

ELECTRICAL
PANEL
LOCATION

FOR PLUMBING, MECHANICAL,
AND ELECTRICAL WORK IN
THIS AREA REFER TO
SHEETS:
ABCS-MP1.01, ABCS-MP2.01,
ABCS-E1.01, AND ABCS-E2.01

AREA OF WORK

EXISTING
ONE STORY
METAL BLDG

EXISTING
ONE STORY
BLOCK BLDG



TOMBALL ISD - CHILLER
PACKAGE #2a

Ancillary Services Building
Baker Dr
Tomball, TX 77375

Wylie
ENGINEERING
1177 West Loop South, Suite 900
Houston, TX 77027
TX Firm No. 1869 713-781-2526
Project No. 26026.00 www.wylieeng.com

1 ABCS - OVERALL PLAN

3/64" = 1'-0"

OVERALL PLAN

ABCS -
MEP1.00

Scale 3/64" = 1'-0"

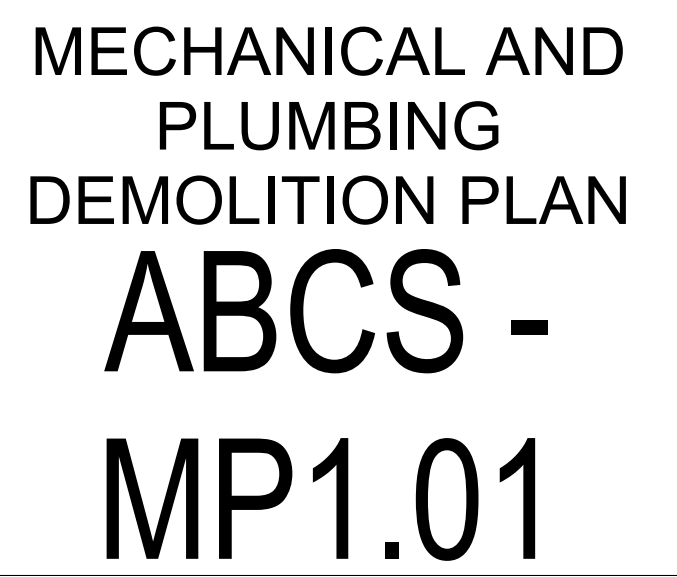
Scale AS INDICATED



- A. REFER TO REFER TO THE COVER SHEET FOR MORE INFORMATION.
- B. PRIOR TO DEMOLITION WORK, GENERAL AND MECHANICAL CONTRACTORS SHALL OBTAIN CONFIRMATION FROM BUILDING OWNER BEFORE REMOVING ANY CONDUITS, CIRCUITS, WIRING, PIPING, EQUIPMENT, CONTROLS, AND OTHERS WHICH MAY STILL BE IN USE. THE CONTRACTOR SHALL REPLACE ANY ITEMS REMOVED DURING THE DEMOLITION PROCESS WHICH ARE INTENDED TO REMAIN AT NO ADDITIONAL COST TO THE OWNER.
- C. REMOVE ALL EXISTING UNUSED OR ABANDONED MECHANICAL EQUIPMENT, CONTROLS, PIPING, WIRING, ETC. AND WHERE INDICATED IN THE DRAWING, COORDINATE DISPOSAL LOCATION WITH THE CONSTRUCTION MANAGER AND THE CLIENT REPRESENTATIVE.
- D. DEMOLISH INACTIVE PIPING BACK TO NEAREST ACTIVE MAIN AND CAP.
- E. CONTRACTOR TO COORDINATE EXTENT OF DEMOLITION WITH ALL NEW WORK PERMIT.
- F. DEMOLITION AND NEW CONSTRUCTION ACTIVITIES SHALL IN NO WAY DISRUPT ONGOING OPERATIONS. TEMPORARY SHUTDOWN SCHEDULES MUST BE APPROVED IN ADVANCE BY THE CONSTRUCTION MANAGER AND THE CLIENT REPRESENTATIVE.
- G. CONTRACTOR SHALL MAINTAIN A CLEAN JOBSITE AT ALL TIMES.

- 1 DEMOLISH EXISTING AIR COOLED CHILLER UNIT, DISCONNECT PIPES, CONTROLS AND POWER WIRING. MAKE THE SPACE READY FOR A NEW AIR COOLED CHILLER TO BE INSTALLED. PRIOR TO HAULING OFF EXISTING CHILLER, CONTRACTOR TO PROVIDE OWNER WITH ANY PARTS AND PIECES WHICH THE OWNER WOULD LIKE TO SALVAGE FOR FUTURE MAINTENANCE USE. COORDINATE WITH OWNER.
- 2 DEMOLISH EXISTING PIPING AND ALL ASSOCIATED SUPPORTS.
- 3 DEMOLISH EXISTING CHILLED WATER PUMPS IN ITS ENTIRETY, INCLUDING ALL CONTROLS, INERTIA PADS, SUPPORTS AND POWER WIRING. DEMOLISH EXISTING PIPING BACK TO ISOLATION VALVES. IF NO ISOLATION VALVES EXIST, THE CONTRACTOR IS TO PROVIDE PROVISIONS TO LINE FREEZE AND ADD NEW LINE SUPPLY AND RETURN MANUAL ISOLATION VALVES PER SPECIFICATIONS.
- 4 DEMOLISH EXISTING EXPANSION TANK IN ITS ENTIRETY, INCLUDING ALL CONTROLS, AND SUPPORTS. DEMOLISH EXISTING PIPING BACK TO ISOLATION VALVES. IF NO ISOLATION VALVES EXIST, THE CONTRACTOR IS TO PROVIDE PROVISIONS TO LINE FREEZE AND ADD NEW LINE SUPPLY AND RETURN MANUAL ISOLATION VALVES PER SPECIFICATIONS.
- 5 DEMOLISH EXISTING CHEMICAL POT FEEDER IN ITS ENTIRETY, INCLUDING ALL CONTROLS, AND SUPPORTS. DEMOLISH EXISTING PIPING BACK TO ISOLATION VALVES. IF NO ISOLATION VALVES EXIST, THE CONTRACTOR IS TO PROVIDE PROVISIONS TO LINE FREEZE AND ADD NEW LINE SUPPLY AND RETURN MANUAL ISOLATION VALVES PER SPECIFICATIONS.
- 6 DEMOLISH EXISTING AIR SEPARATOR IN ITS ENTIRETY, INCLUDING ALL CONTROLS, AND SUPPORTS. DEMOLISH EXISTING PIPING BACK TO ISOLATION VALVES. IF NO ISOLATION VALVES EXIST, THE CONTRACTOR IS TO PROVIDE PROVISIONS TO LINE FREEZE AND ADD NEW LINE SUPPLY AND RETURN MANUAL ISOLATION VALVES PER SPECIFICATIONS.
- 7 DEMOLISH ALL CHW AND HW PIPING. LOCATION INDICATED AS DASHED LINES.
- 8 PIPING SUPPORTS TO REMAIN.

Ancillary Services Building
Baker Dr
Tomball, TX 77375



Scale As indicated

EXISTING
ONE STORY
METAL BLDG

HVAC CONTROLS SCOPE OF WORK:

CONTROLS CONTRACTOR TO PROVIDE NEW CONTROLLER AND NEW CONTROLS, INCLUDING VALVES, ACTUATORS, ETC. PER DRAWINGS FOR THE CHILLER PLANT, WHICH INCLUDES CHILLER AND PUMP. CONNECT AND INCORPORATE NEW CONTROLS INTO EXISTING BUILDING AUTOMATION SYSTEM. REFER TO SHEET MP-5.01 FOR MORE INFORMATION.

CONTRACTOR TO RETURN ALL REMOVED CONTROLS CARDS AND CONTROLLERS TO THE OWNER.

MECHANICAL GENERAL NOTES:

- A. REFER TO MECHANICAL COVER SHEET FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL INFORMATION.
- B. REFER TO MECHANICAL SCHEDULES AND DETAIL DRAWINGS FOR ADDITIONAL INFORMATION.
- C. MAINTAIN MANUFACTURER'S RECOMMENDED SERVICE CLEARANCE FOR NEW AND EXISTING MECHANICAL EQUIPMENT.
- D. THE CONTRACTOR SHALL VERIFY THAT ALL EXISTING AND NEW MECHANICAL EQUIPMENT ARE MOUNTED SO THAT ALL REQUIRED CLEARANCES ARE MAINTAINED AT THE BOTTOM AND SIDES OF EACH UNIT FOR PROPER SERVICING AND MAINTENANCE. COORDINATE COMPLETELY WITH ALL NEW WALLS TO STRUCTURE, AND RELOCATE AS REQUIRED TO MAINTAIN PROPER CLEARANCES.
- E. CONTRACTOR SHALL FIELD VERIFY ACTUAL LOCATIONS OF ALL EQUIPMENT, DUCTWORK, & PIPING PRIOR TO SUBMITTING A BID. COORDINATE COMPLETELY WITH ALL OTHER TRADES. RELOCATE TERMINAL UNITS AND PROVIDE ADDITIONAL DUCTWORK, OFFSETS, FITTINGS, ETC. AS REQUIRED.

PLUMBING KEYED NOTES:

- 1 EXISTING 1 1/2" CW FROM BELOW GRADE TO REMAIN. REPLACE SHUT-OFF BALL VALVE.
- 2 PROVIDE NEW 1-1/2" RPZBFP-1, WATTS MODEL 909 SERIES REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER ASSEMBLY, RATED FOR HIGH-HAZARD APPLICATIONS, FOR HORIZONTAL INSTALLATION. COORDINATE WITH ELECTRICAL FOR HEAT TRACING POWER REQUIREMENTS. INSTALL NO MORE THAN 5'-0" ABOVE FINISHED FLOOR AND SHALL BE READILY ACCESS FOR TESTING, MAINTENANCE, AND REPAIR. REFER TO 01/ABCS - MP5.01 FOR DETAIL.
- 3 1-1/2" CW PIPING SHALL BE ROUTED, SUPPORTED, AND PROTECTED FROM PHYSICAL DAMAGE IN A MANNER SATISFACTORY TO THE OWNER. PIPING SHALL BE MOUNTED WITH FLOOR-MOUNTED PIPE STANDS OR STRUT SUPPORTS WITH CUSHIONED PIPE CLAMPS AT 6'-0" O.C. MAXIMUM. PROVIDE ADDITIONAL SUPPORT WITHIN 24" OF CHANGES IN DIRECTION, VALVES, BACKFLOW PREVENTER ASSEMBLY, AND EQUIPMENT CONNECTIONS. DO NOT REST PIPE DIRECTLY ON FLOOR OR SLAB. MAINTAIN CLEAR ACCESS TO VALVES AND ASSOCIATED APPURTENANCES. REF: ABCS-MP4.00/07
- 4 ALL WATER PIPING, VALVES, BFPs, AND ASSOCIATED APPURTENANCES SUBJECT TO FREEZING SHALL BE INSULATED WITH FACTORY-APPLIED ALUMINUM JACKET AND HEAT TRACED. COORDINATE WITH ELECTRICAL.
- 5 CONTRACTOR SHALL PROVIDE AN ALTERNATE UNIT PRICE FOR REPLACEMENT OF THE EXISTING UNDERGROUND DOMESTIC COLD WATER PIPING FROM THE POINT INDICATED BACK TO THE NEAREST ACTIVE MAIN OR BRANCH IN THE EXISTING BUILDING. IF REPLACEMENT IS DEEMED NECESSARY, CONTRACTOR SHALL FIELD VERIFY EXACT ROUTING, SIZE, CONDITION, AND EXTENT OF THE EXISTING 1-1/2" CW PIPING PRIOR TO COMMENCING WORK.
- 6 1 1/2" CW MAKE-UP (VALVED) TO SERVE MECHANICAL EQUIPMENT. COORDINATE WITH MECHANICAL FOR FINAL CONNECTION POINT.

MECHANICAL KEYNOTES

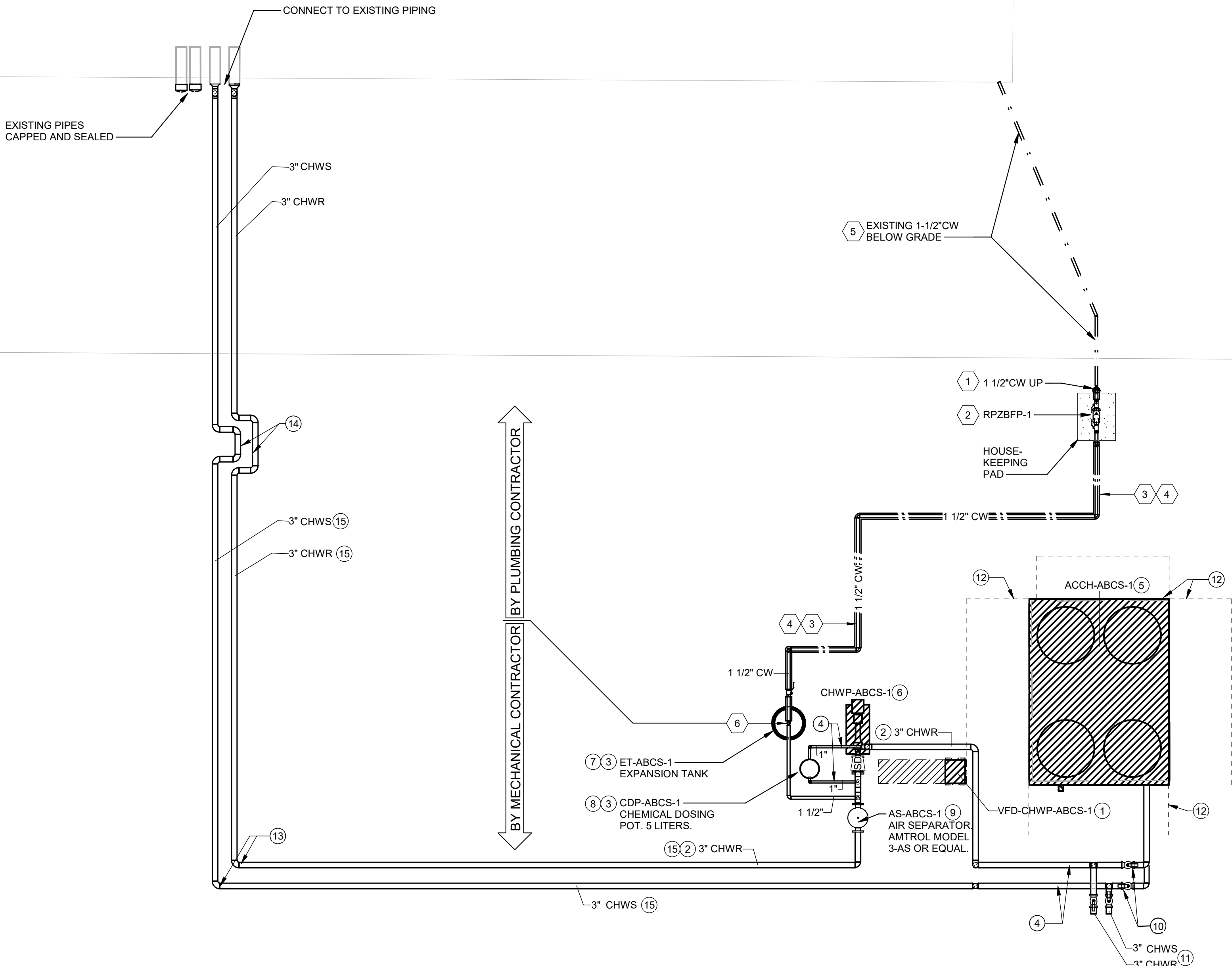
- 1 NEW OUTDOOR TYPE PUMP MOTOR VFD UNIT. PROVIDE NEW MOUNTING BRACKET AND SUPPORTS IN CONCRETE BASE. INSTALLATION SHALL BE PER MANUFACTURER'S REQUIREMENT.
- 2 PROVIDE SPRING VIBRATION TYPE ON THE FIRST 4 PIPE SUPPORTS FROM AND TO THE PUMP. OTHER SUPPORTS TO BE RIGID TYPE. REFER TO DETAIL DRAWING.
- 3 PROVIDE NEOPRENE PAD AT THE BASE OF THE UNIT FOR MOUNTING.
- 4 PROVIDE HEAT TRACE TO ALL PIPING. REFER TO ELECTRICAL.
- 5 PROVIDE A NEW AIR-COOLED CHILLER. REFER TO MECHANICAL DETAILS AND PIPING SCHEMATICS FOR ALL PIPING ACCESSORIES REQUIRED, INCLUDING VALVES, GAUGES, ETC. CONTROLS CONTRACTOR TO PROVIDE AND INSTALL NEW CONTROL VALVES AND ASSOCIATED WIRING AND PROGRAMMING TO INCORPORATE BACK INTO EXISTING CONTROLS SEQUENCE.
- 6 PROVIDE A NEW CHILLED WATER PUMP TYING INTO NEW PIPING. PROVIDE ALL NEW GAUGES, VALVES, AND ASSOCIATED APPURTENANCES, ETC. PER MECHANICAL DETAIL. CONTRACTOR TO COORDINATE ALL PIPING CONNECTIONS TO ENSURE NO UNNECESSARY CONNECTIONS ARE CREATED WHICH WOULD POTENTIALLY CREATE AN ISSUE WITH CONTROLS, GAUGES, VALVES, ETC. TO BE INSTALLED IN THE PIPING. REFER TO SCHEDULE SHEET FOR ADDITIONAL INFORMATION.
- 7 PROVIDE A NEW EXPANSION TANK TYING INTO NEW PIPING. PROVIDE ALL NEW GAUGES, VALVES, AND ASSOCIATED APPURTENANCES, ETC. PER MECHANICAL DETAIL. CONTRACTOR TO COORDINATE ALL PIPING CONNECTIONS TO ENSURE NO UNNECESSARY CONNECTIONS ARE CREATED WHICH WOULD POTENTIALLY CREATE AN ISSUE WITH CONTROLS, GAUGES, VALVES, ETC. TO BE INSTALLED IN THE PIPING.
- 8 PROVIDE A CHEMICAL POT FEEDER TYING INTO NEW PIPING. PROVIDE ALL NEW GAUGES, VALVES, AND ASSOCIATED APPURTENANCES, ETC. PER MECHANICAL DETAIL. CONTRACTOR TO COORDINATE ALL PIPING CONNECTIONS TO ENSURE NO UNNECESSARY CONNECTIONS ARE CREATED WHICH WOULD POTENTIALLY CREATE AN ISSUE WITH CONTROLS, GAUGES, VALVES, ETC. TO BE INSTALLED IN THE PIPING.
- 9 PROVIDE A NEW AIR SEPARATOR TYING INTO EXISTING PIPING TO REMAIN.
- 10 NEW CHILLED WATER PIPES, ISOLATION VALVES COMPLETE WITH INSULATION AS REQUIRED.
- 11 CHWS/R EMERGENCY CONNECTION.
- 12 OUTLINE OF CHILLER UNIT SERVICE AND MAINTENANCE CLEARANCE.
- 13 PROVIDE WITH RIGID PIPE SUPPORT CLOSE TO THE BEND.
- 14 PIPE EXPANSION LOOP ASSOCIATED WITH SUPPORT.
- 15 PROVIDE WITH PIPE ROLLER SUPPORT.

LINETYPE LEGEND

	ITEMS EXISTING TO REMAIN
	ITEMS EXISTING TO BE REMOVED
	NEW ITEMS

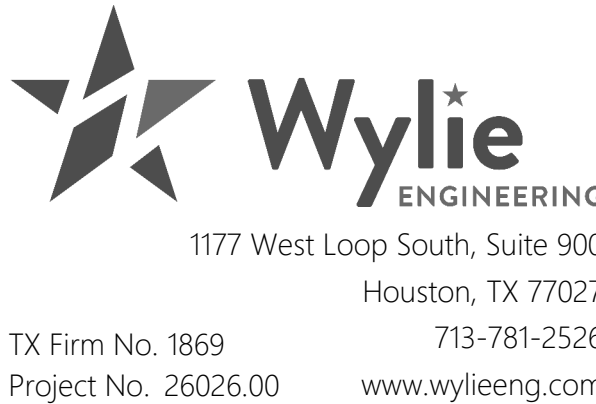
1 ABCS - MECHANICAL PLAN

1/4" = 1'-0"



TOMBALL ISD - CHILLER
PACKAGE #2a

Ancillary Services Building
Baker Dr
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MECHANICAL AND
PLUMBING PLAN

ABCS -
MP2.01

Scale As indicated

[illegible]

NOTES:

1. PROVIDE WITH PREMIUM EFFICIENCY VSD-RATED MOTOR. PROVIDE ELECTRICALLY INSULATED BEARINGS ON VSD DRIVEN MOTORS.
2. PUMP SHALL BE INSTALLED ON A NEW CONCRETE INERTIA BASE. PROVIDE VIBRATION ISOLATION RAILS, VARIABLE SPEED DRIVE (VSD), AND
3. ELECTRICAL DISCONNECT TO THE EXISTING PUMP ELECTRICAL SERVICE.
4. ELECTRICAL DISCONNECT SHALL BE PROVIDED AND INSTALLED BY EPC.
5. PUMP SHALL HAVE ABB VSD OR APPROXIMATELY EQUAL.
6. PUMP SHALL BE OVERTOURN RATED AND MOTOR RATED AT 122°F (50°C) AMBIENT TEMPERATURE.
7. CONTROLS CONTRACTOR TO PROVIDE NEW CONTROLLERS AND SEQUENCE PER TSD STANDARDS FOR NEW VARIABLE FREQUENCY DRIVE (PUMPS)
8. MECHANICAL CONTRACTOR SHALL VERIFY QUALITY OF ALL CONNECTIONS AND FIELD WELDING. MECHANICAL CONTRACTOR TO COORDINATE LOCATIONS OF TAPS FOR DP SENSORS WITH CONTROLS CONTRACTOR. RECOMMEND TO BE INSTALLED APPROXIMATELY TWO THIRDS
9. DOWNSTREAM FROM THE PUMP BODY.
10. CONTRACTOR SHALL VERIFY PUMP BODY DISCHARGE PIPING CONNECTION TO ENSURE ALIGNMENT WITH PIPING OR ADJUST PIPING AS REQUIRED WHILE MAINTAINING APPEARANCES AS SHOWN IN THE DETAILS.
11. PROVIDE 690AC CONTROLLER.

[illegible]

NOTES:

1. CERTIFIED IN ACCORDANCE WITH THE AHRI AIR-COOLED WATER CHILLING PACKAGES CERTIFICATION PROGRAM, WHICH IS BASED ON AHRI STANDARD 550 / 590 (I-P) AND AHRI STANDARD 551 / 591 (SI).
2. CHILLER UNIT SHALL BE PROVIDED WITH VARIABLE SPEED CONDENSER PANS.
3. CHILLER UNIT SHALL BE PROVIDED WITH CONDENSER FIN MATERIAL OF MICROCHANNEL COILS WITH COMPLETE COAT.
4. CHILLER UNIT SHALL BE PROVIDED WITH BACNET INTERFACE.
5. CHILLER UNIT SHALL BE PROVIDED WITH WIDE AMBIENT RATED FROM 0-125°F.
6. CHILLER UNIT SHALL BE PROVIDED WITH FREEZE PROTECTION.
7. CHILLER UNIT SHALL BE PROVIDED WITH INSULATION FOR HIGH HUMIDITY / LOW EVAP TEMP.
8. CHILLER UNIT SHALL BE PROVIDED WITH ACROSS THE LINE STARTER / DIRECT ON LINE STARTER TYPE.
9. CHILLER UNIT SHALL BE PROVIDED WITH SINGLE POINT POWER CONNECTION, PROVIDE CIRCUIT BREAKER WITH HIGH FAULT RATED CONTROL PANEL POWER LIN CONNECTION TYPE.
10. CHILLER UNIT SHALL BE PROVIDED WITH ELASTOMERIC ISOLATORS.
11. CHILLER UNIT SHALL BE PROVIDED WITH FACTORY INSTALLED STRAINER.
12. CHILLER UNIT SHALL BE PROVIDED WITH SUPER QUIET SOUND ATTENUATOR PACKAGE.
13. CHILLER UNIT SHALL BE PROVIDED WITH ARCHITECTURAL LOUVER PANELS.
14. CHILLER UNIT SHALL BE INSTALLED IN AN EXISTING PAD. CONTRACTOR IS RESPONSIBLE TO MAKE ANY NECESSARY ADJUSTMENT WHERE REQUIRED.
15. PROVIDE 65KA CONTROLLER.

[illegible]

NOTES:

1. CERTIFIED IN ACCORDANCE WITH THE AHRI AIR-COOLED WATER CHILLING PACKAGES CERTIFICATION PROGRAM, WHICH IS BASED ON AHRI STANDARD 550 / 590 (I-P) AND AHRI STANDARD 551 / 591 (SI).
2. RATED IN ACCORDANCE WITH AHRI (AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE) STANDARD 550/590, LATEST EDITION (U.S.A.) AND ALL UNITS SHALL BE ASHRAE (AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS) 90, 2019 COMPLIANT.
3. VARIABLE SPEED CONDENSER FANS.
4. DIGITAL SCROLL-TYPE COMPRESSORS.
5. CUAL E-COATED CONDENSER AND SHELL AND TUBE EVAPORATOR.
6. BACnet IP & BACnet MS/TP.
7. EVAPORATOR HEATER (FREEZE PROTECTION)
8. REMOTE CONNECTIVITY & GFI
9. SINGLE POINT POWER.
10. FULL HAIL GUARDS.
11. DISCONNECT.
12. CHILLER UNIT SHALL BE INSTALLED IN AN EXISTING PAD. CONTRACTOR IS RESPONSIBLE TO MAKE ANY NECESSARY ADJUSTMENT WHERE REQUIRED.
13. PROVIDE BSAKAC CONTROLLER.

[illegible]

NOTES:

1. CERTIFIED IN ACCORDANCE WITH THE AHRI AIR-COOL-HEATED WATER CHILLING PACKAGES CERTIFICATION PROGRAM, WHICH IS BASED ON AHRI STANDARD 550 / 580 (L/P) AND AHRI STANDARD 551 / 591 (S).
2. CERTIFIED IN ACCORDANCE WITH THE AHRI (AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE) STANDARD 550/590, LATEST EDITION (U.S.A.) AND ALL UNITS SHALL BE ASHRAE (AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS) 90.1-2019 COMPLIANT.
3. VARIABLE SPEED CONDENSER FANS
4. FULLY HERMETIC, DIRECT DRIVE, SCROLL-TYPE COMPRESSORS
5. CUAL-C-EOATED CONDENSER AND SHELL AND TUBE EVAPORATOR
6. BACNET/MT-IP, MODBUS AND ZIG-BEE COMMUNICATIONS, WITH LON PROTOCOL SERVED THROUGH AN ELINK COMMUNICATION CARDS.
7. SINGLE-POINT POWER TERMINAL, NON-FUSED DISCONNECT SWITCH
8. HIGH AND LOW AMBIENT KIT
9. FULL UNIT LOW VOLTAGE PANELS
10. LEVEL ADJUSTING SPRING TYPE VIBRATION ISOLATORS
11. CHILLER UNIT SHALL BE INSTALLED IN AN EXISTING PAD, CONTRACTOR IS RESPONSIBLE TO MAKE ANY NECESSARY ADJUSTMENT WHERE REQUIRED
12. PROVIDE BSAAC CONTROLLER.

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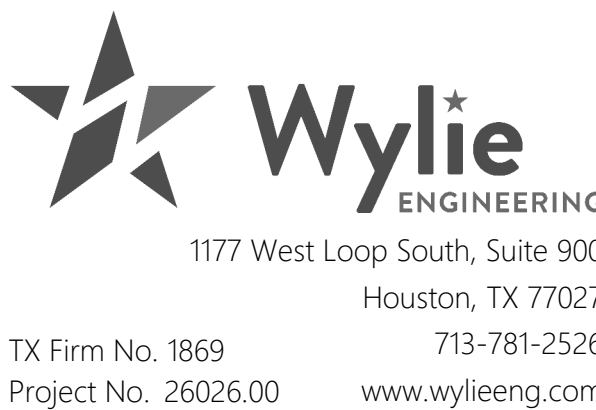
NOTES:

1. PROVIDE SUPPORT FOR VERTICAL MOUNTING.
2. OUTDOOR TYPE, WEATHER / WATER PROOF
3. RATED AT 105°F AMBIENT TEMPERATURE.
4. NORMAL DUTY.

[illegible]

**TOMBALL ISD - CHILLER
PACKAGE #2a**

Ancillary Services Building
Baker Dr
Tomball, TX 77375



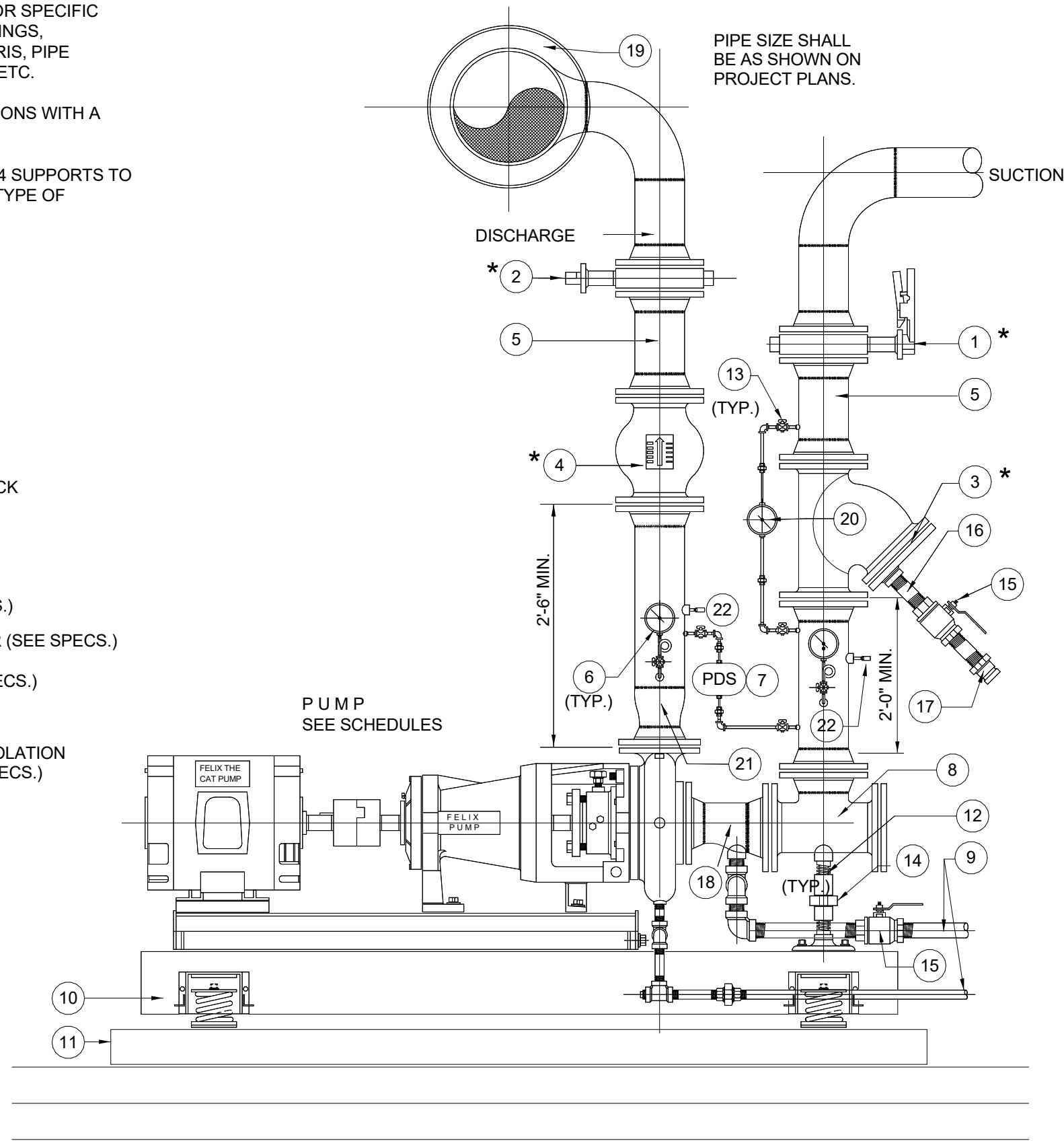
MECHANICAL AND PLUMBING SCHEDULES ABCS - MP3.01

Scale $3/32" = 1'-0"$

1. REFER TO PLAN DRAWING FOR PIPING CONFIGURATION FOR EACH INDIVIDUAL PUMP.
2. REFER TO PLANS, DETAILS, AND SPECIFICATIONS FOR SPECIFIC PUMP, CONCRETE BASE, VIBRATION ISOLATION SPRINGS, HOUSEKEEPING PADS, VALVES, STRAINERS, VENTURIS, PIPE FITTINGS, GAUGES, SENSORS, AND CONTROLLERS, ETC.
3. INSTALL TEST PLUGS IN EASILY ACCESSIBLE LOCATIONS WITH A MINIMUM OF 12" CLEARANCE IN FRONT.
4. PROVIDE VIBRATION ISOLATOR TYPE ON THE FIRST 4 SUPPORTS TO AND FROM THE PUMPS. REFER TO SPECS FOR THE TYPE OF SUPPORTS REQUIRED.

NOTES:

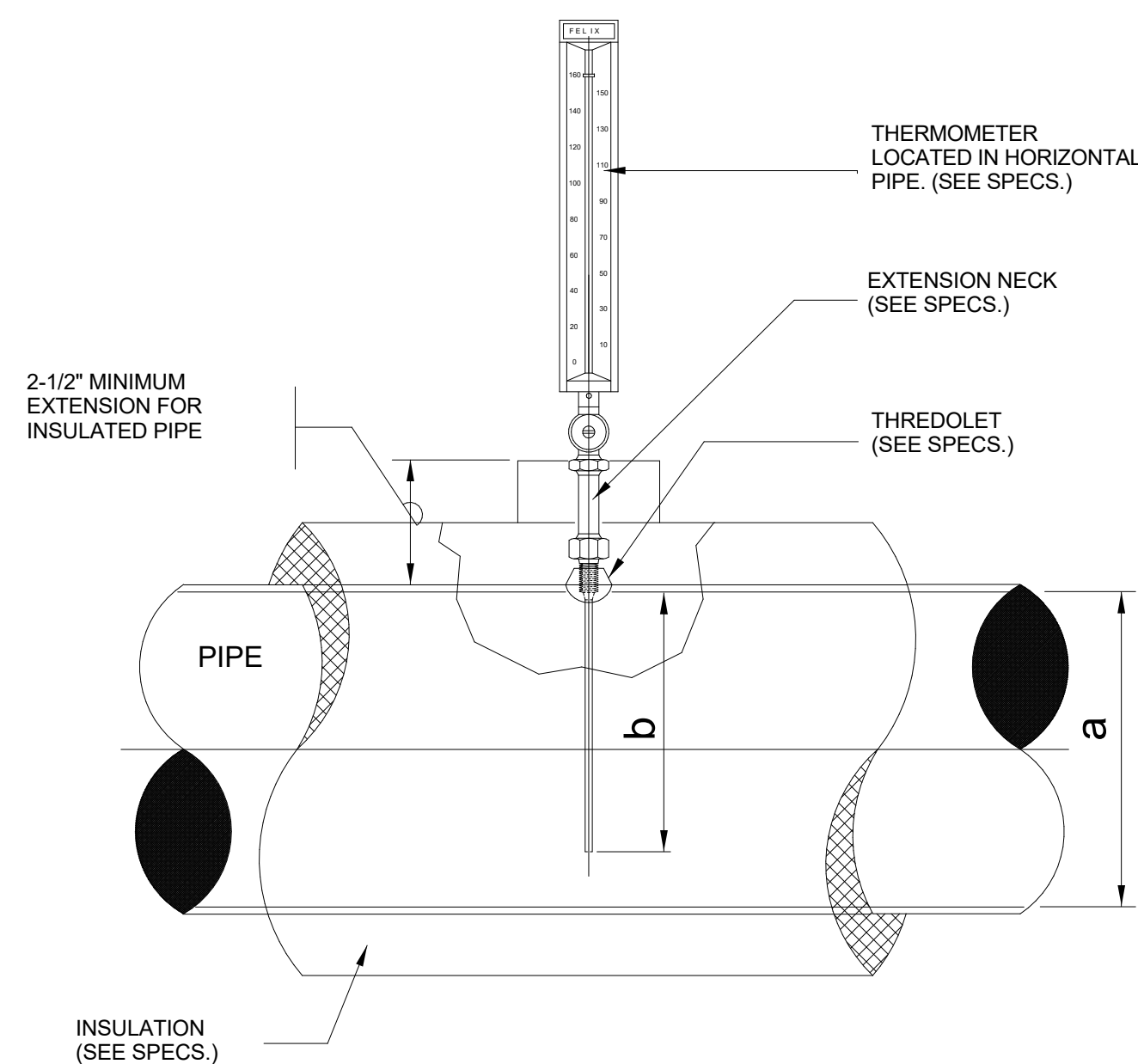
- 1 STOP VALVE (SEE SPECIFICATIONS)
- 2 BALANCING VALVE (SEE SPECIFICATIONS)
- 3 STRAINER (SEE SPECIFICATIONS)
- 4 CHECK VALVE (SEE SPECIFICATIONS) AXIS OF CHECK VALVE SHAFT SHALL BE PERPENDICULAR TO PUMP SHAFT.
- 5 SPOOL PIECE (SEE SPECIFICATIONS)
- 6 PRESSURE GAUGE WITH GAUGE COCK (SEE SPECS.)
- 7 DIFFERENTIAL PRESSURE SENSOR / TRANSMITTER (SEE SPECS.)
- 8 SUCTION DIFFUSER, WITHOUT STRAINER, (SEE SPECS.)
- 9 EXTEND PUMP DRAIN LINES TO FLOOR DRAIN.
- 10 NEW CONCRETE INERTIA BASE WITH VIBRATION ISOLATION RAILS, AND VIBRATION ISOLATION SPRING. (SEE SPECS.)
- 11 HOUSE KEEPING PADS. (SEE SPECIFICATIONS.)
- 12 2" SCREW JACK
- 13 1/4" COCK VALVE (SEE SPECIFICATIONS)
- 14 UNION (SEE SPECIFICATIONS)
- 15 FULL BORE BALL VALVE (SEE SPECS.)
- 16 FULL SIZE STRAINER DRAIN CONNECTION
- 17 HOSE END ADAPTER WITH CAP (SEE SPECIFICATIONS)
- 18 ECCENTRIC REDUCER (SEE SPECS.)
- 19 PIPE INSULATION (SEE SPECS.)
- 20 DIFFERENTIAL PRESSURE GAUGE. (SEE SPECIFICATIONS)
- 21 CONCENTRIC REDUCER (SEE SPECIFICATIONS)
- 22 TEST PLUG (SEE SPECIFICATIONS)



DETAIL M-DET033

01 END SUCTION PUMP DETAIL

SCALE: NONE



DETAIL #M-DET043

02 THERMOMETER WELL DETAIL

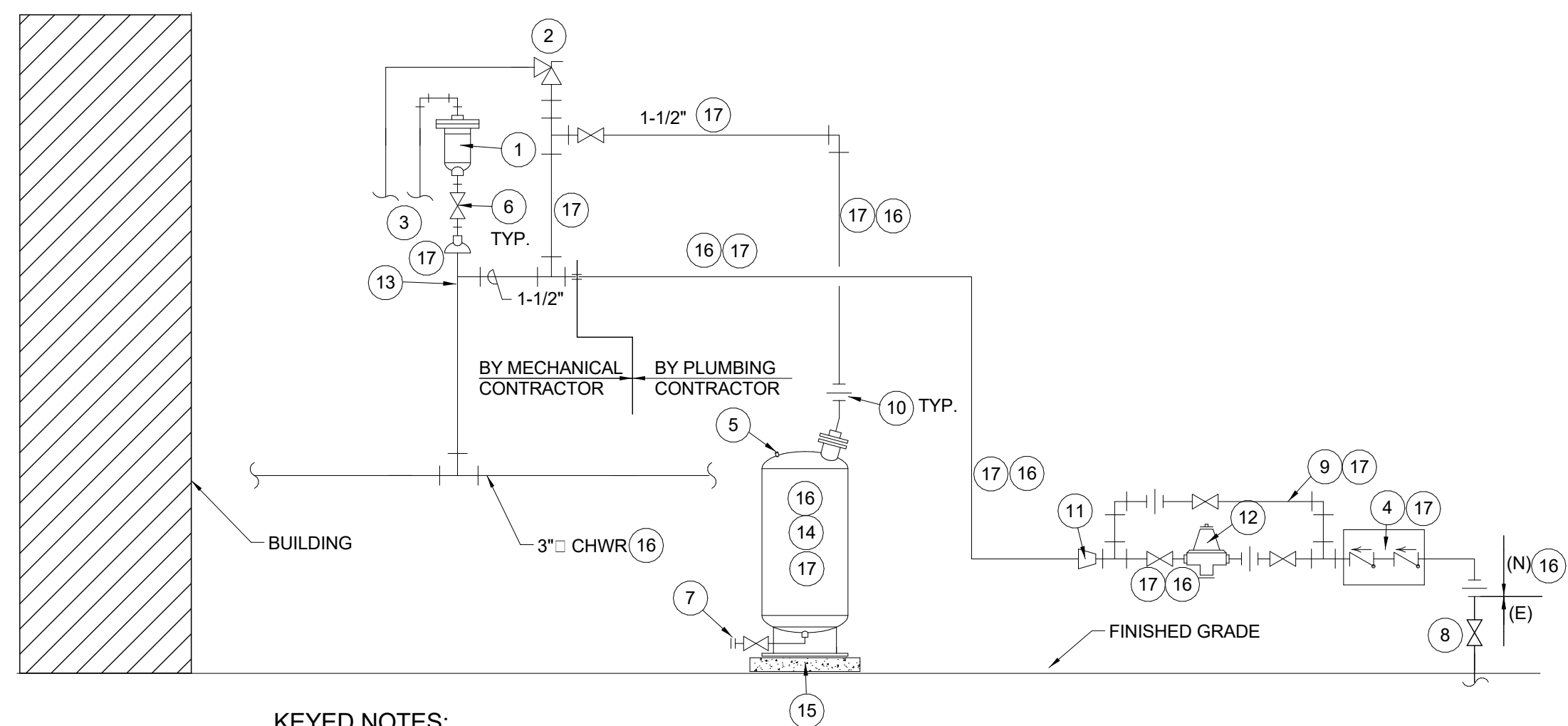
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INSERTION LENGTH SCHEDULE	
a = PIPE DIAMETER	b = INSERTION LENGTH
4" AND 5"	2-1/2"
6" AND 8"	5"
10" AND LARGER	8"

DIAPHRAGM TYPE EXPANSION TANK SCHEDULE

MARK	ET-ABCS-1
SERVICE	CHILLED WATER
TANK VOL. (GAL.)	16.5
ACCEPT VOL. (GAL.)	11.3
INITIAL CHARGE (PSIG)	12
WORKING PRESS. RATING (PSI)	150
SAFETY RELIEF VALVE SETTING (PSIG)	150

NOTES:



KEYED NOTES:

- 1 AUTOMATIC AIR VENT. SEE AUTOMATIC AIR VENT FOR ADDITIONAL INFORMATION.
- 2 PRESSURE RELIEF VALVE.
- 3 ROUTE DRAIN LINES TO NEAREST PLANTER AREA.
- 4 BACK FLOW PREVENTER (REFER TO SPECS)
- 5 CHARGE CONNECTION
- 6 STOP VALVE. (FULL PORT BALL VALVE)
- 7 3/4" VALVED DRAIN LINE WITH HOSE END ADAPTER.
- 8 EXISTING DOMESTIC COLD WATER LINE
- 9 FULL SIZE BY-PASS LINE.
- 10 UNION
- 11 CONCENTRIC REDUCER.
- 12 WATTS PRESSURE REDUCING VALVE.
- 13 DO NOT INSTALL VALVES BETWEEN SYSTEM AND RELIEF VALVE.
- 14 DIAPHRAGM TYPE EXPANSION TANK. SEE SCHEDULE ABOVE FOR CAPACITY.
- 15 CONCRETE HOUSEKEEPING PAN.
- 16 PROVIDE INSULATION. (SEE SPECIFICATIONS)
- 17 PROVIDE HEAT TRACE. REFER TO ELECTRICAL.

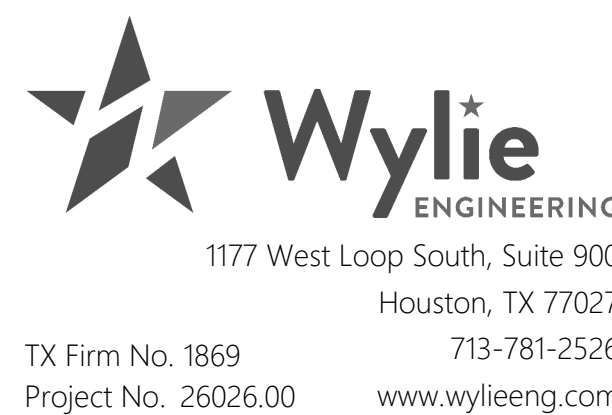
NOTES:

1. PROVIDE DIELECTRIC UNION AT JOINTS OF DISSIMILAR MATERIALS.
2. PROVIDE PIPE SUPPORTS AS REQUIRED. EXISTING SUPPORT SHALL BE REUSED WHERE FOUND FIT.
3. PROVIDE INSULATION AND ALUMINUM JACKETS ON THE EQUIPMENT, ABOVEGROUND MAKE-UP WATER PIPING, AND EXISTING MAKE-UP WATER PIPING.
4. PROVIDE HEAT TRACE AS REQUIRED. REFER TO ELECTRICAL.

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TOMBALL ISD - CHILLER
PACKAGE #2a

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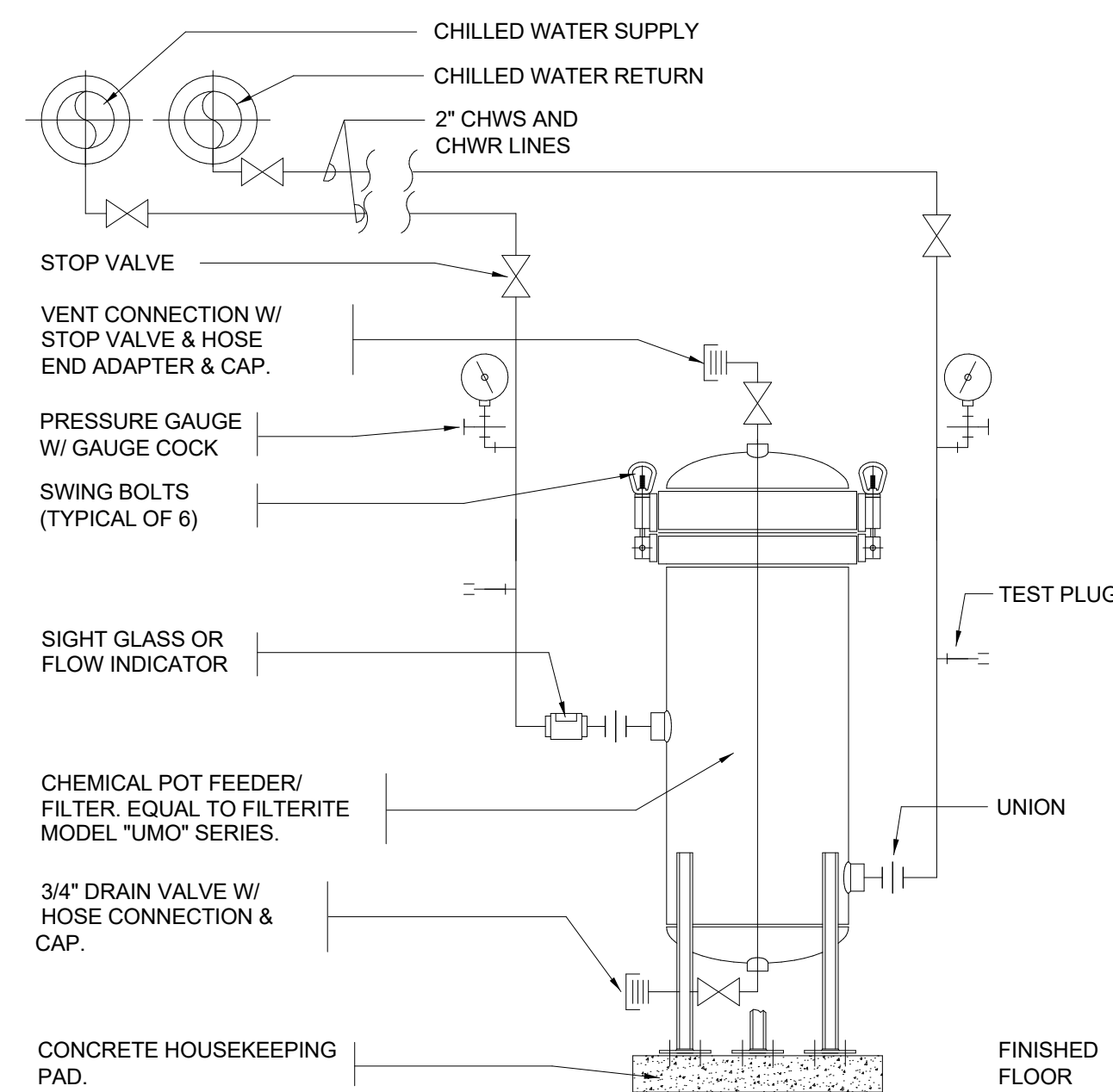


TX Firm No. 1869 713-781-2526
Project No. 26026.00 www.wylieeng.com

MECHANICAL AND PLUMBING DETAILS

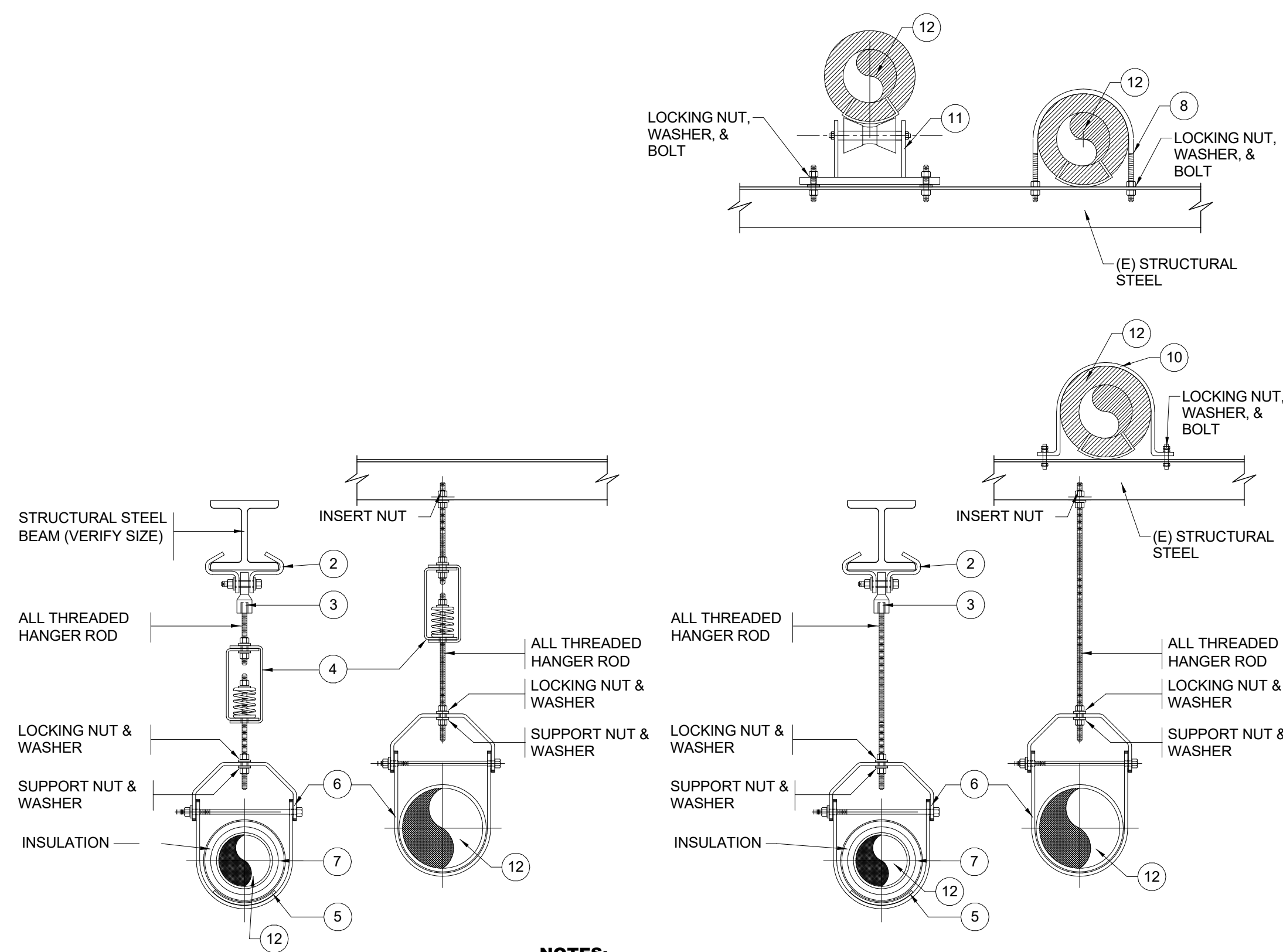
ABCS -
MP4.00

Scale	As indicated
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GENERAL NOTES:

1. PROVIDE INSULATION WITH ALUMINUM JACKET ON PIPES AND EQUIPMENT.
2. PROVIDE HEAT TRACE AS REQUIRED. REFER TO ELECTRICAL

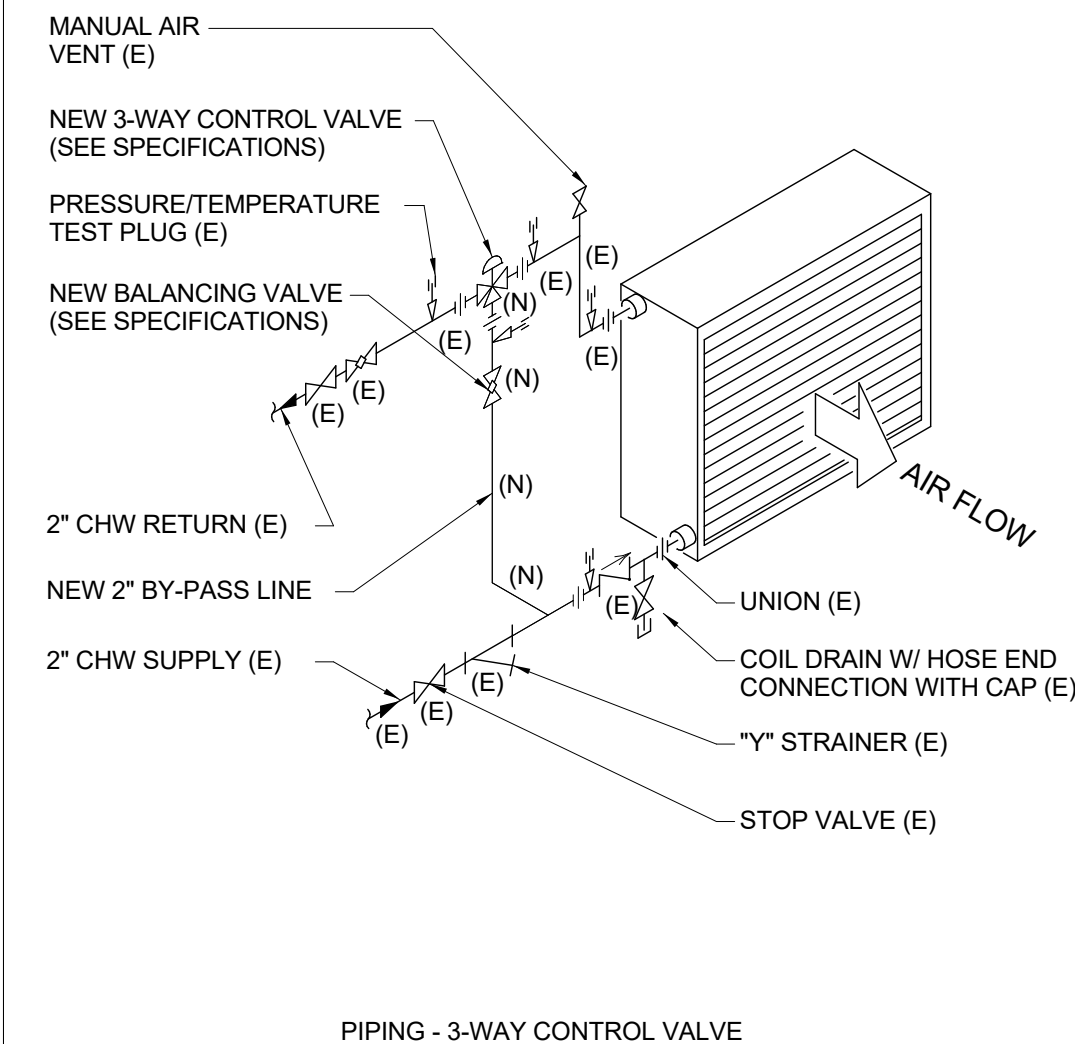


NOTES:

1. REFER TO MANUFACTURERS SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. HEAVY DUTY BEAM CLAMP.
3. EYE SOCKET.
4. SPRING HANGER.
5. 16 GA. GALVANIZED SHEET STEEL SADDLE AT LEAST 12" LONG. (INSULATED LINES ONLY)
6. CLEVIS HANGER.
7. INSULATION WHERE SPECIFIED.
8. U-BOLT
9. SPRING ISOLATOR
10. STEEL PIPE CLAMP OVER SHEET METAL JACKET
11. PIPE ROLLER SUPPORT
12. INSULATED PIPE

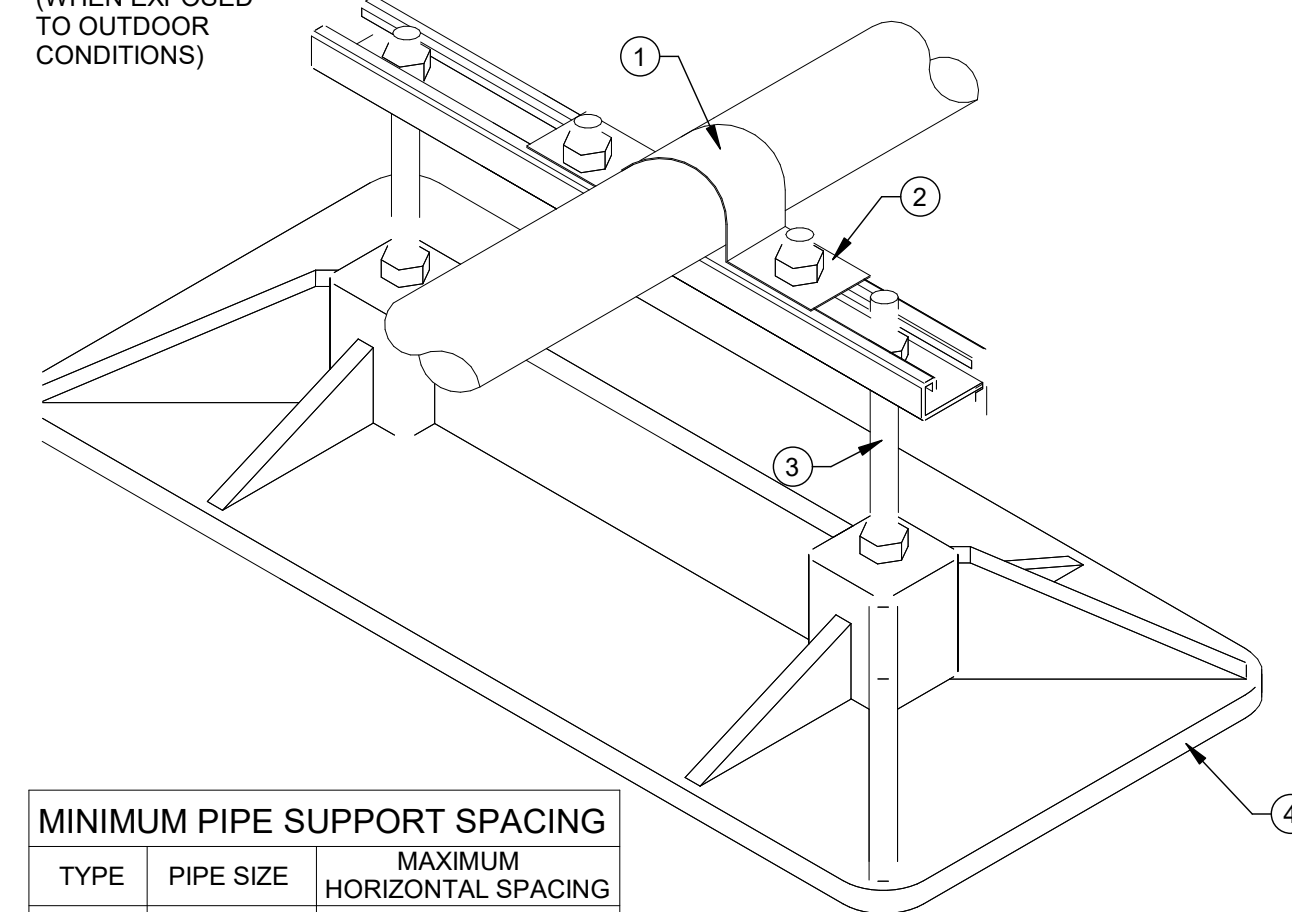
NOTES:

1. INSULATE ALL PIPING, VALVES, FITTINGS AND ACCESSORIES
RE: SPECIFICATIONS



GENERAL NOTE:

PIPING WITH
ALUMINUM JACKETING
(WHEN EXPOSED
TO OUTDOOR
CONDITIONS)



MINIMUM PIPE SUPPORT SPACING		
TYPE	PIPE SIZE	MAXIMUM HORIZONTAL SPACING
STEEL	ALL	10'-0"

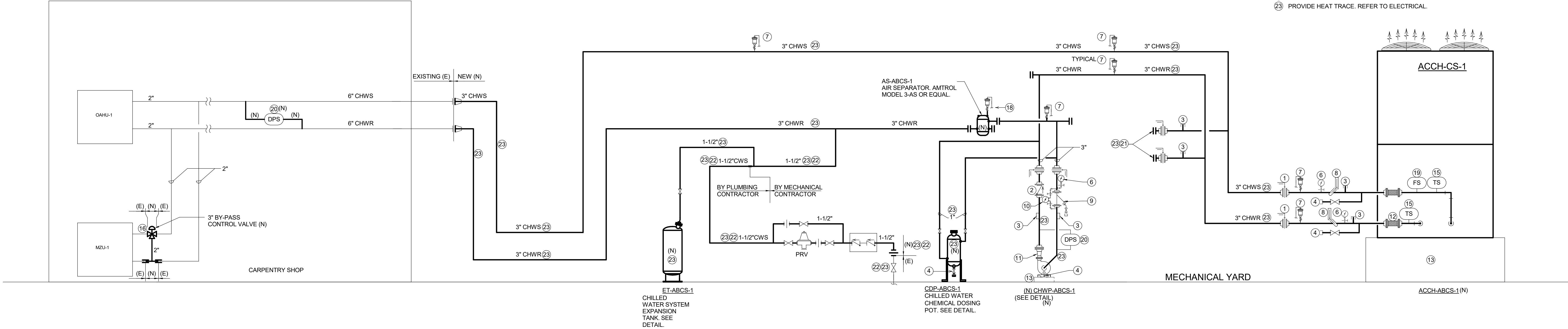
NOTES:

- ① PIPE CLAMP SHALL BE INSTALLED ON THE OUTSIDE OF THE ALUMINUM JACKETING
 - ② SUPPORT WITH STAINLESS CLAMP SECURE PIPING TO STRUT.
 - ③ ADJUST STRUT HEIGHT AS REQUIRED.
- NOTE: FOR VIBRATION TYPE, SPRING ISOLATOR CAPABLE OF REQUIRED DEFLECTION AND LOAD (APPLICABLE ON THE 4 SUPPORTS TO AND FROM THE PUMPS)
- ④ BASE PAD SET ANCHOR BOLTED TO AN EXISTING CONCRETE PAD.

DETAIL #M-DET181

07 PIPE SUPPORT DETAIL

SCALE: NONE



CHILLED WATER PIPING SCHEMATICS
SCALE: N.T.S.

MECHANICAL KEYED NOTES:

- 1 STOP VALVE, REFER TO SPECIFICATIONS.
- 2 CHECK VALVE, REFER TO SPECIFICATIONS.
- 3 PRESSURE/TEMPERATURE TEST PLUG. REFER TO SPECIFICATIONS.
- 4 DRAIN VALVE WITH HOSE END ADAPTER.
- 5 SUCTION DIFFUSER, REFER TO SPECIFICATIONS.
- 6 PRESSURE GAUGE WITH GAUGE COCK. REFER TO SPECIFICATIONS.
- 7 AUTOMATIC AIR VENT, REFER TO SPECIFICATIONS.
- 8 THERMOMETER, REFER TO SPECIFICATIONS.
- 9 "Y" STRAINER, REFER TO SPECIFICATIONS.
- 10 DIFFERENTIAL PRESSURE GAUGE, REFER TO SPECIFICATIONS.
- 11 CONCENTRIC REDUCER, REFER TO SPECIFICATIONS.
- 12 FLEXIBLE CONNECTION, REFER TO SPECIFICATIONS.
- 13 EXISTING HOUSEKEEPING PAD.
- 14 BACKFLOW PREVENTER.
- 15 TEMPERATURE SENSOR. TIE-IN TO B.A.S. AND DISPLAY ON THE GRAPHICS.
- 16 CONTROL VALVE
- 17 EXISTING TO REMAIN
- 18 ROUTE TO THE NEAREST PLANTER AREA
- 19 FACTORY INSTALLED WATER FLOW SWITCH
- 20 DIFFERENTIAL PRESSURE SENSOR (DPS) INSTALLED ON A STRAIGHT PIPE (EQUAL TO 10X DIAMETER)
- 21 3" CHWS/R PROVISION FOR EMERGENCY CONNECTION
- 22 MAKE-UP WATER PIPE WITH INSULATION AND CLADDING.
- 23 PROVIDE HEAT TRACE. REFER TO ELECTRICAL.



TOMBALL ISD - CHILLER
PACKAGE #2a

Ancillary Services Building
Baker Dr
Tomball, TX 77375

CHILLER MANAGER AND PUMP SEQUENCE OF OPERATION

- A. **CHILLED WATER ACTIVATION**
- THE CHILLED WATER SYSTEM WILL BE ACTIVATED BY A REQUEST FOR COOLING FROM ANY AIR HANDLING UNITS OR COOLING EQUIPMENT SUPPLIED WITH CHILLED WATER.
- B. **CHILLER UNIT AND CHILLED WATER PUMP ACTIVATION**
- WHEN THE CHILLED WATER SYSTEM IS ACTIVATED, THE CHILLER CONTROL PROGRAM WILL START THE CHILLED WATER PUMP BY SENDING A 24 VAC SIGNAL TO A RELAY MOUNTED IN THE PUMP MOTOR VFD, WHICH WILL COMPLETE THE AUTO SIDE OF THE CONTROL CIRCUIT AND START THE PUMP. A FLOW SWITCH WILL PROVE STATUS TO THE BUILDING AUTOMATION SYSTEM (B.A.S.) AND WILL ALARM AT THE CENTRAL SITE IF THE SWITCH IS NOT MADE WITHIN THE ADJUSTABLE TIME PERIOD. AFTER 15 SECONDS (ADJUSTABLE), THE B.A.S. WILL SEND 24 VAC SIGNAL TO A RELAY, WHICH WILL COMPLETE THE REMOTE START TERMINALS IN THE CHILLER CONTROL CIRCUIT AND ALLOW THE CHILLER TO RUN. A FLOW SWITCH WILL NOT ALLOW THE CHILLER TO START UNTIL FLOW HAS BEEN PROVEN.
- C. **TEMPERATURE CONTROL AND STAGING**
- THE CHILLER WILL BE SET TO MAINTAIN A CHILLED WATER SUPPLY TEMPERATURE AS SPECIFIED IN THE SCHEDULE DRAWING (ADJUSTABLE). THE CHILLER UNIT WILL OPERATE ON PART LOADS THROUGH MULTI-COMPRESSOR STAGING FEATURING ELECTRONIC EXPANSION VALVES FOR PRECISE REFRIGERANT CONTROL.
- THE ASSOCIATED CHILLED WATER PUMP WILL RUN VARIABLE FLOW TO PROVIDE STABLE CHILLED WATER TEMPERATURE CONTROL AND HELPS LIMIT UNACCEPTABLE SHORT CYCLING OF CHILLER COMPRESSORS.
- THE CHILLER UNIT CONTROLLER ENABLES VARIABLE WATER FLOW PROVIDING +1.2°F LEAVING WATER TEMPERATURE ACCURACY AND TOLERATES 30% PER MINUTE WATER FLOW VARIATION WITH FLOW EQUAL OR ABOVE THE MINIMUM UNIT REQUIREMENT.
- THE B.A.S. WILL INITIATE AN ALARM TO THE CENTRAL SITE IF THE BUILDING CHILLED WATER SUPPLY TEMPERATURE IS 5°F (ADJUSTABLE) AND ABOVE THE SETPOINT. AN ALARM OUTPUT FROM THE CHILLER PANEL WILL BE MONITORED FOR DISPLAY AT THE CENTRAL SITE.
- D. **CHILLED WATER PUMP AND DIFFERENTIAL PRESSURE SENSOR (DPS)**
- WHEN THE EXISTING AHU MEETS THE DEMAND LOAD, THE UNIT WILL GRADUALLY LIMITS THE FLOW OF CHILLED WATER INTO THE COIL VIA THE CONTROL VALVE. THE PRESSURE WILL GRADUALLY INCREASE. WHEN THE PRESET HIGH LIMIT DIFFERENTIAL PRESSURE IN THE DPS IS REACHED, A SIGNAL WILL BE SENT TO CONTROL THE PUMP VIA THE VFD TO MODULATE DOWN FOR LESS CHILLED WATER FLOW.
- WHEN THE EXISTING AHU DEMANDS MORE LOAD, THE UNIT WILL GRADUALLY ALLOW MORE CHILLED WATER INTO THE COIL VIA THE CONTROL VALVE. THE DIFFERENTIAL PRESSURE PIPE WILL GRADUALLY DECREASE. WHEN THE PRESET LOW LIMIT DIFFERENTIAL PRESSURE IN THE DPS IS REACHED, A SIGNAL WILL BE SENT TO CONTROL THE PUMP VIA THE VFD TO MODULATE UP FOR MORE CHILLED WATER FLOW.
- E. **CHILLED WATER SYSTEM SHUTDOWN SEQUENCE**
- AFTER ALL REQUEST FOR COOLING BEEN SATISFIED OR HALTED BY THE B.A.S., THE CHILLER WILL CYCLE TO ITS OFF STATUS. THE ASSOCIATED CHILLED WATER PUMP WILL CONTINUE TO RUN FOR 5 MINUTES (ADJUSTABLE) TO ENSURE ADEQUATE FLOW DURING SHUTDOWN.
- F. **EQUIPMENT OFF CONDITIONS**
- WHEN THE CHILLED WATER SYSTEM IS INACTIVE, THE CHILLER AND ASSOCIATED PUMP WILL BE DE-ENERGIZED.
- G. **FREEZE AVOIDANCE AND WINTER CONDITION**
- FREEZE AVOIDANCE TO BE PRESENT TO ENABLE OR DISABLE. THE CHILLER UNIT SHALL BE CONFIGURED WITH THE PUMP CONTROLLER. WHEN FREEZE AVOIDANCE IS ENABLED, THE CHILLED WATER PUMP SHALL ACTIVATE WHEN THE AMBIENT TEMPERATURE DROPS BELOW THE LEAVING WATER TEMPERATURE CUTOFF. THE PUMP STAYS ENERGIZED UNTIL THE MINIMUM EVAPORATOR TEMPERATURE RISES 10°F ABOVE THE LEAVING WATER CUTOFF. THE PUMP WILL CYCLE OFF FOR A PERIOD OF TIME. AFTER THE TIME EXPIRES, THE PUMP OUTPUT MAY COME BACK ENERGIZED AGAIN IF THE AMBIENT TEMPERATURE IS AGAIN BELOW THE WATER CUTOFF.
- THE PUMP SHALL BE SET TO OPERATE VIA THE VFD PROVIDING MINIMUM FLOW WITH THE BY-PASS VALVE AT OPEN POSITION.

CONTROL SCHEMATIC LEGEND

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI/BI	DIGITAL / BINARY INPUT
DO/BO	DIGITAL / BINARY OUTPUT
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY RIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZE/STAT
HSL	HIGH STATIC LIMIT
SPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE
SP	SET POINT
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTSIDE AIR
HC	HEATING COIL
CC	COOLING COIL
DX	DIRECT EXPANSION COOLING COIL
PICCV	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
AFC	AIRFLOW CROSS
DPS	DIFFERENTIAL PRESSURE SWITCH

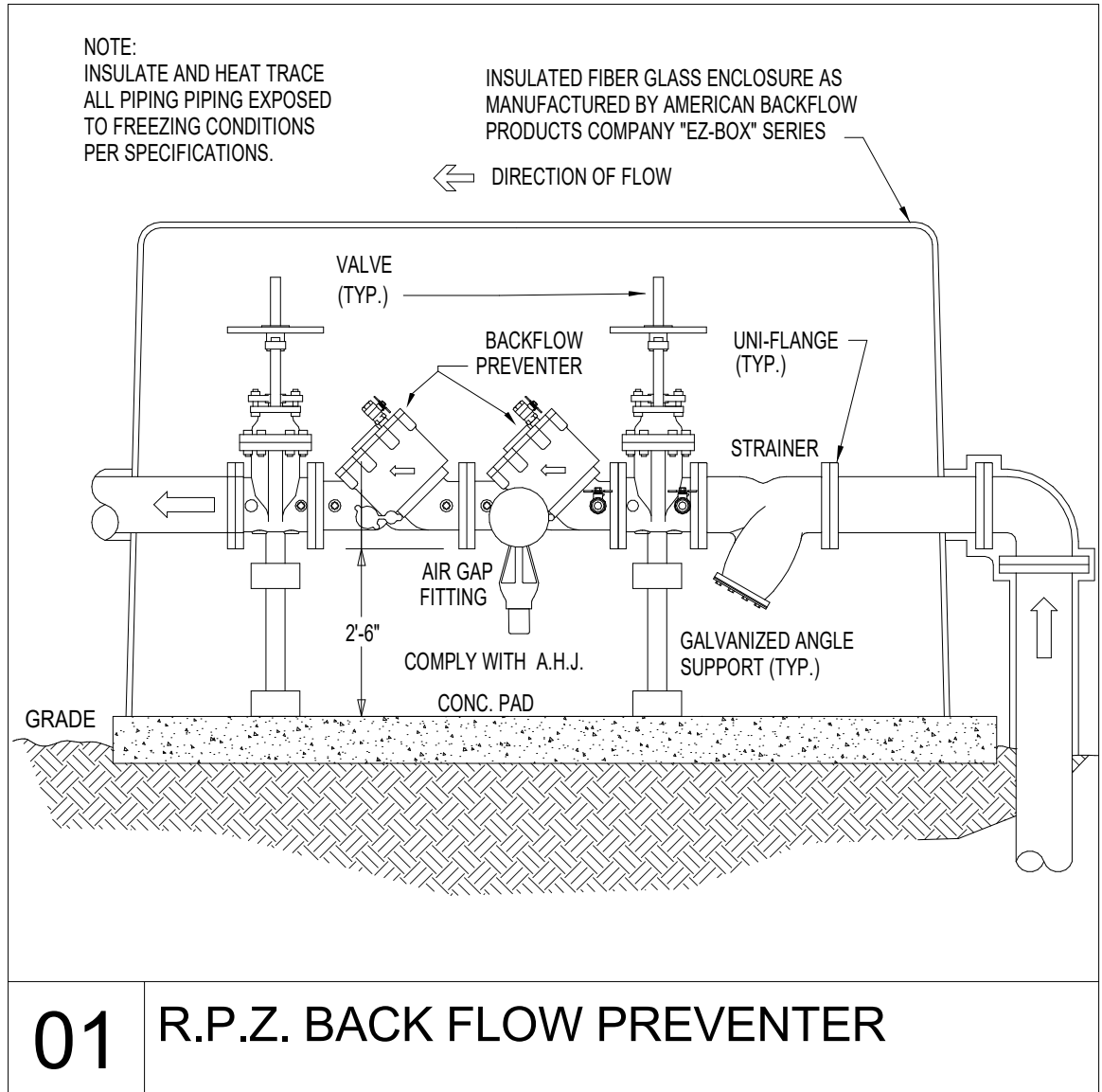
AIR COOLED CHILLER

TYPE	COUNT	NAME	DEVICE
AI	1	BUILDING CHW SUPPLY TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	1	BUILDING CHW RETURN TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	1	CHILLER CHW SUPPLY TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	1	CHILLER CHW RETURN TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	2	CHILLER AMPS	4-20 mA SENSOR
AI	1	OUTSIDE AIR TEMPERATURE	NORMALLY OPEN
DI	2	CHILLER PUMP STATUS	CURRENT SWITCH
DI	2	CHILLER ALARM	DRY CONTACT
DO	2	CHILLER START/STOP	24 VAC RELAY
DO	2	CHILLER PUMP START/STOP	24 VAC RELAY

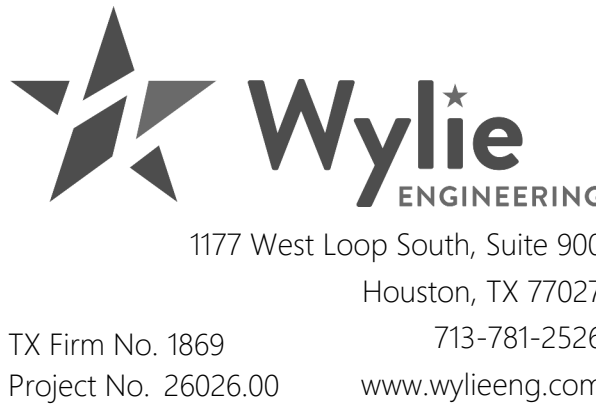
CHILLER BACnet INTEGRATION

FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE ONE BACnet INTEGRATION SCREEN IN THE BAS GRAPHICS THAT INCLUDES THE FOLLOWING INFORMATION AT A MINIMUM FOR MONITORING PURPOSES ONLY.

- LOCAL REMOTE MODE
- ACTIVE ALERT / ALARM WITH ALARM MODE (NOTE: INCLUDE CROSS-REFERENCE TABLE FOR ODE DECIPHERING)
 - ACTIVE DEMAND LIMIT
 - ENTERING / LEAVING TEMPERATURES
 - RUNNING STATUS / MODE
 - COMPRESSOR DISCHARGE PRESSURE
 - COMPRESSOR WINDING TEMPERATURE
 - OUTDOOR AIR TEMPERATURE
 - SUCTION PRESSURE
 - NUMBER OF COMPRESSOR RUNNING OR CIRCUITS
 - CAPACITY
 - OIL PRESSURE ON EACH CIRCUIT
 - WATER SET-POINT
 - WATER FLOW



01 R.P.Z. BACK FLOW PREVENTER



MECHANICAL AND
PLUMBING PIPING
SCHEMATIC DIAGRAM

ABCS -
MP5.01

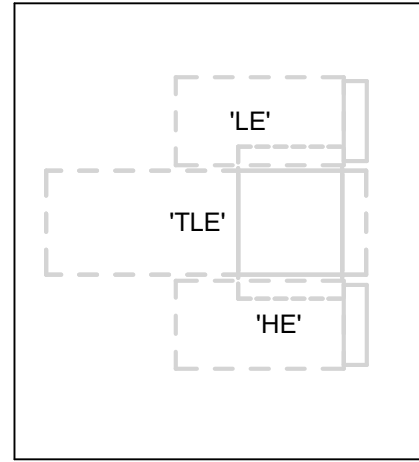
Scale 1/8" = 1'-0"

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ELECTRICAL COVER
SHEET

ABCS-E0.00

Scale AS INDICATED



CARPENTRY SHOP
ELECTRICAL PANEL
APPROXIMATE
LOCATION

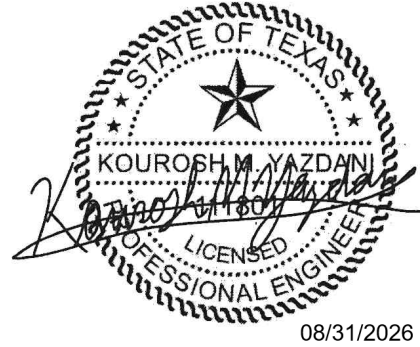
EXISTING
ONE STORY
METAL BLDG

ELECTRICAL DEMOLITION GENERAL NOTES

- A. CONDUCT ALL DEMOLITION WORK IN SUCH A MANNER AS TO MAINTAIN A SAFE WORK ENVIRONMENT AND IN ACCORDANCE WITH APPLICABLE SAFETY RULES AND PROCEDURES WITHIN NEC, NECA AND OSHA REQUIREMENTS.
- B. CONTRACTOR SHALL REQUEST AND REVIEW ANY HAZARDOUS MATERIALS SURVEYS FROM THE OWNER'S REPRESENTATIVE. OBSERVE RECOMMENDED PRECAUTIONS AND VERIFY THE STATUS OF ANY REMEDIAL WORK RECOMMENDED OR NOTED WITHIN THE HAZARDOUS MATERIAL SURVEY. NOTIFY THE OWNER'S REPRESENTATIVE IF ANY HAZARDOUS MATERIALS ARE SUSPECTED OR OBSERVED DURING THE COURSE OF EXECUTING THIS CONTRACT.
- C. SURVEYS AREAS OF THE FACILITY SCHEDULED FOR RENOVATION OR PARTIAL DEMOLITION PRIOR TO ANY WORK BEING PERFORMED. SUBMIT REPORT OF THE PRE-WORK SURVEY DETAILING ANY UTILIZATION EQUIPMENT OR SYSTEMS THAT ARE NOT IN GOOD WORKING ORDER IN ADVANCE OF ANY DEMOLITION WORK AND REVIEW WITH THE OWNER'S REPRESENTATIVE.
- D. THE SCHOOL DISRTRICT SHALL HAVE FIRST RIGHT OF REFUSAL FOR SALVAGED MATERIAL. REQUEST THAT THE DISTRICT PROVIDE DIRECTION ON DISPOSITION OF SALVAGED MATERIAL FIVE(5) WORKING DAYS PRIOR TO REMOVAL. IF SO DIRECTED BY THE DISTRICT, SALVAGED MATERIAL SHALL REMAIN THE PROPERTY OF THE DISTRICT AND SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION AS DIRECTED. REMOVE AND DISPOSE ANY SALVAGED MATERIAL NOT RETAINED BY THE DISTRICT.
- E. DRAWINGS INDICATE APPROXIMATE LOCATION AND QUANTITY OF PANELS, TRANSFORMERS, DISCONNECTS, ETC. TO BE REMOVED. VERIFY LOCATION AND QUANTITY OF ITEMS TO BE REMOVED. NO ALLOWANCE WILL BE MADE BECAUSE OF CONTRACTOR'S UNFAMILIARITY WITH THE SITE.
- F. DAMAGED AREAS CAUSED REMOVAL OF ANY OF THE ABOVE ITEMS AND WHICH ARE NOT CONCEALED BY NEW CONSTRUCTION SHALL BE REPAIRED TO MATCH ADJACENT SURFACES. OPENINGS CREATED BY THE REMOVAL OF THESE ITEMS THROUGH FIRE RATED WALLS SHALL BE FIRE STOPPED.
- G. REMOVE ABANDONED CONDUIT TO POINT OF CONCEALMENT BEHIND INACCESSIBLE SURFACES. ENTIRELY REMOVE ABANDONED WIRING.
- H. PROVIDE BLANK COVERS AND PLATES AT UNUSED OPENINGS IN BOXES, RACEWAYS, AUXILIARY GUTTERS, CABINETS, EQUIPMENT CASES AND HOUSINGS SHALL BE CLOSED TO AFFORD PROTECTION SUBSTANTIALLY EQUIVALENT TO THE EQUIPMENT ENCLOSURE.
- I. IF A CONDUIT RUN IS EXPOSED OR A SURFACE RACEWAY LEFT WITHOUT A MOUNTING SURFACE DUE TO REMOVAL OF A PARTITION, THE RACEWAY SHALL BE REROUTED AS ACCEPTABLE TO THE OWNER/ARCHITECT.
- J. PROTECT ELECTRICAL EQUIPMENT, OUTLETS AND DEVICES THAT ARE SCHEDULED TO BE RELOCATED, REPAIR, RESTORE OR REPLACE ITEMS DAMAGED WHEN REMOVED TO THE APPROVAL OF THE OWNER. NOTIFY OWNER/ARCHITECT/ENGINEER OF ANY ELECTRICAL EQUIPMENT, OUTLETS AND/OR DEVICES WHICH ARE SCHEDULED TO BE RE-USED THAT ARE FOUND TO BE UNUSABLE.

ELECTRICAL KEY NOTES

- 1 EXISTING HVAC AIR COOLED CHILLER TO BE REPLACED. DEMO EXISTING CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES TO THE EXTENT NECESSARY TO RE-ROUTE WIRE. REFER TO NEW WORK PLANS FOR MORE INFORMATION.
- 2 EXISTING HVAC PUMP EQUIPMENT TO BE REPLACED. DEMO EXISTING CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES TO THE EXTENT NECESSARY TO RE-ROUTE WIRE. REFER TO NEW WORK PLANS FOR MORE INFORMATION.



TOMBALL ISD - CHILLER
PACKAGE #2a

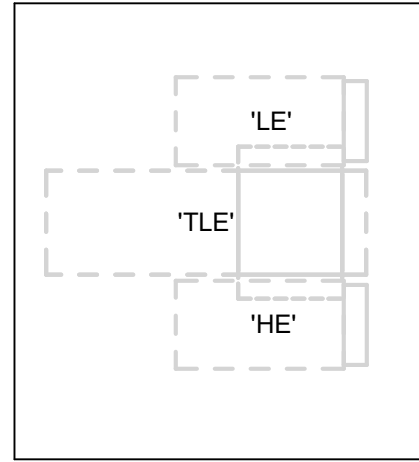
Ancillary Services Building
Baker Dr
Tomball, TX 77375

Wylie
ENGINEERING
1177 West Loop South, Suite 900
Houston, TX 77027
TX Firm No. 1869 713-781-2526
Project No. 26026.00 www.wylieeng.com

ELECTRICAL
DEMOLITION PLAN -
MECHANICAL YARD

ABCS-E1.01

Scale As indicated



CARPENTRY SHOP
ELECTRICAL PANEL
APPROXIMATE
LOCATION

EXISTING
ONE STORY
METAL BLDG

ELECTRICAL POWER GENERAL NOTES

- A. CONDUIT LINES ARE DIAGRAMMATIC. CONTRACTOR SHALL FIELD VERIFY CONDITIONS AND CHOOSE APPROPRIATE CONDUIT ROUTING. IN THE EVENT THAT THE APPROXIMATE CONDUIT ROUTING SHOWN ON PLANS IS NOT FEASIBLE CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER.
- B. RECEPTACLES LOCATED WITHIN 6" OF ANY PLUMBING FIXTURE, IN BREAK ROOMS, AT THE EXTERIOR, IN THE PARKING GARAGE OR OTHERWISE EXPOSED TO WATER SHALL BE TYPE GFCI. "WPI" INDICATES A WEATHERPROOF "WHILE-IN-USE" COVER.
- C. ALL WIRING DEVICES ARE NEW UNLESS NOTED OTHERWISE.
- D. ALL ELECTRICAL EQUIPMENT IS EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
- E. COORDINATE DISCONNECT SWITCHES, VFDS AND STARTER LOCATIONS WITH EQUIPMENT INSTALLERS TO MAINTAIN PROPER MAINTENANCE AND CODE REQUIRED CLEARANCES.
- F. COORDINATE RECEPTACLE AND DATACOM LOCATIONS SO THAT DEVICES ON SIMILAR WALLS ARE ADJACENT TO ONE ANOTHER.
- G. REFERENCE EQUIPMENT CONNECTION SCHEDULE FOR REQUIREMENTS AND ADDITIONAL INFORMATION OF TAGGED EQUIPMENT SHOWN ON PLAN DRAWING.
- H. PROVIDE 120V POWER TO EACH HVAC DDC CONTROL PANEL. COORDINATE EXACT LOCATIONS AND QUANTITIES WITH MECHANICAL DRAWINGS.

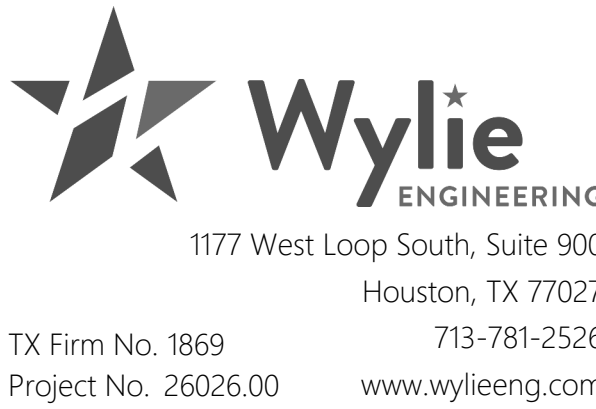
ELECTRICAL KEY NOTES

- 1 NEW HVAC AIR COOLED CHILLER EQUIPMENT. PROVIDE CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES AS REQUIRED. COORDINATE WITH MECHANICAL FOR EXACT LOCATIONS, CIRCUIT REQUIREMENTS, CONNECTION REQUIREMENTS, AND APPURTENANCES.
- 2 NEW HVAC PUMP EQUIPMENT. PROVIDE CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES AS REQUIRED. PULL NEW WIRE FROM THE EXISTING BREAKER TO THE NEW EQUIPMENT, REUSING THE EXISTING BREAKER. COORDINATE WITH MECHANICAL FOR EXACT LOCATIONS, CIRCUIT REQUIREMENTS, CONNECTION REQUIREMENTS, AND APPURTENANCES.
- 3 PROVIDE 120V SWITCHED JUNCTION BOXES FOR CHILLER CONTROL CIRCUITS AND VALVES. COORDINATE EXACT LOCATIONS WITH MECHANICAL CONTRACTOR. PROVIDE STRUT CHANNEL AND ALL ACCESSORIES FOR MOUNTING AS REQUIRED.
- 4 PROVIDE POWER AND CIRCUITING FOR CHILLED WATER PIPE HEAT TRACE SYSTEM AS INDICATED. COORDINATE EXACT CONNECTION POINTS AND CONTROLLER LOCATIONS WITH MECHANICAL CONTRACTOR. PROVIDE GFFE BREAKER AS REQUIRED BY NEC.
- 5 PROVIDE NEW RECEPTACLE WITH WEATHERPROOF-WHILE-IN-USE COVER. CONNECT TO CIRCUIT AS SHOWN. MOUNT AT 18" ABOVE GRADE TO RACK HOLDING MECHANICAL VFD EQUIPMENT.
- 6 NEW POLE LIGHT FIXTURE. CONNECT TO 120V CIRCUIT SERVING OUTLETS IN THIS AREA AS SHOWN. FIXTURE SHALL BE EQUIPPED WITH INTEGRAL PHOTOCELL FOR ON/OFF CONTROL. REFER TO LIGHTING FIXTURE SCHEDULE, SHEET ABCS-E3.00.



TOMBALL ISD - CHILLER
PACKAGE #2a

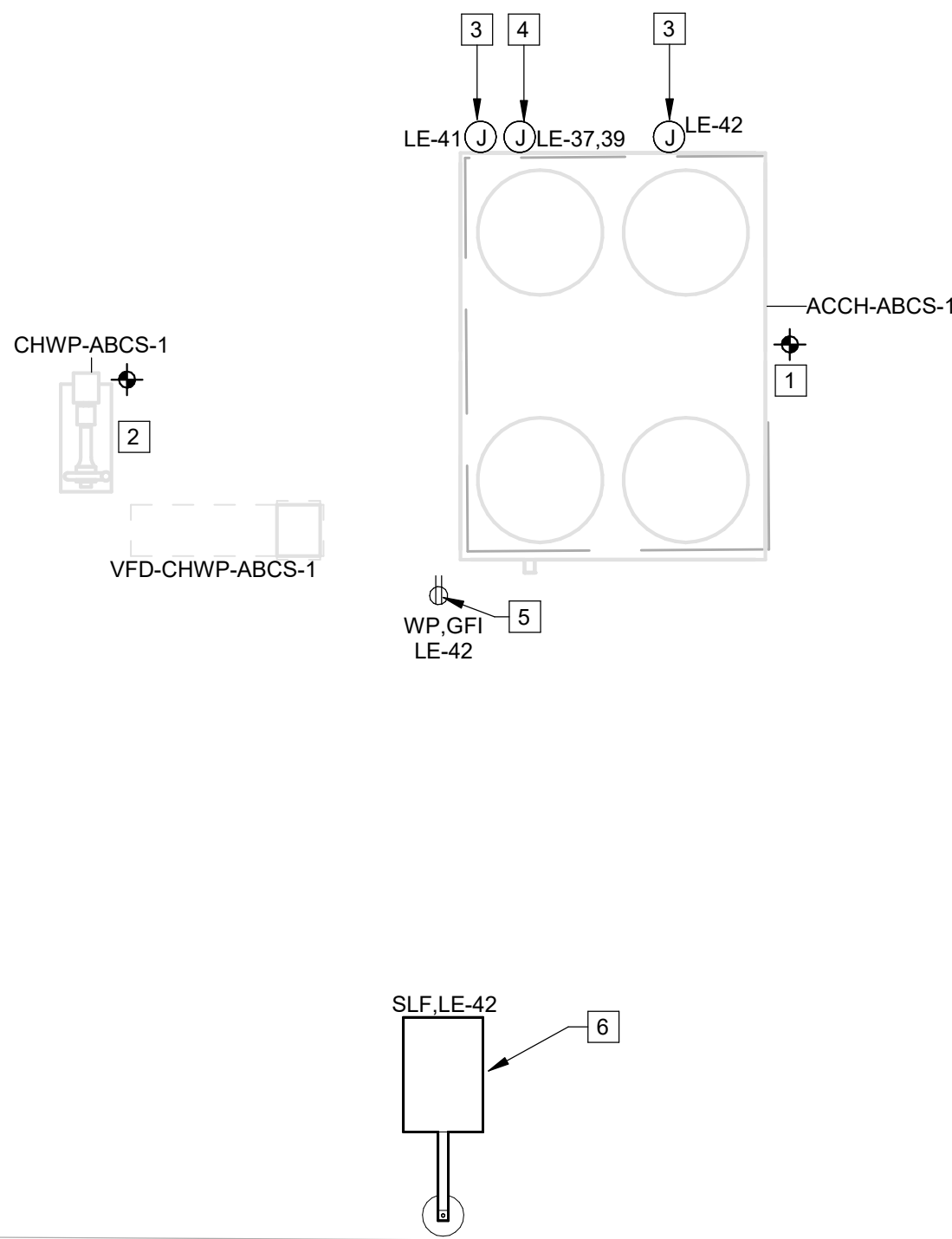
Ancillary Services Building
Baker Dr
Tomball, TX 77375



ELECTRICAL POWER
PLAN - MECHANICAL
YARD

ABCS-E2.01

Scale As indicated





SCHEDULE NOTES

1. DISCONNECTING MEANS AND OVERLOAD PROTECTION PROVIDED INTEGRAL WITH THE CONTROLLER.
2. EQUIPMENT INDICATED CONTROLLED VIA ADJACENT VFD WITH INTEGRAL DISCONNECT. VFD PROVIDED BY DIV 23/25, VFD INSTALLED BY DIV 26

GENERAL NOTES

1. VERIFY ELECTRICAL REQUIREMENTS WITH MECHANICAL/PLUMBING EQUIPMENT SUBMITTALS PRIOR TO ELECTRICAL ROUGH-IN.
2. REFERENCE SPECIFICATIONS AND/OR MECHANICAL DRAWINGS FOR EQUIPMENT CONTROL SEQUENCES.

(E) PANELBOARD: HE

LOCATION:	EQUIP GROUND: YES	VOLTS: 480/277 WYE	BUS RATING: 225 A
SUPPLY FROM:	ISO GROUND: NO	PHASES: 3	MLO OR MCB: MCB
MOUNTING: SURFACE	FEED THRU LUGS: YES	WIRES: 4	MAIN RATING: 100 A
ENCLOSURE: NEMA 1	200% NEUTRAL: NO	A.I.C. RATING: 65KAIC	
	SERVICE ENTRANCE RATED: NO	FULLY RATED: YES	

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
LIGHTING (NC1215.2A1)	0.1 kVA	125%	0.2 kVA	DOWSTREAM FEED THRU LOAD: 0 A
RECEPTACLE (NC1220.4A)	0.2 kVA	NEC TABLE 220.44	0.2 kVA	EXISTING LOAD: 99.7 kVA
OTHER EQUIP (NC220.14)	0.0 kVA		0.0 kVA	TOTAL CONNECTED LOAD: 100.0 kVA
MOTOR (NC430.22)	0.0 kVA	100% + 125% LARGEST	0.0 kVA	DEMAND HEAT+COOL: 100.0 kVA
KITCHEN EQPT (NC220.56)	0.0 kVA	NEC TABLE 220.56	0.0 kVA	TOTAL CONNECTED LOAD: 120 A
HEATING (NC220.60.4A.04)	0.0 kVA	100%	0.0 kVA	DEMAND HEAT+COOL: 120 A
COOLING (NC220.60.4A.04)	0.0 kVA	100%	0.0 kVA	NON-COINCIDENTAL NEC DEMAND: 0 A
ELEVATOR (NEC20.14)	0.0 kVA	NEC TABLE 620.14	0.0 kVA	TOTAL NEC DEMAND: 120 A
CONT EQPT (NC1215.2A1)	0.0 kVA	125%	0.0 kVA	

NOTES:

(E) PANELBOARD: LE

LOCATION:	EQUIP GROUND: YES	VOLTS: 120/208 WYE	BUS RATING: 125 A
SUPPLY FROM: TLE	ISO GROUND: NO	PHASES: 3	MLO OR MCB: MCB
MOUNTING: SURFACE	FEED THRU LUGS: YES	WIRES: 4	MAIN RATING: 100 A
ENCLOSURE: NEMA 1	200% NEUTRAL: NO	A.I.C. RATING: 65KAIC	
	SERVICE ENTRANCE RATED: NO	FULLY RATED: YES	

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
LIGHTING (NEC215.2A1)	0.1 KVA	125%	0.2 KVA	DOWNSTREAM FEED THRU LOAD: 0.0
RECEPTACLE (NEC220.44)	0.2 KVA	KVA NEC TABLE 220.44	0.2 KVA	EXISTING LOAD: 32.7 KVA
OTHER EQUIP (NEC220.44)	0.0 KVA	100%	0.0 KVA	TOTAL CONNECTED LOAD: 33.0 KVA
MOTOR (NEC430.22)	0.0 KVA	100% + 125% LARGEST	0.0 KVA	DEMAND HEAT+COOL: 33.0 KVA
KITCHEN EQUIP (NEC220.56)	0.0 KVA	KVA NEC TABLE 220.56	0.0 KVA	TOTAL CONNECTED LOAD: 92.0
HEATING (NEC220.60/440.6)	0.0 KVA	100%	0.0 KVA	DEMAND HEAT+COOL: 92.0
COOLING (NEC220.60/440.6)	0.0 KVA	100%	0.0 KVA	NON-COINCIDENTAL HEAT/COOL: 0.0
ELEVATOR (NEC620.14)	0.0 KVA	KVA NEC TABLE 620.14	0.0 KVA	TOTAL NEC DEMAND: 92.0
CONT EQUIP (NEC215.2A1)	0.0 KVA	125%	0.0 KVA	

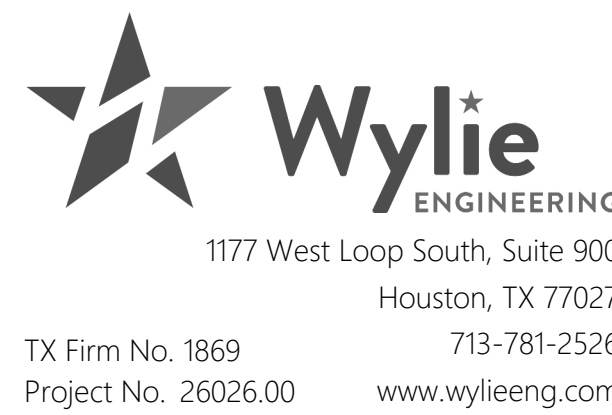
NOTES

1. PROVIDE NEW 125-AMP, 3-POLE BREAKER IN EXISTING SWITCHBOARD FOR NEW CHILLER
2. UTILIZE EXISTING 15A/3P BREAKER IN EXISTING SWITCHBOARD TO SERVE NEW BRANCH CIRCUIT AS INDICATED.
3. EXTEND EXISTING CONDUCTORS TO NEW EQUIPMENT AS REQUIRED.

08/31/2026

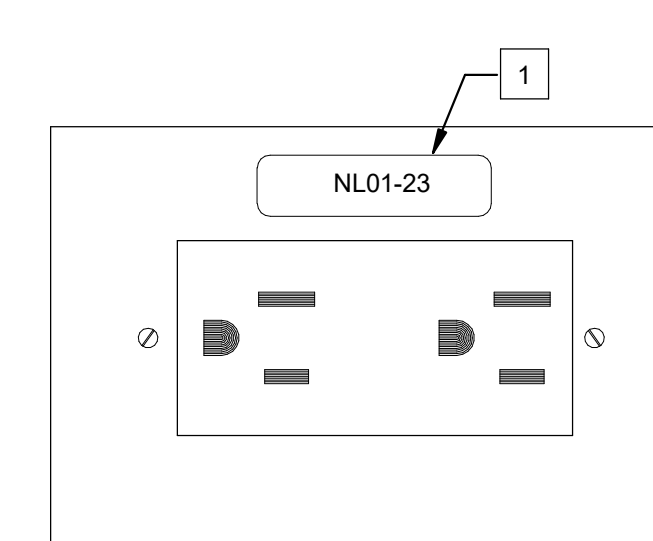
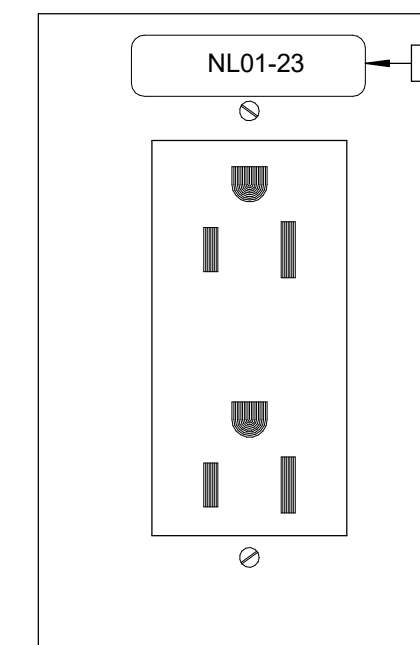
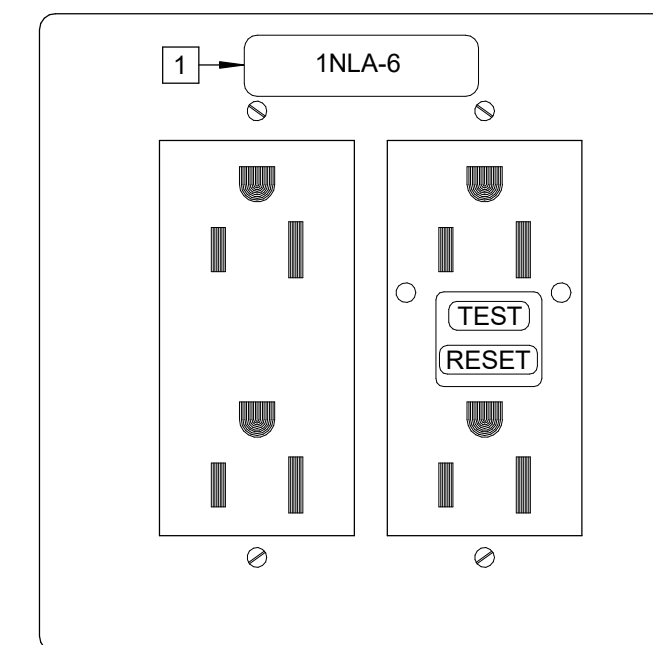
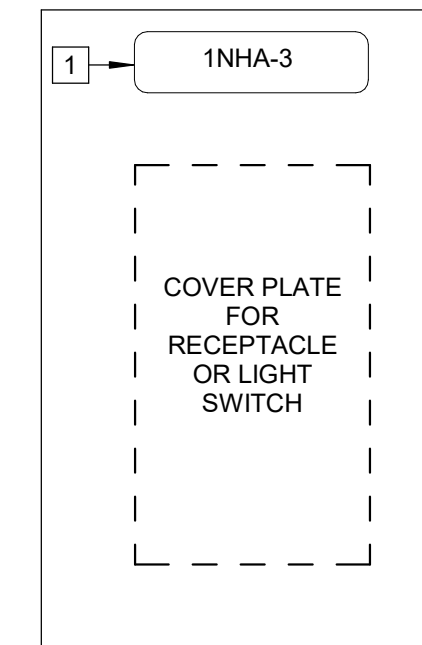
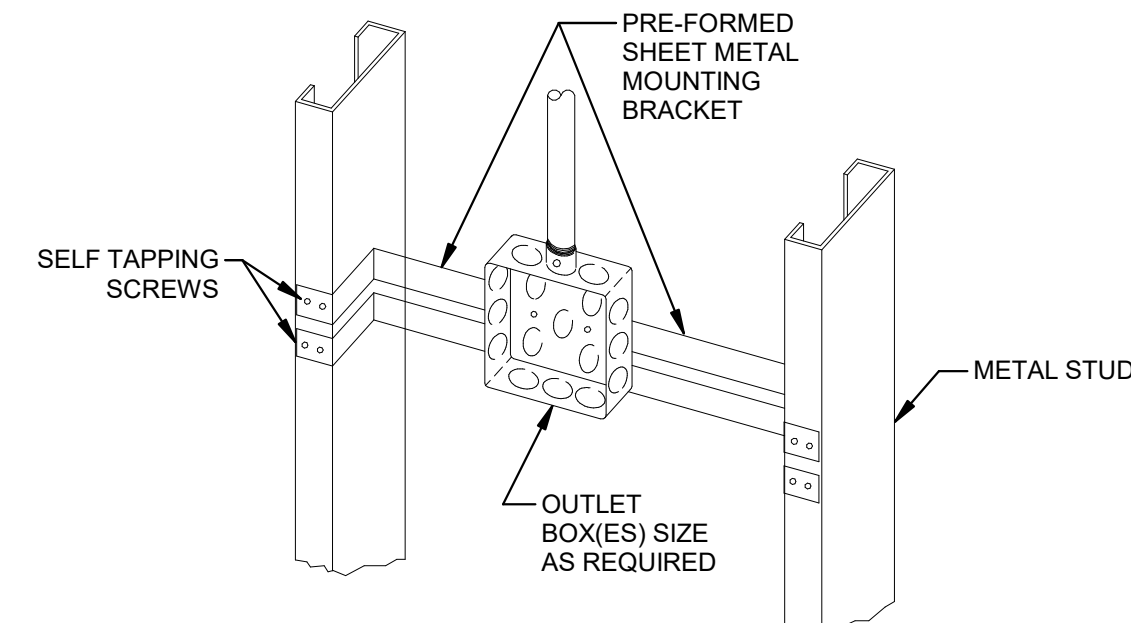
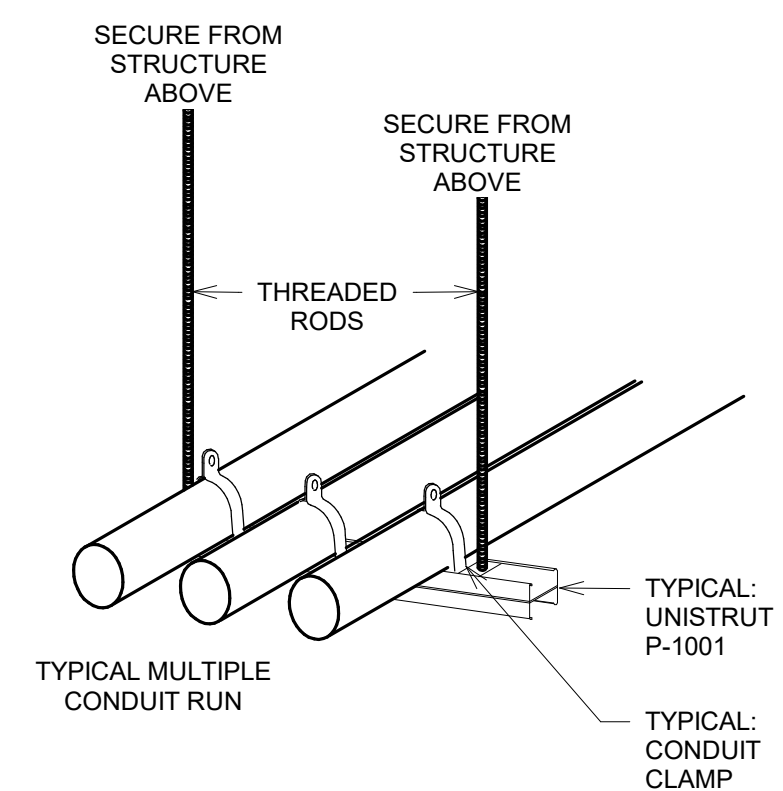
**TOMBALL ISD - CHILLER
PACKAGE #2a**

Ancillary Services Building
Baker Dr
Tomball, TX 77375



ABCS-E3.00

Scale $1/8" = 1'-0"$



GENERAL NOTE:

ALL RECEPTACLES IN SCOPE SHALL BE INSTALLED WITH GROUND PIN RECEIVER IN THE VERTICAL-UP POSITION. FOR HORIZONTALLY MOUNTED RECEPTACLES, THE GROUND PIN RECEIVER SHALL BE TO THE LEFT, NEUTRAL RECEIVER UP.

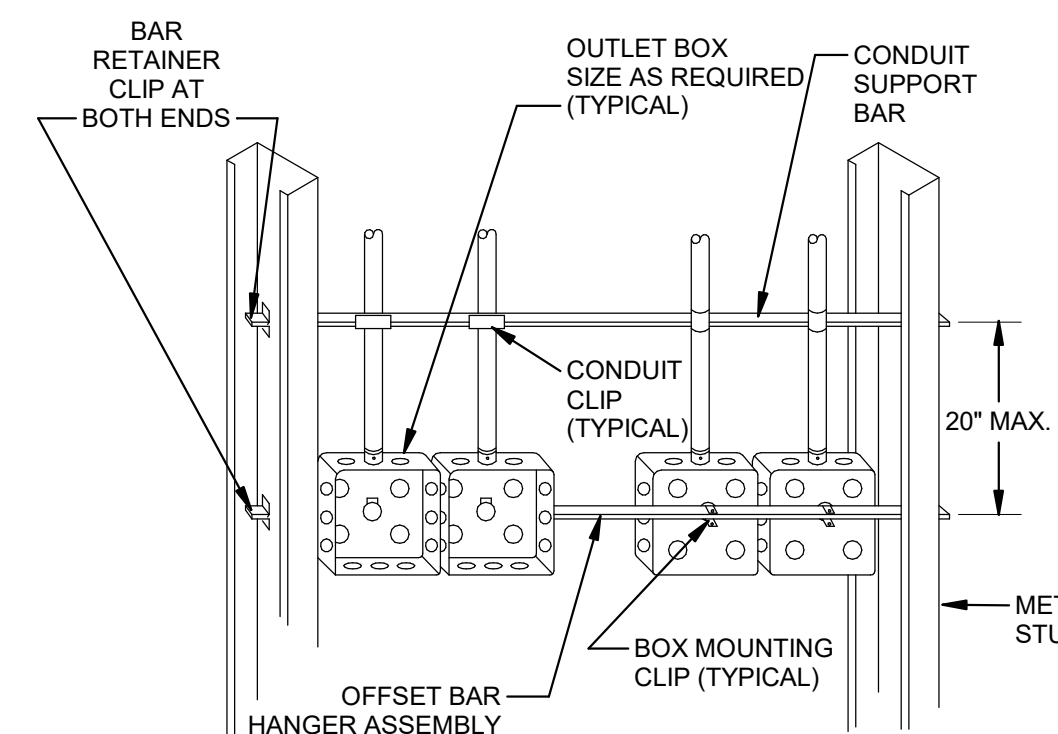
KEYED NOTES:

1 PROVIDE LABELS FOR LIGHT SWITCH AND RECEPTACLE COVER PLATES INDICATING THE PANELBOARD AND THE SUPPLY BRANCH CIRCUIT NUMBER. ALL LABELS SHALL BE TYPED. TEXT SHALL BE THERMAL SET, 12 OR 14 POINT PLAIN OR BLOCK STYLE FONT. ALL ENGRAVED INFORMATION SHALL HAVE A BLACK FINISH.

ADDITIONAL DEVICES TO BE LABELED:

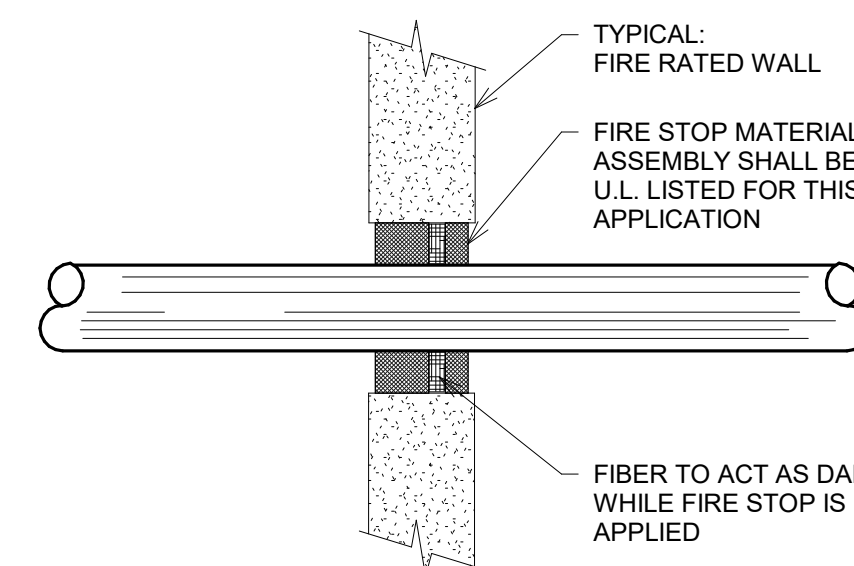
(RE: KEYED NOTE 1)
PROVIDE LABELS FOR THE FOLLOWING ADDITIONAL DEVICES:

- FLOOR CORES
- TOGGLE TYPE LOAD DISCONNECT SWITCHES FOR DIRECT CONNECTED LOADS
- OUTLET BOXES FOR DIRECT CONNECTED LOADS
- OUTLET BOXES FOR DIRECT CONNECT LOADS WHICH DO NOT REQUIRE LOCAL DISCONNECTS.

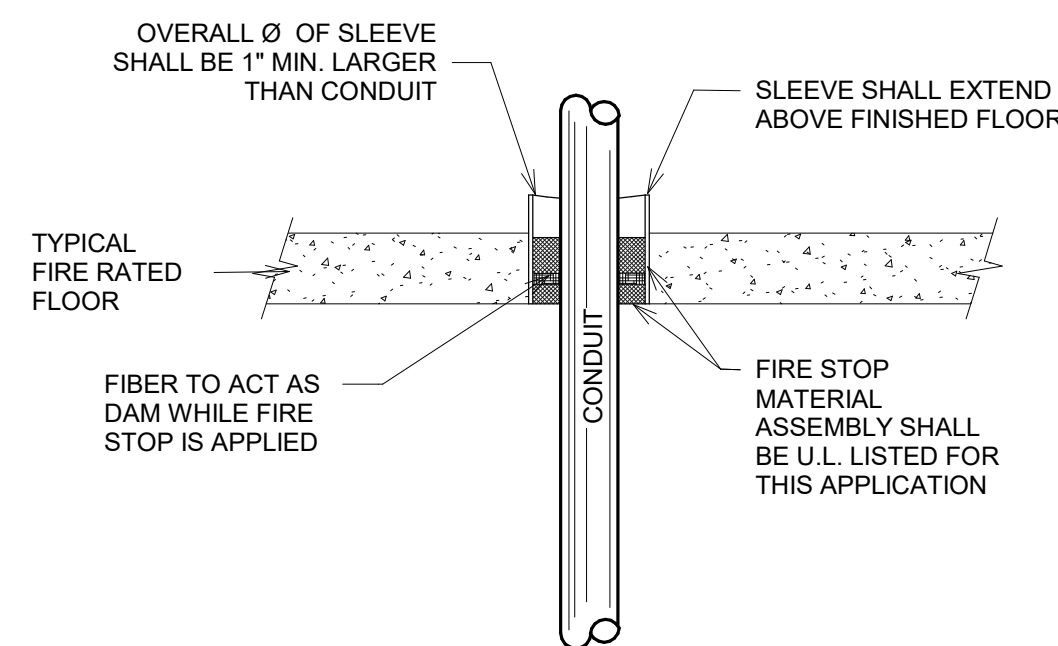


GENERAL NOTES (BOX MOUNTING DETAIL ONLY)

1. CONDUITS SHALL BE SUPPORTED PER NEC 358.30(A).
2. THIS DETAIL TO BE USED ONLY WHERE SWITCHES, RECEPTACLES OR OUTLETS ARE SHOWN IN THE SAME LOCATION ON BOTH SIDES OF A WALL OR PARTITION. DO NOT USE WHERE SWITCHES, RECEPTACLES OR OUTLETS ARE SHOWN ONLY ON ONE SIDE OF A WALL OR PARTITION.



NOTE:
NOTE: FIRE RATING OF COMPLETED FIREPROOFED ASSEMBLY SHALL EQUAL OR EXCEED THE FIRE RATING OF THE WALL.

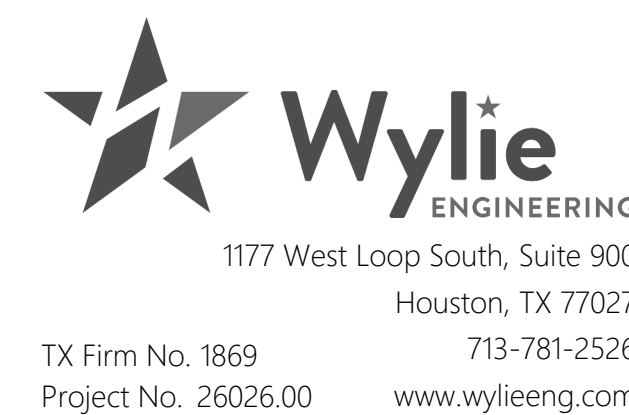


NOTE:
NOTE: FIRE RATING OF COMPLETED FIREPROOFED ASSEMBLY SHALL EQUAL OR EXCEED
THE FIRE RATING OF THE WALL.

[illegible]

**TOMBALL ISD - CHILLER
PACKAGE #2a**

Ancillary Services Building
Baker Dr
Tomball, TX 77375



ELECTRICAL DETAILS

ABCS-E4.00

Scale	Not-To-Scale
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08/31/2016

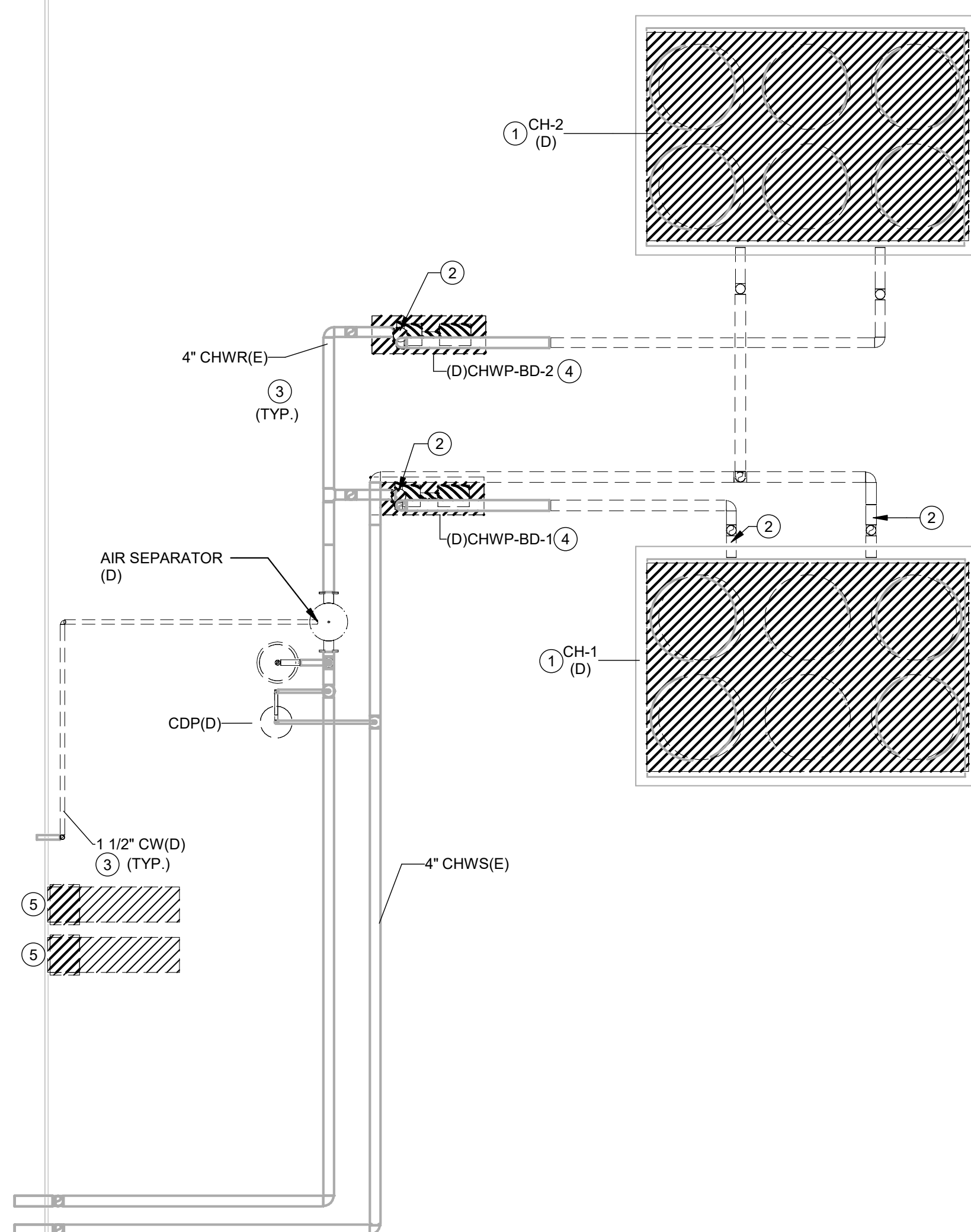
Ancillary Services Building
1110 Baker Dr
Tomball, TX 77375



ABMS -
MEP1.00

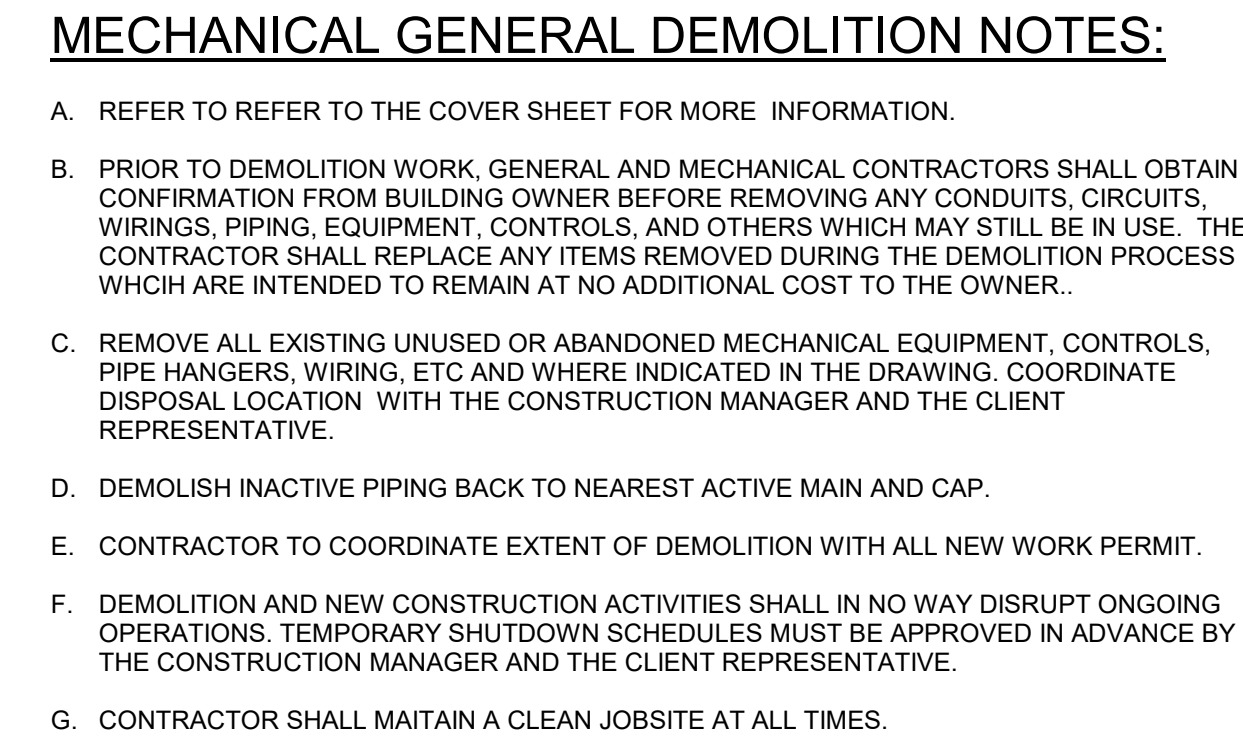
Scale $3/64" = 1'-0"$

Scale AS INDICATED



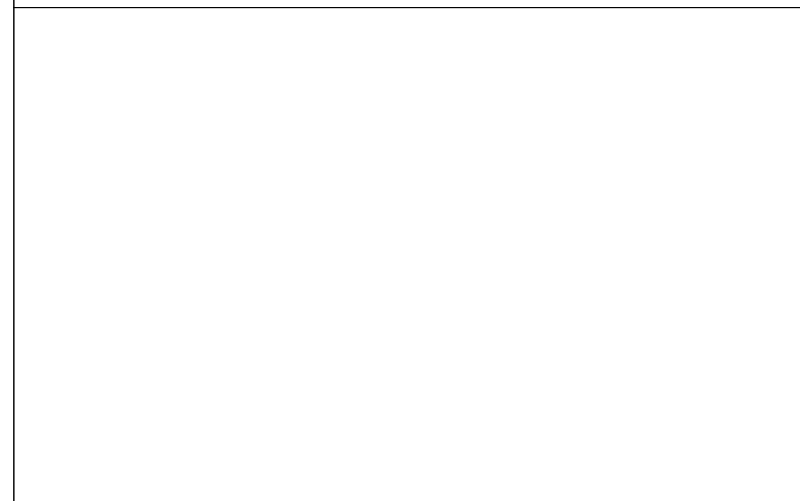
Scale	As indicated
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08/31/2026



- 1 DEMOLISH EXISTING AIR COOLED CHILLER UNIT, DISCONNECT PIPES, CONTROLS AND POWER WIRING. MAKE THE SPACE READY FOR A NEW AIR COOLED CHILLER TO BE INSTALLED PRIOR TO THE START OF THE CONTRACTOR TO PROVIDE OWNER WITH ANY PARTS AND PIECES WHICH THE OWNER WOULD LIKE TO SALVAGE FOR FUTURE MAINTENANCE USE. COORDINATE WITH OWNER.
- 2 DEMOLISH EXISTING PIPING AND ALL ASSOCIATED SUPPORTS.
- 3 DEMOLISH ALL PIPING OUTSIDE THE BUILDING AS SHOWN.
- 4 DEMOLISH EXISTING CHILLED WATER PUMPS IN ITS ENTIRETY, INCLUDING ALL CONTROLS, INERTIA PADS, SUPPORTS AND POWER WIRING. DEMOLISH EXISTING PIPING BACK TO ISOLATION VALVES IF NO ISOLATION VALVES EXIST. THE CONTRACTOR IS TO PROVIDE THE OWNER WITH A NEW PUMP AND NEW LINE SUPPLY AND RETURN MANUAL ISOLATION VALVES PER SPECIFICATIONS.

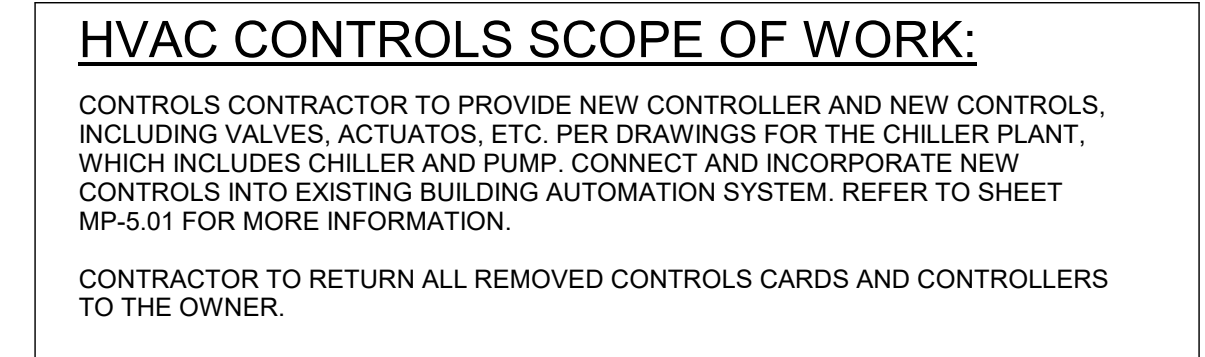
**TOMBALL ISD - CHILLER
PACKAGE #2b**



ABMS - MP1.02

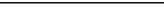
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STATE OF TEXAS
★
KOUROSH M. YAZDANI
10449
LICENSED
PROFESSIONAL ENGINEER
08/31/2026



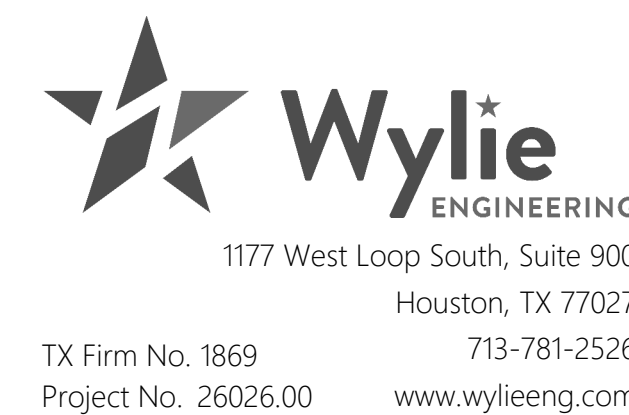
- A. REFER TO MECHANICAL COVER SHEET FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL INFORMATION.
- B. REFER TO MECHANICAL SCHEDULES AND DETAIL DRAWINGS FOR ADDITIONAL INFORMATION.
- C. MAINTAIN MANUFACTURER'S RECOMMENDED SERVICE CLEARANCE FOR NEW AND EXISTING MECHANICAL EQUIPMENT.
- D. THE CONTRACTOR SHALL VERIFY THAT ALL EXISTING AND NEW MECHANICAL EQUIPMENT ARE MOUNTED SO THAT ALL REQUIRED CLEARANCES ARE MAINTAINED AT THE BOTTOM AND SIDES OF EACH UNIT FOR PROPER SERVICING AND MAINTENANCE. COORDINATE COMPLETELY WITH ALL NEW WALLS TO STRUCTURE, AND RELOCATE AS REQUIRED TO MAINTAIN PROPER CLEARANCES.
- E. CONTRACTOR SHALL FIELD VERIFY ACTUAL LOCATIONS OF ALL EQUIPMENT, DUCTWORK, & PIPING REFER TO SUBMITTING A BID. COORDINATE COMPLETELY WITH ALL OTHER TRADES. COORDINATE WITH ALL MECHANICAL UNITS AND PROVIDE ADDITIONAL DUCTWORK, OFFSETS, FITTINGS, ETC. AS REQUIRED.

- 1 ALL NEW INSULATION SHALL BE INSTALLED PER STANDARDS AND MANUFACTURER'S
RECOMMENDATIONS.
- 2 NEW OUTDOOR TYPE PUMP MOTOR VFD UNIT. PROVIDE NEW MOUNTING BRACKET AND
SUPPORTS IN CONCRETE BASE. INSTALLATION SHALL BE PER MANUFACTURER'S
REQUIREMENT.
- 3 PROVIDE A NEW AIR-COOLED CHILLER. REFER TO MECHANICAL DETAILS AND PIPING
SCHEMATICS FOR ALL PIPING ACCESSORIES REQUIRED, INCLUDING VALVES, GAUGES,
ELECTRIC MOTOR CONTROLLER TO PROVIDE AND INSTALL NEW CONTROL VALVES AND
ASSOCIATED WIRING AND PROGRAMMING TO INCORPORATE BACK INTO EXISTING
CONTROLS SEQUENCE.
- 4 PROVIDE A NEW CHILLED WATER PUMP TYING INTO EXISTING PIPING TO REMAIN.
PROVIDE ALL NEW GAUGES, VALVES, AND ASSOCIATED APPURTENANCES, ETC. PER
MECHANICAL DETAIL. CONTRACTOR TO COORDINATE ALL PIPING CONNECTIONS TO
ENSURE ALL NECESSARY CONNECTIONS ARE CREATED WHICH WOULD POTENTIALLY
CREATE AN ISSUE WITH CONTROLS, GAUGES, VALVES, ETC. TO BE INSTALLED IN THE
PIPING. REFER TO SCHEDULE SHEET FOR ADDITIONAL INFORMATION.
- 5 CHWSR EMERGENCY CONNECTION.
- 6 PROVIDE SPRING VIBRATION TYPE ON THE FIRST 4 PIPE SUPPORTS FROM AND TO THE
PUMP. OTHER SUPPORTS TO BE RIGID TYPE. REFER TO DETAIL DRAWING.
- 7 PROVIDE HEAT TRACE TO ALL PIPING. REFER TO ELECTRICAL.
- 8 PROVIDE NEW CONCRETE PAD EXTENSION TO FIT THE NEW CHILLER UNIT.
- 9 OUTLINE OF CHILLER UNIT SERVICE AND MAINTENANCE CLEARANCE.

LINETYPE LEGEND	
	ITEMS EXISTING TO REMAIN
	ITEMS EXISTING TO BE REMOVED
	NEW ITEMS

**TOMBALL ISD - CHILLER
PACKAGE #2b**

Ancillary Services Building
1110 Baker Dr
Tomball, TX 77375



MECHANICAL AND
PLUMBING PLAN -
ALTERNATE 2
**ABMS -
MP2.02**

Scale	As indicated
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[illegible]

NOTES:

1. PROVIDE WITH PREMIUM EFFICIENCY VSD-RATED MOTOR. PROVIDE ELECTRICALLY INSULATED BEARINGS ON VSD DRIVE MOTORS.
2. PUMP SHALL BE INSTALLED ON A VIBRATION ISOLATION BASE. PROVIDE VIBRATION ISOLATED RAILS, VARIABLE SPEED DRIVE (VSD), AND NECESSARY INTERFACE TO THE EXISTING CONTROLLER.
3. ELECTRICAL DISCONNECT SHALL BE PROVIDED AND INSTALLED BY EC.
4. PUMP SHALL HAVE ABB VSD, OR APPROVED EQUIV.
5. PUMP SHALL BE OUTDOOR RATED WITH MOTOR AT 122° (50°C) AMBIENT TEMPERATURE.
6. PUMP SHALL MEET CONTRACTOR'S OWN DESIGN STANDARDS FOR NEW VARIABLE FREQUENCY DRIVE (VFD) STANDARDS (IF PUMPS/ PUMPS) AS REQUIRED. CONTROLS CONTRACTOR TO PROVIDE AND INSTALL NEW DIFFERENTIAL PRESSURE (DP) SENSOR. MECHANICAL CONTRACTOR TO COORDINATE LOCATIONS OF TAPS FOR DP SENSORS WITH CONTROLS CONTRACTOR. RECOMMEND TO BE INSTALLED APPROXIMATELY TWO FEET ABOVE THE PUMP DISCHARGE.
7. CONTRACTOR SHALL VERIFY PUMP BODY DISCHARGE PIPING CONNECTION TO ENSURE ALIGNMENT WITH PIPING OR ADJUST PIPING AS REQUIRED WHILE MAINTAINING APPURTENANCES AS SHOWN IN THE DETAILS.
8. PROVIDE 65KVA CONTROLLER.

SCHEDULE OF AIR COOLED CHILLERS - TRANE																															
DESIGNATION	CAPACITIES										ELECTRICAL										UNIT DIMENSIONS			REFRIGERANT	OPERATING WEIGHT (LBS)	MANUFACTURER / MODEL BASIS FOR DESIGN	NOTES / REMARKS				
	TONS	FLOW RATE (GPM)	ENTERING CHILLED WATER TEMPERATURE °F	LEAVING CHILLED WATER TEMPERATURE °F	WATER PRESSURE DROP (FT)	AMBIENT DRY BULB TEMPERATURE °F		FOULING FACTOR (°F/FT²·HBTU)	CONDENSER FAN			COMPRESSOR		INPUT POWER (KW)	EFFICIENCY (EER) BTU/W·H	PLV/P (EER) BTU/W·H	VOLTS	HZ	PH	MCA	MCCA	LENGTH (INCH)	WIDTH (INCH)					HEIGHT (INCH)			
ACCH-ABMS-1	94.14	187.7	56	44	9.48	105 SUMMER	20 WINTER	0.0001	8	-	-	SCROLL	4	-	125.7	8.985	16.10	460	60	3	207	250	169.2	88.4	92.5	R-454B	6,759	TRANE CGAM-100	1 TO 15		
ACCH-ABMS-2	94.14	187.7	56	44	9.48	105 SUMMER	20 WINTER	0.0001	8	-	-	SCROLL	4	-	125.7	8.985	16.10	460	60	3	207	250	169.2	88.4	92.5	R-454B	6,759	TRANE CGAM-100	1 TO 15		

NOTES:

1. CERTIFIED IN ACCORDANCE WITH THE AHRI AIR-COOLED WATER CHILLING PACKAGES CERTIFICATION PROGRAM, WHICH IS BASED ON AHRI STANDARD 550 / 590 (U) AND AHRI STANDARD 551 / 591 (S)
2. CHILLER UNIT SHALL BE PROVIDED WITH VARIABLE SPEED CONDENSER FANS
3. CHILLER UNIT SHALL BE PROVIDED WITH CONDENSER FIN MATERIAL OF MICROCHANNEL COILS WITH COMPLETE COAT.
4. CHILLER UNIT SHALL BE PROVIDED WITH BACNET INTERFACE.
5. CHILLER UNIT SHALL BE PROVIDED WITH WIDE AMBIENT RATED FROM -125°F.
6. CHILLER UNIT SHALL BE PROVIDED WITH FREEZE PROTECTION
7. CHILLER UNIT SHALL BE PROVIDED WITH INSULATION FOR HIGH HUMIDITY / LOW EVAP TEMP
8. CHILLER UNIT SHALL BE PROVIDED WITH ACROSS THE LINE STARTER / DIRECT ON LINE STARTER TYPE
9. CHILLER UNIT SHALL BE PROVIDED WITH SINGLE POINT POWER CONNECTION. PROVIDE CIRCUIT BREAKER WITH HIGH FAULT RATED CONTROL PANEL POWER LINE CONNECTION TYPE.
10. CHILLER UNIT SHALL BE PROVIDED WITH ELASTOMERIC ISOLATORS.
11. CHILLER UNIT SHALL BE PROVIDED WITH FACTORY INSTALLED STRAINER
12. CHILLER UNIT SHALL BE PROVIDED WITH SUPER QUIET SOUND ATTENUATOR PACKAGE.
13. CHILLER UNIT SHALL BE PROVIDED WITH ARCHITECTURAL LOUVER PANELS.
14. CHILLER UNIT SHALL BE INSTALLED IN AN EXISTING PAD. CONTRACTOR IS RESPONSIBLE TO MAKE ANY NECESSARY ADJUSTMENT WHERE REQUIRED.
15. PROVIDE 65KVA CONTROLLER

SCHEDULE OF AIR COOLED CHILLERS - CARRIER																													
DESIGNATION	CAPACITIES								ELECTRICAL													UNIT DIMENSIONS			REFRIGERANT	OPERATING WEIGHT (LBS)	MANUFACTURER / MODEL BASED FOR DESIGN	NOTES / REMARKS	
	TONS	FLOW RATE (GPM)	ENTERING CHILLED WATER TEMPERATURE °F	LEAVING CHILLED WATER TEMPERATURE °F	WATER PRESSURE DROP (FT)	AMBIENT DRY BULB TEMPERATURE °F		FOULING FACTOR (F.T12/H2BU)	CONDENSER FAN			COMPRESSOR			INPUT POWER (KW)	EFFICIENCY (EER) BTU/W·H	PLV (EER) BTU/W·H	VOLTS	PH	HZ	MCA	MOCA	LENGTH (INCH)	WIDTH (INCH)					HEIGHT (INCH)
ACCH-ABMS-1	91.06	181.6	56	44	7.44	105 SUMMER	20 WINTER	0.0001	6	-	-	SCROLL	2	-	124.2	8.801	16.82	460	60	3	188.8	225	152	88	99	R-32	6,730	CARRIER MODEL 30RC-1026S60HJ829	1 TO 13
ACCH-ABMS-2	91.06	181.6	56	44	7.44	105 SUMMER	20 WINTER	0.0001	6	-	-	SCROLL	2	-	124.2	8.801	16.82	460	60	3	188.8	225	152	88	99	R-32	6,730	CARRIER MODEL 30RC-1026S60HJ829	1 TO 13

NOTES:

1. CERTIFIED IN ACCORDANCE WITH THE AHRI AIR-COOLED WATER CHILLING PACKAGES CERTIFICATION PROGRAM, WHICH IS BASED ON AHRI STANDARD 550 (LUP) AND AHRI STANDARD 551 (SFI) (SFI).
2. RATED IN ACCORDANCE WITH AHRI (AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE) STANDARD 550/550-1, LATEST EDITION (U.S.A.) AND ALL UNITS SHALL BE ASHRAE (AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS) 90-1.2019 COMPLIANT.
3. VARIABLE SPEED CONDENSER FANS.
4. DIGITAL SCROLL-TYPE COMPRESSORS.
5. CUIAL E-COATED CONDENSER AND SHELL AND TUBE EVAPORATOR.
6. PROVIDE WITH NATIVE BACNET INTERFACES.
7. EVAPORATOR HEATER (FREEZE PROTECTION)
8. REMOTE CONNECTIVITY & GPI
9. SINGLE POINT POWER.
10. FULL HALL GUARDS.
11. NON-FLUDED DISCONNECT.
12. CHILLER UNIT SHALL BE INSTALLED IN AN EXISTING PAD. CONTRACTOR IS RESPONSIBLE TO MAKE ANY NECESSARY ADJUSTMENT WHERE REQUIRED.
13. PROVIDE E63AK CONTROLLER.

SCHEDULE OF AIR COOLED CHILLERS - YORK (JOHNSON CONTROLS, INC.)																											
DESIGNATION	CAPACITIES							ELECTRICAL													UNIT DIMENSIONS			REFRIGERANT	OPERATING WEIGHT (LBS)	MANUFACTURER / MODEL BASIS FOR DESIGN	NOTES / REMARKS
	TONS	FLOW RATE (GPM)	ENTERING CHILLED WATER TEMPERATURE °F	LEAVING CHILLED WATER TEMPERATURE °F	WATER PRESSURE DROP (FT)	AMBIENT DRY BULB TEMPERATURE °F SUMMER WINTER	FOULING FACTOR (°F/125HBTU)	CONDENSER FAN NO. LRA (A) FLA (A)	COMPRESSOR TYPE NO. LRA (A)	INPUT POWER (KW)	EFFICIENCY (EER) BTU/W·H	PLV (IP) EER (EER) BTU/W·H	VOLTS	PH	MCA	MOCP	LENGTH (INCH)	WIDTH (INCH)	HEIGHT (INCH)								
ACCH-ABMS-1	91.13	181.3	56	44	11.0	105 SUMMER 20 WINTER	0.0001	4 - -	SCROLL 5 -	124.5	8.781	17.27	460	60	3	225	250	142.7	88.3	94.2	R454B	5,410	YORK MODEL YLAA0101HJ46XFB	1 TO 11			
ACCH-ABMS-2	91.13	181.3	56	44	11.0	105 SUMMER 20 WINTER	0.0001	4 - -	SCROLL 5 -	124.5	8.781	17.27	460	60	3	225	250	142.7	88.3	94.2	R454B	5,410	YORK MODEL YLAA0101HJ46XFB	1 TO 11			

NOTES:

1. CERTIFIED IN ACCORDANCE WITH THE AHRI-AIR-COOL-DRIVE WATER CHILLING PACKAGES CERTIFICATION PROGRAM, WHICH IS BASED ON AHRI STANDARD 550 / 590 (P) AND AHRI STANDARD 551 / 591 (S).
2. RATED IN ACCORDANCE WITH AHRI (AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE) STANDARD 550/590, LATEST EDITION (U.S.A.) AND ALL UNITS SHALL BE ASHRAE (AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS) 90.1-2019 COMPLIANT.
3. VARIABLE SPEED CONDENSER FANS.
4. FULLY HERMETIC DIRECT DRIVE, SCROLL-TYPE COMPRESSORS.
5. CUAL E-COATED CONDENSER AND SHELL AND TUBE EVAPORATOR.
6. BACNET MS/TP, MODBUS AND NZ COMMUNICATIONS, WITH LON PROTOCOL SERVED THROUGH AN ELINK COMMUNICATION CARDS.
7. SINGLE-POINT POWER TERMINAL, NON-FUSED DISCONNECT SWITCH.
8. HIGH AND LOW AMBIENT KIT.
9. FULL UNIT LOUVERED PANELS.
10. LEVEL ADJUSTING SPRING TYPE VIBRATION ISOLATORS.
11. CHILLER UNIT SHALL BE INSTALLED IN AN EXISTING PAD. CONTRACTOR IS RESPONSIBLE TO MAKE ANY NECESSARY ADJUSTMENT WHERE REQUIRED.
12. PROVIDE 6SKAC CONTROLLER.

SCHEDULE OF VARIABLE SPEED DRIVES								
DESIGNATION VSD	SERVES	HORSEPOWER	VOLTAGE	PHASE	ENCLOSURE TYPE	MOUNTING TYPE	BASIS OF DESIGN	NOTES
VFD-CHWP-ABMS-1	CHWP-ABMS-1	7.5	460	3	IP66	WALL/PANEL MOUNT	ABB ACS550 / ACS580	1 TO 4
VFD-CHWP-ABMS-2	CHWP-ABMS-2	7.5	460	3	IP66	WALL/PANEL MOUNT	ABB ACS550 / ACS580	1 TO 4

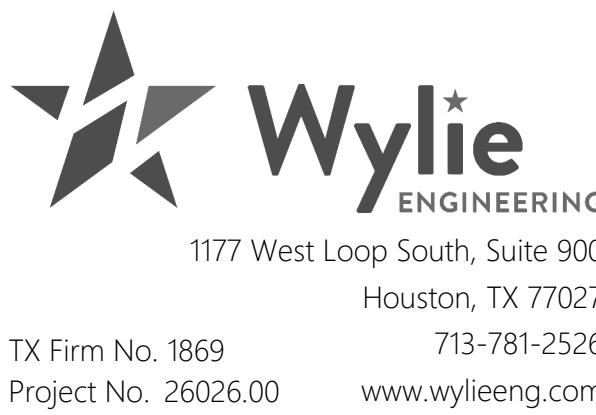
NOTES:

1. PROVIDE SUPPORT FOR VERTICAL MOUNTING
2. OUTDOOR TYPE, WEATHER / WATER PROOF
3. RATED AT 105°F AMBIENT TEMPERATURE.
4. NORMAL DUTY.

[illegible]

**TOMBALL ISD - CHILLER
PACKAGE #2b**

Ancillary Services Building
1110 Baker Dr
Tomball, TX 77375



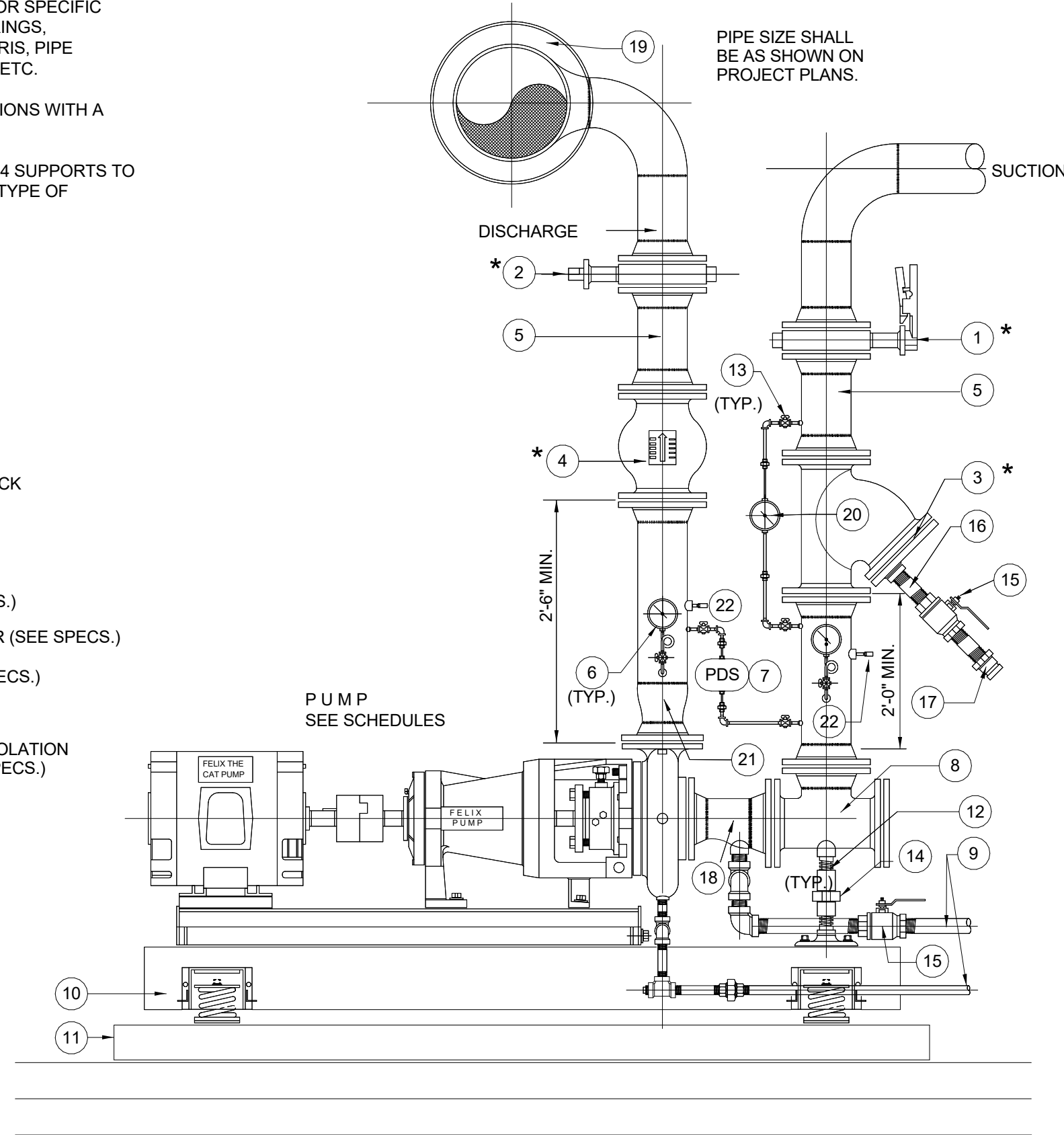
MECHANICAL AND PLUMBING SCHEDULES

ABMS - MP3.00

Scale $3/32" = 1'-0"$

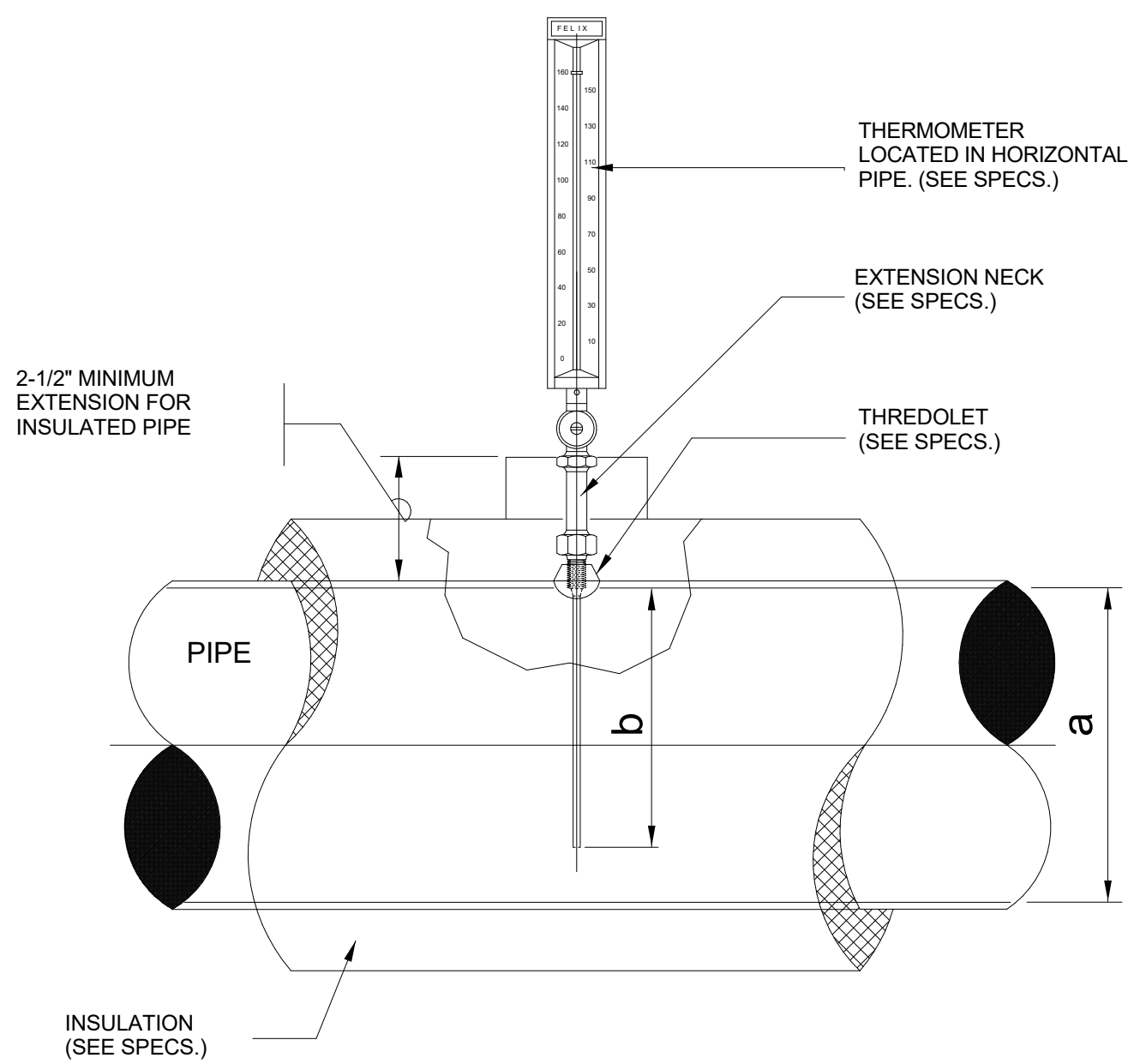
1. REFER TO PLAN DRAWING FOR PIPING CONFIGURATION FOR EACH INDIVIDUAL PUMP.
2. REFER TO PLANS, DETAILS, AND SPECIFICATIONS FOR SPECIFIC PUMP, CONCRETE BASE, VIBRATION ISOLATION SPRINGS, HOUSEKEEPING PADS, VALVES, STRAINERS, VENTURIS, PIPE FITTINGS, GAUGES, SENSORS, AND CONTROLLERS, ETC.
3. INSTALL TEST PLUGS IN EASILY ACCESSIBLE LOCATIONS WITH A MINIMUM OF 12" CLEARANCE IN FRONT.
4. PROVIDE VIBRATION ISOLATOR TYPE ON THE FIRST 4 SUPPORTS TO AND FROM THE PUMPS. REFER TO SPECS FOR THE TYPE OF SUPPORTS REQUIRED.

- 1 STOP VALVE (SEE SPECIFICATIONS)
- 2 BALANCING VALVE (SEE SPECIFICATIONS)
- 3 STRAINER (SEE SPECIFICATIONS)
- 4 CHECK VALVE (SEE SPECIFICATIONS) AXIS OF CHECK VALVE SHAFT SHALL BE PERPENDICULAR TO PUMP SHAFT.
- 5 SPOOL PIECE (SEE SPECIFICATIONS)
- 6 PRESSURE GAUGE WITH GAUGE COCK (SEE SPECS.)
- 7 DIFFERENTIAL PRESSURE SENSOR / TRANSMITTER (SEE SPECS.)
- 8 SUCTION DIFFUSER WITHOUT STRAINER. (SEE SPECS.)
- 9 EXTEND PUMP DRAIN LINES TO FLOOR DRAIN.
- 10 NEW CONCRETE INERTIA BASE WITH VIBRATION ISOLATION RAILS, AND VIBRATION ISOLATION SPRINGS (SEE SPECS.)
- 11 HOUSE KEEPING PADS. (SEE SPECIFICATIONS.)
- 12 2" SCREW JACK
- 13 1/4" COCK VALVE (SEE SPECIFICATIONS)
- 14 UNION (SEE SPECIFICATIONS)
- 15 FULL BORE BALL VALVE (SEE SPECS.)
- 16 FULL SIZE STRAINER DRAIN CONNECTION
- 17 HOSE END ADAPTER WITH CAP (SEE SPECIFICATIONS)
- 18 ECCENTRIC REDUCER (SEE SPECS.)
- 19 PIPE INSULATION (SEE SPECS.)
- 20 DIFFERENTIAL PRESSURE GAUGE. (SEE SPECIFICATIONS)
- 21 CONCENTRIC REDUCER (SEE SPECIFICATIONS)
- 22 TEST PLUG (SEE SPECIFICATIONS)



DETAIL M-DET033

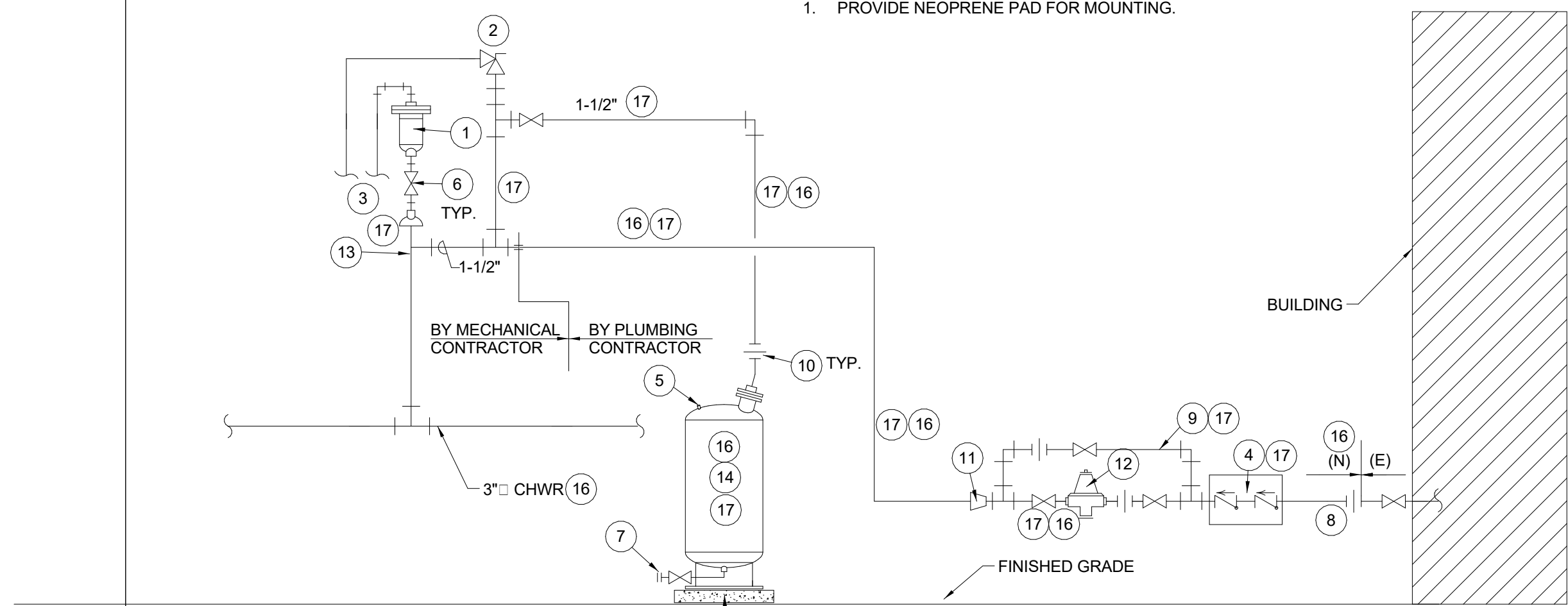
SCALE: NONE



INSERTION LENGTH SCHEDULE	
a = PIPE DIAMETER	b = INSERTION LENGTH
4" AND 5"	2-1/2"
6" AND 8"	5"
10" AND LARGER	8"

DETAIL #M-DET043

SCALE: NONE



- 1 AUTOMATIC AIR VENT. SEE AUTOMATIC AIR VENT FOR ADDITIONAL INFORMATION
- 2 PRESSURE RELIEF VALVE.
- 3 ROUTE DRAIN LINES TO NEAREST PLANTER AREA.
- 4 BACK FLOW PREVENTER (REFER TO SPECS)
- 5 CHARGE CONNECTION
- 6 STOP VALVE. (FULL PORT BALL VALVE)
- 7 3/4" VALVED DRAIN LINE WITH HOSE END ADAPTER.
- 8 DOMESTIC COLD WATER LINE. - REFER TO PLUMBING PLANS FOR ADDITIONAL INFORMATION.
- 9 FULL SIZE BY-PASS LINE.
- 10 UNION
- 11 CONCENTRIC REDUCER.
- 12 WATTS PRESSURE REDUCING VALVE.
- 13 DO NOT INSTALL VALVES BETWEEN SYSTEM AND RELIEF VALVE.
- 14 DIAPHRAGM TYPE EXPANSION TANK. SEE SCHEDULE ABOVE FOR CAPACITY.
- 15 CONCRETE HOUSEKEEPING PAN.
- 16 PROVIDE INSULATION. (SEE SPECIFICATIONS)
- 17 PROVIDE HEAT TRACE. REFER TO ELECTRICAL.

1. PROVIDE DIELECTRIC UNION AT JOINTS OF DISSIMILAR MATERIALS.
2. PROVIDE PIPE SUPPORTS AS REQUIRED. EXISTING SUPPORT SHALL BE REUSED WHERE FOUND FIT.
3. PROVIDE INSULATION AND ALUMINUM JACKETS ON THE EQUIPMENT, ABOVEGROUND MAKE-UP WATER PIPING, AND EXISTING MAKE-UP WATER PIPING.
4. PROVIDE HEAT TRACE AS REQUIRED. REFER TO ELECTRICAL.

04

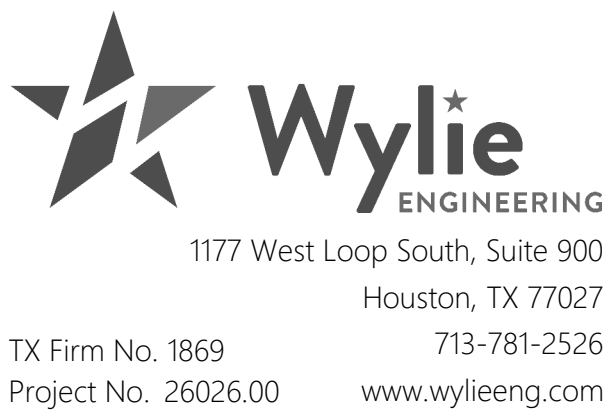
DIAPHRAGM TYPE EXPANSION TANK SCHEDULE	
MARK	ET-ABMS-1
SERVICE	CHILLED WATER
TANK VOL. (GAL.)	16.5
ACCEPT VOL. (GAL.)	11.3
INITIAL CHARGE (PSIG)	12
WORKING PRESS. RATING (PSI)	150
SAFETY RELIEF VALVE SETTING (PSIG)	150

1. PROVIDE NEOPRENE PAD FOR MOUNTING.

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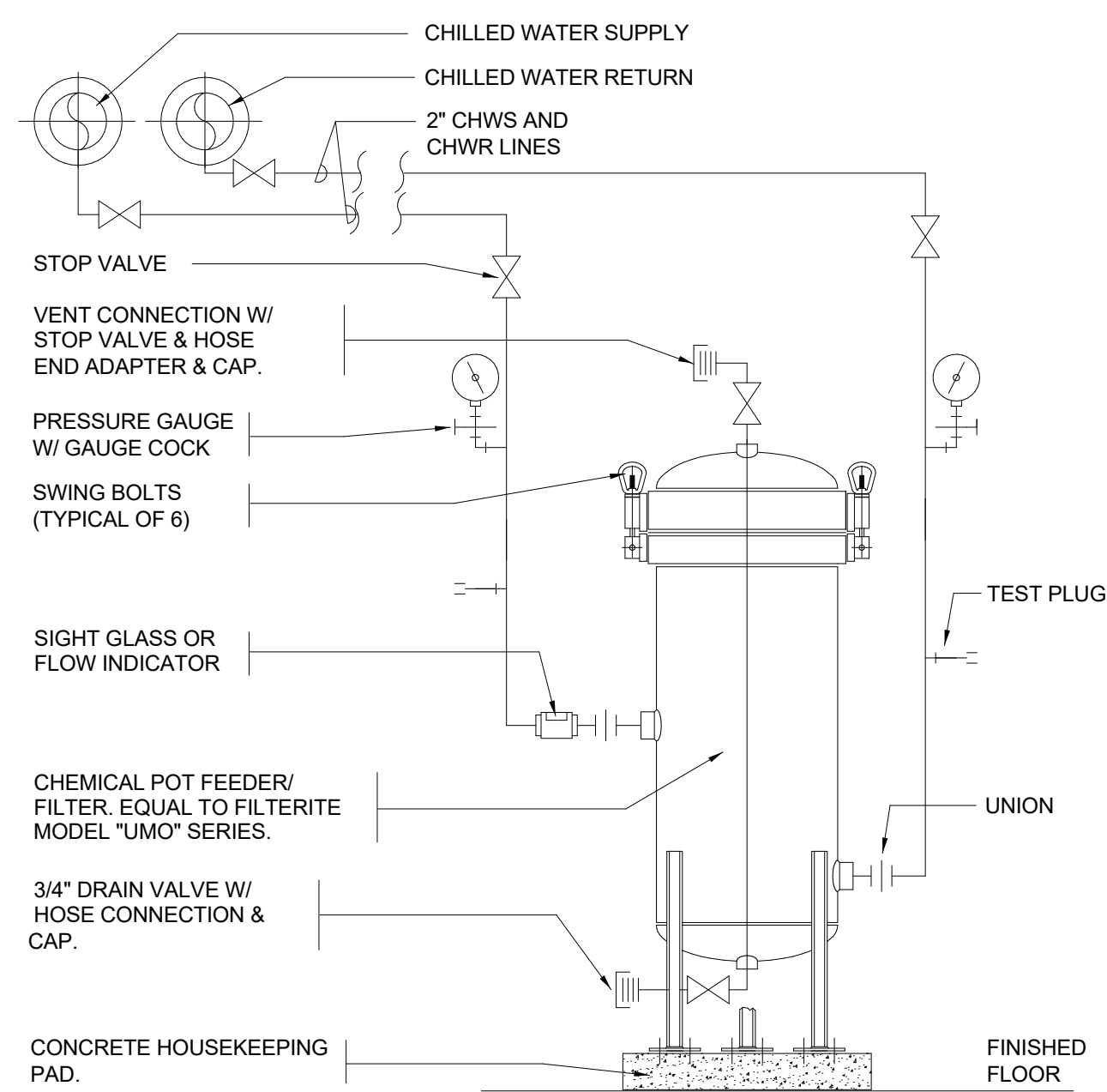
TOMBALL ISD - CHILLER PACKAGE #2b

Ancillary Services Building
1110 Baker Dr
Tomball, TX 77375



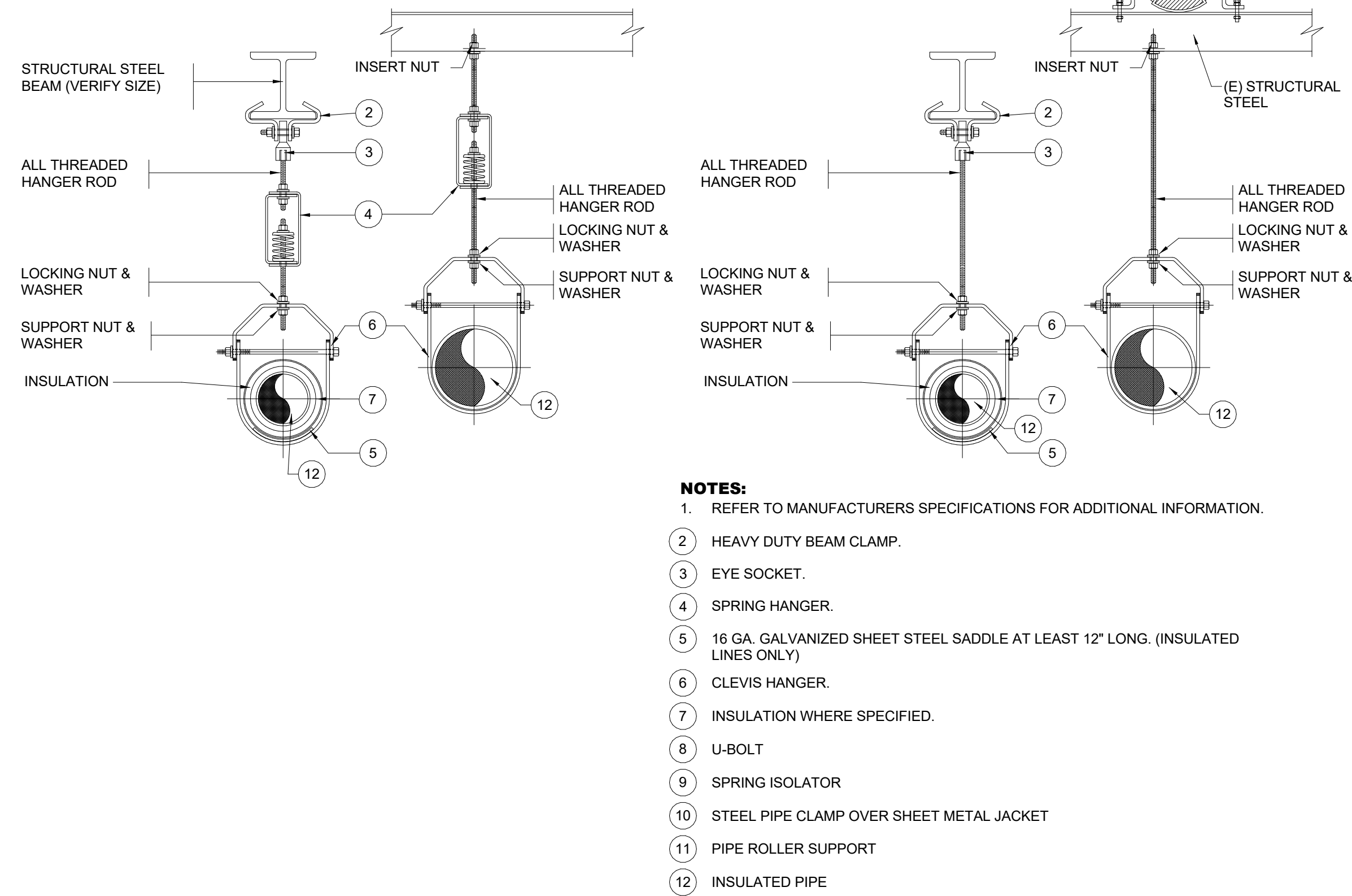
ABMS - MP4.00

Scale As indicated



1. PROVIDE INSULATION WITH ALUMINUM JACKET ON PIPES AND EQUIPMENT.
2. PROVIDE HEAT TRACE AS REQUIRED. REFER TO ELECTRICAL.

SCALE: NONE



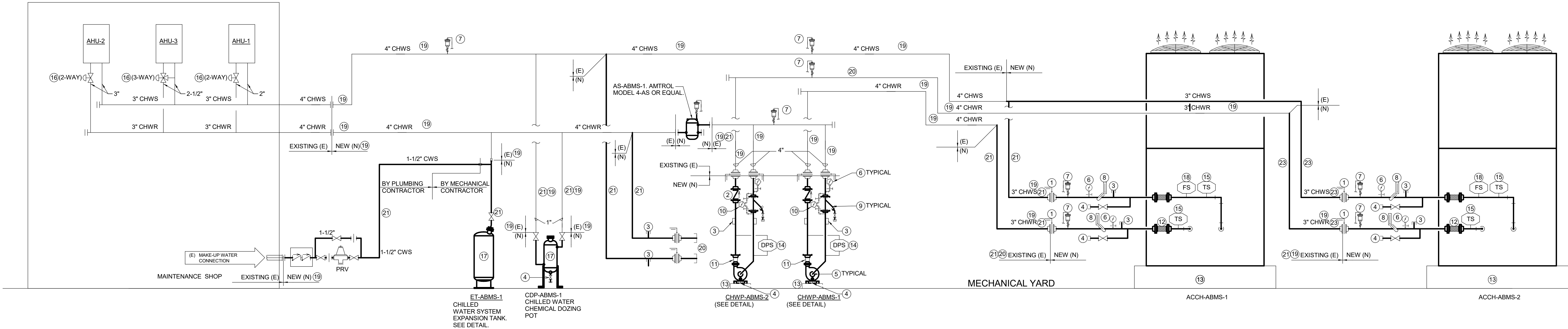
PIPING WITH ALUMINUM JACKETING (WHEN EXPOSED TO OUTDOOR CONDITIONS)

MINIMUM PIPE SUPPORT SPACING		
TYPE	PIPE SIZE	MAXIMUM HORIZONTAL SPACING
STEEL	ALL	10'-0"

DETAIL #M-DET181

SCALE: NONE

SCALE: NONE



CHILLED WATER PIPING SCHEMATICS (ALTERNATE 1)
SCALE: N.T.S.

MECHANICAL KEYED NOTES:

- 1 STOP VALVE, REFER TO SPECIFICATIONS.
- 2 CHECK VALVE, REFER TO SPECIFICATIONS.
- 3 PRESSURE/TEMPERATURE TEST PLUG, REFER TO SPECIFICATIONS.
- 4 DRAIN VALVE WITH HOSE END ADAPTER.
- 5 SUCTION DIFFUSER, REFER TO SPECIFICATIONS.
- 6 PRESSURE GAUGE WITH GAUGE COCK, REFER TO SPECIFICATIONS.
- 7 AUTOMATIC AIR VENT, REFER TO SPECIFICATIONS.
- 8 THERMOMETER, REFER TO SPECIFICATIONS.
- 9 "Y" STRAINER, REFER TO SPECIFICATIONS.
- 10 DIFFERENTIAL PRESSURE GAUGE, REFER TO SPECIFICATIONS.
- 11 CONCENTRIC REDUCER, REFER TO SPECIFICATIONS.
- 12 FLEXIBLE CONNECTION, REFER TO SPECIFICATIONS.
- 13 EXISTING HOUSEKEEPING PAD.
- 14 DIFFERENTIAL PRESSURE SENSOR
- 15 TEMPERATURE SENSOR, TIE-IN TO B.A.S. AND DISPLAY ON THE GRAPHICS.
- 16 CONTROL VALVE (E)
- 17 EXISTING TO REMAIN
- 18 FACTORY APPLIED FLOW SWITCH
- 19 REPLACE PIPE INSULATION AND SHEET METAL CLADDING ON EXISTING PIPES.
- 20 4" CHWS/R PROVISION FOR EMERGENCY CONNECTION
- 21 PROVIDE HEAT TRACE, REFER TO ELECTRICAL.



TOMBALL ISD - CHILLER
PACKAGE #2b

Ancillary Services Building
1110 Baker Dr
Tomball, TX 77375

CHILLER MANAGER SEQUENCE OF OPERATION

- A. CHILLED WATER ACTIVATION**
- THE CHILLED WATER SYSTEM WILL BE ACTIVATED BY A REQUEST FOR COOLING FROM ANY AIR HANDLING UNITS OR COOLING EQUIPMENT SUPPLIED WITH CHILLED WATER.
- B. CHILLER UNITS AND CHILLED WATER PUMPS ACTIVATION**
- WHEN THE CHILLED WATER SYSTEM IS ACTIVATED, THE CHILLER CONTROL PROGRAM WILL START THE LEAD CHILLED WATER PUMP BY SENDING A 24 VAC SIGNAL TO A RELAY MOUNTED IN THE PUMP MOTOR VFD, WHICH WILL COMPLETE THE AUTO SIDE OF THE CONTROL CIRCUIT AND START THE PUMP. A FLOW SWITCH WILL PROVE STATUS TO THE BUILDING AUTOMATION SYSTEM (B.A.S.) AND WILL ALARM AT THE CENTRAL SITE IF THE SWITCH IS NOT MADE WITHIN THE ADJUSTABLE TIME PERIOD. AFTER 15 SECONDS (ADJUSTABLE), THE B.A.S. WILL SEND 24 VAC SIGNAL TO A RELAY, WHICH WILL COMPLETE THE REMOTE START TERMINALS IN THE CHILLER CONTROL CIRCUIT AND ALLOW THE LEAD CHILLER (DEDICATED TO THE PUMP) TO RUN. A FLOW SWITCH WILL NOT ALLOW THE CHILLER TO START UNTIL FLOW HAS BEEN PROVEN. THE B.A.S. CONTROL MODULE WILL AUTOMATICALLY START THE LAG CHILLER AND AN ALRM WILL BE SENT TO THE CENTRAL SITE, 15 MINUTES (ADJUSTABLE) TIME DELAYS WILL BE ASSIGNED TO EACH CHILLER START/ STOP CIRCUIT TO PREVENT SHORT CYCLING.
- C. TEMPERATURE CONTROL AND STAGING**
- THE CHILLER WILL BE SET TO MAINTAIN A CHILLED WATER SUPPLY TEMPERATURE AS SPECIFIED IN THE SCHEDULE DRAWING (ADJUSTABLE). THE CHILLER UNIT WILL OPERATE ON PART LOADS THROUGH MULTI-COMPRESSOR STAGING FEATURING ELECTRONIC EXPANSION VALVES FOR PRECISE REFRIGERANT CONTROL.
- THE ASSOCIATED CHILLED WATER PUMP WILL RUN VARIABLE FLOW TO PROVIDE STABLE CHILLED WATER TEMPERATURE CONTROL AND HELPS LIMIT UNACCEPTABLE SHORT CYCLING OF CHILLER COMPRESSORS.
- THE CHILLER UNIT CONTROLLER ENABLES VARIABLE WATER FLOW PROVIDING +/-2°F LEAVING WATER TEMPERATURE ACCURACY AND TOLERATES 30% PER MINUTE WATER FLOW VARIATION WITH FLOW EQUAL OR ABOVE THE MINIMUM UNIT REQUIREMENT.
- IF THE LEAD CHILLER UNIT AND ASSOCIATED PUMP AT FULL LOAD DELIVERS CHILLED WATER AT 2°F AND ABOVE THE SETPOINT FOR 5 MINUTES (ADJUSTABLE), A RUN REQUEST WILL BE SENT TO THE LAG CHILLER AND ASSOCIATED PUMP. BOTH CHILLERS WILL OPERATE AT SHARED LOAD. WHEN THE CHILLED WATER SUPPLY TEMPERATURE FALLS AT 2°F BELOW THE SETPOINT, THE LEAD UNITS WILL START DE-STAGING UNTIL THE LOAD IS HANDLED BY A SINGLE CHILLER WHICH THE LAG CHILLER WILL ASSUME FULL CONTROL.
- THE B.A.S. WILL INITIATE AN ALARM TO THE CENTRAL SITE IF THE BUILDING CHILLED WATER SUPPLY TEMPERATURE IS 5°F (ADJUSTABLE) AND ABOVE THE SETPOINT. AN ALARM OUTPUT FROM THE CHILLER PANEL WILL BE MONITORED FOR DISPLAY AT THE CENTRAL SITE.
- D. CHILLED WATER PUMP AND DIFFERENTIAL PRESSURE SENSOR (DPS)**
- WHEN THE EXISTING AHU MEETS THE DEMAND LOAD, THE UNIT WILL GRADUALLY LIMITS THE FLOW OF CHILLED WATER INTO THE COIL VIA THE 2-WAY AND 3-WAY CONTROL VALVES. THE PRESSURE IN THE PIPE WILL GRADUALLY INCREASE. WHEN THE PRESET HIGH LIMIT PRESSURE IN THE DPS IS REACHED, A SIGNAL WILL BE SENT TO CONTROL THE PUMP VIA THE VFD TO MODULATE DOWN THE OPERATION FOR LESS CHILLED WATER FLOW.
- WHEN THE EXISTING AHU DEMANDS MORE LOAD, THE UNIT WILL GRADUALLY ALLOW MORE CHILLED WATER INTO THE COIL VIA THE 2-WAY AND 3-WAY CONTROL VALVES. THE PRESSURE IN THE PIPE WILL GRADUALLY DECREASE. WHEN THE PRESET LOW LIMIT PRESSURE IN THE DPS IS REACHED, A SIGNAL WILL BE SENT TO CONTROL THE PUMP VIA THE VFD TO MODULATE UP THE OPERATION FOR MORE CHILLED WATER FLOW.
- E. LEAD / LAG ROTATION AND SEQUENCING (EQUAL RUN-TIME)**
- ON A DAILY BASIS, CHANGE THE CHILLER UNIT AND PUMP LEAD / LAG INDEXING. DAILY LEAD PUMP INDEXED TO RUN WITH THE LEAD CHILLER UNIT. DAILY LAG PUMP INDEXED TO RUN WITH THE LAG CHILLER.
- UPON THE LAG PUMP STARTING, THE LEAD PUMP SHALL RAMP DOWN THAT BOTH PUMPS (LEAD/LAG) SHARE THE FLOW / LOAD AT 50% EACH TO PREVENT TOTAL FLOW SPIKES AND ALLOW BOTH PUMPS TO MODULATE IN PARALLEL.
- THE BUILDING AUTOMATION SYSTEM (BAS) OR THE PROGRAMMABLE LOGIC CONTROLLER (PLC) SHALL ALTERNATE THE LEAD AND LAG DESIGNATIONS THAT TRIGGER THE ROTATION BASED ON CUMULATIVE RUN-HOURS (E.G. SWAPPING ROLES EVERY 500 HOURS) OR ON A WEEKLY SCHEDULE TO EQUALIZE WEAR AND TEAR ACCROSS BOTH PUMPS.
- F. CHILLED WATER SYSTEM SHUTDOWN SEQUENCE**
- AFTER ALL REQUEST FOR COOLING BEEN SATISFIED OR HALTED BY THE B.A.S., THE CHILLER WILL CYCLE TO ITS OFF STATUS. THE ASSOCIATED CHILLED WATER PUMP WILL CONTINUE TO RUN FOR 5 MINUTES (ADJUSTABLE) TO ENSURE ADEQUATE FLOW DURING SHUTDOWN.
- G. EQUIPMENT OFF CONDITIONS**
- WHEN THE CHILLED WATER SYSTEM IS INACTIVE, THE CHILLER AND ASSOCIATED PUMP WILL BE DE-ENERGIZED.
- H. FREEZE AVOIDANCE AND WINTER CONDITION**
- FREEZE AVOIDANCE TO BE PRESENT TO ENABLE OR DISABLE, THE CHILLER UNIT SHALL BE CONFIGURED WITH THE PUMP CONTROLLER. WHEN FREEZE AVOIDANCE IS ENABLED, THE CHILLED WATER PUMP SHALL ACTIVATE WHEN THE AMBIENT TEMPERATURE DROPS BELOW THE LEAVING WATER TEMPERATURE CUTOFF. THE PUMP STAYS ENERGIZED UNTIL THE MINIMUM EVAPORATOR TEMPERATURE RISES 13°F ABOVE THE LEAVING WATER CUTOFF. THE PUMP WILL CYCLE OFF FOR A PERIOD OF TIME. AFTER THE TIME EXPIRES, THE PUMP OUTPUT MAY COME BACK ENERGIZED AGAIN IF THE AMBIENT TEMPERATURE IS AGAIN BELOW THE WATER CUTOFF.
- THE PUMP SHALL BE SET TO OPERATE VIA THE VFD PROVIDING MINIMUM FLOW WITH THE EXISTING 3-WAY VALVE LOCATED AT AHU-3 AT OPEN POSITION.

CONTROL SCHEMATIC LEGEND

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DIBI	DIGITAL / BINARY INPUT
DOBO	DIGITAL / BINARY OUTPUT
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY RIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZE/STAT
HSL	HIGH STATIC LIMIT
SPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE
SP	SET POINT
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTSIDE AIR
HC	HEATING COIL
CC	COOLING COIL
DX	DIRECT EXPANSION COOLING COIL
PICCV	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
AFC	AIRFLOW CROSS
DPS	DIFFERENTIAL PRESSURE SWITCH

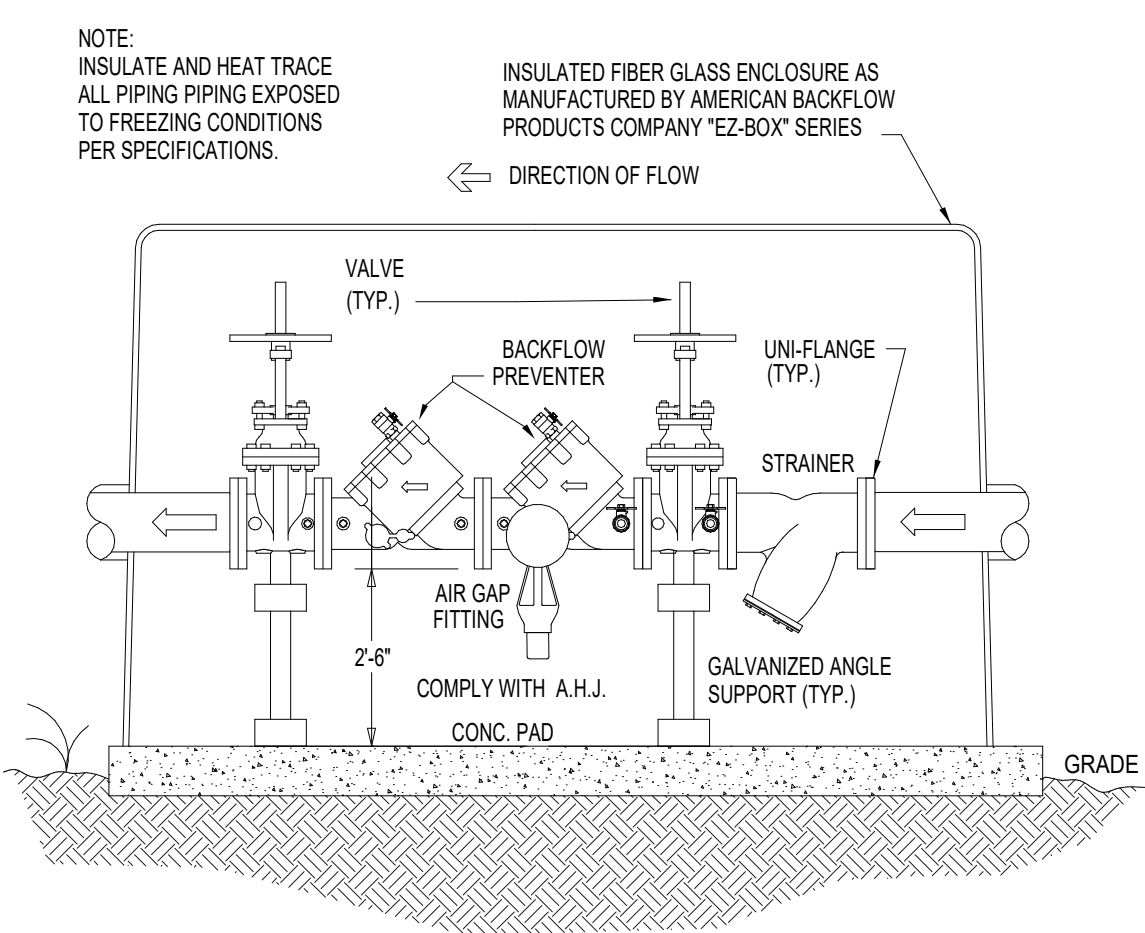
AIR COOLED CHILLER

TYPE	COUNT	NAME	DEVICE
AI	1	BUILDING CHW SUPPLY TEMPERATURE	10 KΩ IMMERSION SENSOR
AI	1	BUILDING CHW RETURN TEMPERATURE	10 KΩ IMMERSION SENSOR
AI	2	CHILLER CHW SUPPLY TEMPERATURE	10 KΩ IMMERSION SENSOR
AI	2	CHILLER CHW RETURN TEMPERATURE	10 KΩ IMMERSION SENSOR
AI	2	CHILLER AMPS	4-20 mA SENSOR
AI	1	OUTSIDE AIR TEMPERATURE (NORTH SIDE OF BLDG)	NORMALLY OPEN
DI	2	CHILLER PUMP STATUS	CURRENT SWITCH
DI	2	CHILLER ALARM	DRY CONTACT
DO	2	CHILLER START/STOP	24 VAC RELAY
DO	2	CHILLER PUMP START/STOP	24 VAC RELAY

CHILLER BACnet INTEGRATION

FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE ONE BACnet INTEGRATION SCREEN IN THE BAS GRAPHICS THAT INCLUDES THE FOLLOWING INFORMATION AT A MINIMUM FOR MONITORING PURPOSES ONLY:

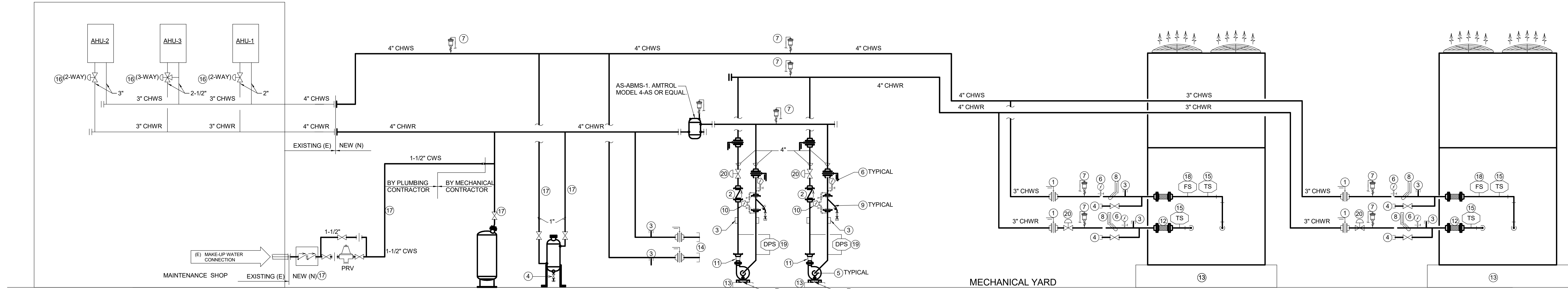
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 - ACTIVE DEMAND LIMIT
 - ENTERING / LEAVING TEMPERATURES
 - RUNNING STATUS / MODE
 - COMPRESSOR DISCHARGE PRESSURE
 - COMPRESSOR WINDING TEMPERATURE
 - OUTDOOR AIR TEMPERATURE
 - SUCTION PRESSURE
 - NUMBER OF COMPRESSOR RUNNING OR CIRCUITS
 - CAPACITY
 - OIL PRESSURE ON EACH CIRCUIT
 - WATER SET-POINT
 - WATER FLOW



01 R.P.Z. BACK FLOW PREVENTER

MECHANICAL AND
PLUMBING PIPING
SCHEMATIC DIAGRAM
(ALTERNATE 1)
ADVIS -
MP5.01

Scale 1/8" = 1'-0"



CHILLED WATER PIPING SCHEMATICS (ALTERNATE 2)
SCALE: N.T.S.

MECHANICAL KEYED NOTES:

- 1 STOP VALVE, REFER TO SPECIFICATIONS.
- 2 CHECK VALVE, REFER TO SPECIFICATIONS.
- 3 PRESSURE/TEMPERATURE TEST PLUG, REFER TO SPECIFICATIONS.
- 4 DRAIN VALVE WITH HOSE END ADAPTER.
- 5 SUCTION DIFFUSER, REFER TO SPECIFICATIONS.
- 6 PRESSURE GAUGE WITH GAUGE COCK, REFER TO SPECIFICATIONS.
- 7 AUTOMATIC AIR VENT, REFER TO SPECIFICATIONS.
- 8 THERMOMETER, REFER TO SPECIFICATIONS.
- 9 1" STRAINER, REFER TO SPECIFICATIONS.
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- 13 EXISTING HOUSEKEEPING PAD.
- 14 4" CHWS/R PROVISION FOR EMERGENCY CONNECTION.
- 15 TEMPERATURE SENSOR, TIE-IN TO B.A.S. AND DISPLAY ON THE GRAPHICS.
- 16 CONTROL VALVE (E).
- 17 PROVIDE HEAT TRACE, REFER TO ELECTRICAL.
- 18 FACTORY APPLIED FLOW SWITCH.
- 19 DIFFERENTIAL PRESSURE SENSOR.
- 20 ISOLATION VALVES.



TOMBALL ISD - CHILLER
PACKAGE #2b

Ancillary Services Building
1110 Baker Dr
Tomball, TX 77375

CHILLER MANAGER SEQUENCE OF OPERATION

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- THE PUMP SHALL BE SET TO OPERATE VIA THE VFD PROVIDING MINIMUM FLOW WITH THE EXISTING 3-WAY VALVE LOCATED AT AHU-3 AT OPEN POSITION.

CONTROL SCHEMATIC LEGEND

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DIBI	DIGITAL / BINARY INPUT
DOBO	DIGITAL / BINARY OUTPUT
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY RIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZE/STAT
HSL	HIGH STATIC LIMIT
SPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE
SP	SET POINT
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTSIDE AIR
HC	HEATING COIL
CC	COOLING COIL
DX	DIRECT EXPANSION COOLING COIL
PICCV	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
AFC	AIRFLOW CROSS
DPS	DIFFERENTIAL PRESSURE SWITCH

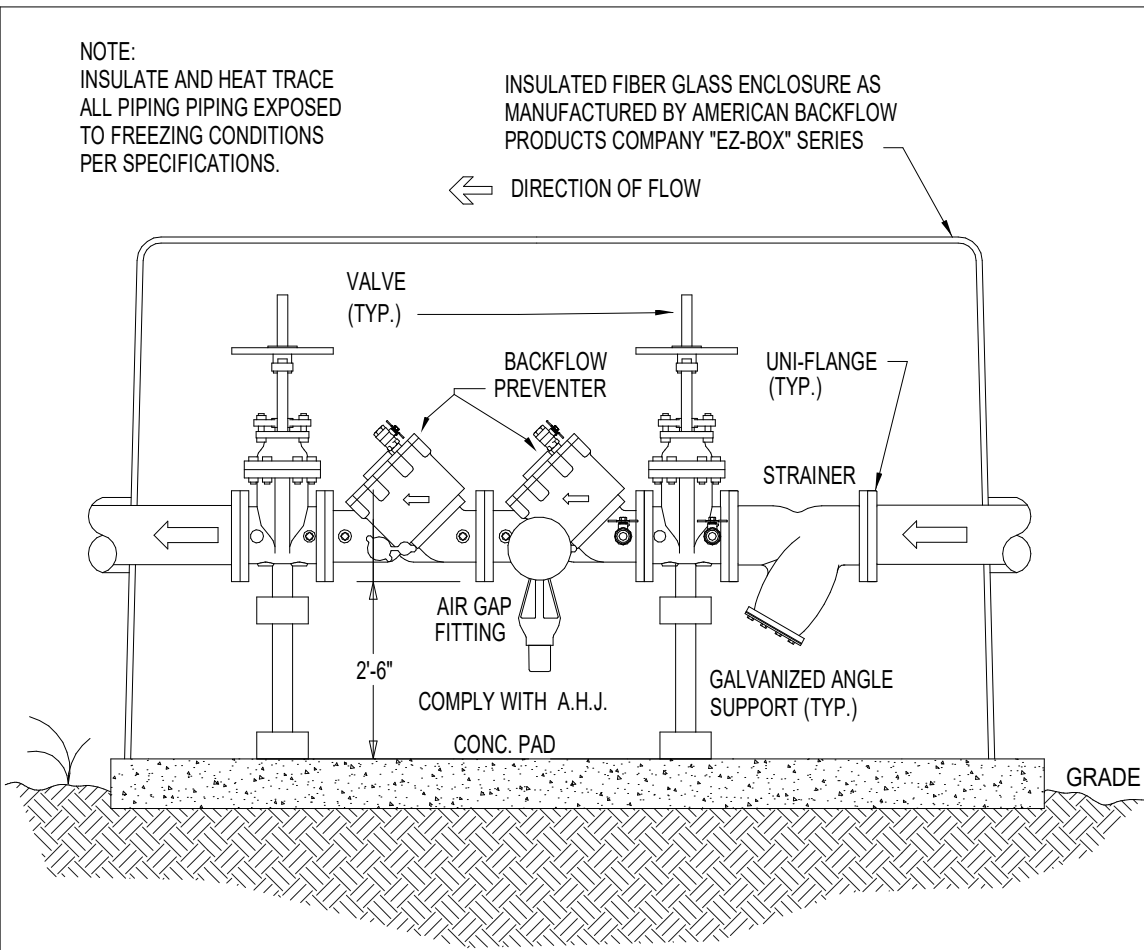
AIR COOLED CHILLER

TYPE	COUNT	NAME	DEVICE
AI	1	BUILDING CHW SUPPLY TEMPERATURE	10 KΩ IMMERSION SENSOR
AI	1	BUILDING CHW RETURN TEMPERATURE	10 KΩ IMMERSION SENSOR
AI	2	CHILLER CHW SUPPLY TEMPERATURE	10 KΩ IMMERSION SENSOR
AI	2	CHILLER CHW RETURN TEMPERATURE	10 KΩ IMMERSION SENSOR
AI	2	CHILLER AMPS	4-20 mA SENSOR
AI	1	OUTSIDE AIR TEMPERATURE (NORTH SIDE OF BLDG)	NORMALLY OPEN
DI	2	CHILLER PUMP STATUS	CURRENT SWITCH
DI	2	CHILLER ALARM	DRY CONTACT
DO	2	CHILLER START/STOP	24 VAC RELAY
DO	2	CHILLER PUMP START/STOP	24 VAC RELAY

CHILLER BACnet INTEGRATION

FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE ONE BACnet INTEGRATION SCREEN IN THE BAS GRAPHICS THAT INCLUDES THE FOLLOWING INFORMATION AT A MINIMUM FOR MONITORING PURPOSES ONLY:

- LOCAL REMOTE MODE
- ACTIVE ALERT / ALARM WITH ALARM MODE (NOTE: INCLUDE CROSS-REFERENCE TABLE FOR ODE DECIPHERING)
 - ACTIVE DEMAND LIMIT
 - ENTERING / LEAVING TEMPERATURES
 - RUNNING STATUS / MODE
 - COMPRESSOR DISCHARGE PRESSURE
 - COMPRESSOR WINDING TEMPERATURE
 - OUTDOOR AIR TEMPERATURE
 - SUCTION PRESSURE
 - NUMBER OF COMPRESSOR RUNNING OR CIRCUITS
 - CAPACITY
 - OIL PRESSURE ON EACH CIRCUIT
 - WATER SET-POINT
 - WATER FLOW



01 R.P.Z. BACK FLOW PREVENTER

MECHANICAL AND
PLUMBING PIPING
SCHEMATIC DIAGRAM
(ALTERNATE 2)
ADVIS -
MP5.02

Scale 1/8" = 1'-0"

LEGEND OF ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	BOLD DEVICE/CIRCUITING INDICATES NEW DEVICE/CIRCUITING OR RELOCATED DEVICE.
	SHADED DEVICE/CIRCUITING INDICATES EXISTING TO REMAIN
	DASHED DEVICE/CIRCUITING INDICATES DEMOLITION
	CONDUIT RUN CONCEALED IN WALLS OR ABOVE CEILING. ARROW INDICATES HOMERUN TO PANEL. CONDUCTOR DESIGNATIONS ARE AS FOLLOWS: LONG HATCH INDICATES NEUTRAL, SHORT HATCH INDICATES PHASE. "COT" INDICATES INSULATED OR ISOLATED GROUND, AND NO HATCHES INDICATES TWO CONDUCTORS.
	CONDUIT RUN CONCEALED IN FLOOR OR BELOW FLOOR SLAB OR BELOW GRADE. WIRING SAME AS ABOVE.
	LIGHT FIXTURE TAG: A = FIXTURE TYPE X = CIRCUIT NUMBER A = SWITCH LEG
	SCREENING SHADE INDICATES FIXTURE CONNECTION ON EMERGENCY CIRCUIT OR BATTERY BACKUP. SEE PLANS.
	EXIT LIGHT. PROVIDE ARROWS AND FACES AS INDICATED ON DRAWINGS.
	SIMPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE OR SPECIAL RECEPTACLE OUTLET; SEE DRAWINGS FOR NEMA CONFIGURATION AND VOLTAGE.
	DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE.
	TWO-WIRE DUPLEX RECEPTACLE OUTLETS GANGED WITH A COMMON WALL PLATE; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE EACH.
	ESSENTIAL POWER DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE.
	DUPLEX RECEPTACLE OUTLET LOCATED ABOVE STANDARD HEIGHT; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT HEIGHT.
	DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER; DUPLEX WITH "WEATHERPROOF" WHILE IN USE COVER AND GFCI 20 AMP, 125V, 3 WIRE GROUNDED TYPE.
	CONTROLLED DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE. SPLIT CONTROLLED DUPLEX- LEGRAND #26332CH OR EQUAL.
	CONTROLLED DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE. FULL CONTROLLED- LEGRAND #26332CD OR EQUAL.
	TWO-WIRE DUPLEX OUTLETS UNDER COMMON COVER PLATE. LEFT DUPLEX CONTROLLED- LEGRAND #26332CH OR EQUAL. RIGHT DUPLEX NON-CONTROLLED. 20 AMP, 125V, 3W+G, EACH.
	TWO-WIRE DUPLEX OUTLETS UNDER COMMON COVER PLATE. LEFT DUPLEX CONTROLLED- LEGRAND #26332CH OR EQUAL. RIGHT DUPLEX NON-CONTROLLED. 20 AMP, 125V, 3W+G, EACH.
	DUPLEX RECEPTACLE OUTLET WITH (2) USB RECEPTACLES; 20 AMP, 125V, 3 WIRE GROUNDED TYPE.
	SPECIAL RECEPTACLE OUTLET; SEE DRAWINGS FOR NEMA CONFIGURATION AND VOLTAGE.
	CEILING MOUNTED RECEPTACLE OUTLET, DUPLEX/QUAD/SPECIAL. SEE DRAWINGS FOR SPECIAL OUTLET CONFIGURATION AND VOLTAGE.
	FLUSH MOUNTED FIRE RATED POWER THRU DEVICE (W/ RECEPTACLE) AND/OR DATA AND/OR TELEPHONE. SEE DRAWINGS FOR SPECIFICATIONS.
	FLUSH MOUNTED FLOOR BOX (W/ RECEPTACLE(S)) AND/OR DATA AND/OR TELEPHONE. SEE DRAWINGS FOR SPECIFICATIONS.
	POWER POLE. RE: DRAWINGS FOR MORE INFORMATION.
	TELEPHONE / DATA / COMBINATION TELEDATA OUTLET
	CABLE T.V. OUTLET
	TELEPHONE TERMINAL BOARD, 8" x 3/4" FIRE RATED PLYWOOD
	SINGLE POLE, 3-WAY, 4-WAY SWITCH; 20 AMP, 120/277V.
	NETWORK ENABLED, WALL MOUNTED, 1 BUTTON, DUAL TECH SENSOR, ON/OFF.
	NETWORK ENABLED, WALL MOUNTED, DUAL TECH SENSOR, ON/OFF + RAISE/LOWER.
	1 ZONE / 2 ZONE DIGITAL NETWORK ENABLED, ON/OFF SWITCH.
	1 ZONE / 2 ZONE DIGITAL NETWORK ENABLED, RAISE/LOWER/ON/OFF.
	LIGHTING CONTROL NETWORK ENABLED GRAPHIC TOUCH SCREEN 3.5" & PRESETS OR 16 ZONES. USE NEAREST 120/277V LTO CKT FOR POWER SUPPLY.
	KEY SWITCH 120/277V, DIGITAL KEY SWITCH
	DIMMER SWITCH 120/277V, LUTRON "NOVA" OR EQUAL.
	ON/OFF ONLY, WITH RAISE/LOWER - WALL MOUNTED MOTION SENSOR, 120/277VAC.
	NETWORK ENABLED CEILING MOTION SENSOR EXTENDED RANGE / WALKING MOTION
	NETWORK ENABLED CEILING MOTION SENSOR STANDARD RANGE / SITTING MOTION
	PHOTOCELL / DAYLIGHT SENSOR
	WIRELESS DEVICE
	DOORBELL CHIME; RE: SPECIFICATIONS/PLANS.
	EMERGENCY POWER OFF SWITCH (E.P.O.)
	PUSH BUTTON /BUZZER
	JUNCTION BOX MOUNTED ABOVE ACCESSIBLE CEILING.
	JUNCTION BOX - WALL MOUNTED/FLOOR; RE: FLOOR PLANS
	DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, & FUSE SIZE (IF REQUIRED) VOLTS/AMPS/POLES TO MATCH BREAKER U.N.O.
	SINGLE PHASE MOTOR
	THREE PHASE MOTOR
	MOTOR STARTER (DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, FUSE SIZE (IF REQUIRED), AND SIZE. VOLT/AMPS/POLES TO MATCH BREAKER U.N.O.)
	MOTOR STARTER W/VD IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, AND SIZE.
	TRANSFER SWITCH- REFER TO DRAWINGS FOR SPECIFICATIONS
	CARD READER JUNCTION BOX WITH 3/4" TO ACCESSIBLE CEILING U.N.O.
	VARIABLE SPEED DRIVE (SUPPLIED BY MECHANICAL/CONTRACTOR)
	GROUND BAR
	TRANSFORMER W/ NEC CLEARANCES; REFER TO DRAWING FOR VOLTAGE/VA
	SURFACE PANELBOARD W/ NEC CLEARANCES.
	RECESSED PANELBOARD W/ NEC CLEARANCES
	MECHANICAL EQUIPMENT CONNECTION POINT. REFER TO SCHEDULE ON EX.XX FOR CONNECTION INFORMATION.

LOW VOLTAGE PROVISIONS

1. PROVIDE A 4" X 4" X 2'-10 1/2" JUNCTION BOX WITH RING AND STRING ABOVE ACCESSIBLE CEILING FOR ALL LOW VOLTAGE ROUGH-IN LOCATIONS (TYPICAL).
2. FOR WALLS & DECK OR WALLS WITH INSULATION, PROVIDE A 4" X 4" X 2'-10 1/2" JUNCTION BOX WITH 3/4" EMT CONDUIT TO ABOVE ACCESSIBLE CEILING.
3. LOW VOLTAGE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO: FIRE ALARM, BUILDING CONTROLS, LIGHTING CONTROLS, DATA, AUDIO/VISUAL, SECURITY.
4. ALL LOW VOLTAGE CABLEING IN THIS PROJECT SHALL BE ROUTED IN MINIMUM 3/4" EMT CONDUIT WHERE EXPOSED TO VIEW OR WHERE ABOVE INACCESSIBLE CEILINGS. PROVIDE A SHOP DRAWING FOR ARCHITECT REVIEW.

ABBREVIATIONS

(E)	EXISTING TO REMAIN
(ER)	EXISTING TO BE RE-CROUTED
(N)	NEW
(R)	ITEM NOTED TO BE RELOCATED
AD	ITEM NOTED TO BE DEMOLISHED
AF	ABOVE FINISHED FLOOR
AC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINUM
AMP	AMPERAGE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BMT	BREAKER
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
DC	DIRECT CURRENT
DISC	DISCONNECT
EUT	ELECTRICAL CONTRACTOR
EPO	EMERGENCY POWER OFF
FACP	FIRE ALARM CONTROL PANEL
FLA	FOOT CANDLE
FLC	FULL LOAD AMPS
GFI	GROUND FAULT INTERRUPTER
GR	GROUND FAULT CIRCUIT INTERRUPTER
HD	HAND-OUT/AUTO
HDA	HEAVY DUTY
HP	HORSEPOWER
IS	ISOLATED GROUND
KCM	THOUSAND CIRCULAR MILS
KW	KILOWATT
MCB	MAIN CIRCUIT BREAKER
NC	NOT TO SCALE
NH	NON-HALIDE
MSB	MAIN SWITCHBOARD
NES	NATIONAL ELECTRIC CODE
NFPA	NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NE	NOT IN CONTRACT
NE	NOT USED
NTS	NOT TO SCALE
PNL	PANEL OR PANELBOARD
RAC	REMOTE ANNUNCIATOR CONTROL PANEL
RCP	REFLECTOR CUP AND PLAN
RE	REFERENCE
RFP	SMOKE/FIRE DAMPER
SPEC	SPECIFICATIONS
TS	SQUARE FEET
TB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
UNO	UNDERGROUND
VPS	VARIABLE FREQUENCY DRIVE
VFD	VARIABLE FREQUENCY DRIVE
WP	WEATHER PROOF
XMR	TRANSFORMER

APPLICABLE CODES & STANDARDS

1. BUILDING CODE - 2021 IRC WITH LOCAL AMENDMENTS
2. FIRE CODE - 2021 IFC WITH LOCAL AMENDMENTS
3. ELECTRICAL CODE - 2023 NEC WITH LOCAL AMENDMENTS
4. MECHANICAL CODE - 2021 UMC WITH LOCAL AMENDMENTS
5. PLUMBING CODE - 2021 UPC WITH LOCAL AMENDMENTS
6. ENERGY CODE - 2021 INTERNATIONAL ENERGY CONSERVATION CODE WITH LOCAL AMENDMENTS
7. OTHER - LIFE SAFETY CODE (NFPA 101)
8. OTHER - FEDERAL DEPARTMENT OF JUSTICE AMERICANS WITH DISABILITIES ACT AND TEXAS ACCESSIBILITY STANDARDS.
9. FIRE ALARM - 2021 NFPA 72 WITH LOCAL AMENDMENTS.

BREAK OUT PRICING

THE CONTRACTOR SHALL PROVIDE SEPARATE LINE-ITEM COST FOR ALL WORK AND MATERIALS ASSOCIATED WITH EACH OF THE FOLLOWING:

1. INSTALLATION FOR ONE (1) DEDICATED 20-AMP DUPLEX RECEPTACLE
2. INSTALLATION FOR ONE (1) DEDICATED 20-AMP QUAD RECEPTACLE
3. INSTALLATION FOR ONE (1) RING AND STRING ROUGH-IN FOR VOICE/DATA OUTLET
4. INSTALLATION FOR ONE (1) DEDICATED 125-VOLT JUNCTION BOX
5. INSTALLATION FOR ONE (1) 1/4" X 1/4" X 2 1/2" LIGHT FIXTURE ON AN EXISTING 277-VOLT SWITCHED CIRCUIT WITH 8 FT OF CONDUIT/CONDUCTORS
6. CIRCUIT TRACE OF ALL EXISTING CIRCUITS IN ALL PANELS USED IN THIS PROJECT. SEE PANEL SCHEDULES

PRICES SHALL INCLUDE ALL INSTALLATION COST, INCLUDING CONDUITS AND BRANCH CIRCUIT CONDUCTORS AS REQUIRED. ASSUME 100 FT CONDUIT AND CONDUCTOR LENGTH FROM SOURCE TO LOAD U.N.O.

IDENTIFICATION/LABELING

1. ALL PANELBOARDS, MOTOR STARTERS, CONTROL PANELS, CONTROL REMOTE STATIONS, DISCONNECT SWITCHES, CIRCUIT BREAKERS OR OTHER EQUIPMENT IN SEPARATE ENCLOSURES SHALL BE EQUIPPED WITH NAMEPLATES. THE NAMEPLATES SHALL BE ENGRAVED, ROD PLASTIC, LAMINATE OR APPROVED EQUAL, WHITE LETTERING ON BLACK BACKGROUND FOR EQUIPMENT 208/250 VOLT AND BLACK LETTERING ON WHITE BACKGROUND FOR EQUIPMENT 480/277 VOLT, AND BE ATTACHED TO THE EQUIPMENT SECURELY WITH SCREWS. EACH NAMEPLATE SHALL GIVE THE NUMBER DESIGNATION OF THE EQUIPMENT AS SHOWN ON THE ONE LINE DIAGRAM AND ALSO THE SOURCE VOLTAGE. SIMILAR RED AND WHITE NAMEPLATES FOR ALL EMERGENCY POWERED EQUIPMENT.
2. ALL WIRING DEVICES (EXCLUDING LIGHT SWITCHES) SHALL BE LABELED WITH SELF-ADHESIVE, LAMINATED TAPE INDICATING THE CIRCUIT NUMBER AND PANEL DESIGNATIONS. UTILIZE CLEAR TAPE WITH BLACK LETTERS UNLESS NOTED OTHERWISE. PROVIDE SAMPLE OF LABELS TO ARCHITECT AND LANDSCAPE FOR APPROVAL PRIOR TO INSTALLATION.
3. NEW AND EXISTING CIRCUITS SHALL BE ACCURATELY IDENTIFIED AT THE RESPECTIVE ABOVE CEILING JUNCTION BOXES. THE ASSOCIATED PANEL, CIRCUITS, AND VOLTAGE SHALL BE IDENTIFIED ON ALL JUNCTION BOX COVER CIRCUITS LEAVING PANELBOARDS AND DISTRIBUTION PANELS SHALL BE PROVIDED WITH LABEL ON CIRCUITS CONTAINED IN CONDUIT.
4. EXISTING CIRCUITRY IS SHOWN FOR INFORMATION ONLY. EXISTING CIRCUITRY INFORMATION TAKEN FROM COMBINATION OF FIELD SURVEY AND PREVIOUS TENANT DRAWINGS. CONTRACTOR SHALL FIELD VERIFY EXACT CIRCUITRY AND INDICATE ANY DEVIATIONS ON THE "AS-BUILT" DRAWINGS. "AS-BUILT" DRAWINGS SHALL ACCURATELY INDICATE THE LOCATION OF ALL NEW AND EXISTING JUNCTION BOXES WITH THE RESPECTIVE PANEL AND CIRCUIT NUMBERS.

REQUIRED SUBMITTALS

ELECTRICAL GEAR

WIRING DEVICES

ALL SUBMITTALS SHALL BE SUBMITTED VIA EMAIL TO SUBMITTALS@WYLIEENG.COM AND COPIED TO THE PROJECT MANAGER.

ALL RFTS SHALL BE SUBMITTED VIA EMAIL TO RFTS@WYLIEENG.COM AND COPIED TO THE PROJECT MANAGER.

ELECTRICAL GENERAL NOTES

- A. GENERAL PROVISIONS:
 1. FURNISH AND INSTALL ALL ITEMS, INCLUDING EVERY ARTICLE, DEVICE OR ACCESSORY REASONABLY NECESSARY TO FACILITATE EACH SYSTEM'S FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT SPECIFIED. ELEMENTS OF THE WORK SHALL INCLUDE, BUT ARE NOT LIMITED TO: MATERIALS, LABOR, SUPERVISION, DESIGN, SUPPLIES, EQUIPMENT, TRANSPORTATION, HOISTING/RIGGING, STORAGE, UTILITIES, AND ALL REQUIRED PERMITS AND LICENSES.
 2. DRAWINGS ARE SCHEMATIC IN NATURE AND DO NOT NECESSARILY REFLECT ALL WORK REQUIRED TO COMPLETE PROJECT. CONTRACTOR SHALL PROVIDE NECESSARY MATERIALS, LABOR, AND EQUIPMENT AS REQUIRED TO COMPLETE PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST TO OBTAIN TENANT CONTRACTOR SHALL REQUEST ADDITIONAL INFORMATION IN CASES OF DOUBT.
 3. WORK SHALL COMPLY WITH THE MOST RECENT VERSION OF ALL APPLICABLE LAWS, RULES, REGULATIONS, AND ORDINANCES OF ALL FEDERAL, STATE, AND LOCAL AUTHORITIES. IN THE EVENT OF CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND THE LOCAL ENFORCING AUTHORITY, THE LATTER SHALL RULE. ANY MODIFICATION RESULTING THEREFROM SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER OR ARCHITECT/ENGINEER. THE CONTRACTOR SHALL REPORT ANY SUCH MODIFICATIONS TO THE ARCHITECT/ENGINEER AND SECURE THEIR APPROVAL BEFORE PROCEEDING. SHOULD THE REQUIREMENTS OF THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE CODES, THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE PROVIDED THEY ARE NOT IN CONFLICT WITH THOSE CODES.
 4. AREAS OF THE EXISTING BUILDING WILL BE OCCUPIED DURING CONSTRUCTION OF THIS PROJECT. NOISY, DUSTY, AND/OR OTHER CONSTRUCTION OPERATIONS REQUIRED FOR WORK WHICH DISTURBS OR CAUSES COMPLAINTS BY THE EXISTING BUILDING OCCUPANTS SHALL NOT BE ACCEPTABLE. ALL AFTER-HOURS OR OVERTIME WORK REQUIRED BY THE CONTRACTOR TO AVOID DISRUPTION OF EXISTING OCCUPANCY WILL BE PROVIDED AT NO COST TO THE OWNER/TENANT. THE CONTRACTOR SHALL USE CONSTRUCTION METHOD AND MATERIALS WHICH SHALL NOT ADVERSELY AFFECT THE INDOOR AIR QUALITY OF THE EXISTING OCCUPIED AREAS.
 5. CONSIDERATION SHALL NOT BE GRANTED FOR UNDERSTANDING OF THE SCOPE OR AMOUNT OF WORK TO BE PERFORMED. TENDER OF A PROPOSAL CONVEYS FULL CONTRACTOR AGREEMENT OF THE ITEM AND CONDITIONS SPECIFIED AND/OR INDICATED, SCHEDULED, OR IMPLIED ON THE CONTRACT DOCUMENTS, AND/OR REQUIRED BY THE NATURE OF THIS WORK.
 6. IN THE EVENT OF A CONFLICT BETWEEN DRAWINGS AND/OR SPECIFICATIONS, THE GREATER AMOUNT OF TOTAL COST SHALL BE PRICED. BRING THE CONFLICT TO THE ATTENTION OF THE ENGINEER AND REQUEST DIRECTION.
 8. PRE-CONSTRUCTION:
 1. BEFORE SUBMITTING A BID, IT WILL BE NECESSARY FOR EACH CONTRACTOR WHOSE WORK IS INVOLVED TO VISIT THE SITE AND ACCEPTANCE FOR THEMSELVES THE CONDITIONS TO BE MET IN INSTALLING THE WORK AND MAKE PROVISIONS FOR THE CONDITIONS IN THEIR FINAL PRICE. FAILURE ON THE PART OF THE CONTRACTOR TO COMPLY WITH THIS REQUIREMENT SHALL NOT BE CONSIDERED JUSTIFICATION FOR THE OMISSION OR FAULTY INSTALLATION OF ANY WORK COVERED BY THE CONTRACT DOCUMENTS.
 2. THIS CONTRACTOR SHALL SECURE ALL PERMITS, LICENSES AND INSPECTIONS REQUIRED FOR THEIR WORK, AND SHALL PAY ALL FEES IN CONNECTION WITH SUCH PERMITS, LICENSES AND INSPECTIONS.
 - C. DEMOLITION:
 1. ALL EXISTING CONDUIT AND CONDUCTORS SERVING THE AREA UNDER CONTRACT NOT TO BE REPAIRED SHALL BE TERMINATED AT LAST PORTION OF CIRCUIT REQUIRING DEMOLITION BEFORE THE DEMOLITION AREA. IF A CIRCUIT SERVES ONLY THE DEMOLITION AREA, REMOVE ALL CONDUITS AND CONDUCTORS BACK TO THE PANELBOARD OR BASE BUILDING GRID BOX AND DE-ENERGIZE THE CIRCUIT BREAKER, MAKING IT A SPARE. NOTE "SPARE" OR "VOID-SPARE" ACCORDINGLY ON PANELBOARD DIRECTORY.
 2. REMOVE ALL ABANDONED LOW VOLTAGE CABLEING INCLUDING FIRE ALARM CABLEING, TELEPHONE/DATA CABLEING, AND SECURITY CABLEING. REMOVE ALL EXISTING CONDUIT AND WIRING THAT IS SUPPORTED FROM THE CEILING GRID. REMOVE ALL EXISTING UNUSED ELECTRICAL EQUIPMENT, CONTROLS, CONDUIT, HANGERS, WIRING, ETC.
 3. RELOCATE AND RECONNECT ACTIVE PORTIONS OF THE ELECTRICAL SYSTEM OUTSIDE OF THE SCOPE OF DEMOLITION, AS REQUIRED TO MAINTAIN A COMPLETE AND OPERATING SYSTEM THAT IS FUNCTIONALLY EQUIVALENT TO THE PRE-EXISTING SYSTEM PRIOR TO DEMOLITION.
 4. ELECTRICAL PLANS INDICATE FINAL WIRING DEVICE, DATA/COMMUNICATIONS OUTLET AND SWITCH LOCATIONS. ALL OTHER EXISTING WIRING DEVICES, DATA/COMMUNICATIONS OUTLETS AND SWITCHES SHALL BE REMOVED AND WALLS SHALL BE PATCHED, UNLESS OUTSIDE OF SCOPE OR NOTED AS (E).
 5. ALL EXISTING JUNCTION BOXES, OUTLETS, PULL BOXES, ETC., LOCATED ABOVE NON-ACCESSIBLE CEILINGS INSTALLED UNDER THIS TENANT IMPROVEMENT PROJECT SHALL BE RELOCATED ABOVE AN ACCESSIBLE CEILING, WHERE EXISTING JUNCTION BOXES ARE NOT PRACTICAL TO RELOCATE, ELECTRICAL CONTRACTOR SHALL NOTIFY ARCHITECT AND ENGINEER PRIOR TO SUBSTANTIAL START OF CONSTRUCTION.
 6. REMOVE ALL EXISTING UNUSED ELECTRICAL EQUIPMENT, CONTROLS, CONDUIT, HANGERS, WIRING, ETC. FROM ABOVE CEILINGS.
 7. REFER TO ARCHITECTURAL DRAWINGS FOR LIGHT FIXTURES TO BE RELOCATED. RELOCATE AND RECONFIGURE FIXTURES AS SHOWN. PROVIDE ADDITIONAL FIXTURES TO MATCH FIXTURE QUANTITIES SHOWN. FIELD VERIFY EXISTING CONDITIONS.
 8. REFER TO ARCHITECTURAL PLANS FOR WALL AND PARTITIONS TO BE REMOVED. CONTRACTOR SHALL PROVIDE ELECTRICAL DEMOLITION AS PREVIOUSLY DESCRIBED.
 9. REFER TO ARCHITECTURAL DRAWINGS FOR RECEPTACLES AND VOICE/DATA OUTLETS TO BE REMOVED. FIELD VERIFY EXISTING CONDITIONS.
 10. CONTRACTOR SHALL REMOVE AND REPLACE ALL WIRING DEVICES NOT CONFORMING TO BUILDING STANDARDS.
 11. REMOVE ALL EXISTING CONDUIT AND WIRING THAT IS SUPPORTED FROM THE CEILING GRID VIA CADDY CLIPS, ETC. AND REPLACE EXISTING CONDUIT THAT IS TO BE RE-UTILIZED WITH MATCHING CONDUIT AND WIRING PROPERLY SUPPORTED FROM STRUCTURE ABOVE.
 12. RE-SUPPORT AND RE-ROUTE ANY REMAINING PIPING OR DEVICES THAT WERE SUPPORTED BY DEMOLISHED WALLS.
 13. ALL ITEMS INSTALLED IN AIR PLenums SHALL BE PLenum RATED.
 - D. SUBMITTALS:
 1. ALL EQUIPMENT AND MATERIAL TO BE FURNISHED AND INSTALLED ON THE PROJECT SHALL BE UL OR ETL LISTED, IN ACCORDANCE WITH THE AUTHORITY HAVING JURISDICTION, AND SUITABLE FOR ITS INTENDED USE ON THIS PROJECT.
 2. THE CONTRACTOR SHALL PROVIDE SUBMITTALS FOR ALL NEW EQUIPMENT, CONTROLS, DEVICES, AND FIXTURES TO BE PROVIDED. SUBMIT MINIMUM ELECTRONIC SUBMITTALS FOR APPROVAL:
 - A. EQUIPMENT AND MATERIALS SHOP DRAWINGS
 - B. COORDINATION DRAWINGS
 - C. RECORD DRAWINGS
 - D. OPERATING AND MAINTENANCE MANUALS
 - E. FIRE STOP MATERIALS AND DETAILS
 - E. PRE-CONSTRUCTION FUNCTIONAL TEST:
 1. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL FUNCTIONALLY TEST ALL ELECTRICAL AND FIRE ALARM EQUIPMENT THAT IS EXISTING TO REMAIN OR RELOCATED IN THIS PROJECT. THE CONTRACTOR SHALL PROVIDE A WRITTEN DESCRIPTION OF ANY AND ALL DEFICIENCIES TO THE OWNER/TENANT. ANY DEFICIENCIES IDENTIFIED AT THE START OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER/TENANT. THE EQUIPMENT TO BE TESTED INCLUDES, BUT IS NOT LIMITED TO: RECEPTACLES, LIGHT FIXTURES, EXIT SIGNS, OCCUPANCY SENSORS, PANEL BOARDS, TRANSFORMERS, EMERGENCY LIGHTING BATTERY UNITS, AND SWITCHES.
 2. FOR EXISTING LIGHT FIXTURES AND EXIT SIGNS WITH BATTERY PACKS, ELECTRICAL CONTRACTOR SHALL ASSUME NEW BATTERY PACKS WILL BE REQUIRED UNLESS FUNCTIONAL TEST PROVES OTHERWISE.
 - F. CONSTRUCTION:
 1. ALL WORK SHALL BE ARRANGED IN A NEAT, WELL-ORGANIZED MANNER. ALL SERVICES SHALL BE ROUTED PARALLEL AND PERPENDICULAR TO THE PRIMARY LINES OF THE BUILDING. LOCATE ALL OPERATING AND CONTROL EQUIPMENT PROPERLY TO PROVIDE EASY ACCESS AND ARRANGE ENTRY WORK WITH ADEQUATE ACCESS FOR OPERATOR AND MAINTENANCE, AND FOR PROPER CODE AND/OR MANUFACTURERS CLEARANCES.
 2. DAMAGE CAUSED DURING CONSTRUCTION TO EXISTING MATERIALS/EQUIPMENT WILL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO OWNER. RE-SUPPORT ANY REMAINING PIPING OR DEVICES THAT WERE SUPPORTED BY WALLS BEING REMOVED.
 3. THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL COORDINATE THE INSTALLATION OF DUCTWORK, PIPING, CONDUIT, CABLE, ETC., WITH LIGHTING FIXTURES, SPEAKER, CEILING CONSTRUCTION, AIR DISTRIBUTION EQUIPMENT, AND THE STRUCTURE. PROVIDE ADDITIONAL RESES AND PRESSES AS REQUIRED. IF AFTER INSTALLED, NEW DUCTWORK, PIPING, CONDUIT, CABLE, ETC., IS FOUND TO BE IN CONFLICT WITH THE ARCHITECTURE, STRUCTURE OR OTHER TRADE WORK, WHICH IS EITHER EXISTING OR SHOWN ON THE CONTRACT DOCUMENTS, THE DUCTWORK, PIPING, CONDUIT, CABLE, ETC., SHALL BE RELOCATED WITHOUT ADDITIONAL COST TO THE OWNER/TENANT. COORDINATE ALL WORK COMPLETED WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
 4. ALL BUILDING SERVICES, UTILITIES, POWER, FIRE PROTECTION, AND DOMESTIC COLD AND HOT WATER MAY NOT BE DISRUPTED FOR ANY REASON WITHOUT PRIOR COORDINATION WITH A REPRESENTATIVE OF BUILDING OPERATIONS.
 5. THIS BUILDING MAY HAVE A STRUCTURAL SYSTEM UTILIZING POST-TENSIONED CABLES. THE CONTRACTOR SHALL DETERMINE THE EXISTING STRUCTURAL SYSTEM PRIOR TO CUTTING, DRILLING, OR CORING. THE CONTRACTOR SHALL X-RAY ALL PENETRATIONS PRIOR TO CUTTING THE FLOOR SLAB.
 6. PENETRATIONS THROUGH FLOORS OR FIRE-RATED CONCRETE SHALL BE FIRE-RATED TO COMPLY WITH ASTM E-814 (UL 1479), AND THE LOCAL AUTHORITY HAVING JURISDICTION.
 - G. PROJECT CLOSE OUT:
 1. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COMPLETE SET OF "AS-BUILT" DRAWINGS, PORTRAYING ACTUAL SITE CONDITIONS OF THE MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION WORK. SUBMISSION SHALL CONSIST OF ONE SET OF PDF AND ONE SET OF CAD FILES IN AUTOCAD V. 2018 OR REVIT V. 2018 OR NEWER FORMAT WITH THE OWNERS STANDARD LAYERING SCHEME.
 2. EXISTING CIRCUITRY IS SHOWN FOR INFORMATION ONLY. EXISTING CIRCUITRY INFORMATION TAKEN FROM COMBINATION OF FIELD SURVEY AND PREVIOUS TENANT DRAWINGS. CONTRACTOR SHALL FIELD VERIFY EXACT CIRCUITRY AND INDICATE ANY DEVIATIONS ON THE "AS-BUILT" DRAWINGS. "AS-BUILT" DRAWINGS SHALL ACCURATELY INDICATE THE LOCATION OF ALL NEW AND EXISTING JUNCTION BOXES WITH THE RESPECTIVE PANEL AND CIRCUIT NUMBERS.
 3. SUBMIT "AS-BUILT" RECORD DRAWINGS INDICATING ACTUAL, AS-BUILT CONDITIONS TO THE ARCHITECT/ENGINEER FOR REVIEW. RECORD DRAWINGS SHALL BE STAMPED "AS-BUILT" AND SHALL HAVE THE NAME, ADDRESS, AND TELEPHONE NUMBER OF THE CONTRACTOR. ALL ENGINEERS' SEALS SHALL BE REMOVED FROM THE DRAWINGS. PROVIDE BLACK AND WHITE DIGITAL COPIES AND ONE (1) ELECTRONIC FILE.
 4. SUBMIT ELECTRONIC PDF OF OPERATION AND MAINTENANCE MANUALS. THE MANUALS SHALL INCLUDE RATINGS, CAPACITIES, PARTS LISTS, WIRING DIAGRAMS, SERVICE/MAINTENANCE RECOMMENDATIONS, AND WARRANTIES.
 5. THE ELECTRICAL CONTRACTOR SHALL PERFORM THE FOLLOWING TASKS UPON PROJECT COMPLETION: ALL REQUIRED PERMITS AND AS-BUILTS SHALL BE SUBMITTED WITHIN TWO (2) WEEKS OF DATE OF SUBSTANTIAL COMPLETION OR OWNER OCCUPANCY.
 6. SUBMIT WRITTEN RESPONSE TO ALL FIELD REPORTS INDICATING CORRECTIVE ACTIONS TAKEN AND DATE CORRECTIVE ACTION WAS TAKEN TO THE ARCHITECT/ENGINEER FOR REVIEW.
 - G. WARRANTY:
 1. THE START OF THE CONTRACTOR'S WARRANTY PERIOD SHALL COMMENCE ON THE DATE OF "SUBSTANTIAL COMPLETION" AS AGREED TO BY THE OWNER/TENANT.
 2. THE WARRANTY PERIOD SHALL BE NO LESS THAN ONE (1) FULL YEAR, UNLESS SPECIFIED OTHERWISE AND SHALL INCLUDE AT LEAST ONE (1) FULL HEATING SEASON AND ONE (1) FULL COOLING SEASON. DURING THE WARRANTY PERIOD THE CONTRACTOR SHALL GUARANTEE THE FOLLOWING IN A FORM SATISFACTORY TO THE OWNER/TENANT:
 - A. WORK INSTALLED SHALL BE FREE FROM ANY AND ALL DEFECTS IN WORKMANSHIP AND/OR MATERIALS.
 - B. APPARATUS WILL DEVELOP CAPACITIES AND PERFORMANCE CHARACTERISTICS SPECIFIED.
 - C. SYSTEMS SHALL OPERATE WITHOUT MALFUNCTION.

COMMISSIONING NOTES

BREAK OUT PRICE - WORK TO BE COMPLETED BY CX AGENT

1. COMMISSION MECHANICAL AND SERVICE WATER HEATING SYSTEMS PER ECC C408.2 WITH COMBINED CAPACITY GREATER THAN 400BTUH.
 - A. THE CX AGENT SHALL PROVIDE A COMMISSIONING PLAN PER C408.2.1
 - B. BALANCE AND ADJUST AIR AND HYDRAULIC SYSTEMS AS APPLICABLE PER C408.2.2
 - C. VERIFY PERFORMANCE AND INTERFACING OF SYSTEMS, CONTROLS, AND ECONOMIZERS FOR ALL MODES AND SEQUENCE OF OPERATIONS PER C408.2.3
 - D. PROVIDE A PRELIMINARY COMMISSIONING REPORT PER C408.2.4
 - E. PROVIDE ALL CX DOCUMENTS TO BUILDING OWNER WITHIN 90 DAYS OF CERTIFICATE OF OCCUPANCY, INCLUDING SYSTEM BALANCING REPORT AND FINAL CX REPORT
2. COMMISSION LIGHTING CONTROLS SYSTEMS PER ECC C408.3.
 - A. OCCUPANCY SENSOR CONTROLS PER C408.3.1
 - B. TIME SWITCH CONTROLS PER C408.3.1.2
 - C. DAYLIGHT RESPONSE CONTROLS PER C408.3.1.3
 - D. PROVIDE ALL CX DOCUMENTS TO BUILDING OWNER WITHIN 90 DAYS OF CERTIFICATE OF OCCUPANCY, INCLUDING DRAWINGS, MANUALS, AND TEST REPORTS

DRAWING INDEX

SHEET NUMBER SHEET NAME

- | | |
|------------|---|
| ABMS-E0-00 | ELECTRICAL COVER SHEET |
| ABMS-E1-01 | ELECTRICAL DEMOLITION PLAN - SERVICE YARD |
| ABMS-E2-01 | ELECTRICAL POWER PLAN - SERVICE YARD |
| ABMS-E3-00 | ELECTRICAL ONE-LINE DIAGRAM & SCHEDULES |
| ABMS-E4-00 | ELECTRICAL DETAILS |



TOMBALL ISD - CHILLER PACKAGE #2b



Wylie
ENGINEERING

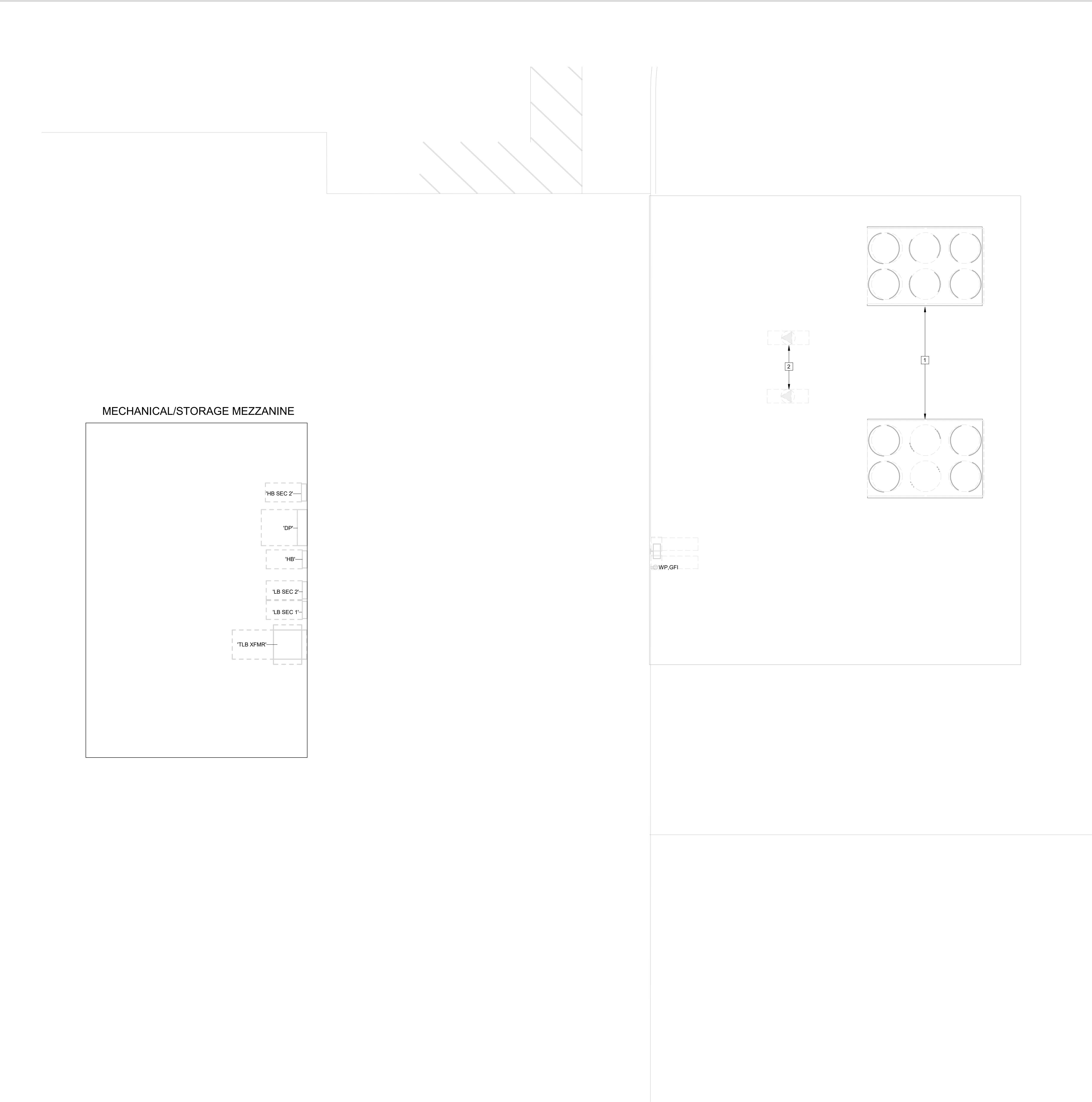
1177 West Loop South, Suite 900
Houston, TX 77027
713-781-2526
www.wylieeng.com

TX Firm No. 1869
Project No. 26026.00

ELECTRICAL COVER SHEET

ABMS-E0.00

Scale AS INDICATED



ELECTRICAL DEMOLITION GENERAL NOTES

- A. CONDUCT ALL DEMOLITION WORK IN SUCH A MANNER AS TO MAINTAIN A SAFE WORK ENVIRONMENT AND IN ACCORDANCE WITH APPLICABLE SAFETY RULES AND PROCEDURES WITHIN NEC, NECA AND OSHA REQUIREMENTS.
- B. CONTRACTOR SHALL REQUEST AND REVIEW ANY HAZARDOUS MATERIALS SURVEYS FROM THE OWNER'S REPRESENTATIVE. OBSERVE RECOMMENDED PRECAUTIONS AND VERIFY THE STATUS OF ANY REMEDIAL WORK RECOMMENDED OR NOTED WITHIN THE HAZARDOUS MATERIAL SURVEY. NOTIFY THE OWNER'S REPRESENTATIVE IF ANY HAZARDOUS MATERIALS ARE SUSPECTED OR OBSERVED DURING THE COURSE OF EXECUTING THIS CONTRACT.
- C. SURVEYS AREAS OF THE FACILITY SCHEDULED FOR RENOVATION OR PARTIAL DEMOLITION PRIOR TO ANY WORK BEING PERFORMED. SUBMIT REPORT OF THE PRE-WORK SURVEY DETAILING ANY UTILIZATION EQUIPMENT OR SYSTEMS THAT ARE NOT IN GOOD WORKING ORDER IN ADVANCE OF ANY DEMOLITION WORK AND REVIEW WITH THE OWNER'S REPRESENTATIVE.
- D. THE SCHOOL DISTRICT SHALL HAVE FIRST RIGHT OF REFUSAL FOR SALVAGED MATERIAL. REQUEST THAT THE DISTRICT PROVIDE DIRECTION ON DISPOSITION OF SALVAGED MATERIAL FIVE(5) WORKING DAYS PRIOR TO REMOVAL. IF SO DIRECTED BY THE DISTRICT, SALVAGED MATERIAL SHALL REMAIN THE PROPERTY OF THE DISTRICT AND SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION AS DIRECTED. REMOVE AND DISPOSE ANY SALVAGED MATERIAL NOT RETAINED BY THE DISTRICT.
- E. DRAWINGS INDICATE APPROXIMATE LOCATION AND QUANTITY OF PANELS, TRANSFORMERS, DISCONNECTS, ETC. TO BE REMOVED. VERIFY LOCATION AND QUANTITY OF ITEMS TO BE REMOVED. NO ALLOWANCE WILL BE MADE BECAUSE OF CONTRACTOR'S UNFAMILIARITY WITH THE SITE.
- F. DAMAGED AREAS CAUSED REMOVAL OF ANY OF THE ABOVE ITEMS AND WHICH ARE NOT CONCEALED BY NEW CONSTRUCTION SHALL BE REPAIRED TO MATCH ADJACENT SURFACES. OPENINGS CREATED BY THE REMOVAL OF THESE ITEMS THROUGH FIRE RATED WALLS SHALL BE FIRE STOPPED.
- G. REMOVE ABANDONED CONDUIT TO POINT OF CONCEALMENT BEHIND INACCESSIBLE SURFACES. ENTIRELY REMOVE ABANDONED WIRING.
- H. PROVIDE BLANK COVERS AND PLATES AT UNUSED OPENINGS IN BOXES, RACEWAYS, AUXILIARY GUTTERS, CABINETS, EQUIPMENT CASES AND HOUSINGS SHALL BE CLOSED TO AFFORD PROTECTION SUBSTANTIALLY EQUIVALENT TO THE EQUIPMENT ENCLOSURE.
- I. IF A CONDUIT RUN IS EXPOSED OR A SURFACE RACEWAY LEFT WITHOUT A MOUNTING SURFACE DUE TO REMOVAL OF A PARTITION, THE RACEWAY SHALL BE REROUTED AS ACCEPTABLE TO THE OWNER/ARCHITECT.
- J. PROTECT ELECTRICAL EQUIPMENT, OUTLETS AND DEVICES THAT ARE SCHEDULED TO BE RELOCATED, REPAIR, RESTORE OR REPLACE ITEMS DAMAGED WHEN REMOVED TO THE APPROVAL OF THE OWNER. NOTIFY OWNER/ARCHITECT/ENGINEER OF ANY ELECTRICAL EQUIPMENT, OUTLETS AND/OR DEVICES WHICH ARE SCHEDULED TO BE RE-USED THAT ARE FOUND TO BE UNUSABLE.

ELECTRICAL KEY NOTES

- 1 NEW HVAC AIR COOLED CHILLER EQUIPMENT. PROVIDE CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES AS REQUIRED. COORDINATE WITH MECHANICAL FOR EXACT LOCATIONS, CIRCUIT REQUIREMENTS, CONNECTION REQUIREMENTS, AND APPURTENANCES.
- 2 EXISTING HVAC PUMP EQUIPMENT TO BE REPLACED. DEMO EXISTING CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES TO THE EXTENT NECESSARY TO RE-ROUTE WIRE. REFER TO NEW WORK PLANS FOR MORE INFORMATION.

REVISIONS		
No.	Date	Description
	08/31/2026	ISSUE FOR BID



TOMBALL ISD - CHILLER
PACKAGE #2b

Ancillary Services Building
1110 Baker Dr
Tomball, TX 77375



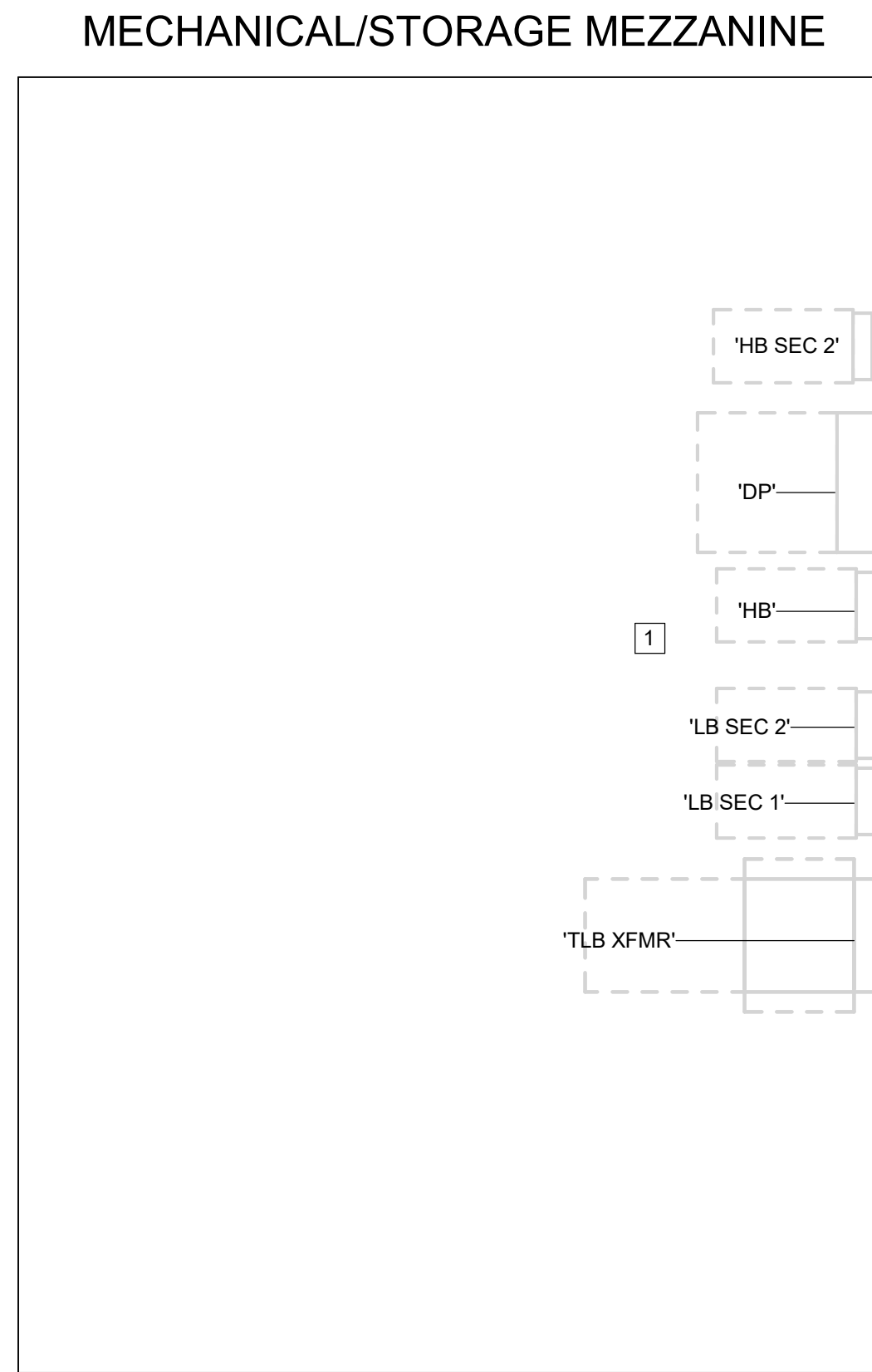
Wylie
ENGINEERING

1177 West Loop South, Suite 900
Houston, TX 77027
TX Firm No. 1869 713-781-2526
Project No. 26026.00 www.wylieeng.com

ELECTRICAL
DEMOLITION PLAN -
SERVICE YARD

ABMS-E1.01

Scale As indicated

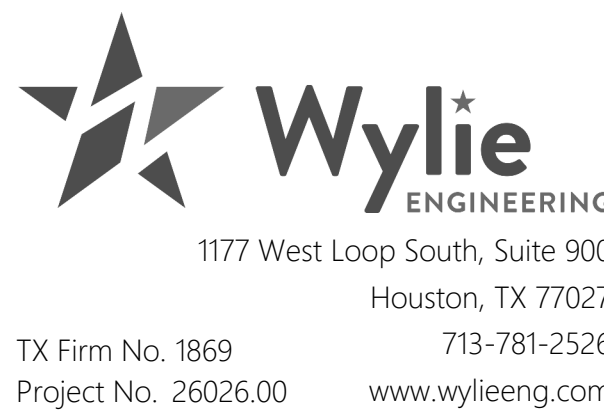


- A. CONDUIT LINES ARE DIAGRAMMATIC. CONTRACTOR SHALL FIELD VERIFY CONDITIONS AND CHOOSE APPROPRIATE CONDUIT ROUTING. IN THE EVENT THAT THE APPROXIMATE LOCATION SHOWN ON PLANS IS NOT FEASIBLE CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER.
- B. RECEPTACLES LOCATED WITHIN 6' OF ANY PLUMBING FIXTURE, IN BREAK ROOMS, AT THE EXTERIOR, IN THE PARKING GARAGE OR OTHERWISE EXPOSED TO WATER SHALL BE TYPE GFCI. "WP" INDICATES A WEATHERPROOF "WILE-IN-USE" COVER.
- C. ALL WIRING DEVICES ARE NEW UNLESS NOTED OTHERWISE.
- D. ALL ELECTRICAL EQUIPMENT IS EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
- E. COORDINATE DISCONNECT SWITCHES, VFDs AND STARTER LOCATIONS WITH EQUIPMENT INSTALLERS TO MAINTAIN PROPER MAINTENANCE AND CODE REQUIRED CLEARANCES.
- F. COORDINATE RECEPTACLE AND DATACOM LOCATIONS SO THAT DEVICES ON SIMILAR WALLS ARE ADJACENT TO ONE ANOTHER.
- G. REFERENCE EQUIPMENT CONNECTION SCHEDULE FOR REQUIREMENTS AND ADDITIONAL INFORMATION OF TAGGED EQUIPMENT SHOWN ON PLAN DRAWING.
- H. PROVIDE 120V POWER TO EACH HVAC DDC CONTROL PANEL. COORDINATE EXACT LOCATIONS AND QUANTITIES WITH MECHANICAL DRAWINGS.

- 3 EXISTING ELECTRICAL EQUIPMENT AND DEVICES IN THIS AREA ARE EXISTING TO REMAIN.
- 2 NEW HVAC PUMP EQUIPMENT: PROVIDE CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES AS REQUIRED. PULL NEW WIRING FROM THE EXISTING BREAKER TO THE NEW EQUIPMENT, REUSING THE EXISTING BREAKER. COORDINATE WITH MECHANICAL FOR EXACT LOCATIONS, CIRCUIT REQUIREMENTS, CONNECTION REQUIREMENTS, AND APPURTENANCES.
- 3 PROVIDE 120V SWITCHED JUNCTION BOXES FOR CHILLER CONTROL. CIRCUITS AND CONDUITS COORDINATE EXACT LOCATIONS WITH MECHANICAL CONTRACTOR. PROVIDE STRUT CHANNEL AND ALL ACCESSORIES FOR MOUNTING AS REQUIRED.
- 4 NEW HVAC AIR COOLED CHILLER EQUIPMENT: PROVIDE CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES AS REQUIRED. COORDINATE EXACT LOCATIONS WITH MECHANICAL CONTRACTOR. PROVIDE CIRCUIT REQUIREMENTS, CONNECTION REQUIREMENTS, AND APPURTENANCES.
- 5 POWER AND LIGHTING DEVICES SHOWN IN SERVICE VARY ARE EXISTING TO REMAIN AND ARE SHOWN FOR RECORD PURPOSES ONLY.
- 6 PROVIDE NEW WEATHER-RATED SERVICE RECEPTACLE OUTLET. CONNECT DEVICE TO ADJACENT CIRCUIT SERVING EXISTING SERVICE VARY RECEPTACLE(S).
- 7 PROVIDE POWER AND CIRCUITING FOR CHILLED WATER PIPE HEAT TRACE SYSTEM AS INDICATED. COORDINATE EXACT CONNECTION POINTS AND LOCATIONS WITH MECHANICAL CONTRACTOR. PROVIDE GFIPE BREAKER AS REQUIRED BY NEC.

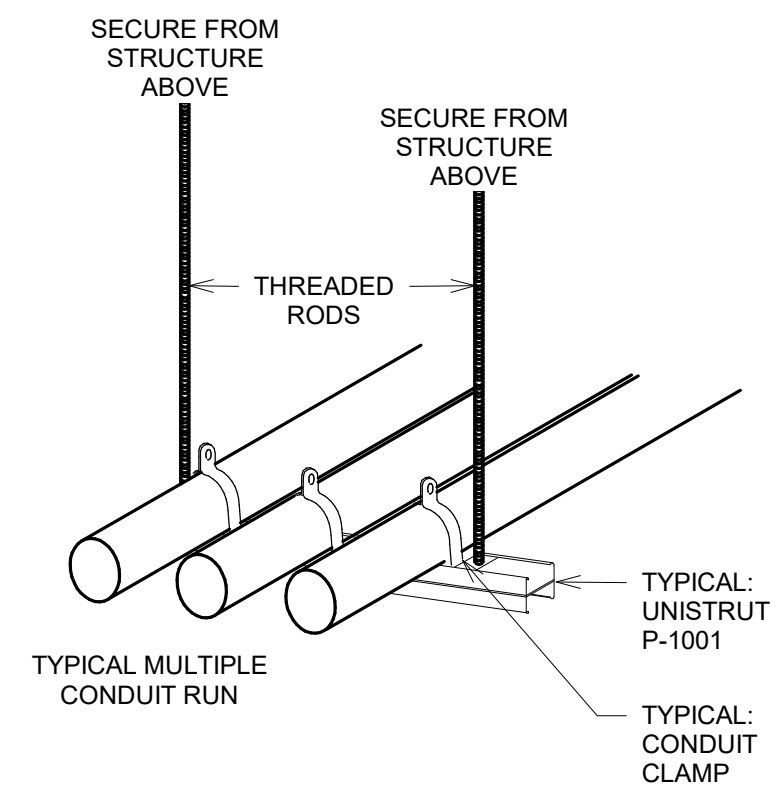
08/31/2026

Ancillary Services Building
1110 Baker Dr
Tomball, TX 77375

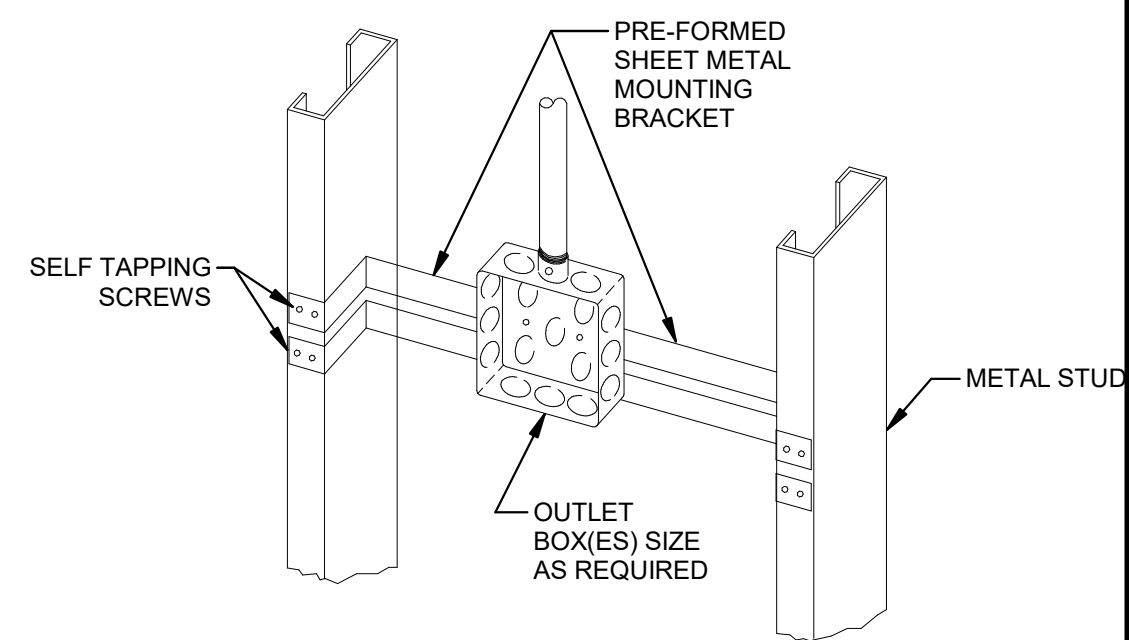


ABMS-E2.01	
Scale	As indicated

Scale $1/8" = 1'-0"$



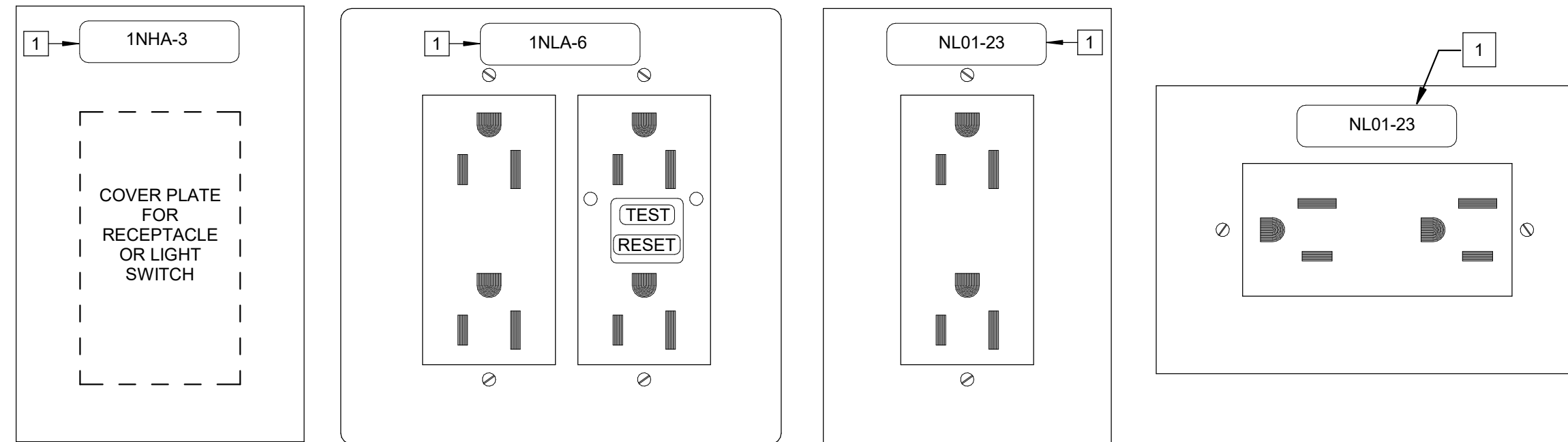
1	TRAPEZE MOUNTED CONDUIT SUPPORT DETAIL
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GENERAL NOTES (BOX MOUNTING DETAIL ONLY)

1. CONDUITS SHALL BE SUPPORTED PER NEC 358.30(A).
2. THIS DETAIL TO BE USED FOR OUTLET AND DEVICE BOX INSTALLATIONS NOT INCLUDED IN OTHER DETAILS. IF DEPTH OF BOX EXCEEDS 2-1/2", OR IF METAL STUD EXCEEDS 3-5/8", PROVIDE SUPPORT BRACKET SIMILAR TO AND EQUAL IN STRENGTH TO THE ONE SPECIFIED.

2 TYPICAL BOX MOUNTING DETAIL



GENERAL NOTE:

ALL RECEPTACLES IN SCOPE SHALL BE INSTALLED WITH GROUND PIN RECEIVER IN THE VERTICAL-UP POSITION. FOR HORIZONTALLY MOUNTED RECEPTACLES, THE GROUND PIN RECEIVER SHALL BE TO THE LEFT, NEUTRAL RECEIVER UP.

KEYED NOTES:

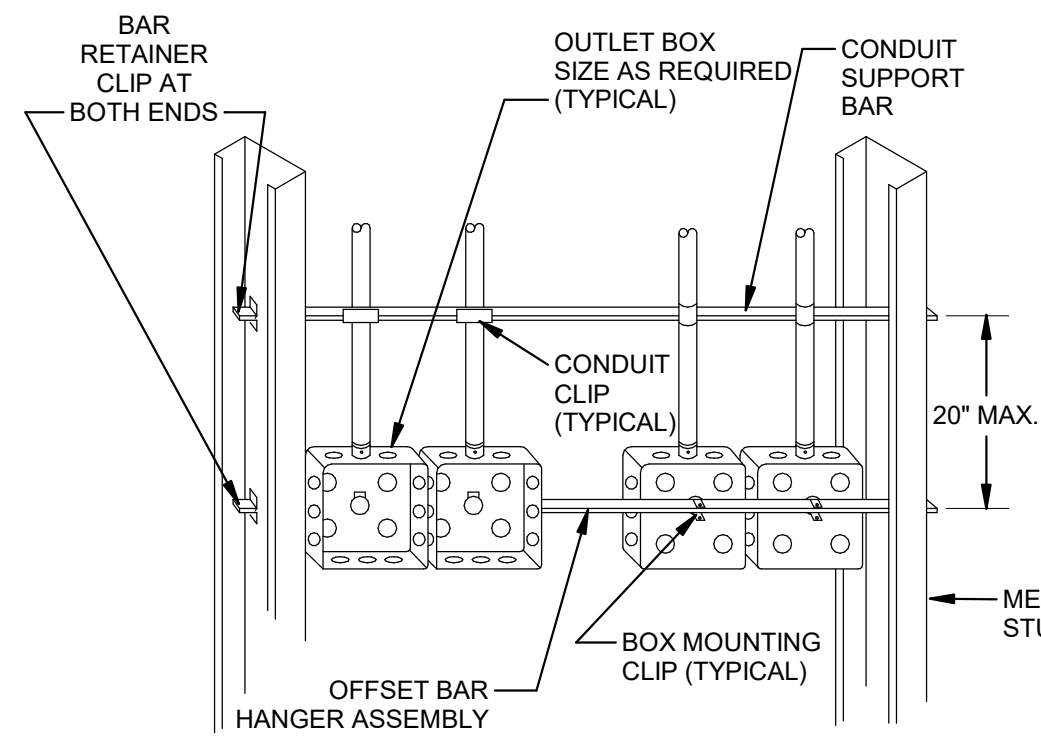
- 1 PROVIDE LABELS FOR LIGHT SWITCH AND RECEPTACLE COVER PLATES INDICATING THE PANELBOARD AND THE SUPPLY BRANCH CIRCUIT NUMBER. ALL LABELS SHALL BE TYPED. TEXT SHALL BE THERMAL SET, 12 OR 14 POINT PLAIN OR BLOCK STYLE FONT. ALL ENGRAVED INFORMATION SHALL HAVE A BLACK FINISH.

ADDITIONAL DEVICES TO BE LABELED:

(RE: KEYED NOTE 1)

- PROVIDE LABELS FOR THE FOLLOWING ADDITIONAL DEVICES:
- FLOOR CORES
 - TOGGLE TYPE LOAD DISCONNECT SWITCHES FOR DIRECT CONNECTED LOADS
 - OUTLET BOXES FOR DIRECT CONNECTED LOADS
 - OUTLET BOXES FOR DIRECT CONNECT LOADS WHICH DO NOT REQUIRE LOCAL DISCONNECTS.

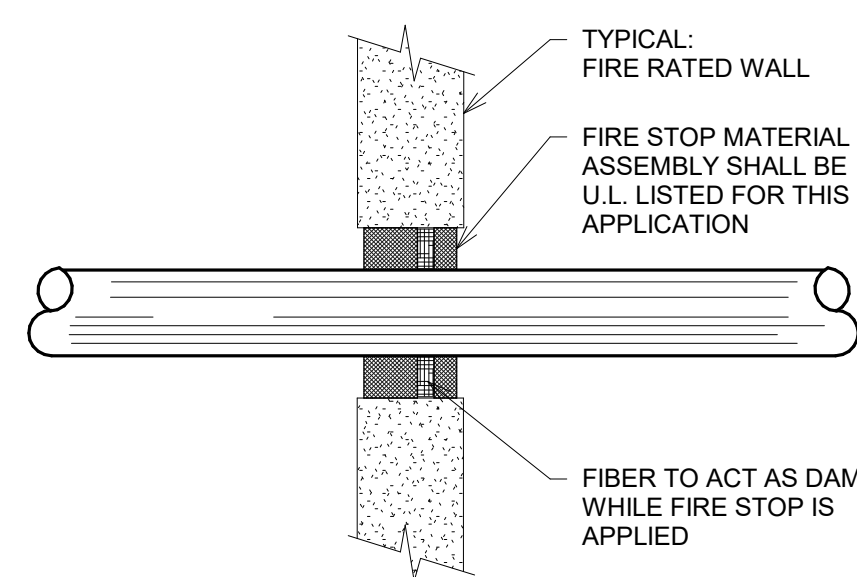
3	ELECTRICAL DEVICE IDENTIFICATION
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GENERAL NOTES (BOX MOUNTING DETAIL ONLY)

1. CONDUITS SHALL BE SUPPORTED PER NEC 358.30(A).
2. THIS DETAIL TO BE USED ONLY WHERE SWITCHES, RECEPTACLES OR OUTLETS ARE SHOWN IN THE SAME LOCATION ON BOTH SIDES OF A WALL OR PARTITION. DO NOT USE WHERE SWITCHES, RECEPTACLES OR OUTLETS ARE SHOWN ONLY ON ONE SIDE OF A WALL OR PARTITION.

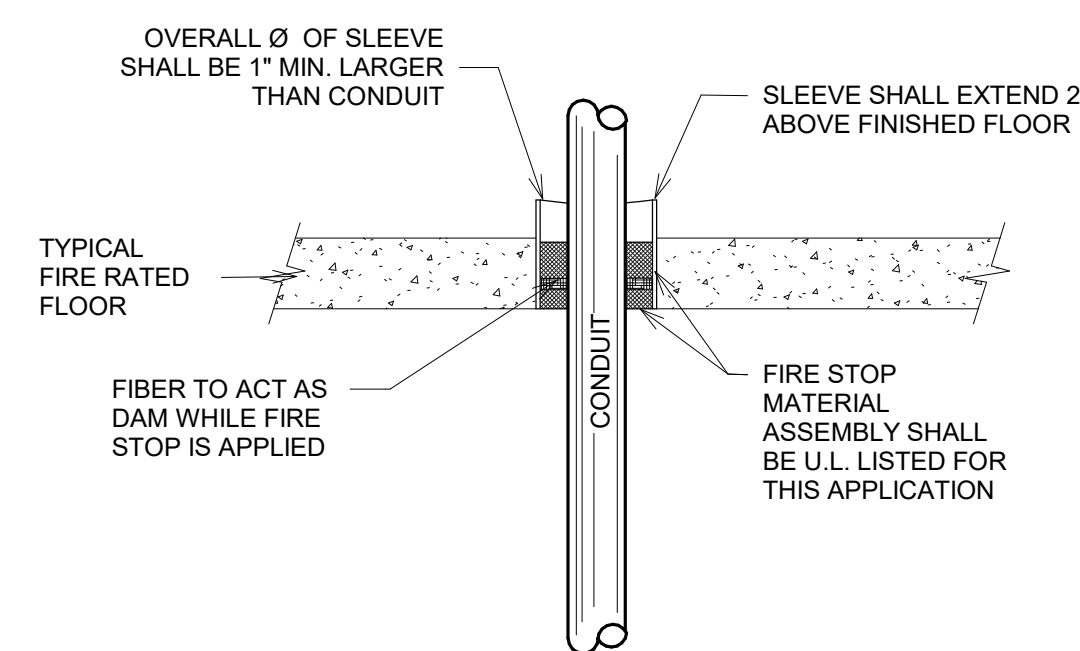
4 TYPICAL MULTIPLE BOX MOUNTING DETAIL



NOTE:

NOTE: FIRE RATING OF COMPLETED FIREPROOFED ASSEMBLY SHALL EQUAL OR EXCEED THE FIRE RATING OF THE WALL.

5	TYPICAL FIRE RATED PENETRATION DETAIL
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NOTE:

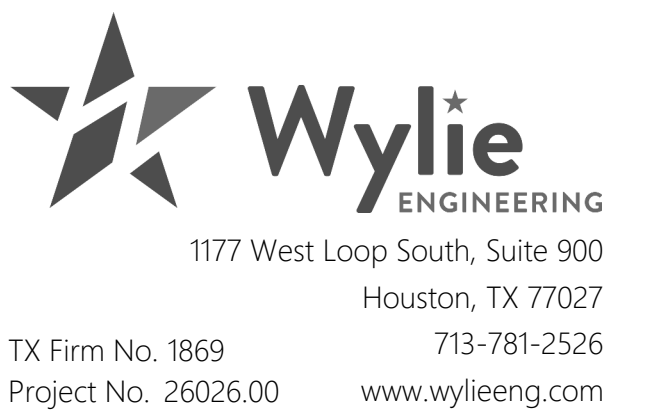
NOTE: FIRE RATING OF COMPLETED FIREPROOFED ASSEMBLY SHALL EQUAL OR EXCEED THE FIRE RATING OF THE WALL.

6 TYPICAL FIRE RATED PENETRATION DETAIL

[illegible]

TOMBALL ISD - CHILLER PACKAGE #2b

Ancillary Services Building
1110 Baker Dr
Tomball, TX 77375



TX Firm No. 1869 713-781-2526
Project No. 26026.00 www.wylieeng.com

ELECTRICAL DETAILS

ABMS-E4.00

Scale	Not-To-Scale
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Scale AS INDICATED

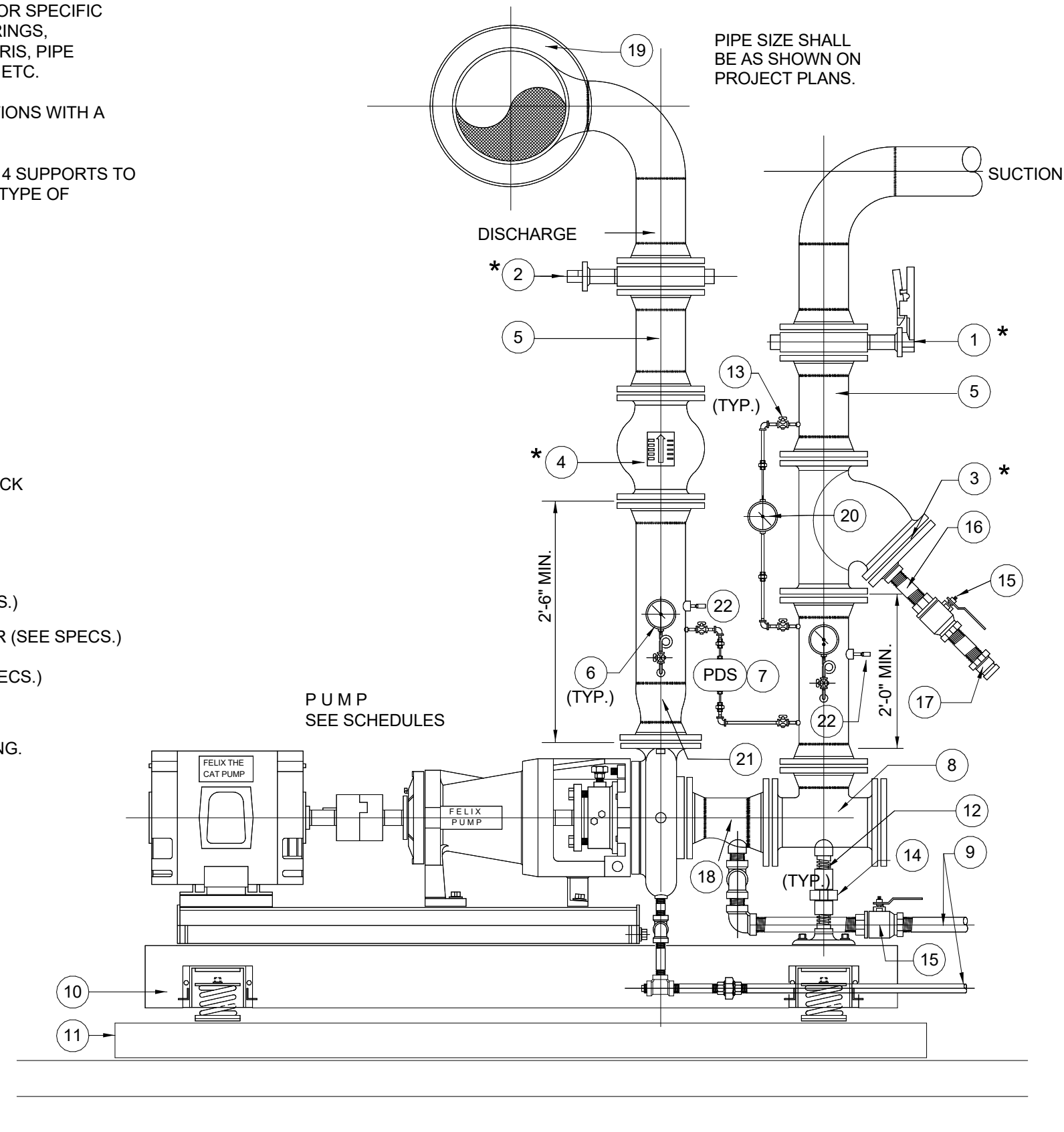
Scale $1/8" = 1'-0"$



Scale	1/8" = 1'-0"
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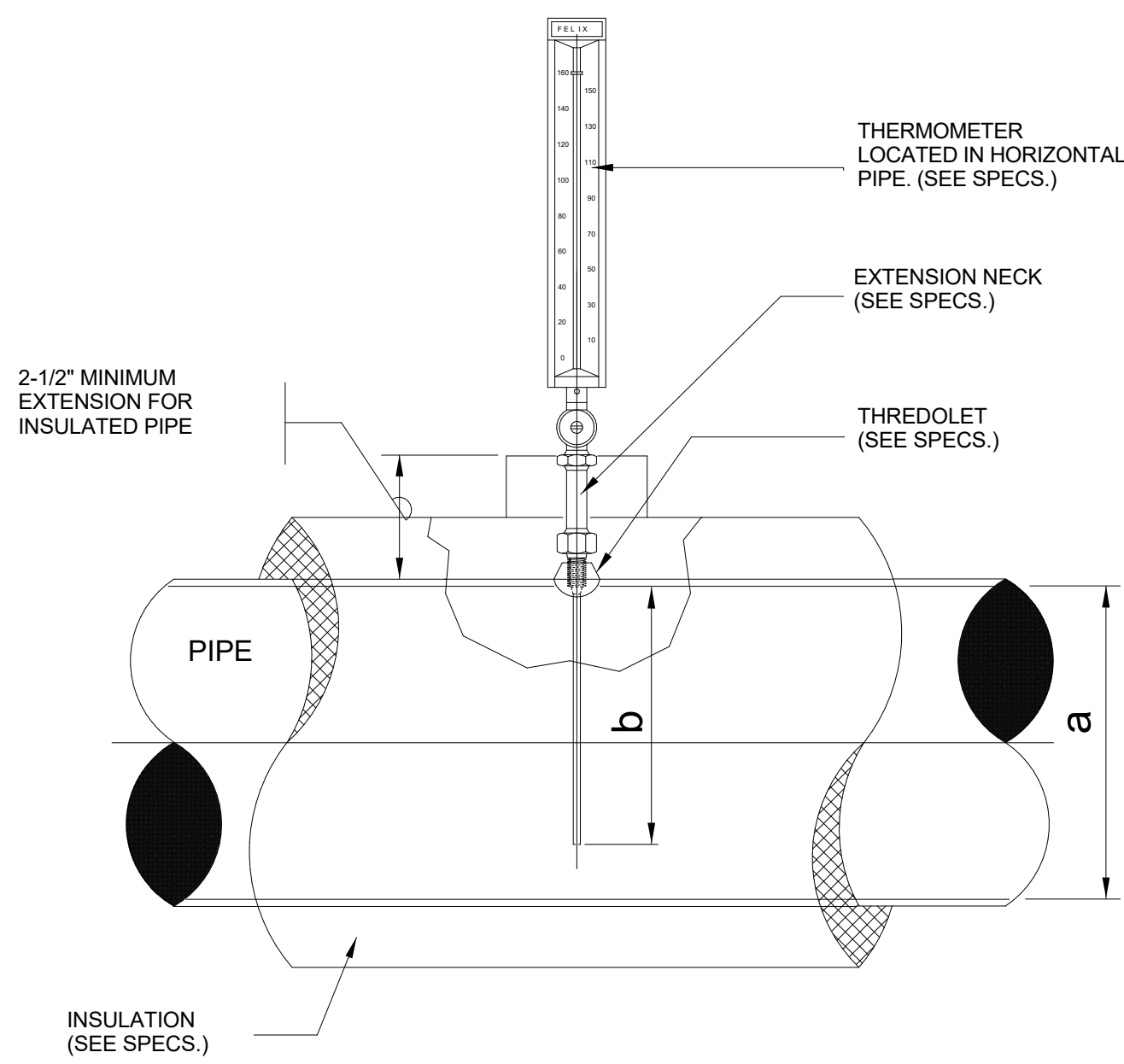
- GENERAL NOTES:
1. REFER TO PLAN DRAWING FOR PIPING CONFIGURATION FOR EACH INDIVIDUAL PUMP.
 2. REFER TO PLANS, DETAILS, AND SPECIFICATIONS FOR SPECIFIC PUMP, CONCRETE BASE, VIBRATION ISOLATION SPRINGS, HOUSEKEEPING PADS, VALVES, STRAINERS, VENTURIS, PIPE FITTINGS, GAUGES, SENSORS, AND CONTROLLERS, ETC.
 3. INSTALL TEST PLUGS IN EASILY ACCESSIBLE LOCATIONS WITH A MINIMUM OF 12" CLEARANCE IN FRONT.
 4. PROVIDE VIBRATION ISOLATOR TYPE ON THE FIRST 4 SUPPORTS TO AND FROM THE PUMPS. REFER TO SPECS FOR THE TYPE OF SUPPORTS REQUIRED.

- NOTES:
- 1 STOP VALVE (SEE SPECIFICATIONS)
 - 2 BALANCING VALVE (SEE SPECIFICATIONS)
 - 3 STRAINER (SEE SPECIFICATIONS)
 - 4 CHECK VALVE (SEE SPECIFICATIONS) AXIS OF CHECK VALVE SHAFT SHALL BE PERPENDICULAR TO PUMP SHAFT.
 - 5 SPOOL PIECE (SEE SPECIFICATIONS)
 - 6 PRESSURE GAUGE WITH GAUGE COCK (SEE SPECS.)
 - 7 DIFFERENTIAL PRESSURE SENSOR / TRANSMITTER (SEE SPECS.)
 - 8 SUCTION DIFFUSER WITHOUT STRAINER (SEE SPECS.)
 - 9 EXTEND PUMP DRAIN LINES TO FLOOR DRAIN.
 - 10 CONCRETE BASE AND VIBRATION ISOLATION SPRING (SEE SPECS.)
 - 11 HOUSE KEEPING PADS. (SEE SPECIFICATIONS.)
 - 12 2" SCREW JACK
 - 13 1/4" COCK VALVE (SEE SPECIFICATIONS)
 - 14 UNION (SEE SPECIFICATIONS)
 - 15 FULL BORE BALL VALVE (SEE SPECS.)
 - 16 FULL SIZE STRAINER DRAIN CONNECTION
 - 17 HOSE END ADAPTER WITH CAP (SEE SPECIFICATIONS)
 - 18 ECCENTRIC REDUCER (SEE SPECS.)
 - 19 PIPE INSULATION (SEE SPECS.)
 - 20 DIFFERENTIAL PRESSURE GAUGE (SEE SPECIFICATIONS)
 - 21 CONCENTRIC REDUCER (SEE SPECIFICATIONS)
 - 22 TEST PLUG (SEE SPECIFICATIONS)



01 END SUCTION PUMP DETAIL

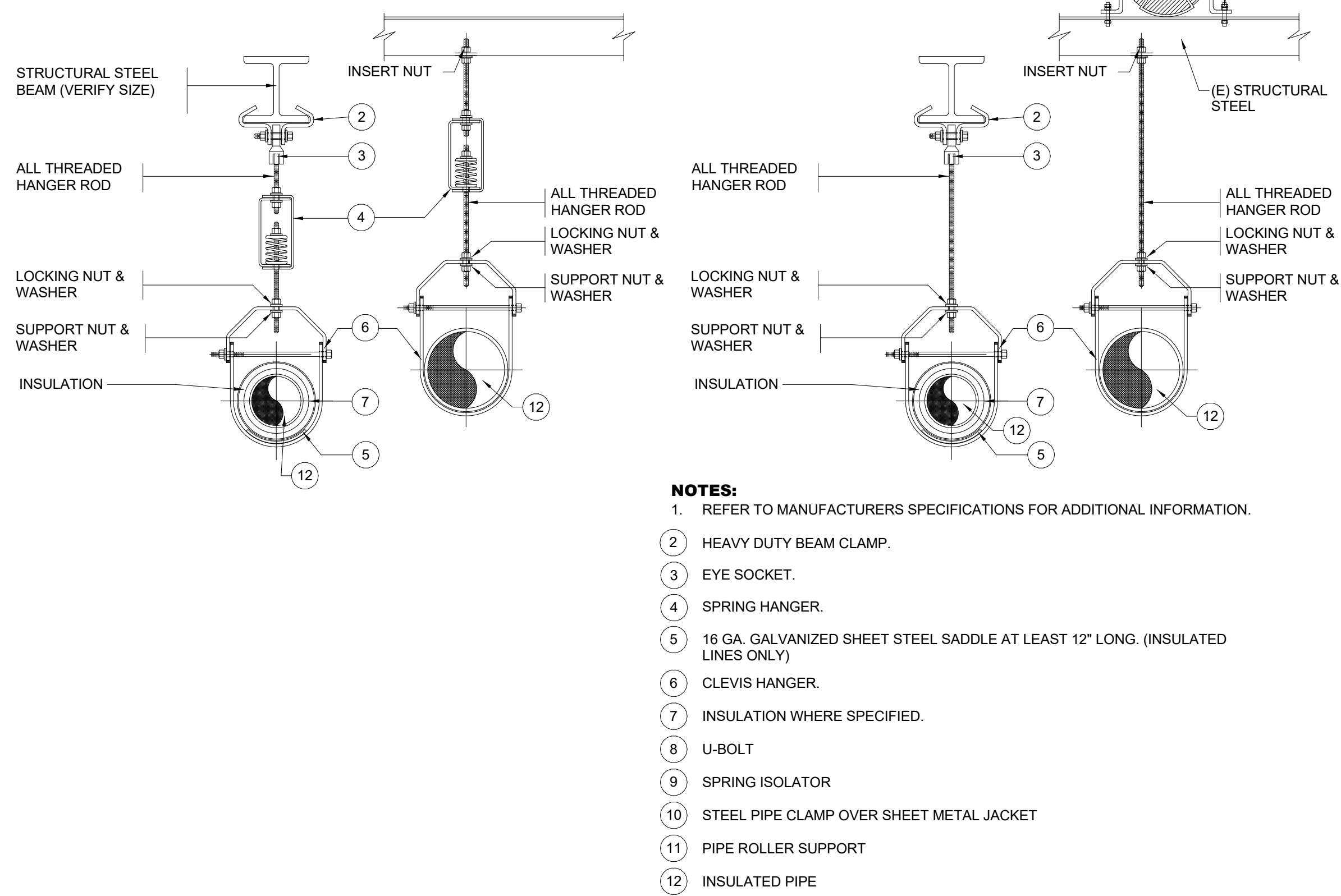
SCALE: NONE



INSERTION LENGTH SCHEDULE	
a = PIPE DIAMETER	b = INSERTION LENGTH
4" AND 5"	2-1/2"
6" AND 8"	5"
10" AND LARGER	8"

02 THERMOMETER WELL DETAIL

SCALE: NONE



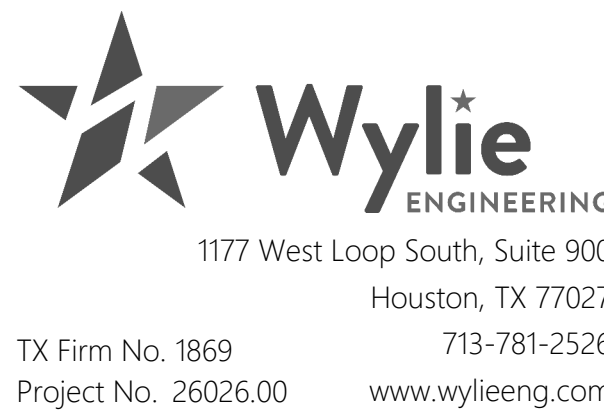
03 PIPE SUPPORT DETAIL

SCALE: NONE



TOMBALL ISD - CHILLER
PACKAGE #2e

Creekside Forest ES
5949 Creekside Forest Dr
Spring, TX 77389



MECHANICAL AND
PLUMBING DETAILS

CSES -
MP4.00

Scale 1/8" = 1'-0"

LEGEND OF ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	BOLD DEVICE/CIRCUITING INDICATES NEW DEVICE/CIRCUITING OR RELOCATED DEVICE.
	SHADED DEVICE/CIRCUITING INDICATES EXISTING TO REMAIN
	DASHED DEVICE/CIRCUITING INDICATES DEMOLITION
	CONDUIT RUN CONCEALED IN WALLS OR ABOVE CEILING. ARROW INDICATES HOMERUN TO PANEL. CONDUCTOR DESIGNATIONS ARE AS FOLLOWS: LONG HATCH INDICATES NEUTRAL, SHORT HATCH INDICATES PHASE. "COT" INDICATES INSULATED OR ISOLATED GROUND, AND NO HATCHES INDICATES TWO CONDUCTORS.
	CONDUIT RUN CONCEALED IN FLOOR OR BELOW FLOOR SLAB OR BELOW GRADE. WIRING SAME AS ABOVE.
	LIGHT FIXTURE TAG: A = FIXTURE TYPE XX = CIRCUIT NUMBER a = SWITCH LEG
	SCREENING SHADE INDICATES FIXTURE CONNECTION ON EMERGENCY CIRCUIT OR BATTERY BACKUP. SEE PLANS.
	EXIT LIGHT. PROVIDE ARROWS AND FACES AS INDICATED ON DRAWINGS.
	SIMPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDING TYPE OR SPECIAL RECEPTACLE OUTLET; SEE DRAWINGS FOR NEMA CONFIGURATION AND VOLTAGE.
	DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDING TYPE.
	TWO-WIRE DUPLEX RECEPTACLE OUTLETS GANGED WITH A COMMON WALL PLATE; 20 AMP, 125V, 3 WIRE, GROUNDING TYPE EACH.
	ESSENTIAL POWER DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDING TYPE.
	DUPLEX RECEPTACLE OUTLET LOCATED ABOVE STANDARD HEIGHT; 20 AMP, 125V, 3 WIRE, GROUNDING TYPE. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT HEIGHT.
	DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER; DUPLEX WITH WEATHERPROOF WHILE IN USE COVER AND GFCI 20 AMP, 125V, 3 WIRE, GROUNDING TYPE.
	CONTROLLED DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDING TYPE. SPLIT CONTROLLED DUPLEX- LEGRAND #26332CH OR EQUAL.
	CONTROLLED DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDING TYPE. FULL CONTROLLED- LEGRAND #26332CD OR EQUAL.
	TWO-WIRE DUPLEX OUTLETS UNDER COMMON COVER PLATE. LEFT DUPLEX CONTROLLED- LEGRAND #26332CH OR EQUAL. RIGHT DUPLEX NON-CONTROLLED. 20 AMP, 125V, 3W+G, EACH.
	TWO-WIRE DUPLEX OUTLETS UNDER COMMON COVER PLATE. LEFT DUPLEX CONTROLLED- LEGRAND #26332CH OR EQUAL. RIGHT DUPLEX NON-CONTROLLED. 20 AMP, 125V, 3W+G, EACH.
	DUPLEX RECEPTACLE OUTLET WITH (2) USB RECEPTABLES; 20 AMP, 125V, 3 WIRE GROUNDING TYPE.
	SPECIAL RECEPTACLE OUTLET. SEE DRAWINGS FOR NEMA CONFIGURATION AND VOLTAGE.
	CEILING MOUNTED RECEPTACLE OUTLET, DUPLEX/QUAD/SPECIAL. SEE DRAWINGS FOR SPECIAL OUTLET CONFIGURATION AND VOLTAGE.
	FLUSH MOUNTED FIRE RATED POWER THRU DEVICE (W/ RECEPTACLE) AND/OR DATA AND/OR TELEPHONE. SEE DRAWINGS FOR SPECIFICATIONS.
	FLUSH MOUNTED FLOOR BOX (W/ RECEPTACLE) AND/OR DATA AND/OR TELEPHONE. SEE DRAWINGS FOR SPECIFICATIONS.
	POWER POLE. RE: DRAWINGS FOR MORE INFORMATION.
	TELEPHONE / DATA / COMBINATION TELEDATA OUTLET
	CABLE T.V. OUTLET
	TELEPHONE TERMINAL BOARD, 8" x 3/4" FIRE RATED PLYWOOD
	SINGLE POLE, 3-WAY, 4-WAY SWITCH; 20 AMP, 120/277V.
	NETWORK ENABLED, WALL MOUNTED, 1 BUTTON, DUAL TECH SENSOR, ON/OFF.
	NETWORK ENABLED, WALL MOUNTED, DUAL TECH SENSOR, ON/OFF + RAISE/LOWER.
	1 ZONE / 2 ZONE DIGITAL NETWORK ENABLED, ON/OFF SWITCH.
	1 ZONE / 2 ZONE DIGITAL NETWORK ENABLED, RAISE/LOWER/ON/OFF.
	LIGHTING CONTROL NETWORK ENABLED GRAPHIC TOUCH SCREEN 3.5" & PRESETS OR 16 ZONES. USE NEAREST 120/277V LTO CKT FOR POWER SUPPLY.
	KEY SWITCH 120/277V, DIGITAL KEY SWITCH
	DIMMER SWITCH 120/277V, LUTRON 700VA10 OR EQUAL.
	ON/OFF ONLY WITH RAISE/LOWER - WALL MOUNTED MOTION SENSOR, 120/277VAC.
	NETWORK ENABLED CEILING MOTION SENSOR EXTENDED RANGE / WALKING MOTION
	NETWORK ENABLED CEILING MOTION SENSOR STANDARD RANGE / SITTING MOTION
	PHOTOCELL / DAYLIGHT SENSOR
	WIRELESS DEVICE
	DOORBELL CHIME; RE: SPECIFICATIONS/PLANS.
	EMERGENCY POWER OFF SWITCH (E.P.O.)
	PUSH BUTTON /BUZZER
	JUNCTION BOX MOUNTED ABOVE ACCESSIBLE CEILING.
	JUNCTION BOX - WALL MOUNTED/FLOOR; RE: FLOOR PLANS
	DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, & FUSE SIZE (IF REQUIRED) VOLTS/AMPS/POLES TO MATCH BREAKER U.N.O.
	SINGLE PHASE MOTOR
	THREE PHASE MOTOR
	MOTOR STARTER (DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, FUSE SIZE (IF REQUIRED), AND SIZE. VOLT/AMPS/POLES TO MATCH BREAKER U.N.O.)
	MOTOR STARTER/VPD IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, AND SIZE.
	TRANSFER SWITCH - REFER TO DRAWINGS FOR SPECIFICATIONS
	CARD READER JUNCTION BOX WITH 3/4"CTO ACCESSIBLE CEILING U.N.O.
	VARIABLE SPEED DRIVE (SUPPLIED BY MECHANICAL/CONTRACTOR)
	GROUND BAR
	TRANSFORMER W/ NEC CLEARANCES; REFER TO DRAWING FOR VOLTAGE/VA
	SURFACE PANELBOARD W/ NEC CLEARANCES.
	RECESSED PANELBOARD W/ NEC CLEARANCES
	MECHANICAL EQUIPMENT CONNECTION POINT. REFER TO SCHEDULE ON EX.XX FOR CONNECTION INFORMATION.

LOW VOLTAGE PROVISIONS

1. PROVIDE A 4" X 4" X 2'-10 1/2" JUNCTION BOX WITH RING AND STRING ABOVE ACCESSIBLE CEILING FOR ALL LOW VOLTAGE ROUGH-IN LOCATIONS (TYPICAL).
2. FOR WALLS & DECK OR WALLS WITH INSULATION, PROVIDE A 4" X 4" X 2'-10 1/2" JUNCTION BOX WITH 3/4" EMT CONDUIT TO ABOVE ACCESSIBLE CEILING.
3. LOW VOLTAGE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO: FIRE ALARM, BUILDING CONTROLS, LIGHTING CONTROLS, DATA, AUDIO/VISUAL, SECURITY.
4. ALL LOW VOLTAGE CABLEING IN THIS PROJECT SHALL BE ROUTED IN MINIMUM 3/4" EMT CONDUIT WHERE EXPOSED TO VIEW OR WHERE ABOVE INACCESSIBLE CEILINGS. PROVIDE A SHOP DRAWING FOR ARCHITECT REVIEW.

ABBREVIATIONS

(E)	EXISTING TO REMAIN
(ER)	EXISTING TO BE RE-CROUTED
(N)	NEW
(R)	ITEM NOTED TO BE RELOCATED
(D)	ITEM NOTED TO BE DEMOLISHED
AF	ABOVE FINISHED FLOOR
AD	AUTOMATIC DAMPER
AC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINUM
AMP	AMPERAGE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BRK	BREAKER
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
DC	DIRECT CURRENT
DISC	DISCONNECT
EUT	ELECTRICAL CONTRACTOR
EPO	EMERGENCY POWER OFF
FACP	FIRE ALARM CONTROL PANEL
FC	FOOT CANDLE
FIA	FULL LOAD AMPS
FLA	FULL LOAD AMPS
GF	GROUND FAULT INTERRUPTER
GR	GROUND FAULT CIRCUIT INTERRUPTER
HD	HAND-OUT/AUTO
HDA	HEAVY DUTY
HP	HORSEPOWER
IS	ISOLATED GROUND
KCM	THOUSAND CIRCULAR MILS
KW	KILOWATT
MC	MAIN CIRCUIT BREAKER
MB	METAL CLAD
MH	METAL HALIDE
MSB	MAIN SWITCHBOARD
NB	NOT IN CONTRACT
NCA	NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NE	NOT FIELD
NE	NOT FIELD
NTS	NOT TO SCALE
PNL	PANEL OR PANELBOARD
PS	POWER SUPPLY
RACP	REMOTE ANNUNCIATOR CONTROL PANEL
RCP	REFLECTOR CUP AND PLAN
RE	REFERENCE
RF	SMOKE/FIRE DAMPER
SPEC	SPECIFICATIONS
TS	TELEPHONE TERMINAL BOARD
TS	TIME SWITCH
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VPS	VARIABLE FREQUENCY DRIVE
VFD	VARIABLE FREQUENCY DRIVE
WPR	WEATHER PROOF
XMR	TRANSFORMER

APPLICABLE CODES & STANDARDS

1. BUILDING CODE - 2021 IRC WITH LOCAL AMENDMENTS
2. FIRE CODE - 2021 IFCC WITH LOCAL AMENDMENTS
3. ELECTRICAL CODE - 2023 NEC WITH LOCAL AMENDMENTS
4. MECHANICAL CODE - 2021 UMC WITH LOCAL AMENDMENTS
5. PLUMBING CODE - 2021 UPC WITH LOCAL AMENDMENTS
6. ENERGY CODE - 2021 INTERNATIONAL ENERGY CONSERVATION CODE WITH LOCAL AMENDMENTS
7. OTHER - LIFE SAFETY CODE (NFPA 101)
8. OTHER - FEDERAL DEPARTMENT OF JUSTICE AMERICANS WITH DISABILITIES ACT AND TEXAS ACCESSIBILITY STANDARDS.
9. FIRE ALARM - 2021 NFPA 72 WITH LOCAL AMENDMENTS.

BREAK OUT PRICING

- THE CONTRACTOR SHALL PROVIDE SEPARATE LINE-ITEM COST FOR ALL WORK AND MATERIALS ASSOCIATED WITH EACH OF THE FOLLOWING:
1. INSTALLATION FOR ONE (1) DEDICATED 20-AMP DUPLEX RECEPTACLE
 2. INSTALLATION FOR ONE (1) DEDICATED 20-AMP QUAD RECEPTACLE
 3. INSTALLATION FOR ONE (1) RING AND STRING ROUGH-IN FOR VOICE/DATA OUTLET
 4. INSTALLATION FOR ONE (1) DEDICATED 125-VOLT JUNCTION BOX
 5. INSTALLATION FOR ONE (1) 1/4" X 1/4" X 2' LIGHT FIXTURE ON AN EXISTING 277-VOLT SWITCHED CIRCUIT WITH 8 FT OF CONDUIT/CONDUCTORS
 6. CIRCUIT TRACE OF ALL EXISTING CIRCUITS IN ALL PANELS USED IN THIS PROJECT. SEE PANEL SCHEDULES

PRICES SHALL INCLUDE ALL INSTALLATION COST, INCLUDING CONDUITS AND BRANCH CIRCUIT CONDUCTORS AS REQUIRED. ASSUME 100 FT CONDUIT AND CONDUCTOR LENGTH FROM SOURCE TO LOAD U.N.O.

IDENTIFICATION/LABELING

1. ALL PANELBOARDS, MOTOR STARTERS, CONTROL PANELS, CONTROL REMOTE STATIONS, DISCONNECT SWITCHES, CIRCUIT BREAKERS OR OTHER EQUIPMENT IN SEPARATE ENCLOSURES SHALL BE EQUIPPED WITH NAMEPLATES. THE NAMEPLATES SHALL BE ENGRAVED, ROD PLASTIC, LAMINATE OR APPROVED EQUAL, WHITE LETTERING ON BLACK BACKGROUND FOR EQUIPMENT 208/250 VOLT AND BLACK LETTERING ON WHITE BACKGROUND FOR EQUIPMENT 480/277 VOLT, AND BE ATTACHED TO THE EQUIPMENT SECURELY WITH SCREWS. EACH NAMEPLATE SHALL GIVE THE NUMBER DESIGNATION OF THE EQUIPMENT AS SHOWN ON THE ONE LINE DIAGRAM AND ALSO THE SOURCE. UTILIZE SIMILAR RED AND WHITE NAMEPLATES FOR ALL EMERGENCY POWERED EQUIPMENT.
2. ALL WIRING DEVICES (EXCLUDING LIGHT SWITCHES) SHALL BE LABELED WITH SELF-ADHESIVE, LAMINATED TAPE INDICATING THE CIRCUIT NUMBER AND PANEL DESIGNATIONS. UTILIZE CLEAR TAPE WITH BLACK LETTERS UNLESS NOTED OTHERWISE. PROVIDE SAMPLE OF LABELS TO ARCHITECT AND LANDSCAPE FOR APPROVAL PRIOR TO INSTALLATION.
3. NEW AND EXISTING CIRCUITS SHALL BE ACCURATELY IDENTIFIED AT THE RESPECTIVE ABOVE CEILING JUNCTION BOXES. THE ASSOCIATED PANEL, CIRCUITS, AND VOLTAGE SHALL BE IDENTIFIED ON ALL JUNCTION BOX COVER CIRCUITS LEAVING PANELBOARDS AND DISTRIBUTION PANELS SHALL BE PROVIDED WITH LABEL ON CIRCUITS CONTAINED IN CONDUIT.
4. EXISTING CIRCUITRY IS SHOWN FOR INFORMATION ONLY. EXISTING CIRCUITRY INFORMATION TAKEN FROM COMBINATION OF FIELD SURVEY AND PREVIOUS TENANT DRAWINGS. CONTRACTOR SHALL FIELD VERIFY EXACT CIRCUITRY AND INDICATE ANY DEVIATIONS ON THE "AS BUILT" DRAWINGS. "AS BUILT" DRAWINGS SHALL ACCURATELY INDICATE THE LOCATION OF ALL NEW AND EXISTING JUNCTION BOXES WITH THE RESPECTIVE PANEL AND CIRCUIT NUMBERS.

REQUIRED SUBMITTALS

ELECTRICAL GEAR

WIRING DEVICES

ALL SUBMITTALS SHALL BE SUBMITTED VIA EMAIL TO SUBMITTALS@WYLIEENG.COM AND COPIED TO THE PROJECT MANAGER.

ALL RFTS SHALL BE SUBMITTED VIA EMAIL TO RFTS@WYLIEENG.COM AND COPIED TO THE PROJECT MANAGER.

ELECTRICAL GENERAL NOTES

- A. GENERAL PROVISIONS:
1. FURNISH AND INSTALL ALL ITEMS, INCLUDING EVERY ARTICLE, DEVICE OR ACCESSORY REASONABLY NECESSARY TO FACILITATE EACH SYSTEM'S FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT SPECIFIED. ELEMENTS OF THE WORK SHALL INCLUDE, BUT ARE NOT LIMITED TO: MATERIALS, LABOR, SUPPLIES, EQUIPMENT, TRANSPORTATION, HOISTING/RIGGING, STORAGE, UTILITIES, AND ALL REQUIRED PERMITS AND LICENSES.
 2. DRAWINGS ARE SCHEMATIC IN NATURE AND DO NOT NECESSARILY REFLECT ALL WORK REQUIRED TO COMPLETE PROJECT. CONTRACTOR SHALL PROVIDE NECESSARY MATERIALS, LABOR, AND EQUIPMENT AS REQUIRED TO COMPLETE PROJECT. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND LICENSES.
 3. WORK SHALL COMPLY WITH THE MOST RECENT VERSION OF ALL APPLICABLE LAWS, RULES, REGULATIONS, AND ORDINANCES OF ALL FEDERAL, STATE, AND LOCAL AUTHORITIES. IN THE EVENT OF CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND THE LOCAL ENFORCING AUTHORITY, THE LATTER SHALL RULE. ANY MODIFICATION RESULTING THEREFROM SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER OR ARCHITECT/ENGINEER. THE CONTRACTOR SHALL REPORT ANY SUCH MODIFICATIONS TO THE ARCHITECT/ENGINEER AND SECURE THEIR APPROVAL BEFORE PROCEEDING. SHOULD THE REQUIREMENTS OF THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE CODES, THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE PROVIDED THEY ARE NOT IN CONFLICT WITH THOSE CODES.
 4. AREAS OF THE EXISTING BUILDING WILL BE OCCUPIED DURING CONSTRUCTION OF THIS PROJECT. NOISY, DUSTY, AND/OR OTHER CONSTRUCTION OPERATIONS REQUIRED FOR WORK WHICH DISTURBS OR CAUSES COMPLAINTS BY THE EXISTING BUILDING OCCUPANTS SHALL NOT BE ACCEPTABLE. ALL AFTER-HOURS OR OVERTIME WORK REQUIRED BY THE CONTRACTOR TO AVOID DISRUPTION OF EXISTING OCCUPANCY WILL BE PROVIDED AT NO COST TO THE OWNER/TENANT. THE CONTRACTOR SHALL USE CONSTRUCTION METHOD AND MATERIALS WHICH SHALL NOT ADVERSELY AFFECT THE INDOOR AIR QUALITY OF THE EXISTING OCCUPIED AREAS.
 5. CONSIDERATION SHALL NOT BE GRANTED FOR UNDERSTANDING OF THE SCOPE OR AMOUNT OF WORK TO BE PERFORMED. TENDER OF A PROPOSAL CONVEYS FULL CONTRACTOR AGREEMENT OF THE ITEM AND CONDITIONS SPECIFIED AND/OR INDICATED, SCHEDULED, OR IMPLIED ON THE CONTRACT DOCUMENTS, AND/OR REQUIRED BY THE NATURE OF THIS WORK.
 6. IN THE EVENT OF A CONFLICT BETWEEN DRAWINGS AND/OR SPECIFICATIONS, THE GREATER AMOUNT OF TOTAL COST SHALL BE PRICED. BRING THE CONFLICT TO THE ATTENTION OF THE ENGINEER AND REQUEST DIRECTION.
 8. PRE-CONSTRUCTION:
 1. BEFORE SUBMITTING A BID, IT WILL BE NECESSARY FOR EACH CONTRACTOR WHOSE WORK IS INVOLVED TO VISIT THE SITE AND ACCEPTANCE FOR THEMSELVES THE CONDITIONS TO BE MET IN INSTALLING THE WORK AND MAKE PROVISIONS FOR THE CONDITIONS IN THEIR FINAL PRICE. FAILURE ON THE PART OF THE CONTRACTOR TO COMPLY WITH THIS REQUIREMENT SHALL NOT BE CONSIDERED JUSTIFICATION FOR THE OMISSION OR FAULTY INSTALLATION OF ANY WORK COVERED BY THE CONTRACT DOCUMENTS.
 2. THIS CONTRACTOR SHALL SECURE ALL PERMITS, LICENSES AND INSPECTIONS REQUIRED FOR THEIR WORK, AND SHALL PAY ALL FEES IN CONNECTION WITH SUCH PERMITS, LICENSES AND INSPECTIONS.
 - C. DEMOLITION:
 1. ALL EXISTING CONDUIT AND CONDUCTORS SERVING THE AREA UNDER CONTRACT NOT TO BE REPAIRED SHALL BE TERMINATED AT LAST PORTION OF CIRCUIT REQUIRING DEMOLITION BEFORE THE DEMOLITION AREA. IF A CIRCUIT SERVES ONLY THE DEMOLITION AREA, REMOVE ALL CONDUITS AND CONDUCTORS BACK TO THE PANELBOARD OR BASE BUILDING GRID BOX AND DE-ENERGIZE THE CIRCUIT BREAKER, MAKING IT A SPARE. NOTE "SPARE" OR "VOID-SPARE" ACCORDINGLY ON PANELBOARD DIRECTORY.
 2. REMOVE ALL ABANDONED LOW VOLTAGE CABLEING INCLUDING FIRE ALARM CABLEING, TELEPHONE/DATA CABLEING, AND SECURITY CABLEING. REMOVE ALL EXISTING CONDUIT AND WIRING THAT IS SUPPORTED FROM THE CEILING GRID. REMOVE ALL EXISTING UNUSED ELECTRICAL EQUIPMENT, CONTROLS, CONDUIT, HANGERS, WIRING, ETC.
 3. RELOCATE AND RECONNECT ACTIVE PORTIONS OF THE ELECTRICAL SYSTEM OUTSIDE OF THE SCOPE OF DEMOLITION, AS REQUIRED TO MAINTAIN A COMPLETE AND OPERATING SYSTEM THAT IS FUNCTIONALLY EQUIVALENT TO THE PRE-EXISTING SYSTEM PRIOR TO DEMOLITION.
 4. ELECTRICAL PLANS INDICATE FINAL WIRING DEVICE, DATA/COMMUNICATIONS OUTLET AND SWITCH LOCATIONS. ALL OTHER EXISTING WIRING DEVICES, DATA/COMMUNICATIONS OUTLETS AND SWITCHES SHALL BE REMOVED AND WALLS SHALL BE PATCHED, UNLESS OUTSIDE OF SCOPE OR NOTED AS (E).
 5. ALL EXISTING JUNCTION BOXES, OUTLETS, PULL BOXES, ETC., LOCATED ABOVE NON-ACCESSIBLE CEILINGS INSTALLED UNDER THIS TENANT IMPROVEMENTS PROJECT SHALL BE RELOCATED ABOVE AN ACCESSIBLE CEILING WHERE EXISTING JUNCTION BOXES ARE NOT PRACTICAL TO RELOCATE. ELECTRICAL CONTRACTOR SHALL NOTIFY ARCHITECT AND ENGINEER PRIOR TO SUBSTANTIAL START OF CONSTRUCTION.
 6. REMOVE ALL EXISTING UNUSED ELECTRICAL EQUIPMENT, CONTROLS, CONDUIT, HANGERS, WIRING, ETC. FROM ABOVE CEILINGS.
 7. REFER TO ARCHITECTURAL DRAWINGS FOR LIGHT FIXTURES TO BE RELOCATED. RELOCATE AND RECONFIGURE FIXTURES AS SHOWN. PROVIDE ADDITIONAL FIXTURES TO MATCH FIXTURE QUANTITIES SHOWN. FIELD VERIFY EXISTING CONDITIONS.
 8. REFER TO ARCHITECTURAL PLANS FOR WALL AND PARTITIONS TO BE REMOVED. CONTRACTOR SHALL PROVIDE ELECTRICAL DEMOLITION AS PREVIOUSLY DESCRIBED.
 9. REFER TO ARCHITECTURAL DRAWINGS FOR RECEPTABLES AND VOICE/DATA OUTLETS TO BE REMOVED. FIELD VERIFY EXISTING CONDITIONS.
 10. CONTRACTOR SHALL REMOVE AND REPLACE ALL WIRING DEVICES NOT CONFORMING TO BUILDING STANDARDS.
 11. REMOVE ALL EXISTING CONDUIT AND WIRING THAT IS SUPPORTED FROM THE CEILING GRID VIA CADDY CLIPS, ETC. AND REPLACE EXISTING CONDUIT THAT IS TO BE RE-UTILIZED WITH MATCHING CONDUIT AND WIRING PROPERLY SUPPORTED FROM STRUCTURE ABOVE.
 12. RE-SUPPORT AND RE-ROUTE ANY REMAINING PIPING OR DEVICES THAT WERE SUPPORTED BY DEMOLISHED WALLS.
 13. ALL ITEMS INSTALLED IN AIR PLenums SHALL BE PLenum RATED.
 - D. SUBMITTALS:
 1. ALL EQUIPMENT AND MATERIAL TO BE FURNISHED AND INSTALLED ON THE PROJECT SHALL BE UL OR ETL LISTED, IN ACCORDANCE WITH THE AUTHORITY HAVING JURISDICTION, AND SUITABLE FOR ITS INTENDED USE ON THIS PROJECT.
 2. THE CONTRACTOR SHALL PROVIDE SUBMITTALS FOR ALL NEW EQUIPMENT, CONTROLS, DEVICES, AND FIXTURES TO BE PROVIDED. SUBMIT MINIMUM ELECTRONIC SUBMITTALS FOR APPROVAL:
 1. EQUIPMENT AND MATERIALS SHOP DRAWINGS
 2. COORDINATION DRAWINGS
 3. RECORD DRAWINGS
 4. OPERATING AND MAINTENANCE MANUALS
 5. FIRE STOP MATERIALS AND DETAILS
 - E. PRE-CONSTRUCTION FUNCTIONAL TEST:
 1. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL FUNCTIONALLY TEST ALL ELECTRICAL AND FIRE ALARM EQUIPMENT THAT IS EXISTING TO REMAIN OR RELOCATED IN THIS PROJECT. THE CONTRACTOR SHALL PROVIDE A WRITTEN REPORT FOR ANY AND ALL DEFICIENCIES TO THE OWNER/TENANT. ANY DEFICIENCIES IDENTIFIED AT THE START OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER/TENANT. THE EQUIPMENT TO BE TESTED INCLUDES, BUT IS NOT LIMITED TO: RECEPTABLES, LIGHT FIXTURES, EXIT SIGNS, OCCUPANCY SENSORS, PANEL BOARDS, TRANSFORMERS, EMERGENCY LIGHTING BATTERY UNITS, AND SWITCHES.
 2. FOR EXISTING LIGHT FIXTURES AND EXIT SIGNS WITH BATTERY PACKS, ELECTRICAL CONTRACTOR SHALL ASSUME NEW BATTERY PACKS. WILL BE REQUIRED UNLESS FUNCTIONAL TEST PROVIDES OTHERWISE.
 - F. CONSTRUCTION:
 1. ALL WORK SHALL BE ARRANGED IN A NEAT, WELL-ORGANIZED MANNER. ALL SERVICES SHALL BE ROUTED PARALLEL AND PERPENDICULAR TO THE PRIMARY LINES OF THE BUILDING. LOCATE ALL OPERATING AND CONTROL EQUIPMENT PROPERLY TO PROVIDE EASY ACCESS AND ARRANGE ENTRY WORK WITH ADEQUATE ACCESS FOR OPERATOR AND MAINTENANCE, AND FOR PROPER CODE AND/OR MANUFACTURERS CLEARANCES.
 2. DAMAGE CAUSED DURING CONSTRUCTION TO EXISTING MATERIALS/EQUIPMENT WILL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO OWNER. RE-SUPPORT ANY REMAINING PIPING OR DEVICES THAT WERE SUPPORTED BY WALLS BEING REMOVED.
 3. THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL COORDINATE THE INSTALLATION OF DUCTWORK, PIPING, CONDUIT, CABLE, ETC., WITH LIGHTING FIXTURES, SPEAKER, CEILING CONSTRUCTION, AIR DISTRIBUTION EQUIPMENT, AND THE STRUCTURE. PROVIDE ADDITIONAL RESES AND PRESSES AS REQUIRED. IF AFTER INSTALLED, NEW DUCTWORK, PIPING, CONDUIT, CABLE, ETC., IS FOUND TO BE IN CONFLICT WITH THE ARCHITECTURE, STRUCTURE OR OTHER TRADE WORK, WHICH IS EITHER EXISTING OR SHOWN ON THE CONTRACT DOCUMENTS, THE DUCTWORK, PIPING, CONDUIT, CABLE, ETC., SHALL BE RELOCATED WITHOUT ADDITIONAL COST TO THE OWNER/TENANT. COORDINATE ALL WORK COMPLETED WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
 4. ALL BUILDING SERVICES, UTILITIES, POWER, FIRE PROTECTION, AND DOMESTIC COLD AND HOT WATER MAY NOT BE DISRUPTED FOR ANY REASON WITHOUT PRIOR COORDINATION WITH A REPRESENTATIVE OF BUILDING OPERATIONS.
 5. THIS BUILDING MAY HAVE A STRUCTURAL SYSTEM UTILIZING POST-TENSIONED CABLES. THE CONTRACTOR SHALL DETERMINE THE EXISTING STRUCTURAL SYSTEM PRIOR TO CUTTING, DRILLING, OR CORING. THE CONTRACTOR SHALL X-RAY ALL PENETRATIONS PRIOR TO CUTTING THE FLOOR SLAB.
 6. PENETRATIONS THROUGH FLOORS OR FIRE-RATED CONCRETE SHALL BE FIRE-RATED TO COMPLY WITH ASTM E-814 (UL 1479), AND THE LOCAL AUTHORITY HAVING JURISDICTION.
 - G. WARRANTY:
 1. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COMPLETE SET OF "AS BUILT" DRAWINGS PORTRAYING ACTUAL SITE CONDITIONS OF THE MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION WORK. SUBMISSION SHALL CONSIST OF ONE SET OF PDF AND ONE SET OF CAD FILES IN AUTOCAD V. 2018 OR REVIT V. 2018 OR NEWER FORMAT WITH THE OWNERS STANDARD LAYERING SCHEME.
 2. EXISTING CIRCUITRY IS SHOWN FOR INFORMATION ONLY. EXISTING CIRCUITRY INFORMATION TAKEN FROM COMBINATION OF FIELD SURVEY AND PREVIOUS TENANT DRAWINGS. CONTRACTOR SHALL FIELD VERIFY EXACT CIRCUITRY AND INDICATE ANY DEVIATIONS ON THE "AS BUILT" DRAWINGS. "AS BUILT" DRAWINGS SHALL ACCURATELY INDICATE THE LOCATION OF ALL NEW AND EXISTING JUNCTION BOXES WITH THE RESPECTIVE PANEL AND CIRCUIT NUMBERS.
 3. SUBMIT "AS-BUILT" RECORD DRAWINGS INDICATING ACTUAL, AS-BUILT CONDITIONS TO THE ARCHITECT/ENGINEER FOR REVIEW. RECORD DRAWINGS SHALL BE STAMPED "AS-BUILT" AND SHALL HAVE THE NAME, ADDRESS, AND TELEPHONE NUMBER OF THE CONTRACTOR. ALL ENGINEERS' SEALS SHALL BE REMOVED FROM THE DRAWINGS. PROVIDE BLACK AND WHITE DIGITAL COPIES AND ONE (1) ELECTRONIC FILE.
 4. SUBMIT ELECTRONIC PDF OF OPERATION AND MAINTENANCE MANUALS. THE MANUALS SHALL INCLUDE RATINGS, CAPACITIES, PARTS LISTS, WIRING DIAGRAMS, SERVICE/MAINTENANCE RECOMMENDATIONS, AND WARRANTIES.
 5. THE ELECTRICAL CONTRACTOR SHALL PERFORM THE FOLLOWING TASKS UPON PROJECT COMPLETION: ALL REQUIRED PERMITS AND AS-BUILTS SHALL BE SUBMITTED WITHIN TWO (2) WEEKS OF DATE OF SUBSTANTIAL COMPLETION OR OWNER OCCUPANCY.
 6. SUBMIT WRITTEN RESPONSE TO ALL FIELD REPORTS INDICATING CORRECTIVE ACTIONS TAKEN AND DATE CORRECTIVE ACTION WAS TAKEN TO THE ARCHITECT/ENGINEER FOR REVIEW.
 - H. WARRANTY:
 1. THE START OF THE CONTRACTORS WARRANTY PERIOD SHALL COMMENCE ON THE DATE OF "SUBSTANTIAL COMPLETION" AS AGREED TO BY THE OWNER/TENANT.
 2. THE WARRANTY PERIOD SHALL BE NO LESS THAN ONE (1) FULL YEAR, UNLESS SPECIFIED OTHERWISE AND SHALL INCLUDE AT LEAST ONE (1) FULL HEATING SEASON AND ONE (1) FULL COOLING SEASON. DURING THE WARRANTY PERIOD THE CONTRACTOR SHALL GUARANTEE THE FOLLOWING IN A FORM SATISFACTORY TO THE OWNER/TENANT:
 1. WORK INSTALLED SHALL BE FREE FROM ANY AND ALL DEFECTS IN WORKMANSHIP AND/OR MATERIALS.
 2. APPARATUS WILL DEVELOP CAPACITIES AND PERFORMANCE CHARACTERISTICS SPECIFIED.
 3. SYSTEMS SHALL OPERATE WITHOUT MALFUNCTION.

COMMISSIONING NOTES

BREAK OUT PRICE - WORK TO BE COMPLETED BY CX AGENT

1. COMMISSION MECHANICAL AND SERVICE WATER HEATING SYSTEMS PER ECC C408.2.1
2. BALANCE AND ADJUST AIR AND HYDRAULIC SYSTEMS AS APPLICABLE PER C408.2.2
3. VERIFY PERFORMANCE AND INTERFACING OF SYSTEMS, CONTROLS, AND ECONOMIZERS FOR ALL MODES AND SEQUENCE OF OPERATIONS PER C408.2.3
4. PROVIDE A PRELIMINARY COMMISSIONING REPORT PER C408.2.4
5. PROVIDE ALL CX DOCUMENTS TO BUILDING OWNER WITHIN 90 DAYS OF CERTIFICATE OF OCCUPANCY, INCLUDING SYSTEM BALANCING REPORT AND FINAL CX REPORT
2. COMMISSION LIGHTING CONTROLS SYSTEMS PER ECC C408.3
3. OCCUPANCY SENSOR CONTROLS PER C408.3.1
4. TIME SWITCH CONTROLS PER C408.3.1.2
5. DAYLIGHT RESPONSE CONTROLS PER C408.3.1.3
6. PROVIDE ALL CX DOCUMENTS TO BUILDING OWNER WITHIN 90 DAYS OF CERTIFICATE OF OCCUPANCY, INCLUDING DRAWINGS, MANUALS, AND TEST REPORTS

DRAWING INDEX

SHEET NUMBER SHEET NAME

- | | |
|------------|---|
| CSES-E0-00 | ELECTRICAL COVER SHEET |
| CSES-E1-01 | ELECTRICAL DEMOLITION PLAN |
| CSES-E2-01 | ELECTRICAL POWER PLAN |
| CSES-E3-00 | ELECTRICAL ONE-LINE DIAGRAM & SCHEDULES |
| CSES-E4-00 | ELECTRICAL DETAILS |



08/31/2026

TOMBALL ISD - CHILLER PACKAGE #2e

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TX Firm No. 1869

Project No. 26026.00

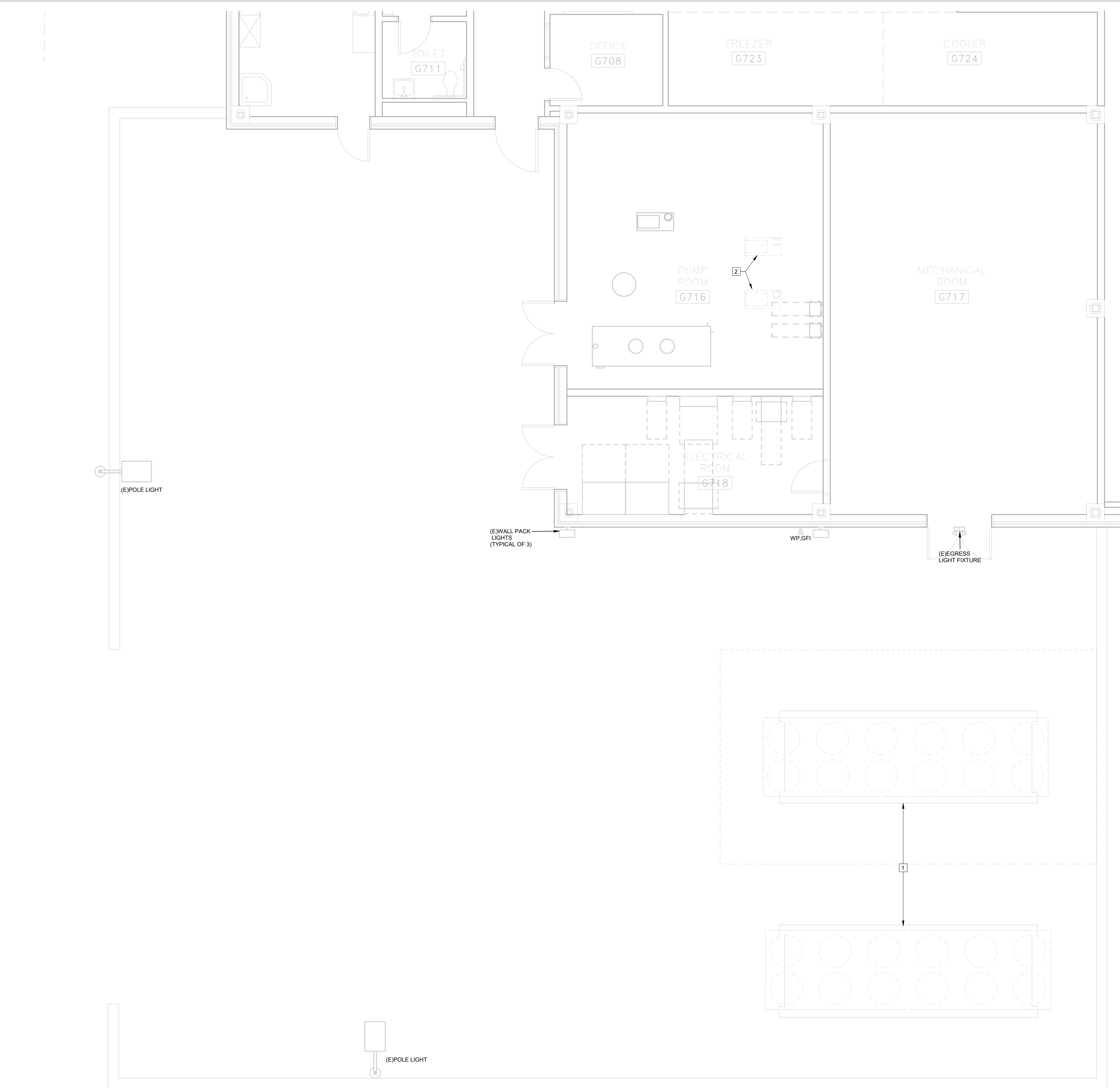
713-781-2526

www.wylieeng.com

ELECTRICAL COVER SHEET

CSES-E0.00

Scale AS INDICATED



ELECTRICAL DEMOLITION GENERAL NOTES

- A. CONDUCT ALL DEMOLITION WORK IN SUCH A MANNER AS TO MAINTAIN A SAFE WORK ENVIRONMENT AND IN ACCORDANCE WITH APPLICABLE SAFETY RULES AND PROCEDURES WITHIN NEC, NECA AND OSHA REQUIREMENTS.
- B. CONTRACTOR SHALL REQUEST AND REVIEW ANY HAZARDOUS MATERIALS SURVEYS FROM THE OWNER'S REPRESENTATIVE. OBSERVE RECOMMENDED PRECAUTIONS AND VERIFY THE STATUS OF ANY REMEDIAL WORK RECOMMENDED OR NOTED WITHIN THE HAZARDOUS MATERIAL SURVEY. NOTIFY THE OWNER'S REPRESENTATIVE IF ANY HAZARDOUS MATERIALS ARE SUSPECTED OR OBSERVED DURING THE COURSE OF EXECUTING THIS CONTRACT.
- C. SURVEYS AREAS OF THE FACILITY SCHEDULED FOR RENOVATION OR PARTIAL DEMOLITION PRIOR TO ANY WORK BEING PERFORMED. SUBMIT REPORT OF THE PRE-WORK SURVEY DETAILING ANY UTILIZATION EQUIPMENT OR SYSTEMS THAT ARE NOT IN GOOD WORKING ORDER IN ADVANCE OF ANY DEMOLITION WORK AND REVIEW WITH THE OWNER'S REPRESENTATIVE.
- D. THE SCHOOL DISTRICT SHALL HAVE FIRST RIGHT OF REFUSAL FOR SALVAGED MATERIAL. REQUEST THAT THE DISTRICT PROVIDE DIRECTION ON DISPOSITION OF SALVAGED MATERIAL FIVE(S) WORKING DAYS PRIOR TO REMOVAL. IF SO DIRECTED BY THE DISTRICT, SALVAGED MATERIAL SHALL REMAIN THE PROPERTY OF THE DISTRICT AND SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION AS DIRECTED. REMOVE AND DISPOSE ANY SALVAGED MATERIAL NOT RETAINED BY THE DISTRICT.
- E. DRAWINGS INDICATE APPROXIMATE LOCATION AND QUANTITY OF PANELS, TRANSFORMERS, DISCONNECTS, ETC. TO BE REMOVED. VERIFY LOCATION AND QUANTITY OF ITEMS TO BE REMOVED. NO ALLOWANCE WILL BE MADE BECAUSE OF CONTRACTOR'S UNFAMILIARITY WITH THE SITE.
- F. DAMAGED AREAS CAUSED REMOVAL OF ANY OF THE ABOVE ITEMS AND WHICH ARE NOT CONCEALED BY NEW CONSTRUCTION SHALL BE REPAIRED TO MATCH ADJACENT SURFACES. OPENINGS CREATED BY THE REMOVAL OF THESE ITEMS THROUGH FIRE RATED WALLS SHALL BE FIRE STOPPED.
- G. REMOVE ABANDONED CONDUIT TO POINT OF CONCEALMENT BEHIND INACCESSIBLE SURFACES. ENTIRELY REMOVE ABANDONED WIRING.
- H. PROVIDE BLANK COVERS AND PLATES AT UNUSED OPENINGS IN BOXES, RACEWAYS, AUXILIARY GUTTERS, CABINETS, EQUIPMENT CASES AND HOUSINGS SHALL BE CLOSED TO AFFORD PROTECTION SUBSTANTIALLY EQUIVALENT TO THE EQUIPMENT ENCLOSURE.
- I. IF A CONDUIT RUN IS EXPOSED OR A SURFACE RACEWAY LEFT WITHOUT A MOUNTING SURFACE DUE TO REMOVAL OF A PARTITION, THE RACEWAY SHALL BE REROUTED AS ACCEPTABLE TO THE OWNER/ARCHITECT.
- J. PROTECT ELECTRICAL EQUIPMENT. OUTLETS AND DEVICES THAT ARE SCHEDULED TO BE RELOCATED. REPAIR, RESTORE OR REPLACE ITEMS DAMAGED WHEN REMOVED TO THE APPROVAL OF THE OWNER. NOTIFY OWNER/ARCHITECT/ENGINEER OF ANY ELECTRICAL EQUIPMENT, OUTLETS AND/OR DEVICES WHICH ARE SCHEDULED TO BE RE-USED THAT ARE FOUND TO BE UNUSABLE.

ELECTRICAL KEY NOTES

- 1 EXISTING HVAC AIR COOLED CHILLER TO BE REPLACED. DEMO EXISTING CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES TO THE EXTENT NECESSARY TO RE-ROUTE WIRE. REFER TO NEW WORK PLANS FOR MORE INFORMATION.
- 2 EXISTING HVAC PUMP EQUIPMENT TO BE REPLACED. DEMO EXISTING CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES TO THE EXTENT NECESSARY TO RE-ROUTE WIRE. REFER TO NEW WORK PLANS FOR MORE INFORMATION.

REVISIONS		
No.	Date	Description
	08/31/2026	ISSUE FOR BID



TOMBALL ISD - CHILLER
PACKAGE #2e

Creekside Forest ES
5949 Creekside Forest Dr
Spring, TX 77389



Wylie
ENGINEERING

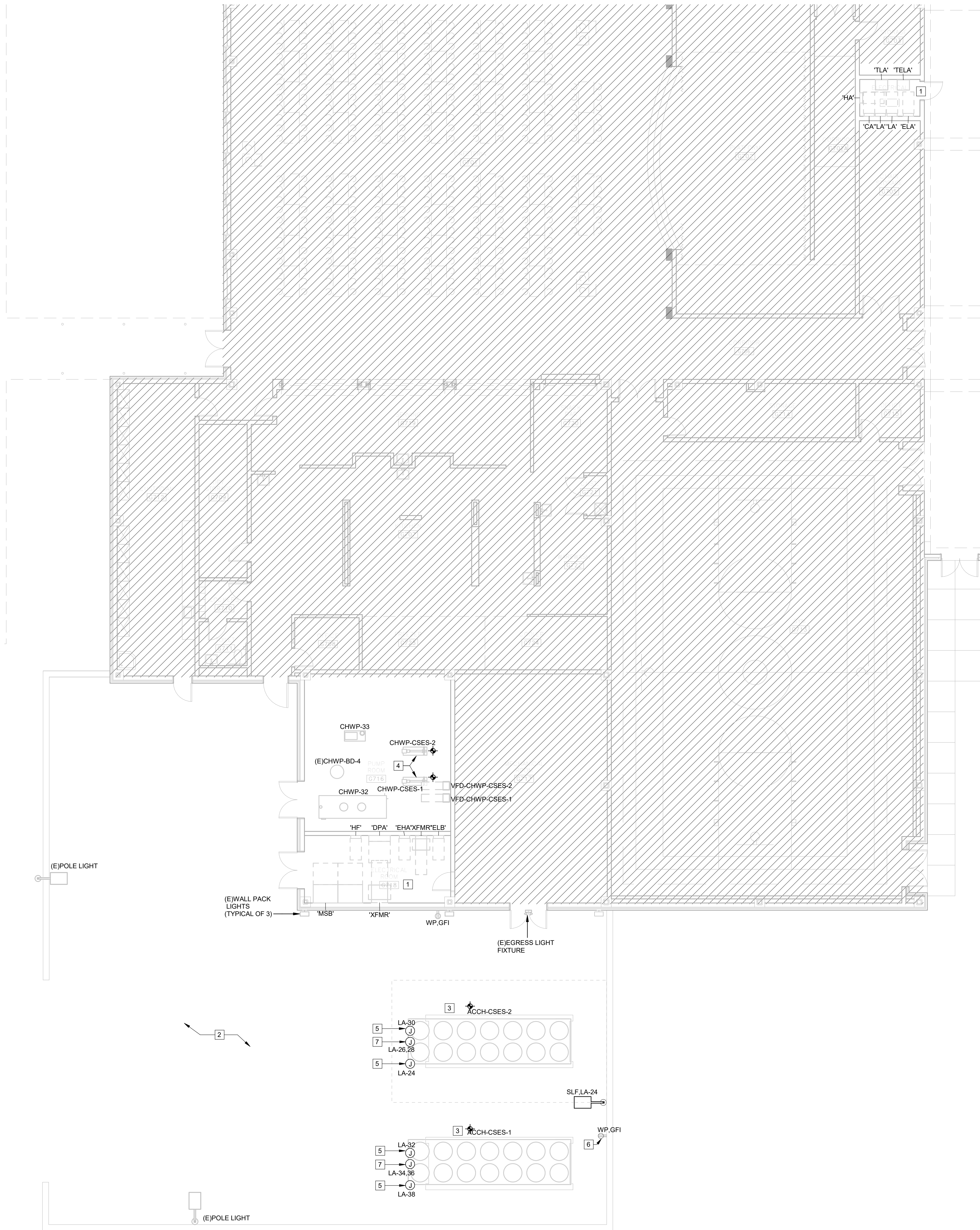
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Houston, TX 77027

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Project No. 26026.00 www.wylieeng.com

ELECTRICAL
DEMOLITION PLAN

CSES-E1.01

Scale As indicated



ELECTRICAL POWER GENERAL NOTES

- A. CONDUIT LINES ARE DIAGRAMMATIC. CONTRACTOR SHALL FIELD VERIFY CONDITIONS AND CHOOSE APPROPRIATE CONDUIT ROUTING. IN THE EVENT THAT THE APPROXIMATE CONDUIT ROUTING SHOWN ON PLANS IS NOT FEASIBLE CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER.
- B. RECEPTACLES LOCATED WITHIN 6' OF ANY PLUMBING FIXTURE, IN BREAK ROOMS, AT THE EXTERIOR, IN THE PARKING GARAGE OR OTHERWISE EXPOSED TO WATER SHALL BE TYPE GFCI. 'WIP' INDICATES A WEATHERPROOF 'WHILE-IN-USE' COVER.
- C. ALL WIRING DEVICES ARE NEW UNLESS NOTED OTHERWISE.
- D. ALL ELECTRICAL EQUIPMENT IS EXISTING TO REMAIN UNLESS NOTED OTHERWISE.
- E. COORDINATE DISCONNECT SWITCHES, VFDS AND STARTER LOCATIONS WITH EQUIPMENT INSTALLERS TO MAINTAIN PROPER MAINTENANCE AND CODE REQUIRED CLEARANCES.
- F. COORDINATE RECEPTACLE AND DATA/COM LOCATIONS SO THAT DEVICES ON SIMILAR WALLS ARE ADJACENT TO ONE ANOTHER.
- G. REFERENCE EQUIPMENT CONNECTION SCHEDULE FOR REQUIREMENTS AND ADDITIONAL INFORMATION OF TAGGED EQUIPMENT SHOWN ON PLAN DRAWING.
- H. PROVIDE 120V POWER TO EACH HVAC DDC CONTROL PANEL. COORDINATE EXACT LOCATIONS AND QUANTITIES WITH MECHANICAL DRAWINGS.

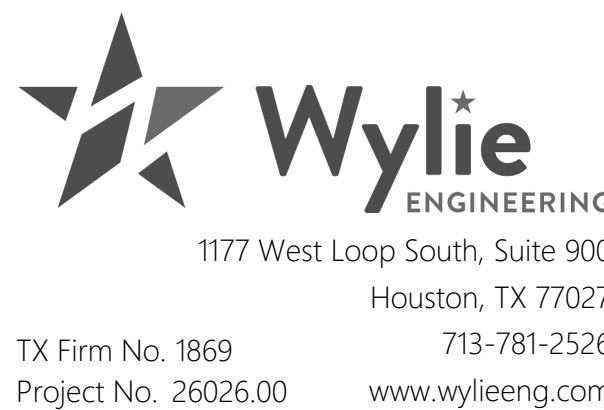
ELECTRICAL KEY NOTES

- 1 EXISTING ELECTRICAL EQUIPMENT AND DEVICES IN THIS AREA ARE EXISTING TO REMAIN.
- 2 POWER AND LIGHTING DEVICES SHOWN IN SERVICE YARD ARE EXISTING TO REMAIN AND ARE SHOWN FOR RECORD PURPOSES ONLY.
- 3 NEW HVAC AIR COOLED CHILLER EQUIPMENT: PROVIDE CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES AS REQUIRED. PULL NEW WIRE FROM THE EXISTING BREAKER TO THE NEW EQUIPMENT, REUSING THE EXISTING BREAKER. COORDINATE WITH MECHANICAL FOR EXACT LOCATIONS, CIRCUIT REQUIREMENTS, CONNECTION REQUIREMENTS, AND APPURTENANCES.
- 4 NEW HVAC PUMP EQUIPMENT: PROVIDE CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES AS REQUIRED. PULL NEW WIRE FROM THE EXISTING BREAKER TO THE NEW EQUIPMENT, REUSING THE EXISTING BREAKER. COORDINATE WITH MECHANICAL FOR EXACT LOCATIONS, CIRCUIT REQUIREMENTS, CONNECTION REQUIREMENTS, AND APPURTENANCES.
- 5 PROVIDE 120V SWITCHED JUNCTION BOXES FOR CHILLER CONTROL CIRCUITS AND VALVES. COORDINATE EXACT LOCATIONS WITH MECHANICAL CONTRACTOR. PROVIDE STRUT CHANNEL AND ALL ACCESSORIES FOR MOUNTING AS REQUIRED.
- 6 PROVIDE NEW WEATHER-RATED SERVICE RECEPTACLE OUTLET. CONNECT DEVICE TO ADJACENT CIRCUIT SERVING EXISTING SERVICE YARD RECEPTACLE(S).
- 7 PROVIDE POWER AND CIRCUITING FOR CHILLED WATER PIPE HEAT TRACE SYSTEM AS INDICATED. COORDINATE EXACT CONNECTION POINTS AND CONTROLLER LOCATIONS WITH MECHANICAL CONTRACTOR. PROVIDE GFPE BREAKER AS REQUIRED BY NEC.



TOMBALL ISD - CHILLER
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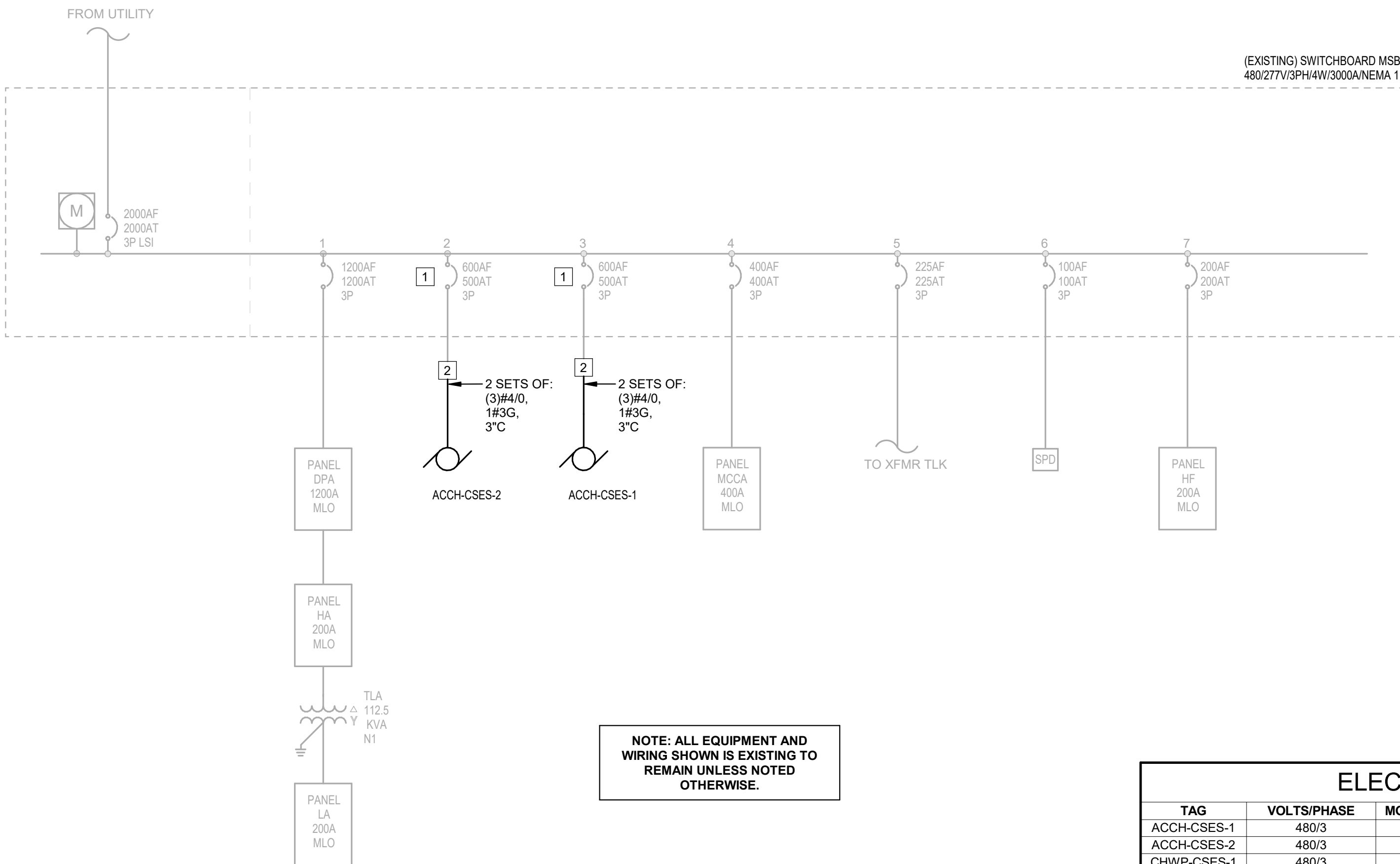


ELECTRICAL POWER
PLAN

CSES-E2.01

Scale 1/8" = 1'-0"

1 CSES - ELECTRICAL POWER PLAN
1/8" = 1'-0"



ELECTRICAL ONE-LINE DIAGRAM GENERAL NOTES

- REFERENCE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- PROVIDE ARC FLASH LABELING FOR ALL NEW EQUIPMENT AS REQUIRED PER NEC ARTICLE 110.16 AND NFPA-70E.
- ALL ABOVE GRADE FEEDER CONDUIT SHALL BE EMT.
- ALL FEEDER CONDUCTORS SHALL BE COPPER TYPE THHN (INTERIOR) OR THWN-2 (WHERE EXTERIOR TO BUILDING) UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALUMINUM FEEDER CONDUCTORS SHALL BE TYPE XHHW-2 ALCAN "STABLOY" OR APPROVED EQUAL. BRANCH CIRCUIT CONDUCTORS SHALL BE COPPER THHN/THWN2 UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL GROUND CONDUCTORS SHALL BE COPPER.
- CIRCUITS FOR MECHANICAL AND PLUMBING EQUIPMENT SHALL BE COPPER UNLESS NOTED OTHERWISE.
- NEW BREAKERS IN EXISTING PANELS SHALL MATCH EXISTING PANEL KAIC RATING.
- REFERENCE EQUIPMENT CONNECTION SCHEDULE, FOR ADDITIONAL INFORMATION OF TAGGED EQUIPMENT.
- FIELD VERIFY EXISTING SPARE BREAKER RATINGS AND QUANTITIES. PROVIDE NEW AS REQUIRED.

ELECTRICAL ONE-LINE DIAGRAM KEYED NOTES

- UTILIZE EXISTING 600A/3P BREAKER IN EXISTING PANEL FOR NEW FEEDER INDICATED.
- EXTEND EXISTING CONDUCTORS TO NEW EQUIPMENT AS REQUIRED.

ELEC-MECHANICAL EQUIPMENT CONNECTION SCHEDULE - SINGLE POINT - CSES

TAG	VOLTS/PHASE	MOTOR (HP)	FLA	MCA	OCP	DISCONNECTING MEANS	WIRE & CONDUIT	PANEL	CIRCUIT	NOTES
ACCH-CSES-1	480/3		390.0 A	487.0 A	600 A	INTEGRAL	RE: ONE-LINE	MSB	1,2,3	1
ACCH-CSES-2	480/3		390.0 A	487.0 A	600 A	INTEGRAL	RE: ONE-LINE	MSB	4,5,6	1
CHWP-CSES-1	480/3	20.0	27.0 A	33.8 A	60 A	VSD	3#8, #10G, 3/4" C	HF	2,4,6	12
CHWP-CSES-2	480/3	20.0	27.0 A	33.8 A	60 A	VSD	3#8, #10G, 3/4" C	HF	8,10,12	2

SCHEDULE NOTES

- DISCONNECTING MEANS AND OVERLOAD PROTECTION PROVIDED INTEGRAL WITH THE CONTROLLER.
- EQUIPMENT INDICATED CONTROLLED VIA ADJACENT VFD WITH INTEGRAL DISCONNECT. VFD PROVIDED BY DIV 23/25. VFD INSTALLED BY DIV 26.

GENERAL NOTES

- VERIFY ELECTRICAL REQUIREMENTS WITH MECHANICAL/PLUMBING EQUIPMENT SUBMITTALS PRIOR TO ELECTRICAL ROUGH-IN.
- REFERENCE SPECIFICATIONS AND/OR MECHANICAL DRAWINGS FOR EQUIPMENT CONTROL SEQUENCES.

ELEC - LIGHTING FIXTURE SCHEDULE - CSES

TYPE	MANUFACTURER	MODEL	VOLTS	LAMP(S)	CONTROL	LOAD (UNIT)	MOUNTING	DESCRIPTION
SLF	STONCO - PHILIPS SIGNIFY	SF100-SCT-T-G2-10-PCB-BZ	120	LED 4000K	PHOTOCELL	120.0 W	POLE MTD	FLOOD LIGHT WITH TRUNNION MOUNT

ELECTRICAL LOAD ANALYSES

PANEL 'HF'

480/277V-3P-4W

EXISTING LOAD = 149 AMPS
NEW LOAD = 84 AMPS

TOTAL = 233 AMPS

EXISTING PANEL IS FED BY A 400A-3P CIRCUIT BREAKER IN EXISTING SWITCHBOARD 'MSB'. THEREFORE NO CHANGE IN SERVICE IS REQUIRED.

PANEL 'HA'

480/277V-3P-4W

EXISTING LOAD = 0 AMPS
NEW LOAD = 0 AMPS

TOTAL = 0 AMPS

NEW PANEL IS FED BY A NEW 100A-3P CIRCUIT BREAKER IN EXISTING PANEL "2H1". THEREFORE NO CHANGE IN SERVICE IS REQUIRED.

PANEL 'LA'

208/120V-3P-4W

EXISTING LOAD = 80 AMPS
NEW LOAD = 64 AMPS

TOTAL = 144 AMPS

EXISTING PANEL IS FED BY AN EXISTING 112.5KVA TRANSFORMER WITH A SECONDARY SIDE RATING OF 312 AMPS. THEREFORE NO CHANGE IN SERVICE IS REQUIRED.

NOTE: REFER TO PANEL SCHEDULE FOR MORE DETAILED LOAD INFORMATION.

ELECTRICAL ONE-LINE DIAGRAM CF ES

N.T.S.

PANELBOARD: HF

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

EQUIP GROUND: YES
ISO GROUND: NO
FEED THRU LUGS: YES
200% NEUTRAL: NO
SERVICE ENTRANCE RATED: NO

VOLTS: 480/277 WYE
PHASES: 3
WIRES: 4
A.I.C. RATING: 65KAIC
FULLY RATED: YES

BUS RATING: 200 A
MLO OR MCB: MLO
MAIN RATING: 200 A

CKT	NOTES	CIRCUIT DESCRIPTION	AMP	P	A	B	C	P	AMP	CIRCUIT DESCRIPTION	NOTES	CKT	
3		AHU-1	40	3	5.8	7.5		3	60	CHWP-CSES-1	1	2	
5						5.8						4	
7					3.1	7.5						6	
9		AHU-2	20	3		3.1	7.5		3	60	CHWP-CSES-2	1	8
11							3.1	7.5					10
13					3.1	7.5							12
15		AHU-3	20	3		3.1	7.5		3	40	PUMP P-3		14
17							3.1	7.5					16
19					0.8	5.8							18
21		OAHU-6	20	3		0.8	5.8		3	20	BOILER		20
23							0.8	5.8					22
25					2.1	0.3							24
27		OAHU-7	20	3		2.1	0.3		3	20	SF-2		26
29							2.1	0.3					28
31					0.3	0.5							30
33		SF-1	20	3		0.3	0.5		3	20	EF-24		32
35							0.3	0.5					34
37		SPACE	--	1	--	0.5							36
39		SPACE	--	1	--		0.5		3	20	EF-25		38
41		SPACE	--	1	--			0.5					40
TOTAL PHASE LOAD:					44.8 kVA	44.8 kVA	44.8 kVA						
TOTAL PHASE AMPS:					162 A	162 A	162 A						

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
LIGHTING (NEC215.2A1)	0.0 kVA	125%	0.0 kVA	DOWNSTREAM FEED THRU LOAD: 0 A
RECEPTACLE (NEC220.44)	0.0 kVA	NEC TABLE 220.44	0.0 kVA	EXISTING LOAD: 0.0 kVA
OTHER EQPT (NEC220.14)	0.0 kVA	100%	0.0 kVA	TOTAL CONNECTED LOAD: 134.3 kVA
MOTOR (NEC430.22)	44.9 kVA	100% + 125% LARGEST	50.5 kVA	DEMAND HEAT+COOL: 139.9 kVA
KITCHEN EQPT (NEC220.56)	0.0 kVA	NEC TABLE 220.56	0.0 kVA	TOTAL CONNECTED LOAD: 162 A
HEATING (NEC220.60/440.6)	0.0 kVA	100%	0.0 kVA	DEMAND HEAT+COOL: 168 A
COOLING (NEC220.60/440.6)	0.0 kVA	100%	0.0 kVA	NON-COINCIDENTAL HEAT/COOL: 0 A
ELEVATOR (NEC620.14)	0.0 kVA	NEC TABLE 620.14	0.0 kVA	TOTAL NEC DEMAND: 168 A
CONT EQPT (NEC215.2A1)	0.0 kVA	125%	0.0 kVA	

NOTES:
BOLD CIRCUIT(S) INDICATE NEW/MODIFIED CIRCUIT AND/OR CIRCUIT BREAKER.
1. REUSE EXISTING CIRCUIT BREAKER. EXTEND CONDUCTORS TO NEW EQUIPMENT AS REQUIRED

PANELBOARD: LA

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

EQUIP GROUND: YES
ISO GROUND: NO
FEED THRU LUGS: YES
200% NEUTRAL: NO
SERVICE ENTRANCE RATED: NO

VOLTS: 120/208 WYE
PHASES: 3
WIRES: 4
A.I.C. RATING: 65KAIC
FULLY RATED: YES

BUS RATING: 200 A
MLO OR MCB: MCB
MAIN RATING: 200 A

CKT	NOTES	CIRCUIT DESCRIPTION	AMP	P	A	B	C	P	AMP	CIRCUIT DESCRIPTION	NOTES	CKT	
3		RCPT	20	1	0.9	0.5		1	20	RCPT		2	
5		RCPT	20	1				1	20	IRR. CONTROLLER		4	
7		RCPT	20	1	0.2	0.7		1	20	RCPT		6	
9		RCPT	20	1		0.5	0.7	1	20	WATER SOFTNER		8	
11		RCPT	20	1				1	20	GW-H-1		10	
13		RCPT	20	1	0.9	0.2	0.2	0.2	1	20	CP-1	12	
15		RCPT	20	1		0.2	0.7	1	20	FIRE PROTECTION		14	
17		EXTERIOR RCPT	20	1			0.4	0.7	1	20	EF-26	16	
19		MOTORIZED DAMPER	20	1	0.0	0.7		1	20	EF-27	18		
21		ROLLING GRILLE DOORS	20	1		0.5	0.7	1	20	EF-28		20	
23		ROLLING GRILLE DOORS	20	1			0.5	0.6	1	20	EF-29	22	
25		ROLLING GRILLE DOORS	20	1	0.5	0.3		0.5	0.6	1	20	CHILLER VALVES	24
27		MOTORIZED GOAL	20	1		1.2	0.3	2	20	HEAT TRACE (GFCI)	26		
29		MOTORIZED GOAL	20	1			0.7	0.5	1	20	CHILLER CONTROLS	28	
31		GYM RCPT	20	1	0.4	0.5		1	20	CHILLER CONTROLS		30	
33		GYM RCPT	20	1		0.5	0.3	2	20	HEAT TRACE (GFCI)	32		
35		GYM RCPT	20	1			0.5	0.3	2	20	HEAT TRACE (GFCI)	34	
37		STATE TRACK LIGHTING	20	1	1.5	0.5		1	20	CHILLER VALVES		36	
39		STATE TRACK LIGHTING	20	1		1.5	0.5	1	20	CLOCKS		38	
41		STATE TRACK LIGHTING	20	1			1.5	0.2	1	20	MOTORIZED SCREEN	40	42
TOTAL PHASE LOAD:					7.8 kVA	8.4 kVA	7.4 kVA						
TOTAL PHASE AMPS:					65 A	70 A	61 A						

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
LIGHTING (NEC215.2A1)	0.1 kVA	125%	0.2 kVA	DOWNSTREAM FEED THRU LOAD: 0 A
RECEPTACLE (NEC220.44)	0.0 kVA	NEC TABLE 220.44	0.0 kVA	EXISTING LOAD: 0.0 kVA
OTHER EQPT (NEC220.14)	3.0 kVA	100%	3.0 kVA	TOTAL CONNECTED LOAD: 23.5 kVA
MOTOR (NEC430.22)	0.0 kVA	100% + 125% LARGEST	0.0 kVA	DEMAND HEAT+COOL: 23.5 kVA
KITCHEN EQPT (NEC220.56)	0.0 kVA	NEC TABLE 220.56	0.0 kVA	TOTAL CONNECTED LOAD: 65 A
HEATING (NEC220.60/440.6)	0.0 kVA	100%	0.0 kVA	DEMAND HEAT+COOL: 65 A
COOLING (NEC220.60/440.6)	0.0 kVA	100%	0.0 kVA	NON-COINCIDENTAL HEAT/COOL: 0 A
ELEVATOR (NEC620.14)	0.0 kVA	NEC TABLE 620.14	0.0 kVA	TOTAL NEC DEMAND: 65 A
CONT EQPT (NEC215.2A1)	0.0 kVA	125%	0.0 kVA	

NOTES:
BOLD CIRCUIT(S) INDICATE NEW/MODIFIED CIRCUIT AND/OR CIRCUIT BREAKER.

PANELBOARD: HA

LOCATION:
SUPPLY FROM:
MOUNTING: SURFACE
ENCLOSURE: NEMA 1

EQUIP GROUND: YES
ISO GROUND: NO
FEED THRU LUGS: YES
200% NEUTRAL: NO
SERVICE ENTRANCE RATED: NO

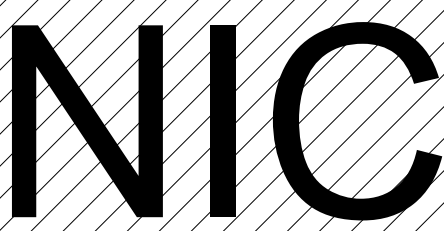
VOLTS: 480/277 WYE
PHASES: 3
WIRES: 4
A.I.C. RATING: 65KAIC
FULLY RATED: YES

BUS RATING: 200 A
MLO OR MCB: MLO
MAIN RATING: 200 A

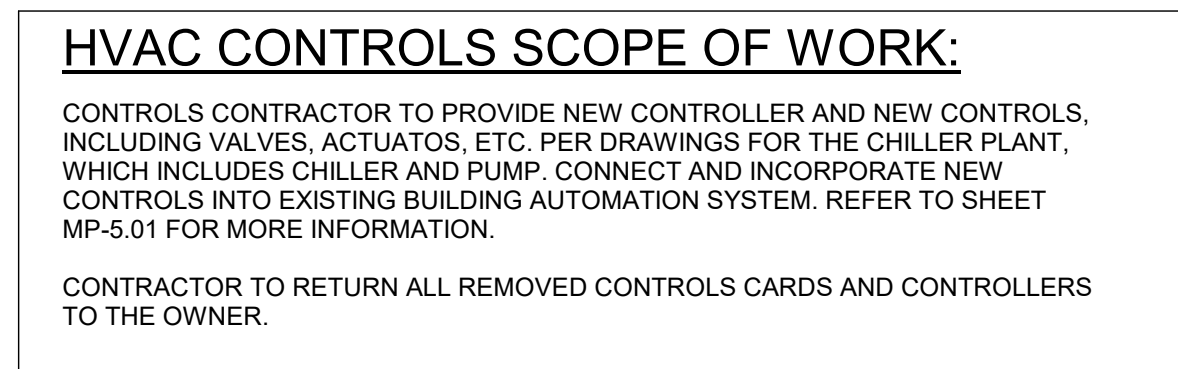
CKT	NOTES	CIRCUIT DESCRIPTION	AMP	P	A	B	C	P	AMP	CIRCUIT DESCRIPTION	NOTES	CKT
1		LIGHTING CAFETERIA	20	1	3.2	0.8						2
3		LIGHTING CAFETERIA	20	1		2.8	0.8					4
5		LIGHTING GYM	20	1			3.2	0.8				6
7		LIGHTING GYM	20	1	3.2	4.5						8
9		LIGHTING KITCHEN	20	1		3.2	4.5		3	40	DISHMACHINE	10
11		LIGHTING KITCHEN	20	1			3.2	4.5				12
13		CORRIDOR LIGHTING	20	1	2.5	0.0			1	20	SPARE	14
15		CORRIDOR LIGHTING	20	1		2.5	0.0		1	20	SPARE	16
17		SPARE	20	1			0.0	0.0	1	20	SPARE	18
19		SPARE	20	1	0.0	0.0			1	20	SPARE	20
21		SPARE	20	1		0.0	0.0		1	20	SPARE	22
23		SPARE	20	1			0.0	0.0	1	20	SPARE	24
25		SPARE	20	1	0.0	0.0			1	20	SPARE	26
27		SPARE	20	1		0.0	0.0		1	20	SPARE	28
29		LIGHTING MECH./ELEC	20	1			1.2	0.0	1	20	SPARE	30
31		PARKING LOT LIGHTING	20	1	1.2	0.0			1	20	SPARE	32
33		PARKING LOT LIGHTING	20	1		1.2	0.0		1	20	SPARE	34
35		PARKING LOT LIGHTING	20	1			1.2	0.0	1	20	SPARE	36
37		PARKING LOT LIGHTING	20	1	1.2	7.4						38
39		PARKING LOT LIGHTING	20	1		1.2	7.4		3	70	XFMR "TLA"	40
41		PARKING LOT LIGHTING	20	1			1.2	7.4				42
TOTAL PHASE LOAD:					24 kVA	23.6 kVA	22.7 kVA					
TOTAL PHASE AMPS:					87 A	86 A	82 A					

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
LIGHTING (NEC215.2A1)	0.0 kVA	125%	0.0 kVA	DOWNSTREAM FEED THRU LOAD: 0 A
RECEPTACLE (NEC220.44)	0.0 kVA	NEC TABLE 220.44	0.0 kVA	EXISTING LOAD: 0.0 kVA
OTHER EQPT (NEC220.14)	0.0 kVA	100%	0.0 kVA	TOTAL CONNECTED LOAD: 70.3 kVA
MOTOR (NEC430.22)	0.0 kVA	100% + 125% LARGEST	0.0 kVA	DEMAND HEAT+COOL: 70.3 kVA
KITCHEN EQPT (NEC220.56)	0.0 kVA	NEC TABLE 220.56	0.0 kVA	TOTAL CONNECTED LOAD: 85 A
HEATING (NEC220.60/440.6)	0.0 kVA	100%	0.0 kVA	DEMAND HEAT+COOL: 85 A
COOLING (NEC220.60/440.6)	0.0 kVA	100%	0.0 kVA	NON-COINCIDENTAL HEAT/COOL: 0 A
ELEVATOR (NEC620.14)	0.0 kVA	NEC TABLE 620.14	0.0 kVA	TOTAL NEC DEMAND: 85 A
CONT EQPT (NEC215.2A1)	0.0 kVA	125%	0.0 kVA	

**TOMBALL ISD - CHILLER
PACKAGE #2e**



Scale	As indicated
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- A. REFER TO MECHANICAL COVER SHEET FOR SYMBOLS, ABBREVIATIONS, AND ADDITIONAL INFORMATION.
- B. REFER TO MECHANICAL SCHEDULES AND DETAIL DRAWINGS FOR ADDITIONAL INFORMATION.
- C. MAINTAIN MANUFACTURER'S RECOMMENDED SERVICE CLEARANCE FOR NEW AND EXISTING MECHANICAL EQUIPMENT.
- D. THE CONTRACTOR SHALL VERIFY THAT ALL EXISTING AND NEW MECHANICAL EQUIPMENT IS INSTALLED SO THAT ALL REQUIRED CLEARANCES ARE MAINTAINED AT THE BOTTOM AND SIDES OF EACH UNIT FOR PROPER SERVING AND MAINTENANCE. COORDINATE COMPLETELY WITH ALL NEW WALLS TO STRUCTURE, AND RELOCATE AS REQUIRED TO MAINTAIN PROPER CLEARANCES.
- E. CONTRACTOR SHALL FIELD VERIFY ACTUAL LOCATIONS OF ALL EQUIPMENT, DUCTWORK, & PIPING PRIOR TO SUBMITTING A BID. COORDINATE COMPLETELY WITH ALL OTHER TRADES, RELOCATE TRADES, LINES AND PROVIDE ADDITIONAL DUCTWORK, OFFSETS, FITTINGS, ETC. AS REQUIRED.

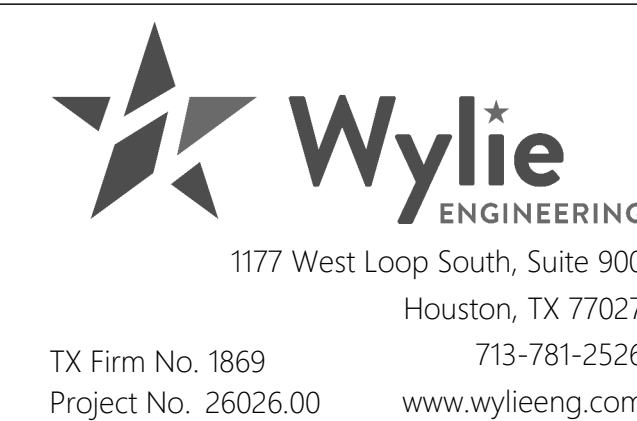
- 1 NEW CHILLED WATER PIPES, ISOLATION VALVES COMPLETE WITH INSULATION AS REQUIRED.
- 2 PROVIDE A NEW AIR-COOLED CHILLER. REFER TO MECHANICAL DETAILS AND PIPING SCHEMATICS FOR ALL PIPING ACCESSORIES REQUIRED, INCLUDING VALVES, GAUGES, ETC. CONTROL CONTRACTOR TO PROVIDE AND INSTALL NEW CONTROL VALVES AND ASSOCIATED WIRING AND PROGRAMMING TO INCORPORATE BACK INTO EXISTING CONTROLS SEQUENCE.
- 3 PROVIDE A NEW CHILLED WATER PUMP TYING INTO EXISTING PIPING TO REMAIN. PROVIDE ALL NEW GAUGES, VALVES, AND ASSOCIATED APPURTENANCES, ETC. PER MECHANICAL DETAIL. CONTRACTOR TO COORDINATE ALL PIPING CONNECTIONS TO ENSURE NO UNNECESSARY CONNECTIONS ARE CREATED WHICH WOULD POTENTIALLY CREATE AN ISSUE WITH CONTROLS, GAUGES, VALVES, ETC. TO BE INSTALLED IN THE PIPING. REFER TO SCHEDULE SHEET FOR ADDITIONAL INFORMATION.
- 4 PROVIDE PIPE SUPPORTS IN NEW PIPING INSTALLATION.
- 5 CHW/SR EMERGENCY CONNECTION.
- 6 PROVIDE HEAT TRACE TO ALL PIPING. REFER TO ELECTRICAL.
- 7 PROVIDE NEW CONCRETE PAD EXTENSION TO FIT THE NEW CHILLER UNIT.
- 8 OUTLINE OF CHILLER UNIT SERVICE AND MAINTENANCE CLEARANCE.

	ITEMS EXISTING TO REMAIN
	ITEMS EXISTING TO BE REMOVED
	NEW ITEMS

[illegible]

**TOMBALL ISD - CHILLER
PACKAGE #2d**

Timber Creek ES
8455 Creekside Green Dr
The Woodlands, TX 77389



TX Firm No. 1869 713-781-2526
Project No. 26026.00 www.wylieeng.com

MECHANICAL AND
PLUMBING PLAN

TCES - MP2.01

Scale	As indicated
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[illegible]

NOTES:

1. PROVIDE WITH PREMIUM EFFICIENCY VSD-RATED MOTOR. PROVIDE ELECTRICALLY INSULATED BEARINGS ON VSD DRIVEN MOTORS.
2. PUMP SHALL BE INSTALLED ON A NEW CONCRETE INERTIA BASE. PROVIDE VIBRATION ISOLATION RAILS, VARIABLE SPEED DRIVE (VSD), AND NECESSARY INTERFACE TO THE EXISTING CONTROLLER.
3. ELECTRICAL DISCONNECT SHALL BE PROVIDED AND INSTALLED BY EC.
4. PROVIDE WITH ABB VSD, OR APPROVED EQUAL.
5. PUMP SHALL FIT IN THE EXISTING 71"X28" EXISTING CONCRETE PAD.
6. PROVIDE WITH SUCTION HEADER.
7. CONTROLS CONTRACTOR TO PROVIDE NEW CONTROLLERS AND SEQUENCE PER TSD STANDARDS FOR NEW VARIABLE FREQUENCY DRIVE (PUMPS) AS REQUIRED; CONTRACTOR TO PROVIDE AND INSTALL NEW DIFFERENTIAL PRESSURE (DP) SENSOR; MECHANICAL CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTORS WITH CONTROLS CONTRACTOR. RECOMMEND TO BE INSTALLED APPROXIMATELY TWO THIRDS (2/3) TO THREE QUARTERS (3/4) DOWNSTREAM OF PUMP(S).
8. CONTRACTOR SHALL VERIFY PUMP BODY DISCHARGE PIPING CONNECTION TO ENSURE ALIGNMENT WITH PIPING OR ADJUST PIPING AS REQUIRED WHILE MAINTAINING APPEARANCES AS SHOWN IN THE DETAILS.
9. PROVIDE 65A&C CONTROLLER.

SCHEDULE OF AIR COOLED CHILLERS - TRANE																													
DESIGNATION	CAPACITIES								ELECTRICAL												UNIT DIMENSIONS			REFRIGERANT	OPERATING WEIGHT (LBS)	MANUFACTURER / MODEL BASIS FOR DESIGN	NOTES / REMARKS		
	TONS	FLOW RATE (GPM)	ENTERING CHILLED WATER TEMPERATURE °F	LEAVING CHILLED WATER TEMPERATURE °F	WATER PRESSURE DROP (FT)	AMBIENT DRY BULB TEMPERATURE °F	WINTER	FOULING FACTOR (F.T2/HBTU)	CONDENSER FAN NO.	LRA (A)	FLA (A)	TYPE	NO.	RLA (A)	INPUT POWER (KW)	EFFICIENCY (EER) BTU/W.H	PLV (EER) BTU/W.H	VOLTS	HZ	PH	MCA	MCCB	LENGTH (INCH)					WIDTH (INCH)	HEIGHT (INCH)
ACCH-TCES-1	241.9	361.3	58	42	4.09	105 SUMMER	20 WINTER	0.0001	18	-	-	SCREW	2	-	340.3	8.529	15.85	460	60	3	544	700	414	88	94	R-513A	17,231	TRANE RTAF 280	1 TO 15
ACCH-TCES-2	241.9	361.3	58	42	4.09	105 SUMMER	20 WINTER	0.0001	18	-	-	SCREW	2	-	340.3	8.529	15.85	460	60	3	544	700	414	88	94	R-513A	17,231	TRANE RTAF 280	1 TO 15

NOTES

1. CERTIFIED IN ACCORDANCE WITH THE AHRI AIR-COOLED WATER CHILLING PACKAGES CERTIFICATION PROGRAM, WHICH IS BASED ON AHRI STANDARD 550 / 590 (L-P) AND AHRI STANDARD 551 / 591 (S).
2. CHILLER UNIT SHALL BE PROVIDED WITH VARIABLE SPEED CONDENSER FANS.
3. CHILLER UNIT SHALL BE PROVIDED WITH CONDENSER FIN MATERIAL OF MICROCHANNEL COILS WITH COMPLETE COAT.
4. CHILLER UNIT SHALL BE PROVIDED WITH BACNET INTERFACE.
5. CHILLER UNIT SHALL BE PROVIDED WITH WIDE AMBIENT RATED FROM 0-125°F.
6. CHILLER UNIT SHALL BE PROVIDED WITH FREEZE PROTECTION.
7. CHILLER UNIT SHALL BE PROVIDED WITH INSULATION FOR HIGH HUMIDITY / LOW VAP TEMP.
8. CHILLER UNIT SHALL BE PROVIDED WITH LINE STARTER / DIRECT ON LINE STARTER TYPE.
9. CHILLER UNIT SHALL BE PROVIDED WITH SINGLE POINT POWER CONNECTION. PROVIDE CIRCUIT BREAKER WITH HIGH FAULT RATED CONTROL PANEL POWER LINE CONNECTION TYPE.
10. CHILLER UNIT SHALL BE PROVIDED WITH ELASTOMERIC ISOLATORS.
11. CHILLER UNIT SHALL BE PROVIDED WITH FACTORY INSTALLED STRAINER.
12. CHILLER UNIT SHALL BE PROVIDED WITH SUPER QUIET SOUND ATTENUATOR PACKAGE.
13. CHILLER UNIT SHALL BE PROVIDED WITH ARCHITECTURAL LOUVER PANELS.
14. CHILLER UNIT SHALL BE INSTALLED IN AN EXISTING PAD. CONTRACTOR IS RESPONSIBLE TO MAKE ANY NECESSARY ADJUSTMENT WHERE REQUIRED.
15. PROVIDE 6SKAC CONTROLLER.

SCHEDULE OF AIR COOLED CHILLERS - CARRIER																													
DESIGNATION	CAPACITIES								ELECTRICAL													UNIT DIMENSIONS			REFRIGERANT	OPERATING WEIGHT (LBS)	MANUFACTURER / MODEL BASIS FOR DESIGN	NOTES / REMARKS	
	TONS	FLOW RATE (GPM)	ENTERING CHILLED WATER TEMPERATURE °F	LEAVING CHILLED WATER TEMPERATURE °F	WATER PRESSURE DROP (FT)	AMBIENT DRY BULB TEMPERATURE °F	AMBIENT WET BULB TEMPERATURE °F	FOULING FACTOR (°F/12.5HTU)	CONDENSER FAN NO.	LRA (A)	FLA (A)	TYPE	NO.	RLA (A)	INPUT POWER (KW)	EFFICIENCY (EER) BTU/W.H	PLV (EER) BTU/W.H	VOLTS	PH	HZ	MCA	MOC	LENGTH (INCH)	WIDTH (INCH)					HEIGHT (INCH)
ACCH-TCES-1	219.2	327.7	58	42	4.24	105 SUMMER	20 WINTER	0.0001	14	-	-	SCREW	2	-	328.1	8.016	18.18	460	60	3	472.3	600	346	88	99	R-513A	17,568	CARRIER MODEL 30XV-2506MU0364C0	1 TO 13
ACCH-TCES-2	219.2	327.7	58	42	4.24	105 SUMMER	20 WINTER	0.0001	14	-	-	SCREW	2	-	328.1	8.016	18.18	460	60	3	472.3	600	346	88	99	R-513A	17,568	CARRIER MODEL 30XV-2506MU0364C0	1 TO 13

NOTES

1. CERTIFIED IN ACCORDANCE WITH THE AHRI AIR-COOLED WATER CHILLING PACKAGES CERTIFICATION PROGRAM, WHICH IS BASED ON AHRI
2. STANDARD 550 (LHP) AND AHRI STANDARD 551-I (SI) (SI).
3. RATED IN ACCORDANCE WITH AHRI (AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE) STANDARD 550/550-1, LATEST EDITION (U.S.A.) AND
4. ALL UNITS SHALL BE ASHRAE (AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS) 90.1-2019 COMPLIANT.
5. VARIABLE SPEED CONDENSER FANS
6. DIGITAL SCROLL-TYPE COMPRESSORS
7. CU/AL E-COATED CONDENSER AND SHELL AND TUBE EVAPORATOR.
8. EXACT IP & B3/CNTR MSTRIP
9. EVAPORATOR HEATER (FREEZE PROTECTION)
10. REMOTE CONNECTIVITY & GFI
11. SINGLE POINT POWER
12. FULL HALL GUARDS
13. NON-FUSED DISCONNECT.
14. CHILLER UNIT SHALL BE INSTALLED IN AN EXISTING PAD. CONTRACTOR IS RESPONSIBLE TO MAKE ANY NECESSARY ADJUSTMENT WHERE
15. REQUIRED.
16. PROVIDE GSXAC CONTROLLER.

SCHEDULE OF AIR COOLED CHILLERS - YORK (JOHNSON CONTROLS, INC.)																													
DESIGNATION	CAPACITIES								ELECTRICAL												UNIT DIMENSIONS			REFRIGERANT	OPERATING WEIGHT (LBS)	MANUFACTURER / MODEL BASED FOR DESIGN	NOTES / REMARKS		
	TONS	FLOW RATE (GPM)	ENTERING CHILLED WATER TEMPERATURE °F	LEAVING CHILLED WATER TEMPERATURE °F	WATER PRESSURE DROP (FT)	AMBIENT DRY BULB TEMPERATURE °F	AMBIENT WET BULB TEMPERATURE °F	FOULING FACTOR (°F/12.5HTU)	CONDENSER FAN NO.	LRA (A)	FLA (A)	TYPE	NO.	RLA (A)	INPUT POWER (KW)	EFFICIENCY (BTU/W.H)	PLV (EER) BTU/W.H	VOLTS	PH	HZ	MCA	MCC	LENGTH (INCH)					WIDTH (INCH)	HEIGHT (INCH)
ACCH-TCES-1	220	329.2	58	42	11.8	105 SUMMER	20 WINTER	0.0001	16	-	-	SCREW	2	-	286	9.23	19.35	460	60	3	449.3	600	379.2	88.3	92.8	R513A	16,111	YORK MODEL YVAA0219	1 TO 12
ACCH-TCES-2	220	329.2	58	42	11.8	105 SUMMER	20 WINTER	0.0001	16	-	-	SCREW	2	-	286	9.23	19.35	460	60	3	449.3	600	379.2	88.3	92.8	R513A	16,111	YORK MODEL YVAA0219	1 TO 12

NOTES

1. CERTIFIED IN ACCORDANCE WITH THE AHRI AIR-COOLED WATER CHILLING PACKAGES CERTIFICATION PROGRAM, WHICH IS BASED ON AHRI STANDARD 550 / 590 (H) AND AHRI STANDARD 551 / 591 (S).
2. RATED IN ACCORDANCE WITH AHRI (AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE) STANDARD 550/590, LATEST EDITION (U.S.A.) AND ALL UNITS SHALL BE ASHRAE (AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS) 90.1-2019 COMPLIANT.
3. VARIABLE SPEED CONDENSER FANS.
4. FULLY HERMETIC DIRECT DRIVE SCROLL-TYPE COMPRESSORS.
5. CUMULATED COATED CONDENSER AND SHELL AND TUBE EVAPORATOR.
6. BACKFLOW PREVENTERS AND NO. 10 COLUPLICATIONS, WITH AN AUTO-COOL SERVED THROUGH AN ELINK COMMUNICATION CARDS.
7. SINGLE-POINT POWER TERMINAL- NON-FUSED DISCONNECT SWITCH.
8. HIGH AND LOW AMBIENT KIT.
9. FULL UNIT LOUVERED PANELS.
10. LEVEL ADJUSTING SPRING TYPE VIBRATION ISOLATORS.
11. CHILLER UNIT SHALL BE INSTALLED IN AN EXISTING PAD. CONTRACTOR IS RESPONSIBLE TO MAKE ANY NECESSARY ADJUSTMENT WHERE REQUIRED.
12. PROVIDE 65KVA CONTROLLER.

SCHEDULE OF VARIABLE SPEED DRIVES								
DESIGNATION VSD	SERVES	HORSEPOWER	VOLTAGE	PHASE	ENCLOSURE TYPE	MOUNTING TYPE	BASIS OF DESIGN	NOTES
VFD-CHWP-TCES-1	CHWP-TES-1	30	460	3	IP55 NEMA 1	WALL/PANEL MOUNT	ABB ACH580-01023A-4	1 TO 4
VFD-CHWP-TCES-2	CHWP-TES-2	30	460	3	IP55 NEMA 1	WALL/PANEL MOUNT	ABB ACH580-01023A-4	1 TO 4

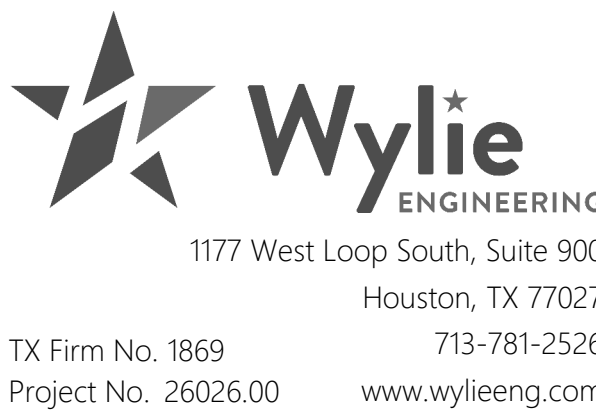
NOTES:

1. PROVIDE SUPPORT FOR VERTICAL WALL MOUNTING.
2. INDOOR TYPE.
3. RATED AT 105°F AMBIENT TEMPERATURE.
4. NORMAL DUTY.

[illegible]

**TOMBALL ISD - CHILLER
PACKAGE #2d**

Timber Creek ES
8455 Creekside Green Dr
The Woodlands, TX 77389

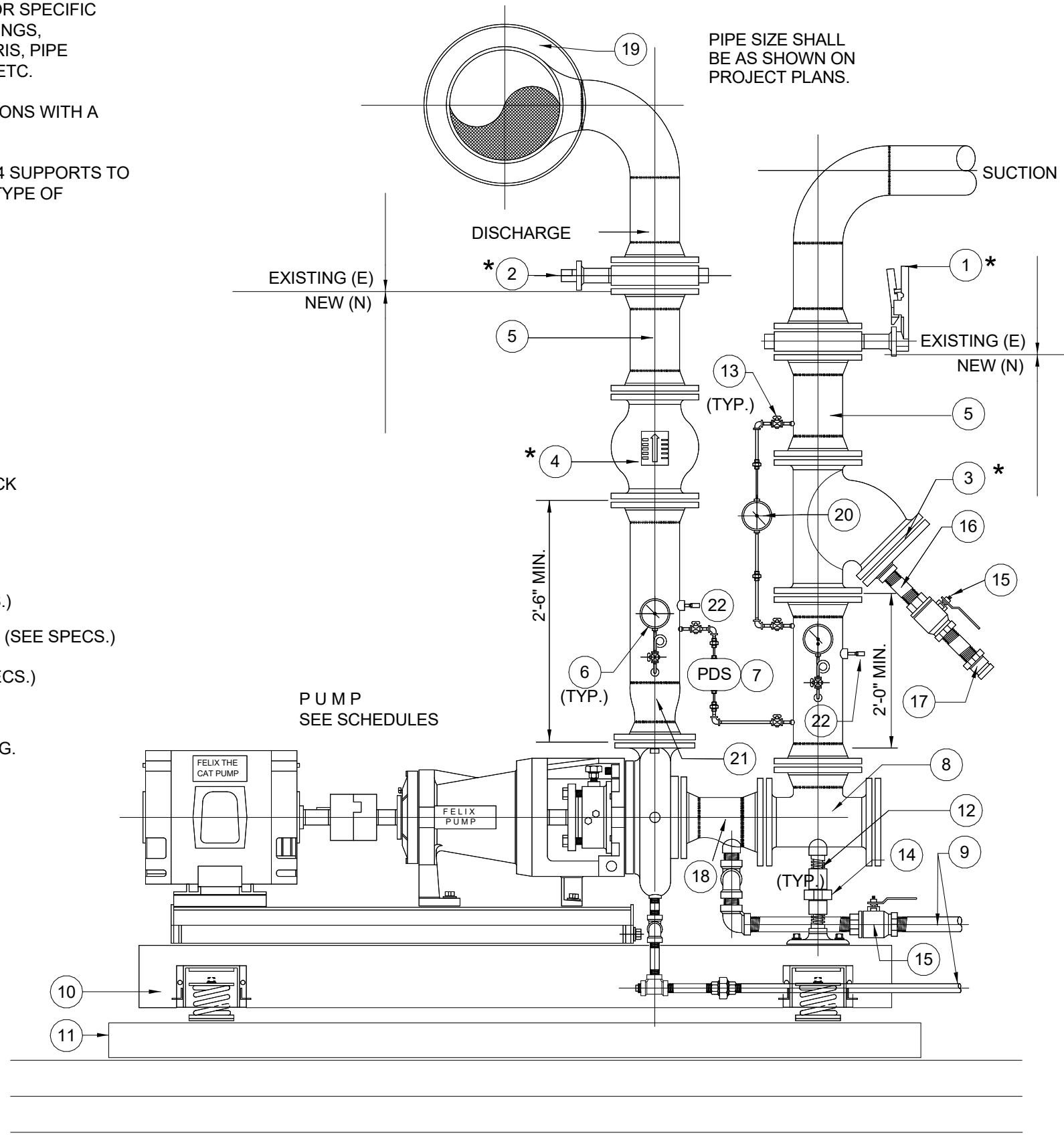


MECHANICAL AND
PLUMBING
SCHEDULES
TCES -
MP3.00

Scale $3/32" = 1'-0"$

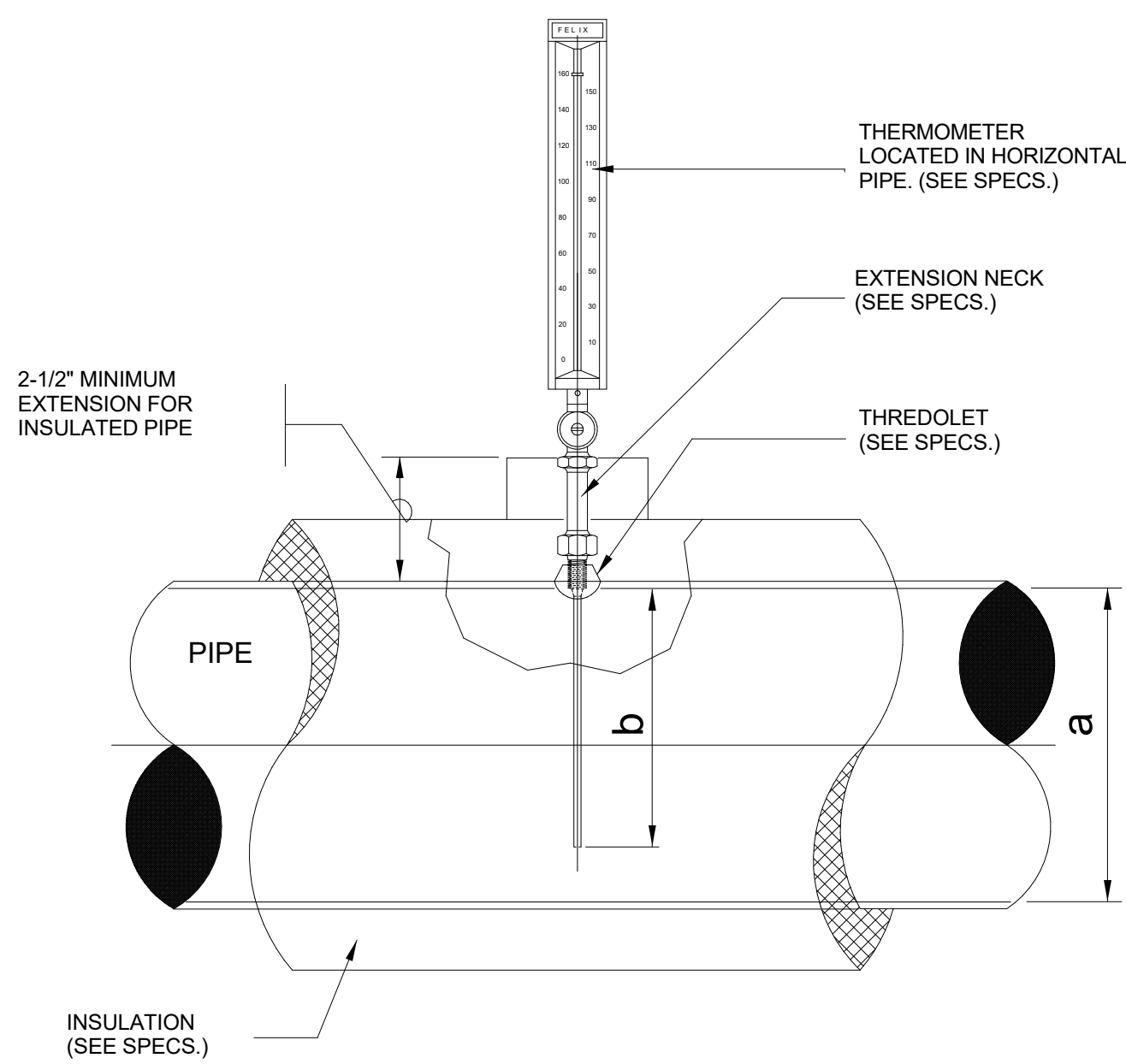
- GENERAL NOTES:
- REFER TO PLAN DRAWING FOR PIPING CONFIGURATION FOR EACH INDIVIDUAL PUMP.
 - REFER TO PLANS, DETAILS, AND SPECIFICATIONS FOR SPECIFIC PUMP, CONCRETE BASE, VIBRATION ISOLATION SPRINGS, HOUSEKEEPING PADS, VALVES, STRAINERS, VENTURIS, PIPE FITTINGS, GAUGES, SENSORS, AND CONTROLLERS, ETC.
 - INSTALL TEST PLUGS IN EASILY ACCESSIBLE LOCATIONS WITH A MINIMUM OF 12" CLEARANCE IN FRONT.
 - PROVIDE VIBRATION ISOLATOR TYPE ON THE FIRST 4 SUPPORTS TO AND FROM THE PUMPS. REFER TO SPECS FOR THE TYPE OF SUPPORTS REQUIRED.

- NOTES:
- STOP VALVE (SEE SPECIFICATIONS)
 - BALANCING VALVE (SEE SPECIFICATIONS)
 - STRAINER (SEE SPECIFICATIONS)
 - CHECK VALVE (SEE SPECIFICATIONS) AXIS OF CHECK VALVE SHAFT SHALL BE PERPENDICULAR TO PUMP SHAFT.
 - SPOOL PIECE (SEE SPECIFICATIONS)
 - PRESSURE GAUGE WITH GAUGE COCK (SEE SPECS.)
 - DIFFERENTIAL PRESSURE SENSOR / TRANSMITTER (SEE SPECS.)
 - SUCTION DIFFUSER, WITHOUT STRAINER. (SEE SPECS.)
 - EXTEND PUMP DRAIN LINES TO FLOOR DRAIN.
 - CONCRETE BASE AND VIBRATION ISOLATION SPRING. (SEE SPECS.)
 - HOUSE KEEPING PADS. (SEE SPECIFICATIONS.)
 - 2" SCREW JACK
 - 1/4" COCK VALVE (SEE SPECIFICATIONS)
 - UNION (SEE SPECIFICATIONS)
 - FULL BORE BALL VALVE (SEE SPECS.)
 - FULL SIZE STRAINER DRAIN CONNECTION
 - HOSE END ADAPTER WITH CAP (SEE SPECIFICATIONS)
 - ECCENTRIC REDUCER (SEE SPECS.)
 - PIPE INSULATION (SEE SPECS.)
 - DIFFERENTIAL PRESSURE GAUGE. (SEE SPECIFICATIONS)
 - CONCENTRIC REDUCER (SEE SPECIFICATIONS)
 - TEST PLUG (SEE SPECIFICATIONS)



DETAIL M-DET033
01 END SUCTION PUMP DETAIL

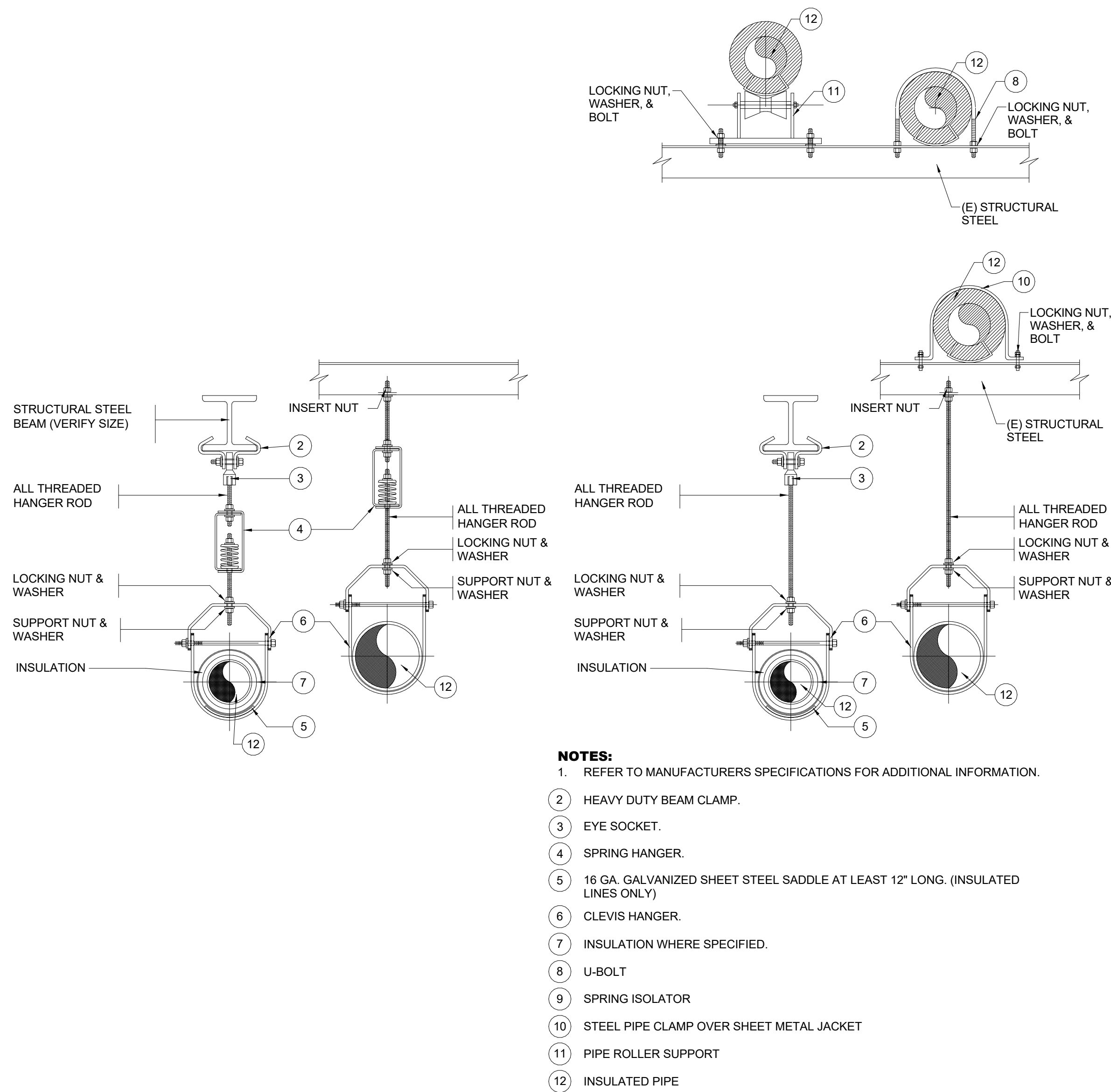
SCALE: NONE



INSERTION LENGTH SCHEDULE	
a = PIPE DIAMETER	b = INSERTION LENGTH
4" AND 5"	2'-1/2"
6" AND 8"	5"
10" AND LARGER	8"

DETAIL #M-DET043
02 THERMOMETER WELL DETAIL

SCALE: NONE



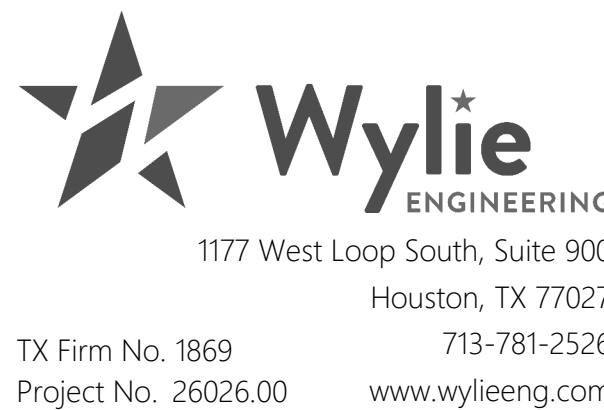
03 PIPE SUPPORT DETAIL

SCALE: NONE



**TOMBALL ISD - CHILLER
PACKAGE #2d**

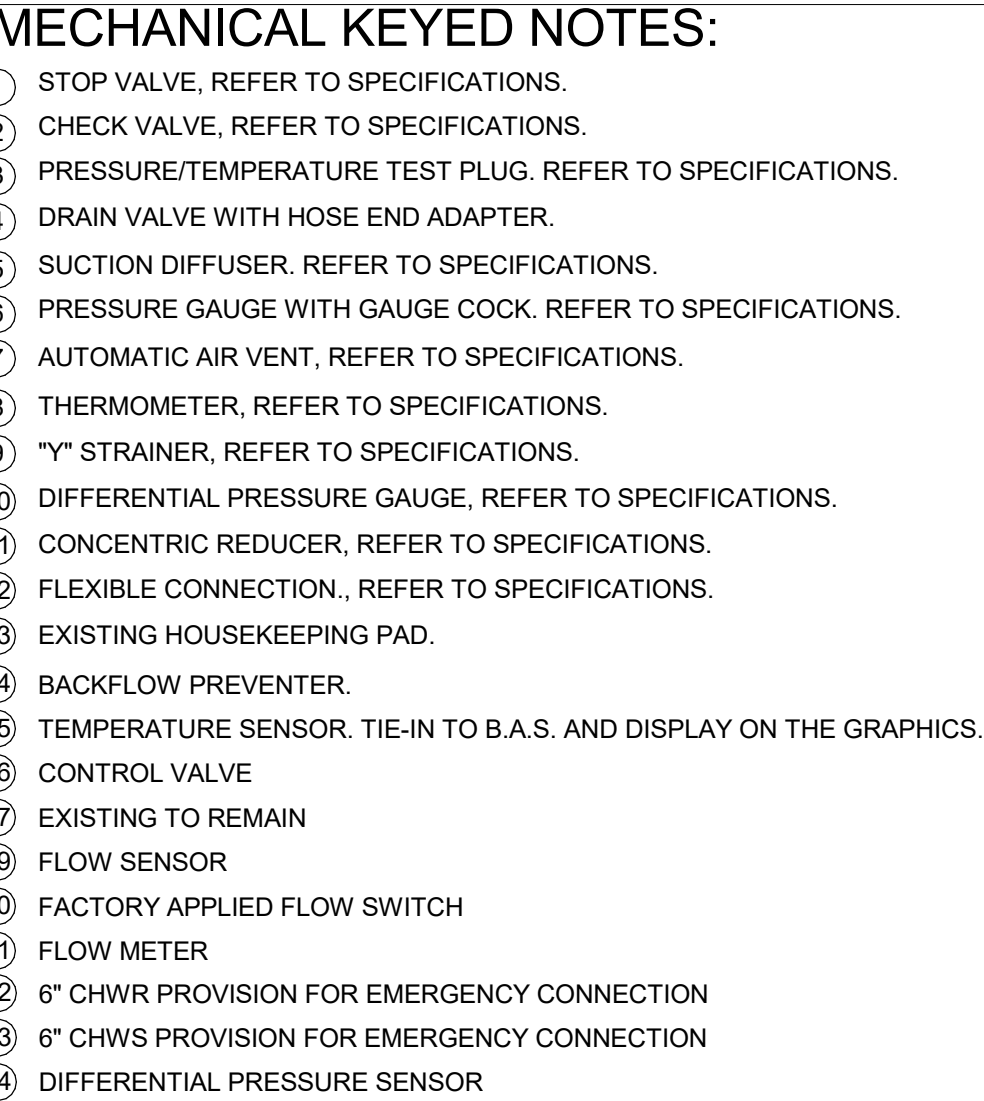
Timber Creek ES
8455 Creekside Green Dr
The Woodlands, TX 77389



MECHANICAL AND
PLUMBING DETAILS

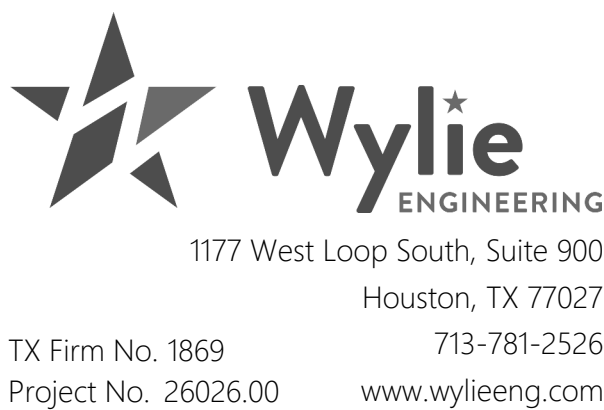
**TCES -
MP4.00**

Scale 1/8" = 1'-0"

[illegible]

**TOMBALL ISD - CHILLER
PACKAGE #2d**

Timber Creek ES
8455 Creekside Green Dr
The Woodlands, TX 77389



CHILLED WATER ACTIVATION

THE CHILLED WATER SYSTEM WILL BE ACTIVATED BY A REQUEST HANDLING FROM ANY AIR HANDLING UNIT OR COOLING EQUIPMENT SUPPLIED WITH CHILLED WATER.

B. CHILLER UNITS AND CHILLED WATER PUMPS ACTIVATION

WHEN THE CHILLED WATER SYSTEM IS ACTIVATED, THE CHILLER CONTROL PROGRAM WILL START THE LEAD CHILLED WATER PUMP BY SENDING A 24 VAC SIGNAL TO A RELAY MOUNTED IN THE PUMP MOTOR VFD, WHICH WILL COMPLETE THE AUTO SIDE OF THE CONTROL CIRCUIT AND START THE PUMP. A FLOW SWITCH WILL PROVE STATUS TO THE BUILDING AUTOMATION SYSTEM (B.A.S.) AND WILL ALARM AT THE CENTRAL SITE IF THE SWITCH IS NOT MADE WITHIN THE ADJUSTABLE TIME PERIOD. AFTER 15 SECONDS (ADJUSTABLE), THE B.A.S. WILL SEND 24 VAC SIGNAL TO A RELAY WHICH WILL COMPLETE THE REMOTE START TERMINALS IN THE CHILLER CONTROL CIRCUIT AND ALLOW THE LEAD CHILLER TO RUN. A FLOW SWITCH WILL NOT ALLOW THE CHILLER TO START UNTIL FLOW HAS BEEN PROVEN. THE B.A.S. CONTROL MODULE WILL AUTOMATICALLY START THE LAG CHILLER AND AN ALARM WILL BE SENT TO THE CENTRAL SITE. 15 MINUTES (ADJUSTABLE) TIME DELAYS WILL BE ASSIGNED TO EACH CHILLER START / STOP CIRCUIT TO PREVENT SHORT CYCLING.

C. TEMPERATURE CONTROL AND STAGING

THE CHILLER WILL BE SET TO MAINTAIN A CHILLED WATER SUPPLY TEMPERATURE AS SPECIFIED IN THE SCHEDULE DRAWING (ADJUSTABLE). THE CHILLER UNIT WILL OPERATE ON PART LOADS THROUGH MULTI-COMPRESSOR STAGING FEATURING ELECTRONIC EXPANSION VALVES FOR PRECISE REFRIGERANT CONTROL.

THE ASSOCIATED CHILLED WATER PUMP WILL RUN VARIABLE FLOW TO PROVIDE STABLE CHILLED WATER TEMPERATURE CONTROL AND HELPS LIMIT UNACCEPTABLE SHORT CYCLING OF CHILLER COMPRESSORS.

THE CHILLER UNIT CONTROLLER ENABLES VARIABLE WATER FLOW PROVIDING $\pm 2^{\circ}\text{F}$ LEAVING WATER TEMPERATURE ACCURACY AND TOLERATES 30% PER MINUTE WATER FLOW VARIATION WITH FLOW EQUAL OR ABOVE THE MINIMUM UNIT REQUIREMENT.

IF THE LEAD CHILLER UNIT AND ASSOCIATED PUMP AT FULL LOAD DELIVERS CHILLED WATER AT 2°F AND ABOVE THE SETPOINT FOR 5 MINUTES (ADJUSTABLE), A RUN REQUEST WILL BE SENT TO THE LAG CHILLER AND ASSOCIATED PUMP. BOTH CHILLERS WILL OPERATE AT SHARED LOAD WHEN THE CHILLED WATER SUPPLY TEMPERATURE FALLS AT 2°F BELOW THE SETPOINT. THE LEAD UNITS WILL START DE-STAGING UNTIL THE LOAD IS HANDLED BY A SINGLE CHILLER WHICH THE LAG CHILLER WILL ASSUME FULL CONTROL.

THE B.A.S. WILL INITIATE AN ALARM TO THE CENTRAL SITE IF THE BUILDING CHILLED WATER SUPPLY TEMPERATURE IS 5°F (ADJUSTABLE) AND ABOVE THE SETPOINT. AN ALARM OUTPUT FROM THE CHILLER PANEL WILL BE MONITORED FOR DISPLAY AT THE CENTRAL SITE.

D. CHILLED WATER PUMP AND DIFFERENTIAL PRESSURE SENSOR (DPS)

WHEN THE EXISTING AHU MEETS THE DEMAND LOAD, THE UNIT WILL GRADUALLY LIMITS THE FLOW OF CHILLED WATER INTO THE COIL VIA THE 2-WAY CONTROL VALVE. THE PRESSURE IN THE PIPE WILL GRADUALLY INCREASE. WHEN THE PRESET HIGH LIMIT PRESSURE IN THE DPS IS REACHED, A SIGNAL WILL SENT BE TO CONTROL THE PUMP VIA THE VFD TO MODULATE DOWN THE OPERATION FOR LESS CHILLED WATER FLOW.

WHEN THE EXISTING AHU DEMANDS MORE LOAD, THE UNIT WILL GRADUALLY ALLOW MORE CHILLED WATER INTO THE COIL VIA THE 2-WAY CONTROL VALVES. THE PRESSURE IN THE PIPE WILL GRADUALLY DECREASE. WHEN THE PRESET LOW LIMIT PRESSURE IN THE DPS IS REACHED, A SIGNAL WILL BE SENT TO CONTROL THE PUMP VIA THE VFD TO MODULATE UP THE OPERATION FOR MORE CHILLED WATER FLOW.

E. LEAD / LAG ROTATION AND SEQUENCING (EQUAL RUN-TIME)

ON A DAILY BASIS, CHANGE THE CHILLER UNIT AND PUMP LEAD / LAG INDEXING. DAILY LEAD PUMP INDEXED TO RUN WITH THE LEAD CHILLER UNIT. DAILY LAG PUMP INDEXED TO RUN WITH THE LAG CHILLER.

UPON THE LAG PUMP STARTING, THE LEAD PUMP SHALL RAMP DOWN THAT BOTH PUMPS (LEAD/LAG) SHARE THE FLOW / LOAD AT 50% EACH TO PREVENT TOTAL FLOW SPIKES AND ALLOW BOTH PUMPS TO MODULATE IN PARALLEL.

THE BUILDING AUTOMATION SYSTEM (BAS) OR THE PROGRAMMABLE LOGIC CONTROLLER (PLC) SHALL ALTERNATE THE LEAD AND LAG DESIGNATIONS THAT TRIGGER THE ROTATION BASED ON CUMULATIVE RUN-HOURS (E.G. SWAPPING ROLES EVERY 500 HOURS) OR ON A WEEKLY SCHEDULE TO EQUALIZE WEAR AND TEAR ACROSS BOTH PUMPS.

F. CHILLED WATER SYSTEM SHUTDOWN SEQUENCE

AFTER ALL REQUEST FOR COOLING BEEN SATISFIED OR HALTED BY THE B.A.S., THE CHILLER WILL CYCLE TO ITS OFF STATUS. THE ASSOCIATED CHILLED WATER PUMP WILL CONTINUE TO RUN FOR 5 MINUTES (ADJUSTABLE) TO ENSURE ADEQUATE FLOW DURING SHUTDOWN.

G. EQUIPMENT OFF CONDITIONS

WHEN THE CHILLED WATER SYSTEM IS INACTIVE, THE CHILLER AND ASSOCIATED PUMP WILL BE DE-ENERGIZED.

H. FREEZE AVOIDANCE AND WINTER CONDITION

FREEZE AVOIDANCE TO BE PRESENT TO ENABLE OR DISABLE, THE CHILLER UNIT SHALL BE CONFIGURED WITH THE PUMP CONTROLLER. WHEN FREEZE AVOIDANCE IS ENABLED, THE CHILLED WATER PUMP SHALL ACTIVATE WHEN THE AMBIENT TEMPERATURE DROPS BELOW THE LEAD WATER TEMPERATURE CUTOFF. THE PUMP STAYS ENERGIZED UNTIL THE MINIMUM EVAPORATOR TEMPERATURE RISES 13°F ABOVE THE LEAVING WATER CUTOFF. THE PUMP WILL CYCLE OFF FOR A PERIOD OF TIME. AFTER THE TIME EXPIRES, THE PUMP OUTPUT MAY COME BACK ENERGIZED AGAIN IF THE AMBIENT TEMPERATURE IS AGAIN BELOW THE WATER CUTOFF.

THE PUMP SHALL BE SET TO OPERATE VIA THE VFD PROVIDING MINIMUM FLOW WITH THE EXISTING BYPASS VALVE AT OPEN POSITION.

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DIVI	DIGITAL / BINARY INPUT
DO/BO	DIGITAL / BINARY OUTPUT
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY RIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZE/STAT
HSL	HIGH STATIC LIMIT
SPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE
SP	SET POINT
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTSIDE AIR
HC	HEATING COIL
CC	COOLING COIL
DX	DIRECT EXPANSION COOLING COIL
PICCV	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
AFC	AIRFLOW CROSS
DPS	DIFFERENTIAL PRESSURE SWITCH

TYPE	COUNT	NAME	DEVICE
AI	1	BUILDING CHW SUPPLY TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	1	BUILDING CHW RETURN TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	2	CHILLER CHW SUPPLY TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	2	CHILLER CHW RETURN TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	2	CHILLER AMPS	4-20 mA SENSOR
AI	1	OUTSIDE AIR TEMPERATURE (NORTH SIDE OF BLDG)	NORMALLY OPEN
DI	2	CHILLER PUMP STATUS	CURRENT SWITCH
DI	2	CHILLER ALARM	DRY CONTACT
DO	2	CHILLER START/STOP	24 VAC RELAY
DO	2	CHILLER PUMP START/STOP	24 VAC RELAY

FURNISH AND INSTALL Bacnet® INTEGRATION MEANS AND PROVIDE ONE Bacnet® ADDRESS GREEN IN THE BAG CIRCUITS THAT INCLUDES THE FOLLOWING INFORMATION AT A MINIMUM FOR MONITORING PURPOSES ONLY:

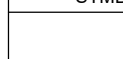
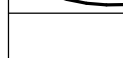
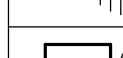
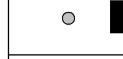
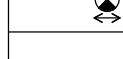
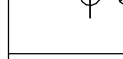
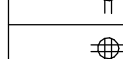
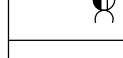
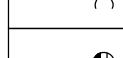
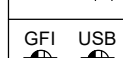
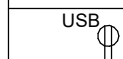
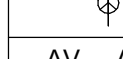
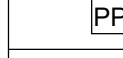
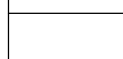
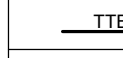
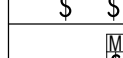
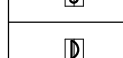
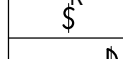
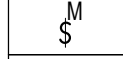
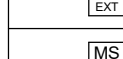
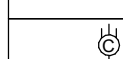
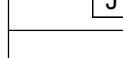
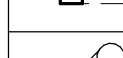
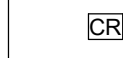
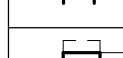
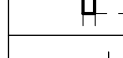
LOCAL REMOTE MODE

- ACTIVE ALERT / ALARM WITH ALARM MODE (NOTE: INCLUDE CROSS-REFERENCE TABLE FOR ODE DECRYPTING)
- ACTIVE DEMAND LIMIT
- ENTERING / LEAVING TEMPERATURES
- RUNNING STATUS / MODE
- COMPRESSOR DISCHARGE PRESSURE
- COMPRESSOR WINDING TEMPERATURE
- OUTDOOR AIR TEMPERATURE
- SUCTION PRESSURE
- NUMBER OF COMPRESSOR RUNNING OR CIRCUITS CAPACITY
- OIL PRESSURE ON EACH CIRCUIT
- WATER SET-POINT
- WATER FLOW

MECHANICAL AND
PLUMBING PIPING
SCHEMATIC DIAGRAM
**TCES -
MP5.01**

Scale $1/8" = 1'-0"$

LEGEND OF ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	BOLD DEVICE/CIRCUITING INDICATES NEW DEVICE/CIRCUITING OR RELOCATED DEVICE.
	SHADED DEVICE/CIRCUITING INDICATES EXISTING TO REMAIN
	DASHED DEVICE/CIRCUITING INDICATES DEMOLITION
	CONDUIT RUN CONCEALED IN WALLS OR ABOVE CEILING. ARROW INDICATES HOMERUN TO PANEL. CONDUCTOR DESIGNATIONS ARE AS FOLLOWS: LONG HATCH INDICATES NEUTRAL, SHORT HATCH INDICATES PHASE. "COT" INDICATES INSULATED OR ISOLATED GROUND, AND NO HATCHES INDICATES TWO CONDUCTORS.
	CONDUIT RUN CONCEALED IN FLOOR OR BELOW FLOOR SLAB OR BELOW GRADE. WIRING SAME AS ABOVE.
	LIGHT FIXTURE TAG: A = FIXTURE TYPE X = CIRCUIT NUMBER A = SWITCH LEG
	SCREENING SHADE INDICATES FIXTURE CONNECTION ON EMERGENCY CIRCUIT OR BATTERY BACKUP. SEE PLANS.
	EXIT LIGHT. PROVIDE ARROWS AND FACES AS INDICATED ON DRAWINGS.
	SIMPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE OR SPECIAL RECEPTACLE OUTLET; SEE DRAWINGS FOR NEMA CONFIGURATION AND VOLTAGE.
	DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE.
	TWO-WIRE DUPLEX RECEPTACLE OUTLETS GANGED WITH A COMMON WALL PLATE; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE EACH.
	ESSENTIAL POWER DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE.
	DUPLEX RECEPTACLE OUTLET LOCATED ABOVE STANDARD HEIGHT; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT HEIGHT.
	DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER; DUPLEX WITH WEATHERPROOF WHILE IN USE COVER AND GFCI 20 AMP, 125V, 3 WIRE GROUNDED TYPE.
	CONTROLLED DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE. SPLIT CONTROLLED DUPLEX- LEGRAND #26332CH OR EQUAL.
	CONTROLLED DUPLEX RECEPTACLE OUTLET; 20 AMP, 125V, 3 WIRE, GROUNDED TYPE. FULL CONTROLLED- LEGRAND #26332CD OR EQUAL.
	TWO-WIRE DUPLEX OUTLETS UNDER COMMON COVER PLATE. LEFT DUPLEX CONTROLLED- LEGRAND #26332CH OR EQUAL. RIGHT DUPLEX NON-CONTROLLED; 20 AMP, 125V, 3W+G, EACH.
	TWO-WIRE DUPLEX OUTLETS UNDER COMMON COVER PLATE. LEFT DUPLEX CONTROLLED- LEGRAND #26332CH OR EQUAL. RIGHT DUPLEX NON-CONTROLLED GFI, USB, OR GFI/USB, 20A, 125V, 2W+0.
	DUPLEX RECEPTACLE OUTLET WITH (2) USB RECEPTABLES; 20 AMP, 125V, 3 WIRE GROUNDED TYPE.
	SPECIAL RECEPTACLE OUTLET; SEE DRAWINGS FOR NEMA CONFIGURATION AND VOLTAGE.
	CEILING MOUNTED RECEPTACLE OUTLET, DUPLEX/QUAD/SPECIAL. SEE DRAWINGS FOR SPECIAL OUTLET CONFIGURATION AND VOLTAGE.
	FLUSH MOUNTED FIRE RATED POWER THRU DEVICE (W/ RECEPTACLE) AND/OR DATA AND/OR TELEPHONE. SEE DRAWINGS FOR SPECIFICATIONS.
	FLUSH MOUNTED FLOOR BOX (W/ RECEPTACLE)S AND/OR DATA AND/OR TELEPHONE. SEE DRAWINGS FOR SPECIFICATIONS.
	POWER POLE. RE: DRAWINGS FOR MORE INFORMATION.
	TELEPHONE / DATA / COMBINATION TELEDATA OUTLET
	CABLE T.V. OUTLET
	TELEPHONE TERMINAL BOARD, 8" x 3/4" FIRE RATED PLYWOOD
	SINGLE POLE, 3-WAY, 4-WAY SWITCH; 20 AMP, 120/277V.
	NETWORK ENABLED, WALL MOUNTED, 1 BUTTON, DUAL TECH SENSOR, ON/OFF.
	NETWORK ENABLED, WALL MOUNTED, DUAL TECH SENSOR, ON/OFF + RAISE/LOWER.
	1 ZONE / 2 ZONE DIGITAL NETWORK ENABLED, ON/OFF SWITCH.
	1 ZONE / 2 ZONE DIGITAL NETWORK ENABLED, RAISE/LOWER/ON/OFF.
	LIGHTING CONTROL, NETWORK ENABLED GRAPHIC TOUCH SCREEN 3.5" & PRESETS OR 16 ZONES. USE NEAREST 120/277V LTO CKT FOR POWER SUPPLY.
	KEY SWITCH 120/277V, DIGITAL KEY SWITCH
	DIMMER SWITCH 120/277V, LUTRON 700VA10 OR EQUAL.
	ON/OFF ONLY, WALL RAISE/LOWER - WALL MOUNTED MOTION SENSOR, 120/277VAC.
	NETWORK ENABLED CEILING MOTION SENSOR STANDARD RANGE / SITTING MOTION
	PHOTOCELL / DAYLIGHT SENSOR
	WIRELESS DEVICE
	DOORBELL CHIME; RE: SPECIFICATIONS/PLANS.
	EMERGENCY POWER OFF SWITCH (E.P.O.)
	PUSH BUTTON /BUZZER
	JUNCTION BOX MOUNTED ABOVE ACCESSIBLE CEILING.
	JUNCTION BOX - WALL MOUNTED/FLOOR; RE: FLOOR PLANS
	DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, & FUSE SIZE (IF REQUIRED) VOLTS/AMPS/POLES TO MATCH BREAKER U.N.O.
	SINGLE PHASE MOTOR
	THREE PHASE MOTOR
	MOTOR STARTER/ DISCONNECT IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, FUSE SIZE (IF REQUIRED), AND SIZE. VOLT/AMPS/POLES TO MATCH BREAKER U.N.O.
	MOTOR STARTER/WVPFD IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE SPECIFIED. REFER TO DRAWINGS FOR AMPERAGE, PHASES, AND SIZE.
	TRANSFER SWITCH- REFER TO DRAWINGS FOR SPECIFICATIONS
	CARD READER JUNCTION BOX WITH 3/4"CTO TO ACCESSIBLE CEILING U.N.O.
	VARIABLE SPEED DRIVE (SUPPLIED BY MECHANICAL/CONTRACTOR)
	GROUND BAR
	TRANSFORMER W/ NEC CLEARANCES; REFER TO DRAWING FOR VOLTAGE/VA.
	SURFACE PANELBOARD W/ NEC CLEARANCES.
	RECESSED PANELBOARD W/ NEC CLEARANCES
	MECHANICAL EQUIPMENT CONNECTION POINT. REFER TO SCHEDULE ON EX.XX FOR CONNECTION INFORMATION.

LOW VOLTAGE PROVISIONS

1. PROVIDE A 4" X 4" X 2'-10 1/2" JUNCTION BOX WITH RING AND STRING ABOVE ACCESSIBLE CEILING FOR ALL LOW VOLTAGE ROUGH-IN LOCATIONS (TYPICAL).
2. FOR WALLS & DECK OR WALLS WITH INSULATION, PROVIDE A 4" X 4" X 2'-10 1/2" JUNCTION BOX WITH 3/4" EMT CONDUIT TO ABOVE ACCESSIBLE CEILING.
3. LOW VOLTAGE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO: FIRE ALARM, BUILDING CONTROLS, LIGHTING CONTROLS, DATA, AUDIO/VISUAL, SECURITY.
4. ALL LOW VOLTAGE CABLEING IN THIS PROJECT SHALL BE ROUTED IN MINIMUM 3/4" EMT CONDUIT WHERE EXPOSED TO VIEW OR WHERE ABOVE INACCESSIBLE CEILINGS. PROVIDE A SHOP DRAWING FOR ARCHITECT REVIEW.

ABBREVIATIONS

(E) (ER) (R) (N) (D) AFC AD AC AL AMP ATS AWG BMT CCT CCT CCT DISC EUT EPO FACP FLA FLC GFI GFI HD HDA HP HSD KCM KW MC MCH MH MSB NEC NEMA NFPA NE NFI NTS PNL PVC RACP RCP RE RFP SPEC TS TBS TYP UNO UPS VFD WP XMR	EXISTING TO REMAIN EXISTING TO BE RE-CROUTED NEW ITEM NOTED TO BE RELOCATED ITEM NOTED TO BE DEMOLISHED ABOVE FINISHED FLOOR AUTOMATIC DAMPER AMPERE INTERRUPTING CAPACITY ALUMINUM AMPERAGE AUTOMATIC TRANSFER SWITCH AMERICAN WIRE GAUGE BREAKER CIRCUIT CIRCUIT CURRENT TRANSFORMER DISCONNECT ELECTRICAL CONTRACTOR EMERGENCY POWER OFF FIRE ALARM FIRE ALARM CONTROL PANEL FOOT CANDLE FULL LOAD AMPS GENERAL CONTRACTOR GROUND FAULT CIRCUIT INTERRUPTER HAND-OUT-AUTO HOBSEPOWER ISOLATED GROUND THOUSAND CIRCULAR MILS METAL CLAD MAIN CIRCUIT BREAKER METAL HALIDE MAIN SWITCHBOARD MAN LUG ONLY NATIONAL ELECTRIC CODE NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION NOT IN CONTRACT NOT FUSED NOT LOG NOT TO SCALE PANEL OR PANELBOARD PVC REMOTE ANNUNCIATOR CONTROL PANEL REFLECTOR LIGHT AND PLAN REFERENCE SMOKE/FIRE DAMPER SPECIFICATIONS SQUARE FEET TIME SWITCH TELEPHONE TERMINAL BOARD TYPICAL UNDERGROUND UNLESS NOTED OTHERWISE VARIABLE FREQUENCY DRIVE VOLTAGE WEATHER PROOF TRANSFORMER
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APPLICABLE CODES & STANDARDS

1. BUILDING CODE - 2021 IRC WITH LOCAL AMENDMENTS
2. FIRE CODE - 2021 IFCC WITH LOCAL AMENDMENTS
3. ELECTRICAL CODE - 2023 NEC WITH LOCAL AMENDMENTS
4. MECHANICAL CODE - 2021 UMC WITH LOCAL AMENDMENTS
5. PLUMBING CODE - 2021 UPC WITH LOCAL AMENDMENTS
6. ENERGY CODE - 2021 INTERNATIONAL ENERGY CONSERVATION CODE WITH LOCAL AMENDMENTS
7. OTHER - LIFE SAFETY CODE (NFPA 101)
8. OTHER - FEDERAL DEPARTMENT OF JUSTICE AMERICANS WITH DISABILITIES ACT AND TEXAS ACCESSIBILITY STANDARDS.
9. FIRE ALARM - 2021 NFPA 72 WITH LOCAL AMENDMENTS.

BREAK OUT PRICING

THE CONTRACTOR SHALL PROVIDE SEPARATE LINE-ITEM COST FOR ALL WORK AND MATERIALS ASSOCIATED WITH EACH OF THE FOLLOWING:

1. INSTALLATION FOR ONE (1) DEDICATED 20-AMP DUPLEX RECEPTACLE
2. INSTALLATION FOR ONE (1) DEDICATED 20-AMP QUAD RECEPTACLE
3. INSTALLATION FOR ONE (1) RING AND STRING ROUGH-IN FOR VOICE/DATA OUTLET.
4. INSTALLATION FOR ONE (1) DEDICATED 125-VOLT JUNCTION BOX
5. INSTALLATION FOR ONE (1) 1/4" X 1/4" X 2' LIGHT FIXTURE ON AN EXISTING 277-VOLT SWITCHED CIRCUIT WITH 8 FT OF CONDUIT/CONDUCTORS
6. CIRCUIT TRACE OF ALL EXISTING CIRCUITS IN ALL PANELS USED IN THIS PROJECT. SEE PANEL SCHEDULES.

PRICES SHALL INCLUDE ALL INSTALLATION COST, INCLUDING CONDUITS AND BRANCH CIRCUIT CONDUCTORS AS REQUIRED. ASSUME 100 FT CONDUIT AND CONDUCTOR LENGTH FROM SOURCE TO LOAD U.N.O.

IDENTIFICATION/LABELING

1. ALL PANELBOARDS, MOTOR STARTERS, CONTROL PANELS, CONTROL REMOTE STATIONS, DISCONNECT SWITCHES, CIRCUIT BREAKERS OR OTHER EQUIPMENT IN SEPARATE ENCLOSURES SHALL BE EQUIPPED WITH NAMEPLATES. THE NAMEPLATES SHALL BE ENGRAVED ROD PLASTIC/LAMINATE OR APPROVED EQUAL, WHITE LETTERING ON BLACK BACKGROUND FOR EQUIPMENT 208/250 VOLT AND BLACK LETTERING ON WHITE BACKGROUND FOR EQUIPMENT 480/277 VOLT, AND BE ATTACHED TO THE EQUIPMENT SECURELY WITH SCREWS. EACH NAMEPLATE SHALL GIVE THE NUMBER DESIGNATION OF THE EQUIPMENT AS SHOWN ON THE ONE LINE DIAGRAM AND ALSO THE SOURCE VOLTAGE. SIMILAR RED AND WHITE NAMEPLATES FOR ALL EMERGENCY POWERED EQUIPMENT.
2. ALL WIRING DEVICES (EXCLUDING LIGHT SWITCHES) SHALL BE LABELED WITH SELF-ADHESIVE, LAMINATED TAPE INDICATING THE CIRCUIT NUMBER AND PANEL DESIGNATIONS. UTILIZE CLEAR TAPE WITH BLACK LETTERS. UNLESS NOTED OTHERWISE, PROVIDE SAMPLE OF LABELS TO ARCHITECT AND LANDSCAPE FOR APPROVAL PRIOR TO INSTALLATION.
3. NEW AND EXISTING CIRCUITS SHALL BE ACCURATELY IDENTIFIED AT THE RESPECTIVE ABOVE CEILING JUNCTION BOXES. THE ASSOCIATED PANEL, CIRCUITS, AND VOLTAGE SHALL BE IDENTIFIED ON ALL JUNCTION BOX COVER, CIRCUITS LEAVING PANELBOARDS AND DISTRIBUTION PANELS SHALL BE PROVIDED WITH LABEL ON CIRCUITS CONTAINED IN CONDUIT.
4. EXISTING CIRCUITRY IS SHOWN FOR INFORMATION ONLY. EXISTING CIRCUITRY INFORMATION TAKEN FROM COMBINATION OF FIELD SURVEY AND PREVIOUS TENANT DRAWINGS. CONTRACTOR SHALL FIELD VERIFY EXACT CIRCUITRY AND INDICATE ANY DEVIATIONS ON THE "AS BUILT" DRAWINGS. "AS BUILT" DRAWINGS SHALL ACCURATELY INDICATE THE LOCATION OF ALL NEW AND EXISTING JUNCTION BOXES WITH THE RESPECTIVE PANEL AND CIRCUIT NUMBERS.

REQUIRED SUBMITTALS

ELECTRICAL GEAR
WIRING DEVICES

ALL SUBMITTALS SHALL BE SUBMITTED VIA EMAIL TO SUBMITTALS@WYLIEENG.COM AND COPIED TO THE PROJECT MANAGER.
ALL RFTS SHW SHAL BE SUBMITTED VIA EMAIL TO RFTS@WYLIEENG.COM AND COPIED TO THE PROJECT MANAGER.

ELECTRICAL GENERAL NOTES

- A. GENERAL PROVISIONS:
1. FURNISH AND INSTALL ALL ITEMS, INCLUDING EVERY ARTICLE, DEVICE OR ACCESSORY REASONABLY NECESSARY TO FACILITATE EACH SYSTEM'S FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT SPECIFIED. ELEMENTS OF THE WORK SHALL INCLUDE, BUT ARE NOT LIMITED TO: MATERIALS, LABOR, SUPERVISION, DESIGN, SUPPLIES, EQUIPMENT, TRANSPORTATION, HOISTING/RIGGING, STORAGE, UTILITIES, AND ALL REQUIRED PERMITS AND LICENSES.
2. DRAWINGS ARE SCHEMATIC IN NATURE AND DO NOT NECESSARILY REFLECT ALL WORK REQUIRED TO COMPLETE PROJECT. CONTRACTOR SHALL PROVIDE SUFFICIENT MATERIAL, LABOR, AND EQUIPMENT AS REQUIRED TO COMPLETE PROJECT WITH CONSTRUCTION INTENT AT NO ADDITIONAL COST TO OWNER/TENANT. CONTRACTOR SHALL REQUEST ADDITIONAL INFORMATION IN CASES OF DOUBT.
3. WORK SHALL COMPLY WITH THE MOST RECENT VERSION OF ALL APPLICABLE LAWS, RULES, REGULATIONS, AND ORDINANCES OF ALL FEDERAL, STATE, AND LOCAL AUTHORITIES. IN THE EVENT OF CONFLICT BETWEEN THE CONTRACT DOCUMENTS AND THE LOCAL ENFORCING AUTHORITY, THE LATTER SHALL RULE. ANY MODIFICATION RESULTING THEREFROM SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER OR ARCHITECT/ENGINEER. THE CONTRACTOR SHALL REPORT ANY SUCH MODIFICATIONS TO THE ARCHITECT/ENGINEER AND SECURE THEIR APPROVAL BEFORE PROCEEDING. SHOULD THE REQUIREMENTS OF THE CONTRACT DOCUMENTS EXCEED THE REQUIREMENTS OF THE CODES, THE CONTRACT DOCUMENTS SHALL TAKE PRECEDENCE PROVIDED THEY ARE NOT IN CONFLICT WITH THOSE CODES.
4. AREAS OF THE EXISTING BUILDING WILL BE OCCUPIED DURING CONSTRUCTION OF THIS PROJECT. NOISY, DUSTY, AND/OR OTHER CONSTRUCTION OPERATIONS REQUIRED FOR WORK WHICH DISTURBS OR CAUSES COMPLAINTS BY THE EXISTING BUILDING OCCUPANTS SHALL NOT BE ACCEPTABLE. ALL AFTER-HOURS OR OVERTIME WORK REQUIRED BY THE CONTRACTOR TO AVOID DISRUPTION OF EXISTING OCCUPANCY WILL BE PROVIDED AT NO COST TO THE OWNER/TENANT. THE CONTRACTOR SHALL USE CONSTRUCTION METHOD AND MATERIALS WHICH SHALL NOT ADVERSELY AFFECT THE INDOOR AIR QUALITY OF THE EXISTING OCCUPIED AREAS.
5. CONSIDERATION SHALL NOT BE GRANTED FOR UNDERSTANDING OF THE SCOPE OR AMOUNT OF WORK TO BE PERFORMED. TENDER OF A PROPOSAL CONVEYS FULL CONTRACTOR AGREEMENT OF THE ITEM AND CONDITIONS SPECIFIED AND/OR INDICATED, SCHEDULED, OR IMPLIED ON THE CONTRACT DOCUMENTS, AND/OR REQUIRED BY THE NATURE OF THIS WORK.
6. IN THE EVENT OF A CONFLICT BETWEEN DRAWINGS AND/OR SPECIFICATIONS, THE GREATER AMOUNT OF TOTAL COST SHALL BE PRICED. BRING THE CONFLICT TO THE ATTENTION OF THE ENGINEER AND REQUEST DIRECTION.
8. PRE-CONSTRUCTION
1. BEFORE SUBMITTING A BID, IT WILL BE NECESSARY FOR EACH CONTRACTOR WHOSE WORK IS INVOLVED TO VISIT THE SITE AND ACCEPTANCE FOR THEMSELVES THE CONDITIONS TO BE MET IN INSTALLING THE WORK AND MAKE PROVISIONS FOR THE CONDITIONS IN THEIR FINAL PRICE. FAILURE ON THE PART OF THE CONTRACTOR TO COMPLY WITH THIS REQUIREMENT SHALL NOT BE CONSIDERED JUSTIFICATION FOR THE OMISSION OR FAULTY INSTALLATION OF ANY WORK COVERED BY THE CONTRACT DOCUMENTS.
2. THIS CONTRACTOR SHALL SECURE ALL PERMITS, LICENSES AND INSPECTIONS REQUIRED FOR THEIR WORK, AND SHALL PAY ALL FEES IN CONNECTION WITH SUCH PERMITS, LICENSES AND INSPECTIONS.
C. DEMOLITION
1. ALL EXISTING CONDUIT AND CONDUCTORS SERVING THE AREA UNDER CONTRACT NOT TO BE REPAIRED SHALL BE TERMINATED AT LAST PORTION OF CIRCUIT REQUIRING DEMOLITION BEFORE THE DEMOLITION AREA. IF A CIRCUIT SERVES ONLY THE DEMOLITION AREA, REMOVE ALL CONDUITS AND CONDUCTORS BACK TO THE PANELBOARD OR BASE BUILDING GRID BOX AND DE-ENERGIZE THE CIRCUIT BREAKER, MAKING IT A SPARE. NOTE "SPARE" OR "VOID-SPARE" ACCORDINGLY ON PANELBOARD DIRECTORY.
2. REMOVE ALL ABANDONED LOW VOLTAGE CABLEING INCLUDING FIRE ALARM CABLEING, TELEPHONE/DATA CABLEING, AND SECURITY CABLEING. REMOVE ALL EXISTING CONDUIT AND WIRING THAT IS SUPPORTED FROM THE CEILING GRID. REMOVE ALL EXISTING UNUSED ELECTRICAL EQUIPMENT, CONTROLS, CONDUIT, HANGERS, WIRING, ETC.
3. RELOCATE AND RECONNECT ACTIVE PORTIONS OF THE ELECTRICAL SYSTEM OUTSIDE OF THE SCOPE OF DEMOLITION, AS REQUIRED TO MAINTAIN A COMPLETE AND OPERATING SYSTEM THAT IS FUNCTIONALLY EQUIVALENT TO THE PRE-EXISTING SYSTEM PRIOR TO DEMOLITION.
4. ELECTRICAL PLANS INDICATE FINAL WIRING DEVICE, DATA/COMMUNICATIONS OUTLET AND SWITCH LOCATIONS. ALL OTHER EXISTING WIRING DEVICES, DATA/COMMUNICATIONS OUTLETS AND SWITCHES SHALL BE REMOVED AND WALLS SHALL BE PATCHED, UNLESS OUTSIDE OF SCOPE OR NOTED AS (E).
5. ALL EXISTING JUNCTION BOXES, OUTLETS, PULL BOXES, ETC., LOCATED ABOVE NON-ACCESSIBLE CEILINGS INSTALLED UNDER THIS TENANT IMPROVEMENT PROJECT SHALL BE RELOCATED ABOVE AN ACCESSIBLE CEILING WHERE EXISTING JUNCTION BOXES ARE NOT PRACTICAL TO RELOCATE. ELECTRICAL CONTRACTOR SHALL NOTIFY ARCHITECT AND ENGINEER PRIOR TO SUBSTANTIAL START OF CONSTRUCTION.
6. REMOVE ALL EXISTING UNUSED ELECTRICAL EQUIPMENT, CONTROLS, CONDUIT, HANGERS, WIRING, ETC. FROM ABOVE CEILINGS.
7. REFER TO ARCHITECTURAL DRAWINGS FOR LIGHT FIXTURES TO BE RELOCATED. RELOCATE AND RECONFIGURE FIXTURES AS SHOWN. PROVIDE ADDITIONAL FIXTURES TO MATCH FIXTURE QUANTITIES SHOWN. FIELD VERIFY EXISTING CONDITIONS.
8. REFER TO ARCHITECTURAL PLANS FOR WALL AND PARTITIONS TO BE REMOVED. CONTRACTOR SHALL PROVIDE ELECTRICAL DEMOLITION AS PREVIOUSLY DESCRIBED.
9. REFER TO ARCHITECTURAL DRAWINGS FOR RECEPTABLES AND VOICE/DATA OUTLETS TO BE REMOVED. FIELD VERIFY EXISTING CONDITIONS.
10. CONTRACTOR SHALL REMOVE AND REPLACE ALL WIRING DEVICES NOT CONFORMING TO BUILDING STANDARDS.
11. REMOVE ALL EXISTING CONDUIT AND WIRING THAT IS SUPPORTED FROM THE CEILING GRID VIA CADDY CLIPS, ETC. AND REPLACE EXISTING CONDUIT THAT IS TO BE RE-UTILIZED WITH MATCHING CONDUIT AND WIRING PROPERLY SUPPORTED FROM STRUCTURE ABOVE.
12. RE-SUPPORT AND RE-ROUTE ANY REMAINING PIPING OR DEVICES THAT WERE SUPPORTED BY DEMOLISHED WALLS.
13. ALL ITEMS INSTALLED IN AIR PLenums SHALL BE PLenum RATED.
- D. SUBMITTALS
1. ALL EQUIPMENT AND MATERIAL TO BE FURNISHED AND INSTALLED ON THE PROJECT SHALL BE UL OR ETL LISTED, IN ACCORDANCE WITH THE AUTHORITY HAVING JURISDICTION, AND SUITABLE FOR ITS INTENDED USE ON THIS PROJECT.
2. THE CONTRACTOR SHALL PROVIDE SUBMITTALS FOR ALL NEW EQUIPMENT, CONTROLS, DEVICES, AND FIXTURES TO BE PROVIDED. SUBMIT MINIMUM ELECTRONIC SUBMITTALS FOR APPROVAL:
A. EQUIPMENT AND MATERIALS SHOP DRAWINGS
B. COORDINATION DRAWINGS
C. RECORD DRAWINGS
D. OPERATING AND MAINTENANCE MANUALS
E. FIRE STOP MATERIALS AND DETAILS
E. PRE-CONSTRUCTION FUNCTIONAL TEST
1. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL FUNCTIONALLY TEST ALL ELECTRICAL AND FIRE ALARM EQUIPMENT THAT IS EXISTING TO REMAIN OR RELOCATED IN THIS PROJECT. THE CONTRACTOR SHALL PROVIDE A WRITTEN DESCRIPTION OF ANY AND ALL DEFICIENCIES TO THE OWNER/TENANT. ANY DEFICIENCIES IDENTIFIED AT THE START OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER/TENANT. THE EQUIPMENT TO BE TESTED INCLUDES, BUT IS NOT LIMITED TO: RECEPTABLES, LIGHT FIXTURES, EXIT SIGNS, OCCUPANCY SENSORS, PANEL BOARDS, TRANSFORMERS, EMERGENCY LIGHTING BATTERY UNITS, AND SWITCHES.
2. FOR EXISTING LIGHT FIXTURES AND EXIT SIGNS WITH BATTERY PACKS, ELECTRICAL CONTRACTOR SHALL ASSUME NEW BATTERY PACKS WILL BE REQUIRED UNLESS FUNCTIONAL TEST PROVIDES OTHERWISE.
- F. CONSTRUCTION
1. ALL WORK SHALL BE ARRANGED IN A NEAT, WELL-ORGANIZED MANNER. ALL SERVICES SHALL BE ROUTED PARALLEL AND PERPENDICULAR TO THE PRIMARY LINES OF THE BUILDING, LOCATE ALL OPERATING AND CONTROL EQUIPMENT PROPERLY TO PROVIDE EASY ACCESS AND ARRANGE ENTRY WORK WITH ADEQUATE ACCESS FOR OPERATOR AND MAINTENANCE, AND FOR PROPER CODE AND/OR MANUFACTURERS CLEARANCES.
2. DAMAGE CAUSED DURING CONSTRUCTION TO EXISTING MATERIALS/EQUIPMENT WILL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO OWNER. RE-SUPPORT ANY REMAINING PIPING OR DEVICES THAT WERE SUPPORTED BY WALLS BEING REMOVED.
3. THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS SHALL COORDINATE THE INSTALLATION OF DUCTWORK, PIPING, CONDUIT, CABLE, ETC., WITH LIGHTING FIXTURES, SPEECH, CEILING CONSTRUCTION, AIR DISTRIBUTION EQUIPMENT, AND THE STRUCTURE. PROVIDE ADDITIONAL RESES AND PRESSES AS REQUIRED. IF, AFTER INSTALLATION, NEW DUCTWORK, PIPING, CONDUIT, CABLE, ETC., IS FOUND TO BE IN CONFLICT WITH THE ARCHITECTURE, STRUCTURE OR OTHER TRADE WORK, WHICH IS EITHER EXISTING OR SHOWN ON THE CONTRACT DOCUMENTS, THE DUCTWORK, PIPING, CONDUIT, CABLE, ETC., SHALL BE RELOCATED WITHOUT ADDITIONAL COST TO THE OWNER/TENANT. COORDINATE ALL WORK COMPLETELY WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
4. ALL BUILDING SERVICES, UTILITIES, POWER, FIRE PROTECTION, AND DOMESTIC COLD AND HOT WATER MAY NOT BE DISRUPTED FOR ANY REASON WITHOUT PRIOR COORDINATION WITH A REPRESENTATIVE OF BUILDING OPERATIONS.
5. THIS BUILDING MAY HAVE A STRUCTURAL SYSTEM UTILIZING POST-TENSIONED CABLES. THE CONTRACTOR SHALL DETERMINE THE EXISTING STRUCTURAL SYSTEM PRIOR TO CUTTING, DRILLING, OR CORING. THE CONTRACTOR SHALL X-RAY ALL PENETRATIONS PRIOR TO CUTTING THE FLOOR SLAB.
6. PENETRATIONS THROUGH FLOORS OR FIRE-RATED STRUCTURE SHALL BE FIRE-RATED TO COMPLY WITH ASTM E-814 (UL 1479), AND THE LOCAL AUTHORITY HAVING JURISDICTION.
F. PROJECT CLOSE OUT
1. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A COMPLETE SET OF "AS BUILT" DRAWINGS, PORTRAYING ACTUAL SITE CONDITIONS OF THE MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PROTECTION WORK. SUBMISSION SHALL CONSIST OF ONE SET OF PDF AND ONE SET OF CAD FILES IN AUTOCAD V. 2018 OR REVIT V. 2018 OR NEWER FORMAT WITH THE OWNERS STANDARD LAYERING SCHEME.
2. EXISTING CIRCUITRY IS SHOWN FOR INFORMATION ONLY. EXISTING CIRCUITRY INFORMATION TAKEN FROM COMBINATION OF FIELD SURVEY AND PREVIOUS TENANT DRAWINGS. CONTRACTOR SHALL FIELD VERIFY EXACT CIRCUITRY AND INDICATE ANY DEVIATIONS ON THE "AS BUILT" DRAWINGS. "AS BUILT" DRAWINGS SHALL ACCURATELY INDICATE THE LOCATION OF ALL NEW AND EXISTING JUNCTION BOXES WITH THE RESPECTIVE PANEL AND CIRCUIT NUMBERS.
3. SUBMIT "AS-BUILT" RECORD DRAWINGS INDICATING ACTUAL, AS-BUILT CONDITIONS TO THE ARCHITECT/ENGINEER FOR REVIEW. RECORD DRAWINGS SHALL BE STAMPED "AS-BUILT" AND SHALL HAVE THE NAME, ADDRESS, AND TELEPHONE NUMBER OF THE CONTRACTOR. ALL ENGINEERS' SEALS SHALL BE REMOVED FROM THE DRAWINGS. PROVIDE BLACK AND WHITE DIGITAL COPIES AND ONE (1) ELECTRONIC FILE.
4. SUBMIT ELECTRONIC PDF OF OPERATION AND MAINTENANCE MANUALS. THE MANUALS SHALL INCLUDE RATINGS, CAPACITIES, PARTS LISTS, WIRING DIAGRAMS, SERVICE/MAINTENANCE RECOMMENDATIONS, AND WARRANTIES.
5. THE ELECTRICAL CONTRACTOR SHALL PERFORM THE FOLLOWING TASKS UPON PROJECT COMPLETION: ALL REQUIRED PERMITS AND AS-BUILTS SHALL BE SUBMITTED WITHIN TWO (2) WEEKS OF DATE OF SUBSTANTIAL COMPLETION OR OWNER OCCUPANCY.
6. SUBMIT WRITTEN RESPONSE TO ALL FIELD REPORTS INDICATING CORRECTIVE ACTIONS TAKEN AND DATE CORRECTIVE ACTION WAS TAKEN TO THE ARCHITECT/ENGINEER FOR REVIEW.
G. WARRANTY
1. THE START OF THE CONTRACTORS WARRANTY PERIOD SHALL COMMENCE ON THE DATE OF "SUBSTANTIAL COMPLETION" AS AGREED TO BY THE OWNER/TENANT.
2. THE WARRANTY PERIOD SHALL BE NO LESS THAN ONE (1) FULL YEAR, UNLESS SPECIFIED OTHERWISE AND SHALL INCLUDE AT LEAST ONE (1) FULL HEATING SEASON AND ONE (1) FULL COOLING SEASON. DURING THE WARRANTY PERIOD THE CONTRACTOR SHALL GUARANTEE THE FOLLOWING IN A FORM SATISFACTORY TO THE OWNER/TENANT:
A. WORK INSTALLED SHALL BE FREE FROM ANY AND ALL DEFECTS IN WORKMANSHIP AND/OR MATERIALS.
B. APPARATUS WILL DEVELOP CAPACITIES AND PERFORMANCE CHARACTERISTICS SPECIFIED.
C. SYSTEMS SHALL OPERATE WITHOUT MALFUNCTION.

COMMISSIONING NOTES

BREAK OUT PRICE - WORK TO BE COMPLETED BY CX AGENT

1. COMMISSION MECHANICAL AND SERVICE WATER HEATING SYSTEMS PER ECC C408.2.1
A. THE CX AGENT SHALL PROVIDE A COMMISSIONING PLAN PER C408.2.1
B. BALANCE AND ADJUST AIR AND HYDRAONIC SYSTEMS AS APPLICABLE PER C408.2.2
C. VERIFY PERFORMANCE AND INTERFACING OF SYSTEMS, CONTROLS, AND ECONOMIZERS FOR ALL MODES AND SEQUENCE OF OPERATIONS PER C408.2.3
D. PROVIDE A PRELIMINARY COMMISSIONING REPORT PER C408.2.4
E. PROVIDE ALL CX DOCUMENTS TO BUILDING OWNER WITHIN 90 DAYS OF CERTIFICATE OF OCCUPANCY, INCLUDING SYSTEM BALANCING REPORT AND FINAL CX REPORT
2. COMMISSION LIGHTING CONTROLS SYSTEMS PER ECC C408.3
A. OCCUPANCY SENSOR CONTROLS PER C408.3.1
B. TIME SWITCH CONTROLS PER C408.3.1.2
C. DAYLIGHT RESPONSE CONTROLS PER C408.3.1.3
D. PROVIDE ALL CX DOCUMENTS TO BUILDING OWNER WITHIN 90 DAYS OF CERTIFICATE OF OCCUPANCY, INCLUDING DRAWINGS, MANUALS, AND TEST REPORTS

DRAWING INDEX

SHEET NUMBER SHEET NAME

- | | |
|-------------|---|
| TCES-E0.00 | ELECTRICAL COVER SHEET |
| TCES-E0.01 | ELECTRICAL DEMOLITION PLAN |
| TCES-E0.01 | ELECTRICAL POWER PLAN |
| TCES-E0.300 | ELECTRICAL ONE-LINE DIAGRAM & SCHEDULES |
| TCES-E0.00 | ELECTRICAL DETAILS |



**TOMBALL ISD - CHILLER
PACKAGE #2d**

Timber Creek ES
8455 Creekside Green Dr
The Woodlands, TX 77389



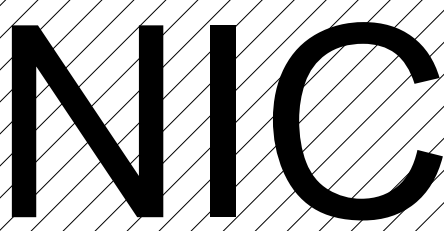
1177 West Loop South, Suite 900
Houston, TX 77027
713-781-2526
www.wylieeng.com

TX Firm No. 1869
Project No. 26026.00

ELECTRICAL COVER
SHEET

TCES-E0.00

Scale AS INDICATED



A. CONDUCT ALL DEMOLITION WORK IN SUCH A MANNER AS TO MAINTAIN A SAFE WORK ENVIRONMENT AND IN ACCORDANCE WITH APPLICABLE SAFETY RULES AND PROCEDURES WITHIN NEC, NECA AND OSHA REQUIREMENTS.

B. CONTRACTOR SHALL REQUEST AND REVIEW ANY HAZARDOUS MATERIALS SURVEYS FROM THE ARCHITECT REPRESENTATIVE. OBSERVE RECOMMENDED PRECAUTIONS AND VERIFY THE STATUS OF ANY REMEDIAL WORK RECOMMENDED OR NOTED WITHIN THE HAZARDOUS MATERIAL SURVEY. NOTIFY THE OWNER'S REPRESENTATIVE IF ANY HAZARDOUS MATERIALS ARE SURVEYED OR OBSERVED DURING THE COURSE OF PERFORMING THIS CONTRACT.

C. SURVEY AREAS OF THE FACILITY SCHEDULED FOR RENOVATION OR PARTIAL DEMOLITION PRIOR TO ANY WORK BEING PERFORMED. SUBMIT REPORT OF THE PRE-WORK SURVEY. DETAILING ANY UTILIZATION EQUIPMENT OR SYSTEMS THAT ARE NOT IN GOOD WORKING ORDER IN ADVANCE OF ANY DEMOLITION WORK AND REVIEW WITH THE OWNER'S REPRESENTATIVE.

D. THE SCHOOL DISTRICT SHALL HAVE FIRST RIGHT OF REFUSAL FOR SALVAGED MATERIAL. REQUEST THAT THE DISTRICT PROVIDE DIRECTION ON DISPOSITION OF SALVAGED MATERIAL. IF THE DISTRICT DOES NOT PROVIDE DIRECTION, THE CONTRACTOR SHALL SALVAGE. SALVAGED MATERIAL SHALL REMAIN THE PROPERTY OF THE DISTRICT AND SHALL BE DELIVERED BY THE CONTRACTOR TO A LOCATION AS DIRECTED. REMOVE AND DISPOSE ANY SALVAGED MATERIAL. RETURN THE REMAINING MATERIAL TO THE DISTRICT.

E. DRAWINGS INDICATE APPROXIMATE LOCATION AND QUANTITY OF PANELS, TRANSFORMERS, DISCONNECTS, ETC. TO BE REMOVED. VERIFY LOCATION AND QUANTITY OF ITEMS TO BE REMOVED. NO ALLOWANCE WILL BE MADE BECAUSE OF CONTRACTOR'S UNFAMILIARITY WITH THE SITE.

F. DAMAGED AREAS CAUSED REMOVAL OF ANY OF THE ABOVE ITEMS AND WHICH ARE NOT REPAIRABLE BY NEW CONSTRUCTION SHALL BE REPAIRABLE TO MATCH EXISTING. SURFACES OPENINGS CAUSED BY THE REMOVAL OF THESE ITEMS THROUGH FIRE RATED WALLS SHALL BE FIRE STOPPED.

G. REMOVE ABANDONED CONDUIT TO POINT OF CONCEALMENT BEHIND INACCESSIBLE SURFACES. ENTIRELY REMOVE ABANDONED WIRING.

H. PROVIDE BLANK COVERS AND PLATES AT UNUSED OPENINGS IN BOXES, RACEWAYS, AUXILIARY GUTTERS, CABINETS, EQUIPMENT CASES AND HOUSINGS SHALL BE CLOSED TO AFFORD PROTECTION SUBSTANTIALLY EQUIVALENT TO THE EQUIPMENT ENCLOSURE.

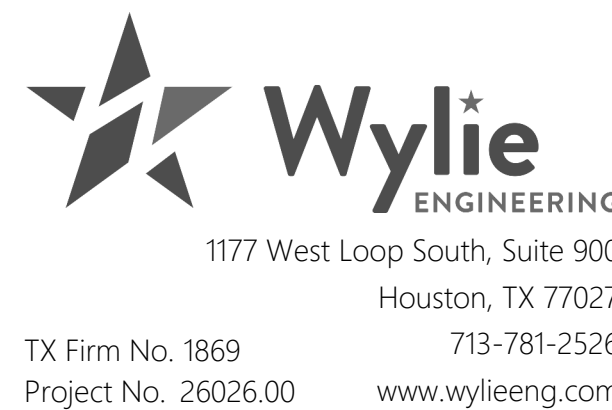
IF A CONDUIT RUN IS EXPOSED OR A SURFACE RACEWAY LEFT WITHOUT A MOUNTING SURFACE OR THE REMOVAL OF A PARTITION, THE RACEWAY SHALL BE REROUTED AS ACCEPTABLE TO THE OWNER/ARCHITECT.

J. PROTECT ELECTRICAL EQUIPMENT, OUTLETS AND DEVICES THAT ARE SCHEDULED TO BE RELOCATED, REPAIR, RESTORE OR REPLACE ITEMS DAMAGED WHEN REMOVED TO THE APPROVAL OF THE OWNER. NOTIFY OWNER/ARCHITECT/ENGINEER OF ANY ELECTRICAL EQUIPMENT, OUTLETS OR DEVICES WHICH ARE SCHEDULED TO BE RE-USED THAT ARE FOUND TO BE UNUSABLE.

- 1 EXISTING HVAC AIR COOLED CHILLER TO BE REPLACED. DEMO EXISTING CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES TO THE EXTENT NECESSARY TO RE-ROUTE WIRE. REFER TO NEW WORK PLANS FOR MORE INFORMATION.
- 2 EXISTING HVAC PUMP EQUIPMENT TO BE REPLACED. DEMO EXISTING CIRCUITS, DISCONNECTS, RACEWAYS & CONDUITS, AND OTHER ELECTRICAL APPURTENANCES TO THE EXTENT NECESSARY TO RE-ROUTE WIRE. REFER TO NEW WORK PLANS FOR MORE INFORMATION.

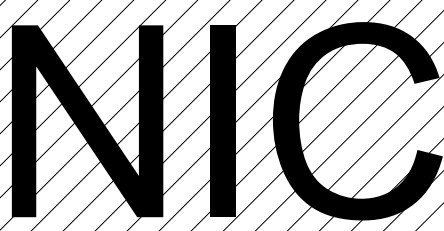
08/31/2026

Timber Creek ES
8455 Creekside Green Dr
The Woodlands, TX 77389



TCES-E1.01

Scale	As indicated
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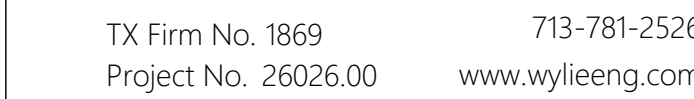


H. PROVIDE 120V POWER TO EACH HVAC DDC CONTROL PANEL. COORDINATE EXACT LOCATIONS AND QUANTITIES WITH MECHANICAL DRAWINGS.

7 PROVIDE POWER AND CIRCUITING FOR CHILLED WATER PIPE HEAT TRACE SYSTEM AS INDICATED. COORDINATE EXACT CONNECTION POINTS AND CONTROLLER LOCATIONS WITH MECHANICAL CONTRACTOR. PROVIDE GFCI BREAKER AS REQUIRED BY NEC.

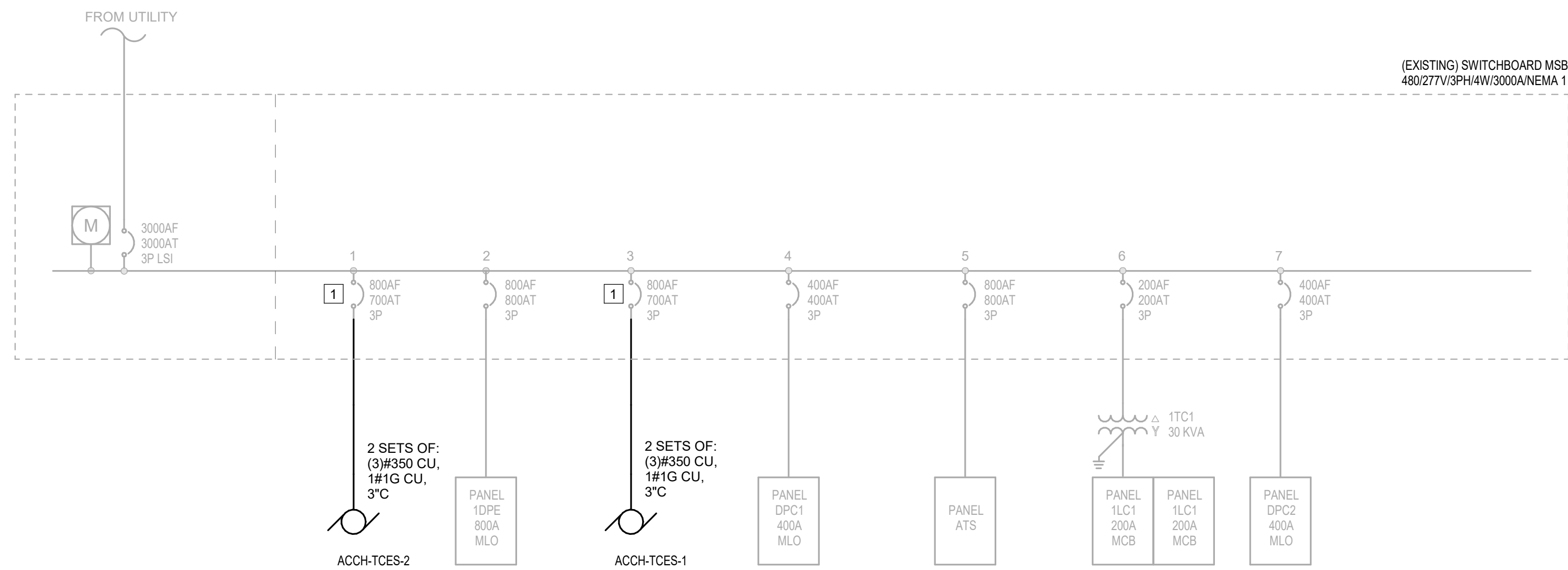
08/31/2026

Timber Creek ES
8455 Creekside Green Dr
The Woodlands, TX 77389



Scale	As indicated
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- A. REFERENCE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- B. PROVIDE ARC FLASH LABELING FOR ALL NEW EQUIPMENT AS REQUIRED PER NEC ARTICLE 110.16 AND NFPA-70E.
- C. ALL ABOVE GRADE FEEDER CONDUIT SHALL BE EMT.
- D. ALL FEEDER CONDUCTORS SHALL BE COPPER TYPE THHN (INTERIOR) OR THWN-2 (WHEN EXTERIOR TO BUILDING) UNLESS SPECIFICALLY NOTED OTHERWISE.
- E. ALUMINUM FEEDER CONDUCTORS SHALL BE TYPE XHHW-2 ALCAN 'STABLOY' OR APPROVED EQUAL. BRANCH CIRCUIT CONDUCTORS SHALL BE COPPER THHN/THWN2 UNLESS SPECIFICALLY NOTED OTHERWISE.
- F. ALL GROUND CONDUCTORS SHALL BE COPPER.
- G. CIRCUITS FOR MECHANICAL AND PLUMBING EQUIPMENT SHALL BE COPPER UNLESS NOTED OTHERWISE.
- H. NEW BREAKERS IN EXISTING PANELS SHALL MATCH EXISTING PANEL KAIC RATING.
- I. REFERENCE EQUIPMENT CONNECTION SCHEDULE, FOR ADDITIONAL INFORMATION OR TAGGED EQUIPMENT.
- J. FIELD VERIFY EXISTING SPARE BREAKER RATINGS AND QUANTITIES. PROVIDE NEW AS REQUIRED.



1. PROVIDE NEW 700-AMP, 3-POLE BREAKER IN EXISTING SWITCHBOARD FOR NEW CHILLER

NOTE: ALL EQUIPMENT AND WIRING SHOWN IS EXISTING TO REMAIN UNLESS NOTED OTHERWISE.

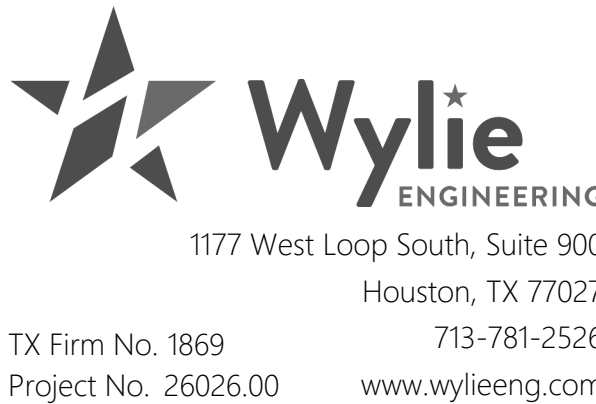
ELEC-MECHANICAL EQUIPMENT CONNECTION SCHEDULE						
TAG	VOLTS/PHASE	MOTOR (HP)	FLA	MCA	OCF	DISCONNECTING
AOCH-TCES-1	480/3		435.2 A	544.0 A	700 A	INTEGRAL
AOCH-TCES-2	480/3		435.2 A	544.0 A	700 A	INTEGRAL
POHWP-TCES-1	480/3	30	40.0 A	50.0 A	80 A	VSD
POHWP-TCES-2	480/3	30	40.0 A	50.0 A	80 A	VSD

WIRE & CONDUIT				PANEL	CIRCUIT	NOTES
RE: ONE-LINE				MSB	1,2,3	1
RE: ONE-LINE				MSB	4,5,6	1
3#10, #10G, 3/4"C				DPC2	16, 17, 18	2
3#10, #10G, 3/4"C				DPC2	19,20,21	2

[illegible]

**TOMBALL ISD - CHILLER
PACKAGE #2d**

Timber Creek ES
8455 Creekside Green Dr
The Woodlands, TX 77389



ELECTRICAL ONE-LINE DIAGRAM & SCHEDULES

TCES-E3.00

Scale $1/8" = 1'-0"$

**TOMBALL ISD - CHILLER
PACKAGE #2d**

ELECTRICAL DETAILS

TCES-E4.00

Scale Not-To-Scale

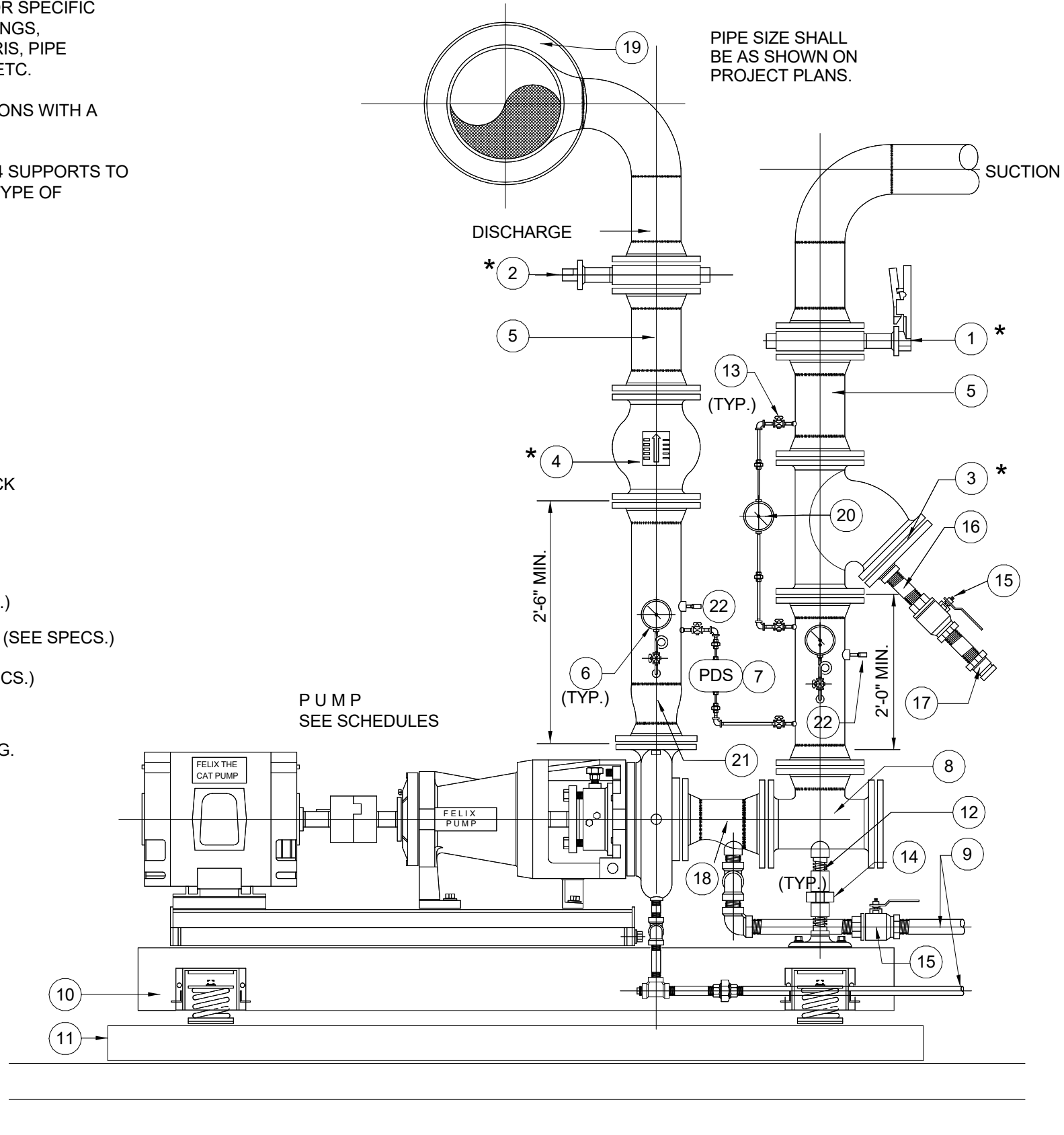
Scale As indicated



Scale	As indicated
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- GENERAL NOTES:
- REFER TO PLAN DRAWING FOR PIPING CONFIGURATION FOR EACH INDIVIDUAL PUMP.
 - REFER TO PLANS, DETAILS, AND SPECIFICATIONS FOR SPECIFIC PUMP, CONCRETE BASE, VIBRATION ISOLATION SPRINGS, HOUSEKEEPING PADS, VALVES, STRAINERS, VENTURIS, PIPE FITTINGS, GAUGES, SENSORS, AND CONTROLLERS, ETC.
 - INSTALL TEST PLUGS IN EASILY ACCESSIBLE LOCATIONS WITH A MINIMUM OF 12" CLEARANCE IN FRONT.
 - PROVIDE VIBRATION ISOLATOR TYPE ON THE FIRST 4 SUPPORTS TO AND FROM THE PUMPS. REFER TO SPECS FOR THE TYPE OF SUPPORTS REQUIRED.

- NOTES:
- STOP VALVE (SEE SPECIFICATIONS)
 - BALANCING VALVE (SEE SPECIFICATIONS)
 - STRAINER (SEE SPECIFICATIONS)
 - CHECK VALVE. (SEE SPECIFICATIONS) AXIS OF CHECK VALVE SHAFT SHALL BE PERPENDICULAR TO PUMP SHAFT.
 - SPOOL PIECE (SEE SPECIFICATIONS)
 - PRESSURE GAUGE WITH GAUGE COCK (SEE SPECS.)
 - DIFFERENTIAL PRESSURE SENSOR / TRANSMITTER (SEE SPECS.)
 - SUCTION DIFFUSER. WITHOUT STRAINER. (SEE SPECS.)
 - EXTEND PUMP DRAIN LINES TO FLOOR DRAIN.
 - CONCRETE BASE AND VIBRATION ISOLATION SPRING. (SEE SPECS.)
 - HOUSE KEEPING PADS. (SEE SPECIFICATIONS.)
 - 2" SCREW JACK
 - 1/4" COCK VALVE (SEE SPECIFICATIONS)
 - UNION (SEE SPECIFICATIONS)
 - FULL BORE BALL VALVE (SEE SPECS.)
 - FULL SIZE STRAINER DRAIN CONNECTION
 - HOSE END ADAPTER WITH CAP (SEE SPECIFICATIONS)
 - ECCENTRIC REDUCER (SEE SPECS.)
 - PIPE INSULATION (SEE SPECS.)
 - DIFFERENTIAL PRESSURE GAUGE. (SEE SPECIFICATIONS)
 - CONCENTRIC REDUCER (SEE SPECIFICATIONS)
 - TEST PLUG (SEE SPECIFICATIONS)



DETAIL M-DET033

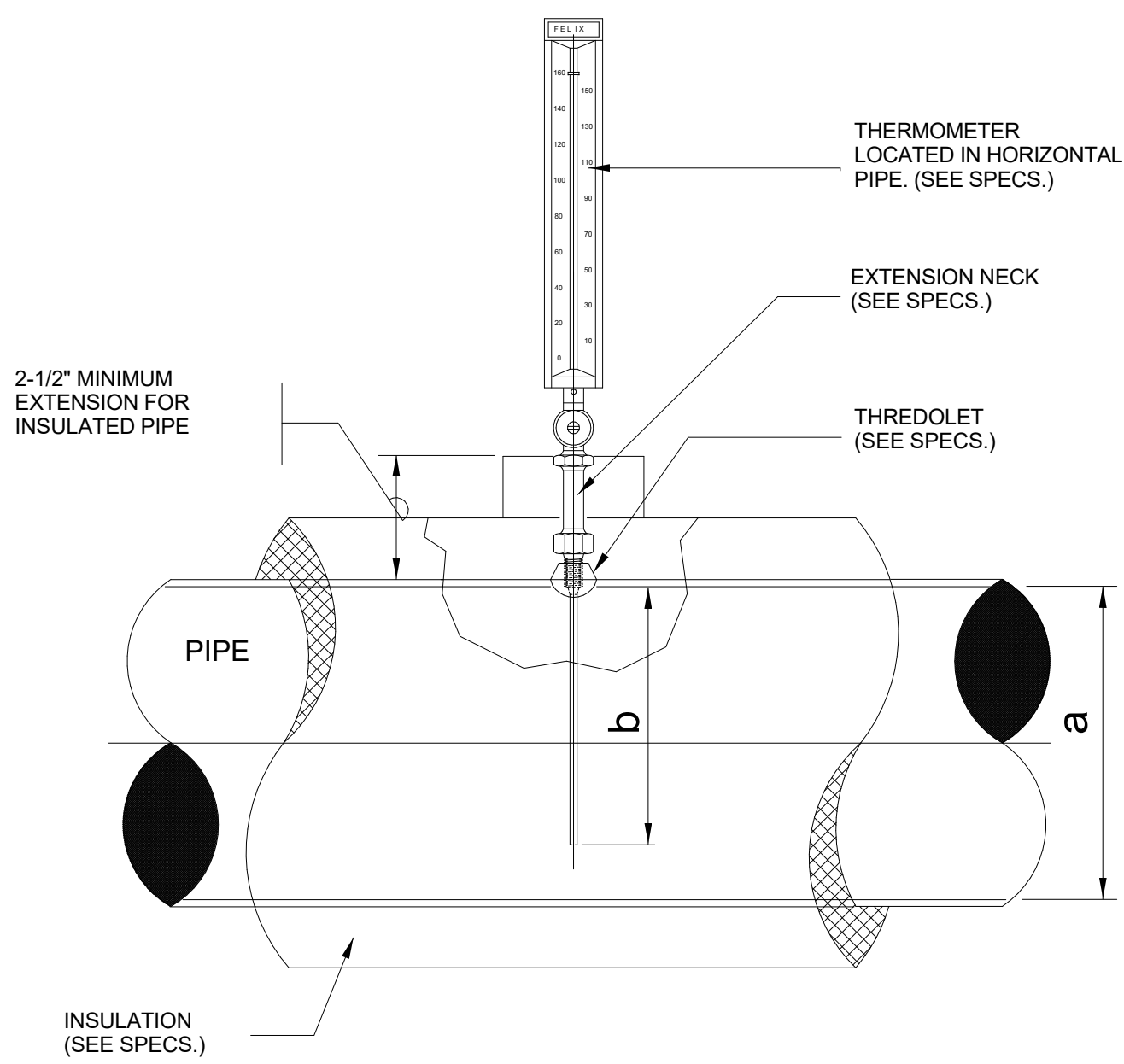
01 END SUCTION PUMP DETAIL

SCALE: NONE

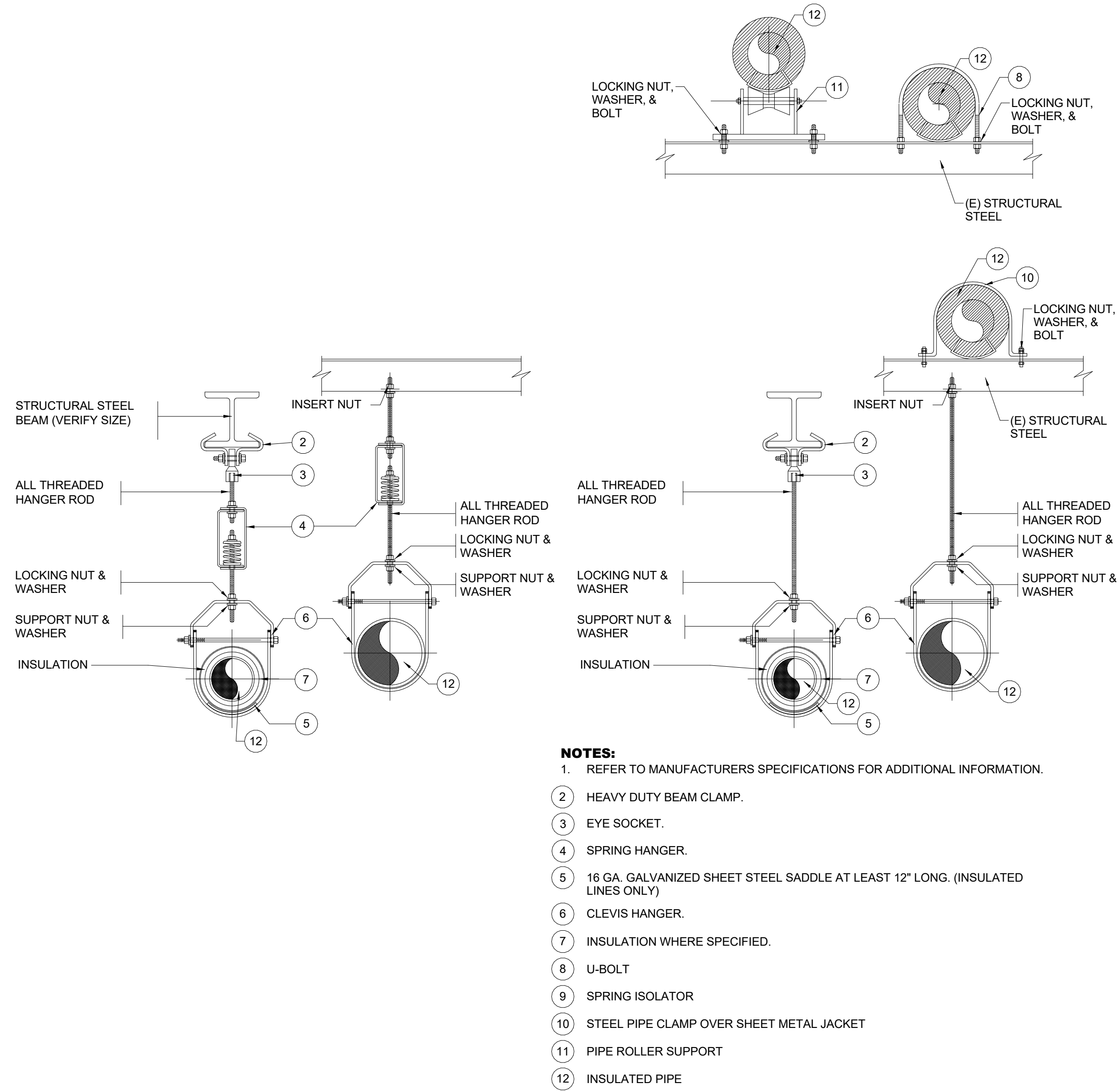
DETAIL #M-DET043

02 THERMOMETER WELL DETAIL

SCALE: NONE



INSERTION LENGTH SCHEDULE	
a = PIPE DIAMETER	b = INSERTION LENGTH
4" AND 5"	2-1/2"
6" AND 8"	5"
10" AND LARGER	8"



- NOTES:
- REFER TO MANUFACTURERS SPECIFICATIONS FOR ADDITIONAL INFORMATION.
 - HEAVY DUTY BEAM CLAMP.
 - EYE SOCKET.
 - SPRING HANGER.
 - 16 GA. GALVANIZED SHEET STEEL SADDLE AT LEAST 12" LONG. (INSULATED LINES ONLY)
 - CLEVIS HANGER.
 - INSULATION WHERE SPECIFIED.
 - U-BOLT.
 - SPRING ISOLATOR
 - STEEL PIPE CLAMP OVER SHEET METAL JACKET
 - PIPE ROLLER SUPPORT
 - INSULATED PIPE

SCALE: NONE



TOMBALL ISD - CHILLER
PACKAGE #2c

Tomball ES
1110 Inwood St,
Tomball, TX 77375

Wylie
ENGINEERING
1177 West Loop South, Suite 900
Houston, TX 77027
TX Firm No. 1869 713-781-2526
Project No. 26026.00 www.wylieeng.com

MECHANICAL AND
PLUMBING DETAILS

TES -
MP4.00

Scale 1/8" = 1'-0"



CHILLED WATER ACTIVATION

THE CHILLED WATER SYSTEM WILL BE ACTIVATED BY A REQUEST FOR COOLING FROM ANY AIR HANDLING UNITS OR COOLING EQUIPMENT SUPPLIED WITH CHILLED WATER.

B. CHILLER UNITS AND CHILLED WATER PUMPS ACTIVATION

WHEN THE CHILLED WATER SYSTEM IS ACTIVATED, THE CHILLER CONTROL PROGRAM WILL START THE LEAD CHILLED WATER PUMP BY SENDING A 24 VAC SIGNAL TO A RELAY MOUNTED IN THE PUMP MOTOR VFD, WHICH WILL COMPLETE THE AUTO SIDE OF THE CONTROL CIRCUIT AND START THE PUMP. A FLOW SWITCH WILL PROVIDE STATUS TO THE BUILDING AUTOMATION SYSTEM (B.A.S.) AND WILL ALARM AT THE CENTRAL SITE IF THE SWITCH IS NOT IN POSITION UNTIL THE ADJUSTABLE TIME PERIOD, AFTER 15 SECONDS (ADJUSTABLE), THE B.A.S. WILL SEND 24 VAC SIGNAL TO A RELAY WHICH WILL COMPLETE THE REMOTE START TERMINALS IN THE CHILLER CONTROL CIRCUIT AND ALLOW THE LEAD CHILLER TO RUN. A FLOW SWITCH WILL NOT ALLOW THE CHILLER TO START UNTIL FLOW HAS BEEN PROVEN. THE B.A.S. CONTROL MODULE WILL AUTOMATICALLY START THE LEAD CHILLER AND AN ALARM WILL BE SENT TO THE CENTRAL SITE, 15 MINUTES (ADJUSTABLE) TIME DELAYS WILL BE ASSIGNED TO EACH CHILLER START / STOP CIRCUIT TO PREVENT SHORT CYCLING.

C. TEMPERATURE CONTROL AND STAGING

THE CHILLER WILL BE SET TO MAINTAIN A CHILLED WATER SUPPLY TEMPERATURE AS SPECIFIED IN THE SCHEDULE DRAWING (ADJUSTABLE), THE CHILLER UNIT WILL OPERATE ON PART LOADS THROUGH MULTI-COMPRESSOR STAGING FEATURING ELECTRONIC EXPANSION VALVES FOR PRECISE REFRIGERANT CONTROL.

THE ASSOCIATED CHILLED WATER PUMP WILL RUN VARIABLE FLOW TO PROVIDE STABLE CHILLED WATER TEMPERATURE CONTROL AND HELPS LIMIT UNACCEPTABLE SHORT CYCLING OF CHILLER COMPRESSORS.

THE CHILLER UNIT CONTROLLER ENABLES VARIABLE WATER FLOW PROVIDING $\pm 2^{\circ}\text{F}$ LEAVING WATER TEMPERATURE ACCURACY AND TOLERATES 30% PER MINUTE WATER FLOW VARIATION WITH FLOW EQUAL OR ABOVE THE MINIMUM UNIT REQUIREMENT.

IF THE LEAD CHILLER UNIT AND ASSOCIATED PUMP AT FULL LOAD DELIVERS CHILLED WATER AT 2°F AND ABOVE THE SETPOINT FOR 5 MINUTES (ADJUSTABLE), A RUN REQUEST WILL BE SENT TO THE LEAD CHILLER AND ASSOCIATED PUMP. BOTH CHILLERS WILL OPERATE AT SHARED LOAD, WHEN THE CHILLED WATER SUPPLY TEMPERATURE FALLS AT 2°F BELOW THE SETPOINT, THE LEAD UNITS WILL START DE-STAGING UNTIL THE LOAD IS HANDLED BY A SINGLE CHILLER WHICH THE LEAD CHILLER WILL ASSUME FULL CONTROL.

THE B.A.S. WILL INITIATE AN ALARM TO THE CENTRAL SITE IF THE BUILDING CHILLED WATER SUPPLY TEMPERATURE IS 5°F (ADJUSTABLE) AND ABOVE THE SETPOINT. AN ALARM OUTPUT FROM THE CHILLER PANEL WILL BE MONITORED FOR DISPLAY AT THE CENTRAL SITE.

D. CHILLED WATER PUMP AND DIFFERENTIAL PRESSURE SENSOR (DPS)

WHEN THE EXISTING AHU MEETS THE DEMAND LOAD, THE UNIT WILL GRADUALLY LIMITS THE FLOW OF CHILLED WATER INTO THE COIL, VIA THE 2-WAY CONTROL VALVE. THE PRESSURE IN THE PIPE WILL GRADUALLY INCREASE. WHEN THE PRESET HIGH LIMIT PRESSURE IN THE DPS IS REACHED, A SIGNAL WILL BE SENT TO CONTROL THE PUMP VIA THE VFD TO MODULATE DOWN THE OPERATION FOR LESS CHILLED WATER FLOW.

WHEN THE EXISTING AHU DEMANDS MORE LOAD, THE UNIT WILL GRADUALLY ALLOW MORE CHILLED WATER INTO THE COIL, VIA THE 2-WAY CONTROL VALVES. THE PRESSURE IN THE PIPE WILL GRADUALLY DECREASE, WHEN THE PRESET LOW LIMIT PRESSURE IN THE DPS IS REACHED, A SIGNAL WILL BE SENT TO CONTROL THE PUMP VIA THE VFD TO MODULATE UP THE OPERATION FOR MORE CHILLED WATER FLOW.

E. LEAD / LAG ROTATION AND SEQUENCING (EQUAL RUN TIME)

ON A DAILY BASIS, CHANGE THE CHILLER UNIT AND PUMP LEAD / LAG INDEXING. DAILY LEAD PUMP INDEXED TO RUN WITH THE LEAD CHILLER UNIT. DAILY LEAD PUMP INDEXED TO RUN WITH THE LAG CHILLER.

UPON THE LEAD PUMP STARTING, THE LEAD PUMP SHALL RAMP DOWN THAT BOTH PUMPS (LEAD/LAG) SHARE THE FLOW / LOAD AT 50% EACH TO PREVENT TOTAL FLOW SPIKES AND ALLOW BOTH PUMPS TO MODULATE IN PARALLEL.

THE BUILDING AUTOMATION SYSTEM (BAS) OR THE PROGRAMMABLE LOGIC CONTROLLER (PLC) SHALL ALTERNATE THE LEAD AND LAG DESIGNATIONS THAT TRIGGER THE ROTATION BASED ON CUMULATIVE RUN-HOURS (E.G. SWAPPING ROLES EVERY 500 HOURS) OR ON A WEEKLY SCHEDULE TO EQUALIZE WEAR AND TEAR ACROSS BOTH PUMPS.

F. CHILLED WATER SYSTEM SHUT/DOWN SEQUENCE

AFTER ALL REQUEST FOR COOLING BEEN SATISFIED OR HALTED BY THE B.A.S., THE CHILLER WILL CYCLE TO ITS OFF STATUS. THE ASSOCIATED CHILLED WATER PUMP WILL CONTINUE TO RUN FOR 5 MINUTES (ADJUSTABLE) TO ENSURE ADEQUATE FLOW DURING SHUTDOWN.

G. EQUIPMENT OFF CONDITIONS

WHEN THE CHILLED WATER SYSTEM IS INACTIVE, THE CHILLER AND ASSOCIATED PUMP WILL BE DE-ENERGIZED.

H. FREEZE AVOIDANCE AND WINTER CONDITION

FREEZE AVOIDANCE TO BE PRESENT TO ENABLE OR DISABLE, THE CHILLER UNIT SHALL BE CONFIGURED WITH THE PUMP CONTROLLER. WHEN FREEZE AVOIDANCE IS ENABLED, THE CHILLED WATER PUMP SHALL ACTIVATE WHEN THE AMBIENT TEMPERATURE DROPS BELOW THE LEAVING WATER TEMPERATURE SETPOINT. THE PUMP RUNS FOR 5 MINUTES UNTIL THE MINIMUM EVAPORATOR TEMPERATURE RISES 1°F ABOVE THE LEAVING WATER CUTOFF. THE PUMP WILL CYCLE OFF FOR A PERIOD OF TIME, AFTER THE TIME EXPIRES, THE PUMP OUTPUT MAY BACK EMERGENCY AGAIN IF THE AMBIENT TEMPERATURE IS AGAIN BELOW THE WATER CUTOFF.

THE PUMP SHALL BE SET TO OPERATE VIA THE VFD PROVIDING MINIMUM FLOW WITH THE EXISTING BYPASS VALVE AT OPEN POSITION.

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DVBI	DIGITAL / BINARY INPUT
DOBO	DIGITAL / BINARY OUTPUT
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY RIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZESTAT
HSL	HIGH STATIC LIMIT
SPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE
SP	SET POINT
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTSIDE AIR
HC	HEATING COIL
CC	COOLING COIL
DX	DIRECT EXPANSION COOLING COIL
PICCV	PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE
AFS	AIRFLOW CROSS
DPS	DIFFERENTIAL PRESSURE SWITCH

TYPE	COUNT	NAME	DEVICE
AI	1	BUILDING CHW SUPPLY TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	1	BUILDING CHW RETURN TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	2	CHILLER CHW SUPPLY TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	2	CHILLER CHW RETURN TEMPERATURE	10 kΩ IMMERSION SENSOR
AI	2	CHILLER AMPS	4-20 mA SENSOR
AI	1	OUTSIDE AIR TEMPERATURE (NORTH SIDE OF BLDG)	NORMALLY OPEN
DI	2	CHILLER PUMP STATUS	CURRENT SWITCH
DI	2	CHILLER ALARM	DRY CONTACT
DO	2	CHILLER START/STOP	24 VAC RELAY
DO	2	CHILLER PUMP START/STOP	24 VAC RELAY

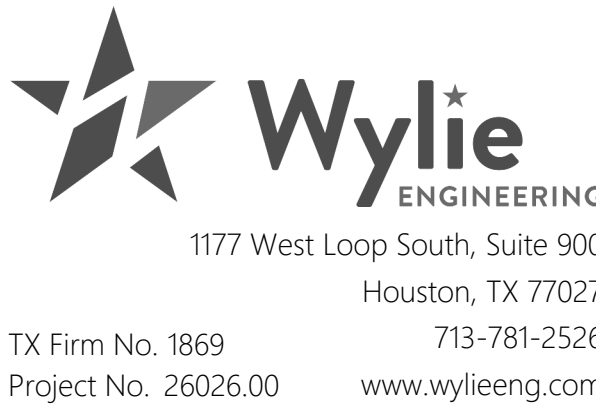
FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE ONE BACnet INTEGRATION SCREEN IN THE BAS GRAPHICS THAT INCLUDES THE FOLLOWING INFORMATION AT A MINIMUM FOR MONITORING PURPOSES ONLY:

- LOCAL REMOTE / MODE
- ACTIVE ALERT / ALARM WITH ALARM MODE (NOTE: INCLUDE CROSS-REFERENCE TABLE FOR ODE DEPICTING)
- ACTIVE DEMAND LIMIT
- ENTERING / LEAVING TEMPERATURES
- RUNNING STATUS / MODE
- COMPRESSOR DISCHARGE PRESSURE
- COMPRESSOR WINDING TEMPERATURE
- OUTDOOR AIR TEMPERATURE
- SUCTION PRESSURE
- NUMBER OF COMPRESSOR RUNNING OR CIRCUITS
- CAPACITY
- OIL PRESSURE ON EACH CIRCUIT
- WATER SET-POINT
- WATER FLOW

[illegible]

TOMBALL ISD - CHILLER PACKAGE #2c

Tomball ES
1110 Inwood St,
Tomball, TX 77375



MECHANICAL AND PLUMBING PIPING SCHEMATIC DIAGRAM

TES -
MP5.01

Scale $1/8" = 1'-0"$

LEGEND OF ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	BOLD DEVICE/CIRCUITING INDICATES NEW DEVICE/CIRCUITING OR RELOCATED DEVICE.
	SHADED DEVICE/CIRCUITING INDICATES EXISTING TO REMAIN

LOW VOLTAGE PROVISIONS

1. PROVIDE A 4" X 4" X 2-1/8" JUNCTION BOX WITH RING AND STRING ABOVE ACCESSIBLE CEILING FOR ALL LOW VOLTAGE ROUGH-IN LOCATIONS (TYPICAL).
2. FOR WALLS TO DECK OR WALLS WITH INSULATION, PROVIDE A 4" X 4" X 2-1/8" JUNCTION BOX WITH 3/4" EMT CONDUIT TO ABOVE ACCESSIBLE CEILING.
3. LOW VOLTAGE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO: FIRE ALARM, BUILDING CONTROLS, LIGHTING CONTROLS, DATA, AUDIO/VISUAL, SECURITY.
4. ALL LOW VOLTAGE CABLEING IN THIS PROJECT SHALL BE ROUTED IN MINIMUM 3/4" EMT

ELECTRICAL GENERAL NOTES

A. GENERAL PROVISIONS
 FURNISH AND INSTALL ALL ITEMS, INCLUDING EVERYTHING, DEVICE OR ACCESSORY REASONABLY NECESSARY TO FACILITATE EACH SYSTEMS FUNCTION AS INDICATED BY THE DESIGN AND THE EQUIPMENT SPECIFIED ELEMENTS OF THE WORK SHALL INCLUDE, BUT ARE NOT LIMITED TO: MATERIALS, LABOR, SUPERVISIONS, SUPPLIES, EQUIPMENT, TRANSPORTATION, HOISTING/CRANING, STORAGE, UTILITY, AND REMEDIATION.

B. DRAWINGS ARE SCHEDULED IN NATURE AND DO NOT NECESSARILY REFLECT ALL WORK REQUIRED TO COMPLETE PROJECT. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, AND EQUIPMENT AS REQUIRED TO COMPLETE PROJECT WITH DESIGN INTENT AT NO ADDITIONAL COST TO OWNER/INTEMT. CONTRACTOR SHALL REQUEST ADDITIONAL INFORMATION IN CASES OF DOUBT.

STATE OF TEXAS
KOUROSH M. YAZDANI
10439
PROFESSIONAL ENGINEER
08/31/2026

**TOMBALL ISD - CHILLER
PACKAGE #2c**

Tomball ES
1110 Inwood St.,
Tomball, TX 77375

 **Wylie**
ENGINEERING

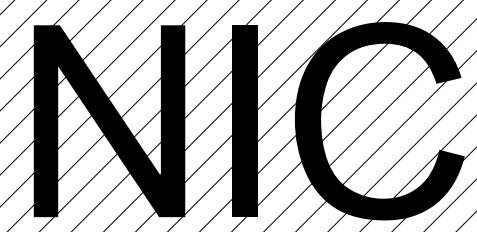
1177 West Loop South, Suite 900
Houston, TX 77027
713-781-2526
www.wylieeng.com

TX Firm No. 1869
Project No. 26026.00

ELECTRICAL COVER
SHEET

TES-E0.00

scale AS INDICATED



Scale	As indicated
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Scale	As indicated
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(E) PANELBOARD: LB SEC. 1														SEC. 1		
LOCATION:				EQUIP GROUND: YES				VOLTS: 120/208 WYE				BUS RATING: 225 A				
SUPPLY FROM:				ISO GROUND: NO				PHASES: 3				MLO OR MCB: MCB				
MOUNTING: SURFACE				FEED THRU LUGS: YES				WIRES: 4				MAIN RATING: 225 A				
ENCLOSURE: NEMA 1				200% NEUTRAL: NO				A.I.C. RATING: 65KAC								
				SERVICE ENTRANCE RATED: NO				FULLY RATED: YES								
CKT	NOTES	CIRCUIT DESCRIPTION	AMP	P	A		B		C		P	AMP	CIRCUIT DESCRIPTION	NOTES	CKT	
1		RCPT- B211	20	1	1.3	1.1					1	20	RCPT STAGE		2	
3		RCPT B210	20	1			1.3	1.1			1	20	RCPT STAGE		4	
5		RCPT B209	20	1					1.3	1.1	1	20	RCPT STAGE		6	
7		RCPT B214	20	1	1.3	1.1					1	20	RCPT B222 MUSIC		8	
9		RCPT B213	20	1			1.3	1.1			1	20	RCPT B223 MUSIC		10	
11		RCPT B212	20	1					1.3	1.1	1	20	RCPT B223 MUSIC		12	
13		RCPT B215	20	1	1.3	1.1					1	20	RCPT B220		14	
15		RCPT B216	20	1			1.3	1.1			1	20	RCPT B221		16	
17		RCPT B217	20	1					1.3	1.1	1	20	RCPT B221		18	
19		EDF	20	1	0.8	1.3					1	20	RCPT B218		20	
21		EDF	20	1			0.8	1.3			1	20	RCPT B218 A		22	
23		EDF	20	1					0.8	1.3	1	20	RCPT B219		24	
25		EDF	20	1	0.8	0.8					1	20	EF-8		26	
27		REFRIGERATOR B221	20	1			0.8	0.8			1	20	EF-9		28	
29		WASHER B221	20	1					0.8	0.8	1	20	EF-16		30	
31		DRYER B221	20	2	2.5	0.5					1	20	DISPLAY CASE		32	
33							2.5	0.5			1	20	DISPLAY CASE		34	
35		BMCS CONTROLS	20	1					0.5	1.0		2	20	KILN		36
37		BMCS CONTROLS	20	1	0.5	1.0									38	
39		BMCS CONTROLS	20	1			0.5	0.5			1	20	RCPT SERVICE YARD		40	
41		SPARE	20	1					0.0	0.0	1	20	OUTSIDE LIGHT CONTROL		42	
TOTAL PHASE LOAD:					27 kVA		23 kVA		20.6 kVA							
TOTAL PHASE AMPS:					228 A		195 A		171 A							
LOAD CLASSIFICATION			CONNECTED LOAD		DEMAND FACTOR		ESTIMATED DEMAND		PANEL TOTALS							
LIGHTING (NEC215.2A1)			0.0 kVA		125%		0.0 kVA		DOWNSTREAM FEED THRU LOAD: 77 A							
RECEPTACLE (NEC220.44)			0.0 kVA		NEC TABLE 220.44		0.0 kVA		EXISTING LOAD: 0.0 kVA							
OTHER EQPT (NEC220.14)			3.0 kVA		100%		3.0 kVA		TOTAL CONNECTED LOAD: 70.5 kVA							
MOTOR (NEC430.22)			0.0 kVA		100% + 125% LARGEST		0.0 kVA		DEMAND HEAT+COOL: 70.5 kVA							
KITCHEN EQPT (NEC220.56)			0.0 kVA		NEC TABLE 220.56		0.0 kVA		TOTAL CONNECTED LOAD: 196 A							
HEATING (NEC220.60/440.6)			0.0 kVA		100%		0.0 kVA		DEMAND HEAT+COOL: 196 A							
COOLING (NEC220.60/440.6)			0.0 kVA		100%		0.0 kVA		NON-COINCIDENTAL HEAT/COOL: 0 A							
ELEVATOR (NEC620.14)			0.0 kVA		NEC TABLE 620.14		0.0 kVA		TOTAL NEC DEMAND: 196 A							
CONT EQPT (NEC215.2A1)			0.0 kVA		125%		0.0 kVA									
NOTES:																

(E) PANELBOARD: LB SEC. 2														SEC. 2	
LOCATION:				EQUIP GROUND: YES				VOLTS: 120/208 WYE				BUS RATING: 200 A			
SUPPLY FROM: LB SEC. 1				ISO GROUND: NO				PHASES: 3				MLO OR MCB: MLO			
MOUNTING: SURFACE				FEED THRU LUGS: YES				WIRES: 4				MAIN RATING: 200 A			
ENCLOSURE: NEMA 1				200% NEUTRAL: NO				A.I.C. RATING: 65KAIC							
				SERVICE ENTRANCE RATED: NO				FULLY RATED: YES							
CKT	NOTES	CIRCUIT DESCRIPTION	AMP	P	A		B		C		P	AMP	CIRCUIT DESCRIPTION	NOTES	CKT
43		CHILLER CONTROLS	20	1	0.5	1.4					1	20	TRACK LTG STAGE		44
45		CHILLER VALVES	20	1			0.5	1.4			1	20	TRACK LTG STAGE		46
47		CHILLER CONTROLS	20	1					0.5	1.4	1	20	TRACK LTG STAGE		48
49		CHILLER VALVES	20	1	0.5	1.4					1	20	TRACK LTG STAGE		50
51		BOILER MAIN MECH	20	1			0.5	0.5			1	20	TP-3		52
53		CIRC PUMP	20	1					0.8	1.1					54
55		EWVH-3	30	2	2.3	1.1					2	20	RANGE B221		56
57							2.3	0.0			1	20	SPARE		58
59		EWVH-4	30	2					2.3	0.5	1	20	FIA PWR SUPPLY		60
61		HOOD FAN B 221	20	1	2.3	0.5					1	20	BP/ MECH S		62
63							0.5	0.3							64
65		SPARE - OFF	20	1					0.0	0.3	2	20	HEAT TRACE (GFCI)		66
67		BOILER 1	20	1	0.5	0.3									68
69		SPARE - OFF	20	1			0.0	0.3			2	20	HEAT TRACE (GFCI)		70
71		SPARE - OFF	20	1					0.0	0.0	1	20	SPARE - OFF		72
73		SPARE - OFF	20	1	0.0	0.0					1	20	SPARE - OFF		74
75							0.8	0.0			1	20	SPARE - OFF		76
77		FREEZER - OFF	20	3					0.8	0.0	1	20	SPARE - OFF		78
79					0.8	0.0					1	20	SPARE - OFF		80
81		LIGHT - OFF	20	1			1.1	0.0			1	20	SPARE - OFF		82
83		HEATER - OFF	20	1					0.5	0.0	1	20	SPARE - OFF		84
TOTAL PHASE LOAD:					11.6 kVA		8.1 kVA		8.2 kVA						
TOTAL PHASE AMPS:					97 A		68 A		68 A						
LOAD CLASSIFICATION			CONNECTED LOAD		DEMAND FACTOR		ESTIMATED DEMAND		PANEL TOTALS						
LIGHTING (NEC215.2A1)			0.0 kVA		125%		0.0 kVA		DOWNSTREAM FEED THRU LOAD: 0 A						
RECEPTACLE (NEC220.44)			0.0 kVA		NEC TABLE 220.44		0.0 kVA		EXISTING LOAD: 0.0 kVA						
OTHER EQPT (NEC220.14)			3.0 kVA		100%		3.0 kVA		TOTAL CONNECTED LOAD: 27.8 kVA						
MOTOR (NEC430.22)			0.0 kVA		100% + 125% LARGEST		0.0 kVA		DEMAND HEAT+COOL: 27.8 kVA						
KITCHEN EQPT (NEC220.56)			0.0 kVA		NEC TABLE 220.56		0.0 kVA		TOTAL CONNECTED LOAD: 77 A						
HEATING (NEC220.60/440.6)			0.0 kVA		100%		0.0 kVA		DEMAND HEAT+COOL: 77 A						
COOLING (NEC220.60/440.6)			0.0 kVA		100%		0.0 kVA		NON-COINCIDENTAL HEAT/COOL: 0 A						
ELEVATOR (NEC620.14)			0.0 kVA		NEC TABLE 620.14		0.0 kVA		TOTAL NEC DEMAND: 77 A						
CONT EQPT (NEC215.2A1)			0.0 kVA		125%		0.0 kVA								
NOTES:															
BOLD CIRCUIT(S) INDICATE NEW/MODIFIED CIRCUIT AND/OR CIRCUIT BREAKER.															

ELEC-MECHANICAL EQUIPMENT CONNECTION SCHEDULE - SINGLE POINT - TES										
TAG	VOLTS/PHASE	MOTOR (HP)	FLA	MCA	OCP	DISCONNECTING MEANS	WIRE & CONDUIT	PANEL	CIRCUIT	NOTES
ACCH-TES-1	480/3		390.0 A	487.0 A	600 A	INTEGRAL	RE. ONE-LINE	MSB	1,2,3	1
ACCH-TES-2	480/3		390.0 A	487.0 A	600 A	INTEGRAL	RE. ONE-LINE	MSB	4,5,6	1
CHWP-TES-1	480/3	15	21.0 A	26.3 A	45 A	VSD	RE. ONE-LINE	MCCA	1,2,3	2
CHWP-TES-2	480/3	15	21.0 A	26.3 A	45 A	VSD	RE. ONE-LINE	MCCA	4,5,6	2

SCHEDULE NOTES



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