**HVAC SPECIFICATIONS SECTION 15500:**

**A. GENERAL:**
- THE WORK OF THIS SECTION INCLUDES, BUT IS NOT LIMITED TO, THE HVAC SYSTEM. QUALITY ASSURANCE: COMPLY WITH THE CURRENT:
  - INTERNATIONAL MECHANICAL CODE (IMC), INTERNATIONAL PLUMBING CODE (IPC), INTERNATIONAL FUEL GAS CODE (IFGC), INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL ENERGY CONSERVATION CODE (IECC); LOCAL CODES AND AMENDMENTS
  - NFPA 70; UL LISTING; NFPA 90A & 90;

**B. SUBMITTALS:**
- PRODUCT DATA FOR HEATING AND COOLING UNITS.
- DUCTWORK SHOP STANDARDS AND ACCESSORIES.
- PIPING SHOP STANDARDS AND ACCESSORIES.
- WARRANTIES AND GUARANTEES

**C. PIPING:**
- GENERAL: PROVIDE STEEL PIPE SLEEVES FOR MASONRY WALL PENETRATIONS, TIGHT FITTING SHEET METAL SLEEVES IN WOOD PENETRATIONS AND 3M FIRE STOPPING IN RATED WALL OR FLOOR PENETRATIONS. PROVIDE DIELECTRIC FITTINGS OR UNIONS IN ALL PIPE CONNECTIONS OF DISSIMILAR METALS.
- REFRIGERANT: ASTM B 743 COPPER TUBE WITH WROUGHT COPPER FITTINGS AND BRAZED JOINTS. REFER TO MANUFACTURER'S RECOMMENDATION FOR INSULATION THICKNESS.
- CONDENSATE PIPING: TYPE M DWV, DRAWN-TEMPER COPPER TUBING, WROUGHT-COPPER FITTINGS, AND SOLDER JOINTS. ½" FIBERGLASS INSULATION.
- CHILLED/HOT WATER:
  - PIPE SIZE 2" AND SMALLER: TYPE "L" DRAWN-TEMPER COPPER TUBING, WROUGHT-COPPER FITTINGS, AND BRAZED JOINTS.
  - PIPE SIZE 2-1/2" AND OVER: SCHEDULE 40 STEEL PIPE, GROOVED, MECHANICAL JOINT COUPLING AND FITTINGS, AND GROOVED, MECHANICAL JOINTS.
  - INSULATION: TO MATCH EXISTING WHERE SYSTEMS WERE CAPPED.
- NATURAL GAS ABOVE GRADE: RUN IN SCHEDULE 40 ASTM A53 BLACK STEEL PIPE AND THREADED FITTINGS. USE WELDED FITTINGS FOR 10 PSIG AND ABOVE. THREADED JOINTS WITH MALLEABLE FITTINGS MAY BE MADE AT UNIT CONNECTIONS. PAINT EXTERIOR EXPOSED STEEL PIPING FOR CORROSION PROTECTION, COLOR SELECTED BY OWNER OR ARCHITECT.

**D. PIPE HANGERS AND SUPPORTS:**
- PROVIDE CLEVIS TYPE HANGER WITH OVER-SIZED YOKE WHERE REQUIRED FOR INSULATION.
- PROVIDE JOIST HANGERS AND ALL-THREAD RODS.
- PROVIDE PIPE CLAMPS TO SUPPORT VERTICAL PIPING THROUGH FLOOR.
- PROVIDE INSULATION SHIELDS WHERE INSULATION OCCURS.
- PROVIDE B-LINE DURA-BLOCK (OR EQUAL) SUPPORTS WITH UNISTRUCT PIPE CLAMP FOR ROOF PIPING.
- REFER TO DRAWING TABLES [DWG M001]:
  - PIPING SPACING SUPPORT
  - GAS PIPING SPACING SUPPORT
  - HANGER ROD SIZING

**E. IDENTIFICATION:**
- GENERAL: PROVIDE PERMANENT LABELS ON ALL EQUIPMENT WITH DRAWING TAG, CAPACITY, AND ELECTRICAL CHARACTERISTICS.
- OUTDOOR EQUIPMENT: PROVIDE STAMPED METAL NAMEPLATES.
- PROVIDE PIPE LABELS SHOWING TYPE OF DUTY (I.E. "HOT WATER SUPPLY" AND DIRECTION OF FLOW) AT 15 FOOT INTERVALS.

**F. ELECTRICAL REQUIREMENTS:**
- GENERAL: PROVIDE STARTERS, RELAYS, CONTROLS, POWER FOR ACTUATORS, SWITCHES, MEANS OF DISCONNECT, JUNCTION BOXES, CONTROLLERS, ET CETERA REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM. FOLLOW THE REQUIREMENTS OF THE ELECTRICAL SECTION OF THE SPECIFICATION.
- MOTORS: PROVIDE MOTORS FOR MECHANICAL EQUIPMENT SUPPLIED BY THE EQUIPMENT MANUFACTURER WHEN POSSIBLE. PROVIDE MOTORS OF PHASE AND VOLTAGE INDICATED ON DRAWINGS AND SUITABLE FOR THE LOADING AND ENVIRONMENT. PROVIDE OPEN DRIP PROOF (ODP) MOTOR ENCLOSURES FOR NORMAL USE OR TOTALLY ENCLOSED FAN COOLED (TEFC) ENCLOSURES FOR OUTDOOR USE, HAZARDOUS OR DIRTY ENVIRONMENTS. PROVIDE MOTORS WITH 1.15 SERVICE FACTOR, INSULATION CLASS F, AND PRE-LUBRICATED BALL BEARINGS RATED FOR CONTINUOUS DUTY UP TO 105°F AMBIENT TEMPERATURE AND 3300FT ALTITUDE. POLY-PHASE MOTORS SHALL BE PREMIUM EFFICIENCY AND WHEN USED WITH VARIABLE SPEED DRIVES, SHALL BE RATED FOR INVERTER DUTY. SINGLE PHASE MOTORS LARGER THAN 1/6HP SHALL BE OPEN-CAPACITOR START, CAPACITOR RUN TYPE UNLESS OTHERWISE INDICATED. SINGLE PHASE MOTORS 1/6HP AND SMALLER MAY BE SPLIT PHASE START, CAPACITOR RUN TYPE OR PERMANENT-SPLIT CAPACITOR TYPE.
- STARTERS: PROVIDE EACH MOTOR WITH A MOTOR STARTER OF PROPER DESIGN TO MEET THE REQUIREMENTS OF THE MOTOR AND DRIVE. STARTER TYPES SHALL INCLUDE MAGNETIC, MANUAL, SOLID-STATE REDUCED VOLTAGE, OR VARIABLE SPEED DRIVE. COORDINATE STARTER REQUIREMENTS WITH THE EQUIPMENT AND CONTROL SEQUENCE. PROVIDE ACCESSORIES SUCH AS CONTACTS, OVERLOADS, EXTERNAL RESETS, CONTROL CIRCUIT TRANSFORMERS, PILOT LIGHTS, PUSH BUTTONS, HOA AND OTHER SELECTOR SWITCHES AS NEEDED FOR THE SPECIFIED OPERATION.

**G. PACKAGED HEATING AND COOLING ROOFTOP UNIT [RTU-1 & RTU-2]:**
- FURNISH AND INSTALL GAS HEATING/COOLING SYSTEMS, SELF CONTAINED, FULLY CHARGED, FACTORY ASSEMBLED, WIRED AND TESTED UNITS WITH VERTICAL DISCHARGE AIRFLOW AND 12" ROOF CURB.
- PROVIDE 100% MODULATING OUTSIDE AIR ECONOMIZER DAMPERS AND GRAVITY RELIEF OR POWERED EXHAUST. INCLUDE DUAL ENTHALPY CONTROLS.
- PROVIDE CAPACITY, PERFORMANCE, STAGES, AND OPTIONS LISTED ON THE DRAWING SCHEDULE.
- UNIT SHALL HAVE STAGED COOLING.
- UNIT SHALL HAVE STAGED GAS HEAT.
- ALL UNITS SHALL BE FACTORY ASSEMBLED, PIPED, INTERNALLY WIRED AND FULLY CHARGED WITH R-410.
- ALL UNITS SHALL BE DESIGNED TO OPERATE AT OUTDOOR AMBIENT TEMPERATURES FROM 0°F TO 120°F.
- COOLING AND HEATING CAPACITIES SHALL BE RATED IN ACCORDANCE WITH A.R.I. STANDARDS.
- THE UNIT DESIGN SHALL BE CERTIFIED BY THE AGA OR CSA, SPECIFICALLY FOR OUTDOOR APPLICATIONS USING PROPANE OR NATURAL GAS.
- UNITS SHALL BE WEATHERPROOFED AND DESIGNED FOR OUTDOOR ROOFTOP INSTALLATION.
- PROVIDE HOT GAS REHEAT COIL AND DEHUMIDIFICATION CONTROLS.
- PROVIDE LOW AMBIENT CONTROLS.
- PROVIDE FACTORY MOUNTED CONVENIENCE OUTLET.
- PROVIDE FAULT DETECTION AND DIAGNOSTICS.
- PROVIDE FACTORY MOUNTED DISCONNECT.
- PROVIDE FIELD DUCT MOUNTED CARBON DIOXIDE SENSOR.
- PROVIDE FIELD DUCT MOUNTED RELATIVE HUMIDITY SENSOR.
- EXTERIOR SURFACES OF ALL UNITS SHALL BE PHOSPHATIZED, ZINC-COATED STEEL WITH EPOXY RESIN PRIMER AND BAKED ENAMEL FINISH.
- ACCESS TO FILTERS, BLOWER, HEATING SECTION, AND OTHER ITEMS NEEDING PERIODIC CHECKING OR MAINTENANCE SHALL BE THROUGH HINGED ACCESS DOORS WITH QUARTER-TURN LATCHES. DOOR FASTENING SCREWS ARE NOT ACCEPTABLE.
- ALL OPENINGS THROUGH THE BASE PAN OF THE UNIT SHALL HAVE UPTURNED FLANGES OF AT LEAST ½" IN HEIGHT AROUND THE OPENING THROUGH THE BASE PAN.
- THE INTERIOR AIR SIDE OF THE CABINET SHALL BE ENTIRELY INSULATED ON ALL EXTERIOR PANELS WITH 1 INCH THICK, 1-1/2 LB DENSITY FIBERGLASS INSULATION.
- ALL BELT DRIVE BLOWER(S) SHALL HAVE BACKWARD INCLINED AIRFOIL BLADES.
- ALL DIRECT DRIVE BLOWER(S) SHALL HAVE FORWARD CURVED BLADES.
- OVER SIZED FAN FOR VAV APPLICAITON WITH SHAFT GROUND RINGS.
- COORDINATE ROOF OPENINGS AND LOCATIONS WITH STRUCTURAL OPENINGS AND REINFORCEMENT.

**H. ROOFTOP MAKE UP AIR UNITS:**
- DESCRIPTION: 100% OUTSIDE AIR ROOFTOP HEATING AND COOLING VENTILATION UNIT, DIRECT FIRED, RAIN HOOD, INLET SCREEN, FILTER SECTION W/ 2" PLEATED FILTERS, ROOF CURB, TWO (2) CONDENSING UNIT.
- INSULATION: DOUBLE WALL, FROM BURNER SECTION THROUGH END OF UNIT.
- BURNER: CAST ALUMINUM BURNER MANIFOLD WITH STAINLESS STEEL MIXING PLATES. ELECTRONICALLY MODULATED.
- FAN & MOTOR: FORWARD CURVED CENTRIFUGAL FAN, BELT DRIVE, W/ STARTER & OVERLOADS.
- CONTROLS: REMOTE CONTROL STATION, DISCHARGE AIR SENSOR CONTROL WITH SPACE OVERRIDE SENSORS.
  - INTERLOCK TO ASSOCIATED EXHAUST FAN OPERATION.
- AIR BALANCE BASED ON FUTURE HOOD REQUIREMENTS.
- SEE DRAWING SCHEDULE FOR MANUFACTURER/MODEL. AND ADDITIONAL INFORMATION.

**I. DUCTWORK, ACCESSORIES AND INSULATION:**
- DUCTWORK: GALVANIZED G90 SHEET METAL FABRICATED IN ACCORDANCE WITH SMACNA STANDARDS.
- BLANKET INSULATION (FIBERGLASS): 3/4 LB/CF GLASS FIBERS BONDED WITH A THERMOSETTING RESIN (MIN R-6), ASTM C 1290 TYPE III WITH ASTM C 1136 TYPE II FOIL REINFORCED KRAFT (FRK) LOW PERMEANCE VAPOR RETARDER FACING.
- INSULATION APPLICATION: APPLY INSULATION AS FOLLOWS:
  - SEE DUCTWORK CONSTRUCTION MATERIAL SCHEDULE:
    - INDOOR CONCEALED SUPPLY AIR: 2.2" BLANKET WITH VAPOR BARRIER (R-6).
    - INDOOR EXPOSED SUPPLY AIR: 1" THICK, 1.5 LB DUCT LINER.
    - INDOOR CONCEALED RETURN AND TRANSFER AIR: 2.2" BLANKET WITH VAPOR BARRIER (R-6).
    - INDOOR EXPOSED RETURN AIR: NONE EXCEPT 1" THICK, 1.5 LB DUCT LINER FROM UNIT TO 15FT UPSTREAM DUCTWORK
    - INDOOR CONCEALED OUTSIDE AIR: 1.5" BLANKET WITH VAPOR BARRIER.
    - INDOOR EXHAUST AIR: BARE METAL
- TURNING VANES: PROVIDE GALVANIZED STEEL AIRFOIL TYPE TURNING VANES IN DUCT ELBOWS AS INDICATED.
- CONTROL DAMPERS: PROVIDE ULTRA-LOW LEAK GALVANIZED STEEL DAMPERS GALVANIZED STEEL SHAFTS AND STEEL BEARINGS, NEOPRENE BLADE AND EDGE SEALS.
- FLEXIBLE DUCTWORK: VINYL LINER, 2" FIBERGLASS INSULATION (MIN R-6) WITH STEEL WIRE REINFORCEMENT AND VINYL JACKET, MEETING FLAME SPREAD AND SMOKE DEVELOPED REQUIREMENTS OF UL 181.

**J. AIR DEVICES:**
- CONSTRUCTION: PROVIDE REGISTERS, GRILLES, AND DIFFUSERS WITH BAKED WHITE ENAMEL ALUMINUM OR STEEL CONSTRUCTION, SUITABLE FOR FIELD PAINTING.
- CEILING DIFFUSERS: ASPIRATING TYPE, SQUARE FACE, WITH ROUND NECK OR SQUARE TO ROUND TRANSITION AND OPPOSED BLADE DAMPER. SEE SCHEDULE OR EQUAL.
- GRILLES & REGISTERS: HORIZONTAL FACE BARS WITH 45° DEFLECTION ON ½" CENTERS, OPPOSED BLADE DAMPER FOR REGISTERS. SEE SCHEDULE OR EQUAL.

**K. CONTROLS:**
- PROVIDE TRANE DIGITIAL CONTROL PACKAGE TO CONNECT TO EXISTING BUILDING MANANGEMENT SYSTEM. COORDINATE WITH TRANE.
- PROVIDE ALL DEVICES, AND LOW VOLTAGE CONTROL WIRING NECESSARY TO ACCOMPLISH THE SPECIFIED SEQUENCE OF OPERATION, PLUS 120V POWER FOR DAMPER AND VALVE ACTUATORS.
- PROVIDE 120 TO 24 VAC TRANSFORMERS, RELAYS, WIRING, SWITCHES, ELECTRIC AND ELECTRONIC CONTROLS EQUIPMENT, ACTUATORS, ENGINEERING, COMMISSIONING, START-UP, ET CETERA REQUIRED FOR A COMPLETE CONTROL SYSTEM WITH SPECIFIED SEQUENCE OF OPERATION:

**L. BALANCING AND COMMISSIONING:**
- VERIFY PROPER INSTALLATION OF MECHANICAL EQUIPMENT PRIOR TO BALANCING AND REPORT ANY DEFICIENCIES.
- VERIFY ALL NECESSARY COMPONENTS ARE INSTALLED SUCH AS BALANCING VALVES AND DAMPERS.
- VERIFY OPERATION OF SYSTEMS AND EQUIPMENT COMPLIES WITH THE SPECIFIED SEQUENCE OF OPERATION IN ALL MODES.
- BALANCE AIR SYSTEMS TO WITHIN 0 TO 10% OF INDICATED VALUES.
- SUBMIT REPORTS SPECIFIED UNDER SUBMITTALS.

**M. TRAINING:**
- TRAIN OWNERS REPRESENTATIVE TO ADJUST, OPERATE, AND MAINTAIN ALL EQUIPMENT AND ASSOCIATED CONTROLS.

**N. RECORD DOCUMENTS/CLOSEOUT SUBMITTALS:**
- PROVIDE OPERATIONAL AND MAINTENANCE MANUALS TO BE DELIVERED ELECTRONICALLY AND IN THREE RING BINDER.
- AS-BUILT DRAWINGS: DELIVER TO OWNER AT THE COMPLETION OF THE PROJECT A SET OF PRINTS OF THE DRAWINGS MARKED IN RED SHOWING CHANGES IN LOCATIONS, MODELS AND CAPACITIES OF THE SYSTEM.
- BALANCING AND COMMISSIONING REPORTS: SUBMIT PRE-TEST VERIFICATION AND BALANCING DATA REPORTS.

SEQUENCE OF OPERATION: (ALL SET POINTS SHALL BE ADJUSTABLE THROUGH TRANE CONTROL SYSTEM)

CONSTANT VOLUME PACKAGED UNITS [RTU-#]:
- COOLING AND HEATING CYCLES WILL BE BASED ON DIGITAL CONTROLLER. ALL SET POINTS, SCHEDULES, AND SETBACKS WILL BE ADJUSTABLE BY OCCUPANT.
- OCCUPIED CYCLE (BASED ON T-STAT PROGRAM): OPEN OUTSIDE AIR DAMPER TO MINIMUM POSITION, AND OPERATE SUPPLY FAN CONTINUOUSLY. ON A RISE IN SPACE TEMPERATURE ABOVE THE COOLING SET POINT (74°F) WITH ECONOMIZER DISABLED, OPERATE COMPRESSOR(S) IN STAGES TO SATISFY THE THERMOSTAT. ON A RISE IN SPACE TEMPERATURE ABOVE THE COOLING SET POINT (74°F) WITH ECONOMIZER ENABLED, MODULATE THE RETURN AIR AND OUTSIDE AIR DAMPERS TO SATISFY THE THERMOSTAT. ON A CONTINUED RISE IN SPACE TEMPERATURE ABOVE THE COOLING SET POINT (74°F), OPERATE THE COMPRESSOR(S) IN STAGES TO SATISFY THE THERMOSTAT. ON A FALL IN SPACE TEMPERATURE BELOW THE HEATING SET POINT (70°F) AND THE OUTSIDE AIR DAMPER AT MINIMUM, OPERATE THE GAS BURNER TO SATISFY THE THERMOSTAT.
- UNOCCUPIED CYCLE: CLOSE THE OUTSIDE AIR DAMPER. ON A FALL IN SPACE TEMPERATURE BELOW THE HEATING SETBACK TEMPERATURE (65°F), START THE SUPPLY FAN AND OPERATE THE GAS BURNER TO SATISFY THE THERMOSTAT.
- ECONOMIZER: ENABLE ECONOMIZER CYCLE WHEN OUTSIDE AIR ENTHALPY IS LESS THAN 28 BTU/LB.
- DEHUMIDIFICATION (HOT GAS REHEAT): OPERATE DEHUMIDIFICATION CYCLE, WHEN COOLING IS NOT ENABLED, UPON RISE IN SPACE HUMIDITY ABOVE 60%RH.
- CO2 CONTROL: MODULATE OUTSIDE AIR DAMPER, WHEN NOT IN ECONOMIZER MODE, TO MAINTAIN A CARBON DIOXIDE LEVEL AT OR BELOW 1000 PPM. MAINTAIN MINIMUM OUTSIDE AIR DAMPER SETTING WHEN UNIT IS OPERATING IN OCCUPIED MODE.

KITCHEN MAKEUP AIR UNIT (MAU-1):
- UNIT CONTROLS: THE UNIT SHALL BE PROVIDED FROM THE FACTORY WITH:
  - 24VAC TRANSFORMER
  - TERMINAL STRIP
  - EXHAUST FAN MOTOR STARTER [KEF-1] PROVIDE FIELD WIRING.
  - FACTORY MOUNTED AND WIRED OUTDOOR AIR INLET DAMPER WITH ACTUATOR
  - REMOTE CONTROL PANEL: MOUNTED AT COOKLINE HOOD [KH-1]
- KITCHEN REMOTE CONTROL PANEL:
  - INTEGRATE INTO EXISTING KITCHEN CONTROL PANEL OR POWER SWITCH.
- UNIT STARTUP:
  - EXHAUST FAN ENABLED.
  - SUPPLY FAN ENABLE IS RECEIVED.
  - EXHAUST FAN CONTRACTORS ARE PROVED ELECTRICALLY.
  - OUTDOOR AIR INLET DAMPER ACTUATOR IS ENERGIZED.
  - OUTDOOR AIR INLET DAMPER ACTUATOR LIMIT SWITCH IS PROVEN CLOSED.
  - SUPPLY FAN IS ENABLED.
- COOLING CYCLE: ON A RISE IN DISCHARGE AIR TEMPERATURE ABOVE SET POINT (76°F) THE UNIT SHALL OPERATE COMPRESSOR (S) IN STAGES TO REDUCE DISCHARGE AIR TEMPERATURE. AN OUTDOOR AIR TEMPERATURE SENSOR (MOUNTED IN UNIT INLET) WILL ALLOW COOLING OR LOCKOUT COOLING BASED ON OUTDOOR TEMPERATURE SET POINT (76°F). UPON DROP IN OUTDOOR TEMPERATURE BELOW SET POINT, COOLING SHALL BE DISABLED. , ADJUSTABLE DISCHARGE AIR SET POINT.
- HEATING CYCLE: ON A FALL IN DISCHARGE AIR TEMPERATURE BELOW SET POINT (65°F) THE UNIT SHALL MODULATE GAS HEATING TO MAINTAIN A 55°F TO 95°F, ADJUSTABLE DISCHARGE AIR SETPOINT.
  - COOLING CYCLE: ON A RISE IN DISCHARGE AIR TEMPERATURE ABOVE SETPOINT (80°F) THE UNIT SHALL OPERATE COOLING (STAGES) TO DROP DISCHARGE AIR TEMP TO SETPOINT (70°F)
  - ROOM OVERRIDE: A ROOM OVERRIDE THERMOSTAT SHALL ELEVATE THE SUPPLY AIR TEMPERATURE SET POINT 5°F TO 40°F UPON A CALL FOR HEATING FROM THE SPACE.
- BUILDING FREEZE PROTECTION: IF SUPPLY AIR DROPS BELOW 35°F FOR 5 MINUTES THE SUPPLY FAN SHALL DISABLE.
  - CYCLING THE THE FAN SWITCH WILL RESET THE TIMER.
- SEQUENCE IS INTENDED TO PREVENT THE UNIT FROM SUPPLYING COLD AIR TO THE BUILDING.

## VENTILATION SUMMARY SCHEDULE

| ZONE INFORMATION | | | 2015 INTERNATIONAL MECHANICAL CODE - SECTION 403.3 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Zone Name | Occupancy Category | Area (sf) - Az | People Oair Rate (cfm/person) - Rp | Area Oair Rate (cfm/sf) - Ra | Actual Occupancy (if known) - Pz | Occupant Density (if Actual is not known) (#/1000sf) - PZ | Breathing Zone Oair Flow - Vbz (cfm) | Zone Air Distribution Effectiveness - Ez (Table 6.2) | Zone Oair Flow - Voz (cfm) | Type of Zone: (S)ingle; (M)ulti; (100%)Oair | Oair Intake Flow - Vot (cfm) | Design Oair Intake (cfm) |
| **RTU-3 & 4** | | | | | | | | | | | | |
| AUDITORIUM | AUDITORIUM | 6,600 | 5.0 | 0.06 | 1000 | 0 | 5,396 | 1.0 | 5,396 | S | 5396 | **6400** |
| **RTU-5 & 6** | | | | | | | | | | | | |
| LOBBY | LOBBY | 1,800 | 7.5 | 0.06 | 55 | 0 | 521 | 1.0 | 521 | S | 521 | **1200** |
| **RTU-7** | | | | | | | | | | | | |
| STAGE | STAGE | 3,400 | 5.0 | 0.06 | 55 | 0 | 479 | 1.0 | 479 | S | 479 | **500** |
| **RTU-8 & 9** | | | | | | | | | | | | |
| LIBRARY | LIBRARY | 3,900 | 7.5 | 0.06 | 100 | 0 | 984 | 1.0 | 984 | S | 984 | **1400** |
| **RTU-10 & 11** | | | | | | | | | | | | |
| CAFETERIA | CAFETERIS | 3,300 | 7.5 | 0.18 | 150 | 0 | 1,719 | 1.0 | 1,719 | S | 1719 | **1700** |
| **RTU-12** | | | | | | | | | | | | |
| KITCHEN | KITCHEN | 2,100 | 5.0 | 0.06 | 12 | 0 | 186 | 1.0 | 186 | S | 186 | **400** |
| **RTU-13** | | | | | | | | | | | | |
| STORAGE | STORAGE | 1,500 | 0.0 | 0.18 | 0 | 0 | 270 | 1.0 | 270 | S | 270 | **300** |
| **RTU-14** | | | | | | | | | | | | |
| AUXILIARY GYM | GYM | 4,300 | 0.0 | 0.30 | 0 | 0 | 1,290 | 1.0 | 1,290 | S | 1290 | **1500** |
| **RTU-15** | | | | | | | | | | | | |
| WEIGHT ROOM | WEIGHT ROOM | 3,100 | 20.0 | 0.06 | 31 | 0 | 806 | 1.0 | 806 | S | 806 | **975** |
| **RTU-16** | | | | | | | | | | | | |
| TRAINING ROOM | OFFICE | 750 | 5.0 | 0.06 | 3 | 0 | 60 | 1.0 | 60 | S | 60 | **120** |



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HVAC UPGRADES PHASE II

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LEESPORT, PA 19533

SPECIFICATION AND SCHEDULE

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM SHAMENEK
ENGINEER
PE075884

ENGINEER: ADAM SHAMENEK PE075884
PROJECT NUMBER: 20158
SCALE: AS NOTED
DATE: 4/20/2021
DRAWN BY: BCS
CHECKED BY: ALS
DATE CHECKED: 4/20/2021

REVISIONS

| DATE: | DESCRIPTION: |
|---|---|
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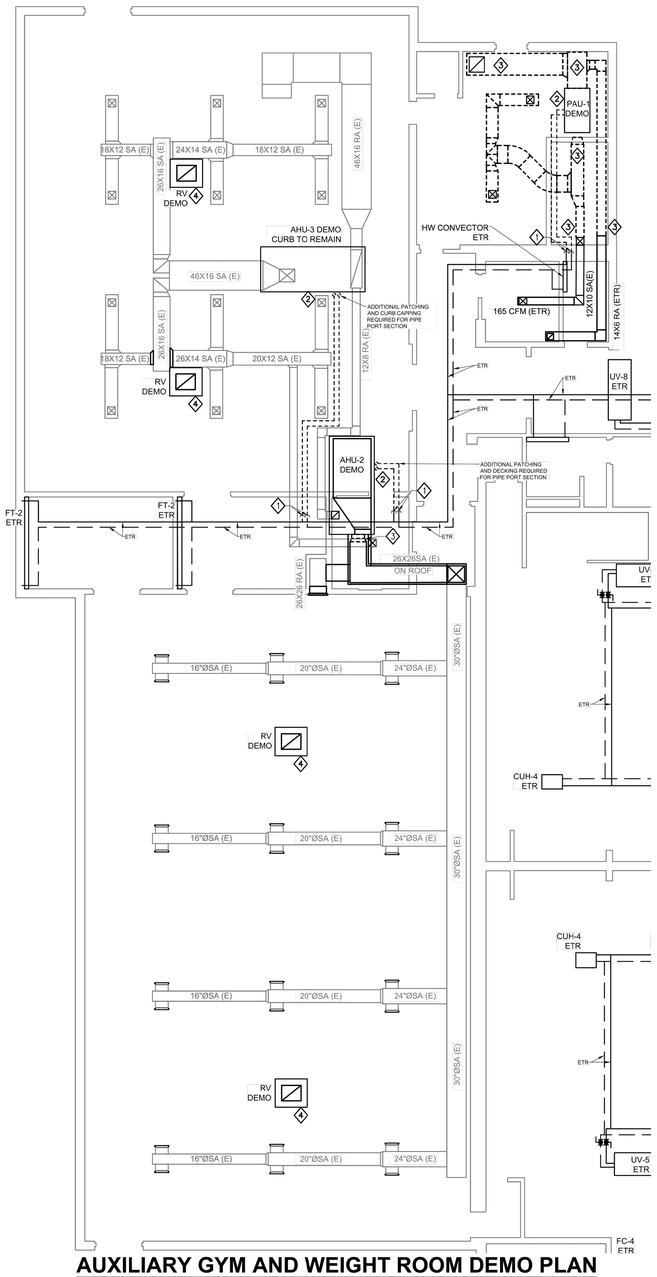
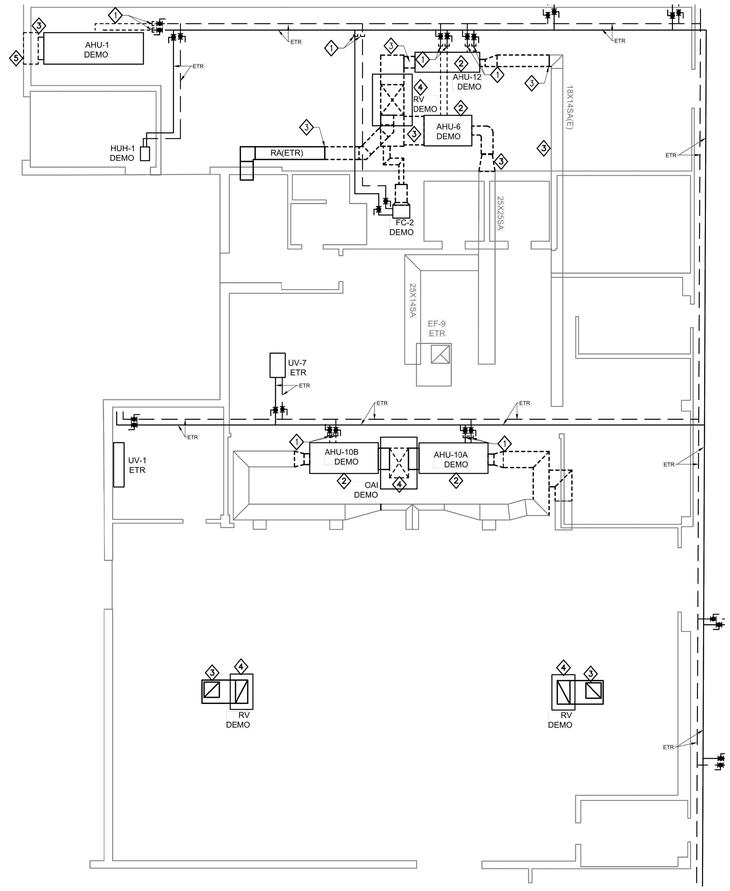
| | |
| | |

M003




## AUXILIARY GYM AND WEIGHT ROOM DEMO PLAN

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




## CAFETERIA AND KITCHEN DEMO PLAN

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

## KEYED DEMO NOTES

1. REMOVE EXISTING CHILLED/HOT WATER PIPING TO THE POINT INDICATED. DRAIN SYSTEM TO BELOW PIPING CONNECTION LEVEL AND CAP AS CLOSE TO MAIN AS POSSIBLE. COORDINATE PATCHING AND SEALING OF WALL OPENINGS.
2. DEMO EXISTING CONDENSATE PIPING.
3. REMOVE EXISTING DUCTWORK TO POINT INDICATED.
4. REMOVE EXISTING GRAVITY INTAKES, DUCTWORK TO AHU(S) AND CURBS. COORDINATE PATCHING OF CURB WITH GENERAL CONTRACTOR, OWNER, AND ROOFER.
5. PATCH AND SEAL OUTSIDE AIR INTAKE OPENING. COORDINATE PATCHING WITH GENERAL CONTRACTOR

## DEMOLITION GENERAL NOTES

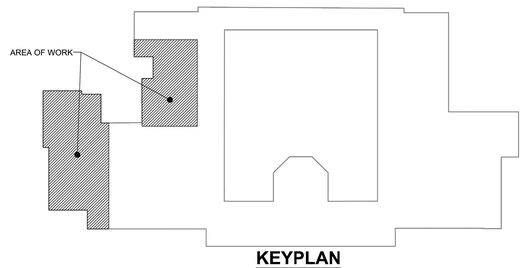
1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM RECORD DRAWINGS WHEN AVAILABLE .MAY NOT INDICATE ACTUAL CONDITIONS IN DETAIL AND DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXACT EXISTING CONDITIONS PRIOR TO PERFORMING ANY WORK. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OR ENGINEER IN WRITING IF THE EXISTING CONDITIONS ARE DISCOVERED THAT PREVENT THE EXECUTION OF WORK. THE CONTRACTOR SHALL NOT PROCEED WITH WORK UNTIL DIRECTION IS PROVIDED.
2. EVERY EFFORT HAS BEEN MADE TO INDICATE ALL DEVICES THAT ARE BEING REMOVED THROUGH EXISTING DRAWINGS AND FIELD OBSERVATIONS.
3. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, AND LABOR REQUIRED TO COMPLETE DEMOLITION WORK.
4. THE CONTRACTOR SHALL COORDINATE PATCH AND SEALING OF ALL OPENINGS GENERATED BY DEMOLITION WORK TO MATCH EXISTING CONDITIONS.
5. COORDINATE ANY ELECTRICAL CIRCUIT DEMOLITION WITH ELECTRICAL CONTRACTOR. COORDINATE ELECTRIC HAS BEEN DISCONNECTED BEFORE REMOVING ANY EQUIPMENT.
6. PROTECT EXISTING TO REMAIN EQUIPMENT.
7. REMOVE ALL THERMOSTATS WITHIN AREA OF WORK.
8. REMOVE AND REINSTALL EXISTING SUPPLY AIR SMOKE DETECTORS. COORDINATE WITH FACILITY STAFF AND ELECTRICAL CONTRACTOR FOR DISCONNECTION AND RECONNECTION TO FIRE ALARM SYSTEM.
9. EXISTING RETURN AIR SMOKE DETECTORS TO REMAIN IN RETURN DUCTWORK TO REMAIN.
10. REFER TO STRUCTURAL DRAWINGS FOR ROOF DECKING DETAIL FOR DEMOED GRAVITY INTAKES AND FANS.

PIPING SYSTEM DEMOLITION NOTES:

SYSTEM DRAINING:
- DISABLE AT ELECTRICAL DISCONNECT ALL EQUIPMENT, INCLUDING BUT NOT LIMITED TO PUMPS, BOILERS, CHILLER, AND DEVICES CRITICAL TO WATER FLOW.
- DRAIN CHILLED/HOT WATER SYSTEM TO BELOW PIPING TO REMOVED ON SYSTEM.
- DRAIN AHU-#, FC-#, UV-#, AND PIPING IN A MANNER TO NOT DAMAGE OTHER ELEMENTS OF THE BUILDING.
  - PROVIDED PROTECTION TO BUILDING ELEMENTS IF DRAINING SYSTEM COULD CAUSE DAMAGE.
- DISPOSE OF SYSTEM WATER IN ACCORDANCE WITH CHEMICAL TREATMENT GUIDELINES.

SYSTEM REFILL:
- VERIFY ALL NEW PIPING CONNECTIONS ARE SECURED AND TIGHT BEFORE REFILLING SYSTEM.
- PURGE ALL AIR FROM SYSTEM BEFORE PUTTING SYSTEM EQUIPMENT BACK INTO OPERATION.
- INSPECT AREAS OF WORK FOR LEAKS.
- AFTER SYSTEMS ARE PUT BACK INTO SERVICE CHECK MANUAL AIR VENTS FOR RESIDUAL AIR TRAPPED IN SYSTEM.
- VERIFY OPERATION OF EQUIPMENT.

CHEMICAL TREATMENT:
- BEFORE DRAINING SYSTEM, MEASURE EXISTING CHEMICAL/GLYCOL LEVELS.
  - VERIFY TYPES OF CHEMICALS WITH FACILITY STAFF.
- RETURN SYSTEM TO EXISTING TREATMENT LEVELS.
  - MEASURE VOLUME OF WATER USED TO REFILL SYSTEM TO CALCULATE NECESSARY CHEMICAL TREATMENT VOLUME.




## KEYPLAN

NOT TO SCALE

NORTH



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10 KACEY COURT, SUITE 2
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WWW.SHAMENEKENG.COM

SCHUYLKILL VALLEY HIGH SCHOOL
HVAC UPGRADES PHASE II

929 LAKE SHORE DRIVE
LEESPORT, PA 19533

DEMOLITION PLAN AUXILIARY GYM, WEIGHT ROOM, TRAINING, CAFETERIA AND KITCHEN

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM SHAMENEK
ENGINEER PE075884

ENGINEER: ADAM SHAMENEK PE075884

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| PROJECT NUMBER: | 20158 |
| SCALE: | AS NOTED |
| DATE: | 4/20/2021 |
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| CHECKED BY: | ALS |
| DATE CHECKED: | 4/20/2021 |

REVISIONS

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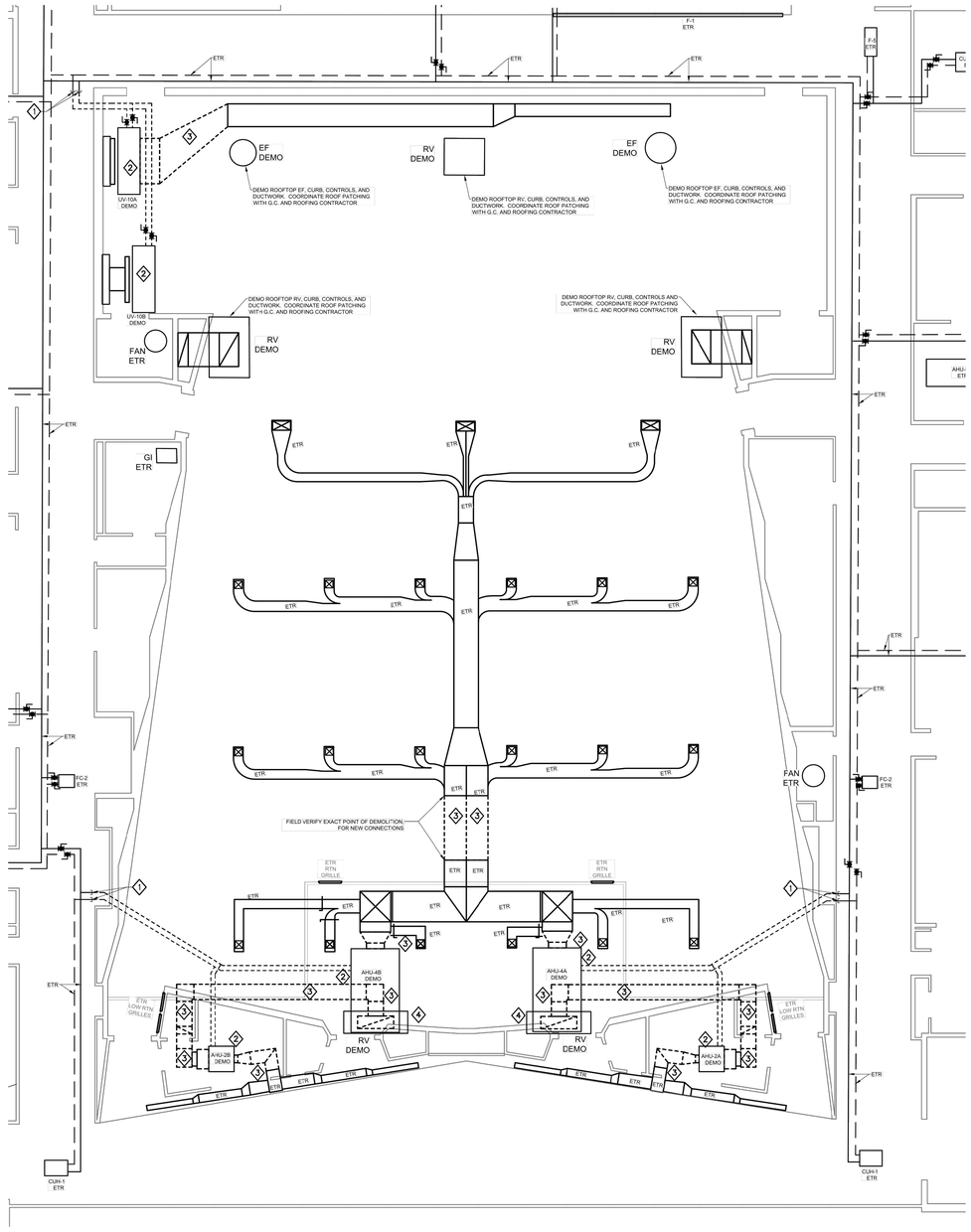



## AUDITORIUM AND LOBBY DEMO PLAN

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

PIPING SYSTEM DEMOLITION NOTES:

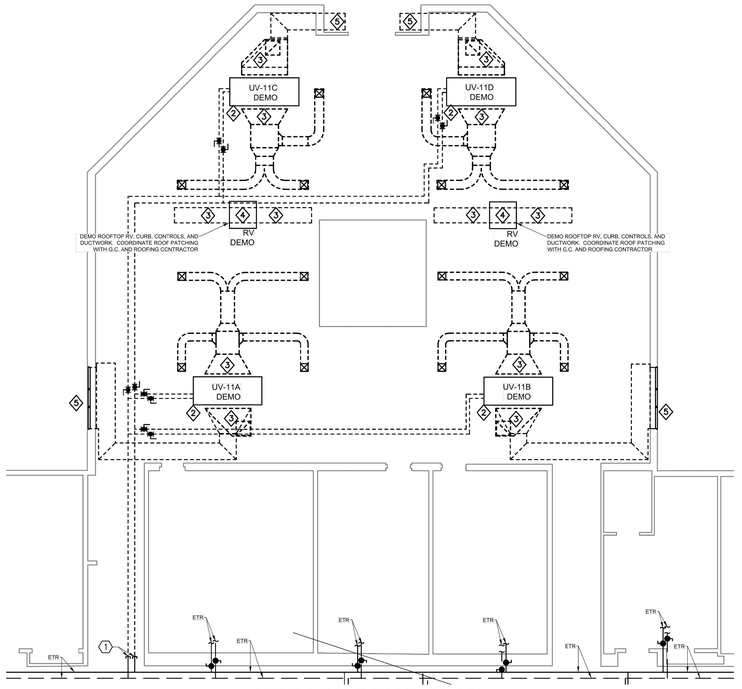
SYSTEM DRAINING:
- DISABLE AT ELECTRICAL DISCONNECT ALL EQUIPMENT, INCLUDING BUT NOT LIMITED TO PUMPS, BOILERS, CHILLER, AND DEVICES CRITICAL TO WATER FLOW.
- DRAIN CHILLED/HOT WATER SYSTEM TO BELOW PIPING TO REMOVED ON SYSTEM.
- DRAIN AHU-#, FC-#, UV-#, AND PIPING IN A MANNER TO NOT DAMAGE OTHER ELEMENTS OF THE BUILDING.
  - •• PROVIDED PROTECTION TO BUILDING ELEMENTS IF DRAINING SYSTEM COULD CAUSE DAMAGE.
- DISPOSE OF SYSTEM WATER IN ACCORDANCE WITH CHEMICAL TREATMENT GUIDELINES.

SYSTEM REFILL:
- VERIFY ALL NEW PIPING CONNECTIONS ARE SECURED AND TIGHT BEFORE REFILLING SYSTEM.
- PURGE ALL AIR FROM SYSTEM BEFORE PUTTING SYSTEM EQUIPMENT BACK INTO OPERATION.
- INSPECT AREAS OF WORK FOR LEAKS.
- AFTER SYSTEMS ARE PUT BACK INTO SERVICE CHECK MANUAL AIR VENTS FOR RESIDUAL AIR TRAPPED IN SYSTEM.
- VERIFY OPERATION OF EQUIPMENT.

CHEMICAL TREATMENT:
- BEFORE DRAINING SYSTEM, MEASURE EXISTING CHEMICAL/GLYCOL LEVELS.
  - •• VERIFY TYPES OF CHEMICALS WITH FACILITY STAFF.
- RETURN SYSTEM TO EXISTING TREATMENT LEVELS.
  - •• MEASURE VOLUME OF WATER USED TO REFILL SYSTEM TO CALCULATE NECESSARY CHEMICAL TREATMENT VOLUME.

## # KEYED DEMO NOTES

1. REMOVE EXISTING CHILLED/HOT WATER PIPING TO THE POINT INDICATED. DRAIN SYSTEM TO BELOW PIPING CONNECTION LEVEL AND CAP AS CLOSE TO MAIN AS POSSIBLE. COORDINATE PATCHING AND SEALING OF WALL OPENINGS.
2. DEMO EXISTING CONDENSATE PIPING.
3. REMOVE EXISTING DUCTWORK TO POINT INDICATED.
4. REMOVE EXISTING GRAVITY INTAKES AND DUCTWORK TO AHU(S). COORDINATE PATCHING OF CURB WITH GENERAL CONTRACTOR. CURB TO REMAIN, CLOSE OPENING AT ROOF, INSTALL INSULATION IN CURB SPACE, AND CAP OPENING WITH WEATHERPROOF/SEALED CAP.
5. PATCH AND SEAL OUTSIDE AIR INTAKE OPENING. COORDINATE PATCHING WITH GENERAL CONTRACTOR

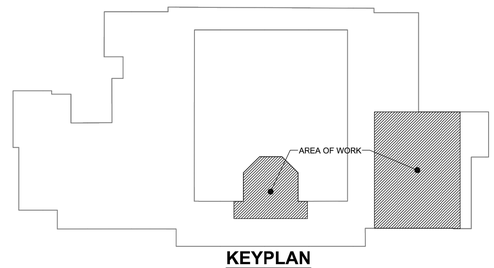



## LIBRARY DEMO PLAN

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

## DEMOLITION GENERAL NOTES

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM RECORD DRAWINGS WHEN AVAILABLE MAY NOT INDICATE ACTUAL CONDITIONS IN DETAIL AND DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXACT EXISTING CONDITIONS PRIOR TO PERFORMING ANY WORK. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OR ENGINEER IN WRITING IF THE EXISTING CONDITIONS ARE DISCOVERED THAT PREVENT THE EXECUTION OF WORK. THE CONTRACTOR SHALL NOT PROCEED WITH WORK UNTIL DIRECTION IS PROVIDED.
2. EVERY EFFORT HAS BEEN MADE TO INDICATE ALL DEVICES THAT ARE BEING REMOVED THROUGH EXISTING DRAWINGS AND FIELD OBSERVATIONS.
3. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, EQUIPMENT, AND LABOR REQUIRED TO COMPLETE DEMOLITION WORK.
4. THE CONTRACTOR SHALL COORDINATE PATCH AND SEALING OF ALL OPENINGS GENERATED BY DEMOLITION WORK TO MATCH EXISTING CONDITIONS.
5. COORDINATE ANY ELECTRICAL CIRCUIT DEMOLITION WITH ELECTRICAL CONTRACTOR. COORDINATE ELECTRIC HAS BEEN DISCONNECTED BEFORE REMOVING ANY EQUIPMENT.
6. PROTECT EXISTING TO REMAIN EQUIPMENT.
7. REMOVE ALL THERMOSTATS WITHIN AREA OF WORK.
8. REMOVE AND REINSTALL EXISTING SUPPLY AIR SMOKE DETECTORS. COORDINATE WITH FACILITY STAFF AND ELECTRICAL CONTRACTOR FOR DISCONNECTION AND RECONNECTION TO FIRE ALARM SYSTEM.
9. EXISTING RETURN AIR SMOKE DETECTORS TO REMAIN IN RETURN DUCTWORK TO REMAIN.
10. REFER TO STRUCTURAL DRAWINGS FOR ROOF DECKING DETAIL FOR DEMOED GRAVITY INTAKES AND FANS.




## KEYPLAN

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LEESPORT, PA 19533

DEMOLITION PLAN: AUDITORIUM, STAGE, LOBBY AND LIBRARY

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM SHAMENEK
ENGINEER
PE075884

ENGINEER: ADAM SHAMENEK PE075884

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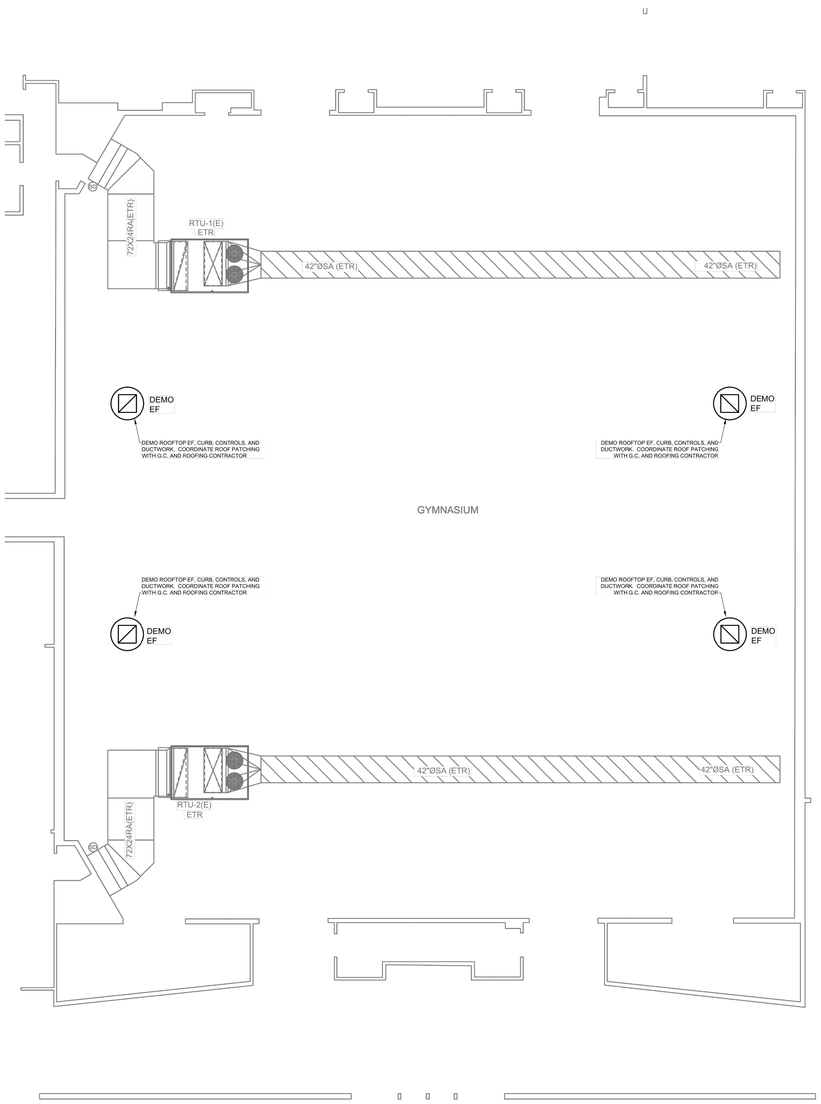


## GYMNASIUM DEMO PLAN

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

## # KEYED DEMO NOTES

1. REMOVE EXISTING CHILLED/HOT WATER PIPING TO THE POINT INDICATED. DRAIN SYSTEM TO BELOW PIPING CONNECTION LEVEL AND CAP AS CLOSE TO MAIN AS POSSIBLE. COORDINATE PATCHING AND SEALING OF WALL OPENINGS.
2. DEMO EXISTING CONDENSATE PIPING.
3. REMOVE EXISTING DUCTWORK TO POINT INDICATED.
4. REMOVE EXISTING GRAVITY INTAKES AND DUCTWORK TO AHU(S). COORDINATE PATCHING OF CURB WITH GENERAL CONTRACTOR. CURB TO REMAIN, CLOSE OPENING AT ROOF, INSTALL INSULATION IN CURB SPACE, AND CAP OPENING WITH WEATHERPROOF/SEALED CAP.
5. PATCH AND SEAL OUTSIDE AIR INTAKE OPENING. COORDINATE PATCHING WITH GENERAL CONTRACTOR

## DEMOLITION GENERAL NOTES

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM RECORD DRAWINGS WHEN AVAILABLE MAY NOT INDICATE ACTUAL CONDITIONS IN DETAIL AND DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXACT EXISTING CONDITIONS PRIOR TO PERFORMING ANY WORK. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OR ENGINEER IN WRITING IF THE EXISTING CONDITIONS ARE DISCOVERED THAT PREVENT THE EXECUTION OF WORK. THE CONTRACTOR SHALL NOT PROCEED WITH WORK UNTIL DIRECTION IS PROVIDED.
2. EVERY EFFORT HAS BEEN MADE TO INDICATE ALL DEVICES THAT ARE BEING REMOVED THROUGH EXISTING DRAWINGS AND FIELD OBSERVATIONS.
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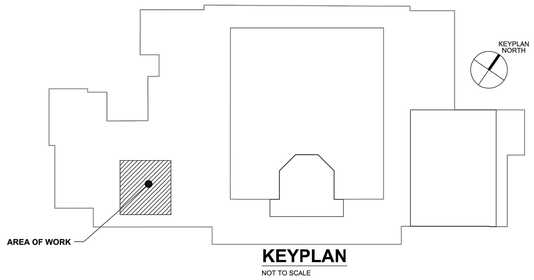
4. THE CONTRACTOR SHALL COORDINATE PATCH AND SEALING OF ALL OPENINGS GENERATED BY DEMOLITION WORK TO MATCH EXISTING CONDITIONS.
5. COORDINATE ANY ELECTRICAL CIRCUIT DEMOLITION WITH ELECTRICAL CONTRACTOR. COORDINATE ELECTRIC HAS BEEN DISCONNECTED BEFORE REMOVING ANY EQUIPMENT.
6. PROTECT EXISTING TO REMAIN EQUIPMENT.
7. REMOVE ALL THERMOSTATS WITHIN AREA OF WORK.
8. REMOVE AND REINSTALL EXISTING SUPPLY AIR SMOKE DETECTORS. COORDINATE WITH FACILITY STAFF AND ELECTRICAL CONTRACTOR FOR DISCONNECTION AND RECONNECTION TO FIRE ALARM SYSTEM.
9. EXISTING RETURN AIR SMOKE DETECTORS TO REMAIN IN RETURN DUCTWORK TO REMAIN.
10. REFER TO STRUCTURAL DRAWINGS FOR ROOF DECKING DETAIL FOR DEMOED GRAVITY INTAKES AND FANS.




## KEYPLAN

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DEMOLITION PLAN: GYM

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM SHAMENEK
ENGINEER
PE075884

ENGINEER: ADAM SHAMENEK PE075884

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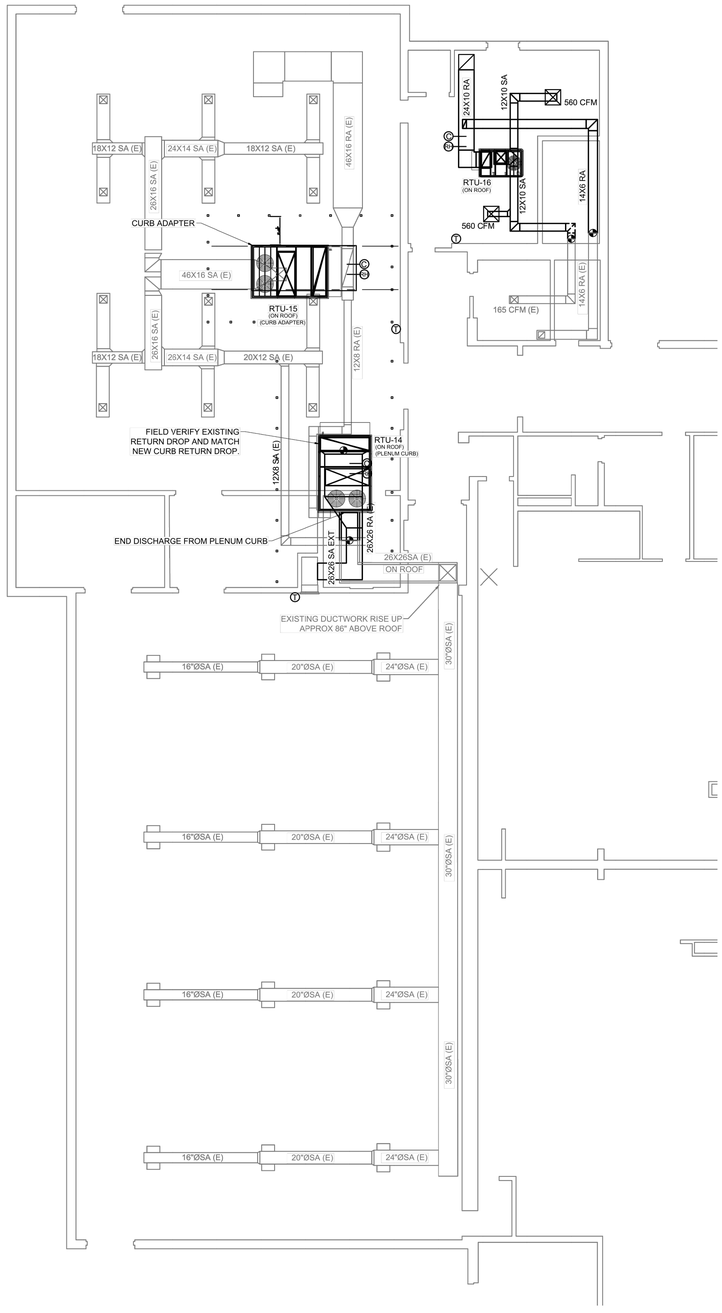
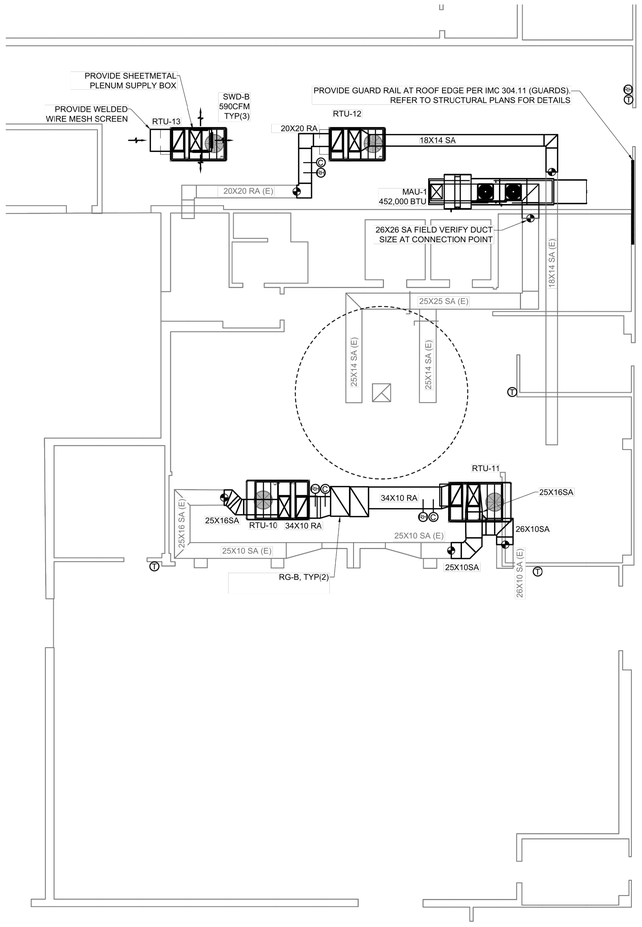


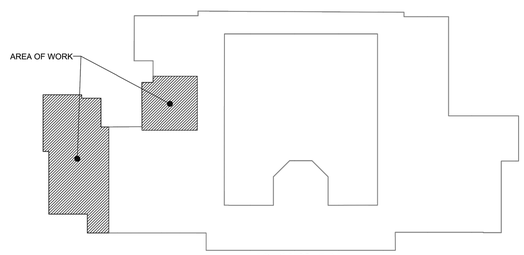

## AUXILIARY GYM AND WEIGHT ROOM PLAN

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




## CAFETERIA AND KITCHEN PLAN

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




## KEYPLAN

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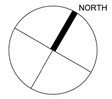




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NEW WORK PLAN: AUXILIARY GYM,
WEIGHT ROOM, TRAINING, CAFETERIA AND KITCHEN

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM SHAMENEK
ENGINEER
PE075884

ENGINEER: ADAM SHAMENEK PE075884

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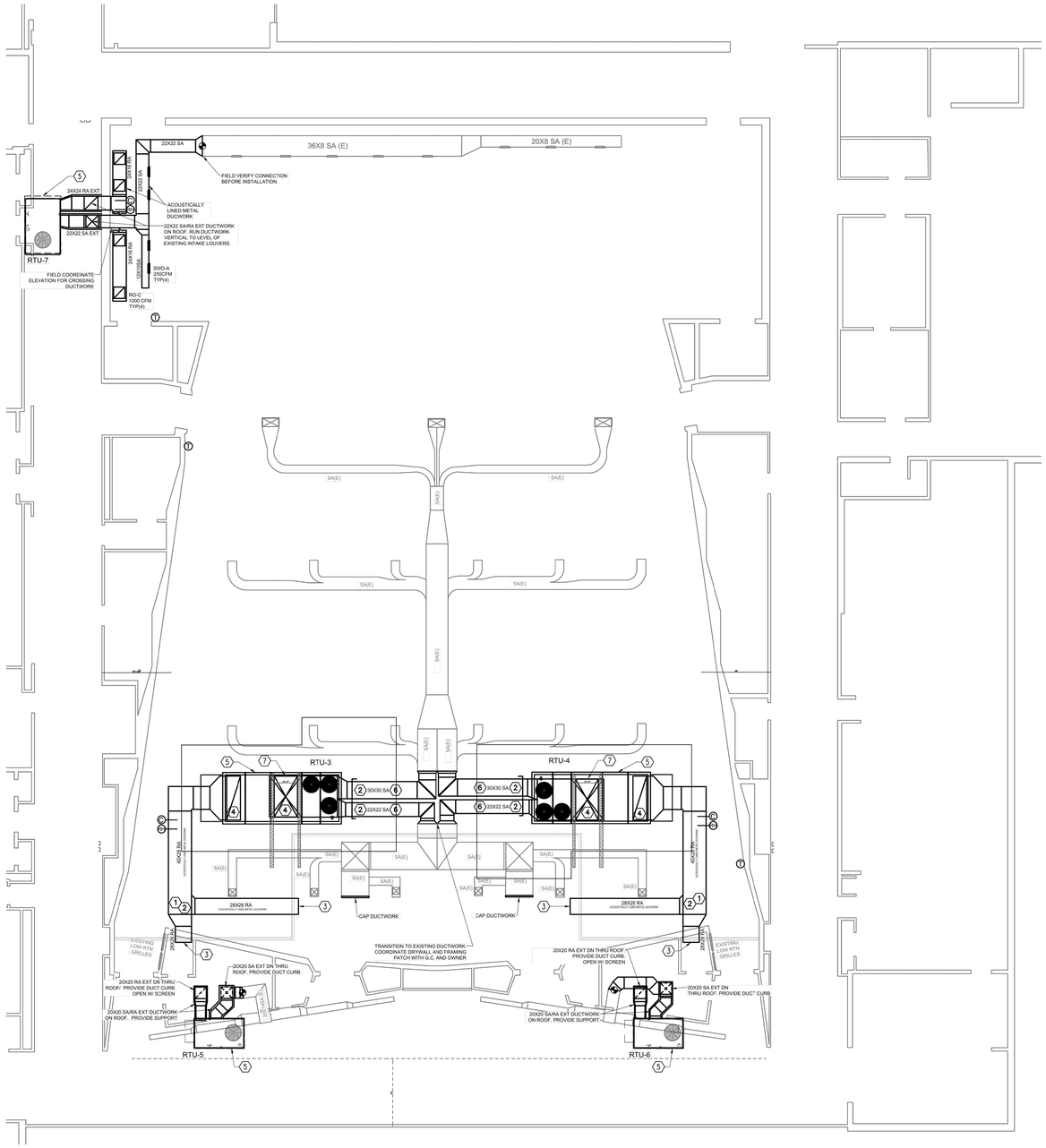
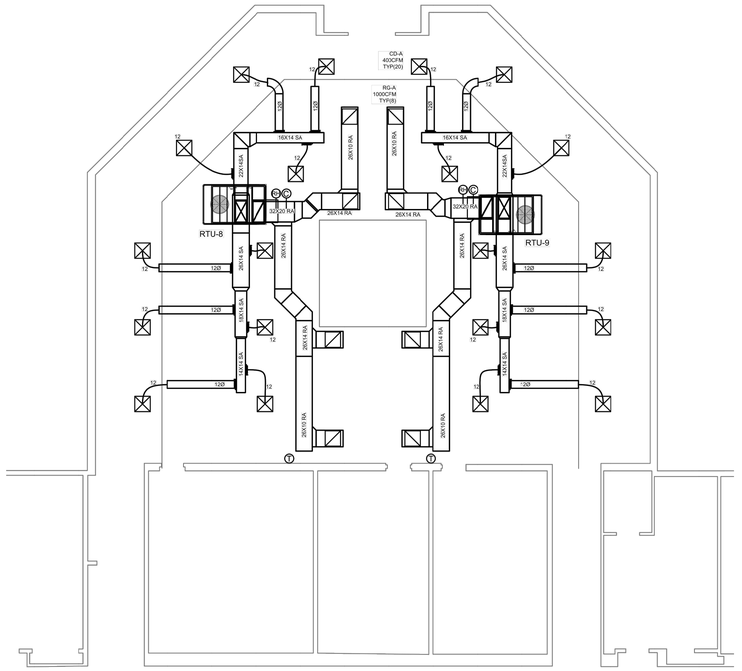



## AUDITORIUM AND LOBBY PLAN

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

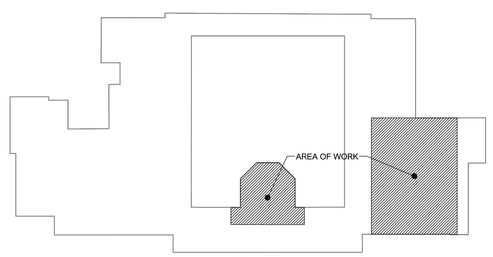
## # KEYED HVAC NOTES

1. COORDINATE PENETRATION, PATCHING, AND SEALING OF BULKHEAD W/ G.C. AND OWNER
2. ALL DUCT ABOVE AUDITORIUM TO BE PAINTED BLACK
3. EXTEND DUCTWORK INTO BULKHEAD PLENUM, PROVIDE WIRE MESH SCREEN ON END
4. OFFSET DUCT DROPS IN CURBS, REFER TO STRUCTURAL PLANS FOR CONFLICTS
5. ACOUSTICALLY INSULATE CURB
6. RUN DUCTWORK ABOVE LIGHTING. PROVIDE NECESSARY HEIGHT TRANSITION TO RUN DUCTWORK THROUGH OPENINGS IN LARGE WEB BEAM.
7. TRANSITION DUCTWORK IN UNIT CURB TO MISS EXISTING STRUCTURE. FIELD VERIFY EXACT DIMENSIONS.




## LIBRARY PLAN

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




## KEYPLAN

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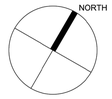




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NEW WORK PLAN: AUDITORIUM, STAGE, LOBBY AND LIBRARY

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ADAM SHAMENEK
ENGINEER
PE075884

ENGINEER: ADAM SHAMENEK PE075884

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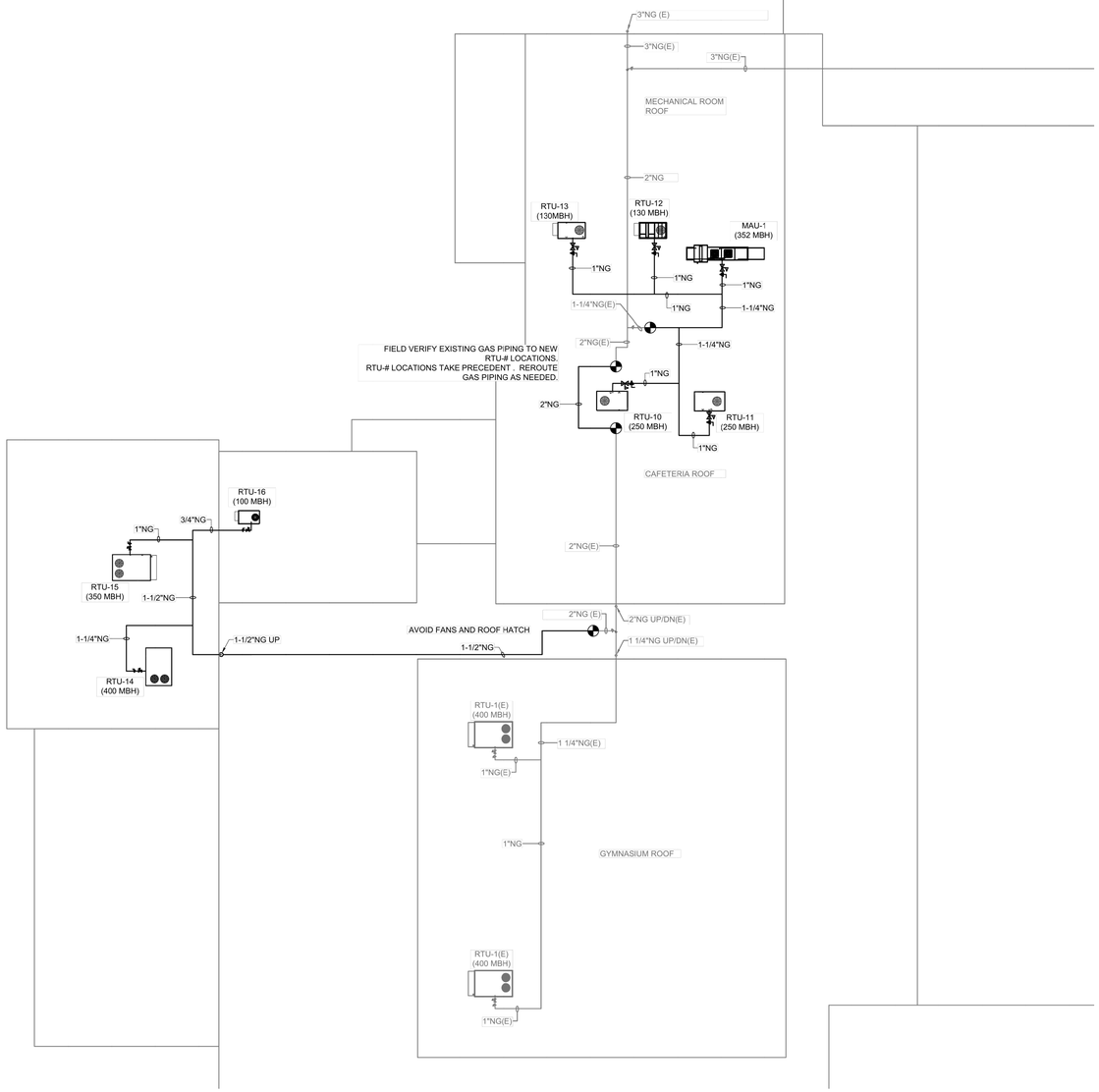
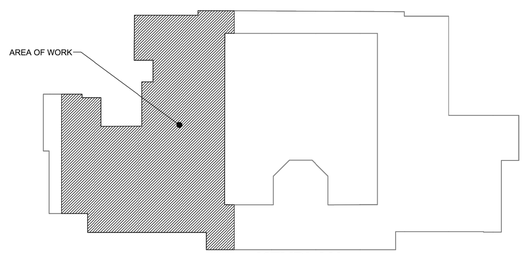



## NATURAL GAS LAYOUT - WEST

SCALE: 1/16" = 1'-0"

## HVAC PIPING GENERAL NOTES

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM RECORD DRAWINGS WHEN AVAILABLE. MAY NOT INDICATE ACTUAL CONDITIONS IN DETAIL AND DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXACT EXISTING CONDITIONS PRIOR TO PERFORMING ANY WORK. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OR ENGINEER IN WRITING IF THE EXISTING CONDITIONS ARE DISCOVERED THAT PREVENT THE EXECUTION OF WORK. THE CONTRACTOR SHALL NOT PROCEED WITH WORK UNTIL DIRECTION IS PROVIDED.
2. AVOID EXISTING OBJECTS AND EQUIPMENT ON ROOF WHEN RUNNING GAS PIPING. PROVIDE NECESSARY OFFSETS AND FITTINGS.




## KEYPLAN

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LEESPORT, PA 19533
ROOFTOP GAS PIPING PLAN

COMMONWEALTH OF PENNSYLVANIA
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ENGINEER
PE075884

ENGINEER: ADAM SHAMENEK PE075884

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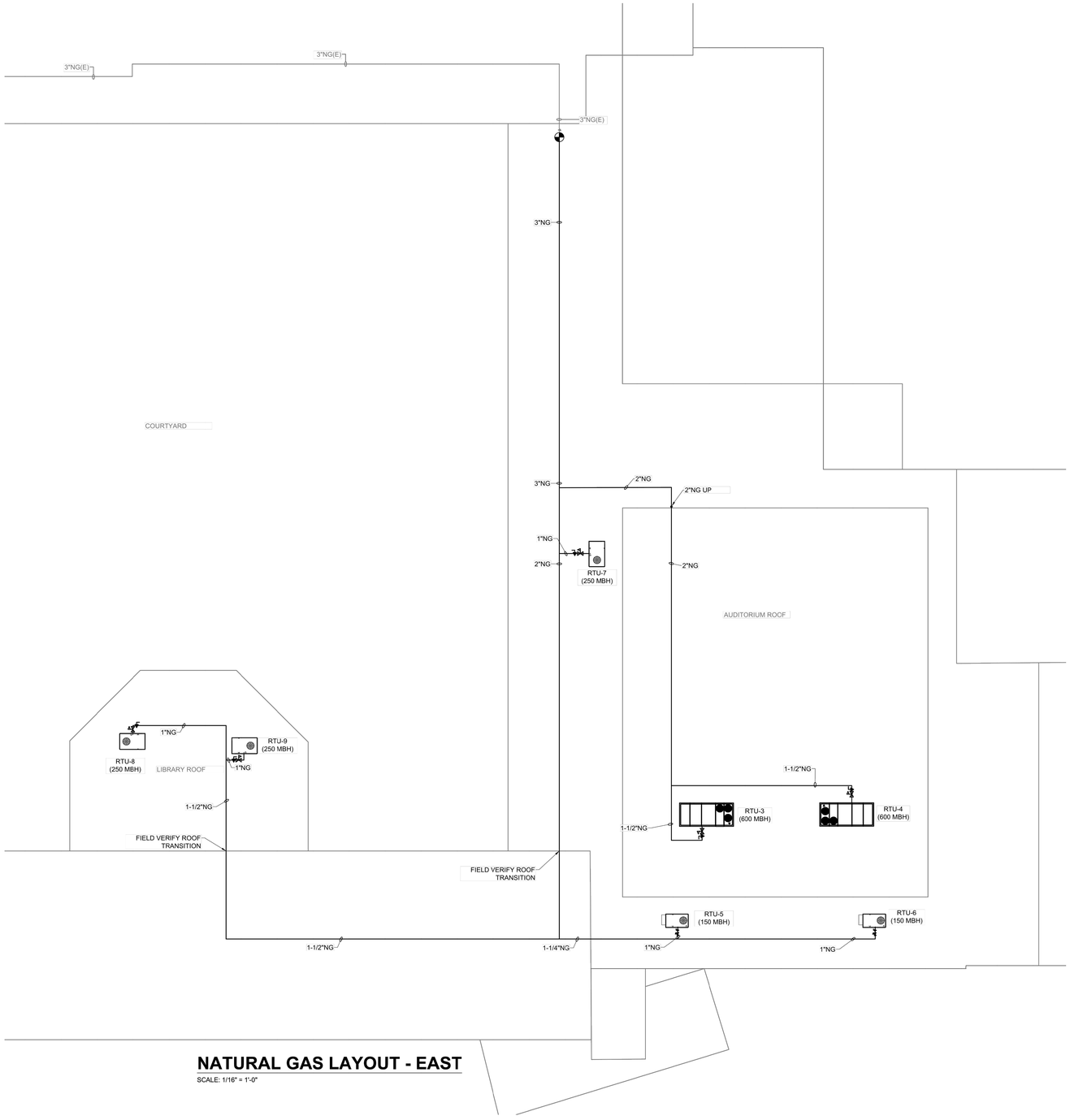
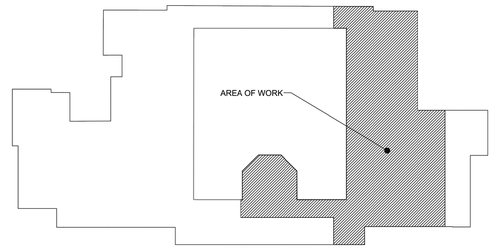



## NATURAL GAS LAYOUT - EAST

SCALE: 1/16" = 1'-0"

## HVAC PIPING GENERAL NOTES

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING HAVE BEEN OBTAINED FROM RECORD DRAWINGS WHEN AVAILABLE. MAY NOT INDICATE ACTUAL CONDITIONS IN DETAIL AND DIMENSION. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING EXACT EXISTING CONDITIONS PRIOR TO PERFORMING ANY WORK. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OR ENGINEER IN WRITING IF THE EXISTING CONDITIONS ARE DISCOVERED THAT PREVENT THE EXECUTION OF WORK. THE CONTRACTOR SHALL NOT PROCEED WITH WORK UNTIL DIRECTION IS PROVIDED.
2. AVOID EXISTING OBJECTS AND EQUIPMENT ON ROOF WHEN RUNNING GAS PIPING. PROVIDE NECESSARY OFFSETS AND FITTINGS.

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ROOFTOP GAS PIPING PLAN

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