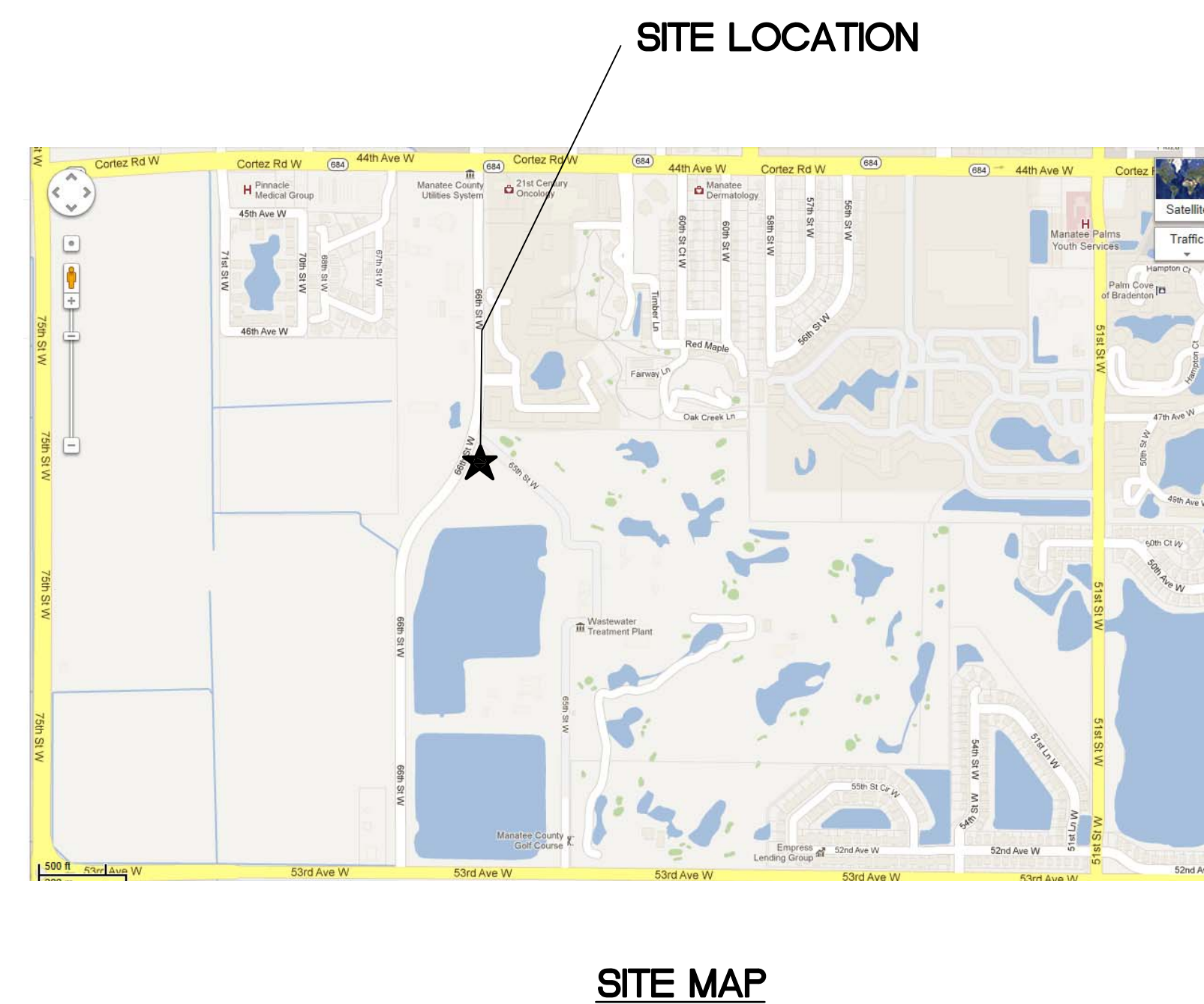
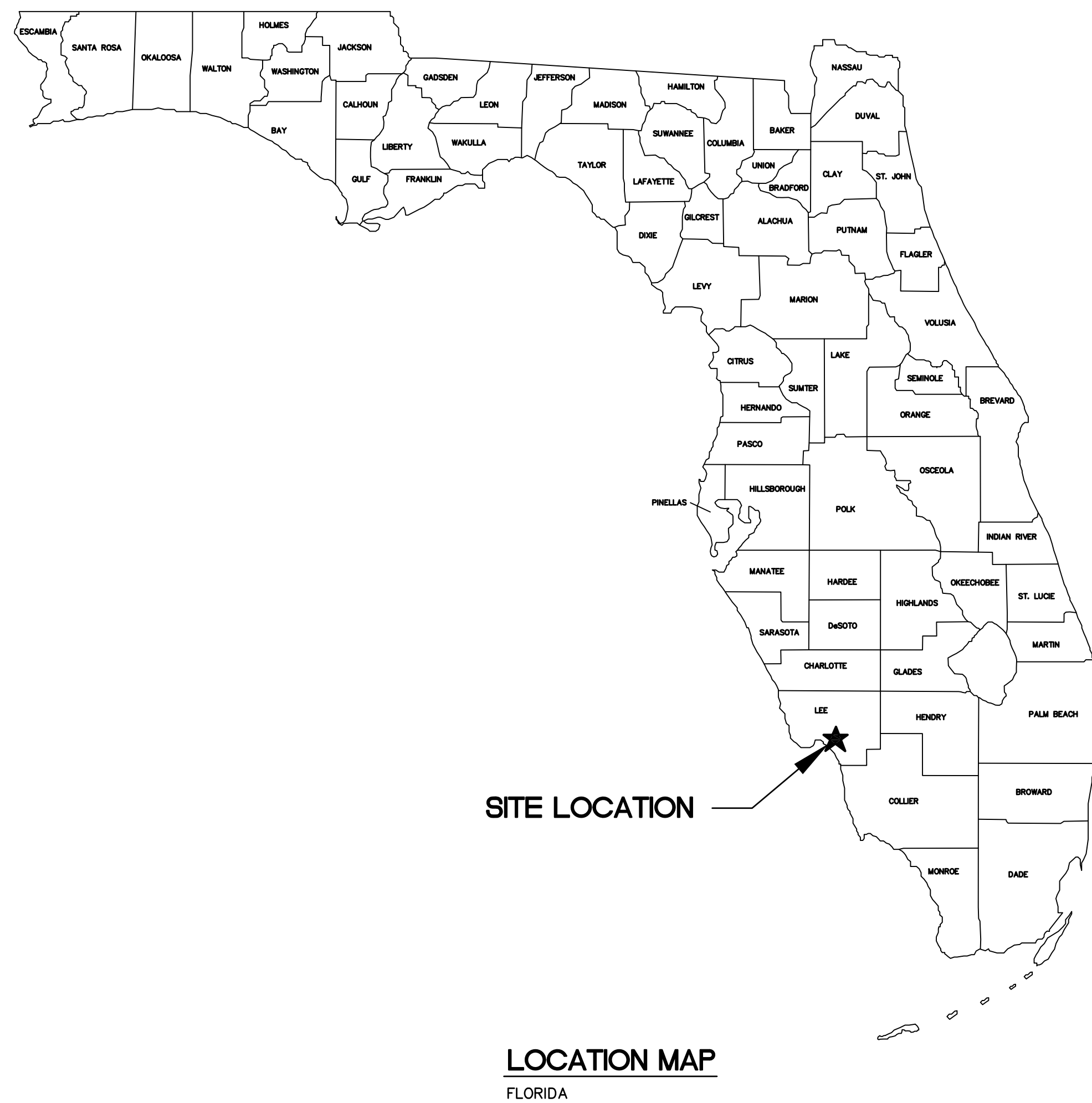


# MANATEE COUNTY WASTE WATER TREATMENT FACILITY LAB MEP UPGRADES 4751 66TH ST. W., BRADENTON, FLORIDA IFAS# W13000194



| SHEET SCHEDULE |  |
|----------------|--|
| SHEET          | DESCRIPTION  |
| COVER          | PROJECT NAME, LOCATION and SITE MAPS, SHEET SCHEDULE |
| E1.0-A         | ELECTRICAL SYMBOLS, LEGENDS AND GENERAL NOTES        |
| E2.0-A         | ELECTRICAL PLAN                                      |
| E5.0-A         | ELECTRICAL ONE-LINE RISER AND SCHEDULES              |
| E6.0-A         | ELECTRICAL GENERAL NOTES AND DETAILS                 |
| M1.0-A         | MECHANICAL SYMBOLS AND LEGENDS                       |
| M2.0-A         | MECHANICAL PLANS                                     |
| M3.0-A         | MECHANICAL SCHEDULES                                 |
| M4.0-A         | MECHANICAL DETAILS                                   |

To the best of the engineer's knowledge, said plans and specifications comply with the applicable building codes and the applicable minimum fire safety standards as determined in accordance with Chapters 553 and 633, Florida Statutes.

**ATP ENGINEERING SOUTH, PL.**  
BRADENTON, FLORIDA  
ENGR. BUSINESS #8908  
941-751-6485

SEAL

FLJ53468

# ELECTRICAL SYMBOLS AND ABBREVIATIONS

**NOTE:**

THESE ARE STANDARD SYMBOLS AND MAY NOT ALL APPEAR ON THE PROJECT DRAWINGS; HOWEVER WHEREVER THE SYMBOL APPEARS ON THE PROJECT DRAWINGS, THE ITEM SHALL BE PROVIDED AND INSTALLED.

| EQUIPMENT |  |
|-----------|--|
| SYMBOL    | DESCRIPTION  |
|           | DISTRIBUTION PANELBOARD AND CABINET - RECESSED MOUNT   |
|           | DISTRIBUTION PANELBOARD AND CABINET - SURFACE MOUNT  |
|           | BRANCH PANELBOARD AND CABINET - RECESSED MOUNT   |
|           | BRANCH PANELBOARD AND CABINET - SURFACE MOUNT  |
|           | LOAD CENTER - SURFACE MOUNT  |
|           | LOAD CENTER - RECESSED MOUNT   |
|           | DENOTES PANEL/PANELBOARD DESIGNATION   |
|           | MOTOR "X" INDICATES HORSEPOWER "Y" INDICATES PHASE   |
|           | CAPACITOR "X" INDICATES KVAR   |
|           | DISCONNECT SWITCH - FUSED "X" = RATING, "Y" = FUSE SIZE  |
|           | DISCONNECT SWITCH - NON-FUSED  |
|           | DISCONNECT SWITCH - CIRCUIT BREAKER  |
|           | MOTOR STARTER  |
|           | COMBINATION MOTOR STARTER  |
|           | DRY TYPE TRANSFORMER - "XX" INDICATES KVA  |
|           | METER SOCKET   |
|           | CURRENT TRANSFORMER METER SOCKET   |
|           | TRANSIENT VOLTAGE SURGE SUPPRESSOR   |
|           | GENERATOR  |
|           | TRANSFER SWITCH  |
|           | ATS = AUTOMATIC TRANSFER SWITCH  |
|           | MTS = MANUAL TRANSFER SWITCH   |
|           | N = NORMAL POWER   |
|           | E = EMERGENCY POWER  |
|           | L = LOAD   |
|           | WIREWAY  |
|           | BUSWAY   |
|           | GROUND CONNECTION  |
|           | HORSEPOWER RATED MANUAL MOTOR STARTER TOGGLE SWITCH WITH THERMAL OVERLOAD PROTECTION "X" INDICATES AS FOLLOWS<br>NONE - SINGLE POLE<br>2 - 2 POLE<br>3 - 3 POLE  |
|           | HORSEPOWER RATED MANUAL MOTOR STARTER TOGGLE SWITCH WITH THERMAL OVERLOAD PROTECTION WITH PILOT LIGHT<br>"X" INDICATES AS FOLLOWS "Y" INDICATES AS FOLLOWS<br>NONE - SINGLE POLE Y - YELLOW LENS<br>2 - 2 POLE G - GREEN LENS<br>3 - 3 POLE R - RED LENS<br>W - WHITE LENS<br>B - BLUE LENS<br>A - AMBER |
|           | LOW VOLTAGE DRAWOUT TYPE CIRCUIT BREAKER<br>"X" INDICATES AS FOLLOWS<br>A - AIR TYPE<br>S - SF6 TYPE<br>V - VACUUM TYPE  |
|           | MOLDED CASE CIRCUIT BREAKER  |
|           | FUSE   |
|           | DRAW OUT MOTOR STARTER ASSEMBLY  |

| DEVICES |   |
|---------|---|
| SYMBOL  | DESCRIPTION   |
|         | DUPLEX RECEPTACLE - NORMAL CIRCUIT "X" INDICATES AS FOLLOWS:<br>NONE = 20 AMP, 125VAC<br>GFI = 20 AMP, 125VAC, GROUND FAULT INTERRUPTER TYPE<br>HM = 20 AMP, 125VAC, HORIZONTAL MOUNT TYPE<br>IG = 20 AMP, 125VAC, ISOLATED GROUND TYPE<br>S = 20 AMP, 125VAC, TVSS PROTECTION TYPE<br>WP = 20 AMP, 125VAC, WEATHERPROOF TYPE |
|         | DOUBLE DUPLEX RECEPTACLE  |
|         | DUPLEX RECEPTACLE - ABOVE COUNTER. 44" AFF  |
|         | DOUBLE DUPLEX RECEPTACLE - ABOVE COUNTER. 44" AFF   |
|         | SINGLE RECEPTACLE - SEE DRAWINGS AND SPECIFICATIONS.  |
|         | SPECIAL RECEPTACLE - SEE DRAWINGS AND SPECIFICATIONS.   |
|         | SINGLE RECEPTACLE - FLOOR, SEE DRAWINGS AND SPECIFICATIONS.   |
|         | DUPLEX RECEPTACLE - FLOOR, SEE DRAWINGS AND SPECIFICATIONS.   |
|         | CLOCK RECEPTACLE - 120VAC   |
|         | TOGGLE SWITCH - SINGLE POLE   |
|         | TOGGLE SWITCH - DOUBLE POLE   |
|         | TOGGLE SWITCH - 3-WAY   |
|         | TOGGLE SWITCH - 4-WAY   |
|         | TOGGLE SWITCH - α - INDICATES TYPE T: TIMER, K: KEY OPERATED  |
|         | SWITCH - DIMMER   |
|         | SWITCH - FAN SPEED CONTROL  |
|         | WALL MOUNTED OCCUPANCY SENSOR   |
|         | CEILING MOUNTED OCCUPANCY SENSOR<br>x = TYPE, SEE PLANS   |
|         | JUNCTION BOX  |
|         | HVAC THERMOSTAT   |
|         | HVAC HUMIDISTAT   |
|         | FURNITURE POWER POLE  |
|         | FURNITURE CABLE MANAGEMENT POLE.  |
|         | MUSHROOM HEAD RED PUSH BUTTON   |

| DRAWING SYMBOLS |                             |
|-----------------|-----------------------------|
|                 | DETAIL NUMBER               |
|                 | DRAWING NUMBER WHERE DRAWN  |
|                 | SECTION LETTER              |
|                 | DRAWING NUMBER WHERE DRAWN  |
|                 | REFER TO LIKE NUMBER NOTES. |
|                 | REFER TO LIKE NUMBER NOTES. |

| RACEWAY SYSTEM |   |
|----------------|---|
| SYMBOL         | DESCRIPTION   |
|                | CONCEALED CONDUIT   |
|                | 4" CONDUIT SLEEVE WITH BUSHINGS THRU WALL ABOVE CEILING             |
|                | LETTER DESIGNATION REFERS TO SYSTEM (SEE ABBREVIATIONS)             |
|                | PHASE CONDUCTORS QUANTITY OF CONDUCTORS OR CABLES IN CONDUIT        |
|                | "F50" DENOTES THE FEEDER SIZE<br>"A-XX" DENOTES PANEL AND CIRCUIT # |
|                | CONDUIT TURNED UP   |
|                | CONDUIT TURNED DOWN   |
|                | JUNCTION OR PULL BOX  |
|                | CABLE TRAY  |
|                | U/G CONDUIT TURNED UP   |
|                | U/G CONDUIT TURNED DOWN   |

| ABBREVIATIONS |   |
|---------------|---|
| A             | AMPERE  |
| AC            | AIR CONDITIONING OR ALTERNATING CURRENT       |
| ACC           | ACCESS  |
| AF            | AMPERE FRAME                                  |
| AFF           | ABOVE FINISHED FLOOR                          |
| AFG           | ABOVE FINISHED GRADE                          |
| AHJ           | AUTHORITY HAVING JURISDICTION                 |
| AHU           | AIR HANDLER UNIT                              |
| AM            | AMMETER                                       |
| ARCH          | ARCHITECT                                     |
| AT            | AMPERE TRIP                                   |
| ATC           | AUTOMATIC TEMPERATURE CONTROL                 |
| ATS           | AUTOMATIC TRANSFER SWITCH                     |
| AWG           | AMERICAN WIRE GAUGE                           |
| C             | CONDUIT                                       |
| CAT           | CATEGORY                                      |
| CB            | CIRCUIT BREAKER                               |
| CH            | CHILLER                                       |
| CKT           | CIRCUIT                                       |
| CL            | CENTER LINE                                   |
| CLF           | CURRENT-LIMITING FUSE                         |
| CM            | CEILING MOUNTED                               |
| CNTL          | CONTROL                                       |
| CU            | COPPER  |
| DWG(S)        | DRAWING(S)                                    |
| EC            | ELECTRICAL CONTRACTOR                         |
| EF            | EXHAUST FAN                                   |
| EM            | EMERGENCY                                     |
| EMS           | ENERGY MANAGEMENT SYSTEM                      |
| EMT           | ELECTRICAL METALLIC TUBING                    |
| EPO           | EMERGENCY POWER OFF                           |
| EW            | ELECTRIC WATER COOLER                         |
| EWH           | ELECTRIC WATER HEATER                         |
| EX            | EXISTING TO REMAIN                            |
| FA            | FIRE ALARM                                    |
| FACP          | FIRE ALARM CONTROL PANEL                      |
| FACC          | FIRE ALARM COMMAND CENTER                     |
| FATC          | FIRE ALARM TERMINAL CABINET                   |
| FLR           | FLOOR   |
| FMC           | FURNISHED BY MECHANICAL CONTRACTOR            |
| FO            | FIBER OPTIC                                   |
| FOTC          | FIBER OPTIC TERMINAL CABINET                  |
| FSS           | FIRE SUPPRESSION SYSTEM                       |
| FWE           | FURNISHED WITH EQUIPMENT                      |
| GFI           | GROUND FAULT INTERRUPTER                      |
| GND,G         | GROUND  |
| GRS           | GALVANIZED RIGID STEEL CONDUIT                |
| HOA           | HAND-OFF-AUTO                                 |
| HACR          | HEATING/AIR CONDITIONING-RATED                |
| HID           | HIGH INTENSITY DISCHARGE                      |
| HPF           | HIGH POWER FACTOR                             |
| HPS           | HIGH PRESSURE SODIUM                          |
| HZ            | HERTZ   |
| HP            | HORSEPOWER                                    |
| IG            | ISOLATED GROUND                               |
| IMC           | INTERMEDIATE METALLIC CONDUIT                 |
| JB            | JUNCTION BOX                                  |
| KAIC          | KILO AMPERE INTERRUPTING CAPACITY             |
| KCMIL         | THOUSAND CIRCULAR MILS                        |
| KVA           | KILOVOLT AMPERE                               |
| KW            | KILOWATT                                      |
| LC            | LIGHTING CONTACTOR                            |
| MC            | MECHANICAL CONTRACTOR                         |
| MCC           | MOTOR CONTROL CENTER                          |
| M-G           | MOTOR GENERATOR                               |
| MDP           | MAIN DISTRIBUTION PANEL                       |
| MH            | METAL HALIDE                                  |
| MOD           | MOTOR OPERATED DAMPER OR DOOR                 |
| MTD           | MOUNTED                                       |
| NC            | NORMALLY CLOSED                               |
| NEC           | NATIONAL ELECTRICAL CODE                      |
| NEMA          | NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION |
| NF            | NON-FUSED                                     |
| NFPA          | NATIONAL FIRE PROTECTION ASSOCIATION          |
| NIC           | NOT IN CONTRACT                               |
| NL            | NIGHT LIGHT                                   |
| NO            | NORMALLY OPEN                                 |
| NTS           | NOT TO SCALE                                  |
| OCPD          | OVER CURRENT PROTECTIVE DEVICE                |
| PNL           | PANEL   |
| φ             | PHASE   |
| PB            | PUSHBUTTON                                    |
| PE            | PHOTOELECTRIC CONTROLLER                      |
| PC            | PLUMBING CONTRACTOR                           |
| PVC           | POLYVINYL CHLORIDE CONDUIT                    |
| R             | RELOCATED                                     |
| RTU           | ROOF TOP UNIT                                 |
| SCH           | SCHEDULE                                      |
| SEC           | SECURITY                                      |
| SW            | SWITCH  |
| SWGR          | SWITCHGEAR                                    |
| TEL,T         | TELEPHONE                                     |
| TBB           | TELEPHONE BACKBOARD                           |
| TVSS          | TRANSIENT VOLTAGE SURGE SUPPRESSOR            |
| TC            | TIME CLOCK                                    |
| XFMR          | TRANSFORMER                                   |
| XFR           | TRANSFER                                      |
| TYP           | TYPICAL                                       |
| UG            | UNDERGROUND                                   |
| UH            | UNIT HEATER                                   |
| UL,U.L.       | UNDERWRITERS LABORATORIES                     |
| UPS           | UNINTERRUPTIBLE POWER SUPPLY                  |
| U.O.N.        | UNLESS OTHERWISE NOTED                        |
| VT            | VAPORLIGHT                                    |
| VAV           | VARIABLE AIR VOLUME                           |
| VFD           | VARIABLE FREQUENCY DRIVE                      |
| VSD           | VARIABLE SPEED DRIVE                          |
| V             | VOLT  |
| VM            | VOLTMETER                                     |
| W             | WATT  |
| WHM           | WATT-HOUR METER                               |
| WM            | WATTMETER                                     |
| WP            | WEATHER PROOF                                 |

## GENERAL NOTES (APPLY TO ALL DRAWINGS):

- THE WORK INDICATED ON THESE DRAWINGS IS DIAGRAMMATIC AND IS INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT AND DEVICES FOR A COMPLETE SYSTEM IN EVERY RESPECT AND DETAIL, TESTED AND LEFT READY IN PERFECT OPERATING CONDITION FOR THE OWNER'S USE. MATERIALS AND EQUIPMENT SHALL BE LISTED BY UNDERWRITERS' LABORATORIES AND SHALL BE INSTALLED IN ACCORDANCE WITH SUCH LISTINGS. INSTALLATIONS SHALL BE MADE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. WORK SHALL MEET THE REQUIREMENTS OF THE SPECIFICATIONS AND CONFORM TO THE NEC (NFPA 70 & 72) AND ALL APPLICABLE CODES, AND BE COMPLETED BY A QUALIFIED, EXPERIENCED, LICENSED ELECTRICAL CONTRACTOR.
- THE ENGINEER HAS MADE AN EFFORT TO COORDINATE WORK WITH OTHER TRADES AND IDENTIFY ANY AND ALL CONFLICTS. THE CONTRACTOR IS RESPONSIBLE TO COORDINATE FIELD WORK BETWEEN TRADES AND TO IDENTIFY FIELD CONDITIONS PRIOR TO INSTALLATION AND REPORT ANY CONFLICTS TO THE ENGINEER.
- WHEN A CONFLICT OCCURS BETWEEN THE SPECIFICATIONS AND DRAWINGS, THE ITEMS OF GREATER QUANTITY AND/OR COST SHALL BE PROVIDED.
- CONTRACTOR SHALL VERIFY THE LOCATION AND ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT FURNISHED BY OTHER TRADES PRIOR TO INSTALLATION. COORDINATE ROUGH-IN INSTALLATION WITH EQUIPMENT DETAILS.
- ALL OPENINGS IN FIRE AND SMOKE PARTITIONS SHALL BE SEALED AS REQUIRED BY THE NEC/ FLORIDA BUILDING CODE. PROVIDE UL LISTED COMPOUND TO MATCH PARTITION RATING.
- DO NOT SCALE DRAWINGS. VERIFY FIELD CONDITIONS PRIOR TO AND DURING CONSTRUCTION FOR EXACT DEVICE / EQUIPMENT LOCATION.
- DEMOLITION WORK: PROVIDE DEMOLITION AND REMOVAL WORK AS INDICATED OR NEEDED. EQUIPMENT THAT IS TO BE REMOVED INCLUDES ALL ASSOCIATED WIRING, BOXES AND CONDUIT BACK TO SOURCE. CLOSE ALL UNUSED OPENINGS IN JUNCTION BOXES THAT REMAIN WITH SUITABLE PLUG OR COVER. WHEN REMOVING OR RELOCATING LIGHT FIXTURES OR OTHER DEVICES, FIELD VERIFY REMAINING DEVICES IN THE SAME CIRCUIT AND RECONNECT FOR CONTINUED SERVICE. EXISTING ELECTRICAL WORK INTERFERING WITH NEW CONSTRUCTION SHALL BE RELOCATED OR REROUTED TO SUIT FINAL INSTALLATION. CUTTING AND PATCHING REQUIRED SHALL BE DONE TO RESTORE AREAS TO ORIGINAL CONDITION.
- CONTRACTOR SHALL PROVIDE TO LOCAL AHJ OR PERMITTING AGENCY A COPY OF ALL MAJOR EQUIPMENT CUT SHEETS AT TIME OF APPLICATION IF REQUESTED.

THESE DOCUMENTS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY OTHERS. THE CONSULTANT HAS NOT VERIFIED THE ACCURACY AND/OR COMPLETENESS OF THIS INFORMATION AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS THAT MAY BE INCORPORATED AS A RESULT OF ERRONEOUS INFORMATION PROVIDED BY OTHERS. NOTIFY THIS ENGINEER IMMEDIATELY OF ANY DISCREPANCIES FOUND.

SCALE
FL#63458

**ATEP ENGINEERING SOUTH, FL**  
BRADENTON, FLORIDA  
ENGR. BUSINESS #8908  
941-751-6485

| REV # | DESCRIPTION | DATE |
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**MANATEE WASTE WATER TREATMENT FACILITY**

**LAB MEP UPGRADES**

**4751 66TH ST. W., BRADENTON, FL 34210**

**IFAS# W1300194**

**ELECTRICAL LEGEND, SYMBOLS AND GENERAL NOTES**

FILE: 66th St Lab Gen & Chiller

JOB NO.: 2013.40

DATE: 5/20/2013

PLOT SIZE: 1:1

DRAWN BY: CMD/MC

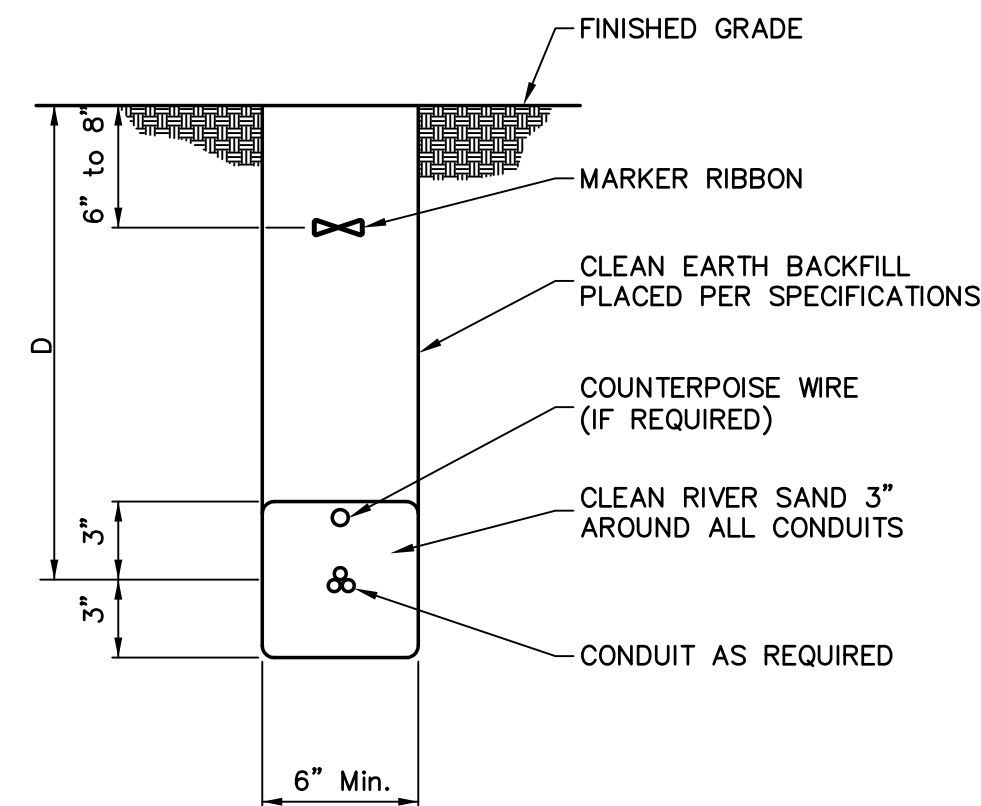
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E1.0-A







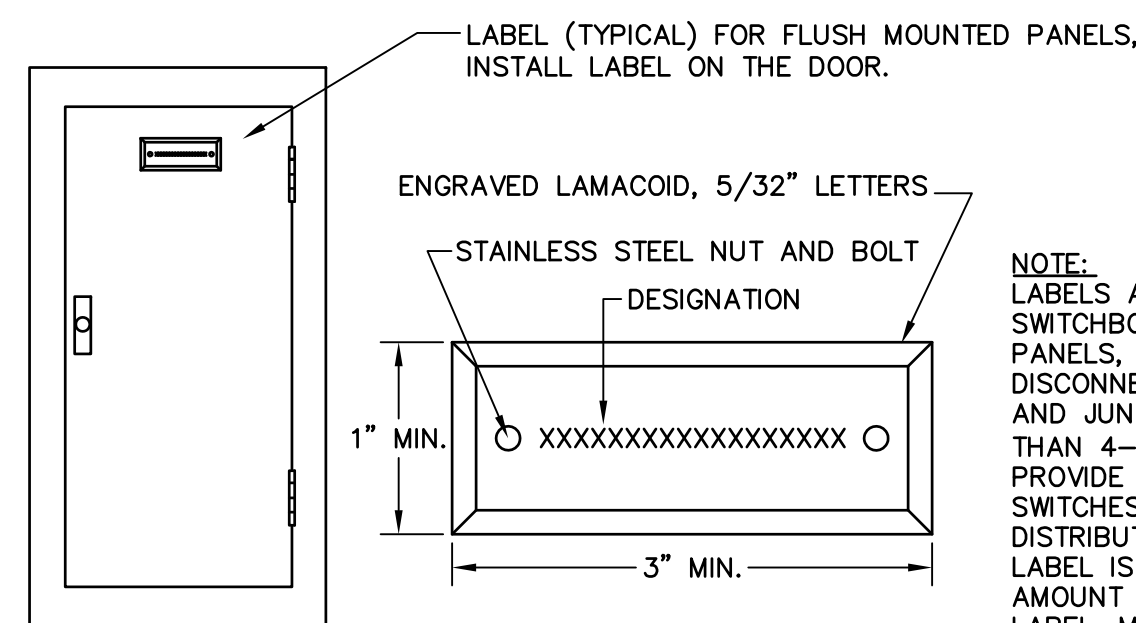
| BURIAL DEPTH         |       |
|----------------------|-------|
| SERVICE              | "D"   |
| CCTV cable           | 1'-6" |
| Telephone            | 2'-0" |
| Power under 600V     | 3'-0" |
| Medium voltage power | 3'-0" |

**NOTE:**

USE BURIAL DEPTHS SHOWN ON TABLE UNLESS NOTED OTHERWISE IN SPECIFICATIONS OR ON DRAWINGS. BURIAL DEPTHS FOR UTILITY COMPANY CABLES SHALL BE AS DIRECTED BY THE UTILITY COMPANY.

**2** CONDUIT BURIAL DETAIL  
E6.0-A

NOT TO SCALE



**NOTE:** LABELS ARE REQUIRED ON ALL SWITCHBOARDS, DISTRIBUTION PANELS, PANEL BOARDS, STARTERS, DISCONNECT SWITCHES, RELAYS, AND JUNCTION BOXES GREATER THAN 4-11/16" SQUARE. ALSO PROVIDE LABELS ON BRANCH SWITCHES OF SWITCHBOARDS AND DISTRIBUTION PANELS. SIZE OF THE LABEL IS DEPENDENT UPON THE AMOUNT OF INFORMATION ON THE LABEL. MINIMUM DIMENSIONS ARE SHOWN.

**STANDARD COLORS:**

- NORMAL POWER- BLACK BACKGROUND, WHITE LETTERS
- EMERGENCY POWER- RED BACKGROUND, WHITE LETTERING
- IN ADDITION TO THE FUNCTION LABELS, PROVIDE LABELS IDENTIFYING ALL "MAIN SERVICE LABEL DISCONNECTS"- RED BACKGROUND, WHITE LETTERING

**1** EQUIPMENT LABELING DETAIL  
E6.0-A

NOT TO SCALE

**GENERAL NOTES -1 :**

(APPLY TO ALL ELECTRICAL SHEETS, REFER TO BOOK SPECIFICATIONS)

- PROVIDE AND INSTALL NEW GREEN INSULATED COPPER GROUNDING CONDUCTORS AS THE EQUIPMENT GROUNDING MEANS FOR ALL ELECTRICAL DEVICES AND EQUIPMENT.
- ALL PANELBOARDS AND SWITCHBOARDS SHALL HAVE COPPER BUS, COPPER GROUND BAR AND COPPER NEUTRAL, AND RATINGS AS SPECIFIED. REFERENCE STANDARDS SHALL BE GENERAL ELECTRIC "A" SERIES "PRO-STOCK" BRANCH PANELS WITH BOLT IN TYPE CIRCUIT BREAKERS.
- PROVIDE LABELING FOR ALL PANELBOARDS, SWITCHBOARDS, AND DISCONNECT SWITCHES TO INCLUDE AN ENGRAVED PLASTIC LABEL IDENTIFYING THE EQUIPMENT AND WHERE IT IS FED FROM.
  - ALL BRANCH DEVICES IN THE MAIN SWITCHBOARD SHALL HAVE AN ENGRAVED PLASTIC LABEL.
  - ALL PANELBOARDS SHALL INCLUDE A TYPEWRITTEN DIRECTORY. ALL RECEPTACLES SHALL HAVE CIRCUIT NUMBERS WRITTEN ON THE INSIDE OF THE COVERPLATE.
  - ALL JUNCTION BOX COVERS SHALL BE IDENTIFIED TO INDICATE CIRCUITS CONTAINED. WHERE MULTIPLE SWITCHES ARE GANGED TOGETHER THE SWITCHES SHALL BE IDENTIFIED.
  - PROVIDE (1) 3/4" SPARE CONDUIT FOR EACH 3 SPACES OR SPARES IN EACH FLUSH MOUNTED PANEL FROM PANEL TO ABOVE ACCESSIBLE CEILING FOR FUTURE USE.
- ALL CONDUIT INSIDE THE BUILDING SHALL BE A ELECTRICAL METALLIC TUBING (EMT) AND SHALL BE A MINIMUM 1/2" UNLESS OTHERWISE NOTED. ALL CONDUIT INSTALLED UNDERGROUND SHALL BE SCHEDULE 40 PVC UNLESS OTHERWISE NOTED. ALL CONDUIT INSTALLED ABOVE GRADE OUTSIDE THE BUILDING SHALL BE GALVANIZED RIGID STEEL. NO PVC CONDUIT SHALL BE USED ABOVE THE FLOOR SLAB.
- ALL ELECTRICAL CONNECTORS, LUGS, BREAKERS, EQUIPMENT, ETC. SHALL BE RATED AT A MINIMUM OF 75 DEG. C.
- WIRING METHODS:
 

ALL WIRING SHALL BE COPPER. NO ALUMINUM WIRING WILL BE ALLOWED.  
MC TYPE CABLE SHALL NOT BE USED.
- SWITCHES SHALL BE 20 AMPERE RATED, 120/277 VOLT, LEVITON 1221-21 SERIES OR APPROVED EQUIVALENT, UNLESS OTHERWISE NOTED.
  - SWITCHES CONTROLLING LIGHTING SHALL HAVE NEUTRAL CONDUCTOR.
- RECEPTACLES SHALL BE 20A, 120V GROUNDING TYPE LIKE LEVITON T5B20 SERIES, UNLESS OTHERWISE NOTED.
  - WHITE IN COLOR
  - PROVIDE GROUND FAULT CIRCUIT-INTERRUPTER (GFI) TYPE RECEPTACLE IF SHOWN OR AS REQUIRED BY NEC.
- ALL COVERPLATES FOR INTERIOR WIRING DEVICES SHALL BE WHITE NYLON TYPE. DEVICES SHALL BE WHITE IN COLOR.
- ALL EXTERIOR RECEPTACLES SHALL BE GFCI (GFI) TYPE AND HAVE IN-USE TYPE WEATHERPROOF COVERPLATES.

**GENERAL NOTES -2 :**

(APPLY TO ALL ELECTRICAL SHEETS)

- PROVIDE COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM.
- ALL WORK SHALL CONFORM TO OR EXCEED THE MINIMUM REQUIREMENTS OF THE CURRENT ANS/NFPA 70 WITH STATE OF FLORIDA AMENDMENTS, ANS/IEEE C2 AND ALL FEDERAL, STATE, LOCAL, AND MUNICIPAL CODES AND ORDINANCES. THE ELECTRICAL SUBCONTRACTOR SHALL COMPLY WITH THE DIRECTIONS OF ALL AUTHORITIES HAVING JURISDICTION.
- INSTALL WORK USING PROCEDURES DEFINED IN NECA STANDARDS OF INSTALLATION. ALL WORK SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED.
- REFER TO THE ARCHITECTURAL DRAWINGS FOR CEILING AND MILLWORK WORK BY THE SEPARATE GENERAL CONTRACT. COORDINATE ALL ELECTRICAL WORK.
- THE ELECTRICAL SUBCONTRACTOR SHALL PROVIDE ALL FLOOR, WALL, AND CEILING PENETRATIONS TO COMPLETE HIS WORK. PROVIDE PROPER FIRE SAFING FOR ALL PENETRATIONS MADE.
- COORDINATE ALL ELECTRICAL WORK WITH ALL OTHER TRADES TO ENSURE EFFECTIVE AND EFFICIENT OVERALL INSTALLATION.
- COORDINATE ALL ELECTRICAL SYSTEM DOWNTIME WITH THE OWNER, PERFORMANCE SERVICES, AND OTHER TRADES. DOWNTIME OF THE SYSTEM SHALL BE MINIMIZED. WEEKEND AND AFTER HOUR WORK SHALL BE REQUIRED TO PREVENT OR MINIMIZE INTERFERENCE WITH THE OWNER'S OPERATION.
- THE LOCATIONS OF RECEPTACLES, PHONE/DATA JACKS, AND ROOM EQUIPMENT SHOWN ON THESE DRAWINGS ARE APPROXIMATE. FINAL LOCATIONS WILL BE DETERMINED DURING THE CONSTRUCTION PHASE- COORDINATE AND REFER TO ARCHITECTURAL DRAWINGS.
- ALL NEW EQUIPMENT SHALL BE SUBMITTED FOR APPROVAL PRIOR TO ORDERING. PROVIDE COPIES OF ALL LIGHTING EQUIPMENT AND CONTROLS DATA SHEETS FOR THE LEED CONSULTANT AND COMMISSIONING CONSULTANT. ALL LIGHTING SYSTEMS SHALL MEET OR EXCEED ASHRAE 90.1 IN ENERGY USAGE PER SQUARE FOOT.
- PHYSICAL SIZES AND LOCATIONS OF ALL MECHANICAL EQUIPMENT SHOWN ON THESE DRAWINGS ARE APPROXIMATE. COORDINATE ELECTRICAL WORK FOR THIS EQUIPMENT WITH THE OTHER TRADES.
- PROVIDE APPROPRIATE SEALANT (I.E. FIRESAFING) TO MAINTAIN CONSTRUCTION INTEGRITY FOR ANY PENETRATIONS THROUGH FLOORS, STRUCTURAL CEILINGS, AND FIRE WALLS.
- ALL BRANCH CIRCUITS SHALL UTILIZE SEPARATE INDEPENDENT NEUTRAL CONDUCTOR, AND INSULATED GROUNDING CONDUCTOR. DO NOT COMBINE NEUTRAL CONDUCTORS.
- ALL FEEDER NEUTRAL/GROUNDED CONDUCTORS SHALL BE CONSIDERED CURRENT CARRYING. DERATE MULTIPLE CONDUCTORS IN A RACEWAY ACCORDINGLY WITH NEC TABLES.
- INSTALL ALL CONDUITS, RACEWAYS, AND CABLE TRAY FOR MAXIMUM HEAD CLEARANCE IN MECHANICAL AREAS, AND ATTIC. COORDINATE CLEARANCES WITH PERFORMANCE SERVICES AND THE OWNER.
- ALL ELECTRICAL SERVICE WORK SHALL COMPLY WITH THE LOCAL UTILITY. COORDINATE ALL REQUIREMENTS AND MAXIMUM AVAILABLE FAULT CURRENT PRIOR TO BID AND INCLUDE ALL NECESSARY MATERIAL AND LABOR REQUIRED FOR THE ADDITION TO THE ELECTRICAL SERVICE. PROVIDE PRICING FOR ANY UTILITY FEES.
- TEST GROUNDING SYSTEM AFTER COMPLETION OF JOB TO INSURE PROPER GROUND CONDUCTIVITY.
- RECORD DRAWINGS: PROVIDE AMPERE READINGS ON ALL PANELBOARDS TO PROVE PANELS ARE BALANCED. PROVIDE PHASE ROTATION READINGS ON ALL PANELBOARDS. PROVIDE ALL RECORD DRAWINGS TO THE OWNER'S REPRESENTATIVE.

FL#6458

SEAL

ATP ENGINEERING SOUTH, FL  
BRADENTON, FLORIDA  
ENGR. BUSINESS #8908  
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DATE

DESCRIPTION

MANATEE WASTE WATER TREATMENT FACILITY  
LAB MEP UPGRADES  
4751 66TH ST. W., BRADENTON, FL 34210  
IFAS# W1300194

DRAWING TITLE  
**ELECTRICAL  
GENERAL NOTES AND  
DETAILS**

FILE: 66th St Lab Gen & Chiller

JOB NO.: 2013.40

DATE: 5/20/2013

PLOT SIZE: 1:1

DRAWN BY: CMD/MC

CHECKED BY: JDC

SHEET No.:

**E6.0-A**

## LEGENDS, GENERAL NOTES AND ABBREVIATIONS

### ABBREVIATIONS

|       |                                |
|-------|--------------------------------|
| AC    | AIR CONDITIONING               |
| AD    | ACCESS DOOR                    |
| AFF   | ABOVE FINISHED FLOOR           |
| AHU   | AIR HANDLING UNIT              |
| AI    | ANALOG INPUT                   |
| AO    | ANALOG OUTPUT                  |
| AP    | ACCESS PANEL                   |
| BFF   | BELOW FINISHED FLOOR           |
| BHP   | BRAKE HORSE POWER              |
| BOT   | BOTTOM                         |
| CC    | COOLING COIL                   |
| CD    | CONDENSATE DRAIN               |
| CFM   | CUBIC FEET PER MINUTE          |
| CH    | CHILLER                        |
| CHWR  | CHILLED WATER RETURN           |
| CHWS  | CHILLED WATER SUPPLY           |
| CLG   | CEILING                        |
| CO    | CLEANOUT                       |
| CT    | COOLING TOWER                  |
| CU    | CONDENSING UNIT                |
| CW    | COLD WATER                     |
| CWR   | CONDENSER WATER RETURN         |
| CWS   | CONDENSER WATER SUPPLY         |
| DB    | DRY BULB                       |
| DCC   | DIRECT DIGITAL CONTROL         |
| DC    | DOOR GRILLE                    |
| DI    | DIGITAL INPUT                  |
| DO    | DIGITAL OUTPUT                 |
| DP    | DEW POINT                      |
| DX    | DIRECT EXPANSION               |
| EA    | EXHAUST AIR                    |
| EAT   | ENTERING AIR TEMPERATURE       |
| EC    | ELECTRICAL CONTRACTOR          |
| ECC   | ENERGY CONTROL CENTER          |
| EER   | ENERGY EFFICIENCY RATIO        |
| EF    | EXHAUST FAN                    |
| ET    | EXPANSION TANK                 |
| EL    | ELEVATION                      |
| EQUIP | EQUIPMENT                      |
| EWC   | ELECTRIC WATER COOLER          |
| EWT   | ENTERING WATER TEMPERATURE     |
| EXIST | EXISTING                       |
| FDR   | FIRE DAMPER                    |
| FCU   | FAN COIL UNIT                  |
| FD    | FLOOR DRAIN                    |
| FL    | FLOOR                          |
| FPI   | FINS PER INCH                  |
| FPF   | FINS PER FOOT                  |
| FFM   | FEET PER MINUTE                |
| G     | GUARD                          |
| GC    | GENERAL CONTRACTOR             |
| GPH   | GALLONS PER HOUR               |
| GPM   | GALLONS PER MINUTE             |
| H     | HUMIDITY                       |
| HB    | HOSE BIBB                      |
| HC    | HEATING COIL                   |
| HE    | HEAT EXCHANGER                 |
| HP    | HORSE POWER                    |
| HW    | HOT WATER                      |
| HWR   | HOT WATER RETURN               |
| HWS   | HOT WATER SUPPLY               |
| KW    | KILOWATT                       |
| LAT   | LEAVING AIR TEMPERATURE        |
| LWT   | LEAVING WATER TEMPERATURE      |
| MC    | MECHANICAL CONTRACTOR          |
| MD    | MOTORIZED DAMPER               |
| MAX   | MAXIMUM                        |
| MIN   | MINIMUM                        |
| NC    | NORMALLY CLOSED                |
| NO    | NORMALLY OPENED                |
| OA    | OUTSIDE AIR                    |
| OS&Y  | OUTSIDE SCREW & YOKE           |
| PC    | PLUMBING CONTRACTOR            |
| PD    | PRESSURE DROP                  |
| PRESS | PRESSURE                       |
| RA    | RETURN AIR                     |
| RD    | ROOF DRAIN                     |
| RL    | RAIN LEADER                    |
| RTU   | ROOF TOP UNIT                  |
| S     | SANITARY                       |
| SDPR  | SMOKE DAMPER                   |
| SA    | SUPPLY AIR                     |
| SP    | STATIC PRESSURE                |
| TCC   | TEMPERATURE CONTROL CONTRACTOR |
| T     | TEMPERATURE                    |
| TYP   | TYPICAL                        |
| UC    | UNDERCUT                       |
| UG    | UNDERGROUND                    |
| UON   | UNLESS OTHERWISE NOTED         |
| UV    | UNIT VENTILATOR                |
| V     | VENT                           |
| VAC   | VACUUM                         |
| VAV   | VARIABLE AIR VOLUME            |
| VD    | VOLUME DAMPER                  |
| VFD   | VARIABLE FREQUENCY DRIVE       |
| VSD   | VARIABLE SPEED DRIVE           |
| VTR   | VENT THRU ROOF                 |
| W     | WASTE                          |
| WB    | WET BULB                       |
| WCO   | WALL CLEANOUT                  |

### DUCTWORK

|  |      |  |    |   |
|--|------|--|----|---|
|  | UP   |  | DN | SUPPLY DUCT (UP & DOWN)   |
|  | UP   |  | DN | EXHAUST DUCT (UP & DOWN)  |
|  | UP   |  | DN | RETURN AIR DUCT (UP & DOWN)   |
|  |      |  |    | CEILING DIFFUSERS   |
|  |      |  |    | SIDE WALL REGISTER OR GRILLE  |
|  |      |  |    | RETURN OR EXHAUST CEILING GRILLE  |
|  |      |  |    | EXHAUST OR RETURN WALL MTD GRILLE   |
|  | 10x8 |  |    | NEW DUCT - WIDTH X DEPTH (SINGLE LINE)  |
|  |      |  |    | EXISTING DUCT TO REMAIN (SINGLE LINE)   |
|  |      |  |    | EXISTING DUCT TO BE REMOVED (SINGLE LINE)   |
|  |      |  |    | FLEXIBLE DUCTWORK (INSULATED) (SINGLE LINE)   |
|  |      |  |    | SPIN-IN FITTING (SINGLE LINE)   |
|  |      |  |    | DUCT SIZE TRANSITION (CONCENTRIC) (SINGLE LINE)   |
|  |      |  |    | DUCT SIZE TRANSITION (ECCENTRIC) (SINGLE LINE)  |
|  |      |  |    | DUCT TRANSITION (RECTANGULAR TO ROUND) (SINGLE LINE)  |
|  |      |  |    | ACOUSTICALLY LINED DUCT   |
|  |      |  |    | INCLINED RISE, IN DIRECTION OF AIR FLOW   |
|  |      |  |    | INCLINED DROP, IN DIRECTION OF AIR FLOW   |
|  |      |  |    | FLEXIBLE CONNECTION   |
|  |      |  |    | LOUVER  |
|  |      |  |    | MANUAL VOLUME DAMPER  |
|  |      |  |    | FIRE DAMPER   |
|  |      |  |    | SMOKE DAMPER  |
|  |      |  |    | FIRE / SMOKE DAMPER   |
|  |      |  |    | SMOKE DETECTOR  |
|  |      |  |    | DUCT HEATER   |
|  |      |  |    | VANED ELBOW (PROVIDE ALL SQUARE OR RECTANGULAR ELBOWS WITH VANES EVEN IF SYMBOL IS MISSING) |
|  |      |  |    | VANED ELBOW (SHORT RADIUS)  |
|  |      |  |    | STANDARD RADIUS ELBOW   |
|  |      |  |    | VANE TURN ELBOW & AIR SPLIT TYPE DUCT TAKE-OFF  |
|  |      |  |    | THERMOSTAT / TEMPERATURE SENSOR   |
|  |      |  |    | HUMIDISTAT / HUMIDITY SENSOR  |
|  |      |  |    | UNDERCUT (1" U.O.N.)  |
|  |      |  |    | DOOR GRILLE (18"x12" U.O.N.)  |
|  |      |  |    | AIR DEVICE TYPE   |
|  |      |  |    | AIR FLOW CFM  |
|  |      |  |    | NECK SIZE   |
|  |      |  |    | 4-WAY AIR FLOW  |
|  |      |  |    | 3-WAY AIR FLOW  |
|  |      |  |    | 2-WAY AIR FLOW  |
|  |      |  |    | 1-WAY AIR FLOW  |

### PIPING

|  |                                    |                        |
|--|------------------------------------|------------------------|
|  | CWS                                | CONDENSER WATER SUPPLY |
|  | CWR                                | CONDENSER WATER RETURN |
|  | CHWS                               | CHILLED WATER SUPPLY   |
|  | CHWR                               | CHILLED WATER RETURN   |
|  | CD                                 | CONDENSATE LINE        |
|  | RL                                 | REFRIGERANT LIQUID     |
|  | RS                                 | REFRIGERANT SUCTION    |
|  | RHG                                | REFRIGERANT HOT GAS    |
|  | HWS                                | HOT WATER SUPPLY       |
|  | HWR                                | HOT WATER RETURN       |
|  | DOMESTIC WATER                     |                        |
|  | GATE VALVE                         |                        |
|  | GLOBE VALVE                        |                        |
|  | CHECK VALVE                        |                        |
|  | BALL VALVE                         |                        |
|  | PLUG VALVE                         |                        |
|  | PRESSURE REDUCING VALVE            |                        |
|  | 2-WAY CONTROL VALVE                |                        |
|  | 3-WAY MODULATING CONTROL VALVE     |                        |
|  | SAFETY OR PRESSURE RELIEF VALVE    |                        |
|  | MANUAL AIR VENT                    |                        |
|  | BUTTERFLY VALVE                    |                        |
|  | HOSE BIBB                          |                        |
|  | ANGLE GLOBE VALVE                  |                        |
|  | MOTOR OPERATED GATE VALVE          |                        |
|  | MOTOR OPERATED GLOBE VALVE         |                        |
|  | TEST PLUG (PRESSURE / TEMPERATURE) |                        |
|  | OUTSIDE SCREW & YOKE (O S & Y)     |                        |
|  | DIRECTION OF FLOW                  |                        |
|  | ANCHOR                             |                        |
|  | REDUCER OR INCREASER               |                        |
|  | ECCENTRIC REDUCER                  |                        |
|  | TOP CONNECTION, 45 OR 90 DEG.      |                        |
|  | BOTTOM CONNECTION, 45 OR 90 DEG.   |                        |
|  | SIDE CONNECTION                    |                        |
|  | CAPPED OUTLET                      |                        |
|  | RISE OR DROP IN PIPE               |                        |
|  | UNION                              |                        |
|  | STRAINER                           |                        |
|  | THERMOMETER                        |                        |
|  | PRESSURE GAGE                      |                        |
|  | WATER FLOW MEASURING DEVICE        |                        |
|  | EXISTING PIPE TO BE REMOVED        |                        |

### DRAWING SYMBOLS

|  |  |                            |
|--|--|----------------------------|
|  | 2  | DETAIL NUMBER              |
|  | FPS  | DRAWING NUMBER WHERE DRAWN |
|  | A  | SECTION LETTER             |
|  | FPS  | DRAWING NUMBER WHERE DRAWN |
|  | POINT OF INTERFACE BETWEEN NEW & EXISTING P.O.C. |                            |
|  | POINT OF DEMOLITION P.O.D.                       |                            |
|  | POINT OF INTERFACE BETWEEN CONTRACTORS           |                            |

### GENERAL NOTES

- HVAC WORK CONSISTS OF PROVIDING AND INSTALLING AIR CONDITIONING SYSTEMS FOR A COMPLETE OPERATING SYSTEM AND AS INDICATED ON THE DRAWINGS. ALL WORK SHALL COMPLY WITH APPLICABLE CODES IN SPECIFICATIONS. IT IS THE INTENTION OF THE CONTRACT DRAWINGS AND SPECIFICATIONS TO CALL FOR COMPLETE, FINISHED WORK, TESTED, AND READY FOR OPERATION.
- THE SCOPE OF WORK INCLUDES 2 PRICES. SEPARATE BIDS FOR THE FOLLOWING A) COMPLETE INSTALLATION OF PIPING FOR A BACK-UP EMERGENCY CHILLER INCLUDING PIPE CONNECTIONS, ISOLATION VALVES AND POWER FOR THE EMERGENCY CHILLER. B) PROVIDE AND INSTALL COMPLETE INSTALLATION OF A 4-TON AIR COOLED FAN COIL, REFRIGERANT PIPING, WALL PENETRATIONS, PIPE SLEEVES, CONDENSATE PIPING, CONTROLS, AIR COOLED CONDENSER, AND CONDENSER SUPPORT, CEILING TILE, PAINT, DRYWALL REPAIRS, AND ELECTRICAL FOR THE NEW UPS INSTALLATION.
- TEST AND BALANCE SHALL BE PROVIDED BY A COMPANY SPECIALIZING IN THE TESTING AND BALANCING OF HVAC SYSTEMS AS SUBCONTRACTOR TO THE HVAC CONTRACTOR OR OWNER. THE TEST AND BALANCE CONTRACTOR SHALL BE A MEMBER OF EITHER AABC OR NEBB.
- ALL PIPING SUBJECT TO THERMAL EXPANSION AND/OR CONTRACTION THAT PENETRATES A SMOKE, FIRE, OR FIRE/SMOKE WALL, PARTITION, OR FLOOR SLAB SHALL BE SUITABLY SLEEVED AND FIRE SAFED.
- PROVIDE IDENTIFICATION OF THE LOCATION OF ALL EQUIPMENT AND VALVES ON THE PROJECT. IDENTIFICATION TAGS SHALL BE AFFIXED TO THE WALLS OR CEILINGS AND SHALL BE VISIBLE FROM THE OCCUPIED SPACE.
- ALL PIPING SHALL BE SUPPORTED WITH COMMERCIAL MANUFACTURED CLAMPS. PROVIDE ISOLATION SLEEVES TO PREVENT CONTACT OF DISSIMILAR METALS.
- INSTALL ALL EQUIPMENT IN STRICT ACCORDANCE WITH THE MANUFACTURERS' INSTRUCTIONS AND RECOMMENDATIONS.
- CONTRACTOR TO PROVIDE ALL SUPPLEMENTARY STEEL REQUIRED TO SUSPEND MECHANICAL EQUIPMENT AND MATERIALS.
- PENETRATIONS THROUGH FIRE RATED ASSEMBLIES, PENETRATIONS FOR PIPES, CONDUITS, OR OTHER PURPOSES THROUGH ASSEMBLIES (FLOORS, ROOF, WALLS, PARTITIONS, ETC.) WITH A REQUIRED FIRE RESISTANCE RATING FIRE STOP MATERIAL. FIRE STOP SEALANTS SHALL BE UL LISTED. APPLY FIRE STOP AS RECOMMENDED BY THE MANUFACTURER AND IN ACCORDANCE WITH ITS LISTING TO MEET OR EXCEED THE FIRE RATING OF THE ASSEMBLY IN WHICH IT IS INSTALLED.
- ALL INSULATION SHALL BE FIRE RATED IN ACCORDANCE WITH ASHRAE 90A 50/25 SMOKE DEVELOPMENT AND FLAME SPREAD REQUIREMENTS. INSULATION "R" VALUES SHALL COMPLY WITH THE FLORIDA ENERGY CODE.
- MOUNT ALL SPACE THERMOSTATS AND/OR SENSORS 4 FEET ABOVE THE FLOOR, UNLESS OTHERWISE NOTED IN ACCORDANCE WITH ADA GUIDELINES.
- SEE ELECTRICAL DRAWINGS FOR ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT.
- UNLESS OTHERWISE NOTED, COORDINATE ELEVATION AND LOCATION WITH RAIN LEADERS, WATER PIPING, PLUMBING VENTS, AND MAJOR ELECTRICAL CONDUITS OR CABLE TRAY.
- PROVIDE DRAIN P-TRAPS IN THE CONDENSATE LINES AT ALL AIR HANDLING UNITS. PROVIDE FLOAT SWITCHES FOR ALL CONDENSATE TRAP SYSTEM TO SHUT THE UNITS DOWN TO PREVENT OVERFLOW.
- ROUTE FULL SIZE (MIN. 1") COPPER DRAIN PIPE FROM EACH AHU DRAIN PAN TO RESPECTIVE FLOOR DRAIN OR EXISTING CONDENSATE MAIN LINE. INSULATE WITH 3/4" ARMSTRONG "ARMAFLEX" INSULATION.
- THE ENGINEER HAS MADE AN EXTENSIVE EFFORT TO IDENTIFY ABOVE CEILING CONFLICTS. THE CONTRACTOR IS RESPONSIBLE TO ALSO CHECKING FIELD CONDITIONS PRIOR TO BIDDING AND REPORT ANY PROBLEMS/CONFLICTS TO THE ENGINEER WITHIN 2 DAYS OF DISCOVERY. ANY CHANGES RESULTING FROM CONDITIONS ARISING IN THE FIELD WHICH WERE NOT BROUGHT TO THE ENGINEER'S ATTENTION ARE TO BE MADE BY THIS CONTRACTOR WITH NO ADDITIONAL COST TO THE OWNER.
- THE WORK INDICATED ON THESE DRAWINGS IS GENERALLY DIAGRAMMATIC AND IS INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE THE GENERAL ARRANGEMENT OF DUCTWORK AND EQUIPMENT, ETC.
- ALL WORK IS TO BE FREE OF DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF THREE YEARS (3) FROM DATE OF FINAL ACCEPTANCE. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST TO THE OWNER.
- UPON COMPLETION OF THE WORK UNDER THIS CONTRACT, THE CONTRACTOR SHALL REMOVE ALL TOOLS, APPLIANCES, SURPLUS MATERIALS, AND SCRAP. ALL IDENTIFIED EXISTING EQUIPMENT TO BE REMOVED SHALL BE TURNED OVER TO THE OWNER.
- WHEN CONFLICTS OCCUR IN SPECIFICATIONS OR IN THE DRAWINGS, OR BETWEEN EITHER, THE ITEMS OF GREATER QUANTITY OR HIGHER COST SHALL BE PROVIDED.
- THE CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES IN ORDER TO AVOID CONFLICTS.
- ALL GROUND MOUNTED ATTACHED EQUIPMENT AND APPURTENANCES INCLUDED IN THE SCOPE OF THIS PROJECT ARE REQUIRED TO BE SECURED TO THE CONCRETE STRUCTURE. THE FASTENING SYSTEMS SHALL BE DESIGNED TO WITHSTAND A 140 MPH WIND LOAD.
- CONTRACTOR SHALL PROVIDE TO LOCAL AHJ OR PERMITTING AGENCY A COPY OF ALL MAJOR EQUIPMENT CUTS SHEETS AT TIME OF APPLICATION.
- NO ENERGY CALCULATIONS ARE PROVIDED FOR THE DATA ROOM. SINCE NO ARCHITECTURAL MODIFICATIONS ARE COMPLETED, THE DATA ROOM IS PROCESS EQUIPMENT AND DOES NOT REQUIRE ENERGY CALCULATIONS.

### NOTE:

THESE ARE STANDARD SYMBOLS AND MAY NOT ALL APPEAR ON THE PROJECT DRAWINGS; HOWEVER WHEREVER THE SYMBOL APPEARS ON THE PROJECT DRAWINGS, THE ITEM SHALL BE PROVIDED AND INSTALLED.

FL#63458

SEAL

**ATP ENGINEERING SOUTH, FL**  
BRADENTON, FLORIDA  
ENGR. BUSINESS #6908  
941-751-6485

DATE

REV / DESCRIPTION

**MANATEE WASTE WATER TREATMENT FACILITY**  
LAB MEP UPGRADES  
4751 66TH ST. W., BRADENTON, FL 34210  
IFAS# W1300194

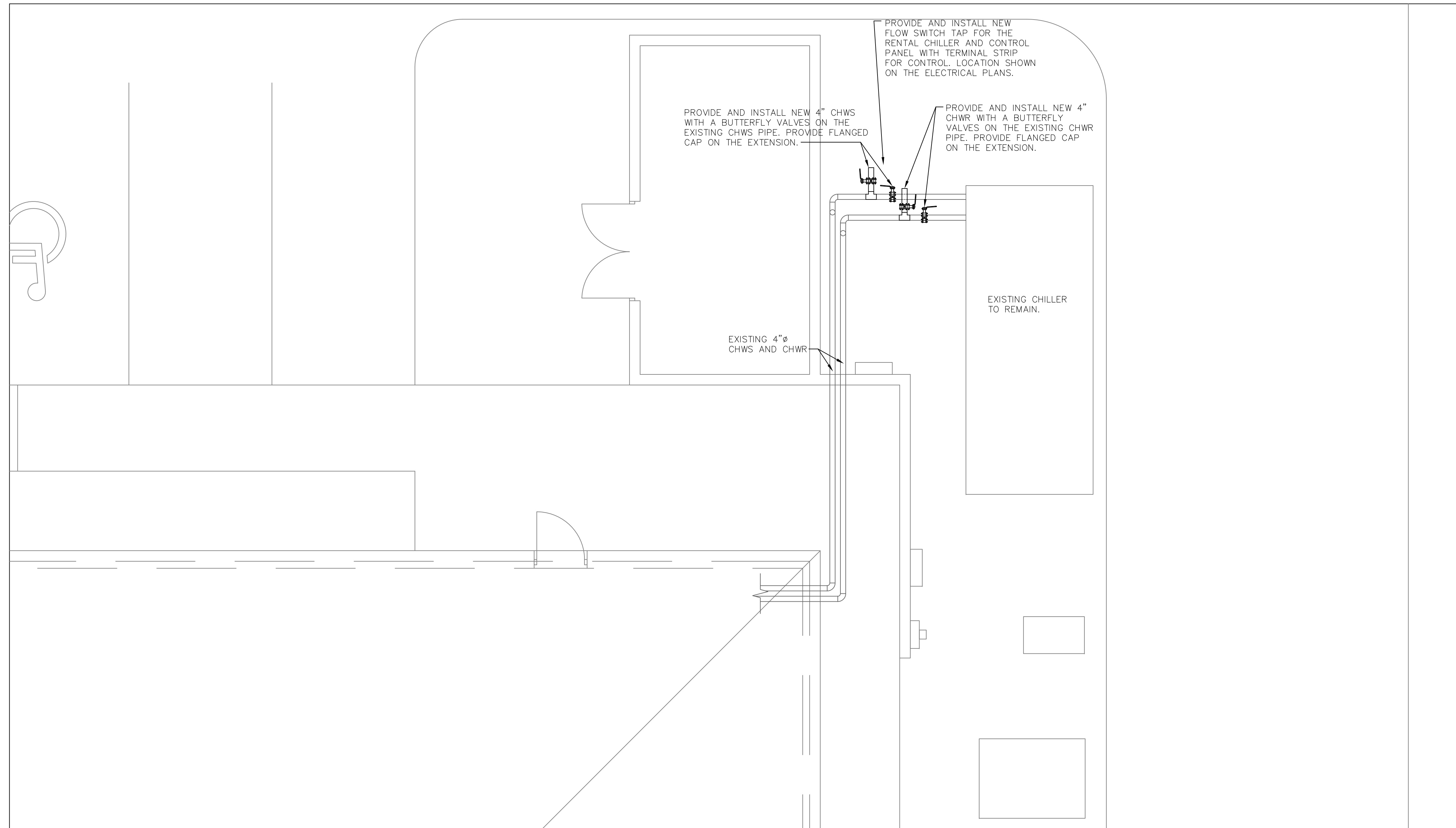
**MECHANICAL**  
SYMBOLS, LEGEND  
AND GENERAL NOTES

DRAWING TITLE

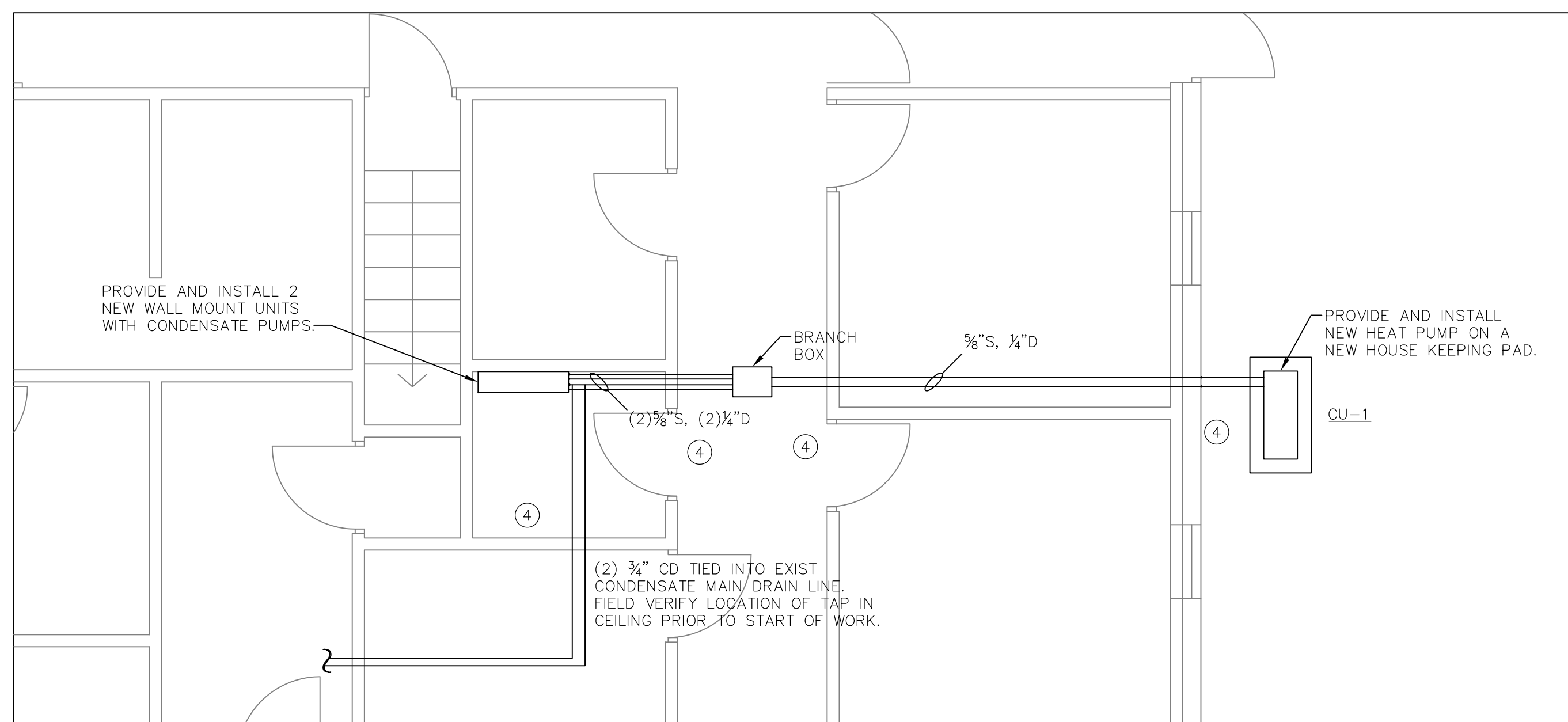
FILE: 66th St Lab Gen & Chiller

JOB NO.: 2013.40  
DATE: 5/20/2013  
PLOT SIZE: 1:1  
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CHECKED BY: JDC  
SHEET No.:

**M1.0-A**



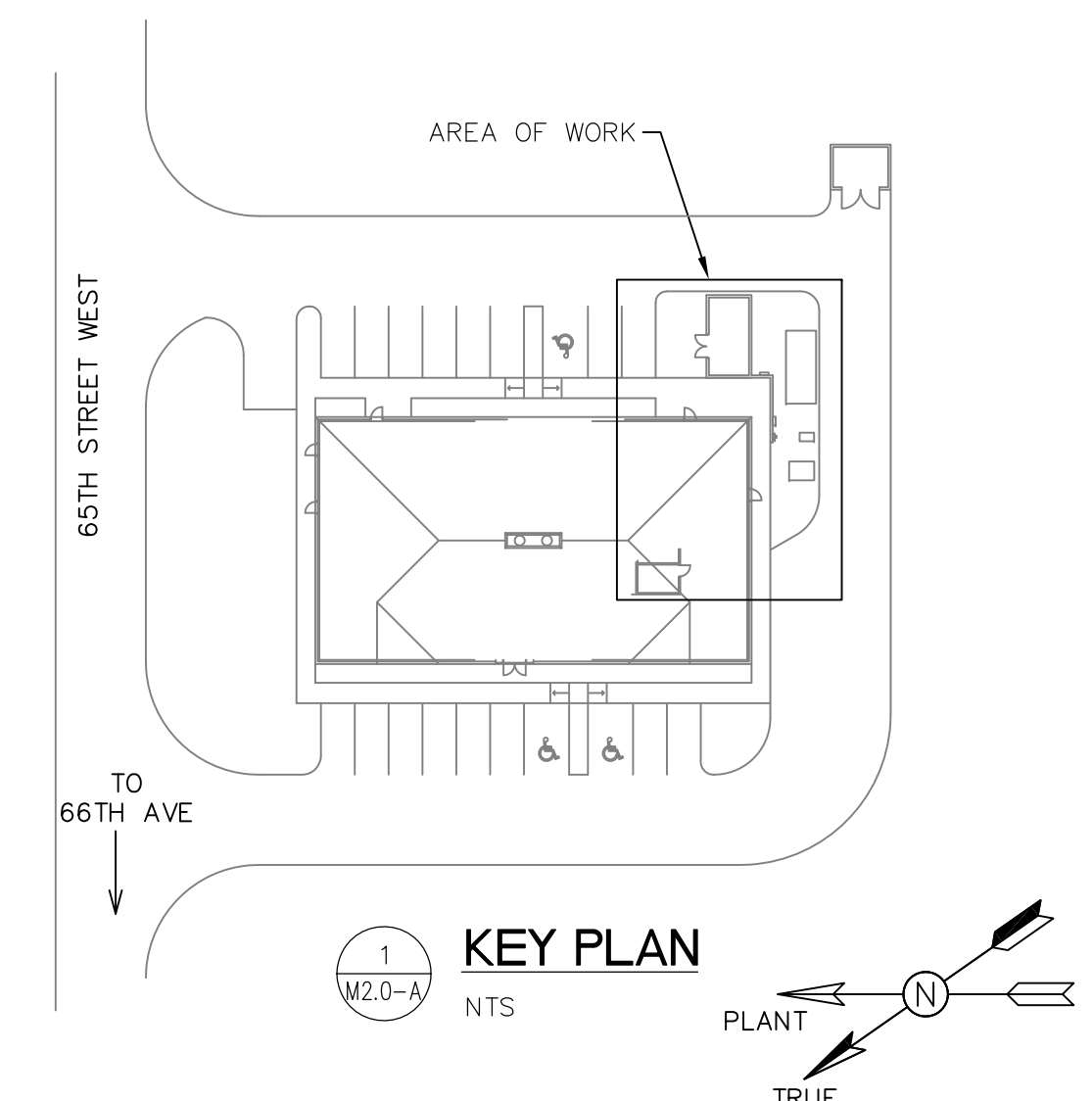
2 MECHANICAL PLAN - CHILLER EMERGENCY PIPING AND CHILLER REPLACEMENT  
 W2.0-A 1/4" = 1'-0"



2 MECHANICAL PLAN-DATA ROOM AC  
 W2.0-A 1/4" = 1'-0"

**GENERAL NOTES:**

- 1 REFER TO PLANS AND SPECIFICATIONS FOR ADDITIONAL SCOPE OF WORK. REFER TO GENERAL NOTES FOR THE TWO PRICES REQUIRED FOR THE TWO SEPARATE ITEMS.
- 2 CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO START OF WORK. ANY QUESTIONS SHALL BE ANSWERED BY THE PROJECT MANAGER PRIOR TO START WORK.
- 3 SCHEDULE ALL WORK WITH OWNER AND PROJECT MANAGER PRIOR TO START OF WORK. BUILDING IS A 24 HOUR FACILITY. TEMPORARY AIR CONDITIONING IS REQUIRED FOR THE PIPING INSTALLATION.
- 4 PROVIDE PIPE ESCUTCHEONS FOR CEILING PENETRATIONS, WALL PENETRATIONS AND PIPE SLEEVES WITH FOAM SEALED OPENING AND ESCUTCHEON AT EXTERIOR PIPE PENETRATIONS. PAINT ALL EXTERIOR AND INTERIOR WALLS DAMAGED IN THE PROCESS TO MATCH EXISTING.
- 5 ITEMS IN GRAYSACLE ARE EXISTING AND TO REMAIN. FOR DUCTWORK AND DIFFUSERS THAT ARE "TO REMAIN" PRESERVE EXISTING LOCATION.

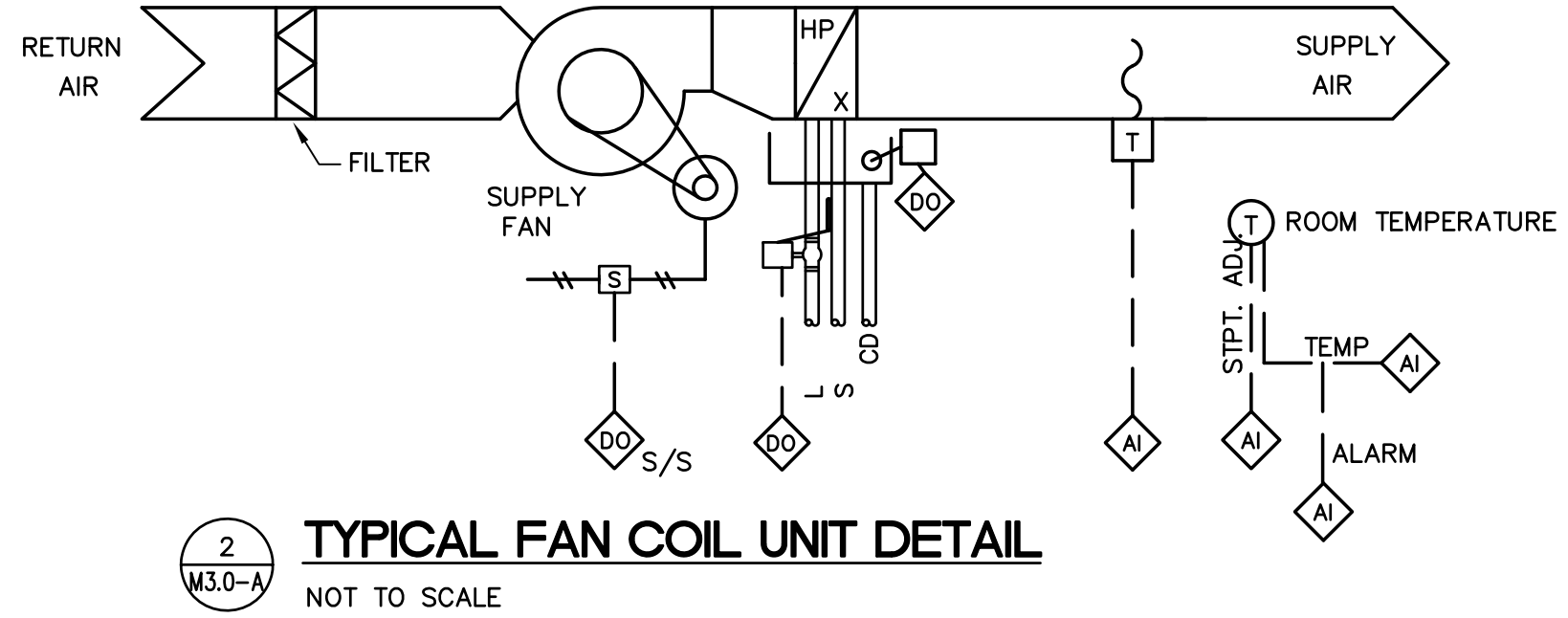


| REV # | DESCRIPTION | DATE |
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| AIR COOLED HEAT PUMP SCHEDULE |                    |             |              |                  |                      |        |                |     |            |              |             |            |                 |       |       |       |              |           |             |         |                |
|-------------------------------|--------------------|-------------|--------------|------------------|----------------------|--------|----------------|-----|------------|--------------|-------------|------------|-----------------|-------|-------|-------|--------------|-----------|-------------|---------|----------------|
| Tag No.                       | Equipment Location | Area Served | Capacity MBH | Refrigerant Type | Operating Charge LBS | E.E.R. | Compressors    |     |            | Motor        |             |            | Electrical Data |       |       |       | Manufacturer | Model No. | Weight      | Remarks |                |
|                               |                    |             |              |                  |                      |        | Expansion Type | No. | HP/KW Each | Unload Steps | No. of Fans | HP/KW Each | RPM             | Volts | Phase | Hertz |              |           |             |         | Min. fan Speed |
| HP-1                          | EXT                | DATA RM     | 48           | R410A            | --                   | 18     | --             | 2   | 5.19       | VAR          | 1           | .11        | 910             | 208   | 1     | 60    | QUIET        | FUJITSU   | AQU48RLXFZ1 | 216     | 1-6            |

**NOTES:**

- MCA 23A (208 / 1 PH), MOCP 40A
- COORDINATE LOCATION WITH MC.
- UNIT IS TO MATCHED FANCOILS IN SPACE. MANUFACTURER TO PROVIDE FINAL PIPING ARRANGEMENT AND SIZING.
- PROVIDE WALL PENETRATION SLEEVE, SEALING, AND DRY WALL AND PAINTING REPAIR.
- MC SHALL PROVIDE STANDS, CONCRETE PAD, HURRICANE STRAPS, AND VIBRATION ISOLATION. BRANCH BOX UTP--PU03, AND CONTROL INTERFACE FOR BACNET THERMOMETER MONITOR AND ALARM.
- UNIT SIZED FOR 95 F AMBIENT. COILS COATED WITH LUVATA COATING FOR WASTEWATER PLANT USE.



**SEQUENCE OF OPERATION**

FOR EACH FAN COIL THE TMX REVERSING VALVE SHALL BE MODULATED TO MAINTAIN THE COOLING ROOM TEMPERATURE SETPOINT. PROVIDE A SPACE TEMPERATURE INPUT TO THE DDC. MAINTAIN THE SPACE COOLING TEMPERATURE SETPOINT (75 F ±0.5 F - SOFTWARE ADJUSTABLE).

UPON A DROP IN THE ROOM SPACE TEMPERATURE BELOW THE HEATING SET POINT (71 F - SOFTWARE ADJUSTABLE) THE HEATING TMX REVERSING VALVE SHALL BE ENERGIZED AND STAGED TO MAINTAIN THE ROOM HEATING SETPOINT ± .5° F.

THE UNIT'S FAN SHALL OPERATE AS PER THE USER PROGRAMMABLE SCHEDULE. THE UNIT'S CONDENSATE SWITCH WILL SHUT DOWN THE UNIT IF THE CONDENSATE PUMP FAILS. .

THE UNIT'S SHALL PROVIDE A BACNET CONNECTION FOR CONTROL AND OVER-TEMP ALARM ( ADJ. )

| FAN COIL UNIT SCHEDULE - DATA ROOM |         |                |
|------------------------------------|---------|----------------|
| ITEM                               | ---     | FCU-1,2        |
| TOTAL SUPPLY AIR                   | CFM     | 365            |
| MATCHING HP UNIT                   |         | HP-1           |
| MOTOR, UNIT MCA- NO ELECT HT.      | AMPS    | 0.3            |
| ELECTRICAL                         | V/PH/HZ | 208/1/60       |
| COOLING COIL-HEAT PUMP             |         | --             |
| TOTAL COOLING CAPACITY             | MBH     | 24             |
| TOTAL HEATING CAPACITY             | MBH     | 27             |
| MANUFACTURER                       | ---     | FUJITSU        |
| MODEL NO.                          | ---     | ASU24RLF (1-7) |

**NOTES:**

- UNIT SUPPLIED WITH VIBRATION ISOLATION, STANDARD FILTER, FAN COIL DRAIN PAN, WALL THERMOSTAT, REVERSING VALVE, REFRIGERANT LINE SET CONNECTIONS, FACE GRILLE/COVER, DISCONNECT, CONDENSATE PUMP AND CONDENSATE SHUTDOWN.
- COOLING CAPACITY RATED AT COIL ENTERING 80° DB/67° FWB, REFRIGERANT R410A.
- ALL UNITS SHALL BE HAVE FILTER ACCESS, AND CONDENSATE RETURN. CONDENSATE PUMPS SHALL BE INTEGRAL WITH UNITS.
- PROVIDE DRAIN PAN CUT OUT SWITCH WIRED IN SERIES WITH INLINE FLOAT SWITCH AT FCU PRIOR TO CONDENSATE LINE TRAP.
- ALL REFRIGERATION PIPING SHALL BE COMPLETED IN THE FIELD USING THE FUJITSU SUPPLIER SYSTEM OF CALCULATION USING THEIR SIZING SYSTEM AND ACTUAL LENGTHS.
- POWER SUPPLY AND CONTROL VOLTAGE FROM CONDENSING UNIT TO FAN COIL. MANUFACTURER SUPPLIED DISCONNECT.
- PROVIDE WALL BRACKET FOR UNIT INSTALLATION.

| CONTROL POINT ABBREVIATION LEGEND |                          |
|-----------------------------------|--------------------------|
| DI                                | DIGITAL INPUT            |
| DO                                | DIGITAL OUTPUT           |
| AI                                | ANALOG INPUT             |
| AO                                | ANALOG OUTPUT            |
| S/S                               | START/STOP               |
| VFD                               | VARIABLE FREQUENCY DRIVE |
| S                                 | REFRIGERANT SUCTION      |
| L                                 | REFRIGERANT LIQUID       |
| T                                 | TEMPERATURE              |
| H                                 | HUMIDITY                 |
| CD                                | CONDENSATE               |
| SP                                | STATIC PRESSURE          |
| FS                                | FLOW SWITCH              |
| LAT                               | LEAVING AIR TEMPERATURE  |
| S                                 | STARTER                  |
| FM                                | FLOW METER               |
| CHWR                              | CHILLED WATER RETURN     |
| CHWS                              | CHILLED WATER SUPPLY     |

SEAL

ATP ENGINEERING SOUTH, FL  
BRADENTON, FLORIDA  
ENGR. BUSINESS #8908  
941-751-6485

DATE

REV. / DESCRIPTION

MANATEE WASTE WATER TREATMENT FACILITY  
LAB MEP UPGRADES  
4751 66TH ST. W., BRADENTON, FL 34210  
IFAS# W1300194

DRAWING TITLE  
**MECHANICAL SCHEDULES**

FILE: 66th St Lab Gen & Chiller

JOB NO.: 2013.40

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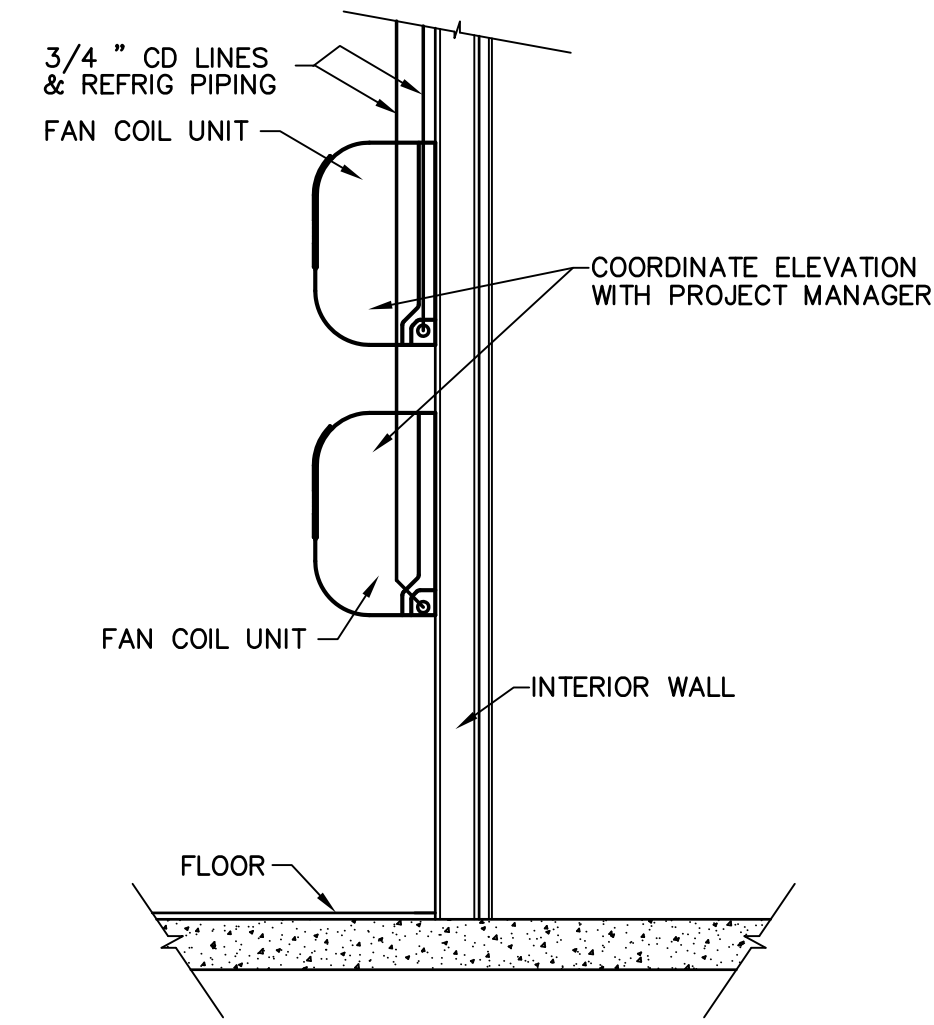
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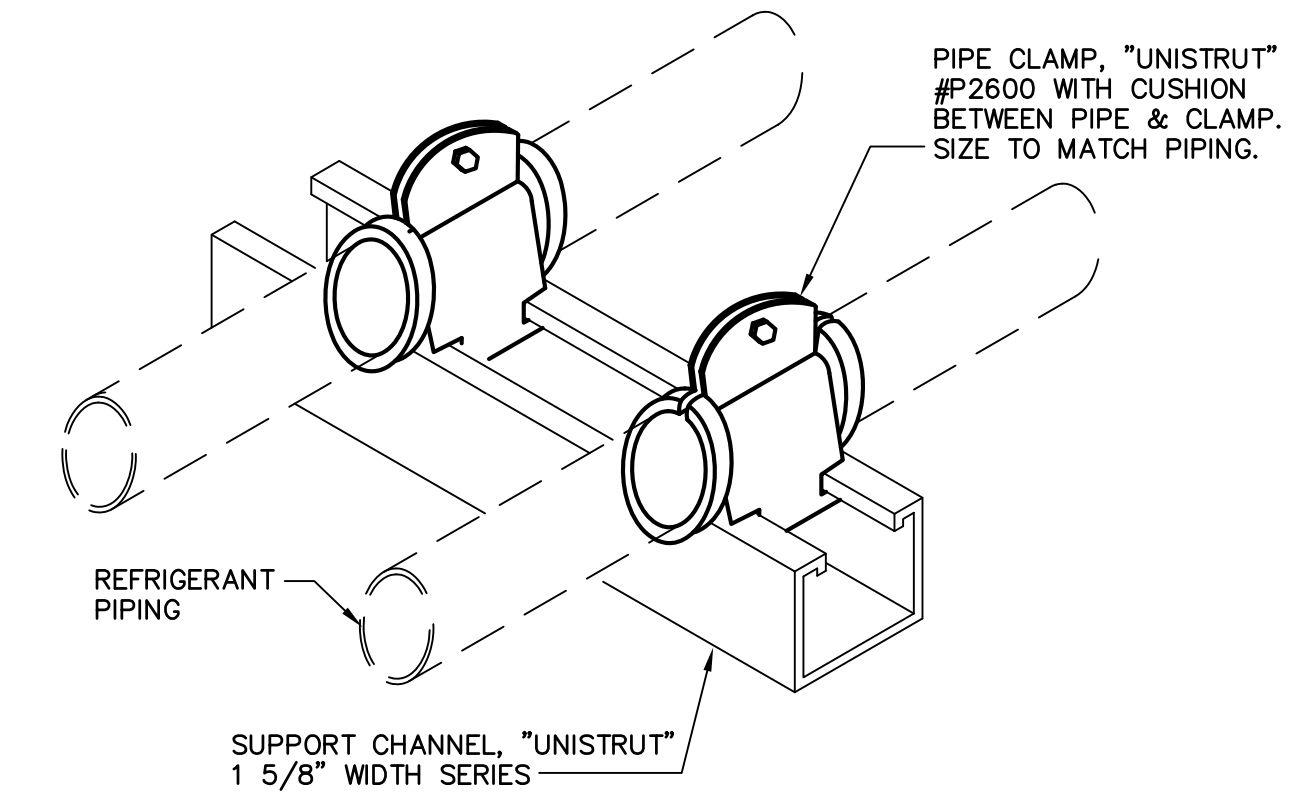
SHEET No.:

**M3.0-A**



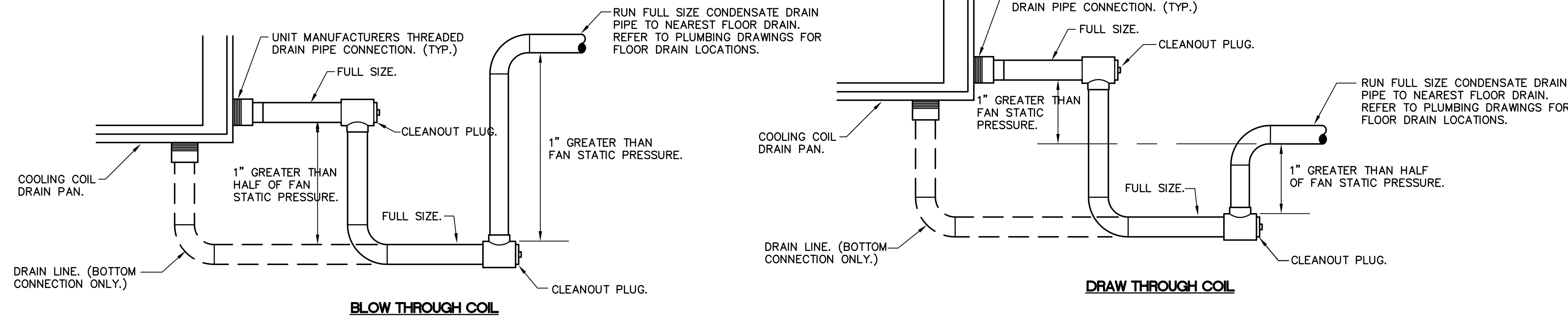


**2 WALL PACK UNIT DETAIL**  
NOT TO SCALE

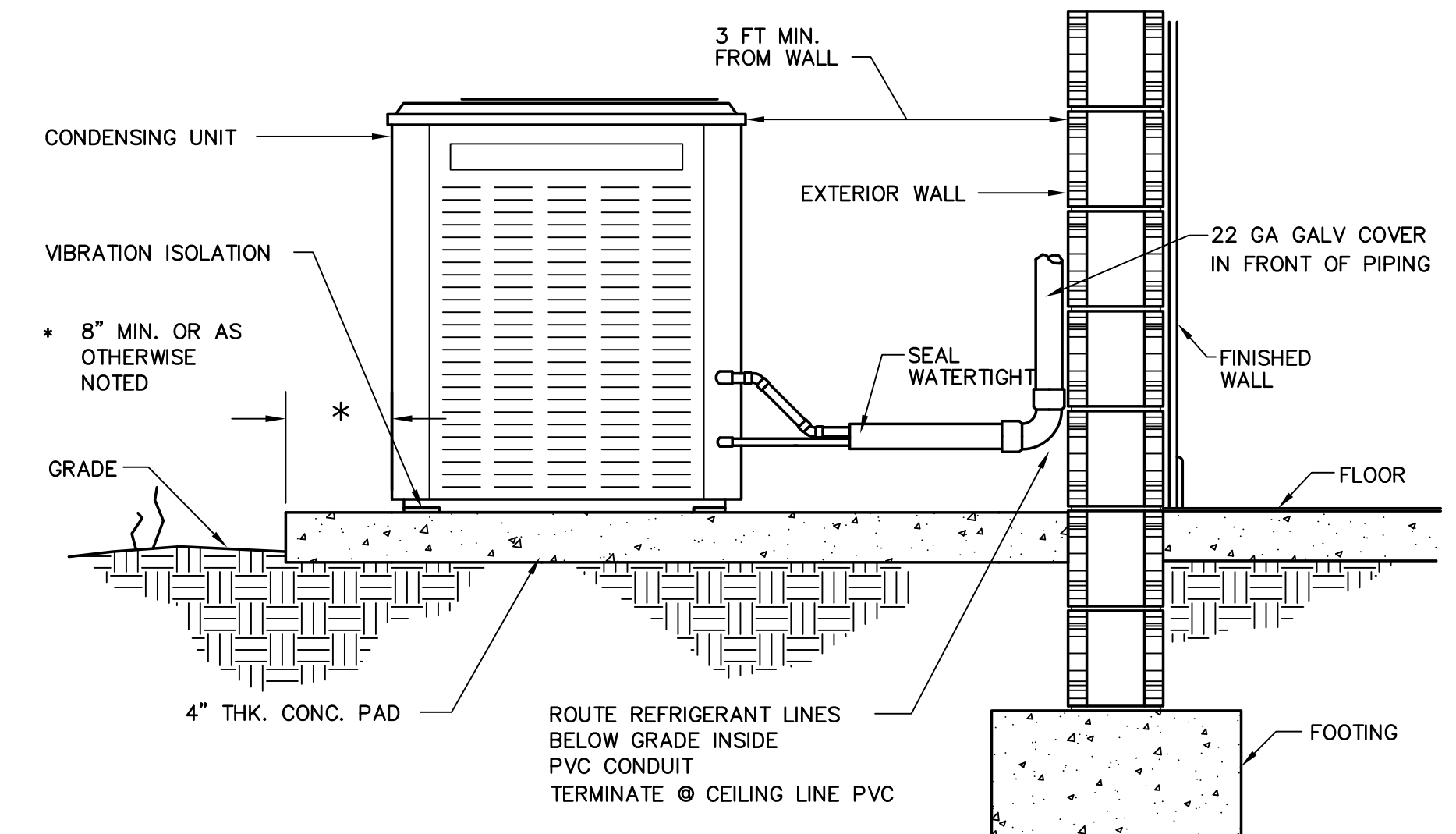


1. ALL REFRIGERANT PIPING SHALL BE HARD COPPER, TYPE "L" WITH LONG RADIUS ELBOWS.
2. TRAPS SHALL BE SINGLE PIECE, WROUGHT COPPER.
3. INSULATE SUCTION LINE WITH  $\frac{3}{8}$ " ARMAFLEX INSULATION FULL LENGTH. DO NOT SPLIT DURING INSULATION BUTT JOINTS WITH ARMAFLEX SEALANT, AND APPLY ARMAFLEX PRESERVATIVE ON ALL LINES.
4. ROUTING OF ALL REFRIGERANT PIPING SHALL BE PLUMB AND SHALL RUN TRUE WITH THE BUILDING LINES. HORIZONTAL RUNS OF SUCTION LINES OVER 25' SHALL BE PITCHED "ONE-HALF" BUBBLE TOWARD THE COMPRESSOR, FOR OIL RETURN.
5. SUPPORT OF ALL PIPING AT COMPRESSORS, CONDENSERS, AND AIR HANDLING UNITS SHALL BE AS SHOWN ABOVE. SUPPORT OF PIPING IN BETWEEN THE UNITS SHALL BE WITH STRAP MATERIAL, USING ARMAFLEX INSULATION AS SADDLES. NO METAL-TO-METAL CONTACT.
6. BRAZE REFRIGERANT PIPING WITH FLOW OF DRY NITROGEN DURING BRAZING.
7. SOLDER SHALL BE 15% SILVER "SIL-FOS" OR EQUAL.
8. CHANGE FILTER-DRIER CORES AFTER 30 DAYS OF OPERATION.
9. PROVIDE LOW VOL SEALANT IN ACCORDANCE WITH LEED REQUIREMENTS.
10. COORDINATE HG, DISCH, S, AND L LINE LENGTHS FOR INDIVIDUAL UNITS WITH MFG.
11. LOCATE BRANCH BOX IN ACCORDANCE WITH MFR REQUIREMENTS.

**3 REFRIGERANT PIPING DETAIL**  
NOT TO SCALE



**1 CONDENSATE DRAIN PIPING DETAIL**  
NOT TO SCALE



BOLT UNITS DOWN WITH  $\frac{1}{4}$ " SS BOLTS AND MFR ISOLATION AT EACH CORNER, TAPCON WITH #12 SCREWS INTO CONCRETE MIN 1", RUN 18 GA STRAP OVER UNIT, TAPCON INTO CONCRETE SAME. COORDINATE WITH PROJECT MANAGER

**4 CONDENSING UNIT DETAIL**  
NOT TO SCALE

|  |      |             |
|--|------|-------------|
| SCALE  | DATE | DESCRIPTION |
| ATP ENGINEERING SOUTH, FL<br>BRADENTON, FLORIDA<br>ENGR BUSINESS #8908<br>941-751-6485 |      |             |

**MANATEE WASTE WATER TREATMENT FACILITY  
LAB MEP UPGRADES  
4751 66TH ST. W., BRADENTON, FL 34210  
IFAS# W1300194**

**MECHANICAL DETAIL**  
DRAWING TITLE:  
FILE: 66th St Lab Con & Chiller  
JOB NO.: 2013.40  
DATE: 5/20/2013  
PLOT SIZE: 1:1  
DRAWN BY: DC  
CHECKED BY: JDC  
SHEET No.:  
**M4.0-A**