MECHANICAL AND PLUMBING LEGEND

- CONNECT TO EXISTING
- EXTENT OF DEMOLITION
- EXISTING
- DEMOLITION WORK SHOWN DARK AND HEAVY ON DEMOLITION DRAWINGS
- NEW WORK SHOWN DARK AND HEAVY ON NEW WORK DRAWINGS
- HWS — HEAT PUMP WATER SUPPLY
- HWR — HEAT PUMP WATER RETURN
- COLD WATER
- HOT WATER
- HOT WATER CIRCULATING
- SAN — SANITARY
- VENT
- CD — CONDENSATE DRAIN
- TEE TURNED DOWN
- TEE TURNED UP
- PIPING TURNED DOWN
- PIPING TURNED UP
- CAPPED PIPING
- BALL VALVE
- BALANCING VALVE
- THERMOSTAT
- METER
- UNIT HEATER
- FAN
- DIRECTION OF FLOW ARROW

- MOD — MOTOR OPERATED DAMPER
- OPPOSED BLADE DAMPER
- RECTANGULAR CEILING DIFFUSER, ARROWS INDICATE THROW DIRECTIONS
- RECTANGULAR RETURN AIR GRILLE
- RECTANGULAR EXHAUST AIR GRILLE
- 24x12 — DUCT DIMENSION (FIRST DIMENSION SHOWN IS "VIEWED" DIMENSION)
- AD — ACCESS DOOR
- R — RISE IN ELEVATION RELATIVE TO DIRECTION OF FLOW (D) INDICATES DROP
- SD-1 / 250 — AIR DEVICE TYPE; SD-1(UON); AIR QUANTITY (CFM)
- FLEXIBLE DUCT
- FLANGED ROUND TAKE-OFF WITH INTEGRAL VOLUME DAMPER
- 24x12 — SUPPLY OR OUTSIDE AIR DUCT (FIRST DIMENSION SHOWN IS TOP)
- 24x12 — RETURN DUCT (FIRST DIMENSION SHOWN IS TOP)
- 24x12 — EXHAUST DUCT (FIRST DIMENSION SHOWN IS TOP)
- DUCT TURNED UP
- DUCT TURNED DOWN
- TRANSITION
- RECTANGULAR BRANCH TAKE-OFF WITH VOLUME DAMPER
- RECTANGULAR ELBOW WITH TURNING VANES
- FD — FIRE DAMPER WITH ACCESS DOOR
- FLEXIBLE CONNECTION
- VOLUME DAMPER
- HB — HOSE BIBB
- CO — FLOOR CLEANOUT
- FD — FLOOR DRAIN
- FLOOR DRAIN
- CO — FLOOR CLEANOUT
- CO — FLOOR CLEANOUT

MECHANICAL AND PLUMBING ABBREVIATIONS

&	AND
@	AT
ABV	ABOVE
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AFS	AIRFLOW SWITCH
AP	ACCESS PANEL
BDD	BACKDRAFT DAMPER
BFP	BACK FLOW PREVENTER
BOD	BOTTOM OF DUCT
BPD	BYPASS DAMPER
BTUH	BRITISH THERMAL UNIT PER HOUR
CAP	CAPACITY
CD	CONDENSATE DRAIN
CFM	CUBIC FEET PER MINUTE
CLG	CEILING
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
DR	DRAIN
D-1	DAMPER DESIGNATOR
dB	DECIBLES
DB	DRY BULB
DCW	DOMESTIC COLD WATER
DEG F,°F	DEGREE FAHRENHEIT
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
DIA	DIAMETER
DN	DOWN
DPS	DIFFERENTIAL PRESSURE SENSOR/SWITCH
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	EXHAUST GRILLE
EL	ELEVATION
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EX, EXIST	EXISTING
EXH	EXHAUST
ETR	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FIN	FINISHED
FD	FLOOR DRAIN, FIRE DAMPER
FLA	FULL LOAD AMPERES
FLR	FLOOR
FM	FACTORY MUTUAL
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FS	FLOW SWITCH
FT	FEET
FTR	FINNED TUBE RADIATOR
G	NATURAL GAS
GAL	GALLONS
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
HB	HOSE BIB
HD	HEAD
HP	HORSEPOWER
HPWS/R	HEAT PUMP WATER SUPPLY/RETURN
HZ	HERTZ
HR	HOUR
HTG	HEATING
ID	IDENTIFICATION, INSIDE DIAMETER
IN	INCH
IN WG	INCHES WATER GAUGE
INV	INVERT
KG	KILOGRAM
KW	KILOWATT
LB	POUND
LAT	LEAVING AIR TEMPERATURE
LF	LINEAR FEET
LS	LIMIT SWITCH
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	1,000 BRITISH THERMAL UNITS –BTU– PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MIN	MINIMUM
MISC	MISCELLANEOUS
MOCP	MAXIMUM OVERCURRENT PROTECTION
MOD	MOTOR OPERATED DAMPER
MTD	MOUNTED
MV	MANUAL AIR VENT
MFR	MANUFACTURER
MECH	MECHANICAL
N	NORTH
NC	NOISE CRITERIA, NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
No	NUMBER
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAT	OUTSIDE AIR TEMPERATURE
OC	ON CENTER
OED	OPEN ENDED DUCT
PD	PRESSURE DROP
PH	PHASE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH (GAGE)
PCD	PUMPED CONDENSATE DRAIN
PHC	PREHEAT COIL
PRV	REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER
RA	RETURN AIR
RAF	RETURN AIR FAN
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY
RL	REFRIGERANT LIQUID
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RX	REMOVE EXISTING
RD	ROOF DRAIN
S/M	SHEET METAL
S/S	STAINLESS STEEL
SA	SUPPLY AIR
SD	SUPPLY AIR DIFFUSER, SMOKE DAMPER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SENS	SENSIBLE COOLING
SF	SUPPLY AIR FAN
SAN	SANITARY WASTE
SAR	SUPPLY AIR REGISTER
SP	STATIC PRESSURE
SQ	SQUARE
SR	SUPPLY REGISTER
STD	STANDARD
SYS	SYSTEM
TAB	TESTING, ADJUSTING, AND BALANCING
TG	TRANSFER GRILLE
TEMP	TEMPERATURE
TG	TRANSFER GRILL
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
V	VOLTS
VAVS	VARIABLE AIR VOLUME SUPPLY
VAVE	VARIABLE AIR VOLUME EXHAUST
VD	VOLUME DAMPER
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
W/	WITH/
WB	WET BULB
W.C.	WATER COLUMN
WHA	WATER HAMMER ARRESTOR
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
WT	WEIGHT

GENERAL NOTES

1. GENERAL NOTES ARE JOB SPECIFIC AND APPLY TO THE ENTIRE PROJECT. GENERAL MECHANICAL NOTES ARE DISCIPLINE SPECIFIC AND APPLY TO EVERY DRAWING IN THAT DISCIPLINE. GENERAL SHEET NOTES APPLY TO ALL WORK SHOWN ON THIS DRAWING. SHEET KEYNOTES APPLY TO INDIVIDUAL SITUATIONS AND EQUIPMENT.
2. DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE.
3. DETAILS WITHOUT SPECIFIC REFERENCE TO A LOCATION SHALL BE APPLIED TO THE GENERAL INSTALLATION OF THE WORK INDICATED.
4. WORK SHALL BE PERFORMED IN ACCORDANCE WITH STATE CODES AND STANDARDS ENFORCED BY THE STATE REGULATING AUTHORITIES.
5. SLOPES AND INVERT ELEVATIONS SHALL BE ESTABLISHED BEFORE ANY PIPING IS INSTALLED IN ORDER TO MAINTAIN PROPER SLOPES.
6. MAKE PROPER CONNECTIONS TO FIXTURES AND EQUIPMENT. DRAWINGS ARE SCHEMATIC AND ALL BRANCH MAINS, ELBOWS, AND CONNECTIONS ARE NOT SHOWN.
7. COORDINATE LOCATION OF PIPING AND DUCTWORK WITH LIGHTING FIXTURES, OTHER PIPING AND DUCTWORK, EQUIPMENT AND BUILDING STRUCTURE. PIPING AND DUCTWORK SHALL BE RUN TO AVOID CONFLICTS WITH OTHER TRADES.
8. DO NOT LOCATE MECHANICAL EQUIPMENT DIRECTLY ABOVE ELECTRICAL SUBSTATIONS, CABLE TRAYS, TRANSFORMERS, PANEL BOARDS, OR SWITCHES.
9. PROVIDE A MANUAL AIR VENT AT THE TOPS OF RISERS AND AT THE HIGH POINT OF EACH DROP IN ALL PRESSURE PIPING SYSTEMS.
10. UNLESS OTHERWISE NOTED, PIPING AND DUCTWORK IS OVERHEAD, TIGHT TO UNDERSIDE OF STRUCTURE, WITH SPACE FOR INSULATION IF REQUIRED.
11. INSTALL PIPING AND DUCTWORK SO THAT VALVES AND DAMPERS ARE ACCESSIBLE.
12. CERTAIN ITEMS SUCH AS ACCESS DOORS, RISE AND DROPS IN DUCTWORK AND PIPING, ETC. ARE INDICATED ON THE DRAWINGS FOR CLARITY OR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THESE ITEMS AS REQUIRED IN THE CONTRACT DRAWINGS AND SPECIFICATIONS.
13. LOCATION OF SENSORS AND OTHER WALL MOUNTED CONTROL DEVICES SHALL BE NORMALLY 48" ABOVE FINISHED FLOOR (TO TOP) AND ALIGNED WITH OTHER DEVICES (SWITCHES, RECEPTACLES, ETC.). WHERE DEVICES ARE INDICATED TO BE INSTALLED ON ANY SURFACE OTHER THAN DRYWALL OR CMU, APPROVAL MUST BE OBTAINED FROM THE ARCHITECT OR ENGINEER.
14. EQUIPMENT TO BE REMOVED SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH STATE LAWS, ORDINANCES, RULES AND REGULATIONS.
15. THE CONTRACTOR SHALL ENSURE THAT ADEQUATE CLEARANCE EXISTS FOR THE INSTALLATION OF WORK SHOWN ON THE DRAWINGS AND DESCRIBED IN THE SPECIFICATIONS.
16. THE CONTRACTOR SHALL PERFORM CUTTING AND PATCHING REQUIRED BY THE MECHANICAL WORK, UNLESS OTHERWISE NOTED.
17. WHERE THE INSTALLATION OF NEW SERVICES OR THE EXTENSION OF EXISTING SERVICES REQUIRE CUTTING OF EXISTING FLOORS, WALLS, PARTITIONS, ETC., IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK FOR THE PRESENCE OF EXISTING MECHANICAL AND/OR ELECTRICAL SERVICES WITHIN OR IMMEDIATELY BENEATH CONSTRUCTION AND EXERCISE NECESSARY PRECAUTIONS TO PREVENT DAMAGE TO THE SERVICES OR INJURY TO HIS PERSONNEL DUE TO CONTACT WITH SAME. WHERE PRACTICAL, SUCH EXISTING SERVICES SHALL BE TEMPORARILY DISCONNECTED DURING THE CUTTING OPERATION. SUCH OUTAGES IN SERVICE SHALL BE SCHEDULED IN ADVANCE WITH THE OWNER.
18. THE CONTRACTOR SHALL REPAIR DAMAGE TO THE BUILDING OR FURNISHINGS RESULTING FROM THE MECHANICAL WORK. PATCHING AND REPAIR WORK SHALL MATCH THE SURROUNDING SURFACE.
19. MECHANICAL PENETRATIONS THROUGH FIRE RESISTANCE RATED WALLS, FLOORS AND ASSEMBLIES SHALL BE FIRE–STOPPED IN ACCORDANCE WITH APPLICABLE CODES AND STANDARDS.
20. THE CONTRACTOR SHALL PROVIDE ACCESS PANELS, IN WALLS OR CEILING, OR ACCESS DOORS, IN DUCTWORK, AS INDICATED OR REQUIRED FOR ACCESS TO CONCEALED MECHANICAL EQUIPMENT OR DEVICES.
21. COORDINATE INSTALLATION OF PIPING AND EQUIPMENT WITH MECHANICAL, PLUMBING, STRUCTURAL, AND ELECTRICAL DISCIPLINES.
22. PROVIDE SUFFICIENT ACCESS AND WORKING SPACE FOR REPAIR AND MAINTENANCE ABOUT ALL MECHANICAL EQUIPMENT TO PERMIT READY AND SAFE OPERATION AND MAINTENANCE OF SUCH EQUIPMENT (OSHA 29 CFR 1910 SUBPART D AND 1910.303g).
23. CONTRACTOR SHALL COMPLY WITH SMACNA IAQ GUIDELINES FOR OCCUPIED BUILDINGS UNDER CONSTRUCTION (2007).
24. MAINTAIN MINIMUM 6'–8" CLEARANCE TO UNDERSIDE OF PIPES, DUCTS, CONDUIT, SUSPENDED EQUIPMENT, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL AND ELECTRICAL ROOMS.
25. UNLESS OTHERWISE NOTED, ELEVATIONS INDICATED ARE TO CENTERLINES OF PIPES FOR ALL PRESSURE LINES AND TO INVERT FOR ALL GRAVITY FLOW LINES.
26. REFRIGERANTS SHALL BE RECOVERED FROM ALL REFRIGERANT EQUIPMENT IN ACCORDANCE WITH ARI AND EPA STANDARDS. RECOVERED REFRIGERANT SHALL BE PLACED IN CONTAINERS LABELED IN ACCORDANCE WITH ARI AND EPA STANDARDS AND TURNED OVER TO THE CONTRACTING OFFICER OR OWNER.
27. RUN ALL SOIL, WASTE, AND DRAIN PIPING WITH 2 PERCENT MINIMUM GRADE UNLESS OTHERWISE NOTED. HORIZONTAL VENT PIPING SHALL BE GRADED TO DRIP BACK TO THE SOIL OR WASTE PIPE BY GRAVITY.
28. ADJUST SEWER INVERTS TO KEEP TOPS OF PIPES IN LINE WHERE PIPE SIZE CHANGES.
29. PROVIDE SHUTOFF VALVES IN DOMESTIC WATER SYSTEMS IN BRANCH LINES SERVING TWO OR MORE FIXTURES.
30. PIPING SHALL BE RUN TO AVOID CONFLICTS WITH OTHER TRADES.

COMMONWEALTH OF VIRGINIA
CRAIG ALAN HOSSFELD
Lic. No. 040205864
PROFESSIONAL ENGINEER
11/23/20

REV	DATE	DESCRIPTION

WRA
Wiseman, Requardt & Associates, LLP
2905 Kraft Dr, Suite 1200, Blacksburg, VA 24060

WESTERN VIRGINIA WATER AUTHORITY
601 South Jefferson Street, Suite 300
Roanoke, Virginia 24011

DES: NAE	SCALE: NOT TO SCALE
DRAWN: NAE	HORIZ: N/A
CHECK: CAH	VERT: N/A
DATE: 1/24/20	

CRYSTAL SPRING
PUMP STATION RELOCATION

HVAC LEGEND, ABBREVIATIONS, AND NOTES

DRAWING: HV0.01

SHEET: 44