## CONSTRUCTION PLANS FOR

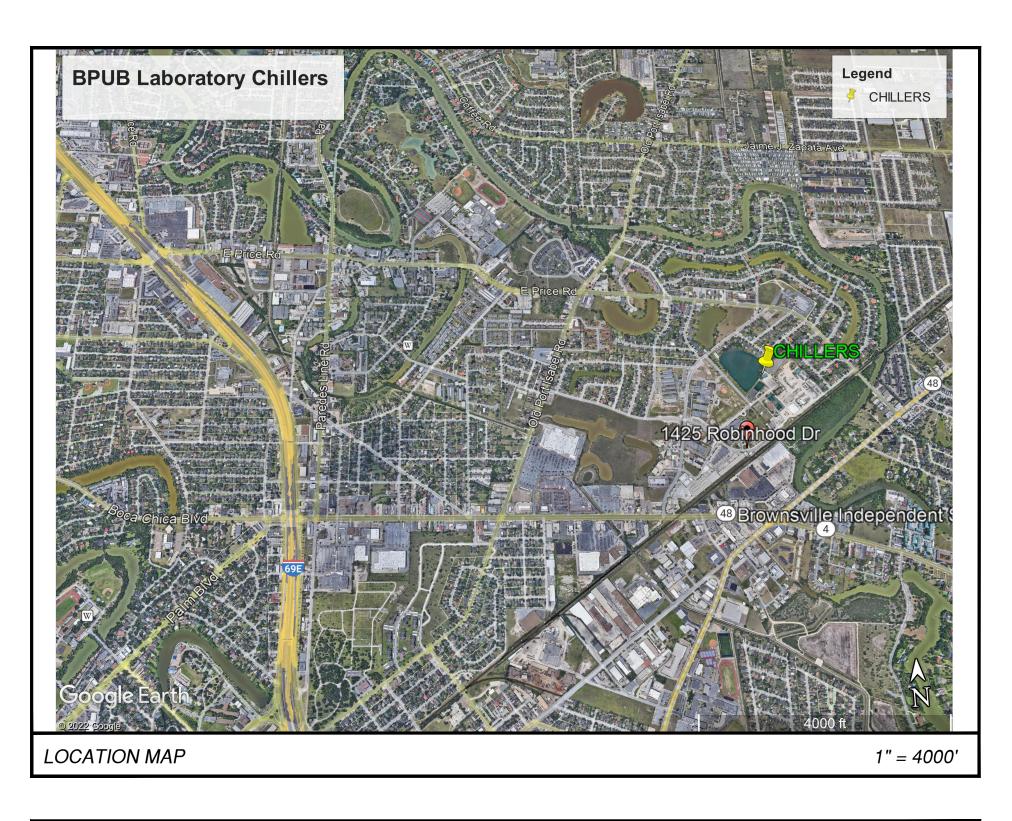
# BPUB Laboratory Facility HVAC Replacement Project

BID# B001-23



#### Board of Directors

| SANDRA SAENZ              | .CHAIR              |
|---------------------------|---------------------|
| PATRICIO SAMPAYO          | VICE-CHAIR          |
| SANDRA LOPEZ - LANGLEY    | SECRETARY/TREASURER |
| JOSEPH L. HOLLMANN, Ph.D. | MEMBER              |
| JUDE A. BENAVIDES, Ph.D   | MEMBER              |
| ARTHUR RENDON             | MEMBER              |
| MAVOD TDEV MENDEZ         | EX-OFFICIO MEMBER   |





#### SHEET INDEX

#### LABORATORY FACILITY HVAC REPLACEMENT PROJECT

| SHEET | TITLE                                                   |
|-------|---------------------------------------------------------|
| 01    | LEGEND AND ABBREVIATIONS AND MECHANICAL NOTES           |
| 02    | BPUB LABORATORY FACILITY FLOOR PLAN                     |
| 03    | BPUB LABORATORY FACILITY ROOF PLAN                      |
| 04    | BPUB LABORATORY BUILDING ROOF FRAMING PLAN AND SECTIONS |
| 05    | BPUB LABORATORY BUILDING HVAC FLOOR PLAN                |
| 06    | BPUB LABORATORY BUILDING HVAC DEMOLITION PLAN           |
| 07    | HVAC SCHEDULES                                          |
| 80    | BPUB LABORATORY BUILDING HVAC SCHEMATIC                 |
| 09    | HVAC SCHEDULES                                          |
| 10    | HVAC DETAIL SHEET 1 OF 4                                |
| 11    | HVAC DETAIL SHEET 2 OF 4                                |
| 12    | HVAC DETAIL SHEET 3 OF 4                                |
| 13    | HVAC DETAIL SHEET 4 OF 4                                |
| 14    | HVAC SCHEDULES                                          |
| 15    | HVAC SLAB DETAILS                                       |
| 16    | SITE PHOTOS DEMOLITION                                  |
| 17    | SITE PHOTOS                                             |
|       |                                                         |



|                                        |                                  |                                        | HVAC LEGEND                         |               |                              |
|----------------------------------------|----------------------------------|----------------------------------------|-------------------------------------|---------------|------------------------------|
| SYMBOL                                 | DESCRIPTION                      | SYMBOL                                 | DESCRIPTION                         | SYMBOL        | DESCRIPTION                  |
| " HWS                                  | HOT WATER SUPPLY                 | —————————————————————————————————————— | UNION                               |               | BUTTERFLY VALVE              |
| HWR                                    | HOT WATER RETURN                 | <del></del>                            | STRAINER                            |               | GATE VALVE                   |
| " CHWS                                 | CHILLED WATER SUPPLY             | —————————————————————————————————————— | STRAINER WITH BLOW OFF              | \$\frac{1}{2} | ANGLE VALVE                  |
| * CHWR                                 | CHILLED WATER RETURN             |                                        | THERMOMETER                         |               | GLOBE VALVE                  |
| ***                                    | SUCTION DIFFUSER WTIH STRAINER   |                                        | CIRCUIT SETTER                      |               | CONTROL VALVE, THREE WAY     |
| -0-                                    | PUMP SYMBOL                      |                                        | PRESSURE INDICATOR                  |               | CONTROL VALVE, TWO WAY       |
| -                                      | CONCENTRIC REDUCER               |                                        | TRIPLE DUTY VALVE                   |               | PRESSURE REDUCING VALVE      |
|                                        | ECCENTRIC REDUCER FLAT ON BOTTOM | <b>─</b>                               | BALANCING VALVE                     |               | AUTOMATIC FLOW CONTROL VALVE |
|                                        | ECCENTRIC REDUCER FLAT ON TOP    | 4                                      | AUTOMATIC AIR VALVE                 |               | CHECK VALVE                  |
| <del></del>                            | ELBOW TURNED DOWN                |                                        | MANUAL AIR VALVE WITH DICHARGE TUBE |               | NEEDLE VALVE                 |
| —                                      | ELBOW TURNED UP                  |                                        | TEE                                 |               | END CAP                      |
| <u> </u>                               | TEE OUTLET UP                    | <u></u>                                | PLUG VALVE                          | I             | BLIND FLANGED                |
| 83                                     | EXISTING PIPING TO REMAIN        | <u> </u>                               | BALL VALVE                          | FMS           | FLOW METER STATION           |
| 14111111111111111111111111111111111111 | PIPING TO BE DEMOLISHED          |                                        | TEE OUTLET DOWN                     |               |                              |
| 23                                     | EXISTING PIPING BELOW GRADE      | <b>*</b>                               | CONNECT TO EXISTING                 |               |                              |

|       | ABBRE                                     | VIATION | S                                |
|-------|-------------------------------------------|---------|----------------------------------|
| ACC-# | Air Cooled Chiller - No.                  | MIN     | Minimum                          |
| A/C   | Air Conditioning                          | MOD     | Motor Operated Damper            |
| AAV   | Automatic Air Vent                        | MPT     | Male Pipe Thread                 |
| ABV   | Above                                     | N/A     | Not Applicable                   |
| AD    | Access Door                               | NC      | Normally Closed                  |
| ADP   | Apparatus Dew Point                       | NIC     | Not in Contract                  |
| AFF   | Above Finished Floor                      | NO      | Normally Open                    |
| BFP   | Backflow Preventer                        | NPSH    | Net Positive Suction Head        |
| BHP   | Brake Horsepower                          | NPT     | National Pipe Thread             |
| BMS   | Building Management System                | NTS     | Not To Scale                     |
| BOP   | Bottom of Pipe                            | PD      | Pressure Drop                    |
| CHWR  | Chilled Water Return                      | PI      | Pressure Indicator               |
| CHWS  | Chilled Water Supply                      | POC     | Point of Connection              |
| CO    | Clean Out                                 | PRV     | Pressure Reducing Valve          |
| COL   | Column Line                               | PS      | Pressure Switch                  |
| DB    | Dry Bulb Temperature                      | PSI     | Pounds Per Square Inch           |
| DP    | Dew Point                                 | PSIA    | Pounds Per Square Inch Absolute  |
| EAT   | Entering Air Temperature                  | PSIG    | Pounds Per Square Inch Guage     |
| EDB   | Entering Air Dry Bulb                     | REG     | Register                         |
| ELEC  | Electric or Electrical                    | RH      | Relative Humidity                |
| ELEV  | Elevation                                 | SEER    | Seasonal Energy Efficiency Ratio |
| EWB   | Entering Air Wet Bulb                     | SHT     | Sheet                            |
| EWT   | Entering Water Temperature                | SP      | Static Pressure                  |
| FL    | Floor                                     | SPEC    | Specifications                   |
| FOB   | Flat On Bottom                            | SPL     | Supply                           |
| FOT   | Flat On Top                               | SS      | Stainless Steel                  |
| FPT   | Female Pipe Thread                        | STD     | Standard                         |
| FT    | Feet                                      | T       | Thermostat                       |
| FT HD | Feet of Head                              | T-#     | Tank - No.                       |
| FZ    | Freezestat (low limit thermostat)         | TDH     | Total Dynamic Head               |
| GAL   | Gallons                                   | TEMP    | Temperature                      |
| GPD   | Gallons Per Day                           | TOC     | Top of Concrete                  |
| GPH   | Gallons Per Hour                          | TOD     | Top of Duct                      |
| GPM   | Gallons Per Minute                        | TOP     | Top of Pipe                      |
| HD    | Head                                      | TOS     | Top of Steel                     |
| HP    | Horsepower                                | TSTAT   | Thermostat                       |
| HVAC  | "Heating, Ventilating & Air Conditioning" | TYP     | Typical                          |
| ID    | Inside Diameter                           | VB      | Vacuum Breaker                   |
| ΪΕ    | Invert Elevation                          | VENT    | "Ventilate, Ventilator"          |
| LAT   | Leaving Air Temperature                   | VFD     | Variable Frequency Drive         |
| LWB   | Leaving Air Wet Bulb                      | WB      | Wet Bulb Temperature             |
| LWT   | Leaving Water Temperature                 | XFMR    | Transformer                      |
| MAV   | Manual Air Vent                           |         | v v mad 3505 900 0 03'903        |
| MAX   | Maximum                                   |         |                                  |
| MBH   | Thousand BTU/Hr (thousands)               |         |                                  |

#### MECHANICAL GENERAL NOTES

- DO NOT SCALE DRAWINGS.
  USE ECCENTRIC REDUCERS ON AUTOMATIC VALVES WHERE
  REQUIRED.
  EXTEND ALL DRAIN LINES TO NEAREST FLOOR DRAIN OR AS
  INDICATED. ROUTE TO AVOID INTERFERENCE WITH PASSAGEWAYS.
  CONDENSATE DRAINS SHALL BE TRAPPED. SLOPE DRAIN LINES 1/8"
  PER ECOT.

- PER FOOT.

  ALL PIPING SHALL PITCH DOWN IN DIRECTION OF FLOW OR AS INDICATED ON DRAWINGS: 1" PER 40 FEET WITH MANUAL AIR VENTS AT ALL HIGH POINTS, AND 3/4" DRAIN VALVES AT ALL LOW POINTS.

  ALL PIPING AND DUCTWORK INSULATION SHALL BE RUN CONTINUOUSLY THROUGH FLOORS, ROOPS AND PARTITIONS
- EXCEPT WHERE PROHIBITED BY FIRE CODES.

  EXTEND DRAIN LINES FROM RELIEF VALVES TO 2" ABOVE NEAREST FLOOR DRAIN OR AS INDICATED.

  ALL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE SPECIFICATIONS AND FURTHER SUPPORTS OR HANGERS SHALL BE ADJACENT TO ELBOWS, TO PREVENT WEIGHT OF PIPING BEING PLACED ON THE EQUIPMENT. SUPPORT DETAILS SHALL BE
- SUBMITTED TO THE MECHANICAL ENGINEER.
  ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED
  WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS
- TO AVOID INTERFERENCE.
  CORRECT SETTINGS ON ALL BALANCING FITTINGS SHALL BE
- PERMANENTLY MARKED. RUNOUTS SHALL PITCH DOWN IN DIRECTION OF FLOW A MINIMUM
- OF 1" IN 30 FEET.

  ALL PIPING, DUCTS, VENTS, ETC. EXTENDING THRU EXTERIOR
  WALLS AND ROOFS SHALL BE FLASHED AND COUNTERFLASHED.
  COORDINATE ORIENTATION OF SUPPLY AND RETURN PIPING
  BEFORE FABRICATION.
  PROVIDE DIELECTRIC FITTINGS AT ALL LOCATIONS WHERE
- DISSIMILAR METALS ARE JOINED IN PIPING AND DUCT SYSTEMS.

LEGEND AND ABBREVIATIONS AND MECHANICAL NOTES SHEET TITLE

COUNTY RD, 725; 956-454-6 LOS FRESNOS, TEXAS 78566 

LABORATORY FACILITY REPLACEMENT PROJECT

BPUB HVAC

PROJECT:

PROJECT #

DRAWN BY: AJM

JUAN J. BUJANOS

9/17/22

DATE: 9-17-2022

SHEET 1 OF 17



PROJECT:

UB LABORATORY FACILIT EXISTING FLOOR PLAN

SHEET

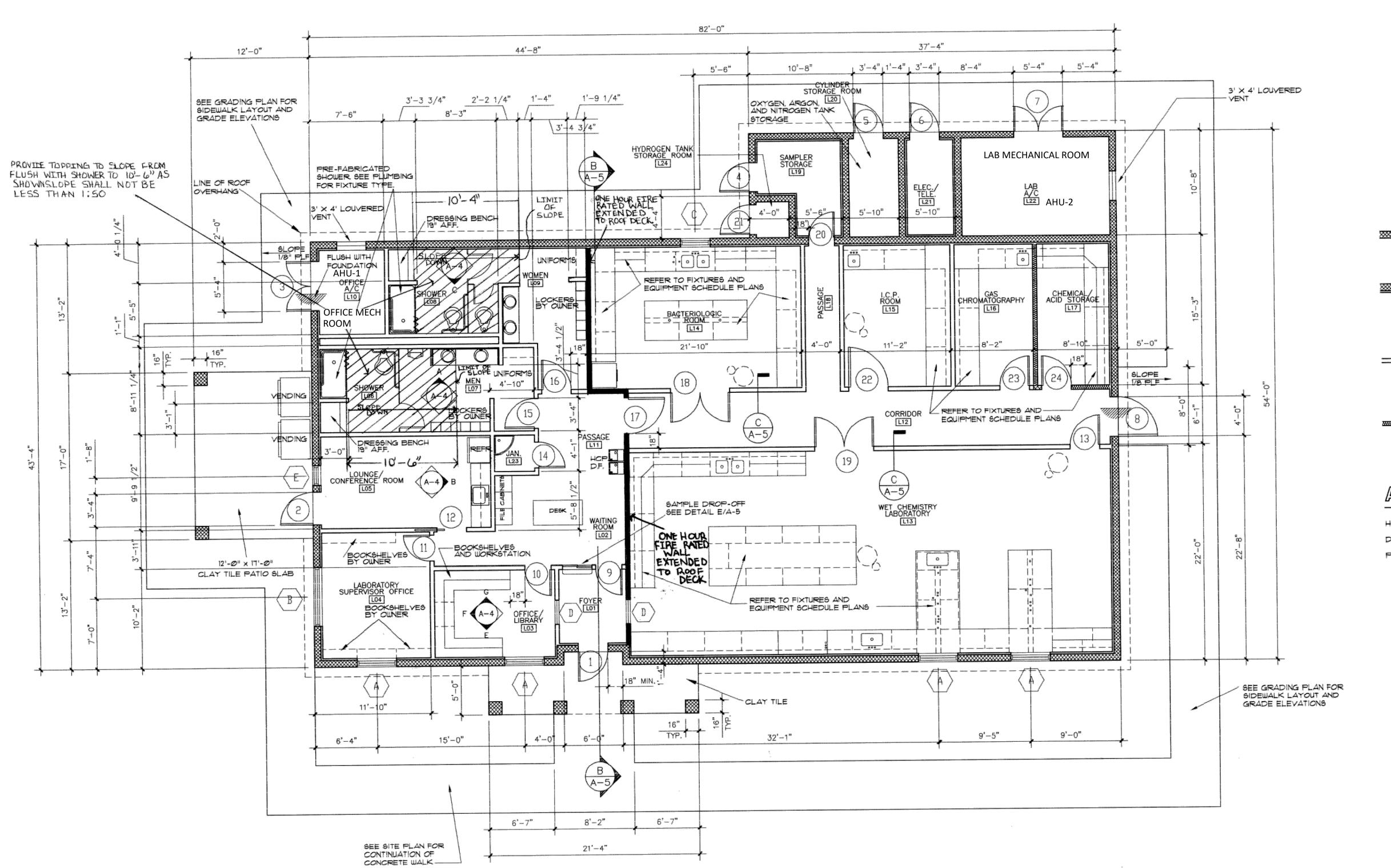
COUNTY RD, 725; 956-454-LOS FRESNOS, TEXAS 7856 ENGINEERING 

PROJECT #

DRAWN BY: AJM

DATE: 9-17-2022

SHEET 2 OF 17



SCALE: N.T.S.

WALL LEGEND :

8" CONCRETE MASONRY UNITS (SEE ELEVATIONS & SECTIONS FOR CMU. TYPES)

8" C.M.U. WITH I" RIGID INSULATION A6 SPECIFIED 4 5/8" GYP. BD. (SEE ELEVATIONS & SECTIONS FOR C.M.U. TYPES) FILL ALL YOID CELLS W/ "YERMICULITE" INSULATION TO 10' AFF

COMMON PARTITION (5/8" F.C. GYP. BD. EACH SIDE OF 3 5/8" MTL. STUDS @ 16" O.C.) WALL TO EXTEND TO 6" ABOY CEILING UNLESS NOTED OTHERWISE.

INSULATED PARTITION (5/8" F.C. GYP. BD EACH SIDE OF 3 5/8" MTL. STUDS @ 16" O.C.) WALL TO EXTEND TO ROOF STRUCTURE, PROVIDE "RACO" TRI

© CEILING TO MATCH COMMON PARTITIO

水

JUAN J. BUJANOS 97472

9/17/22

## ABBREVIATION LEGEND:

HCP HANDICAPPED

DF. DRINKING FOUNTAIN

PLF PER LINEAR FEET

EXISTING JUNE 1998 AS-BUILT DRAWINGS BY NRS CONSULTING ENGINEERS WERE PROVIDED BY THE OWNER FOR OUR USE.

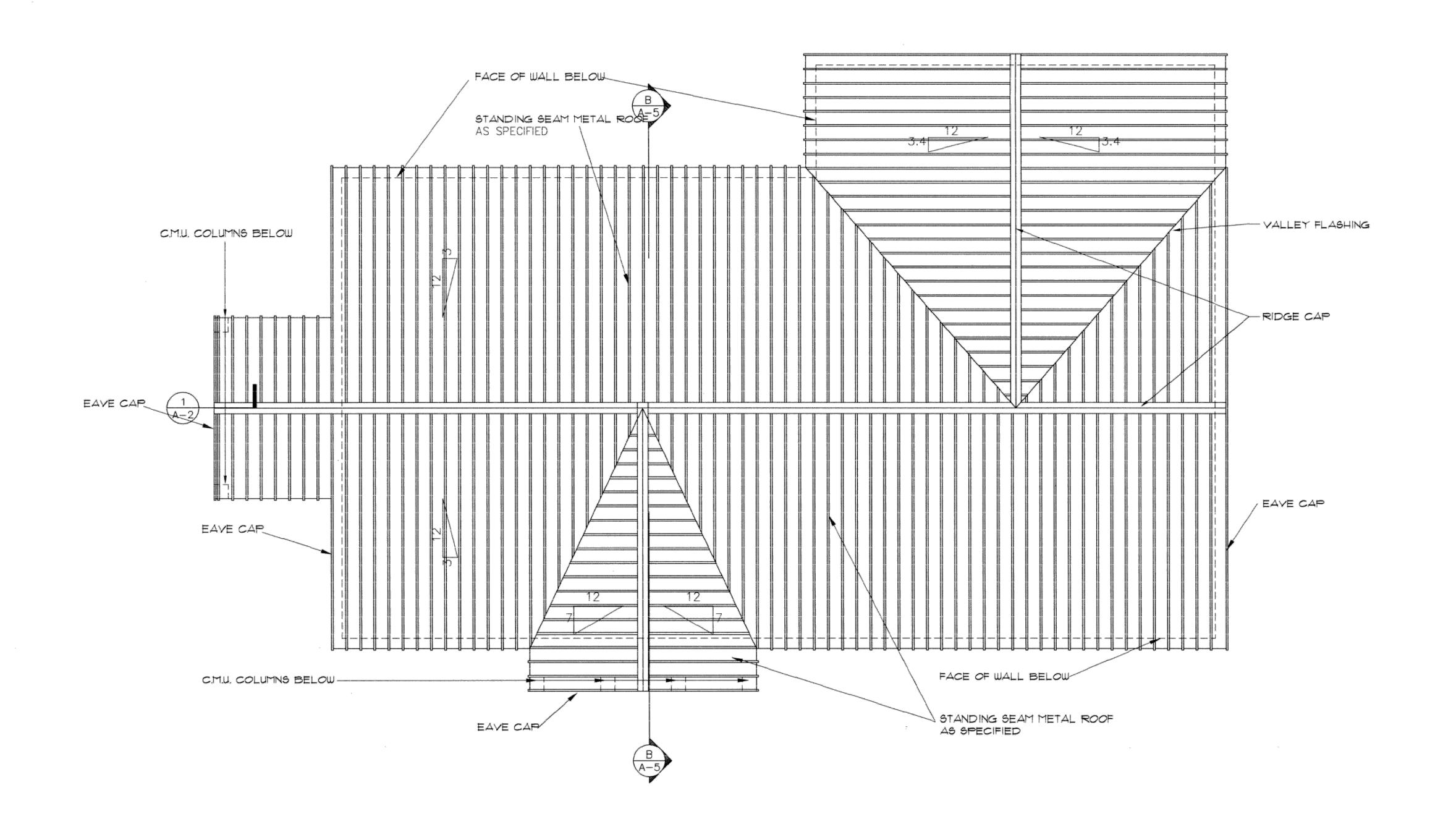


97472

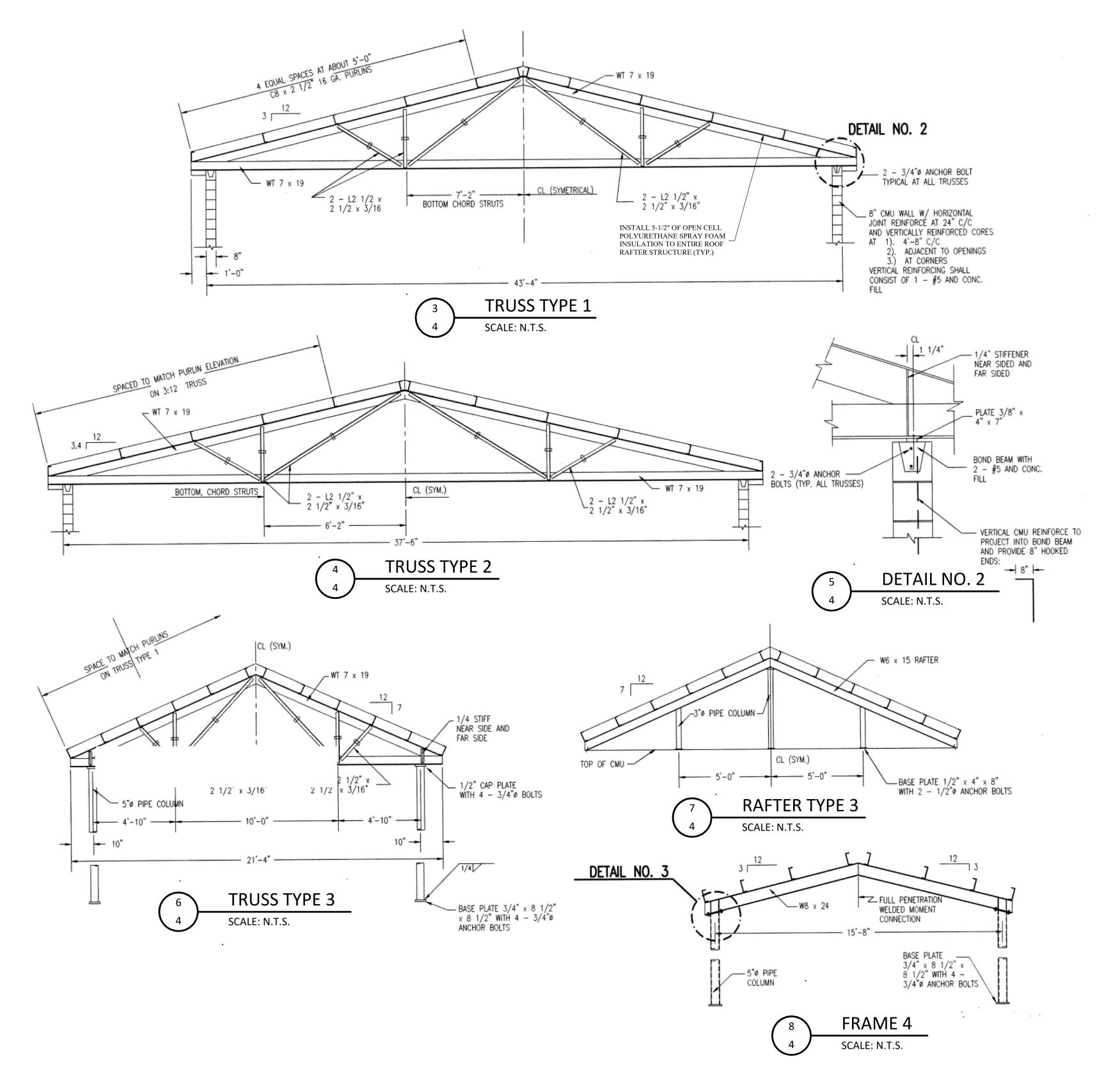
9/17/22

DATE: 9-17-2022

SHEET 3 OF 17









9/17/22

BPUB LABORATORY FACILITY HVAC REPLACEMENT PROJECT

PROJECT:

BPUB LABORATORY EXISTING BUILDING ROOF FRAMING PLAN AND SECTIONS

SHEET TITLE

ENGINEERING

COUNTY RD, 725, 956-454-6740

LOS FRESNOS, TEXAS 78566

PROJECT #

DRAWN BY: AJM

DATE: 9-17-2022

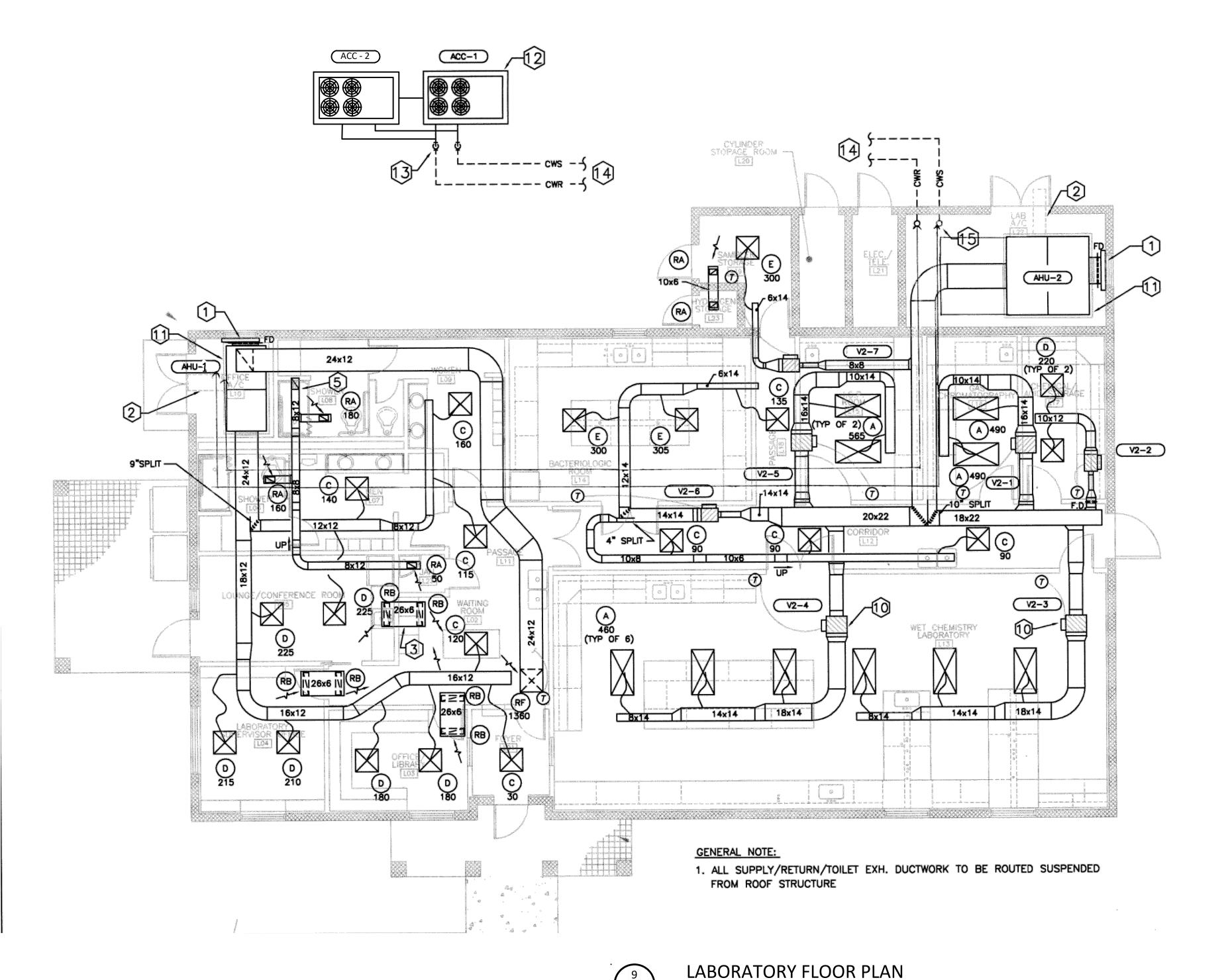
SHEET 4 OF 17

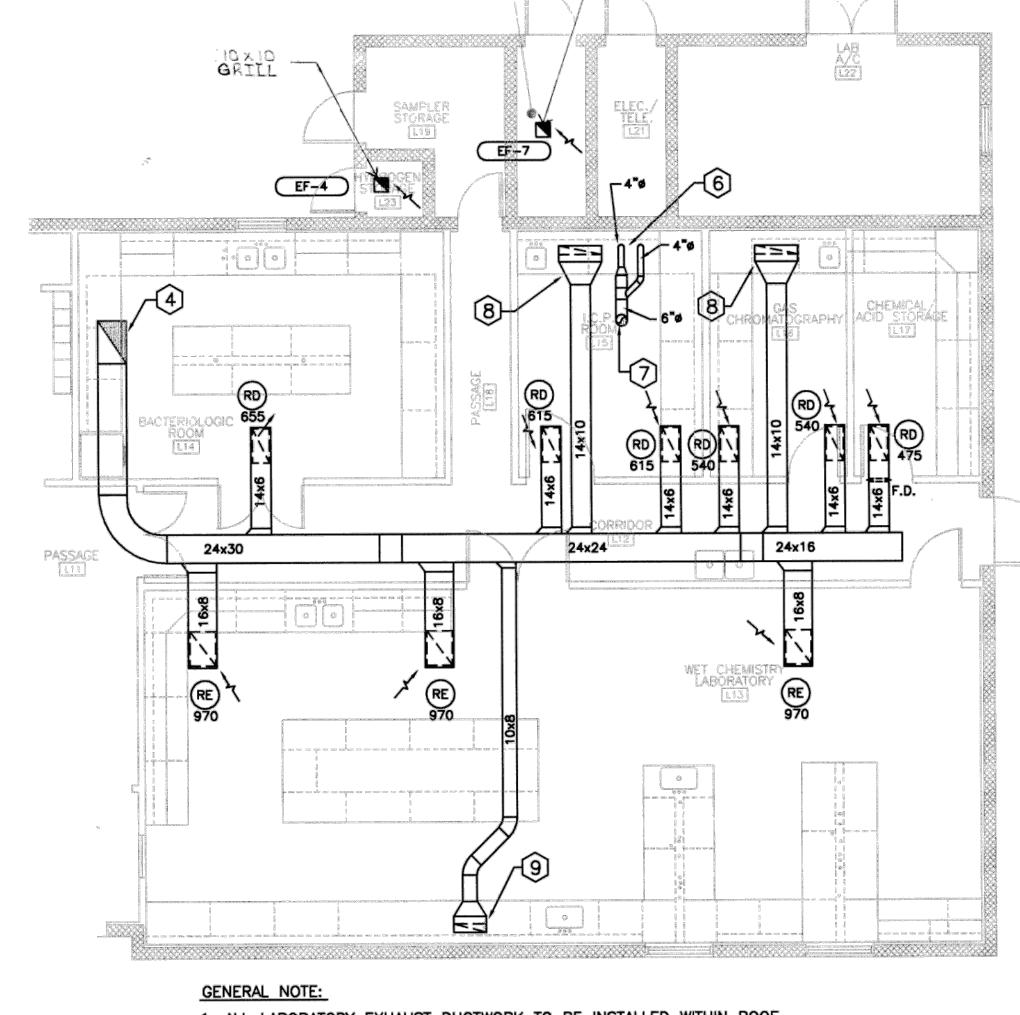
PROJECT #

DATE: 9-17-2022

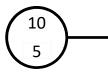
DRAWN BY: AJM

**SHEET** 5 OF 17





- 1. ALL LABORATORY EXHAUST DUCTWORK TO BE INSTALLED WITHIN ROOF STRUCTURE, COORDINATE WITH ROOF FRAMING PLAN
- 2. ALL LABORATORY EXHAUST DUCTWORK TO BE CONSTRUCTED OF STAINLESS STEEL AND SHALL BE EXTERNALLY INSULATED



## LABORATORY EXHAUST PLAN

SCALE: N.T.S.

#### **KEYED NOTES:**

SCALE: N.T.S.

- 0.A. INTAKE PLENUM, FULL SIZE OF LOUVER. SLOPE BOTTOM OF PLENUM BOX TO DRAIN WATER THROUGH LOUVER. ROUTE O.A. DUCT TO AIR HANDLER AS SHOWN
- 2 COIL PULL SPACE
- 3 TANSFER DUCT (TYPICAL)
- 4 TRANSITION TO 30" IN RISER TO EF-2
- 5 TRANSITION IN RISER TO EF-1

- 6 SEE DETAIL 5/M502 FOR ICP-SPECTROMETER CONNECTION
- 7 TRANSITION IN RISER TO EF-3
- TRANSITION TO 6"X30" IN DROP TO FUME HOOD, SEE ARCH.
- TRANSITION TO 6"X23" IN DROP TO FUME HOOD, SEE ARCH.
- 24"X24" CEILING ACCESS DOOR IN GYP BOARD CEILING AT POINT INDICATED. PAINT TO MATCH CEILING
- EXISTING 5-1/2" CONCRETE HOUSEKEEPING PAD. PAD SHALL BE 3" LARGER THAN UNIT IN ALL DIRECTIONS. CONTRACTOR SHALL ENLARGE PAD IF NEEDED FOR NEW AHU-2.
- 13 SEE CHILLED WATER EQUIPMENT SCHEMATIC 1/M400 FOR CONNECTION
- 14 SEE CHILLED WATER PIPING SCHEMATIC 2/M400 FOR CHILLED WATER ROUTING AND SIZE
- 15 SEE CHILLED WATER EQUIPMENT SCHEMATIC 1/M400 FOR MECHANICAL ROOM LAYOUT.



DATE: 9-17-2022

SHEET 6 OF 17

#### **DEMOLITION PLAN:**

AHU-2

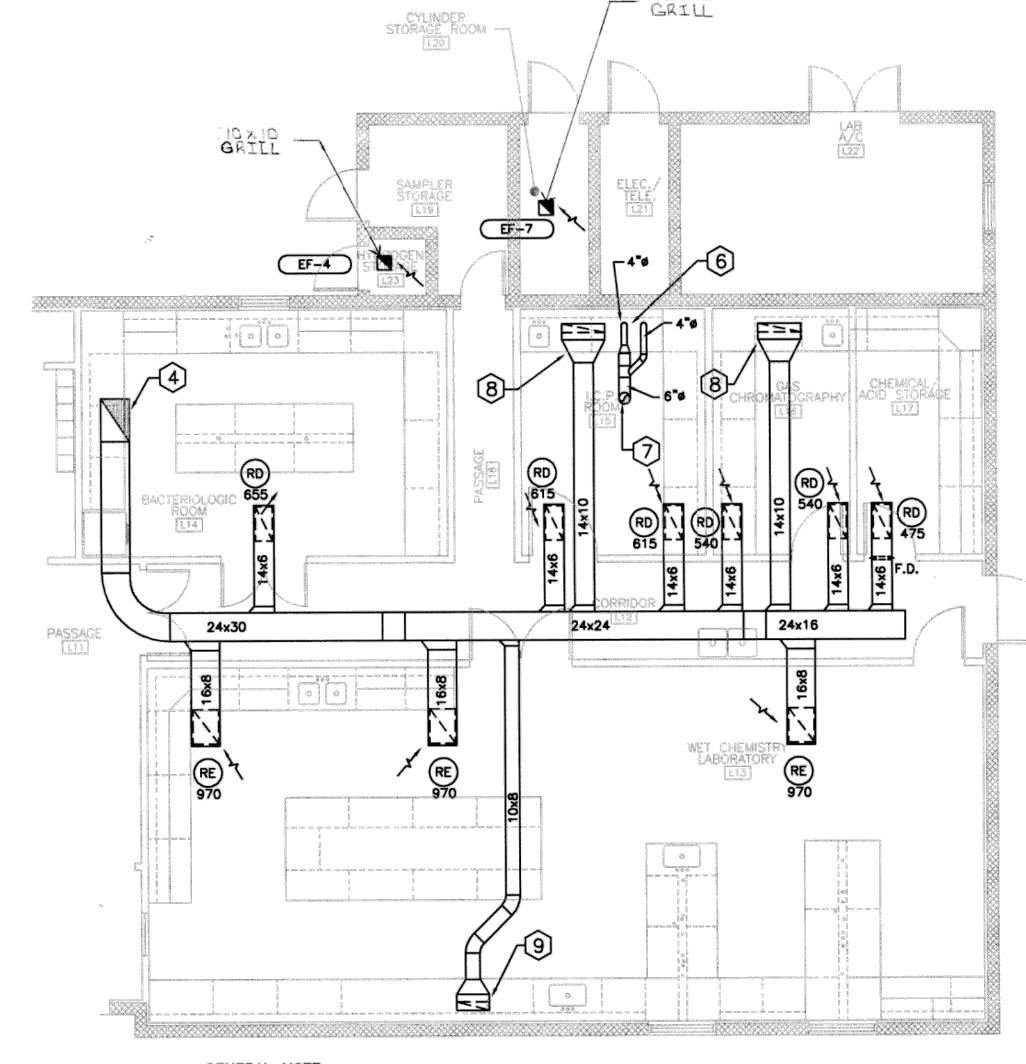
**√2−3** 

18x14

14×14

V2-2

- 1. REMOVE AND REPLACE ALL HVAC DUCTWORK, SUPPLY / RETURN AIR DEVICES, INSULATION SYSTEMS, HANGER SUPPORT SYSTEMS AND VAVs, REUSE SMOKE AND FIRE DAMPERS, AND SENSORS.
- 2. REMOVE AND REPLACE ALL EXHAUST DUCTWORK, ROOF EXHAUST FANS, SUPPLY / RETURN AIR DEVICES AND HANGER SUPPORT SYSTEMS, REUSE SMOKE AND FIRE DAMPERS AND SENSORS.
- 3. REMOVE AND REPLACE AHU-1 AND AHU-2



#### GENERAL NOTE:

- 1. ALL LABORATORY EXHAUST DUCTWORK TO BE INSTALLED WITHIN ROOF STRUCTURE, COORDINATE WITH ROOF FRAMING PLAN
- 2. ALL LABORATORY EXHAUST DUCTWORK TO BE CONSTRUCTED OF STAINLESS STEEL AND SHALL BE EXTERNALLY INSULATED



## KEYED NOTES:

SCALE: N.T.S.

O.A. INTAKE PLENUM, FULL SIZE OF LOUVER. SLOPE BOTTOM OF PLENUM BOX TO DRAIN WATER THROUGH LOUVER. ROUTE O.A. DUCT TO AIR HANDLER AS SHOWN

(V2-7) 8x8

**√2-5** 

<sub>C</sub>14×14

(V2-4)

18x14

14×14

(V2-6)

14x14

- 2 COIL PULL SPACE
- 3 TANSFER DUCT (TYPICAL)
- TRANSITION TO 30" IN RISER TO EF-2
- 5 TRANSITION IN RISER TO EF-1

- 6 SEE DETAIL 5/M502 FOR ICP-SPECTROMETER CONNECTION
- 7 TRANSITION IN RISER TO EF-3
- TRANSITION TO 6"X30" IN DROP TO FUME HOOD, SEE ARCH.
- 9) TRANSITION TO 6"X23" IN DROP TO FUME HOOD, SEE ARCH.
- 24"X24" CEILING ACCESS DOOR IN GYP BOARD CEILING AT POINT INDICATED. PAINT TO MATCH CEILING
- EXISTING 5-1/2" CONCRETE HOUSEKEEPING PAD. PAD SHALL BE 3" LARGER THAN UNIT IN ALL DIRECTIONS. CONTRACTOR SHALL ENLARGE PAD IF NEEDED FOR NEW AHU-2.
- SEE CHILLED WATER EQUIPMENT SCHEMATIC 1/M400 FOR CONNECTION
- 14 SEE CHILLED WATER PIPING SCHEMATIC 2/M400 FOR CHILLED WATER ROUTING AND SIZE
- 15) SEE CHILLED WATER EQUIPMENT SCHEMATIC 1/M400 FOR MECHANICAL ROOM LAYOUT.



# GENERAL NOTE: 1. ALL SUPPLY/RETURN/TOILET EXH. DUCTWORK TO BE ROUTED SUSPENDED FROM ROOF STRUCTURE LABORATORY FLOOR PLAN

© 30

16x12

\ E≥1 RB

BACTERIOLOGIC

24x12

16x12

|        |          |                |       |       |       |              |               |         |                      |       |       |    | Alf  | R CO   | OLED  | CHILL | ER SCI | HEDULE  |    |                |           |     |         |              |      |         |                |        |           |      |         |              |                      |
|--------|----------|----------------|-------|-------|-------|--------------|---------------|---------|----------------------|-------|-------|----|------|--------|-------|-------|--------|---------|----|----------------|-----------|-----|---------|--------------|------|---------|----------------|--------|-----------|------|---------|--------------|----------------------|
|        |          | AREA           |       |       |       | İ            |               | İ       |                      |       |       |    |      | EVAPOF | RATOR |       |        |         |    | DENSER         |           |     |         |              | EL   | ECTRICA |                |        |           |      |         |              |                      |
| MARK   | LOCATION | AND/OR<br>BLDG | TYPE  | E CAP | ACITY | # OF<br>COMP | MAX<br>kW/TON | MIN COP | MAX IPLV<br>(kW/TON) | FL    | OW    | E/ | WT   | LV     | wT    | MAX   | WPD    | FOULING |    | IENT OA<br>EMP | ш         | COM | PRESSOF | R MOTOR<br>i | ī    |         | CONE<br>NOMINA |        | AN MOTORS |      | REMARKS | MANUFACTURER | MODEL N              |
|        |          | SERVED         |       | TONS  | [kW]  | COIVIP       | KW/TON        |         | (KW/TON)             | GPM   | [L/s] | °F | [°C] | °F     | [°C]  | FT    | [kPa]  | FACTOR  | °F | <del> i</del>  | #<br>COMP | HP  | [kW]    | PHASE        | VOLT | # FANS  | HP             | [W]    | PHASE     | VOLT |         |              |                      |
|        |          |                |       |       | [ ]   |              |               |         |                      |       | []    |    |      |        |       | •     | []     |         |    |                |           |     | []      |              |      |         |                | []     |           |      |         |              |                      |
| ACCH-1 | Exterior | Office         | SCREW | 62.29 | [220] | 5            | 1.05          | 3.3     | .156                 | 148.7 | [9]   | 54 | [12] | 44     | [7]   | 12    | [36]   | 0.0001  | 95 | [35]           | 5         | 87  | [ 65 ]  | 3            | 460  | 4       | 2              | [1500] | 3         | 460  |         | York         | YLAA<br>0065HE46XFBS |
| ACCH-2 | Exterior | Lab            | SCREW | 62.29 | [220] | 5            | 1.05          | 3.3     | .156                 | 148.7 | [9]   | 54 | [12] | 44     | [7]   | 12    | [36]   | 0.0001  | 95 | [35]           | 5         | 87  | [65]    | 3            | 460  | 4       | 2              | [1500] | 3         | 460  |         | York         | YLAA<br>0065HE46XFBS |
|        |          |                |       |       | [ ]   |              |               |         |                      |       | []    |    |      |        |       | ·     | []     |         |    |                |           |     | []      |              |      |         |                | []     |           |      |         |              |                      |
|        |          |                |       |       | [ ]   |              |               |         |                      |       | []    |    |      |        |       | '     | []     |         |    |                |           |     | []      |              |      |         |                | []     |           |      |         |              |                      |
|        |          |                |       |       | [ ]   |              |               |         |                      |       | []    |    |      |        |       |       | []     |         |    |                |           |     | []      |              |      |         |                | []     |           |      |         |              |                      |
|        |          |                |       |       | [ ]   |              |               |         |                      |       | []    |    |      |        |       |       | []     |         |    |                |           |     | []      |              |      |         |                | []     |           |      |         |              |                      |

|           |     |     |       |      |          |                | RESULTS        |          |        |         |                       |        |         |        |      |       |       | ELECT | RIC HEAT |      |       |       |     | SOU | ND        | RA  | D SOU      | 'OP DNI | WER     | C   | DIS SOU           | JND PC | WER  |
|-----------|-----|-----|-------|------|----------|----------------|----------------|----------|--------|---------|-----------------------|--------|---------|--------|------|-------|-------|-------|----------|------|-------|-------|-----|-----|-----------|-----|------------|---------|---------|-----|-------------------|--------|------|
| TAG       | MFG | QTY | MODEL | SIZE | CONTROLS | MAX            | MIN            | INLET SP | MIN SP | DOWN SP | ARRANGEMENT           | MCA ** | MSCP ** | WEIGHT | HEAT | EAT   | LAT   | HTR   | HTR      | HTR  | PHASE | STEPS | RAD | DIS | ATTEN     |     |            |         |         |     |                   |        |      |
|           |     |     |       |      |          | PRIMARY<br>CFM | PRIMARY<br>CFM | IN WC    | IN WC  | IN WC   |                       |        |         | lb     | CFM  | DEG F | DEG F | KW    | AMPS     | VOLT |       |       | NC  | NC  | METHOD    | 125 | 500<br>250 | 1000    | 4000    | 125 | 250               | 1000   | 2000 |
| V2-1      | JCI | 1   | TSS   | 08   |          | 980            | 105            | 1        | 0.37   | 0.25    | LH Controls / LH Coil | 18.04  | 20      | 32     | 980  | 55    | 93.7  | 12    | 14.43    | 480  | 3     | 3     | 20  | 16  | AHRI-885E | 58  | 47 45      | 40      | 35 28   | 66  | 60 5              | 5 52   | 48 4 |
| V2-2      | JCI | 1   | TSS   | 06   |          | 440            | 53             | 1        | 0.48   | 0.25    | LH Controls / LH Coil | 9.02   | 15      | 29     | 440  | 55    | 98.09 | 6     | 7.22     | 480  | 3     | 2     | 16  | 15  | AHRI-885E | 52  | 47 43      | 37      | 32 27   | 63  | 58 5              | 3 50   | 43 4 |
| V2-3 V2-4 | JCI | 2   | TSS   | 10   |          | 1380           | 165            | 1        | 0.19   | 0.25    | LH Controls / LH Coil | 27.06  | 30      | 34     | 1380 | 55    | 96.22 | 18    | 21.65    | 480  | 3     | 3     | 21  | 19  | AHRI-885E | 57  | 49 47      | 40      | 34 30   | 68  | 62 5              | 8 55   | 51 4 |
| V2-5      | JCI | 1   | TSS   | 10   |          | 1130           | 165            | 1        | 0.13   | 0.25    | LH Controls / LH Coil | 22.55  | 25      | 34     | 1130 | 55    | 96.95 | 15    | 18.04    | 480  | 3     | 3     | 19  | 16  | AHRI-885E | 55  | 47 45      | 38      | 32   30 | 65  | 60 50             | ô 53   | 49 4 |
| V2-6      | JCI | 1   | TSS   | 10   |          | 1010           | 165            | 1        | 0.11   | 0.25    | LH Controls / LH Coil | 19.55  | 20      | 34     | 1010 | 55    | 95.67 | 13    | 15.64    | 480  | 3     | 3     | 18  | 16  | AHRI-885E | 54  | 46 44      | 37      | 32 29   | 64  | 60 50             | ô 52   | 49 4 |
| V2-7      | JCI | 1   | TSS   | 05   |          | 300            | 48             | 1        | 0.19   | 0.25    | LH Controls / LH Coil | 6.01   | 15      | 29     | 300  | 55    | 97.13 | 4     | 4.81     | 480  | 3     | 2     | 20  | 24  | AHRI-885E | 51  | 50 46      | 38      | 34 30   | 68  | 65 5 <sup>t</sup> | 5 51   | 46 4 |

\* "-" signifies a NC value (radiated or discharge) that is less than 15

\* Actual coil APD shown is at max airflow, not heating airflow.

1. SEE SPECIFICATIONS FOR OTHER APPLICABLE ENGINEERING REQUIREMENTS.

. PROVIDE WITH HOT GAS BYPASS SUCH THAT YOU CAN MODULATE DOWN TO 5%

\*\* MCA/MSCP number may vary from unit nameplate due to component changes related to actual product selections and devices applied.

3. PROVIDE WITH PART WINDING STARTER

4. PROVIDE WITH SINGLE POINT POWER CONNECTION

|      |          |                |                          |             |               |     |       |      | CHIL      | LER P  | JMP SC   | HEDUL | .E     |       |              |         |         |          |          |            |          |         |                |          |
|------|----------|----------------|--------------------------|-------------|---------------|-----|-------|------|-----------|--------|----------|-------|--------|-------|--------------|---------|---------|----------|----------|------------|----------|---------|----------------|----------|
|      |          | AREA           |                          |             |               |     |       | CIRC | ULATING F | FLUID  |          |       |        |       |              |         |         | ELECTRIC | CAL MOTO | OR         |          |         |                |          |
| MARK | LOCATION | AND/OR<br>BLDG | SYSTEM AND/OR<br>SERVICE | TYPE        | FLUID         | FL  | .OW   | HE   | EAD       | NPSH A | VAILABLE | TEMPE | RATURE | SP GR | MIN %<br>EFF | NOMINAI | L POWER | PHASE    | VOLT     | MAX<br>RPM | SPEED    | REMARKS | MANUFACTURER   | MODEL NO |
|      |          | SERVED         |                          |             |               | GPM | [L/s] | FT   | [kPa]     | FT     | [kPa]    | °F    | [°C]   |       |              | HP      | [kW]    |          |          | RPM        | CONTROL  |         |                |          |
| P-1  | OUTDOORS | LAB/OFFICE     | CHILLED WATER            | END SUCTION | CHILLED WATER | 180 | [11]  | 45   | [720]     | N/A    | #VALUE!  | 95    | [ 35 ] | 1     | 85           | 7.5     | [6]     | 3        | 460      | 1800       | VARIABLE |         | BELL & GOSSETT | 209251   |
| P-2  | 1220 MER | SURGERY        | CHILLED WATER            | END SUCTION | CHILLED WATER | 255 | [16]  | 46   | [730]     | N/A    | N/A      | 95    | [ 35 ] | 1     | 85           | 7.5     | [6]     | 3        | 460      | 1800       | VARIABLE |         | BELL & GOSSETT | 209251   |
|      |          |                |                          |             |               |     |       |      |           |        |          |       |        |       |              |         |         |          |          |            |          |         |                |          |

1. ANTIFREEZE FLUID IS USUALLY PROPYLENE GLYCOL WATER (PGW). ADJUST FLOW, HEAD, AND POWER FOR FLUID PUMPED, EXCEPT SIZE MOTORS FOR HOT FLUIDS ON COLD CONDITIONS.



| AIR HANDLING UN                         | IITS     |       |            |          |           |         |      |      |           |        |        |         |        |      |        |     |            |      |       |          |             |         |            |           |         |          |                   |      |      |          |      |          |      |           |        |      |       |         |        |      |      |              |       |
|-----------------------------------------|----------|-------|------------|----------|-----------|---------|------|------|-----------|--------|--------|---------|--------|------|--------|-----|------------|------|-------|----------|-------------|---------|------------|-----------|---------|----------|-------------------|------|------|----------|------|----------|------|-----------|--------|------|-------|---------|--------|------|------|--------------|-------|
| TAG LOCATION SERVICE                    | AIR FLOW | MIN.  | SUPPLY FAN | CHARACT  | ERISTICS  | MOTOR   |      |      | RETURN    | FAN CH | ARACTE | RISTICS | NOTOR  |      |        |     | HEATING CO | IL   |       |          |             |         |            |           |         |          |                   |      |      | COOLING  | COIL |          |      |           |        |      |       |         |        |      |      | MANUFACTURE  | .R    |
|                                         | (CFM)    | OA    | WHEEL WHE  | EL TSP   | ESP RPM   | 1 BHP H | P PH | VOLT | VFD WHEEL | WHEEL  | ESP    | RPM     | BHP H  | P P  | H VOLT | VFD | TYPE       | EAT  | LAT   | CAPACITY | MAX.        | AIRFLOV | / AIR PD A | T STEAM C | OIL     | N TOH    | <b>VATER COIL</b> |      |      | EAT (°F) |      | LAT (°F) |      | MAX.      | MAX.   | MAX. | MAX.  | CAPACI  | TY GPM | EWT  | LWT  |              |       |
|                                         |          | (CFM) | TYPE DIA   | 4. ("WG) | ("WG)     |         |      |      | TYPE      | DIA.   | ("WG)  |         |        |      |        |     |            | (°F) | (°F)  | (MBH)    | <b>FACE</b> | AT MAX  | UNIT MAX   | STEAM     | 1 STEAM | /I MAX   | X. GPM            | EWT  | LWT  | DB       | WB   | DB       | WB   | FINS/INCH | H FACE | AIR  | WATER | R (MBH) | )      | (°F) | (°F) |              |       |
|                                         |          |       | (1)        | 1)       | (1)       |         |      |      |           | (IN)   | (1)    |         |        |      |        |     |            |      |       |          | VEL         | HEATING | AIRFLOW    | PRESSU    | RE FLOW | / WATE   | ER                | (°F) | (°F) |          |      |          |      |           | VEL.   | PD   | PD    | (TOTAL  | .)     |      |      |              |       |
|                                         |          |       | Ì          |          |           |         |      |      |           | , ,    |        |         |        |      |        |     |            |      |       |          | (FPM)       | (CFM)   |            |           |         | R) PD (F |                   |      |      |          |      |          |      |           | (FPM)  |      | (FT)  |         |        |      |      |              |       |
| AHU-2 LAB VERTICAL MECH RM DRAW-THRU    | 6620     | 100%  | AF.FS 15   | 2.63     | 1.75 1800 | 5.71 7  | .5 3 | 460  | DWDI      | 15     | 1.75   | 3500    | 6.02 7 | .5 3 | 460    |     | STAGED     | 36   | 64.89 | 3876     |             | 6620    | 0.03       |           |         |          |                   |      |      | 95.7     | 79.9 | 53.6     | 52.8 | 11        | 453    | 0.74 | 19.6  | 603     | 144    | 44   | 54   | YORK XTI-45  | 5X72  |
|                                         |          |       |            |          |           |         |      |      |           |        |        |         |        |      |        |     |            |      |       |          |             |         |            |           |         |          |                   |      |      |          |      |          |      |           |        |      |       |         |        |      |      |              |       |
| AHU-1 OFFICE VERTICAL MECH RM DRAW-THRU | 1800     | 420%  | FC 10)     | (7       | 1 1800    | 1.03 1  | .5 3 | 460  |           | 10X7   | 1      | 1800    | 1.03   | 1 3  | 460    |     | STAGED     |      |       | 388      |             | 1800    | 0.03       |           |         |          |                   |      |      | 80.8     | 67.2 | 55       | 54.2 | 8         | 500    | 0.6  | 15    | 91.2    | 15     | 44   | 54   | YORK XTI-030 | 0X039 |
|                                         |          |       |            |          |           |         |      |      |           |        |        |         |        |      |        |     |            |      |       |          |             |         |            |           |         |          |                   |      |      |          |      |          |      |           |        |      |       |         |        |      |      |              |       |

(1) ESP TO EXCLUDE PD OF UNIT COMPONENTS FURNISHED BY UNIT MANUFACTURER

SUCH AS COILS, FACE AND BYPASS DAMPERS, HOT AND COLD DECK DAMPERS,

INLET VANES AND PERFORATED DIFFUSER PLATES WHERE REQUIRED. (2) STEAM PRESSURE INDICATED IS STEAM PRESSURE AVAILABLE DOWNSTREAM OF CONTROL VALVE.

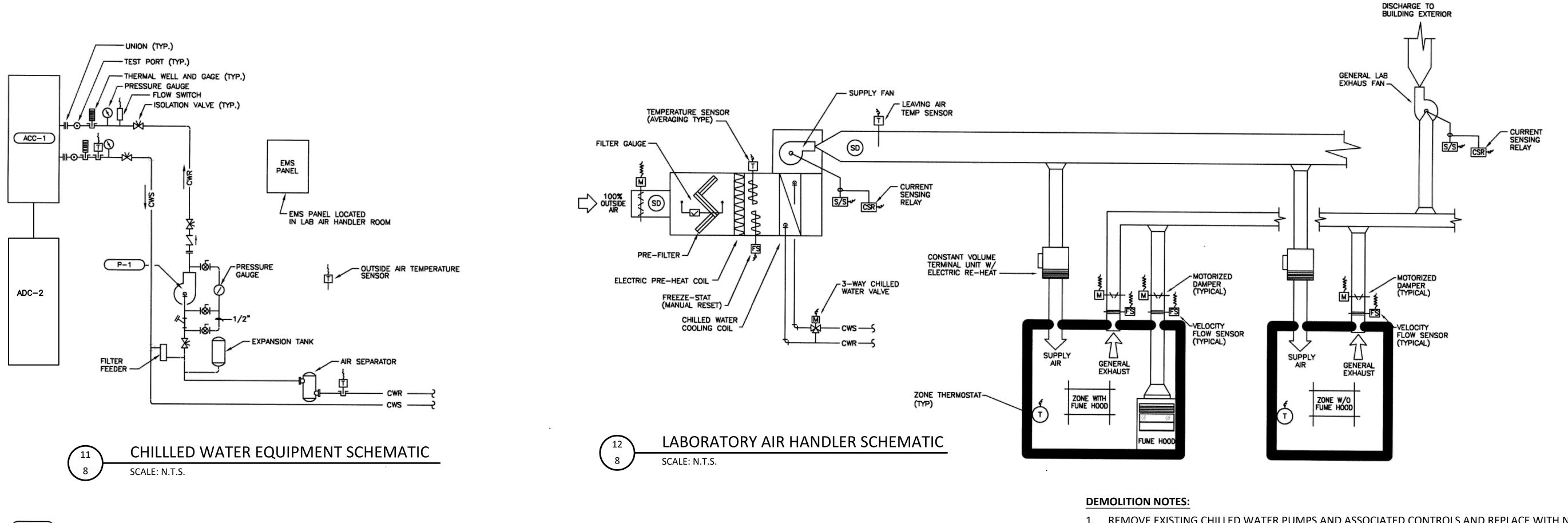
PROJECT:

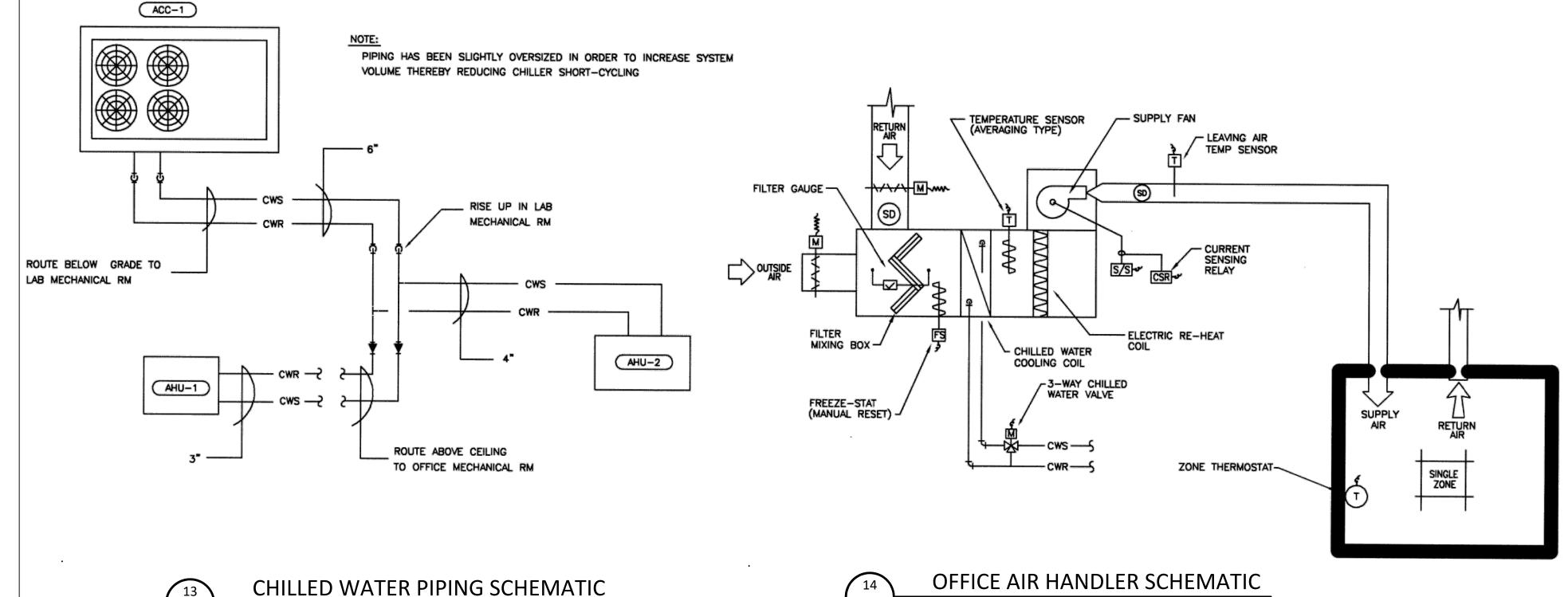
PROJECT #

DRAWN BY: AJM

DATE: 9-17-2022

SHEET 7 OF 17





SCALE: N.T.S.

JUAN J. BUJANOS

97472

9/17/22

SCALE: N.T.S.

- 1. REMOVE EXISTING CHILLED WATER PUMPS AND ASSOCIATED CONTROLS AND REPLACE WITH NEW. PUMPS WILL BE SALVAGE BY THE OWNER.
- 2. REMOVE AIR SEPARATOR, EXPANSION TANK, AND CHEMICAL POT FEEDER AND REPLACE WITH NEW.
- 3. REMOVE AIR COOLED CHILLERS, DISCONNECT MECHANICAL PIPING, ELECTRICAL AND CONTROLS. REMOVE & REPLACE BOTH PUMP ELECTRICAL DISCONNECTS, AND RECONNECT.
- 4. REMOVE & REPLACE CHILLED WATER PUMP SUPPLY / RETURN INSULATION SYSTEMS.
- 5. REMOVE & REPLACE ABOVE GROUND CHILLED WATER SUPPLY / RETURN PIPING.
- 6. CONTRACTOR SHALL MEASURE AND DOCUMENT FLOW AND PRESSURE AT EACH AIR HANDLER.

#### CHILLED WATER SYSTEM HAS THE FOLLOWING EQUIPMENT:

- . AHU-1 -
- 2. AHU-2 -
- 3. CH-1 -
- 4. CH-2 -

DOCUMENT MEASURED FLOW , PRESSURE AND PRESSUREE; SUBMIT REPORT TO ENGINEER FOR REVIEW PRIOR TO DEMOLITION ANY OF THE CHILLED WATER SYSTEM.

#### **KEYED NOTES: MECHANICAL DEMOLITION**

- 1. EXISTING CONCRETE PADS TO REMAIN.
- 2. EXISTING CHILLED WATER LINE INSULATION, AND ALUMINUM JACKET TO BE REMOVED / REPLACED. EXISTING PIPE STANDS TO BE REMOVED AND REPLACED WITH NEW HDG, ALUMINUM OR STAINLESS STEEL. FIELD VERIFY HEIGHT AND QUANTITY.
- 3. CHILLERS TO BE REMOVED AND RETURNED TO OWNER (IF OWNER SO DESIRES).
- 4. CHILLED WATER LINES VALVES TO BE REMOVED AND REPLACED.
- 5. EXISTING AIR-DIRT SEPARATOR TO BE REMOVED AND REPLACED WITH NEW.
- 6. EXISTING CHILLER PUMPS TO BE REMOVED AND REPLACED & RETURNED TO OWNER.
- 7. EXISTING CHEMICAL BYPASS POT FEEDER TO BE REMOVED AND REPLACED WITH NEW.
- 8. EXISTING CHILLER DISCONNECTS TO BE REMOVED REPLACED WITH NEW.
- 9. VSDs FOR AIR HANDLERS TO BE REMOVED AND REPLACED.
- 10. CHILLERS VIBRATION ISOLATORS, BASES AND ANCHORS TO MEET ALL TDI WINDSTORM REQUIREMENTS; DESIGN TO BE PROVIDED BY CONTRACTOR WINDSTORM ENGINEER AS A SUBMITTAL.

SHEET TITLE

BPUB LABORATORY BU

HVAC SCHEMAT

PROJECT:

LABORATORY FACILITY REPLACEMENT PROJECT

ENGINEER ING

PROJECT#

DRAWN BY: AJM

DATE: 9-17-2022

SHEET 8 OF 17

#### 1. AIR COOLED CHILLER:

FMS SHALL START/STOP CHILLER PER USER DEFINED SCHEDULE. UPON CALL FOR COOLING, FMS SHALL INITIATE PUMP P-1. UPON PROOF OF FLOW, CHILLER ACC-1 SHALL BE INITIATED. CHILLER'S INTEGRAL CONTROLS SHALL STAGE CHILLER TO MAINTAIN LOOP SET POINT OF 44°F (ADJ).

IF OUTSIDE AIR TEMPERATURE FALLS BELOW 38°F (AS MEASURED BY OUTSIDE AIR TEMPERATURE SENSOR), PUMP P-1 SHALL BE INITIATED AND RUN CONTINUOUSLY UNTIL TEMPERATURE RISES ABOVE 40°F (FREEZE PROTECTION).

#### 2. OFFICE AIR HANDLING UNIT (AHU-1)

FMS SHALL START/STOP AIR HANDLING UNIT PER USER DEFINED SCHEDULE; OUTSIDE AIR DAMPERS AND RETURN AIR DAMPERS CLOSE WHEN UNIT IS OFF.

WHEN UNIT IS ON, CHILLED WATER 3-WAY VALVE SHALL MODULATE TO MAINTAIN 55°F (ADJ) LEAVING AIR TEMPERATURE AND ELECTRIC RE-HEAT COIL SHALL BE STAGED TO MAINTAIN ROOM SET POINT.

UPON SIGNAL FROM DUCT MOUNTED SMOKE DETECTOR, THE AIR HANDLER SHALL BE STOPPED.

AIR HANDLER SHALL BE STOPPED IF CAPILLARY TYPE FREEZE STAT SENSES LESS THAN 40°F. RESET SHALL BE MANUAL. FMS SHALL BE ALARMED.

EXHAUST FAN EF-1 SHALL BE INTERLOCKED WITH AIR HANDLER.

#### 3. 100% OUTSIDE AIR LABORATORY AIR HANDLING UNIT (AHU-2)

FMS SHALL START/STOP AIR HANDLING UNIT PER USER DEFINED SCHEDULE; OUTSIDE AIR DAMPER CLOSES WHEN UNIT IS OFF.

ELECTRIC PRE-HEAT COIL SHALL BE STAGED TO MAINTAIN 50°F (ADJ) COOLING COIL ENTERING AIR TEMPERATURE (FREEZE PROTECTION).

WHEN UNIT IS ON, CHILLED WATER 3—WAY VALVE SHALL MODULATE TO MAINTAIN 55°F (ADJ) LEAVING AIR TEMPERATURE. CONSTANT VOLUME TERMINAL UNIT ELECTRIC RE—HEAT COIL SHALL BE STAGED TO MAINTAIN ROOM SET POINT.

UPON SIGNAL FROM DUCT MOUNTED SMOKE DETECTOR, THE AIR HANDLER SHALL BE STOPPED.

AIR HANDLER SHALL BE STOPPED IF CAPILLARY TYPE FREEZE STAT SENSES LESS THAN 40°F. RESET SHALL BE MANUAL. FMS SHALL BE ALARMED.

EXHAUST FAN EF-2 SHALL BE INTERLOCKED WITH AIR HANDLER. ROOM EXHAUST AIRFLOW RATES SHALL BE MAINTAINED PER ROOM PRESSURIZATION SCHEDULE (M401) BY MODULATING DUCT MOUNTED MOTORIZED DAMPERS. FLOW RATES SHALL BE MONITORED WITH DUCT MOUNTED VELOCITY FLOW SENSORS. UPON SIGNAL FROM FUME HOODS INTEGRAL ON/OFF SWITCH, FUME HOOD DAMPER SHALL BE MODULATED OPEN TO MAINTAIN PROPER HOOD FLOW RATE WHILE LAB'S GENERAL EXHAUST DAMPER SHALL MODULATED PARTIALLY/FULLY CLOSED AS NECESSARY TO MAINTAIN ROOM'S OVERALL EXHAUST FLOW RATE PER SCHEDULE. EXHAUST FAN EF-2 SHALL RUN AT CONSTANT RATE.

EXHAUST FAN EF-3 SHALL BE INTERLOCKED WITH ICP FUME HOOD ON/OFF SWITCH. ICP EXHAUST DUCT SHALL BE PROVIDED WITH A MOTORIZED DAMPER AND A VELOCITY FLOW SENSOR. WHEN UNIT IS ENERGIZED, DAMPER SHALL BE MODULATED TO MAINTAIN FLOW RATE PER ROOM PRESSURIZATION SCHEDULE (M401) AND ICP ROOM'S GENERAL EXHAUST SHALL BE MODULATED ACCORDINGLY TO MAINTAIN ROOM'S OVERALL EXHAUST FLOW RATE.

|      |           |                  |                         |     | Al     | R SEP | ARATO     | R SCH | EDULE |                   |         |
|------|-----------|------------------|-------------------------|-----|--------|-------|-----------|-------|-------|-------------------|---------|
|      |           | SYSTEM           |                         |     |        | ,     | AIR SEPAF | RATOR |       |                   |         |
| MARK | LOCATION  | AND/OR           | TYPE                    | SIZ | E IN   | FL    | WC        | W     | PD    | BUILT-IN          | REMARKS |
|      |           | SERVICE          |                         | IN  | [mm]   | GPM   | [L/s]     | FT    | [kPa] | STRAINER<br>REQ'D |         |
| AS-1 | MECH ROOM | CHILLED<br>WATER | FULL FLOW<br>TANGENTIAL | 1   | [ 25 ] | 500   | [ 32 ]    | 3.5   | [10]  | YES               |         |
|      |           |                  |                         |     | []     |       | [ ]       |       | []    |                   |         |

|      |           |                   |                   |        |          |       |           |          |       |               | EX     | (PANSI  | ON TA   | NK SC  | HEDU     | LE        |       |                    |      |        |       |        |         |        |         |         |
|------|-----------|-------------------|-------------------|--------|----------|-------|-----------|----------|-------|---------------|--------|---------|---------|--------|----------|-----------|-------|--------------------|------|--------|-------|--------|---------|--------|---------|---------|
|      |           | SYSTEM            |                   | APPROX | (SYSTEM  | SYSTE | ЕМ ТЕМРЕІ | RATURE F | RANGE | INIT<br>PRESS |        | MAX OPE | ERATING | FIL    | L PRESSU | JRE AT TA | NK    | MIN VOLUME<br>TANK |      | MIN BL | ADDER | PIPE S | SIZE TO | MAKE-U | P WATER |         |
| MARK | LOCATION  | AND/OR<br>SERVICE | TYPE              | VOL    | LUME     | М     | IIN       | MA       | λX    | TA            |        | PRES    | SURE    | RELIEF | VALVE    | AT T      | ANK   | TANK               | NK   | VOL    | UME   | TA     | ANK     | FILL   | SIZE    | REMARKS |
|      |           | OLIVIOL           |                   | GAL    | [L]      | °F    | [°C]      | °F       | [°C]  | PSIG          | [kPa]  | PSIG    | [kPa]   | PSIG   | [kPa]    | PSIG      | [kPa] | GAL                | [L]  | GAL    | [L]   | IN     | [mm]    | IN     | [mm]    |         |
| EX-1 | MECH ROOM | CHILLED<br>WATER  | VERT<br>DIAPHRAGM | 500    | [ 1900 ] | 40    | [4]       | 105      | [41]  | 5             | [ 35 ] | 30      | [210]   | 125    | [ 860 ]  |           | []    | 5                  | [19] | 20     | [76]  | 6      | [150]   | 1      | [25]    |         |
|      |           |                   |                   |        | []       |       |           |          |       |               | [ ]    |         | []      |        | []       |           | [ ]   |                    | []   |        | []    |        | []      |        | []      |         |

**DESIGNER NOTE** 

1. INCLUDE STRAINER

JUAN J. BUJANOS

97472

POR PEGISTERED

SSIONAL ENGINEER

9/17/22

BPUB LABORATORY FACILITY HVAC REPLACEMENT PROJECT

PROJECT:

SHEET TITLE

BPUB LABORATORY BUILDIN
ROOM AIR BALANCES

ENGINEERING

COUNTY RD, 725, 956-454-67

LOS FRESNOS, TEXAS 78566

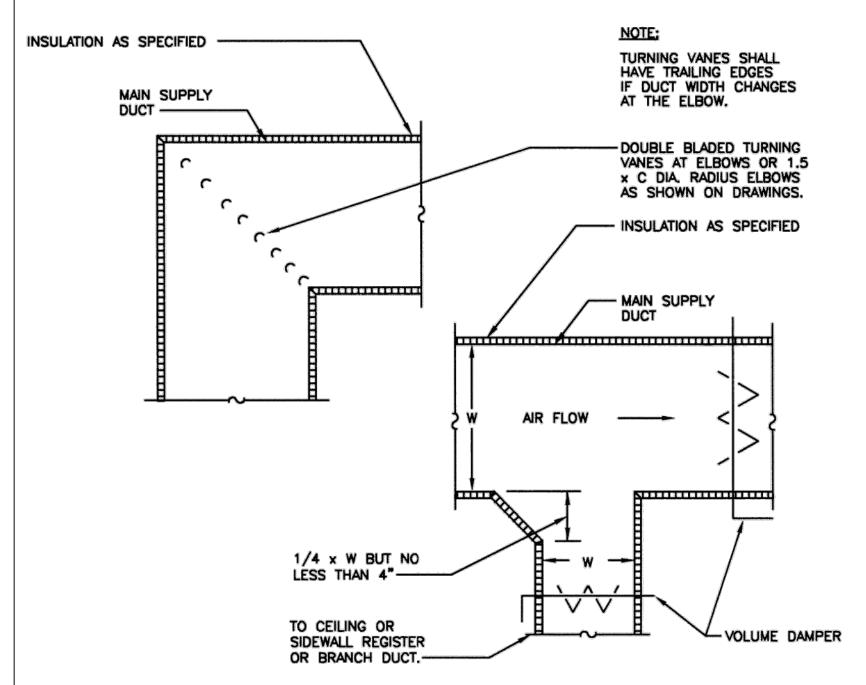
PROJECT #

DRAWN BY: AJM

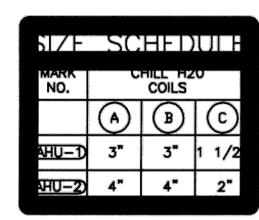
DATE: 9-17-2022

SHEET 9 OF 17





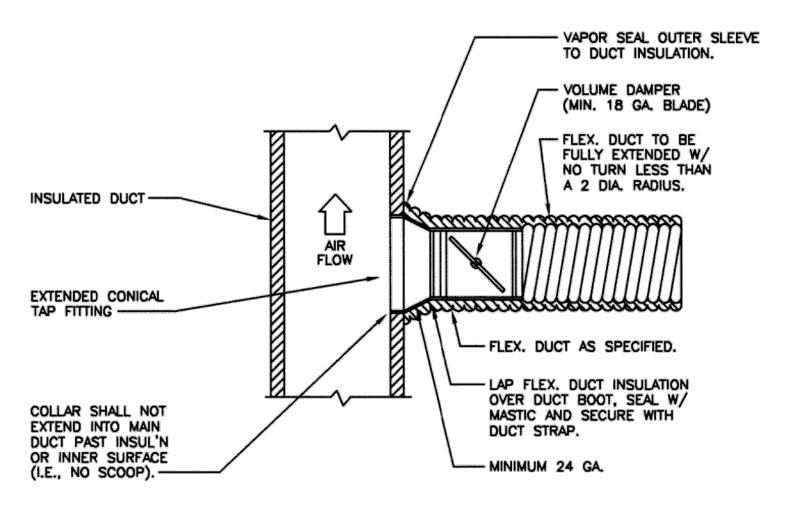




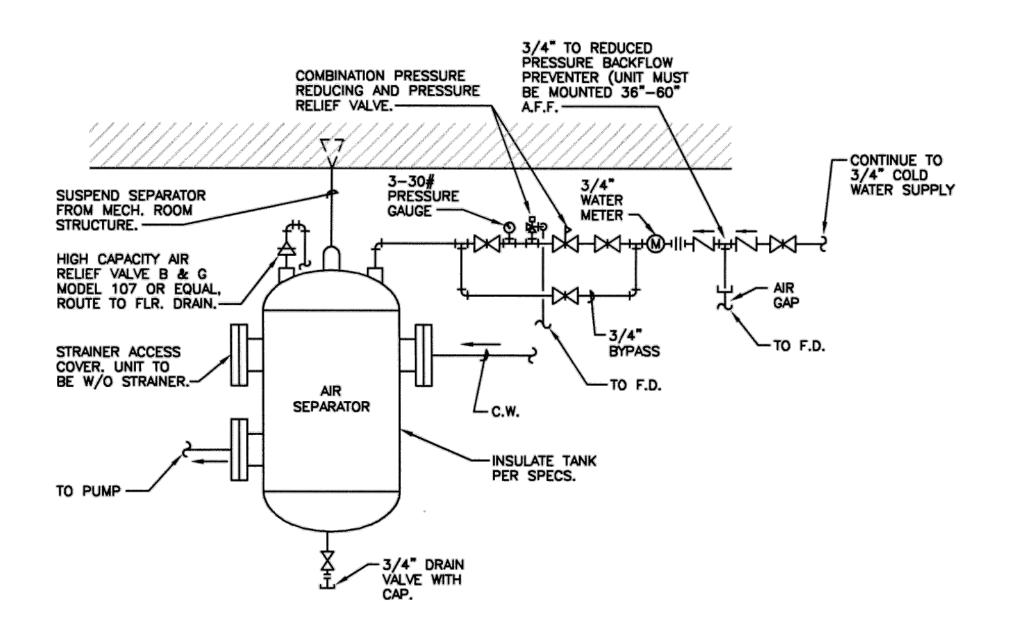
#### NOTES:

- 1 NOT USE
- THERMOMETER WELL AND PETES PLUG TO BE INSTALLED FULLY
- 3 BALL OR BUTTERFLY ISOLATION VALVE DEPENDING ON SIZE.
- 2-WAY MODULATING VALVE IS REQUIRED WHEN NO VALUE IS GIVEN FOR ©, AND SHALL BE INSTALLED IN SUPPLY LINE.
- 5 PIPE ALL COILS FOR COUNTER FLOW WATER TO AIR HEAT EXCHANGE.
- 6 LINE SIZE VALVES AND BYPASSES FOR COOLING COIL MAY BE USED AT THE CONTRACTORS OPTION.
- AUTOMATIC AIR VENT PIPED TO FLOOR DRAIN. PROVIDE WHEN MAINS ARE LOCATED BELOW COIL.

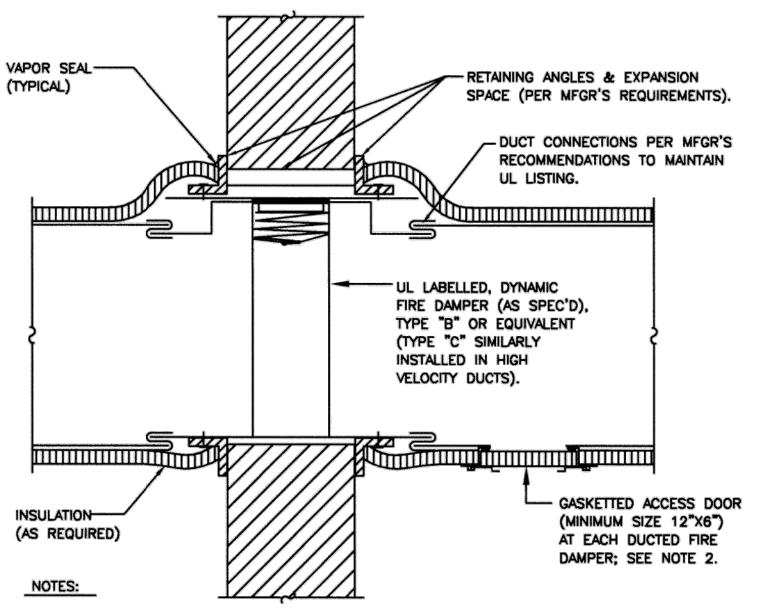
# COIL PIPING SIZE SCHEDULE AND NOTES SCALE: N.T.S.











- INSTALLATION MUST BE AS PER MANUFACTURER'S REQUIREMENTS TO MAINTAIN UL LISTING. WHEN CLOSED, DAMPER BLADES MUST BE WITHIN THE PLANE OF THE WALL.
- ACCESS DOOR PROVIDED SHALL BE GASKETTED (AND INSULATED, DOUBLE-WALL CONSTRUCTION ON INSULATED DUCTS); DOOR SHALL CLOSE AGAINST AIR PRESSURE, I.E. OPEN "IN" ON NEGATIVE PRESSURE, "OUT" AGAINST POSITIVE PRESSURE, LABEL PER NFPA 90A, 2,3,4.2.
- 3. HORIZONTAL OR FLOOR MOUNTING IS SIMILAR.
- 4. THIS IS NOT INTENDED TO SERVE AS A CEILING RADIATION DAMPER.





BPUB LABORATORY FACILITY HVAC REPLACEMENT PROJECT

PROJECT:

I OF 4

SHEET

ENGINEERING

COUNTY RD, 725, 956-454-6740

LOS FRESNOS, TEXAS 78566

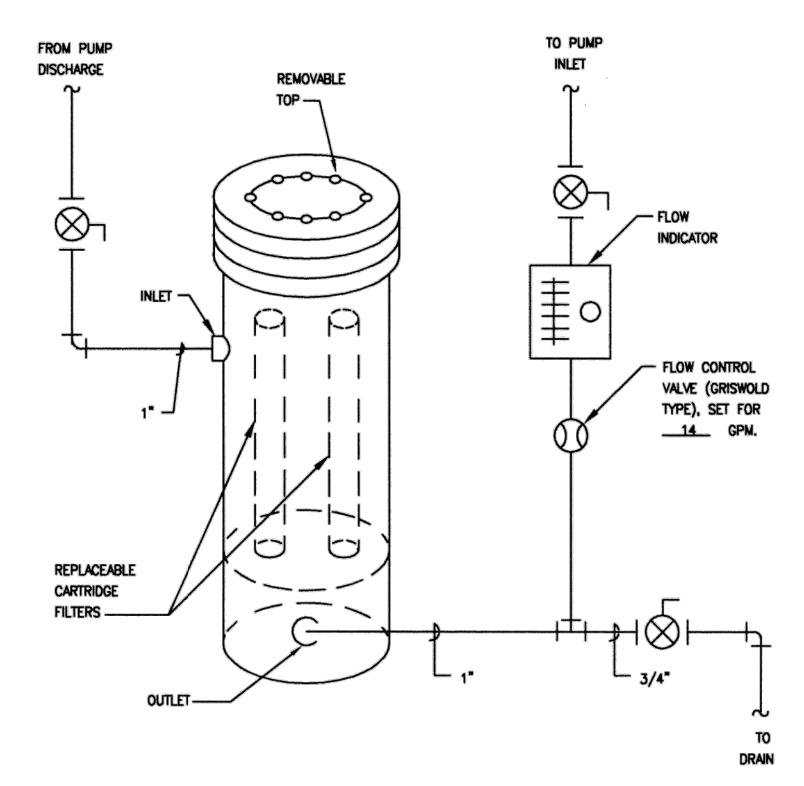
PROJECT #

DRAWN BY: AJM

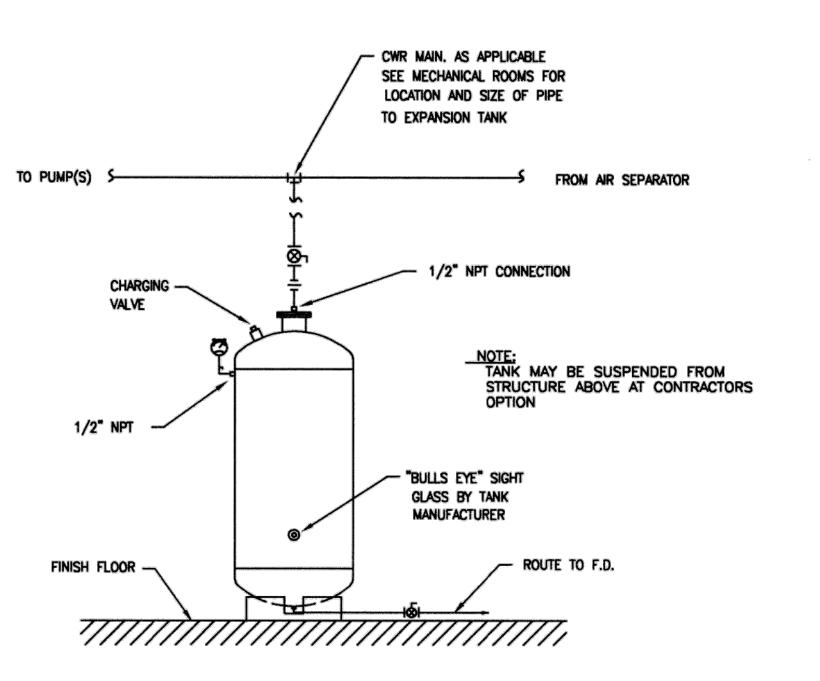
DATE: 9-17-2022

SHEET 10 OF 17

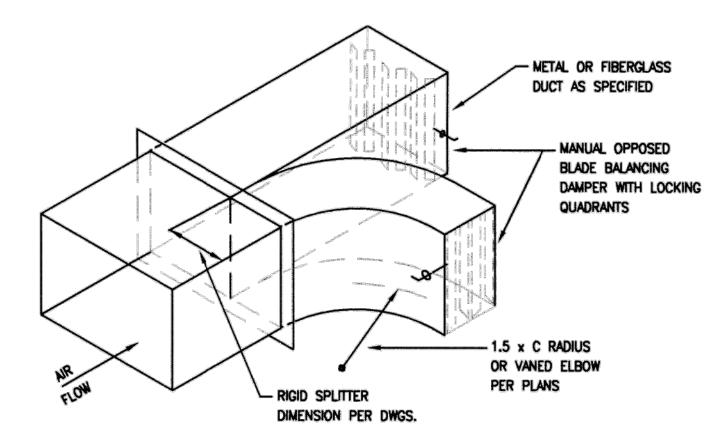




FILTER FEEDER DETAIL SCALE: N.T.S.

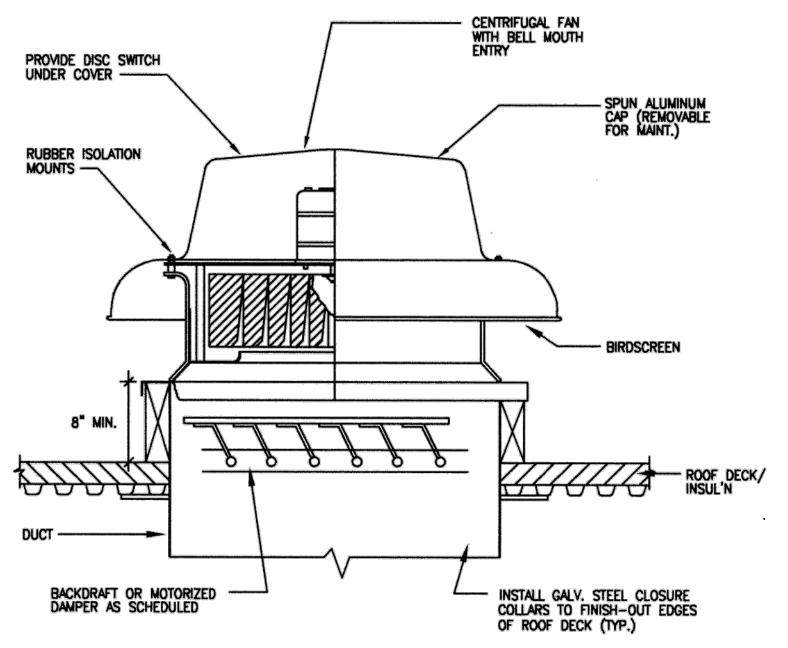


**BLADDER - TYPE EXPANSION TANK** SCALE: N.T.S.



**DUCT SPLITTER DETAIL** SCALE: N.T.S.

NOTE: CONDUIT SHALL NOT INTERFERE WITH BACKDRAFT DAMPER OPERATION,



TYP. ROOF MOUNTED EXHAUST FAN DETAIL SCALE: N.T.S.



11 OF 17

9/17/22

LABORATORY FACILITY REPLACEMENT PROJECT BPUB HVAC

PROJECT:

SHEE DETAIL 2 OF 4 SHEET

COUNTY RD, 725, 956-454-6 LOS FRESNOS, TEXAS 78566

PROJECT #

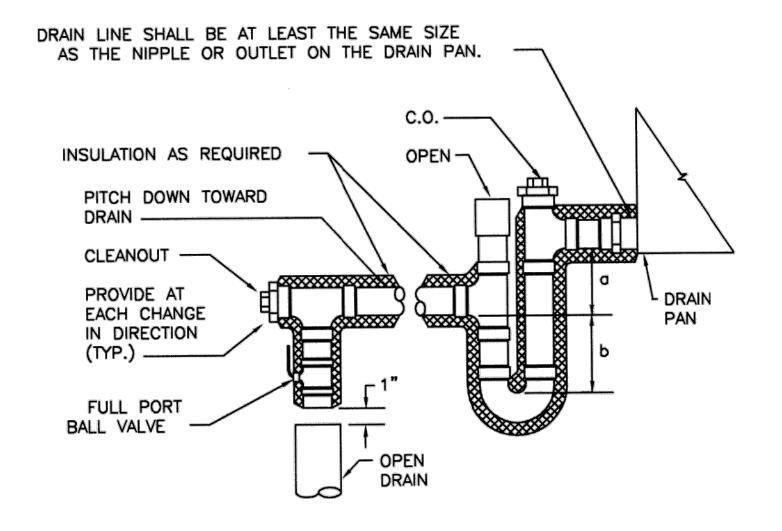
DRAWN BY: AJM DATE: 9-17-2022

SHEET

#### NOT

- SUPPORT PUMP FROM PIPING ONLY. DO NOT SUPPORT PUMP FROM MOTOR ON VERTICAL OR HORIZONTAL IN-LINE PUMPS.
- BALL VALVE TO 2", BUTTERFLY VALVE 2 1/2" & LARGER.





| UNIT STATIC PRESS. | a  | Ь  |
|--------------------|----|----|
| 0"-1"              | 1" | 3" |
| 1"-2"              | 2" | 4" |
| 2"-3"              | 3" | 5" |

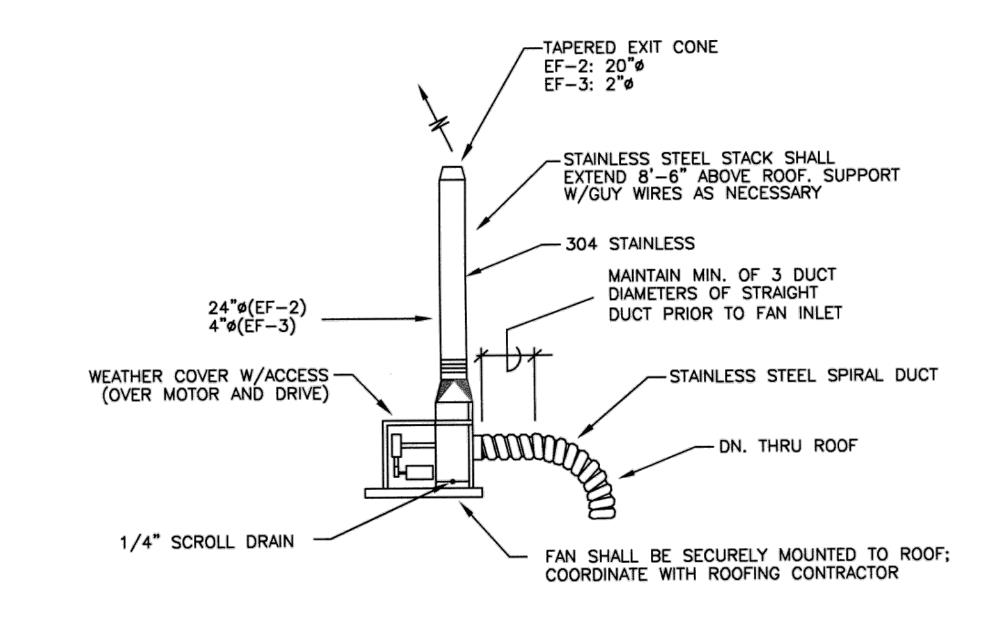
#### NOTES:

- FOR DEPTH OF SEAL, SEE SCHEDULE BELOW.
- LOCATE TRAP SO AS TO BE ACCESSIBLE FOR CLEANING.
- 3. PROVIDE ADEQUATE AHU
  HEIGHT TO ALLOW FOR
  TRAP HEIGHT.

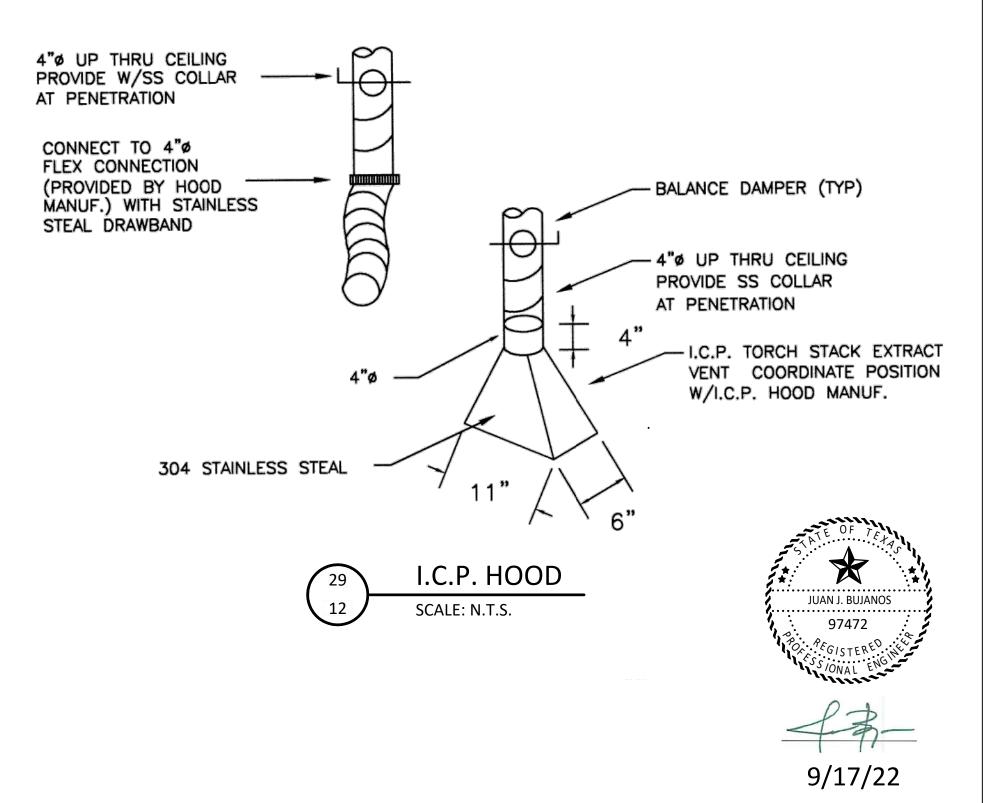


AIR HANDLING UNIT DRAIN TRAP

SCALE: N.T.S.



LABORATORY EXHAUST FAN INSTALLATION
SCALE: N.T.S.



BPUB LABORATORY FACILITY HVAC REPLACEMENT PROJECT

PROJECT:

HVAC DETAIL SHEET
3 OF 4

SHEET INGINEERING

ENGINIEBRING

798 COUNTY RD, 725, 956-454-6

LOS FRESNOS, TEXAS 78566

PROJECT#

DRAWN BY: AJM

DATE: 9-17-2022

SHEET 12 OF 17

PROJECT:

SHEET

DATE: 9-17-2022

**SHEET** 13 OF 17

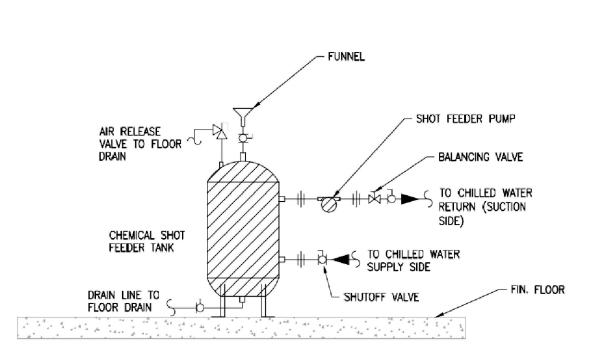
AT BOTH SIDES OF WALL/FLOOR PENETRATIONS. ARROWS OF SAME COLOR AS

NOTE: IDENTIFICATION MARKERS OR STRIPS TO BE PLACED ON ALL EXPOSED COVERED AND UNCOVERED PIPES AT 50'-0" INTERVALS, ADJACENT TO ALL VALVES OR BRANCHES, AND IDENTIFICATION MARKERS SHALL ALSO BE PLACED ON PIPES POINTING AWAY FROM MARKER INDICATING DIRECTION OF FLOW.

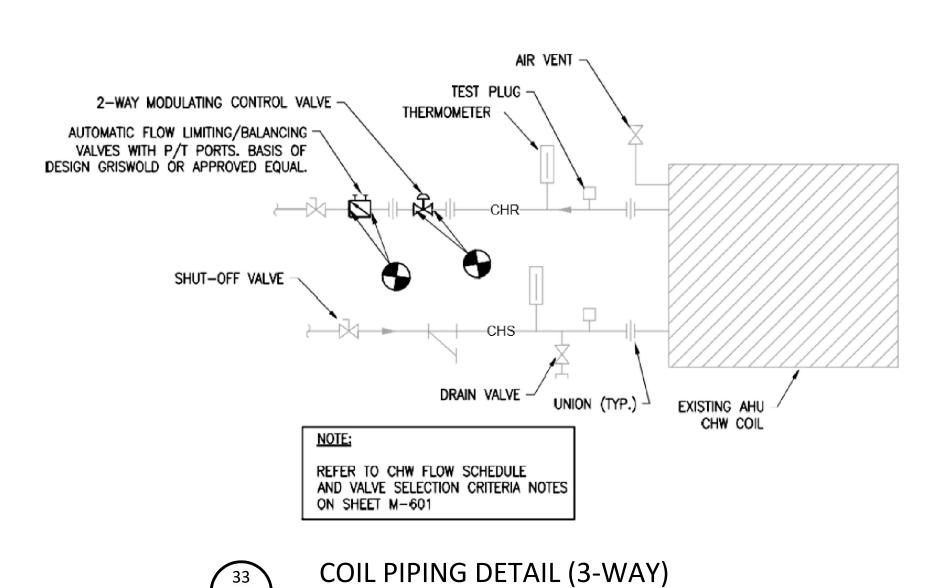
| SIZE OF LEGEND LETTERS |             |              |  |  |  |
|------------------------|-------------|--------------|--|--|--|
| OUTSIDE DIAMETER       | LENGTH OF   | SIZE OF      |  |  |  |
| OF PIPE                | COLOR FIELD | LETTERS      |  |  |  |
| OR COVERING            | A           | B            |  |  |  |
| 3/4" TO 1 1/4"         | 8"          | 1/2 <b>"</b> |  |  |  |
| 1 1/2" TO 2"           | 8"          | 3/4"         |  |  |  |
| 2" 1/2" TO 6"          | 12"         | 1 1/4"       |  |  |  |

| SERVICE                                                                                               | BACKGROUND OR<br>COLOR BAND                                                  | LETTER<br>COLOR                           |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------|
| CHILLED WATER SUPPLY CHILLED WATER RETURN CONDENSER WATER RETURN CONDENSER WATER SUPPLY MAKE-UP WATER | SAFETY GREEN<br>SAFETY GREEN<br>SAFETY GREEN<br>SAFETY GREEN<br>SAFETY GREEN | WHITE<br>WHITE<br>WHITE<br>WHITE<br>WHITE |

TYPICAL PIPE IDENTIFICATION MARKERS SCALE: N.T.S.



SHOT FEEDER - CHEMICAL TREATMENT DETAIL SCALE: N.T.S.



SCALE: N.T.S.

NOTES:

1. PIPING CONTRACTOR SHALL FURNISH/INSTALL WELL FOR TEMPERATURE SENSOR AND TAP FOR FLOW SWITCH AS SHOWN FOR FUTURE USE EVEN IF SENSOR OR FLOW SWITCH ARE NOT PROVIDED

11

EXTEND CONCRETE PAD MINIMUM OF — 4" ALL SIDES OF PUMP INERTIA BASE

BASE MOUNTED PUMP DETAIL

PIPING CONTRACTOR

FURNISH AND INSTALL

- TEMPERATURE SENSOR

- 1/4" COPPER TUBES

- HYDRONIC INDICATOR

W/TRUMPET VALVES

BUTTERFLY VALVE

FLEXIBLE CONNECTION

SUCTION DIFFUSER

- ADJUSTABLE PIPE

SUPPORT FOOT

FLOOR-

- BLOW DOWN PIPE AND GATE VALVE WITH THREADED HOSE CONN.

ALL PIPE WELLS

FOR THIS PROJECT.

MOUNT PIPE HANGER AT EACH PIPE DROP TO AVOID STRAIN

ON PUMP (TYPICAL)

WATER FLOW SWITCH-

FLEXIBLE CONNECTION -

PIPE INCREASER ---

NON-SHRINK GROUT

4" THICK CONCRETE PAD -

CONCRETE INERTIA BASE-

SPRING VIBRATION ISOLATORS

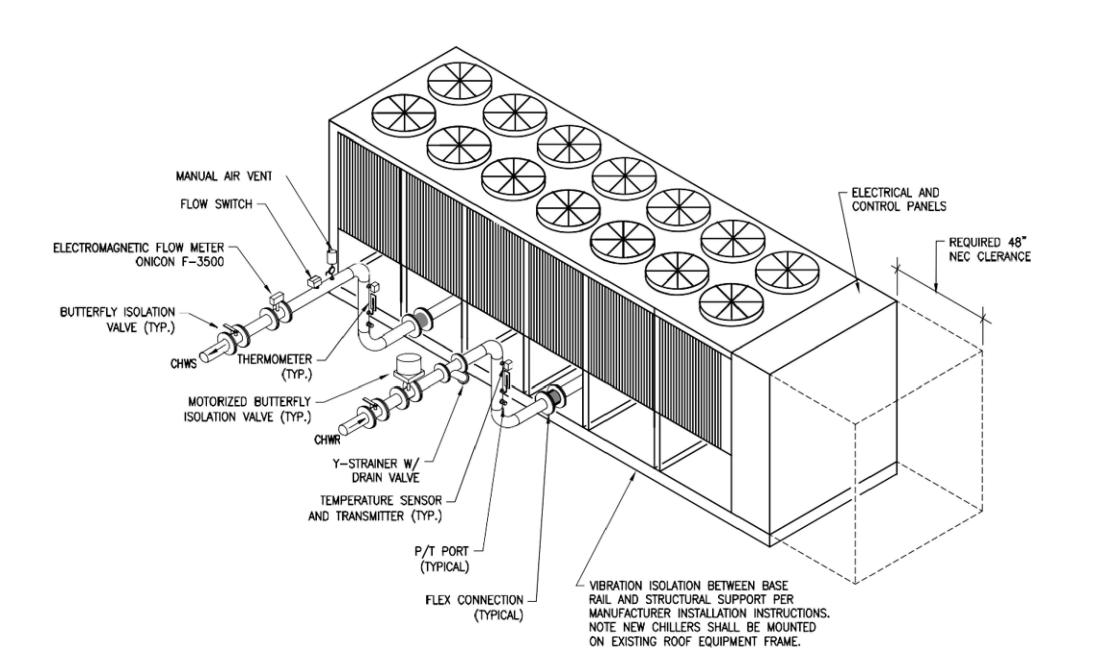
(CHWP (NLY)

(CHWP (NLY)

BASE MOUNTED PUMP -FILL PUMP BASE WITH-

TRIPLE DUTY VALVE

DISCHARGE







|      |            |         | AIR         | DEVICE       | - SCHE        | DULE               |              |            |           |       |
|------|------------|---------|-------------|--------------|---------------|--------------------|--------------|------------|-----------|-------|
| MARK | MODEL      | SIZE    | (O 100 FPM) | CFM<br>RANGE | INLET         | O.B.D.<br>REQ'D. ? | P.D. (*WG) * | MAX.<br>NC | REFERENCE | NOTES |
| A    | TRI-TEC-AL | 24"x48" | 5'          | 450-650      | 10 <b>"</b> ø | YES                | 0.15         | 35         | TITUS     | 1     |
| В    | TRI-TEC-AL | 24"x48" | 2'          | 651-750      | 12"¢          | YES                | 0.18         | 35         | TITUS     | 1     |
| ©    | PAS-AA     | 24"x24" | 5'          | 50-160       | 6 <b>"</b> ø  | YES                | 0.1          | 30         | TITUS     | 1 2   |
| 0    | PAS-AA     | 24"x24" | 6'          | 161-250      | 8**           | YES                | 0.1          | 30         | TITUS     | 1 2   |
| E    | PAS-AA     | 24"x24" | 6'          | 250-350      | 10 <b>"</b> ø | YES                | 0.1          | 30         | TITUS     | 1 2   |
|      |            |         |             |              |               |                    |              |            |           |       |
| RA   | 50F        | 10"x6"  |             | 0-270        |               | YES                | .07          | 30         | TITUS     | 1     |
| RB   | 50F        | 24"x6"  |             | 0-650        |               | YES                | .07          | 30         | TITUS     | 1     |
| RC   | 50F        | 16"x12" |             | 0-1,100      |               | YES                | .07          | 30         | TITUS     | ①     |
| RD   | 4FL        | 24"x12" |             | 0-725        |               | YES                | .08          | 31         | TITUS     | 1     |
| RE   | 4FL        | 24"x16" |             | 0-1,000      |               | YES                | .08          | 31         | TITUS     | 1     |
| RF   | PAR        | 24"x24" |             | 0-2,000      | 22*x22*       | YES                | .13          | 30         | TITUS     | 1     |

| CHEMICAL SHOT (POT) FEEDER |                  |                |  |  |  |  |
|----------------------------|------------------|----------------|--|--|--|--|
| YSTEM MAIN SIZE            | MODEL            | CAPACITY (GAL) |  |  |  |  |
| 4" AND SMALLER             | FB-2-SB-CS-Z-250 | 2-GALLONS      |  |  |  |  |

| SYSTEM MAIN SIZE | MODEL             | CAPACITY (GAL) |  |  |
|------------------|-------------------|----------------|--|--|
| 4" AND SMALLER   | FB-2-SB-CS-Z-250  | 2-GALLONS      |  |  |
| 5" THRU 10"      | FB-5-SB-CS-Z-250  | 5-GALLONS      |  |  |
| 12" AND LARGER   | FB-12-SB-CS-Z-250 | 12-GALLONS     |  |  |

NOTES: 1. Model numbers based upon Griswold Water Systems

- 2. All feeders to include FP-75 funnel package and VP-75 valve package
- 3. Contractor to provide legs with minimum 10" clearance above floor or a Griswold P-12 pedestal
- 4. Where plans indicate "SHOT FEEDER/FILTER," in addition to the feeder trim above, also provide a Griswold CFA Filter Assembly with CF-25-250 filter and one (1) package of twenty-five (25) filters [part #CF-2525-250] to owner

- PROVIDE WITH SURFACE MOUNT FRAME OR LAY-IN FRAME WHERE APPLICABLE (SEE ARCH. REFLECTED CEILING PLAN.)
- 4-WAY THROW UNLESS INDICATED OTHERWISE.

|      | FAN SCHEDULE           |                           |                     |        |                |          |          |        |               |        |                          |            |
|------|------------------------|---------------------------|---------------------|--------|----------------|----------|----------|--------|---------------|--------|--------------------------|------------|
| MARK | TYPE                   | MANUFACTURER<br>AND MODEL | SERVICE             | CFM    | S.P.<br>(" WG) | MAX. BHP | H,P,     | V/PH   | MAX.<br>SONES | DRIVE  | CONTROL                  | NOTES      |
| EF-1 | CENTRIFUGAL<br>ROOFTOP | COOK<br>120C2B            | OFFICE              | 390    | .375           | .07      | 1/6      | 120/16 | 8.0           | BELT   | INTERLOCK W/AHU-1        | 1          |
| EF-2 | UTILITY SET            | COOK<br>210CPA            | GENERAL<br>LAB      | 6,350  | 1.0            | 2.5      | 3        | 480/3¢ | -             | BELT   | THRU DDC                 | <b>② ④</b> |
| EF-3 | UTILITY SET            | COOK<br>120CPA            | ICP<br>HOOD         | 150    | 1.0            | .15      | 1/4      | 120/16 | -             | BELT   | TOGGLE SWITCH<br>AT HOOD | 234        |
| EF-4 | CENTRIFUGAL ROOFTOP    | COOK<br>90C11DM           | HYDROGEN<br>STORAGE | 300    | .125           |          | 91 WATTS | 120/16 | 5.0           | DIRECT | CONTINUOUS               | <b>6 7</b> |
| EF-5 | WALL-PROPELLER         | COOK<br>48SP7B            | PCB<br>BUILDING     | 18,600 | .125           | 1.2      | 1        | 480/3¢ | -             | BELT   | THERMOSTAT               | 5          |
| EF-6 | WALL-PROPELLER         | COOK<br>48SP7B            | PCB<br>BUILDING     | 18,600 | .125           | 1.2      | 1        | 480/3¢ | -             | BELT   | THERMOSTAT               | 5          |
| EF-7 | CENTRIFUGAL ROOFTOP    | COOK<br>90C100H           | CYLINDER<br>STORAGE | 300    | .125           |          | 91 WATTS | 120/16 | 5.0           | DIRECT | CONTINUOUS               |            |

- PROVIDE WITH MANUFACTURERS 8" ROOF CURB, BIRDSCREEN, BACKDRAFT DAMPER, AND INTEGRAL DISC SWITCH. (7) CURB TO BE MOUNTED ON STANDING SEAM METAL ROOF, SEE ARCH.
- PROVIDE WITH MANUFACTURER'S 8" ROOF CURB, BIRDSCREEN AND BACKDRAFT DAMPER. CURB TO BE MOUNTED ON STANDING SEAM METAL ROOF, SEE ARCHITECTURAL.

- SEE DETAIL 3/M502 FOR INSTALLATION
- AIR TEMPERATURE 400°F
- PROVIDE W/SCROLL DRAIN AND FLEXIBLE DUCT CONNECTION AT INLET
- PROVIDE W/MOTORIZED SHUTTER AND GALVANIZED STEEL PROTECTIVE CAGE WITH 1/2" MESH SCREEN
- FURNISH SPARK RESISTANT MOTOR AND DISCONNECT RATED FOR CLASS I DIVISION 2 HAZARDOUS LOCATION

| FLEX DUC    | T SCHED.   |
|-------------|------------|
| CFM RANGE   | SIZE ("ø") |
| < 50        | 5          |
| 51 - 100    | 6          |
| 101 - 200   | 8          |
| 201 - 350   | 10         |
| 351 - 600   | 12         |
| 601 - 900   | 14         |
| 901 - 1300  | 16         |
| 1301 — 1800 | 18         |
| 1801 - 2300 | 20         |

FLEX DUCT SHALL BE SIZED IN ACCOR-DANCE W/ FLEX DUCT SCHEDULE. PRO-VIDE RIGID REDUCER AT NECK OF AIR DEVICE, VAV INLET DUCT, ETC. TO TRAN-SITION FROM FLEX DUCT SIZE TO EQUIP-MENT CONNECTION SIZE.





PROJECT:

SHEET

PROJECT #

DRAWN BY: AJM

DATE: 9-17-2022

**SHEET** 14 OF 17

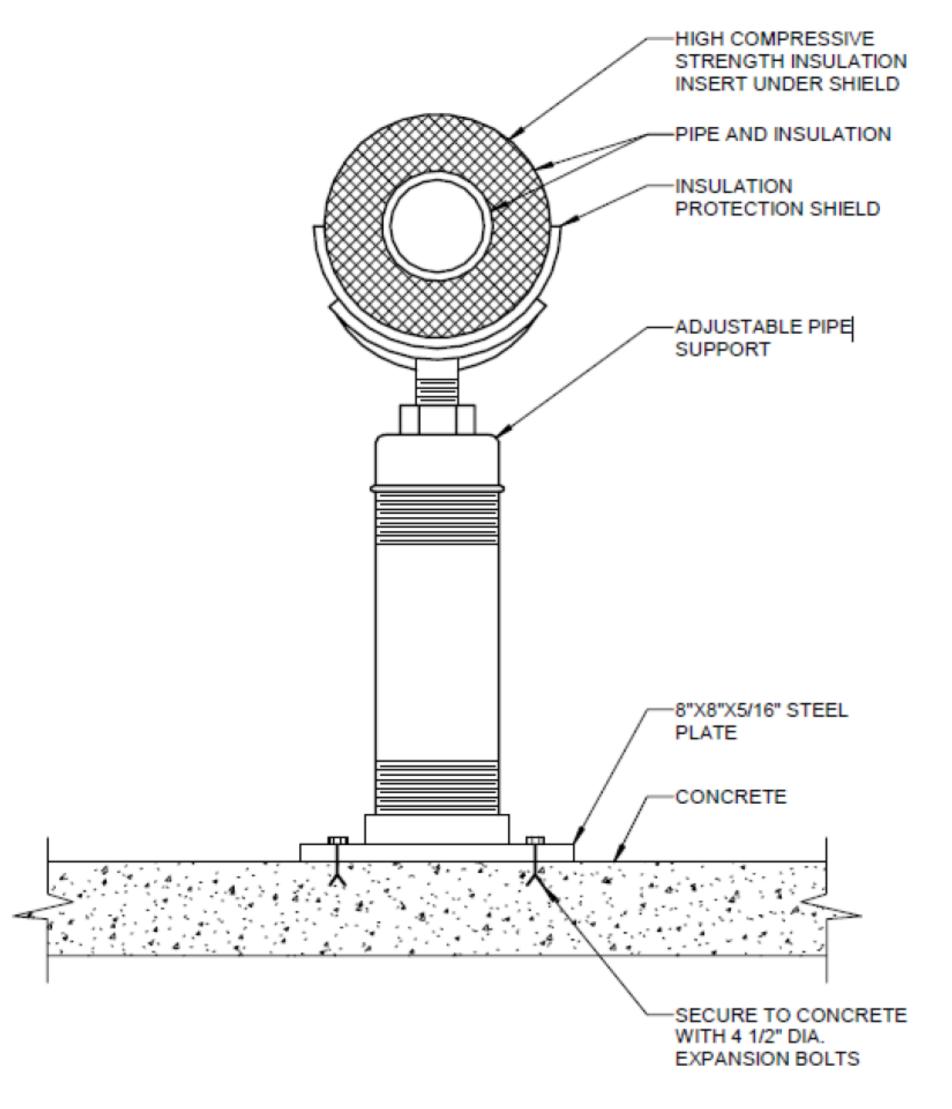
C-S01 EXTERIOR EQUIPMENT PAD

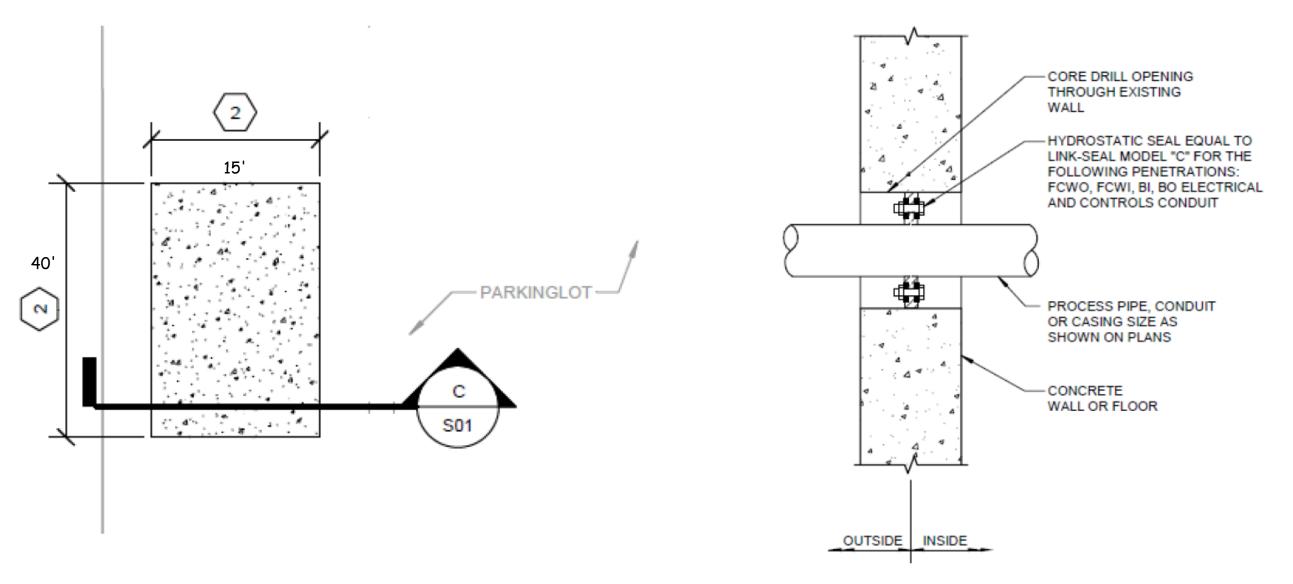
#### NOTES:

 4000PSI 28DAY CONCRETE COMPRESSIVE STRENGTH REQUIRED. CONCRETE SHALL CONFORM TO ASTM C-150. MAXIMUM AGGREGATE SHALL NOT EXCEED 1-1/2IN. REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60.

#### **NEW WORK KEYNOTES:**

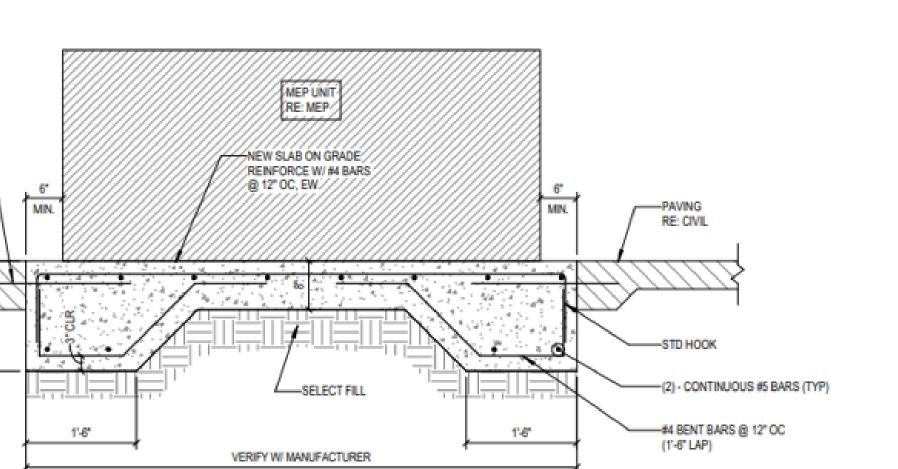
- 1. SEE C-M09 FOR THE PIPE PENETRATION DETAIL THROUGH THE EXISTING WALL. REBAR SHALL BE AVOIDED BY PENETRATIONS AND SHALL BE LOCATED BY SCAN PRIOR TO CORE-DRILLING. REPAIR AND SEAL WALL WATERPROOFING MEMBRANE AT PIPE PENETRATIONS.
- PER FINAL EQUIPMENT DIMENSIONS.





- 1. INSTALL HYDROSTATIC SEAL PER MANUFACTURER INSTRUCTIONS AND RECOMMENDATIONS INCLUDING FOR MINIMUM SPACING BETWEEN ADJACENT HYDROSTATIC SEALS.
- 2. COORDINATE WITH UT EHS ASBESTOS PROGRAM FOR CORING AND CUTTING THROUGH WALLS, FLOORS, WALKWAYS, CEILINGS, OR ROOFS PRIOR TO STARTING WORK.

#### DETAIL SCALE: 1 1/2" = 1'-0" C-M09 CONCRETE WALL PENETRATION WITH LINK SEAL



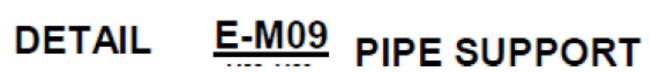
NOTE: SEE ARCHITECTURAL SITE PLAN FOR

PAD LOCATION AND OVERALL DIMENSIONS.

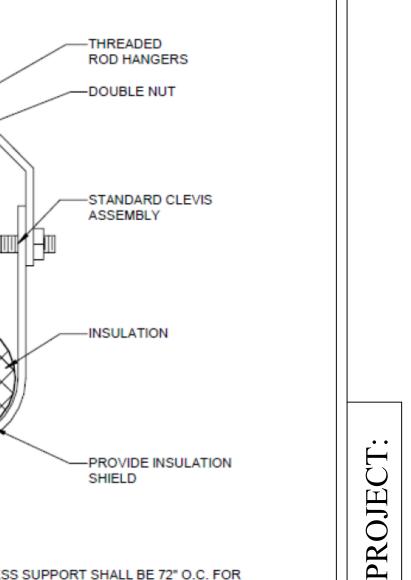
2-0" LONG #4 DOWELS @ 12" OC

DRILLED & EPOXIED W/ 6" EMBED-









NOTES:

- 1. FOR PIPING 2" DIA. AND LESS SUPPORT SHALL BE 72" O.C. FOR PIPING 2" DIA. AND LARGER SUPPORT SHALL BE 120" O.C.
- 2. DO NOT HANG PIPE DIRECTLY FROM TRUSSES. HANG FROM CHANNEL SPANNING 2 OR MORE TRUSSES (TYPICAL OF ALL PIPING, INCLUDING PIPING PERPENDICULAR AND PARALLEL TO TRUSSES.

DETAIL D-M09 PIPE HANGER

LABORATORY FACILITY REPLACEMENT PROJECT BPUB HVAC

SHEET

PROJECT #

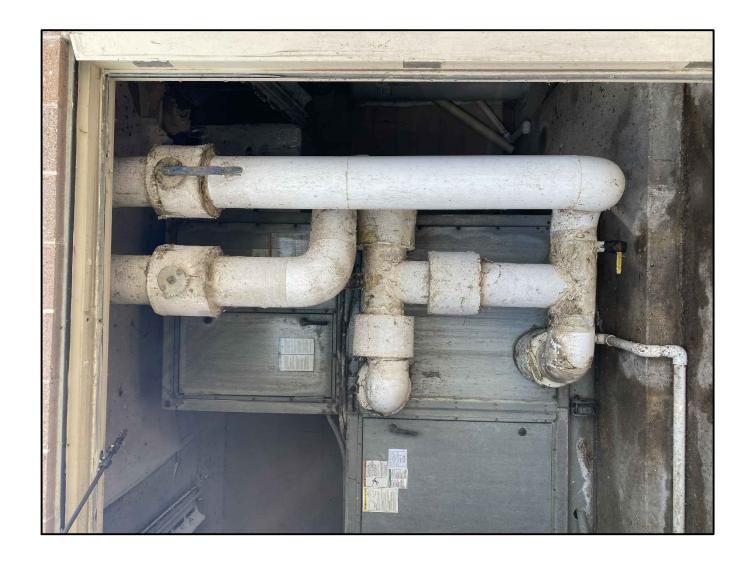
DRAWN BY: AJM

DATE: 9-17-2022

SHEET 15 OF 17

DATE: 9-17-2022

SHEET 16 OF 17







ACC-1 AND CHILLER PUMP P-1



ACC-1 AND ACC-2



ACC-1 AND ACC-2



CWS AND SWR PIPING



CWS AND SWR PIPING



ELECTRICAL, CWS AND CWR PIPING



AREA VIEW OF EXTERIOR CHILLER LAYOUTS



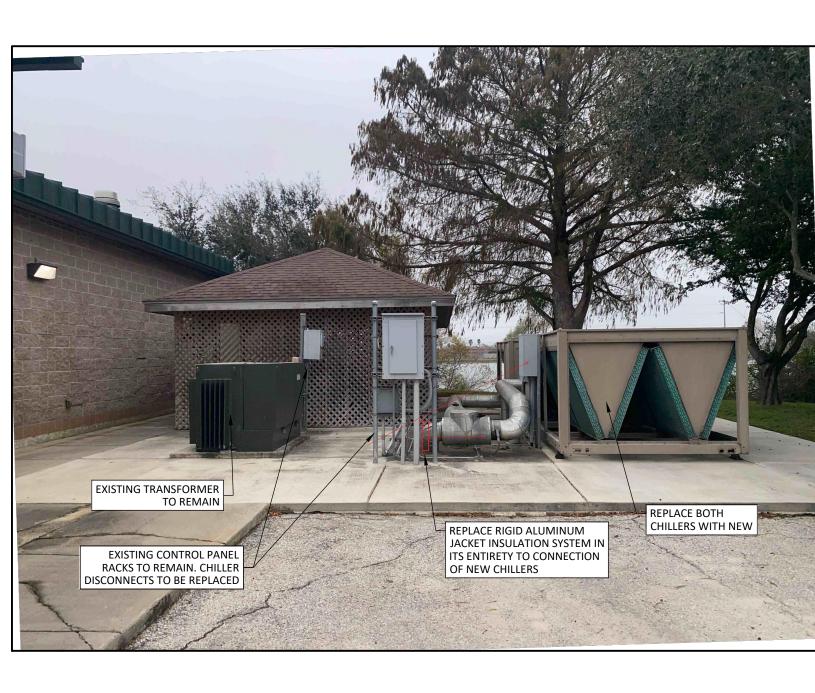
9/17/22



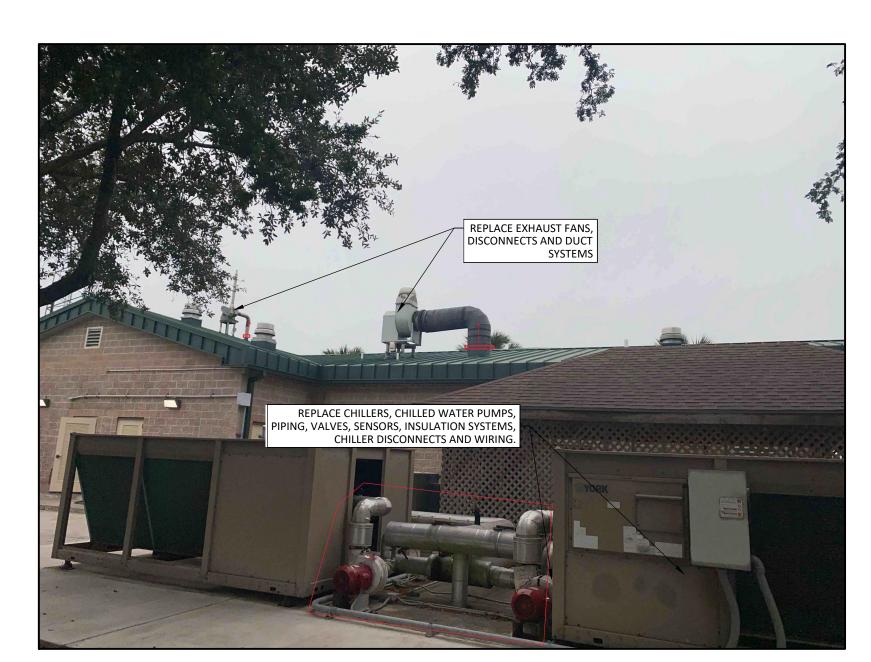
DRAWN BY: AJM

DATE:
9-17-2022

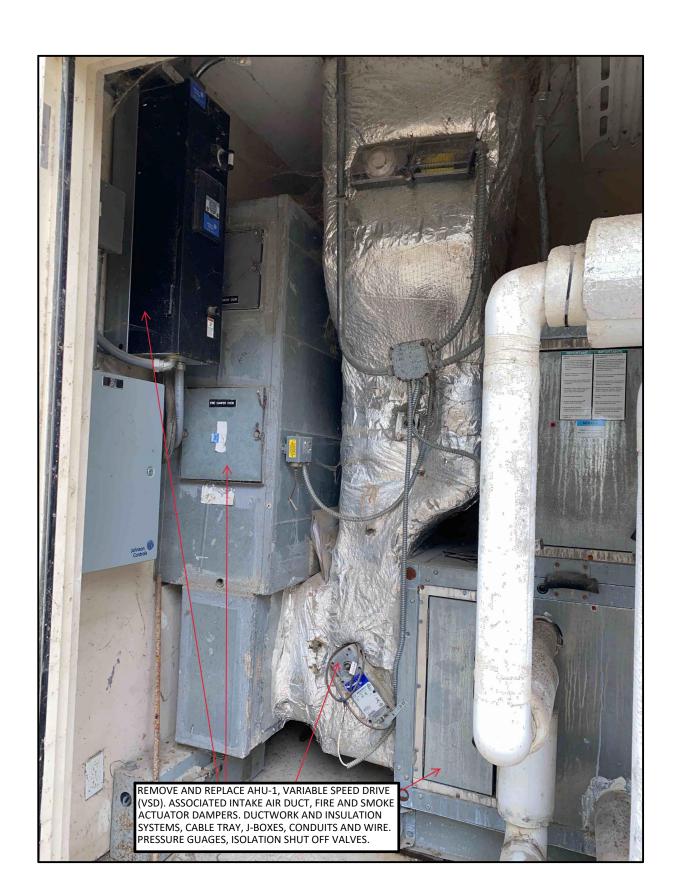
SHEET 17 OF 17



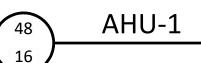
EXTERIOR CHILLERS



EXTERIOR CHILLERS AND ROOFTOP EXHAUST FANS



REMOVE AND REPLACE PRESSURE GAUGES, SHOT OFF VALVE AND INSULATION SYSTEMS





CHILLERS ACC-1 & ACC-2



50 AHU-2



9/17/22