

# WESTBROOK SCHOOL DEPARTMENT WESTBROOK MIDDLE SCHOOL AIR-COOLED CHILLER INSTALLATION

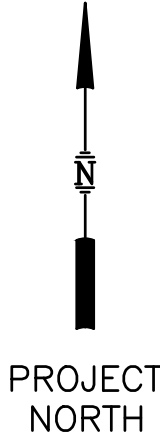
471 STROUDWATER STREET  
WESTBROOK, ME 04092



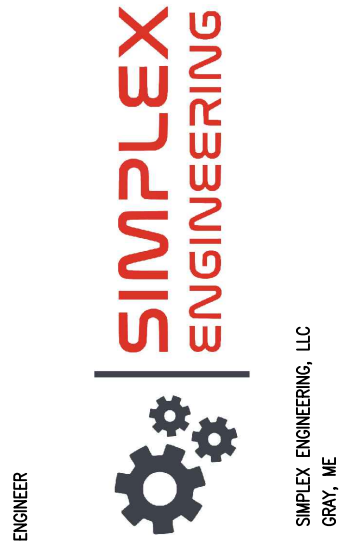
NEW CHILLER

MECHANICAL ROOM

DRAWING LIST		
DRAWING #	TITLE	REVISION
G-001	COVER SHEET	0
G-002	PROJECT SPECIFICATIONS 1 OF 2	0
G-003	PROJECT SPECIFICATIONS 2 OF 2	0
MD-401	LARGE SCALE MECHANICAL DEMO PLAN	0
MD-401A	MECHANICAL ROOM DEMO PICTURES	0
MD-701	4-PIPE HEAT PUMP DEMO SCHEMATIC	0
M-001	MECHANICAL SYMBOLS LEGEND & ABBREVIATIONS	0
M-002	MECHANICAL SITE PLAN	0
M-401	LARGE SCALE MECHANICAL PIPING PLAN	0
M-501	MECHANICAL DETAILS	0
M-701	CHILLER PLANT P&ID	0



CLIENT  
WESTBROOK SCHOOL DEPARTMENT  
WESTBROOK MIDDLE SCHOOL  
AIR-COOLED CHILLER INSTALLATION  
471 STROUDWATER STREET  
WESTBROOK, ME 04092



DRAWN BY: AMS  
CHECKED BY: AMS  
DESIGNED BY: AMS

REV	DATE	DESCRIPTION
0	02/21/23	ISSUED FOR CONSTRUCTION

PROJ. NO. 22-117    DATE: 12/26/22  
TITLE: COVER SHEET  
DWG. NO. G-001  
SIZE: ARCH D    SCALE: NONE

SCOPE OF WORK:

- 1. THE CASE BID SCOPE OF WORK IS GENERALLY DESCRIBED AS:
1.1. INSTALL OWNER FURNISHED CONTRACTOR INSTALLED (OFCI) AIR-COOLED CHILLER AS INDICATED ON DRAWINGS AND IN SPECIFICATIONS.
1.2. FURNISH AND INSTALL ALL MATERIALS AND EQUIPMENT FOR A TURN KEY INSTALLATION INCLUDING BUT NOT LIMITED TO ALL PIPING, INSULATION, ELECTRICAL WORK, CONTROLS, EXCAVATION AND EARTHWORK, PAVING/SEEDING, EQUIPMENT FOUNDATIONS, BUILDING PENETRATIONS AND WEATHER SEALING.
1.3. THE EXISTING BUILDING MANAGEMENT SYSTEM WAS PROVIDED BY SIEMENS. THE CONTRACTOR SHALL HIRE SIEMENS TO PERFORM CONTROLS WORK.
1.4. PROVIDE DEMOLITION AS INDICATED ON DRAWINGS/SPECIFICATIONS. THE BASE BID DEMOLITION SCOPE IS LOCATED BELOW THE MEZZANINE LEVEL AS SHOWN ON DRAWINGS. REFER TO BID ALTERNATES FOR DEMOLITION WORK ON THE MEZZANINE LEVEL.
1.5. ASSIST IN STARTUP AND TESTING OF THE CHILLER PLANT IN COORDINATION WITH MANUFACTURER EQUIPMENT TECHNICIANS.

BID ALTERNATES: PROVIDE BID ALTERNATE PRICING FOR THE FOLLOWING:

- 1. ADDITIVE ALTERNATE NO. 1
1.1. IN ADDITION TO BASE DEMOLITION SCOPE SHOWN ON DRAWINGS PROVIDE DEMOLITION OF 14 HEAT PUMPS AND ALL ASSOCIATE PIPING (CHILLED WATER, HOT WATER AND WELL WATER), PUMPS, ELECTRICAL AND CONTROLS WORK RELATED TO EXISTING HEAT PUMP SYSTEM OPERATION WHICH ARE LOCATED ON THE MEZZANINE IN THE MECHANICAL ROOM. THE HEAT PUMPS WILL NO LONGER BE USED AND ALL SYSTEMS SHALL BE REMOVED. THE DEMOLITION WORK SCHEDULE DESCRIBED HERE IS NOT TIED TO THE BASE SCOPE ALLOWING THE CONTRACTOR A LONGER PERIOD AS NEEDED TO SCHEDULE/PERFORM THE WORK.

CHILLER INSTALLATION:

- 1. CHILLER SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND REQUIREMENTS.
2. CHILLED WATER SYSTEM FLUSHING:
2.1. ALL NEW PIPING AND EQUIPMENT, INCLUDING CHILLER SHALL BE FLUSHED WITH CLEAN POTABLE WATER TO REMOVE ANY FOREIGN DEBRIS PRIOR TO OPERATING OR TESTING THE CHILLER. STRAINERS SHALL BE CLEANED AFTER INITIAL FLUSHING.
3. CHILLER SHALL BE STARTED UP BY A FACTORY AUTHORIZED TECHNICIAN PROVIDED BY THE OWNER.
4. CHILLER SHALL BE ANCHORED TO FOUNDATION WITH APPROVED METHODS.

CHAIN LINK FENCING:

- 1. PROVIDE AND INSTALL GALVANIZED STEEL CHAIN LINK FENCE TO SECURE CHILLER AS SHOWN ON DRAWINGS.
2. PROVIDE CONCRETE SAUNA TUBES OR ANCHORING PER MANUFACTURER RECOMMENDATIONS.
3. PROVIDE LOCKING HARDWARE FOR ACCESS DOOR.

CHILLER FOUNDATION:

- 1. PROVIDE 10" THICK REBAR REINFORCED CONCRETE FOUNDATION FOR CHILLER.
2. FOUNDATION SHALL EXTEND MINIMUM 12" BEYOND FOOTPRINT OF EQUIPMENT.
3. THE FOUNDATION SHALL BE DESIGNED BY THE CONTRACTOR FOR SITE CONDITIONS AND FOLLOW INDUSTRY BEST PRACTICES.
4. A SUITABLE COMPACTED SUB BASE OF GRAVEL OR SIMILAR MATERIAL SHALL BE PROVIDED. PROVIDE PERFORATED PIPE DRAINAGE IF SOIL CONDITIONS REQUIRE.
5. 2 LAYERS OF #4 REBAR REINFORCEMENT AT 16" ON CENTER BOTH DIRECTIONS.
6. PROVIDE CONTROL JOINTS TO MINIMIZE CRACKING.
7. FOUNDATION SHALL BE LEVEL AND BE CONSTRUCTED TO MINIMIZE POTENTIAL FOR WATER POOLING.
8. TOP OF FOUNDATION SHALL BE MINIMUM 4" INCHES ABOVE GRADE.
9. REFER TO M-002 FOR FOUNDATION DIMENSIONS.

GENERAL:

- 1.PERFORM ALL WORK IN A NEAT WORKMANLIKE MANNER. ALL DEMOLITION, RELOCATION AND CONSTRUCTION ACTIVITIES SHALL BE COORDINATED WITH THE OWNER/ENGINEER INCLUDING OUTAGE SCHEDULE REQUIREMENTS.
2.THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING THE MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES OF CONSTRUCTION, SUBJECT, HOWEVER, TO THE OWNERS/ENGINEERS RIGHT TO PROHIBIT MEANS AND METHODS PROPOSED BY CONTRACTOR THAT IN THE OWNER/ENGINEERS JUDGEMENT POSE A SAFETY HAZARD, ARE INCOMPATIBLE WITH THE OWNERS ONGOING OPERATIONS, OR PRODUCE AN UNDESIRABLE OUTCOME.
3.IT IS THE CONTRACTORS RESPONSIBILITY TO INQUIRE DIRECTLY WITH THE OWNER ABOUT THE POTENTIAL PRESENCE OF ASBESTOS, LEAD PAINT AND OTHER HAZARDOUS MATERIALS THAT MAY IMPACT THE COST OF THE WORK PRIOR TO SUBMITTING A BID FOR THE WORK.
4.ALL SUBSTITUTIONS SHALL BE SUBMITTED IN WRITING TO THE OWNER/ENGINEER FOR APPROVAL PRIOR TO BIDDING. AFTER BIDDING, NO SUBSTITUTIONS WILL BE ALLOWED.
5.CONTRACTORS ARE REQUIRED TO VISIT THE SITE BEFORE BIDDING.
6.THE CONSTRUCTION AREA SHALL BE KEPT CLEAN.
7.INSTALL EQUIPMENT AND MATERIALS TO PROVIDE THE REQUIRED ACCESS FOR SERVICE AND MAINTENANCE.
8.ENSURE NEC CLEARANCE IS MAINTAINED.
9.ALL PIPING AND WIRING SHALL BE ROUTED PARALLEL TO WALLS FOR A NEAT INSTALLATION, DIAGONAL RUNS ARE NOT ACCEPTABLE.
10.EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER REQUIREMENTS BY INSTALLER MEETING ALL CERTIFICATIONS AND REQUIREMENTS OF MANUFACTURER.

SUBMITTALS:

- 1.EACH SHEET INDICATING PERFORMANCE DATA SHALL BE CLEARLY HIGHLIGHTED INDICATING APPROPRIATE MODEL OR TYPE OF EQUIPMENT TO BE REVIEWED. CLEARLY INDICATE EQUIPMENT NAME/NUMBER OR OTHER UNIQUE IDENTIFIER SPECIFIC TO THE PROJECT.
2.INCOMPLETE OR UNMARKED SUBMITTALS WILL BE RETURNED WITHOUT REVIEW.
3.IN GENERAL, THE CONTRACTOR SHALL PLAN FOR NO LESS THAN 2 WEEK REVIEW PERIOD, ALTHOUGH AN EFFORT TO RETURN SUBMITTALS AS QUICKLY AS POSSIBLE WILL BE MADE. EXPEDITED REVIEWS MUST BE CLEARLY REQUESTED.
4.PRIOR TO COMMENCING WORK THE CONTRACTOR SHALL PROVIDE SUBMITTALS FOR APPROVAL FOR THE FOLLOWING:
4.1. ABOVE GRADE PIPING AND FITTING MATERIALS AND JOINING METHODS.
4.2. BELOW GRADE PIPING AND FITTING MATERIALS AND JOINING METHODS.
4.3. HYDRONIC SPECIALTIES INCLUDING STRAINERS, GAUGES, FLEXIBLE CONNECTIONS ETC.
4.4. HYDRONIC VALVES.
4.5. PIPING INSULATION AND JACKETING: SPECIFY MATERIAL, THICKNESS, AND JACKETING (IF ANY) BY EACH PIPING SERVICE AND APPLICATION.
4.6. CHAIN LINK FENCING INCLUDING ANCHORAGE.
4.7. CHILLER FOUNDATION DESIGN.
4.8. CONTROL COMPONENTS INCLUDING CONTROLLERS, FLOW METER, INSTRUMENTATION AND SEQUENCE OF OPERATIONS.

QUALITY ASSURANCE:

- 1.INSTALLERS: ALL WORK SHALL BE PERFORMED BY QUALIFIED JOURNEYMEN AND SUPERVISED BY A MASTER OF THEIR RESPECTIVE TRADES WHO ARE EMPLOYED BY A FIRM THAT CAN DEMONSTRATE SUCCESSFUL EXPERIENCE WITH WORK OF SIMILAR TYPE, QUALITY, EXTENT AND COMPLEXITY TO THE WORK REQUIRED BY THE PROJECT.
2.MATERIALS AND EQUIPMENT: STANDARD PRODUCTS FROM MANUFACTURERS REGULARLY ENGAGED IN MANUFACTURE OF SUCH PRODUCTS. PRODUCTS MUST HAVE A PROVEN TRACK RECORD OF AT LEAST 3 YEARS PRIOR TO BIDDING THE WORK.
3.SERVICE SUPPORT: EQUIPMENT SHALL BE SUPPORTED BY SERVICE ORGANIZATIONS WHICH ARE REASONABLY CONVENIENT TO THE EQUIPMENT INSTALLATION AND ABLE TO RENDER SATISFACTORY SERVICE ON A REGULAR AND EMERGENCY BASIS.

DELIVERY, STORAGE AND HANDLING:

- 1.CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING, DELIVERY, UNLOADING, RIGGING AND STORAGE OF ALL EQUIPMENT AND MATERIALS REQUIRED FOR THE PROJECT, UNLESS NOTED OTHERWISE. THE CONTRACTOR IS RESPONSIBLE FOR RIGIN, TRANSPORTATION, UNLOADING AND SETTING F THE OFCI CHILLER.
2.PRODUCTS DELIVERED TO THE PROJECT SITE SHALL BE PROPERLY IDENTIFIED WITH NAMES, MODEL NUMBERS, TYPES, GRADES, COMPLIANCE LABELS, AND SIMILAR INFORMATION NEEDED FOR DISTINCT IDENTIFICATION, ADEQUATELY PACKAGED AND PROTECTED TO PREVENT DAMAGE DURING SHIPMENT, STORAGE, AND HANDLING.
3.STORE EQUIPMENT AND MATERIALS AT THE SITE, UNLESS OFFSITE STORAGE IS AUTHORIZED IN WRITING. PROTECT STORED EQUIPMENT AND MATERIALS FROM DAMAGE.
4.COORDINATE DELIVERIES OF MECHANICAL MATERIALS AND EQUIPMENT TO MINIMIZE CONSTRUCTION SITE CONGESTION. LIMIT EACH SHIPMENT OF MATERIALS AND EQUIPMENT TO THE ITEMS AND QUANTITIES NEEDED FOR THE SMOOTH AND EFFICIENT FLOW OF INSTALLATIONS.

DRAWINGS AND SPECIFICATIONS:

- 1.THE DRAWINGS AND SPECIFICATIONS ARE COMPLIMENTARY. WHAT IS SHOWN OR NOTED ON THE DRAWINGS, BUT NOT MENTIONED IN THE SPECIFICATIONS, AUTOMATICALLY BECOMES A PART OF THE SPECIFICATIONS. WHAT IS NOTED IN THE SPECIFICATIONS, BUT NOT SHOWN ON THE DRAWINGS, AUTOMATICALLY BECOMES A PART OF THE DRAWINGS. CONFLICTS BETWEEN THE REQUIREMENTS OF THE DRAWINGS AND THE SPECIFICATIONS MUST BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE ENGINEER. THE MORE STRINGENT REQUIREMENT WILL APPLY, UNLESS RULED OTHERWISE BY THE ENGINEER. WHEN CONFLICTS OR DISCREPANCIES ARE NOTED, NO WORK SHALL PROCEED UNTIL THE CONFLICT OR DISCREPANCY HAS BEEN RESOLVED BY THE ENGINEER.
2.THE DRAWINGS MAY NOT SHOW EVERY DETAIL OF THE DUCTING, PIPING AND EQUIPMENT. WHETHER SPECIFICALLY SHOWN OR NOT, ALL EQUIPMENT/PIPING/DUCTING SHALL BE CONNECTED IN ACCORDANCE WITH THE MANUFACTURERS STANDARD DETAILS, ACCEPTED TRADE PRACTICE, AND THE INTENT OF THE CONTRACT DOCUMENTS. COORDINATE WITH ALL OTHER TRADES.
3.WHERE EXISTING SYSTEMS ARE ADDED TO OR MODIFIED AS PART OF THE WORK, ONLY LIMITED INFORMATION MAY HAVE BEEN AVAILABLE DURING DESIGN. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY RELEVANT DIMENSIONS, OPERATING CONDITIONS, ELECTRICAL AND MECHANICAL CHARACTERISTICS PRIOR TO BIDDING AND/OR ORDERING MATERIALS.

CODES AND STANDARDS:

- 1.THE WORK SHALL COMPLY WITH LOCAL, STATE AND FEDERAL ADOPTED STANDARDS AND CODES, INCLUDING BUT NOT LIMITED TO;
1.1. NFPA STANDARDS
1.2. MUBEC
1.3. MAINE STATE INTERNAL PLUMBING CODE (UPC).
1.4. ASME - IN PARTICULAR 31.9.
1.5. CITY OF WESTBROOK, MAINE ADOPTED CODES AND STANDARDS.
2.ELECTRICAL WORK SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 70.

SEALING AND FIRE-STOPPING:

- 1. SEALING AND FIRE STOPPING OF SLEEVES/OPENINGS BETWEEN DUCTWORK, PIPING, ETC. AND THE SLEEVE, STRUCTURAL OR PARTITION OPENING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR WHOSE WORK PENETRATES THE OPENING.
2. FIRE AND SMOKE BARRIER INFORMATION PRESENTED ON DRAWINGS MAY NOT BE COMPLETE, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY THE FIRE/SMOKE RATING OF ANY AND ALL WALL PENETRATIONS.
3. PROVIDE ALL FIRE STOPPING OF FIRE RATED PENETRATIONS AND SEALING OF SMOKE RATED PENETRATIONS IN ACCORDANCE WITH NFPA AND IBC STANDARDS.

DEMOLITION:

- 1. PERFORM ALL DEMOLITION AS INDICATED ON THE DRAWINGS TO ACCOMPLISH WORK.
2. WHERE DEMOLITION WORK IS TO BE PERFORMED ADJACENT TO EXISTING WORK THAT REMAINS IN AN OCCUPIED AREA, CONSTRUCT TEMPORARY DUST PARTITION TO MINIMIZE THE AMOUNT OF CONTAMINATION OF THE OCCUPIED SPACE.
3. WHERE PIPE OR DUCT IS REMOVED AND ABANDONED IN PLACE, CAP ENDS OF EXISTING SERVICES.
4. THE CONTRACTOR IS RESPONSIBLE FOR LAWFUL DISPOSAL OF ALL PIPE, DUCTWORK, INSULATION, WIRING AND ASSOCIATED CONDUIT, EQUIPMENT AND SIMILAR MATERIALS WHICH ARE DEMOLISHED.

CUTTING, PATCHING, PAINTING:

- 1. WHERE PORTIONS OF EXISTING WORK IS DISRUPTED, THE CONTRACTOR SHALL REPAIR WITH SIMILAR MATERIALS, FINISH AND PAINT TO MATCH ORIGINAL CONSTRUCTION.

PIPE SLEEVES:

- 1. PROVIDE FOR ALL PIPING PASSING THROUGH WALLS, FLOORS, PARTITIONS, ROOFS AND SIMILAR ELEMENTS, EXCEPT NOT REQUIRED WHERE ELEMENT IS SOLID ENTIRE WAY THROUGH (EG, CONCRETE).
2. PIPE SLEEVE SHALL BE SCH 40 STEEL PIPE FOR ANY STRUCTURAL ASSEMBLY, 20 GA GALV SHEET STEEL, PVC, OR SIMILAR MAY BE USED FOR NON-STRUCTURAL ASSEMBLIES. INTERSTITIAL SPACE SHALL BE FILLED WITH SILICON CAULK. PROVIDE ESCUTCHEONS FOR PIPING EXPOSED TO OCCUPANT VIEW.
3. BELOW GRADE WALLS: IN EXTERIOR WALL OPENINGS BELOW GRADE, USE A MODULAR MECHANICAL TYPE SEAL CONSISTING OF INTERLOCKING SYNTHETIC RUBBER LINKS SHAPED TO CONTINUOUSLY FILL THE ANNULAR SPACE BETWEEN THE NON-INSULATED PIPE AND THE CORED OPENING. LINK SEAL OR EQUAL.

TESTING AND BALANCING:

- 1. CONTRACT WITH A THIRD PARTY INDEPENDENT TESTING AND BALANCING CONTRACTOR CERTIFIED BY AABC OR NEBB FOR ALL TESTING, ADJUSTING AND BALANCING OF ALL EQUIPMENT AND SYSTEMS.
2. IN ACCORDANCE WITH STANDARDS PUBLISHED BY AABC, NEBB, OR TABB.
3. SYSTEMS SHALL BE BALANCED TO WITHIN THE FOLLOWING TOLERANCE OF DESIGN VALUES:
3.1. FLOW RATES: 0 TO +5%.
4. MEASURE AND RECORD THE FOLLOWING DATA POINTS AT A MINIMUM:
4.1. CHILLER AMPERAGE/VOLTAGE UNDER LOAD.
4.2. PRESSURE DROP ACROSS THE CHILLER EVAPORATOR AT DESIGN FLOW RATE.
4.3. CHILLED WATER PUMP FLOW RATE AT DESIGN CONDITIONS, HEAD, AND BRAKE HORSEPOWER. RECORD DIFFERENTIAL PRESSURE MEASURED AT SYSTEM DP SENSOR, RECORD VFD HZ.
4.4. CHILLED WATER PUMP FLOW RATE WITH NO LOAD ON SYSTEM (ALL CALL FOR COOLING DISABLED). THIS IS NEEDED TO VERIFY THE SYSTEM PROVIDES THE REQUIRED MINIMUM FLOW ACROSS VIA THE BYPASS CONTROL VALVE FOR STABLE CHILLER OPERATION.
4.5. CHILLED WATER COIL BALANCED FLOW RATES.
4.6. CHILLED WATER MINIMUM FLOW BYPASS RATE.

PIPE IDENTIFICATION:

- 1. LABEL PIPING IN ACCORDANCE WITH ASME 13.1.
2. LABELS SHALL INDICATE FLUID SERVICE AND FLOW DIRECTION.
3. SELF ADHESIVE STICKERS, SNAP-AROUND, OR STENCILED.
4. INSTALL LABELS AT INTERVALS NOT TO EXCEED 25 FEET, AND ADDITIONALLY AT EACH TURN.
5. REFER TO PIPE IDENTIFICATION SCHEDULE FOR SERVICE AND COLORS.
6. REFRIGERANT AT BRANCH BOX: LABEL EACH BRANCH ACCORDING TO INDOOR UNIT SERVED.
7. REFRIGERANT AT INDOOR UNIT: LABEL ACCORDING TO THE BRANCH BOX # AND PORT.
8. PROVIDE COLORED TACKS AT CEILING LEVEL TO INDICATE LOCATIONS OF BRANCH BOXES AND DUCTED INDOOR UNITS WHERE CONCEALED FROM VIEW.

EQUIPMENT IDENTIFICATION:

- 1. PROVIDE LAMICOID NAME PLATES LISTING EQUIPMENT NAME AND IDENTIFICATION TAG.

SITE ACCEPTANCE TESTING AND DEMONSTRATION:

- 1. FOLLOWING TESTING AND BALANCING, THE CONTRACTOR SHALL DEMONSTRATE TO THE SATISFACTION OF THE OWNER/ENGINEER THAT THE ENTIRE SYSTEM IS FUNCTIONAL. COORDINATE THIS ACTIVITY WITH OWNER/ENGINEER MINIMUM 2 WEEKS PRIOR TO SCHEDULED DEMONSTRATION DATE.
2. WHERE SPECIALTY FACTORY TRAINED PERSONNEL ARE REQUIRED, THE CONTRACTOR IS RESPONSIBLE FOR PROCURING THEIR SERVICES (EXCEPT FOR OFCI EQUIPMENT) AND COORDINATING THE DATES.
3. THIS EFFORT INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
3.1. START/STOP ALL EQUIPMENT.
3.2. DEMONSTRATE ALL SEQUENCES OF OPERATION AND CONTROL CYCLES, ALARMS, RELAYS, INTERLOCKS AND OTHER ACTIONS.
3.3. CYCLE ALL VALVES AND ACTUATORS.
3.4. BUMP ALL MOTORS.
3.5. FULLY PRESSURIZE/FILL SYSTEMS.
3.6. ADJUST CONTROL SETPOINTS AND SYSTEM PARAMETERS.
3.7. DEMONSTRATE CONTROL SYSTEMS ARE FUNCTIONAL, INCLUDING BUILDING MANAGEMENT SYSTEM (BMS) FRONT END INTEGRATION WHERE PRESENT.

TRAINING OF OWNER PERSONNEL:

- 1. FOLLOWING SITE ACCEPTANCE TESTING AND DEMONSTRATION THE CONTRACTOR SHALL INSTRUCT OWNER PERSONNEL IN THE PROPER OPERATION AND MAINTENANCE OF SYSTEMS AND EQUIPMENT PROVIDED AS PART OF THE PROJECT.
2. THIS ACTIVITY WILL OCCUR ON A SEPARATE DATE FROM SITE ACCEPTANCE TESTING AND DEMONSTRATION IN ORDER TO ALLOW TIME FOR NEEDED CORRECTIONS AND COORDINATION OF OWNER STAFFING. WHERE SPECIALTY FACTORY TRAINED PERSONNEL ARE REQUIRED, THE CONTRACTOR IS RESPONSIBLE FOR PROCURING THEIR SERVICES AND COORDINATING THE TRAINING TIME AND PLAN WITH THE OWNER.
2.1. PROVIDE THE FOLLOWING TO OWNER/ENGINEER FOR APPROVAL PRIOR TO DATE OF TRAINING:
2.1.1. A BRIEF OUTLINE OF TOPICS TO BE COVERED DURING TRAINING.
2.1.2. PROVIDE SUPPLEMENTARY MATERIAL INCLUDING PROJECT DRAWINGS, SEQUENCES OF OPERATION, CONTROL DIAGRAMS AND SIMILAR THAT WILL BE USED IN THE TRAINING PROCESS. INCOMPLETE AND OUT OF DATE MATERIALS WILL BE REJECTED.
2.2. WALKDOWN ENTIRE SYSTEM WITH OWNER STAFF, DESCRIBE SYSTEM COMPONENTS ETC.
2.3. DEMONSTRATE STARTUP AND SHUTDOWN PROCEDURES FOR ALL EQUIPMENT.
2.4. DEMONSTRATE SEQUENCES OF OPERATION FOR ALL SYSTEMS AND EQUIPMENT.
2.5. INSTRUCT STAFF IN ROUTINE MAINTENANCE REQUIRED FOR EACH PIECE OF EQUIPMENT.

RECORD DOCUMENTS:

- 1. THE CONTRACTOR SHALL MAINTAIN A FULL SIZE SET OF PROJECT DRAWINGS AND SPECIFICATIONS (CONTRACT DOCUMENTS) AT THE SITE AT ALL TIMES.
2. THE CONTRACTOR SHALL REGULARLY UPDATE THE CONTRACT DOCUMENTS SHOWING THE AS-BUILT CONDITIONS AND ANY OWNER/ENGINEER DIRECTED CHANGES.
3. PROVIDE A FULL SIZE COLOR HARD COPY AND ELECTRONIC PDF COPY OF THE AS-BUILTS TO THE OWNER AT PROJECT COMPLETION.

OPERATION AND MAINTENANCE MANUAL:

- 1. PROVIDE COMPLETE O&M MANUAL BOUND IN 3-RING BINDER CONTAINING THE FOLLOWING:
1.1. PROVIDE DESCRIPTION OF FUNCTION, NORMAL OPERATING CHARACTERISTICS AND LIMITATIONS, PERFORMANCE CURVES, ENGINEERING DATA AND TESTS, AND COMPLETE NOMENCLATURE AND COMMERCIAL NUMBERS OF ALL REPLACEABLE PARTS.
1.2. PROVIDE MANUFACTURER'S PRINTED OPERATING PROCEDURES TO INCLUDE START UP, BREAK IN, ROUTINE AND NORMAL OPERATING INSTRUCTIONS INCLUDING REGULATION CONTROL, STOPPING, SHUT DOWN, AND EMERGENCY INSTRUCTIONS, AS WELL AS SUMMER AND WINTER OPERATING INSTRUCTIONS.
1.3. PROVIDE MAINTENANCE PROCEDURES FOR ROUTINE PREVENTIVE MAINTENANCE AND TROUBLESHOOTING: DISASSEMBLY, REPAIR, AND REASSEMBLY, AS WELL AS ALIGNING AND ADJUSTING INSTRUCTIONS.
1.4. PROVIDE SERVICING INSTRUCTIONS AND LUBRICATION CHARTS AND SCHEDULES.
1.5. COPY OF ALL APPROVED SUBMITTALS.
1.6. COPY OF TESTING AND BALANCING REPORT.
1.7. COPY OF AS-BUILT DRAWINGS
1.8. COPY OF SEQUENCE OF OPERATIONS AND CONTROLS DIAGRAMS.

WARRANTIES:

- 1. WARRANTIES ARE REQUIRED FOR ALL ELECTRICALLY POWERED EQUIPMENT AND/OR OTHER MECHANICAL EQUIPMENT HAVING MOVING PARTS.
2. COMPIL AND ASSEMBLE THE WARRANTIES INTO A SEPARATED SET OF VINYL COVERED, THREE RING BINDERS, TABULATED AND INDEXED FOR EASY REFERENCE.
3. PROVIDE COMPLETE WARRANTY INFORMATION FOR EACH ITEM, TO INCLUDE DATE OF COMMENCEMENT, DURATION, AND THE NAMES, ADDRESSES, AND TELEPHONE NUMBERS AND PROCEDURES FOR FILING CLAIMS AND OBTAINING WARRANTY SERVICES.
4. DURATION OF WARRANTIES SHALL BE NOT LESS THAN ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OF THE FACILITY UNLESS PRIOR APPROVAL HAS BEEN GRANTED IN WRITING BY THE OWNER. IF THE MANUFACTURER'S WARRANTY EXPIRES LESS THAN ONE YEAR FROM THE DATE OF BENEFICIAL OCCUPANCY, THAT WARRANTY SERVICE AND REPLACEMENT OF PARTS SHALL BE PROVIDED BY THE CONTRACTOR AT NO COST TO THE OWNER.



CLIENT: WESTBROOK SCHOOL DEPARTMENT, WESTBROOK MIDDLE SCHOOL, AIR-COOLED CHILLER INSTALLATION, 471 STROUDWATER STREET, WESTBROOK, ME 04092

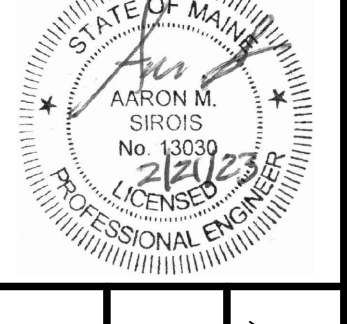
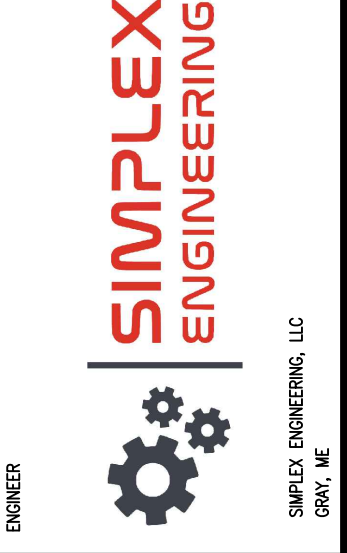


Table with columns: REV, DATE, DESCRIPTION, ISSUED FOR CONSTRUCTION, PROJ. NO., DATE, TITLE, ENG. NO., SCALE. Includes project details: PROJ. NO. 22-117, DATE 12/29/22, TITLE PROJECT SPECIFICATIONS 1 OF 2, ENG. NO. G-002, SCALE NONE.



**NOTES:**

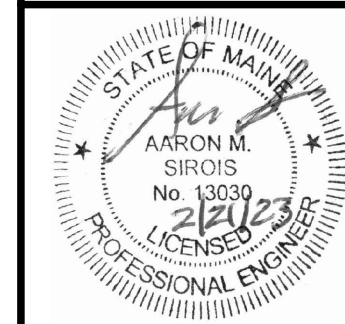
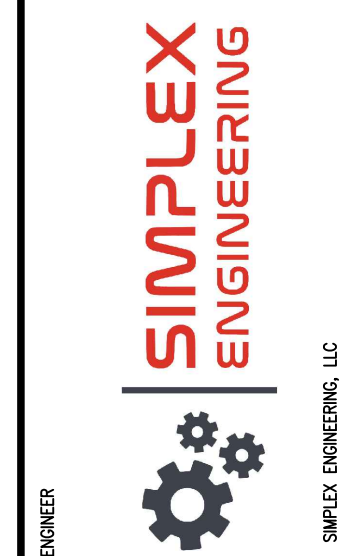
- SEE SHEET M-001 FOR GENERAL NOTES AND CONDITIONS APPLICABLE TO PROJECT, SYMBOLS, LEGEND AND ABBREVIATIONS.
- DIMENSIONS WHERE SHOWN ARE APPROXIMATE TO INDICATE INTENDED LAYOUT. THE CONTRACTOR SHALL VERIFY ALL DIMENSION AND MAKE MINOR ADJUSTMENTS BASED ON FIELD CONDITIONS.
- PROVIDE FLANGES AND CAPS FOR ALL PIPING SYSTEMS THAT ARE PARTIALLY DEMOLISHED.
- DEMO SCOPE FOR ADDITIVE ALTERNATE NO. 1 NOT SHOWN. REFER TO G-002 FOR SCOPE OF WORK.

**KEYED NOTES:**

① NA



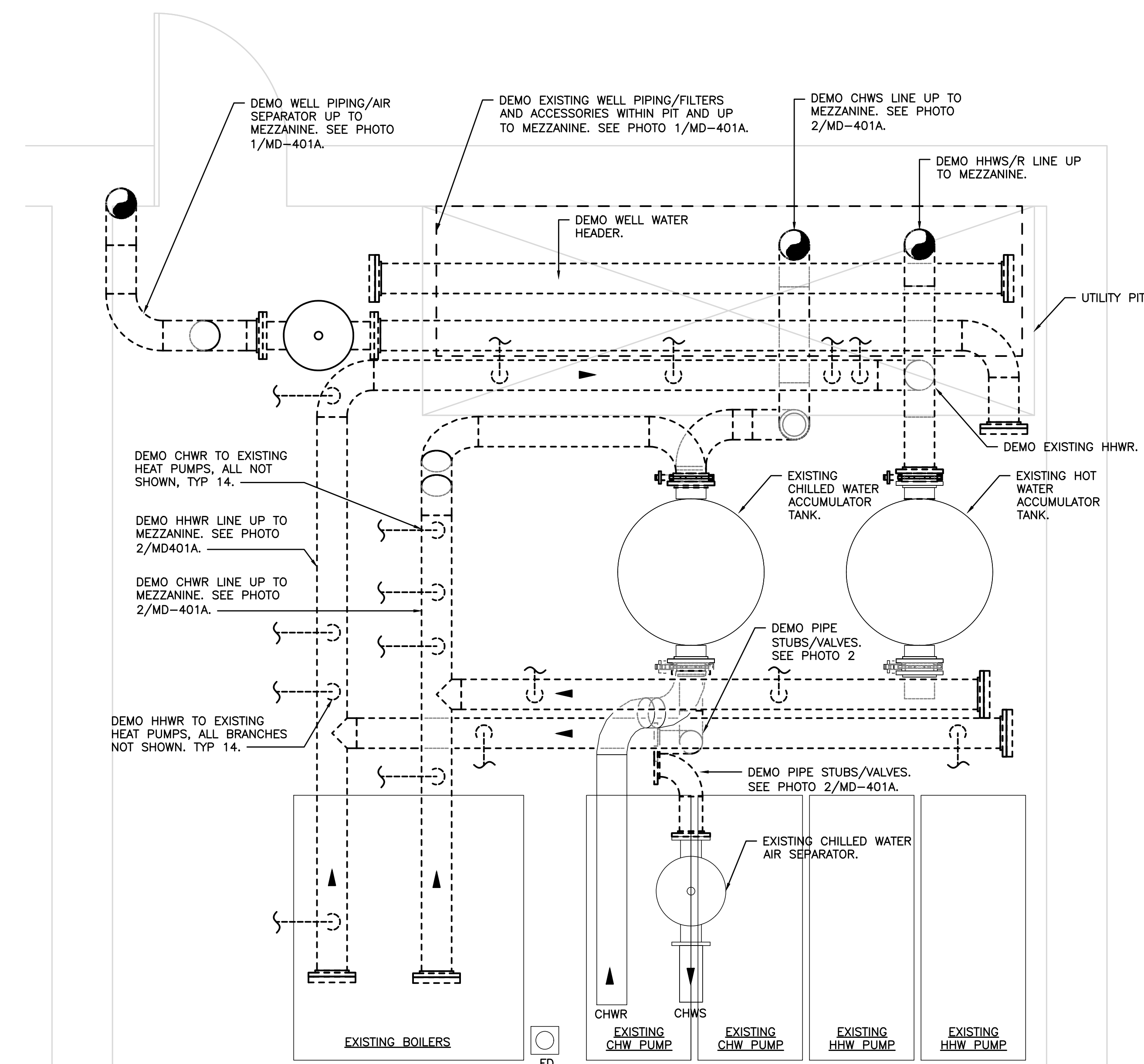
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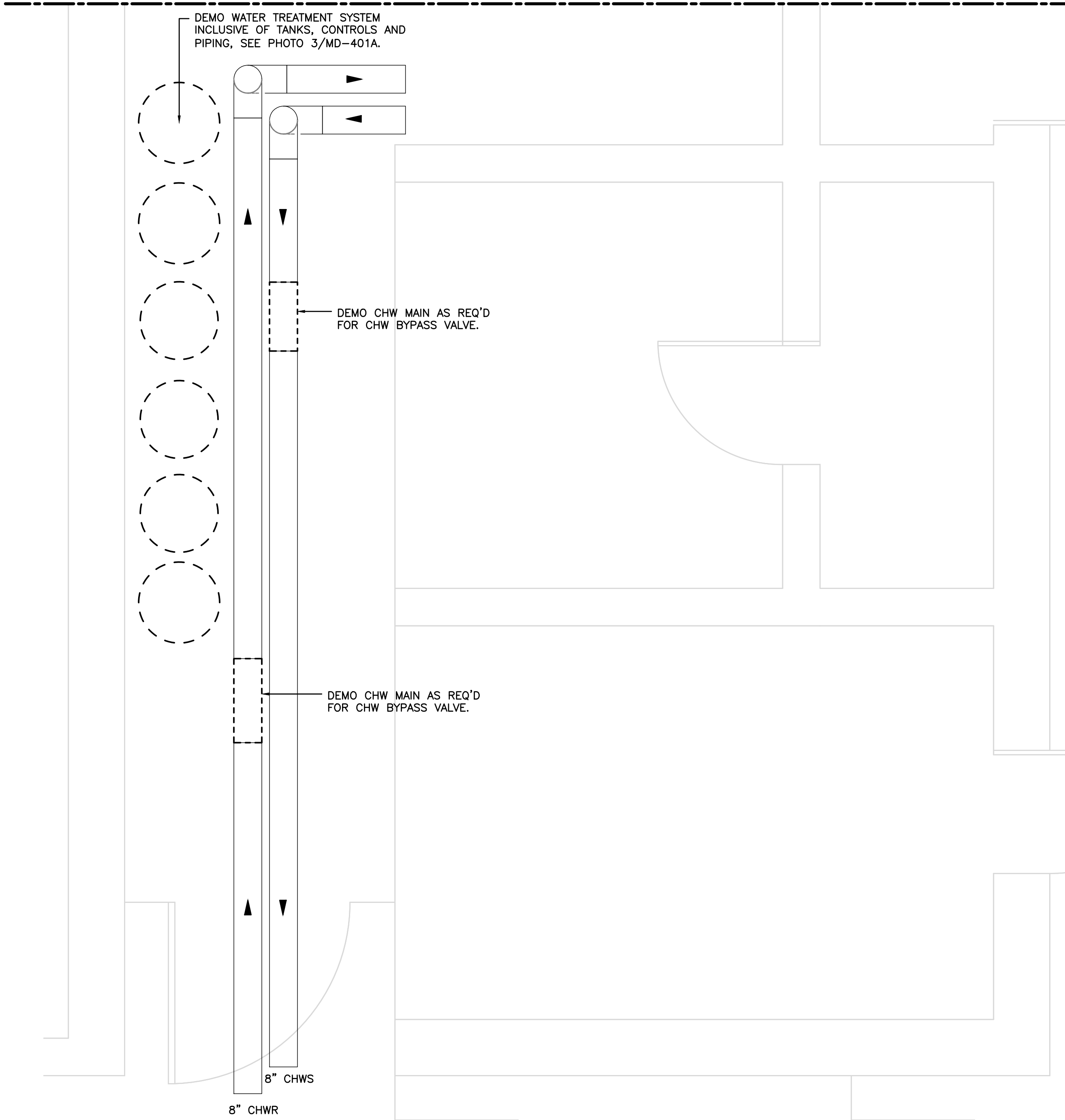
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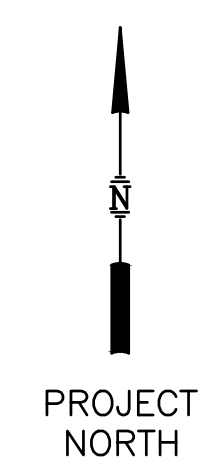
PROJ NO. 22-117 DATE: 12/29/22  
TITLE: LARGE SCALE MECHANICAL ROOM DEMO PLAN  
DWG NO. MD-401  
SIZE: ARCH D SCALE: AS NOTED



**LARGE SCALE MECHANICAL ROOM DEMO PLAN**  
SCALE: 1/2" = 1'-0"



**LARGE SCALE MECHANICAL ROOM DEMO PLAN (CONT.)**  
SCALE: 1/2" = 1'-0"



MATCHLINE A-A  
MATCHLINE B-B

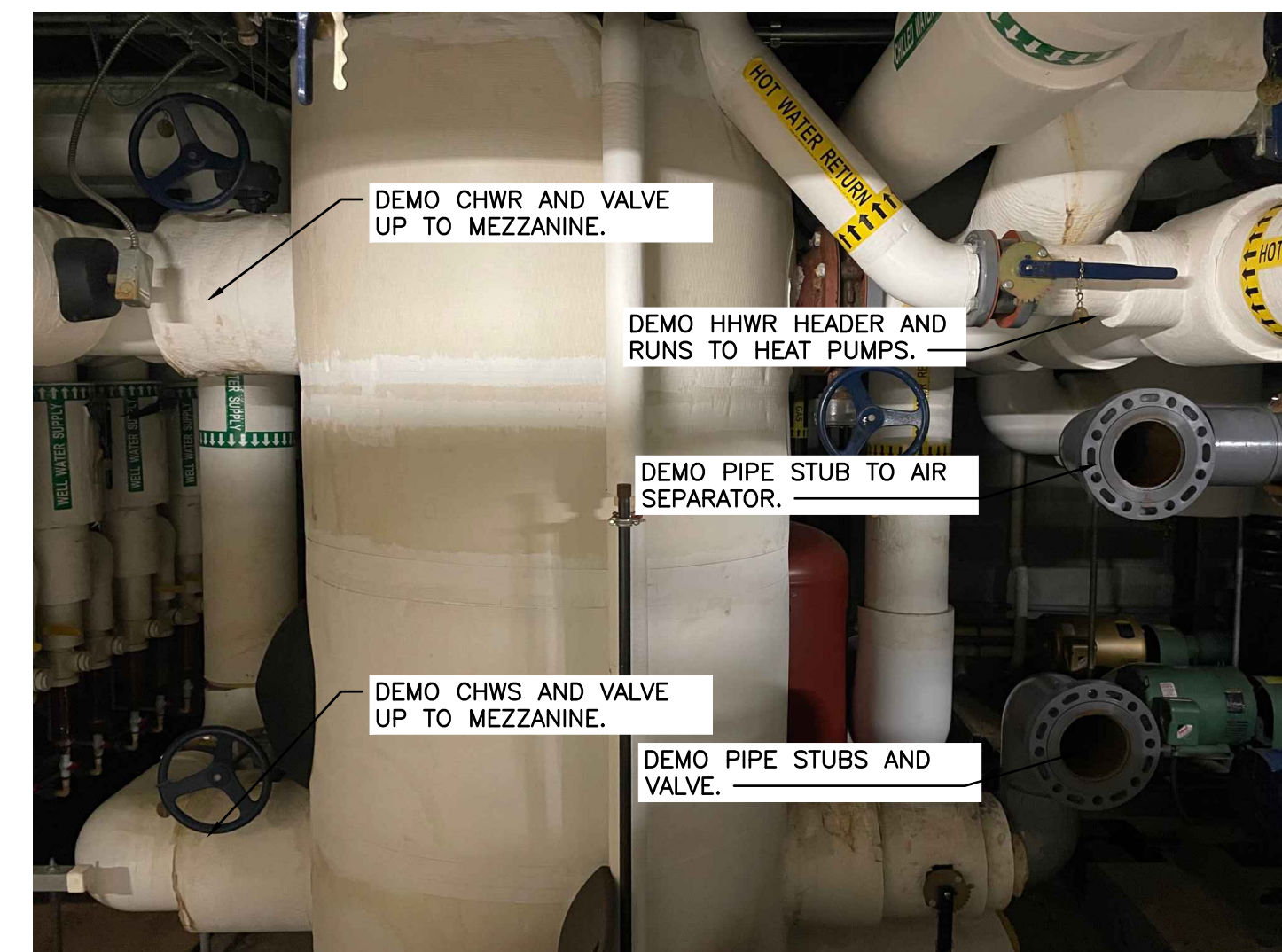
MATCHLINE A-A  
MATCHLINE B-B



1 PHOTO 1: DEMO WELL PIPING/ACCESORIES  
 MD-401 SCALE: NTS



3 PHOTO 3: DEMO WATER TREATMENT TANKS AND PIPING  
 MD-401 SCALE: NTS



2 PHOTO 2: DEMO PIPING  
 MD-401 SCALE: NTS



CLIENT

WESTBROOK SCHOOL DEPARTMENT  
 WESTBROOK MIDDLE SCHOOL  
 AIR-COOLED CHILLER INSTALLATION  
 471 STROUDWATER STREET  
 WESTBROOK, ME 04092

PROJECT

**SIMPLEX**  
 ENGINEERING



ENGINEER



DOWN BY

BY

AMS

DECIDED BY

AMS

DESIGNED BY

AMS

REV

DATE

DESCRIPTION

0

02/21/23

ISSUED FOR CONSTRUCTION

PROJ NO. 22-117

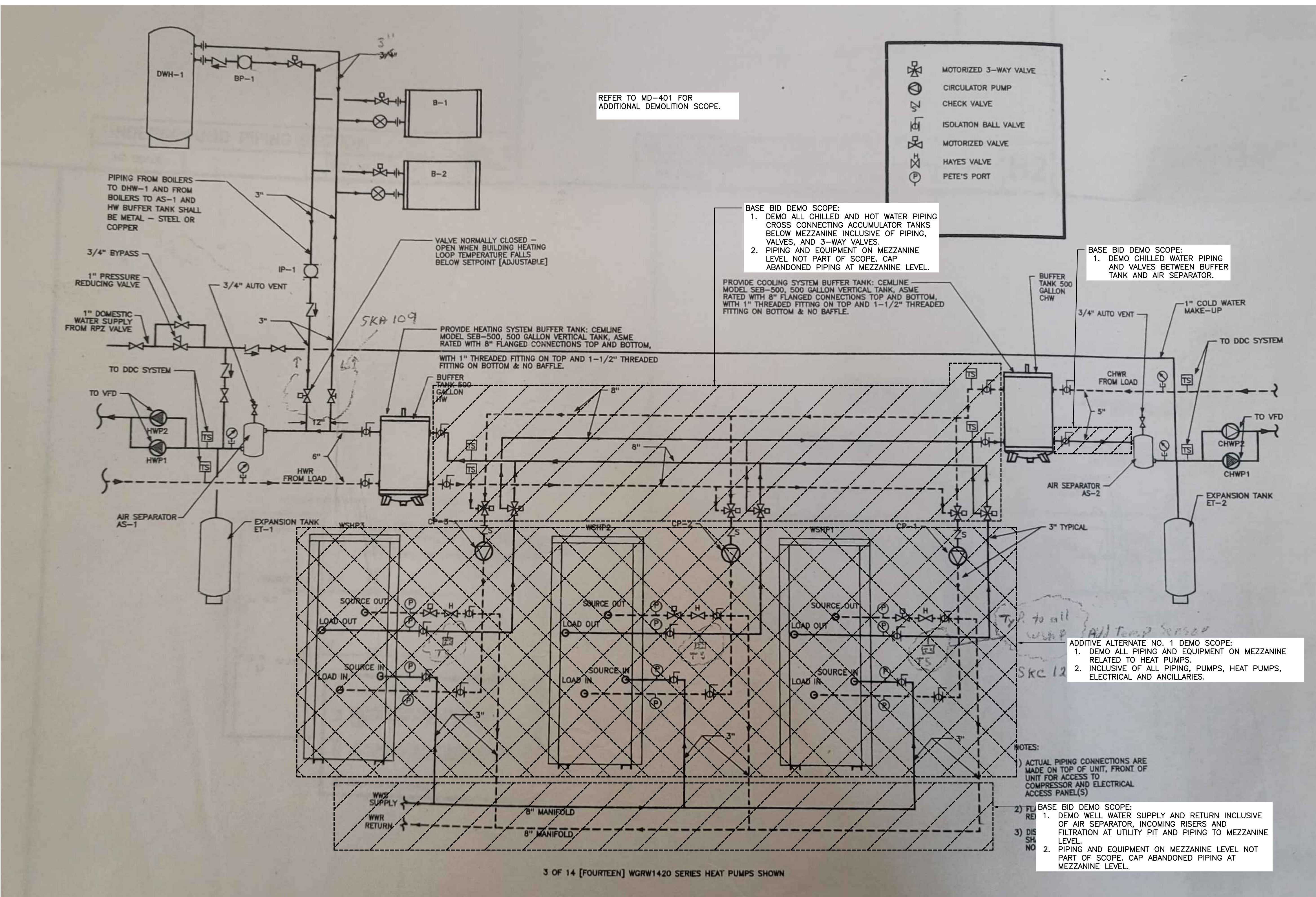
DATE: 12/20/22

TITLE: MECHANICAL ROOM DEMO PICTURES

DWG NO. M-401A

SIZE: ARCH D SCALE: AS NOTED

2436 SHEET



4-PIPE HEAT PUMP DEMO SCHEMATIC  
SCALE: NTS

NOTE:  
1. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

REFER TO MD-401 FOR ADDITIONAL DEMOLITION SCOPE.

- MOTORIZED 3-WAY VALVE
- CIRCULATOR PUMP
- CHECK VALVE
- ISOLATION BALL VALVE
- MOTORIZED VALVE
- HAYES VALVE
- PETE'S PORT

BASE BID DEMO SCOPE:  
1. DEMO ALL CHILLED AND HOT WATER PIPING CROSS CONNECTING ACCUMULATOR TANKS BELOW MEZZANINE INCLUSIVE OF PIPING, VALVES, AND 3-WAY VALVES.  
2. PIPING AND EQUIPMENT ON MEZZANINE LEVEL NOT PART OF SCOPE. CAP ABANDONED PIPING AT MEZZANINE LEVEL.

PROVIDE COOLING SYSTEM BUFFER TANK: CEMLINE MODEL SEB-500, 500 GALLON VERTICAL TANK, ASME RATED WITH 8" FLANGED CONNECTIONS TOP AND BOTTOM, WITH 1" THREADED FITTING ON TOP AND 1-1/2" THREADED FITTING ON BOTTOM & NO BAFFLE.

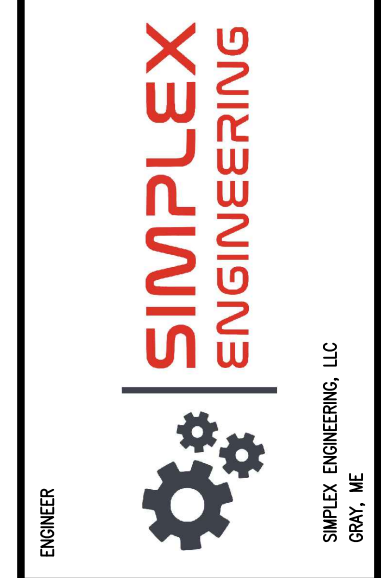
BASE BID DEMO SCOPE:  
1. DEMO CHILLED WATER PIPING AND VALVES BETWEEN BUFFER TANK AND AIR SEPARATOR.

ADDITIVE ALTERNATE NO. 1 DEMO SCOPE:  
1. DEMO ALL PIPING AND EQUIPMENT ON MEZZANINE RELATED TO HEAT PUMPS.  
2. INCLUSIVE OF ALL PIPING, PUMPS, HEAT PUMPS, ELECTRICAL AND ANCILLARIES.

- NOTES:
- 1) ACTUAL PIPING CONNECTIONS ARE MADE ON TOP OF UNIT, FRONT OF UNIT FOR ACCESS TO COMPRESSOR AND ELECTRICAL ACCESS PANEL(S)
  - 2) **FD** BASE BID DEMO SCOPE:  
1. DEMO WELL WATER SUPPLY AND RETURN INCLUSIVE OF AIR SEPARATOR, INCOMING RISERS AND FILTRATION AT UTILITY PIT AND PIPING TO MEZZANINE LEVEL.  
2. PIPING AND EQUIPMENT ON MEZZANINE LEVEL NOT PART OF SCOPE. CAP ABANDONED PIPING AT MEZZANINE LEVEL.
  - 3) **DIS SH NO**



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WESTBROOK MIDDLE SCHOOL  
AIR-COOLED CHILLER INSTALLATION  
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WESTBROOK, ME 04092



DESIGNED BY: AMS  
CHECKED BY: AMS  
APPROVED BY: AMS

REV	DATE	DESCRIPTION
0	02/21/23	ISSUED FOR CONSTRUCTION

PROJ NO: 22-117 DATE: 12/29/22  
TITLE: 4-PIPE HEAT PUMP DEMO SCHEMATIC  
DWG NO: MD-701  
SIZE: ARCH D SCALE: NONE

### ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AG	ABOVE GRADE
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DROP
BAS	BUILDING AUTOMATION SYSTEM
BD	BALANCING DAMPER
BFW	BOILER FEED WATER
BG	BELOW GRADE
BHP	BRAKE HORSEPOWER
BMS	BUILDING MANAGEMENT SYSTEM
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
CA	COMPRESSED AIR
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CLG	COOLING
CR	CONDENSATE RETURN
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
DC	DUST COLLECTOR
DB	DRY BULB
DEG	DEGREE
DIA. Ø	DIAMETER
DN	DOWN
(E)	EXISTING
EA	EACH, EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EG	ETHYLENE GLYCOL
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
F	FAHRENHEIT
FD	FLOOR DRAIN
FT	FEET
GA	GAUGE
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
HMI	HUMAN MACHINE INTERFACE
HP	HORSEPOWER, HEAT PUMP
HPC	HIGH PRESSURE CONDENSATE
HPS	HIGH PRESSURE STEAM
HR	HOUR
HTG	HEATING
HWS	HOT WATER SUPPLY
HWR	HOT WATER RETURN
HX	HEAT EXCHANGER
HZ	HERTZ
IC	INSTRUMENTATION AND CONTROL
IN	INCHES
LAT	LEAVING AIR TEMPERATURE
LB	POUND
LEL	LOWER EXPLOSIVE LIMIT SENSOR
LPG	LIQUID PROPANE GAS
LPC	LOW PRESSURE CONDENSATE
LPS	LOW PRESSURE STEAM
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MIN	MINIMUM
NC	NOISE CRITERIA
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
PCR	CONDENSATE RETURN (PUMPED)
PG	PROPYLENE GLYCOL
PH	PHASE
PICV	PRESSURE INDEPENDENT CONTROL VALVE
PRV	PRESSURE REDUCING VALVE
RED	REDUCER
RA	RETURN AIR
RG	REFRIGERANT, GAS PHASE
RL	REFRIGERANT, LIQUID PHASE
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SD	SMOKE DETECTOR
SS	STAINLESS STEEL
T	TEMPERATURE SENSOR, THERMOSTAT
TSP	TOTAL STATIC PRESSURE
TT	TEMPERATURE TRANSMITTER
TYP	TYPICAL
UH	UNIT HEATER
VD	VOLUME DAMPER
VFD	VARIABLE FREQUENCY DRIVE
W/	WITH
WB	WET BULB
WC	WATER COLUMN
WG	WATER GAUGE
WPD	WATER PRESSURE DROP

### DUCTWORK SYMBOLS

	RETURN DUCT UP
	RETURN DUCT DOWN
	SUPPLY DUCT UP
	SUPPLY DUCT DOWN
	EXHAUST DUCT UP
	EXHAUST DUCT DOWN
	SUPPLY AIR DIFFUSER
	RETURN AIR GRILLE
	RADIUS ELBOW
	MITRED ELBOW WITH TURNING VANES
	OFFSET
	DUCT TRANSITION FROM RECTANGULAR TO ROUND
	STANDARD BRANCH TAKEOFF
	VOLUME DAMPER
	FIRE DAMPER
	SMOKE DAMPER
	COMBINATION FIRE SMOKE DAMPER

### DRAWING SYMBOLS

	SECTION NUMBER
	DRAWING WHERE SECTION IS DRAWN
	TERMINAL HYDRONIC UNIT TAG
	FLOW RATE, GPM CAPACITY, MBH OR LINEAR FEET OF ELEMENT
	EQUIPMENT TAG
	EQUIPMENT SEQUENCE NUMBER
	EQUIPMENT TAG
	CFM
	REVISION TAG
	DRAWING CONTINUATION REFERENCE

### EQUIPMENT SYMBOLS

	UNIT HEATER
	MOTORIZED DAMPER (PARALLEL BLADES)
	MOTORIZED DAMPER (OPPOSED BLADES)
	BACKDRAFT DAMPER
	PNEUMATIC DAMPER
	HAND DAMPER
	CENTRIFUGAL FAN OR PUMP
	CIRCULATOR
	LOUVER
	AIR FILTER
	HEAT/COOL COIL
	H.C.C.
	PROPELLER FAN AND MOTOR
	MOTOR

### PIPING SYMBOLS

	BALANCING VALVE
	COMBINATION FLOW MEASURING/BALANCING VALVE (CIRCUIT SETTER)
	GATE VALVE
	GLOBE VALVE
	BALL VALVE
	BUTTERFLY VALVE
	CHECK VALVE
	STOP CHECK VALVE
	MULTI-PURPOSE/TRIPLE DUTY VALVE
	TWO-WAY AUTOMATIC CONTROL VALVE
	PRESSURE INDEPENDENT CONTROL VALVE W/ PRESSURE TAPS
	THREE-WAY AUTOMATIC CONTROL VALVE
	SAFETY RELIEF VALVE
	BASKET STRAINER W/ BLOWDOWN
	STRAINER W/ BALL DRAIN VALVE, HOSE BIB & CAP
	PRESSURE INDEPENDENT FLOW LIMITING VALVE
	ORIFICE PLATE FOR BALANCING (TYP)
	UNION AS DICTATED BY PIPE SIZE
	FLANGE AS DICTATED BY PIPE SIZE
	PIPE RISE
	PIPE DROP
	DRAIN VALVE WITH CAPPED HOSE CONNECTION
	PRESSURE REGULATOR
	THERMAL EXPANSION VALVE
	SIGHT GLASS/MOISTURE INDICATOR

### LINE TYPE LEGEND

	BACKGROUND
	EXISTING
	NEW WORK
	HIDDEN LINE
	OR DEMO
	CONTROL

### CONTROLS SYMBOLS

	TEMPERATURE GAUGE
	PRESSURE GAUGE W/ ISOLATION COCK
	PRESSURE GAUGE W/PIGTAIL SIPHON AND ISOLATION COCK
	P/T PORT (PRESSURE/TEMPERATURE)
	METER
	COMBINATION THERMOSTATIC AIR VENT & VACUUM BREAKER
	AUTO AIR VENT
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	RUBBER EXPANSION JOINT (2 SPHERE)
	BRAIDED EXPANSION JOINT (FLEX PIPE)
	CAP THREADED
	CAP WELDED
	FLOAT & THERMOSTATIC STEAM TRAP (W/VENT & VACUUM BREAKER)
	THERMO DYNAMIC STEAM TRAP
	INVERTED BUCKET STEAM TRAP
	THERMO STATIC STEAM TRAP (BALANCED PRESSURE TYPE)
	BALANCED FLOW RATE (GPM)
	SUCTION DIFFUSER
	VARIABLE FREQUENCY DRIVE

### GENERAL SYMBOLS

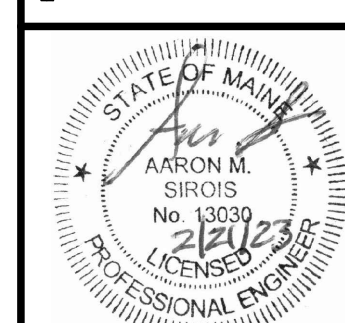
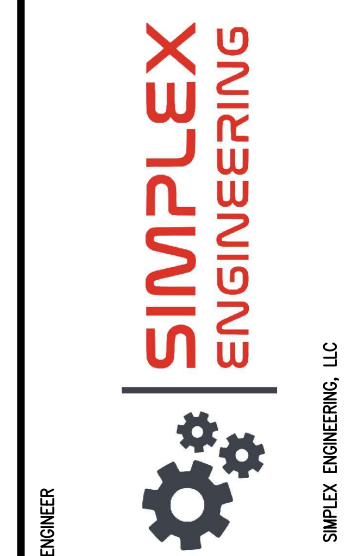
	TIE-IN POINT
	SCOPE OR SPEC BREAK
	CONTINUATION
	PIPE FLOW DIRECTION
	AIR FLOW DIRECTION
	PRESSURIZATION AIR FLOW DIRECTION
	SMACNA DUCT PRESSURE CLASS CHANGE
	SMACNA DUCT PRESSURE CLASS

### GENERAL NOTES

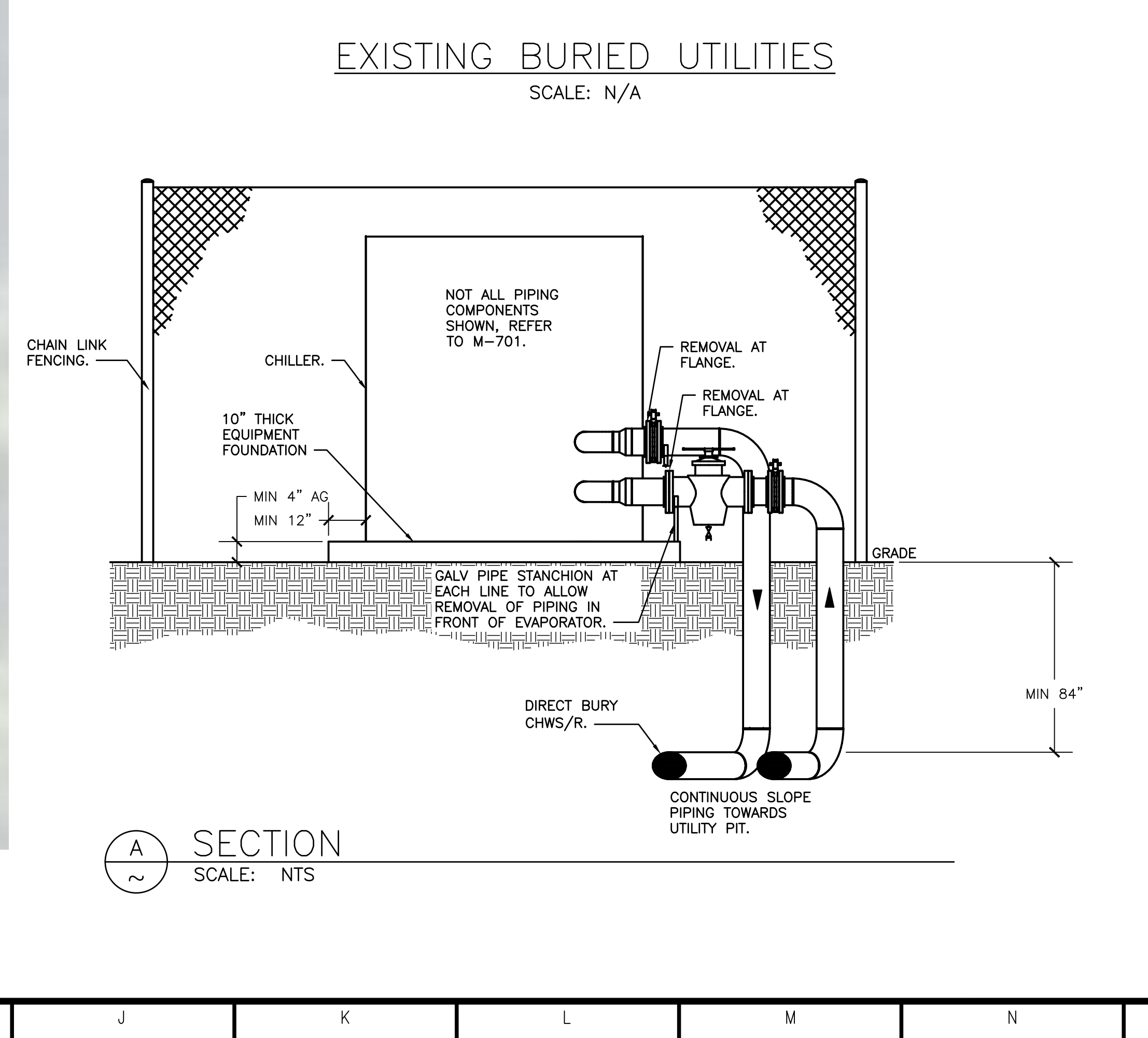
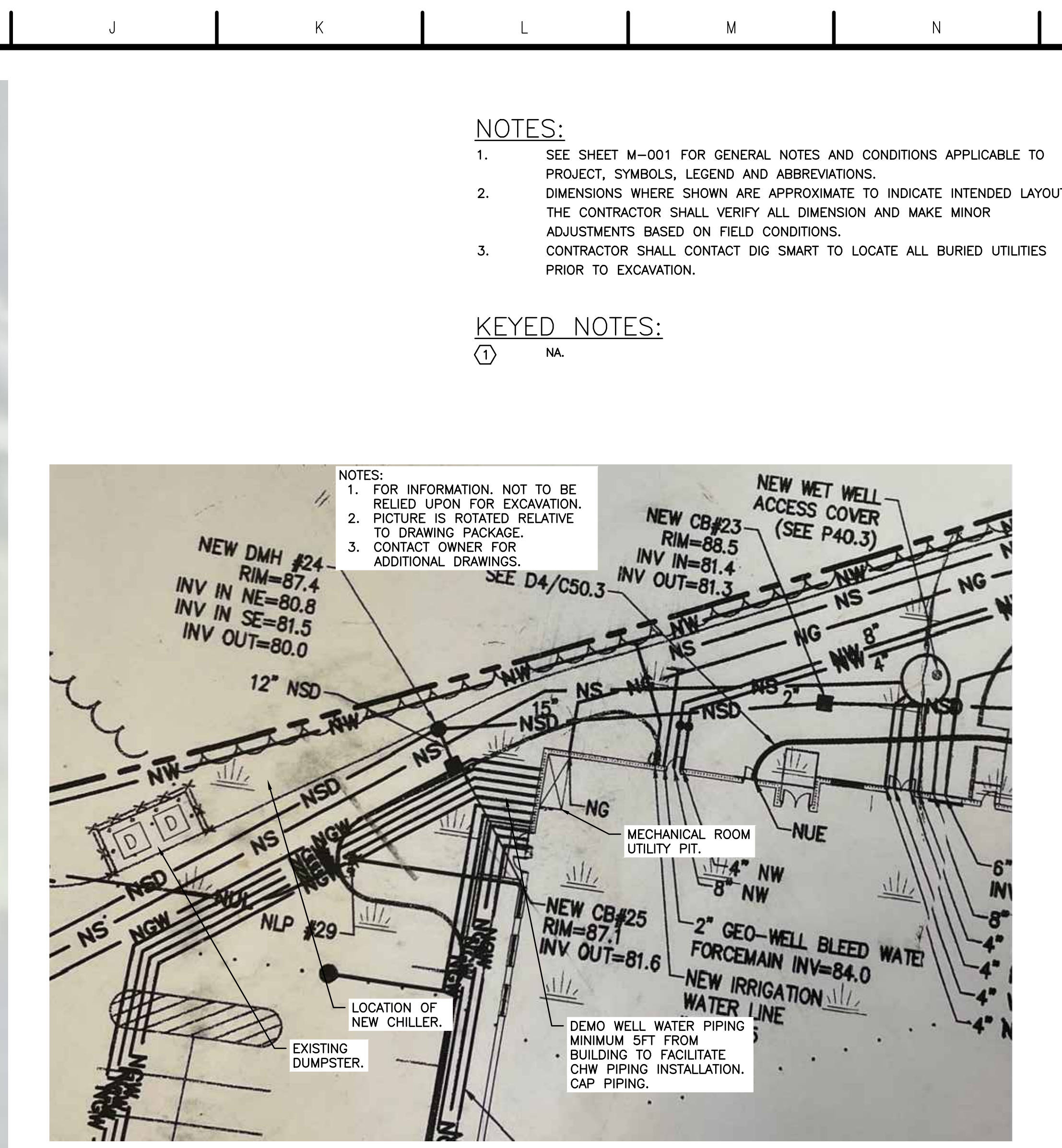
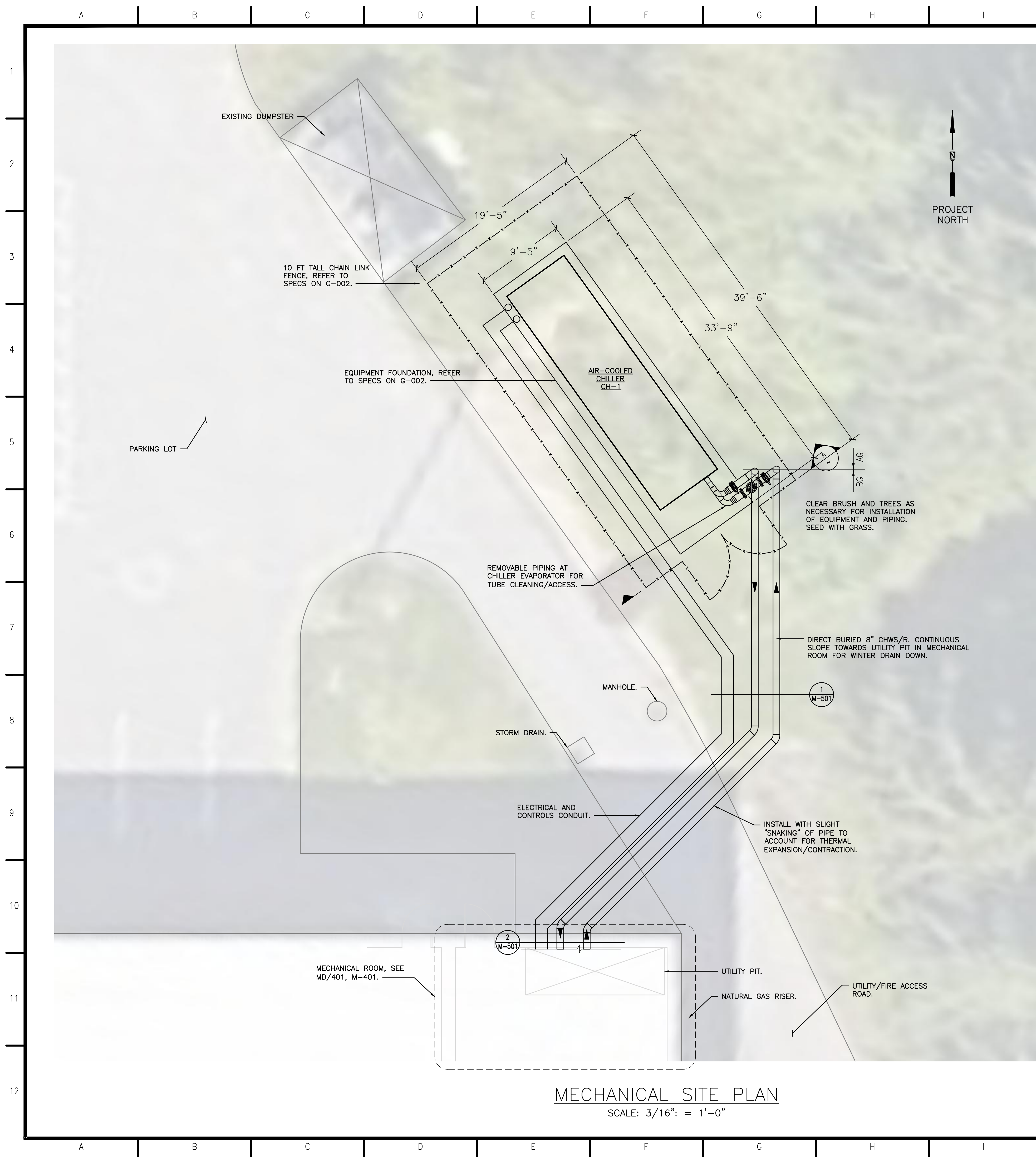
- GENERAL NOTES, SYMBOLS LIST AND DETAILS ARE APPLICABLE TO DRAWINGS MARKED M-#
- DRAWINGS ARE DIAGRAMMATIC; DETERMINE LOCATIONS OF SYSTEMS AND COMPONENTS IN FIELD.
- THE CONTRACTOR IS RESPONSIBLE FOR FIELD MEASUREMENTS.
- COORDINATE WORK OF THIS SECTION WITH THAT OF OTHER SECTIONS.
- WORK SHALL BE COORDINATED WITH TRADES INVOLVED. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST.
- VERIFY EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
- INSTALL EQUIPMENT, PIPING AND DUCTWORK AS REQUIRED TO PROVIDE VIBRATION FREE INSTALLATION AND TO FACILITATE EQUIPMENT ACCESS AS REQUIRED BY EQUIPMENT MANUFACTURER.
- INTERNAL AIR FLOW DIMENSIONS ARE SHOWN FOR DUCTS.
- PROVIDE VENTS AT HIGH POINTS IN PIPING SYSTEMS AND DRAIN VALVES AT LOW POINTS. THIS INCLUDES LOW POINTS IN COMPRESSED AIR SYSTEM PIPING TO ACCOMMODATE DRAINING MOISTURE IN LINES.
- PROVIDE ADEQUATE CLEARANCE FOR ACCESS TO HARDWARE AND DUCT FLANGES.



CLIENT  
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471 STROUDWATER STREET  
WESTBROOK, ME 04092




BY	AMS	DESIGNED BY	AMS	ENGINEERED BY	AMS
DATE	02/21/23	ISSUED FOR CONSTRUCTION			
REV	0	DATE	02/21/23	DATE	12/29/22
PROJ NO.	22-117	TITLE	MECHANICAL SYMBOLS, LEGEND & ABBREVIATIONS		
DWG NO.	M-001	SCALE	NONE		
SIZE	ARCH D	SCALE	NONE		



- NOTES:**
- SEE SHEET M-001 FOR GENERAL NOTES AND CONDITIONS APPLICABLE TO PROJECT, SYMBOLS, LEGEND AND ABBREVIATIONS.
  - DIMENSIONS WHERE SHOWN ARE APPROXIMATE TO INDICATE INTENDED LAYOUT. THE CONTRACTOR SHALL VERIFY ALL DIMENSION AND MAKE MINOR ADJUSTMENTS BASED ON FIELD CONDITIONS.
  - CONTRACTOR SHALL CONTACT DIG SMART TO LOCATE ALL BURIED UTILITIES PRIOR TO EXCAVATION.


**KEYED NOTES:**  
① NA.



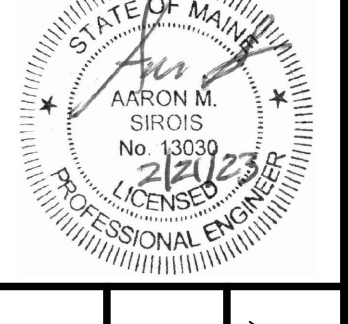
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WESTBROOK MIDDLE SCHOOL  
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471 STROUDWATER STREET  
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PROJECT



ENGINEER



DESIGNED BY: AMS  
CHECKED BY: AMS  
APPROVED BY: AMS

REV	DATE	DESCRIPTION
0	02/21/23	ISSUED FOR CONSTRUCTION

PROJ. NO. 22-117    DATE: 12/29/22  
TITLE: MECHANICAL SITE PLAN  
DWG. NO. M-002  
SIZE: ARCH D    SCALE: AS NOTED

2436 SHEET



**NOTES:**

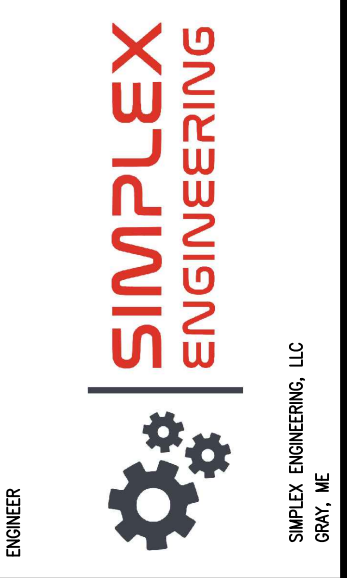
1. SEE SHEET M-001 FOR GENERAL NOTES AND CONDITIONS APPLICABLE TO PROJECT, SYMBOLS, LEGEND AND ABBREVIATIONS.
2. DIMENSIONS WHERE SHOWN ARE APPROXIMATE TO INDICATE INTENDED LAYOUT. THE CONTRACTOR SHALL VERIFY ALL DIMENSION AND MAKE MINOR ADJUSTMENTS BASED ON FIELD CONDITIONS.

**KEYED NOTES:**

- ① INSTALL 2 BLIND FLANGES AT HOT WATER ACCUMULATOR TANK.
- ② INSTALL BLIND FLANGE AT TOP CHILLED WATER ACCUMULATOR TANK FLANGE.
- ③ INSTALL BLIND FLANGE AT BOTTOM CHILLED WATER ACCUMULATOR TANK FLANGE.

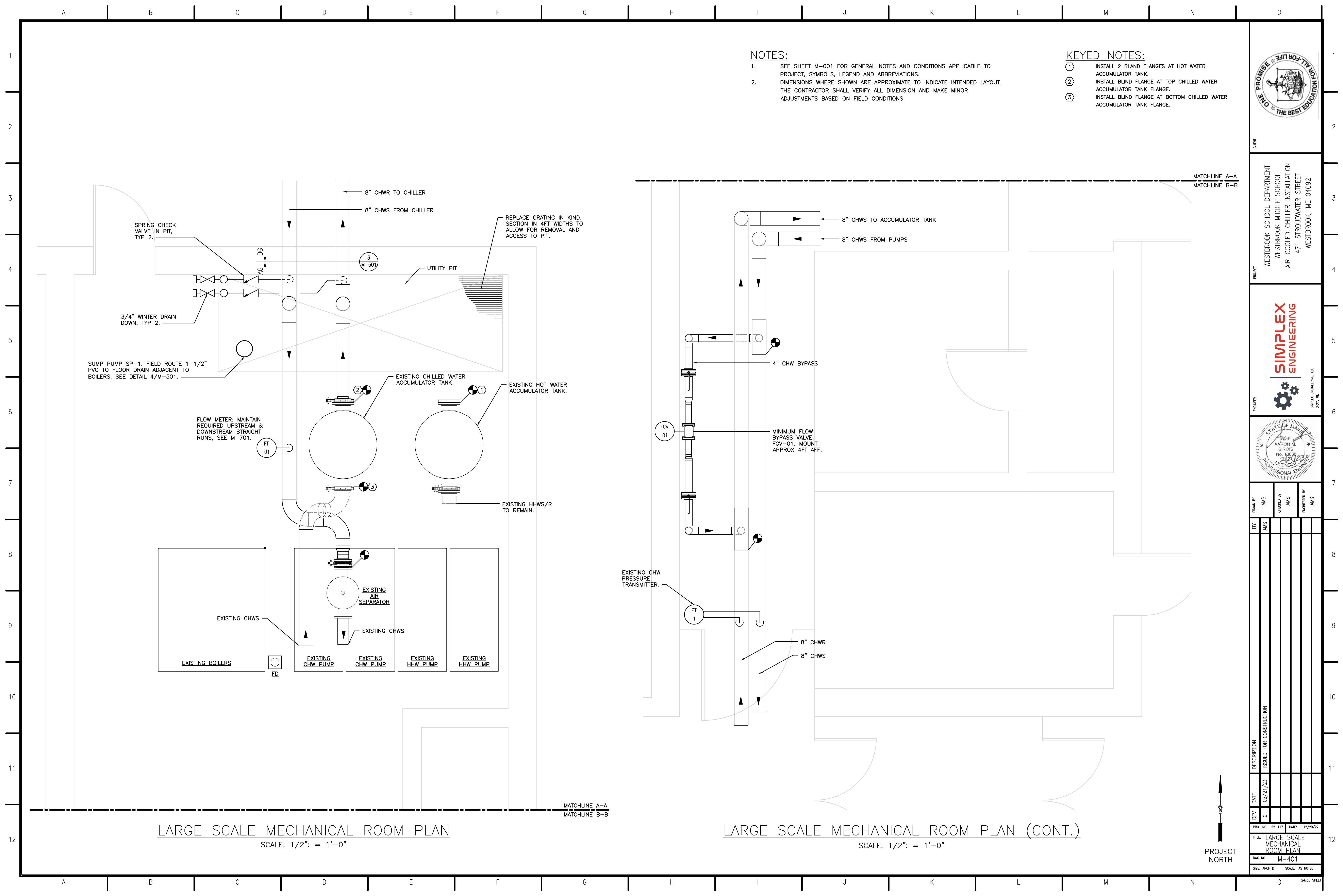


CLIENT  
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 AIR-COOLED CHILLER INSTALLATION  
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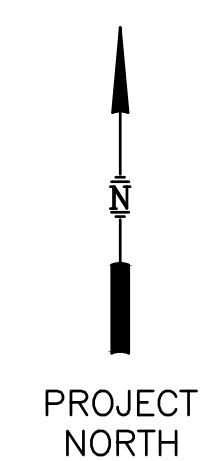
ENGINEER  
 STATE OF MAINE  
 AARON M. SIROUIS  
 No. 13399  
 PROFESSIONAL ENGINEER

PROJ NO.	22-117	DATE:	12/29/22
TITLE	LARGE SCALE MECHANICAL ROOM PLAN		
DWG NO.	M-401		
SIZE:	ARCH D	SCALE:	AS NOTED
REV	DATE	DESCRIPTION	
0	02/21/23	ISSUED FOR CONSTRUCTION	
BY	AMS	DESIGNED BY	AMS
DRAWN BY	AMS	CHECKED BY	AMS
		ENGINEER BY	AMS



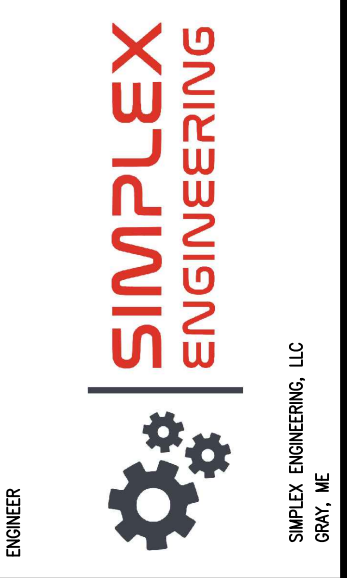
LARGE SCALE MECHANICAL ROOM PLAN  
 SCALE: 1/2" = 1'-0"

LARGE SCALE MECHANICAL ROOM PLAN (CONT.)  
 SCALE: 1/2" = 1'-0"





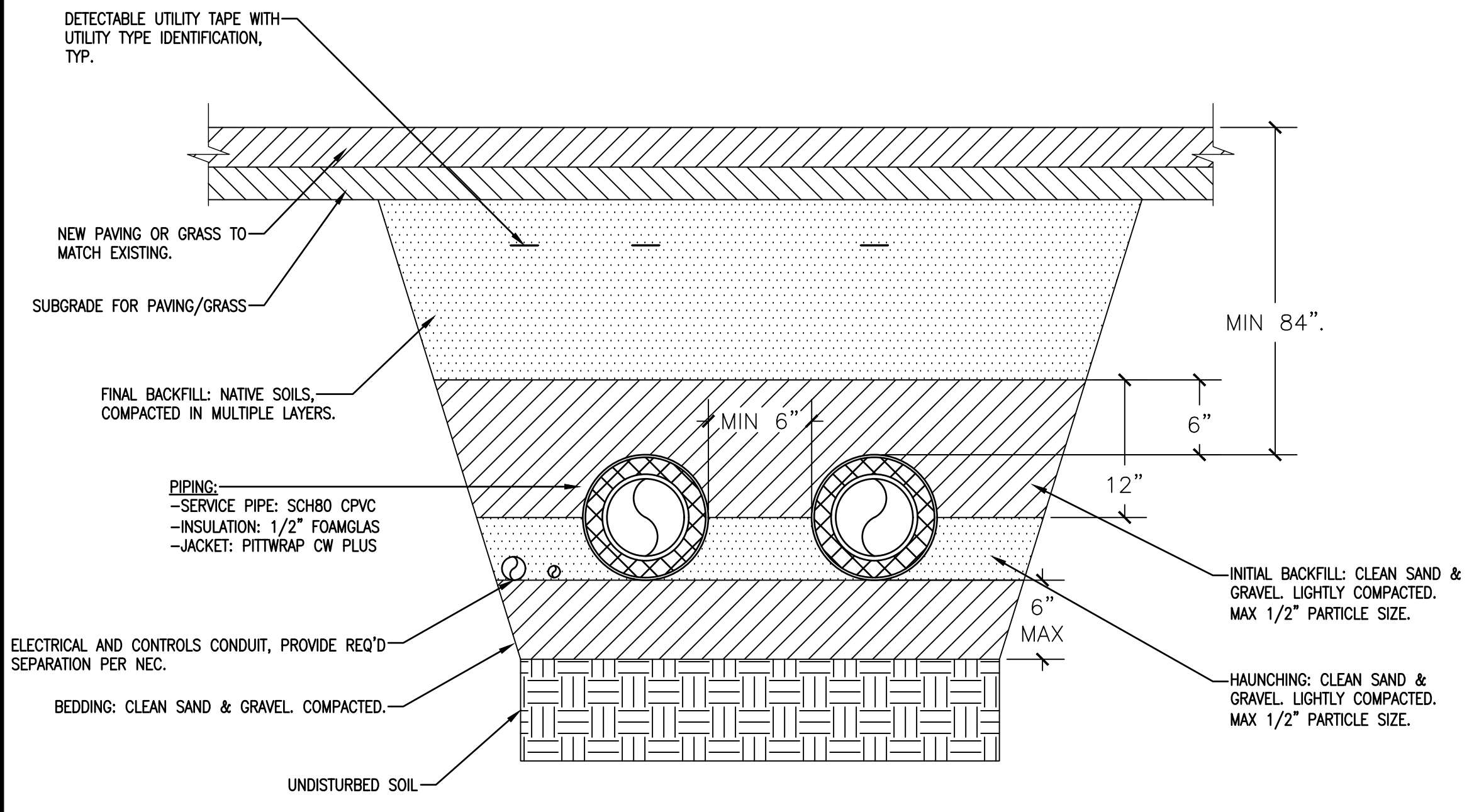
CLIENT  
WESTBROOK SCHOOL DEPARTMENT  
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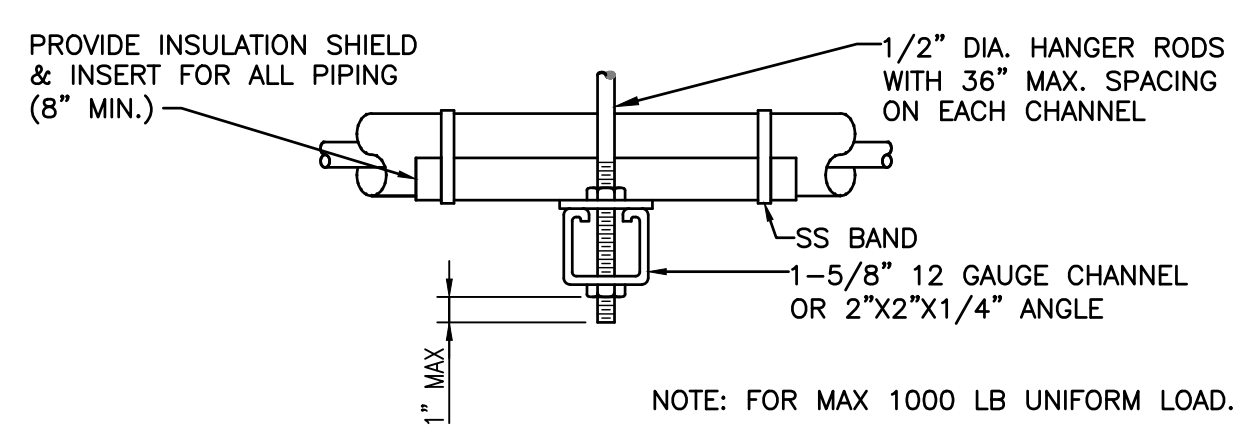
DESIGNED BY: AMS  
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APPROVED BY: AMS

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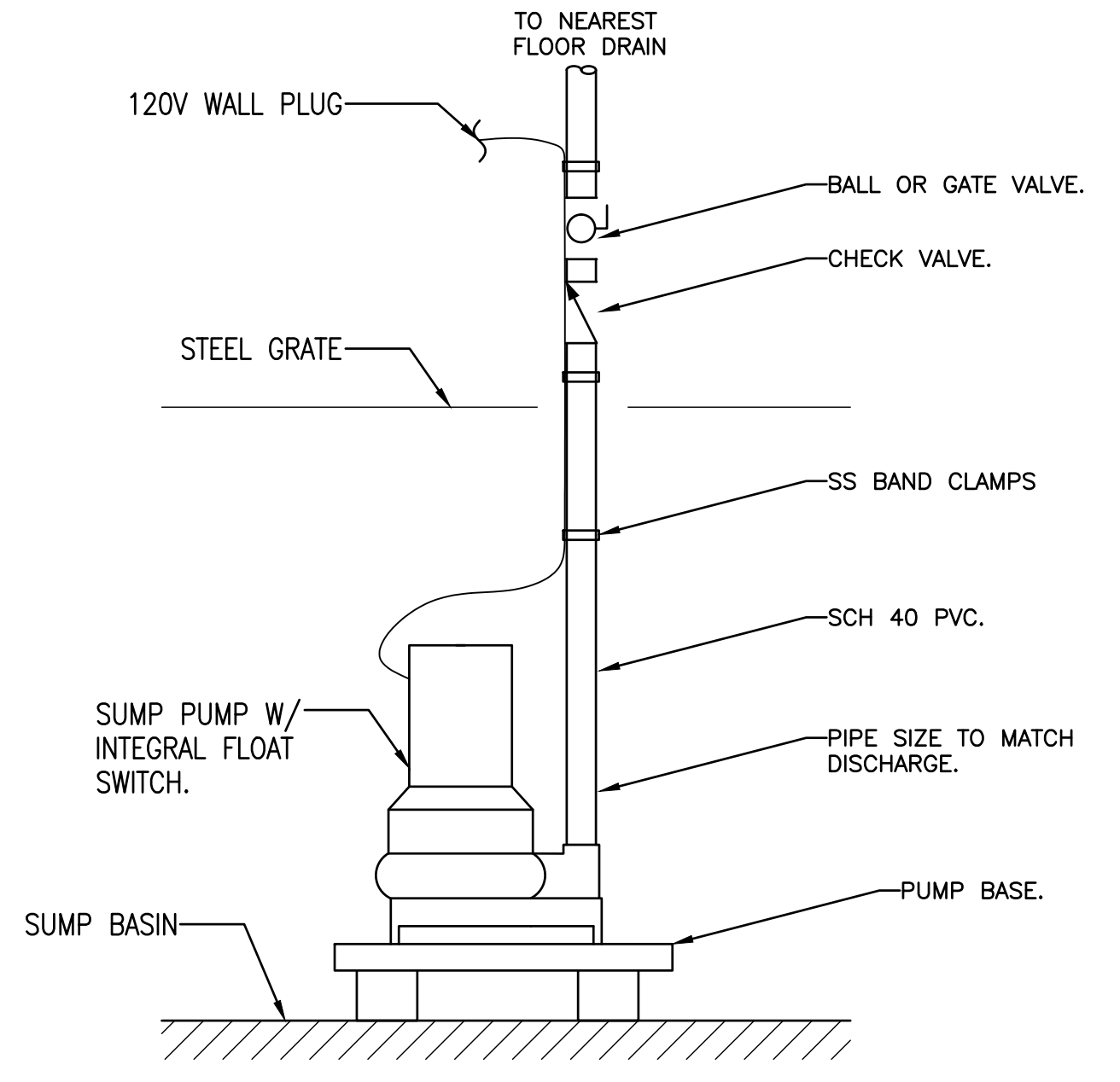
PROJ. NO. 22-117 DATE: 12/29/22  
TITLE: MECHANICAL DETAILS  
DWG. NO. M-501  
SIZE: ARCH D SCALE: NONE



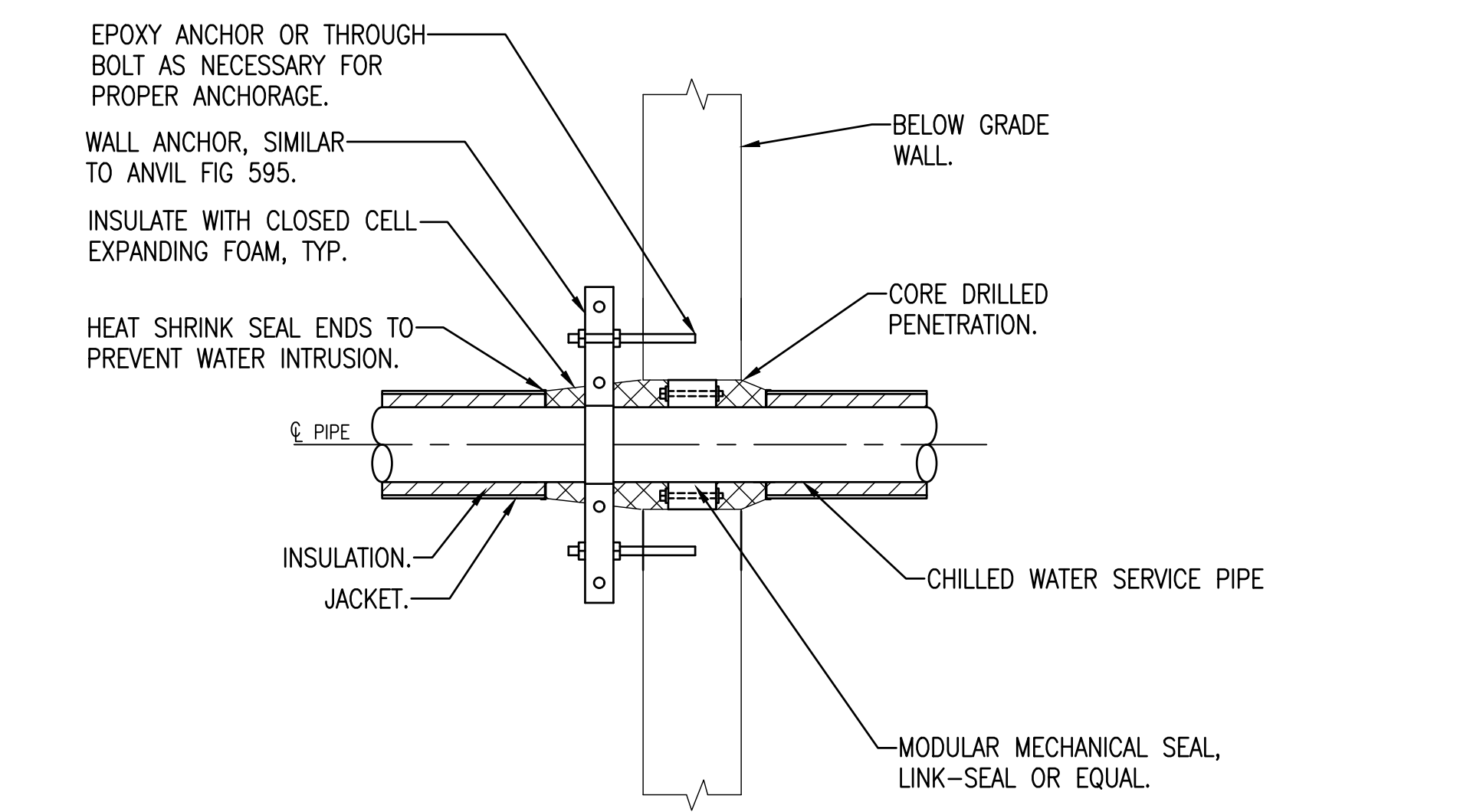
1 DIRECT BURIED CHILLED WATER PIPING DETAIL  
SCALE: NTS



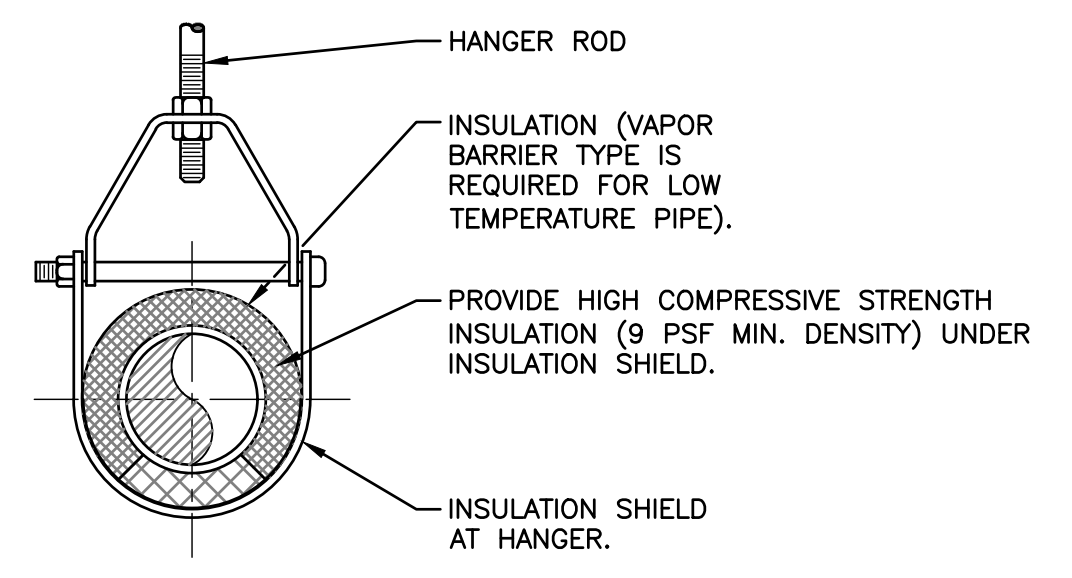
3 TRAPEZE HANGER DETAIL  
SCALE: NTS



4 SUMP PUMP DETAIL  
SCALE: NTS



2 CHILLED WATER PIPE PENETRATION DETAIL  
SCALE: NTS

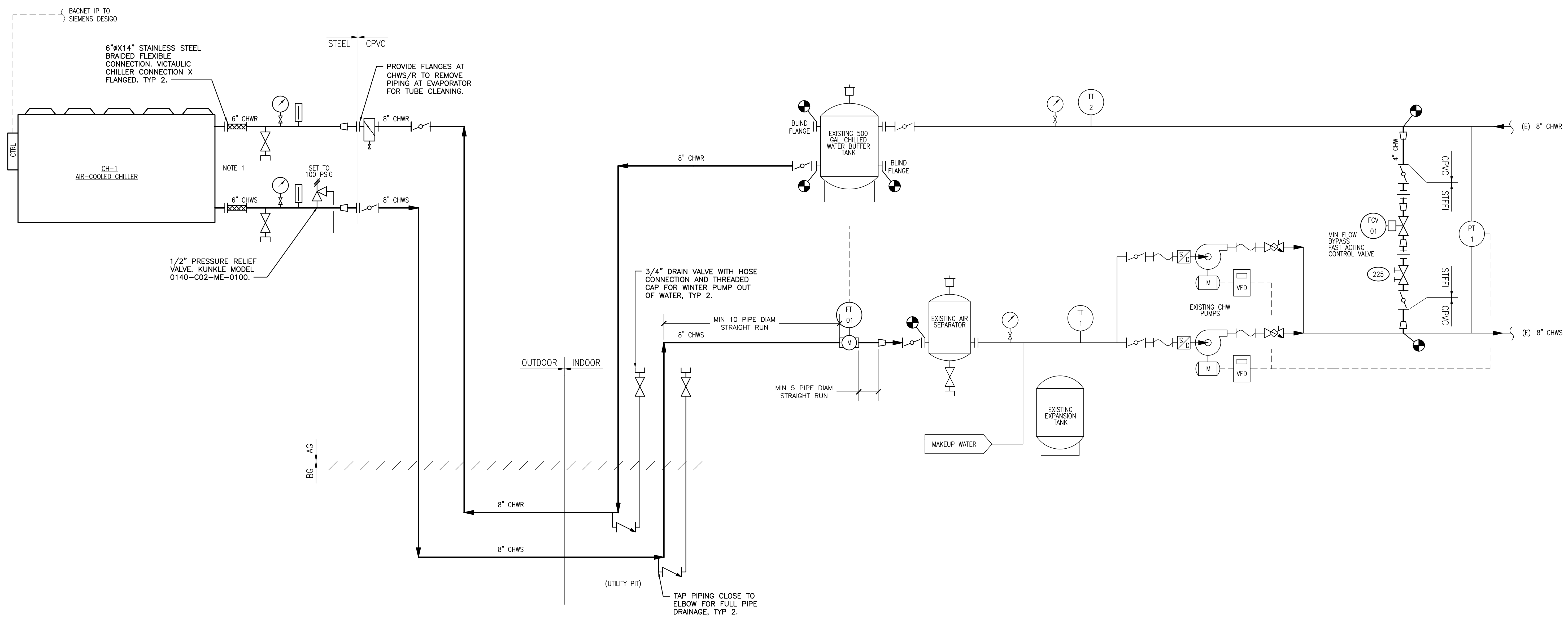


5 ADJUSTABLE CLEVIS HANGER DETAIL  
SCALE: NTS

DDC POINTS LIST	POINTS				SUPER				
	GRAPHIC	ANALOG INPUT (AI)	DIGITAL INPUT (DI)	ANALOG OUTPUT (AO)	DIGITAL OUTPUT (DO)	SOFTWARE POINT INTERLOCK	TOTALIZATION	TREND	PRELIMINARY INTEGRATION
<b>CHILLER</b>	X								
ENABLE/DISABLE	X	X							
CHWS TEMPERATURE	X	X						X	
CHWR TEMPERATURE	X	X						X	
CHW RESET SUPPLY TEMPERATURE	X		X					X	
COMMON TROUBLE ALARM	X	X							
CHILLED WATER FLOW METER	X	X							
MIN FLOW BYPASS VALVE	X		X						

- SEQUENCE OF OPERATIONS:**
- THE CHILLER IS ENABLED VIA THE BUILDING MANAGEMENT SYSTEM (BMS) ON A CALL FOR COOLING.
  - THE MINIMUM FLOW BYPASS VALVE STARTS COOLING CYCLE IN THE WIDE OPEN POSITION. THE VALVE MODULATES TO MAINTAIN A MINIMUM FLOW SETPOINT AT THE CHILLED WATER FLOW METER FT-1.
  - CHILLED WATER FLOW THROUGH THE CHILLER EVAPORATOR IS PROVEN VIA THE CHILLER FLOW SWITCH, ONCE PROVEN THE CHILLER ALLOWS OPERATION.
  - THE CHILLED WATER TEMPERATURE IS RESET LINEARLY VIA THE BMS BASED ON THE OUTSIDE AIR TEMPERATURE. AT 55 DEG F AMBIENT, THE CHILLED WATER SHALL BE 55 DEG F (ADJ.). AT 85 DEG F AMBIENT THE CHILLED WATER SHALL BE 47 DEG F (ADJ.).
  - THE CHILLED WATER PUMPS SHALL BE OPERATED PER THE EXISTING BMS CONTROL SCHEME. THE VFD MODULATES TO MAINTAIN HEADER DIFFERENTIAL PRESSURE AT THE PIPING LEAVING THE MECHANICAL ROOM. LEAD/LAG CONTROLLER ALTERNATES LEAD PUMP ON WEEKLY BASIS AND ENERGIZES LAG ON FAILURE OF LEAD.

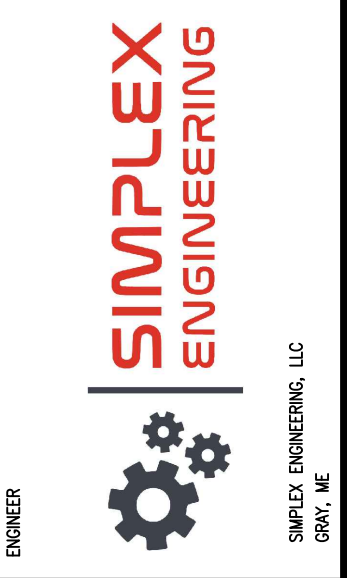
- NOTES:**
- CHW CONNECTIONS TO CHILLER SHALL BE REMOVABLE TO ALLOW COMPLETE REMOVAL OF PIPING IN FRONT OF EVAPORATOR FOR SERVICING AND TUBE CLEANING.



**CHILLED WATER PLANT P&ID**  
SCALE: NTS



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CHECKED BY: AMS  
DESIGNED BY: AMS

REV	DATE	DESCRIPTION
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PROJ NO: 22-117 DATE: 12/20/22  
TITLE: CHILLER PLANT P&ID  
DWG NO: M-701  
SIZE: ARCH D SCALE: NONE