MECHANICAL SPECIFICATIONS

1. ALL WORK SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES, LAWS, ACTS AND ALL AUTHORITIES HAVING JURISDICTION INCLUDING, BUT NOT LIMITED TO THE 2015 IMC, 2015 IECC AND 2015 IBC AS ADOPTED BY FORT DEFIANCE, AZ.

2. WORK SHALL INCLUDE FURNISHING AND INSTALLING ALL MATERIALS, LABOR, SERVICES AND EQUIPMENT NECESSARY TO REMOVE (19) EXISTING WATER SOURCE HEAT PUMPS (WSHP) AND INSTALL (19) NEW REPLACEMENT WSHP'S AND TO PROVIDE (19) PROPERLY OPERATING SYSTEMS WHERE SHOWN ON THE PLANS. REPLACEMENT WATER SOURCE HEAT PUMPS ARE NOT EXACT REPLACEMENTS FOR EXISTING. ADJUSTMENTS OF AND TO ALL SURROUNDING SYSTEMS SHALL BE REQUIRED, ANTICIPATED, AND ALL WORK AND MATERIALS INCLUDED AS PART OF THE WORK OF THE CONTRACTOR. PLANS ARE SCHEMATIC AND DO NOT SPECIFY ALL INCIDENTAL HARDWARE OR IDENTIFY OFFSETS OR DIFFICULTIES WHICH WILL BE ENCOUNTERED IN THE COURSE OF COMPLETING THE PROJECT. DO NOT SCALE THE PLANS. CONTRACTORS SHALL FIELD MEASURE AND CREATE SHOP DRAWINGS FOR EACH WSHP REPLACEMENT INCLUDING EXTENSIVE DUCT FABRICATION TO EXTEND DUCT FROM EXISTING POSITIONS TO NEW CONNECTIONS ON THE NEW WSHP'S. CONTRACTOR SHALL EXTEND CONDENSATE DRAINS, SUPPLY AND RETURN WATER, SPRINKLERS, SPECIAL SYSTEMS, IT, POWER, CONTROLS, AND EQUIPMENT SUPPORTS FROM EXISTING WSHP LOCATIONS TO NEW WSHP LOCATIONS WHEN REQUIRED TO INSTALL NEW UNITS AND SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY TO ACCOMPLISH THIS WORK AS A COMPLETE TURN-KEY PROJECT. LOCATIONS OF EXISTING EQUIPMENT SHOWN ON PLANS ARE APPROXIMATE ONLY. CONTRACTOR SHALL FIELD VERIFY AND OBSERVE ALL UNITS PRIOR TO SUBMITTING A FEE FOR THE REPLACEMENT WORK.

3. FIELD VERIFY ALL CLEARANCES PRIOR TO FABRICATION OR ORDERING DUCTWORK. CONTRACTOR SHALL NOT CHARGE OWNER, ARCHITECT, GENERAL CONTRACTOR, ENGINEER OR OTHERS FOR ADJUSTMENT DUE TO FIELD CONDITIONS. CONTRACTOR MUST INCLUDE IN FEE TO COMPLETE PROJECT MISCELLANEOUS DUCT FITTINGS TO/FROM WSHP'S INCLUDING DUCTS REQUIRING OFFSETS, SPECIAL FITTINGS AROUND BEAMS, COLUMNS OR STRUCTURAL BRACES. FIELD VERIFICATION AND INSTALLATION SHALL BE CONSIDERED INCLUDED IN BASE SCOPE OF WORK WITHOUT ADDITIONAL COMPENSATION FEES. MECHANICAL CONTRACTOR SHALL OBTAIN ARCHITECTURAL PLANS AND VERIFY INTENDED CEILING HEIGHTS, SOFFIT LOCATIONS, AND OTHER ARCHITECTURAL FEATURE LOCATIONS AND SHALL ROUTE DUCTWORK ACCORDINGLY TO ALLOW CONSTRUCTION OF ELEMENTS OF BUILDING SUCH AS CEILINGS TO BE RECONSTRUCTED AFTER MECHANICAL INSTALLATION PHASE. LOCATE ALL DUCTS TO PROVIDE SUFFICIENT CLEARANCE FOR CEILING HARDWARE, ALL LIGHTS, ALL SPRINKLERS, AND ANY ARCHITECTURAL FEATURES IN CEILINGS. DUCT ROUTING WILL NEED TO BE FIELD MEASURED AND ADJUSTED FOR FIELD CONDITIONS AND ALL FITTINGS PROVIDED TO SUIT. AIR FLOW TOTAL CROSS SECTIONAL AREA SHALL BE MAINTAINED THROUGH SUCH FITTINGS.

4. DISCREPANCIES ON MECHANICAL PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION PRIOR TO SUBMISSION OF BID TO CONSTRUCT MECHANICAL SYSTEM. DISCREPANCIES BROUGHT TO ENGINEER'S ATTENTION AFTER SUBMISSION OF BID SHALL NOT BE BILLABLE TO ENGINEER, ARCHITECT, CLIENT OR OTHERS AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMEDY PER CODE AND WITH THE ASSISTANCE OF THE ENGINEER. ENGINEER WILL ASSIST CONTRACTOR IN DETERMINING REMEDY AND SHALL STRIVE IN GOOD FAITH TO FIND A LEAST COST AND CODE COMPLIANT SOLUTION TO SUCH DISCREPANCIES. CONTRACTOR'S SUBMISSION OF BID TO CONSTRUCT MECHANICAL SYSTEM IS SEEN AS AGREEMENT TO THESE TERMS.

5. MECHANICAL CONTRACTOR SHALL PROVIDE ALL CONTROLS SYSTEMS WORK AND MATERIALS PER CONTROLS SYSTEM SPECIFICATIONS ON THIS SHEET.

6. FIELD VERIFY EXACT LOCATIONS OF STRUCTURE AND INSTALL NEW EQUIPMENT ACCORDINGLY.

7. DO NOT CUT STRUCTURAL MEMBERS TO INSTALL DUCTS OR UNITS.

8. PROVIDE AS-BUILT DRAWINGS AND NEW EQUIPMENT OPERATION AND MAINTENANCE MANUALS TO OWNER FOLLOWING PROJECT COMPLETION.

9. ALL HVAC EQUIPMENT SHALL BE UL LISTED AND INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

10. PROVIDE ID LABEL AT EACH PIECE OF HVAC EQUIPMENT NEAR DISCONNECT. LABEL SHALL IDENTIFY EACH PIECE OF EQUIPMENT PER EXISTING IDENTIFICATION SCHEME (NOT THESE PLANS).

11. CONTRACTOR TO PROVIDE SIGNED AND SEALED TEST AND BALANCE REPORT TO ENGINEER AND OWNER SHOWING TOTAL AIRFLOW THROUGH EACH WSHP UNIT MATCHES THESE PLANS WITHIN 10%. A TEST OF ALL SUPPLIES AND RETURNS IS NOT REQUIRED. TEST AND BALANCE OF SYSTEM TO BE PERFORMED BY AN AABC OR NEBB CONTRACTOR CERTIFIED IN THE STATE OF ARIZONA. PRIOR TO FINAL INSPECTION, PROVIDE A COPY OF THE SIGNED AND SEALED AIR-BALANCE REPORT TO THE MECHANICAL ENGINEER FOR FINAL APPROVAL.

DEFINITIONS:
PROVIDE – FURNISH AND INSTALL.
FURNISH – DELIVER EQUIPMENT AND/OR MATERIALS TO SITE.
INSTALL – PHYSICALLY PLACE IN POSITION AND PUT INTO OPERATION.

REPLACEMENT WATER SOURCE HEAT PUMP SCHEDULE

*PROVIDE SCHEDULED OR APPROVED EQUAL EQUIPMENT BY OTHER MANUFACTURERS

LOCATION:	MARK	MFG.	MODEL	NOM. TONS	SUPPLY CFM	ESP	FLOW (GPM)	ELECTRICAL DATA VOLTS/PHASE	MCA	MOCP	COOLING EWT (°F)	LWT (°F)	(S)EER	SENS.	TOTAL	HEATING EWT (°F)	LWT (°F)	COP	TOTAL	WT (LBS.)	ELEV. (FT)	NOTES
BASE BID																						
NW GYM SW GYM GYM NE CAFETERIA NW CAFETERIA SW CAFETERIA	NWG SWG NEG NEC NWC SWC	CLIMATE MASTER	TCL-096	8	3,200	0.7	24	480 / 3 PH	23.55	25	85	95.2	13.7	72.1	97.3	70	63.2	3.9	101.4	644	6,800	1-21
A-B HALLWAY B-30	ABH B30	CLIMATE MASTER	TC-048	4	1,520	0.5	12	480 / 3 PH	9.5	15	85	94.8	13.3	30.7	46.9	70	64.4	3.2	44.3	263	6,800	1-21
A-03 BOYS LOCKER ROOM MAIN ENTRANCE B-05 B-10 B-22	A03 BL ME B05 B10 B22	CLIMATE MASTER	TC-036	3	1,174	0.5	9	480 / 3 PH	8.5	15	85	94.4	13	22.1	33.4	70	64.1	3.0	35.7	203	6,800	1-21
A-05 SNACK BAR B-07 B-09 B-19	A05 SB B07 B09 B19	CLIMATE MASTER	TC-024	2	789	0.5	6	208 / 1 PH	17.5	30	85	94.8	13	15.8	23.2	70	64.2	3.2	23.1	174	6,800	1-21

NOTES:
1. PROVIDE AND INSTALL UNIT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND INSTRUCTIONS AND SPECIFICATIONS ON PLANS.
2. GROSS COOLING CAPACITY BASED ON 80°F DB / 67°F WB EAT. GROSS HEATING CAPACITY BASED ON 68°F DB EAT, CAPACITIES LISTED WITH AN * ARE BASED ON ARI CONDITIONS.
3. COOLING CAPACITY, HEATING CAPACITY, CFM AT ESP AND (S)EER ARE MINIMUM CAPACITIES REQUIRED. UNIT SHALL HAVE NO LESS THAN THESE CAPACITIES.
4. MCA, MOCP, COIL PD, AND WEIGHT ARE MAXIMUM CAPACITIES ALLOWED.
5. EACH UNIT SHALL BE FURNISHED WITH AND CONTRACTOR SHALL INSTALL: (1) NEW PRESSURE INDEPENDENT AUTOMATIC FLOW CONTROL VALVE (HAYES MEASURE-FLOW OR EQUAL), (2) NEW FULL-PORT BRASS BALL VALVES WITH STAINLESS STEEL BALLS, (2) FLEX LINES MINIMUM 18" LONG WITH BRAIDED STAINLESS STEEL REINFORCEMENT, ALL NEW BRASS FITTINGS AND ELBOWS, AND ALL NEW WATER PIPING IN TYPE L COPPER WITH SOLDERED WROUGHT COPPER FITTINGS AS NEEDED TO EXEND PIPING FROM EXISTING LOCATION TO NEW LOCATION. ALL PIPING AND HOSES SHALL BE FULL SIZE OF UNIT CONNECTION.
6. UNIT SHALL COME INTERNALLY ISOLATED WITH DOUBLE ISOLATION COMPRESSOR MOUNTING FOR QUIET OPERATION FROM THE FACTORY.
7. PROVIDE UNIT WITH R410A REFRIGERANT.
8. PROVIDE UNIT WITH ECM FAN MOTOR OPTION.
9. PROVIDE UNIT WITH GALVANIZED STEEL CONSTRUCTION FRONT ACCESS PANEL
10. PROVIDE UNIT WITH EPOXY POWDER PAINTED GALVANIZED STEEL DRAIN PAN.
11. PROVIDE UNIT WITH SOUND ABSORBING GLASS FIBER INSULATION.
12. PROVIDE UNIT INSULATED DIVIDER AND SEPARATE COMPRESSOR / AIR HANDLER COMPARTMENTS.
13. PROVIDE UNIT WITH COPELAND SCROLL COMPRESSORS.
14. PROVIDE UNIT WITH TXV METERING DEVICE.
15. PROVIDE UNIT FROM THE FACTORY WITH CONTROLS TERMINAL BOARD RCGYO STANDARD 24V READY FOR CONNECTION TO THE EXISTING HIGH SCHOOL ALTERTON DDC CONTROL SYSTEM. FIELD TO VERIFY COMPATIBILITY PRIOR TO ORDERING WITH CLIMATEC TECH COLLEEN TURSKI (602) 686-5070
16. UNIT SHALL BE EQUIPPED WITH FIELD CONVERTIBLE DISCHARGE ARRANGEMENT.
17. PROVIDE SINGLE POINT POWER CONNECTION TO UNIT. DISCONNECTS BY ELECTRICAL, SEE ELECTRICAL PLANS.
18. PROVIDE WITH CONDENSATE OVERFLOW SWITCH.
19. PROVIDE 5 YEAR COMPRESSOR WARRANTY.
20. PROVIDE UNIT WITH ONE SET OF 2" DISPOSABLE PLEATED MERV 8 FILTERS WITH FILTER RACK SIZED FOR MAXIMUM 500 FPM VELOCITY.
21. PROVIDE UNIT CONFIGURATIONS PER CONTRACTOR'S DIRECTION FOLLOWING CONTRACTOR'S FIELD MEASURING AND SURVEY. PREFERRED HANDING TO BE DETERMINED BY THE INSTALLING CONTRACTOR.

SMOKE DETECTOR TEST AND SPECIFICATIONS

MECHANICAL CONTRACTOR TO RECONNECT EXISTING DUCT SMOKE DETECTORS TO NEW UNITS. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR RE-CONNECTING ALL DUCT SMOKE DETECTOR LOW VOLTAGE INTERLOCK WIRING. COORDINATE WITH ELECTRICAL CONTRACTOR TO RECONNECT POWER TO THE DUCT SMOKE DETECTOR.

MECHANICAL SYMBOLS LEGEND

SINGLE LINE DUCTWORK	DOUBLE LINE DUCTWORK	DESCRIPTION
EQ #	EQUIPMENT TYPE UNIQUE DESIGNATION	MECHANICAL EQUIPMENT TAG
CD CFM SIZE	DIFFUSER TAG AIR QUANTITY (CFM) NECK SIZE	GRILLE, REGISTER OR DIFFUSER TAG WITH CFM AND NECK SIZE.
A M-1	SECTION DESIGNATION SHEET NUMBER	MECHANICAL SECTION TAG.
SUPPLY RETURN EXHAUST	ROUND SIDEWALL LINEAR	GRILLES REGISTERS AND DIFFUSERS.
WXD X"ø	WXD X"ø	RECTANGULAR AND ROUND DUCT. DUCT SIZES ARE IN INCHES. DUCT SIZES REPRESENT INSIDE DIMENSIONS OF DUCTWORK.
WXD WXD	WXD	45° TAP USED AT BRANCH DUCTS ONLY.
WXD X"ø	WXD	CONICAL TAP USED AT ROUND BRANCH DUCTS.
		90° ELBOW WITH SINGLE RADIUS TURNING VANES CURVED ELBOW (MIN. RADIUS R = 1.5 WIDTH)
EQUIPMENT	WXD EQUIPMENT	FLEXIBLE DUCT CONNECTION
W	W	SPIN-IN FLEX DUCT TAKE-OFF WITH MANUAL BALANCE DAMPER. FLEX DUCT NOT TO EXCEED 8'-0"
		BALANCING DAMPER (USE OBD IN RECTANGULAR DUCTS AND PLATE DAMPER IN ROUND DUCTS UNLESS OTHERWISE NOTED)
M	M	MOTORIZED DAMPER.
BDD VD	BDD VD	BACKDRAFT DAMPER / MANUAL VOLUME DAMPER.
		ACCESS PANEL (AP).
SD FD FSD	SD FD FSD	SMOKE DAMPER, FIRE DAMPER, AND COMBINATION FIRE SMOKE DAMPER WITH ACCESS PANEL.
SUPPLY RETURN EXHAUST	SUPPLY RETURN EXHAUST	DUCTWORK DOWN.
SUPPLY RETURN EXHAUST	SUPPLY RETURN EXHAUST	DUCTWORK UP.
UP DOWN	UP DOWN	ROUND DUCTWORK.
WXD WXD	WXD WXD	DUCT TRANSITION
DSD CO2	DSD CO2	DUCT SMOKE DETECTOR / CO2 SENSOR
T S H RS CO CO2		PROGRAMMABLE THERMOSTAT, TEMPERATURE SENSOR, HUMIDISTAT, REMOTE SENSOR, CO SENSOR AND CO2 SENSOR (ALL UNITS MOUNTED @ 48" AFF).
T S H RS CO CO2		SAME AS ABOVE EXCEPT WITH VENTILATED, CLEAR PLASTIC, LOCKABLE COVER ENCLOSURE.

*** NOT ALL SYMBOLS ARE APPLICABLE FOR THIS PROJECT ***

MECHANICAL ABBREVIATIONS

ABBV	DESCRIPTION	ABBV	DESCRIPTION
AFF	ABOVE FINISHED FLOOR	LTG	LIGHTING
AC	AIR CONDITIONING UNIT	MFR	MANUFACTURER
AHU	AIR HANDLING UNIT	MAX	MAXIMUM
ALT	ALTERNATE	MECH	MECHANICAL
AP	ACCESS PANEL	MC	MECHANICAL CONTRACTOR
BDD	BACKDRAFT DAMPER	MBH	THOUSAND BTU/ HOUR
BHP	BRAKE HORSEPOWER	MIN	MINIMUM
BLDG	BUILDING	MAT	MIXED AIR TEMPERATURE
CAP	CAPACITY	MCC	MOTOR CONTROL CENTER
CLG	CEILING	NEG	NEGATIVE
CCT	CIRCUIT	NEUT	NEUTRAL
CW	COLD WATER	NC	NORMALLY CLOSED
CONN	CONNECTION	NO	NORMALLY OPEN
CONT	CONTINUED	NA	APPLICABLE
CPR	COPPER	NIC	NOT IN CONTRACT
CFM	CUBIC FEET PER MINUTE	NTS	NOT TO SCALE
DTR	DUCT THROUGH ROOF	OAT	OUTSIDE AIR TEMPERATURE
DIA,ø	DIAMETER	OBD	OPPOSED BLADE DAMPER
DIF	DIFFUSER	PSI	POUNDS PER SQUARE INCH
DIM	DIMENSION	PRESS	PRESSURE
DAT	DIS. AIR TEMPERATURE	PD	PRESSURE DROP
DG	DOOR GRILLE	PRV	PRESSURE REDUCING VALVE
DWG	DRAWING	P	PUMP
DX	DIRECT EXPANSION	QTY	QUANTITY
EA	EACH	RA	RETURN AIR
EC	ELECTRICAL CONTRACTOR	RAT	RETURN AIR TEMPERATURE
EL	ELEVATION	RF	RETURN FAN
EMER	EMERGENCY	REF	REFERENCE
EAT	ENTERING AIR TEMPERATURE	REG	REGISTER
EWT	ENT. WATER TEMPERATURE	REQD	REQUIRED
EQUIP	EQUIPMENT	REV	REVISION
EXH	EXHAUST	RM	ROOM
FC	FAN COIL	SECT	SECTION
FPM	FEET PER MINUTE	SHT	SHEET
FLEX	FLEXIBLE	SA	SUPPLY AIR
FLR	FLOOR	SPEC	SPECIFICATION
FD	FLOOR DRAIN	SS	STAINLESS STEEL
FUT	FUTURE	STD	STANDARD
GPM	GALLONS PER MINUTE	SF	SUPPLY FAN
GALV	GALVANIZED	SQFT	SQUARE FEET
GRD	GRADE	TEMP	TEMPERATURE
GR	GRILLE	TG	TRANSFER AIR GRILLE
HVAC	HEATING/VENTILATING/AC	TYP	TYPICAL
HT	HEIGHT	UL	UNDERWRITER'S LABORATORY
HOR	HORIZONTAL	UH	UNIT HEATER
HP	HORSEPOWER	VAV	VARIABLE AIR VOLUME
HW	HOT WATER	VFD	VARIABLE FREQUENCY DRIVE
IN	INCH	VENT	VENTILATION
KW	KILOWATT	VERT	VERTICAL
LAT	LEAVING AIR TEMPERATURE	VD	VOLUME DAMPER
LWT	LEAVING WATER TEMPERATURE	WSHP	WATER SOURCE HEAT PUMP

*** NOT ALL ABBREVIATIONS ARE APPLICABLE FOR THIS PROJECT ***

CONTRACTOR COORDINATION SPECIFICATIONS

AREAS ABOVE CEILINGS HAVE VERY RESTRICTED SPACE LIMITATIONS. CONTRACTOR SHALL REVIEW FIELD CONDITIONS CAREFULLY AND FURNISH AND COORDINATE ALL TRADES REQUIRED TO REMOVE, REPLACE AND ADJUST ALL DUCTS, PIPING, POWER, FIRE SPRINKLER PIPE, PLUMBING, ELECTRICAL, CABLE TRAY, AND CONDUIT ROUTES TO ACCOMMODATE ALL TRADES, ALL BUILDING ELEMENTS, LIGHTING, FIRE, AND EQUIPMENT. FIELD VERIFY ALL REQUIRED CLEARANCES AND EQUIPMENT LOCATIONS PRIOR TO COMMENCING PROJECT, FABRICATING OR INSTALLING SYSTEMS. CONTRACTOR SHALL ESTABLISH A RIGHT-OF WAY PLAN, AND SET DUCT AND PIPE ELEVATIONS PRIOR TO CONSTRUCTION AND CLOSELY COORDINATE ROUTING TO AVOID CONFLICTS. CONTRACTOR SHALL NOT CHARGE OWNER, ARCHITECT, GENERAL CONTRACTOR, ENGINEER OR OTHERS FOR FIELD ADJUSTMENT DUE TO FIELD CONDITIONS. CONTRACTOR MUST INCLUDE IN FEE TO COMPLETE PROJECT MISCELLANEOUS DUCT, TRANSITIONS, AND OFFSETS. PRIOR CLOSE COORDINATION SHALL BE CONSIDERED INCLUDED IN BASE SCOPE OF WORK WITHOUT ADDITIONAL COMPENSATION FEES. CONTRACTOR SHALL OBTAIN ELECTRICAL PLANS, STRUCTURAL PLANS, AND GENERAL CONTRACT REQUIREMENTS AND SHALL INSTALL AND ROUTE SYSTEMS ACCORDINGLY TO ENSURE EQUIPMENT FITS AND THAT EQUIPMENT SERVICE ACCESS INCLUDING FOR FITER CHANGES AND UNIT SERVICE ACCESS IS UNOBSTRUCTED. FIELD ROUTING OF SYSTEMS MAY NEED TO BE ADJUSTED FROM THESE SCHEMATIC PLANS, AND ANY REQUIRED FITTINGS SHALL BE PROVIDED TO SUIT.

CONTROLS WORK SPECIFICATIONS:

GENERAL WORK INCLUDED:
MECHANICAL CONTRACTOR'S SCOPE SHALL INCLUDE PROVIDING THE HVAC CONTROLS WORK AS FOLLOWS: INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, AND SERVICE NECESSARY FOR ALL (19) OF THE NEW REPLACEMENT WSHP UNITS TO INTEGRATE INTO THE EXISTING BUILDING ALERTON HVAC CONTROL SYSTEM.

THE EXISTING CONTROL SYSTEM "BAS" IS AN ALERTON SYSTEM INSTALLED AND SERVICED BY CLIMATEC. THE NEW BAS WORK SHALL BE PERFORMED AND INSTALLED BY AN ALERTON CERTIFIED AND TRAINED TECHNICIAN ONLY AND SHALL NOT BE PERFORMED USING THIRD-PARTY CONTROLS OR USING EQUIPMENT OTHER THAN ALERTON CONTROLS EQUIPMENT. CLIMATEC SERVICE CONTACT: COLLEEN TURSKI (602) 686-5070, COLLEENT@CLIMATEC.COM.

CONTROL SYSTEM WORK SHALL INCLUDE A CLIMATEC CONTROLS TECHNICIAN TO SAFELY AND CAREFULLY REMOVE THE EXISTING CONTROLLERS FROM THE (19) EXISTING WSHP UNITS AND STORE THEM ON SITE UNTIL THE NEW WSHP UNITS HAVE BEEN INSTALLED BY THE MECHANICAL CONTRACTOR. FOLLOWING INSTALLATION OF THE NEW UNITS, THE CONTROLS CONTRACTOR SHALL RE-INSTALL THE EXISTING CONTROLLERS ON THE NEW UNITS AND ALSO SHALL PROVIDE (19) NEW IDEC RELAYS AND (19) NEW ALERTON SPACE SENSORS. CONTROLS CONTRACTOR SHALL THEN WIRE IN, CONFIGURE AND TEST THE HEATING, COOLING, AND VENTILATION CONTROLS OF EACH OF THE (19) UNITS FROM THE ALERTON SYSTEM FRONT END. FOLLOWING THE INSTALLATION ALL (19) UNITS SHALL BE DEMONSTRATED TO CONTROL PROPERLY AND TO HEAT AND COOL THE SPACES AUTOMATICALLY AS NEEDED BASE UPON SPACE DEMAND AND/OR BAS SYSTEM COMMAND. (NOTE: IF ANY OF THE EXISTING CONTROLLERS HAVE FAILED THE CONTRACTOR SHALL NOT BE REQUIRED TO REPLACE THEM HOWEVER THE ENGINEER SHALL BE NOTIFIED PRE-DEMOLITION OF ANY FAILED CONTROLLERS)

CONTROL WORK SHALL INCLUDE ALL INCIDENTAL MATERIALS TO ACCOMPLISH THIS WORK INCLUDING MISCELLANEOUS MATERIALS NEEDED TO RE-INSTALL THE OLD CONTROLLERS ON THE NEW UNITS AND TO EXTEND BUS, SENSOR WIRING (SHIELDED CABLES), DISCONNECTION, RECONNECTION, WORKSTATION PROGRAMMING, SETTING SCHEDULES, SETTING ALARM FUNCTIONS, TRENDING AND PERFORMANCE TESTING COMPLETE.

TESTING:
PRIOR TO DEMOLITION REMOVAL AND FOLLOWING NEW WORK CONSTRUCTION THE CONTROLS CONTRACTOR SHALL LOG ON TO THE SYSTEM FRONT END, TEST CONTROLS FUNCTION OF ALL EQUIPMENT CONTROLLERS IN THE BUILDING, AND DELIVER A REPORT TO THE ENGINEER LISTING ALL PRESENT CONTROLS DEFICIENCIES, NON-FUNCTIONAL DEVICES, AND NON-COMMUNICATING EQUIPMENT. IF ANY OF THE EXISTING (19) ALERTON CONTROLLERS HAVE FAILED NOTIFY THE ENGINEER AT THE START OF THE PROJECT DURING THE DEMOLITION PRE-REMOVAL TEST. FOLLOWING THE NEW WORK ALL (19) NEW WSHP UNITS SHALL FUNCTION PROPERLY. PROVIDE (2) REPORTS TO THE ENGINEER.

TRAINING:
PROVIDE (2) HOURS OF ON-SITE CONTROLS SYSTEM TRAINING TO THE OWNER'S REPRESENTATIVE. DEMONSTRATE PROPER CONTROL OF THE NEW (19) WSHP UNITS AS WELL AS DISCUSSING ANY FINDINGS OF THE CONTROL SYSTEM TESTS WITH THE OPERATOR.

APPLIED ENGINEERING
2800 S. RURAL RD. SUITE 101
TEMPE, AZ 85282 (480)968 3070
JOB NUMBER 19-061

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WINDOW ROCK HIGH SCHOOL

WINDOW ROCK USD NO. 08
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FORT DEFIANCE VALLEY, AZ 86504

MECHANICAL SPECIFICATIONS, LEGENDS, & SCHEDULES

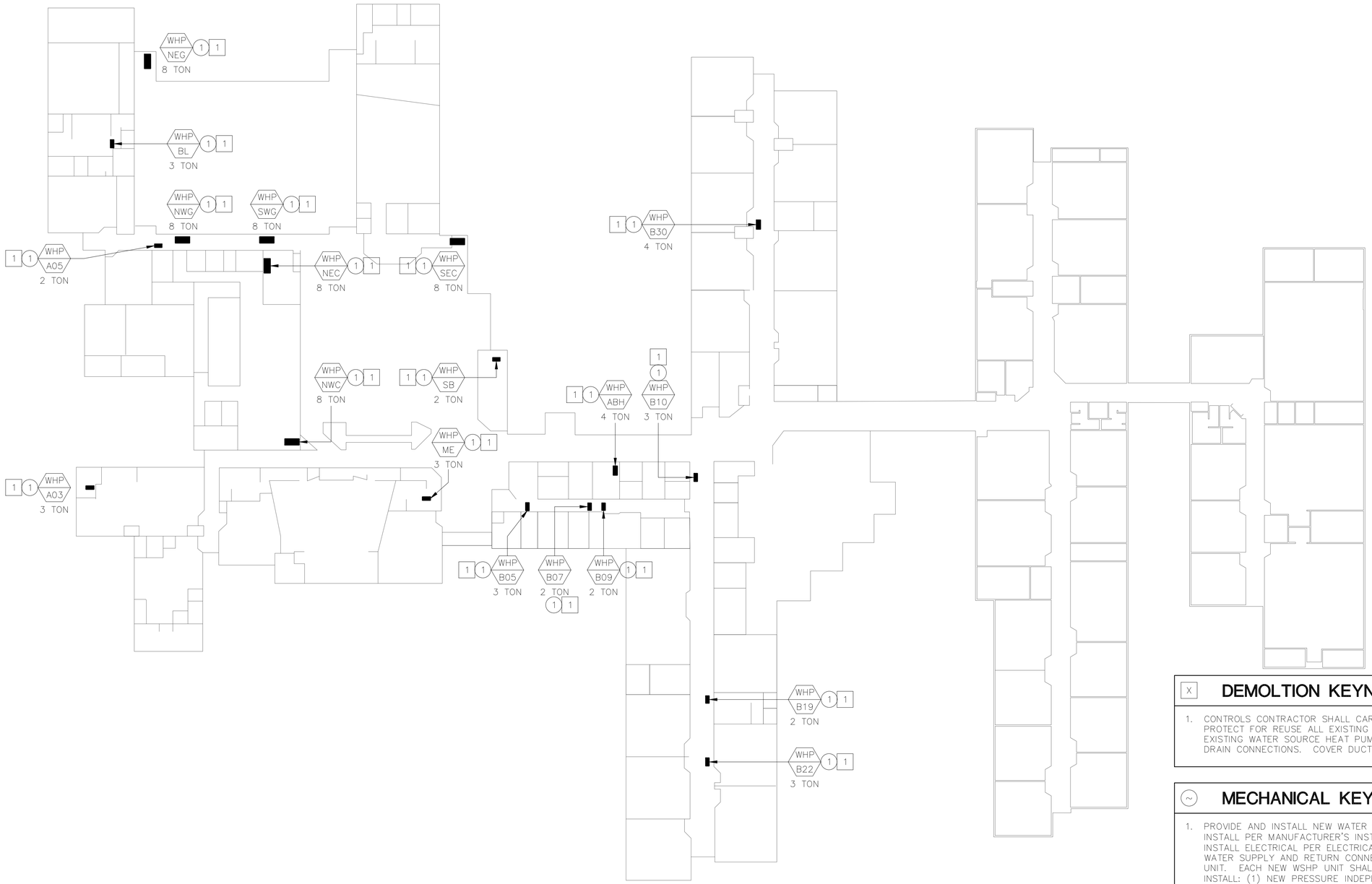
REVISIONS

REV#	DATE	DESCRIPTION

REVIEWED BY: GSP
DRAWN BY: CMT

Registered Professional Engineer (Mechanical) Certificate No. 29717 GREGORY PENARD Date Signed 04-24-2020 State of Arizona, U.S.A.
Expires 12/31/2022

ORIGINAL ISSUE DATE: 04-24-2020
JOB No: 19101
SHEET: M001
SEQUENCE #:



GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UNIT LOCATIONS AND NOTE ALL PIPES DUCTS, PIPING, SPRINKLERS, ELECTRICAL CONDUITS, IT LINES, OR SPECIAL SYSTEMS IN THE VICINITY OF THE UNIT BEING REPLACED AND SHALL TEMPORARILY RELOCATE OR MOVE AS REQUIRED TO ALLOW FOR THE INSTALLATION OF THE NEW UNIT.
2. CONTRACTOR SHALL FIELD VERIFY EACH UNIT'S HANDING R OR L PRIOR TO ORDER.

MECHANICAL FLOOR PLAN

SCALE: N.T.S

NORTH

DEMOLTION KEYNOTES:

1. CONTROLS CONTRACTOR SHALL CAREFULLY REMOVE AND SAFELY SET ASIDE AND PROTECT FOR REUSE ALL EXISTING UNIT CONTROLLERS. REMOVE AND DISPOSE OF EXISTING WATER SOURCE HEAT PUMP UNIT. TEMPORARILY CAP ALL WATER AND DRAIN CONNECTIONS. COVER DUCT MAIN OPENINGS WITH BLUE PLASTIC DUCT FILM.

MECHANICAL KEYNOTES:

1. PROVIDE AND INSTALL NEW WATER SOURCE HEAT PUMP UNIT AS SCHEDULED. INSTALL PER MANUFACTURER'S INSTRUCTIONS. RECONNECT EXISTING CONTROLLERS, INSTALL ELECTRICAL PER ELECTRICAL PLANS, EXTEND CONDENSATE DRAIN AND WATER SUPPLY AND RETURN CONNECTIONS TO NEW WATER SOURCE HEAT PUMP UNIT. EACH NEW WSHP UNIT SHALL BE FURNISHED WITH AND CONTRACTOR SHALL INSTALL: (1) NEW PRESSURE INDEPENDENT AUTOMATIC FLOW CONTROL VALVE (HAYES MEASURE-FLOW OR EQUAL), (2) NEW FULL-PORT BRASS BALL VALVES WITH STAINLESS STEEL BALLS, (2) FLEX LINES MINIMUM 18" LONG WITH BRAIDED STAINLESS STEEL REINFORCEMENT, ALL NEW BRASS FITTINGS AND ELBOWS, AND ALL NEW WATER PIPING IN TYPE L COPPER WITH SOLDERED WROUGHT COPPER FITTINGS AS NEEDED TO EXEND PIPING FROM EXISTING LOCATION TO NEW LOCATION. ALL PIPING AND HOSES SHALL BE FULL SIZE OF UNIT CONNECTION. INCLUDE ALL REQUIRED DUCTWORK AND REWORK EXISTING DUCTING AS NEEDED TO ACCOMODATE NEW WSHP'S. THE NEW WSHP'S ARE NOT AN EXACT FIT TO THE EXISTING WSHP'S SO EXTENSIVE RECONFIGURATION OF ALL EXISTING SYSTEMS SHALL BE ANTICIPATED AND INCLUDED.

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MECHANICAL FLOOR PLAN

REVISIONS		
REV#	DATE	DESCRIPTION

REVIEWED BY: GSP
DRAWN BY: CMT

Registered Professional Engineer (Mechanical) Certificate No. 29717 GREGORY PENNO Signed 04-04-20 Arizona, U.S.A.
Expires 12/31/2022

ORIGINAL ISSUE DATE: 04-24-2020

JOB No: **19101**

SHEET: M100

SEQUENCE #: _____

REPLACEMENT WATER SOURCE HEAT PUMP SCHEDULE

LOCATION	MK	NOM. TONS	MCA/ea.	MOCP	VOLTS-Ø	FEEDERS/CONDUIT	DISC. SWITCH W/ LPS-RK1 FUSES	C/B SIZES	EXIST. POWER PANEL & EXIST. EQUIPMENT CIRCUITS	NOTES
BASE BID										
NW GYM SW GYM GYM NE CAFETERIA SE CAFETERIA NW CAFETERIA SW CAFETERIA	NWG SWG NEG NEC SEC NWC SWC	8	23.55	25	480-3	3#10 & 1#10 (BOND) - 3/4"C.	30/3 W/ (3) 25A	25/3	LAE/7-9-11 RAF/2-4 LAB/20-22-24 LAE/2-4-6 LAH-14-16-18 LAE/1-3-5 LAH/2-4-6, 8-10-12	1-2
A-B HALLWAY B-30	ABH B30	4	9.5	15	480-3	3#12 & 1#12 (BOND) - 3/4"C.	30/3 W/ (3) 15A	15/3	LBC/26-28-30, 32-34-36 LBB/2-4-6, 8-10-12	1-2
A-03 BOYS LOCKER ROOM MAIN ENTRANCE B-05 B-10 B-22	A03 BL ME B05 B10 B22	3	8.5	15	480-3	3#12 & 1#12 (BOND) - 3/4"C.	30/3 W/ (3) 15A	15/3	LAE/8-10-12 LAB/2-4-6, 8-10-12 LAH/1-3-5, 7-9-11 LBC/31-33-35 LBB/2-4-6, 8-10-12 LBC/2-4-6, 8-10-12	1-2
A-05 SNACK BAR B-07 B-09 B-19	A05 SB B07 B09 B19	2	17.5	30	208-1	2#10 & 1#10 (BOND) - 3/4"C.	30/2 W/ (3) LPN-RK1 30A	30/2	- RAF/1-3 RBB/24-26 RBB/20-22 RBC/20-22	1-2

PANEL NOTES:

1. MCA, MOCP, ARE MAXIMUM CAPACITIES ALLOWED (REFER TO MECHANICAL PLANS FOR ADDITIONAL INFORMATION).
2. PROVIDE SINGLE POINT POWER CONNECTION TO UNIT. REFER TO SCHEDULE ABOVE FOR DISCONNECT, CIRCUIT BREAKER & FEEDER/ CONDUIT SIZE(S).

GENERAL NOTES

A. THE ELECTRICAL CONTRACTOR SHALL VERIFY AND COORDINATE WITH THE MECHANICAL CONTRACTOR AND CONTRACT DOCUMENTS THE FOLLOWING AND COMPLY AS REQUIRED.

1. LOCATION OF MECHANICAL EQUIPMENT, e.g. MOTORS, PUMPS, T-STATS, ETC.
2. ELECTRICAL CHARACTERISTICS e.g. PHASE, VOLTAGE, H.P.,AMPS, CONTROL WIRING, NO. OF CONNECTIONS, ETC.

B. IT SHALL BE THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO VERIFY ELECTRICAL CHARACTERISTICS AND ADDITIONAL REQUIREMENTS OF ALL ELECTRICAL EQUIPMENT (AS SHOWN FOR THIS PROJECT). VERIFY AND COORDINATE WITH THE EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN AND COMPLY AS REQUIRED TO COMPLETE THE THE ELECTRICAL WIRING IN AN APPROVED MANNER, e.g. VERIFY EXACT LOCATIONS, MOUNTING HEIGHTS, LOADS, H.P., NO. OF CONDUCTORS, INTERWIRING, CONTROLS, ETC., AS REQUIRED FOR EQUIPMENT TO BE FULLY OPERATIONAL.

C. THE ELECTRICAL CONTRACTOR SHALL BE HELD FULLY RESPONSIBLE FOR RELOCATION, EXTENSION AND RECONNECTION OF ANY AND ALL SYSTEMS BEING DISRUPTED BY DEMOLITION WORK e.g. ELECTRICAL BRANCH CIRCUITS, ETC. SO THAT THEY ARE FULLY OPERATIONAL.

D. CONTRACTOR SHALL COORDINATE REMOVAL OF EXISTING AND INSTALLATION OF NEW WORK SO THAT ALL EXISTING ELECTRICAL SYSTEMS REMAIN OPERATIONAL DURING USE OF FACILITIES BY OWNER. PRIOR TO ANY PLANNED INTERRUPTION OF ANY OF THE ELECTRICAL SYSTEMS, NOTIFY THE ARCHITECT AND OWNER IN WRITING WELL IN ADVANCE SO THAT THERE WILL BE ADEQUATE TIME TO PREPARE AFFECTED AREAS.

E. AT COMPLETION OF ELECTRICAL INSTALLATION, PROVIDE OWNER WITH ACCURATE AS-BUILT DRAWINGS INDICATING ALL VARIATIONS FROM CONTRACT DRAWINGS AND A LETTER TO THE OWNER'S REPRESENTATIVE STATING PROJECT FULLY COMPLIES WITH ALL CONTRACT DOCUMENTS AND IF NOT, HOW INSTALLATION WAS ACCOMPLISHED. ALL CHANGES SHALL BE SUBJECT TO OWNER'S REPRESENTATIVE'S APPROVAL.

F. THIS CONTRACT IS TO INCLUDE ALL CONTINGENCIES WHICH MAY ARISE AND WHICH MAY BE REQUIRED BY ALTERATION, DEMOLITION AND NEW WORK. THIS IS TO INCLUDE ALL REMOVAL, RELOCATION AND REWORKING OF ELECTRICAL WORK, e.g. CONDUIT, WIRING AND ITEMS OF ELECTRICAL EQUIPMENT REQUIRED AND ANY NECESSARY SPLICING OR EXTENSION OF WIRING SYSTEMS. THE ELECTRICAL CONTRACTOR SHALL VISIT SITE AND DETERMINE FULL EXTENT OF THE WORK. NO ADDITIONAL COMPENSATION WILL BE PERMITTED FOR FAILURE TO FULLY ASCERTAIN ASPECTS OF THIS PROJECT.

ELECTRICAL SPECIFICATION

FURNISH AND INSTALL INCLUDING LABOR, SUPERVISION, MATERIALS, TOOLS, SERVICES, TRANSPORTATION, OVERHEAD COSTS, ROYALTIES, PROFITS, ETC., A COMPLETE INSTALLATION AS SPECIFIED HEREIN AND INDICATED ON ALL ELECTRICAL AND OTHER DRAWINGS, e.g. CONTROL WIRING FOR MECHANICAL SYSTEM, IN A APPROVED, NEAT, FIRST-CLASS, FINISHED, SAFE, WORKMANSHIPLIKE MANNER THAT COMPLIES WITH UTILITIES, ETC., CODES, ORDINANCES, RULES, STANDARDS ETC., INCLUDING CURRENT ADDENDA AND ERRATA. ENTIRE ELECTRICAL INSTALLATION SHALL COMPLY WITH OR SURPASS THE MOST RECENT EDITION OF THE NATIONAL ELECTRICAL CODE PER OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).

ALL MATERIALS AND EQUIPMENT FURNISHED BY THE ELECTRICAL CONTRACTOR SHALL BE NEW AND OF FIRST-CLASS QUALITY, UNLESS NOTED OTHERWISE, FREE FROM DEFECTS, AND CONFORM WITH UNDERWRITERS' LABORATORIES, INC. STANDARDS WHERE APPLICABLE AND BE SO LABELED. MATERIALS AND EQUIPMENT NOT SPECIFIED AND WHERE UNDERWRITERS' LABORATORIES APPROVAL IS NOT APPLICABLE AND THAT ARE REQUIRED TO COMPLETE THE ELECTRICAL INSTALLATION SHALL BE OF FIRST-CLASS QUALITY FOR USE INTENDED, MATERIALS, EQUIPMENT, ETC., NOT INDICATED ON DRAWINGS OR SPECIFIED HEREIN, BUT REQUIRED FOR A SUCCESSFUL AND EFFICIENT COMP- LETION OF THE ELECTRICAL INSTALLATION SHALL BE HELD TO BE IMPLIED AND SHALL BE FURNISHED AND INSTALLED FOR NO ADDITIONAL COST. ENCLOSURES FOR ALL EQUIPMENT SHALL BE SUITABLE FOR USE INTENDED, e.g. WEATHERPROOF FOR EXTERIOR AND WET LOCATIONS, VOLTAGE, H.P., RATING OF DISCONNECT SWITCHES, ETC.

MATERIALS, EQUIPMENT, ETC., INCLUDING THOSE FURNISHED BY OTHERS, THAT ARE TO BE INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE RECEIVED AND PROPERLY PROTECTED BY THIS CONTRACTOR UNTIL ENTIRE INSTALLATION IS COMPLETE.

MAKE NO INSTALLATION OF WORK WHICH WOULD LEAVE INADEQUATE OPERATING OR SERVICING SPACE FOR ANY ITEM FOR THE ENTIRE PROJECT. DRAWINGS ARE NOT INTENDED TO SHOW IN DETAIL ALL FEATURES OF WORK. CHECK LOCATION OF ELECTRICAL WORK TO DETERMINE IN ADVANCE THAT IT CLEARS ALL OPENINGS, STRUCTURAL MEMBERS, ETC. ARRANGE AND SCHEDULE WORK SO THAT A MINIMUM OF CUTTING AND PATCHING IS REQUIRED. WHERE CONTRACT DOCUMENTS, e.g. DRAWINGS AND SPECIFICATIONS DO NOT MEET WITH MINIMUM CODES, ETC., THIS CONTRACTOR SHALL COMPLY FOR NO ADDITIONAL COST.

ALL DEVICES FOR PROJECT SHALL BE EQUAL TO COMMERCIAL GRADE 20A TOGGLE SWITCHES AND 20A RECEPTACLES. ALL DEVICE COVER PLATES TO BE COLOR OF DEVICES AND PLATES SHALL MATCH COLOR OF WALLS, e.g. IVORY COLORED ON LIGHT COLORED WALLS AND BROWN COLORED ON DARK COLORED WALLS AND W.P. TYPES FOR EXTERIOR OR WET LOCATIONS. APPROVED MANUF. P & S, HUBBELL & LEVITON.

ALL WIRING (POWER & CONTROL) SHALL BE INSTALLED IN APPROVED RACEWAYS. RACEWAYS SHALL BE APPROVED FOR USE INTENDED. ALL ELECTRICAL CONDUCTORS SHOWN ARE COPPER, MINIMUM SIZE CONDUCTOR IS NO. 12 AWG, WITH THN OR THWN INSULATION, CONTROL WIRING MAY BE NO. 14 AWG OR SMALLER IF RE- QUIRED OR RECOMMENDED BY SUPPLIER OF EQUIPMENT AS APPLICABLE.

PROVIDE & INSTALL SEPARATE EQUIP. GROUNDING CONDUCTOR IN ALL CONDUIT RACENAYS PER NEC &LOCAL CODE.

ELECTRIC METALLIC TUBING (EMT): EMT TO BE USED WHERE CONCEALED IN AREAS ABOVE CEILINGS, FURRED SPACES, PARTITIONS OR WALLS. PROVIDE BOND CONDUCTOR WITH ALL BRANCH WIRING INSTALLED IN EMT MIN. SIZED CONDUIT 3/4"C.

FLEXIBLE CONDUIT (FLEX) SHALL BE USED FOR CONNECTIONS TO MOTORS AND OTHER ELECTRICAL EQUIPMENT WHERE IT IS SUBJECT TO MOVEMENT, VIBRATIONS, MISALIGNMENTS, CRAMPED QUARTERS, OR WHERE NOISE TRANSMISSION IS TO BE ELIMINATED OR REDUCED. LENGTH SHALL BE ADEQUATE BUT NOT TO EXCEED THIRTY-SIX (36") INCHES. FLEXIBLE CONDUITS AND FITTINGS USED TO MEET THE ABOVE REQUIREMENT SHALL, IN ADDITION, BE OF THE LIQUID TIGHT TYPE WHEN INSTALLED ON EXTERIOR. INSTALL A N.E.C. SIZE BONDING CONDUCTOR IN ALL FLEX, WHERE PERMITTED BY CODE, FLEX MAY BE USED WHERE THE INSTALLATION OF RIGID STEEL CONDUIT AND EMT ARE NOT FEASIBLE, WHERE FLEX IS INSTALLED IN RUNS OVER FOUR (4') FEET IN LENGTH, IT SHALL BE TIGHT WITH A MINIMUM OF SLACK AND SHALL BE SUPPORTED AS DIRECTED BY THE ENGINEER.

DRAWINGS SHOWING ELECTRICAL WORK ARE PARTLY DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW IN DETAIL ALL FEATURES OF WORK. NO EXTRA PAYMENT WILL BE ALLOWED WHERE OBSTRUCTIONS IN WORK OF OTHER TRADES OR WORK UNDER THIS SECTION REQUIRE OFFSETS, ETC. TAKE MEASUREMENTS AND DO FITTING ON JOB. CHECK LOCATION OF ELECTRICAL WORK TO DETERMINE IN ADVANCE THAT IT CLEARS ALL OPENINGS AND STRUCTURAL MEMBERS, THAT EQUIPMENT WILL BE PROPERLY CONCEALED AND THAT EQUIPMENT CLEARS ALL OTHER CABINETS, FIXED EQUIPMENT, WIN- DOWS, DOOR OPENINGS, ETC.

ANY ITEMS NOT MENTIONED IN THESE SPECIFICATIONS OR NOT INDICATED ON DRAWINGS BUT ARE NECESSARY FOR SUCCESSFUL AND EFFICIENT OPERATION OF THE WORK SHALL BE HELD TO BE IMPLIED AND SHALL BE FURNISHED AND INSTALLED AS PART OF THIS CONTRACT AT NO ADDITIONAL COST. EQUIPMENT AND MATERIAL CHANGES IN LOCATION NOT OVER (10) TEN FEET IN ANY DIRECTION SHALL BE MADE AT NO ADDITIONAL COST.

SHOP DRAWINGS: SUBMIT WITHIN (30) THIRTY CALENDAR DAYS, (6) SIX SETS OF COMPLETE SHOP DRAWINGS, BROCHURES, SPECIFICATIONS, LITERATURE, PERFORMANCE DATA, DIMENSIONS (MAKING ALL MARKINGS WITH INK IN COLOR OTHER THAN RED), FOR ALL MATERIALS AND EQUIPMENT TO BE USED ON THIS PROJECT.

PRIOR TO SUBMITTING ANY OF THE ABOVE SHOP DRAWINGS, ETC., DATA, THE CONTRACTOR SHALL CAREFULLY VERIFY THAT ALL MATERIALS, EQUIPMENT PROPOSED FOR THIS PROJECT WILL MEET SPACE REQUIREMENTS, HAS PROPER ELECTRICAL RATINGS FITS INTO SPACE PROVIDED AND COMPLIES WITH THE CONTRACT DOCUMENTS.

THE ELECTRICAL CONTRACTOR SHALL FULLY GUARANTEE THE ENTIRE ELECTRICAL INSTALLATION AND ALL WORK UNDER THIS SECTION FOR A PERIOD OF TWO YEARS FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER AGAINST ALL EVIDENCE OF IMPERFECT WORKMANSHIP, FAILURE OR MALFUNCTION OF MATERIALS AND EQUIPMENT FURNISHED BY CONTRACTOR. WORK FOUND TO BE DEFECTIVE WITHIN THIS PERIOD, SHALL BE REPLACED PROMPTLY WITHOUT COST.

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WINDOW ROCK HIGH SCHOOL

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ELECTRICAL DETAILS & NOTES

REVISIONS

REV#	DATE	DESCRIPTION

REVIEWED BY: GTB
DRAWN BY: DAV

Registered Professional Engineer (Electrical)
CERTIFICATE NO.
10526
GEORGE T.
BAYLES
Date Signed 4/20/20
ARIZONA, U.S.A.

EXPIRES 3/31/2023

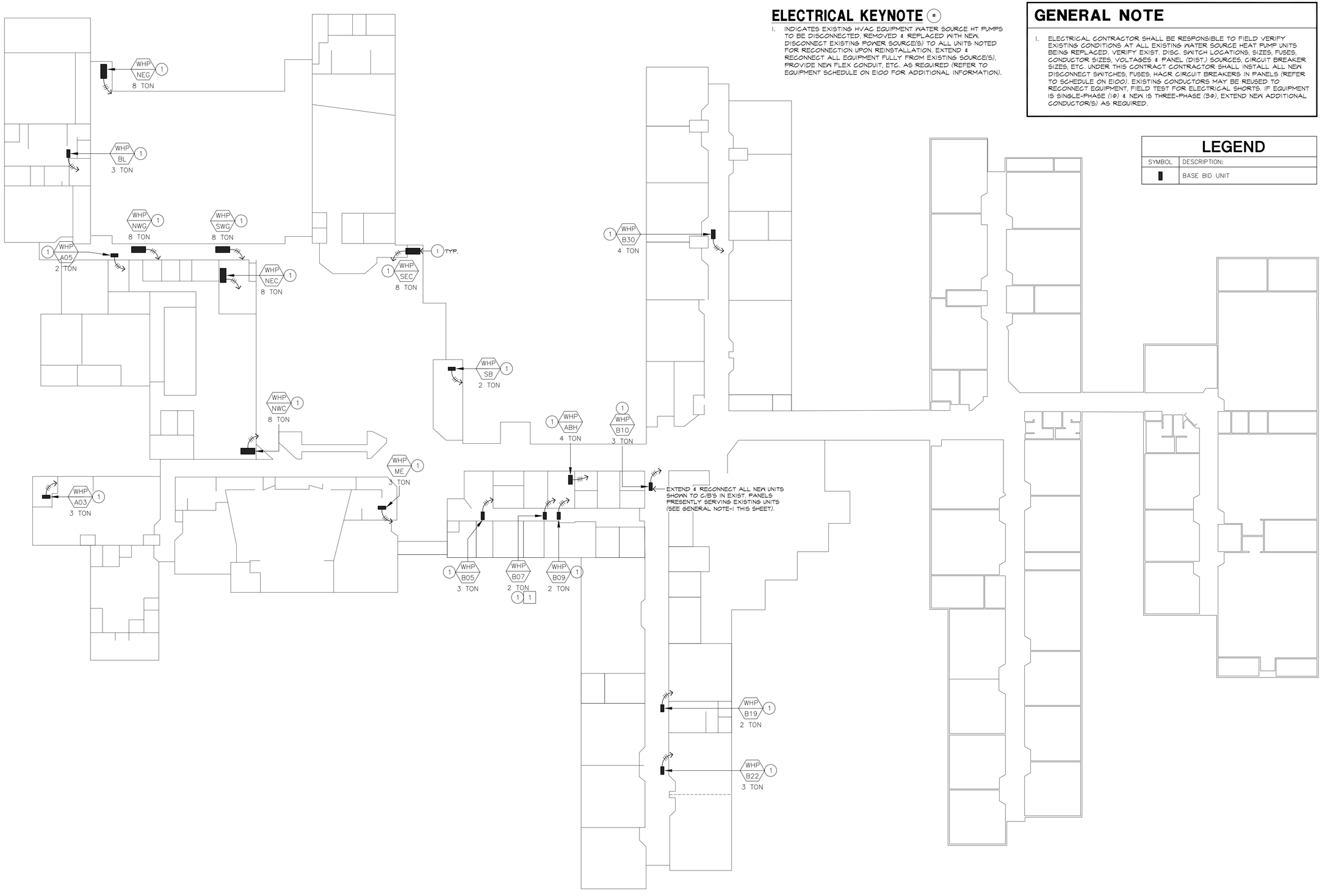
ORIGINAL ISSUE
DATE: 4/20/2020

JOB No: 0000

SHEET:

E100

SEQUENCE #:



ELECTRICAL KEYNOTE (#)

1. INDICATES EXISTING HVAC EQUIPMENT WATER SOURCE HT PUMPS TO BE DISCONNECTED, REMOVED & REPLACED WITH NEW. DISCONNECT EXISTING POWER SOURCE(S) TO ALL UNITS NOTED FOR RECONNECTION UPON REINSTALLATION. EXTEND & RECONNECT ALL EQUIPMENT FULLY FROM EXISTING SOURCE(S), PROVIDE NEW FLEX CONDUIT, ETC. AS REQUIRED (REFER TO EQUIPMENT SCHEDULE ON E100 FOR ADDITIONAL INFORMATION).

GENERAL NOTE

1. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY EXISTING CONDITIONS AT ALL EXISTING WATER SOURCE HEAT PUMP UNITS BEING REPLACED. VERIFY EXIST. DISC. SWITCH LOCATIONS, SIZES, FUSES, CONDUCTOR SIZES, VOLTAGES & PANEL (DIST.) SOURCES, CIRCUIT BREAKER SIZES, ETC. UNDER THIS CONTRACT CONTRACTOR SHALL INSTALL ALL NEW DISCONNECT SWITCHES, FUSES, HACR CIRCUIT BREAKERS IN PANELS (REFER TO SCHEDULE ON E100). EXISTING CONDUCTORS MAY BE REUSED TO RECONNECT EQUIPMENT, FIELD TEST FOR ELECTRICAL SHORTS. IF EQUIPMENT IS SINGLE-PHASE (1Ø) & NEW IS THREE-PHASE (3Ø), EXTEND NEW ADDITIONAL CONDUCTOR(S) AS REQUIRED.

LEGEND

SYMBOL	DESCRIPTION:
▮	BASE BID UNIT

ELECTRICAL FLOOR PLAN

SCALE: N.T.S.

NORTH

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ELECTRICAL FLOOR PLAN

REVISIONS

REV#	DATE	DESCRIPTION

REVIEWED BY: GTB
DRAWN BY: DAV

Registered Professional Engineer Certificate No. 10526 GEORGE T. BAYLES Date Signed 4/20/20 ARIZONA, U.S.A.

EXPIRES 3/31/2023

ORIGINAL ISSUE
DATE: 4/20/2020

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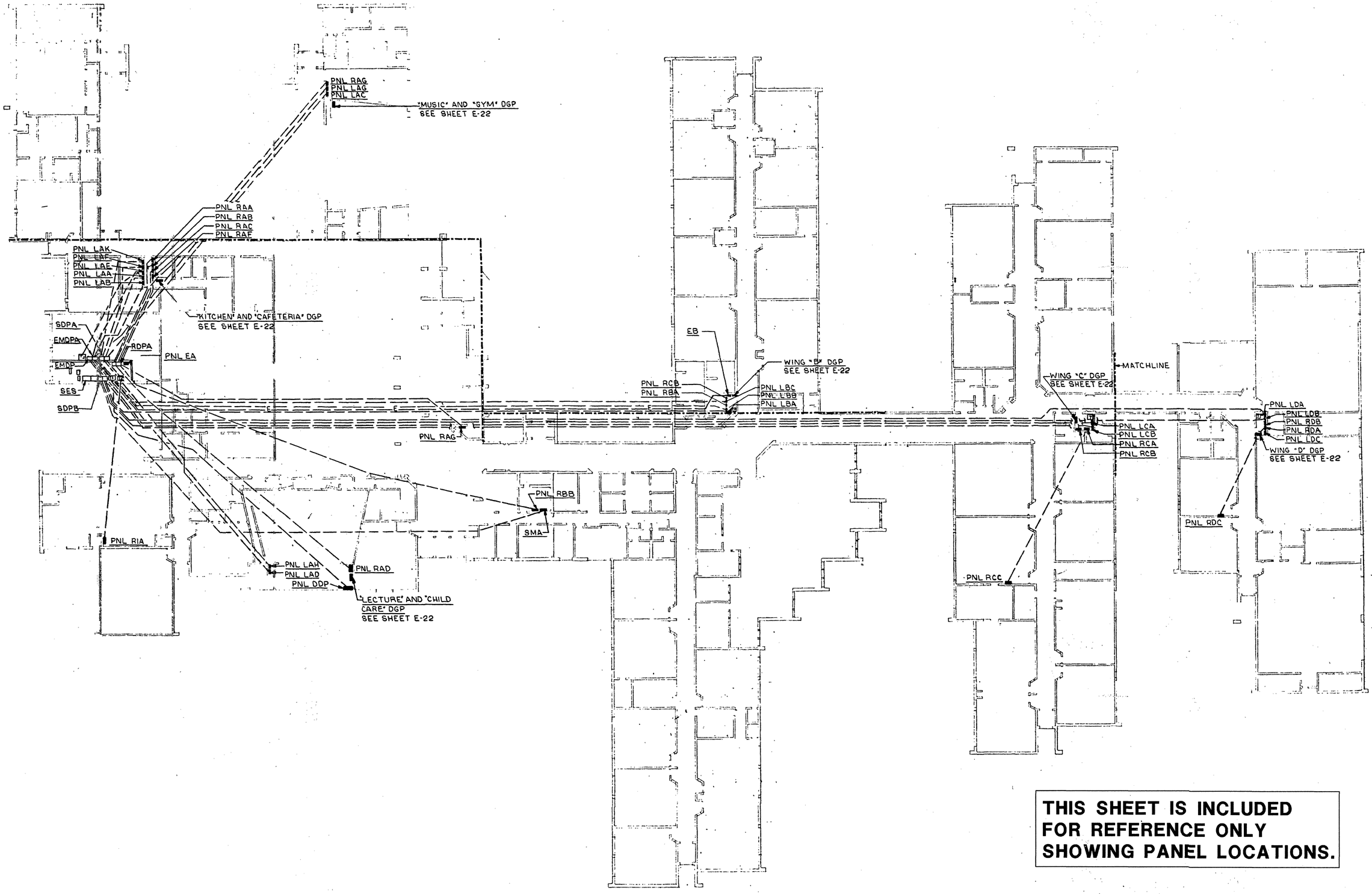

ELECTRICAL POWER PLAN

NOT TO SCALE

NORTH

THIS SHEET IS INCLUDED FOR REFERENCE ONLY SHOWING PANEL LOCATIONS.

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ELECTRICAL POWER PLAN

REVISIONS		
REV#	DATE	DESCRIPTION

REVIEWED BY: GTB
DRAWN BY: DAV

Registered Professional Engineer (Electrical)
CERTIFICATE NO.
10526
GEORGE T. BAYLES
Date Signed 4/20/20
ARIZONA, U.S.A.
EXPIRES 3/31/2023

ORIGINAL ISSUE DATE: 4/20/2020

JOB No: 0000

SHEET:

E300

SEQUENCE #:

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KITCHEN AREA

PANEL LAB | TYPE BOLT-ON | MOUNTING FLUSH | 277/480[illegible] | MAINS 225 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
HEAT PUMP #8	30/	1	5402 / 1935			2	20/	HEAT PUMP #4
		3		5402 / 1935		4		
	/3	5			5402 / 1935	6	/3	
#4	20/	7	1935 / 1935			8	20/	#4
		9		1935 / 1935		10		
	/3	11			1935 / 1935	12	/3	
8	30/	13	5402 / 2216			14	20/	#5
		15		5402 / 2216		16		
	/3	17			5402 / 2216	18	/3	
SPARE	20/1	19	5402			20	30/	#8
		21		5402		22		
		23			5402	24	/3	
		25				26	20/1	SPARE
		27				28		
SPACE		29				30		
		31				32		
		33				34		SPACE
		35				36		
		37				38		
		39				40		
		41				42		
TOTAL LOAD PER PHASE			24227	24227	24227	24227 ÷ 277		87 AMPS

HALL A56

PANEL LAE | TYPE BOLT-ON | MOUNTING FLUSH | 277/480V-3Φ-4W | MAINS 100 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
HEAT PUMP #9	30/	1	6104 / 6104			2	30/	HEAT PUMP #9
		3		6104 / 6104		4		
	/3	5			6104 / 6104	6	/3	
#5	20/	7	2216 / 5402			8	30/	#8
		9		2216 / 5402		10		
	/3	11			2216 / 5402	12	/3	
SPACE		13				14		SPACE
		15				16		
		17				18		
		19				20		
		21				22		
		23				24		
		25				26		
		27				28		
		29				30		
		31				32		
		33				34		
		35				36		
		37				38		
		39				40		
		41				42		
TOTAL LOAD PER PHASE			21026	21026	21026	21026 ÷ 277V =		76 AMPS

HALL A56

PANEL RAF | TYPE BOLT-ON | MOUNTING FLUSH | 120/208V-3Φ-4W | MAINS 225 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
HEAT PUMP #3	20/	1	1548 / 1548			2	20/	HEAT PUMP #3 ●
	/2	3		1548 / 1548		4	/2	
SPARE	20/1	5				6	20/1	SPARE
		7	1560			8	20/	ICE MACHINE #81
		9		1560		10	/2	
		11			1392	12	20/1	COLD PAN
WELLS-HOT FOOD #86	30/	13	2196 / 1600			14		REGISTER #91
	/2	15		2196 / 2196		16	30/	WELLS-HOT FOOD #86
WARMER DRAWERS #87	15/	17			390 / 2196	18	/2	
	/2	19	390 / 390			20	15/	WARMER DRAWERS #87
HOT FOOD WELLS #94	15/	21		552 / 390		22	/2	
	/2	23			552 / 1325	24	20/	COFFEE MAKER #93
SPARE	20/1	25	1325			26	/2	
		27		924		28	20/1	WATER DISPENSER #93
SPACE		29			1096	30		EXHAUST FAN 1/4 HP
		31				32		SPACE
		33				34		
		35				36		
		37				38		
		39				40		
		41				42		
TOTAL LOAD PER PHASE			10551	10914	10651	10914 ÷ 120V =		91 AMPS

● REPLACE EXISTING 20/2P C/B W/ NEW 25/3 C/B.

BLDG. B ELEC. RM.

PANEL LBB | TYPE BOLT ON | MOUNTING SURFACE | 277/480V-3Φ-4W | MAINS 225 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
HEAT PUMP #6	20/	1	3130 / 2216			2	20/	HEAT PUMP #5
		3		3130 / 2216		4		
	/3	5			3130 / 2216	6	/3	
#4	20/	7	1939 / 2216			8	20/	#5
		9		1939 / 2216		10		
	/3	11			1939 / 2216	12	/3	
#5	20/	13	2216 / 2216			14	20/	#5
		15		2216 / 2216		16		
	/3	17			2216 / 2216	18	/3	
#4	20/	19	1939 / 1939			20	20/	#4
		21		1939 / 1939		22		
	/3	23			1939 / 1939	24	/3	
#5	20/	25	2216 / 3130			26	20/	#6
		27		2216 / 3130		28		
	/3	29			2216 / 3130	30	/3	
#8		31	5402			32		SPACE
		33		5402		34		
		35			5402	36		
#8		37	5402			38		
		39		5402		40		
		41			5402	42		
TOTAL LOAD PER PHASE			33961	33961	33961	33961 ÷ 277 =		123 AMPS

BLDG. B. ELEC. RM.

PANEL LBC | TYPE BOLT ON | MOUNTING SURFACE | 277/480V-3Φ 4W | MAINS 225 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
HEAT PUMP #5	20/	1	2216 / 1939			2	20/	HEAT PUMP #4
		3		2216 / 1939		4		
	/3	5			2216 / 1938	6	/3	
#5	20/	7	2216 / 1939			8	20/	#4
		9		2216 / 1939		10		
	/3	11			2216 / 1939	12	/3	
#4	20/	13	1939 / 1939			14	20/	#4
		15		1939 / 1939		16		
	/3	17			1939 / 1939	18	/3	
#4	20/	19	1939 / 1939			20	20/	#4
		21		1939 / 1939		22		
	/3	23			1939 / 1939	24	/3	
#4	20/	25	1939 / 3130			26	20/	#6
		27		1939 / 3130		28		
	/3	29			1939 / 3130	30	/3	
#4	20/	31	1939 / 3130			32	20/	#6
		33		1939 / 3130		34		
	/3	35			1939 / 3130	36	/3	
#5	20/	37	1939			38		SPARE
		39		1939		40		
	/3	41			1939	42		
TOTAL LOAD PER PHASE			28143	28143	28143	28143 ÷ 277 =		101 AMPS

OFFICE AREA

PANEL RBB | TYPE BOLT-ON | MOUNTING FLUSH | 120/208V-3Φ-4W | MAINS 225 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
RECEPTACLES	20/1	1	720 / 720			2	20/1	RECEPTACLES
		3		720 / 540		4		
		5			1080 / 720	6		
		7	900 / 900			8		
HAND DRYER		9		1200 / 720		10		
		11			1200 / 1200	12		HAND DRYER
RECEPTACLES		13	1080 / 200			14		
		15		900 / 720		16		RECEPTACLE
		17			1260 / 720	18		
ADMINISTRATION HEAD		19	1200 / 1224			20	20/	HEAT PUMP #2
HEAT PUMP #2	20/	21		1224 / 1224		22	/2	
	/2	23			1224 / 1548	24	20/	#3
CONFER. TRACT LIGHTS	20/1	25	900 / 1548			26	/2	
		27		720 / 1176		28	20/1	ROLL-UP CORR. DOOR
HALL TRACT LIGHTS		29			600	30		SPARE
SPACE		31				32		
		33				34		
		35				36		
		37				38		
		39				40		
		41				42		
TOTAL LOAD PER PHASE			10392	9174	9552	10392 ÷ 120V =		87 AMPS

BLDG. B ELEC. RM.

PANEL RBC | TYPE BOLT-ON | MOUNTING SURFACE | 120/208V-3Φ-4W | MAINS 225 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
RECEPTACLES	20/1	1	1080 / 720			2	20/1	RECEPTACLES
		3		1080 / 900		4		
		5			900 / 1080	6		
		7	1080 / 1080			8		
		9		900 / 1080		10		
DOOR DETECTOR		11			500 / 1080	12		
RECEPTACLES		13	1260 / 1080			14		
SPARE		15		1260 / 1224		16	20/	HEAT PUMP #2
		17			— / 1224	18	/2	
		19	— / 1224			20	20/	#2
DARK RM.	20/1	21		300 / 1224		22	/2	
RECEPTACLES		23			900 / 612	24	20/	#1
SPARE		25	612			26	/2	
		27		1224		28	20/	#2
		29			1224	30	/2	
SPACE		31				32		SPACE
		33				34		
		35				36		
		37				38		
		39				40		
		41				42		
TOTAL LOAD PER PHASE			8190	9192	7580	9192 ÷ 120 =		77 AMPS

BLDG. D ELEC. RM.

PANEL LDB | TYPE BOLT-ON | MOUNTING SURFACE | 277/480V-3Φ-4W | MAINS 100 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
HEAT PUMP #6	20/	1	3130 / 1939			2	20/	HEAT PUMP #4
		3		3130 / 1939		4		
	/3	5			3130 / 1909	6	/3	
#5	20/	7	2216 / 1550			8	20/	EC-3
		9		2216 / 1550		10		3HP
	/3	11			2216 / 1550	12	/3	
SPARE	20/1	13	— / 4000			14	30/	WATER HEATER
		15		— / 4000		16		
		17			— / 4000	18	/3	
SPACE		19				20	20/1	SPARE
		21				22		SPACE
		23				24		
		25				26		
		27				28		
		29				30		
		31				32		
		33				34		
		35				36		
		37				38		
		39				40		
		41				42		
TOTAL LOAD PER PHASE			12615	12615	12615	12615 ÷ 277V =		46 AMPS

BLDG. D ELEC. RM.

PANEL RDA | TYPE BOLT-ON | MOUNTING SURFACE | 120/208V-3Φ-4W | MAINS 400 MB

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
RECEPTACLES DRAFT. RM.	20/1	1	900 / 720			2	20/1	RECEPTACLES
		3		900 / 720		4		
AUTO		5			1080 / 540	6		REEL COIL-LIGHTS
		7	1080 / 360			8		
		9		720 / 360		10		
AUTO ISLAND		11			900 / 720	12		RECEPTACLE-METAL SHOP
		13	900 / 720			14		
		15		600 / 720		16		RECEPT METAL SHOP ISLAND
METAL SHOP		17			720 / 720	18		
METAL SHOP		19	1200 / 360			20		RECEPTACLE-FINISH RM.
		21		1200 / 1244		22	20/	HEAT PUMP #2
		23			1200 / 1244	24	/2	
		25	1200 / 1176			26	20/1	EXHAUST FAN EF-7
		27		1200 / 1176		28		EXHAUST FAN EF-8
SPARE		29				30		SPARE
PNL RDB	125/	31	12484			32		
		33		12161		34		
	/3	35			13189	36		
PNL RDC	100/	37	9192			38		
		39		5912		40		
	/3	41			8112	42		
TOTAL LOAD PER PHASE			28297	26913	28925	28925 ÷ 120 =		237 AMPS

BLDG. D ELEC. RM.

PANEL RDB | TYPE BOLT-ON | MOUNTING SURFACE | 120/208V-3Φ-4W | MAINS 225 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
RECEPTACLE WOOD	20/1	1	540 / 360			2	20/1	RECEPTACLE
		3		540 / 360		4		
		5			360 / 720	6		TABLE
		7	360 / 720			8		
		9		1000 / 720		10		
HEAT PUMP #3	20/	11			1548 / 1200	12		HAND DRYERS
	/2	13	1548 / 1200			14		
RECEPTACLES HALL	20/1	15		720 / 1200		16		
WOOD SHOP		17			1080 / 1200	18		
		19	360 / 300			20		EXHAUST FAN
		21		540 / 1176		22		WET WELDER EXH. 1/2 HP
VACUUM PUMP		23			864 / 1176	24		WE 2 1/2 HP
		25	864 / 696			26		EXHAUST FAN EF5 1/4 HP
		27		864 / 2704		28	20/	TABLE SAW
PLANER	50/	29			4576 / 2704	30		1HP
1HP		31	4576 / 2704			32	/3	
	/3	33		4576		34	20/1	SPARE
JOINTER	20/	35			707	36	20/1	SPACE
1HP		37	707			38		
	/3	39		707		40		
		41				42		
TOTAL LOAD PER PHASE			14935	15107	16135	16135 ÷ 120 =		135 AMPS

BLDG. C ELEC. RM.

PANEL RCB | TYPE BOLT-ON | MOUNTING SURFACE | 120/208-3Φ-4W | MAINS 100 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
RECEPTACLES	20/1	1	900 / 900			2	20/1	RECEPTACLES
		3		760 / 1080		4		
		5			900 / 900	6		
HEAT PUMP #3	20/	7	1548 / 1080			8		
	/2	9		1548 / 460		10		
#3	20/	11			1548 / 760	12		
HEAT PUMP	/2	13	1548			14	20	SPARE
SPARE	20	15				16		
		17				18		
		19				20		SPACE
SPACE		21				22		
		23				24		
		25				26		
		27				28		
		29				30		
		31				32		
		33				34		
		35				36		
		37				38		
		39				40		
		41				42		
TOTAL LOAD PER PHASE			5976	3848	4128	5976 ÷ 120V =		50 AMPS

PANEL LAH | TYPE BOLT-ON | MOUNTING | 277V-3Φ-4W | MAINS 225 MLO

USE AND/OR AREA SERVED	C/B	CIR NO	ΦA	ΦB	ΦC	CIR NO	C/B	USE AND/OR AREA SERVED
HEAT PUMP #8	30/	1	5402 / 3761			2	20/	HEAT PUMP #7
		3		5402 / 3761		4		
	/3	5			5402 / 3761	6	/3	
#5	20/	7	2216 / 6104			8	30/	#9
		9		2216 / 6104		10		
	/3	11			2216 / 6104	12	/3	
#6	20/	13	3130 / 6104			14	30/	#9
		15		3130 / 6104		16		
	/3	17			3130 / 6104	18	/3	
#8	30/	19	5402 / 3761			20	20/	#7
		21		5402 / 3761		22		
	/3	23			5402 / 3761	24	/3	
#5	20/	25	2216			26		SPACE
		27		2216		28		
	/3	29			2216	30		
		31				32		
		33				34		
		35				36		
		37				38		
		39				40		
		41				42		
TOTAL LOAD PER PHASE			39308	39308	39308	39308 ÷ 277 =		142 AMPS

PANEL SCHEDULES SHOWN FOR REFERENCE ONLY

ELECTRICAL DESIGN CONSULTANTS, LLC
40 W. BASELINE RD., SUITE #104
MESA, ARIZONA 85210
T (602) 279-7010
www.edcinc.biz
EDC Project #: 2020-51

SPS+ ARCHITECTS
SPS+ ARCHITECTS LLP
SCOTTSDALE, AZ 85258
TEL: 480.991.0800
FAX: 480.991.2623
spsplusarchitects.com

WINDOW ROCK HIGH SCHOOL

WINDOW ROCK USD NO. 08
P.O.BOX 559, NAVAJO ROUTE 12
FORT DEFIANCE, VALLEY, AZ 86504

ELECTRICAL PANEL SCHEDULES

REVISIONS

REV.#	DATE	DESCRIPTION

REVIEWED BY: GTB
DRAWN BY: DAV

Registered Professional Engineer (Electrical) — CERTIFICATE NO. 10526 — GEORGE T. BAYLES — Date Signed 4/20/20 — ARIZONA, U.S.A. — EXPIRES 3/31/2023

ORIGINAL ISSUE DATE: 4/20/2020
JOB No: 0000
SHEET: E400
SEQUENCE #:

CARUSO TURLEY SCOTT
structural engineers

April 21, 2020

Richard Begay
SPS+ Architects, LLP
8681 East Via De Negocio
Scottsdale, AZ 85258

RE: Window Rock High School
Heat Pump Replacement
PO Box 559
Fort Defiance, AZ 86504
CTS Job No: 20-0490

Dear Richard:

Please be advised that CTS performed a review of the existing drawings by Wyatt / Rhodes Architects, Inc & Varney, Sexton, Lunsford, Aye Associates-architects, Inc. (a joint venture) dated, August 23, 1985 and existing drawings by Lowry Sorensen Willcoxson Engineers Inc dated August 23, 1985, for the support of 19 new interior mechanical units. The new units have been reviewed as replacing existing mechanical units. It is assumed that the existing structure for these mechanical units will be re-used and existing structure was reviewed to confirm the ability to support the new mechanical loads.

The existing roof framing is approved to support the proposed mechanical units with the following stipulations:

1. The new replacement mechanical units are Climate Master model "TCL-096" weighing 644 lbs each, Climate Master model “TC-048” weighing 263 lbs each, Climate Master model “TC-036” weighing 203 lbs each, and Climate Master model "TC-024" weighing 174 lbs each.

2. The existing mechanical units are being removed and replaced by the units described above.

3. The new mechanical units shall be installed to be equally supported by the existing structure all existing locations appear to have 3-1/8”x9” glulam beams installed. This structure should be used for the support of the new units per the attached details.

Please contact our office if you have any questions or comments.

Respectfully,

Cody Haptonstall
Structural Designer
CARUSO TURLEY SCOTT INC.

Reviewed By:

Registered Professional Engineer (Structural)
CERTIFICATE NO.
23288
C.J.
ATKINSON
4/22/20
Date Signed
ARIZONA, U.S.A.

Chris Atkinson, P.E., S.E., LEED AP
Partner
CARUSO TURLEY SCOTT INC.

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www.ctsaz.com

Job No.	20-0490	**Sheet No.**	Cover
By	CJH	**Date**	Apr-20

CARUSO
TURLEY
SCOTT
structural
engineers

CLIENT:

SPS+ Architects, LLP
8681 East Via de Negocio
Scottsdale, AZ 85258

PROJECT:

Window Rock High School
Mechanical Unit Replacement

Ft Defiance, AZ

GENERAL INFORMATION:

BUILDING CODE: 2015 INTERNATIONAL BUILDING CODE

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Tempe, AZ 85281
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YOUR STRUCTURAL ENGINEERING EXPERTS

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Job Name Window Rock Mechanical

Job No. 20-0490 Sheet No. **1 of**

By CJH Date Apr-20

BASIS FOR DESIGN

BUILDING CODE: 2015 EDITION OF THE INTERNATIONAL BUILDING CODE

LOADS: ROOF LIVE LOAD = 18 PSF (NON-REDUCIBLE).
ROOF SNOW LOAD = 20 PSF.

WIND:
3 SECOND WIND GUST = 105 MPH.
WIND IMPORTANCE FACTOR = I.
EXPOSURE C.

SEISMIC:
SEISMIC IMPORTANCE FACTOR, I = 1.0.
RISK CATEGORY, I.
MAPPED SHORT PERIOD SPECTRAL ACCELERATION, Ss = 0.144.
MAPPED ONE SECOND SPECTRAL ACCELERATION, S1 = 0.049.
SOIL SITE CLASS, D.
DESIGN SHORT PERIOD SPECTRAL ACCELERATION, Sds = 0.153.
DESIGN ONE SECOND SPECTRAL ACCELERATION, Sd1 = 0.078.
SEISMIC DESIGN CATEGORY, B.
SEISMIC RESPONSE COEFFICIENT, Cs = 0.122.
RESPONSE MODIFICATION FACTOR (R)= 1.25.
ANALYSIS PROCEDURE USED = EQUIVALENT LATERAL FORCE PROCEDURE

STRUCTURAL STEEL: MISC. STRUCTURAL STEEL (A36): Fy = 36,000 PSI.

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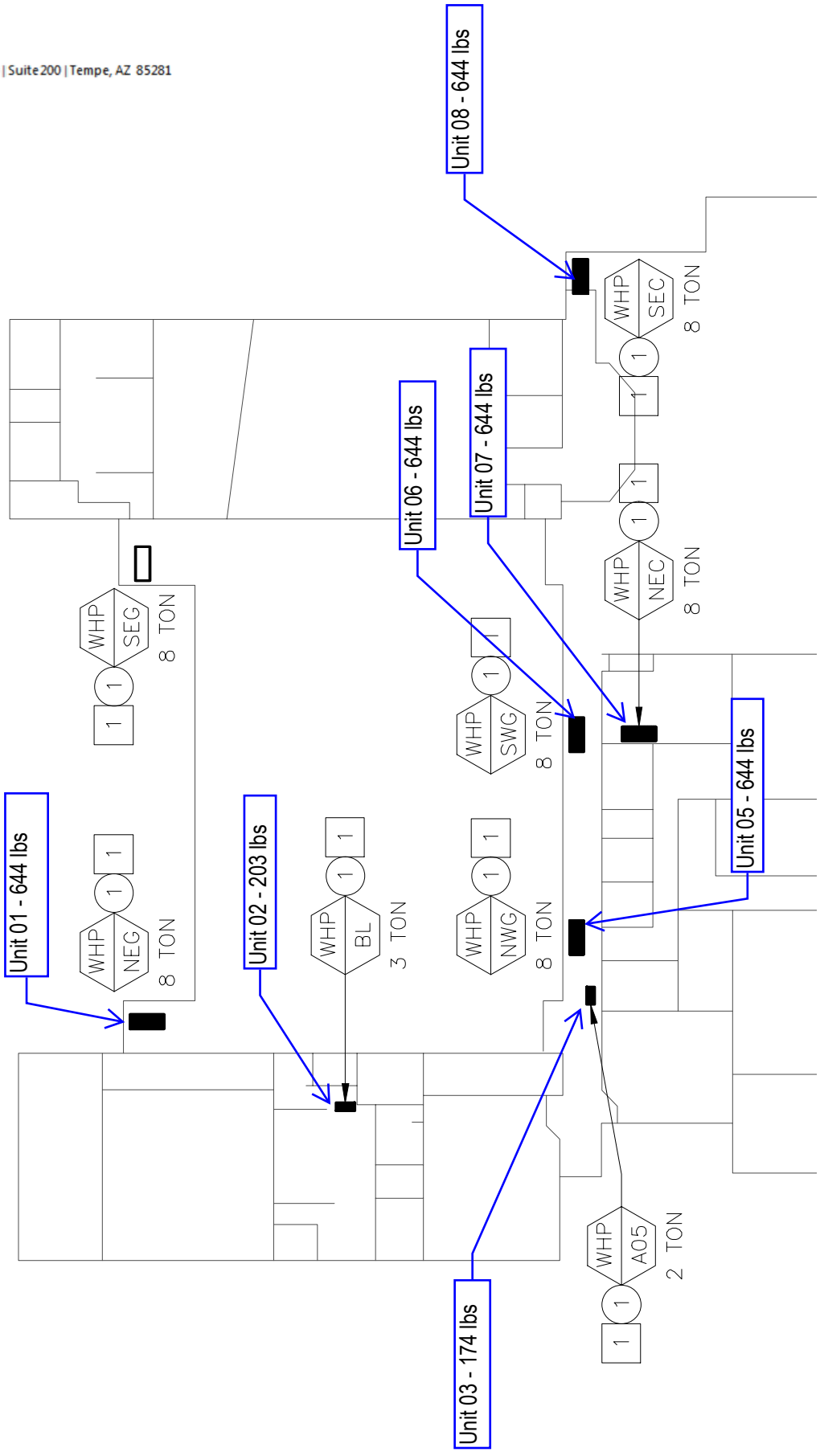

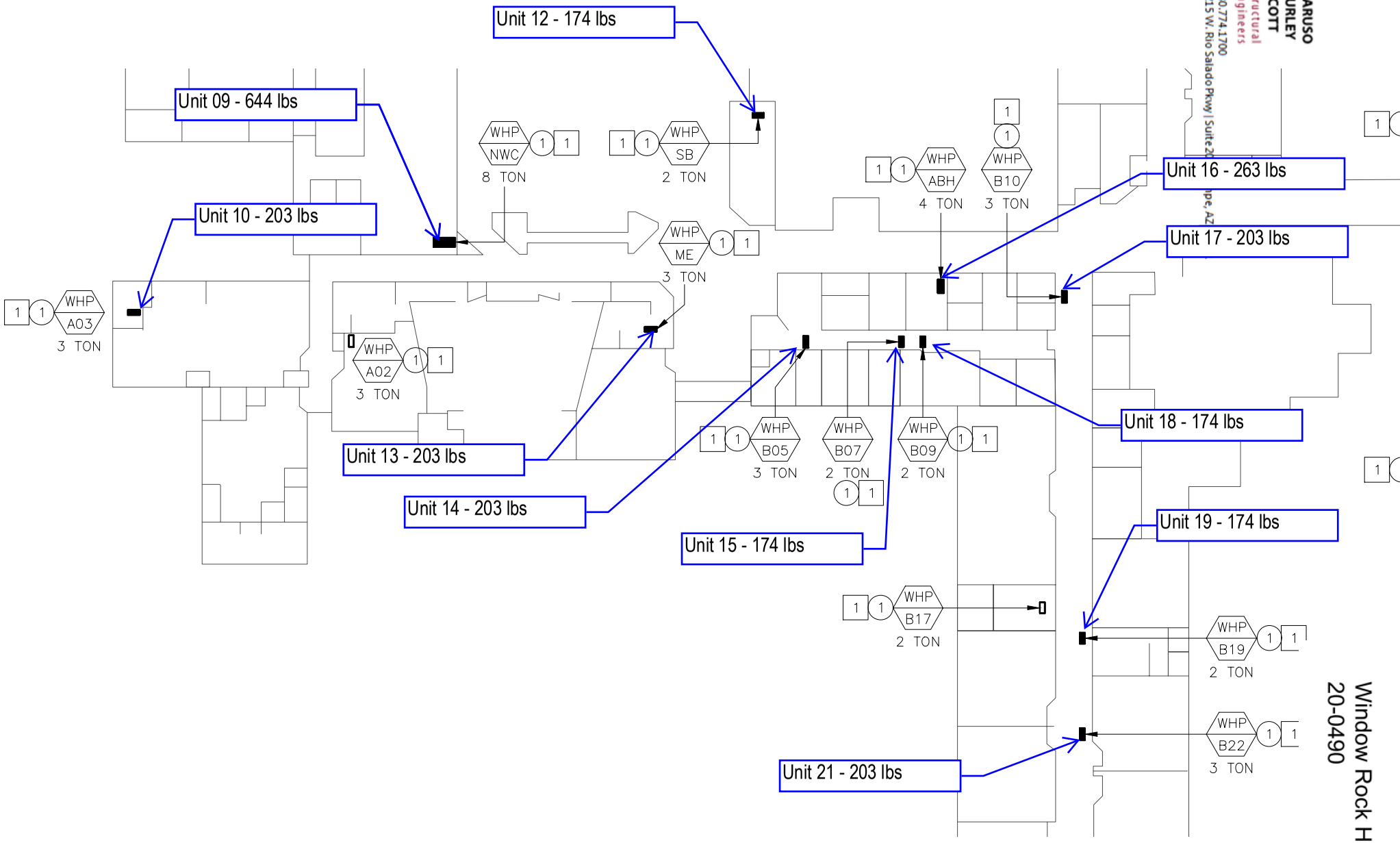

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Window Rock High School
20-0490
Apr-2020

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Job Name UNKNOWN ROCK

Job No. 20-0490 Sheet No. _____

By CJH Date APR 20

LOADS TO ROOF MEMBERS
MECHANICAL UNIT DESIGN

UNIT 01

EXISTING MECH = 580 lbs MARK (8)
NEW MECH = 644 lbs
EXISTING DRAWINGS SHOW 3 1/2 x 9 GLB
AS SUPPORTS FOR MECH UNIT

$P = \frac{(644\ lbs)(1.2)}{2} = 386\ lbs$

USE DETAIL 02

UNIT 02

EXISTING MECH = 225 lbs MARK (4)
NEW MECH = 203 lbs
EXIST DRAWINGS SHOW 3 1/8 x 9 GLB
ACCEPTABLE SUPPORT AS IS

USE DETAIL 02

UNIT 03

EXIST MECH NOTE SHOWN
NEW MECH = 174 lbs
EXISTING DWGS SHOW 3 1/2 x 9 GLB

USE DET 02

UNIT 04 SAME AS UNIT 01

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Job Name WINDOW ROCK

Job No. 20-0490 Sheet No. _____

By CJH Date APR -20

MECHANICAL DESIGN SUPPORT CONT.

UNIT 05 — SAME AS UNIT 01

UNIT 06 — SAME AS UNIT 01

UNIT 07 — SAME AS UNIT 01

UNIT 08 — SAME AS UNIT 01

UNIT 09 — SAME AS UNIT 01

UNIT 10

EXISTING MECH = 555 lbs MARK (8)
NEW MECH = 203 lbs
EXISTING DWG'S SHOW 3½x9 GLB
OK AS IS
USE DETAIL 02

UNIT 11

EXISTING MECH = 300lbs MARK (6)
NEW MECH = 203 lbs
EXISTING DWG'S SHOW 3½x9 GLB
OK AS IS
USE DETAIL 02

UNIT 12 — SAME AS UNIT 03

UNIT 13 — SAME AS UNIT 11

UNIT 14 — SAME AS UNIT 11

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Job Name WINDOW ROCK

Job No 20-0490 Sheet No. _____

By CTH Date MAR -20

UNIT 15 SAME AS UNIT 3

UNIT 16 EXIST MECH = 300 lbs MARK (6)
NEW MECH = 263 lbs
EXIST DWGS SHOW $3\frac{1}{5}$ x9 GLB
USE DETAIL 02

UNIT 17 SAME AS UNIT 02

UNIT 18 SAME AS UNIT 03

UNIT 19 SAME AS UNIT 03

CARUSO TURLEY SCOTT, INC
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Project Title: Window Rock HS - Mechanical Units
Engineer:
Project ID: 20-0490
Project Descr:

Printed: 22 APR 2020, 11:38AM

Wood Beam

Lic. # : KW-06000624 CARUSO TURLEY SCOTT

DESCRIPTION: Existing 3-1/8x9 GLB

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2012

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2012

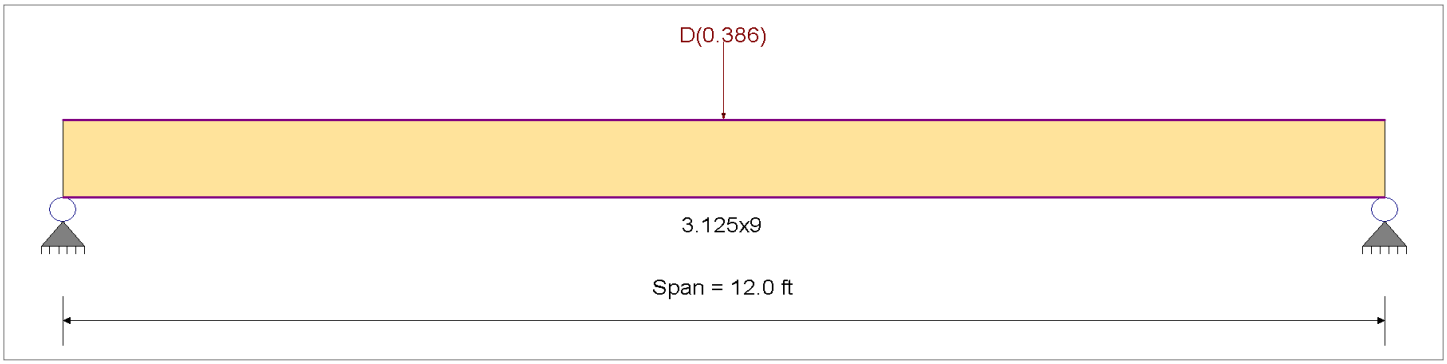
Wood Species : SP/SP
Wood Grade : 24F - V8

Beam Bracing : Beam is Fully Braced against lateral-torsional buckling

Fb +	2,400.0 psi
Fb -	2,400.0 psi
Fc - Prll	1,650.0 psi
Fc - Perp	740.0 psi
Fv	300.0 psi
Ft	1,150.0 psi

E : Modulus of Elasticity

Ebend- xx	1,800.0 ksi
Eminbend - xx	950.0 ksi
Ebend- yy	1,600.0 ksi
Eminbend - yy	850.0 ksi
Density	34.330 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads
Point Load : D = 0.3860 k @ 6.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.168 : 1	Maximum Shear Stress Ratio	=	0.045 : 1
Section used for this span		3.125x9	Section used for this span		3.125x9
	=	363.72 psi		=	12.17 psi
	=	2,160.00 psi		=	270.00 psi
Load Combination		D Only	Load Combination		D Only
Location of maximum on span	=	6.000 ft	Location of maximum on span	=	0.000 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.000 in	Ratio =	0 <360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.080 in	Ratio =	1803 >=180
Max Upward Total Deflection	0.000 in	Ratio =	0 <180

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios									Moment Values			Shear Values		
Segment Length	Span #	M	V	C_d	$C_{F/V}$	C_i	C_r	C_m	C_t	C_L	M	fb	F'b	V	fv	F'v
D Only													0.00	0.00	0.00	0.00
Length = 12.0 ft	1	0.168	0.045	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.28	363.72	2160.00	0.23	12.17	270.00
+0.60D					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.0 ft	1	0.057	0.015	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.77	218.23	3840.00	0.14	7.30	480.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
D Only	1	0.0799	6.044		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.233	0.233
Overall MINimum	0.140	0.140

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Project Title: Window Rock HS - Mechanical Units
Engineer:
Project ID: 20-0490
Project Descr:

Wood Beam

DESCRIPTION: Existing 3-1/8x9 GLB

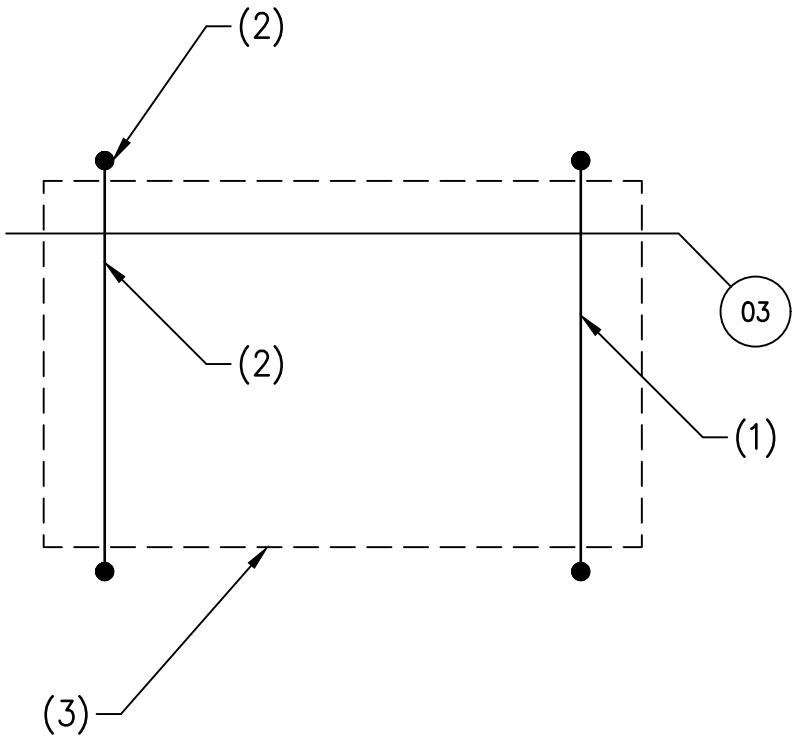
Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
D Only	0.233	0.233
+0.60D	0.140	0.140

NOTES:

1. P1000 LOW.
2. 1/2" DIA THREADED ROD – TYP.
3. EQUIPMENT.



01 PLAN – SUSPENDED EQUIPMENT SUPPORT

20–0490 NO SCALE

SEAL

Registered Professional Engineer (Structural)
CERTIFICATE NO.
23288
C.J.
ATKINSON
Date Signed: 04-22-20
ARIZONA, U.S.A.

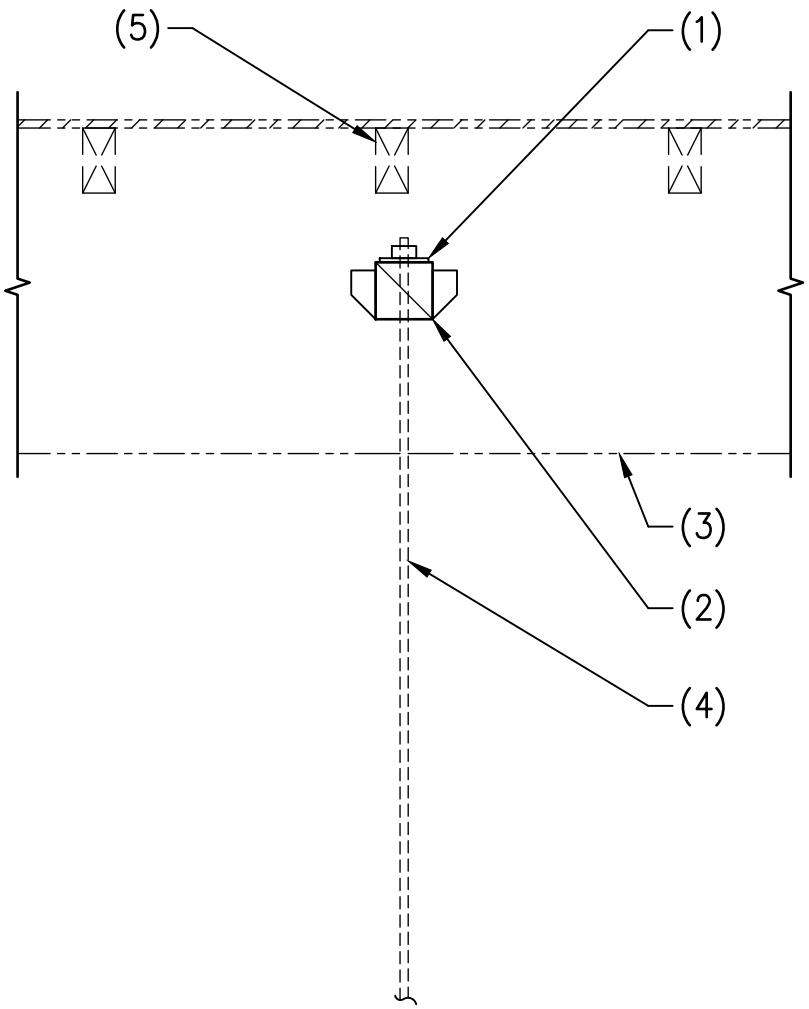
CARUSO ■ TURLEY ■ SCOTT ■ INC.
CONSULTING STRUCTURAL ENGINEERS
1215 WEST RIO SALADO PARKWAY SUITE 200
TEMPE, ARIZONA 85281 www.ctsaz.com
Ph: (480)774–1700 Fax: (480)774–1701

JOB NUMBER	DRAWN
20–0490	MDF
DATE	ENGR
04.22.2020	CJH

TITLE
WINDOW ROCK
WINDOW ROCK UNIFIED SCHOOL DISTRICT
FT. DEFIANCE, ARIZONA

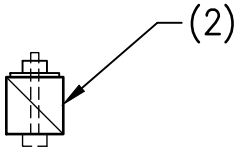
SHEET REF
N/A

SSK1



NOTES:

1. 1/4"x3"x3" WASHER.
2. 4x4 BLOCKING WITH LU HANGER EACH END.
3. EXISTING WOOD BEAM.
4. THREADED ROD.
5. EXISTING 2x AT 24" O.C. AS OCCURS



BRACE

02 HOOD SUPPORT

20-0490 NO SCALE

SEAL

Registered Professional Engineer (Structural)
CERTIFICATE NO.
23288
C.J.
ATKINSON
Date Signed: 04-22-20
ARIZONA, U.S.A.

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JOB NUMBER	DRAWN
20-0490	MDF
DATE	ENGR
04.22.2020	CJH

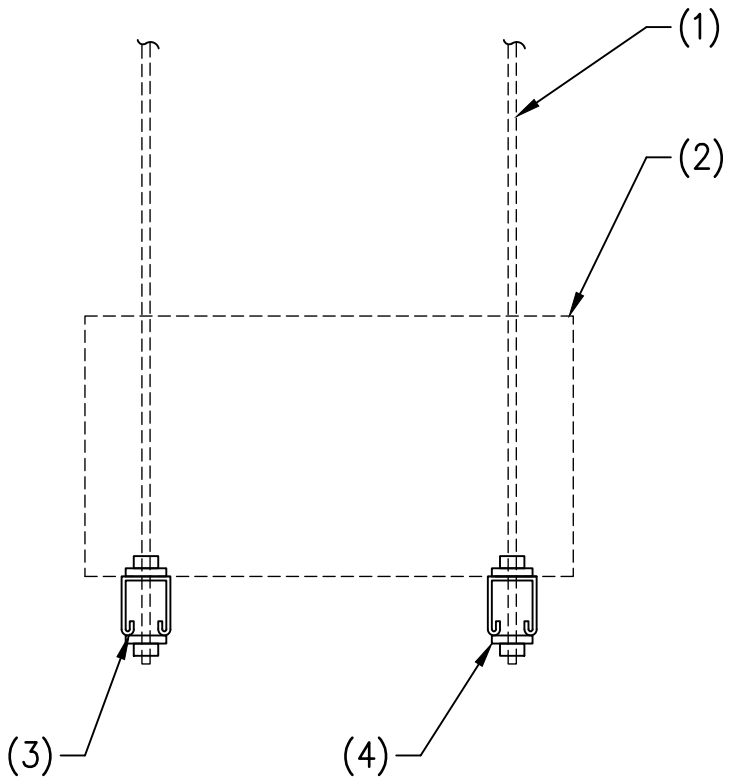
TITLE
WINDOW ROCK
WINDOW ROCK UNIFIED SCHOOL DISTRICT
FT. DEFIANCE, ARIZONA

SHEET REF
N/A

SSK2

NOTES:

1. 1/2" DIA THREADED ROD.
2. EQUIPMENT WITH 1/2" DIA BOLT EACH CORNER TO UNISTRUT.
3. UNISTRUT ANGLE FITTING.
4. 1/4" SQ. PLATE WASHERS AND NUTS TOP AND BOTTOM.



03 SUSPENDED EQUIPMENT SUPPORT

20-0490 NO SCALE

SEAL

Registered Professional Engineer (Structural)
CERTIFICATE NO.
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C.J.
ATKINSON
Date Signed: 04-22-20
ARIZONA, U.S.A.

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JOB NUMBER	DRAWN
20-0490	MDF
DATE	ENGR
04.22.2020	CJH

TITLE
WINDOW ROCK
WINDOW ROCK UNIFIED SCHOOL DISTRICT
FT. DEFIANCE, ARIZONA

SHEET REF
N/A

SSK3