CONTROLS

PG	AIR PRESSURE GAUGE
S	AIR SAMPLING POINT
CDS	CARBON DIOXIDE SENSOR
CO	CARBON MONOXIDE SENSOR
CO2	COMBUSTIBLE GAS SENSOR
CT	CURRENT SENSOR
CT	CURRENT TRANSMITTER WITH LEAD
D	DEWPOINT SENSOR
DPS	DIFFERENTIAL PRESSURE SENSOR
DPT	DIFFERENTIAL PRESSURE TRANSMITTER
FM	FLOW METER
FS	FLOW SWITCH
FT	FLOW TRANSMITTER
FZ	FREEZE STAT
HOA	HAND SWITCH
H	HUMIDITY SENSOR
LC	LEVEL CONTROL
LS	LIMIT SWITCH
LPI	LOOP POWER INDICATOR
NOx	NITROGEN OXIDE SENSOR
O	OCCUPANCY SENSOR
O2	OXYGEN SENSOR
P	POSITION INDICATOR
PS	PRESSURE SENSOR
R	REFRIGERANT SENSOR
RH	RELATIVE HUMIDITY SENSOR
R	RELAY
R	ROOM HUMIDITY SENSOR
SP	STATIC PRESSURE SENSOR
TS	TEMPERATURE SENSOR
T	THERMOSTAT
T	THERMOSTAT WITH GUARD
TVOC	TOTAL VOLATILE ORGANIC COMPOUND SENSOR
VIB	VIBRATION SENSOR
AFS	AIR FLOW SWITCH
I / P	CURRENT TO PRESSURE
E / P	ELECTRIC / PNEUMATIC
SCR	SILICON CONTROLLED RECTIFIER
TCP	TEMPERATURE CONTROL PANEL
TEC	TERMINAL EQUIPMENT CONTROLLER
	SENSOR WELL
	ALARM HORN
	ALARM BEACON
AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI	DIRECT INPUT
DO	DIRECT OUTPUT
VFD	STARTER
VFD	VARIABLE FREQUENCY DRIVE
	NON MOTORIZED VALVE
M	TWO WAY MOTORIZED VALVE
M	THREE WAY MOTORIZED VALVE
NO NC	TWO WAY SOLENOID VALVE
NO NC	THREE WAY SOLENOID VALVE
NC	TWO WAY PNEUMATIC VALVE
NO NC	THREE WAY PNEUMATIC VALVE
	PUMP
S	DUCT SMOKE DETECTOR
H	DUCT SMOKE DETECTOR
	AIR VALVE

CONTROLS

- UNITARY HEATING COIL
- UNITARY COOLING COIL
- UNITARY HEAT RECOVERY COIL
- FILTER
- AIR BLENDER
- ENERGY WHEEL
- PLATE ENERGY RECOVERY COIL
- AIR FLOW MEASURING STATION
- AIR FLOW PROBE
- BACKDRAFT DAMPER
- REFRIGERANT HOT GAS
- REFRIGERANT SUCTION
- DAMPER ACTUATOR - ELECTRIC
- DAMPER ACTUATOR - ELECTRIC
- CENTRIFUGAL FAN
- PROP FAN
- PLENUM FAN
- HUMIDIFIER
- ENERGY CORE
- ETHERNET CONNECTION
- CONTACT
- DDC PANEL
- COMPUTER

DRAWING INDEX

PRCNC20240647

Revision to "LOW ENGERGY BUILDING"
See architectural plans for insulation, cladding and finishes.

City of Puyallup
Building
REVIEWED
FOR
COMPLIANCE
RayC
05/10/2024
1:01:53 PM

PRCNC20240647

THE APPROVED CONSTRUCTION PLANS AND ALL ENGINEERING MUST BE POSTED ON THE JOB AT ALL INSPECTIONS IN A VISIBLE AND READILY ACCESSIBLE LOCATION.
PRINT in COLOR and to SCALE.

Approval of submitted plans is not an approval of omissions or oversight by this office or noncompliance with any applicable regulations of local government. The contractor is responsible for making sure that the building complies with all applicable building codes and regulations of the local government.

See separate engineering and architectural plans.

NOTE: NOT ALL SYMBOLS, SYSTEMS, AND ABBREVIATIONS MAY BE USED ON THIS PROJECT

FIRE PROTECTION

- FIRE - ANTIFREEZE
- FIRE - CLEAN AGENT
- FIRE - DELUGE
- FIRE - DRAIN
- FIRE - DRY
- FIRE - PRE-ACTION
- FIRE - WET
- SPRINKLER GUARD FOR UPTIGHT, PENDANT OR SIDEWALL SPRINKLER
- ABBREVIATION FOR ANTICORROSION
- ABBREVIATION FOR HIGH TEMPERATURE
- SPARE CABINET FOR 12 SPRINKLERS
- DRAINAGE PIPING
- FIRE EXTINGUISHER
- SIAMESE FIRE DEPARTMENT CONNECTION
- PRIVATE HYDRANT - ONE HOSE OUTLET
- PUBLIC HYDRANT - TWO HOSE OUTLETS
- PUBLIC HYDRANT - TWO HOSE OUTLETSAND PUMPER CONNECTION
- UPRIGHT SPRINKLER
- PENDANT SPRINKLER
- SIDEWALL SPRINKLER
- DRY PENDANT SPRINKLER
- DRY SIDEWALL SPRINKLER
- FIRE ALARM CONTROL PANEL
- FIRE VALVE CABINET
- SPRINKLER CABINET
- FIRE HOSE VALVE ASSEMBLY
- FIRE DAMPER
- SMOKE DAMPER
- FIRE SMOKE DAMPER
- DUCT MOUNTED SMOKE SENSOR
- SUPERVISED BUTTERFLY VALVE
- SUPERVISED BUTTERFLY VALVE NORMALLY CLOSED
- SUPERVISED GATE VALVE
- SUPERVISED OUSIDE SCREW AND YORK (OS&Y) VALVE
- SUPERVISED OS&Y VALVE
- SUPERVISED WATERFLOW SWITCH
- SUPERVISED BACKFLOW PREVENTER
- WET ALARM CHECK VALVE WITH TRIMING
- DELUGE ALARM CHECK WITH TRIMING
- AIR MENTENANCE DEVICE
- FLOOR AIR COMPRESSOR TANK
- MOUNTED AIR COMPRESSOR ASSEMBLY
- DRY ALARM CHCEK VALVE WITH TRIMING
- PREACTION ALARM CHECK VALVE WITH TRIMING
- BOSTER PUMP (ALBANY PUMP)
- TEST AND DRAIN VALVE
- PRESSURE REDUCING VALVE
- 1-1/2 FIRE CONNECTION ANGLE VALVE
- 2-1/2 FIRE CONNECTION ANGLE VALVE
- FLOOR CONTROL VALVE ASSEMBLY
- CHECK VALVE
- TREADED BALL VALVE
- GROOVED BALL VALVE
- HYDRAULIC GONG
- ELECTRIC BELL
- ELBOW WITH DRAIN 1 IN.
- GROOVE ELBOW
- GROOVE TEE
- FIRE DEPARTMENT CONNECTION AND BACKFLOW PREVENTER
- SIAMESE PROJECTING CONNECTION «Y»
- SIAMESE CONNECTION «Y» FREE STANDING
- BODY FOR FIRE DEPARTMENT CONNECTION AND BACKFLOW PREVENTER
- CONCENTRIC GROOVED MECHANICAL REDUCER
- GROOVED MECHANICAL TEE OR CAP
- REDUCING COUPLING
- THREADED MECHANICAL TEE OR CAP
- THREADED MECHANICAL CROSS
- THREADED MECHANICAL TEE
- HORIZONTAL SPLIT CASE FIRE PUMP
- END SUCTION FIRE PUMP
- VERTICAL INLINE FIRE PUMP
- FIRE PUMP ANGLE BODY 4 WAY
- JOCKEY PUMP
- PREACTION CABINET
- FIRE HOSE RACK
- SEISMIC EXPANSION LOOP
- WALL POST INDICATOR VALVE (PIV)
- HANGER
- HYDRANT VALVE CONTROL
- WALL HYDRANT
- WALL MOUNTED PORTABLE FIRE EXTINGUISHER
- SEMI RECESSED CABINET FOR PORTABLE EXTINGUISHER

PLUMBING SYSTEMS

- PIPE SIZE
- PIPING ROUTED BELOW SLAB OR GRADE
- ACID VENT
- ACID WASTE
- BOILER BLOWDOWN
- COMPRESSED AIR (NOMINAL PRESSURE)
- CONDENSATE DISCHARGE PUMPED
- CONDENSATE DRAIN
- DIONIZED WATER
- DIONIZED WATER RECIRCULATING
- DISTILLED WATER
- DOMESTIC COLD WATER
- DOMESTIC COLD WATER SOFTENED
- DOMESTIC HOT WATER
- DOMESTIC HOT WATER RECIRCULATION
- DRAIN
- GREASE WASTE
- HUMIDIFICATION
- LABORATORY VENT
- LABORATORY WASTE
- NATURAL GAS (LOW PRESSURE)
- GARAGE DRAINAGE
- NATURAL GAS VENT
- MEDIUM PRESSURE GAS
- NON-POTABLE COLD WATER
- NON-POTABLE COLD WATER SOFTENED
- NON-POTABLE HOT WATER
- NON-POTABLE HOT WATER SOFTENED
- PNEUMATIC TRANSPORT
- PROPANE GAS
- REVERSE OSMOSIS
- REVERSE OSMOSIS RECIRCULATION
- SAMPLING LINE
- SANITARY DRAIN
- SANITARY DRAIN (OIL)
- SANITARY PUMPED
- SANITARY RADIOACTIVE
- STORM DRAIN
- STORM DRAIN OVERFLOW
- STORM DRAIN PUMPED
- VACUUM (AIR)
- VACUUM PUMP EXHAUST
- VENT
- VENT (OIL)
- VENT (SEWAGE EJECTOR)
- PIPE INSULATION
- FIXTURE TRAP
- CATCH BASIN
- MAN HOLE
- ROOF DRAIN
- FLOOR DRAIN
- FUNNEL FLOOR DRAIN
- TRAP PRIMER
- HOSE BIBB
- PLUMBING FIXTURES

LAB & MEDICAL GAS

- ANESTHETIC EVACUATION
- CARBON DIOXIDE
- DENTAL COMPRESSED AIR
- DENTAL VACUUM
- HELIUM
- HYDROGEN
- INSTRUMENT AIR
- LABORATORY COMPRESSED AIR
- LABORATORY VACUUM
- MEDICAL AIR
- MEDICAL VACUUM
- NITROGEN
- NITROUS OXIDE
- OXYGEN
- MEDICAL AIR OUTLET
- MEDICAL VACUUM OUTLET
- MEDICAL NITROGEN OUTLET
- MEDICAL NITROUS OXIDE OUTLET
- MEDICAL OXYGEN OUTLET
- LAB AIR SINGLE BENCH OUTLET
- LAB VACUUM SINGLE BENCH OUTLET
- LAB NITROGEN SINGLE BENCH OUTLET
- LAB NITROUS OXIDE SINGLE BENCH OUTLET
- LAB OXYGEN SINGLE BENCH OUTLET
- LAB DOUBLE 45 DEGREE BENCH OUTLET
- LAB DOUBLE BENCH OUTLET
- LAB QUAD 45 DEGREE BECNH OUTLET
- MEDICAL GAS MASTER ALARM PANEL
- MEDICAL GAS AREA ALARM PANEL
- MEDICAL GAS ZONE VALVE
- BALL VALVE
- CHECK VALVE

PIPING SYSTEMS (HVAC)

- PIPE SIZE
- BOILER BLOWDOWN
- BOILER FEED WATER
- BRINE RETURN
- BRINE SUPPLY
- CHILLED WATER RETURN
- CHILLED WATER RETURN - GLYCOL
- CHILLED WATER RETURN - PROCESS
- CHILLED WATER SUPPLY
- CHILLED WATER SUPPLY - GLYCOL
- CHILLED WATER SUPPLY - PROCESS
- CONDENSER WATER RETURN
- CONDENSER WATER RETURN - COOLING TOWER
- CONDENSER WATER SUPPLY
- CONDENSER WATER SUPPLY - COOLING TOWER
- DUAL TEMPERATURE RETURN (HOT OR CHILLED)
- DUAL TEMPERATURE SUPPLY (HOT OR CHILLED)
- FLUID COOLER FILTRATION SUPPY
- FLUID COOLER FILTRATION RETURN
- FUEL OIL FILL
- FUEL OIL RETURN
- FUEL OIL SUPPLY
- FUEL OIL VENT
- HEAT RECOVERY LOOP RETURN
- HEAT PUMP WATER SUPPLY
- HEAT RECOVERY LOOP RETURN
- HEAT RECOVERY LOOP SUPPLY
- HEATING WATER RETURN
- HEATING WATER RETURN - GLYCOL
- HEATING WATER SUPPLY
- HEATING WATER SUPPLY - GLYCOL
- NATURAL GAS
- NATURAL GAS VENT
- RADON GAS
- REFRIGERANT HOT GAS
- REFRIGERANT LIQUID
- REFRIGERANT SUCTION
- REFRIGERANT VENT
- RELIEF VENT
- STEAM (NOMINAL PRESSURE)
- STEAM - CLEAN (NOMINAL PRESSURE)
- STEAM CONDENSATE (NOMINAL PRESSURE)
- STEAM PUMPED CONDENSATE (NOMINAL PRESSURE)
- STEAM VENT
- PIPE INSULATION

PIPING COMPONENTS

REAL OBJECT	SYMBOL	
		ISOLATION VALVE (GENERIC)
		GATE VALVE
		GLOBE VALVE
		BUTTERFLY VALVE NPS 6 AND LESS
		BUTTERFLY VALVE NPS 8 AND MORE
		BALL VALVE
		PLUG VALVE
		NEEDLE VALVE
		CHECK VALVE (GENERIC)
		BALANCING VALVE
		FLOW LIMITING VALVE
		PRESSURE REDUCING VALVE
2-WAY		2-WAY CONTROL VALVE (GENERIC)
2-WAY		TWO-WAY ELECTRIC CONTROL VALVE, BUTTERFLY TYPE
3-WAY		3-WAY CONTROL VALVE (GENERIC)
3-WAY		THREE-WAY ELECTRIC CONTROL VALVE, BUTTERFLY TYPE
		SOLENOID 2-WAY CONTROL VALVE
		SOLENOID 3-WAY CONTROL VALVE
		FLOAT OPERATED VALVE ACTUATOR
		SAFETY OR RELIEF VALVE
		ANGLE VALVE
		BOILER STOP AND CHECK VALVE
		DOUBLE CHECK VALVE ASSEMBLY
		MULTI-PURPOSE VALVE (SHUT-OFF, BALANCING AND CHECK)
		REDUCE PRESSURE BACKFLOW PREVENTER
		SUCTION DIFFUSER
		PUMP (GENERIC)
		Y-STRAINER (GENERIC)
		STEAM TRAP (GENERIC)
		AUTOMATIC AIR VENT
		MANUAL AIR VENT
		VACUUM BREAKER
		SHOCK ABSORBER
		TEMPERATURE GAUGE
		PRESSURE GAUGE
		TEMPERATURE AND PRESSURE TRAP
		SIGHT FLOW GLASS
		FLEXIBLE CONNECTOR
		EXPANSION JOINT
		GUIDE
		ANCHOR
		FLOW ARROW
		PIPING SLOPE
		PIPE CAP
		PIPE BREAK
		PIPE CROSS
		PIPING ELBOW UP
		PIPING ELBOW DOWN
		PIPING TEE UP
		PIPING TEE DOWN
		UNION CONNECTION
		FLANGED CONNECTION
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		STANDARD CLEAN-OUT IN LINE END OF RUN
		STANDARD CLEAN-OUT THROUGH FLOOR END OF RUN
		STANDARD CLEAN-OUT THROUGH FLOOR IN LINE
		DIFFERENTIAL PRESSURE CONTROL VALVE
		Y-PATTERN MANUAL BALANCING/SHUT-OFF VALVE
		PRESSURE INDEPENDENT CONTROL VALVE

WORK DEFINITION

- NEW WORK (N)
- EXISTING (E)
- REMOVE EXISTING (D)
- REMOVE EXISTING EQUIPMENT (D)
- FUTURE
- TEMPORARY, AS NOTED
- RELOCATE (R)
- KEY NOTE
- EQUIPMENT IDENTIFICATION
- CONNECTION TO EXISTING
- DISCONNECT (CUT AND CAP)

(HVAC)

***NOTE:** ALL DUCT SIZES ARE INTERIOR, FREE DIMENSIONS ALWAYS WIDTH (HORIZONTAL DIM.) x HEIGHT (VERTICAL DIM.)

- AIR FLOW ARROW
- 18"x12" — 18"x12" — RECTANGULAR DUCT AND SIZE*
- 18"ø — 18"ø — ROUND DUCT AND SIZE*
- 18"x12"ø — 18"x12"ø — FLAT OVAL DUCT AND SIZE*
- 18"x12" — EXTERIOR DUCT TREATMENT*
- 18"x12" — 18"x12" — RECTANGULAR DUCT WITH ACOUSTIC LINING*
- 30"x12" — DUCT SECTION, SUPPLY AIR. APPLIES TO RECT., ROUND AND OVAL
- DUCT SECTION, OUTSIDE AIR. APPLIES TO RECT., ROUND AND OVAL
- DUCT SECTION, RETURN AIR. APPLIES TO RECT., ROUND AND OVAL
- DUCT SECTION, EXHAUST AIR. APPLIES TO RECT., ROUND AND OVAL
- FLEXIBLE DUCT
- ELBOW TURN, SUPPLY DOWN. APPLIES TO RECT., ROUND AND OVAL
- DUCT SECTION, OUTSIDE AIR. APPLIES TO RECT., ROUND AND OVAL
- DUCT SECTION, OUTSIDE AIR. APPLIES TO RECT., ROUND AND OVAL
- DUCT SECTION, OUTSIDE AIR. APPLIES TO RECT., ROUND AND OVAL
- UP — CHANGE IN DUCT ELEVATION RISING IN DIRECTION INDICATED
- DN — CHANGE IN DUCT ELEVATION DROPPING IN DIRECTION INDICATED
- END CAP
- ELBOW, RECTANGULAR, SMOOTH RADIUS WITH SPLITTER VANES (0.25 R/W DEFAULT)
- ELBOW, RECTANGULAR, SMOOTH RADIUS WITHOUT VANES (1.5 R/W DEFAULT)
- ELBOW, ROUND, SMOOTH RADIUS (1.5 R/W DEFAULT)
- MITERED ELBOW, RECTANGULAR, WITHOUT VANES
- MITERED ELBOW, RECTANGULAR, WITH TURNING VANES
- RECTANGULAR TO ROUND TRANSITION
- DUCT ACCESS DOOR (TOP, SIDE, BOTTOM)
- FLEXIBLE CONNECTION
- BDD — BACKDRAFT DAMPER
- ODD — CABLE OPERATED DAMPER
- MANUAL DAMPER
- M — MOTORIZED DAMPER
- CAR — PRESSURE INDEPENDENT REGULATOR
- FIRE DAMPER
- SMOKE DAMPER
- SMOKE AND FIRE DAMPER
- DUCT SILENCER/TRANSFER ELBOW
- T — CONTROL DEVICE (REFER TO CONTROLS LEGEND)
- AIR FLOW MEASURING STATION (REFER TO CONTROLS LEGEND)
- QUANTITY
- TYPE
- SIZE (IN.)
- VOLUME (CFM)
- AIR OUTLET OR INLET TAG)REFER TO SCHEDULE)
- RECTANGULAR DIFFUSER, SUPPLY. OPTIONAL ARROWS SHOW THE FLOW DIRECTION.
- RECTANGULAR REGISTER OR GRILLE, RETURN
- RECTANGULAR REGISTER OR GRILLE, EXHAUST
- ROUND DIFFUSER, SUPPLY
- LINEAR DIFFUSER
- SIDEWALL REGISTER OR GRILLE, SUPPLY
- SIDEWALL GRILLE, RETURN OR EXHAUST
- UC — UNDERCUT DOOR
- DOOR GRILLE OR LOUVER
- TRANSFER GRILLE OR LOUVER
- COIL (REFER TO CONTROLS LEGEND)
- QUANTITY
- TYPE
- LENGTH (FT.)
- CAPACITY (MBH)
- RADIATION HEATING TAG (REFER TO SCHEDULE)

ABBREVIATIONS

A/C	AIR CONDITIONING UNIT
AAV	AUTOMATIC AIR VENT
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJUSTABLE
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFR	ABOVE FINISH ROOF
AHJ	AUTHORITY HAVING JURISDICTION
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
AVG	AVERGAGE
BAS	BUILDING AUTOMATION SYSTEM
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BMS	BUILDING MANAGEMENT SYSTEM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
C/W	COMPLETE WITH
CAV	CONSTANT AIR VOLUME
CBV	CIRCUIT BALANCING VALVE
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB TEMEPRATURE
dB	DECIBEL(S)
dBA	A-WEIGHTED DECIBLES
DDC	DIRECT DIGITAL CONTROL
DEG	DEGREE
DIA./Ø	DIAMETER
DIFF	DIFFERENTIAL
DIV	DIVISION
DN	DOWN
DWG	DRAWING
EA	EXHAUST AIR
EA (D)	EXHAUST AIR, DISHWASH
EA (G)	EXHAUST AIR, GENERAL
EA (K)	EXHAUST AIR, KITCHEN
EA (LAB)	EXHAUST AIR, LABORATORY
EA (LD)	EXHAUST AIR, LAUNDRY/DRYER
EA (W)	EXHAUST AIR, WASHROOM
EAT	ENTERING AIR TEMPERATURE
EAV	EXHAUST AIR VALVE
ECM	ELECTRONICALLY COMMUNICATED MOTOR
ED	EXISTING TO BE DEMOLISHED (DEMOLITION PLANS)
EER	ENERGY EFFICIENCY RATIO
EG	ETHELYENE GLYCOL
EMCS	ENERGY MANAGMENT CONTROL SYSTEM
ER	EXISTING RELOCATED (NEW CONSTRUCTION PLANS)
ERL	EXISTING TO BE RELOCATED (DEMOLITION PLANS)
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
EXIST / E	EXISTING (DEMOLITION PLANS)
FC	FAIL CLOSED
FLA	FULL LOAD AMPERAGE
FO	FAIL OPEN
FP	FIRE PROTECTION
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FOOT/FEET
GA	GAUGE
GAL	GALLON (US)
GC	GENERAL CONTRACTOR
GEO	GEODETIC
GPM	GALLONS PER MINUTE
HEPA	HIGH EFFICIENCY PARTICULATE AIR (FILTER)
HP	HORSEPOWER
HR	HOUR
HVAC	HEATING / VENTILATING / AIR CONDITIONING
HZ	HERTZ
IE	INVERT ELEVATION
IEER	INTEGRATED ENERGY EFFECIENCY RATIO
IN	INCHES
IN WG	INCHES WATER GAUGE
IPLV	INTEGRATED PART LOAD VALUE
kW	KILOWATT
kWh	KILOWATT HOUR
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LF	LINEAR FEET
LWT	LEAVING WATER TEMPERATURE
M	METER
MAX	MAXIMUM
MBH	THOUSAND OF BTUH
MCA	MINIMUM CIRCUIT AMPS
MERV	MINIMUM EFFECIENCY REPORTING VALUES
MFR	MANUFACTURER
MIN	MINIMUM
MOP	MAXIMUM OVERCURRENT PROTECTION
MWT	MEAN WATER TEMPERATURE
N/A	NOT APPLICABLE
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NPS	NOMINAL PIPE SIZE
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFE	OWNER FURNISHED EQUIPMENT
OFOI	OWNER FURNISHED / OWNER INSTALLED
PG	PROPYLENE GLYCOL
POE	POINT OF ENTRANCE
POS	POINT OF SERVICE
PPM	PARTS PER MILLION
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH, ABSOLUTE
PSIG	POUNDS PER SQUARE INCH, GAGE
PTS	PNEUMATIC TUBE STATION
PVC	POLYVINYL CHLORIDE
RA	RETURN AIR
RELA	RELIEF AIR
REQD	REQUIRED
RH	RELATIVE HUMIDITY
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SEER	SEASONAL ENERGY EFFICIENCY RATION
SP	STATIC PRESSURE
SP	STAIR PRESSURIZATION AIR (")
SRV	SAFETY RELIEF VALVE
TA	TRANSFER AIR
TEMP	TEMPERATURE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TYP	TYPICAL
UC	UNDER CUT (DOOR)
UG	UNDERGROUND
UP	UP
VAV	VARIABLE AIR VOLUME
VFD	VARIABLE FREQUENCY DRIVE
VIF	VERIFY IN FIELD
VTR	VENT-THRU-ROOF
W/	WITH
W/O	WITHOUT
WB	WET BULB TEMPERATURE
WG	WATER GAUGE
ZN.#	ZONE
°C	CELSIUS
°F	FAHRENHEIT

EQUIPMENT IDENTIFICATION

AB-#	AIR BLENDER
AC-#	AIR COMPRESSOR
ACU-#	AIR CONDITIONING UNIT
ADS-#	AIR AND DIRT SEPARATOR
AF-#	AIR FILTER
AHU-#	AIR HANDLING UNIT
AS-#	AIR SEPARATOR
ATU-#	AIR TERMINAL UNIT
B-#	BOILER
BCU-#	BLOWER COIL UNIT
BT-#	BATH TUB
CB-#	CHILLED BEAM
CC-#	COOLING COIL
CH-#	CHILLER
CONV-#	CONVECTOR
CRU-#	CONDENSATE RETURN UNIT
CT-#	COOLING TOWER
CU-#	CONDENSING UNIT
CUH-#	CABINET UNIT HEATER
CV-#	CONTROL VALVE
DAC-#	DOOR AIR CURTAIN
DC-#	DUST COLLECTOR
DCT-#	DECONTAMINATION TANK
DCVA-#	DOUBLE CHECK VALVE ASSEMBLY
DF-#	DRINKING FOUNTAIN
DG-#	DOOR GRILLE
DS-#	DUCT SILENCER
DU-#	DEHUMIDIFICATION UNIT
DWH-#	DOMESTIC WATER HEATER
E-#	EXHAUST GRILLE / REGISTER / DIFFUSER
EL-#	EXPANSION LOOP
ERC-#	ENERGY RECOVERY COIL
ERU-#	ENERGY RECOVERY UNIT
ES-#	EMERGENCY SHOWER
ETU-#	EXHAUST TERMINAL UNIT
EWC-#	ELECTRIC WATER COOLER
EWS-#	EYE WASH STATION
F(C)-#	FAN CEILING
F(E)-#	FAN EXHAUST
F(LE)-#	FAN LABORATORY EXHAUST
F(R)-#	FAN RETURN
F(S)-#	FAN SUPPLY
F(T)-#	FAN TRANSFER
F-#	FAN
FCU-#	FAN COIL UNIT
FD-#	FLOOR DRAIN
FFU-#	FAN FILTER UNIT
FPP-#	FIRE PROTECTION PUMP
FPTU-#	FAN POWERED TERMINAL UNIT
FTR-#	FINNED TUBE RADIATOR
FUR-#	FURNACE
GFS-#	GLYCOL FEED SYSTEM
GSG-#	GAS-FIRED STEAM GENERATOR(")
H(C)-#	HOOD (CANOPY)
H(HC)-#	HOOD (HEAT AND CONDENSATE)
H(I)-#	HOOD (INTAKE)
H(K)-#	HOOD (KITCHEN)
H(R)-#	HOOD (RELIEF)
H(RH)-#	HOOD (RANGE)
H-#	HUMIDIFIER
HC-#	HEATING COIL
HP-#	HEAT PUMP
HRU-#	HEAT RECOVERY UNIT
HT-#	HYDROPNEUMATIC TANK
HX-#	HEAT EXCHANGER
LATU-#	LAB AIR TERMINAL UNIT
LAV-#	LAVATORY
MAC-#	MEDICAL AIR COMPRESSOR
MAU-#	MAKEUP AIR UNIT
MD-#	MOTORIZED DAMPER
MSK-#	MOP SINK
MV-#	MIXING VALVE
MVP-#	MEDICAL VACUUM PUMP
P-#	PUMP
PDU-#	POOL DEHUMIDIFICATION UNIT
PRV-#	PRESSURE REDUCING VALVE
PTAC-#	PACKAGED TERMINAL AIR CONDITIONER
R-#	RETURN AIR GRILLE / REGISTER / DIFFUSER
RD-#	ROOF DRAIN
RH-#	RANGE HOOD
RP-#	RADIANT PANEL
RPBP-#	REDUCED PRESSURE BACKFLOW PREVENTER
RTU-#	ROOFTOP UNIT
S-#	SUPPLY GRILLE / REGISTER / DIFFUSER
SH-#	SHOWER
SK-#	SINK
SPC-#	SOLAR PANEL COLLECTOR
SSF-#	SIDE STREAM FILTER
T(B)-#	TANK (BUFFER TANK)
T(E)-#	TANK (EXPANSION TANK)
T(H)-#	TANK (HYDRO PNEUMATIC TANK)
T(S)-#	TANK (STORAGE TANK)
T-#	TRANSFER AIR GRILLE
UH-#	UNIT HEATER
UR-#	URINAL
USG-#	UNFIRED STEAM GENERATOR
UV-#	UNIT VENTILATOR
VA-#	VALVE
VFD-#	VARIABLE FREQUENCY DRIVE
WC-#	WATER CLOSET
WS-#	WATER SOFTENER
L-#	LOUVER

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JEFFREY M. LINDH — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER
2024-05-30

Revision No.	Description	Date

Drawn By: JLV
Checked By: BO

Title: MECHANICAL SWITCHGEAR LEGEND AND ABBREVIATIONS

Sheet: M500

FAN SCHEDULE

UNIT IDENTIFICATION			MAX AIRFLOW (CFM)	ESP (IN-WG)	FAN WHEEL		FAN MOTOR				ELECTRICAL		OPERATING WEIGHT (LBS.)	MANUFACTURER	MODEL NUMBER	NOTES
MARK	NUMBER	UNIT/AREA SERVED			TYPE	SPEED (RPM)	BHP	HP	SPEED (RPM)	DRIVE TYPE	VOLTS	PHASE				
TF	1	SWITCHGEAR ROOM	200	0.25	INLINE	1,276	0.1	1/6	1,276	DIRECT	120	1	80	GREENHECK	BSQ-90	1

NOTES:
1. PROVIDE WITH SPEED CONTROLLER, BACKDRAFT DAMPER, .

LOUVER SCHEDULE

UNIT IDENTIFICATION			TYPE	MAX APD ("W.C.)	BLADE TYPE	NET FREE AREA (SF)	SIZE (")	MANUFACTURER	MODEL NUMBER	NOTES
MARK	NUMBER	SYSTEM SERVED								
LVR	1	SWITCHGEAR ROOM	STATIONARY	0.1	HORIZONTAL DRAINABLE	1.94	24"X24"	RUSKIN	ELF375	
LVR	2	SWITCHGEAR ROOM	STATIONARY	0.1	HORIZONTAL DRAINABLE	2.64	28"X28"	RUSKIN	ELF375	

NOTES:
1. PROVIDE WITH CLASS 1A MOTORIZED DAMPER INTERLOCKED WITH FAN OPERATION.

2

GENERAL NOTES

1. THE MECHANICAL PLANS ARE DIAGRAMMATIC IN NATURE AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL OF THE DETAILS FOR THE EQUIPMENT. THE MECHANICAL CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT AND ENSURE THAT IT WILL FIT IN THE AVAILABLE SPACE.
2. MECHANICAL CONTRACTOR RESPONSIBLE FOR INSTALLATION OF COMPLETED AND OPERATIONAL SYSTEMS WITH DUE RESPECT TO ALL APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION.
3. IT IS THE CONTRACTOR RESPONSIBILITY TO FIELD VERIFY ALL CONNECTION POINTS PRIOR TO INSTALL. NOT ALL CONNECTION SIZES ARE SHOWN, BUT THOSE THAT ARE APPROXIMATE AND TAKEN FROM EXISTING AS-BUILTS AND FIELD OBSERVATIONS.
4. COORDINATE PIPE ROUTING WITH DUCTWORK, SPRINKLER PIPING AND ELECTRICAL POWER/LIGHTING CIRCUITING AND STRUCTURAL MEMBERS PRIOR TO INSTALLATION.
5. CONTRACTORS TO VERIFY ALL GRADES, DIMENSIONS AND EXISTING CONDITIONS AT THE SITE BEFORE PROCEEDING WITH WORK. NOTIFY PRIME CONSULTANT OF ANY DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL CONDITIONS BEFORE INSTALLATION.
6. EQUIPMENT AND SYSTEMS SHALL COMPLY WITH 2021 WASHINGTON STATE ENERGY AND MECHANICAL CODES.
7. COORDINATE INSTALLATION OF PIPING AND DUCTWORK WITH ELECTRICAL CONTRACTOR AND OTHER TRADES.
8. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS NEEDED TO CONSTRUCT WORK SHOULD IN THE CONSTRUCTION DOCUMENTS AND ACCOMPANYING SPECIFICATIONS.
9. IF THERE IS A CONFLICT BETWEEN THE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, THE MOST STRINGENT WILL APPLY.
10. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURERS. CONTRACTOR TO PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS, VALVES, AND OTHER DEVICES REQUIRED FOR A COMPLETE WORKABLE INSTALLATION.
11. BUILDING IS UNHEATED AND SHALL BE CLASSIFIED AS A LOW ENERGY BUILDING PER C4021.1.1.
12. SYSTEMS ADHERE TO SECTION C403.3.2 HVAC EQUIPMENT PERFORMANCE REQUIREMENTS: EQUIPMENT SHALL MEET THE MINIMUM EFFICIENCY REQUIREMENTS OF TABLES C403.3.2(1) THROUGH C403.3.2(12) WHEN TESTED AND RATED IN ACCORDANCE WITH THE APPLICABLE TEST PROCEDURE.
13. SYSTEMS ADHERE TO C405.8 ELECTRIC MOTOR EFFICIENCY:
    A. ALL ELECTRIC MOTORS, FRACTIONAL OR OTHERWISE, SHALL MEET THE MINIMUM EFFICIENCY REQUIREMENTS OF TABLES C405.8(1) THOUGH C405.8(4) WHEN TESTED IN ACCORDANCE WITH DOE 10 CFR UNLESS OTHER EXCEPTIONS ARE QUALIFIED AND MET BY THIS SECTION.
    B. FRACTIONAL HP FAN MOTORS THAT ARE 1/12 HP OR GREATER AND LESS THAN 1 HP (BASED ON THE OUTPUT POWER) WHICH ARE NOT COVERED IN TABLES C405.8(3) AND C405.8(4) SHALL BE ELECTRONICALLY COMMUTATED MOTORS OR SHALL HAVE A MINIMUM MOTOR EFFICIENCY OF 70 PERCENT WHEN RATED IN ACCORDANCE WITH DOE 10 CFR 431.
14. PENETRATIONS OF DUCTS, PIPES, CONDUITS, ETC IN WALLS REQUIRING PROTECTED OPENINGS SHALL BE FIRE STOPPED, FIRE STOP MATERIAL, SHALL BE A UL/ULC-LISTED ASSEMBLY APPROPRIATE FOR FIRE OR SMOKE PENETRATIONS AS APPLICABLE AND AS APPROVED BY THE FIRE MARSHAL.
15. THE MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL FIRE, SMOKE, OR COMBINATION SMOKE/FIRE DAMPERS AND ACCESS PANELS COMMENSURATE WITH THE RATING OF THE WALL IN ALL DUCTWORK THAT PENETRATES FIRE WALLS, FIRE BARRIERS, FIRE PARTITIONS, SMOKE BARRIERS AND SMOKE PARTITION IN ALL DUCTWORK THAT PENETRATES A HORIZONTAL OR VERTICAL FIRE PARTITION, OR AS OTHERWISE SHOWN ON THE DRAWINGS.
16. ALL BRANCH DUCTS SHALL HAVE VOLUME DAMPERS.
17. WHERE FLOW EXCEEDS 150 CFM, THE CONTRACTOR SHALL USE SMOOTH RADIUS ELBOWS OR TURNING VANES.
18. ALL DUCT JOINTS SHALL BE SEALED IN ACCORDANCE WITH SMACNA STANDARDS.
19. ALL DUCT DIMENSIONS ARE NET INSIDE VALUES. DIMENSIONS MAY BE CHANGED PROVIDED THAT THE NET FREE AREA IS MAINTAINED.
20. ALL CONCEALED DUCTWORK SHALL BE INSULATED WITH 1" FIBERGLASS INSULATING BLANKET WITH ALUMINUM FOIL FACING.
21. ALL DUCTWORK SHALL BE CONSTRUCTED, ERECTED AND TESTED IN ACCORDANCE WITH THE LOCAL REGULATIONS AND PROCEDURES DETAILED IN THE APPLICABLE STANDARDS ADOPTED BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION. (SMACNA).
22. ALL DUCTWORK SHALL BE CONSTRUCTED AND SEALED PER IMC.
23. DUCTWORK SHALL MEET THE AIR LEAKAGE REQUIREMENTS OF 2021 WSEC C402.5 AND VAPOR RETARDER REQUIREMENTS PER THE IBC.
24. ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE OR METAL STRAPS TO SUPPORT PIPES WILL NOT BE PERMITTED. REFER TO SPECIFICATIONS FOR MINUMUM SPACING OF PIPE SUPPORTS.
25. ALL EQUIPMENT TO BE INSTALLED ON MIN 6" THICK CONCRETE HOUSEKEEPING PADS.
26. ALL EQUIPMENT, DUCTS PIPING, AND OTHER DEVICES AND MATERIALS INSTALLED OUTSIDE OF THE BUILDING OR OTHERWISE EXPOSED TO THE WEATHER SHALL BE COMPLETELY WEATHERPROOFED.
27. MECHANICAL EQUIPMENT, DUCTS AND PIPING ARE TO BE COORDINATED WITH STRUCTURAL JOISTS AND CROSS BRACING.
28. ALL EXPOSED PIPING IN OCCUPIED SPACES SUBJECT TO ARCHITECTURAL APPROVAL PRIOR TO INSTALLATION.
29. ALL DUCTWORK SHALL BE CONSTRUCTED AND SEALED PER IMC.
30. THE HVAC SYSTEMS SHALL BE TESTED AND BALANCED BY AN INDEPENDENT AGENCY, UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER PRIOR TO COMMISSIONING. A SEALED TYPE WRITTEN REPORT SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER.
31. A BUILDING COMMISSIONING PROCESS AND FUNCTIONAL TESTING OF MECHANICAL SYSTEMS SHALL BE CARRIED OUT BY A CERTIFIED COMMISSIONING PROFESSIONAL IN ACCORDANCE WITH 2021 WSEC SECTION C408. THE MECHANICAL, ELECTRICAL, PLUMBING, AND CONTROL CONTRACTORS ARE REQUIRED TO PERFORM FUNCTIONAL PERFORMANCE TESTING OF ALL EQUIPMENT PRIOR TO TESTING BY THE COMMISSIONING AGENT. CONTRACTORS SHALL PROVIDE THE NECESSARY ASSISTANCE TO THE COMMISSIONING AGENT TO PERFORM COMMISSIONING DUTIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING CORRECTIVE ACTION IF ANY DEFICIENCIES ARE FOUND DURING COMMISSIONING.
32. SYSTEMS ADHERE TO 2021 WSEC SECTION C408 SYSTEM COMMISSIONING:
    A. A CERTIFIED COMMISSIONING PROFESSIONAL (CCP) SHALL LEAD THE COMMISSIONING PROCESS. A CCP IS AN INDIVIDUAL WHO IS CERTIFIED BY AN ANSI/ISO/IEC 17024:2012 ACCREDITED ORGANIZATION TO LEAD, PLAN, COORDINATE, AND MANAGE COMMISSIONING TEAMS AND IMPLEMENT THE COMMISSIONING PROCESS.
    B. A CERTIFIED COMMISSIONING PROFESSIONAL SHALL PERFORM THE FOLLOWING:
        a. DEVELOP A COMMISSIONING PLAN.
        b. REVIEW BUILDING DOCUMENTATION AND CLOSE-OUT SUBMITTALS.
        c. PROVIDE A COMMISSIONING REPORT.
        d. LIST SPECIFIC EQUIPMENT, APPLIANCES AND SYSTEMS COMMISSIONED.
    C. FUNCTIONAL TESTING SHALL BE COMPLETED FOR THE FOLLOWING SYSTEMS AND THEIR ASSOCIATED CONTROL SYSTEMS:
        a. MECHANICAL SYSTEMS
        b. SERVICE WATER HEATING SYSTEMS
        c. CONTROLLED RECEPTACLE AND LIGHTING SYSTEMS
        d. EQUIPMENT APPLIANCE AND SYSTEMS
        e. ENERGY METERING
        f. REFRIGERATION SYSTEMS
    D. A COMMISSIONING REPORT SHALL BE DELIVERED TO THE BUILDING OWNER AND INCLUDE:
        a. RESULTS OF THE FUNCTIONAL PERFORMANCE TESTS
        b. LIST OF DEFICIENCIES AND CORRECTIVE MEASURES IMPLEMENTED OR PROPOSED.
        c. FUNCTIONAL PERFORMANCE TEST PROCEDURES.
        d. COMMISSIONING PLAN.
        e. TAB REPORT.
33. TESTING AND BALANCING: ALL HVAC SYSTEMS SHALL BE BALANCED BY A LICENSED CONTRACTOR IN ACCORDANCE WITH ACCEPTED ENGINEERING STANDARDS AND SPECIFICATIONS PRIOR TO COMMISSIONING.
34. OWNER TRAINING BY CONTRACTORS FOR EACH PIECE OF EQUIPMENT OR SYSTEM SHALL INCLUDE: SYSTEM/EQUIPMENT OVERVIEW (WHAT IT IS, WHAT IT DOES, AND WHICH OTHER SYSTEMS OR EQUIPMENT DOES IT INTERFACE WITH). REVIEW OF THE AVAILABLE O&M MATERIALS. REVIEW OF THE RECORD DRAWINGS ON THE SUBJECT SYSTEM/EQUIPMENT. HANDS-ON DEMONSTRATION OF ALL NORMAL MAINTENANCE PROCEDURES, NORMAL OPERATING MODES, AND ALL EMERGENCY SHUTDOWN AND START-UP PROCEDURES.

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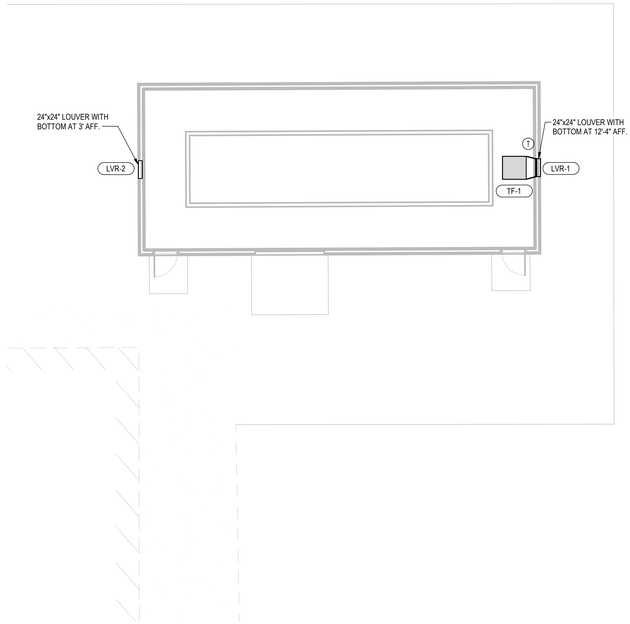
Sheet: **M501**



1 M502 **MECHANICAL SWITCHGEAR ENLARGED PLAN**

1/8" = 1'-0"

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