPERATOR AND DAMPER WITH REMOTE CABLE FOR DAMPERS ABOVE HARD CEILINGS.

2 HARD CEILING DIFFUSER DETAIL
NO SCALE

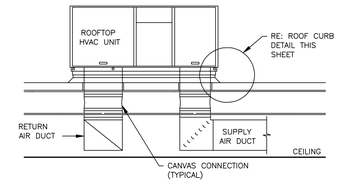


1 CEILING EXHAUST FAN DETAIL
NO SCALE



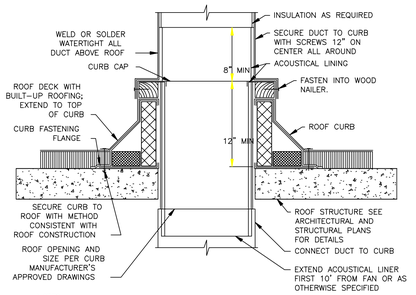
NOTES:
1. EXTEND HARD METAL DUCT SO THAT MAXIMUM FLEXIBLE DUCT LENGTH DOES NOT EXCEED PROVIDE RIGID 90° ELBOW WHERE REQUIRED TO KEEP FLEXIBLE DUCT WITHIN LENGTH LIMITATION.
2. COORDINATE EXACT LENGTH AND LOCATION OF SLOT DIFFUSER WITH ARCHITECT'S REFLECTED PLAN.
3. PORTIONS OF THE SLOT DIFFUSER NOT USED FOR SUPPLY SHALL REMAIN OPEN TO THE PLENUM RETURN UNLESS NOTED OTHERWISE.
4. ALL FLEXIBLE DUCT OFFSETS SHALL MAINTAIN A RADIUS OF 1.5 TIMES THE DIAMETER.
5. AT THE CONTRACTORS OPTION SUPPLY PLENUM MAY BE FIELD FABRICATED AS SHOWN IN DETAIL-XX1 OR PURCHASED FROM DIFFUSER SUPPLIER.
6. REFER TO DIFFUSER MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR EACH BORDER TYPE.

10 LINEAR SLOT DIFFUSER DETAIL
NO SCALE



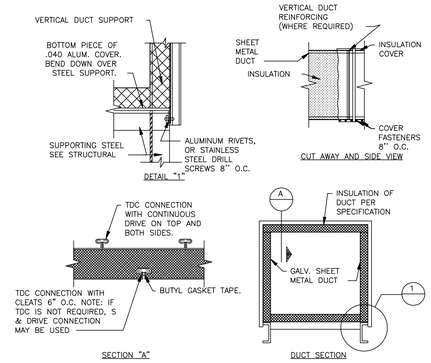
NOTES:
1. PROVIDE OPENING THROUGH ROOF AND ROOF DECK INSULATION NO LARGER THAN REQUIRED TO ALLOW DUCTS TO PASS THROUGH. REFER TO PLANS FOR DUCT SIZES. TRANSITION AS REQUIRED IN ROOF CURB TO RTU SUPPLY AND RETURN OPENINGS.
2. PROVIDE SLOPED ROOF CURB TO INSTALL ROOFTOP UNIT LEVEL TO ENSURE PROPER DRAINAGE. COORDINATE ROOF SLOPE WITH ARCHITECTURAL. FLASH AND COUNTER FLASH ROOF PENETRATIONS, ETC. TO ENSURE WEATHER TIGHT INSTALLATION.

9 ROOFTOP UNIT WITH DUCTWORK DETAIL
NO SCALE

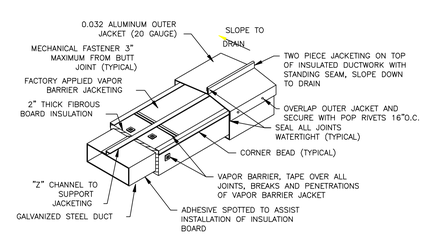


NOTES:
1. SPUD BACK GRAVEL A MINIMUM OF 30" IN ALL DIRECTIONS. FLASH WITH 90# MINERAL FACED BASED FLASHING. STRIP WITH THREE LAYERS OF ROOFING FELT EMBEDDED IN HOT ASPHALT. GRAVEL TO MATCH.

8 RECTANGULAR AIR DUCT PENETRATION THROUGH ROOF DETAIL
NO SCALE



7 EXTERIOR DUCT INSULATION DETAILS
NO SCALE



6 DUCTWORK ABOVE ROOF DETAIL
NO SCALE

DATE: ISSUE:
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06.24.2019 PERMIT R1

STAMP:

TITLE: MECHANICAL DETAILS

SCALE: 1/8" = 1'-0"

SHEET: M400

COMcheck Software Version 4.0.8.2

Mechanical Compliance Certificate

Project Information

Energy Code:	2018 IECC
Project Title:	
Location:	Phoenix, Arizona
Climate Zone:	2b
Project Type:	Alteration

Construction Site: Owner/Agent: Designer/Contractor:

Mechanical Systems List

Quantity	System Type & Description
1	RTU-1 (Single Zone): Single Package Heat Pump Heating Mode: Capacity = 25 kBtu/h, Proposed Efficiency = 8.50 HSPF, Required Efficiency = 8.00 HSPF Cooling Mode: Capacity = 29 kBtu/h, Proposed Efficiency = 16.00 SEER, Required Efficiency: 14.00 SEER Fan System: Unspecified
1	RTU-2 (Single Zone): Single Package Heat Pump Heating Mode: Capacity = 45 kBtu/h, Proposed Efficiency = 8.00 HSPF, Required Efficiency = 8.00 HSPF Cooling Mode: Capacity = 49 kBtu/h, Proposed Efficiency = 16.00 SEER, Required Efficiency: 14.00 SEER Fan System: Unspecified

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2015 IECC requirements in COMcheck Version 4.0.8.2 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Joshua Riddle, PE - Mechanical Engineer — Name - Title

Signature

07/01/2019 — Date

COMcheck Software Version 4.0.8.2

Inspection Checklist

Energy Code: 2015 IECC

Requirements: 100.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical systems and equipment and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.2.4.5, C403.2.4.6 [FO9][1]	Snow/ice melting system sensors for future connection to controls. Freeze protection systems have automatic controls installed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6][1]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.5, C404.5.1, C404.5.2 [PL6][1]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.6.3 [PL7][1]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.3 [PL7][1]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8][1]	Water distribution system that pumps water from a heated-water supply pipe back to the heated-water source through a cold-water supply pipe is a demand recirculation water system. Pumps within this system have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.7 [PL8][1]	Water distribution system that pumps water from a heated-water supply pipe back to the heated-water source through a cold-water supply pipe is a demand recirculation water system. Pumps within this system have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41][1]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.12.3, [ME65][1]	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. *See the Mechanical Systems list for values.*
C403.2.12.1 [ME65][1]	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. *See the Mechanical Systems list for values.*
C403.2.12.3 [ME117][1]	Fans have efficiency grade (FEG) >= 67. The total efficiency of the fan at the design point of operation <= 15% of maximum total efficiency of the fan.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.12.3 [ME117][1]	Fans have efficiency grade (FEG) >= 67. The total efficiency of the fan at the design point of operation <= 15% of maximum total efficiency of the fan.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.13 [ME71][1]	Unenclosed spaces that are heated use only radiant heat.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.3 [ME55][1]	HVAC equipment efficiency verified.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C403.2.6.1 [ME59][1]	Demand control ventilation provided for spaces >500 ft2 and >25 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.6.2 [ME115][1]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.7 [ME57][1]	Exhaust air energy recovery on systems meeting Table C403.2.7(1) and C403.2.7(2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.8 [ME116][1]	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.9 [ME60][1]	HVAC ducts and plenums insulated. Where ducts or plenums are installed in or under a slab, verification may need to occur during Foundation Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.2.9 [ME10][1]	Ducts and plenums sealed based on static pressure and location.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.9.1.3 [ME11][1]	Ductwork operating >3 in. water column requires air leakage testing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.2.9.1.3 [ME11][1]	Ductwork operating >3 in. water column requires air leakage testing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.4.4.6 [ME110][1]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
C403.4.4.6 [ME110][1]	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply. *See the Mechanical Systems list for values.*
C408.2.2.1 [ME53][1]	Air outlets and zone terminal devices have means for air balancing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME123][1]	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.5.1 and refrigeration compressor systems that comply with C403.5.2..	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.3 [FI8][1]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.2 [FI27][1]	HVAC systems and equipment capacity does not exceed calculated loads.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47][1]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1 [FI47][1]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1.1 [FI42][1]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1.1 [FI42][1]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1.2 [FI38][1]	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.1.3 [FI20][1]	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2 [FI39][1]	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.4.2.1, C403.2.4.2.2 [FI40][1]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.1 [FI28][1]	Commissioning plan developed by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.1 [FI31][1]	HVAC equipment has been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Unitary or packaged HVAC eqiupment without supply air economizers.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.2.3.2 [FI10][1]	HVAC control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.4 [FI29][1]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.1 [FI7][1]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.3 [FI43][1]	Air air and/or hydronic system balancing report is provided for HVAC systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.4 [FI30][1]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

DATE: ISSUE:

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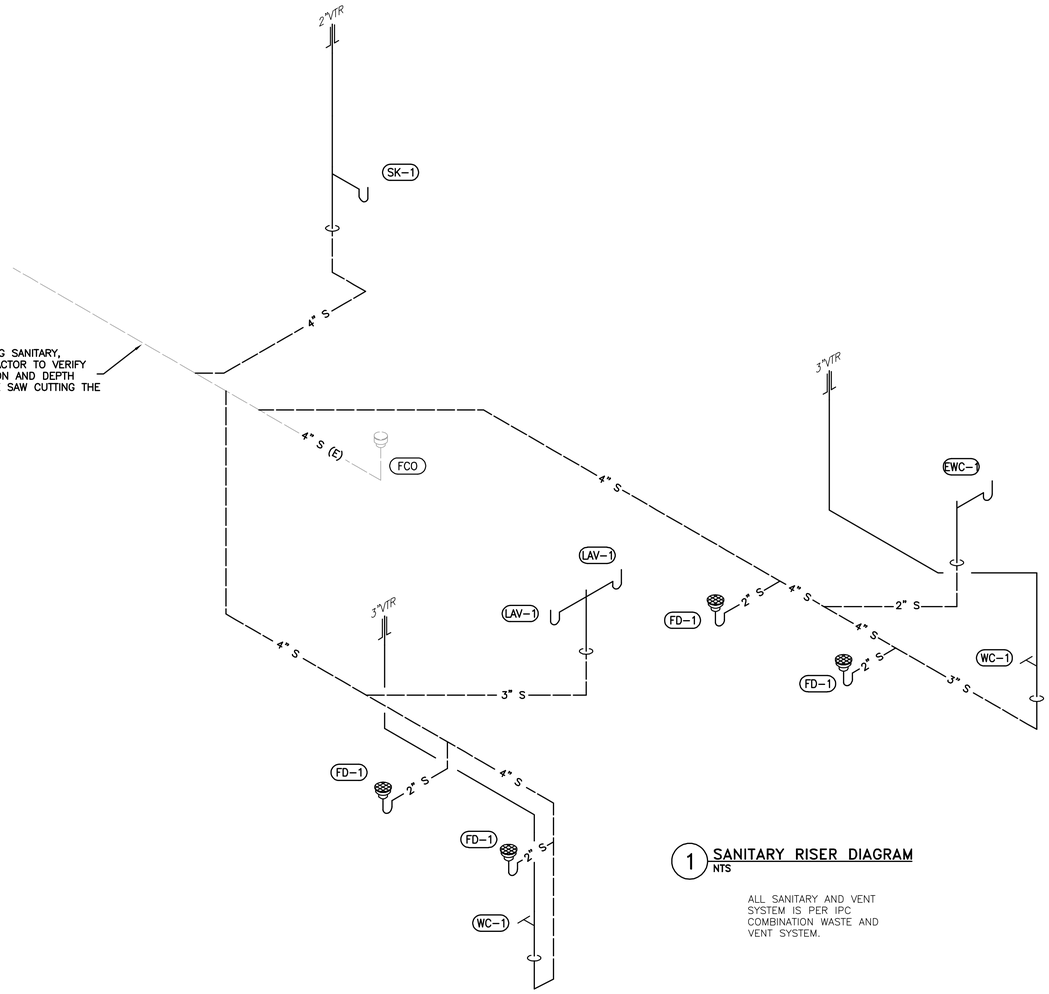
TITLE: MECHANICAL COMPLIANCE

SCALE: 1/8" = 1'-0"

SHEET: M500



1 **SANITARY RISER DIAGRAM**
NTS

ALL SANITARY AND VENT SYSTEM IS PER IPC COMBINATION WASTE AND VENT SYSTEM.

GENERAL NOTES:

1. PROVIDE A CONSTRUCTION RECORD SET OF "AS-BUILT" DOCUMENTS TO THE ARCHITECT REFLECTING ANY VARIANCES OF INSTALLED PIPING LOCATIONS OR EQUIPMENT CONTRARY TO THE CONSTRUCTION DOCUMENTS, REFER TO SPECIFICATIONS.
2. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE TO OBSERVE THE EXISTING CONDITIONS OF THE PROJECT, REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.
3. PROVIDE TO THE ARCHITECT A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS, REFER TO SPECIFICATIONS.
4. INSTALLATION SHALL COMPLY WITH LEGALLY CONSTITUTED CODES AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION AND ALSO MEET ALL REQUIREMENTS OF THE LANDLORD. OBTAIN A COPY OF THE LANDLORD'S REQUIREMENTS AND REVIEW PRIOR TO SUBMITTING BID.
5. PLANS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE REQUIREMENTS.
6. VERIFY LOCATION AND DEPTH OF UTILITIES AT POINTS OF CONNECTION BEFORE START OF PIPING INSTALLATION.
7. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF PLUMBING FIXTURES.
8. DO NOT SCALE FLOOR PLANS FOR EXACT HORIZONTAL LOCATION OF PIPE ROUTING.
9. INSTALL CONCEALED PIPING TIGHT TO THE STRUCTURE AND AS HIGH AS POSSIBLE. INSTALL EXPOSED PIPING TIGHT TO THE STRUCTURE, WALL OR CEILING AND AS HIGH AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS.
10. VALVES SHALL BE LINE SIZE UNLESS OTHERWISE NOTED.
11. PIPING IN FINISHED AREAS SHALL BE ROUTED CONCEALED, EXPOSED PIPING, WHERE NECESSARY, SHALL BE ROUTED AS HIGH AS POSSIBLE AND TIGHT TO WALLS.
12. INSTALL NO PLASTIC PIPE OF ANY KIND ABOVE SLAB INSIDE THE BUILDING. INSTALL NO PLASTIC PIPE IN THE CEILING RETURN AIR PLENUM.
13. COORDINATE ALL WORK WITH OTHER TRADES AND CONTRACTORS.
14. COORDINATE PIPING INSTALLATION WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THROUGH GRADE BEAMS, FOOTING, ETC. WHERE REQUIRED AND AS NOTED ON PLANS. COORDINATE SLEEVE INSTALLATIONS WITH THE ARCHITECT, STRUCTURAL ENGINEER, STRUCTURAL CONTRACTOR AND GENERAL CONTRACTOR BEFORE CONCRETE IS INSTALLED.
15. CLEAN FAUCET AERATORS AND PIPE STRAINERS PRIOR TO TURNING BUILDING OVER TO THE OWNER.
16. PROVIDE TRAP PRIMERS WHERE REQUIRED BY LOCAL AUTHORITIES.
17. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL PIPING OVER ELECTRICAL PANELS.
18. PAINT ALL EXPOSED GAS AND WATER PIPING USING RUST INHIBITOR PAINT. PAINT AND COLOR SHALL BE COORDINATED WITH THE ARCHITECT AND / OR OWNER.
19. COORDINATE ALL ROOF PENETRATIONS WITH OTHER TRADES. MAINTAIN 10' MINIMUM CLEARANCE FROM ALL AIR INTAKES. MAINTAIN 2' CLEARANCE FROM ALL OTHER EQUIPMENT.
20. INSULATE PIPING ROUTED IN EXTERIOR BUILDING WALLS WITH MINIMUM 2" BATT INSULATION TO PREVENT FREEZING.
21. PROVIDE "HEAVY-DUTY" NO-HUB COUPLINGS ON STORM PIPING, INCLUDING CONNECTIONS TO ROOF DRAINS. SEE SPECIFICATION SECTION "15400 FOR MORE INFORMATION.
22. PROVIDE TRANSITION ADAPTER COUPLINGS FOR CONNECTION OF PVC DWV TO CAST IRON AT SLAB ON GRADE. SEE SPECIFICATION SECTION 15400 FOR MORE INFORMATION.
23. FLOW CONTROL VALVES SHALL BE SIZE 1/2" AND SET AT 0.5 GPM UNLESS NOTED OTHERWISE.
24. WATER HAMMER ARRESTORS SHALL BE SIZE "A" UNLESS NOTED OTHERWISE.
25. PROVIDE VERTICAL LIFT SPRING LOADED CHECK VALVES IN HOT AND COLD WATER SUPPLIES FOR MOP SINK FAUCETS DOWNSTREAM OF SHUTOFF VALVES.

PLUMBING SYMBOLS

NOTE: THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS, ABBREVIATIONS, ETC. ARE NECESSARILY USED ON THE DRAWINGS.

ANNOTATION

- (1) PLUMBING PLAN NOTE CALLOUT
- (1) PLUMBING EQUIPMENT DESIGNATION. (CONTRACTOR FURNISHED AND INSTALLED). REFER TO PLUMBING FIXTURE OR EQUIPMENT SCHEDULES
- [1] EQUIPMENT DESIGNATION (OWNER FURNISHED, CONTRACTOR INSTALLED)
- CU 1 MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- CONNECTION POINT OF NEW WORK TO EXISTING
- 1 / M1 DETAIL REFERENCE UPPER NUMBER INDICATES DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER
- 1 / M1 SECTION CUT DESIGNATION

STANDARD MOUNTING HEIGHTS

PLUMBING (AFF, AFG, UNLESS NOTED OTHERWISE)

REFER TO THE ARCHITECTURAL DRAWINGS FOR PLUMBING FIXTURE MOUNTING HEIGHTS. UNO, INSTALL PLUMBING FIXTURES WITH THE MOUNTING HEIGHTS AS LISTED BELOW WITH FINAL APPROVAL BY THE ARCHITECT.

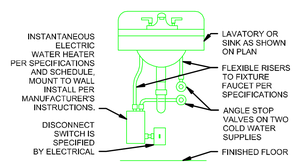
ADA ACCESSIBLE DRINKING FOUNTAIN	36" MAX. FLOOR TO SPOUT
ADA ACCESSIBLE LAVATORIES	34" FLOOR TO RIM
ADA ACCESSIBLE SHOWER VALVES	38" MINIMUM TO 48" MAXIMUM FLOOR TO CENTERLINE
ADA ACCESSIBLE URINALS	17" FLOOR TO RIM
ADA ACCESSIBLE WATER CLOSET	17" TO 19" FLOOR TO TOP OF SEAT
ADA ACCESSIBLE WATER COOLER	35" FLOOR TO RIM
ADULT STANDARD DRINKING FOUNTAIN	41" FLOOR TO RIM
ADULT STANDARD WATER COOLER	41" FLOOR TO RIM
HOSE BIBBS	36" AFF TO CENTERLINE
LAVATORY OR SINK	31" FLOOR TO RIM
NON FREEZE HYDRANT	18" AFG TO CENTERLINE
SHOWER HEADS	6'-6" MEN & 6'-0" WOMEN FLOOR TO CENTERLINE
SHOWER VALVES	48" MEN & 42" WOMEN FLOOR TO CENTERLINE
STANDARD URINALS	22" FLOOR TO RIM
WATER CLOSET	15" FLOOR TO RIM

ABBREVIATIONS

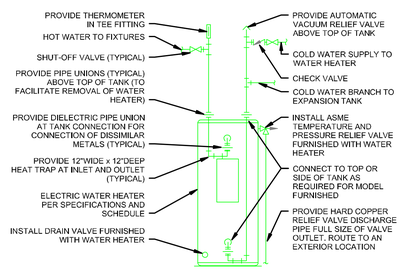
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BOP	BOTTOM OF PIPE
BOS	BOTTOM OF STRUCTURE
BTU	BRITISH THERMAL UNIT
CPVC	CHLORINATED POLYVINYL CHLORIDE
DN	DOWN
DFU	DRAINAGE FIXTURE UNIT
DS	DOWNSPOUT
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
FD	FLOOR DRAIN
FFA	FROM FLOOR ABOVE
FFB	FROM FLOOR BELOW
FF	FINISHED FLOOR
FL	FLOW LINE
FLA	FULL LOAD AMPS
FLR	FLOOR
GPM	GALLONS PER MINUTE
HD	HEAD, HUB DRAIN
IE	INVERT ELEVATION
IN WC	INCHES OF WATER COLUMN
JB	JUNCTION BOX
J-BOX	JUNCTION BOX
kW	KILOWATT
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MH	MANHOLE
MIN	MINIMUM
N/C	NORMALLY CLOSED
N/O	NORMALLY OPEN
ORD	OVERFLOW ROOF DRAIN
PDI	PLUMBING DRAINAGE INSTITUTE
PVC	POLYVINYL CHLORIDE
PRV	PRESSURE REDUCING VALVE
RD	ROOF DRAIN
RPM	REVOLUTIONS PER MINUTE
RTU	ROOFTOP UNIT
SF	SQUARE FEET, SUPPLY FAN
SP	SUMP PUMP
SS	STAINLESS STEEL, SANITARY SEWER, SOIL STACK
TDH	TOTAL DYNAMIC HEAD
TFA	TO FLOOR ABOVE
TFB	TO FLOOR BELOW
TYP	TYPICAL
UL	UNDERWRITERS LABORATORIES, INC.
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT(S)
VCP	VITRIFIED CLAY PIPE
VS	VENT STACK
VTR	VENT THROUGH ROOF
W/	WITH
W/O	WITHOUT
WC	WATER COLUMN
WS	WASTE STACK
WSFU	WATER SUPPLY FIXTURE UNIT

PIPING

- DOMESTIC COLD WATER (CW)
- DOMESTIC HOT WATER (HW)
- DOMESTIC HOT WATER RECIRC. (HWR)
- S — SOIL PIPING – ABOVE FLOOR (S)
- S — SOIL PIPING – BELOW FLOOR (S)
- W — WASTE PIPING – ABOVE FLOOR (W)
- W — WASTE PIPING – BELOW FLOOR (W)
- CWV — COMBINATION WASTE AND VENT (CWV)
- ID — INDIRECT DRAIN (ID)
- CD — CONDENSATE DRAIN (CD)
- EXISTING PIPING TO BE REMOVED
- EXISTING PIPING TO REMAIN
- V — VENT PIPING (V)
- FLOOR SINK (FS), SIZE & TYPE
- FLOOR DRAIN (FD), SIZE & TYPE
- ROOF DRAIN (RD), SIZE & TYPE
- BALL VALVE
- CONTROL VALVE
- SHUTOFF VALVE
- CHECK VALVE
- BALANCING VALVE WITH PRESSURE PORTS
- WATER METER
- STRAINER
- STRAINER WITH BLOWOFF
- RELIEF/SAFETY VALVE
- SOLENOID VALVE
- PRESSURE REDUCING VALVE
- GAS PRESSURE REGULATOR
- THERMOSTATIC MIXING VALVE
- PA — PIPE ANCHOR
- EJ — EXPANSION JOINT
- BACKFLOW PREVENTER
- PRESSURE GAUGE
- THERMOMETER
- UNION
- FLANGE CONNECTION
- HOSE BIBB (HB)
- NONFREEZE WALL HYDRANT (NW)
- MANUAL / AUTOMATIC AIR VENT OR VACUUM RELIEF VALVE
- PRESSURE / VACUUM SWITCH
- CLEANOUT
- CAP
- WALL CLEANOUT (WCO)
- FLOOR CLEANOUT (FCO)
- EXTERIOR CLEANOUT (ECO)
- ELBOW UP
- ELBOW DOWN
- TEE UP
- TEE DOWN
- ELBOW UP WITH SHUT-OFF VALVE (SOV)
- ELBOW DOWN WITH SHUT-OFF VALVE (SOV)
- TEE UP WITH SHUT-OFF VALVE (SOV)
- TEE DOWN WITH SHUT-OFF VALVE (SOV)
- "A" — WATER HAMMER ARRESTER (WHA) WITH PDI SIZES, (A, B, C, D, & E)
- RECIRCULATION PUMP
- P-TRAP



1 **ELECTRIC TANKLESS WATER HEATER**
NTS



REFER TO SPECIFICATIONS, SCHEDULES, AND NOTES FOR MORE INFORMATION. PIPING ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. VERIFY CONNECTION SIZES AND LOCATIONS WITH WATER HEATER FURNISHED. REFER TO FLOOR PLANS FOR PIPE SIZES AND CONTINUATIONS. PROVIDE SEISMIC STRAP OR BRACING WHEN REQUIRED BY LOCAL AUTHORITIES. POWER WIRING AND DISCONNECT SWITCH ARE SPECIFIED BY ELECTRICAL.

2 **ELECTRIC TANK TYPE WATER HEATER**
NTS

FIXTURE TYPE	QTY	D.F.U. (EA)	TOTAL D.F.U.	HOT S.F.U (EA)	COLD S.F.U (EA)	COMBINED S.F.U (EA)	TOTAL S.F.U (HOT)	TOTAL S.F.U (COLD)	TOTAL SERVICE S.F.U.
DRINKING FOUNTAIN	1	0.5	0.5	0.00	0.25	0.25	0	0.25	0.3
PRIVATE SINK (BAR, KITCHEN OR BREAKROOM)	1	2.0	2.0	1.00	1.00	1.40	1	1	1.4
PRIVATE LAVATORY	2	1.0	2.0	0.50	0.50	0.70	1	1	1.4
FLOOR DRAIN	2	2.0	4.0	0.00	0.00	0.00	0	0	0.0
SHOWER (PRIVATE- ONE HEAD)	2	2.0	4.0	1.00	1.00	1.40	2	2	2.8
WALL HYDRANT	2	0.0	0.0	0.00	5.00	5.00	0	10	10.0
PRIVATE / PUBLIC WC (1.6 GPF FLUSHOMETER TANK)	2	4.0	8.0	0.00	2.00	2.00	0	4	4.0
TOTAL UNITS:	12		20.5				4.0	18.3	19.9

3 **FIXTURE CALCULATION (2012 1PC)**
NTS

PLUMBING FIXTURE SCHEDULE

FIXTURES IN THIS SCHEDULE ARE OWNER REQUIRED. ANY SUBSTITUTION SHALL BE PROVIDED TO THE OWNER FOR APPROVAL. VERIFY ROUGH-IN REQUIREMENTS WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND INSTALL PER MANUFACTURER'S RECOMMENDATIONS. REFER TO THE ARCHITECTURAL DRAWINGS FOR THE PLUMBING FIXTURE MOUNTING HEIGHTS.

SK-1	ELKAY ELUHAD11655PD, SINGLE UNDERMOUNT ADA SINK, 14"X18.5"X5-3/8" WITH TOTO TEL115-D10ET WITH TLT10R THERMOSTATIC MIXING VALVE.
WC-1	KOHLER VEIL K622+ WALL HUNG ELONGATED TOILET BOWL WITH K-18829 2X4 WALL TANK CARRIER SYSTEM AND K-4177 FLUSH ACTUATOR PLATE.
SH-1	TOTO TS626F2 AIMES SINGLE SPRAY HANDSHOWER WITH AIMES TS626T THERMOSTATIC MIXING VALVE TRIM.
FD-1	ZURN EZ1-PV2-R6-TSP, PLASTIC FLOOR DRAIN WITH 2" OUTLET AND TRAP SEAL PROTECTION DEVICE.
LAV-1	SOLID SURFACE BOWL WITH TOTO TEL133-D20E HELIX WALL MOUNT SPOUT KIT WITH TLM10 MIXING VALVE.
EWC-1	ELKAY ENHANCED EZH20 BOTTLE FILLING STATION BI LEVEL ADA COOLER FILTERED 8 GPH MODEL LZSTL8WSLP.
EWH-1	EEXMAX EX3512T THERMOSTATIC POINT OF USE ELECTRIC WATER HEATER, 3.5KW WITH 48 DEGREE RISE AT 0.5 GPM.
WH-1	A O SMITH ENL-36 COMMERCIAL GRADE 36 GALLON LOW BOY WATER HEATER WITH EXPANSION TANK.

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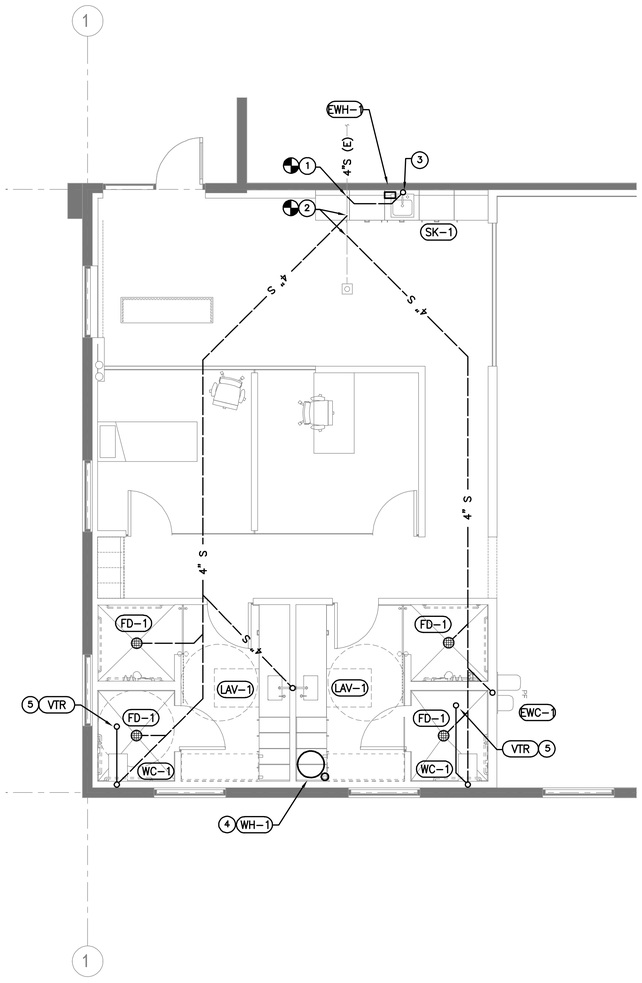
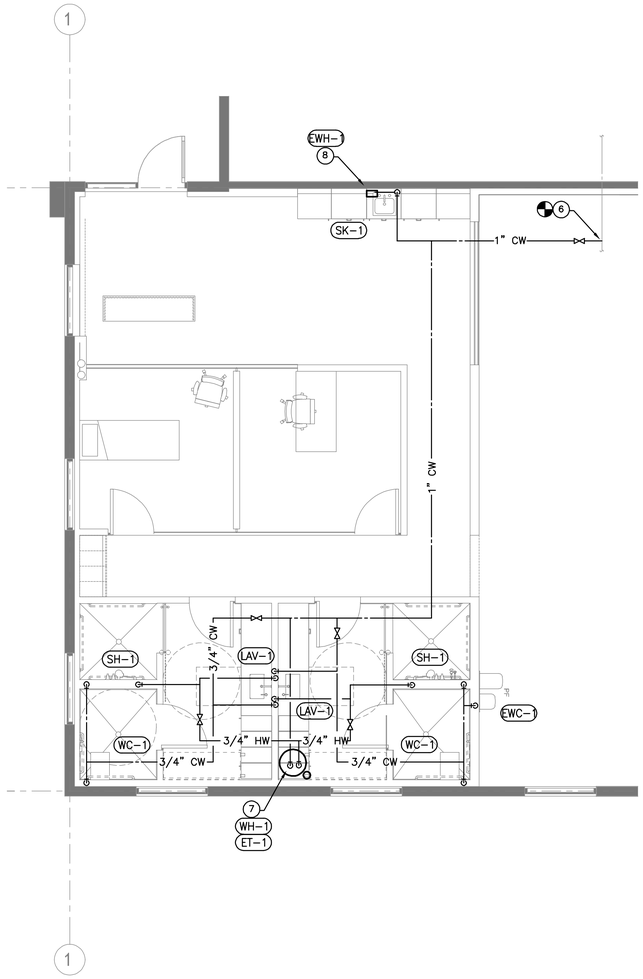
TITLE: PLUMBING NOTES, SCHEDULE & SYMBOLS

SCALE: N/A

SHEET: P000



1 SANITARY FLOOR PLAN
SCALE: 1/4"=1'-0"



2 WATER FLOOR PLAN
SCALE: 1/4"=1'-0"

GENERAL NOTES:

A CONTRACTOR TO VERIFY EXISTING SANITARY AND DOMESTIC WATER MAINS BEFORE SAW CUTTING THE FLOOR. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL SYSTEM SHUT DOWN WITH THE OWNER.

B REFER TO ARCHITECTURAL PLANS FOR ALL FINISHES AND CONNECTION HEIGHTS.

PLAN NOTES:

1. CONNECT 2" S TO EXISTING, CONTRACTOR TO VERIFY LOCATION AND DEPTH BEFORE SAW CUTTING THE FLOOR.
2. CONNECT 4" S TO EXISTING, CONTRACTOR TO VERIFY LOCATION AND DEPTH BEFORE SAW CUTTING THE FLOOR.
3. 2" S DN, 2" VTR. VTR TO BE LOCATED AT A MIN 10' AWAY FROM AIR INTAKE.
4. ROUTE T&P VALVE AND DRAIN FROM WH-1 DRAIN PAN, TO EXTERIOR.
5. 3" VTR, VTR TO BE LOCATED AT A MIN 10' AWAY FROM AIR INTAKE.
6. CONNECT 1" CW TO EXISTING MAIN, PROVIDE ISOLATION VALVE. PIPING SERVING HOSE BIBBS TO REMAIN.
7. 1" CW TO, 1" HW FROM WATER HEATER TO SERVE THE AREA. REFER TO DETAIL.
8. 1/2" CW TO EWH-1. 1/2" HW FROM EWH-1 TO SK-1.

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TITLE:
PLUMBING FLOOR PLAN

SCALE: 1/4" = 1'-0"

SHEET:
P100