MECHANICAL ABBREVIATIONS

(NOTE: NOT ALL ABBREVIATIONS MAY APPEAR ON DRAWINGS)

A/E	ARCHITECT / ENGINEER
AAV	AUTOMATIC AIR VENT
AD	ACCESS DOOR
AF	AFTER FILTER
AFF	ABOVE FINISHED FLOOR
AHU	AIR-HANDLING UNIT
AMP	AMPERAGE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AW	AIR WASHER
BD	BUTTERFLY DAMPER
BDD	BACKDRAFT DAMPER
BFP	BACKFLOW PREVENTER
BFT	BOILER PLANT FIRE TUBE
BG	BOTTOM GRILLE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CB	CHILLED BEAM
CC	COOLING COIL
CCD	COOLING COIL CONDENSATE DRAIN
CD	CEILING DIFFUSER
CD-1	CONSTRUCTION DOCUMENTS (SUBMISSION1)
CD-2	CONSTRUCTION DOCUMENTS (SUBMISSION2)
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFT	CUBIC FEET
CG	CEILING GRILLE
CH	CHILLER
CHP	CHILLED WATER PUMP
CHW	CHILLER WATER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CI	CAST IRON
CO	CLEAN OUT
CP	CONDENSATE PUMP
CR	CEILING REGISTER
CRAC	COMPUTER ROOM AIR CONDITIONING UNIT
CU	CONDENSING UNIT
CW	COLD WATER (POTABLE)
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN (TO COOLING TOWER)
CWS	CONDENSER WATER SUPPLY (FROM COOLING TOWER)
(D)	DEMOLISH
D-1	OUTDOOR AIR DAMPER
D-2	RETURN AIR DAMPER
D-3	RELIEF AIR DAMPER
DB	DECIBELS
Db	DRY-BULB TEMPERATURE
DD-1	DESIGN DEVELOPMENT (SUBMISSION1)
DD-2	DESIGN DEVELOPMENT (SUBMISSION2)
DDC	DIRECT DIGITAL CONTROLS
DEG	DEGREE
DF	DIFFUSER
DIA	DIAMETER
DOM	DOMESTIC
DP	DEW POINT TEMPERATURE
DPA	DIFFERENTIAL PRESSURE ASSEMBLY
DPS	DIFFERENTIAL PRESSURE SENSOR
DSS	DUCTLESS SPLIT-SYSTEM (EVAPORATOR)
DX	DIRECT EXPANSION
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EG	EXHAUST GRILLE
EH	EXHAUST HOOD
EJ	EXPANSION JOINT
ENT	ENTERING
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
(E)	EXISTING
(ER)	EXISTING RELOCATE
F	FAHRENHEIT
F&T	FLOAT AND THERMOSTATIC
F/SDPR	COMBINATION FIRE SMOKE DAMPER
FA	FREE AREA
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT (4 PIPE)
FCUC	FAN COIL UNIT COOLING ONLY
FCUH	FAN COIL UNIT HEATING ONLY
FCW	FORWARD CURVED WHEEL (FAN)
FD	FLOOR DRAIN
FD	FIRE DAMPER
FM	FLOW METER
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FR	FLOOR REGISTER
FS	FLOW SWITCH
FSTAT	FREEZESTAT
FT	FEET
FT-LB	FOOT-POUND
FTR	FIN TUBE RADIATION
FV	FACE VELOCITY
GA	GAUGE
GAL	GALLONS
GH	GRAVITY HOOD
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRR	GLYCOL-WATER RUN AROUND RETURN
GRS	GLYCOL-WATER RUN AROUND SUPPLY
GS	GALVANIZED STEEL
H	HUMIDIFIER
H&CW	HOT & COLD WATER
HC	HEATING COIL
HD	HEAD
HD	HOOD
HOA	HAND/OFF/AUTOMATIC
HP	HORSEPOWER
HRC	HEAT RECOVERY COIL
HRD	HEAT RECOVERY DEVICE
HRW	HEAT RECOVERY WHEEL
HSTAT	HUMIDISTAT
HVU	HEATING AND VENTILATING UNIT
HW	HOT WATER
HWC	HOT WATER COIL
HWHC	HOT WATER HEATING COIL
HWP	HEATING HOT WATER PUMP
HWR	HEATING HOT WATER RETURN
HWS	HEATING HOT WATER SUPPLY
HWUH	HOT WATER UNIT HEATER
HX	HEAT EXCHANGER
HZ	HERTZ
I/O	INPUT/OUTPUT
IAQ	INDOOR AIR QUALITY
ID	INSIDE DIAMETER
IFB	INTEGRAL FACE AND BYPASS
IN	INCHES
IN HG	INCHES OF MERCURY
IN WC	INCH WATER COLUMN
IRH	INFRARED HEATER
IS	INSECT SCREEN
IU	INDUCTION UNIT
IV	INLET VANES
J	(INTENTIONALLY LEFT BLANK)
kPa	KILOPASCAL
kW	KILOWATT
L/s	LITERS PER SECOND
LAT	LEAVING AIR TEMPERATURE
LBS/HR	POUNDS PER HOUR
LF	LINEAR FOOT (FEET)
LH	LATENT HEAT
LPR	LOW PRESSURE RETURN (STEAM CONDENSATE)
LPRC	LOW PRESSURE STEAM RETURN (CLEAN)
LPS	LOW PRESSURE STEAM
LPSC	LOW PRESSURE STEAM (CLEAN)
LTCP	LOCAL TEMPERATURE CONTROL PANEL
LVG	LEAVING
LVR	LOUVER
LWT	LEAVING WATER TEMPERATURE
MA	MIXED AIR
MAU	MAKE-UP AIR UNIT
MAX	MAXIMUM
MB	MIXING BOX
MBH	1000 BTUH
MCA	MINIMUM BRANCH CIRCUIT AMPACITY
MIN	MINIMUM
MM	MILLIMETER
MOD	MOTOR OPERATED DAMPER
MOV	MOTOR OPERATED VALVE
MTD	MEAN TEMPERATURE DIFFERENCE
MVD	MANUAL VOLUME DAMPER
MZ	MULTI-ZONE
(N)	NEW
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NOM	NOMINAL
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAG	OUTSIDE AIR GRILLE
OAI	OUTSIDE AIR INTAKE
OD	OUTSIDE DIAMETER
P	PUMP
PA	PASCAL
PC	PUMPED CONDENSATE
PCF	POUNDS PER CUBIC FOOT (FEET)
PD	PRESSURE DROP
PG	PRESSURE GAGE
PHC	PREHEAT COIL
PPM	PARTS PER MILLION
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH -ABSOLUTE
PSIG	POUNDS PER SQUARE INCH -GAGE
PSV	PRESSURE SAFETY VALVE
(R)	RELOCATE/RELOCATED
R/E	RETURN OR EXHAUST
RA	RETURN AIR
RAT	RETURN AIR TEMPERATURE
RCP	RADIANT CEILING PANEL
REA	RELIEF AIR
RF	RETURN FAN
RG	RETURN GRILLE
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RLA	RUN LOAD AMPERE
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RR	RETURN REGISTER
RTU	ROOF TOP UNIT
RV	RELIEF VALVE
SA	SUPPLY AIR
SAD	SOUND ATTENUATOR DEVICE
SAT	SUPPLY AIR TEMPERATURE
SCFM	STANDARD CUBIC FEET PER MINUTE
SD	SMOKE DETECTOR
SD	SUPPLY AIR DIFFUSER
SD-1	SCHEMATIC DESIGN (SUBMISSION1)
SD-2	SCHEMATIC DESIGN (SUBMISSION2)
SDPR	SMOKE DAMPER
SDR	SMOKE DAMPER (RETURN)
SDS	SMOKE DAMPER (SUPPLY)
SEN	SENSIBLE HEAT
SF	SUPPLY FAN
SG	SUPPLY AIR GRILLE
SP	STATIC PRESSURE
SP GR	SPECIFIC GRAVITY
SPS	STATIC PRESSURE SENSOR
SQ FT	SQUARE FOOT (FEET)
SR	SUPPLY AIR REGISTER
SS	STAINLESS STEEL
ST	STEAM TRAP
SVS	STEAM VENT SILENCER
T&PCV	TEMPERATURE AND PRESSURE CONTROL VALVE
TAB	TESTING, ADJUSTING, BALANCE
TD	TEMPERATURE DIFFERENCE
TDH	TOTAL DYNAMIC HEAD
TG	TRANSFER GRILLE
TP	TRAP
TR	TOP REGISTER
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TU	TERMINAL UNIT
UC	UNDER CUT
UL	UNDERWRITERS LABORATORY
V	VALVE
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VD	VOLUME DAMPER (MANUAL OPPOSED BLADE)
VFD	VARIABLE FREQUENCY DRIVE
VI	VIBRATION ISOLATOR
VIV	VARIABLE INLET VANES
VPS	VARIABLE PRIMARY SYSTEM
VR	VACUUM (STEAM CONDENSATE) RETURN
W	WATTS
Wb	WET-BULB (TEMPERATURE)
WC	WATER COOLED
WCACU	WATER-COOLED COMP RM A/C
WEF	WALL EXHAUST FAN
WF	WATER FILTER
WFCV	WATER FLOW CONTROL VALVE
WFM	WATER FLOW METER
WFMD	WATER FLOW MEASURING DEVICE
WG	WATER GAGE
WHA	WATER HAMMER ARRESTOR

GENERAL PIPING SYMBOLS

(NOTE: NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS)

- DIRECTION OF PIPE PITCH (DOWN)
- DIRECTION OF FLOW
- ANCHOR
- REDUCER OR INCREASER
- ECCENTRIC REDUCER
- TOP CONNECTION, 45° OR 90°
- BOTTOM CONNECTION, 45° OR 90°
- SIDE CONNECTION
- CAPPED OUTLET
- RISE OR DROP IN PIPE
- UNION
- PIPE UP
- PIPE DOWN
- INVERTED BUCKET TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
- FLOAT & THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
- THERMOSTATIC TRAP SET INCLUDING PIPING ACCESSORIES SEE DETAIL
- THERMOMETER
- PRESSURE GAGE
- FLOW ELEMENT
- REFRIGERANT SIGHT GLASS
- TEST PLUG (PRESSURE/TEMPERATURE)
- AUTOMATIC AIR VENT
- MANUAL AIR VENT
- QUICK-COUPLE HOSE CONNECTOR

PIPING SYMBOLS

- HPS — HIGH PRESSURE STEAM (60 PSIG AND ABOVE)
- HPR — HIGH PRESSURE STEAM CONDENSATE RETURN
- MPS — MEDIUM PRESSURE STEAM (16 PSIG THRU 59 PSIG)
- MPR — MEDIUM PRESSURE STEAM CONDENSATE RETURN
- LPS — LOW PRESSURE STEAM (15 PSIG AND BELOW)
- LPR — LOW PRESSURE STEAM CONDENSATE RETURN
- PC — CONDENSATE PUMP DISCHARGE
- HWS — HOT WATER HEATING SUPPLY
- HWR — HOT WATER HEATING RETURN
- GHS — GLYCOL-WATER HEATING SUPPLY
- GHR — GLYCOL-WATER HEATING RETURN
- CHWS — CHILLED WATER SUPPLY
- CHWR — CHILLED WATER RETURN
- GCS — CHILLED GLYCOL-WATER SUPPLY
- GCR — CHILLED GLYCOL-WATER RETURN
- V — VENT LINE
- GRS — GLYCOL-WATER RUN AROUND SUPPLY
- GRR — GLYCOL-WATER RUN AROUND RETURN
- A — COMPRESSED AIR

VALVE SYMBOLS

- GATE VALVE – THREADED/FLANGED
- GLOBE VALVE – THREADED/FLANGED
- GATE VALVE WITH 3/4" HOSE ADAPTER
- CHECK VALVE
- WYE STRAINER (WITH BALL VALVE & HOSE CONNECTION)
- WYE STRAINER WITH VALVED DRAIN AND QUICK-COUPLE HOSE CONNECTOR
- FLEXIBLE CONNECTION
- BUTTERFLY VALVE
- BALL VALVE
- MODULATING CONTROL VALVE
- MODULATING CONTROL BUTTERFLY VALVE
- TWO POSITION CONTROL VALVE
- THREE-WAY MODULATING CONTROL VALVE
- THREE-WAY TWO POSITION CONTROL VALVE
- PRESSURE REGULATING VALVE
- PRESSURE SAFETY VALVE
- AUTOMATIC BALANCING CONTROL VALVE
- CIRCUIT SETTER VALVE
- PLUG VALVE
- CONTROL VALVE (CV) – FLOAT-OPERATED
- PRESSURE REDUCING VALVE (PRV)

DUCTWORK SYMBOLS

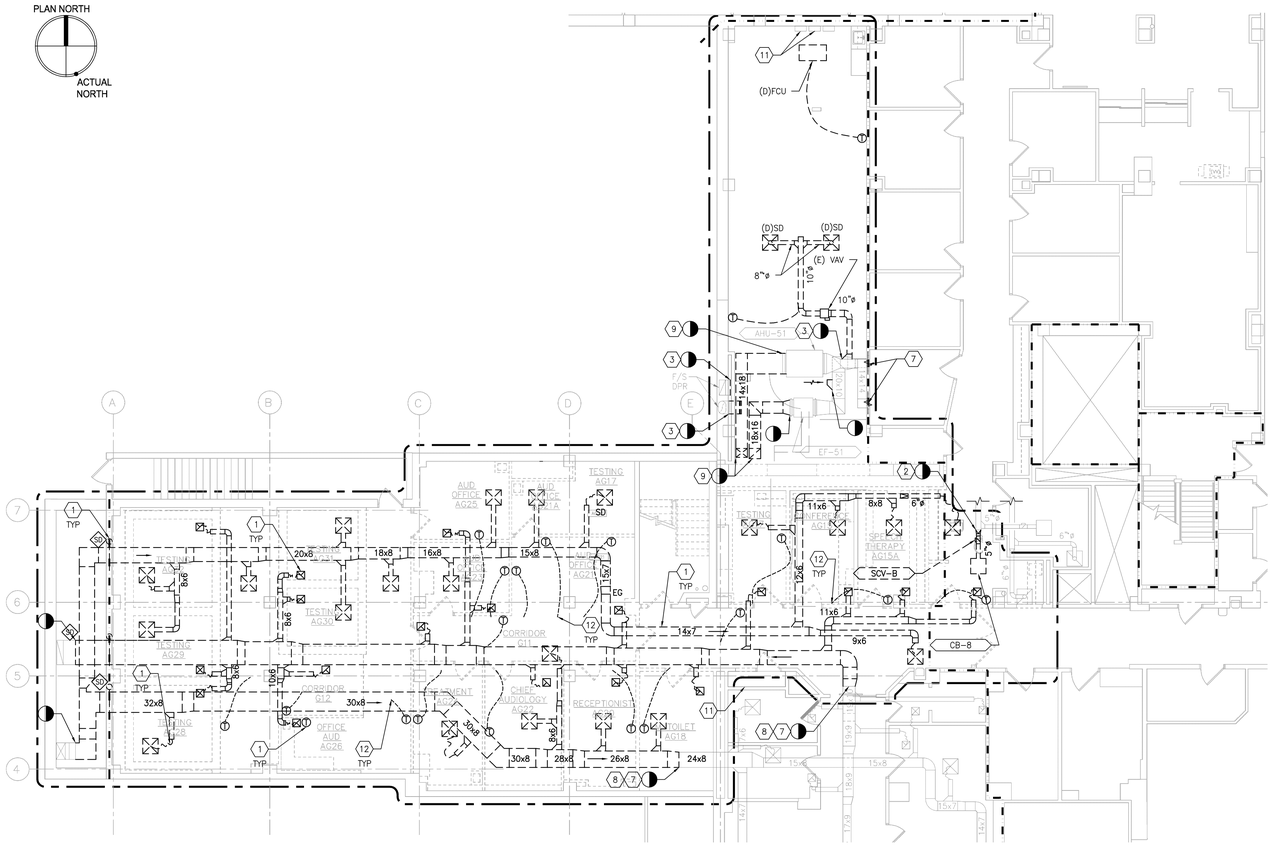
- UP / DN — SUPPLY DUCT (UP & DOWN)
- UP / DN — EXHAUST DUCT (UP & DOWN)
- UP / DN — RETURN DUCT (UP & DOWN)
- ROUND AND SQUARE 4-WAY CEILING DIFFUSERS
- SQUARE 3-WAY CEILING DIFFUSERS
- SQUARE 2-WAY CEILING DIFFUSERS
- SQUARE 1-WAY CEILING DIFFUSERS
- SUPPLY TOP REGISTER OR GRILLE (WALL TYPE)
- EXHAUST OR RETURN CEILING REGISTER OR GRILLE
- EXHAUST OR RETURN BOTTOM REGISTER OR GRILLE (WALL TYPE)
- EXHAUST OR RETURN REGISTER OR TOP GRILLE (WALL TYPE)
- VANED ELBOW & AIR SPLIT TYPE DUCT TAKE-OFF
- CONNECT NEW DUCT TO EXISTING DUCT
- R — INCLINED RISE, IN DIRECTION OF AIR FLOW
- D — INCLINED DROP, IN DIRECTION OF AIR FLOW
- LIMIT OF DEMOLITION
- FC — FLEXIBLE CONNECTION, EQUIPMENT, VIBRATION, OR SEISMIC
- VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES EVEN IF SYMBOL IS MISSING)
- VANED ELBOW (SHORT RADIUS)
- STANDARD RADIUS ELBOW (LONG RADIUS)
- 10x8 — NEW DUCT (INSIDE DIMENSIONS: WIDTH x DEPTH)
- EXISTING DUCT TO REMAIN
- EXISTING DUCT TO BE REMOVED
- FLEXIBLE DUCTWORK (INSULATED)
- MANUAL VOLUME DAMPER
- VD
- 2 — POINT OF CHANGE IN DUCT CONSTRUCTION BY STATIC PRESSURE CLASS. THE NUMBER ASSIGNS PRESSURE CLASS (IN. OF WATER) WHICH WILL ACCOMMODATE MAXIMUM OPERATING PRESSURE IN THE DUCT SUBSECTION. THE SYMBOL CONTINUES THE ASSIGNMENT UNTIL THE DUCT TERMINATES OR ANOTHER SYMBOL APPEARS. A "N" SUPERSCRIPT INDICATES NEGATIVE PRESSURE.
- AUTOMATIC CONTROL DAMPER MODULATING
- AUTOMATIC CONTROL DAMPER TWO POSITION
- F/S DPR — COMBINATION FIRE/SMOKE DAMPER
- 45° SUPPLY — STANDARD BRANCH SUPPLY OR RETURN, NO SPLITTER (45° TAP)
- 45° RETURN
- F/S DPR — COMBINATION FIRE/SMOKE DAMPER
- AIR TERMINAL UNIT WITH INTEGRAL REHEAT COIL
- REHEAT COIL
- T — THERMOSTAT
- DUCT SMOKE DETECTOR

GENERAL NOTES AND CONDITIONS

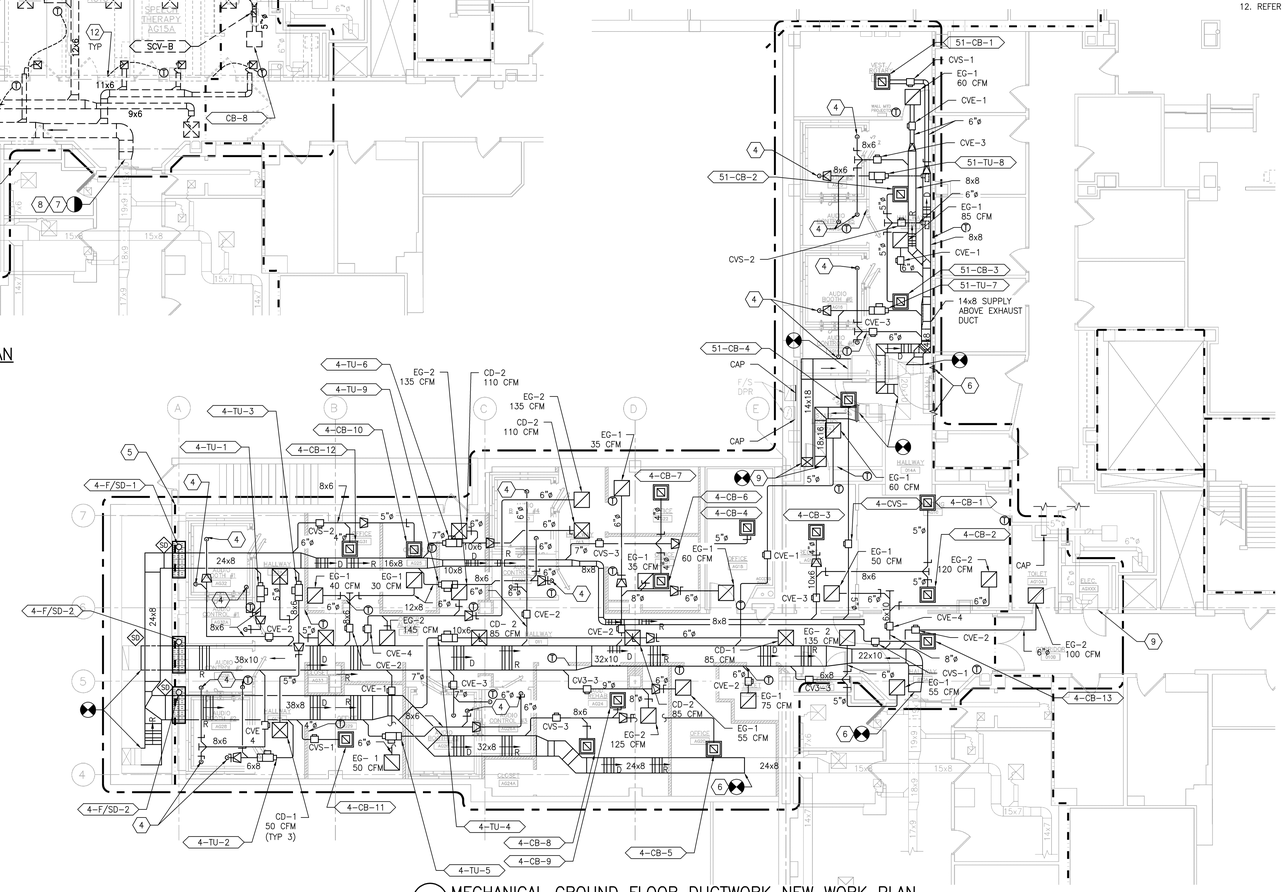
1. THESE DRAWINGS WERE PREPARED FROM INFORMATION TAKEN FROM THE AVAILABLE BUILDING DRAWINGS, ARCHITECTURAL BACKGROUNDS PROVIDED BY THE OWNER AND FIELD SURVEY INFORMATION COMPILED BY THE ENGINEERING DESIGN TEAM FOR THE PURPOSE OF ENGINEERING DESIGN. EXISTING CONDITIONS ARE SHOWN AS ACCURATELY AS POSSIBLE. THERE IS THE POSSIBILITY THAT CONDITIONS SHOWN ARE NOT EXACTLY AS EXISTING. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, LOCATIONS, SIZES AND CONDITIONS AT THE SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO BEGINNING INSTALLATION OR FABRICATION WORK.
   - 1.1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW THE PLANS AND SPECIFICATIONS, AS WELL AS ALL RELATED PROJECT PLANS AND SPECIFICATIONS FROM OTHER DISCIPLINES, TO BECOME FAMILIAR WITH THE FULL PROJECT SCOPE AND COORDINATED RESPONSIBILITIES.
   - 1.2.. SHOULD IT APPEAR THAT THE WORK INTENDED TO BE DESCRIBED OR RELATED WORK ARE NOT SUFFICIENTLY DETAILED OR EXPLAINED ON THE DRAWINGS, OR IN THE SPECIFICATIONS, CONSULT THE ENGINEER FOR NECESSARY CLARIFICATIONS, AND CONFORM TO THOSE CLARIFICATIONS INSOFAR AS THEY ARE CONSISTENT WITH THE ORIGINAL DRAWINGS AND SPECIFICATIONS. IN NO CASE SHALL WORK PROCEED IN UNCERTAINTY.
   - 1.3.. EQUIPMENT ARRANGEMENTS ARE DESIGNED TO SHOW PREFERRED CONFIGURATIONS TO SUIT KNOWN CONDITIONS. ACTUAL INSTALLATION BY CONTRACTOR MAY BE ALTERED AS REQUIRED TO SUIT FIELD CONDITIONS ENCOUNTERED DURING CONSTRUCTION WITHOUT COMPROMISING THE INTENT OF THE ORIGINAL DESIGN. COORDINATE ANY MODIFICATIONS WITH THE ENGINEER AND OWNER PRIOR TO STARTING WORK IN AREAS AFFECTED.
   - 1.4. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS AT SITE PRIOR TO STARTING WORK.
   - 1.5. DO NOT SCALE DRAWINGS.
2. IT IS HIGHLY RECOMMENDED THAT ALL BIDDERS VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH THE NATURE AND SCOPE OF THE WORK AND THE EXISTING CONDITIONS. VISITS TO THE SITE BY BIDDERS MAY BE MADE ONLY BY APPOINTMENT WITH THE MEDICAL CENTER ENGINEERING OFFICER. ANY CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED, OR FOR ANY DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD AN EXAMINATION BEEN MADE, WILL NOT BE ACCEPTED.
3. THE CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING THAT ALL RULES AND REGULATIONS, INCLUDING THOSE WHICH MAY BE ISSUED BY THE OWNER, ARE BEING OBSERVED, PARTICULARLY WORKPLACE SAFETY AND THE CONDUCT OF ALL THOSE EMPLOYED DIRECTLY AND INDIRECTLY ON THE PREMISES, AND THE OWNER'S EMPLOYEES WHO MAY BE IMPACTED OR AFFECTED BY CONSTRUCTION ACTIVITIES. THE CONTRACTOR WILL INSTALL SIGNAGE, BARRIERS, AND OTHER MEANS TO PROVIDE WARNING AND PERSONNEL SAFETY. PLACEMENT OF THESE ITEMS WILL BE COORDINATED WITH THE OWNER AND HIS ONGOING OPERATIONS AND WILL PROMPTLY BE REVISED WHEN WORK IN A PARTICULAR AREA HAS BEEN COMPLETED.
   - 3.1. DURING PERFORMANCE OF WORK, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVISION AND MAINTENANCE OF WARNING SIGNS, LIGHT SIGNAL DEVICES, GUARD LIGHTS, BARRICADES, GUARD RAILS, FENCES AND OTHER DEVICES, APPROPRIATELY LOCATED ON AND AROUND THE JOB SITE WHICH GIVE PROPER AND UNDERSTANDABLE WARNING TO PERSONS WITH REGARD TO HAZARDOUS CONDITIONS, EQUIPMENT AND OPERATIONS BEING PERFORMED IN CONJUNCTION WITH THE WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH OTHER TRADES FOR ITEMS IN THEIR SCOPE OF WORK WHICH COULD REQUIRE ADDITIONAL MECHANICAL/PLUMBING WORK, AND ITEMS THAT ARE NOT INDICATED ON THE DRAWINGS.
5. THIS INSTALLATION WILL CONFORM TO ALL CODES AND THE REQUIREMENTS OF FEDERAL, STATE, AND LOCAL REGULATORY AGENCIES HAVING JURISDICTION. IN PARTICULAR, THE WORK WILL BE IN ACCORDANCE WITH THE CURRENT ADOPTED EDITION OF THE NEW YORK STATE UNIFORM FIRE PROTECTION AND BUILDING CODE AND ALL OF ITS APPLICABLE SUBCODES AND AMENDMENTS.
6. ALL WORK WILL BE LAWFULLY EXECUTED IN A NEAT AND WORKMANLIKE MANNER AND WILL BE COMPLETED IN ACCORDANCE WITH THE GOVERNING CODES (ABOVE), INDUSTRY STANDARDS, AND IN CONFORMANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND REQUIREMENTS.
7. WORK UNDER THIS CONTRACT SHALL CONSIST OF THE CONTRACTOR PROVIDING ALL LABOR, MATERIALS, AND SERVICES, INCLUDING WORK NOT SPECIFICALLY SHOWN BUT REASONABLY IMPLIED. THIS SHALL INCLUDE CUTTING, PATCHING AND RESTORATION OF EXISTING SURFACES DAMAGED DURING THE CONSTRUCTION. CONTRACTOR SHALL ALSO PROVIDE ALL EQUIPMENT SHOWN OR SPECIFIED OR AN APPROVED EQUIVALENT. SUBSTITUTED EQUIPMENT OR MATERIALS SHALL NOT BE INSTALLED UNTIL GIVEN WRITTEN APPROVAL BY THE OWNER.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR COSTS INCURRED FOR NONCOMPLIANCE WITH THESE CONTRACT DOCUMENTS. CONTRACTOR WILL NOT BE ALLOWED CHANGE ORDERS FOR PROBLEMS ARISING FROM NEGLECT OF PROVISIONS INCLUDED IN THESE CONDITIONS.
9. MAINTAIN ORDERLY HOUSEKEEPING DURING CONSTRUCTION, AND UPON SUBSTANTIAL COMPLETION PERFORM FINAL CLEANUP. REMOVE CONSTRUCTION RUBBISH, SCAFFOLDING, EQUIPMENT, TEMPORARY PROTECTION, TEMPORARY FIELD STRUCTURES, AND OTHER MATERIALS OR EQUIPMENT THAT WAS REQUIRED IN CONNECTION WITH THE CONSTRUCTION, BUT NOT A PERMANENT PART THEREOF.
10. THOSE PERFORMING WORK AS A CONTRACTOR MUST EXAMINE SUBSTRATES AND CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND NOTIFY THE CONTRACTOR IN WRITING, OF CONDITIONS DETRIMENTAL TO THE PROPER AND TIMELY COMPLETION OF THE WORK. COMMENCEMENT OF WORK BY A TRADE ON A SURFACE OR CONSTRUCTION SHALL IMPLY ACCEPTANCE OF SUCH SURFACE OR CONSTRUCTION. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
11. THE CONTRACTOR SHALL SECURE ALL PERMITS AND APPLICATIONS AND PAY ANY AND ALL FEES AS REQUIRED. THE CONTRACTOR SHALL GIVE ALL NECESSARY NOTICES AND CERTIFICATES OF INSPECTION REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. DELIVER ALL PERMITS, CERTIFICATES AND APPROVALS TO THE OWNER AGENT PRIOR TO FINAL ACCEPTANCE OF THE WORK. THE CONTRACTOR MUST FILE NECESSARY DRAWINGS, PREPARE DOCUMENTS AND MAKE APPLICATIONS FOR EACH REQUIRE PERMIT AND INSPECTION, PRIOR TO COMMENCING WORK TO AVOID DELAYS DURING CONSTRUCTION.
12. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND MANUFACTURERS DATA SHEETS ON ALL EQUIPMENT AND MATERIALS SPECIFIED ON DRAWINGS FOR APPROVAL BY OWNER OR AGENT FOR THE OWNER. THESE DRAWINGS OR SHEETS SHALL CONTAIN ALL NECESSARY DATA, I.E., MANUFACTURER, CATALOG NUMBER, SIZE, DIMENSIONS, CAPACITY, WIRING DETAILS AND ALL OTHER ENGINEERING DATA AND DETAILS NECESSARY FOR COMPLETE CLARITY AND INSTALLATION.
13. THE CONTRACTOR SHALL KEEP ONE SET OF THE LATEST ISSUE OF DRAWINGS WHICH SHALL REFLECT THE ACTUAL INSTALLED CONDITIONS AND CONNECTIONS OF ALL EQUIPMENT AND DEVICES. THE CONTRACTOR SHALL PROVIDE COPIES OF ALL MAINTENANCE INFORMATION AND INSTRUCTIONS RECEIVED WITH EQUIPMENT AND SYSTEMS. ALL "AS-BUILT" DRAWINGS AND MISCELLANEOUS INFORMATION SHALL BE GIVEN TO THE OWNER AND ENGINEER AT COMPLETION OF WORK. THE CONTRACTOR SHALL GUARANTEE ALL MATERIAL AND LABOR TO BE FREE FROM DEFECTS FOR A ONE YEAR PERIOD FROM THE TIME OF OWNER ACCEPTANCE. ANY DEFECTS OCCURRING DURING THIS PERIOD SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
14. AS DIRECTED BY THE OWNER, ALL EXISTING EQUIPMENT AND MATERIAL IN USABLE CONDITION THAT IS REMOVED SHALL REMAIN THE PROPERTY OF THE OWNER, OR HANDLED AS INSTRUCTED BY THE OWNER, BE DISPOSED OF BY THE CONTRACTOR. ALL MATERIALS DEEMED FOR REMOVAL SHALL BE RECYCLED WHENEVER POSSIBLE, IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH WITHIN SPECIFICATION SECTION 01 74 19 (CONSTRUCTION WASTE MANAGEMENT).
15. CONTRACTOR IS TO PROVIDE ALL REQUIRED SCAFFOLDING, LADDERS, RIGGING, HOISTING AND ALL OTHER EQUIPMENT REQUIRED FOR THE INSTALLATION OF THEIR WORK.
16. ESTABLISH PASSAGE CLEARANCES REQUIRED TO DELIVER, INSTALL AND ERECT ALL REQUIRED EQUIPMENT. IF STRUCTURES, EQUIPMENT AND SYSTEMS MUST BE ALTERED TO PROVIDE PASSAGE OF EQUIPMENT, THE CONTRACTOR SHALL RESTORE STRUCTURES, EQUIPMENT AND SYSTEMS TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE; INCLUDING REMOVING AND REPLACEMENT OF ALL CEILING AS REQUIRED TO COMPLETE THE WORK.

HVAC NOTES AND CONDITIONS:

1. ALL HVAC EQUIPMENT SHALL MEET THE REQUIREMENTS SET FORTH IN THE ANSI/ASHRAE/IESNA STANDARD 90.1 ENTITLED "ENERGY STANDARDS FOR BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS".
2. ALL METALLIC DUCTWORK SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARD "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE" AND NFPA STANDARD 90A TITLED "INSTALLATION OF AIR CONDITIONING AND VENTILATION SYSTEMS". ALL DUCTWORK SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SMACNA 2 IN WG PRESSURE CLASS, SEAL CLASS A, UNLESS OTHERWISE NOTED.
3. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS. CONTRACTOR SHALL INCREASE THE DUCT SIZE ACCORDINGLY TO COMPENSATE FOR ACOUSTICAL DUCT LINING THICKNESS (UNLESS OTHERWISE NOTED). CONTRACTOR MAY ADJUST DUCT SIZES ACCORDINGLY TO SUIT FIELD CONDITIONS AS LONG AS THE DUCT FREE AREA AND STATIC PRESSURE DROP ARE EQUAL TO THE PROJECT DOCUMENTS.
4. CONTRACTOR SHALL PROVIDE ACCESS DOORS IN DUCTWORK FOR OPERATION, ADJUSTMENT AND MAINTENANCE OF ALL FANS, VALVES, COILS AND MECHANICAL EQUIPMENT.
5. ADEQUATELY SIZED ACCESS PANELS SHOULD BE PROVIDED ON BOTH SIDES OF THE SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, HUMIDIFIERS, COILS AND OTHER DEVICES LOCATED IN THE DUCTWORK WHICH REQUIRE INSPECTION AND/OR MAINTENANCE.
6. CONTRACTOR SHALL PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCT WORK SYSTEMS (SUPPLY, RETURN, VENTILATION AIR AND EXHAUST) CONNECTED TO ALL AIR HANDLING UNITS, FANS AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT (UNLESS NOTED OTHERWISE).
7. ALL AIR HANDLING SYSTEMS SHALL BE DESIGNED AND INSTALLED WITH BALANCE DAMPERS LOCATED IN THE MAIN SUPPLY, EXHAUST AND OUTSIDE AIR DUCTS FOR PROPER BALANCING OF EACH SYSTEM, AND FOR EACH SUPPLY, RETURN, OR EXHAUST GRILLE, UNLESS OTHERWISE NOTED.
8. DUCTWORK WILL INCLUDE ALL DUCTS, FITTINGS, TURNING VANES, DAMPERS, SUPPORTS, AND ALL ACCESSORIES, SUBASSEMBLIES, AND PARTS INCORPORATED THEREIN OR REQUIRED FOR THE INSTALLATION AND COMPLETION OF SYSTEMS. ALL SUPPLY AND RETURN DUCT BRANCHES SHALL BE DESIGNED AND INSTALLED WITH BALANCE DAMPERS.
9. UNLESS NOTED OTHERWISE DUCTWORK SHALL BE CONSTRUCTED TO 2" WG LEAKAGE CLASS AND SEAL CLASS SHALL BE CLASS A IN ACCORDANCE WITH THE STANDARDS DESCRIBED IN SMACNA "DUCT CONNECTION STANDARDS METAL AND FLEXIBLE" AND "SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL".
10. SMOOTH TURN RADIUS DUCTWORK OR TURNING VANES AND 45 DEGREE ENTRY OR CONICAL DUCT BRANCH CONNECTIONS SHALL BE USED THROUGHOUT.
11. ALL DAMPER SHAFTING, RODS AND LINKAGE WILL HAVE CORROSION RESISTANT FINISH. ALL VOLUME DAMPERS WILL MOVE FREELY THROUGH FULL TRAVEL WITHOUT BINDINGS AFTER INSTALLATION OF INSULATION.
12. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS, INCLUDING DIVING DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST.
13. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.
14. INSTALL NEW THERMOSTATS FOR ALL NEW AND EXISTING ZONES UNLESS OTHERWISE INDICATED.
15. CONTRACTOR SHALL PROPERLY SUPPORT & BRACE ALL DUCTWORK IN ACCORDANCE WITH SMACNA STANDARDS FROM BUILDING STRUCTURE ONLY. DUCTWORK SUPPORT MATERIALS, UNLESS OTHERWISE INDICATED, SUPPORTS, FASTENERS, ANCHORS, STRAPS, TRIM AND ANGLES WILL GENERALLY BE THE SAME MATERIAL AS THE DUCTWORK, HOT DIPPED GALVANIZED.
16. DUCT HANGERS, SUPPORTS AND METHODS OF INSTALLATION WILL CONFORM TO SMACNA STANDARDS AND THE MANUFACTURERS' INSTALLATION REQUIREMENTS WHERE NOT OTHERWISE SPECIFIED, INDICATED OR REQUIRED.
17. ALL INTERIOR AND EXTERIOR WALL, CEILING AND ROOF OPENINGS AND DUCT AND PIPE THROUGH WALL PENETRATIONS, FRAMING, SLEEVES, WEATHERPROOFING AND FIRE SEALING SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR, UNLESS NOTED OTHERWISE.
18. CONTRACTOR SHALL FURNISHED AND INSTALL ALL FIRE DAMPERS IN ACCORDANCE WITH UL 555 AND MANUFACTURER'S REQUIREMENTS WHERE DUCTS PENETRATE FIRE RATED WALLS OR FLOORS. ALL FIRE DAMPERS SHALL BE UL LISTED AND LABELED CONSISTENT WITH THE WALLS OR FLOORS THAT ARE PENETRATED. ALL FIRE DAMPERS SHALL BE DYNAMICALLY RATED. PROVIDE ACCESS DOORS SIZED AND LOCATED TO FACILITATE TESTING AND RESETTING OF ALL FIRE DAMPERS.
19. IN



1 MECHANICAL GROUND FLOOR DUCTWORK DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



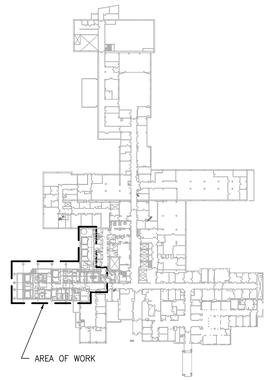
2 MECHANICAL GROUND FLOOR DUCTWORK NEW WORK PLAN
SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES:

1. CONTRACTOR TO PERFORM EXISTING AIR FLOW AND BALANCING REPORT PRIOR TO DEMOLITION FOR REBALANCING UPON COMPLETION OF NEW WORK AND REPORT RESULTS TO ENGINEER PER THE SPECIFICATIONS. AIRFLOW QUANTITIES IN AREAS OUTSIDE OF SCOPE OF WORK SHALL REMAIN UNAFFECTED BY NEW WORK.
2. ALL SUPPLY, RETURN, & EXHAUST AIR DEVICES SHALL HAVE BALANCING DAMPERS. CONTRACTOR SHALL ALSO PROVIDE VOLUME DAMPER AT EACH BRANCH/TAKEOFF AND AS SHOWN ON DRAWINGS.
3. CONTRACTOR SHALL REBALANCE AC-04, EF-04, AHU-51, AND EF-51 FOR THE NEW AIRFLOW QUANTITIES REQUIRED PER THE SPECIFICATIONS. CONTRACTOR SHALL ALSO REBALANCE HYDRONIC FLOWS TO THIS EQUIPMENT AS REQUIRED TO MEET THE REQUIREMENTS OF THE NEWLY RENOVATED SPACES WHILE AREAS OUTSIDE OF SCOPE REMAIN UNAFFECTED.

SHEET KEYNOTES:

1. CONTRACTOR SHALL DEMOLISH AND REMOVE SUPPLY AND EXHAUST DUCT, HANGERS, REGISTERS, GRILLES, FIRE DAMPERS, THERMOSTATS, FLEX DUCT AND ALL APPURTENANCES AS SHOWN.
2. CONTRACTOR SHALL CUT, CAP AND SEAL DUCTWORK. SEAL DUCTWORK TO MAINTAIN CLASS "A" SEAL PER SMACNA PRESSURE CLASSIFICATION. PATCH ANY WALL PENETRATIONS AS NECESSARY TO MAINTAIN EXISTING CONDITIONS AND/OR RATINGS.
3. DEMOLISH AND REMOVE LOW WALL EXHAUST GRILLE AND CAP DUCT TO MATCH EXISTING PRESSURE CLASS. CUT BACK SUPPLY DUCT TAP AND CAP TO MATCH EXISTING PRESSURE CLASS.
4. DEMOLISH AND REMOVE SUPPLY DUCT AND ALL APPURTENANCES BACK TO MAIN SUPPLY. OPENING IS TO BE REUSED FOR NEW WORK.
5. CONTRACTOR TO CONNECT DUCT WORK TO PREFABRICATED BOOTH. COORDINATE WITH BOOTH MANUFACTURER CONNECTION SIZES AND LOCATIONS AND ANY SPECIAL REQUIREMENTS. DUCT RUN OUT TO BOOTHS SHALL BE FULL SIZE OF BOOTH CONNECTION.
6. CONTRACTOR TO PROVIDE AND INSTALL NEW COMBINATION FIRE/SMOKE DAMPERS TO MAINTAIN FIRE RATING OF THE EXISTING SHAFT. THIS WORK SHALL BE SCHEDULED WITH THE VA AND EXECUTED TO MINIMIZE THE DURATION OF WORK.
7. CONTRACTOR TO TAKE PRE-DEMO AIR BALANCING READINGS AT THESE LOCATIONS AND RE-BALNCE TO PRE-DEMO READINGS UPON COMPLETION.
8. SUPPLY AND EXHAUST SYSTEMS TO BE OPERATIONAL DURING CONSTRUCTION TO MAINTAIN ROOMS DOWN AND UP STREAM OF DUCT MAINS. CONTRACTOR TO PROVIDE TEMPORARY HEATING AND COOLING TO MATCH EXISTING DESIGN CONDITIONS.
9. CONTRACTOR TO DEMOLISH AND REMOVE EXISTING EXHAUST AND OUTSIDE AIR DUCT WORK AS SHOWN. INSTALL NEW EXHAUST AND OUTSIDE AIR DUCT WORK TO UNDER SIDE OF BEAM AND RECONNECT TO EXISTING OPENINGS TO ALLOW FOR NEW CEILING. EXISTING FIRE/SMOKE DAMPERS TO REMAIN PROVIDE NEW ACCESS PANELS PER THE VA STANDARD.
10. REBALANCE EXISTING EXHAUST CEILING DIFFUSER TO 50 CFM.
11. DDC PANELS TO BE RELOCATED REFER TO THE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION. CONTROLS TO BE RELOCATED REFER TO THE ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION.
12. REFER TO DRAWING MP-101 FOR CONTROL VALVE PANEL DEMOLITION.



KEY PLAN – GROUND FLOOR
SCALE: NONE

100% CONTRACT DOCUMENTS
FULLY SPRINKLERED

Revisions	Date

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Reviewed: Facility Manager
Reviewed: Facility Director
Reviewed:
Reviewed:

Drawing Title: MECHANICAL GROUND FLOOR DUCTWORK DEMO AND NEW WORK PLANS
Approved: Project Director

Project Title: **AUDIOLOGY LAB RENOVATION**
Building Number: NO. 1
Checked: GFE
Drawn: ATF
Location: VAMC SYRACUSE, NY

Date: 05-19-2014
Project No.: **528A7-13-750**
DRAWING NO.: MH-101
Dwg. 25 Of 46

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Department of Veterans Affairs

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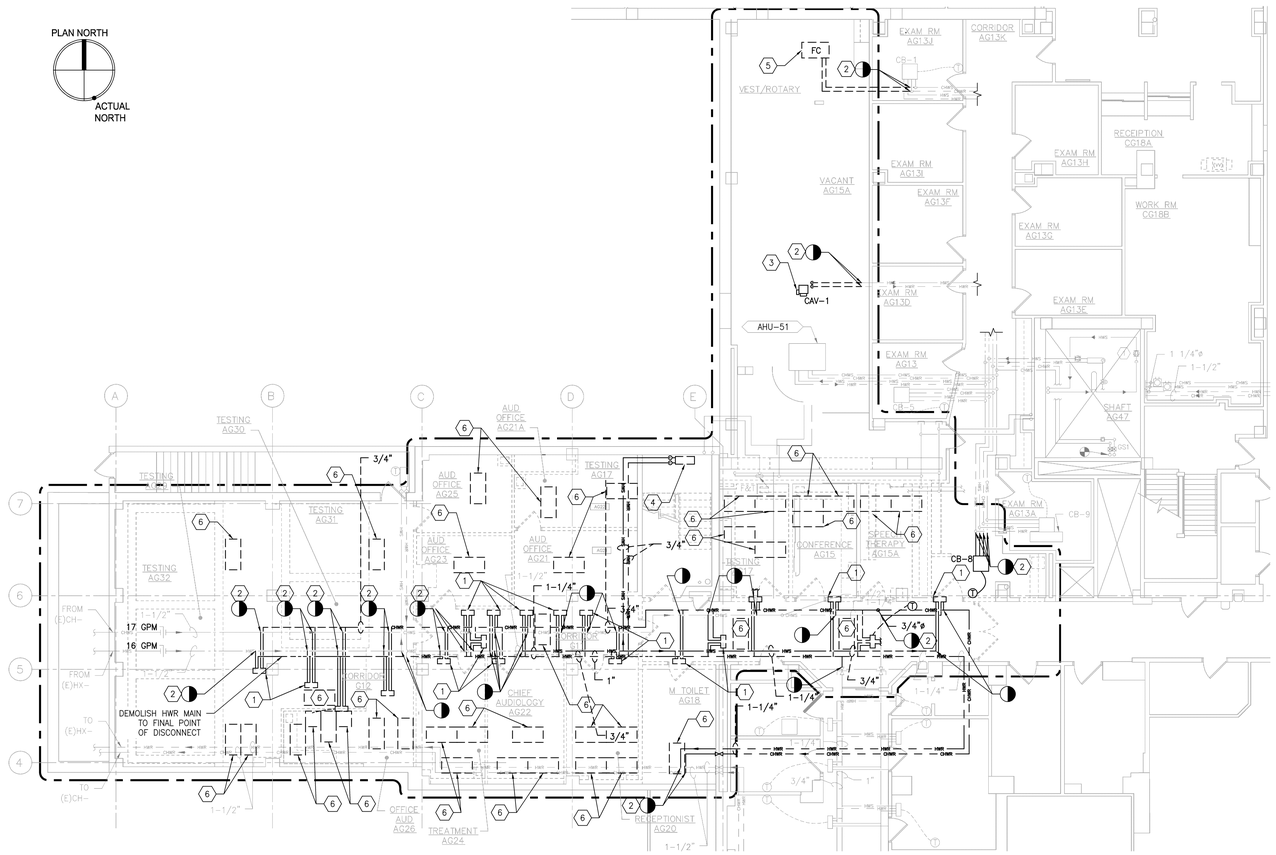
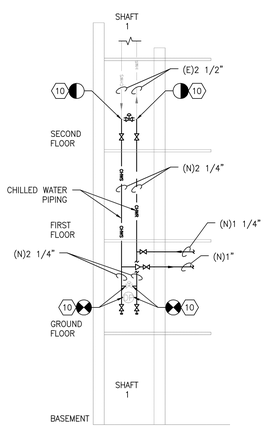
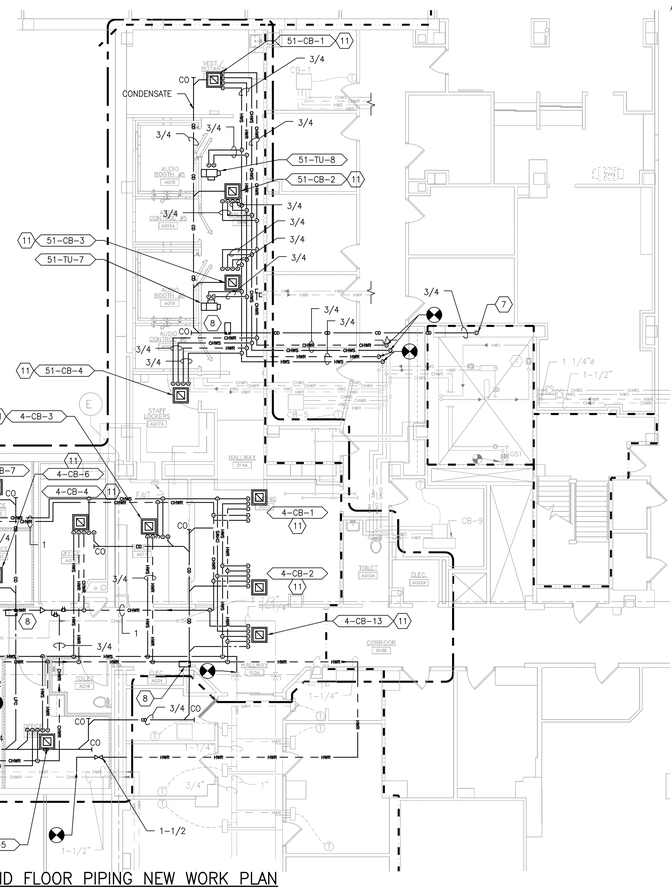


1 MECHANICAL GROUND FLOOR PIPING DEMOLITION PLAN
SCALE: 1/8" = 1'-0"



3 MECHANICAL SHAFT ELEVATION
SCALE: NONE



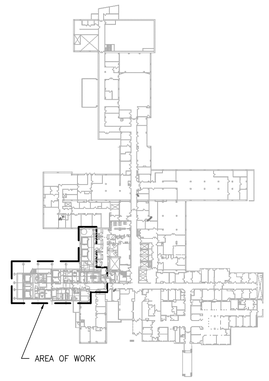
2 MECHANICAL GROUND FLOOR PIPING NEW WORK PLAN
SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES:

1. CONTRACTOR TO PERFORM EXISTING HYDRONIC TESTING AND BALANCING REPORT PRIOR TO DEMOLITION FOR REBALANCING UPON COMPLETION OF NEW WORK AND REPORT RESULTS TO ENGINEER. HYDRONIC FLOW QUANTITIES IN AREAS OUTSIDE OF SCOPE OF WORK SHALL REMAIN UNAFFECTED BY NEW WORK. SEE SPECIFICATIONS FOR BALANCING INFORMATION REQUIRED.
2. ALL RADIANT PANELS AND ASSOCIATED PIPING, VALVES, CONTROLS AND APPURTENANCES FOR THE AREA OF WORK SHALL BE DEMOLISHED BACK TO MAIN OR NEAREST ISOLATION POINT IN ITS ENTIRETY AND CAPPED.

SHEET KEYNOTES:

1. DEMOLISH AND REMOVE EXISTING CHILLED WATER AND HOT WATER VALVE STATIONS SERVING RADIANT PANELS IN ITS ENTIRETY TO INCLUDE THERMOSTATS, HANGERS AND ALL ASSOCIATED APPURTENANCES.
2. DEMOLISH AND REMOVE PIPE BACK TO THE MAIN OR NEAREST ISOLATION POINT/VALVE AND CAP.
3. DEMOLISH AND REMOVE TERMINAL UNIT AND ASSOCIATED THERMOSTAT AND ANY AND ALL ASSOCIATED CONTROLS AND APPURTENANCES. DEMOLISH PIPING AS SHOWN TO ALLOW NEW PIPING TO FEED NEW CHILLED BEAMS AND VAV BOXES. REFER TO PLAN 2 ON THIS SHEET FOR FURTHER CLARIFICATION.
4. DEMOLISH AND REMOVE UNIT HEATERS AND ASSOCIATED THERMOSTAT AND ANY AND ALL ASSOCIATED CONTROLS AND APPURTENANCES. DEMOLISH AND REMOVE PIPING AS SHOWN TO ALLOW NEW PIPING TO FEED NEW CHILLED BEAMS AND VAV BOXES. REFER TO PLAN 2 ON THIS SHEET FOR FURTHER CLARIFICATION.
5. DEMOLISH AND REMOVE THE FAN COIL UNITS AND ASSOCIATED THERMOSTAT AND ANY AND ALL ASSOCIATED CONTROLS AND APPURTENANCES. DEMOLISH PIPING AS SHOWN TO ALLOW NEW PIPING TO FEED NEW CHILLED BEAMS AND VAV BOXES. REFER TO PLAN 2 ON THIS SHEET FOR FURTHER CLARIFICATION.
6. DEMOLISH AND REMOVE RADIANT PANELS AND ASSOCIATED THERMOSTATS, PIPING BACK TO THE MAIN AND ALL ASSOCIATED CONTROLS AND APPURTENANCES. DEMOLISH AND REMOVE PIPING TO ALLOW NEW PIPING TO FEED NEW CHILLED BEAMS AND VAV BOXES.
7. PIPE CONDENSATE TO FLOOR DRAIN.
8. PROVIDE LOW PROFILE CONDENSATE PUMP WITH 10' HEAD AT 45 GPM, 115 VOLT, 60 HERTZ AND 1.5 AMPS (LITTLE GIANT VCC-20 OR APPROVED EQUAL).
9. CONNECT CONDENSATE PIPING TO EXISTING STORM DRAIN BELOW SLAB. REFERENCE PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.
10. CONTRACTOR SHALL CONNECT TO EXISTING SECONDARY (45°F) CHILLED WATER PIPING RISERS IN SHAFT 1 ON THE SECOND FLOOR AND EXTEND PIPING AS SHOWN. RELOCATE EXISTING BYPASS VALVE AND DP SENSOR FROM THE SECOND FLOOR TO THE GROUND FLOOR. REBALANCE EXISTING BYPASS IN SHAFT UPON COMPLETION OF NEW WORK. PROVIDE LOW POINT DRAINS ON RISERS.
11. CONTRACTOR SHALL PIPE THE CHILLED BEAMS PER THE DETAIL ON DRAWING MH-501. ALL BRANCH PIPING SHALL BE 3/4" UNLESS OTHERWISE INDICATED.



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