Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade
RFP #1002-6

Tomball High School
30330 Quinn Rd.
Tomball, TX, 77375

TOMBALL ISD
DESTINATION EXCELLENCE

PROJECT TEAM:

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BOARD OF TRUSTEES

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APPLICABLE CODES:

2021 INTERNATIONAL BUILDING CODE
2021 INTERNATIONAL MECHANICAL CODE
2021 INTERNATIONAL ENERGY CONSERVATION CODE
2023 NATIONAL ELECTRICAL CODE

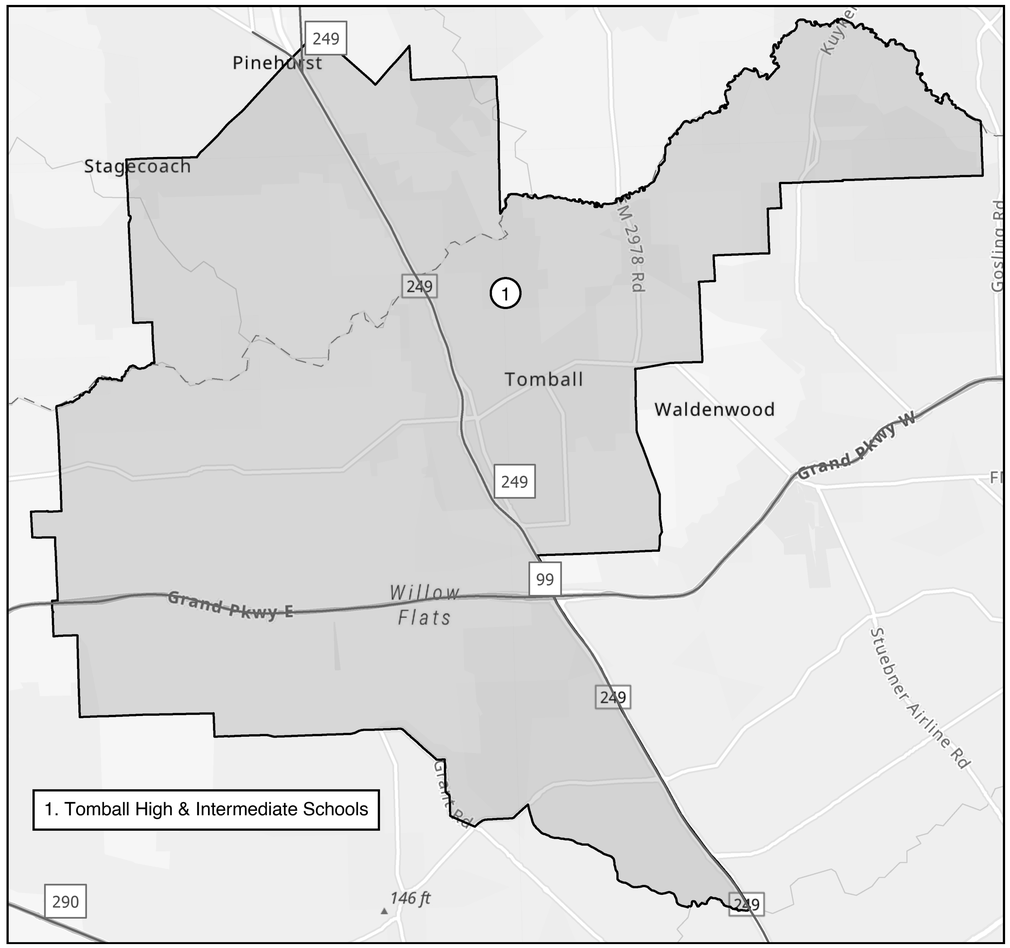
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M3.01	DEMOLITION MECHANICAL PLAN LEVEL 1 - KITCHEN/CAFETERIA - ALT 1
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E6.01	ELECTRICAL DETAILS AND SCHEDULES

VICINITY MAP



DBR
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REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

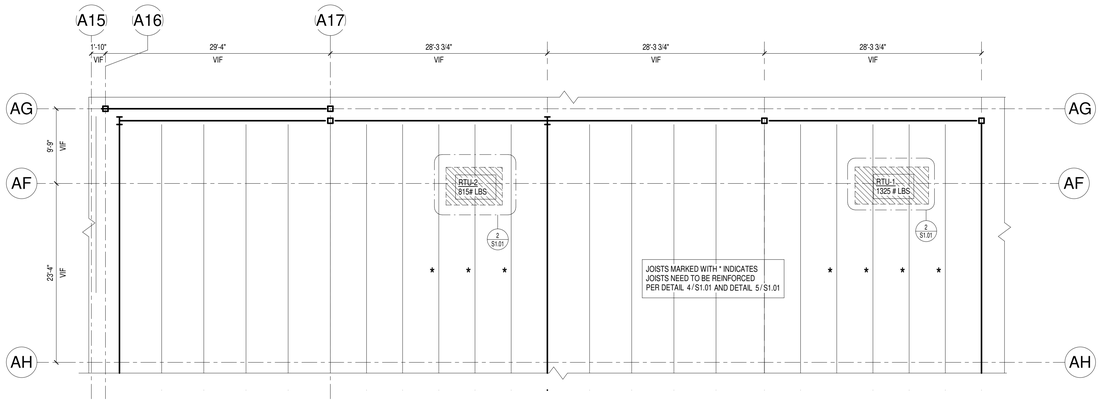
ADAM C. JONES
110008
LICENSED
PROFESSIONAL ENGINEER

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

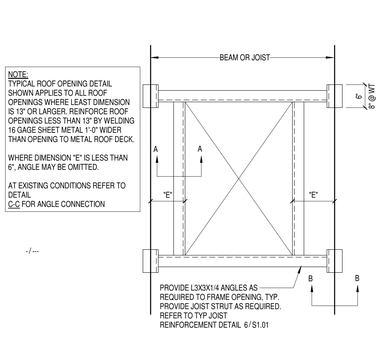
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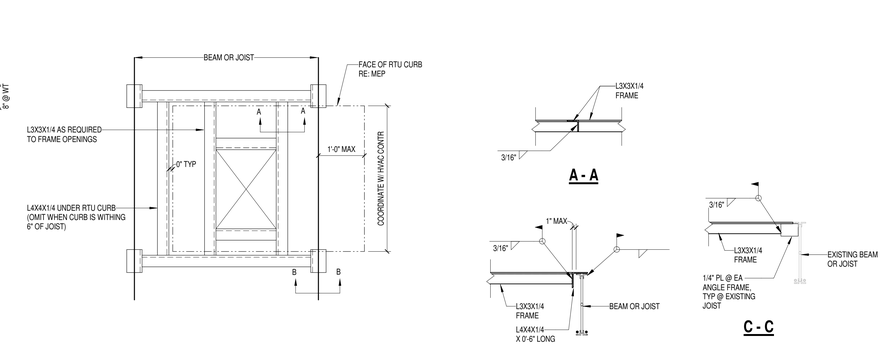
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1 RTU SUPPORT DIAGRAM
1/8" = 1'-0"

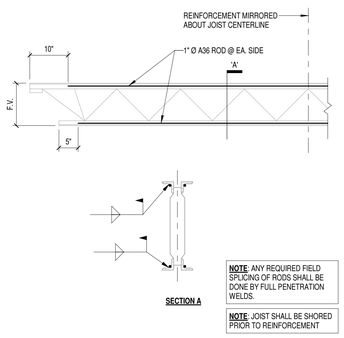


TYPICAL ROOF OPENING - PLAN VIEW

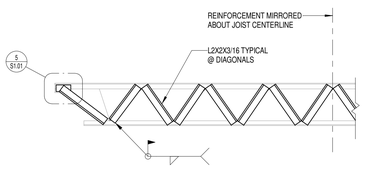


TYPICAL RTU SUPPORT DETAILS

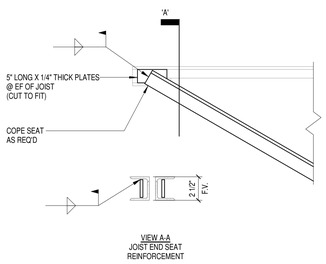
2 TYPICAL RTU CURB OPENING
3/4" = 1'-0"



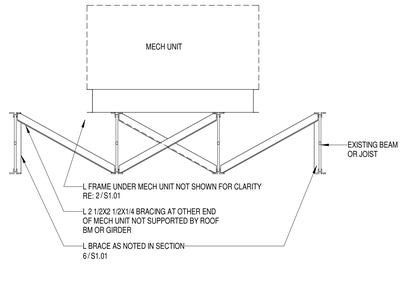
4 EXISTING JOIST SEAT REINFORCING
3/4" = 1'-0"

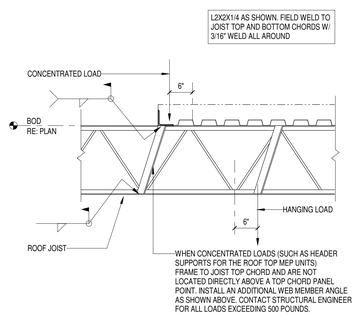


5 EXISTING JOIST SEAT REINFORCING
1 1/2" = 1'-0"



3 JOIST BRIDGING UNDER RTU
3/4" = 1'-0"





6 TYPICAL OFFSET LOAD JOIST SUPPORT
3/4" = 1'-0"

STRUCTURAL CONCEPT, STANDARDS AND LOADS

A. **DESIGN CONCEPT:**
1. THE STRUCTURE AS SHOWN HAS BEEN DESIGNED IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS AND DESIGN STANDARDS TO SUPPORT THE FINAL BUILDING SERVICE LOADS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADDITIONAL SUPPORTS FOR THE STRUCTURE IF NECESSITATED BY THE CONSTRUCTION SEQUENCE OR METHODS OF FABRICATION, HANDLING, ERECTION, AND OTHER CONSTRUCTION OPERATIONS.

B. **BUILDING CODES AND DESIGN STANDARDS:**
1. INTERNATIONAL BUILDING CODE, **IBC 2021** EDITION.
2. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE); MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, **ASCE 7-16**, AS AMENDED.
3. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, **15TH EDITION** (ASD), 2017, AS AMENDED.
4. AMERICAN WELDING SOCIETY (AWS).

C. GRAVITY LOADS:
1. SUPER IMPOSED LOADS ARE GIVEN IN POUNDS PER SQUARE FOOT (PSF)

BUILDING AREA	DEAD LOAD (PSF)	LIVE LOAD (PSF)
ROOF	20	20
MECHANICAL AREAS	10	150 (**)

** EQUIPMENT WEIGHT IF LARGER

D. **LATERAL DESIGN LOADS (ENCLOSED STRUCTURE):**
1. WIND LOADS FOR AN BASIC DESIGN WIND SPEED OF **129** MPH (ASD WIND SPEED OF **100** MPH), 3-SECOND GUST, WITH EXPOSURE **C** AND A RISK CATEGORY **II**.

STRUCTURAL STEEL

A. ROLLED SHAPES:
1. ALL STRUCTURAL STEEL FOR ALL THE HORIZONTAL FRAMING MEMBER SHALL CONFORM TO ASTM A992, GRADE 50, UNLESS OTHERWISE NOTED.
2. ALL STRUCTURAL STEEL FOR HOLLOW STRUCTURAL SECTIONS SHALL CONFORM TO ASTM A500, GRADE B WITH A MINIMUM YIELD OF 46 KSI, UNLESS OTHERWISE NOTED.
3. ALL STRUCTURAL STEEL FOR PIPE SHALL CONFORM TO ASTM A53, TYPE E OR S, GRADE B, UNLESS OTHERWISE NOTED.
4. ALL STRUCTURAL STEEL FOR ANGLES, PLATES AND MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36, UNLESS OTHERWISE NOTED.
5. ALL EXPOSED STEEL TO BE HOT DIPPED GALVANIZED.

B. CONNECTIONS:
1. THE DESIGN OF STRUCTURAL STEEL CONNECTIONS IS THE RESPONSIBILITY OF THE CONTRACTOR AND THE STEEL FABRICATOR. THE DESIGN OF THE CONNECTION SHALL BE PERFORMED BY A REGISTERED PROFESSIONAL ENGINEER EMPLOYED BY THE STEEL FABRICATOR REGISTERED, IN THE JURISDICTION THAT THE PROJECT IS BEING CONSTRUCTED. THE DETAILS AND CALCULATIONS SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
   - ALL WELD SIZES AND LENGTHS
   - ALL BOLT SIZES, LOCATIONS, QUANTITIES AND GRADES
   - ALL PLATE AND ANGLE SIZES, THICKNESS AND DIMENSIONS
   - ALL WORK POINT LOCATIONS AND RELATED INFORMATION.
2. PROVIDE STANDARD BOLTED CONNECTIONS CONFORMING TO AISC BOLTED CONNECTIONS, USING ASTM A325 OR A490 BOLTS, FOR THE BEAM END SHEARS INDICATED IN THE DOCUMENTS. PROVIDE MINIMUM OF TWO BOLTS FOR ALL CONNECTIONS.
3. ALL WELDED CONNECTIONS SHALL CONFORM TO AWS UNLESS OTHERWISE NOTED.
4. SURVEY ALL PLANS, DETAILS, SECTIONS, SCHEDULES AND SPECIFICATIONS FOR SPECIAL CONNECTIONS.
5. WHERE FILLET WELD IS NOT SHOWN ON DETAIL, ITS SIZE SHALL BE ASSUMED TO BE THE PLATE THICKNESS OF THE THINNEST PIECE MINUS 1/16"

C. WELDS:
1. CONFORM TO "CODE FOR WELDING IN BUILDING CONSTRUCTION" BY THE AMERICAN WELDING SOCIETY, LATEST EDITION.
2. WELDS ON INDICATED ON DRAWINGS ARE TO BE FILLET ALL AROUND AS PRESCRIBED BY AISC SPECIFICATION. PROVIDE WELDING OF CONTINUOUS MEMBERS OF 2 INCHES OF 3/16" INCH FILLET STITCH WELDS AT 12 INCHES OC, STAGGERED EACH SIDE, UNLESS OTHERWISE NOTED.
3. FIELD PAINT ALL WELDS W/ "GALVILITE" BY Z.R.C. OR APPROVED EQUAL ARC WELDING ELECTRODES.
4. METAL DECK - E80XX
5. STRUCTURAL STUDS - E6022 OR E6011, 3/32" RODS.
6. ALL OTHER - E70XX LOW HYDROGEN, 250 DEGREE MIN. OVEN TEMP.
7. SIZE - ALL FILLETS ARE 1/16" LESS THAN MINIMUM THICKNESS TO BE WELDED.
8. PROVIDE ULTRASONIC INSPECTION BY THE TESTING LABORATORY FOR ALL WELDS INDICATED AS PENETRATION WELDS.

GENERAL NOTES FOR CONSTRUCTION

A. CONSTRUCTION METHODS, PROCEDURES AND SEQUENCES ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTOR SHALL TAKE ALL THE NECESSARY MEANS TO MAINTAIN AND PROTECT THE STRUCTURAL INTEGRITY OF ALL CONSTRUCTION AT ALL STAGES.

B. ALL PROPOSED SUBSTITUTIONS MUST BE EQUAL OR BETTER AND SHALL BE REVIEWED BY THE ARCHITECT/ENGINEER PRIOR TO ANY PERTINENT WORK AND PRIOR TO THE AWARD OF THE CONTRACT.

C. NOT ALL OPENINGS AND OTHER COMPONENTS THAT ARE REQUIRED HAVE BEEN SHOWN IN THE STRUCTURAL DRAWINGS. COORDINATE WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS AND VERIFY THE LOCATIONS AND SIZES OF ALL CHASES, INSERTS, OPENINGS, SLEEVES, FINISHES, DEPRESSIONS, PADS AND OTHER PROJECT REQUIREMENTS. FLOOR PLAN WILL BE FURNISHED FOR THAT PURPOSE.

D. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE MECHANICAL, ELECTRICAL, PLUMBING AND ARCHITECTURAL DRAWINGS TO DETERMINE WHERE OPENINGS ARE REQUIRED IN REINFORCED CONCRETE BEAMS, SLABS AND WALLS.

E. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, DETAILING ALL THE OPENINGS, INCLUDING ADDED REINFORCEMENT AS SHOWN ON THE TYPICAL WALL, SLAB AND BEAM OPENING DETAILS FOR REVIEW.

F. ADDITIONAL REINFORCEMENT ABOVE THAT SHOWN IN THE TYPICAL SLAB AND BEAM OPENING DETAILS MAY BE REQUIRED AND WILL BE REVIEWED ON THE SHOP DRAWINGS.

G. USE THE MANUFACTURER'S CERTIFIED DRAWINGS AND SPECIFICATIONS FOR THE EQUIPMENT ANCHORAGE AND DETAILS.

H. ALL CONSTRUCTION JOINTS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE INCORPORATED INTO THE STRUCTURE. ADDITIONAL CONSTRUCTION JOINTS TO FACILITATE CONSTRUCTION SHALL BE LOCATED AND DETAILED ON THE SHOP DRAWINGS FOR REVIEW.

I. HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE PERMITTED IN BEAMS UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.

J. ALL CONSTRUCTION AND CONTROL JOINTS FOR BEAMS WHICH ARE EXPOSED TO VIEW ARE TO BE LOCATED TO COINCIDE WITH THE ARCHITECTURAL RUSTICATION JOINTS AS SHOWN ON THE BUILDING ELEVATION SHEETS OR AS REVIEWED IN WRITING.

K. SHOP DRAWINGS:
1. THE TERM "SHOP DRAWINGS" INCLUDES FABRICATION, MANUFACTURING, ERECTION AND SETTING DRAWINGS, BROCHURES, CERTIFICATES, AND PRODUCT DATA DESCRIBING MATERIALS AND EQUIPMENT. SHOP DRAWINGS SHALL INCLUDE ALL PERTINENT INFORMATION REQUIRED FOR THE ENGINEER TO FULLY EVALUATE THE MATERIALS BEING REPRESENTED BY THE SUBMITTAL INCLUDING THE PHYSICAL PROPERTIES, DIMENSIONS, LOCATIONS AND METHOD OF INSTALLATION.
2. SHOP DRAWINGS WILL BEAR THE REVIEW STAMP OF THE CONTRACTOR INDICATING THAT HE HAS REVIEWED THE DRAWINGS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS; COORDINATED ITEMS INCLUDED IN THE SUBMITTAL WITH RELATED ITEMS; AND VERIFIED AND COORDINATED DIMENSIONS.
3. REPRODUCTIONS OF THE ENGINEERING DRAWINGS WILL NOT BE ACCEPTABLE AS SHOP DRAWINGS.
4. ANY SHOP DRAWING NOT CONFORMING TO THESE REQUIREMENTS WILL BE CAUSE FOR REJECTION AND WILL BE RETURNED WITHOUT ANY FURTHER ACTION.
5. STRUCTURAL SUBMITTALS REQUIRED FOR APPROVAL INCLUDE, BUT ARE NOT LIMITED TO:
   - CONCRETE ACCESSORIES (MANUFACTURERS PRODUCT DATA)
   - STEEL REINFORCING
   - CONCRETE MIX DESIGN
   - CONTROL JOINT LAYOUT
   - CONCRETE MATERIAL CERTIFICATES
   - STRUCTURAL STEEL FRAMING
   - STRUCTURAL STEEL CONNECTION CALCULATIONS
   - STEEL ROOF DECK
   - COLD FORMED METAL FRAMING
   - COLD FORMED METAL FRAMING CALCULATIONS
   - MISC. STEEL FABRICATIONS
6. DELEGATED STRUCTURAL DESIGN OF COMPONENTS:
   - SEE APPLICABLE SECTIONS OF GENERAL NOTES FOR THE APPROPRIATE DESIGN RESPONSIBILITIES OF THE SUPPLIER AND IT'S LICENSED ENGINEER.

L. THESE NOTES APPLY TO STRUCTURAL DOCUMENTS SEALED BY THE STRUCTURAL ENGINEER AND ARE INTENDED TO BE COMPLEMENTARY TO AND USED IN CONJUNCTION WITH THE PLANS AND SPECIFICATIONS, INCLUDING THOSE PREPARED BY OTHER DISCIPLINES. CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ARCHITECT/STRUCTURAL ENGINEER IMMEDIATELY. ANY SUCH DISCREPANCIES SHALL BE RESOLVED TO THE MORE STRINGENT REQUIREMENTS, UNLESS OTHERWISE AUTHORIZED BY THE STRUCTURAL ENGINEER.

M. ANY DISCREPANCIES ON THE STRUCTURAL DOCUMENTS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT/STRUCTURAL ENGINEER PRIOR TO SUBMISSION OF BIDS OR PROPOSALS, OR IF NOT REASONABLE DISCERNABLE DURING PREPARATION OF BIDS AND PROPOSALS, BEFORE COMMENCING THE WORK IN QUESTIONS. NO FIELD CHANGES OR DEVIATIONS FROM THE DESIGN ARE TO BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ARCHITECT AND/OR STRUCTURAL ENGINEER. NO CHANGE ORDER CONSIDERATION WILL BE GIVEN TO CHANGES FOR WHICH THE ARCHITECT AND/OR ENGINEER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.

N. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONSTRUCTION, INCLUDING EXISTING WORK, PRIOR TO COMMENCING WORK. ANY DISCREPANCIES SHALL BE REPORT IMMEDIATELY TO THE ARCHITECT/STRUCTURAL ENGINEER.

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REVISION:

No.	DATE	DESCRIPTION
	05/22/2026	ISSUE FOR PROPOSAL

FRED DALLY 90904 REGISTERED PROFESSIONAL ENGINEER
05/22/2026

TOMBALL HIGH SCHOOL RTU ADDITIONS

DATE: 05/26/2026
DRAWN BY: JY
CHECKED BY: LMM
PROJECT NUMBER 26-126-00
SHEET TITLE: PLANS & DETAILS
SHEET NUMBER: S1.01

Dally + ASSOCIATES STRUCTURAL | CIVIL
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t 713 337 8881
Texas Registered Engineering Firm F-003428

D+A PROJECT NO. 26-126

5/20/2026 10:02:51 AM
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ABBREVIATIONS

A

A	AIR (COMPRESSED)
ABV	ABOVE
A/C	AIR CONDITIONING
AC	ALTERNATING CURRENT, AIR COMPRESSOR
ACCH	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR, AREA DRAIN
ADJ	ADJUSTABLE
AF	AIR FILTER
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHRI	AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AMB	AMBIENT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARCH	ARCHITECT, ARCHITECTURAL
AS	AIR SEPARATOR
ASHP	AIR SOURCE HEAT PUMP
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AVG	AVERAGE
AWS	AMERICAN WELDING SOCIETY
AUX	AUXILIARY

B

B	BOILER
BC	BELOW COUNTER
B/C	BACK OF CURB
BFF	BELOW FINISHED FLOOR
BFV	BUTTERFLY VALVE
BLDG	BUILDING
BM	BENCHMARK
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STRUCTURE
BP	BACKFLOW PREVENTER
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE

C

C	CELSIUS
CAB	CABINET
CD	CONDENSATE DRAIN LINE
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CH	CHILLER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CHW	CHILLED WATER
CHWP	CHILLED WATER PUMP
CI	CAST IRON
CIRC	CIRCULATING
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE, CONCENTRIC
COND	CONDENSER, CONDENSATE
CONN	CONNECTION
CONT	CONTINUOUS,CONTINUATION
CTR	CENTER
CU	COPPER
CV	CONSTANT VOLUME

D

D	DEPTH, DRAIN, DRYER
DB	DRY BULB
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DOMB	DUAL DUCT MIXING BOX
DESIG	DESIGNATION
DTL	DETAIL
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DPR	DAMPER
DW	DISHWASHER
DWG	DRAWING
DX	DIRECT EXPANSION

E

EA	EACH
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EDB	ENTERING DRY BULB
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EFF	EFFICIENCY
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EMERG	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETD	EXISTING TO BE DEMOLISHED
ETR	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EVAP	EVAPORATOR
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EX	EXPLOSION PROOF
EXT	EXTERNAL
EXTG	EXISTING

F

F	FAHRENHEIT, FIRE
FBO	FURNISHED BY OTHERS
FCU	FAN COIL UNIT
FD	FLOOR DRAIN, FIRE DAMPER
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FPTU	FAN POWERED TERMINAL UNIT
FT	FOOT, FEET
FUT	FUTURE

G

G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GND	GROUND
GPM	GALLONS PER MINUTE
GUH	GAS UNIT HEATER
GV	GATE VALVE

H

HDT	HORIZONTAL DRAW THROUGH
HORIZ	HORIZONTAL
HP	HORSEPOWER, HEAT PUMP
HSTAT	HUMIDISTAT
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HW	HOT WATER
HWP	HEATING WATER PUMP
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ

I

ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INFRARED HEATER
IN	INCH
INSUL	INSULATION
INT	INTERNAL, INTERIOR

K

KEC	KITCHEN EQUIPMENT CONTRACTOR
KO	KNOCKOUT
KVA	KILOVOLT- AMPS
KW	KILOWATT

L

L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LF	LINEAR FEET
LP	LOW PRESSURE
LRA	LOCKED ROTOR AMPS
LVL	LEVEL
LWB	LEAVING WET BULB
LWCO	LOW WATER CUT OFF
LWT	LEAVING WATER TEMPERATURE

M

MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBTUH	THOUSAND OF BTU'S
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MI	MALLEABLE IRON
MIN	MINIMUM
MP	MEDIUM PRESSURE
MTD	MOUNTED
MU	MAKE-UP
MVD	MANUAL VOLUME DAMPER
MSAH	MINI-SPLIT AIR HANDLER
MSCU	MINI-SPLIT CONDENSING UNIT
MZ	MULTI-ZONE

N

N.C.	NORMALLY CLOSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE

O

OA	OUTSIDE AIR
OAF	OUTSIDE AIR FAN
OAHU	OUTSIDE AIR HANDLING UNIT
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN
OFCU	OUTSIDE AIR FAN COIL UNIT
OPG	OPENING
OS&Y	OUTSIDE SCREW AND YOKE

P

PG	PRESSURE GAUGE
PP	POLYPROPYLENE
PPM	PART PER MILLION
PRI	PRIMARY
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE

Q

QTY	QUANTITY

R

RA	RETURN AIR
RAD	REFRIGERATED AIR DRYER
RAF	RETURN AIR FAN
RAG	RETURN AIR GRILLE
RAT	RETURN AIR TEMPERATURE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RE	REFERENCE, REFER
RED	REDUCER
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCING
REQD	REQUIRED
REV	REVISION, REVISE
RH	RELATIVE HUMIDITY
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RV	RELIEF VALVE

S

SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SAG	SUPPLY AIR GRILLE
SAR	SUPPLY AIR REGISTER
SC	STEAM CONDENSATE
SCHED	SCHEDULED
SEC	SECONDARY
SECT	SECTION
SENS	SENSIBLE
SF	SQUARE FEET
SFCS	SPRINKLER FLOOR CONTROL STATION
SH	SHOWER
SHT	SHEET
SIM	SIMILAR
SM	SHEETMETAL
SP	STATIC PRESSURE, SUMP PUMP
SPEC	SPECIFICATION
SPR	SPRINKLER
SQ	SQUARE
SS	STAINLESS STEEL
SSSC	SOLID STATE SPEED CONTROL
STD	STANDARD
STL	STEEL
STM	STEAM
STR	STRAINER
SURF	SURFACE
SUSP	SUSPEND
SV	SANITARY VENT
SW	SOFT WATER
SZ	SINGLE ZONE

T

TC	TEMPERATURE CONTROL
TDH	TOTAL DYNAMIC HEAD
TF	TRANSFER FAN
TH BLK	THRUST BLOCK
THERM	THERMOMETER
TMV	THERMOSTATIC MIXING VALVE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TW	TEMPERED HOT WATER
TYP	TYPICAL

U

UCD	UNDER CUT DOOR
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC
UNO	UNLESS NOTED OTHERWISE
U/F	UNDERFLOOR
U/S	UNDERSLAB

V

V	VOLT
VA	VOLT- AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VALVE BOX, VACUUM BREAKER
VD	VOLUME DAMPER
VDT	VERTICAL DRAW THROUGH
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VIB	VALVE IN BOX
VOV	VALVE ON VERTICAL
VP	VACUUM PUMP
VRF	VARIABLE REFRIGERANT FLOW
VVR	VARIABLE AIR VOLUME REHEAT

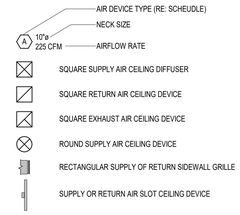
W

W	WATT, WIDTH
W/	WITH
W/O	WITHOUT
WB	WET BULB
WM	WATER METER
WP	WEATHERPROOF
WPD	WATER PRESSURE DROP
WSHP	WATER SOURCE HEAT PUMP
WWF	WELDED WIRE FABRIC

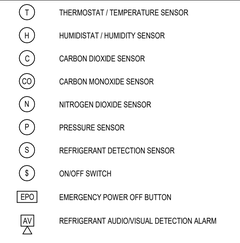
Z

Z	ZONE

AIR DEVICE TYPES



WALL MOUNTED SENSOR AND DEVICE TYPES



CONTROLS SCHEMATIC SYMBOLS LEGEND

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

PIPING TYPES

CD	CONDENSATE DRAIN LINE	REF	REFRIGERANT PIPING SIZED BY MFR.
CHS	CHILLED WATER SUPPLY	HPS	HIGH PRESSURE STEAM SUPPLY
CHR	CHILLED WATER RETURN	HPR	HIGH PRESSURE CONDENSATE RETURN
HWS	HOT WATER SUPPLY	LPS	LOW PRESSURE STEAM SUPPLY
HWR	HOT WATER RETURN	LPR	LOW PRESSURE CONDENSATE RETURN
CWS	CONDENSER WATER SUPPLY	PCR	PUMPED CONDENSATE RETURN
CWR	CONDENSER WATER RETURN		

DESIGN CRITERIA

LOCATION:
30330 Quinn Rd, Tomball, TX 77375

ELEVATION: 152 FEET

DESIGN CONDITIONS:

HEATING DB:	29.8 °F (ASHRAE 99.6%)
COOLING DB / WB:	98.1°F / 75.9 °F (ASHRAE 0.4%)
DEHUMIDIFICATION DP / DB:	78.7 °F / 82.5 °F (ASHRAE 0.4%)

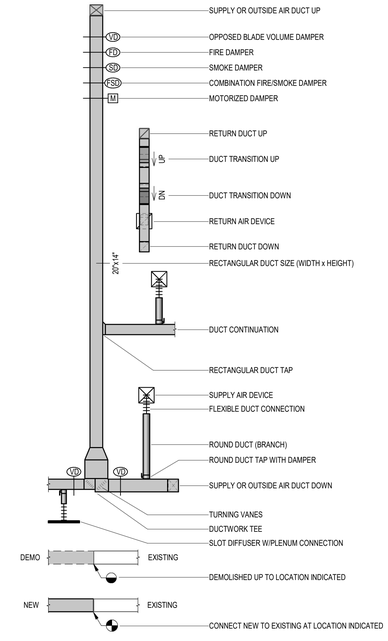
SPACE INDOOR DESIGN TEMPERATURE:

HEATING DB:	70 °F
COOLING DB:	75 °F
RELATIVE HUMIDITY	55%

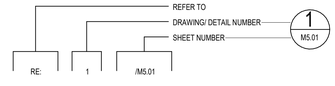
BUILDING CODES & STANDARDS

APPLICABLE CODES:
2021 INTERNATIONAL BUILDING CODE
2021 INTERNATIONAL FIRE CODE
2021 INTERNATIONAL MECHANICAL CODE
2021 INTERNATIONAL ENERGY CONSERVATION CODE
2021 NATIONAL ELECTRICAL CODE

DUCTWORK



DRAWING/DETAIL REFERENCE KEY



DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SYMBOL LEGEND

SHEET NUMBER: M0.01

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

DEMOLITION & RENOVATION MECHANICAL GENERAL NOTES

A. MECHANICAL DEMOLITION DRAWINGS ARE GENERALLY DIAGRAMMATIC AND IT IS THE INTENT AND MEANING OF THE CONTRACT DOCUMENTS THAT ALL MECHANICAL SYSTEMS SHALL REMAIN UNLESS NOTED TO BE REMOVED OR DEMOLISHED. VERIFY EXACT LOCATIONS AND CONDITIONS AND COORDINATE WITH GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO REMOVING ANY EXISTING ITEMS. DO NOT ABANDON ANY ITEMS IN PLACE.

B. EQUIPMENT, DUCTWORK, PIPING, ETC. INDICATED AS EXISTING (E) SHALL REMAIN AND BE RE-USED IN EXISTING LOCATIONS. IF EXISTING ITEMS CONFLICT WITH NEW CONSTRUCTION, CONTRACTOR SHALL RELOCATE, REWORK, REROUTE, RECONNECT, AND REINSTALL COMPLETELY AS REQUIRED AS IF NEW AT NO ADDITIONAL COST. COORDINATE WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE, ETC. PRIOR TO RELOCATION. REFER TO APPLICABLE NOTES FOR NEW ITEMS.

C. EQUIPMENT, DUCTWORK, PIPING ETC. INDICATED AS EXISTING TO BE DEMOLISHED (D) SHALL BE REMOVED IN THEIR ENTIRETY. ALL APPURTENANCES, RELATED COMPONENTS, INCLUDING ALL DUCTWORK, PIPING, SUPPORTS, HANGERS, CONTROLS, ETC. ASSOCIATED WITH EACH ITEM SHALL BE REMOVED UNLESS NOTED OTHERWISE. CAP ALL DUCTWORK AND PIPING AS REQUIRED SERVING EACH ITEM AT BUILDING MAINS. VERIFY EXACT LOCATIONS AND CONDITIONS AND COORDINATE WITH GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO REMOVING ANY EXISTING ITEMS. DO NOT ABANDON ANY ITEMS IN PLACE.

D. WHERE CONSTRUCTION, EXISTING DUCTWORK, MECHANICAL / PLUMBING / FIRE SPRINKLER PIPING, ELECTRICAL CONDUIT, CABLING, ETC. WHICH MUST REMAIN AS PART OF AN ACTIVE SYSTEM CONFLICTS WITH NEW CONSTRUCTION, CONTRACTOR SHALL RELOCATE, REWORK, REROUTE, RECONNECT, AND REINSTALL COMPLETELY AS REQUIRED AS IF NEW AT NO ADDITIONAL COST. COORDINATE WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE, ETC. PRIOR TO RELOCATION. REFER TO APPLICABLE NOTES FOR NEW ITEMS.

E. CONTRACTOR SHALL COORDINATE WITH EACH TRADE CONTRACTOR FOR REMOVAL OF EXISTING ELECTRICAL AND PLUMBING SERVICES INCLUDING ALL CONDUIT, WIRING, PIPING, INSULATION, APPURTENANCES, RELATED COMPONENTS, ETC. ASSOCIATED WITH REMOVAL OF EXISTING MECHANICAL EQUIPMENT. VERIFY EXACT LOCATIONS AND CONDITIONS AND COORDINATE WITH GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO REMOVING ANY EXISTING ITEMS. DO NOT ABANDON ANY ITEMS IN PLACE.

F. THESE DRAWINGS WERE PREPARED FROM THE BEST INFORMATION AVAILABLE. ORIGINAL DRAWINGS, FIELD OBSERVATIONS, ETC., BUT MAY NOT INDICATE THE EXACT LOCATION OF ALL EXISTING MECHANICAL COMPONENTS. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE EXISTING CONDITIONS SURROUNDING THE INSTALLATION OF THEIR WORK PRIOR TO PROCEEDING WITH THE INSTALLATION. MODIFICATIONS REQUIRED DUE TO EXISTING CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER / OWNER FOR REVIEW BY WAY OF SHOP DRAWINGS OR SKETCHES DETAILING THE EXISTING CONDITIONS AND THE PROPOSED REVISION.

G. CONTRACTOR SHALL BE RESPONSIBLE TO VISIT THE JOBSITE, COMPLETELY REVIEW CONTRACT DOCUMENTS, AND FIELD VERIFY EXTENT OF WORK AND EXACT LOCATIONS AND CONDITIONS OF ALL NEW AND EXISTING CONSTRUCTION, ELEVATIONS, SERVICE POINTS, ETC. AS REQUIRED FOR A COMPLETE AND CORRECTLY OPERATING SYSTEM. CONTACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE, AND REPORT IN WRITING ANY CONFLICTS, PROBLEMS, OR ANY CONDITION THAT MAY ADVERSELY AFFECT THE PROPER EXECUTION OF THE WORK THAT IS NOT INDICATED ON THE DRAWINGS. THIS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR MAKING ANY CORRECTIONS OR ALTERATIONS DEEMED NECESSARY TO COMPLETE THE WORK AND SHALL INCLUDE ALL ASSOCIATED COSTS IN THEIR BID WITH NO ADDITIONAL EXPENSE.

H. CONTRACTOR SHALL COORDINATE ALL CUTTING AND PATCHING OF EXISTING WALLS, CEILINGS, ROOF AND FLOOR REQUIRED FOR THEIR WORK WITH GENERAL CONTRACTOR, STRUCTURAL ENGINEER, AND OWNER'S REPRESENTATIVE. ALL PENETRATIONS SHALL BE SEALED AND RESTORED TO THE ORIGINAL CONDITIONS, STRUCTURAL PROPERTIES, AND FINISHED IN SAME MATERIALS AND MANNER AS ADJACENT AREAS. ALL ROOF PENETRATIONS, ROOF PIPE SUPPORTS, FLASHINGS, ETC. SHALL BE MADE WATERTIGHT AND AS RECOMMENDED BY THE ROOF MANUFACTURER. ALL EXISTING PENETRATIONS WHICH ARE NOT TO BE REUSED SHALL BE PROPERLY SEALED OFF TO MAINTAIN THE STRUCTURAL, WATERPROOF, AND FIREPROOF INTEGRITY OF THE WALL, FLOOR, OR ROOF SYSTEM PENETRATED.

J. COORDINATE ALL RENOVATIONS / REMODEL / DEMOLITION WORK WITH THE OWNER'S REPRESENTATIVE, BUILDING ENGINEER / MAINTENANCE PERSONNEL AND OTHER TRADES PERFORMING WORK IN THE BUILDING PRIOR TO THE REMOVAL OF ANY ITEMS OF MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT, FIXTURES, OR SYSTEMS THAT WILL AFFECT OTHER SYSTEM WITHIN THE AREA OF CONSTRUCTION, OR OTHER AREAS OF THE BUILDING. CONTRACTOR SHALL NOTE THAT THE BUILDING IS OCCUPIED, AND WILL REMAIN SO DURING CONSTRUCTION; AND, THEREFORE, UTILITIES / BUILDING SYSTEMS MUST REMAIN IN OPERATION. ANY REQUIRED OUTAGES MUST BE COORDINATED WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE AND BUILDING ENGINEER / MAINTENANCE PERSONNEL. PROVIDE TEMPORARY CONNECTIONS OF UTILITIES AND AIR CONDITIONING AS NECESSARY TO FACILITATE THE PHASING OF CONSTRUCTION.

K. ALL WORK SHALL BE SCHEDULED AND PERFORMED IN STRICT COORDINATION WITH CONSTRUCTION PHASING AND WITH OWNERS' SCHEDULES, OCCUPANCIES, ETC. PROVIDE ADDITIONAL VALVES, TAPS, TEMPORARY DUCTWORK, PIPING, ETC. AS NECESSARY TO PROVIDE UNINTERRUPTED SERVICE TO AREAS OUTSIDE OF THE PHASE IN WHICH WORK IS BEING PERFORMED. ALL NECESSARY SHUTDOWNS OR OUT OF PHASE WORK SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE.

L. PRIOR TO THE REMOVAL OF ANY MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT, FIXTURES, OR SYSTEMS, THE CONTRACTOR MUST VERIFY THE ORIGIN AND TERMINATION OF THOSE SYSTEM AND CONFIRM THAT THE ITEMS BEING REMOVED DO NOT SERVE ANY ITEMS THAT ARE TO REMAIN (INCLUDING THOSE IN AREAS OUTSIDE THE CONTRACT LIMITS). WHEN RENOVATION / REMODEL / DEMOLITION WORK IS PERFORMED, THE CONTRACTOR SHALL EXERCISE CARE IN PROTECTING EXISTING ITEMS TO REMAIN AND EXISTING ITEMS TO BE REMOVED AND RELOCATED. PROTECT ALL EXISTING BUILDING COMPONENTS, WALLS, FLOORS, FINISHES, FURNISHINGS, ADJACENT EQUIPMENT, LIGHTING, ETC. ANY ITEMS DAMAGED OR WHERE FINISHES HAVE BEEN MARRIED, SHALL BE REPAIRED AND REFINISHED TO ORIGINAL CONDITION AT NO COST TO THE OWNER. ALL ITEMS SOILED IN THE PROGRESS OF THE WORK SHALL BE CLEANED TO THEIR PRE- EXISTING CONDITIONS.

M. ALL EXISTING EQUIPMENT REMOVED SHALL BE PROTECTED FROM DAMAGE IN SO FAR AS PRACTICAL. THESE ITEMS SHALL BE STORED ON SITE FOR A MINIMUM OF TWO (2) WEEKS UNLESS INDICTED OTHERWISE BY THE OWNER'S REPRESENTATIVE TO ALLOW INSPECTION BY THE OWNER. ALL ITEMS RETAINED BY THE OWNER SHALL BE TAGGED AND STORED ON SITE UNTIL DIRECTED OTHERWISE BY OWNER. ALL ITEMS NOT RETAINED BY THE OWNER SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE AND DISPOSED OF PROPERLY.

N. REWORK AND REPAIR ALL DUCTWORK AND PIPING INSULATION DAMAGED OR REMOVED DURING RENOVATION / REMODEL / DEMOLITION AS REQUIRED TO MATCH EXISTING.

O. EQUIPMENT INGRESS AND EGRESS ROUTES FOR THE RENOVATION WORK SHALL BE COORDINATED WITH THE OWNER. COORDINATE TIMES, DATES, AND DURATIONS WITH OWNER A MINIMUM OF 2 WEEKS IN ADVANCE TO ENSURE THERE ARE NO CONFLICTS IN USAGE OF EQUIPMENT/SPACES.

P. ALL EXISTING EQUIPMENT THAT INCLUDES A REFRIGERATION CIRCUIT THAT IS TO BE DEMOLISHED OR RELOCATED SHALL HAVE THE REFRIGERANT CHARGE RECOVERED PRIOR TO DEMOLITION OR RELOCATION. REFRIGERANT RECOVERY SHALL COMPLY WITH EPA, STATE, AND LOCAL JURISDICTION REQUIREMENTS. RECOVERED REFRIGERANTS SHALL NOT BE USED IN ANY SYSTEM, NEW OR EXISTING, UNLESS THE REFRIGERANT HAS BEEN RECLAIMED AND FOUND TO MEET THE PURITY REQUIREMENTS OF AHRI 700.

Q. EXISTING EQUIPMENT BEING RELOCATED SHALL BE VERIFIED TO BE IN PROPER OPERATING CONDITION PRIOR TO EQUIPMENT RELOCATION. VERIFICATION SHALL BE PERFORMED BY EQUIPMENT MANUFACTURER'S AUTHORIZED SERVICE REPRESENTATIVE. IF EXISTING EQUIPMENT IS FOUND TO BE DEFICIENT, THE SERVICE REPRESENTATIVE SHALL NOTIFY THE ENGINEER AND OWNER AND PROVIDE RECOMMENDATIONS TO RESTORE EQUIPMENT TO PROPER OPERATING CONDITION.

MECHANICAL GENERAL NOTES

A. MECHANICAL DRAWINGS AND SPECIFICATIONS ARE DIAGRAMMATIC IN NATURE AND INTENDED TO DESCRIBE AND ILLUSTRATE SYSTEMS THAT WILL NOT INTERFERE WITH THE ARCHITECTURAL / STRUCTURAL CONDITIONS OF THE BUILDING AND WILL FIT INTO AVAILABLE SPACES. CONTRACTOR SHALL COORDINATE ALL WORK TO CONFORM TO THE ARCHITECTURAL, STRUCTURAL, FINISH CONDITIONS, EQUIPMENT MANUFACTURER / FIXTURE CUTSHEETS AND WITH OTHER TRADES, TO AVOID OBSTRUCTIONS, AND TO ALLOW THE PROPER INSTALLATION OF EACH ITEM. EQUIPMENT SIZES, DIMENSIONS, AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE MANUFACTURER'S DRAWINGS AND CUTSHEETS PRIOR TO FABRICATING OF DUCTWORK, PIPING, OR POURING OF CONCRETE HOUSEKEEPING PADS. CONTRACTOR SHALL OBTAIN ALL ARCHITECTURAL DRAWINGS AND STRUCTURAL DATA, LOCATIONS OF PIERS, BEAMS, COLUMNS, JOISTS, ETC., FROM STRUCTURAL DRAWINGS AND PROVIDE OFFSETS, RELOCATIONS, ETC., AS REQUIRED TO MEET THIS INTENT AT NO ADDITIONAL COST. PROVIDE ALL NECESSARY PIPING, DUCTWORK, FITTING, INSULATION, AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.

B. CONTRACTOR SHALL BE RESPONSIBLE TO EXAMINE ALL THE CONTRACT DOCUMENTS CAREFULLY BEFORE SUBMITTING THEIR BID. WITH PARTICULAR ATTENTION TO ERRORS, OMISSIONS, CONFLICTS WITH PROVISIONS OF LAWS AND CODES HAVING JURISDICTION, CONFLICTS BETWEEN DRAWINGS OR DRAWINGS AND SPECIFICATIONS, AND AMBIGUOUS DEFINITION OF THE EXTENT OF COVERAGE BETWEEN CONTRACTS. ANY SUCH DISCREPANCY SHALL BE BROUGHT IMMEDIATELY TO ATTENTION FOR CORRECTION. SHOULD ANY OF THESE ERRORS, OMISSIONS, CONFLICTS, OR AMBIGUITIES EXIST, THE CONTRACTOR SHALL HAVE THEM EXPLAINED AND AT THEIR EXPENSE, SUPPLY THE PROPER MATERIALS AND LABOR TO MAKE GOOD ANY DAMAGE OR DEFECTS IN THEIR WORK OR THE RESULTS OBTAINED THEREFORE, CAUSED BY SUCH DISCREPANCY. THE CONTRACTOR SHALL MAKE A CAREFUL EXAMINATION OF THE PREMISES AND THOROUGHLY FAMILIARIZE THEMSELF WITH THE REQUIREMENTS OF THE CONTRACT. UPON COMMENCEMENT OF THE CONSTRUCTION FOR THE WORK INCLUDED IN THIS CONTRACT, THE CONTRACTOR SHALL BE DEEMED TO HAVE MADE SUCH A STUDY OR EXAMINATION AND ACCEPTS ALL CONDITIONS.

C. WHEREVER CONFLICTS OCCUR BETWEEN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS (SUCH AS DRAWINGS AND SPECIFICATIONS), THE GREATER QUANTITY, THE BETTER QUALITY, THE LARGER SIZE, OR THE VALUE WITH THE GREATEST COST IMPACT SHALL PREVAIL UNLESS THE ARCHITECT INFORMS THE CONTRACTOR OTHERWISE IN WRITING. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING DATA: DIMENSIONS, GAUGE THICKNESS, TEMPERATURES, PRESSURE, BTUH, SCHEDULE / TIME DURATION, ELECTRICAL RATING, MATERIAL, SAFETY RATING, ENERGY EFFICIENCY, ETC.

D. CONTRACTOR SHALL PROVIDE A MECHANICAL INSTALLATION THAT IS COMPLETE AND ALL ITEMS AND APPURTENANCES NECESSARY, REASONABLY INCIDENTAL, OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM IS NOT SPECIFICALLY CALLED OUT OR SHOWN. THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIALS, LABOR, SUPERVISION AND SERVICE NECESSARY SO AS TO PROVIDE A COMPLETE, FUNCTIONING MECHANICAL SYSTEM.

E. ALL EQUIPMENT, PIPING, DUCTWORK, ETC. SHALL BE LOCATED APPROXIMATELY IN GENERAL LOCATIONS SHOWN AND SHALL CONFORM TO ALL ARCHITECTURAL AND STRUCTURAL CONDITIONS. PROVIDE ANY ADDITIONAL SUPPORTS, HANGERS, OPENINGS, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS. PIPING THAT ACCESS PANELS ARE NOT BLOCKED. EXPERIENCED CRAFTSMEN SHALL MAKE THE INSTALLATION OF ALL EQUIPMENT IN A NEAT WORKMANSHIP-LIKE MANNER. EQUIPMENT SHALL BE AS SCHEDULED OR APPROVED EQUAL. EQUIPMENT SHALL BE INSTALLED IN FULL ACCORDANCE WITH ALL APPLICABLE CODES HAVING JURISDICTION. COORDINATE BETWEEN ALL TRADES PRIOR TO STARTING ANY WORK. PROVIDE ADEQUATE CLEARANCE FOR PROPER OPERATION, SERVICE/ MAINTENANCE, AIR FLOW, ETC. PIPING AND DUCTWORK ARE NOT PERMITTED IN ELECTRICAL, ELEVATOR MACHINE, TELECOM, IT, AND COMMUNICATION ROOMS. ALL ELEVATIONS INDICATED IN THIS WAY (8' – 4") ARE THE ELEVATIONS FROM THE FINISHED FLOOR DIRECTLY BELOW TO THE BOTTOM OF THE BARE PIPE OR DUCT.

F. EXECUTE ALL WORK FOLLOWING LOCAL, STATE AND/OR NATIONAL CODES, ORDINANCES AND REGULATIONS GOVERNING THE PARTICULAR CLASS OF WORK INVOLVED. THE GOVERNING CODES ARE MINIMUM REQUIREMENTS. THE DRAWINGS AND/OR SPECIFICATIONS SHALL PREVAIL WHERE THE DRAWINGS ARE/OR ACCOMPANYING SPECIFICATIONS EXCEED THE CODE REQUIREMENTS.

G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FILING AND PAYING ALL FEES AND OBTAINING NECESSARY PERMITS AND CERTIFICATES OF INSPECTION. THE CONTRACTOR SHALL DELIVER ALL CERTIFICATES OF INSPECTION TO OWNER/CONSTRUCTION MANAGER INCLUDING COPIES WITH MAINTENANCE MANUALS.

H. CONTRACTOR SHALL PROVIDE DETAILED AND DIMENSIONED HVAC DUCTWORK AND PIPING FABRICATION SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER, DURING THE INSTALLATIONS OF THE WORK, THE CONTRACTOR SHALL KEEP DETAILED RECORDS OF ANY AND ALL CHANGES MADE FROM THE WORK AS ACTUALLY INSTALLED. THESE RECORD DRAWINGS SHALL BE NOTED "AS-BUILT", AND SUBMITTED TO THE ARCHITECT / ENGINEER FOR REVIEW WITH ALL O&M MANUALS.

I. PROPERLY SUPPORT ALL EQUIPMENT, DUCTWORK AND PIPING WITHIN THE BUILDING AND PROVIDE ADEQUATE PROVISIONS FOR SLOPE AND ANCHORAGE. CONTRACTOR SHALL USE HANGERS, RODS AND INSERTS LISTED BY UNDERWRITERS' LABORATORIES FOR THE SERVICE INTENDED, SECURELY SUPPORTED BY STRUCTURAL MEMBERS WHICH IN TURN ARE SUPPORTED DIRECTLY FROM THE BUILDING STRUCTURE.

J. CLEARANCE REQUIREMENTS BETWEEN MECHANICAL COMPONENTS AND SWITCHBOARDS, PANELBOARDS, POWER PANELS, MOTOR CONTROL CENTERS AND TRANSFORMERS SHALL CONFORM TO THE LATEST VERSION OF THE NATIONAL ELECTRICAL CODE.

K. DUCTWORK AND PIPING SHALL BE INSTALLED CONCEALED ABOVE CEILINGS, INSIDES CHASES / WALLS, ETC. IN GENERAL LOCATIONS SHOWN, UNLESS NOTED OTHERWISE. CONFORM TO ALL ARCHITECTURAL, STRUCTURAL, AND FINISH CONDITIONS OF THE BUILDING. WHEREVER CONDITIONS ARISE WHICH WILL CAUSE NORMALLY CONCEALED MATERIALS TO BE EXPOSED, IMMEDIATELY CALL THIS TO THE ATTENTION OF THE ARCHITECT AND STOP WORK IN THOSE AREAS UNTIL THE ARCHITECT DIRECTS THE RESUMPTION OF THE WORK AND THE PROCEDURES TO BE FOLLOWED. ALL DUCTWORK, PIPING AND ASSOCIATED ACCESSORIES IN OCCUPIED AREAS THAT ARE EXPOSED TO VIEW SHALL BE PAINTED. REFER TO ARCHITECT FOR COLOR. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE DIMENSIONS. IN ANY CASE WHERE A PIPE OR DUCT SHOWN ON THE PLAN SHEET DIFFERS FROM THAT SHOWN IN A SCHEMATIC OR DETAIL, PROVIDE THE LARGER OF THE TWO SIZES SHOWN.

L. SLOPE AND ARRANGE HVAC PIPING TO ESTABLISH HIGH POINTS FOR AIR ELIMINATION AND LOW POINTS TO PERMIT PROPER DRAINAGE. PROVIDE AIR VENTS AT HIGH POINTS AND DRAIN VALVES AT LOW POINTS. ALL PIPING SHOWN ON FLOOR PLANS SHALL BE ROUTED ABOVE THE CEILING ON THE FLOOR WHERE IT IS SHOWN, UNLESS OTHERWISE NOTED. ARRANGE PIPING CONNECTIONS TO ALL EQUIPMENT TO ALLOW EASY REMOVAL OF EQUIPMENT, COILS, FANS, MOTORS, FILTERS, ACCESS PANELS, ETC. PROVIDE UNIONS, FLANGES, AND VALVES AT CONNECTIONS. ALL EXTERIOR PIPING SHALL BE INSULATED AND JACKETED. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. PIPING RUN-OUTS TO TERMINAL UNITS SHALL BE 3/4" UNLESS OTHERWISE NOTED. MINIMUM PIPE SIZE FOR THE PROJECT SHALL BE 3/4".

M. WALL MOUNTED THERMOSTATS / HUMIDISTATS / SENSORS SHALL BE MOUNTED AT 42" A.F.F. APPROX. WHERE INDICATED ON PLANS, UNLESS OTHERWISE NOTED. SENSOR LOCATION SHALL BE MAX 12" FROM END OF WALL AND/OR DOOR JAMB. COORDINATE EXACT LOCATIONS WITH ARCHITECT, ELECTRICAL CONTRACTOR, AND BETWEEN OTHER TRADES PRIOR TO MOUNTING. DO NOT MOUNT ABOVE DIMMERS. THERMOSTATS ON EXTERIOR WALLS OR WALLS SEPARATING CONDITIONED SPACE FROM UNCONDITIONED SPACE SHALL BE INSULATED. THERMOSTATS / HUMIDISTATS / SENSORS SHALL NOT BE INSTALLED ON DECORATIVE WALLS.

N. FIRE, SMOKE, AND FIRE/SMOKE DAMPERS SHALL BE INSTALLED AS INDICATED AND WHERE OTHERWISE REQUIRED BY LOCAL CODES AND ORDINANCES. REFER TO ARCHITECTURAL DRAWINGS / BUILDING CODE SUMMARY / LIFE SAFETY PLANS FOR LOCATIONS OF ALL FIRE RESISTANT / RATED WALLS, CEILINGS, CHASES, SHAFTS, SMOKE COMPARTMENTS, AND LOCATIONS OF EGRESS CORRIDORS. DAMPER SIZES INDICATED ARE CLEAR INSIDE AIRSTREAM DIMENSIONS. PROVIDE MEANS TO ADEQUATELY SERVICE THE DAMPER'S FUSIBLE LINKS. PROVIDE 12" X 12" MINIMUM METAL ACCESS DOORS IN ALL GYPBOARD AND PLASTER CEILINGS. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND UL LISTING FOR SERVICE INTENDED. PROVIDE METAL SLEEVES AS REQUIRED. PROVIDE ACCESS DOORS IN DUCTWORK AT ALL FIRE, SMOKE, AND FIRE/SMOKE DAMPERS. ALL SMOKE AND FIRE/SMOKE DAMPERS REQUIRE INTEGRAL SMOKE DETECTORS AND SHALL BE INSTALLED BY THE MECHANCIAL CONTRACTOR. IDENTIFY ACCESS DOORS IN ACCORDANCE WITH SPECIFICATIONS AND CODE.

O. ALL DUCTWORK AND ASSOCIATED ACCESSORIES SHALL BE CONSTRUCTED TO MEET THE LATEST SMACNA STANDARDS FOR HVAC DUCT CONSTRUCTION. IN NO CASE SHALL THE DUCTWORK BE LESS THAN 26 GAUGE FOR LOW PRESSURE DUCTWORK AND 24 GAUGE FOR MEDIUM PRESSURE DUCTWORK. ALL DUCTWORK SHALL BE CONSTRUCTED TO SEAL CLASS 'A' AS REFERENCED IN SMACNA STANDARDS. ALL NON-WELDED JOINTS AND SEAMS SHALL BE SEALED. THIS INCLUDES BUT IS NOT LIMITED TO TRANSVERSE JOINTS, LONGITUDINAL SEAMS, DUCT WALL PENETRATIONS, SPIN-INS, TAPS, AND OTHER BRANCH CONNECTIONS, ACCESS DOORS, ACCESS PANELS, AND DUCT CONNECTIONS TO EQUIPMENT. OPENINGS FOR ROTATING SHAFTS SHALL ALSO BE SEALED WITH BUSHINGS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

P. ALL OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR DUCTWORK AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND SHALL BE INSULATED WITH A MINIMUM OF R-8 INSULATION WHERE LOCATED OUTSIDE THE BUILDING. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

Q. CEILING-MOUNTED AIR DEVICES SHALL BE LOCATED APPROXIMATELY AS SHOWN. COORDINATE FRAME MOUNTING TYPES FOR AIR DEVICES WITH CEILING TYPES INDICATED ON ARCHITECTURAL REFLECTED CEILING PLAN. ALL CEILING DIFFUSERS TO BE 4-WAY TYPE, UNLESS NOTED OTHERWISE BY AIRFLOW ARROWS ON FLOOR PLAN. INSULATE THE BACKSIDE OF ALL CEILING AIR DEVICES. REFER TO PLANS AND AIR DEVICE SCHEDULE FOR SIZE OF DUCT RUNOUT AND AIR DEVICE CONNECTION SIZE. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR LOCATIONS, OF ALL CEILING FEATURES, LIGHTS, AIR DEVICES, FINISHES, CEILING HEIGHTS AND ELECTRICAL DRAWINGS FOR SPEAKERS, DETECTORS, POWER OUTLETS, ETC, AND FIRE PROTECTION SHOP DRAWINGS FOR FIRE SPRINKLER HEADS. COORDINATE FINAL LOCATIONS WITH EXISTING CONDITIONS AND BETWEEN TRADES PRIOR TO MOUNTING. ALL CEILING MOUNTED AND WALL MOUNTED AIR DEVICE FINISHES SHALL MATCH ADJACENT ARCHITECTURAL SURFACE UNLESS OTHERWISE INDICATED. CONTRACTOR SHALL COORDINATE COLOR WITH OWNER.

R. BRANCH DUCT RUN-OUTS TO AIR DEVICES SHALL BE SAME SIZE AS NECK, UNLESS NOTED OTHERWISE. PROVIDE A SPIN-IN TAP WITH MANUAL VOLUME DAMPER AT MAIN DUCT TAP AND EXTEND AS SHOWN. EXTEND FLEX DUCTWORK A MAXIMUM OF 5'-0" FROM AIR DEVICES. INSTALL AS STRAIGHT AS POSSIBLE WITH LONG RADIUS BENDS WITH CLAMPS TO BE USED AT BOTH ENDS. ALL DAMPERS LOCATED ABOVE INACCESSIBLE CEILINGS SHALL BE PROVIDED WITH REMOTE DAMPER OPERATORS.

S. TURNING VANES SHALL BE INSTALLED IN ALL MITERED ELBOWS AND AIR EXTRACTORS. PROVIDE ADEQUATE ACCESS AND MEANS TO ADJUST / BALANCE ALL AIR EXTRACTORS. TURNING VANES SHALL BE CONSTRUCTED TO MEET THE LATEST SMACNA STANDARDS FOR HVAC DUCT CONSTRUCTION.

T. MEDIUM PRESSURE BRANCH DUCT RUN-OUTS TO AIR TERMINAL UNITS SHALL BE SAME SIZE AS AIR TERMINAL UNIT INLET, UNLESS NOTED OTHERWISE. INCREASE DUCT SIZE BY 2" IF THE DISTANCE BETWEEN THE MAIN DUCT AND THE TERMINAL UNIT INLET IS GREATER THAN 6'-0" AND / OR UTILIZES MORE THAN 2-90 DEGREE ELBOWS. PROVIDE A SPIN-IN FLARED CONICAL TAP AT MEDIUM PRESSURE DUCT MAIN AND EXTEND AS SHOWN. FLEXIBLE DUCTWORK SHALL NOT BE USED TO MAKE CHANGES IN DIRECTION IN MEDIUM PRESSURE DUCT.

U. ACCESS PANELS SHALL BE PROVIDED FOR EACH LOCATION WHERE EQUIPMENT, MANUAL VALVES, AUTOMATIC CONTROL VALVES, AUTOMATIC DAMPER MECHANISMS, FIRE/SMOKE DAMPERS, ETC., ARE INSTALLED BEHND FURRINGS, CHASES, OR ABOVE INACCESSIBLE CEILINGS. SIZE AND POSITION EACH ACCESS PANEL SO THAT THE CONCEALED EQUIPMENT CAN BE PROPERLY SERVICED, MINIMUM SIZE SHALL BE 18" X 18" UNLESS FIELD CONDITIONS DICTATE OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS / SPECIFICATIONS AND COORDINATE WITH GENERAL CONTRACTOR FOR EXACT LOCATION, CONDITIONS, SIZES, FINISHES, ETC.

V. PROVIDE REMOTE DAMPER OPERATORS FOR EACH LOCATION WHERE VOLUME DAMPERS ARE INSTALLED BEHIND FURRINGS, CHASES, OR ABOVE INACCESSIBLE CEILINGS. SIZE AND POSITION REMOTE DAMPER OPERATOR SO THAT THE CONCEALED VOLUME DAMPERS CAN BE ADJUSTED. REMOTE OPERATOR SHALL BE A STRAIGHT SOLID SHAFT EXTENSION IN-LINE FOR DIRECT CONNECTION TO VOLUME DAMPER SHAFT WITHOUT GEAR MECHANISM, UNLESS OTHERWISE INDICATED ON THE DRAWINGS. COORDINATE WITH ARCHITECT AND GENERAL CONTRACTOR FOR APPROVAL, EXACT LOCATION, CONDITIONS, SIZES, FINISHES, ETC.

W. HVAC SYSTEMS SHALL BE INSTALLED COMPLETE WITH ALL BALANCING AND REGULATING DEVICES NECESSARY FOR THE TAB CONTRACTOR TO PERFORM THEIR WORK. COORDINATE WITH THE TAB CONTRACTOR TO DETERMINE THEIR EXACT REQUIREMENTS. ALL HVAC SYSTEMS SHALL BE STARTED PER MANUFACTURER'S START-UP INSTRUCTIONS. REPLACE FILTERS, BELTS, SHEAVES, DAMPERS, VALVES, STARTERS AND HEATERS AS NECESSARY PRIOR TO TAB.

X. CONTRACTOR SHALL PROVIDE ALL TESTING, ADJUSTING, AND BALANCING WORK TO INCLUDE, BUT NOT LIMITED TO, ADJUSTMENT OF DAMPERS, BALANCE AIR DEVICES. VERIFY CORRECT SETPOINT AND CALIBRATION OF THERMOSTATS. VERIFY ALL SEQUENCE OF OPERATION, STAGING OF COOLING/ HEATING AS APPLICABLE, BALANCE OF CONDENSER AND HEATING WATER SYSTEMS, PUMPS, BOILERS, COOLING TOWERS, NOTE DEFICIENCIES IN MECHANICAL SYSTEM, ETC. FOR A CORRECTLY OPERATING MECHANICAL SYSTEM. CONTRACTOR SHALL REPLACE ALL FILTERS AND CLEAN ALL STRAINERS. TESTING AND BALANCING SUBCONTRACTOR MUST BE A MEMBER IN GOOD STANDING OF AABC AND SUBMIT REPORT ON AABC OR SMACNA FORMS FOR APPROVAL BY THE ENGINEER. PROVIDE A TEST AND BALANCE REPORT TO THE MECHANICAL INSPECTOR AT TIME OF HEATING FINAL INSPECTION. TAB CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR TO LOCATE DP SENSORS IN PIPING FOR PUMPING SYSTEMS AND STATIC PRESSURE SENSORS IN DUCTWORK FOR FAN SYSTEMS.

Y. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR FOR ALL ELECTRICAL POWER REQUIREMENTS. CONTRACTOR SHALL ENSURE THE FURNISHING AND INSTALLATION OF ALL BRANCH ELECTRICAL CIRCUIT WIRING, CONDUITS, PROTECTIVE DEVICES, DISCONNECTS, AND ACCESSORIES FOR ALL ELECTRICAL EQUIPMENT AND DEVICES FURNISHED UNDER THIS CONTRACT, INCLUDING TO INCLUDE, BUT NOT LIMITED TO CONTROL PANELS, SMOKE DETECTORS, CONTROL / MOTORIZED DAMPER, PRESSURE MONITORS, FIRE/SMOKE DAMPERS, VARIABLE FREQUENCY DRIVES, VAV TERMINALS (24V TRANSFORMER) AND ALL OTHER 120V CONTROLS AS REQUIRED FOR A COMPLETE CONTROL SYSTEM WHETHER SHOWN TO BE PERFORMED BY OTHER OR NOT. ALL ELECTRICAL WORK SHALL BE INSTALLED IN FULL ACCORDANCE WITH REQUIREMENTS OF ELECTRICAL SPECIFICATIONS AND THE NATIONAL ELECTRICAL CODE.

Z. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING FINISHES AND FURNISHINGS FROM DAMAGE DURING WORK.

AA. CONTRACTOR TO PROVIDE TEMPORARY SPACE CONDITIONING DURING ALL HVAC EQUIPMENT OUTAGES AND PRIOR TO HVAC EQUIPMENT START-UP.

BB. COMMISSIONING OF THE MECHANICAL SYSTEMS ON THIS PROJECT IS PART OF THE SCOPE OF WORK. DOCUMENTATION AND TESTING OF THESE SYSTEMS, AS WELL AS TRAINING OF THE OWNER'S OPERATION / MAINTENANCE PERSONNEL, IS REQUIRED IN COOPERATION WITH THE OWNER'S REPRESENTATIVE AND THE COMMISSIONING AGENT. PROJECT CLOSEOUT IS DEPENDENT ON SUCCESSFUL COMPLETION OF ALL COMMISSIONING PROCEDURES, DOCUMENTATION, AND ISSUE CLOSURE.

CC. ALL PIPES, DUCTS, AND OTHER EQUIPMENT SHALL BE PROPERLY



1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA A

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.3 EXISTING FAN-POWERED TERMINAL BOX SHALL BE REMOVED AS PART OF ALTERNATE 2. ASSOCIATED EXISTING DUCTWORK TO REMAIN.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.11 EXISTING VFD TO REMAIN.

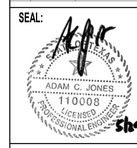
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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SEAL:



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TBPE Firm Registration No. 2234

DATE: 05/29/2026

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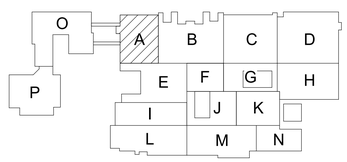
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA A

SHEET NUMBER: M2.11A

KEY PLAN



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MECHANICAL KEYED NOTES

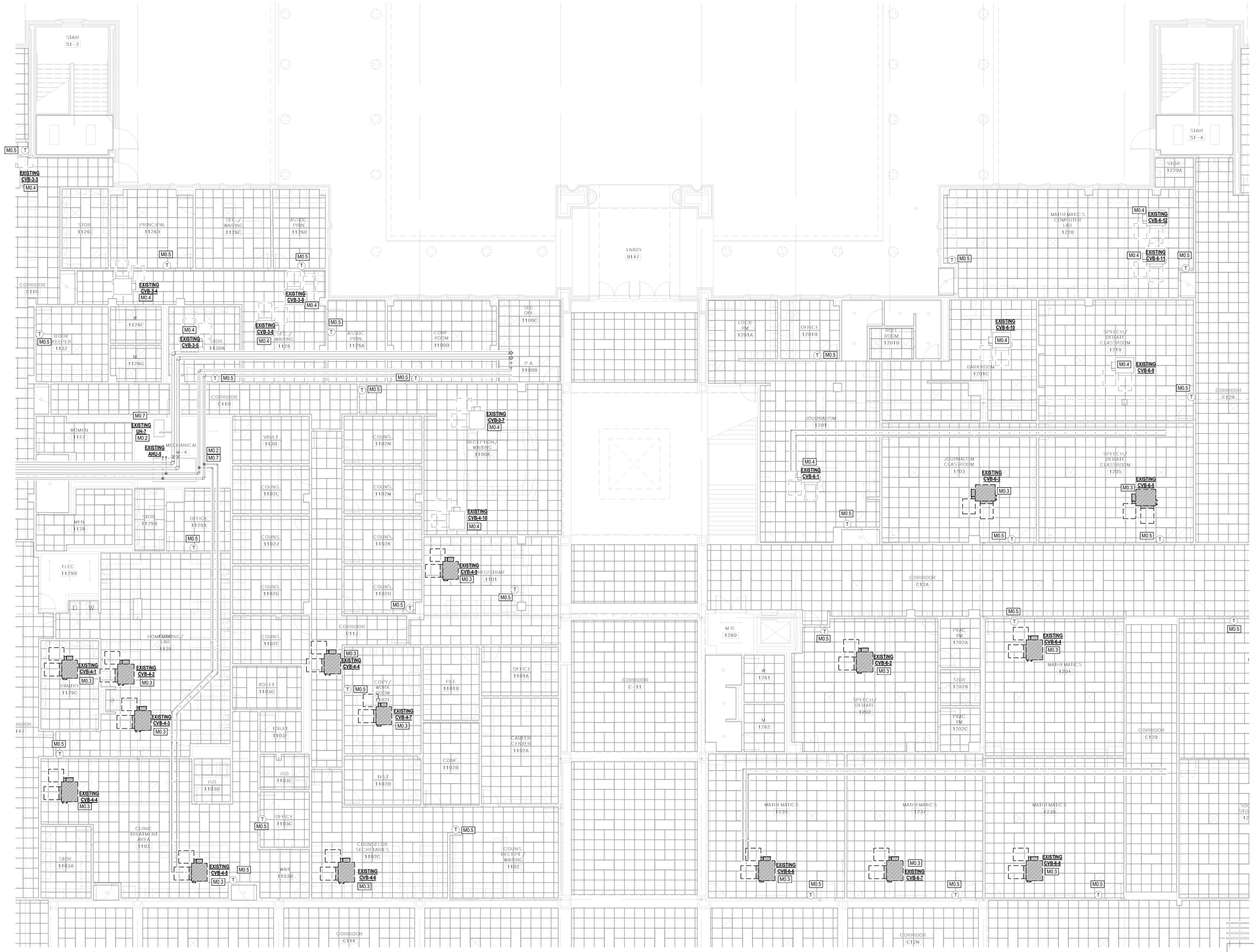
M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.3 EXISTING FAN-POWERED TERMINAL BOX SHALL BE REMOVED AS PART OF ALTERNATE 2. ASSOCIATED EXISTING DUCTWORK TO REMAIN.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

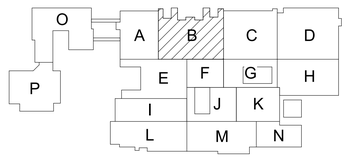
M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.



1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA B

1/8" = 1'-0"

KEY PLAN



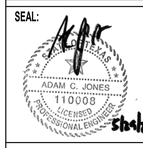
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA B

SHEET NUMBER: M2.11B

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.3 EXISTING FAN-POWERED TERMINAL BOX SHALL BE REMOVED AS PART OF ALTERNATE 2. ASSOCIATED EXISTING DUCTWORK TO REMAIN.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.11 EXISTING VFD TO REMAIN.

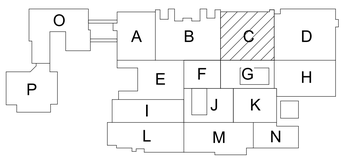
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA C

1/8" = 1'-0"

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SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA C

SHEET NUMBER: M2.11C

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

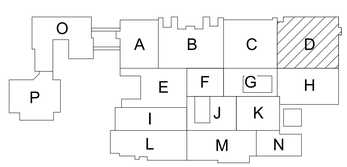
M0.11 EXISTING VFD TO REMAIN.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA D**
1/8" = 1'-0"

KEY PLAN



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ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

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TBPE Firm Registration No. 2234

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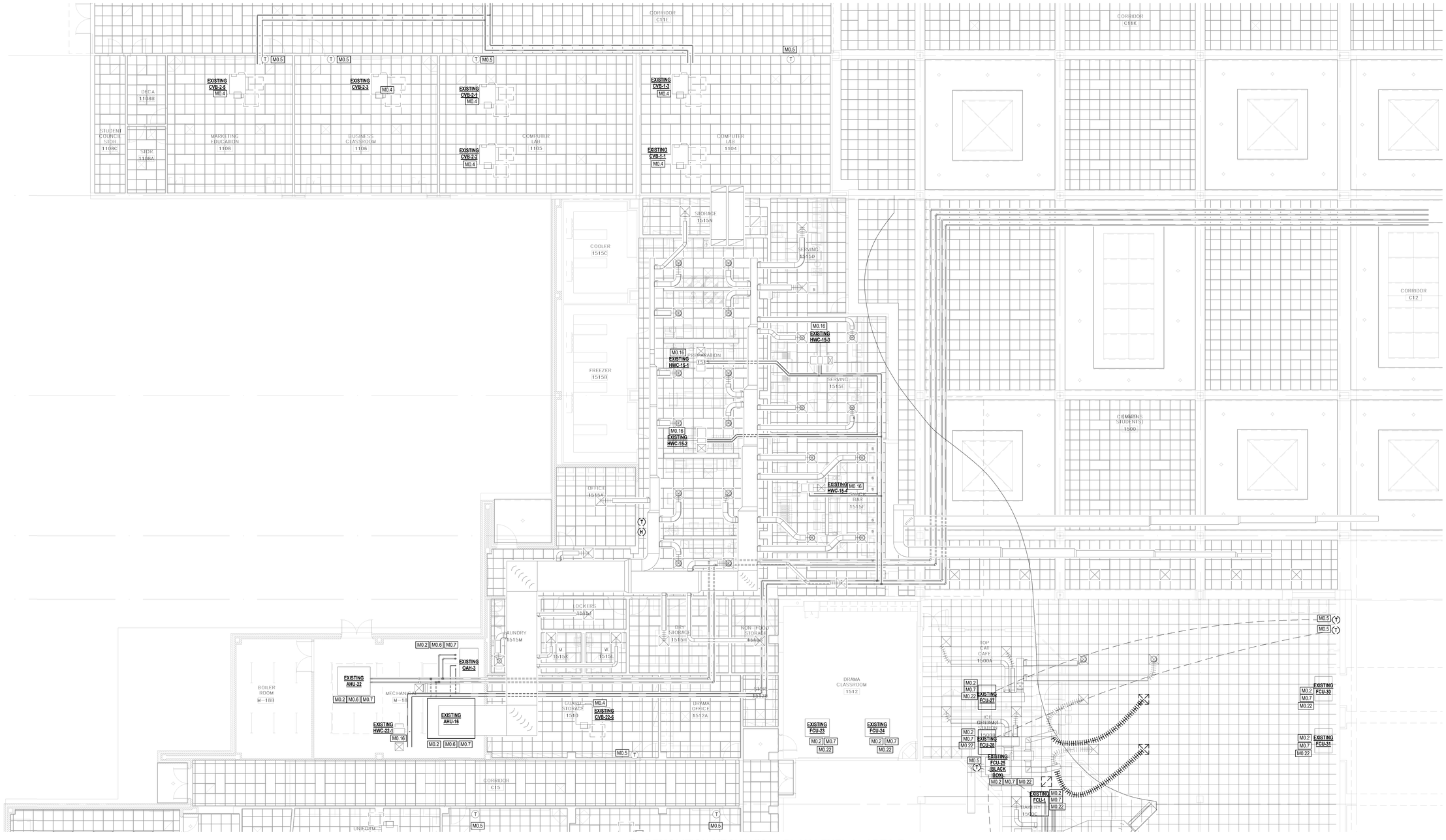
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SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA D

SHEET NUMBER: M2.11D

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1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA E

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

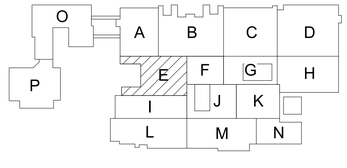
M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

PN N

KEY PLAN

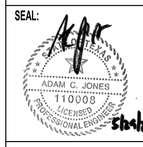


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No.	DATE	DESCRIPTION
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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA E

SHEET NUMBER: M2.11E

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.8 EXISTING UNITS ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

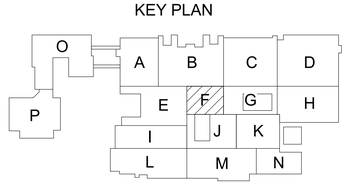
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA F**
1/8" = 1'-0"

KEY PLAN



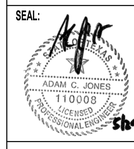
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SEAL:



Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA F

SHEET NUMBER: M2.11F

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.3 EXISTING FAN-POWERED TERMINAL BOX SHALL BE REMOVED AS PART OF ALTERNATE 2. ASSOCIATED EXISTING DUCTWORK TO REMAIN.

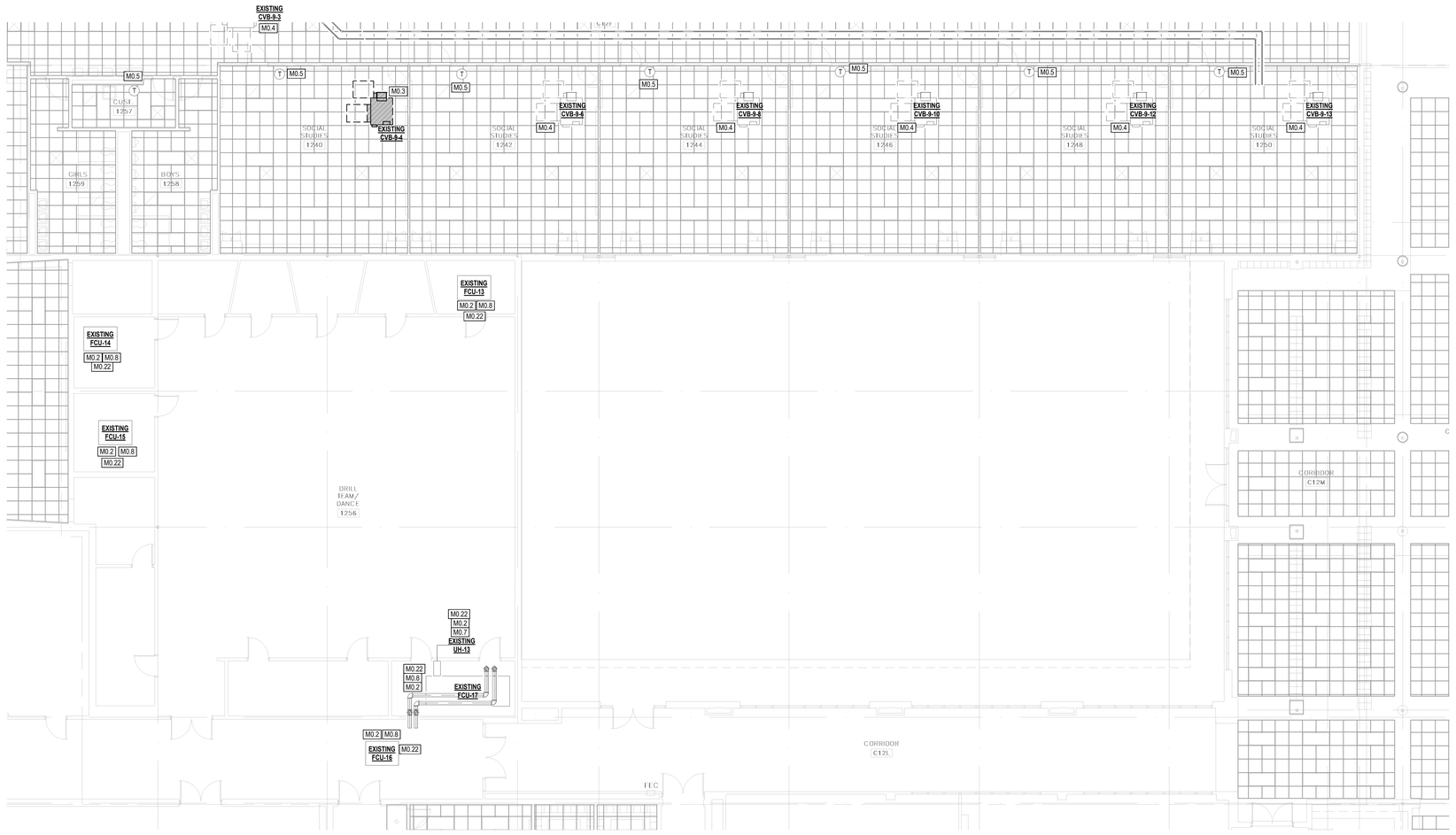
M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



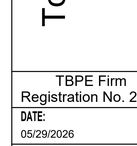
1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA G**
1/8" = 1'-0"

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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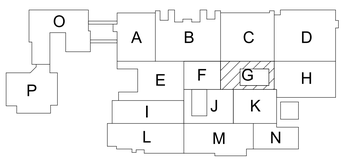
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA G

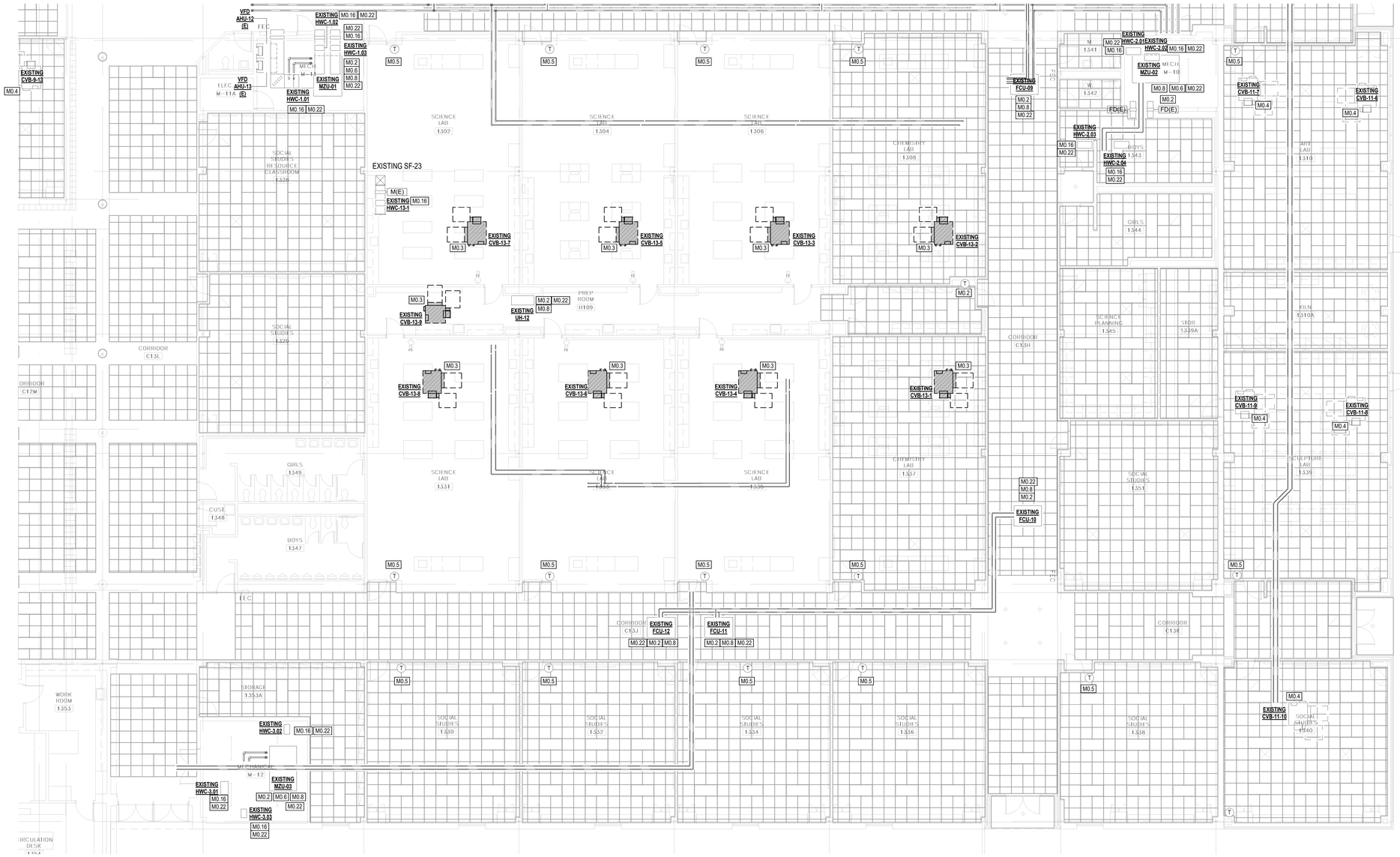
SHEET NUMBER: M2.11G

KEY PLAN



PN

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1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA H

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.3 EXISTING FAN-POWERED TERMINAL BOX SHALL BE REMOVED AS PART OF ALTERNATE 2. ASSOCIATED EXISTING DUCTWORK TO REMAIN.

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M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

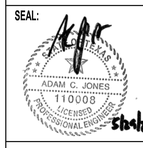
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

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SEAL:



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30330 Quinn Rd.
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TBPE Firm Registration No. 2234

DATE: 05/29/2026

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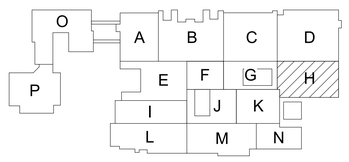
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA H

SHEET NUMBER: M2.11H

KEY PLAN



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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

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M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

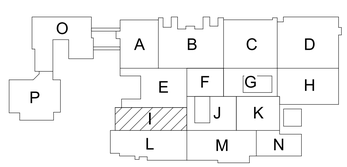
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M2.6 EXISTING PIPING TO REMAIN.



1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA I**
1/8" = 1'-0"

KEY PLAN



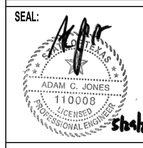
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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

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Tomball, TX, 77375

TBPE Firm Registration No. 2234

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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA I

SHEET NUMBER: M2.11I

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MECHANICAL KEYED NOTES

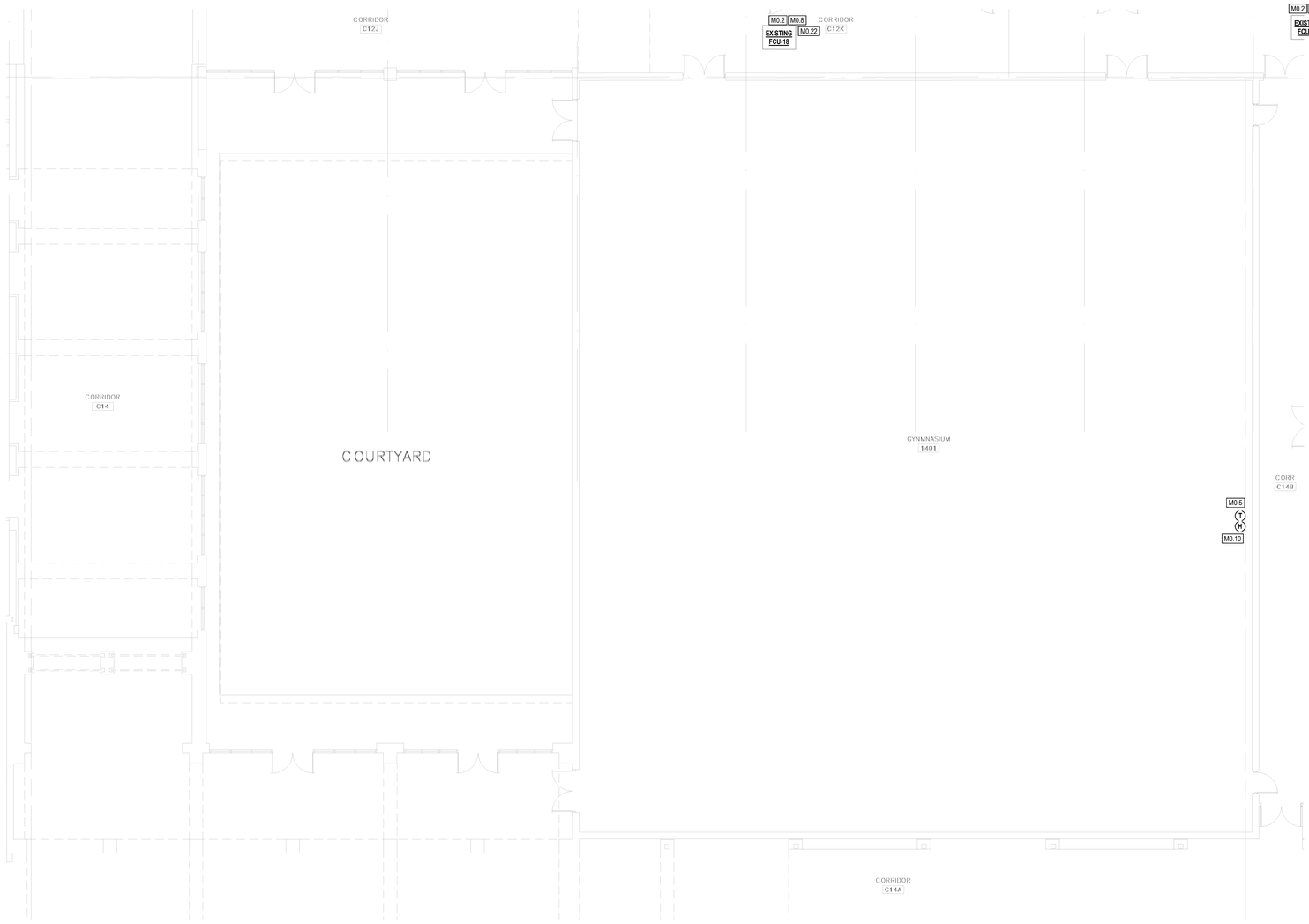
M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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M0.8 EXISTING UNITS ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.10 EXISTING HUMIDITY SENSOR AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

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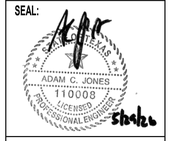
1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA J**
1/8" = 1'-0"

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

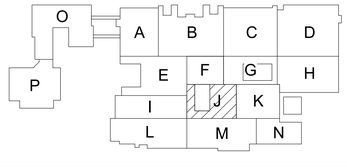
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DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA J

SHEET NUMBER:

M2.11J

KEY PLAN



PN

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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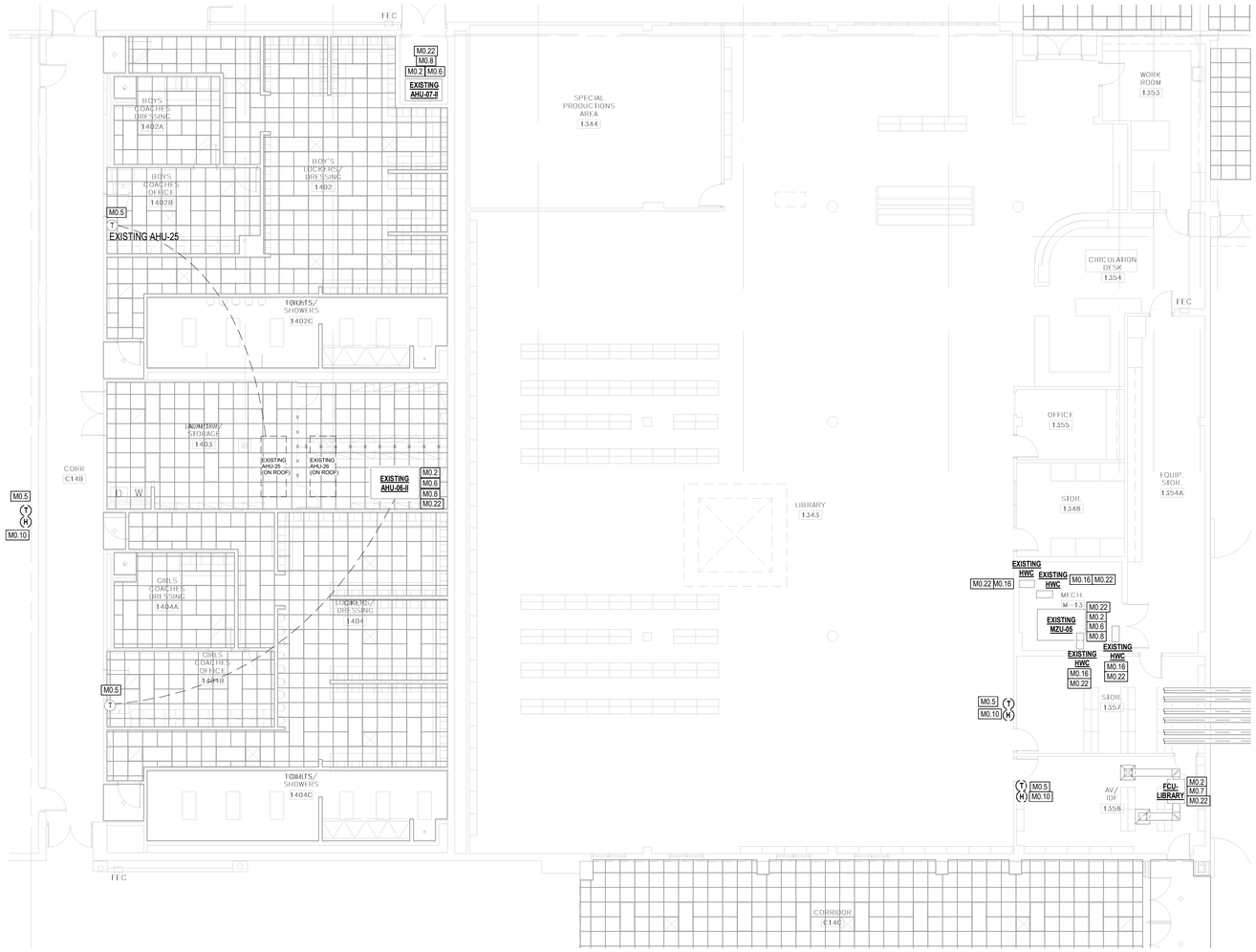
M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.10 EXISTING HUMIDITY SENSOR AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

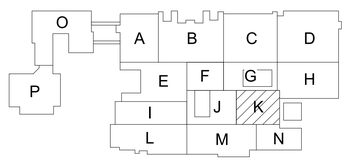
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA K**
1/8" = 1'-0"

KEY PLAN



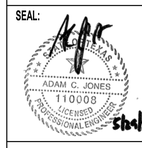
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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

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Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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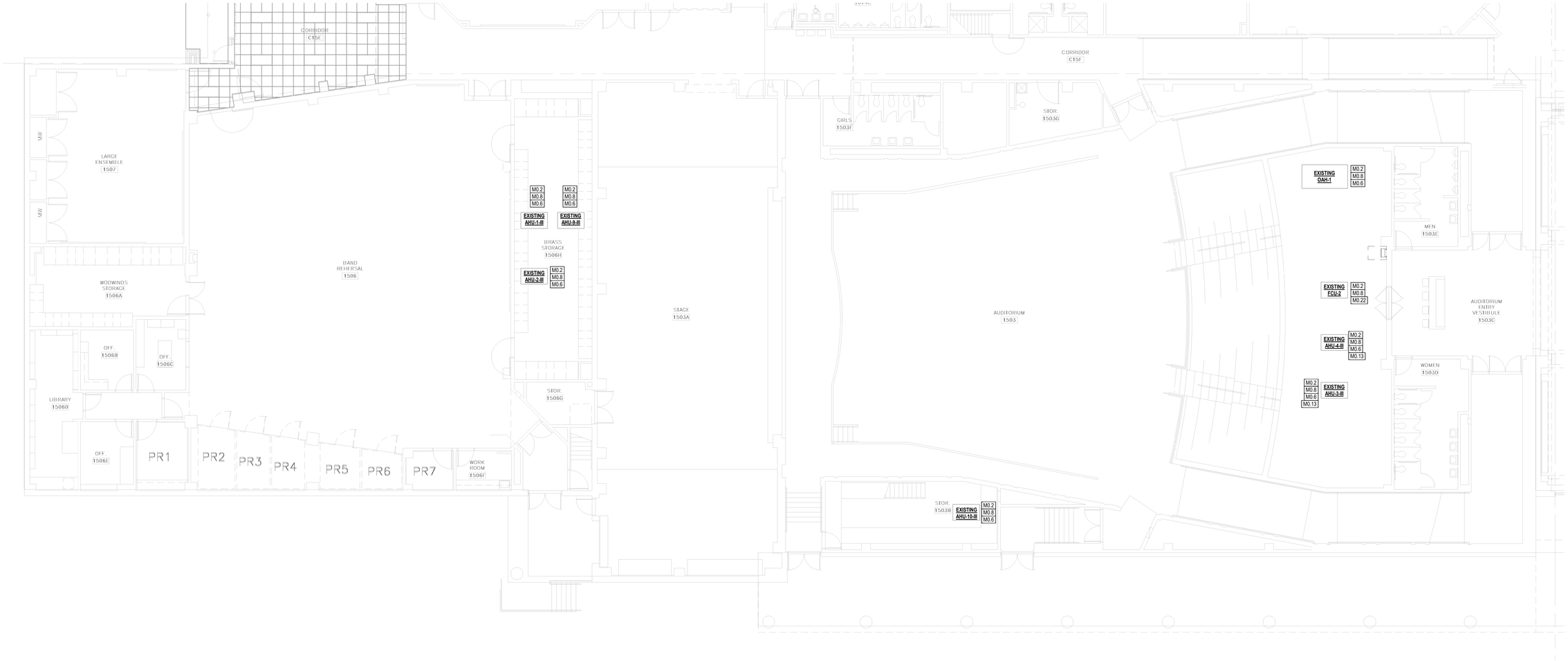
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA K

SHEET NUMBER: M2.11K

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1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA L

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

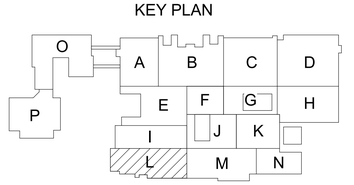
M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.13 EXISTING SENSORS IN RETURN AIR DUCTS TO BE REMOVED AND REPLACED WITH A WALL MOUNTED THERMOSTAT. REFER TO M2.21L FOR NEW APPROXIMATE THERMOSTAT LOCATION.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

KEY PLAN



PN

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REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

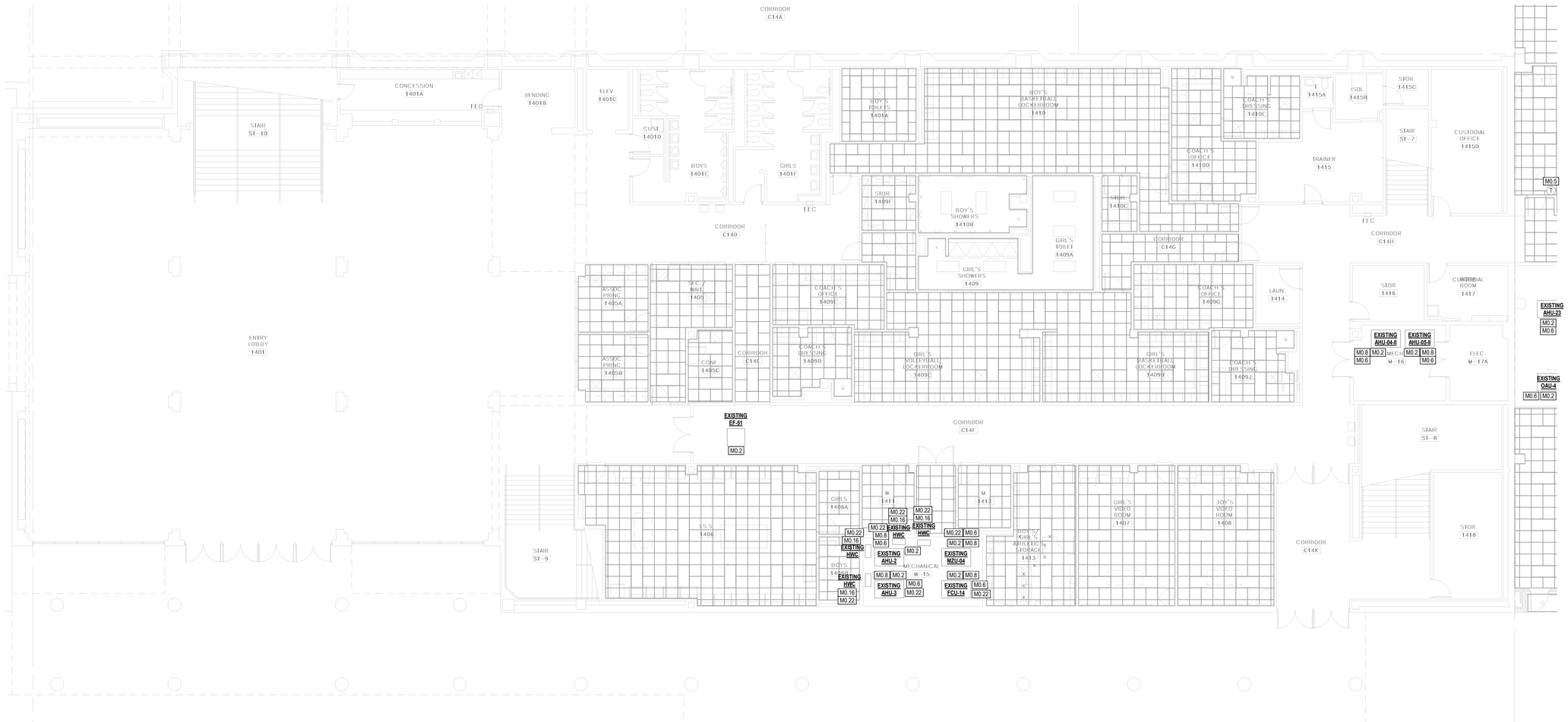
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA L

SHEET NUMBER: M2.11L

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt



1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA M

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

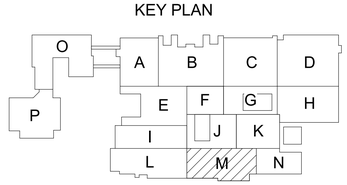
M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

KEY PLAN



PN

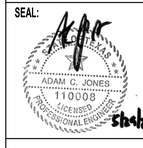
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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA M

SHEET NUMBER: M2.11M

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

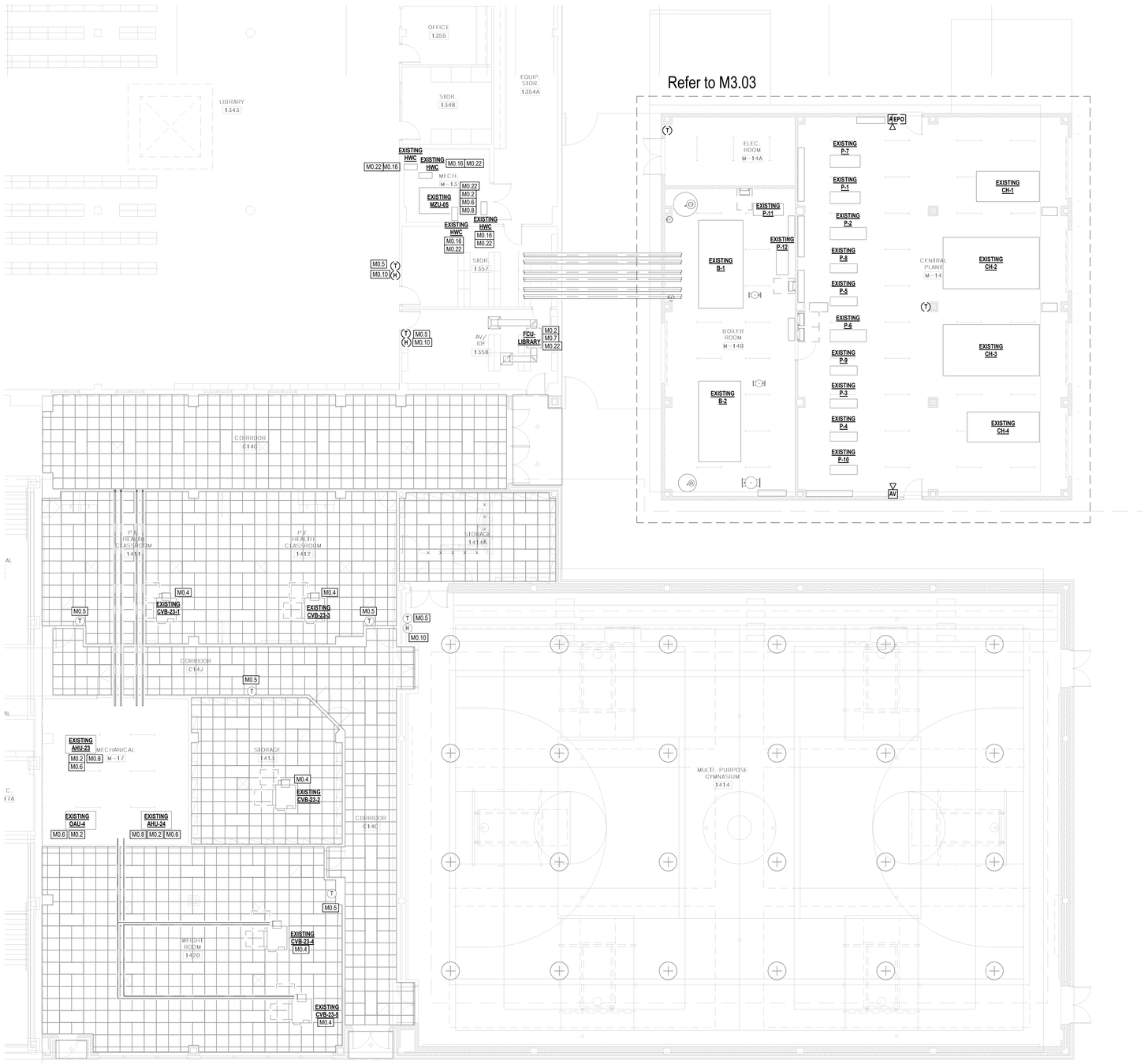
M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.10 EXISTING HUMIDITY SENSOR AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

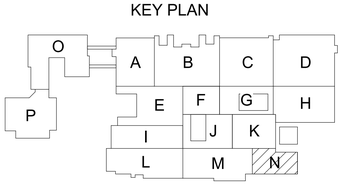
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA N

1/8" = 1'-0"

KEY PLAN



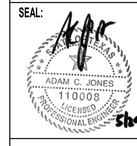
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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

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DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE:

DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA N

SHEET NUMBER:

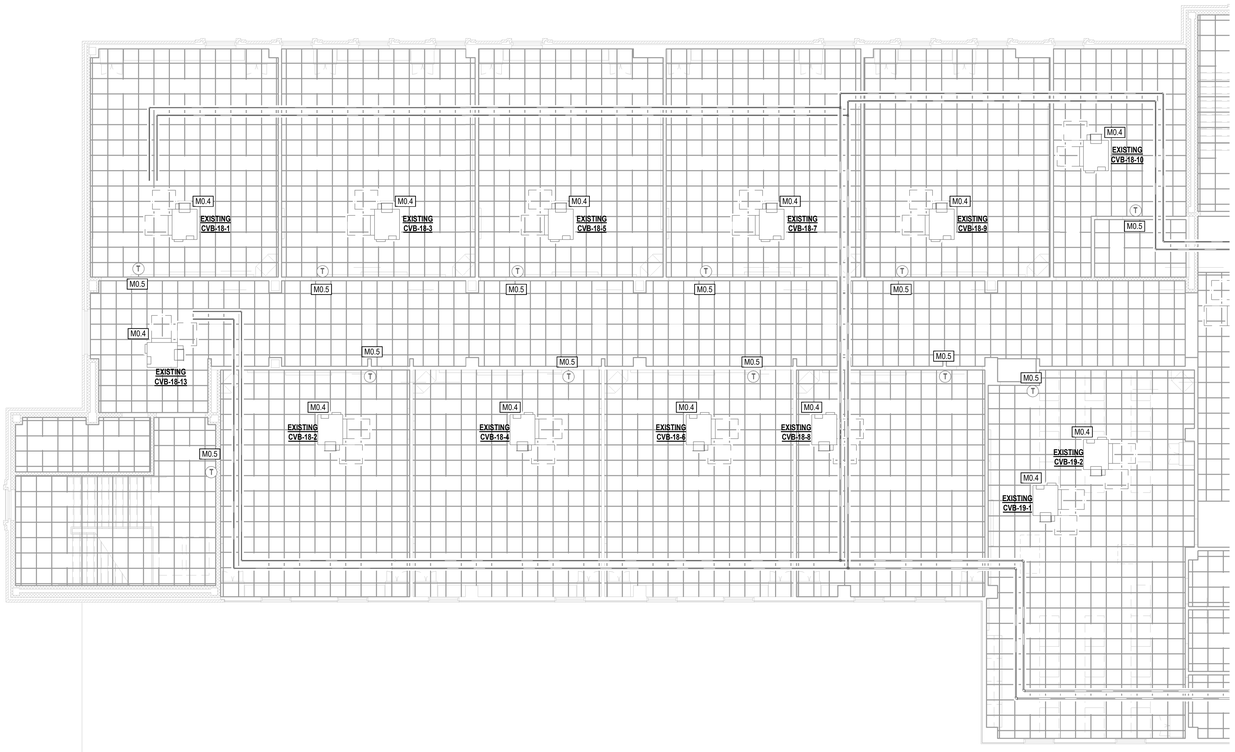
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MECHANICAL KEYED NOTES

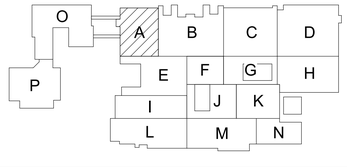
M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.



1 DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA A
1/8" = 1'-0"

KEY PLAN



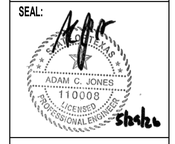
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Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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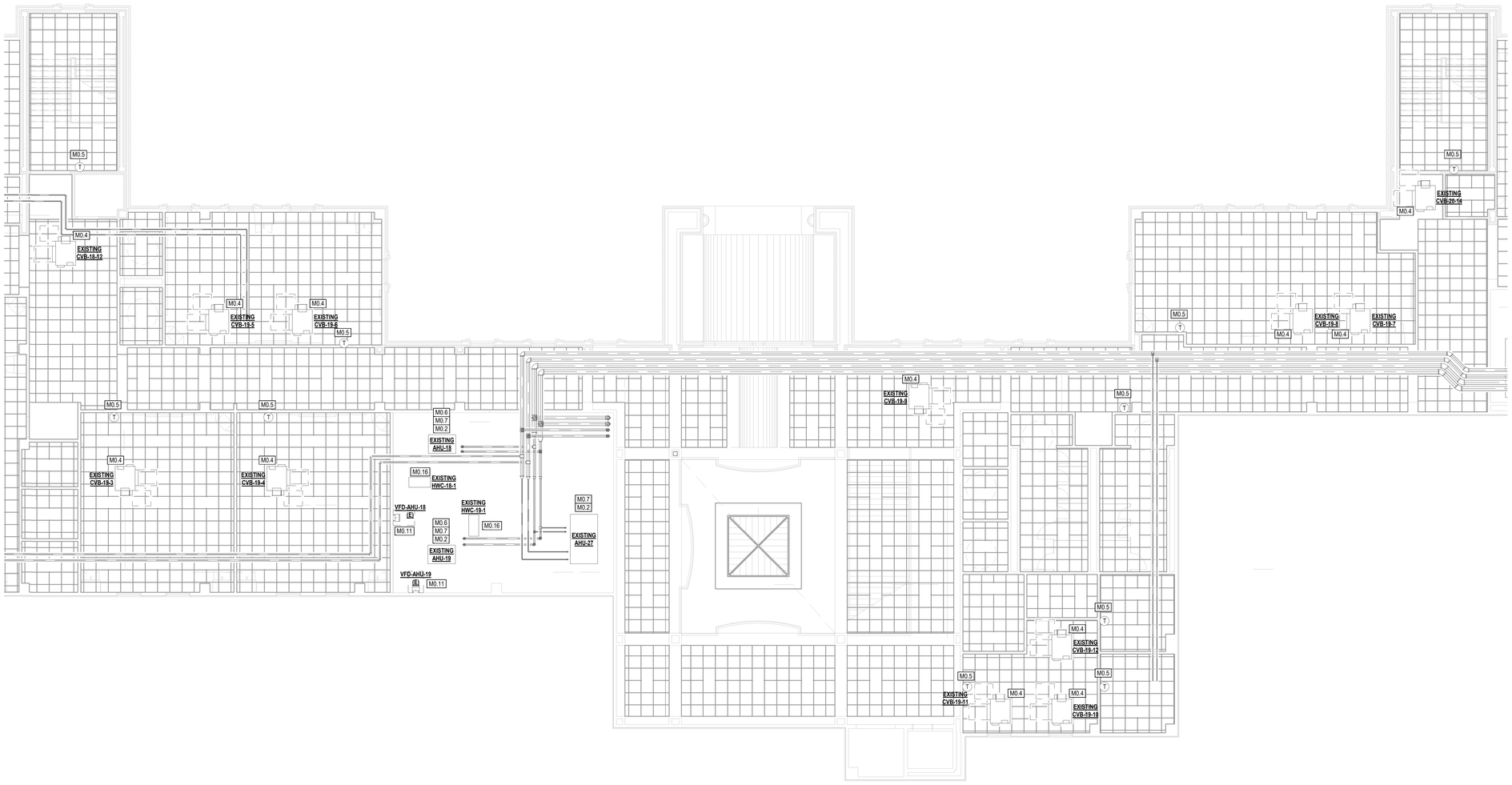
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA A

SHEET NUMBER: M2.12A

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1 DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA B

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.11 EXISTING VFD TO REMAIN.

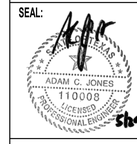
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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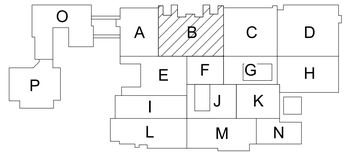
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA B

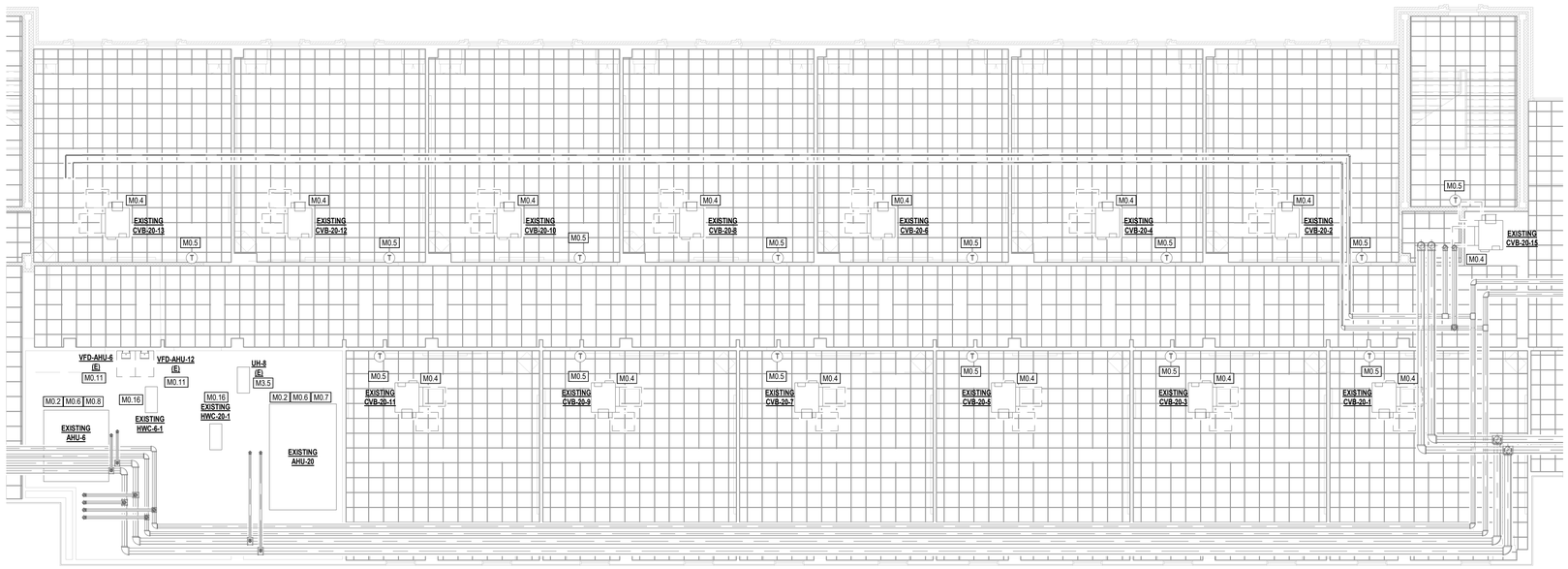
SHEET NUMBER: M2.12B

KEY PLAN



PN

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1 DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA C

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.11 EXISTING VFD TO REMAIN.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

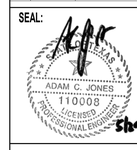
M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

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30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

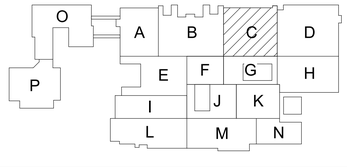
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DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA C

SHEET NUMBER:

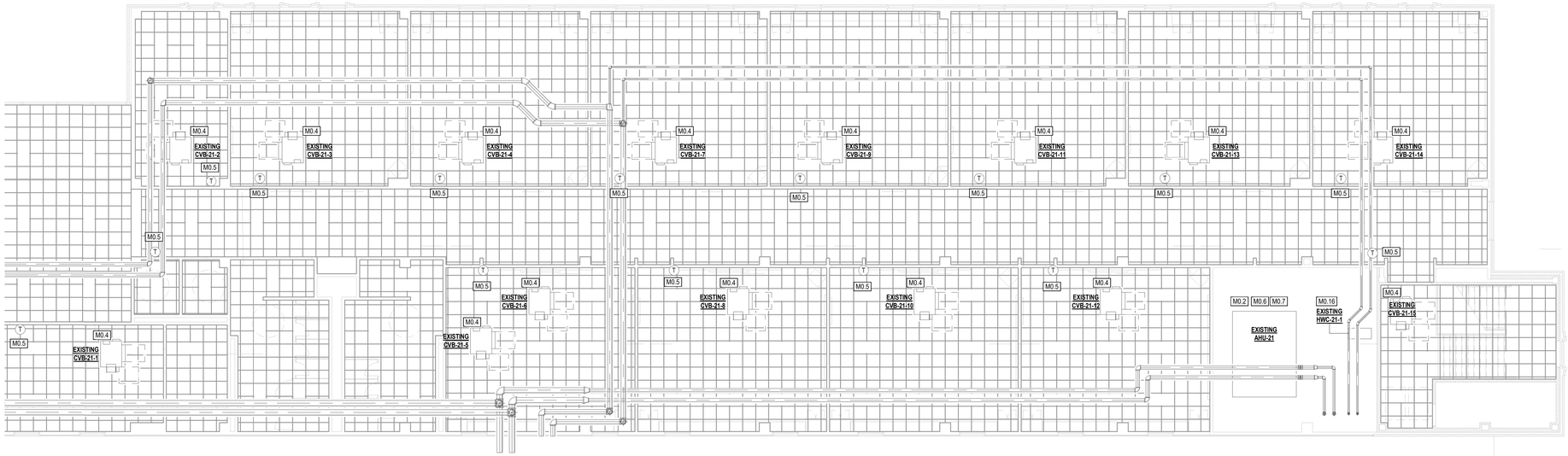
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KEY PLAN



PN

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt



1 DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA D

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

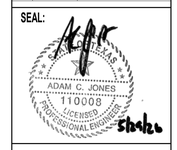
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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30330 Quinn Rd.
Tomball, TX, 77375

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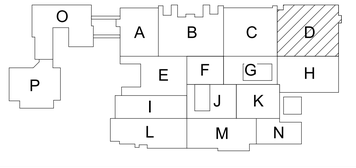
CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA D

SHEET NUMBER: M2.12D

KEY PLAN



PN

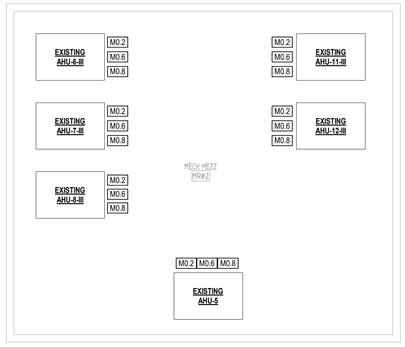
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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

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M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.



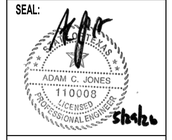
1 **DEMOLITION ENLARGED MECHANICAL PLAN - MR#2 MECH MEZZ**
1/4" = 1'-0"

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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

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PROJECT NUMBER 260018.001

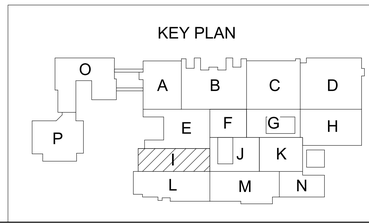
SHEET TITLE:

DEMOLITION MECHANICAL PLAN LEVEL 2 - MECH MEZZ MR#2

SHEET NUMBER:

M2.12I

KEY PLAN



PN

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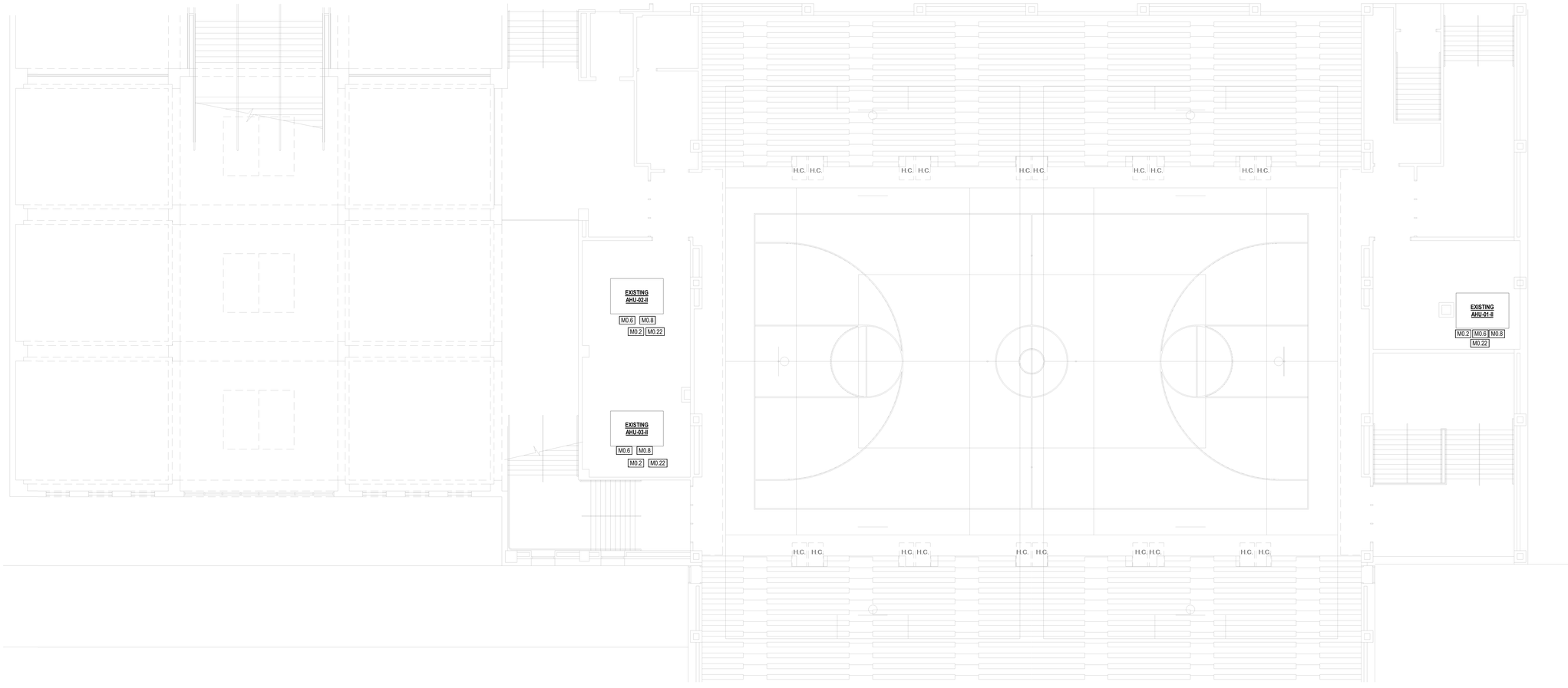
MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



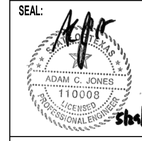
1 **DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA M**
1/8" = 1'-0"

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30330 Quinn Rd.
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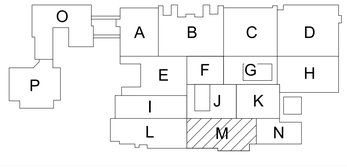
SHEET TITLE:

DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA M

SHEET NUMBER:

M2.12M

KEY PLAN



PN

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

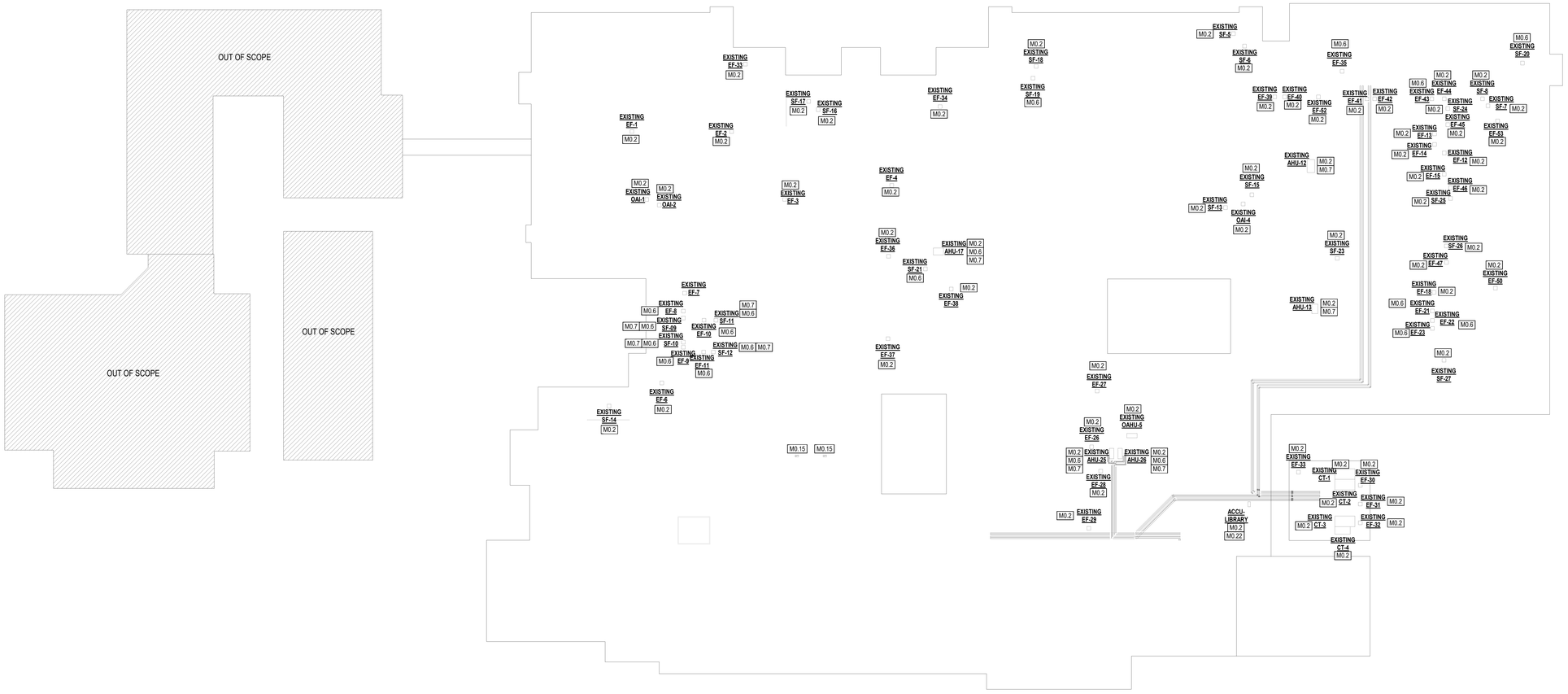
M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

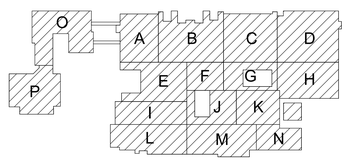
M0.15 LOCATE EXISTING OUTSIDE AIR INTAKE FOR CAFETERIA 1500D AND CAP EXISTING CURB AS PART OF ALTERNATE 1.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



1 **DEMOLITION MECHANICAL ROOF PLAN**
1" = 40'-0"

KEY PLAN



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ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

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SHEET TITLE: DEMOLITION MECHANICAL ROOF PLAN

SHEET NUMBER: M2.13

5/28/2026 5:13:38 PM
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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M2.6 EXISTING PIPING TO REMAIN.

M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

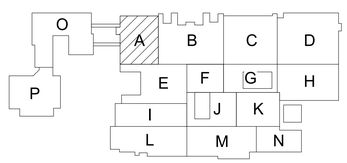
M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2. SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.



1 MECHANICAL PLAN LEVEL 1 - AREA A

1/8" = 1'-0"

KEY PLAN



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SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA A

SHEET NUMBER: M2.21A

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M2.6 EXISTING PIPING TO REMAIN.

M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

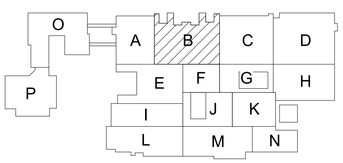
M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2. SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.

1 MECHANICAL PLAN LEVEL 1 - AREA B

1/8" = 1'-0"

KEY PLAN



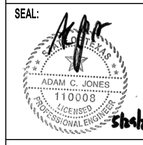
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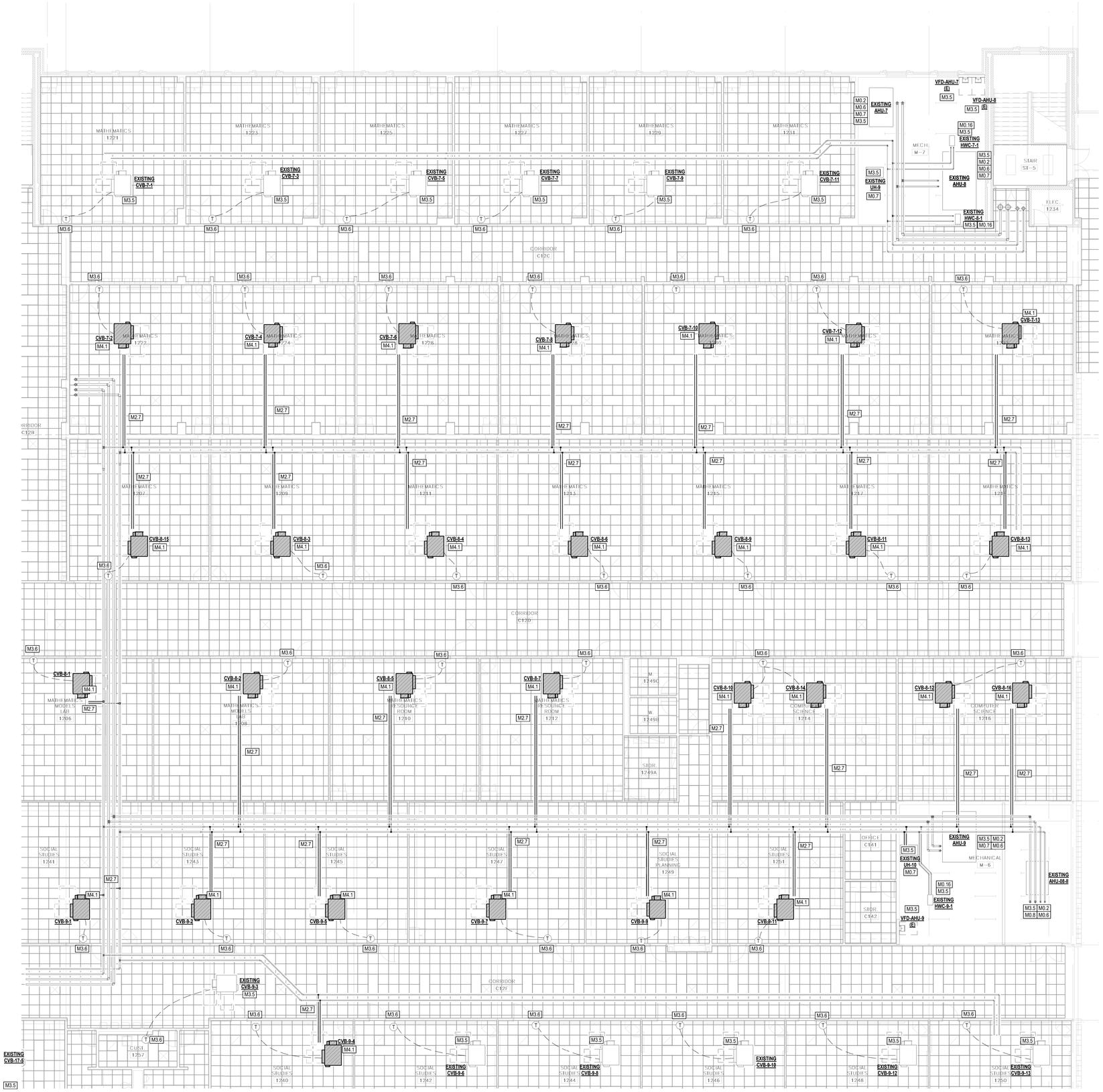
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA B

SHEET NUMBER: M2.21B

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1 MECHANICAL PLAN LEVEL 1 - AREA C

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

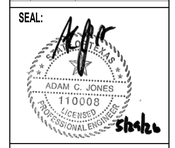
M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2, SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.

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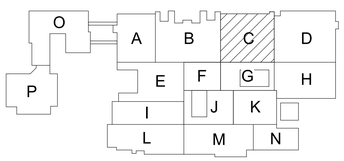
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA C

SHEET NUMBER: M2.21C

KEY PLAN



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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

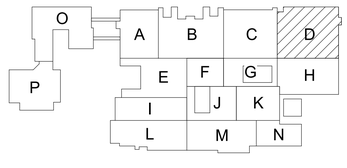
M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2. SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.

1 **MECHANICAL PLAN LEVEL 1 - AREA D**
1/8" = 1'-0"

KEY PLAN



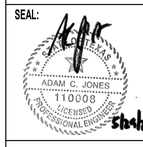
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TBPE Firm Registration No. 2234

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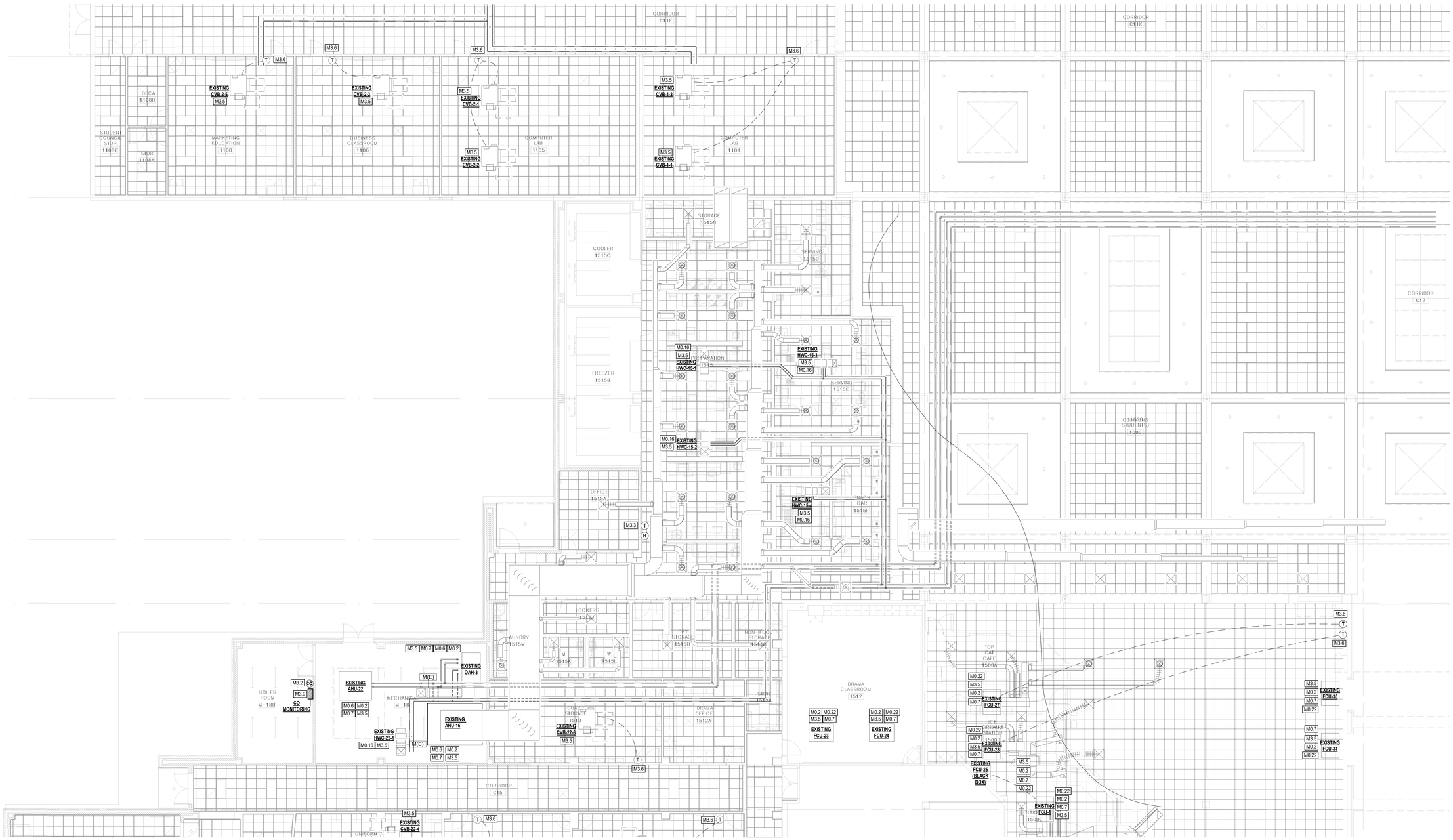
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA D

SHEET NUMBER: M2.21D

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1 MECHANICAL PLAN LEVEL 1 - AREA E

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M3.2 PROVIDE CARBON MONOXIDE SENSOR (MACURCO CM-6 OR APPROVED EQUAL) AT APPROXIMATELY THIS LOCATION. MOUNT AT SAME ELEVATION AS LIGHT SWITCHES. SENSOR SHALL MONITOR CARBON MONOXIDE LEVELS IN BOILER ROOM AS DESCRIBED IN HOT WATER SYSTEM CONTROL SEQUENCE

MECHANICAL KEYED NOTES

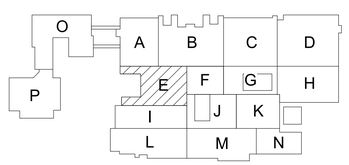
M3.3 PROVIDE COMBINATION TEMPERATURE/HUMIDITY SENSOR AT APPROXIMATE LOCATION SHOWN. SENSOR SHALL BE INSTALLED AT SAME ELEVATION AS LIGHT SWITCHES. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M3.9 PROVIDE CARBON MONOXIDE MONITORING CONTROL PANEL AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

KEY PLAN



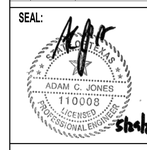
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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

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TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA E

SHEET NUMBER: M2.21E

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

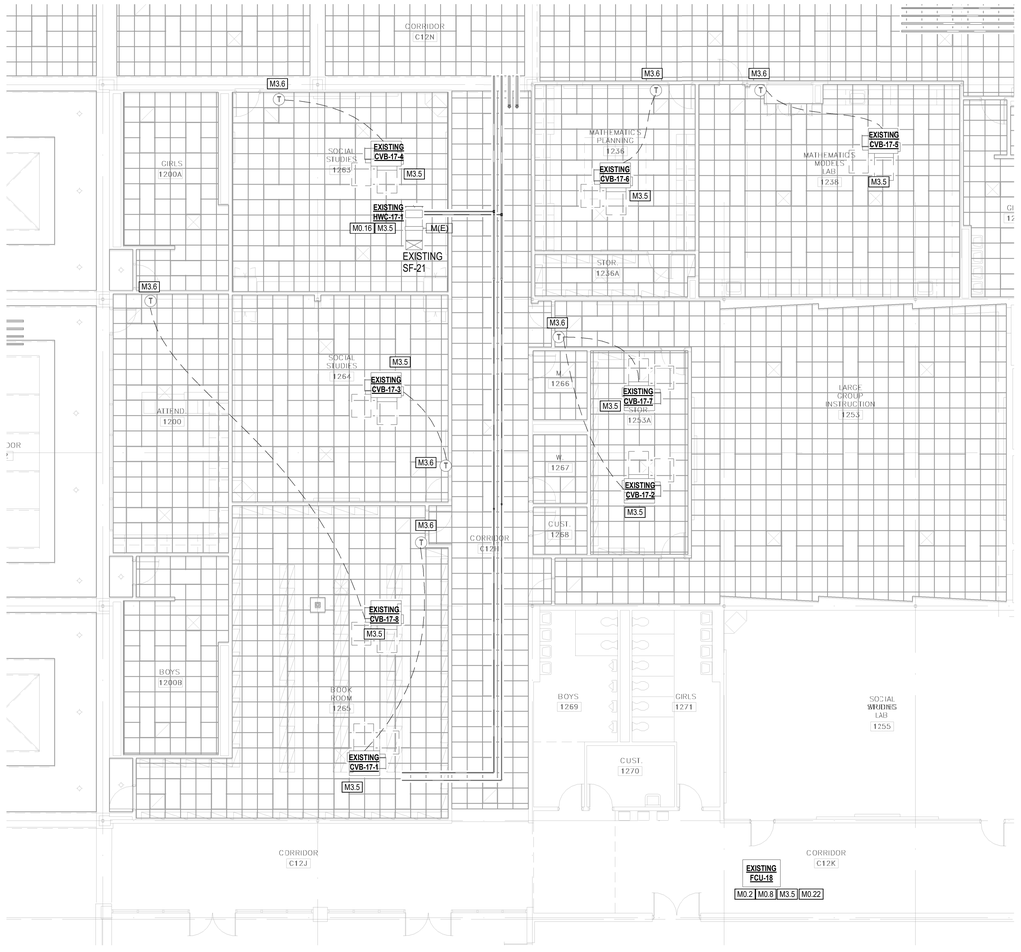
M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.



1 MECHANICAL PLAN LEVEL 1 - AREA F

1/8" = 1'-0"

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No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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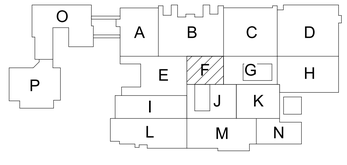
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA F

SHEET NUMBER: M2.21F

KEY PLAN



PN

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

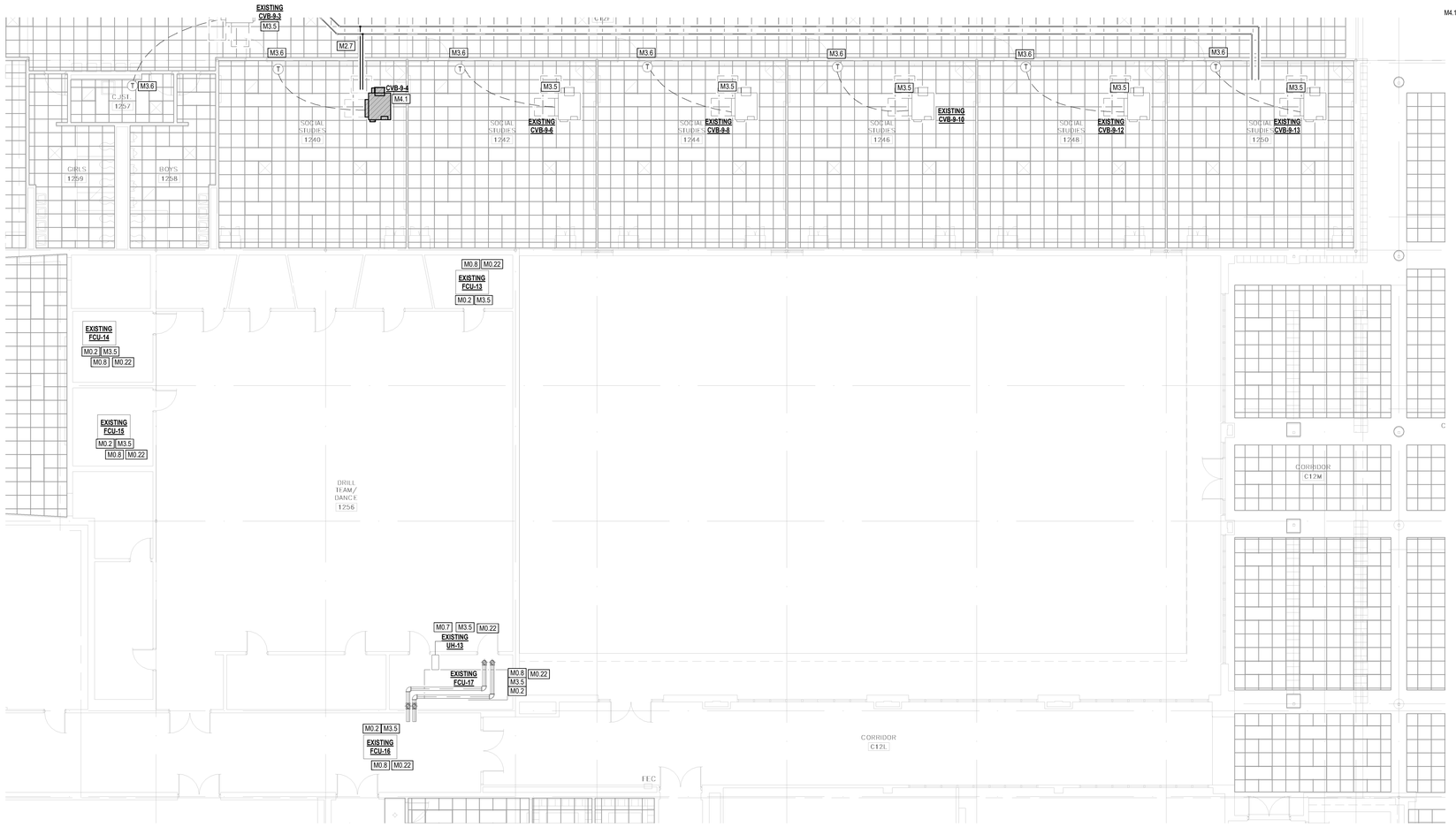
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2, SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.



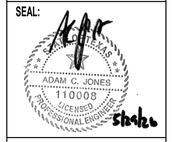
1 **MECHANICAL PLAN LEVEL 1 - AREA G**
1/8" = 1'-0"

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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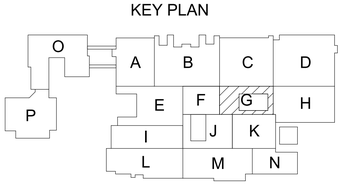
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA G

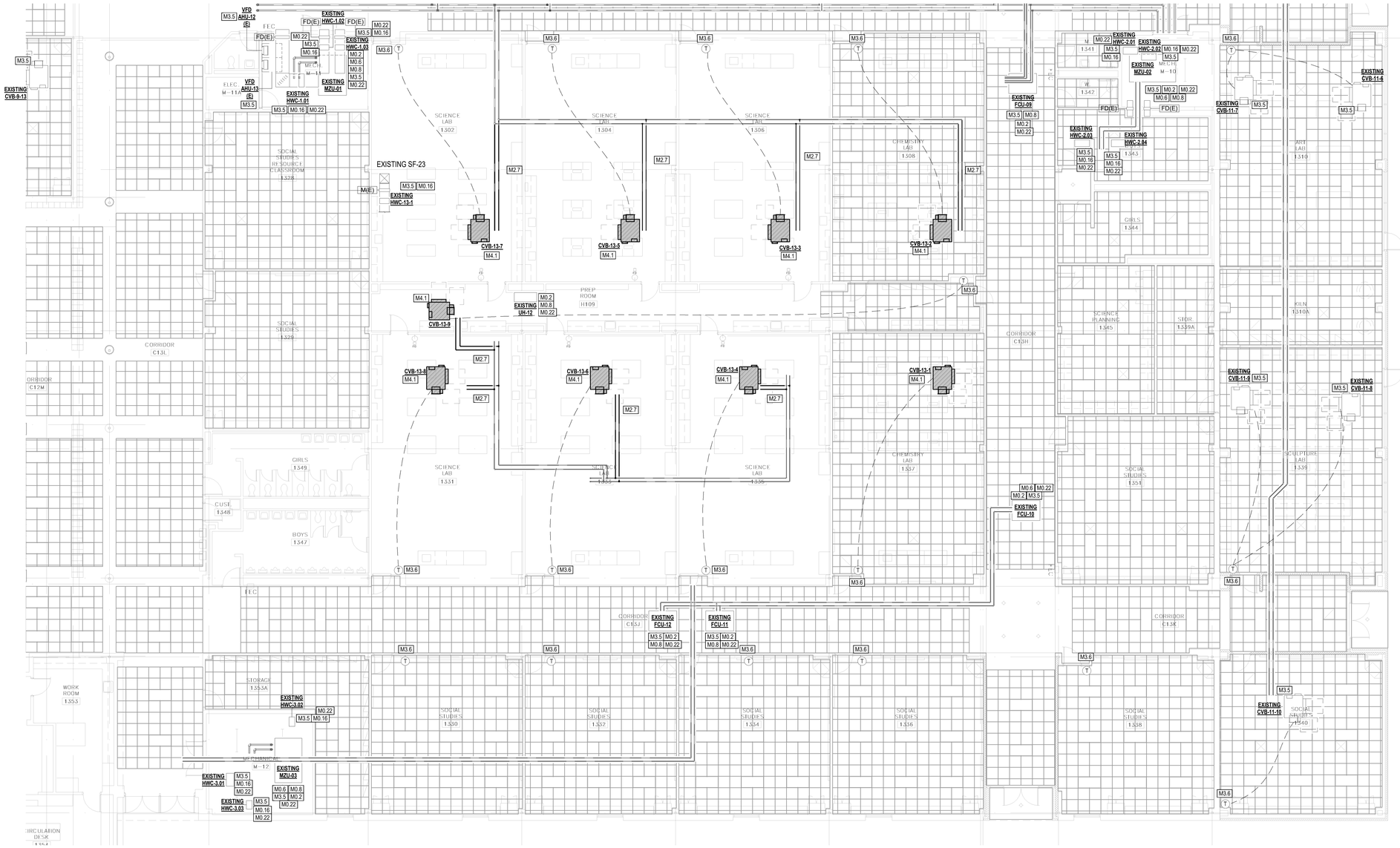
SHEET NUMBER: M2.21G

KEY PLAN



PN

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1 MECHANICAL PLAN LEVEL 1 - AREA H

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

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M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

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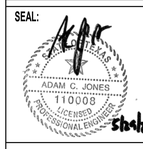
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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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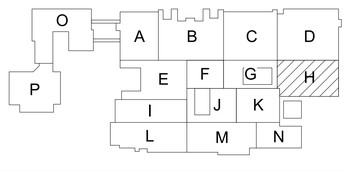
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA H

SHEET NUMBER: M2.21H

KEY PLAN



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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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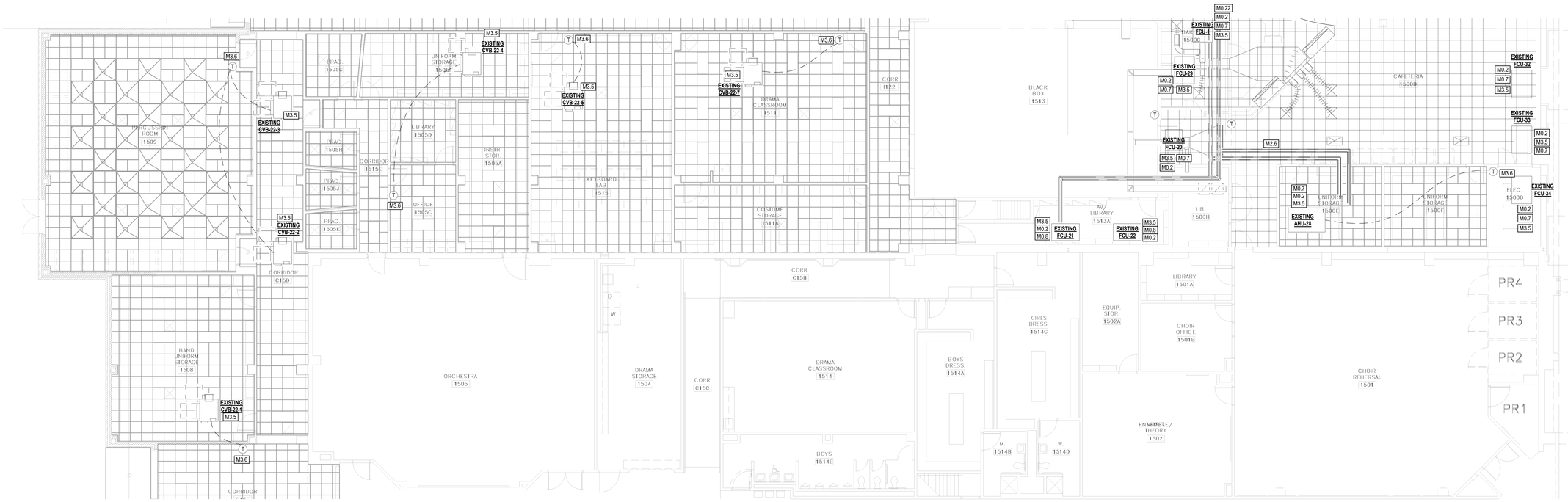
M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

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M2.6 EXISTING PIPING TO REMAIN.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

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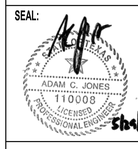
1 **MECHANICAL PLAN LEVEL 1 - AREA I**
1/8" = 1'-0"

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SEAL:



Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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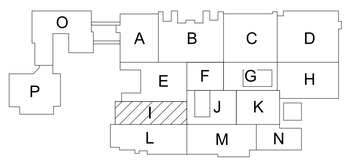
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA I

SHEET NUMBER: M2.21I

KEY PLAN



PN

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MECHANICAL KEYED NOTES

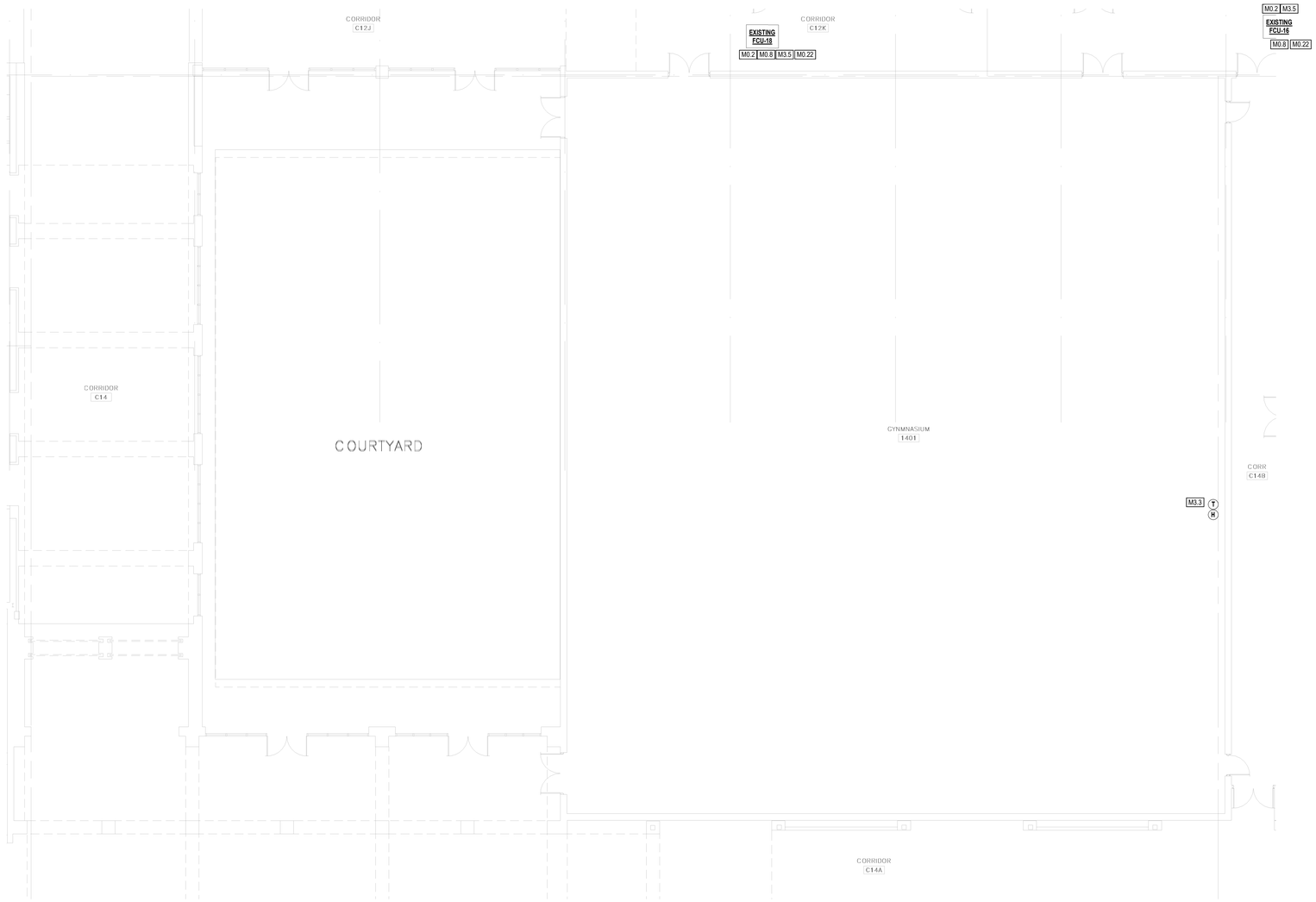
M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

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M3.3 PROVIDE COMBINATION TEMPERATURE/HUMIDITY SENSOR AT APPROXIMATE LOCATION SHOWN. SENSOR SHALL BE INSTALLED AT SAME ELEVATION AS LIGHT SWITCHES. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.



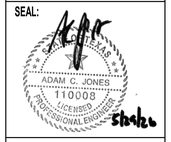
1 **MECHANICAL PLAN LEVEL 1 - AREA J**
1/8" = 1'-0"

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SEAL:



Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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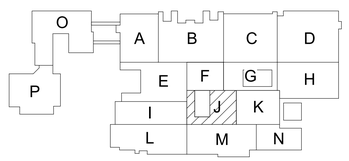
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA J

SHEET NUMBER: M2.21J

KEY PLAN



PN

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.14 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN.

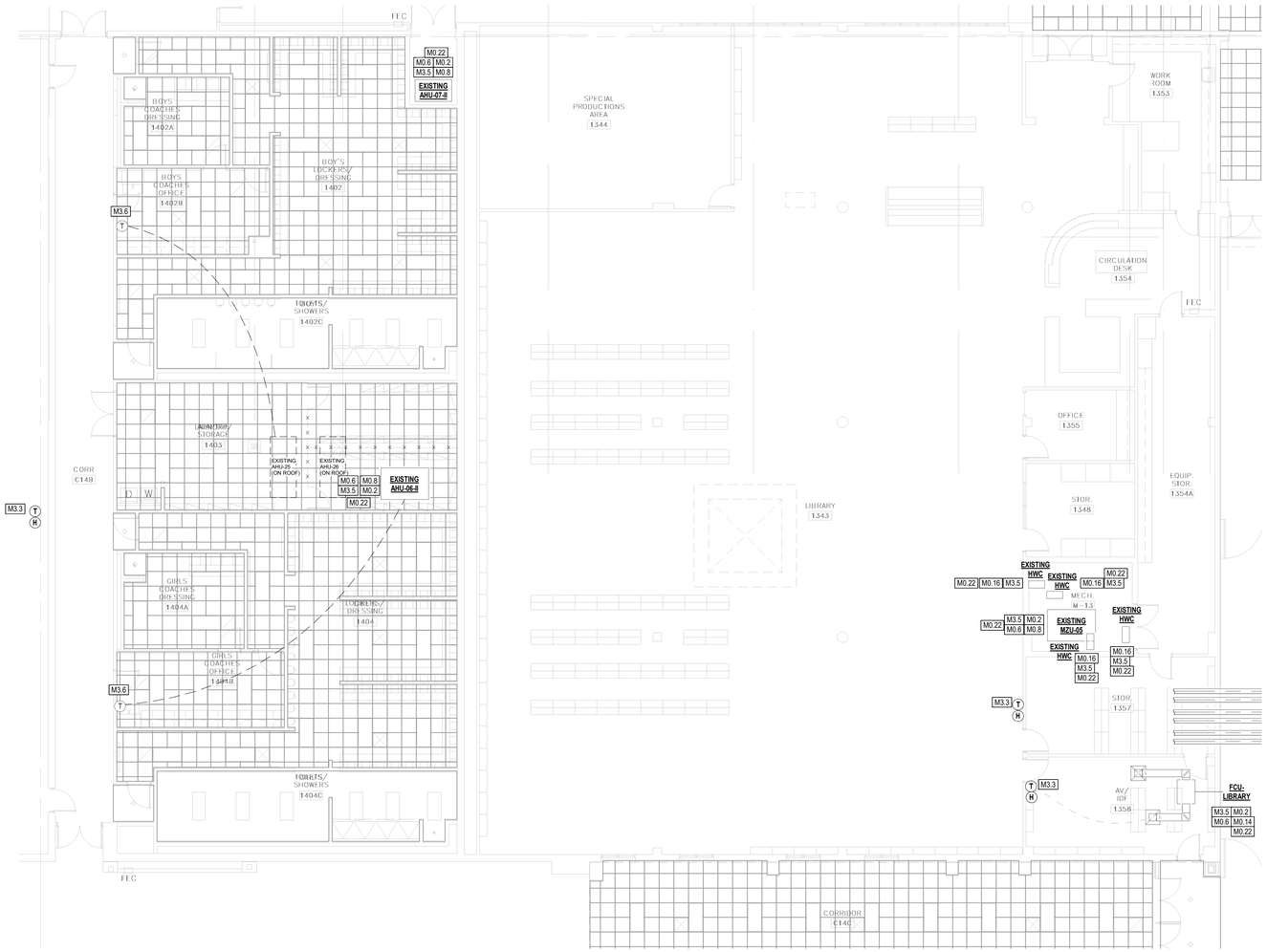
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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1 MECHANICAL PLAN LEVEL 1 - AREA K

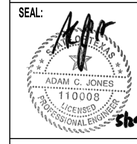
1/8" = 1'-0"

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SEAL:



Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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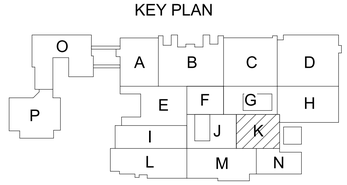
CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA K

SHEET NUMBER: M2.21K

KEY PLAN



PN N

5/28/2026 5:25:48 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

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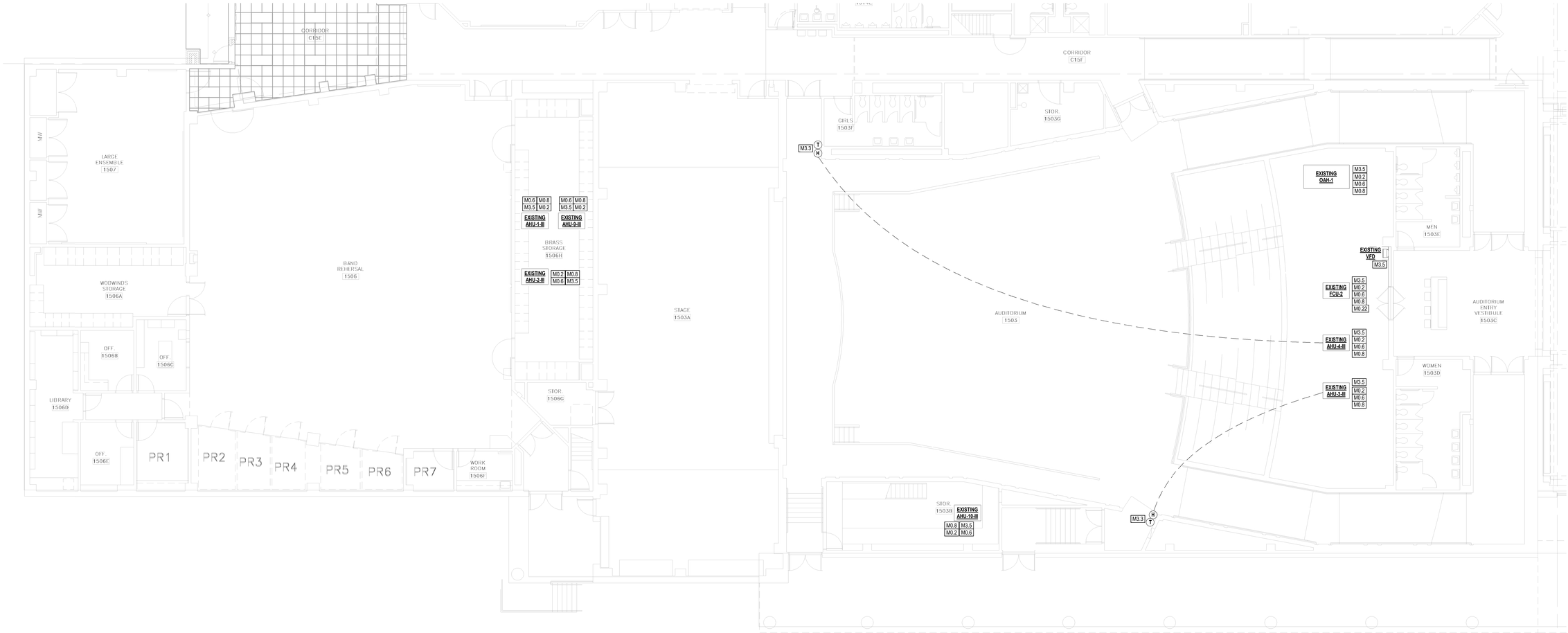
M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

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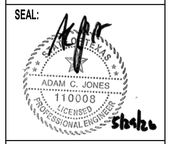
1 **MECHANICAL PLAN LEVEL 1 - AREA L**
1/8" = 1'-0"

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Tomball, TX, 77375

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DATE: 05/29/2026

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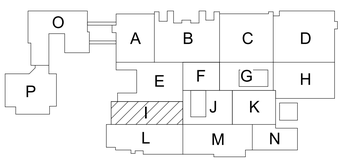
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA L

SHEET NUMBER: M2.21L

KEY PLAN



PN

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

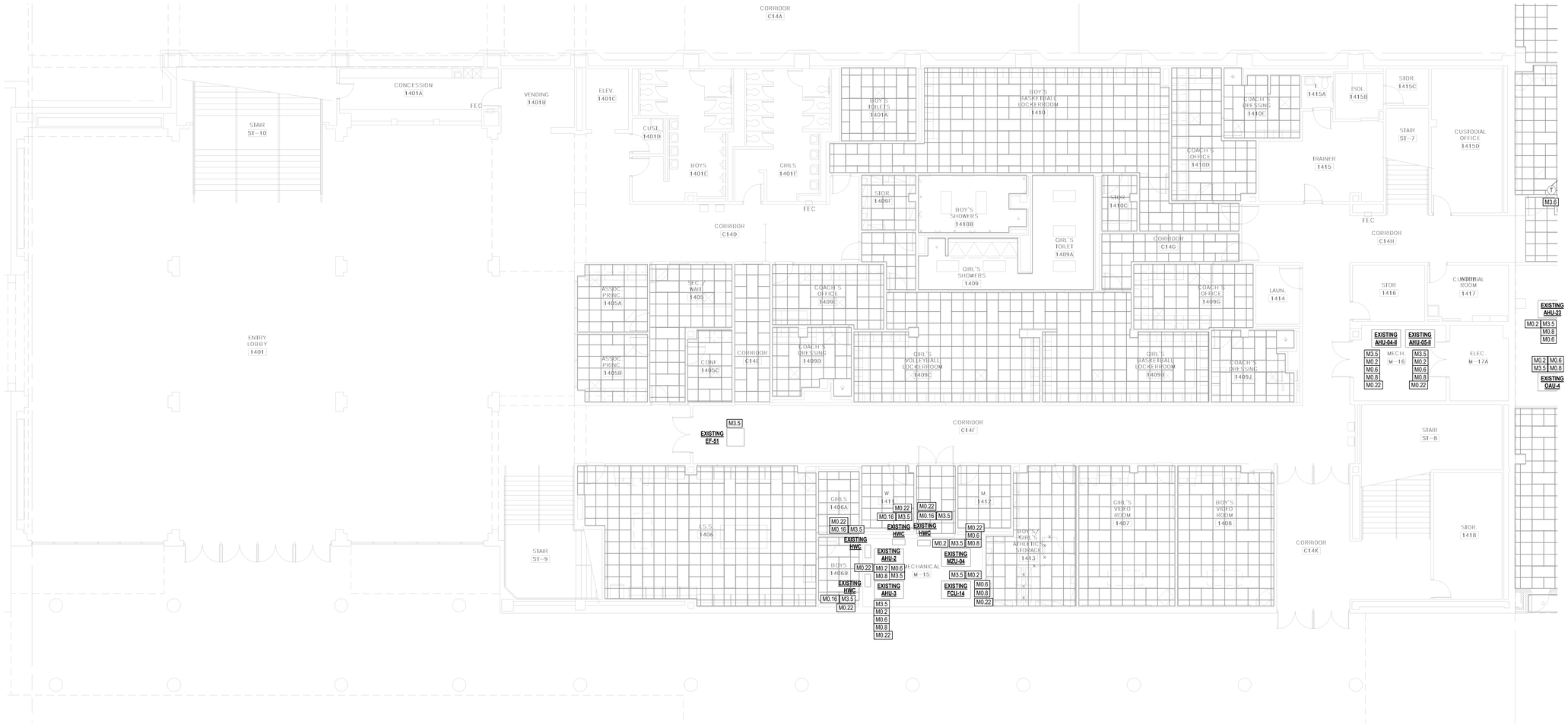
M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

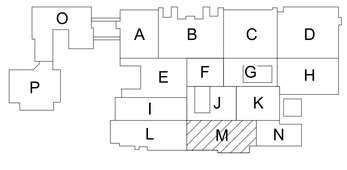
M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.



1 MECHANICAL PLAN LEVEL 1 - AREA M

1/8" = 1'-0"

KEY PLAN



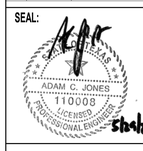
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No.	DATE	DESCRIPTION
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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA M

SHEET NUMBER: M2.21M

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.14 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

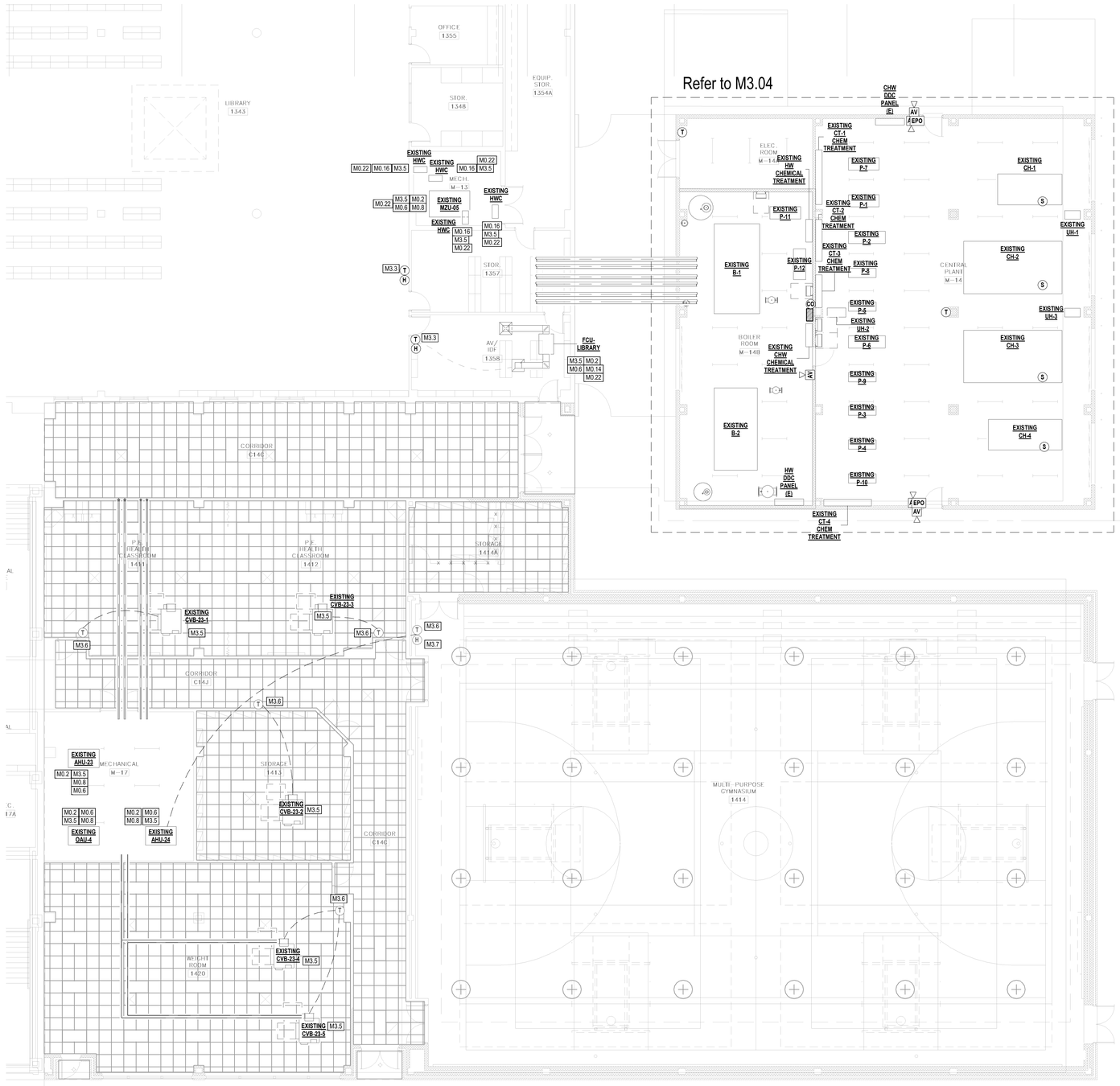
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M3.3 PROVIDE COMBINATION TEMPERATURE/HUMIDITY SENSOR AT APPROXIMATE LOCATION SHOWN. SENSOR SHALL BE INSTALLED AT SAME ELEVATION AS LIGHT SWITCHES. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

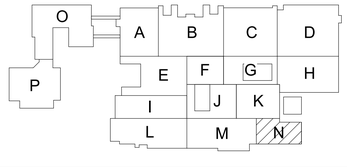
M3.7 PROVIDE NEW HUMIDISTAT IN SAME LOCATION AS EXISTING HUMIDISTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.



1 MECHANICAL PLAN LEVEL 1 - AREA N

1/8" = 1'-0"

KEY PLAN



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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA N

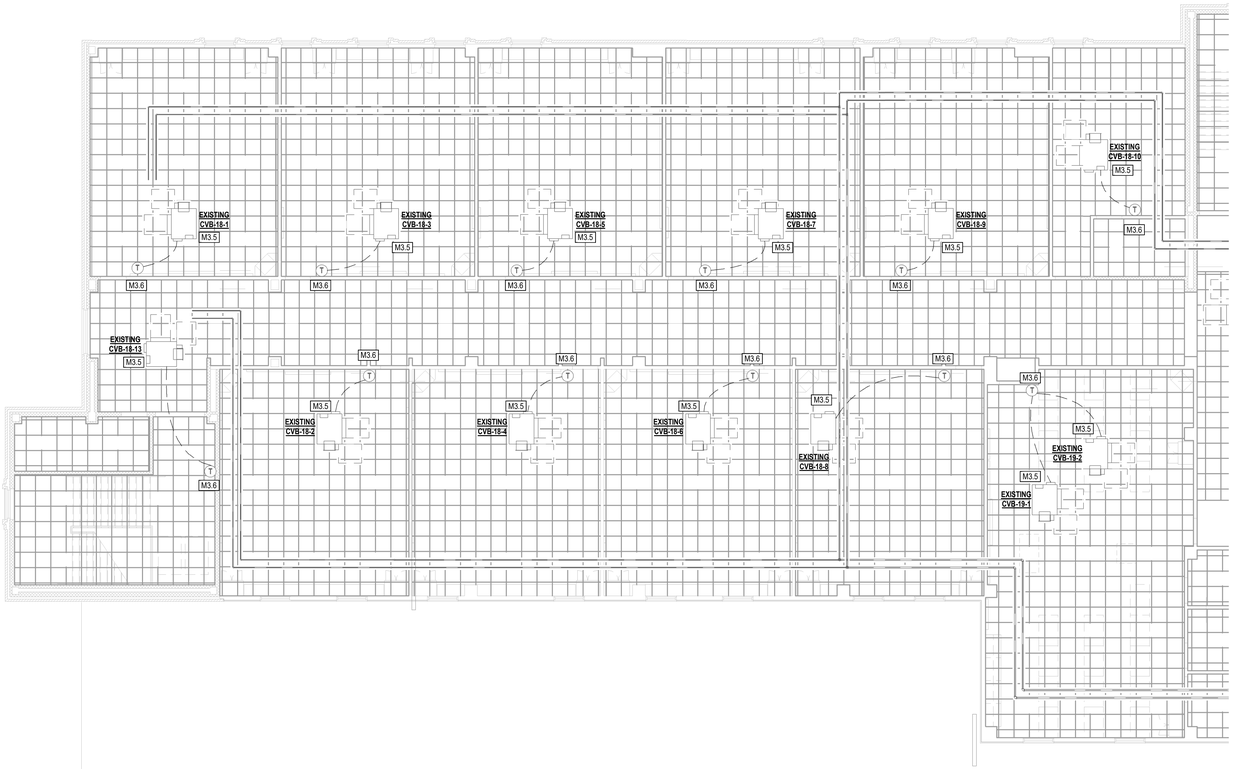
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MECHANICAL KEYED NOTES

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.



1 **MECHANICAL PLAN LEVEL 2 - AREA A**
1/8" = 1'-0"

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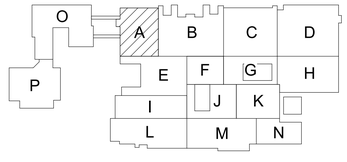
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PROJECT NUMBER 260018.001

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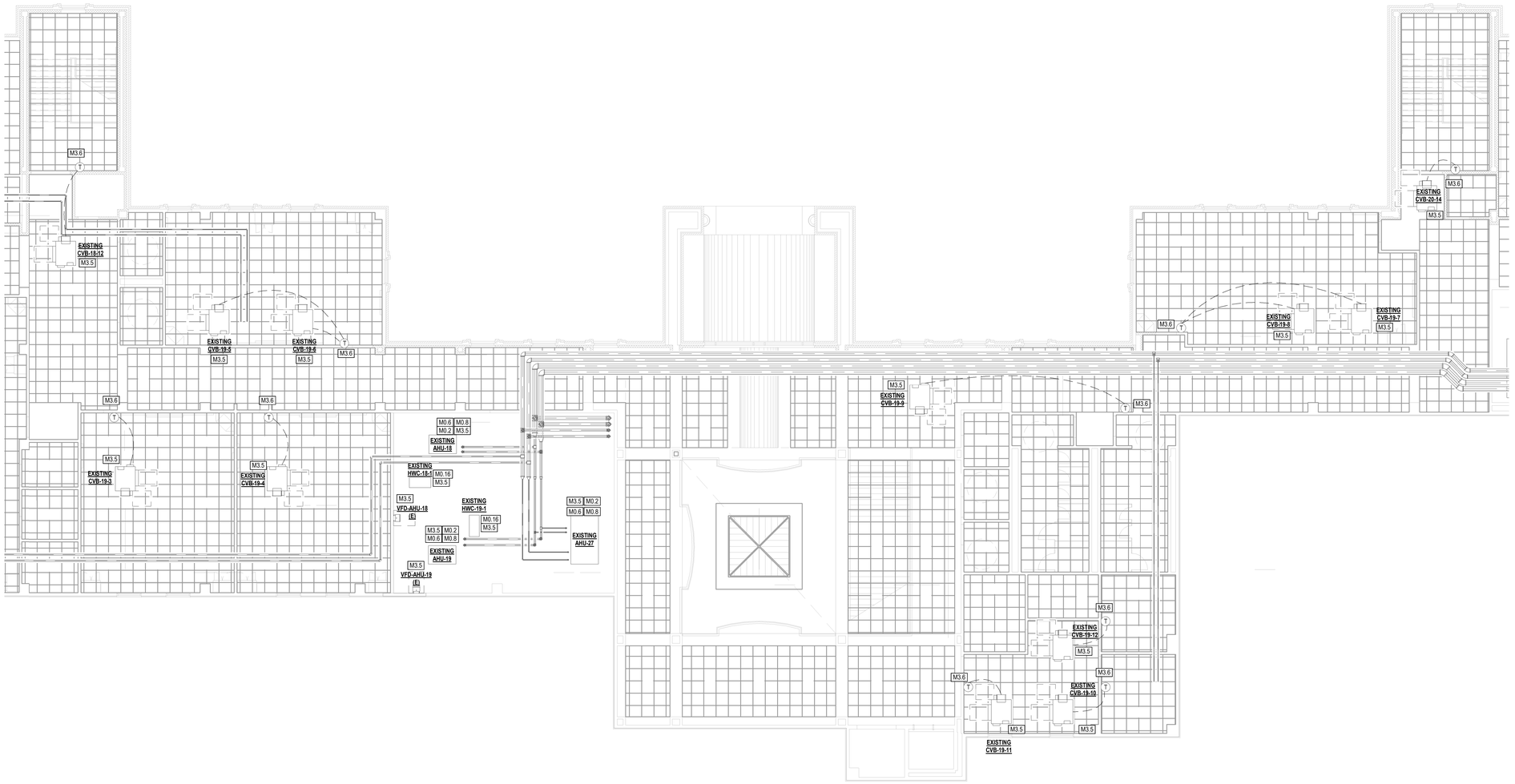
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KEY PLAN



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1 MECHANICAL PLAN LEVEL 2 - AREA B

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

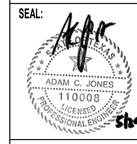
M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

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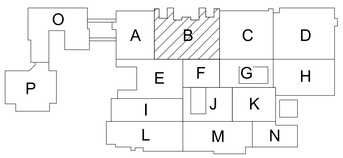
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PROJECT NUMBER 260018.001

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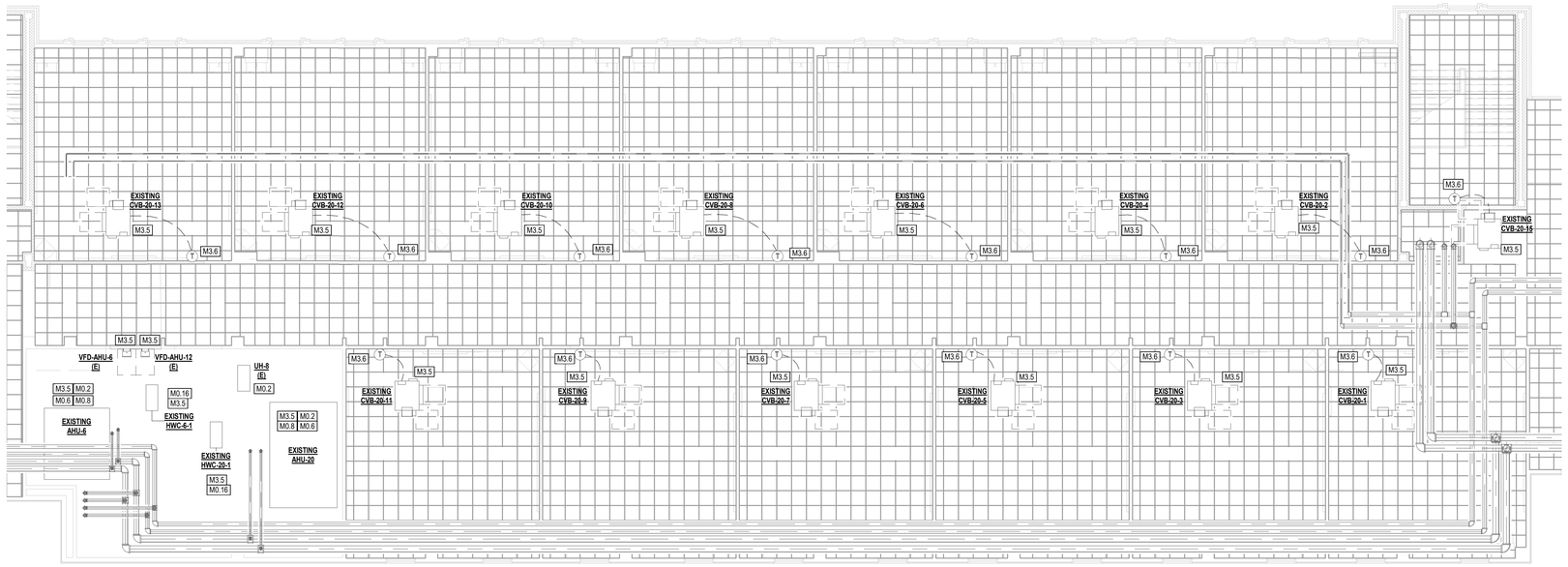
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KEY PLAN



PN

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1 MECHANICAL PLAN LEVEL 2 - AREA C

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

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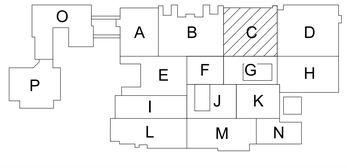
SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

KEY PLAN



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TBPE Firm Registration No. 2234

DATE: 05/29/2026

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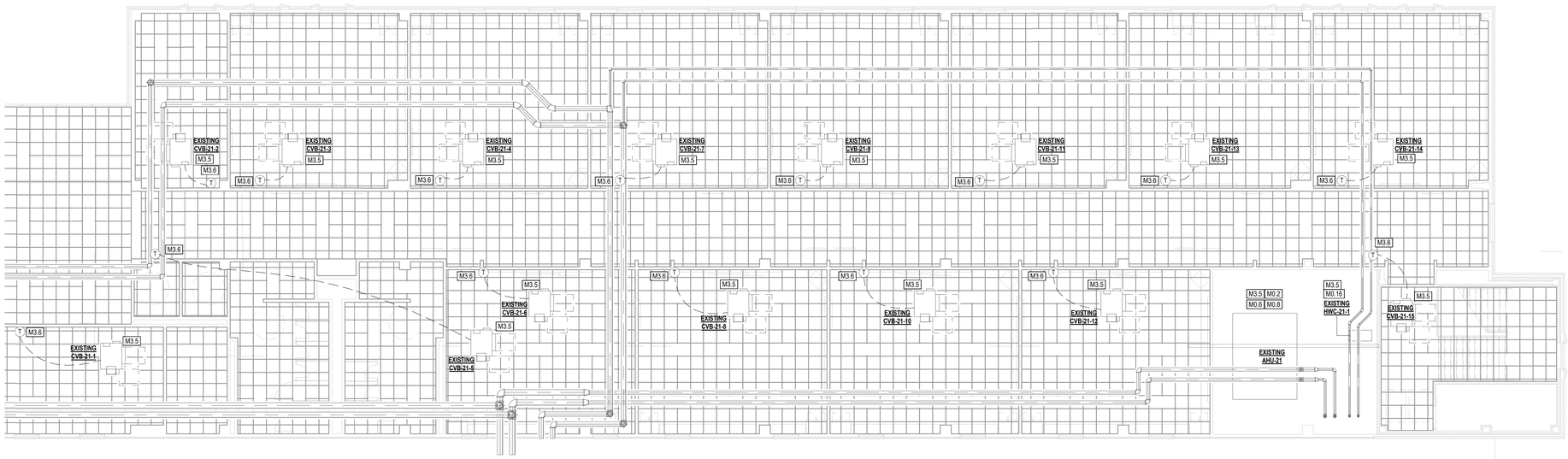
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 2 - AREA C

SHEET NUMBER: M2.22C

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1 **MECHANICAL PLAN LEVEL 2 - AREA D**
1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

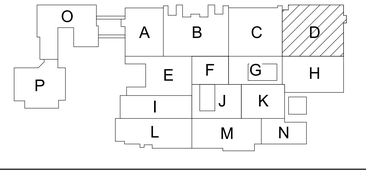
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

PN
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KEY PLAN



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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 2 - AREA D

SHEET NUMBER: M2.22D

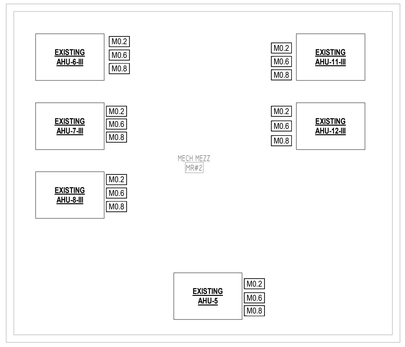
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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.



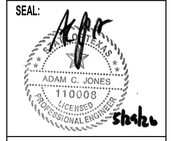
1 **ENLARGED MECHANICAL PLAN - MR#2 MECH MEZZ**
1/4" = 1'-0"

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SEAL:



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Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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CHECKED BY: DBR

PROJECT NUMBER 260018.001

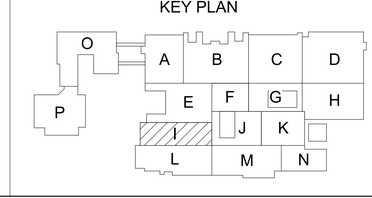
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MECHANICAL PLAN
LEVEL 2 - MECH MEZZ
MR#2

SHEET NUMBER:

M2.22I

KEY PLAN



PN

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MECHANICAL KEYED NOTES

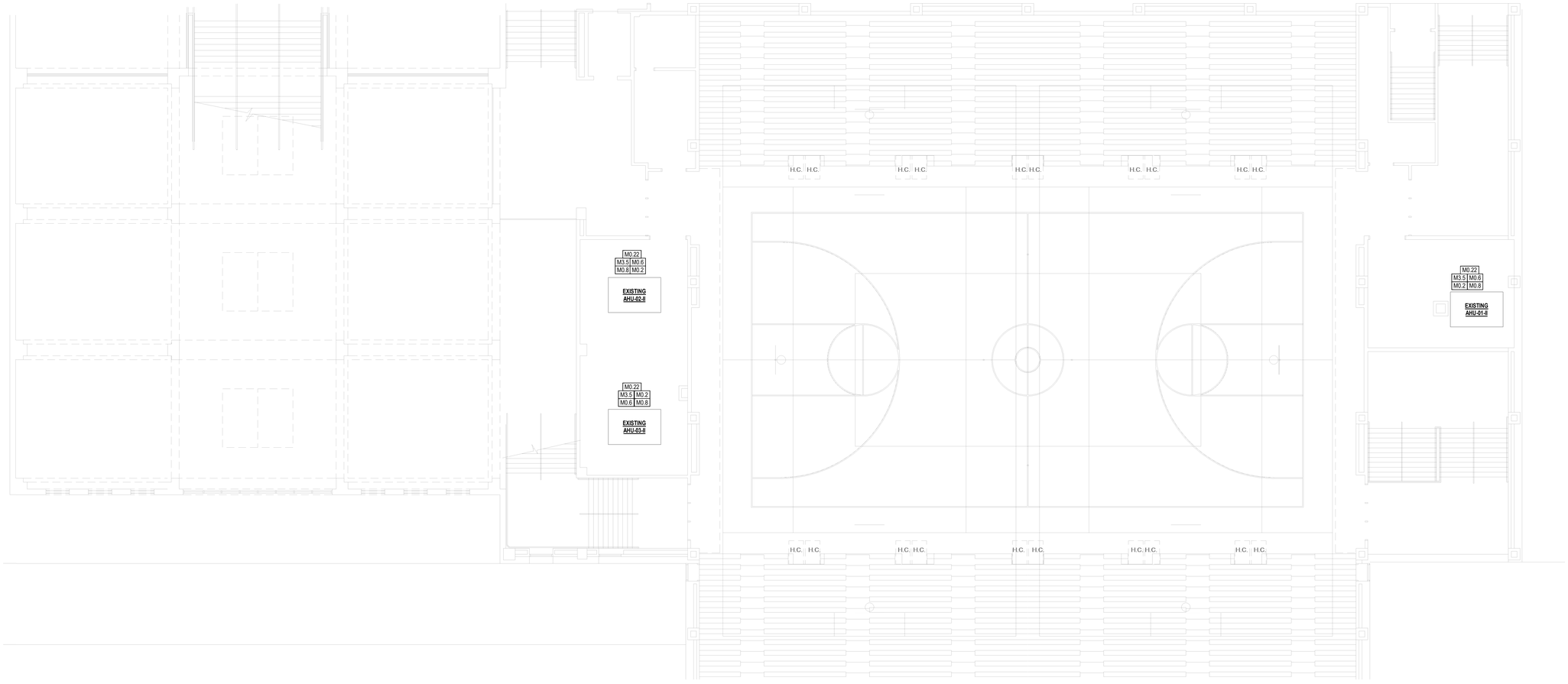
M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.



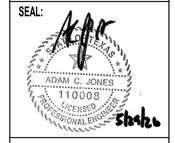
1 **MECHANICAL PLAN LEVEL 2 - AREA M**
1/8" = 1'-0"

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DATE: 05/29/2026

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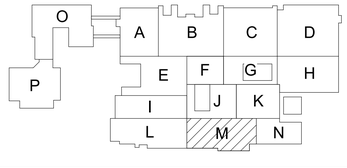
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 2 - AREA M

SHEET NUMBER: M2.22M

KEY PLAN



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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

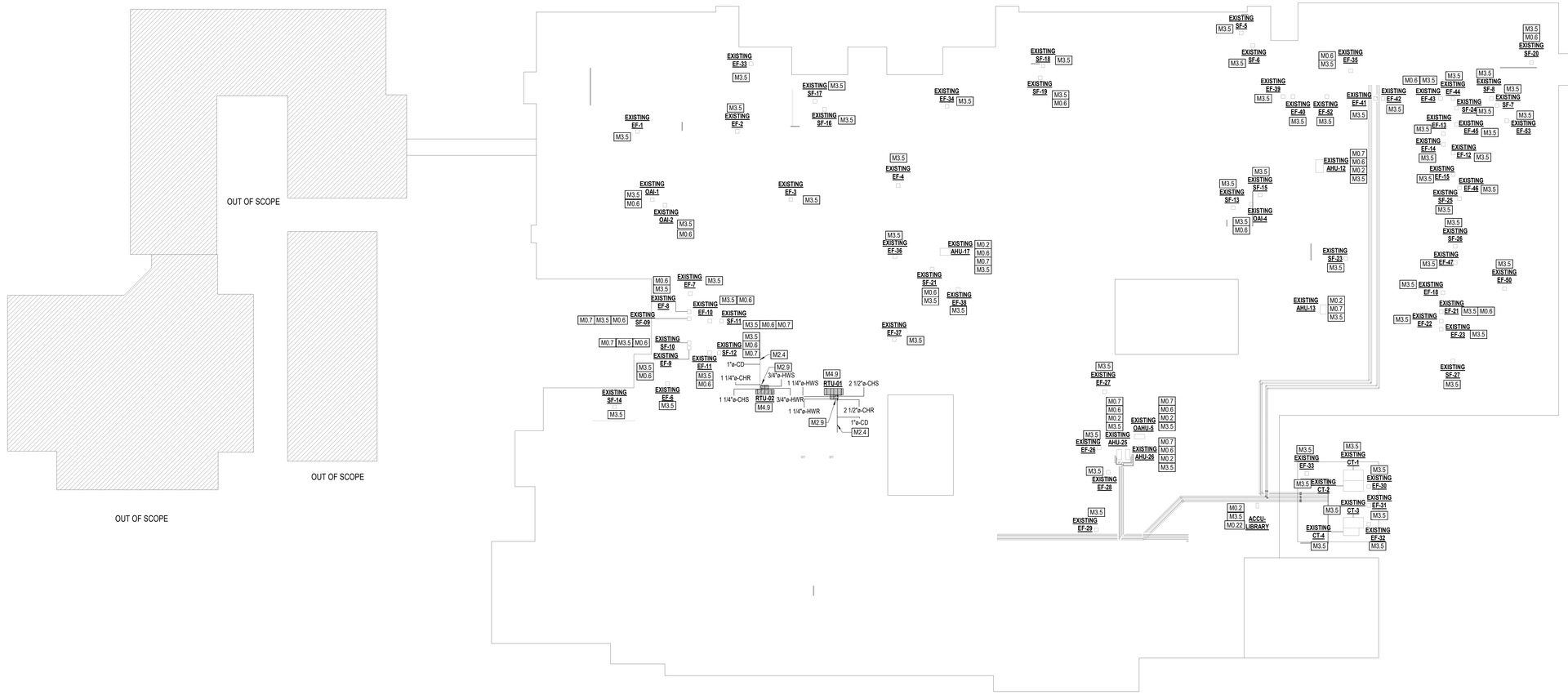
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M2.4 ROUTE CONDENSATE DRAIN LINE FROM ROOFTOP UNIT TO NEAREST ROOF DRAIN. SIZE AS INDICATED. FIELD COORDINATE EXACT ROUTING. PROVIDE PIPE ROOF SUPPORTS AT A MAXIMUM OF 10' O.C. RE: DETAIL 14/M6.01.

M2.9 ROUTE NEW ROOF UNIT HYDRONIC PIPING DOWN INTO BUILDING AND CONNECT TO EXISTING PIPING. COORDINATE ROOF PENETRATIONS AND ROUTING WITH EXISTING STRUCTURAL ELEMENTS. RE: M3.02. FOR APPROXIMATE ROUTING. FIELD VERIFY FINAL ROUTING. RE: DETAIL 11,12,13/M6.01.

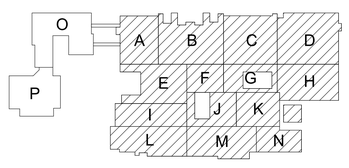
M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M4.9 PROVIDE ROOF MOUNTED AIR HANDLING UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 1. PROVIDE UNIT WITH ROOF CURB TO MATCH ROOF SLOPE. PROVIDE ALL CLEARANCES AROUND UNIT AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE FINAL LOCATION WITH STRUCTURAL. COORDINATE ROOF PENETRATIONS AND ROUTING WITH EXISTING STRUCTURAL ELEMENTS. RE: DETAIL 09/M6.01.



1 **MECHANICAL ROOF PLAN**
1" = 40'-0"

KEY PLAN



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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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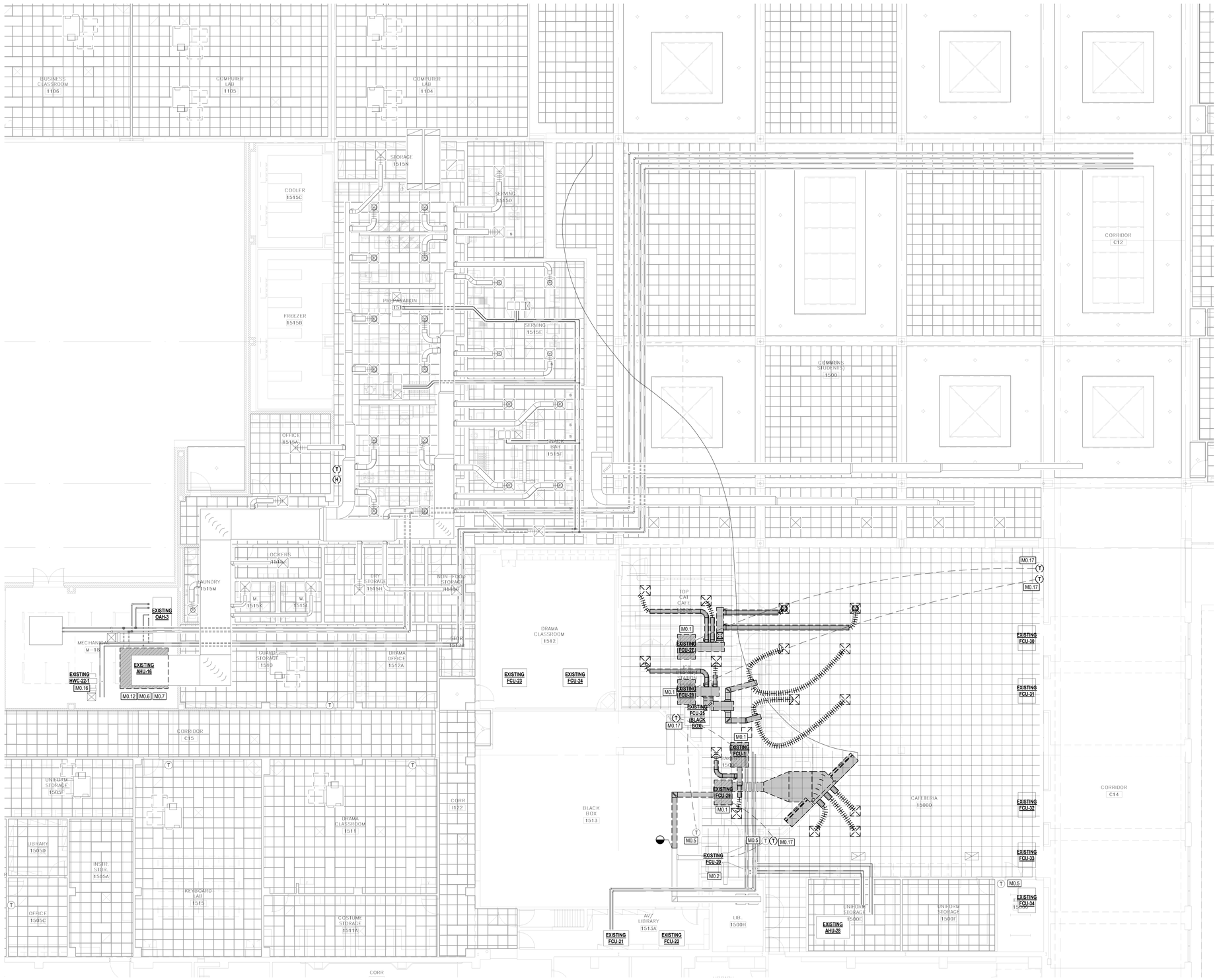
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL ROOF PLAN

SHEET NUMBER: M2.23

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1 DEMOLITION MECHANICAL PLAN LEVEL 1 - KITCHEN

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.1 EXISTING EQUIPMENT AND ALL ASSOCIATED DUCTWORK, DIFFUSERS, PIPING, CONTROLS, ELECTRICAL, VALVES, HANGERS, SUPPORTS, AND ACCESSORIES SHALL BE REMOVED IN ITS ENTIRETY AS PART OF ALTERNATE 1.

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNITS ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.12 EXISTING AIR HANDLING UNIT AND ALL ASSOCIATED MOTOR STARTERS, CONTROLS, ELECTRICAL, VALVES, AND ACCESSORIES SHALL BE REMOVED IN ITS ENTIRETY AS PART OF ALTERNATE 1.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

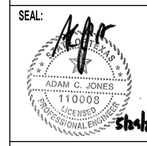
M0.17 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY.

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SEAL:



Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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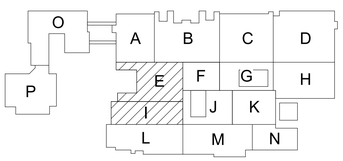
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - KITCHEN/CAFETERIA - ALT 1

SHEET NUMBER: M3.01

KEY PLAN



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MECHANICAL KEYED NOTES

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.15 LOCATE EXISTING OUTSIDE AIR INTAKE FOR CAFETERIA 1500D AND CAP EXISTING CURB AS PART OF ALTERNATE 1.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M1.1 PROVIDE SPIN-IN FITTING WITH LOCKING QUADRANT BUTTERFLY DAMPER FOR ALL ROUND DUCT CONNECTIONS TO RECTANGULAR DUCT. TYPICAL. RE: 06/M6.01.

M1.3 DUCTWORK TO ROUTE UP THROUGH ROOF TO NEW ROOF MOUNTED AIR HANDLING UNIT FOR ALTERNATE 1. COORDINATE ROOF PENETRATIONS AND ROUTING WITH EXISTING STRUCTURAL ELEMENTS.

M1.4 EXISTING DIFFUSER TO REMAIN. RE-BALANCE TO CFM INDICATED AS PART OF ALTERNATE 1.

M1.5 PROVIDE DUCT MOUNTED HOT WATER COIL AS SCHEDULED AS PART OF ALTERNATE 1. TRIM EXISTING DUCTWORK AND PROVIDE TRANSITIONS AS NECESSARY. INTERLOCK HOT WATER COIL WITH AHU-16

M2.8 RECONNECT EXISTING CHILLED AND HOT WATER HYDRONIC PIPING TO NEW UNIT. TRIM/EXTEND EXISTING PIPING AS NECESSARY. ROUTE COOLING COIL CONDENSATE DRAIN LINE TO FLOOR DRAIN WITHIN MECHANICAL ROOM. SIZE AS INDICATED ON DRAWING. FIELD COORDINATE ROUTING AND EXACT LOCATION OF FLOOR DRAIN. RE: DETAIL 14/M6.01.

M3.3 PROVIDE COMBINATION TEMPERATURE/HUMIDITY SENSOR AT APPROXIMATE LOCATION SHOWN. SENSOR SHALL BE INSTALLED AT SAME ELEVATION AS LIGHT SWITCHES. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

M3.4 PROVIDE WALL MOUNTED CO2 SENSOR AT APPROXIMATE LOCATION SHOWN. CO2 SENSOR SHALL BE INSTALLED AT SAME ELEVATION AS LIGHT SWITCHES. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS. CO2 SENSOR SHALL MONITOR SPACE CO2 CONCENTRATION AND SHALL BE UTILIZED TO CONTROL OUTSIDE AIRFLOW SETPOINT AS INDICATED IN THE ASSOCIATED AIR HANDLING UNIT SEQUENCE OF OPERATIONS.

M3.10 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. INTERLOCK WITH NEW AHU-16 AS PART OF ALTERNATE 1. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

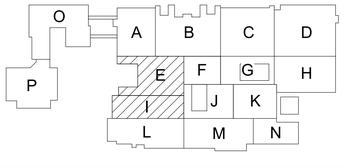
M4.4 PROVIDE AIR HANDLING UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 1. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. INSTALL UNIT ON EXISTING HIGH HOUSEKEEPING PAD. TRIM/EXTEND PAD AS NECESSARY. CONNECT EXISTING DUCTWORK TO NEW AHU. PROVIDE TRANSITIONS AS NECESSARY.

M4.7 PROVIDE VARIABLE FREQUENCY DRIVE AT SAME LOCATION AS EXISTING MOTOR STARTER AS PART OF ALTERNATE 1. COORDINATE FINAL LOCATION WITH ELECTRICAL AND CONTROLS CONTRACTORS.

1 **MECHANICAL PLAN LEVEL 1 - KITCHEN**
1/8" = 1'-0"

PN

KEY PLAN

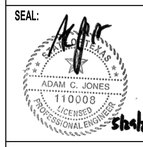


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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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SHEET TITLE: MECHANICAL PLAN LEVEL 1 - KITCHEN/CAFETERIA - ALT 1

SHEET NUMBER: M3.02

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.20 EXISTING FREON MONITORING SYSTEM TO BE REMOVED. OWNER TO HAVE FIRST RIGHT TO ANY FREON MONITORING EQUIPMENT AND ASSOCIATED CONTROLS BEING REMOVED.

M0.21 EXISTING CHILLER TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. OWNER TO HAVE FIRST RIGHT TO ANY PARTS/CONTROL POINTS BEING REMOVED. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

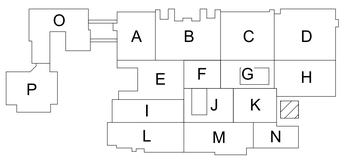


1 DEMOLITION MECHANICAL PLAN LEVEL 1 - CENTRAL PLANT

1/4" = 1'-0"

PN N

KEY PLAN

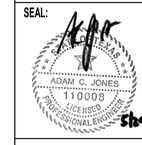


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30330 Quinn Rd.
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SHEET TITLE: DEMOLITION MECHANICAL PLAN - CENTRAL PLANT

SHEET NUMBER: M3.03

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MECHANICAL KEYED NOTES

M3.2 PROVIDE CARBON MONOXIDE SENSOR (MACURCO CM-6 OR APPROVED EQUAL) AT APPROXIMATELY THIS LOCATION. MOUNT AT SAME ELEVATION AS LIGHT SWITCHES. SENSOR SHALL MONITOR CARBON MONOXIDE LEVELS IN BOILER ROOM AS DESCRIBED IN HOT WATER SYSTEM CONTROL SEQUENCE

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M3.8 INTEGRATE EXISTING CHEMICAL TREATMENT INTO NEW BUILDING CONTROLS. PROVIDE BACNET INTEGRATION WITH ALARMS AND MONITORING SYSTEM STATUS.

M3.9 PROVIDE CARBON MONOXIDE MONITORING CONTROL PANEL AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

M5.11 PROVIDE AN "OFF ONLY" GLASS BREAK TYPE EMERGENCY SWITCH TO DE-ENERGIZE CHILLERS, PUMPS, AND ELECTRICAL EQUIPMENT WITHIN CHILLER ROOM. EMERGENCY SWITCH SHALL HAVE MANUAL RESET ONLY INSTALL SWITCH WITHIN 2'-0" OF THE DOOR.

M5.12 PROVIDE AN "ON ONLY" GLASS BREAK TYPE EMERGENCY SWITCH WHICH SHALL ENERGIZE EMERGENCY EXHAUST FAN AND INITIATE AUDIBLE/VISUAL ALARMS. EMERGENCY SWITCH SHALL HAVE MANUAL RESET ONLY. INSTALL SWITCH WITHIN 2'-0" OF THE DOOR.

M5.13 PROVIDE REFRIGERANT SENSOR (CAPABLE OF SENSING MULTIPLE REFRIGERANTS) TO ENERGIZE EMERGENCY EXHAUST FAN FOR EMERGENCY VENTILATION AND ACTIVATE AUDIBLE/VISUAL ALARMS AND DE-ENERGIZE CHILLERS, PUMPS, AND ELECTRICAL EQUIPMENT IN CHILLER ROOM WHEN THE CONCENTRATION OF REFRIGERANT VAPOR EXCEEDS THE QUANTITY ALLOWED BY MECHANICAL CODE.

M5.14 PROVIDE AUDIBLE AND VISUAL REFRIGERANT ALARM FOR REFRIGERANT LEAK DETECTION SYSTEM.

M5.15 PROVIDE VISUAL REFRIGERANT ALARM FOR REFRIGERANT LEAK DETECTION SYSTEM.



1 ENLARGED MECHANICAL PLAN - CENTRAL PLANT

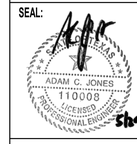
1/4" = 1'-0"

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30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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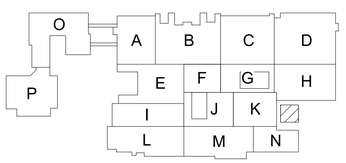
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - CENTRAL PLANT

SHEET NUMBER: M3.04

KEY PLAN



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EXISTING AIR HANDLING UNIT SCHEDULE

	MARK	EXISTING AHU-1	EXISTING AHU-2	EXISTING AHU-3	EXISTING AHU-4	EXISTING AHU-5	EXISTING AHU-6	EXISTING AHU-7	EXISTING AHU-8	EXISTING AHU-9	EXISTING AHU-10	EXISTING AHU-11	EXISTING AHU-12	EXISTING AHU-13	EXISTING AHU-14	EXISTING AHU-15	EXISTING AHU-16	EXISTING AHU-17
	LOCATION	MECHANICAL M-1	MECHANICAL M-1	MECHANICAL M-2	MECHANICAL M-2	MECHANICAL M-4	MECHANICAL M-21	MECHANICAL M-7	MECHANICAL M-7	MECHANICAL M-6	MECHANICAL M-8	MECHANICAL M-8	ROOF ABOVE 1314B	ROOF ABOVE H109	MECHANICAL M-3	MECHANICAL M-3	MECHANICAL M-18	ROOF ABOVE COR.-C12H
FAN	DESIGN SUPPLY AIR FLOW RATE (CFM)	14975	14240	7365	10935	3280	13445	13000	19260	16415	10850	10835	11370	12510	10830	12220	15130	11845
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	5,990	5,700	2,950	4,375	1,315	5,380	5,200	7,705	6,570	4,340	4,335	4,550	5,005	4,335	4,890	6,055	4,740
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	3125	2600	1290	2155	0	3860	4490	4375	3870	2655	1695	2510	2855	3345	4715	2345	2260
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	1,565	1,300	645	1,080	0	1,930	2,245	2,190	1,935	1,330	850	1,255	1,430	1,675	2,360	1,175	1,130
	EXT. S.P. (IN. W.G.)	1.4	1	0.8	1.3	1.2	1.5	1.2	1.6	1.3	1.2	1.5	1	1	1	1.1	0.9	0.8
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	15	15	7.5	10	5	15	15	20	20	15	10	15	15	15	15	20	10
	VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
	EAT DB (°F)	80.2	79	77.1	79.4	75	82	82.2	80.1	80.4	80.6	79.6	80.1	80.3	82.1	83.9	75.8	80.2
	EAT WB (°F)	67.7	66	64.4	66.2	62.5	69.5	69.8	67.8	67.4	67.9	66.3	67.3	67.5	69.6	70.8	63.3	66.8
	LAT DB (°F)	54.9	54.6	55.2	54.8	56.5	54.4	55.1	56	54.3	54	54.2	54.8	54.7	54.4	54.2	56.2	53.8
	LAT WB (°F)	54.1	53.8	54.4	54	55.7	53.5	54.3	55.2	53.5	53	53.4	54	53.9	53.6	53.3	55.3	53
	EWT/LWT (°F)	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
	COIL WATER FLOW RATE (GPM)	113	92	37	68	11	109	108	127	117	81	71	78	87	92	115	61	81
	PIPE SIZE (IN.)	3"	3"	2"	2-1/2"	1-1/4"	3"	3"	3"	3"	3"	2-1/2"	3"	3"	3"	3"	2-1/2"	3"
	MAX. WATER P.D. (FT. HD.)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)																	
	EAT (°F)	-	-	-	-	72	-	-	-	-	-	-	-	-	55	55	-	-
	LAT (°F)	-	-	-	-	100	-	-	-	-	-	-	-	-	95	95	-	-
	EWT (°F)	-	-	-	-	160	-	-	-	-	-	-	-	-	160	160	-	-
	COIL WATER FLOW RATE (GPM)	-	-	-	-	18.3	-	-	-	-	-	-	-	-	25	35	-	-
	PIPE SIZE (IN.)	-	-	-	-	1-1/2"	-	-	-	-	-	-	-	-	2"	2"	-	-
	MAX. WATER P.D. (FT. HD.)	-	-	-	-	10	-	-	-	-	-	-	-	-	10	10	-	-
MANUFACTURER		TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE
MODEL NUMBER		MCCA035	MCCA030	MCCA017	MCCA025	MCCA008	MCCA030	MCCA030	MCCA040	MCCA035	MCCA025	MCCA025			MCCA025	MCCA025	MCCA035	
UNIT TYPE		VAV AHU W/ EF	VAV AHU	VAV AHU W/ EF	VAV AHU W/ EF	SZ AHU	VAV AHU W/ EF	VAV AHU	VAV AHU W/ EF	VAV AHU	VAV AHU	VAV AHU	VAV AHU	VAV AHU	SZ AHU	SZ AHU	SZ AHU	VAV-AHU
NOTES		1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 3	1, 3	1, 3	1,2

NOTES:
1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. TWO-WAY CHILLED WATER AND HEATING WATER CONTROL VALVES.
3. THREE-WAY CHILLED WATER AND HEATING WATER CONTROL VALVES.

EXISTING AIR HANDLING UNIT SCHEDULE

	MARK	EXISTING AHU-18	EXISTING AHU-19	EXISTING AHU-20	EXISTING AHU-21	EXISTING AHU-22	EXISTING AHU-23	EXISTING AHU-24	EXISTING AHU-25	EXISTING AHU-26	EXISTING AHU-27	EXISTING AHU-28	EXISTING OAHU-1	EXISTING OAHU-2	EXISTING OAHU-3	EXISTING OAHU-4	EXISTING OAHU-5
	LOCATION	MECHANICAL M-20	MECHANICAL M-20	MECHANICAL M-21	MECHANICAL M-22	MECHANICAL M-17	MECHANICAL M-17	ROOF ABOVE M-17	ROOF ABOVE RM.1403	ROOF ABOVE RM. 1403	MECHANICAL M-20	1500E	MECHANICAL M-3	MECHANICAL M-3	MECHANICAL M-18	MECHANICAL M-17	ROOF ABOVE RM.1403
FAN	DESIGN SUPPLY AIR FLOW RATE (CFM)	12500	12775	17670	19900	11495	5690	10120	3215	2370	4115	945	3345	4715	2345	1130	1410
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	5,000	5,110	7,070	7,960	4,600	2,280	4,050	1,290	950	1,650	380	3,345	4,715	2,345	1,130	1130
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	4180	2105	4180	4020	2490	1110	1130	765	645	0	0	3345	4715	2345	1130	1410
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	2,090	1,055	2,090	2,010	1,245	555	565	385	325	0	0	1675	2360	1175	565	705
	EXT. S.P. (IN. W.G.)	1.4	1.2	1.6	1.6	0.9	0.8	0.9	0.7	0.7	0.7	0.5	0.1	0.1	0.1	0.1	0.1
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	15	15	20	20	15	7.5	15	5	3	5	1	5	5	3	2	2
	VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	500	500	500	500	500	500	500	500	500	500	500	450	450	450	450	450
	EAT DB (°F)	77.8	80.4	81.7	79.4	79.3	79.6	77.5	80.4	81.2	78.9	75	98	98	98	98	98
	EAT WB (°F)	65	67.6	68.7	66.8	66.1	66.4	65.9	67	68	63.3	62.5	78	78	78	78	78
	LAT DB (°F)	54.4	54.1	54.6	54.9	54	54.3	57	54.7	55.2	56.5	56.5	55	55	55	55	55
	LAT WB (°F)	53.5	53.3	53.8	54.1	53.2	53.4	56.2	53.9	54.4	55.7	55.7	54	54	54	54	54
	EWT (°F)	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
	COIL WATER FLOW RATE (GPM)	72	92	135	130	75	37	52	22	17	16	4	23	28	18	15	15
	PIPE SIZE (IN.)	2-1/2"	3"	3"	3"	2-1/2"	2"	2"	1-1/2"	1-1/2"	1-1/4"	3/4"	1-1/2"	2"	1-1/2"	1-1/4"	1-1/4"
	MAX. WATER P.D. (FT. HD.)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)												-	-	-	-	-
	EAT (°F)	-	-	-	-	-	-	57.3	57.5	55	75	75	27	27	27	27	27
	LAT (°F)	-	-	-	-	-	-	95	95	95	95	95	55.0	55.0	55.0	55.0	55.0
	EWT (°F)	-	-	-	-	-	-	160	160	160	160	160	160.0	160.0	160.0	160.0	160.0
	COIL WATER FLOW RATE (GPM)	-	-	-	-	-	-	22	11	8	7	2	10	15	7	5	5
	PIPE SIZE (IN.)							1-1/2"	1-1/4"	1-1/4"	1"	3/4"	1-1/4"	1-1/4"	1"	1"	1"
	MAX. WATER P.D. (FT. HD.)	-	-	-	-	-	-	10	10	10	10	10	10	10	10	10	10
MANUFACTURER		TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE
MODEL NUMBER		MCCA025	MCCA030	MCCA040	MCCA040	MCAA	MCAA012	MCAA025	MCAA025		MCCA010		MCCA008	MCCA012	MCCA006	MCCA003	
UNIT TYPE		VAV AHU	VAV AHU	VAV AHU	VAV AHU	VAV AHU	VAV AHU	SZ AHU	SZ AHU W/ EF	SZ AHU W/ EF	SZ AHU	SZ AHU	OUTSIDE AIR	OUTSIDE AIR W/ EF	OUTSIDE AIR	OUTSIDE AIR	
NOTES		1, 2	1,2	1,2	1,2	1,3	1,2	1,2	1,2	1,2	1,2	1,2	1,3	1,3	1,3	1,2	1,2

NOTES:
1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. TWO-WAY CHILLED WATER AND HEATING WATER CONTROL VALVES.
3. THREE-WAY CHILLED WATER AND HEATING WATER CONTROL VALVES.

EXISTING CVB SCHEDULE

MARK	PRIMARY AIR CFM		INLET SIZE	HOT WATER GPM
	MAX.	MIN.		
EXISTING CVB-1-1	1,000	225	10"Ø	2.7
EXISTING CVB-1-2	1,265	285	12"Ø	3.4
EXISTING CVB-1-3	1,000	225	10"Ø	2.7
EXISTING CVB-1-4	1455	325	12"Ø	3.9
EXISTING CVB-1-5	1465	330	12"Ø	3.9
EXISTING CVB-1-6	680	150	8"Ø	1.8
EXISTING CVB-1-7	1305	295	12"Ø	3.5
EXISTING CVB-1-8	1140	255	12"Ø	3.0
EXISTING CVB-1-9	480	110	6"Ø	1.3
EXISTING CVB-1-10	1140	255	12"Ø	3.0
EXISTING CVB-1-11	1315	295	12"Ø	3.5
EXISTING CVB-1-12	1365	305	12"Ø	3.6
EXISTING CVB-1-13	1180	265	12"Ø	3.1
EXISTING CVB-1-14	435	100	6"Ø	1.2
EXISTING CVB-2-1	1000	185	10"Ø	2.6
EXISTING CVB-2-2	1000	185	10"Ø	2.6
EXISTING CVB-2-3	1130	210	12"Ø	2.9
EXISTING CVB-2-4	1010	185	10"Ø	2.6
EXISTING CVB-2-5	1450	265	12"Ø	3.7
EXISTING CVB-2-6	950	170	10"Ø	2.5
EXISTING CVB-2-7	950	170	10"Ø	2.5
EXISTING CVB-2-8	970	180	10"Ø	2.5
EXISTING CVB-2-9	970	180	10"Ø	2.5
EXISTING CVB-2-10	1030	190	10"Ø	2.7
EXISTING CVB-2-11	950	170	10"Ø	2.5
EXISTING CVB-2-12	950	170	10"Ø	2.5
EXISTING CVB-2-13	1195	220	12"Ø	3.0
EXISTING CVB-3-1	1195	225	12"Ø	3.1
EXISTING CVB-3-2	1370	260	12"Ø	3.5
EXISTING CVB-3-3	1440	270	12"Ø	3.7
EXISTING CVB-3-4	355	65	6"Ø	3.7
EXISTING CVB-3-5	370	70	6"Ø	1.0
EXISTING CVB-3-6	765	145	10"Ø	2.0
EXISTING CVB-3-7	1165	220	12"Ø	3.0
EXISTING CVB-3-8	725	135	10"Ø	1.9
EXISTING CVB-4-1	820	165	10"Ø	2.1
EXISTING CVB-4-2	1410	285	12"Ø	3.7
EXISTING CVB-4-3	1410	285	12"Ø	3.7
EXISTING CVB-4-4	1495	305	12"Ø	3.9
EXISTING CVB-4-5	680	140	8"Ø	1.8
EXISTING CVB-4-6	1415	290	12"Ø	3.7
EXISTING CVB-4-7	800	160	10"Ø	2.1
EXISTING CVB-4-8	1440	290	12"Ø	3.7
EXISTING CVB-4-9	830	170	10"Ø	2.2
EXISTING CVB-4-10	655	135	8"Ø	1.7
EXISTING CVB-6-1	1350	410	12"Ø	3.8
EXISTING CVB-6-2	1075	330	10"Ø	3.1
EXISTING CVB-6-3	1150	350	12"Ø	3.3
EXISTING CVB-6-4	1405	430	12"Ø	4.0
EXISTING CVB-6-5	1150	350	12"Ø	3.3
EXISTING CVB-6-6	1030	315	10"Ø	2.9
EXISTING CVB-6-7	1030	315	10"Ø	2.9
EXISTING CVB-6-8	1020	310	10"Ø	2.9
EXISTING CVB-6-9	1370	420	12"Ø	3.9
EXISTING CVB-6-10	775	235	10"Ø	2.2
EXISTING CVB-6-11	1360	415	12"Ø	3.9
EXISTING CVB-6-12	730	225	10"Ø	2.0
EXISTING CVB-7-1	1060	370	10"Ø	3.1
EXISTING CVB-7-2	1035	360	10"Ø	3.0
EXISTING CVB-7-3	1060	370	10"Ø	3.1
EXISTING CVB-7-4	710	250	8"Ø	2.1
EXISTING CVB-7-5	1060	370	10"Ø	3.1
EXISTING CVB-7-6	1035	360	10"Ø	3.0
EXISTING CVB-7-7	1060	370	10"Ø	3.1
EXISTING CVB-7-8	710	250	8"Ø	2.1
EXISTING CVB-7-9	1060	370	10"Ø	3.1
EXISTING CVB-7-10	1035	360	10"Ø	3.0
EXISTING CVB-7-11	1060	370	10"Ø	3.1
EXISTING CVB-7-12	710	250	8"Ø	2.1
EXISTING CVB-7-13	1285	450	12"Ø	2.1
EXISTING CVB-8-1	1300	295	12"Ø	3.4
EXISTING CVB-8-2	1300	295	12"Ø	3.4
EXISTING CVB-8-3	1440	330	12"Ø	3.8
EXISTING CVB-8-4	1130	260	12"Ø	3.0
EXISTING CVB-8-5	1460	335	12"Ø	3.9
EXISTING CVB-8-6	1130	260	12"Ø	3.0
EXISTING CVB-8-7	1250	285	12"Ø	3.3
EXISTING CVB-8-9	1130	260	12"Ø	3.0
EXISTING CVB-8-10	1495	340	12"Ø	4.0
EXISTING CVB-8-11	1130	260	12"Ø	3.0
EXISTING CVB-8-12	1495	340	12"Ø	4.0
EXISTING CVB-8-13	1130	260	12"Ø	3.0
EXISTING CVB-8-14	1220	280	12"Ø	3.3
EXISTING CVB-8-15	1440	330	12"Ø	3.8
EXISTING CVB-8-16	1220	280	12"Ø	3.3
EXISTING CVB-9-1	1030	245	12"Ø	2.7
EXISTING CVB-9-2	1030	245	12"Ø	2.7
EXISTING CVB-9-3	995	235	10"Ø	2.6
EXISTING CVB-9-4	1030	220	10"Ø	2.5
EXISTING CVB-9-5	1040	245	12"Ø	2.7
EXISTING CVB-9-6	1495	355	12"Ø	4.0
EXISTING CVB-9-7	1100	260	12"Ø	2.9
EXISTING CVB-9-8	1030	220	10"Ø	2.5
EXISTING CVB-9-9	980	235	12"Ø	2.6
EXISTING CVB-9-10	1495	355	12"Ø	4.0
EXISTING CVB-9-11	1500	355	12"Ø	4.0
EXISTING CVB-9-12	1495	355	12"Ø	4.0
EXISTING CVB-9-13	1030	220	10"Ø	2.5
EXISTING CVB-10-1	1140	335	12"Ø	3.2
EXISTING CVB-10-2	1410	415	12"Ø	4.0
EXISTING CVB-10-3	1455	430	12"Ø	4.1
EXISTING CVB-10-4	920	270	10"Ø	2.6
EXISTING CVB-10-5	910	270	10"Ø	2.5
EXISTING CVB-10-6	1140	335	12"Ø	3.2
EXISTING CVB-10-7	1180	425	12"Ø	4.0
EXISTING CVB-10-8	1450	430	12"Ø	4.1
EXISTING CVB-11-1	980	185	10"Ø	2.5
EXISTING CVB-11-2	1150	215	12"Ø	3.0
EXISTING CVB-11-3	850	160	10"Ø	2.2
EXISTING CVB-11-4	850	160	10"Ø	2.2
EXISTING CVB-11-5	1235	230	12"Ø	3.2
EXISTING CVB-11-6	1250	235	12"Ø	3.2
EXISTING CVB-11-7	1250	235	12"Ø	3.2
EXISTING CVB-11-8	850	160	10"Ø	2.2
EXISTING CVB-11-9	1230	230	12"Ø	3.1
EXISTING CVB-11-10	1190	220	12"Ø	3.0
EXISTING CVB-12-1	1330	290	12"Ø	3.5
EXISTING CVB-12-2	1340	295	12"Ø	3.6
EXISTING CVB-12-3	1310	285	12"Ø	3.5
EXISTING CVB-12-4	1320	290	12"Ø	3.5
EXISTING CVB-12-5	1310	285	12"Ø	3.5
EXISTING CVB-12-6	1320	290	12"Ø	3.5
EXISTING CVB-12-7	1310	285	12"Ø	3.5
EXISTING CVB-12-8	1320	290	12"Ø	3.5
EXISTING CVB-12-9	810	180	10"Ø	2.1
EXISTING CVB-13-1	1310	295	12"Ø	3.5
EXISTING CVB-13-2	1310	295	12"Ø	3.5
EXISTING CVB-13-3	1310	295	12"Ø	3.5
EXISTING CVB-13-4	1310	295	12"Ø	3.5
EXISTING CVB-13-5	1310	295	12"Ø	3.5
EXISTING CVB-13-6	1310	295	12"Ø	3.5
EXISTING CVB-13-7	1310	295	12"Ø	3.5
EXISTING CVB-13-8	1310	295	12"Ø	3.5
EXISTING CVB-13-9	830	190	10"Ø	2.2
EXISTING CVB-17-1	890	195	10"Ø	2.3
EXISTING CVB-17-2	1375	300	12"Ø	3.6
EXISTING CVB-17-3	980	215	10"Ø	2.6
EXISTING CVB-17-4	1470	320	12"Ø	3.9
EXISTING CVB-17-5	1150	250	12"Ø	3.0
EXISTING CVB-17-6	1395	305	12"Ø	3.7
EXISTING CVB-17-7	1130	250	12"Ø	3.0
EXISTING CVB-17-8	1235	270	12"Ø	3.3
EXISTING CVB-18-1	1190	285	12"Ø	3.2
EXISTING CVB-18-2	965	260	10"Ø	2.6
EXISTING CVB-18-3	1440	345	12"Ø	3.8
EXISTING CVB-18-4	1470	350	12"Ø	3.9
EXISTING CVB-18-5	1150	275	12"Ø	3.1
EXISTING CVB-18-6	1470	350	12"Ø	3.9
EXISTING CVB-18-7	1150	275	12"Ø	3.1
EXISTING CVB-18-8	1470	350	12"Ø	3.9
EXISTING CVB-18-9	1290	310	12"Ø	3.5
EXISTING CVB-18-10	890	210	10"Ø	2.4
EXISTING CVB-18-12	830	195	10"Ø	2.2
EXISTING CVB-18-13	965	230	10"Ø	2.6
EXISTING CVB-19-1	1275	215	12"Ø	3.2
EXISTING CVB-19-2	1400	235	12"Ø	3.5
EXISTING CVB-19-3	1375	235	12"Ø	3.5
EXISTING CVB-19-4	1375	235	12"Ø	3.5
EXISTING CVB-19-5	1325	225	12"Ø	3.4
EXISTING CVB-19-6	760	130	10"Ø	1.9
EXISTING CVB-19-7	1210	205	12"Ø	3.0
EXISTING CVB-19-8	1210	205	12"Ø	3.0
EXISTING CVB-19-9	1500	255	12"Ø	3.8
EXISTING CVB-19-10	215	35	6"Ø	0.5
EXISTING CVB-19-11	655	110	8"Ø	1.6
EXISTING CVB-19-12	190	35	6"Ø	0.5
EXISTING CVB-20-1	1480	375	12"Ø	4.0
EXISTING CVB-20-2	1340	340	12"Ø	3.6
EXISTING CVB-20-3	1480	375	12"Ø	4.0
EXISTING CVB-20-4	1340	340	12"Ø	3.6
EXISTING CVB-20-5	1130	290	12"Ø	3.1
EXISTING CVB-20-6	1340	340	12"Ø	3.6
EXISTING CVB-20-7	1480	375	12"Ø	4.0
EXISTING CVB-20-8	1340	340	12"Ø	3.6
EXISTING CVB-20-9	1130	290	12"Ø	3.1
EXISTING CVB-20-10	1340	340	12"Ø	3.6
EXISTING CVB-20-11	1480	375	12"Ø	3.6
EXISTING CVB-20-12	1340	340	12"Ø	3.6
EXISTING CVB-20-13	1390	355	12"Ø	3.8
EXISTING CVB-20-14	830	210	10"Ø	2.2
EXISTING CVB-20-15	830	150	10"Ø	2.2
EXISTING CVB-21-1	1045	205	10"Ø	2.7
EXISTING CVB-21-2	1125	220	12"Ø	2.9
EXISTING CVB-21-3	1350	270	12"Ø	3.5
EXISTING CVB-21-4	1350	270	12"Ø	3.5
EXISTING CVB-21-5	1335	265	12"Ø	3.5
EXISTING CVB-21-6	1500	300	12"Ø	3.9
EXISTING CVB-21-7	1350	270	12"Ø	3.5
EXISTING CVB-21-8	1500	300	12"Ø	3.9
EXISTING CVB-21-9	1350	270	12"Ø	3.5
EXISTING CVB-21-10	1500	300	12"Ø	3.9
EXISTING CVB-21-11	1350	270	12"Ø	3.5
EXISTING CVB-21-12	1500	300	12"Ø	3.9
EXISTING CVB-21-13	1350	270	12"Ø	3.5
EXISTING CVB-21-14	1380	275	12"Ø	3.6
EXISTING CVB-21-15	1385	275	12"Ø	3.6
EXISTING CVB-22-1	1040	200	10"Ø	2.7
EXISTING CVB-22-2	980	190	10"Ø	2.5
EXISTING CVB-22-3	1360	260	12"Ø	3.5
EXISTING CVB-22-4	1490	285	12"Ø	3.8
EXISTING CVB-22-5	1420	275	12"Ø	3.7
EXISTING CVB-22-6	1440	275	12"Ø	3.7
EXISTING CVB-22-7	1405	270	12"Ø	3.6
EXISTING CVB-23-1	980	205	10"Ø	2.6
EXISTING CVB-23-2	1020	210	10"Ø	2.7
EXISTING CVB-23-3	1310	270	12"Ø	3.4
EXISTING CVB-23-4	1190	250	12"Ø	3.1
EXISTING CVB-23-5	1190	250	12"Ø	3.1

NOTES
1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M5.01

5/28/2026 5:36:44 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

EXISTING AIR HANDLING UNIT SCHEDULE (OLD PHASE II)

	MARK	EXISTING AHU-01-II	EXISTING AHU-02-II	EXISTING AHU-03-II	EXISTING AHU-04-II	EXISTING AHU-05-II	EXISTING AHU-06-II	EXISTING AHU-07-II	EXISTING AHU-08	MZU-01	MZU-02	MZU-03	MZU-04	MZU-05
FAN	LOCATION	AREA M LV 2	AREA M LV 2	AREA M LV 2	MECH M-16	MECH M-16	LAUNDRY/STORAGE 1403	AREA K LV 1	MECH M-8	MECH M-11	MECH M-10	MECH M-12	MECH M-15	MECH M-13
	DESIGN SUPPLY AIR FLOW RATE (CFM)													
	MINIMUM SUPPLY AIR FLOW RATE (CFM)													
	DESIGN OUTDOOR AIR FLOW RATE (CFM)													
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	0	0	0	0	0	0	0	0	0	0	0	0	0
	EXT. S.P. (IN. W.G.)													
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	10												
	VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)													
	EAT DB (°F)	80.2	79	77.1	79.4	75	82	82.2	80.1	80.4	80.6	79.6	80.1	80.3
	EAT WB (°F)	67.7	66	64.4	66.2	62.5	69.5	69.8	67.8	67.4	67.9	66.3	67.3	67.5
	LAT DB (°F)	54.9	54.6	55.2	54.8	56.5	54.4	55.1	56	54.3	54	54.2	54.8	54.7
	LAT WB (°F)	54.1	53.8	54.4	54	55.7	53.5	54.3	55.2	53.5	53	53.4	54	53.9
	EWT/LWT (°F)	45	45	45	45	45	45	45	45	45	45	45	45	45
	COIL WATER FLOW RATE (GPM)	113	92	37	68	11	109	108	127	117	81	71	78	87
	PIPE SIZE (IN.)	3"	3"	2"	2-1/2"	1-1/4"	3"	3"	3"	3"	3"	2-1/2"	3"	3"
	MAX. WATER P.D. (FT. HD.)	20	20	20	20	20	20	20	20	20	20	20	20	20
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)													
	EAT (°F)													
	LAT (°F)													
	EWT (°F)	-	-	-	-	-	-	-	-	-	-	-	-	-
	COIL WATER FLOW RATE (GPM)													
	PIPE SIZE (IN.)													
	MAX. WATER P.D. (FT. HD.)													
MANUFACTURER		YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK
MODEL NUMBER		CS446SVLP	CS336SVLP	CS270SVLP			CS74SVLP	CS50SVLP	CS74SVLP	CS113MLP	CS113MLP	CS156MLP	CS74MLP	CS113MLP
UNIT TYPE		SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	MZ AHU	MZ AHU	MZ AHU	MZ AHU	MZ AHU
NOTES		OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II

NOTES:

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY. FIELD VERIFY EXISTING CFMS AND GPMS PRIOR TO INTEGRATION INTO NEW BAS.

EXISTING AIR HANDLING UNIT SCHEDULE (OLD PHASE III)

	MARK	AHU-1-III	AHU-2-III	AHU-3-III	AHU-4-III	AHU-5-III	AHU-6-III	AHU-7-III	AHU-8-III	AHU-9-III	AHU-10-III	AHU-11-III	AHU-12-III	OAHU-1-III
FAN	LOCATION	MR #4	MR #4	MR #1	MR #1	MR #2	MR #2	MR #2	MR #2	MR #4	STOR 1503B	MR #2	MR #2	MR #1
	DESIGN SUPPLY AIR FLOW RATE (CFM)	6565	2905	10170	10120	8480	3245	3830	5035	1250	2490	1100	1105	5425
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	2,630	1,165	4,070	4,050	3,395	1,300	1,535	2,015	500	1,000	440	445	2,170
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	0	0	0	0	0	0	0	0	0	0	0	0	0
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	0	0	0	0	0	0	0	0	0	0	0	0	0
	EXT. S.P. (IN. W.G.)	-	-	-	-	-	-	-	-	-	-	-	-	-
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	5	2	7.5	10	7.5	3	3	5	2	2	1	2	5
	VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	450	380	501	498	515	425	501	503	391	450	459	461	457
	EAT DB (°F)	84	79	75	75	79	87	79	79	79	75	81	81	95
	EAT WB (°F)	69	65.4	63.8	63.8	65.5	69.9	65.9	65.9	66.4	62.5	66.6	67.1	80
	LAT DB (°F)	-	-	-	-	-	-	-	-	-	-	-	-	-
	LAT WB (°F)	54	54	52	53	53	54	-	-	52	55	52	52	56
	EWT (°F)	45	45	45	45	45	45	45	45	45	45	45	45	45
	COIL WATER FLOW RATE (GPM)	60	19	63	62	62	32	30	40	10	10	10	10	96
	PIPE SIZE (IN.)	2-1/2"	1-1/2"	2-1/2"	2-1/2"	2-1/2"	2"	2"	2"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	0.5
	MAX. WATER P.D. (FT. HD.)	10	10	10	10	10	10	10	10	10	10	10	10	10
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)	450	380	501	498	515	425	501	504	391		459	461	456
	EAT (°F)	63.5	67.7	69.3	69.3	68.1	63.4	66.5	66.8	66		60.7	64.3	20
	LAT (°F)	-	-	-	-	-	-	-	-	-		-	-	-
	EWT (°F)	160	160	160	160	160	160	160	160	160		160	160	160
	COIL WATER FLOW RATE (GPM)	22	9	28	28	25	12	12	15	5		5	5	22
	PIPE SIZE (IN.)	1-1/2"	1-1/4"	2"	2"	2"	1-1/4"	1-1/4"	1-1/4"	1"		1"	1"	1-1/2"
	MAX. WATER P.D. (FT. HD.)	5	5	5	5	5	5	5	5	5		5	5	5
MANUFACTURER		YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK
MODEL NUMBER		AP150FSFC18X18	AP80FSFC12X12	AP215FSFC20X15	AP215FSFC20X15	AP170FSVCAF	AP80FSVCAF	AP80FSVCAF	AP105FSVCAF	AP35FSFCII9X6	AP60FSSCAF	AP35FSVCFF	AP35FSVCFF	AP120FSFC15X15
UNIT TYPE		SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	OUTSIDE AIR
NOTES		OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III

NOTES:

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY. FIELD VERIFY EXISTING CFMS AND GPMS PRIOR TO INTEGRATION INTO NEW BAS.

EXISTING HOT WATER COIL SCHEDULE

MARK	LOCATION	SERVES	AIR				WATER				MIN FACE AREA (SQ.FT)	NOTES
			CFM	MIN HEATING CAPACITY (BTUH)	ENTERING AIR TEMP (F)	PRESSURE DROP (IN. W.C.)	GPM	ENTERING WATER TEMP (F)	PRESSURE DROP (FT)	CONNECTING PIPE SIZE (IN.)		
HWC-1-1	-	AHU-1	3125	94500	27	0.25	10	160	10	1-1/4"	4.5	1,2,3
HWC-2-1	-	AHU-2	2600	80290	27	0.25	8	160	10	1-1/4"	3.8	1,2,3
HWC-3-1	-	AHU-3	1290	3900	27	0.25	4	160	10	1"	1.9	1,2,3
HWC-4-1	-	AHU-4	2155	65170	27	0.25	7	160	10	1"	3.1	1,2,3
HWC-6-1	-	AHU-6	1860	119690	27	0.25	12	160	10	1-1/4"	5.7	1,2,3
HWC-7-1	-	AHU-7	4490	133510	27	0.25	13	160	10	1-1/4"	6.3	1,2,3
HWC-8-1	-	AHU-8	4375	129880	27	0.25	13	160	10	1-1/4"	6.2	1,2,3
HWC-9-1	MECHANICAL M-6	AHU-9	3870	117030	27	0.25	12	160	10	1-1/4"	5.5	1,2,3
HWC-10-1	-	AHU-10	2655	77265	27	0.25	8	160	10	1-1/4"	3.7	1,2,3
HWC-10-2	CORRIDOR C13	CORRIDOR C13	535	26000	27	0.25	3	160	10	3/4"	0.8	1,2,4
HWC-11-1		AHU-11	1695	54280	27	0.25	6	160	10	1"	2.6	1,2,3
HWC-12-1	SOC. STUDIES1311	SF-22	2510	-	27	0.25		160	10	1/2"		1
HWC-15-1	PREPERATION 1515	KITCHEN HOOD	2700	125300	27	0.25	13	160	10	1-1/4"	3.9	1,2,3
HWC-15-2	PREPERATION 1515	KITCHEN HOOD	2700	125300	27	0.25	13	160	10	1-1/4"	3.9	1,2,3
HWC-15-3	SERVING 1515E	KITCHEN HOOD	1080	50150	27	0.25	5	160	10	1"	1.6	1,2,3
HWC-15-4	SNACK BAR 1515F	KITCHEN HOOD	2070	96130	27	0.25	10	160	10	1-1/4"	3	1,2,3
HWC	MECHANICAL M-18	AHU-16			27	0.25		160				1,4
HWC-17-1	-	AHU-17	2660	80440	27	0.25	8	160	10	1-1/4"	3.9	1,2,3
HWC-18-1	-	AHU-18	480	126400	27	0.25	12.6	160	10	1-1/4"	6	1,2,3
HWC-19-1	-	AHU-19	2105	47830	27	0.25	5	160	10	1"	2.3	1,2,3
HWC-20-1	-	AHU-20	4180	159820	27	0.25	16	160	10	1-1/4"	7.6	1,2,3
HWC-21-1	-	AHU-21	4020	119450	27	0.25	12	160	10	1-1/4"	5.7	1,2,3
HWC-22-1	-	AHU-22	2490	75300	27	0.25	8	160	10	1-1/4"	3.5	1,2,3
HWC-23-1		AHU-23	1110	34475	27	0.25	4	160	10	1"	1.6	1,2,3
HWC-E-1	MECHANICAL M-12	SOC. STU. 1330	1500	55080	27	0.25	6	160	10	1"	2.2	1,2,4
HWC-E-2	STORAGE 1353A	SOC. STU. 1332	940	34520	27	0.25	4	160	10	1"	1.4	1,2,4
HWC-E-3	STORAGE 1353A	SOC. STU. 1334	940	34520	27	0.25	4	160	10	1"	1.4	1,2,4
HWC-E-4	STORAGE 1353A	SOC. STU. 1336	940	34520	27	0.25	4	160	10	1"	1.4	1,2,4
HWC-E-5	STORAGE 1353A	SOC. STU. 1338	1210	44435	27	0.25	5	160	10	1"	1.8	1,2,4
HWC-01.01	MECHANICAL M-11	MZ-01	12"X28"	94500	27	0.25		160		1/2"		1,4
HWC-01.02	MECHANICAL M-11	MZ-01	12"X20"		27	0.25		160				1,4
HWC-01.03	MECHANICAL M-11	MZ-01	12"X28"		27	0.25		160				1,4
HWC-2.01	MECHANICAL M-12	MZ-02	12"x12"		27	0.25		160				1,4
HWC-2.02	MECHANICAL M-12	MZ-02	12"x12"		27	0.25		160				1,4
HWC-2.03	MECHANICAL M-12	MZ-02			27	0.25		160				1,4
HWC-2.04	MECHANICAL M-12	MZ-02			27	0.25		160				1,4
HWC-3.01	MECHANICAL M-12	MZ-03			27	0.25		160				1,4
HWC-3.02	MECHANICAL M-12	MZ-03			27	0.25		160				1,4
HWC-3.03		MZ-03			27	0.25		160				1,4
HWC		MZ-04			27	0.25		160				1,4
HWC		MZ-05			27	0.25		160				1,4

NOTES

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. CONTROLLED VIA DUCT MOUNTED TEMPERATURE SENSOR LOCATED DOWNSTREAM OF COIL. LOCATE AND REPLACE WITH NEW AND INTEGRATE INTO NEW CONTROLS SYSTEM.
3. CONTROLLED VIA TEMPERATURE SENSOR LOCATED IN ROOM BEING SERVED. LOCATE AND REPLACE WITH NEW AND INTEGRATE INTO NEW CONTROLS SYSTEM.
4. FILED VERIFY EXISTING CONTROL POINT VALUES PRIOR TO RE-BALANCING AND INTEGRATING INTO BAS.

EXISTING UNIT HEATER SCHEDULE

MARK	LOCATION	TYPE	FAN				HOT WATER COIL						ELECTRIC COIL		MANUFACTURER	MODEL	NOTES
			CFM	FPM	HORSE POWER	VOLTS/PHASE/HERTZ	CAPACITY (MBH)	ENTERING AIR TEMP (F)	GPM	COIL SIZE	ENTERING WATER PRESSURE TE...	PRESSURE DROP (FT)	KW	VOLTS/PHASE/HERTZ			
UH-1	CENTRAL PLANT RM M-14	ELECTRIC	666	640	1/20	277/1/60	-	-	-	-	-	-	7.5	277/1/60	TPI	G1GUH07RA1T	1,2,5
UH-2	CENTRAL PLANT RM M-14	ELECTRIC	666	640	1/20	277/1/60	-	-	-	-	-	-	10	277/1/60	TPI	G1GUH07RA1T	1,2,5
UH-3	CENTRAL PLANT RM M-14	ELECTRIC	666	640	1/20	277/1/60	-	-	-	-	-	-	7.5	277/1/60	TPI	G1GUH07RA1T	1,2,5
UH-4	MEN 1600C	ELECTRIC	-	-	-	277/1/60	-	-	-	-	-	-	5	208/1/60	REDD-I	81RCH-5	1,3,5
UH-5	WOMEN 1600D	ELECTRIC	-	-	-	277/1/60	-	-	-	-	-	-	5	208/1/60	REDD-I	81RCH-5	1,3,5
UH-6	MECH M-1	HOT WATER	2900		1/3	115/1/60	148	160	14.8	1-1/4"		250	-	-	STERLING	HS-204	1,4,5,6
UH-7	MECH M-4	HOT WATER	4200		1/3	115/1/60	209.1	160	20.91	1-1/2"		250	-	-	STERLING	HS-280	1,4,5,6
UH-8	MECH M-21	HOT WATER	2200		1/3	115/1/60	104	160	10.4	1-1/4"		250	-	-	STERLING	HS-144	1,4,5,6
UH-9	MECH M-7	HOT WATER	5500		1/2	115/1/60	261.3	160	26.13	2"		250	-	-	STERLING	HS-360	1,4,5,6
UH-10	MECH M-6	HOT WATER	2200		1/3	115/1/60	104	160	10.4	1-1/4"		250	-	-	STERLING	HS-144	1,4,5,6
UH-11	MECH M-8	HOT WATER	1400		1/12	115/1/60	61	160	6.1	1"		250	-	-	STERLING	HS-84	1,4,5,6
UH-12	AREA H	HOT WATER						160				250	-	-	STERLING		1,4,5,6
UH-13	AREA M	HOT WATER						160				250	-	-	STERLING		1,4,5,6

NOTES

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. LOCATE EXISTING PENDENT MOUNTED THERMOSTAT AND REPLACE WITH NEW. INTEGRATE INTO NEW BUILDING CONTROLS.
3. LOCATE EXISTING BUILT-IN THERMOSTAT AND REPLACE WITH NEW. INTEGRATE INTO NEW BUILDING CONTROLS.
4. LOCATE EXISTING SENSORS AND REPLACE WITH NEW. INTEGRATE INTO NEW BUILDING CONTROLS.
5. PROVIDE POINTS FOR AS NECESSARY TO PROVIDE RUN STATUS TO BAS.
6. FIELD VERIFY EXISTING CONTROL POINT VALUES (CFMS, GPM, FPM ECT) PRIOR TO INTEGRATION INTO NEW BAS.

EXISTING PUMP SCHEDULE

MARK	TYPE	GPM	PIPE SIZE	HEAD (FT.)	HP	MAX RPM	VOLTS/PHASE/HERTZ	MANUFACTURER	MODEL
P-1	CHW	1000	8"	50	20	1750	480/3/60	PACO	EM23347
P-2	CHW	1000	8"	50	20	1750	480/3/60	PACO	EM2334T
P-3	CHW	700	6"	50	15	1750	480/3/60	PACO	
P-4	CHW	400	6"	50	10	1750	480/3/60	PACO	EM3770T
P-5	CHW	1550	10"	110	60	1750	480/3/60	PACO	EM4314T
P-6	CHW	1550	10"	110	60	1750	480/3/60	PACO	EM4314T
P-7	CW	1500	10"	50	30	1750	480/3/60	PACO	EM4103T
P-8	CW	1500	10"	50	30	1750	480/3/60	PACO	EM4103T
P-9	CW	1050	10"	50	20	1750	480/3/60	PACO	
P-10	CW	600	6"	50	15	1750	480/3/60	PACO	EM2333T
P-11	HW	670	6"	95	30	1750	480/3/60	PACO	
P-12	HW	670	6"	95	30	1750	480/3/60	PACO	

NOTES

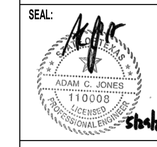
1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M5.02

5/28/2026 5:36:49 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

EXISTING FAN SCHEDULE

MARK	LOCATION	SERVES	INTERLOCK	CFM	MAX RPM	DRIVE	TYPE	SP	HP	ELEC	MANUF.	MODEL	MODEL #
EF-1	ROOF ABOVE CORR. C11B	TOILET ROOMS	AHU-1	600	1460	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-2	ROOF ABOVE MEN 1128	TOILET ROOMS	AHU-3	1000	1200	BELT	CENTRIFUGAL ROOF MOUNTED	0.38	1/4	120/1/60	LOREN-COOK	ACEB	120
EF-3	ROOF ABOVE COUNS. 1102C	TOILET 1103F	AHU-4	465	1275	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-4	ROOF ABOVE MENS 1262	M.1262 W.1261	AHU-6	450	1250	BELT	CENTRIFUGAL ROOF MOUNTED	0.37	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-5	ROOF ABOVE CORRIDOR 1249D	M.1249B W.1249C	AHU-8	240	1530	BELT	CENTRIFUGAL ROOF MOUNTED	0.37	1/4	120/1/60	LOREN-COOK	ACEB	70
EF-6	ROOF ABOVE LOCKER 1515J	M.1515K W.1515L & LAUNDRY	AHU-16	540	1335	BELT	CENTRIFUGAL ROOF MOUNTED	0.38	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-7	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	-	1400	1360	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	1/2	120/1/60	LOREN-COOK	VCR	135
EF-8	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	-	4500	1000	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	1-1/2	480/3/60	LOREN-COOK	VCR	210
EF-9	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	-	4500	1000	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	1-1/2	480/3/60	LOREN-COOK	VCR	210
EF-10	ROOF ABOVE SERVING 1515E	KITCHEN HOOD	-	1800	1065	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	1/2	120/1/60	LOREN-COOK	VCR	165
EF-11	ROOF ABOVE SNACK BAR 1515F	KITCHEN HOOD	-	3450	1000	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	3/4	480/3/60	LOREN-COOK	VCR	195
EF-12	ROOF ABOVE CHEM LAB 1320	SCIENCE LAB EXH	-	2340	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-13	ROOF ABOVE CHEM LAB 1320	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-14	ROOF ABOVE CHEM LAB 1320	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-15	ROOF ABOVE CHEM LAB 1307	SCIENCE LAB EXH	-	2340	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-16	ROOF ABOVE CHEM LAB 1307	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-17	ROOF ABOVE CHEM LAB 1307	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-18	ROOF ABOVE CHEM LAB 1308	SCIENCE LAB EXH	-	2340	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-19	ROOF ABOVE CHEM LAB 1308	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-20	ROOF ABOVE CHEM LAB 1308	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-21	ROOF ABOVE CHEM LAB 1337	SCIENCE LAB EXH	-	2340	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-22	ROOF ABOVE CHEM LAB 1337	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-23	ROOF ABOVE CHEM LAB 1337	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-24	ABOVE CEILING STORAGE 1600B	STOR, RRs	-	1230	700	BELT	CENTRIFUGAL IN-LINE	0.25	1/4	120/1/60	LOREN-COOK	DB	10
EF-25	ABOVE CEILING CUSTODIAN 1600E	CUSTODIAN	-	235	1340	BELT	CENTRIFUGAL CEILING MOUNTED	0.125	1/25	120/1/60	LOREN-COOK	GC	320
EF-26	ROOF ABOVE LAUNDRY 1403	BOYS TOILETS & SHOWERS	AHU-25	820	900	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	135
EF-27	ROOF ABOVE COACH DR.1402A	BOYS COACHES	AHU-25	340	1530	BELT	CENTRIFUGAL ROOF MOUNTED	0.38	1/4	120/1/60	LOREN-COOK	ACEB	80
EF-28	ROOF ABOVE COACH DR.1404A	GIRLS RR	AHU-26	340	1240	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	80
EF-29	ROOF ABOVE CORRIDOR C14C	GIRLS RR	AHU-26	820	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.38	1/4	120/1/60	LOREN-COOK	ACEB	165
EF-30	ROOF ABOVE CENTRAL PLANT	CENTRAL PLANT	-	2100	950	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	165
EF-31	ROOF ABOVE CENTRAL PLANT	CENTRAL PLANT	-	2100	950	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	165
EF-32	ROOF ABOVE CENTRAL PLANT	CENTRAL PLANT	-	2100	950	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	165
EF-33	ROOF ABOVE CENTRAL PLANT	CENTRAL PLANT	-	1450	1540	BELT	CENTRIFUGAL ROOF MOUNTED	0.35	1/3	120/1/60	LOREN-COOK	ACEB	120
EF-34	ROOF ABOVE TOILET GROUPS	RR	EXHAUST	1590	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/3	120/1/60	LOREN-COOK	ACEB	165
EF-35	ROOF ABOVE MENS 2318	RR	EXHAUST	1760	1040	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/3	120/1/60	LOREN-COOK	ACEB	150
EF-36	ROOF ABOVE GIRLS 1200A	RR	EXHAUST	650	1500	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-37	ROOF ABOVE BOYS 1200B	RR	EXHAUST	650	1500	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-38	ROOF ABOVE MENS 1266	RR	EXHAUST	340	1250	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	340
EF-39	ROOF ABOVE CHEM LAB 1320	BIOLOGY LAB	-	2340	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-40	ROOF ABOVE CHEM LAB 1307	BIOLOGY LAB	-	2340	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-41	ROOF ABOVE CORRIDOR C13B	BIOLOGY LAB	-	2540	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-42	ROOF ABOVE CORRIDOR C13B	BIOLOGY LAB	-	2540	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-43	ROOF ABOVE CORRIDOR C13B	BIOLOGY LAB	-	2540	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-44	ROOF ABOVE CORRIDOR C13B	BIOLOGY LAB	-	2540	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-45	ROOF ABOVE CHEM LAB 1320	SCIENCE LAB PURGE	-	3500	540	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	245
EF-46	ROOF ABOVE CHEM LAB 1307	SCIENCE LAB PURGE	-	3500	540	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	245
EF-47	ROOF ABOVE CHEM LAB 1308	SCIENCE LAB PURGE	-	3500	540	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	245
EF-48	ROOF ABOVE CHEM LAB 1337	SCIENCE LAB PURGE	-	3500	540	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	245
EF-49	ROOF ABOVE SCIENCE 1326	RR	EXISTING AHU	350	1260	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	80
EF-50	ROOF ABOVE GIRLS 1344	RR	EXISTING AHU	1330	1100	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	135
EF-51	ABOVE CEILING CORRIDOR C14F	RESTROOM GROUP	EXISTING AHU	1685	915	BELT	CENTRIFUGAL IN-LINE	0.45	1/4	120/1/60	LOREN-COOK	SQN-B	165
EF-52	ROOF ABOVE CORRIDOR C13B	PREP ROOM	-	660	1360	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/4	120/1/60	LOREN-COOK	ACRUB	100
EF-53	ROOF ABOVE SCIENCE 1326	PREP ROOM	-	910	1170	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/4	120/1/60	LOREN-COOK	ACRUB	120
EF-54	ROOF ABOVE SCIENCE 1326	PREP ROOM	-	910	1170	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/4	120/1/60	LOREN-COOK	ACRUB	120
EF-55	ABOVE CEILING BOYS C617C	RR	EXISTING AHU	1520	800	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	DB	10

NOTES

1. SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING

MARK	LOCATION	SERVES	INTERLOCK	CFM	MAX RPM	DRIVE	TYPE	SP	HP	ELEC	MANUF.	MODEL	MODEL #
SF-1	ROOF ABOVE PLANNING 1115	AHU-1	AHU-1	3125	670	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	480/3/60	LOREN-COOK	ASP	150
SF-2	ROOF ABOVE PLANNING 1115	AHU-2	AHU-2	2600	820	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1	480/3/60	LOREN-COOK	ASP	120
SF-3	ROOF ABOVE ADAPTIVE 1118	AHU-3	AHU-3	1290	1040	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1/2	120/1/60	LOREN-COOK	ASP	90
SF-4	ROOF ABOVE CORRIDOR C11C	AHU-4	AHU-4	2155	790	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	3/4	480/3/60	LOREN-COOK	ASP	120
SF-5	ROOF ABOVE LANGUAGE 2215	AHU-7	AHU-7	4490	610	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1-1/2	480/3/60	LOREN-COOK	ASP	180
SF-6	ROOF ABOVE STORAGE 2215A	AHU-8	AHU-8	4375	610	BELT	CENTRIFUGAL ROOF MOUNTED	0.73	1-1/2	480/3/60	LOREN-COOK	ASP	180
SF-7	ROOF ABOVE CORRIDOR C13C	AHU-10	AHU-10	2655	870	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1-1/2	480/3/60	LOREN-COOK	ASP	120
SF-8	ROOF ABOVE SCIENCE 1326	AHU-11	AHU-11	1695	1000	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	3/4	480/3/60	LOREN-COOK	ASP	100
SF-9	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	EF-8	2700	900	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1-1/2	480/3/60	LOREN-COOK	KSP-B	120
SF-10	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	EF-9	2700	900	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1-1/2	480/3/60	LOREN-COOK	KSP-B	120
SF-11	ROOF ABOVE SERVING 1515E	KITCHEN HOOD	EF-10	1080	1120	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1/2	120/1/60	LOREN-COOK	KSP-B	90
SF-12	ROOF ABOVE SNACK BAR 1515F	KITCHEN HOOD	EF-11	2070	1160	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1	480/3/60	LOREN-COOK	KSP-B	100
SF-13	ROOF ABOVE MECH M-6	AHU-9	AHU-9	3870	680	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-14	ROOF ABOVE MECH M-18	AHU-22	AHU-22	2490	790	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1	480/3/60	LOREN-COOK	ASP	120
SF-15	ROOF ABOVE MECH M-17	AHU-23	AHU-23	1110	980	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1/3	120/1/60	LOREN-COOK	ASP	90
SF-16	ROOF ABOVE MECH M-20	AHU-18	AHU-18	4180	700	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-17	ROOF ABOVE MECH M-20	AHU-19	AHU-19	2105	765	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	3/4	480/3/60	LOREN-COOK	ASP	120
SF-18	ROOF ABOVE MECH M-21	AHU-6	AHU-6	3860	680	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-19	ROOF ABOVE MECH M-21	AHU-20	AHU-20	4180	700	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-20	ROOF ABOVE MECH M-22	AHU-21	AHU-21	4020	690	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-21	ROOF ABOVE SOC. STU. 1263	AHU-17	AHU-17	2660	830	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	120
SF-22	ROOF ABOVE SCL. LAB 1314	AHU-12	AHU-12	2510	790	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	120
SF-23	ROOF ABOVE SCL. LAB 1302	AHU-13	AHU-13	2855	830	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	120
SF-24	ROOF ABOVE CHEM. LAB 1320	SCIENCE LAB PURGE	EF-45	3180	550	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-25	ROOF ABOVE CHEM. LAB 1307	SCIENCE LAB PURGE	EF-46	3180	550	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-26	ROOF ABOVE CHEM. LAB 1308	SCIENCE LAB PURGE	EF-47	3180	550	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-27	ROOF ABOVE CHEM. LAB 1337	SCIENCE LAB PURGE	EF-48	3180	550	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1-1/2	480/3/60	LOREN-COOK	ASP	150
AC-1	ABOVE DOORWAY PREP 1515	KITCHEN RECEIVING	-	2550	1750	BELT	CENTRIFUGAL WALL MOUNTED	0.125	1/2	120/1/60	MARS	CH	48

NOTES:

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FAN COIL UNIT SCHEDULE

MARK	LOCATION	SERVES	CONTROL	CFM	VOLTS/PH/H	HP	MANUFACTURER	MODEL NO	CHW	HW
FCU-01	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 B6SC2 R6 CA2	YES	YES
FCU-02	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 B6SC2 R6 CA2	YES	YES
FCU-03	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 B6SC2 L6 CA2	YES	YES
FCU-04	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 D6SC2 L6 CA2	YES	YES
FCU-05	AREA D CORRIDOR	CORRIDOR	T-STAT	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 A6SC2 L6 CA2	YES	YES
FCU-06	AREA D CORRIDOR	CORRIDOR	T-STAT	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 A6SC2 R6 CA2	YES	YES
FCU-07	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 A6SC2 R6 CA2	YES	YES
FCU-08	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 A6SC2 L6 CA2	YES	YES
FCU-9	AREA H	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 A6SC2 L6 CA2	YES	YES
FCU-10	AREA H	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 A6SC2 R6 CA2	YES	YES
FCU-11	AREA H	CORRIDOR	ZONE TEMP	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 A6SC2 R6 CA2	YES	YES
FCU-12	AREA H	CORRIDOR	ZONE TEMP	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 A6SC2 L6 CA2	YES	YES
FCU-13	AREA H	CONTROL								
FCU-13	AREA G	AREA G	ZONE TEMP							
FCU-14	AREA G	AREA G	ZONE TEMP							
FCU-15	AREA G	AREA G	ZONE TEMP							
FCU-16	AREA G	AREA G	ZONE TEMP							
FCU-17	AREA G	DRILL TEAM	ZONE TEMP				PENN	SX100BC	YES	NO
FCU-1 (BAKERY)	AREA E	SERVING/CAFETERIA	ZONE TEMP						YES	YES
FCU-8 (TOP CAT CAFÉ 1500)	AREA E	SERVING/CAFETERIA	ZONE TEMP							
FCU-20	AREA I	CAFETERIA	ZONE TEMP	1500					YES (2)	YES (2)
FCU-24	AREA E	DRAMA 1512	ZONE TEMP						YES	YES
FCU-27	AREA E	SERVING/CAFETERIA	ZONE TEMP						YES	YES
FCU-28	AREA E	SERVING/CAFETERIA	ZONE TEMP						YES	YES
FCU-29	AREA E	CAFATERIA	ZONE TEMP						YES	YES
FCU-30	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-31	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-32	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-33	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-34	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-18	AREA F	CORRIDOR	ZONE TEMP							
FCU-2	AREA L	SOUND BOOTH	ZONE TEMP						YES	NO
FCU-21	AREA I	BLACK BOX/ 1513	ZONE TEMP						YES	YES
FCU-22	AREA I	BLACK BOX/ 1513	ZONE TEMP		115/1	3/4	ROESSLER	56851267	YES	YES
FCU-25	AREA I	BLACK BOX/ 1513	ZONE TEMP		208/3/60	3/4	WILLIAMS	AH2300-W4-B62 RH	YES	YES

NOTES:

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2. FILED VERIFY EXISTING CONTROL POINT VALUES PRIOR TO RE-BALANCING AND INTEGRATING INTO BAS.
3. FIELD VERIFY ANY ADDITIONAL FAN COIL UNITS NOT NOTED IN THIS SCHEDULE AND INTEGRATE ALL INTO NEW BAS.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER TEXAS

Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M5.03

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

EXISTING COOLING TOWER SCHEDULE

MARK	TEMP			GMP	VOLTAGE	MFGR.	MODEL NO.	HP
	ENT. WTR (F)	LEAVE WTR. (F)	WB					
CT-1	96	86	80	1500	480/3/60	MARLEY	NC830M	30
CT-2	96	86	80	1500	480/3/60	MARLEY	NC830M	30
CT-3	96	86	80	1050	480/3/60	MARLEY	NC830M	20
CT-4	96	86	80	600	480/3/60	MARLEY	NC830M	15

NOTES

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EXISTING BOILER SCHEDULE

MARK	MINIMUM (MBH)		GPM	TEMP			FAN HP	VOLTAGE	MFGR.	MODEL NO.	HP
	INPUT	OUTPUT		ENT. WTR (F)	LEAVE WTR. (F)	WB					
B-1	8370	6700	670	96	86	80	1500	480/3/60	MARLEY	NC830M	30
B-2	-	-	670	96	86	80	1500	480/3/60	MARLEY	NC830M	30

NOTES

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EXISTING CHILLER SCHEDULE

MARK	NOMINAL TONS	COOLER (FF=0.0001)				CONDENSER (FF=0.00025)			VOLTAGE	KW/TON	MANUFACTURER	MODEL
		ENT. WTR (F)	LEAVE WTR. (F)	GPM	PRESSURE DROP (FT)	ENT. WTR (F)	GPM	PRESSURE DROP (FT)				
CH-1	500	54	42	1000	80	86	1500	10	480/3/60	0.577	TRANE	CVHF485
CH-2	500	54	42	1000	80	86	1500	10	480/3/60	0.577	TRANE	CVHF485
CH-3	350	-	-	700	80	-	1050	-	480/3/60	-	CARRIER	19XVR04145A1
CH-4	200	54	42	400	80	86	600	10	480/3/60	0.718	TRANE	RTHC1B2F

NOTES

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EXISTING DX FAN COIL UNIT SCHEDULE

MARK	FCU-LIBRARY
SERVES	1358 IDF/AV
EXT. S.P. (IN. W.G.)	0.5
FAN MOTOR HORSEPOWER	1/3
FAN RPM	1050
TOTAL COOLING CAPACITY (MBH)	24000
VOLTS/PHASE/HERTZ	240/1/60
REFRIGERANT TYPE	R-22
MANUFACTURER	SIEMMENS
MODEL NO.	BCS3M24C00NA1P-1
NOTES	

NOTES:

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2. FILED VERIFY EXISTING CFMS, MBH, TEMPERATURE SET POINTS, ECT PRIOR TO RE-BALANCING AND INTEGRATING INTO BAS.
3. PROVIDE NEW CONTROL POINTS AS NEEDED TO INTEGRATE INTO NEW BAS.

EXISTING AIR COOLED CONDENSING UNIT SCHEDULE

MARK	ACCU-LIBRARY
SERVES	FCU-LIBRARY
TOTAL COOLING CAPACITY (MBH)	24000
AMBIENT TEMP. (°F)	105
VOLTS/PHASE/HERTZ	208/230
MCA	16.1
MOCP	25
REFRIGERANT TYPE	R22
MANUFACTURER	YORK
SERIAL NUMBER	EAEM0204276
NOTES	ALL

NOTES:

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. FILED VERIFY EXISTING CFMS, MBH, TEMPERATURE SET POINTS, ECT PRIOR TO RE-BALANCING AND INTEGRATING INTO BAS.
3. PROVIDE NEW CONTROL POINTS AS NEEDED TO INTEGRATE INTO NEW BAS.

ROOF MOUNTED AIR HANDLING UNIT SCHEDULE

	MARK	RTU-01	RTU-02
FAN	SERVES	CAFETERIA	TOP CAT CAFÉ/BAKERY
	TYPE	ROOF MOUNTED	ROOF MOUNTED
	UNIT CONFIGURATION	SZ	SZ
	DISCHARGE	VERTICAL	VERTICAL
	DESIGN SUPPLY AIR FLOW RATE (CFM)	4,690	2,265
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	3,380	910
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	3,380	300
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	1,690	150
	EXT. S.P. (IN. W.G.)	0.56	0.47
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	5/1	2/1
	VOLTS/PHASE/HERTZ	460/3/60	460/3/60
	MAX. FAN RPM	1800	1800
	FULL LOAD AMPS (FLA)	8.2	3.4
	MCA/MOP	10.25/15	4.25/ 15
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	500	500
	MINIMUM COIL ROWS	6	6
	MAX. FINS PER INCH	12	12
	COIL AIR FLOW RATE (CFM)	4,690	2,265
	EAT DB/WB (°F)	92.7/74.15	80.9/66.33
	LAT DB/WB (°F)	53.7/53.72	53.7/53.71
	TOTAL COOLING CAPACITY (MBH)	319.2	86.1
	SENSIBLE COOLING CAPACITY (MBH)	199.7	66.8
	EWT/LWT (°F)	45/ 56	45/56
	COIL WATER FLOW RATE (GPM)	58.0	15.7
	CHW BRANCH PIPING SIZE	2-1/2"	1-1/4"
	MAX. WATER P.D. (FT. HD.)	15.0	15.0
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)	500	500
	MINIMUM COIL ROWS	2	2
	MAX. FINS PER INCH	11	11
	COIL AIR FLOW RATE (CFM))	3,380	1,585
	EAT (°F)	27.0	60.2
	LAT (°F)	85.0	85.0
	EWT/LWT (°F)	160/140	160/140
	HEATING CAPACITY (MBH)	211.7	42.4
	COIL WATER FLOW RATE (GPM)	21.2	4.2
	HW BRANCH PIPING SIZE	1-1/2"	1"
	MAX. WATER P.D. (FT. HD.)	15.0	15.0
MANUFACTURER		TRANE	TRANE
MODEL NUMBER		CSAA010	CSA004
DIMENSIONS		163 x 61.5 x 44	158 x 44 x 35
OPERATING WEIGHT (LBS.)		2800	2023
NOTES		ALL	ALL

NOTES:

1. EXTERNAL STATIC PRESSURE DOES NOT ACCOUNT FOR LOSSES DUE TO COIL(S), FILTERS, HOUSING, NOR ACCESSORIES.
2. PROVIDE UNIT WITH OUTDOOR AIR INTAKE HOOD WITH MODULATING MOTORIZED DAMPER.
3. PROVIDE UNIT WITH SINGLE POINT ELECTRICAL CONNECTION.
4. PROVIDE FLOAT SWITCH IN PRIMARY DRAIN PAN TO DE-ENERGIZE THE ENTIRE UNIT WHEN PRIMARY DRAIN LINE BECOMES RESTRICTED.
5. PROVIDE UNITS WITH MINIMUM MERV 13 FILTERS.
6. PROVIDE UNIT WITH 14" PREFABRICATED ROOF CURB.
7. PROVIDE UNIT OUTDOOR AIR DAMPER SIZED FOR FULL DESIGN SUPPLY AIRFLOW OF THE UNIT.
8. PROVIDE UNIT WITH DISCONNECT SWITCH.
9. PROVIDE UNIT WITH DUCT MOUNTED SMOKE DETECTORS IN SUPPLY DUCTWORK FOR ALL UNITS DISCHARGING IN EXCESS OF 2,000 CFM.
10. PROVIDE UNIT WITH A MINIMUM SHORT CIRCUIT CURRENT RATING (SCCR) OF 65,000A.
11. NEW ROOF MOUNTED AIR HANDLING UNITS TO BE PROVIDED TO REPLACE EXISTING FCUs AS PART OF ALTERNATE 1.

AIR HANDLING UNIT SCHEDULE

	MARK	AHU-16
FAN	SERVES	KITCHEN AREA E
	TYPE	SZ
	UNIT CONFIGURATION	HORIZONTAL
	DISCHARGE	VERTICAL
	DESIGN SUPPLY AIR FLOW RATE (CFM)	15,130
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	6,055
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	2,345
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	1,175
	EXT. S.P. (IN. W.G.)	0.90
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	15/1
	VOLTS/PHASE/HERTZ	480/3/60
	MAX. FAN RPM	2,217
	FULL LOAD AMPS (FLA)	21.0
	MCA/MOP	26.25 / 45
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	500
	MINIMUM COIL ROWS	4
	MAX. FINS PER INCH	11
	COIL AIR FLOW RATE (CFM)	15,130
	EAT DB/WB (°F)	75.8/63.3
	LAT DB/WB (°F)	56.2/55.3
	TOTAL COOLING CAPACITY (MBH)	386.0
	SENSIBLE COOLING CAPACITY (MBH)	345.9
	EWT/LWT (°F)	45/56
	COIL WATER FLOW RATE (GPM)	61.0
	CHW BRANCH PIPING SIZE	2 1/2"
	MAX. WATER P.D. (FT. HD.)	20.0
MANUFACTURER		TRANE
MODEL NUMBER		CSAA035
DIMENSIONS		131.138" X 100" X 70.8"
OPERATING WEIGHT (LBS.)		4097
NOTES		ALL

NOTES:

1. PROVIDE UNIT WITH DRAW THRU DIRECT DRIVE PLENUM FAN SECTION, CHILLED WATER COIL SECTION, AND 2" FLAT FILTER SECTION.
2. EXTERNAL STATIC PRESSURE DOES NOT INCLUDE LOSSES DUE TO COILS, FILTERS, AND CASING.
3. PROVIDE UNIT WITH REMOTE MOUNTED VARIABLE FREQUENCY DRIVE.
4. PROVIDE CHILLED WATER COIL WITH 3-WAY AUTOMATIC CONTROL VALVE.
5. AHU-16 TO BE REPLACED AS PART OF ALTERNATE 1.

FAN POWERED TERMINAL UNIT SCHEDULE

MARK	PRIMARY AIR CFM		HEATING CFM	HOT WATER HEATING				INLET SIZE	VOLTS/ PHASE/ HZ	ECM HP	MFR	MODEL NO.
	MAX.	MIN.		EWT/LWT	ROWS	MBTU/H	GPM					
CVB-1-2	1,265	265	890	160/140	1	18.7	1.9	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-4	1,455	455	1020	160/140	1	23.9	2.4	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-5	1,465	465	1030	160/140	1	24.2	2.4	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-6	680	150	480	160/140	1	10.2	1.0	8"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-1-7	1,305	305	915	160/140	1	19.8	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-8	1,140	140	800	160/140	1	15.2	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-9	480	110	340	160/140	1	7.3	0.7	8"Ø	277/1/60	1/3	TITUS	DTFS-B
CVB-2-8	970	180	680	160/140	1	13.9	1.4	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-2-9	970	180	680	160/140	1	13.9	1.4	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-4-1	820	165	575	160/140	1	12.0	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-4-2	1,410	410	990	160/140	1	22.7	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-3	1,410	410	990	160/140	1	22.7	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-4	1,495	495	1050	160/140	1	25.0	2.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-5	680	140	480	160/140	1	10.0	1.0	8"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-4-6	1,415	415	995	160/140	1	22.8	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-7	800	160	560	160/140	1	11.7	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-4-8	1,440	440	1010	160/140	1	23.5	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-9	830	170	585	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-6-2	1,075	75	755	160/140	1	13.4	1.3	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-3	1,150	150	805	160/140	1	15.5	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-4	1405	405	985	160/140	1	22.5	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-5	1150	150	805	160/140	1	15.5	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-6	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-7	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-8	1020	20	715	160/140	1	11.9	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-7-2	1035	35	725	160/140	1	12.3	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-7-4	710	250	500	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-7-6	1035	35	725	160/140	1	12.3	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-7-8	710	250	500	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-7-10	1035	35	725	160/140	1	12.3	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-7-12	710	250	500	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-7-13	1285	285	900	160/140	1	19.2	1.9	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-1	1300	300	910	160/140	1	19.6	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-2	1300	300	910	160/140	1	19.6	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-3	1440	440	1010	160/140	1	23.5	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-4	1130	130	795	160/140	1	15.0	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-5	1460	460	1025	160/140	1	24.1	2.4	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-6	1130	130	795	160/140	1	15.0	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-7	1250	250	875	160/140	1	18.2	1.8	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-9	1130	130	795	160/140	1	15.0	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-10	1495	495	1050	160/140	1	25.0	2.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-11	1130	130	795	160/140	1	15.0	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-12	1495	495	1050	160/140	1	25.0	2.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-13	1130	495	795	160/140	1	20.9	2.1	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-14	1220	220	855	160/140	1	17.4	1.7	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-15	1440	440	1010	160/140	1	23.5	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-16	1220	220	855	160/140	1	17.4	1.7	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-1	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-2	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-4	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-5	1040	40	730	160/140	1	12.5	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-7	1100	100	770	160/140	1	14.1	1.4	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-9	980	235	690	160/140	1	15.0	1.5	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-9-11	1500	500	1050	160/140	1	25.1	2.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-10-4	920	270	645	160/140	1	14.8	1.5	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-10-5	910	270	640	160/140	1	14.7	1.5	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-12-1	1330	330	935	160/140	1	20.5	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-2	1340	340	940	160/140	1	20.7	2.1	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-3	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-4	1320	320	925	160/140	1	20.2	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-5	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-6	1320	320	925	160/140	1	20.2	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-7	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-8	1320	320	925	160/140	1	20.2	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-9	810	180	570	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-13-1	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-2	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-3	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-4	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-5	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-6	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-7	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-8	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-9	830	190	585	160/140	1	12.6	1.3	10"Ø	277/1/60	1/3	TITUS	DTFS-C

NOTES:

1. PROVIDE AEROCROSS MULTI-POINT CENTER AVERAGING VELOCITY SENSOR IN PRIMARY AIR INLET.
2. PROVIDE TERMINAL UNIT CASING WITH 1" INTERNALLY LINED FIBERGLASS FREE INSULATION.
3. PROVIDE TERMINAL UNIT WITH INTEGRAL DISCONNECT SWITCH.
4. PROVIDE HOT WATER REHEAT COIL WITH 2-WAY AUTOMATIC CONTROL VALVE.
5. THE MAXIMUM ALLOWABLE PRESSURE DROP ACROSS HOT WATER COILS SHALL BE 10 FT.HD.
6. UNITS TO BE REPLACED AS PART OF ALTERNATE 2.

DUCT MOUNTED HOT WATER HEATING COIL SCHEDULE

MARK	HWC-16
SERVES	AHU-16
CFM	15,130
CAPACITY (MBH)	653.6
DUCT DIMENSION WxH (INSIDE)	72 x 20
ENTERING WATER TEMPERATURE (F)	180
LEAVING WATER TEMPERATURE (F)	160
FLOW (GPM)	35
NUMBER OF ROWS	2
MANUFACTURER	TRANE
NOTES	ALL

NOTES:

1. PROVIDE HOT WATER COIL AS PART OF ALTERNATE 1.

AIR TERMINAL SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	REMARKS
A	TITUS	TMS-AA	LOUVERED FACE SUPPLY AIR DIFFUSER	24"X24" FACE, ALUMINUM CONSTRUCTION WITH FRAME FOR ASSOCIATED CEILING TYPE.
B	TITUS	PAR-AA	PERFORATED FACE RETURN / EXHAUST AIR GRILLE	24"X24" FACE, ALUMINUM CONSTRUCTION WITH FRAME FOR ASSOCIATE CEILING TYPE. PROVIDE 22"X22" NECK UNLESS OTHERWISE NOTED.

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR FINISH.
2. REFER TO MECHANICAL FLOOR PLAN FOR NECK SIZES.
3. INSULATE BACK-PAN OF ALL AIR DEVICES.
4. PROVIDE FRAME TO MATCH CEILING TYPE INDICATED ON ARCHITECTS REFLECTED CEILING PLAN.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER

Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

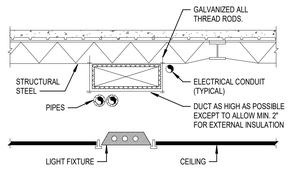
CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M5.04

5/28/2026 5:44:26 PM
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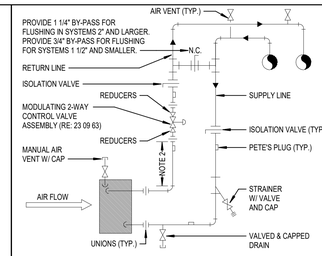


NOTES:
1. PIPES (INCLUDING SPRINKLER PIPING) AND ELECTRICAL CONDUIT CAN BE ROUTED BETWEEN JOISTS OR THROUGH JOIST WEB SPACE AS REQUIRED. DUCT SHALL BE LOCATED AS HIGH AS POSSIBLE.
2. U.L. DESIGN ASSEMBLY NUMBERS ARE SHOWN ON ARCHITECTURAL PLANS WHEN REQUIRED.
3. INSTALLATION OF ALL SERVICES MUST BE COORDINATED BY THE CONTRACTOR.

"NOT TO SCALE"

1 TYPICAL MEP INSTALLATION

M1001

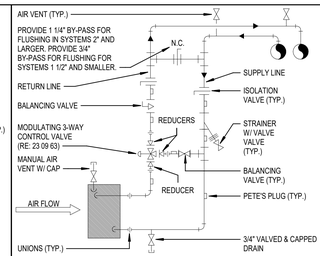


NOTES:
1. INSTALL 2-WAY CONTROL VALVE ORIENTATION PER MFGR. INSTALLATION INSTRUCTIONS.
2. PROVIDE STRAIGHT PIPE LENGTH 5 TIMES NOMINAL PIPE DIA. UPSTREAM OF CTRL. VALVE.

"NOT TO SCALE"

2 TWO-WAY CONTROL VALVE AND COIL PIPING

M1002

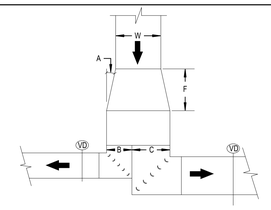


NOTE: INSTALL 3-WAY CONTROL VALVE ORIENTATION PER MFGR. INSTALLATION INSTRUCTIONS

"NOT TO SCALE"

3 3-WAY CONTROL VALVE AND COIL PIPING

M1002



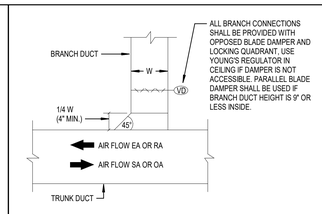
DIMENSIONAL RELATIONSHIPS
1. ANGLE 'A' TO BE 15° OR LESS (BOTH SIDES)
2. SEE FLOOR PLANS FOR B, C, & W.
3. VERTICAL DIMENSION TO BE MAINTAINED THRU F.
4. CHANGE IN VERTICAL DIMENSION TO OCCUR AFTER TURNS.

NOTES:
VOLUME DAMPERS REQUIRED FOR LOW PRESSURE DUCT SYSTEMS ONLY.

"NOT TO SCALE"

4 DUCTWORK TEE

M1008

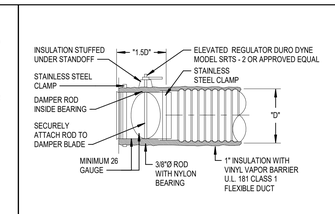


NOTES:
THIS CONNECTION SHALL BE TYPICAL FOR ALL RECTANGULAR BRANCH DUCT CONNECTIONS TO RECTANGULAR TRUNK DUCTS, INCLUDING SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST DUCTS.

"NOT TO SCALE"

5 RECTANGULAR BRANCH DUCT TAP

M1003

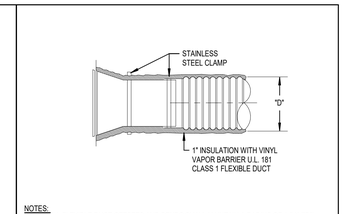


NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 5'-0".
2.TYPICAL OF ROUND DUCT CONNECTIONS TO RECTANGULAR DUCTS
3.ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

"NOT TO SCALE"

6 SPIN-IN

M1003



NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 5'-0".
2. TYPICAL OF ROUND DUCT CONNECTIONS TO VAV BOXES FROM RECTANGULAR MAIN DUCTS.
3. ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

"NOT TO SCALE"

7 CONICAL SPIN-IN

M1004

NOTES:
1. SEAL ALL JOINTS PER SPECIFICATIONS.
2. FLEX DUCT SAG LIMITED TO 1/2" PER FOOT.
3. MAX 30° OFFSET ALLOWED IN FLEX DUCT ROUTING.

"NOT TO SCALE"

8 CEILING DIFFUSER CONNECTION

M1005

NOTE:
REFER TO ARCHITECTURAL FOR AND FLASHING DETAILS.

"NOT TO SCALE"

9 ROOF TOP UNIT MOUNTING

M1006

"NOT TO SCALE"

10 SERIES FAN POWERED TERMINAL UNIT

M1007

NOTE: CONTRACTOR SHALL SECURE STRUCT. ENGR. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS AT CONCRETE OR STEEL STRUCTURE.

"NOT TO SCALE"

11 PIPE HANGER

M1008

NOTE: CONTRACTOR SHALL SECURE STRUCT. ENG. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS AT CONCRETE OR STEEL STRUCTURE.

"NOT TO SCALE"

12 PIPE HANGER (4-PIPE)

M1008

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR FLASHING & ROOF DETAILS.
2. WHERE PIPE IS INSULATED STOP & POINT INSULATION AT SLEEVE.
3. COORDINATE WITH OWNER'S BONDED ROOFER FOR FLASHING & MOPPING IN DETAIL.

"NOT TO SCALE"

13 EXISTING ROOF PENETRATION

M1014

H = FAN INLET PRESSURE (IN. W.C.) + 1 IN.

NOTE:
MAINTAIN MINIMUM 1" AIR GAP AT FLOOR DRAIN, FLOOR SINK, OR ROOF DRAIN.

"NOT TO SCALE"

14 COOLING COIL CONDESNATE DRAIN (DRAW-THRU UNIT)

M1008

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL DETAILS

SHEET NUMBER: M6.01

5/28/2026 5:37:04 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI/BI	DIGITAL/BINARY INPUT
DO/BO	DIGITAL/BINARY OUTPUT
MD	ON-OFF MOTORIZED DAMPER
MMD	MODULATING TYPE MOTORIZED DAMPER
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY DRIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZESTAT
HSL	HIGH STATIC LIMIT
SPT	STATIC PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE SENSOR
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

1 CONTROL SCHEMATIC LEGEND
NOT TO SCALE

Outdoor Air Conditions
The sensors shall be mounted in an area on the north side of the building where the representative temperature and humidity can be monitored, both shall have sun shields. Based on the outdoor air temperature and humidity the EMCS shall calculate the outdoor air enthalpy, wet bulb and dew point temperatures. These outdoor air conditions shall be broadcast as global data points for use by other control programs. These shall be displayed on all major air and water systems graphics.

Emergency Generator Monitoring
The EMCS shall monitor the run status and alarm output of the generator. The EMCS shall display the values and trend log all Change of State (COS) events. The EMCS shall report alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner.

Sump Pumps and Sump Pits Monitoring
The EMCS shall monitor the run status of the pumps and alarm outputs on the water level indicators. The EMCS shall display the values and trend log all Change of State (COS) events. The EMCS shall report alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner.

Heating and Cooling System Controls for Vestibules
Vestibules that are only provided with heating shall have the source of heating disabled when the outdoor air temperature is greater than 45°F. Vestibules that are provided with both heating and cooling shall be controlled by a local thermostat to maintain a maximum heating setpoint of 60°F and a minimum cooling setpoint of 85°F.

Heating and Cooling System Controls for Operable Openings
All doors from a conditioned space to the outdoors and all other operable openings from a conditioned space to the outdoors that are larger than 40 square feet shall be provided with a door contact to report the position of the door or opening. When the door or operable opening is detected to be open the associated zone or system serving the space shall have the space temperature setpoints reset to a minimum cooling setpoint of 90°F and a maximum heating setoint of 55°F. Temperature setpoints shall be reset within 5 minutes of reporting open.

Building Domestic Water Metering
The EMCS shall monitor the building domestic water meter, which is to be furnished by the EMCS contractor and installed by Division 22 contractor at the service entry to the building. This flow meter shall be provided regardless of any water metering provisions on site. The EMCS shall display and trend log the following: the monthly usage, yearly usage, accumulative total usage, and alarm when excessive flow is measured. The EMCS shall report alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner.

Cooling Tower Water Metering
The EMCS shall monitor the cooling tower makeup and discharge water meters. The EMCS shall display and trend log the following: the monthly usage, yearly usage, accumulative total usage, and alarm when excessive flow is measured. The EMCS shall report alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner.

IDF and MDF Room Monitoring
The EMCS shall monitor the space temperature and humidity in the IDF and MDF rooms. The primary cooling for IDF and MDF rooms will be supplied by the packaged computer room units. The EMCS shall report high/low temperature/humidity alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner. Alarms shall be sent if the space conditions deviate from the following, temperature between 60 °F and 80 °F (adj), humidity between 40% RH and 70% RH (adj), for more than 10 minutes.

Walk-in Freezer/Cooler Alarm
Remote bulb temperature sensors shall be mounted in both the freezers and coolers. Alarms shall be configured by the controls contractor. Alarms shall be sent to the computers, email addresses, and/or text message compatible devices designated by the Owner when temperature either rises above or falls below operator adjustable setpoints (28°F (adjustable) for freezer and 35°F (adjustable) for cooler).

HVAC Ventilation Emergency Shutdown Switch
A mushroom button type, local override switch shall be installed to deactivate the building's ventilation and exhaust systems in case of emergency. All 100% outside air conditioning units or outside air supply fans shall be deactivated and all outside air dampers shall be closed. All exhaust and relief fans shall be deactivated and their associated isolation dampers shall be closed. Once depressed, the switch must be manually reset to allow the ventilation and exhaust systems to resume normal operation. The final location of the switch shall be determined by the Owner.

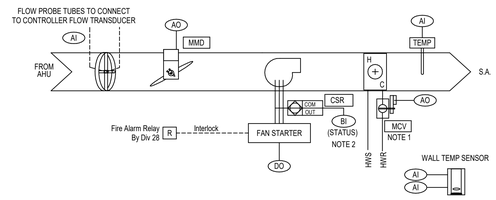
Emergency HVAC Shutdown Switch
A mushroom button type, local override switch shall be installed to deactivate the building's HVAC systems in case of emergency. The final location of the switch shall be determined by the Owner.

HVAC Override Switch
A mushroom button type, local override switch shall be installed to override the building's HVAC systems in case of emergency. The final location of the switch shall be determined by the Owner.

Elevator Machine Room Monitoring
The EMCS shall monitor the space temperature in the machine rooms. The primary cooling for these rooms will be supplied by the packaged AC units. The EMCS shall report high/low temperature alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner. Alarms shall be sent if the space conditions deviate from the following, temperature between 60 °F and 80 °F (adj), for more than 10 minutes.

Demanding Limiting Programming
Provide programming that will initiate demand limiting, manually by the system operator or automatically by schedule or a remote signal from a utility provider or other approved entity. Once initiated, the programming shall increase the cooling space temperature set points and decrease the heating space temperature set points by 4°F (adj) and automatically reduce lighting power on circuits indicated on construction documents. The rate of set point change shall be operator adjustable. The system shall include a dedicated graphics page that shows all adjusted set points (original and demand limited) and power meters being monitored to confirm demand has been affected. Refer to EMCS specification for additional information.

4 MISCELLANEOUS SYSTEMS
NOT TO SCALE



NOTES:
1. PROVIDE 2-WAY AUTOMATIC CONTROL VALVE UNLESS OTHERWISE INDICATED ON SCHEDULE OR IN SEQUENCE OF OPERATION
2. PROVIDE FAN STATUS ONLY FOR BOXES IN CLASSROOMS.
3. HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF TERMINAL UNIT BAS GRAPHICS.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

System Off - When the system is off:
The primary air damper shall be closed.
The fan shall be off.
The heating coil valve shall be closed.
The control loops shall be disabled.

System Startup - Startup shall be initiated automatically by the EMCS:
In Unoccupied when the corresponding AHU is in UNOCCUPIED MODE.
In Occupied when the corresponding AHU is in PRE-START MODE.
In Unoccupied when the corresponding AHU is in NIGHT-SETBACK MODE.
In Occupied when the corresponding AHU is in OCCUPIED MODE.

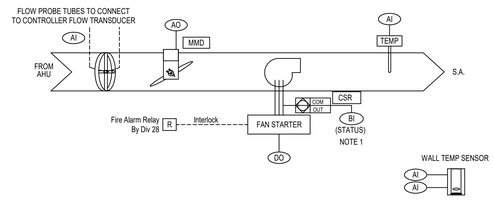
System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan shall run.
The primary air damper shall be modulated between the minimum and maximum values to maintain the space temperature within +/- 0.5 °F of the active Cooling Setpoint.
When the space temperature falls below the deadband, the primary air damper shall be modulated to the minimum flow value, the fan shall be modulated to maintain its scheduled heating airflow rate, and the hot water coil control valve shall be modulated to maintain the space temperature within +/- 0.5 °F of the active Heating Setpoint.

System Setpoints - The setpoints for the system shall be set as follows:
The Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Unoccupied Cooling Setpoint shall be set initially at 90 °F (adjustable).
The Standby Heating Setpoint shall be set initially at 68 °F (adjustable).
The Standby Cooling Setpoint shall be set initially at 76 °F (adjustable).
The minimum and maximum primary air flowrates shall set at the values given in the Mechanical Drawings.

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule for the corresponding air handling unit.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated either at the terminal unit or the corresponding air handling unit.

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature during the Occupied Mode is 5 °F above the cooling setpoint or 5 °F below the heating setpoint respectively.

2 Series Fan-Powered Terminal Unit with Hot Water Reheat - Control Schematic and Sequence of Operations (TYP. 134 EXISTING)
NOT TO SCALE



NOTES:
1. PROVIDE FAN STATUS ONLY FOR BOXES IN CLASSROOMS.
2. HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF TERMINAL UNIT BAS GRAPHICS.

System Off - When the system is off:
The primary air damper shall be closed.
The fan shall be off.
The control loops shall be disabled.

System Startup - Startup shall be initiated automatically by the EMCS:
In Unoccupied when the corresponding AHU is in UNOCCUPIED MODE.
In Occupied when the corresponding AHU is in PRE-START MODE.
In Unoccupied when the corresponding AHU is in NIGHT-SETBACK MODE.
In Occupied when the corresponding AHU is in OCCUPIED MODE.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan shall run.
The primary air damper shall be modulated between the minimum and maximum values to maintain the space temperature within +/- 0.5 °F of the active Cooling Setpoint.

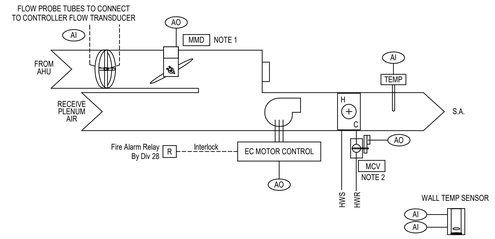
System Setpoints - The setpoints for the system shall be set as follows:
The Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Unoccupied Cooling Setpoint shall be set initially at 90 °F (adjustable).
The Standby Heating Setpoint shall be set initially at 68 °F (adjustable).
The Standby Cooling Setpoint shall be set initially at 76 °F (adjustable).
The minimum and maximum primary air flowrates shall set at the values given in the Mechanical Drawings.

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule for the corresponding air handling unit.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated either at the terminal unit or the corresponding air handling unit.

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature during the Occupied Mode is 5 °F above the cooling setpoint or 5 °F below the heating setpoint respectively.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

3 Series Fan-Powered Terminal Unit - Control Schematic and Sequence of Operations (TYP. 75 EXISTING)
NOT TO SCALE



NOTES:
1. TERMINAL UNIT CONTROLLER AND DAMPER ACTUATOR SHALL BE SHIPPED TO THE TERMINAL UNIT MANUFACTURER FOR MOUNTING AND WIRING.
2. PROVIDE 2-WAY AUTOMATIC CONTROL VALVE UNLESS OTHERWISE INDICATED ON SCHEDULE OR IN SEQUENCE OF OPERATION.
3. HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF TERMINAL UNIT BAS GRAPHICS.

System Off - When the system is off:
The primary air damper shall be closed.
The fan shall be off.
The heating coil valve shall be closed.
The control loops shall be disabled.

System Startup - Startup shall be initiated automatically by the EMCS:
In Unoccupied when the corresponding AHU is in UNOCCUPIED MODE.
In Occupied when the corresponding AHU is in PRE-START MODE.
In Unoccupied when the corresponding AHU is in NIGHT-SETBACK MODE.
In Occupied when the corresponding AHU is in OCCUPIED MODE.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan shall run.
The primary air damper shall be modulated between the minimum and maximum values to maintain the space temperature within +/- 0.5 °F of the active Cooling Setpoint.
When the space temperature falls below the deadband, the primary air damper shall be modulated to the minimum flow value, the fan shall be modulated to maintain its scheduled heating airflow rate, and the hot water coil control valve shall be modulated to maintain the space temperature within +/- 0.5 °F of the active Heating Setpoint.

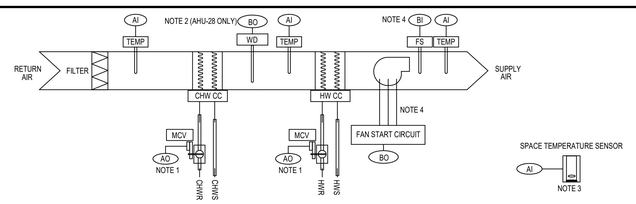
System Setpoints - The setpoints for the system shall be set as follows:
The Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Unoccupied Cooling Setpoint shall be set initially at 85 °F (adjustable).
The Standby Heating Setpoint shall be set initially at 68 °F (adjustable).
The Standby Cooling Setpoint shall be set initially at 76 °F (adjustable).
The minimum and maximum primary air flowrates shall set at the values given in the Mechanical Drawings.

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule for the corresponding air handling unit.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated either at the terminal unit or the corresponding air handling unit.

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature during the Occupied Mode is 5 °F above the cooling setpoint or 5 °F below the heating setpoint respectively.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

5 Series Fan-Powered Terminal Unit with Hot Water Reheat - Control Schematic and Sequence of Operations (Alternate 2)
NOT TO SCALE



NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. For units with cooling coils above ceilings, a cooing coil condensate drain pan float switch will de-energize the unit if the water level becomes high.
3. Refer to floor plans for location of space temperature sensor.
4. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
5. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU/FCU BAS graphics.

System Off - When the system is off:
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Time of Day Schedule.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan coil unit shall be integrated with the EMCS to monitor fan status, schedule run times, and to adjust space temperature setpoints. The outside air motorized isolation damper shall open.

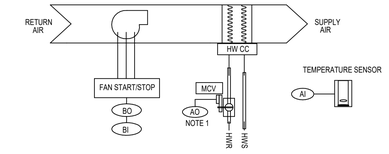
COOLING MODE: When the space temperature is above the Cooling Setpoint, the chilled water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Cooling Setpoint. The chilled water coil discharge temperature shall not be allowed to go below the chilled water coil low-limit setpoint.
HEATING MODE: When the space temperature is below the Heating Setpoint, the hot water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Heating Setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be set as follows:
The Cooling Setpoint shall be set initially at 75 °F (adjustable).
The Heating Setpoint shall be set initially at 70 °F (adjustable).
The design airflow rates shall be set at the values given in the Mechanical Drawings.
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature is 5 °F (adj.) above the cooling setpoint.
If the space temperature is 5 °F (adj.) below the heating setpoint.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

6 Fan Coil Unit - Control Schematic and Sequence of Operations (EXISTING AHU-5, 27 & 28)
NOT TO SCALE



NOTES:
1. Provide automatic control valve as indicated in mechanical schedules or control specifications.
2. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the Unit Heater BAS graphics.

System Start-up - System start-up shall be initiated:
The unit shall run according to a user definable time schedule in the following modes:

OCCUPIED MODE:
The unit shall maintain a heating setpoint of 70 °F (adjustable).

UNOCCUPIED MODE (NIGHT SETBACK):
The unit shall maintain a heating setpoint of 65 °F (adjustable).

Zone Setpoint Adjust:
The occupant shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.

Fan:
The fan shall run anytime the zone temperature drops below heating setpoint, unless shutdown on safeties.

Heating Coil Valve:
The controller shall measure the zone temperature and modulate the heating coil valve to maintain its heating setpoint.

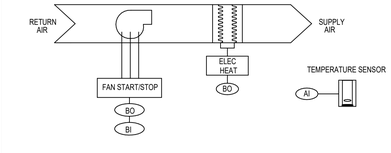
The heating shall be enabled whenever:
Outside air temperature is less than 65°F (adj.).
AND the zone temperature is below heating setpoint.
AND the fan is on.

System Alarms - The EMCS shall generate an alarm as follows:

LOW ZONE TEMP:
If the zone temperature is less than the heating setpoint by a user definable amount (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

7 Hot Water Unit Heater - Control Schematic and Sequence of Operations (EXISTING UH-6,7,8,9,10,11,12,13)
NOT TO SCALE



NOTES:
1. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the Unit Heater BAS graphics.

System Start-up - System start-up shall be initiated:
The unit shall run according to a user definable time schedule in the following modes:

OCCUPIED MODE:
The unit shall maintain a heating setpoint of 70 °F (adjustable).

UNOCCUPIED MODE (NIGHT SETBACK):
The unit shall maintain a heating setpoint of 65 °F (adjustable).

Zone Setpoint Adjust:
The occupant shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.

Fan:
The fan shall run anytime the zone temperature drops below heating setpoint, unless shutdown on safeties.

Electric Heating Element:
The controller shall measure the zone temperature and the electric heat shall be staged to maintain the space temperature within +/- 0.5 °F of the its Heating Setpoint.

The heating shall be enabled whenever:
Outside air temperature is less than 65°F (adj.).
AND the zone temperature is below heating setpoint.
AND the fan is on.

System Alarms - The EMCS shall generate an alarm as follows:

LOW ZONE TEMP:
If the zone temperature is less than the heating setpoint by a user definable amount (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

8 Electric Unit Heater - Control Schematic and Sequence of Operations (EXISTING UH-1,2,3,4,5)
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
STATE OF TEXAS
ADAM C. JONES
110009
LICENSED
PROFESSIONAL ENGINEER
5/29/26

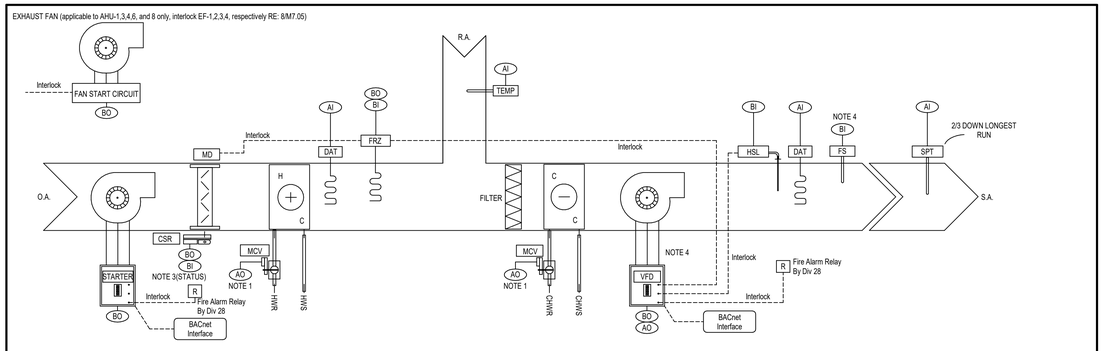
Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

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NOTES:
1. Provide automatic coil control valve as indicated in mechanical schedules and control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Provide status for outside air damper position.
4. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
5. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics

System off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The unit supply fan shall be off.
The cooling coil valve shall be closed.
The heating coil valve shall be closed.
All control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

NIGHT-SETBACK MODE:
The system shall be enabled automatically by the EMCS based on the cooling demand of 5 (adjustable) or more associated terminal units whose space temperature has exceeded the terminal units Unoccupied Cooling Setpoint. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based on the actual space occupancy. When the Time of Day schedule (TOD) is active, the system shall operate per the **System Operation** section, as detailed below, and the Demand Control Ventilation sequence shall be active.
Demand Control Ventilation - The outside air intake damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint. If the space carbon dioxide concentration for any zone served by the associated AHU is above the defined high-limit, then the OSA damper shall be modulated to maintain the scheduled maximum outside air flowrate setpoint. If the OSA damper is above 95% open and the maximum outside air flowrate setpoint cannot be met, then modulate the return air damper closed until the flowrate is achieved. Do not modulate the return air damper to less than 60% open. Once the space carbon dioxide concentration for all associated zones has been below the defined high limit for 5 minutes (adj.), the OSA damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint.
Outside Airflow and Damper Control: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.
Outside Air Damper / Return Air Damper Integration with Supply Fan VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.

System Operation - When system start-up has been initiated:
The variable speed supply fan shall start at its minimum speed. Following a confirmation of fan start status, the supply fan speed shall be modulated to maintain the supply air static pressure at setpoint. The speed of the fan shall not be adjusted by more than 20% in any one-minute period. The static pressure setpoint shall be reset via the control algorithm below to optimize the energy usage.
Supply Air Static Pressure Reset - The static pressure setpoint shall be reset up in defined increments at defined intervals until the primary air damper position to all of the associated terminal units have been below the defined value for more than the defined interval. The static pressure setpoint shall be reset down in defined increments at defined intervals until the primary air damper position to at least one (critical zone) of the associated terminal units has been above the defined value for more than the defined interval. The setpoints are detailed in the **System Setpoint** section below.
Cooling Coil - The chilled water coil control valve shall be modulated to maintain the active supply air temperature setpoint. The supply air temperature setpoint shall be reset via the control algorithm below to optimize the energy usage.
Supply Air Temperature Reset - The supply air temperature setpoint shall be reset based on the actual return air temperature, according to the defined reset schedule detailed in the **System Setpoint** section below. If the Demand Control Ventilation sequence is in maximum outdoor air flow mode, then the supply air temperature reset shall be disabled and the setpoint shall be set to the initial value.
Pre-Heating Coil - The hot water pre-heat coil control valve shall be modulated to maintain the pre-heat coil discharge air temperature at setpoint. The control shall be active when the outside air temperature is below 45 °F. (adj)
Freeze Protection - When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

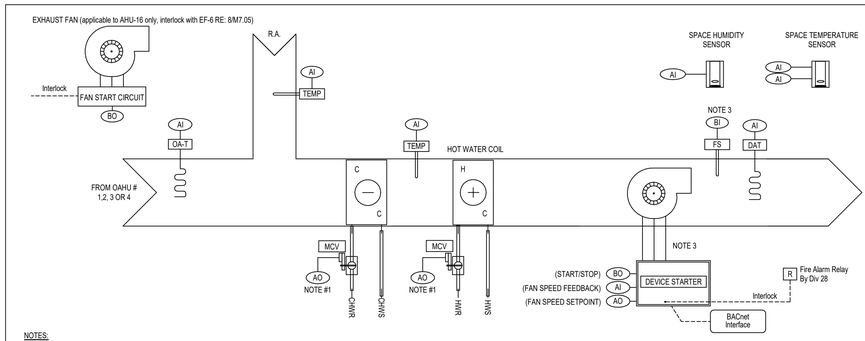
System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The supply air static pressure setpoint shall be set initially at 1.25 inches w.c. (adj) and shall have reset limits of 0.20 to 2.00 inches w.c. (adj)
The time interval for static pressure reset shall be set at 10 minutes (adj).
The static pressure reset increment shall be set at 0.05 inches w.c. (adj).
The terminal unit primary damper position setpoint shall be 90% open. (adj)
The time interval for terminal unit primary damper position shall be set at 15 minutes. (adj)
The supply air temperature setpoint shall be set initially at 54 °F. (adj)
The supply air temperature setpoint shall be reset to 54 °F (adj) when the return air temperature is at 78 °F. (adj)
The supply air temperature setpoint shall be reset to 58 °F (adj) when the return air temperature is at 72 °F. (adj)
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.5 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm if:
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If the space carbon dioxide level for any associated zone exceeds its high-limit for more than 20 minutes (adj) or exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 **VAV Air Handling Unit - Control Schematic and Sequence of Operations (EXISTING AHU-1-4, 6-13, and 17-23)**
NOT TO SCALE



NOTES:
1. Provide automatic coil control valve as indicated in mechanical schedules and control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.
Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.
System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.
OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.
OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.
DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.
ECONOMIZER MODE: The EMCS shall enable airside Economizer Mode whenever the outside air enthalpy is less than 28.0 btu/lb, the outside air dry bulb temperature is less than 75°F, and the space temperature sensor calls for cooling. The EMCS shall modulate the outside air and return air dampers such that the unit provides 100% outside air for space cooling and shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint. Economizer Mode shall be integrated with the cooling coil control valve such that the cooling coil control valve is required to maintain the chilled water coil discharge air temperature setpoint. If the outside air dry bulb temperature is below chilled water coil discharge air temperature setpoint, the EMCS shall begin to modulate the return air damper open as required to maintain a mixed air temperature of 53°F (adj). If the outside air enthalpy exceeds 28.0 btu/lb or the outside air temperature exceeds 75°F, Economizer Mode shall be disabled. DCV and preheat shall be disabled during Economizer Mode.
COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active coil discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.
HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.
DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).
PREHEAT COIL: The EMCS shall modulate the hot water pre-heat control valve to maintain the pre-heat coil discharge air temperature setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

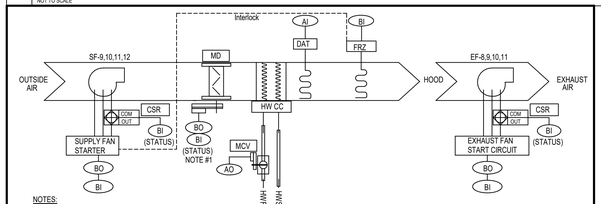
System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

2 **Single Zone VAV AHU Chilled Water Cooling, Hot Water Heating (EXISTING AHU-14,15,16, & 24)- Control Schematic and Sequence of Operations**
NOT TO SCALE



NOTES:
1. Provide status for outside air damper position.
2. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the EF/SF BAS graphics.

Space Occupancy:
Each unit will have an occupancy/vacancy schedule -- all schedules are operator assignable from the central site.

Fan Control:
When the zone becomes occupied the BMCS will open the unit dampers and enable the supply fan. Damper end switch will ensure the dampers are in the open position before the supply fan can run in either the Hand or Auto position of the motor starter. Exhaust fan will run whenever the supply fan is operating.

Discharge Temperature Control:
When the zone becomes occupied, the unit controller will determine, based on the discharge temperature, whether heating is required.
If heating is required, a heating request will be sent to the boiler manager (see Hot Water System Sequence of Operations). The hot water valve will be modulated to maintain the discharge temperature setpoint 70°F. (adjustable) – typical.

Freeze Protection:
A duct mounted double pole single throw, averaging type freeze protection switch will monitor the discharge air temperature from the heating coil. If the discharge air temperature drops below setpoint 38°F (locally adjustable), the freeze protection switch N.O. switch will close indicating an alarm condition to the BMCS, the N.C. switch will open de-energizing the supply fan. The BMCS will close the outside air damper open the heating water valve and start the required central plant equipment. Re-enabling the unit will require manual reset of the freeze protection switch at the unit.

Unoccupied Control:
During the unoccupied time period, equipment will be off.

Equipment Off Conditions:
When the equipment is in the unoccupied period, the hot water valve and outside air damper will be closed and the fans de-energized.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

3 **Kitchen Hood Supply and Exhaust - Control Schematic and Sequence of Operations (EXISTING SF,9,10,11,12 and EF-8,9,10,11)**
NOT TO SCALE

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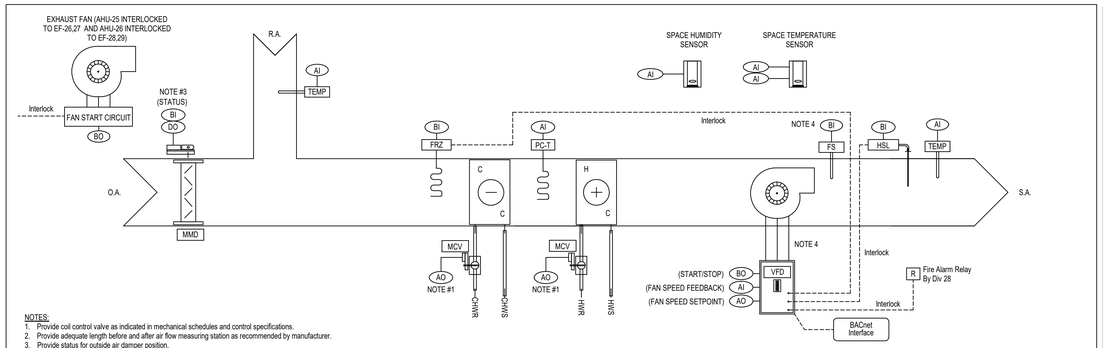
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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade
30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

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DRAWN BY: DBR
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PROJECT NUMBER 260018.001
SHEET TITLE: MECHANICAL CONTROLS DIAGRAMS
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NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Provide status for outside air damper position.
4. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
5. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics.

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.
OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.
OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.
DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.
ECONOMIZER MODE: The EMCS shall enable airside Economizer Mode whenever the outside air enthalpy is less than 28.0 btu/lb, the outside air dry bulb temperature is less than 75°F, and the space temperature sensor calls for cooling. The EMCS shall modulate the outside air and return air dampers such that the unit provides 100% outside air for space cooling and shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint. Economizer Mode shall be integrated with the cooling coil to modulate the chilled water control valve as required to maintain the chilled water coil discharge air temperature setpoint. If the outside air dry bulb temperature is below chilled water coil discharge air temperature setpoint, the EMCS shall begin to modulate the return air damper open as required to maintain a mixed air temperature of 53°F (adj). If the outside air enthalpy exceeds 28.0 btu/lb or the outside air temperature exceeds 75°F, Economizer Mode shall be disabled. DCV and preheat shall be disabled during Economizer Mode.
COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active coil discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.
HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.

DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).
PREHEAT COIL: The EMCS shall modulate the hot water pre-heat control valve to maintain the pre-heat coil discharge air temperature setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

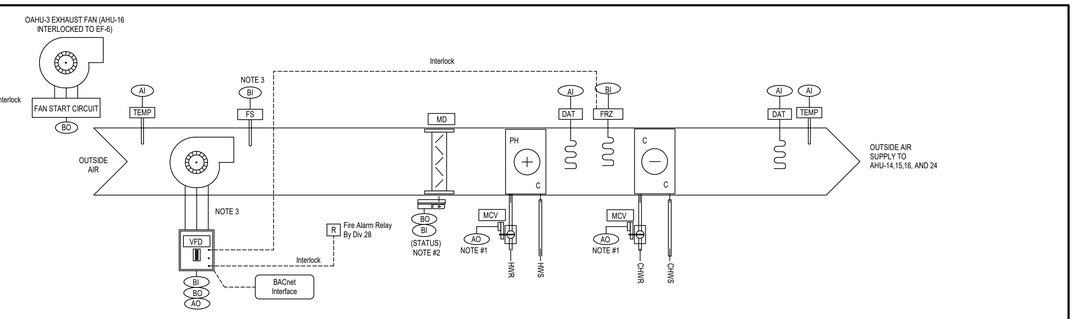
System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 Single Zone VAV AHU Chilled Water Cooling, Hot Water Heating (EXISTING AHU-25, 26) - Control Schematic and Sequence of Operations
NOT TO SCALE



NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. Provide status for outside air damper position.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the OAHU BAS graphics

SYSTEM OFF - WHEN THE SYSTEM IS OFF:
The outside air damper shall be closed.
The unit supply fan shall be off.
The cooling coil valve shall be closed.
The preheating coil valve shall be closed.
All control loops shall be disabled.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the TIme of Day (TOD) occupancy schedule. Once enabled, the system shall operate per the **System Operation** section, as detailed below.

NIGHT-SETBACK MODE:
The outside air handling system shall not operate during unoccupied hours unless started by a manual command at the EMCS.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based whenever any of the associated AHU's it serves has an active call for ventilation air. When the Time of Day schedule (TOD) is active, the system shall operate per the **System Operation** section, as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply fan shall start at its minimum speed. Following a conformation of fan start status, the supply fan speed shall be modulated to maintain the supply air static pressure at setpoint. The speed of the fan shall not be adjusted by more than 20% in any one-minute period.

The chilled water coil control valve shall be modulated to maintain the supply air temperature at setpoint. The control shall be active when the outside air temperature is above 55 °F. (adj)

The hot water pre-heat coil control valve shall be modulated to maintain the pre-heat coil discharge air temperature at setpoint. The control shall be active when the outside air temperature is below 53 °F. (adj)

Freeze Protection: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

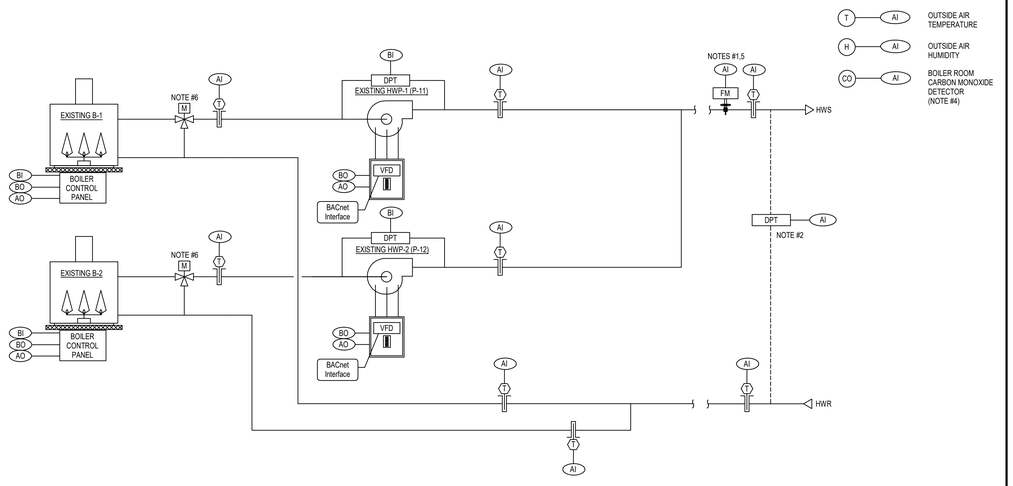
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design maximum supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be the VFD speed required to obtain the design minimum supply airflow value from the unit schedule on the Mechanical Drawings.
The supply air static pressure setpoint shall be 1.0 inches w.c. (adj)
The supply air temperature setpoint shall be set initially at 55 °F. (adj)
The pre-heat setpoint shall be set to 53 °F (adj)
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm if:
If the supply duct static pressure exceeds the high-limit setpoint.
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If the preheat air temperature is below the freezestat trip point, initially set at 37 °F. (adj)
If the filter differential pressure exceeds the trip point initially set at 1.0 inch w.c. (adj)
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating. The alarms, except the fan failure alarm, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

2 Outside Air Handling Unit - Control Schematic and Sequence of Operations (EXISTING OAHU-1,2,3 & 4)
NOT TO SCALE



NOTES:
1. Division 23 to install Thred-o-lets for all devices installed in piping.
2. Field verify differential pressure transmitter in accessible location approximately 2/3 down main loop.
3. EMCS contractor shall be responsible for point-to-point ethernet connection between boiler controllers.
4. EMCS contractor shall be responsible for wiring carbon monoxide detector to auxiliary input at lead boiler controller.
5. Ensure installation location of flow meter meets or exceeds the manufacturer's published placement requirements to meet the specified meter accuracy.
6. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the Boiler/Pump BAS graphics

System Off - When the system is off:
The boilers shall be off.
The pumps shall be off.
The bypass valve shall be closed.
The boiler isolation valves shall be closed.
The control loops shall be disabled.

System Startup - System startup shall be initiated:
Manually by an Operator command on the heating water system graphic at the EMCS.
Automatically by the EMCS, when a call for heating has been received.

System Operation - When system start-up has been initiated:
The outside air temperature must be below the outside air lockout setpoint before the heating water system can be activated. The number of heating requests required and the length of time the requests must be received before activating the heating water system shall be adjustable. The boilers and pumps shall be lead/lag and rotated weekly at a time and on a day of the week when the heating water system is not in operation. Rotation shall be based on accumulated runtime for each type of equipment.

When the heating water system is activated, the boiler system controller shall open the motorized isolation valve on the lead boiler. When the valve end switch has been proven open, the EMCS shall enable the lead pump. A current switch shall prove the pump status at the EMCS, which shall generate an alarm, if the switch is not made within 45 seconds (adjustable). There shall also be a 10 second (adjustable) de-bounce time to prevent nuisance alarms from a bouncing switch. If the pump run status is not proven, the EMCS shall discontinue the enable signal to the pump and rotate pumps. The EMCS shall then energize a lag pump to run in the same manner as described above. That pump shall become the lead pump.

After the pump status has been proven, the EMCS shall send a signal to enable the lead boiler to fire provided all safeties have been met. A contact in the boiler control panel will provide status to the EMCS. If the heating water supply temperature is less than 100 °F (adjustable) or a heating water pump status is not indicating a heating water pump is running, the EMCS control module will broadcast that heating water is not available.

Whenever the boilers are de-activated, the heating water pump will continue to run for 5 minutes (adjustable) to avoid excessive temperature buildup in the boiler.

The boiler room shall be provided with a manual reset type carbon monoxide (CO) detector. The CO detector shall be interlocked with the boiler control panel such that the burners will not operate when the measured level of carbon monoxide in the room rises above 50 ppm. The boiler control panel should also disable the burners in the event that there is a loss of power to the CO detector.

The EMCS shall receive inputs from temperature sensors located in the boiler heating water supply and return piping. The heating water supply setpoint shall be reset based on the outdoor air temperature, the limits shall be 170 °F when the outdoor air is at 35 °F and 110 °F when the outdoor air temperature is 65 °F (all adjustable). The boiler system controller shall enable the lag boiler if the heating water supply temperature is more than 5 °F (adjustable) below setpoint for 10 minutes (adjustable). If the heating water supply temperature is not more than 5 °F (adjustable) below setpoint and the heating water delta-T is less than 5 °F for 10 minutes (adjustable) the lag boiler shall be disabled.

A differential pressure sensor across the heating water supply and return lines shall monitor building differential pressure. The EMCS shall modulate the speed of the operating heating water pumps to maintain the building heating water differential pressure at setpoint (adjustable). If the differential pressure is 2 psi below setpoint and the active pumps output are above the pump stage-up setpoint for 15 minutes (adjustable), a lag pump shall be enabled. When more than one pump is operating and the active pumps output are below the pump stage-down setpoint for 15 minutes (adjustable), the lag pump shall be de-energized. All active pumps shall be modulated with the same ramp signal.

The EMCS shall monitor the position of all of the heating water valves at the units that the plant serves and the differential pressure setpoint shall be reset based on achieving a target valve position of 90%. There shall be a dead band of 5% to prevent hunting of the reset program. The differential pressure setpoint shall not change by more than 1 psi per 5 minute (adj.) interval. The target valve position, the reset time, the dead band, and the rate of change values shall be operator adjustable.

While only one boiler is in operation, the corresponding flow rate sensor shall be used to maintain the boiler minimum flow rate by modulating the bypass valve open. The heating water flow rate shall not change by more than 10% per minute.

System Setpoints - The setpoints for the system shall be set as follows:
The outside air temperature lockout setpoint shall be 65 °F (adjustable).
The boiler minimum flow rate setpoint shall be --- gpm (adjustable).
The heating water system differential pressure setpoint shall be initially set at 12 psi (adjustable) and shall have reset limits of 8 psi to 16 psi (adjustable).
The pump stage-up setpoint shall be 95% (adjustable).
The pump stage-down setpoint shall be 50% (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

4 Hot Water System - All Condensing - Variable Primary Flow with Headered Pumps - Control Schematic and Sequence of Operations (EXISTING P-11, P-12 and B-1, B-2)
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

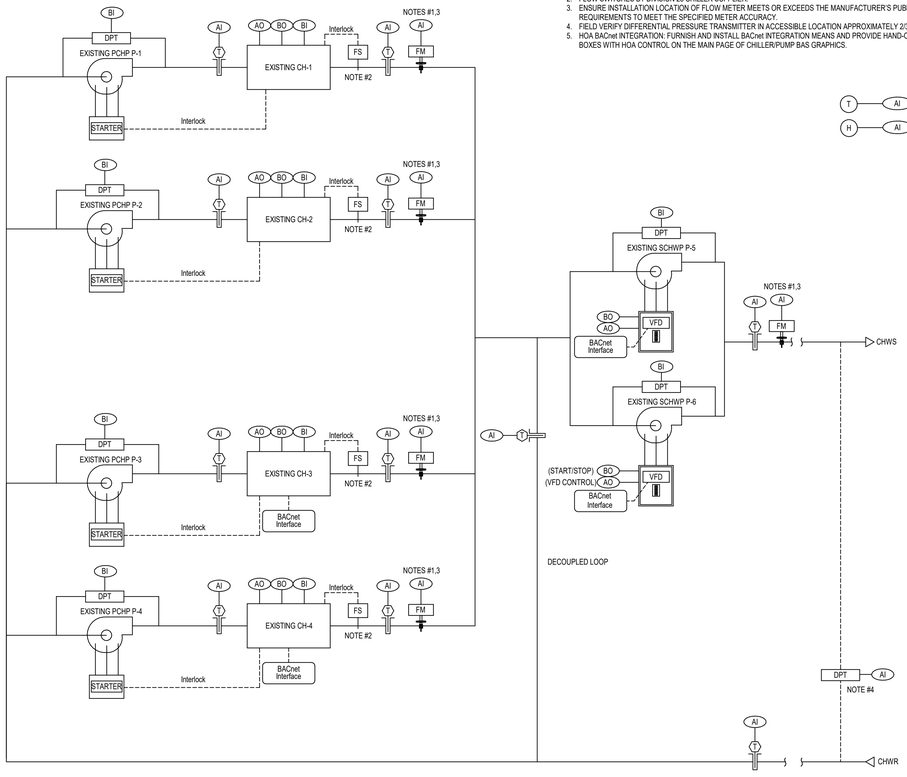

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: MECHANICAL CONTROLS DIAGRAMS
SHEET NUMBER: M7.03

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System Off - When the system is off:
The chillers shall be off.
The pumps shall be off.
The control loops shall be disabled.

System Startup - System startup shall be initiated:
Manually by an Operator command on the chiller graphic at the EMCS.
Automatically by the EMCS, when a call for cooling has been received.

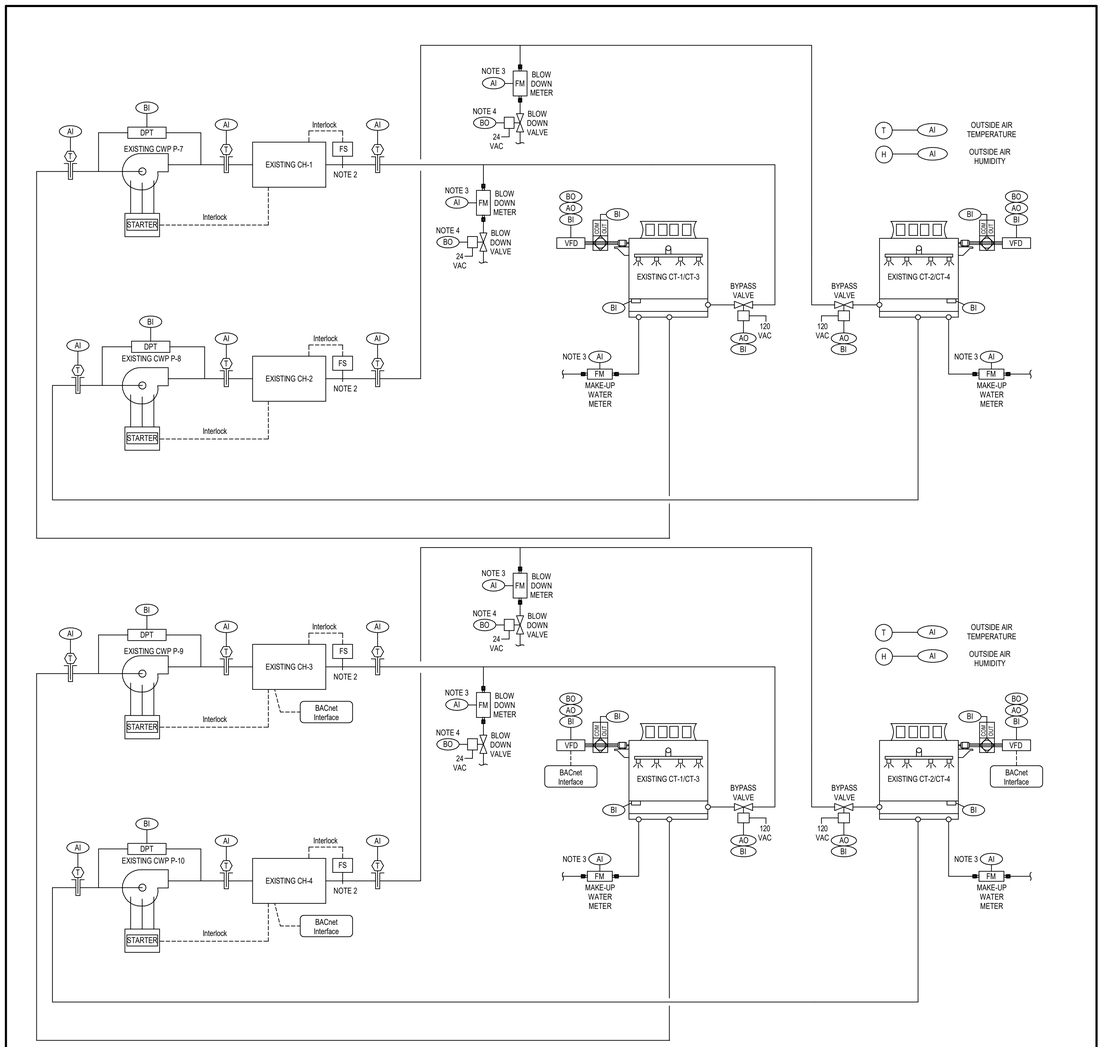
System Operation - When system start-up has been initiated:
The outside air temperature must be above the outside air lockout setpoint, before the chiller can be activated. The number of cooling requests required and the length of time the requests must be received before activating the chiller plant shall be adjustable. The chiller/pump systems shall be lead/lag and rotated weekly at a time and on a day of the week when the chiller plant is not in operation. Rotation shall be based on accumulated runtime for each type of equipment.
When the chiller plant is activated, the lead secondary pump shall be enabled. A differential pressure sensor monitoring the pressure between the building CHWS and CHWR piping shall be used to modulate the speed of the secondary pumps. A PID control loop shall modulate the speed of the secondary CHW pumps from their minimum speed to their maximum speed as the differential pressure deviates from setpoint. If the differential pressure is 2 psi below setpoint and the active pumps output are above the pump stage-up setpoint for 15 minutes (adjustable), the lag secondary pump shall be enabled. When more than one secondary pump is operating and the active secondary pumps output are below the pump stage-down setpoint for 15 minutes (adjustable), the lag secondary pump shall be de-energized. All active secondary pumps shall be modulated with the same ramp signal.
The EMCS shall enable the lead chiller primary pump. A current switch shall prove the pump status at the EMCS, which shall generate an alarm, if the switch is not made within 45 seconds (adjustable). There shall also be a 10 second (adjustable) de-bounce time to prevent nuisance alarms from a bouncing switch. If the pump run status is not proven, the EMCS shall discontinue the enable signal to the pump and rotate chiller systems. The EMCS shall then energize the lag chiller primary pump to run in the same manner as described above. The lag chiller system shall become the lead chiller system.
When the lead primary pump status is proven, the EMCS shall enable the lead chiller. A flow switch in the chilled water piping shall complete the circuit to the chiller factory installed controller proving that evaporator flow has been established. If the chiller alarm input closes (indicating that the chiller has alarm), the EMCS shall generate an alarm, discontinue the enable signal to the lead chiller system and energize the lag chiller system to run in the same manner as described above. The lag chiller system shall become the lead chiller system. The chiller shall run to maintain the supply water temperature setpoint.

The EMCS shall monitor temperature inputs from sensors mounted in the common supply and return piping and flow meters mounted in the chiller supply piping, and calculate the Building Load in Tons. The combined total Nominal Capacity in Tons of all operating chillers shall be the Total Capacity.
If the value of ((Building Load / Total Capacity) * 100) is greater than the stage-up setpoint for 10 minutes (adjustable) or the CHW supply temperature rises greater than 4 °F (adjustable) above setpoint, the lag chiller system shall be enabled into operation. If the value of ((Building Load / Total Capacity) * 100) is less than the stage-down setpoint for 10 minutes (adjustable), the lag chiller system shall be disabled.
The EMCS shall monitor the position of all of the chilled water valves at the units that the plant serves and the differential pressure setpoint shall be reset based on achieving a target valve position of 90%. There shall be a dead band of 5% to prevent hunting of the reset program. The differential pressure setpoint shall not change by more than 1 psi per 5 minute (adj.) interval. The target valve position, the reset time, the deadband, and the rate of change values shall be adjustable.
When a chiller system is to be disabled, the EMCS shall discontinue the command for the chiller system to run. The EMCS shall continue to run the associated primary pump until the chiller status has indicated that it is off. Then the EMCS shall discontinue the command for the primary pump to run.
When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water valves to 50% open (adj.) for flow through the AHU coils and the lead secondary pump shall be activated to run at its minimum referenced speed value until ambient temperature has risen above the freeze protection setpoint for 10 minutes (adj.).
The EMCS shall monitor the outside air temperature and humidity. The EMCS shall calculate the outside air enthalpy, wet bulb temperature, and dew point temperature. These values shall be displayed on all air and water systems graphics.

System Setpoints - The setpoints for the system shall be set as follows:
The outside air temperature lockout setpoint shall be 50 °F (adjustable).
The chiller leaving water temperature setpoint shall be 42 °F (adjustable).
The chiller stage-up setpoint shall be 90% (adjustable).
The chiller stage-down setpoint shall be 50% (adjustable).
The chilled water system differential pressure shall be initially set at 12 psi (adj.) and shall have reset limits of 8 psi to 16 psi (adjustable).
The pump stage-up setpoint shall be 95% (adjustable).
The pump stage-down setpoint shall be 50% (adjustable).
The outdoor air temperature freeze protection setpoint shall be 37 °F (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 **Chilled Water System - Water Cooled - Decoupled Loop - Control Schematic and Sequence of Operations (EXISTING P-1,2,3,4,5,6 and CH-1,2,3,4)**
NOT TO SCALE



NOTES:
1. DIVISION 23 TO INSTALL THRED-O-LETS FOR ALL DEVICES INSTALLED IN PIPING.
2. FLOW SWITCHES BY DIVISION 23 CHILLER SUPPLIER.
3. ENSURE INSTALLATION LOCATION OF FLOW METER MEETS OR EXCEEDS THE MANUFACTURER'S PUBLISHED PLACEMENT REQUIREMENTS TO MEET THE SPECIFIED METER ACCURACY.
4. 24 VAC CONTROL POWER FOR VALVE SHALL BE PROVIDED BY THE CONDENSER WATER CHEMICAL TREATMENT SYSTEM.
5. HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF COOLING TOWER/CHILLER/PUMP BAS GRAPHICS.

System Off - When the system is off:
The chillers shall be off.
The pumps shall be off.
The fans shall be off.
The tower bypass valves shall be closed.
The tower isolation valves shall be closed.
The control loops shall be disabled.

System Startup - System startup shall be initiated:
Automatically by the EMCS, when the chiller plant is enabled.

System Operation - When system start-up has been initiated:
The cooling tower cells shall be lead/lag and rotated weekly at a time and on a day of the week when the chiller plant is not in operation. Rotation shall be based on accumulated runtime for each type of equipment.

When the condenser water system is activated, the EMCS shall open the tower isolation valve on the lead tower cell. When the valve end switch has been proven open, the EMCS shall send an enable signal to the condenser water pump associated with the lead chiller system. A differential pressure switch shall prove the pump status at the EMCS, which shall generate an alarm, if the switch is not made within 40 seconds (adjustable). There shall also be a 20 second (adjustable) de-bounce time to prevent nuisance alarms from a bouncing switch. If the pump run status is not proven, the EMCS shall discontinue the enable signal to the pump and rotate chiller/pump systems. The EMCS shall then energize the condenser water pump associated with the lag chiller/pump system to run in the same manner as described above. That pump shall become the lead pump.

When the lead pump status is proven, the EMCS shall enable the associated chiller. A flow switch in the condenser water piping shall complete the circuit to the chiller factory installed controller proving that flow has been established. If the chiller alarm input closes (indicating that the chiller has alarm), the EMCS shall generate an alarm, discontinue the enable signal to the lead chiller/pump system. The failed chiller and associated pump shall be removed from service. The lag chiller/pump system shall become the lead system. The speed reference of the condenser water pumps shall be determined by TAB and set by the EMCS.

When the lead chiller/pump system status is proven, the EMCS shall enable the lead cooling tower cell fan. The quantity of cooling tower cells enabled shall match the quantity of operating chiller/pumps systems. When the lag chiller/pump system is operating, the lag cooling tower cell and associated tower fan, isolation valve, and bypass valve shall be enabled.

A temperature sensor monitoring the common tower leaving water shall be used to modulate the speed of the tower fans. A PID control loop shall modulate the speed of the fans from their minimum speed to their maximum speed as the temperature deviates from setpoint. All active tower fans shall be modulated with the same ramp signal. The EMCS shall reset the condenser water temperature setpoint based on the outside air wet bulb conditions. The setpoint shall be set as follows: (current outside air wet bulb temperature) + (tower approach). The reset shall be updated every 15 minutes.

When a cooling tower cell is enabled and the temperature falls below the tower bypass valve setpoint, the EMCS shall modulate its bypass valve open to maintain the active tower leaving water temperature setpoint.

When a chiller is to be disabled, the EMCS shall first discontinue the command for the chiler to run. The EMCS shall continue to run its associated condenser water pump until the chiller status has indicated that it is off. After the chiller status has proven disabled for 5 minutes (adj.), the associated condenser water pump shall be disabled, the lag cooling tower cell fan shall be disabled and the lag cooling tower cell isolation valve shall be indexed to the fully closed position.

The EMCS shall monitor the outside air temperature and humidity. The EMCS shall calculate the outside air enthalpy, wet bulb temperature, and dew point temperature. These values shall be displayed on all air and water systems graphics.

A basin level sensor shall disable the CW pumps if the level falls below the design height.

If the outdoor air dry bulb temperature drops below the freeze protection setpoint, the EMCS shall close all cooling tower cell isolation valves and all tower by-pass valves shall be indexed to the fully open position. The EMCS shall enable the lead condenser water pump to circulate water through the piping loop. During freeze protection operation, condenser water pump operation shall be rotated between the lead condenser water pump and the lag condenser water pump at 15 minute (adj.) intervals. Condenser water shall bypass the cooling towers to the cold water basin where the electric immersion heater system shall maintain the condenser water temperature above its freezing point. When the outdoor air temperature has risen above the freeze protection setpoint for 10 minutes (adj.), the system shall return to normal operating conditions.

System Setpoints - The setpoints for the system shall be set as follows:
The tower leaving water temperature setpoint shall be set as follows: (current outside air wet bulb temperature) + (tower approach).
The tower leaving water temperature setpoint shall also have a low-limit setpoint of 55 °F (adjustable).
The tower approach shall be 10 °F (adjustable).
The tower bypass valve setpoint shall be set as follows: (current tower leaving water temperature setpoint) - 4 °F (adjustable).
The outdoor air temperature freeze protection setpoint shall be 37 °F (adjustable).

System Alarms - The EMCS shall generate an alarm as follows:
Bypass valve failure: Commanded open but the status is closed.
Fan failure: Commanded on but the status is off.
Pump failure: Commanded on but the status is off.
Chiller alarm: When the chiller controller alarm input closes.
Vibration cutout switch: When tower vibration cutout switch signals a tower fan shutdown.
Oil level switch: When sensor indicates low oil level.
Overflow sensor: When overflow sensor signals excessive water level.
High tower leaving water temperature: If greater than 90 °F (adjustable).
Low tower leaving water temperature: If less than 37 °F (adjustable).
High condenser water return temp: If greater than 100 °F (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

2 **Condenser Water System - Chiller Plant - Dedicated Pumps - Control Schematic and Sequence of Operations (EXISTING P-7,8,9,10, CH-1,2,3,4, and CT-1,2,3,4)**
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: MECHANICAL CONTROLS DIAGRAMS
SHEET NUMBER: M7.04

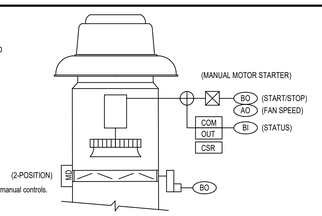
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EXHAUST FANS W/ 60 MIN NO-HOLD TIMER (LOCATED NEAR STRIKE SIDE OF DOOR)

EXHAUST FANS W/ 60 MIN NO-HOLD TIMER (LOCATED NEAR TEACHER'S WORKSTATION)

60 MIN NO HOLD TIMER (SCIENCE PREP ROOM: EXISTING EF-52,53,54)

60 MIN NO HOLD TIMER (SCIENCE LAB: EXISTING EF-12,15,18,21,39,40,41,42,43,44.)



SYSTEM OFF - WHEN THE SYSTEM IS OFF:
Manually controlled exhaust fans shall remain operational via their local manual controls.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator command at local manual control.

MANUALLY CONTROLLED EXHAUST FANS:
The EMCS shall monitor the status of each exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. Upon activation of the building unoccupied mode, the automatically controlled building exhaust fans shall be de-energized. The exhaust fan shall be provided with a relay to the 60-minute no-hold timer located as indicated above. When the timer is engaged the exhaust fan shall operate at its scheduled airflow rate until the timer times out. When the timer disengages, the exhaust fan shall be de-energized.

Fan Status:
The controller shall monitor the fan status.

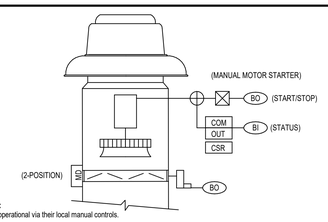
Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).
Purge Event: Emergency purge push button activated.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

1 Exhaust Fans w/ Local Emergency Switch - Control Schematic and Sequence of Operations
NOT TO SCALE

INTERLOCK WITH LIGHT SWITCH (FIELD VERIFY LOCATIONS)



SYSTEM OFF - WHEN THE SYSTEM IS OFF:
Manually controlled exhaust fans shall remain operational via their local manual controls.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator command at local manual control.

MANUALLY CONTROLLED EXHAUST FANS: Manually controlled exhaust fans shall utilize two-position motorized damper interlocked with their manual motor starter. The EMCS shall monitor the status of each manually controlled exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. When the associated light switch is switched on, the motorized damper shall open and the exhaust fan shall be energized. When the light switch is switched off, the exhaust fan shall be energized and the motorized damper shall close.

Fan Status:
The controller shall monitor the fan status.

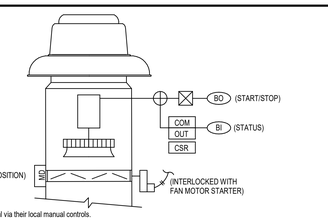
Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

2 Manually Controlled Exhaust/Supply Fans - Control Schematic and Sequence of Operations (EXISTING EF-24,33-38,49-51,55)
NOT TO SCALE

INTERLOCK WITH HOOD SWITCH



SYSTEM OFF - WHEN THE SYSTEM IS OFF:
Manually controlled exhaust fans shall remain operational via their local manual controls.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator command at local manual control.

MANUALLY CONTROLLED EXHAUST FANS: Manually controlled exhaust fans shall utilize two-position motorized damper interlocked with their manual motor starter. The EMCS shall monitor the status of each manually controlled exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. When the associated hood switch is switched on, the motorized damper shall open and the exhaust fan shall be energized. When the hood switch is switched off, the exhaust fan shall be de-energized and the motorized damper shall close.

Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

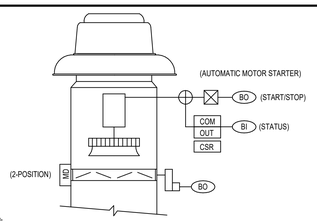
HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

3 Manually Controlled Exhaust/Supply Fans - Control Schematic and Sequence of Operations(EF-13,14,16,17,19,20,22,23 (E))
NOT TO SCALE

ZONE TEMP AI
ZONE SETPOINT ADJUST AI
WALL SENSOR

The space temperature setpoint shall be initially set at 70 °F (adj.)



SYSTEM OFF - When the system is off:
Exhaust fans shall be off

SYSTEM START-UP - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on the associated space temperature setpoint.

AUTOMATICALLY CONTROLLED (TEMP. BASED) EXHAUST FANS: Upon activation of building occupied mode and start-up of the air handling system, the EMCS shall allow exhaust fans to be energized based on the associated space temperature setpoint, and their respective two-position motorized dampers shall open. The EMCS shall monitor the status of each exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. Upon activation of the building unoccupied mode, the automatically controlled building exhaust fans shall be de-energized.

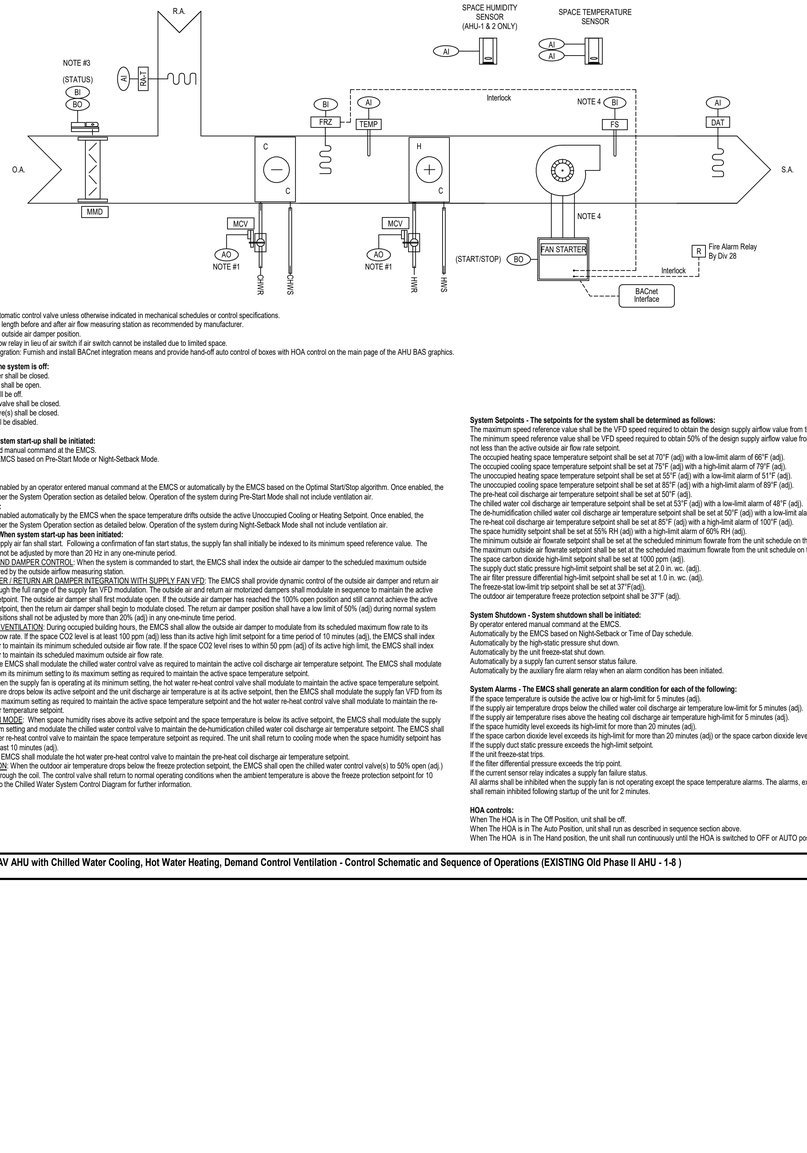
Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

4 Automatically Controlled Temperature Based Exhaust Fans with Local Override Switch - Control Schematic and Sequence of Operations (Electrical Room Ventilation, EXISTING EF-33)
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated in mechanical schedules or control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Provide status for outside air damper position.
4. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
5. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics.

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.
OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.
OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.
DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.
COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active cool discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.
HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.
DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).
PREHEAT COIL: The EMCS shall modulate the hot water pre-heat control valve to maintain the pre-heat coil discharge air temperature setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

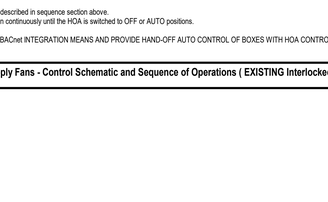
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

5 Single Zone VAV AHU with Chilled Water Cooling, Hot Water Heating, Demand Control Ventilation - Control Schematic and Sequence of Operations (EXISTING Old Phase II AHU - 1-8)
NOT TO SCALE

AUTOMATICALLY CONTROLLED EXHAUST FANS (TOILET ROOMS, LOCKER ROOMS, ETC.)



SYSTEM OFF - When the system is off:
Automatically controlled exhaust fans shall be off and their 2-position dampers closed.

SYSTEM START-UP - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.

AUTOMATICALLY CONTROLLED EXHAUST FANS: Upon activation of building occupied mode and start-up of the air handling system, the EMCS shall energize all automatically controlled exhaust fans and open their respective two-position motorized dampers. The EMCS shall monitor the status of each automatically controlled exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. Upon activation of the building unoccupied mode, the automatically controlled building exhaust fans shall be de-energized.

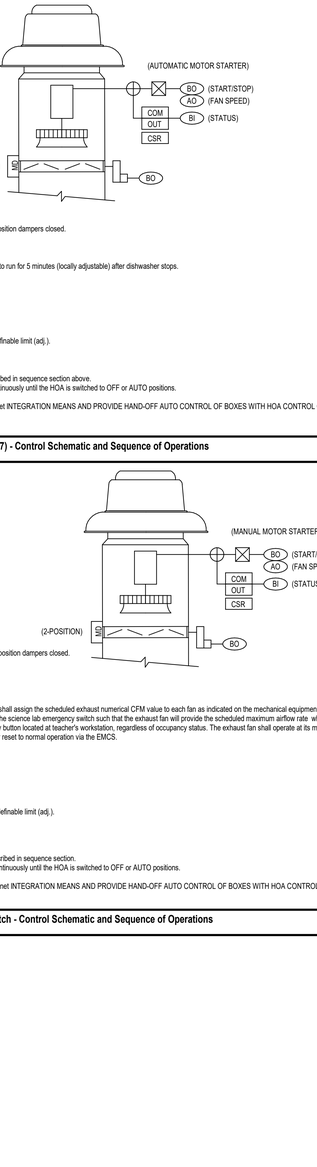
Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

6 Automatically Controlled Exhaust/Supply Fans - Control Schematic and Sequence of Operations(Old Phase EF-43, SF-20, SF-21
NOT TO SCALE



SYSTEM OFF - When the system is off:
Automatically controlled exhaust fans shall be off and their 2-position dampers closed.

SYSTEM START-UP - System start-up shall be initiated:
Whenever dishwasher is operating.
An adjustable off delay timer will ensure that the fan continues to run for 5 minutes (locally adjustable) after dishwasher stops.

Fan Status:
The controller shall monitor the fan status.

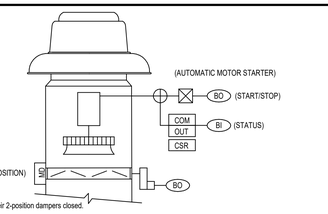
Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

7 Dishwasher Exhaust Fan (EXISTING EF-7) - Control Schematic and Sequence of Operations
NOT TO SCALE

INTERLOCK WITH AHU/FCU/OAHU (REFER TO CONTROL DIAGRAMS 1/M7.02, 1.2/M7.03, AND 4.5/M7.06 FOR EF AND ASSOCIATED UNIT INTERLOCK CONFIGURATIONS)



SYSTEM OFF - When the system is off:
Automatically controlled exhaust fans shall be off and their 2-position dampers closed.

SYSTEM START-UP - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.

AUTOMATICALLY CONTROLLED EXHAUST FANS: Upon activation of building occupied mode and start-up of the air handling system, the EMCS shall energize all interlocked automatically controlled exhaust fans and open their respective two-position motorized dampers. The EMCS shall monitor the status of each automatically controlled exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. Upon activation of the building unoccupied mode, the automatically controlled building exhaust fans shall be de-energized.

Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).
Purge Event: Emergency purge push button activated.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

8 Automatically Controlled Exhaust/Supply Fans - Control Schematic and Sequence of Operations (EXISTING Interlocked Units)
NOT TO SCALE

EXHAUST FANS W/ LOCAL EMERGENCY SWITCH (SCIENCE PURGE FAN: EXISTING EF-45,46,47,48)

LOCAL EMERGENCY SWITCH

SYSTEM OFF - When the system is off:
Automatically controlled exhaust fans shall be off and their 2-position dampers closed.

SYSTEM START-UP - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
By the local emergency switch.

The EMCS shall monitor the status of each exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. The exhaust fan shall be provided with a relay to the science lab emergency switch such that the exhaust fan will provide the scheduled maximum airflow rate when an emergency purge event is activated from the local emergency button located at teacher's workstation, regardless of occupancy status. The exhaust fan shall operate at its maximum scheduled airflow rate indefinitely until manually overridden or reset to normal operation via the EMCS.

Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).
Purge Event: Emergency purge push button activated.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

9 Exhaust Fans w/ Local Emergency Switch - Control Schematic and Sequence of Operations
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

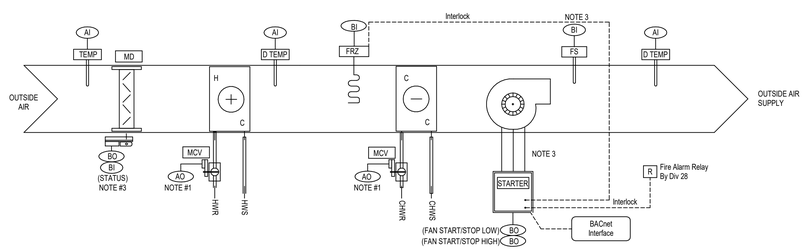
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PROJECT NUMBER 260018.001

SHEET TITLE:
MECHANICAL CONTROLS DIAGRAMS

SHEET NUMBER:
M7.05

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SYSTEM OFF - WHEN THE SYSTEM IS OFF:
The outside air damper shall be closed.
The unit supply fan shall be off.
The cooling coil valve shall be closed.
The preheating coil valve shall be closed.
All control loops shall be disabled.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the TIme of Day (TOD) occupancy schedule. Once enabled, the system shall operate per the **System Operation** section, as detailed below.

NIGHT-SETBACK MODE:
The outside air handling system shall not operate during unoccupied hours unless started by a manual command at the EMCS.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based whenever any of the associated AHU's it serves has an active call for ventilation air. When the Time of Day schedule (TOD) is active, the system shall operate per the **System Operation** section, as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply fan shall start at its minimum speed. Following a conformation of fan start status, the supply fan speed shall be modulated to maintain the supply air static pressure at setpoint. The speed of the fan shall not be adjusted by more than 20% in any one-minute period.

The chilled water coil control valve shall be modulated to maintain the supply air temperature at setpoint. The control shall be active when the outside air temperature is above 55 °F. (adj)

The hot water pre-heat coil control valve shall be modulated to maintain the pre-heat coil discharge air temperature at setpoint. The control shall be active when the outside air temperature is below 53 °F. (adj)

Freeze Protection: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. Provide status for outside air damper position.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the OAHU BAS graphics.

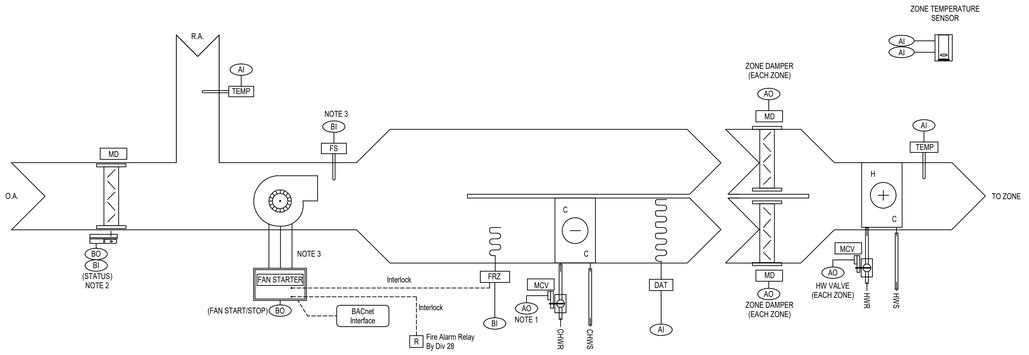
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design maximum supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be the VFD speed required to obtain the design minimum supply airflow value from the unit schedule on the Mechanical Drawings.
The supply air static pressure setpoint shall be 1.0 inches w.c. (adj)
The supply air temperature setpoint shall be set initially at 55 °F. (adj)
The pre-heat setpoint shall be set to 53 °F (adj)
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm if:
If the supply duct static pressure exceeds the high-limit setpoint.
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If the preheat air temperature is below the freezestat trip point, initially set at 37 °F. (adj)
If the filter differential pressure exceeds the trip point initially set at 1.0 inch w.c. (adj)
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating. The alarms, except the fan failure alarm, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 **Outdoor Air Handling Unit - Control Schematic and Sequence of Operations (EXISTING Old Phase III OAHU-1)**
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated on schedules or in sequence of operation.
2. Provide status for outside air damper position.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the MZU BAS graphics.

System Mode - The system shall be controlled by one of the following four modes:
UNOCCUPIED, PRE-START, NIGHT-SETBACK, OCCUPIED

UNOCCUPIED MODE:
The associated outside air supply fan shall be disabled.
The unit supply fan shall be off.
The cooling coil valve shall be closed.
The heating coil valve shall be closed.
All control loops shall be disabled.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section, as detailed below.

NIGHT-SETBACK MODE:
The system shall be enabled automatically by the EMCS based on the cooling demand of 5 (adjustable) or more associated zones whose space temperature has exceeded the Unoccupied Cooling Setpoint. Once enabled, the system shall operate per the System Operation section, as detailed below.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based on the actual space occupancy. When the Time of Day schedule (TOD) is active, the system shall operate per the System Operation section, as detailed below, and the Demand Control Ventilation sequence shall be active.

System Operation - When system start-up has been initiated:
Fan Control
When the AHU is requested to run by the associated zone, the EMCS shall send a 24 VAC electric signal to a relay at the air handling unit VFD/fan starter which shall complete the auto side of the control circuit and start the fan. A switch shall prove status to the EMCS and shall alarm at the central site if the switch is not made within 40 seconds (adjustable). There shall also be a 20 second (adjustable) de-bounce time to prevent nuisance alarms from a bouncing current switch. The associated outdoor air unit shall be energized only during an occupied mode.

Temperature Control
A discharge temperature sensor shall monitor the air temperature leaving the CHW coil. The EMCS shall output a signal to modulate the CHW valve to maintain the discharge air temperature setpoint. CHW coil discharge air temperature shall be 54°F (adjustable). As the zones require cooling the EMCS shall modulate the zone dampers to maintain setpoint. If heating is required, the HW coil shall be opened to maintain setpoint. If the space temperature falls to its occupied heating setpoint, while not in dehumidification mode, the face and by-pass damper shall be modulated to by-pass the cooling coil and the open command to the chilled water shall be discontinued.

Humidity Control
A humidity sensor in the space of each zone shall monitor the humidity at all times. The user shall be able to select humidity control based upon average, high, or low select of the zones served by the AHU. In the event that the humidity setpoint has been exceeded, the EMCS shall reduce the VFD hertz level to 40hz and modulate the chilled water control valve fully open for maximum dehumidification. The leaving cooling coil air temperature shall be a maximum 55°F (adjustable). At this time, the EMCS shall modulate the heating water control valve to maintain the space temperature setpoint (adjustable). If heating water is unavailable while de-humidification is required, the unit shall signal an alarm that heating hot water is unavailable.

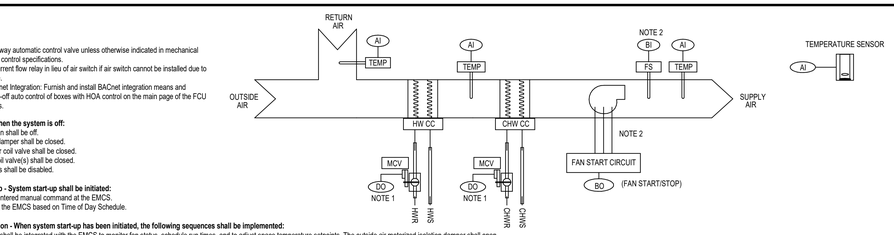
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS or Automatically by the EMCS when in UNOCCUPIED MODE.

System Setpoints - The setpoints for the system shall be determined as follows:
The cooling coil discharge air temperature setpoint shall be set initially at 54 °F. (adj)
The Zone Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Zone Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Zone Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Zone Unoccupied Cooling Setpoint shall be set initially at 85 °F (adjustable).
The chilled water coil low-limit setpoint shall be set initially at 53 °F (adjustable).
The heating coil high-limit setpoint shall be set initially at 120 °F (adjustable).
The Zone Humidity high-limit setpoint shall be set initially at 60% RH (adjustable).
The outside air flowrate setpoint shall be set at the scheduled flowrate.

System Alarms - The EMCS shall generate an alarm if:
If the duct static is outside the low or high alarm limits, initially set at 0.5 and 2.0 in w.c. (adj)
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If the filter differential pressure exceeds the trip point initially set at 1.0 inch w.c. (adj)
If heating water is unavailable while de-humidification is required
All alarms shall be inhibited when the supply fan is not operating.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

2 **Multizone Air Handling Unit - Control Schematic and Sequence of Operations (TYP. 31 EXISTING and EXISTING MZ01 through MZ05 (Old Phase II Zones))**
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated in mechanical schedules or control specifications.
2. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
3. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the FCU BAS graphics.

System Off - When the system is off:
The supply air fan shall be off.
The outside air damper shall be closed.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Time of Day Schedule.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan coil unit shall be integrated with the EMCS to monitor fan status, schedule run times, and to adjust space temperature setpoints. The outside air motorized isolation damper shall open.

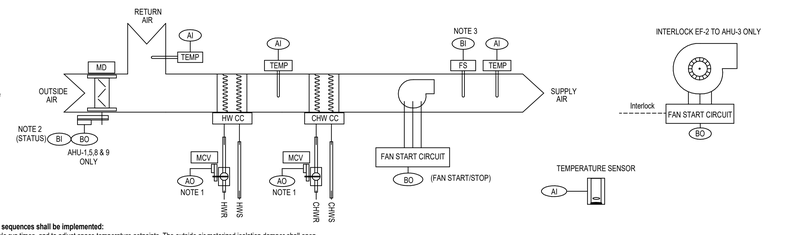
COOLING MODE: When the space temperature is above the Cooling Setpoint, the chilled water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Cooling Setpoint. The chilled water coil discharge temperature shall not be allowed to go below the chilled water coil low-limit setpoint.
HEATING MODE: When the space temperature is below the Heating Setpoint, the hot water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Heating Setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be set as follows:
The Cooling Setpoint shall be set initially at 75 °F (adjustable).
The Heating Setpoint shall be set initially at 70 °F (adjustable).
The design airflow rates shall be set at the values given in the Mechanical Drawings.
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature is 5 °F (adj.) above the cooling setpoint.
If the space temperature is 5 °F (adj.) below the heating setpoint.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

3 **EXISTING Fan Coil Unit - Control Schematic and Sequence of Operations**
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated in mechanical schedules or control specifications.
2. Provide status for outside air damper position.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU/FCU BAS graphics.

System Off - When the system is off:
The supply air fan shall be off.
The outside air damper shall be closed.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Time of Day Schedule.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan coil unit shall be integrated with the EMCS to monitor fan status, schedule run times, and to adjust space temperature setpoints. The outside air motorized isolation damper shall open.

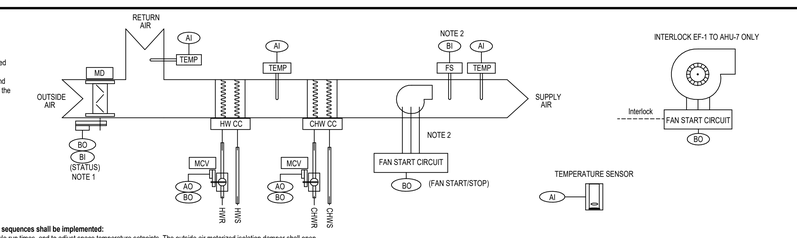
COOLING MODE: When the space temperature is above the Cooling Setpoint, the chilled water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Cooling Setpoint. The chilled water coil discharge temperature shall not be allowed to go below the chilled water coil low-limit setpoint.
HEATING MODE: When the space temperature is below the Heating Setpoint, the hot water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Heating Setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be set as follows:
The Cooling Setpoint shall be set initially at 75 °F (adjustable).
The Heating Setpoint shall be set initially at 70 °F (adjustable).
The design airflow rates shall be set at the values given in the Mechanical Drawings.
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature is 5 °F (adj.) above the cooling setpoint.
If the space temperature is 5 °F (adj.) below the heating setpoint.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

4 **Single Zone Unit - Control Schematic and Sequence of Operations (EXISTING Old Phase III AHU-1,3,4,5,8 & FCU-2)**
NOT TO SCALE



NOTES:
1. Provide status for outside air damper position.
2. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
3. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU/FCU BAS graphics.

System Off - When the system is off:
The supply air fan shall be off.
The outside air damper shall be closed.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Time of Day Schedule.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan coil unit shall be integrated with the EMCS to monitor fan status, schedule run times, and to adjust space temperature setpoints. The outside air motorized isolation damper shall open.

COOLING MODE: When the space temperature is above the Cooling Setpoint, the chilled water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Cooling Setpoint. The chilled water coil discharge temperature shall not be allowed to go below the chilled water coil low-limit setpoint.
HEATING MODE: When the space temperature is below the Heating Setpoint, the hot water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Heating Setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be set as follows:
The Cooling Setpoint shall be set initially at 75 °F (adjustable).
The Heating Setpoint shall be set initially at 70 °F (adjustable).
The design airflow rates shall be set at the values given in the Mechanical Drawings.
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature is 5 °F (adj.) above the cooling setpoint.
If the space temperature is 5 °F (adj.) below the heating setpoint.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

5 **Single Zone Unit - Control Schematic and Sequence of Operations (EXISTING Old Phase III AHU-2,6,7,10,11,12, FCU-1 & 3)**
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
ADAM C. JONES
110005
LICENSED
PROFESSIONAL ENGINEER
5/28/26

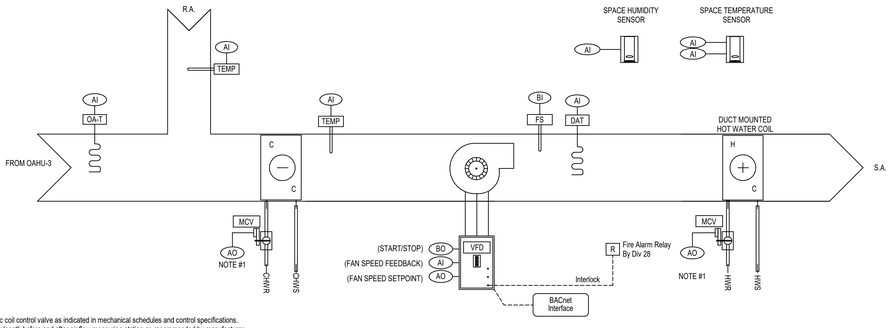
Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: MECHANICAL CONTROLS DIAGRAMS
SHEET NUMBER: M7.06

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NOTES:
1. Provide automatic coil control valve as indicated in mechanical schedules and control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics.

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be Initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.

OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.

OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.

DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.

ECONOMIZER MODE: The EMCS shall enable airside Economizer Mode whenever the outside air enthalpy is less than 28.0 btu/lb, the outside air dry bulb temperature is less than 75°F, and the space temperature sensor calls for cooling. The EMCS shall modulate the outside air and return air dampers such that the unit provides 100% outside air for space cooling and shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint. Economizer Mode shall be integrated with the cooling coil to modulate the chilled water control valve as required to maintain the chilled water coil discharge air temperature setpoint. If the outside air dry bulb temperature is below chilled water coil discharge air temperature setpoint, the EMCS shall begin to modulate the return air damper open as required to maintain a mixed air temperature of 53°F (adj). If the outside air enthalpy exceeds 28.0 btu/lb or the outside air temperature exceeds 75°F, Economizer Mode shall be disabled. DCV and preheat shall be disabled during Economizer Mode.

COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active coil discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.

HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.

DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).

PREHEAT COIL: The EMCS shall modulate the hot water pre-heat control valve to maintain the pre-heat coil discharge air temperature setpoint.

FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

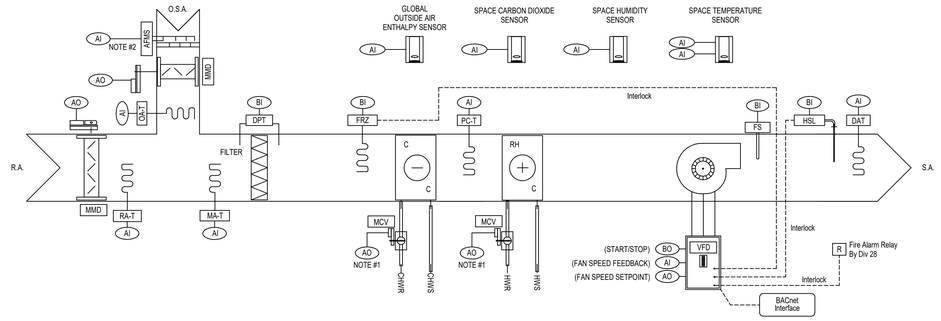
System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 **Single Zone VAV AHU with Chilled Water Cooling, Hot Water Heating, De-Humidification, Demand Control Ventilation - Control Schematic and Sequence of Operations (AHU-16 (ALTERNATE 1))**
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated in mechanical schedules or control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the RTU BAS graphics.

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.

OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.

OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.

DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.

ECONOMIZER MODE: The EMCS shall enable airside Economizer Mode whenever the outside air enthalpy is less than 28.0 btu/lb, the outside air dry bulb temperature is less than 75°F, and the space temperature sensor calls for cooling. The EMCS shall modulate the outside air and return air dampers such that the unit provides 100% outside air for space cooling and shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint. Economizer Mode shall be integrated with the cooling coil to modulate the chilled water control valve as required to maintain the chilled water coil discharge air temperature setpoint. If the outside air dry bulb temperature is below chilled water coil discharge air temperature setpoint, the EMCS shall begin to modulate the return air damper open as required to maintain a mixed air temperature of 53°F (adj). If the outside air enthalpy exceeds 28.0 btu/lb or the outside air temperature exceeds 75°F, Economizer Mode shall be disabled. DCV shall be disabled during Economizer Mode.

COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active coil discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.

HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.

DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).

FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

"NOT TO SCALE"

2 **SINGLE ZONE VAV AHU CHILLED WATER COOLING, HOT WATER HEATING, DE-HUMIDIFICATION, ECONOMIZER, DEMAND CONTROL VENTILATION - CONTROL SCHEMATIC AND SEQUENCE OF OPERATIONS (RTU-01 AND 02 (ALTERNATE 1))**
CONTROLS

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
ADAM C. JONES
110009
LICENSED
PROFESSIONAL ENGINEER
5/29/26

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade
30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE:
MECHANICAL CONTROLS DIAGRAMS

SHEET NUMBER:
M7.07

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ABBREVIATIONS

AC	ALTERNATING CURRENT
AF	AMPERE FUSE, AMPERE FRAME
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPT CAPACITY
AL	ALUMINUM
AM	AMMETER
AMP	AMPLIFIER
ANN	ANNUNCIATOR
ASC	AMPERES SHORT CIRCUIT
AT	AMPERE TRIP RATING
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
BKR	BREAKER
BLDG.	BUILDING
C	CONDUIT, CELSIUS
CKT	CIRCUIT
CLG.	CEILING
CONT.	CONTINUOUS,CONTINUATION
CONTR	CONTROLLER, CONTRACTOR
CT	CURRENT TRANSFORMER/COOLING TOWER
CU	COPPER
DAS	DISTRIBUTED ANTENNA SYSTEM
DC	DIRECT CURRENT
DISC	DISCONNECT
DP	DISTRIBUTION PANEL
DPDT	DOUBLE-POLE, DOUBLE-THROW
DPST	DOUBLE-POLE, SINGLE-THROW
DWG	DRAWING
ELEV.	ELEVATOR
EPO	EMERGENCY POWER OFF
ERRC	EMERGENCY RESPONDER RADIO COVERAGE SYSTEM
FA	FIRE ALARM
FF	FURNITURE FEED
FLA	FULL LOAD AMPS
FTL	FEED-THRU LUGS
GA	GAUGE
GEN	GENERATOR
GND	GROUND
GTD	GENERATOR TRANSFER DEVICE
IG	ISOLATED GROUND
LF	LINEAR FEET
LTG	LIGHTING
LV	LOW VOLTAGE
LVL	LEVEL
MAX.	MAXIMUM
MC	METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCCB	MOLDED CASE CIRCUIT BREAKER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MIC	MICROPHONE
MIN.	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVER-CURRENT PROTECTION
MSB	MAIN SWITCHBOARD
N3R	NEMA 3R
N4X	NEMA 4X
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NF	NON-FUSED
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE
PH	PHASE
POS	POINT OF SALE
QTY	QUANTITY
RCP	REFLECTED CEILING PLAN
RCPT	RECEPTACLE
RE	REFERENCE, REFER
SF	SQUARE FOOT
SIM	SIMILAR
SKVA	STARTING KILOVOLT-AMPS
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE-POLE, DOUBLE-THROW
SPST	SINGLE-POLE, SINGLE-THROW
SPEC	SPECIFICATION
SQFT	SQUARE FOOT
ST	SHUNT TRIP
SWB	SWITCHBOARD
TL	TWIST-LOCK
TOC	TOP OF CURB
TOS	TOP OF STEEL
TR	TAMPER RESISTANT RECEPTACLE
TV	TELEVISION
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SYSTEM
VFD	VARIABLE FREQUENCY DRIVE
WP	WEATHERPROOF
WT	WATERTIGHT, WEIGHT
WSF	WATTS PER SQUARE FOOT
XFMR	TRANSFORMER

MANY ABBREVIATIONS NOT LISTED MAY BE FOUND IN THE NATIONAL ELECTRIC CODE, OR IN THE INTERNATIONAL AND UNIFORM CODES

PHASING

(E)	EXISTING (TO REMAIN)
(D)	SHALL BE DEMOLISHED
(N)	PROVIDE NEW
(R)	RELOCATED ELEMENT

ELECTRICAL SYMBOLS

MOTORS AND CONTROLS

- $_{M}$ — MOTOR RATED SWITCH WITH THERMAL OVERLOADS
- (5) — SINGLE OR THREE PHASE MOTOR NUMBER INDICATES HORSE POWER
- ELECTRIC DUCT HEATER
- DISCONNECT (SAFETY) SWITCH "200/3/150" DENOTES AMPERES/POLE/FUSE. "NF" DENOTES NON-FUSED "N3R" DENOTES NEMA 3R
- [B] — ENCLOSED CIRCUIT BREAKER- "200/3/150" DENOTES AMPERES/POLE/TRIP
- MOTOR STARTER FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER. "30/3/15/#0" DENOTES AMPERES/POLES/FUSE/ STARTER SIZE. "NF" DENOTES NON-FUSED. FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- VFD — VARIABLE FREQUENCY DRIVE PROVIDED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- EPO — EMERGENCY POWER OFF BUTTON.

RECEPTACLES AND OUTLETS

ALL RECEPTACLES SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE. REFER TO SPECIFICATIONS AND DRAWINGS FOR ADDITIONAL REQUIREMENTS.

ABBREVIATIONS APPLICABLE TO RECEPTACLES:
- "GFCI" GROUND FAULT INTERRUPTER
- "WP" WEATHERPROOF
- "IG" ISOLATED GROUND
- "TR" TAMPER RESISTANT
- "USB" RECEPTACLE WITH USB CHARGING PORTS
- "AC" ABOVE COUNTER MOUNTING
- "UC" UNDER COUNTER MOUNTING
- "H" HORIZONTALLY ORIENTED RECEPTACLE

- SIMPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.
- DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V. SHADED INDICATES SPLIT-WIRED
- FOURPLEX (QUADRUPLEX) RECEPTACLE
- DUPLEX RECEPTACLE (PEDESTAL MOUNTED)
- CONTROLLED WALL RECEPTACLE. DUPLEX: SPLIT-WIRED QUAD: SEPARATELY WIRED UNDER A COMMON COVERPLATE.
- POWER DEVICE RED IN COLOR, ON EMERGENCY POWER CIRCUIT
- CEILING RECEPTACLE/QUAD, EMERGENCY POWER SYMBOL MAY APPLY
- SPECIAL RECEPTACLE, NEMA CONFIGURATION PER PLAN OR EQUIPMENT
- TV — TV ROUGH-IN; 3-GANG RECESSED TV BOX, CONTAINING 1 DUPLEX RECEPTACLE, 1 GANG FOR AV, 1 GANG FOR DATA
- FLOOR BOX OR POKE THRU. POKE-THRU'S WHERE IN SUSPENDED SLABS, RECESSED IN FOUNDATION WHERE SLAB ON GRADE
- FLUSH ELECTRICAL FLOOR OUTLET. REFER TO FLOOR BOX SCHEDULE. FIRE RATED POKE-THROUGH SCHEDULE AND KEYED NOTES.
- DROP CORD WITH SIMPLEX RECEPTACLE UNLESS OTHERWISE NOTED
- CR — CORD REEL WITH DUPLEX RECEPTACLE UNLESS OTHERWISE NOTED
- J — JUNCTION BOX
  - "MD" INDICATES POWER CONNECTION TO SERVE MOTOR DAMPER
  - "HD" INDICATES POWER CONNECTION TO SERVE HAND DRYER
  - "FV" INDICATES POWER CONNECTION TO SERVE FLUSH VALVES
- P — PULL BOX (OVER 4" SQUARE)
- BELL/BUZZER/CHIME
- PUSH BUTTON/DOOR BELL/START-STOP
- PP — POWER POLE
- POINT OF DIRECT CONNECTION TO EQUIPMENT
- C (2) — CLOCK RECEPTACLE SHALL BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK.

LIGHTING

LETTER(S) DENOTE TYPE- SEE LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.

2' X 4' 2' X 2' 1' X 4' 1' X 2' 1' X 1'

- STRIP LIGHTING FIXTURES.
- ROUND DOWNLIGHT FIXTURE.
- SQUARE DOWNLIGHT FIXTURE.
- WALL MOUNTED LIGHTING FIXTURE.
- TRACK LIGHTING FIXTURE. MOUNTED AS SHOWN ON LIGHTING FIXTURE SCHEDULE.
- CEILING MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- WALL MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- EMERGENCY WALL MOUNTED LIGHTING FIXTURE. BATTERY OPERATED UNLESS NOTED OTHERWISE.
- SITE LIGHTING FIXTURE.

HATCHING PATTERNS BELOW SHALL APPLY TO ALL LIGHTING FIXTURE SYMBOLS.

- NL — EMERGENCY LIGHT FIXTURE WITH BATTERY PACK. PROVIDE WITH UNSWITCHED HOT FOR LOSS OF VOLTAGE AND CHARGING (SAME CIRCUIT AS NORMAL POWER LIGHTING). FIXTURES SHALL BE WIRED IN A MANNER AS TO ALLOW SWITCHING OF FIXTURES WITHOUT DISCHARGING THE EMERGENCY BATTERY. BATTERY PACK IS TO ONLY OPERATE IN THE EVENT OF A POWER OUTAGE.
  "NL" NIGHT LIGHT ON UNSWITCHED 24HR OPERATION
- EM CIRCUIT — LIGHT FIXTURE ON LIFE SAFETY BRANCH CIRCUIT, GENERATOR TRANSFER DEVICES REQUIRED (UL1008 OR UL924) PROVIDE UNSWITCHED HOT, NEUTRAL AND GROUND FOR ALL LIFE SAFETY LIGHTING ORIGINATING FROM THE LIFE SAFETY CIRCUIT SHOWN.
- CRITICAL OPERATIONS LIGHTING ORIGINATING FROM THE CRITICAL CIRCUIT INDICATED, HATCHED AS INDICATED. HATCHING TYPICAL FOR ALL CRITICAL BRANCH LIGHT FIXTURES

RACEWAYS AND WIRING

- CAP AND STAKE
- CONDUIT CONCEALED IN WALL OR CEILING
- UNDERGROUND, UNDERSLAB, CONCEALED ROUTING
- OHE — OVERHEAD ELECTRIC PRIMARY UTILITY POWER LINE
- CONDUIT UP/DOWN
- HASH MARKS INDICATE NUMBER OF CONDUCTORS. LEFT TO RIGHT: PHASE/NEUTRAL/GROUND/ISOLATED GROUND. NO HASH MARKS INDICATES EMPTY CONDUIT, 1" MINIMUM, UNLESS NOTED OTHERWISE.
- 1LA-2,4,6 — HOMERUN TO PANEL WITH CIRCUIT NUMBER(S) AS INDICATED.
- (ON)1LA-6 — PARTIAL/SHARED CIRCUIT HOMERUN TO PANEL.
- TELECOMMUNICATIONS CABLE TRAY SHALL BE CONCEALED ABOVE ACCESSIBLE CEILING UNLESS OTHERWISE NOTED.

ELECTRICAL EQUIPMENT

- DISTRIBUTION PANEL
- MSB — SWITCHBOARD, MAIN DISTRIBUTION PANEL OR MOTOR CONTROL CENTER
- PANELBOARD (FLUSH/SURFACE MOUNT)
- FLOOR MOUNTED DRY-TYPE TRANSFORMER
- SUSPENDED OR WALL MOUNTED TRANSFORMER
- ATS — AUTOMATIC TRANSFER SWITCH
- FIRE RATED PLYWOOD TERMINAL BOARD, TYPE AS NOTED, 4' X 8' X 3/4" UNLESS NOTED OTHERWISE

COMMUNICATIONS

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 18" ABOVE FINISHED FLOOR (AFF)
- DATA/COMM/AV ROUGH-IN. CONDUIT TO PLENUM AND BOX ONLY
- HS DS — SCHOOL INTERCOMMUNICATION SYSTEM HANDSET.

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 42" AFF
- VC — VOLUME CONTROL - WALL MOUNTED
- CB — INTERCOMPA SYSTEM CALL-IN OR CALL-BACK DEVICE

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 120" AFF OR 12" BELOW CEILING, WHICHEVER IS LOWER
- (S)L — INTERCOMPA SPEAKER "L" LOCAL SOUND REINFORCEMENT

CEILING MOUNTED DEVICES:
- (S)VC — INTERCOMPA SPEAKER "VC" INDICATES VOLUME CONTROL ON SPEAKER.

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

ONE-LINE DIAGRAM

- TRANSFORMER, TYPE AND RATINGS AS NOTED
- 800A/3P — SWITCH, RATING AS SHOWN
- 400A — FUSE, RATING AS SHOWN
- ST — SHUNT TRIP
- GF — GROUND FAULT PROTECTION
- AF — ARCH FAULT PROTECTION
- K — KIRK-KEY INTERLOCK
- M — DIGITAL METER OR SUB-METER INTEGRATED INTO EQUIPMENT
- 1200/5 — CURRENT TRANSFORMER, RATED AS SHOWN
- GROUND CONNECTION
- AUTOMATIC TRANSFER SWITCH
- BUS DUCT PLUG
- M — ELECTRICAL UTILITY REVENUE METER
- SPD — SURGE PROTECTION DEVICE
- GANN — GENERATOR ANNUNCIATOR PANEL
- CIRCUIT BREAKER
- DRAW-OUT CIRCUIT BREAKER
- NEW EQUIPMENT/WIRING
- DEMOLITION EQUIPMENT/WIRING
- EXISTING EQUIPMENT/WIRING
- UNDERGROUND WIRING

DAYLIGHT ZONES

DAYLIGHT ZONE/PRIMARY SECONDARY DAYLIGHT ZONE

DAYLIGHT ZONES SHALL BE INCLUSIVE OF THE FIXTURES WITHIN THE SHADED REGION, AND SHALL BE DIMMED USING ON-BOARD OR EXTERNAL CONTROL IN ACCORDANCE WITH IECC 2021. IECC 2018 OR 2015 MAY BE REFERENCED ONLY WHERE ADOPTED BY LOCAL AHJ.

GENERAL NOTES:

A. NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.

MISCELLANEOUS

- F — SHADED SYMBOLS INDICATE EXISTING DEVICES TO REMAIN, UNLESS OTHERWISE NOTED.
- INDICATES WALL-MOUNTED WHEN ATTACHED TO ANY SYMBOL
- 1 — DRAWING NOTE REFERENCE
- SOS — AREA OF RESCUE ASSISTANCE

FIRE ALARM

- W — WATER FLOW SWITCH
- SP — SUPERVISORY SWITCH
- S — SMOKE DETECTOR - MULTI CRITERIA DETECTOR
- S# — SMOKE DETECTOR - "SB" INDICATES IN INTEGRAL SOUNDER BASE; "D" INDICATES DUCT TYPE; "R" INDICATES 120 VOLT RESIDENTIAL TYPE
- H — HEAT DETECTOR
- S BT — BEAM DETECTOR TRANSMITTER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S BR — BEAM DETECTOR RECEIVER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S — FIRE ALARM SPEAKER STROBE / CEILING MOUNTED
- S — FIRE ALARM SPEAKER / CEILING MOUNT.
- DH — MAGNETIC DOOR HOLDER
- R — AUXILIARY CONTROL RELAY
- FH — FIRE FIGHTER HANDSET
- F — FIRE ALARM PULL STATION +42" AFF
- F — FIREMAN'S TELEPHONE JACK +42" AFF
- AUDIO VISUAL FIRE ALARM HORN STROBE +80" AFF- 15/75cd U.N.O.
- VISUAL FIRE ALARM (STROBE) CEILING MOUNT - 15/75cd U.N.O.
- AUDIO FIRE ALARM HORN +80" AFF
- FACP — FIRE ALARM CONTROL PANEL
- ANN — REMOTE FIRE ALARM ANNUNCIATOR PANEL
- RPS — REMOTE POWER SUPPLY FOR AUDIO/VISUAL FIRE ALARM DEVICES.
- FSD — FIRE SMOKE DAMPER
- REMOTE LED INDICATOR LIGHT

SECURITY

- PB — ADA AUTO DOOR OPEN BUTTON
- DR — DOOR RELEASE BUTTON
- CR — WALL MOUNTED CARD READER

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

SWITCHES AND LIGHTING CONTROL DEVICES

ALL SWITCH TYPES AND SENSORS TYPES FOUND ON 'LIGHTING CONTROL DEVICE SCHEDULE' LOCATED ON ELECTRICAL SCHEDULE SHEETS

SWITCH ANNOTATION AS FOLLOWS:
- X — TYPE, PER SCHEDULE; NO TYPE INDICATES SINGLE POLE TOGGLE SWITCH
- a,b,c — SWITCH LEGS, PER PLAN, SHOWN HERE AS 3 (a,b,c)

OCCUPANCY SENSOR ANNOTATION, AS FOLLOWS:
- OCx — OCCUPANCY / VACANCE SENSOR 'x' INDICATES TYPE, PER SCHEDULE
  - CEILING SENSOR
  - WITH BRACKET INDICATES WALL / CORNER MOUNT

LIGHT SENSOR ANNOTATION, AS FOLLOWS:
- PC — DIGITAL PHOTOCELL
- DS — DAYLIGHT HARVESTING SENSOR

RELAY PANELS, CONTACTORS, TIME SWITCHES:
- XX — RELAYS/CONTACTORS/TIMERS/DEVICES WHERE 'XX' INDICATES:
  - "LC" LIGHTING CONTRACTOR
  - "LCP" LIGHTING CONTROL PANEL
  - "TS" TIME SWITCH
  - "TC" TIME CLOCK

DRAWING/DETAIL REFERENCE KEY

RE: 1 /E3-2 — REFER TO DRAWING/DETAIL NUMBER 1; SHEET NUMBER E3-2

PANELBOARD NOMENCLATURE

5 DP C H A 1
- 5 — SUB PANEL
- DP — AREA
- C — VOLTAGE
  - H: 480Y/277V
  - L: 208Y/120V
- H — BRANCH
  - NONE: NORMAL
  - E: LIFE SAFETY
  - Q: EQUIPMENT
  - C: CRITICAL
  - R: LEGALLY REQUIRED
  - X: OPTIONAL STAND-BY
- A — DISTRIBUTION PANEL (IF APPLICABLE)
- 1 — LEVEL

DBR — SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL: ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER

Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: ELECTRICAL SYMBOL LEGEND

SHEET NUMBER: E0.01

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GENERAL ELECTRICAL NOTES:

A. ELECTRICAL DEVICE LOCATIONS SHOWN ARE NOT EXACT. ALL DEVICE LOCATIONS SHALL BE VERIFIED WITH ARCHITECTURAL MILLWORK, CASEWORK, AND GENERAL ELEVATION VIEWS.

B. HVAC AND PLUMBING EQUIPMENT LOCATIONS ARE NOT EXACT, AND THE EXACT POINT OF CONNECTION TO EQUIPMENT MAY VARY. COORDINATE EXACT ROUGH-IN REQUIREMENTS IN FIELD AND WITH FINAL SUBMITTALS.

C. PROVIDE LABELING OF ALL DEVICES, CONDUIT, PANELS, AND JUNCTION BOXES WITH TYPE-WRITTEN LABEL IDENTIFYING CIRCUIT ON THE BACK OF DEVICE COVER PLATES AND ON COVER OF JUNCTION BOXES IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS.

D. ROOF PENETRATIONS SHALL BE MINIMIZED. WHERE ABLE, ROUTE ALL CONDUIT FOR ROOF MOUNTED EQUIPMENT THROUGH ROOF CURB. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING NECESSARY WATER PROOFING AROUND ROOF PENETRATIONS WITH ROOFING INSTALLER.

E. NEW ELECTRICAL EQUIPMENT LOCATED IN ELECTRICAL ROOMS SHALL BE ARRANGED TO COMPLY WITH LATEST NEC ARTICLE 110.

F. DISTRICT RETAINS FIRST RIGHT OF REFUSAL FOR ALL PARTS AND EQUIPMENT.

G. ELECTRIC METER TIED TO EXISTING B.A.S SYSTEM NEEDS TO BE TIED BACK INTO THE NEW SYSTEM.

GENERAL POWER DEMOLITION NOTES:

A. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS AND LEFT IN THE 'OFF' POSITION.

B. CONTRACTOR SHALL REPORT ANY DAMAGED DEVICES THAT ARE SHOWN AS EXISTING TO REMAIN. ALL DEVICES FOUND TO BE DAMAGED AT THE TIME OF SUBSTANTIAL COMPLETION THAT NOT REPORTED PRIOR TO STARTING WORK SHALL BE REPLACED AT THE CONTRACTOR'S COST.

C. EXISTING RECEPTACLE OR MECHANICAL CIRCUITS MODIFIED IN FIELD SHALL NOT EXCEED 80% CAPACITY BASED ON AMP-RATING OF CIRCUIT.

GENERAL ELECTRICAL DEMOLITION NOTES:

A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED THE EXISTING JOB SITE CONDITIONS DURING THE BIDDING PERIOD TO OBTAIN THE SCOPE OF ELECTRICAL WORK INVOLVED AS A RESULT OF THE ARCHITECTURAL MODIFICATIONS TO THE EXISTING CONDITIONS. THE SCOPE OF WORK SHALL INCLUDE MATERIALS AND OUTLETS, CONSISTING OF FIXTURES, DEVICES, EQUIPMENT OR APPARATUS, WHICH MUST BE REROUTED, RELOCATED OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED SO THAT THE REMODELING WORK MAY BE ACCOMPLISHED. NOT ALL EXISTING OUTLETS ARE NECESSARILY INDICATED ON THE DRAWINGS.

B. CONTRACTOR SHALL REVIEW DEMOLITION AND NEW WORK PLANS SIMULTANEOUSLY TO IDENTIFY SCOPE THAT IS TO BE MODIFIED FOR REUSE WITH NEW SCOPE.

C. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL TO ALL REMOVED MATERIALS. CONTRACTOR SHALL COORDINATE WITH OWNER FOR LOCATION TO RETURN ANY AND ALL MATERIAL FOR OWNER STORAGE. FAILURE TO TURN OVER REMOVED MATERIAL TO OWNER MAY REQUIRE CONTRACTOR TO REPLACE EQUIPMENT REMOVED WITH NEW.

D. ALL ABANDONED CONDUIT AND BOXES FOUND IN CRAWLSPACES, CEILINGS SPACES, CHASES, OR UTILITY SPACES SHALL BE REMOVED. EXISTING UNDERGROUND CONDUIT MAY BE ABANDONED. CAP ABANDONED UNDERGROUND CONDUIT FLUSH WITH GRADE.

E. OWNER SHALL RESERVE THE RIGHT TO CLAIM ALL EQUIPMENT AND CABLING REMOVED DURING DEMOLITION.

F. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS REQUIRED BY SCOPE OF REMODEL.

G. ALL ABANDONED MATERIAL SHALL BE REMOVED FROM JOBSITE PRIOR TO PROJECT COMPLETION.

H. IDENTIFICATION AND LABELING SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATIONS.

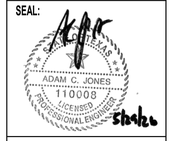
I. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY. CONTRACTOR SHALL RELABEL ALL CIRCUIT DIRECTORIES WITH LOAD NAMES FOR ALL EXISTING AND NEW PANELS THAT WERE MODIFIED WITHIN THIS PROJECT.

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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

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PROJECT NUMBER 260018.001

SHEET TITLE:

ELECTRICAL GENERAL NOTES

SHEET NUMBER:

E0.11

5/28/2026 3:22:05 PM
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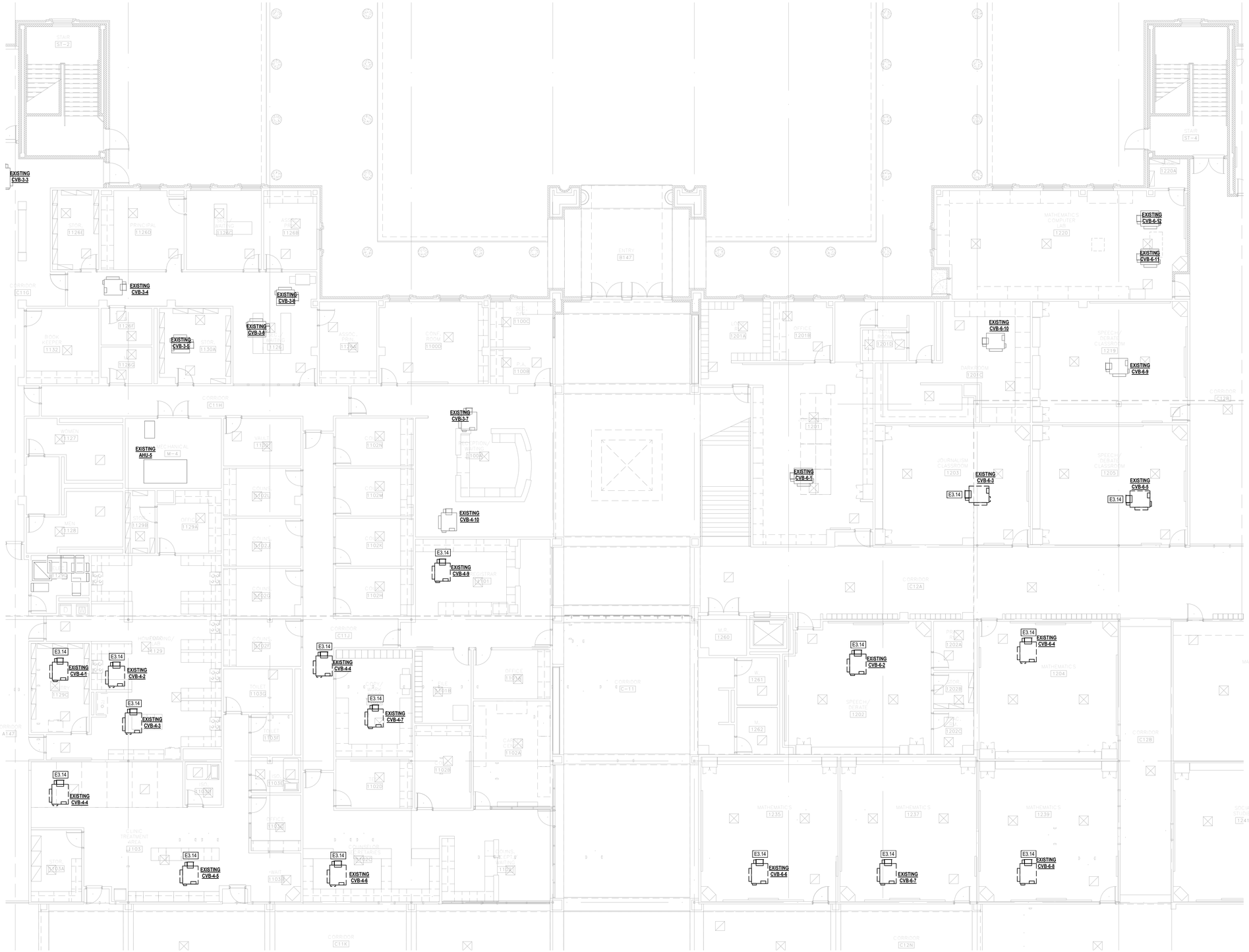
ELECTRICAL KEYED NOTES

E3.14 EXISTING FAN POWERED TERMINAL UNIT TO BE DEMOLISHED AS PART OF ALTERNATE 2.


EXISTING CVB-1-13
EXISTING CVB-1-12
EXISTING CVB-1-11
EXISTING CVB-1-10
EXISTING CVB-3-3
EXISTING CVB-1-9
EXISTING CVB-3-2
EXISTING CVB-1-8
EXISTING AHU-1
EXISTING UH-6
EXISTING AHU-2
VFD-AHU-1 (E)
VFD-AHU-2 (E)
EXISTING HWC-1-1
EXISTING HWC-2-1
EXISTING CVB-1-6
EXISTING CVB-3-1
EXISTING CVB-1-7
EXISTING AHU-3
VFD-AHU-3 (E)
VFD-AHU-4 (E)
EXISTING AHU-4
EXISTING HWC-4-1
TBCA
TBLA.3
TBMA
TBLA
TBHDP1
TB-TA
EXISTING CVB-2-10
EXISTING CVB-2-13
EXISTING CVB-1-14
EXISTING CVB-2-11
EXISTING CVB-2-12
EXISTING CVB-2-9
EXISTING CVB-2-8
EXISTING CVB-1-5
EXISTING CVB-1-4
EXISTING CVB-1-2
EXISTING OAHU-1
EXISTING AHU-14
EXISTING AHU-15
EXISTING OAHU-2
EXISTING CVB-2-7
EXISTING CVB-2-4
EXISTING CVB-2-6
EXISTING CVB-2-5
EXISTING CVB-2-3
EXISTING CVB-2-1
EXISTING CVB-1-3
E3.14
KITCHEN 1123C
FUNCTIONAL LIVING 1123A
FUNCTIONAL LIVING 1123B
VOCATIONAL 1121
TEACHER'S LOUNGE 1124
CORRIDOR C11A
CORRIDOR C11B
CORRIDOR C11C
CORRIDOR C11D
CORRIDOR C11E
CORRIDOR C11F
CORRIDOR C11G
BUSINESS CLASSROOM 1117
PLANNING ROOM 1115
BUSINESS COMPUTER LAB 1116
BUSINESS COMPUTER LAB 1114
BUSINESS COMPUTER LAB 1109
BUSINESS MEETING ROOM 1107
MULTI-PURPOSE ROOM 1113
FAMILY LIVING CLASSROOM 1112
FAMILY LIVING CLASSROOM 1110
MECHANICAL M-1
MECHANICAL M-2
MECHANICAL M-3
STAIR ST-1
STAIR ST-2
STAIR ST-3
STAIR ST-4
BOOK VISTAS 1132
RECEPTION/ WAITING 1119
OFFICE 1119D
ADAPTIVE BEHAVIOR 1118
GYM 1125A
OFFICE 1115K
OFFICE 1115B
OFFICE 1115A
OFFICE 1115J
OFFICE 1115H
OFFICE 1115G
OFFICE 1115F
OFFICE 1115E
OFFICE 1115D
OFFICE 1115C
OFFICE 1115I

ELECTRICAL KEYED NOTES

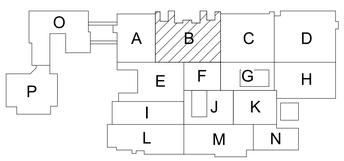
E3.14 EXISTING FAN POWERED TERMINAL UNIT TO BE DEMOLISHED AS PART OF ALTERNATE 2.



1 DEMOLITION ELECTRICAL PLAN LEVEL 1 - AREA B

1/8" = 1'-0"

KEY PLAN



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110008
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PROFESSIONAL ENGINEER
STATE OF TEXAS

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30330 Quinn Rd.
Tomball, TX, 77375

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DATE: 05/29/2026

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PROJECT NUMBER 260018.001

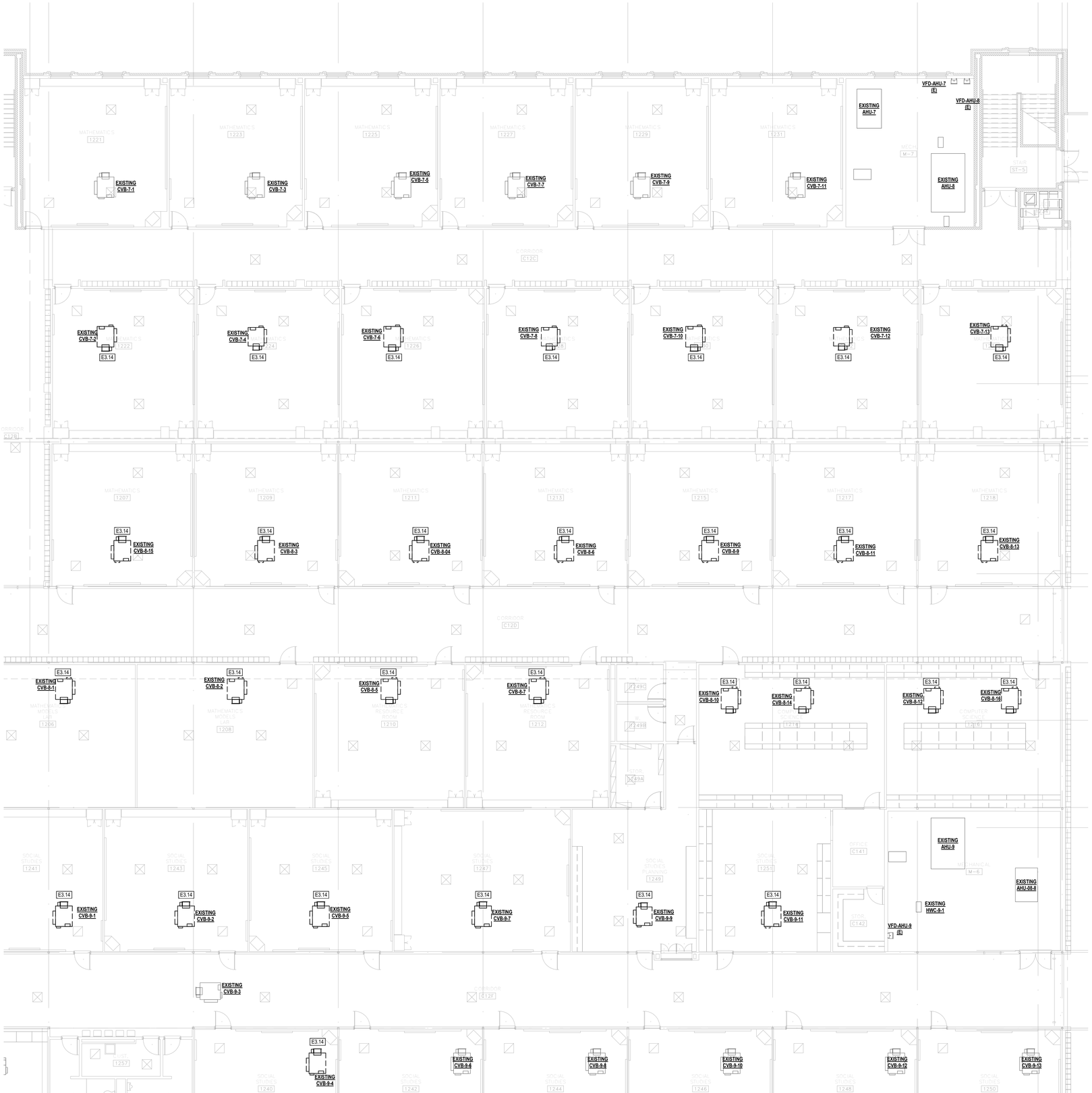
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SHEET NUMBER: E2.11B

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

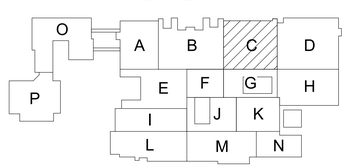
E3.14 EXISTING FAN POWERED TERMINAL UNIT TO BE DEMOLISHED AS PART OF ALTERNATE 2.



1 **DEMOLITION ELECTRICAL PLAN LEVEL 1 - AREA C**
1/8" = 1'-0"

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TBPE Firm Registration No. 2234

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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION ELECTRICAL POWER PLAN LEVEL 1 - AREA C

SHEET NUMBER: E2.11C

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ELECTRICAL KEYED NOTES

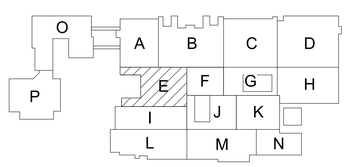
E12.3 EXISTING AIR HANDLING UNIT 'AHU-16' TO BE DEMOLISHED. ALL ELECTRICAL CONNECTIONS SHALL BE DISCONNECTED, REMOVED, AND DISPOSED OF. REMOVE ALL CONDUIT AND WIRE BACK TO PANEL. COORDINATE WITH DIVISION 23 PRIOR TO WORK.



1 DEMOLITION ELECTRICAL PLAN LEVEL 1 - AREA E

1/8" = 1'-0"

KEY PLAN



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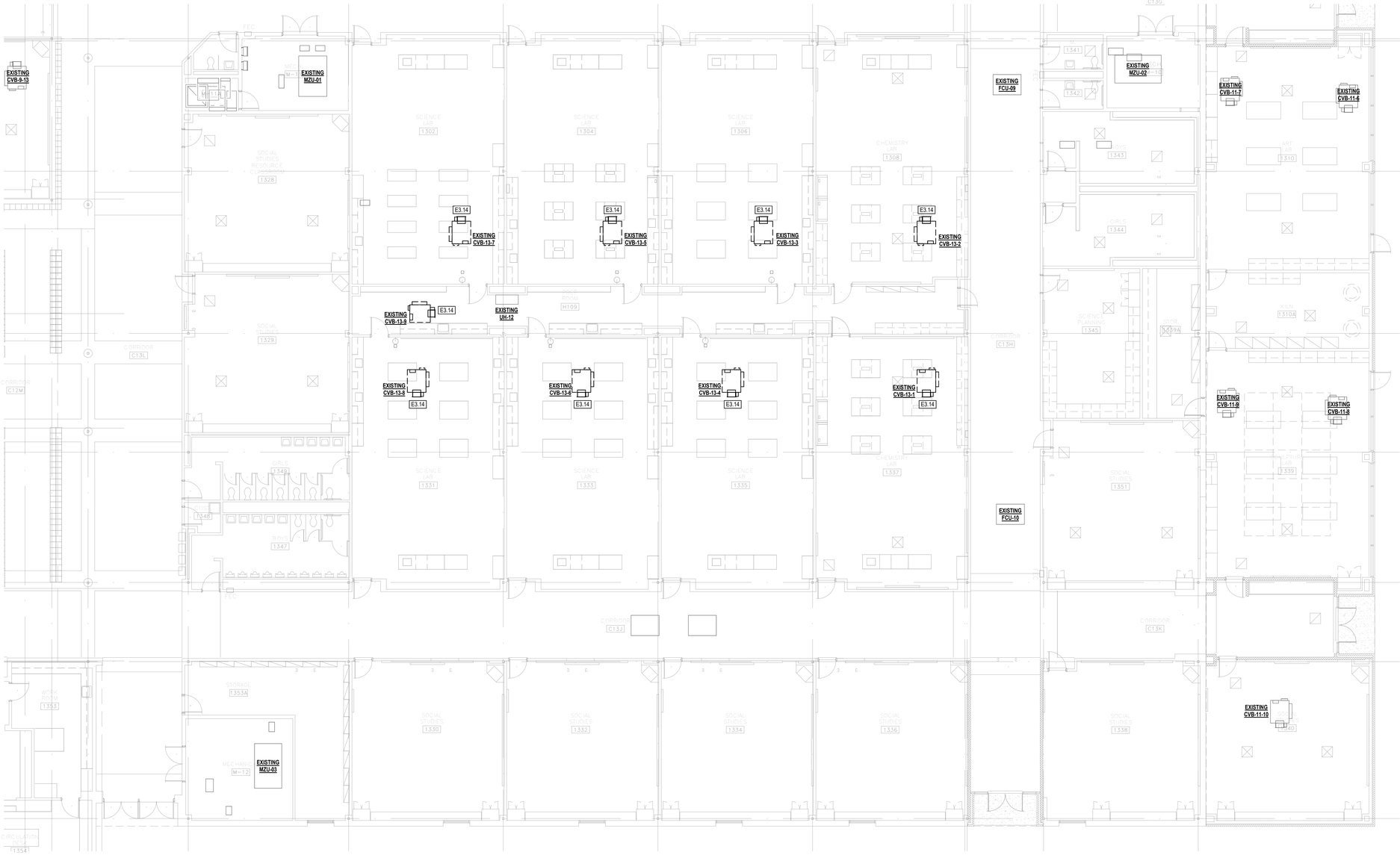
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SHEET NUMBER: E2.11E

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ELECTRICAL KEYED NOTES

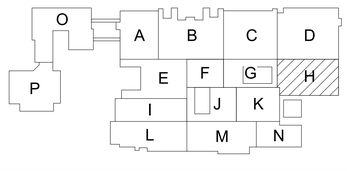
E3.14 EXISTING FAN POWERED TERMINAL UNIT TO BE DEMOLISHED AS PART OF ALTERNATE 2.



1 DEMOLITION ELECTRICAL PLAN LEVEL 1 - AREA H

1/8" = 1'-0"

KEY PLAN



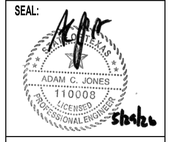
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PROJECT NUMBER 260018.001

SHEET TITLE:

DEMOLITION ELECTRICAL POWER PLAN LEVEL 1 - AREA H

SHEET NUMBER:

E2.11H

5/29/2026 8:27:22 AM
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ELECTRICAL KEYED NOTES

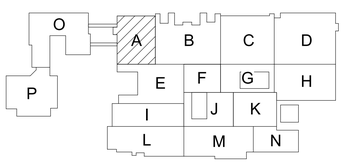
E3.15 AS PART OF ALTERNATE 2: REPLACE EXISTING FAN POWERED TERMINAL UNIT. EXTEND AND RECONNECT EXISTING BRANCH CIRCUIT AND RECONNECT TO NEW FPTU. EXISTING CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. FIELD VERIFY ALL CIRCUIT NUMBERS (TYPICAL).



1 **ELECTRICAL POWER PLAN LEVEL 1 - AREA A**
1/8" = 1'-0"

PN

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PROJECT NUMBER 260018.001

SHEET TITLE: ELECTRICAL POWER PLAN LEVEL 1 - AREA A

SHEET NUMBER: E2.21A

5/29/2026 8:27:32 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

E3.15 AS PART OF ALTERNATE 2: REPLACE EXISTING FAN POWERED TERMINAL UNIT. EXTEND AND RECONNECT EXISTING BRANCH CIRCUIT AND RECONNECT TO NEW FPTU. EXISTING CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. FIELD VERIFY ALL CIRCUIT NUMBERS (TYPICAL).

E10.2 NOTE: IN FRONT OFFICE (RECEPTION/WAITING RM 1100A), REPLACE EXISTING LIGHTING OVERRIDE SWITCH WITH NEW. THE NEW SWITCH SHALL BE COMPATIBLE WITH THE EXISTING BUILDING LIGHTING CONTROL SYSTEM. FIELD VERIFY MANUFACTURER OF EXISTING LIGHTING CONTROL SYSTEM AND COORDINATE ALL REQUIREMENTS FOR REPLACEMENT WITH THE OWNER AND MANUFACTURER.

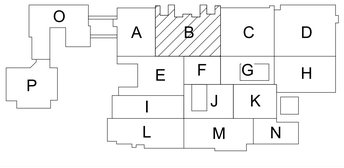


1 ELECTRICAL POWER PLAN LEVEL 1 - AREA B

1/8" = 1'-0"

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DATE: 05/29/2026

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SHEET TITLE: ELECTRICAL POWER PLAN LEVEL 1 - AREA B

SHEET NUMBER: E2.21B

5/29/2026 8:27:42 AM
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ELECTRICAL KEYED NOTES

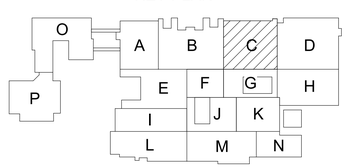
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1 **ELECTRICAL POWER PLAN LEVEL 1 - AREA C**
1/8" = 1'-0"

PN

KEY PLAN

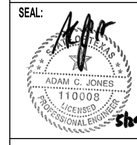


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TBPE Firm Registration No. 2234

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PROJECT NUMBER 260018.001

SHEET TITLE:
ELECTRICAL POWER PLAN LEVEL 1 - AREA C

SHEET NUMBER:
E2.21C

5/29/2026 8:27:54 AM
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ELECTRICAL KEYED NOTES

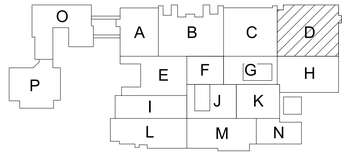
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1 **ELECTRICAL POWER PLAN LEVEL 1 - AREA D**
1/8" = 1'-0"

PN

KEY PLAN



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PROJECT NUMBER 260018.001

SHEET TITLE: ELECTRICAL POWER PLAN LEVEL 1 - AREA D

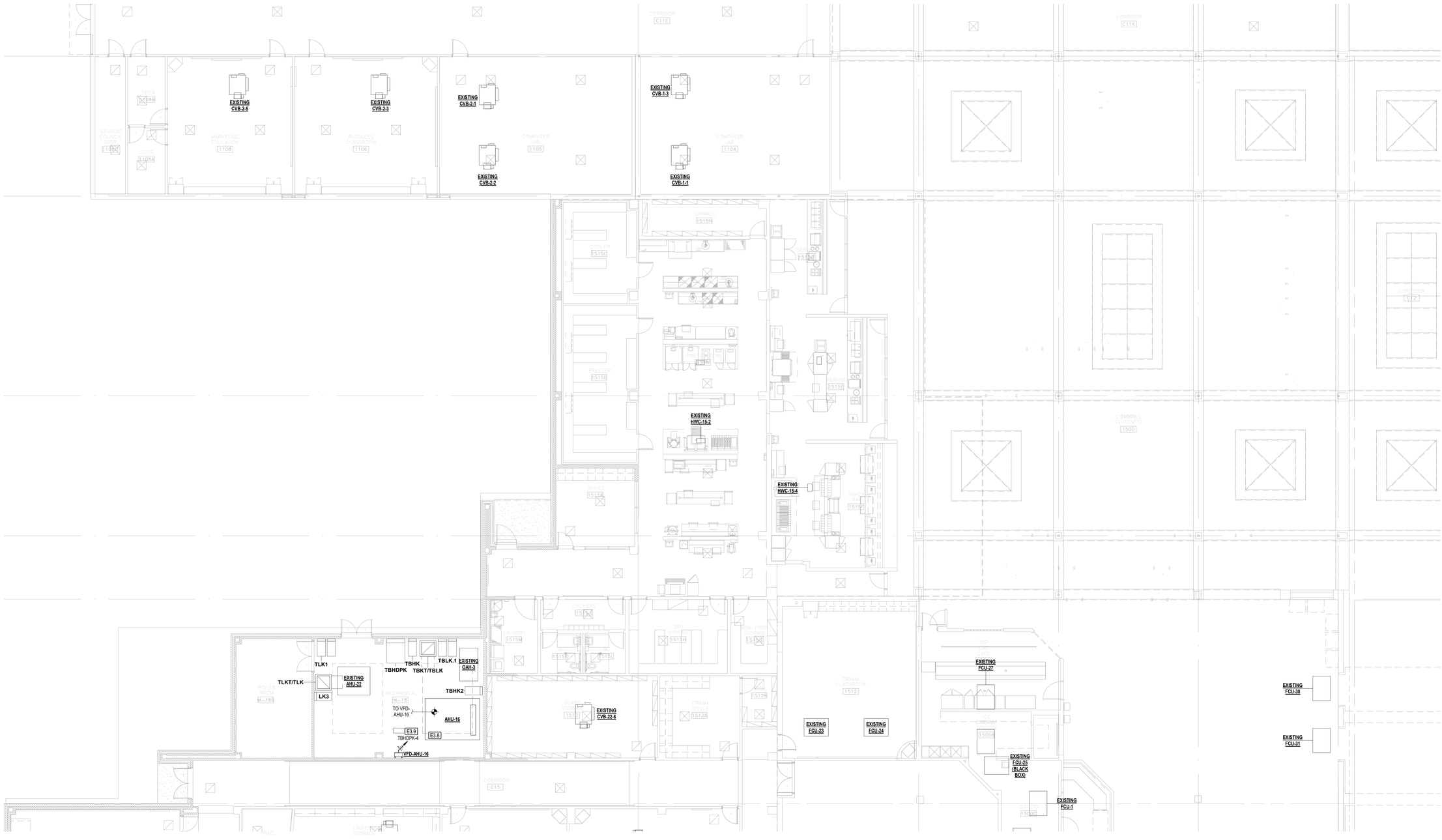
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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

E3.8 PROVIDE DUCT SMOKE DETECTOR AND FIRE ALARM RELAY FOR MECHANICAL AIR HANDLING EQUIPMENT. COORDINATE WITH FIRE ALARM CONTRACTOR FOR EXACT REQUIREMENTS AND INTEGRATING SMOKE DETECTOR AND FIRE ALARM RELAY TO EXISTING FIRE ALARM POWER SOURCE. FIELD VERIFY LOCATION OF EXISTING FIRE ALARM POWER SOURCE.

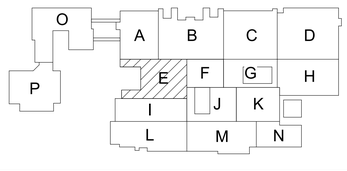
E3.9 REPLACE EXISTING AIR HANDLING UNIT AHU-16, WITH NEW UNIT AS PART OF ALTERNATE 1. DEMOLISH EXISTING BREAKER AND REPLACE WITH NEW BREAKER. PROVIDE NEW WIRE AND CONDUIT BACK TO PANEL. EXISTING CIRCUIT NUMBERS PROVIDED FOR REFERENCE ONLY. FIELD VERIFY CIRCUIT NUMBER. COORDINATE WITH MECHANICAL CONTRACTOR.



1 ELECTRICAL POWER PLAN LEVEL 1 - AREA E

1/8" = 1'-0"

KEY PLAN



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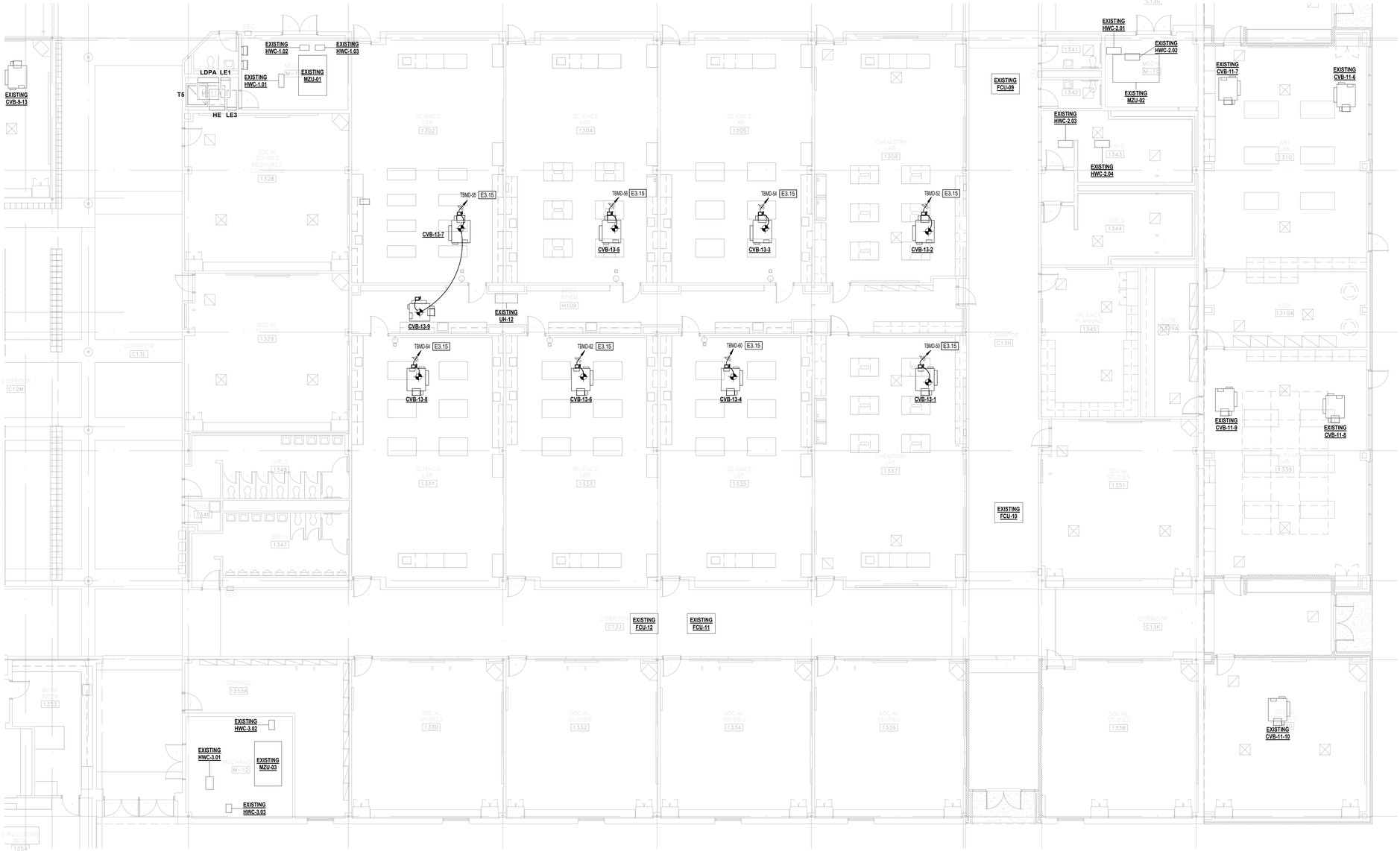
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SHEET NUMBER: E2.21E

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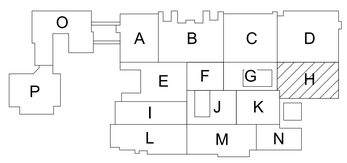
ELECTRICAL KEYED NOTES

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1 ELECTRICAL POWER PLAN LEVEL 1 - AREA H
1/8" = 1'-0"

KEY PLAN



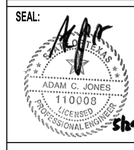
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SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

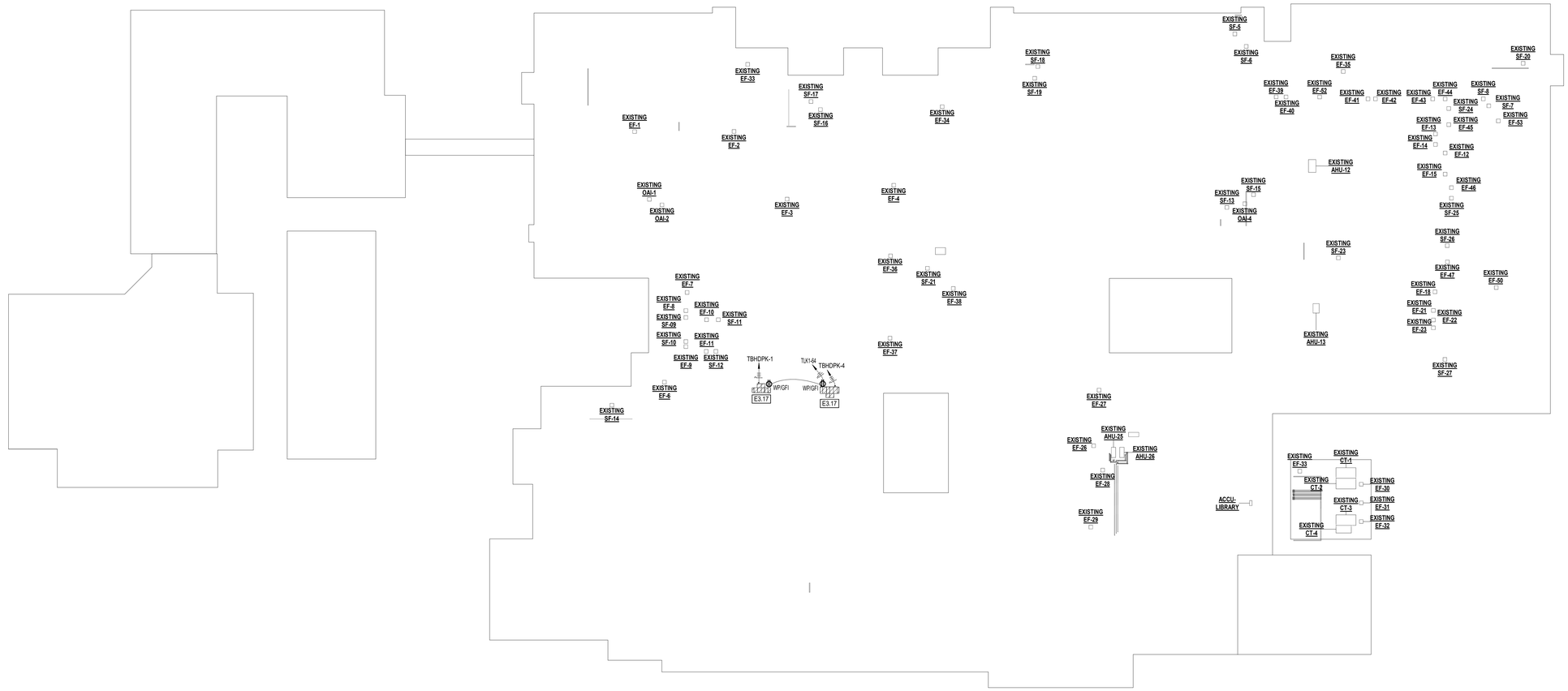
SHEET TITLE: ELECTRICAL POWER PLAN LEVEL 1 - AREA H

SHEET NUMBER: E2.21H

5/29/2026 8:28:27 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

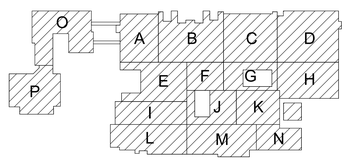
ELECTRICAL KEYED NOTES

E3.17 PROVIDE POWER FOR NEW ROOF TOP UNIT (RTU). PROVIDE NEW BRANCH CIRCUIT (CONDUIT/WIRE) BACK TO PANEL. CIRCUIT NUMBER PROVIDED FOR REFERENCE ONLY. FIELD VERIFY CIRCUIT NUMBERS. COORDINATE WITH MECHANICAL CONTRACTOR.



1 ELECTRICAL ROOF PLAN
1" = 40'-0"

KEY PLAN



PN

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: ELECTRICAL ROOF PLAN

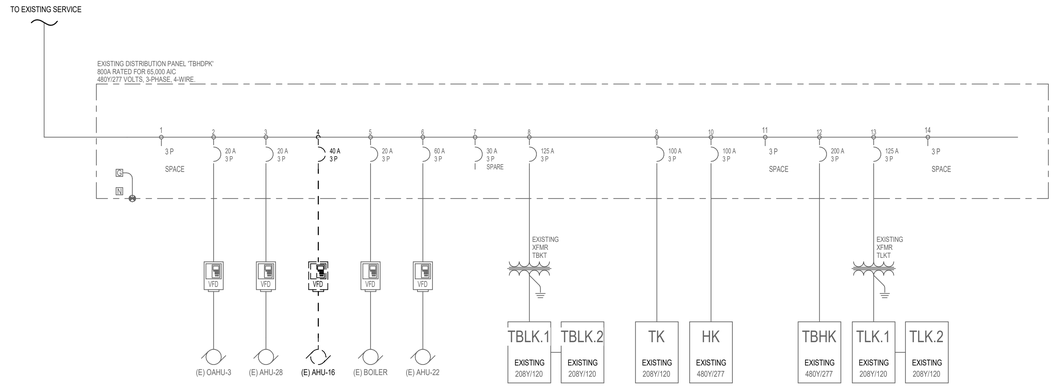
SHEET NUMBER: E2.31

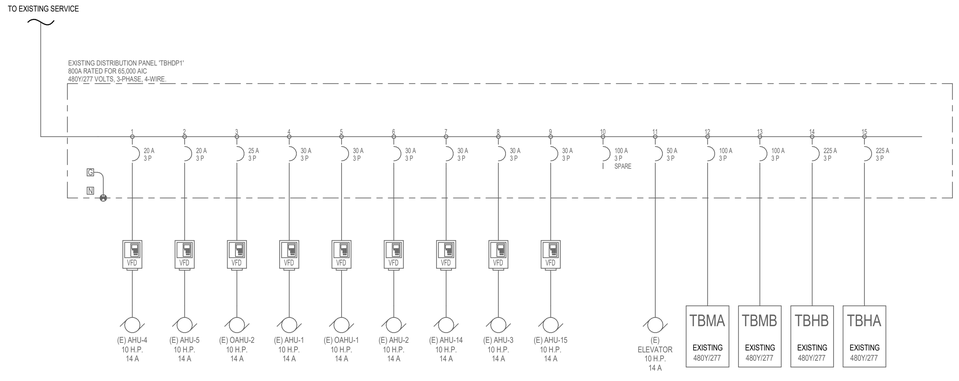
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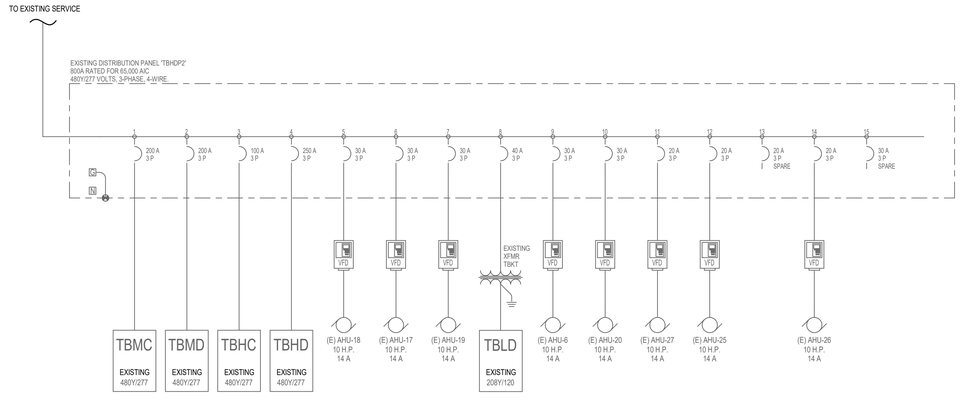
ONE-LINE DIAGRAM GENERAL NOTES:

A. CONTRACTOR SHALL INSTALL FEEDERS BASED ON THE OVERCURRENT DEVICE RATING UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO THE FEEDER SCHEDULE TO OBTAIN AND INSTALL THE FEEDERS REQUIRED.

B. SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION AND CALCULATION. THE LABEL SHALL BE 2" X 3" IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF THE CALCULATION.







1 EXISTING ELECTRICAL ONE LINE DIAGRAM
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110008 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: EXISTING ELECTRICAL ONE-LINE DIAGRAM

SHEET NUMBER: E4.01

5/29/2026 8:28:37 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ONE-LINE DIAGRAM GENERAL NOTES:

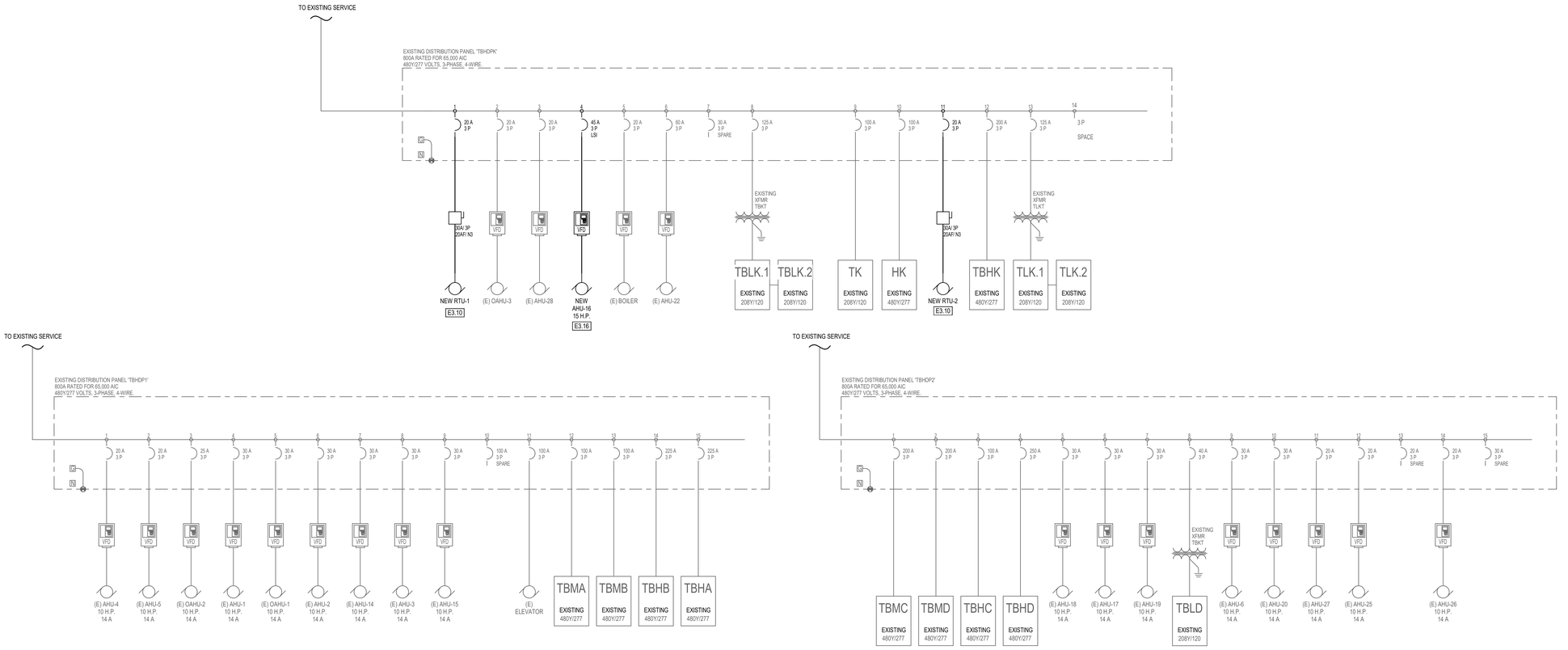
A. CONTRACTOR SHALL INSTALL FEEDERS BASED ON THE OVERCURRENT DEVICE RATING UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO THE FEEDER SCHEDULE TO OBTAIN AND INSTALL THE FEEDERS REQUIRED.

B. SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION AND CALCULATION. THE LABEL SHALL BE 2" X 3" IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF THE CALCULATION.

☐ ELECTRICAL KEYED NOTES

E3.10 PROVIDE POWER FOR NEW ROOF TOP UNIT. PROVIDE NEW 20A 3 POLE BREAKER. PROVIDE NEW WIRE AND CONDUIT BACK TO PANEL. COORDINATE WITH MECHANICAL CONTRACTOR.

E3.16 REPLACE EXISTING AIR HANDLING UNIT AHU-16, WITH NEW UNIT AS PART OF ALTERNATE 1. DEMOLISH EXISTING BREAKER AND REPLACE WITH NEW 45A 3 POLE BREAKER. PROVIDE NEW WIRE AND CONDUIT BACK TO PANEL. CIRCUIT NUMBER PROVIDED FOR REFERENCE ONLY. FIELD VERIFY CIRCUIT NUMBER. COORDINATE WITH MECHANICAL CONTRACTOR.



1 PROPOSED ELECTRICAL ONE LINE DIAGRAM
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: PROPOSED ELECTRICAL ONE-LINE DIAGRAM

SHEET NUMBER: E4.02

5/29/2026 8:28:42 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

Panelboard TBMA

65000 A AIC Rating
New
X Existing

480/277 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 100 A MCB -- 100 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
1	776 VA	M	CVB-1-2	12	20 A	1 2	20 A	12	EXISTING CVB-2-4	--	1000 VA	1
1	1000 VA	--	(E) CVB-10-2	12	20 A	3 4	20 A	12	EXISTING CVB-2-6	--	1000 VA	1
1	776 VA	M	CVB-1-5	12	20 A	5 6	20 A	12	EXISTING CVB-2-7	--	1000 VA	1
1	582 VA	M	CVB-1-6	12	20 A	7 8	20 A	12	CVB-2-8	M	582 VA	1
						9 10	20 A	12	CVB-2-9	M	582 VA	1
1	1330 VA	--	EXISTING SF-4	12	20 A	11 12	20 A	12	EXISTING CVB-2-10	--	1000 VA	1
						13 14	20 A	12	EXISTING CVB-2-11	--	1000 VA	1
						15 16						
1	914 VA	--	EXISTING SF-1	12	20 A	17 18	20 A	12	EXISTING SF-14	--	1745 VA	1
						19 20						
						21 22	20 A	12	EXISTING CVB-2-12	--	1000 VA	1
1	1745 VA	--	EXISTING SF-2	12	20 A	23 24	20 A	12	EXISTING CVB-2-13	--	1000 VA	1
						25 26	20 A	12	EXISTING CVB-1-1/1-3	--	1000 VA	1
1	776 VA	M	CVB-1-7	12	20 A	27 28	20 A	12	EXISTING CVB-3-1	--	1000 VA	1
1	776 VA	M	CVB-1-8	12	20 A	29 30	20 A	12	EXISTING CVB-3-2	--	1000 VA	1
1	582 VA	M	CVB-1-9	12	20 A	31 32	20 A	12	EXISTING CVB-3-3	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-10	12	20 A	33 34	20 A	12	EXISTING CVB-2-1/2-2	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-11	12	20 A	35 36	20 A	12	EXISTING CVB-2-3/2-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-12	12	20 A	37 38	20 A	12	EXISTING CVB-17-2	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-13	12	20 A	39 40	20 A	12	EXISTING CVB-17-3	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-14	12	20 A	41 42	20 A	12	EXISTING CVB-17-4	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-1	12	20 A	43 44	20 A	12	EXISTING CVB-17-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-2	12	20 A	45 46	20 A	12	EXISTING CVB-17-6	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-3	12	20 A	47 48	20 A	12	EXISTING CVB-17-7	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-4	12	20 A	49 50	20 A	12	EXISTING CVB-17-8	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-5	12	20 A	51 52	20 A	12	EXISTING CVB-18-7	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-7	12	20 A	53 54	20 A	12	EXISTING CVB-18-8	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-1	12	20 A	55 56	20 A	12	EXISTING CVB-18-9	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-2	12	20 A	57 58	20 A	12	EXISTING CVB-18-10	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-3	12	20 A	59 60	20 A	12	EXISTING CVB-18-13	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-4	12	20 A	61 62	20 A	12	EXISTING CVB-19-1	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-5	12	20 A	63 64	20 A	12	EXISTING CVB-19-2	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-6	12	20 A	65 66	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	67 68	20 A	12	EXISTING LOAD	--	1000 VA	1
	0 VA	--	EXISTING SPARE	12	20 A	69 70	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	71 72	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	73 74	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	75 76	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	77 78	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	79 80	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	81 82	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	83 84	20 A	12	EXISTING SPARE	--	0 VA	

NEC REF:	Load Type	Conn.	Fct.	Diversity	NEC REF:	Load Type	Conn.	Fct.	Diversity
220.47	(R)Receptacle				210.20A	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.50	(MT)Lrg. Motor			
	(M)Misc.	6208 VA	100.00%	6208 VA		(SP)Sub Pnl.			
					630.11B	(W) Welders			

Total Connected Load: 56942 VA VA = 68 A
Total Load (Diversified): 56942 VA VA = 68 A
Location of Panel:

PANEL SCHEDULE NOTES:
1. EXISTING LOAD.

Panelboard TBMB

65000 A AIC Rating
New
X Existing

480/277 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 150 A MCB -- 150 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
1	1000 VA	--	EXIST. CVB-6-1	12	20 A	1 2	20 A	12	CVB-4-2	M	776 VA	1
1	776 VA	M	CVB-6-2	12	20 A	3 4	20 A	12	CVB-4-3	M	776 VA	1
1	776 VA	M	CVB-6-3	12	20 A	5 6	20 A	12	CVB-4-4	M	776 VA	1
						7 8						
1	1000 VA	--	EXIST. EWH-2	12	20 A	9 10	20 A	12	EXISTING SF-16/SF-17	--	3822 VA	1
						11 12						
						13 14	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	15 16	20 A	12	CVB-4-5	M	582 VA	1
						17 18	20 A	12	CVB-4-6	M	776 VA	1
1	776 VA	M	CVB-6-4	12	20 A	19 20	20 A	12	CVB-4-7	M	582 VA	1
1	776 VA	M	CVB-6-5	12	20 A	21 22	20 A	12	CVB-4-8	M	776 VA	1
1	776 VA	M	CVB-6-6	12	20 A	23 24	20 A	12	CVB-4-9	M	582 VA	1
1	776 VA	M	CVB-6-7	12	20 A	25 26	20 A	12	EXISTING CVB-4-10	--	1000 VA	1
1	776 VA	M	CVB-6-8	12	20 A	27 28	20 A	12	EXISTING CVB-3-4	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-6-9	12	20 A	29 30	20 A	12	EXISTING CVB-3-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-6-10	12	20 A	31 32	20 A	12	EXISTING CVB-3-6	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-6-11	12	20 A	33 34	20 A	12	EXISTING CVB-3-7	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-6-12	12	20 A	35 36	20 A	12	EXISTING CVB-3-8	--	1000 VA	1
1	582 VA	M	CVB-4-1	12	20 A	37 38	20 A	12	EXISTING CVB-18-12	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-19-9A	12	20 A	39 40	20 A	12	EXISTING CVB-19-3	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-19-9B	12	20 A	41 42	20 A	12	EXISTING CVB-19-4	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-19-10	12	20 A	43 44	20 A	12	EXISTING CVB-19-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-19-11	12	20 A	45 46	20 A	12	EXISTING CVB-19-6	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-14	12	20 A	47 48	20 A	12	EXISTING CVB-19-7	--	1000 VA	1
	0 VA	--	EXISTING SPARE	12	20 A	49 50	20 A	12	EXISTING CVB-19-8	--	1000 VA	1
	0 VA	--	EXISTING SPARE	12	20 A	51 52	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	53 54	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	55 56	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	57 58	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	59 60	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	61 62	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	63 64	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	65 66	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	67 68	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	69 70	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	71 72	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	73 74	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	75 76	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	77 78	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	79 80	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	81 82	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	83 84	20 A	12	EXISTING SPARE	--	0 VA	

NEC REF:	Load Type	Conn.	Fct.	Diversity	NEC REF:	Load Type	Conn.	Fct.	Diversity
220.47	(R)Receptacle				210.20A	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.50	(MT)Lrg. Motor			
	(M)Misc.	11640 VA	100.00%	11640 VA		(SP)Sub Pnl.			
					630.11B	(W) Welders			

Total Connected Load: 39462 VA VA = 47 A
Total Load (Diversified): 39462 VA VA = 47 A
Location of Panel:

PANEL SCHEDULE NOTES:
1. EXISTING LOAD.

Panelboard TBMC

65000 A AIC Rating
New
X Existing

480/277 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 200 A MCB -- 200 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
1	1000 VA	--	EXISTING CVB-7-1	12	20 A	1 2	20 A	12	CVB-8-1	M	776 VA	1
1	776 VA	M	CVB-7-2	12	20 A	3 4	20 A	12	CVB-8-15	M	776 VA	1
1	1000 VA	--	EXISTING CVB-7-3	12	20 A	5 6	20 A	12	CVB-8-3	M	776 VA	1
1	582 VA	M	CVB-7-4	12	20 A	7 8						
						9 10	20 A	12	EXISTING SF-5	--	2500 VA	1
1	2500 VA	--	EXISTING SF-13	12	20 A	11 12						
						13 14						
						15 16	20 A	12	EXISTING SF-6	--	2500 VA	1
1	2500 VA	--	EXISTING SF-18	12	20 A	17 18						
						19 20						
						21 22	30 A	10	EXISTING AHU-7	--	17451 VA	1
1	2500 VA	--	EXISTING SF-19	12	20 A	23 24						
						25 26						
1	1000 VA	--	EXISTING CVB-7-5	12	20 A	27 28	50 A	8	EXISTING AHU-8	--	22437 VA	1
1	776 VA	M	CVB-7-6	12	20 A	29 30						
1	1000 VA	--	EXISTING CVB-7-7	12	20 A	31 32						
1	582 VA	M	CVB-7-8	12	20 A	33 34	50 A	8	EXISTING AHU-9	--	22437 VA	1
1	1000 VA	--	EXISTING CVB-7-9	12	20 A	35 36						
1	776 VA	M	CVB-7-10	12	20 A	37 38	20 A	12	CVB-8-5	M	776 VA	1
1	1000 VA	--	EXISTING CVB-7-11	12	20 A	39 40	20 A	12	CVB-8-6	M	776 VA	1
1	582 VA	M	CVB-7-12	12	20 A	41 42	20 A	12	CVB-8-7	M	776 VA	1
1	776 VA	M	CVB-7-13	12	20 A	43 44	20 A	12	EXISTING LOAD	--	0 VA	1
1	776 VA	M	CVB-9-1	12	20 A	45 46	20 A	12	CVB-8-11	M	776 VA	1
1	776 VA	M	CVB-9-2	12	20 A	47 48	20 A	12	CVB-8-10	M	776 VA	1
1	776 VA	M	CVB-8-4	12	20 A	49 50	20 A	12	CVB-8-9	M	776 VA	1
1	776 VA	M	CVB-9-5	12	20 A	51 52	20 A	12	CVB-8-12	M	776 VA	1
1	776 VA	M	CVB-9-7	12	20 A	53 54	20 A	12	CVB-8-13	M	776 VA	1
1	582 VA	M	CVB-8-9	12	20 A	55 56	20 A	12	CVB-8-14	M	776 VA	1
1	776 VA	M	CVB-9-11	12	20 A	57 58	20 A	12	CVB-8-2	M	776 VA	1
1	1000 VA	--	EXISTING CVB-20-15	12	20 A	59 60	20 A	12	EXISTING LOAD	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-2	12	20 A	61 62	20 A	12	CVB-8-16	M	776 VA	1
1	1000 VA	--	EXISTING CVB-20-4	12	20 A	63 64	20 A	12	EXISTING CVB-20-3	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-6	12	20 A	65 66	20 A	12	EXISTING CVB-20-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-8	12	20 A	67 68	20 A	12	EXISTING CVB-20-7	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-10	12	20 A	69 70	20 A	12	EXISTING CVB-20-9	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-12	12	20 A	71 72	20 A	12	EXISTING CVB-20-11	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-13	12	20 A	73 74	20 A	12	EXISTING CVB-9-10	--	1000 VA	1
1	776 VA	M	CVB-9-4	12	20 A	75 76	20 A	12	EXISTING CVB-9-12	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-9-6	12	20 A	77 78	20 A	12	EXISTING CVB-9-13	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-9-8	12	20 A	79 80	20 A	12	EXISTING CVB-20-11	--	1000 VA	1
1	0 VA	--	EXISTING LOAD	12	20 A	81 82	20 A	12	EXISTING LOAD	--	0 VA	1
1	0 VA	--	EXISTING LOAD	12	20 A	83 84	20 A	12	EXISTING LOAD	--	0 VA	1

NEC REF:	Load Type	Conn.	Fct.	Diversity	NEC REF:	Load Type	Conn.	Fct.	Diversity
220.47	(R)Receptacle				210.20A	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.50	(MT)Lrg. Motor			
	(M)Misc.	21728 VA	100.00%	21728 VA		(SP)Sub Pnl.			
					630.11B	(W) Welders			

Total Connected Load: 122553 VA VA = 147 A
Total Load (Diversified): 122553 VA VA = 147 A
Location of Panel:

PANEL SCHEDULE NOTES:
1. EXISTING LOAD.

Panelboard TBMD

65000 A AIC Rating
New
X Existing

480/277 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 200 A MCB -- 200 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
1	1000 VA	--	(E) CVB-10-1	12	20 A	1 2	20 A	12	CVB-12-1	M	776 VA	1
1	1000 VA	--	(E) CVB-10-2	12	20 A	3 4	20 A	12	CVB-12-2	M	776 VA	1
1	1000 VA	--	(E) CVB-10-3	12	20 A	5 6	20 A	12	CVB-12-3	M	776 VA	1
1	582 VA	M	CVB-10-4	12	20 A	7 8	20 A	12	CVB-12-9	M	582 VA	1
1	582 VA	M	CVB-10-5	12	20 A	9 10	20 A	12	CVB-12-8	M	776 VA	1
1	1000 VA	--	(E) CVB-10-6	12	20 A	11 12	20 A	12	CVB-12-6	M	776 VA	1
1	1000 VA	--	(E) CVB-10-7	12	20 A	13 14						
						15 16	20 A	12	(E) SF-8	--	1330 VA	1
1	2500 VA	--	(E) SF-20	12	20 A	17 18						
						19 20						
						21 22	20 A	12	(E) SF-23	--	2500 VA	1
1	2500 VA	--	(E) SF-7	12	20 A	23 24						
						25 26						
						27 28	20 A	12	(E) SF-27	--	2500 VA	1
1	22437 VA	--	(E) AHU-21	12	20 A	29 30						
						31 32	20 A	12	CVB-12-7	M	776 VA	1
1	1000 VA	--	(E) CVB-10-8	12	20 A	33 34	20 A	12	CVB-12-4	M	776 VA	1
						35 36	20 A	12	Spare	--	0 VA	
1	0 VA	--	EXISTING LOAD	12	20 A	37 38	20 A	12	Spare	--	0 VA	
						39 40	20 A	12	CVB-12-5	M	776 VA	1
1	1000 VA	--	(E) CVB-11-4	12	20 A	41 42	20 A	12	(E) CVB-11-1	--	1000 VA	1
	0 VA	--	Spare	12	20 A	43 44						
	0 VA	--	Spare	12	20 A	45 46	20 A	12	(E) SF-22	--	2500 VA	1
	0 VA	--	Spare	12	20 A	47 48						
	0 VA	--	Spare	12	20 A	49 50	20 A	12	CVB-13-1	M	776 VA	1
	0 VA	--	Spare	12	20 A	51 52	20 A	12	CVB-13-2	M	776 VA	1
1	1000 VA	--	(E) CVB-11-7	12	20 A	53 54	20 A	12	CVB-13-3	M	776 VA	1
1	1000 VA	--	(E) CVB-11-8	12	20 A	55 56	20 A	12	CVB-13-5	M	776 VA	1
1	1000 VA	--	(E) CVB-11-9	12	20 A	57 58	20 A	12	CVB-13-7/CVB-13-9	M	1358 VA	1
1	1000 VA	--	(E) CVB-11-10	12	20 A	59 60	20 A	12	CVB-13-4	M	776 VA	1
	0 VA	--	Spare	12	20 A	61 62	20 A	12	CVB-13-6	M	776 VA	1
1	1000 VA	--	(E) CVB-21-1	12	20 A	63 64	20 A	12	CVB-13-8	M	776 VA	1
	0 VA	--	Spare	12	20 A	65 66	20 A	12	(E) CVB-21-8	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-6	12	20 A	67 68	20 A	12	(E) CVB-21-10	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-2	12	20 A	69 70	20 A	12	(E) CVB-21-12	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-3	12	20 A	71 72	20 A	12	(E) CVB-21-15	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-13	12	20 A	73 74	20 A	12	(E) CVB-21-7	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-14	12	20 A	75 76	20 A	12	(E) CVB-21-9	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-14	12	20 A	77 78	20 A	12	(E) CVB-21-11	--	1000 VA	1
						79 80						
1	17451 VA	--	(E) AHU-10	10	30 A	81 82	30 A	10	(E) AHU-11	--	11634 VA	1
						83 84						

NEC REF:	Load Type	Conn.	Fct.	Diversity	NEC REF:	Load Type	Conn.	Fct.	Diversity
220.47	(R)Receptacle				210.20A	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.50	(MT)Lrg. Motor			
	(M)Misc.	14744 VA	100.00%	14744 VA		(SP)Sub Pnl.			
					630.11B	(W) Welders			

Total Connected Load: 106096 VA VA = 128 A
Total Load (Diversified): 106096 VA VA = 128 A
Location of Panel:

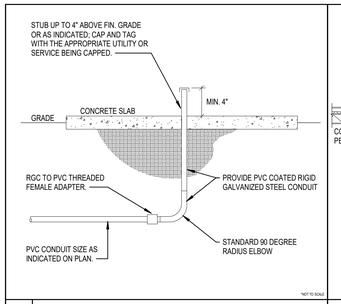
PANEL SCHEDULE NOTES:
1. EXISTING LOAD.

Panelboard TLK1

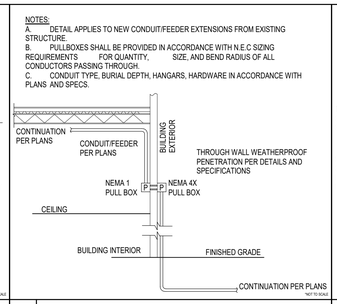
10000 A AIC Rating
New
X Existing

120/208 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 225 A MCB -- 225 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

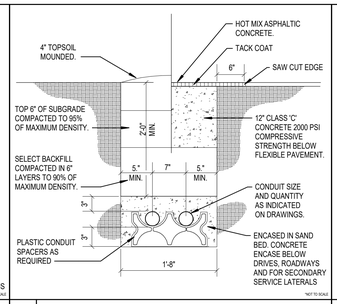
NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
	0 VA	--	EXISTING SHUNT TRIP	12	--	1 2	20 A	12	EXISTING EXHAUST HOOD	--	1000 VA	1
1	1000 VA	--	EXISTING PIZZA OVEN	12	20 A	3 4	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	5 6	20 A	12	EXISTING EXHAUST HOOD	--	1000 VA	1
1	1000 VA	--	EXISTING EXHAUST HOOD	12	20 A	7 8	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	9 10	20 A	12	EXISTING CONVECTION...	--	1000 VA	1
1	1000 VA	--	EXISTING EXHAUST HOOD	12	20 A	11 12	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	13 14	20 A	12	EXISTING CONVECTION...	--	1000 VA	1
1	1000 VA	--	EXISTING CONVECTOR OVEN	12	20 A	15 16	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	17 18	20 A	12	EXISTING CONVECTION...	--	1000 VA	1
1	1000 VA	--	EXISTING CONVECTOR OVEN	12	20 A	19 20	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	21 22	20 A	12	EXISTING FIRE PROT....	--	500 VA	1
1	1000 VA	--	EXISTING CONVECTOR OVEN	12	20 A	23 24	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	25 26	20 A	12	EXISTING FIRE PROT....	--	500 VA	1
1	500 VA	--	EXISTING FIRE PROT....	12	20 A	27 28	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	29 30	20 A	12	EXISTING WARMING LAMP	--	1000 VA	1
1	500 VA	--	EXISTING FIRE PROT....	12	20 A	31 32	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	33 34	20 A	12	EXISTING WARMING LAMP	--	1000 VA	1
1	1000 VA	--	EXISTING WARMING LAMP	12	20 A	35 36	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	37 38	20 A	12	EXISTING FRYER FILTER	--	1000 VA	1
1	1000 VA	--	EXISTING LOAD	12	20 A	39 40	--	12	EXISTING SHUNT TRIP	--	0 VA	
1	1000 VA	--	EXISTING LOAD	12	20 A	41 42	20 A	12	EXISTING LOAD	--	1000 VA	1
	0 VA	--	EXISTING SHUNT TRIP	12	--	43 44						
1	1000 VA	--	EXISTING BRAISING PAN	12	20 A	45 46	20 A	12	EXISTING SPARE	--	0 VA	
						47 48						
1	2000 VA	--	EXISTING HEATED CABINET	12	20 A	49 50						
						51 52	20 A	12	EXISTING SPARE	--	0 VA	
1	2000 VA	--	EXISTING HEATED CABINET	12	20 A	53 54						
						55 56						
1	10000 VA	--	EXISTING LOAD CENTER	4	70 A	57 58	20 A	12	EXISTING DISPOSAL	--	1700 VA	1
						59 60						
						61 62	--	12	EXISTING SPACE	--	0 VA	
1	1700 VA	--	EXISTING DISPOSAL	12



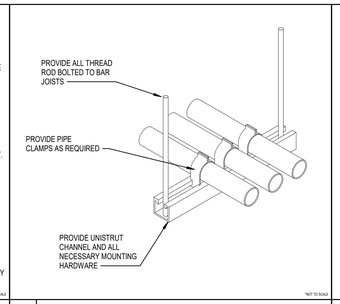
5 CONDUIT STUB-UP E1604



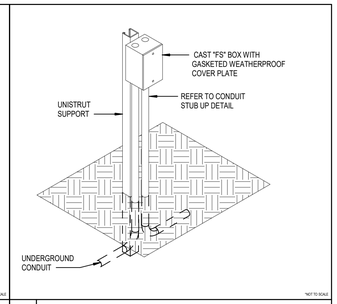
4 EXISTING BUILDING PENETRATION E1604



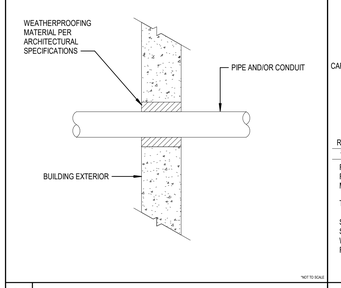
3 CONDUIT BURIAL E1604



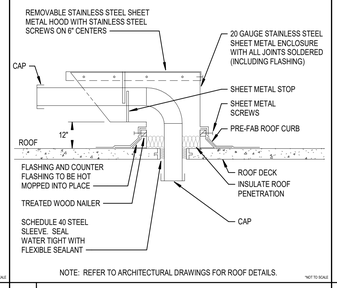
2 UNISTRUT CONDUIT E1604



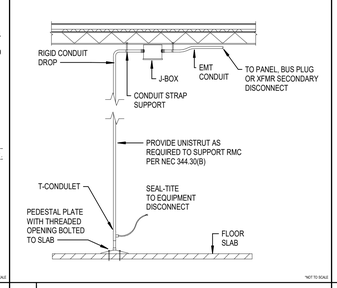
1 JUNCTION BOX MOUNTING E1602



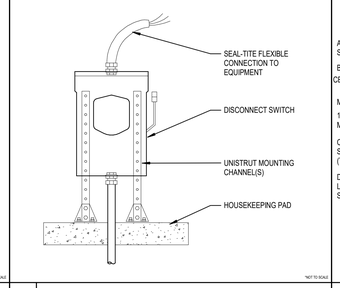
10 PIPE AND/OR CONDUIT PENETRATION E1604



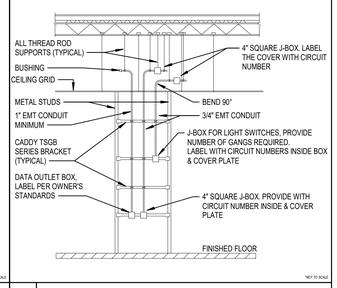
9 ROOF CONDUIT PENETRATION E1604



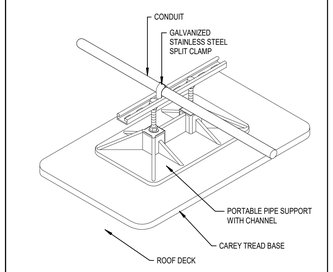
8 RIGID CONDUIT DROP TO EQ. DISCONNECT E1602



7 DISCONNECT SWITCH MOUNTING AT CONCRETE PAD E1604



6 CONDUIT ROUGH-IN 1 E1602



11 ROOF CONDUIT SUPPORT E1602

FEEDER SCHEDULE
COPPER ONLY

RATING	SETS	CONDUCTOR SIZE	CONDUIT
30A	1	4#10, 1#10 G.	3/4"
40A	1	4#8, 1#10 G.	1"
50A	1	4#8, 1#10 G.	1"
60A	1	4#6, 1#10 G.	1"
70A	1	4#4, 1#8 G.	1 1/4"
80A	1	4#4, 1#8 G.	1 1/4"
90A	1	4#3, 1#8 G.	1 1/4"
100A	1	4#3, 1#8 G.	1 1/4"
125A	1	4#1, 1#6 G.	1 1/2"
150A	1	4#1/0, 1#6 G.	1 1/2"
175A	1	4#2/0, 1#6 G.	2"
200A	1	4#3/0, 1#6 G.	2"
225A	1	4#4/0, 1#4 G.	2 1/2"
250A	1	4#250, 1#4 G.	2 1/2"
300A	1	4#350, 1#4 G.	3"
350A	1	4#500, 1#3 G.	3 1/2"
400A	1	4#600, 1#3 G.	4"
450A	2	4#4/0, 1#2 G.	2 1/2"
500A	2	4#250, 1#2G.	2 1/2"
600A	2	4#350, 1#1G.	3"
700A	2	4#500, 1#1/0G.	4"
800A	2	4#600, 1#1/0G.	4"
1000A	3	4#500, 1#2/0G.	4"
1200A	4	4#350, 1#3/0G.	3"
1600A	4	4#600, 1#4/0G.	4"
	5	4#500, 1#4/0G.	4"
2000A	5	4#600, 1#250 G.	4"
	6	4#500, 1#250 G.	4"
2500A	6	4#600, 1#350 G.	4"
	7	4#500, 1#350 G.	4"
3000A	8	4#500, 1#400 G.	4"
3500A	9	4#600, 1#500 G.	4"
	10	4#500, 1#500 G.	4"
4000A	10	4#600, 1#500 G.	4"
	11	4#500, 1#500 G.	4"
5000A	12	4#600, 1#750 G.	4"
	14	4#500, 1#750 G.	4"

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
2. GROUND NOT REQUIRED AT SERVICE LATERAL.

1-PHASE 3-WIRE FEEDER SCHEDULE
COPPER ONLY

RATING	SETS	CONDUCTOR SIZE	CONDUIT
30A	1	3#10, 1#10 G.	3/4"
40A	1	3#8, 1#10 G.	3/4"
50A	1	3#8, 1#10 G.	3/4"
60A	1	3#6, 1#10 G.	1"
70A	1	3#4, 1#8 G.	1"
80A	1	3#4, 1#8 G.	1"
90A	1	3#3, 1#8 G.	1 1/4"
100A	1	3#3, 1#8 G.	1 1/4"
125A	1	3#1, 1#6 G.	1 1/4"
150A	1	3#1/0, 1#6 G.	1 1/2"
175A	1	3#2/0, 1#6 G.	1 1/2"
200A	1	3#3/0, 1#6 G.	2"
225A	1	3#4/0, 1#4 G.	2"
250A	1	3#250, 1#4 G.	2 1/2"
300A	1	3#350, 1#4 G.	2 1/2"
350A	1	3#500, 1#3 G.	3"
400A	1	3#600, 1#3 G.	3 1/2"
450A	2	3#4/0, 1#2 G.	2"
500A	2	3#250, 1#2G.	2 1/2"
600A	2	3#350, 1#1G.	3"
700A	2	3#500, 1#1/0G.	3 1/2"
800A	2	3#600, 1#1/0G.	3 1/2"
1000A	3	3#500, 1#2/0G.	3"
1200A	4	3#350, 1#3/0G.	3"
1600A	4	3#600, 1#4/0G.	3 1/2"
	5	3#500, 1#4/0G.	3"
2000A	5	3#600, 1#250G.	3 1/2"
	6	3#500, 1#250G.	3"
2500A	6	3#600, 1#350G.	3 1/2"
	7	3#500, 1#350G.	3 1/2"
3000A	8	3#500, 1#400G.	3 1/2"
3500A	9	3#600, 1#500G.	3 1/2"
	10	3#500, 1#500G.	3 1/2"
4000A	10	3#600, 1#500G.	3 1/2"
	11	3#500, 1#500G.	3 1/2"

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
2. GROUND NOT REQUIRED AT SERVICE LATERAL.

Load Analysis - Tomball HS
480 / 277 , 3 -PHASE, 4 -WIRE **Date: 5/1/2025**

DESCRIPTION		NEC	KVA
EXISTING			
ESTIMATED EXIST. BLDG. LOAD:	321,539 S.F X 10.0 W/S.F		3215.4
DEMOLISHED LOAD			
AHU-16:	-22,437 VA		-22.4
NEW HVAC LOADS:			
AHU-16:	21,814 VA		21.8
RTU 1,2:	9,640 VA		9.6
		TOTAL =	3230.9
		TOTAL AMPS:	3886.2
		SERVICE SIZE:	4000.0
		SPARE AMPACITY:	113.8

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
ADAM C. JONES, 110009, LICENSED PROFESSIONAL ENGINEER, STATE OF TEXAS

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade
30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: ELECTRICAL DETAILS AND SCHEDULES
SHEET NUMBER: E6.01

5/28/2026 2:19:04 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ABBREVIATIONS

AC	ALTERNATING CURRENT
AF	AMPERE FUSE, AMPERE FRAME
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPT CAPACITY
AL	ALUMINUM
AM	AMMETER
AMP	AMPLIFIER
ANN	ANNUNCIATOR
ASC	AMPERES SHORT CIRCUIT
AT	AMPERE TRIP RATING
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
BKR	BREAKER
BLDG.	BUILDING
C	CONDUIT, CELSIUS
CKT	CIRCUIT
CLG.	CEILING
CONT.	CONTINUOUS,CONTINUATION
CONTR	CONTROLLER, CONTRACTOR
CT	CURRENT TRANSFORMER/COOLING TOWER
CU	COPPER
DAS	DISTRIBUTED ANTENNA SYSTEM
DC	DIRECT CURRENT
DISC	DISCONNECT
DP	DISTRIBUTION PANEL
DPDT	DOUBLE-POLE, DOUBLE-THROW
DPST	DOUBLE-POLE, SINGLE-THROW
DWG	DRAWING
ELEV.	ELEVATOR
EPO	EMERGENCY POWER OFF
ERRC	EMERGENCY RESPONDER RADIO COVERAGE SYSTEM
FA	FIRE ALARM
FF	FURNITURE FEED
FLA	FULL LOAD AMPS
FTL	FEED-THRU LUGS
GA	GAUGE
GEN	GENERATOR
GND	GROUND
GTD	GENERATOR TRANSFER DEVICE
IG	ISOLATED GROUND
LF	LINEAR FEET
LTG	LIGHTING
LV	LOW VOLTAGE
LVL	LEVEL
MAX.	MAXIMUM
MC	METAL CLAD CABLE
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCCB	MOLDED CASE CIRCUIT BREAKER
MD	MOTORIZED DAMPER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MIC	MICROPHONE
MIN.	MINIMUM
MLO	MAIN LUGS ONLY
MOCP	MAXIMUM OVER-CURRENT PROTECTION
MSB	MAIN SWITCHBOARD
N3R	NEMA 3R
N4X	NEMA 4X
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NF	NON-FUSED
NFS	NON-FUSED SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE
PH	PHASE
POS	POINT OF SALE
QTY	QUANTITY
RCP	REFLECTED CEILING PLAN
RCPT	RECEPTACLE
RE	REFERENCE, REFER
SF	SQUARE FOOT
SIM	SIMILAR
SKVA	STARTING KILOVOLT-AMPS
SPD	SURGE PROTECTION DEVICE
SPDT	SINGLE-POLE, DOUBLE-THROW
SPST	SINGLE-POLE, SINGLE-THROW
SPEC	SPECIFICATION
SQFT	SQUARE FOOT
ST	SHUNT TRIP
SWB	SWITCHBOARD
TL	TWIST-LOCK
TOC	TOP OF CURB
TOS	TOP OF STEEL
TR	TAMPER RESISTANT RECEPTACLE
TV	TELEVISION
TYP	TYPICAL
UG	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SYSTEM
VFD	VARIABLE FREQUENCY DRIVE
WP	WEATHERPROOF
WT	WATERTIGHT, WEIGHT
WSF	WATTS PER SQUARE FOOT
XFMR	TRANSFORMER

MANY ABBREVIATIONS NOT LISTED MAY BE FOUND IN THE NATIONAL ELECTRIC CODE, OR IN THE INTERNATIONAL AND UNIFORM CODES

PHASING

(E)	EXISTING (TO REMAIN)
(D)	SHALL BE DEMOLISHED
(N)	PROVIDE NEW
(R)	RELOCATED ELEMENT

ELECTRICAL SYMBOLS

MOTORS AND CONTROLS

- $_{M}$ — MOTOR RATED SWITCH WITH THERMAL OVERLOADS
- (5) — SINGLE OR THREE PHASE MOTOR NUMBER INDICATES HORSE POWER
- ELECTRIC DUCT HEATER
- DISCONNECT (SAFETY) SWITCH "200/3/150" DENOTES AMPERES/POLE/FUSE. "NF" DENOTES NON-FUSED "N3R" DENOTES NEMA 3R
- [B] — ENCLOSED CIRCUIT BREAKER- "200/3/150" DENOTES AMPERES/POLE/TRIP
- MOTOR STARTER FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER. "30/3/15/#0" DENOTES AMPERES/POLES/FUSE/ STARTER SIZE. "NF" DENOTES NON-FUSED. FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- VFD — VARIABLE FREQUENCY DRIVE PROVIDED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- EPO — EMERGENCY POWER OFF BUTTON.

RECEPTACLES AND OUTLETS

ALL RECEPTACLES SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE. REFER TO SPECIFICATIONS AND DRAWINGS FOR ADDITIONAL REQUIREMENTS.

ABBREVIATIONS APPLICABLE TO RECEPTACLES:
- "GFCI" GROUND FAULT INTERRUPTER
- "WP" WEATHERPROOF
- "IG" ISOLATED GROUND
- "TR" TAMPER RESISTANT
- "USB" RECEPTACLE WITH USB CHARGING PORTS
- "AC" ABOVE COUNTER MOUNTING
- "UC" UNDER COUNTER MOUNTING
- "H" HORIZONTALLY ORIENTED RECEPTACLE

- SIMPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.
- DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V. SHADED INDICATES SPLIT-WIRED
- FOURPLEX (QUADRUPLEX) RECEPTACLE
- DUPLEX RECEPTACLE (PEDESTAL MOUNTED)
- CONTROLLED WALL RECEPTACLE. DUPLEX: SPLIT-WIRED QUAD: SEPARATELY WIRED UNDER A COMMON COVERPLATE.
- POWER DEVICE RED IN COLOR, ON EMERGENCY POWER CIRCUIT
- CEILING RECEPTACLE/QUAD, EMERGENCY POWER SYMBOL MAY APPLY
- SPECIAL RECEPTACLE, NEMA CONFIGURATION PER PLAN OR EQUIPMENT
- TV — TV ROUGH-IN; 3-GANG RECESSED TV BOX, CONTAINING 1 DUPLEX RECEPTACLE, 1 GANG FOR AV, 1 GANG FOR DATA
- FLOOR BOX OR POKE THRU. POKE-THRU'S WHERE IN SUSPENDED SLABS, RECESSED IN FOUNDATION WHERE SLAB ON GRADE
- FLUSH ELECTRICAL FLOOR OUTLET. REFER TO FLOOR BOX SCHEDULE. FIRE RATED POKE-THROUGH SCHEDULE AND KEYED NOTES.
- DROP CORD WITH SIMPLEX RECEPTACLE UNLESS OTHERWISE NOTED
- CR — CORD REEL WITH DUPLEX RECEPTACLE UNLESS OTHERWISE NOTED
- J — JUNCTION BOX
  - "MD" INDICATES POWER CONNECTION TO SERVE MOTOR DAMPER
  - "HD" INDICATES POWER CONNECTION TO SERVE HAND DRYER
  - "FV" INDICATES POWER CONNECTION TO SERVE FLUSH VALVES
- P — PULL BOX (OVER 4" SQUARE)
- BELL/BUZZER/CHIME
- PUSH BUTTON/DOOR BELL/START-STOP
- PP — POWER POLE
- POINT OF DIRECT CONNECTION TO EQUIPMENT
- C (2) — CLOCK RECEPTACLE SHALL BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK.

LIGHTING

LETTER(S) DENOTE TYPE- SEE LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.

2' X 4' 2' X 2' 1' X 4' 1' X 2' 1' X 1'

- STRIP LIGHTING FIXTURES.
- ROUND DOWNLIGHT FIXTURE.
- SQUARE DOWNLIGHT FIXTURE.
- WALL MOUNTED LIGHTING FIXTURE.
- TRACK LIGHTING FIXTURE. MOUNTED AS SHOWN ON LIGHTING FIXTURE SCHEDULE.
- CEILING MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- WALL MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- EMERGENCY WALL MOUNTED LIGHTING FIXTURE. BATTERY OPERATED UNLESS NOTED OTHERWISE.
- SITE LIGHTING FIXTURE.

HATCHING PATTERNS BELOW SHALL APPLY TO ALL LIGHTING FIXTURE SYMBOLS.

- NL — EMERGENCY LIGHT FIXTURE WITH BATTERY PACK. PROVIDE WITH UNSWITCHED HOT FOR LOSS OF VOLTAGE AND CHARGING (SAME CIRCUIT AS NORMAL POWER LIGHTING). FIXTURES SHALL BE WIRED IN A MANNER AS TO ALLOW SWITCHING OF FIXTURES WITHOUT DISCHARGING THE EMERGENCY BATTERY. BATTERY PACK IS TO ONLY OPERATE IN THE EVENT OF A POWER OUTAGE.
  "NL" NIGHT LIGHT ON UNSWITCHED 24HR OPERATION
- EM CIRCUIT — LIGHT FIXTURE ON LIFE SAFETY BRANCH CIRCUIT, GENERATOR TRANSFER DEVICES REQUIRED (UL1008 OR UL924) PROVIDE UNSWITCHED HOT, NEUTRAL AND GROUND FOR ALL LIFE SAFETY LIGHTING ORIGINATING FROM THE LIFE SAFETY CIRCUIT SHOWN.
- CRITICAL OPERATIONS LIGHTING ORIGINATING FROM THE CRITICAL CIRCUIT INDICATED, HATCHED AS INDICATED. HATCHING TYPICAL FOR ALL CRITICAL BRANCH LIGHT FIXTURES

RACEWAYS AND WIRING

- CAP AND STAKE
- CONDUIT CONCEALED IN WALL OR CEILING
- UNDERGROUND, UNDERSLAB, CONCEALED ROUTING
- OHE — OVERHEAD ELECTRIC PRIMARY UTILITY POWER LINE
- CONDUIT UP/DOWN
- HASH MARKS INDICATE NUMBER OF CONDUCTORS. LEFT TO RIGHT: PHASE/NEUTRAL/GROUND/ISOLATED GROUND. NO HASH MARKS INDICATES EMPTY CONDUIT, 1" MINIMUM, UNLESS NOTED OTHERWISE.
- 1LA-2,4,6 — HOMERUN TO PANEL WITH CIRCUIT NUMBER(S) AS INDICATED.
- (ON)1LA-6 — PARTIAL/SHARED CIRCUIT HOMERUN TO PANEL.
- TELECOMMUNICATIONS CABLE TRAY SHALL BE CONCEALED ABOVE ACCESSIBLE CEILING UNLESS OTHERWISE NOTED.

ELECTRICAL EQUIPMENT

- DISTRIBUTION PANEL
- MSB — SWITCHBOARD, MAIN DISTRIBUTION PANEL OR MOTOR CONTROL CENTER
- PANELBOARD (FLUSH/SURFACE MOUNT)
- FLOOR MOUNTED DRY-TYPE TRANSFORMER
- SUSPENDED OR WALL MOUNTED TRANSFORMER
- ATS — AUTOMATIC TRANSFER SWITCH
- FIRE RATED PLYWOOD TERMINAL BOARD, TYPE AS NOTED, 4' X 8' X 3/4" UNLESS NOTED OTHERWISE

COMMUNICATIONS

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 18" ABOVE FINISHED FLOOR (AFF)
- DATA/COMM/AV ROUGH-IN. CONDUIT TO PLENUM AND BOX ONLY
- HS DS — SCHOOL INTERCOMMUNICATION SYSTEM HANDSET.

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 42" AFF
- VC — VOLUME CONTROL - WALL MOUNTED
- CB — INTERCOMPA SYSTEM CALL-IN OR CALL-BACK DEVICE

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 120" AFF OR 12" BELOW CEILING, WHICHEVER IS LOWER
- (S)L — INTERCOMPA SPEAKER "L" LOCAL SOUND REINFORCEMENT

CEILING MOUNTED DEVICES:
- (S)VC — INTERCOMPA SPEAKER "VC" INDICATES VOLUME CONTROL ON SPEAKER.

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

ONE-LINE DIAGRAM

- TRANSFORMER, TYPE AND RATINGS AS NOTED
- 800A/3P — SWITCH, RATING AS SHOWN
- 400A — FUSE, RATING AS SHOWN
- ST — SHUNT TRIP
- GF — GROUND FAULT PROTECTION
- AF — ARCH FAULT PROTECTION
- K — KIRK-KEY INTERLOCK
- M — DIGITAL METER OR SUB-METER INTEGRATED INTO EQUIPMENT
- 1200/5 — CURRENT TRANSFORMER, RATED AS SHOWN
- GROUND CONNECTION
- AUTOMATIC TRANSFER SWITCH
- BUS DUCT PLUG
- M — ELECTRICAL UTILITY REVENUE METER
- SPD — SURGE PROTECTION DEVICE
- GANN — GENERATOR ANNUNCIATOR PANEL
- CIRCUIT BREAKER
- DRAW-OUT CIRCUIT BREAKER
- NEW EQUIPMENT/WIRING
- DEMOLITION EQUIPMENT/WIRING
- EXISTING EQUIPMENT/WIRING
- UNDERGROUND WIRING

DAYLIGHT ZONES

DAYLIGHT ZONE/PRIMARY SECONDARY DAYLIGHT ZONE

DAYLIGHT ZONES SHALL BE INCLUSIVE OF THE FIXTURES WITHIN THE SHADED REGION, AND SHALL BE DIMMED USING ON-BOARD OR EXTERNAL CONTROL IN ACCORDANCE WITH IECC 2021. IECC 2018 OR 2015 MAY BE REFERENCED ONLY WHERE ADOPTED BY LOCAL AHJ.

GENERAL NOTES:

A. NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.

MISCELLANEOUS

- F — SHADED SYMBOLS INDICATE EXISTING DEVICES TO REMAIN, UNLESS OTHERWISE NOTED.
- INDICATES WALL-MOUNTED WHEN ATTACHED TO ANY SYMBOL
- 1 — DRAWING NOTE REFERENCE
- SOS — AREA OF RESCUE ASSISTANCE

FIRE ALARM

- W — WATER FLOW SWITCH
- SP — SUPERVISORY SWITCH
- S — SMOKE DETECTOR - MULTI CRITERIA DETECTOR
- S# — SMOKE DETECTOR - "SB" INDICATES IN INTEGRAL SOUNDER BASE; "D" INDICATES DUCT TYPE; "R" INDICATES 120 VOLT RESIDENTIAL TYPE
- H — HEAT DETECTOR
- S BT — BEAM DETECTOR TRANSMITTER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S BR — BEAM DETECTOR RECEIVER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S — FIRE ALARM SPEAKER STROBE / CEILING MOUNTED
- S — FIRE ALARM SPEAKER / CEILING MOUNT.
- DH — MAGNETIC DOOR HOLDER
- R — AUXILIARY CONTROL RELAY
- FH — FIRE FIGHTER HANDSET
- F — FIRE ALARM PULL STATION +42" AFF
- F — FIREMAN'S TELEPHONE JACK +42" AFF
- AUDIO VISUAL FIRE ALARM HORN STROBE +80" AFF- 15/75cd U.N.O.
- VISUAL FIRE ALARM (STROBE) CEILING MOUNT - 15/75cd U.N.O.
- AUDIO FIRE ALARM HORN +80" AFF
- FACP — FIRE ALARM CONTROL PANEL
- ANN — REMOTE FIRE ALARM ANNUNCIATOR PANEL
- RPS — REMOTE POWER SUPPLY FOR AUDIO/VISUAL FIRE ALARM DEVICES.
- FSD — FIRE SMOKE DAMPER
- REMOTE LED INDICATOR LIGHT

SECURITY

- PB — ADA AUTO DOOR OPEN BUTTON
- DR — DOOR RELEASE BUTTON
- CR — WALL MOUNTED CARD READER

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

SWITCHES AND LIGHTING CONTROL DEVICES

ALL SWITCH TYPES AND SENSORS TYPES FOUND ON 'LIGHTING CONTROL DEVICE SCHEDULE' LOCATED ON ELECTRICAL SCHEDULE SHEETS

SWITCH ANNOTATION AS FOLLOWS:
- X — TYPE, PER SCHEDULE; NO TYPE INDICATES SINGLE POLE TOGGLE SWITCH
- a,b,c — SWITCH LEGS, PER PLAN, SHOWN HERE AS 3 (a,b,c)

OCCUPANCY SENSOR ANNOTATION, AS FOLLOWS:
- OCx — OCCUPANCY / VACANCE SENSOR 'x' INDICATES TYPE, PER SCHEDULE
  - CEILING SENSOR
  - WITH BRACKET INDICATES WALL / CORNER MOUNT

LIGHT SENSOR ANNOTATION, AS FOLLOWS:
- PC — DIGITAL PHOTOCELL
- DS — DAYLIGHT HARVESTING SENSOR

RELAY PANELS, CONTACTORS, TIME SWITCHES:
- XX — RELAYS/CONTACTORS/TIMERS/DEVICES WHERE 'XX' INDICATES:
  - "LC" LIGHTING CONTRACTOR
  - "LCP" LIGHTING CONTROL PANEL
  - "TS" TIME SWITCH
  - "TC" TIME CLOCK

DRAWING/DETAIL REFERENCE KEY

RE: 1 /E3-2 — REFER TO DRAWING/DETAIL NUMBER 1; SHEET NUMBER E3-2

PANELBOARD NOMENCLATURE

5 DP C H A 1
- 5 — SUB PANEL
- DP — AREA
- C — VOLTAGE
  - H: 480Y/277V
  - L: 208Y/120V
- H — BRANCH
  - NONE: NORMAL
  - E: LIFE SAFETY
  - Q: EQUIPMENT
  - C: CRITICAL
  - R: LEGALLY REQUIRED
  - X: OPTIONAL STAND-BY
- A — DISTRIBUTION PANEL (IF APPLICABLE)
- 1 — LEVEL

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REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL: ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER

Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: ELECTRICAL SYMBOL LEGEND

SHEET NUMBER: E0.01

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GENERAL ELECTRICAL NOTES:

A. ELECTRICAL DEVICE LOCATIONS SHOWN ARE NOT EXACT. ALL DEVICE LOCATIONS SHALL BE VERIFIED WITH ARCHITECTURAL MILLWORK, CASEWORK, AND GENERAL ELEVATION VIEWS.

B. HVAC AND PLUMBING EQUIPMENT LOCATIONS ARE NOT EXACT, AND THE EXACT POINT OF CONNECTION TO EQUIPMENT MAY VARY. COORDINATE EXACT ROUGH-IN REQUIREMENTS IN FIELD AND WITH FINAL SUBMITTALS.

C. PROVIDE LABELING OF ALL DEVICES, CONDUIT, PANELS, AND JUNCTION BOXES WITH TYPE-WRITTEN LABEL IDENTIFYING CIRCUIT ON THE BACK OF DEVICE COVER PLATES AND ON COVER OF JUNCTION BOXES IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS.

D. ROOF PENETRATIONS SHALL BE MINIMIZED. WHERE ABLE, ROUTE ALL CONDUIT FOR ROOF MOUNTED EQUIPMENT THROUGH ROOF CURB. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING NECESSARY WATER PROOFING AROUND ROOF PENETRATIONS WITH ROOFING INSTALLER.

E. NEW ELECTRICAL EQUIPMENT LOCATED IN ELECTRICAL ROOMS SHALL BE ARRANGED TO COMPLY WITH LATEST NEC ARTICLE 110.

F. DISTRICT RETAINS FIRST RIGHT OF REFUSAL FOR ALL PARTS AND EQUIPMENT.

G. ELECTRIC METER TIED TO EXISTING B.A.S SYSTEM NEEDS TO BE TIED BACK INTO THE NEW SYSTEM.

GENERAL POWER DEMOLITION NOTES:

A. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS AND LEFT IN THE 'OFF' POSITION.

B. CONTRACTOR SHALL REPORT ANY DAMAGED DEVICES THAT ARE SHOWN AS EXISTING TO REMAIN. ALL DEVICES FOUND TO BE DAMAGED AT THE TIME OF SUBSTANTIAL COMPLETION THAT NOT REPORTED PRIOR TO STARTING WORK SHALL BE REPLACED AT THE CONTRACTOR'S COST.

C. EXISTING RECEPTACLE OR MECHANICAL CIRCUITS MODIFIED IN FIELD SHALL NOT EXCEED 80% CAPACITY BASED ON AMP-RATING OF CIRCUIT.

GENERAL ELECTRICAL DEMOLITION NOTES:

A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE VERIFIED THE EXISTING JOB SITE CONDITIONS DURING THE BIDDING PERIOD TO OBTAIN THE SCOPE OF ELECTRICAL WORK INVOLVED AS A RESULT OF THE ARCHITECTURAL MODIFICATIONS TO THE EXISTING CONDITIONS. THE SCOPE OF WORK SHALL INCLUDE MATERIALS AND OUTLETS, CONSISTING OF FIXTURES, DEVICES, EQUIPMENT OR APPARATUS, WHICH MUST BE REROUTED, RELOCATED OR REMOVED EITHER TEMPORARILY OR PERMANENTLY, OR WHICH MUST BE PROVIDED SO THAT THE REMODELING WORK MAY BE ACCOMPLISHED. NOT ALL EXISTING OUTLETS ARE NECESSARILY INDICATED ON THE DRAWINGS.

B. CONTRACTOR SHALL REVIEW DEMOLITION AND NEW WORK PLANS SIMULTANEOUSLY TO IDENTIFY SCOPE THAT IS TO BE MODIFIED FOR REUSE WITH NEW SCOPE.

C. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL TO ALL REMOVED MATERIALS. CONTRACTOR SHALL COORDINATE WITH OWNER FOR LOCATION TO RETURN ANY AND ALL MATERIAL FOR OWNER STORAGE. FAILURE TO TURN OVER REMOVED MATERIAL TO OWNER MAY REQUIRE CONTRACTOR TO REPLACE EQUIPMENT REMOVED WITH NEW.

D. ALL ABANDONED CONDUIT AND BOXES FOUND IN CRAWLSPACES, CEILINGS SPACES, CHASES, OR UTILITY SPACES SHALL BE REMOVED. EXISTING UNDERGROUND CONDUIT MAY BE ABANDONED. CAP ABANDONED UNDERGROUND CONDUIT FLUSH WITH GRADE.

E. OWNER SHALL RESERVE THE RIGHT TO CLAIM ALL EQUIPMENT AND CABLING REMOVED DURING DEMOLITION.

F. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS REQUIRED BY SCOPE OF REMODEL.

G. ALL ABANDONED MATERIAL SHALL BE REMOVED FROM JOBSITE PRIOR TO PROJECT COMPLETION.

H. IDENTIFICATION AND LABELING SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATIONS.

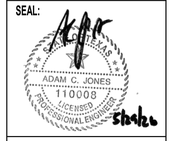
I. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY. CONTRACTOR SHALL RELABEL ALL CIRCUIT DIRECTORIES WITH LOAD NAMES FOR ALL EXISTING AND NEW PANELS THAT WERE MODIFIED WITHIN THIS PROJECT.

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE:

ELECTRICAL GENERAL NOTES

SHEET NUMBER:

E0.11

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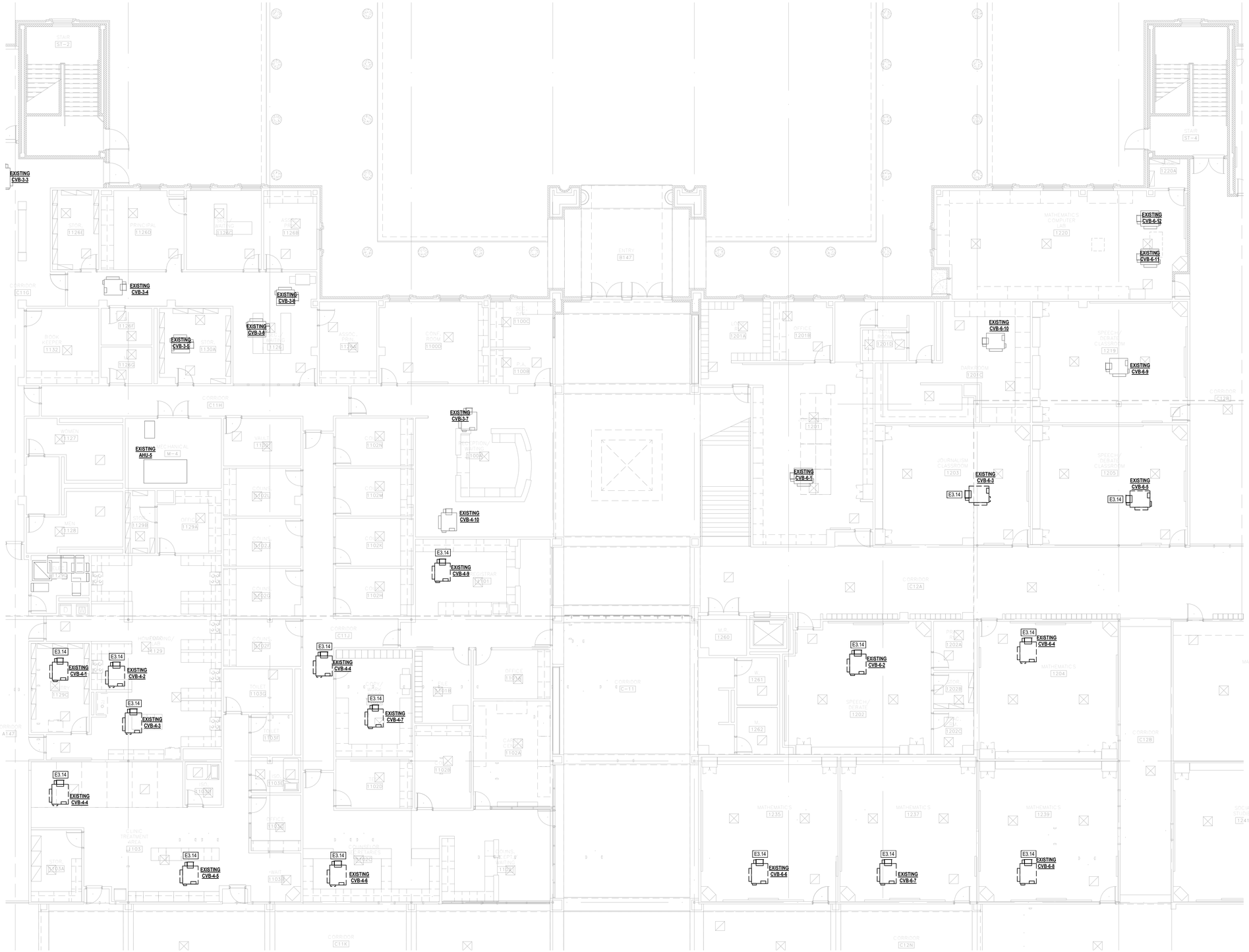
ELECTRICAL KEYED NOTES

E3.14 EXISTING FAN POWERED TERMINAL UNIT TO BE DEMOLISHED AS PART OF ALTERNATE 2.


EXISTING CVB-1-13
EXISTING CVB-1-12
EXISTING CVB-1-11
EXISTING CVB-1-10
EXISTING CVB-3-3
EXISTING CVB-1-9
EXISTING CVB-3-2
EXISTING CVB-1-8
EXISTING AHU-1
EXISTING UH-6
EXISTING AHU-2
VFD-AHU-1 (E)
VFD-AHU-2 (E)
EXISTING HWC-1-1
EXISTING HWC-2-1
EXISTING CVB-1-6
EXISTING CVB-3-1
EXISTING CVB-1-7
EXISTING AHU-3
VFD-AHU-3 (E)
VFD-AHU-4 (E)
EXISTING AHU-4
EXISTING HWC-4-1
TBCA
TBLA.3
TBMA
TBLA
TBHDP1
TB-TA
EXISTING CVB-2-10
EXISTING CVB-2-13
EXISTING CVB-1-14
EXISTING CVB-2-11
EXISTING CVB-2-12
EXISTING CVB-2-9
EXISTING CVB-2-8
EXISTING CVB-1-5
EXISTING CVB-1-4
EXISTING CVB-1-2
EXISTING OAHU-1
EXISTING AHU-14
EXISTING AHU-15
EXISTING OAHU-2
EXISTING CVB-2-7
EXISTING CVB-2-4
EXISTING CVB-2-6
EXISTING CVB-2-5
EXISTING CVB-2-3
EXISTING CVB-2-1
EXISTING CVB-1-3
E3.14
KITCHEN 1123C
FUNCTIONAL LIVING 1123A
FUNCTIONAL LIVING 1123B
VOCATIONAL 1121
TEACHER'S LOUNGE 1124
CORRIDOR C11A
CORRIDOR C11B
CORRIDOR C11C
CORRIDOR C11D
CORRIDOR C11E
CORRIDOR C11F
CORRIDOR C11G
BUSINESS CLASSROOM 1117
PLANNING ROOM 1115
BUSINESS COMPUTER LAB 1116
BUSINESS COMPUTER LAB 1114
BUSINESS COMPUTER LAB 1109
BUSINESS MEETING ROOM 1107
MULTI-PURPOSE ROOM 1113
FAMILY LIVING CLASSROOM 1112
FAMILY LIVING CLASSROOM 1110
MECHANICAL M-1
MECHANICAL M-2
MECHANICAL M-3
STAIR ST-1
STAIR ST-2
STAIR ST-3
STAIR ST-4
BOOK VISTAS 1132
RECEPTION/ WAITING 1119
OFFICE 1119D
ADAPTIVE BEHAVIOR 1118
GYM 1125A
OFFICE 1115K
OFFICE 1115B
OFFICE 1115A
OFFICE 1115J
OFFICE 1115H
OFFICE 1115G
OFFICE 1115F
OFFICE 1115E
OFFICE 1115D
OFFICE 1115C
OFFICE 1115I

ELECTRICAL KEYED NOTES

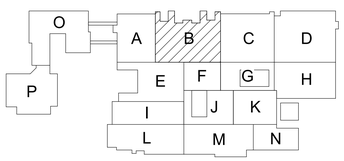
E3.14 EXISTING FAN POWERED TERMINAL UNIT TO BE DEMOLISHED AS PART OF ALTERNATE 2.



1 DEMOLITION ELECTRICAL PLAN LEVEL 1 - AREA B

1/8" = 1'-0"

KEY PLAN



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REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES
110008
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS

Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

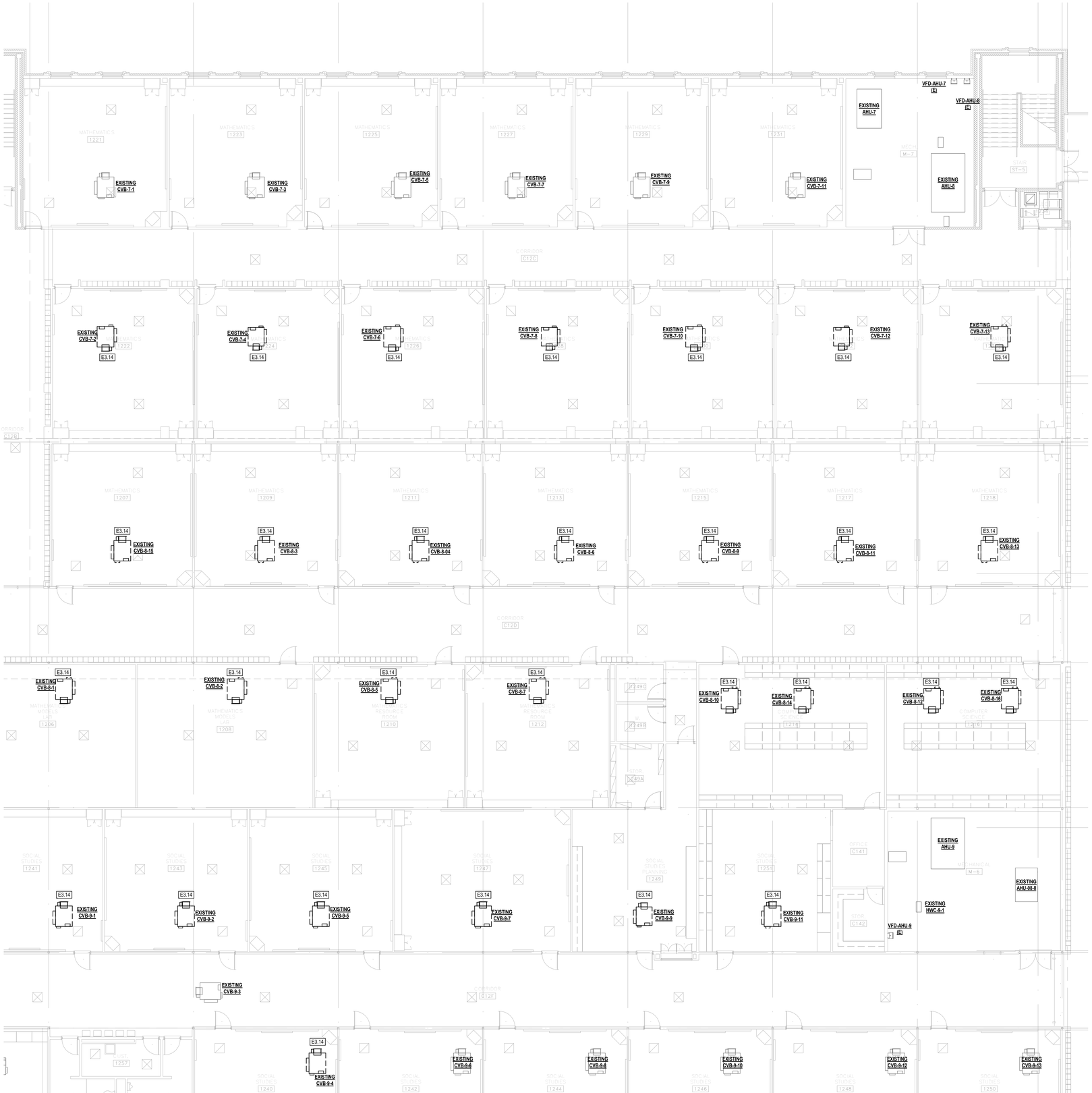
SHEET TITLE: DEMOLITION ELECTRICAL POWER PLAN LEVEL 1 - AREA B

SHEET NUMBER: E2.11B

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ELECTRICAL KEYED NOTES

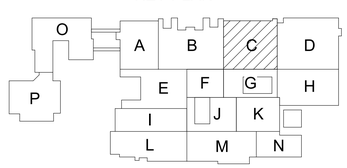
E3.14 EXISTING FAN POWERED TERMINAL UNIT TO BE DEMOLISHED AS PART OF ALTERNATE 2.



1 **DEMOLITION ELECTRICAL PLAN LEVEL 1 - AREA C**
1/8" = 1'-0"

PN

KEY PLAN



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CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION ELECTRICAL POWER PLAN LEVEL 1 - AREA C

SHEET NUMBER: E2.11C

5/29/2026 8:27:07 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

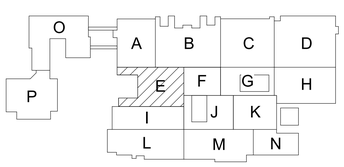
E12.3 EXISTING AIR HANDLING UNIT 'AHU-16' TO BE DEMOLISHED. ALL ELECTRICAL CONNECTIONS SHALL BE DISCONNECTED, REMOVED, AND DISPOSED OF. REMOVE ALL CONDUIT AND WIRE BACK TO PANEL. COORDINATE WITH DIVISION 23 PRIOR TO WORK.



1 DEMOLITION ELECTRICAL PLAN LEVEL 1 - AREA E

1/8" = 1'-0"

KEY PLAN



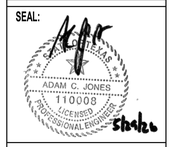
PN

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REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

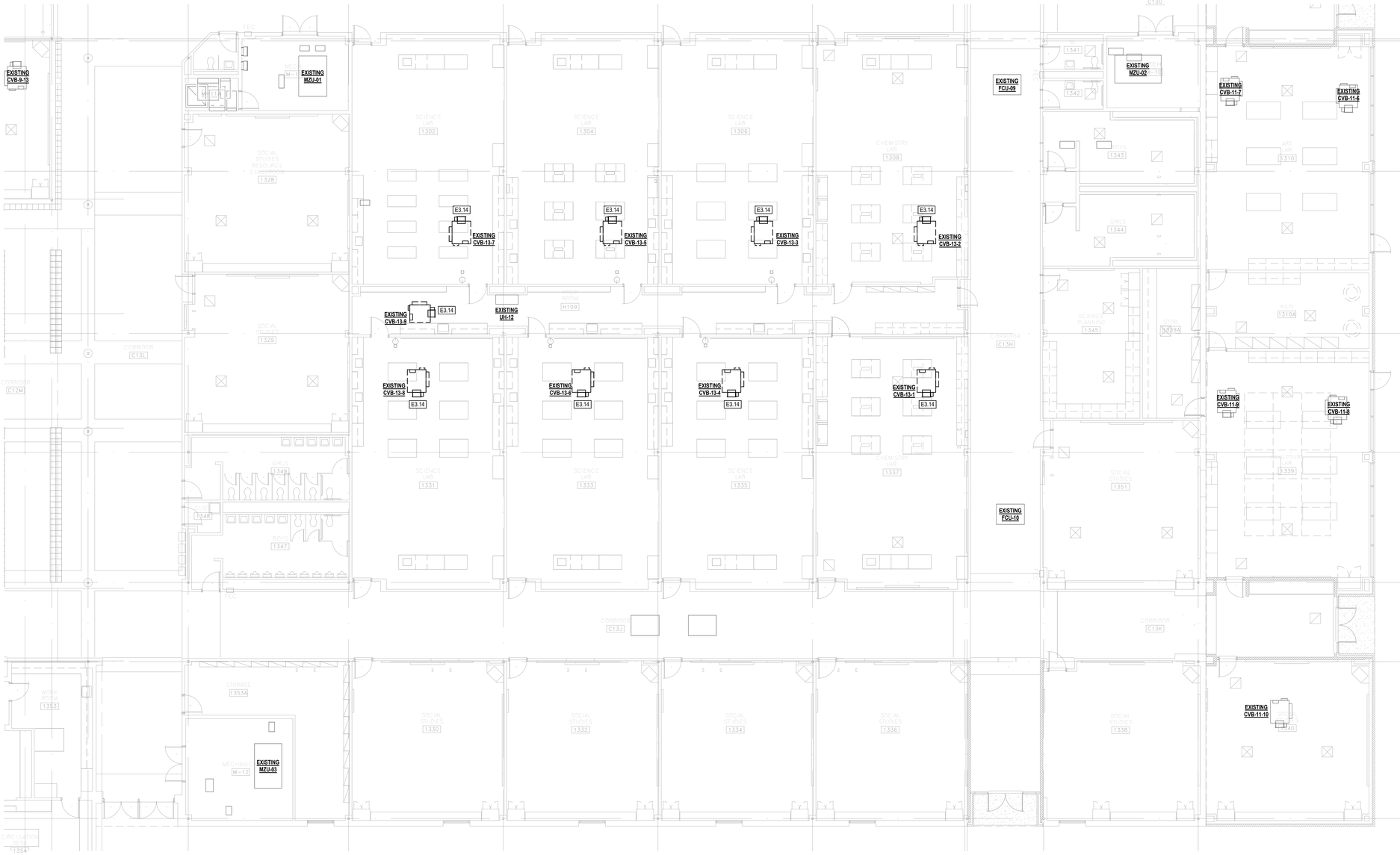
SHEET TITLE: DEMOLITION ELECTRICAL POWER PLAN LEVEL 1 - AREA E

SHEET NUMBER: E2.11E

5/29/2026 8:27:14 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

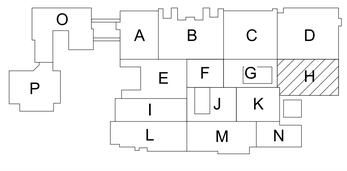
E3.14 EXISTING FAN POWERED TERMINAL UNIT TO BE DEMOLISHED AS PART OF ALTERNATE 2.



1 DEMOLITION ELECTRICAL PLAN LEVEL 1 - AREA H

1/8" = 1'-0"

KEY PLAN



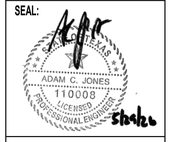
PN

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REVISION:

No.	DATE	DESCRIPTION
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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE:

DEMOLITION ELECTRICAL POWER PLAN LEVEL 1 - AREA H

SHEET NUMBER:

E2.11H

5/29/2026 8:27:22 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

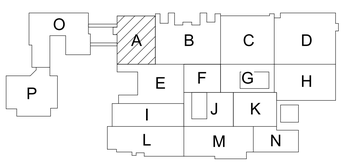
E3.15 AS PART OF ALTERNATE 2: REPLACE EXISTING FAN POWERED TERMINAL UNIT. EXTEND AND RECONNECT EXISTING BRANCH CIRCUIT AND RECONNECT TO NEW FPTU. EXISTING CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. FIELD VERIFY ALL CIRCUIT NUMBERS (TYPICAL).



1 **ELECTRICAL POWER PLAN LEVEL 1 - AREA A**
1/8" = 1'-0"

PN

KEY PLAN



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REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: ELECTRICAL POWER PLAN LEVEL 1 - AREA A

SHEET NUMBER: E2.21A

5/29/2026 8:27:32 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

E3.15 AS PART OF ALTERNATE 2: REPLACE EXISTING FAN POWERED TERMINAL UNIT. EXTEND AND RECONNECT EXISTING BRANCH CIRCUIT AND RECONNECT TO NEW FPTU. EXISTING CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. FIELD VERIFY ALL CIRCUIT NUMBERS (TYPICAL).

E10.2 NOTE: IN FRONT OFFICE (RECEPTION/WAITING RM 1100A), REPLACE EXISTING LIGHTING OVERRIDE SWITCH WITH NEW. THE NEW SWITCH SHALL BE COMPATIBLE WITH THE EXISTING BUILDING LIGHTING CONTROL SYSTEM. FIELD VERIFY MANUFACTURER OF EXISTING LIGHTING CONTROL SYSTEM AND COORDINATE ALL REQUIREMENTS FOR REPLACEMENT WITH THE OWNER AND MANUFACTURER.

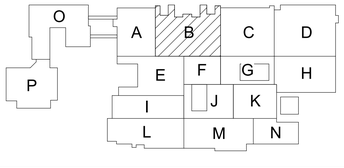


1 ELECTRICAL POWER PLAN LEVEL 1 - AREA B

1/8" = 1'-0"

PN

KEY PLAN



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REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: ELECTRICAL POWER PLAN LEVEL 1 - AREA B

SHEET NUMBER: E2.21B

5/29/2026 8:27:42 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

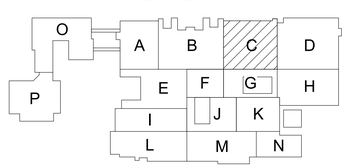
E3.15 AS PART OF ALTERNATE 2: REPLACE EXISTING FAN POWERED TERMINAL UNIT. EXTEND AND RECONNECT EXISTING BRANCH CIRCUIT AND RECONNECT TO NEW FPTU. EXISTING CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. FIELD VERIFY ALL CIRCUIT NUMBERS (TYPICAL).



1 **ELECTRICAL POWER PLAN LEVEL 1 - AREA C**
1/8" = 1'-0"

PN

KEY PLAN

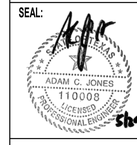


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REVISION:

No.	DATE	DESCRIPTION
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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE:
ELECTRICAL POWER PLAN LEVEL 1 - AREA C

SHEET NUMBER:
E2.21C

5/29/2026 8:27:54 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

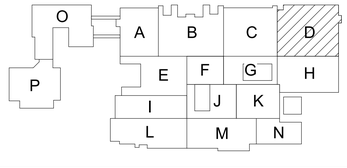
E3.15 AS PART OF ALTERNATE 2: REPLACE EXISTING FAN POWERED TERMINAL UNIT. EXTEND AND RECONNECT EXISTING BRANCH CIRCUIT AND RECONNECT TO NEW FPTU. EXISTING CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. FIELD VERIFY ALL CIRCUIT NUMBERS (TYPICAL).



1 **ELECTRICAL POWER PLAN LEVEL 1 - AREA D**
1/8" = 1'-0"

PN

KEY PLAN



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	05/29/2026	ISSUE FOR PROPOSAL

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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

SHEET TITLE: ELECTRICAL POWER PLAN LEVEL 1 - AREA D

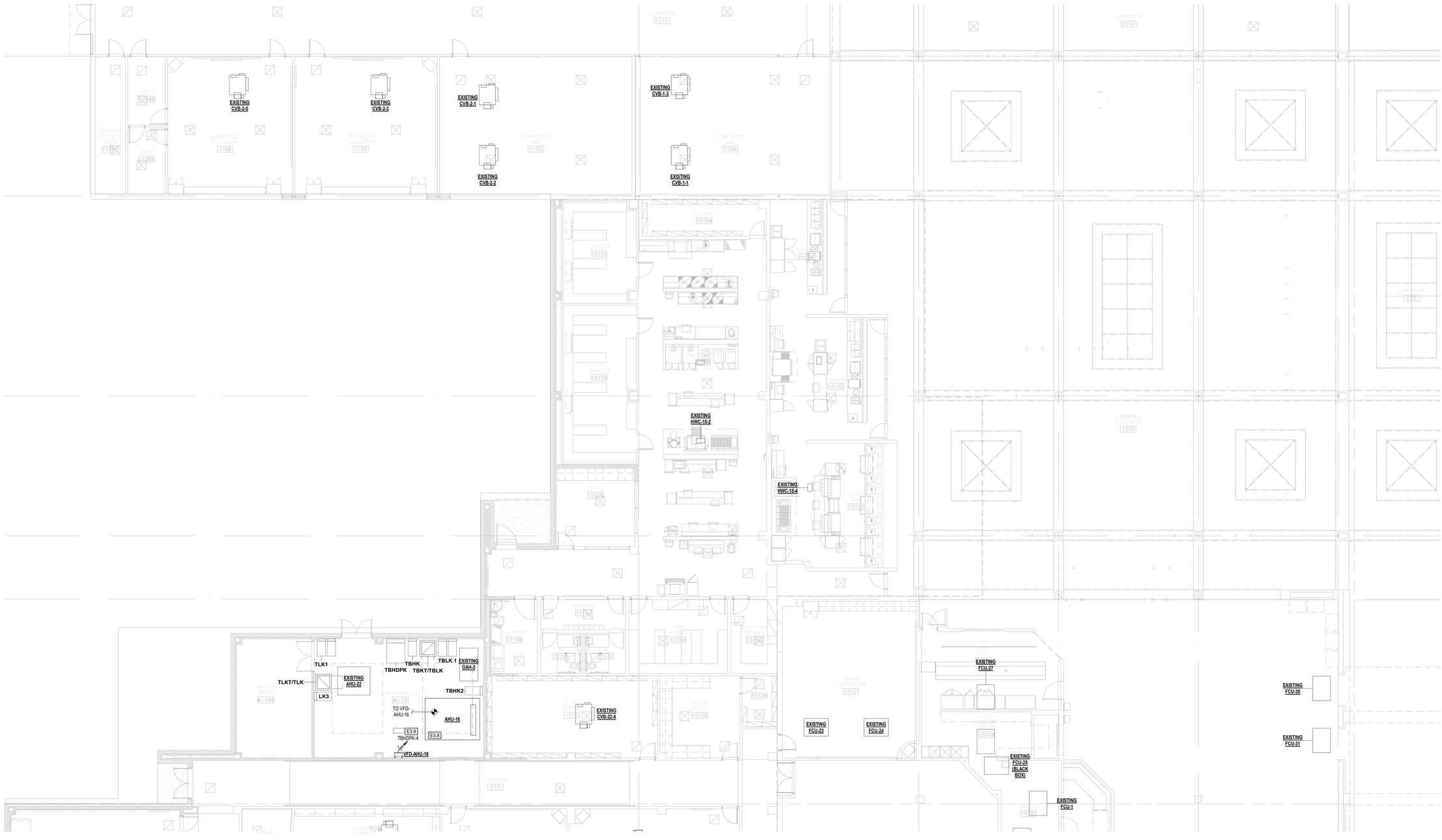
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5/29/2026 8:28:05 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

E3.8 PROVIDE DUCT SMOKE DETECTOR AND FIRE ALARM RELAY FOR MECHANICAL AIR HANDLING EQUIPMENT. COORDINATE WITH FIRE ALARM CONTRACTOR FOR EXACT REQUIREMENTS AND INTEGRATING SMOKE DETECTOR AND FIRE ALARM RELAY TO EXISTING FIRE ALARM POWER SOURCE. FIELD VERIFY LOCATION OF EXISTING FIRE ALARM POWER SOURCE.

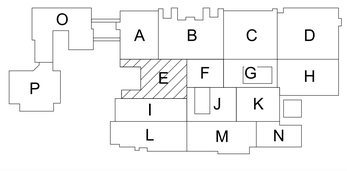
E3.9 REPLACE EXISTING AIR HANDLING UNIT AHU-16, WITH NEW UNIT AS PART OF ALTERNATE 1. DEMOLISH EXISTING BREAKER AND REPLACE WITH NEW BREAKER. PROVIDE NEW WIRE AND CONDUIT BACK TO PANEL. EXISTING CIRCUIT NUMBERS PROVIDED FOR REFERENCE ONLY. FIELD VERIFY CIRCUIT NUMBER. COORDINATE WITH MECHANICAL CONTRACTOR.



1 ELECTRICAL POWER PLAN LEVEL 1 - AREA E

1/8" = 1'-0"

KEY PLAN



PN

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REVISION:

No.	DATE	DESCRIPTION
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ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

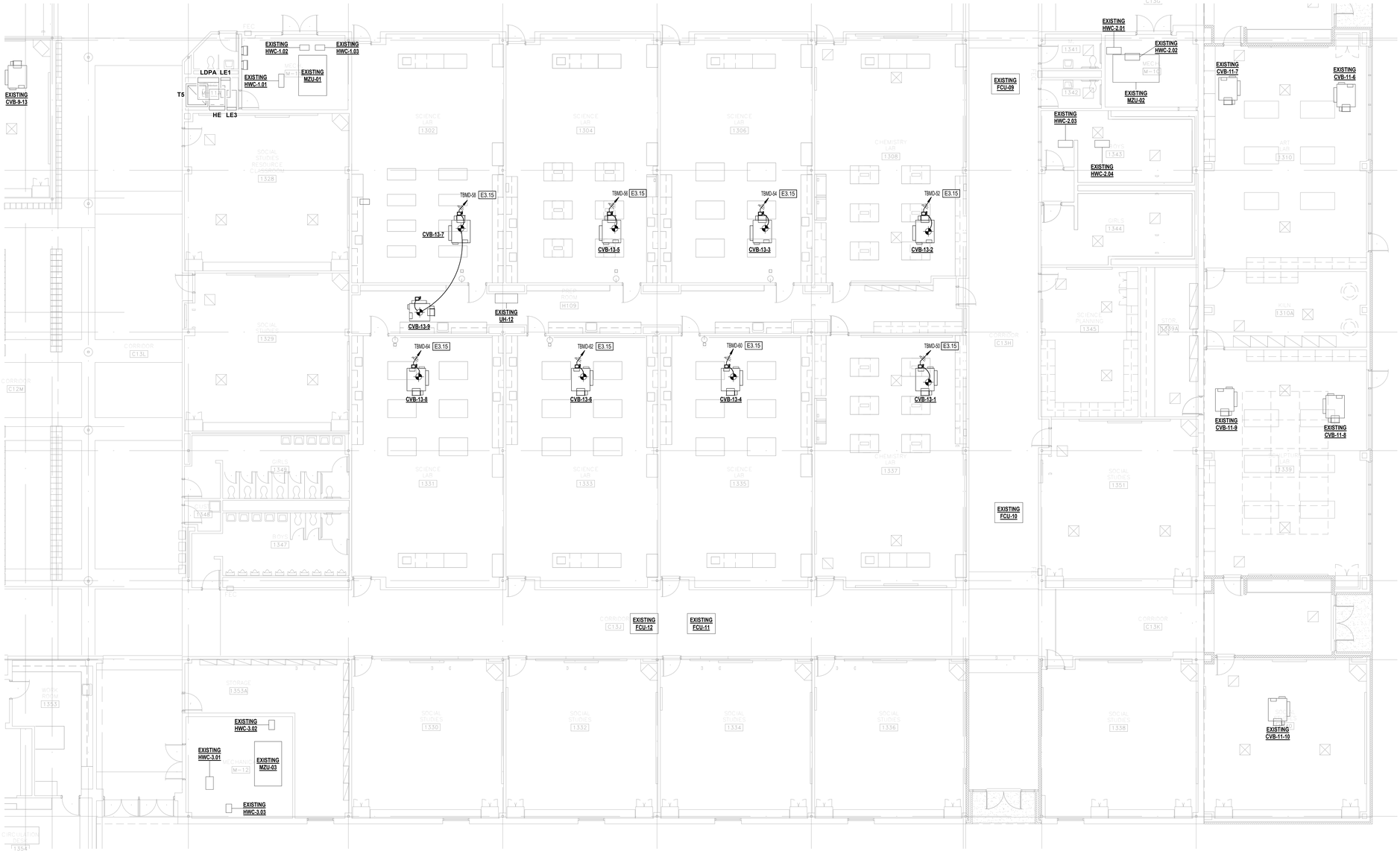
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SHEET NUMBER: E2.21E

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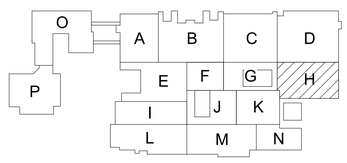
ELECTRICAL KEYED NOTES

E3.15 AS PART OF ALTERNATE 2: REPLACE EXISTING FAN POWERED TERMINAL UNIT. EXTEND AND RECONNECT EXISTING BRANCH CIRCUIT AND RECONNECT TO NEW FPTU. EXISTING CIRCUIT NUMBERS ARE FOR REFERENCE ONLY. FIELD VERIFY ALL CIRCUIT NUMBERS (TYPICAL).



1 ELECTRICAL POWER PLAN LEVEL 1 - AREA H
1/8" = 1'-0"

KEY PLAN



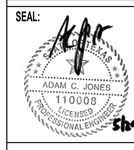
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Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

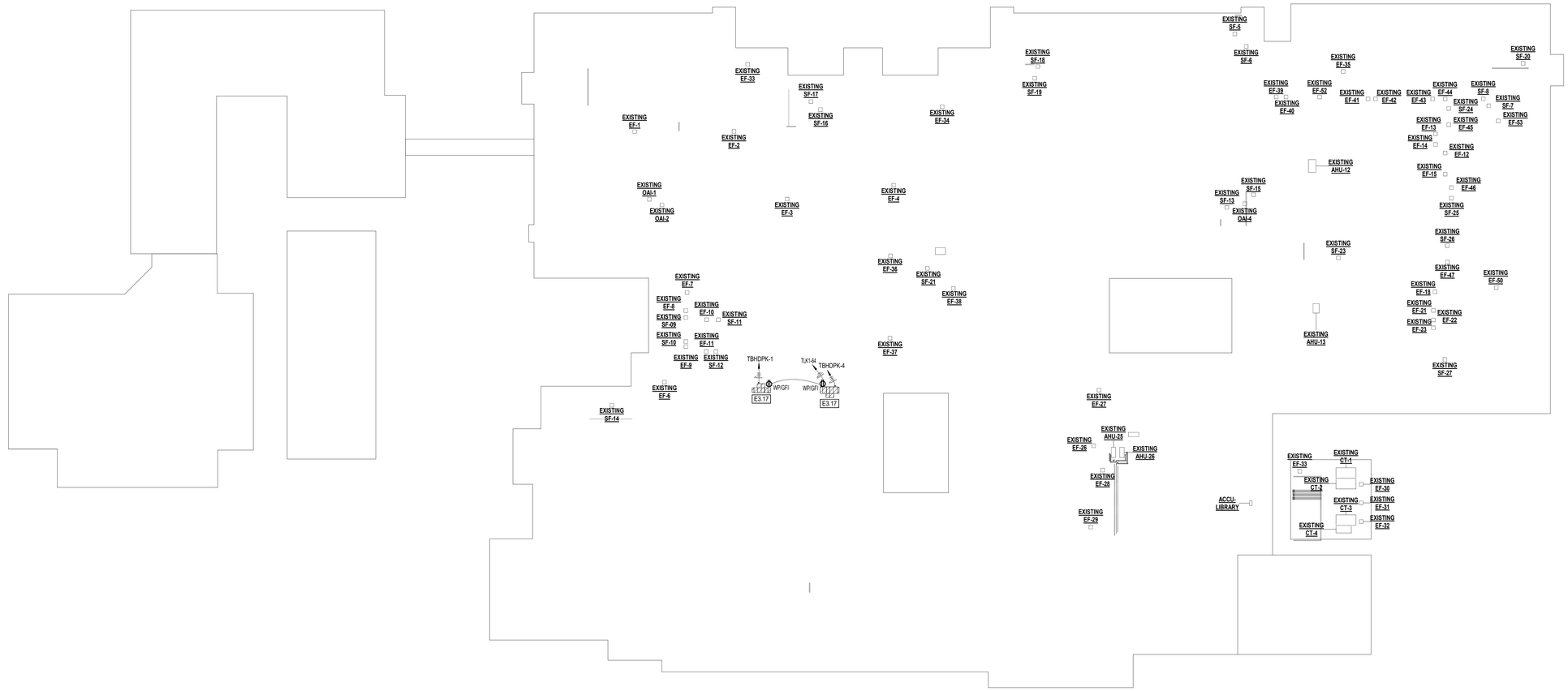
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SHEET NUMBER: E2.21H

5/29/2026 8:28:27 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ELECTRICAL KEYED NOTES

E3.17 PROVIDE POWER FOR NEW ROOF TOP UNIT (RTU). PROVIDE NEW BRANCH CIRCUIT (CONDUIT/WIRE) BACK TO PANEL. CIRCUIT NUMBER PROVIDED FOR REFERENCE ONLY. FIELD VERIFY CIRCUIT NUMBERS. COORDINATE WITH MECHANICAL CONTRACTOR.



1 ELECTRICAL ROOF PLAN
1" = 40'-0"

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Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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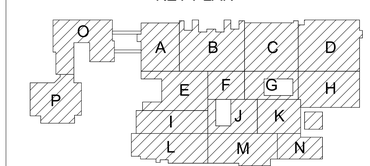
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PROJECT NUMBER 260018.001

SHEET TITLE: ELECTRICAL ROOF PLAN

SHEET NUMBER: E2.31

KEY PLAN



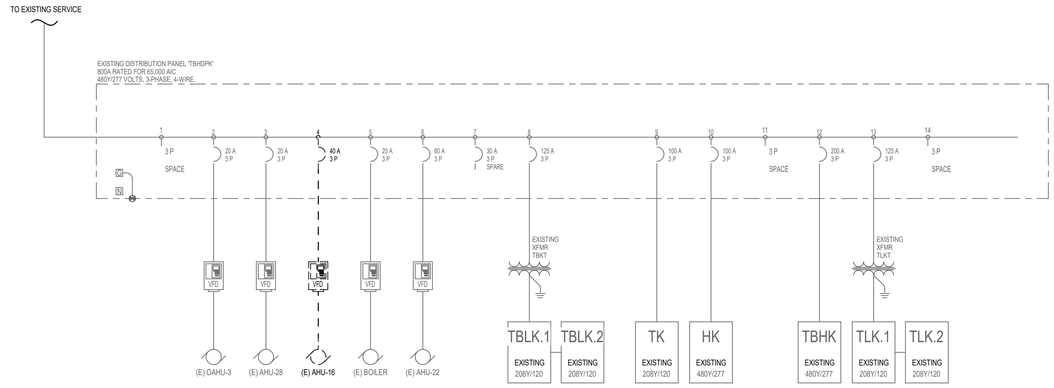
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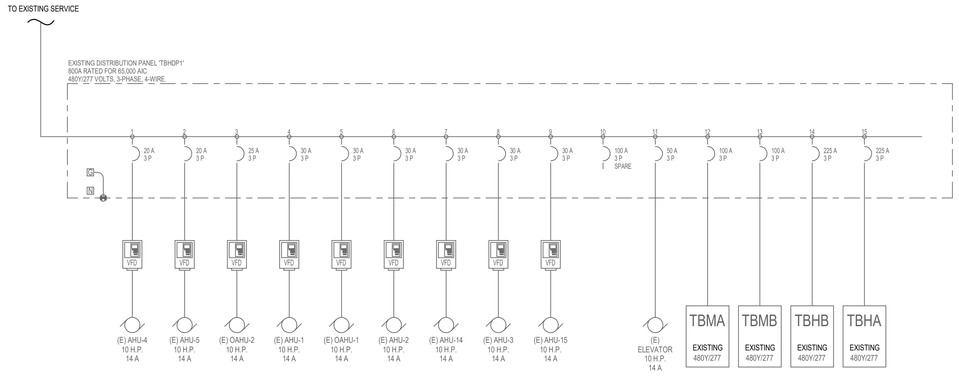
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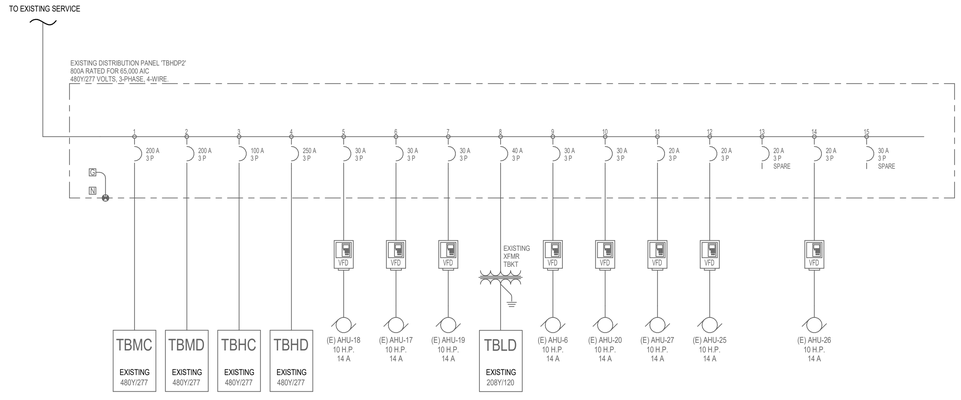
ONE-LINE DIAGRAM GENERAL NOTES:

A. CONTRACTOR SHALL INSTALL FEEDERS BASED ON THE OVERCURRENT DEVICE RATING UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO THE FEEDER SCHEDULE TO OBTAIN AND INSTALL THE FEEDERS REQUIRED.

B. SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION AND CALCULATION. THE LABEL SHALL BE 2" X 3" IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF THE CALCULATION.







1 EXISTING ELECTRICAL ONE LINE DIAGRAM
NOT TO SCALE

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SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
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SEAL:

ADAM C. JONES 110008 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: EXISTING ELECTRICAL ONE-LINE DIAGRAM

SHEET NUMBER: E4.01

5/29/2026 8:28:37 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ONE-LINE DIAGRAM GENERAL NOTES:

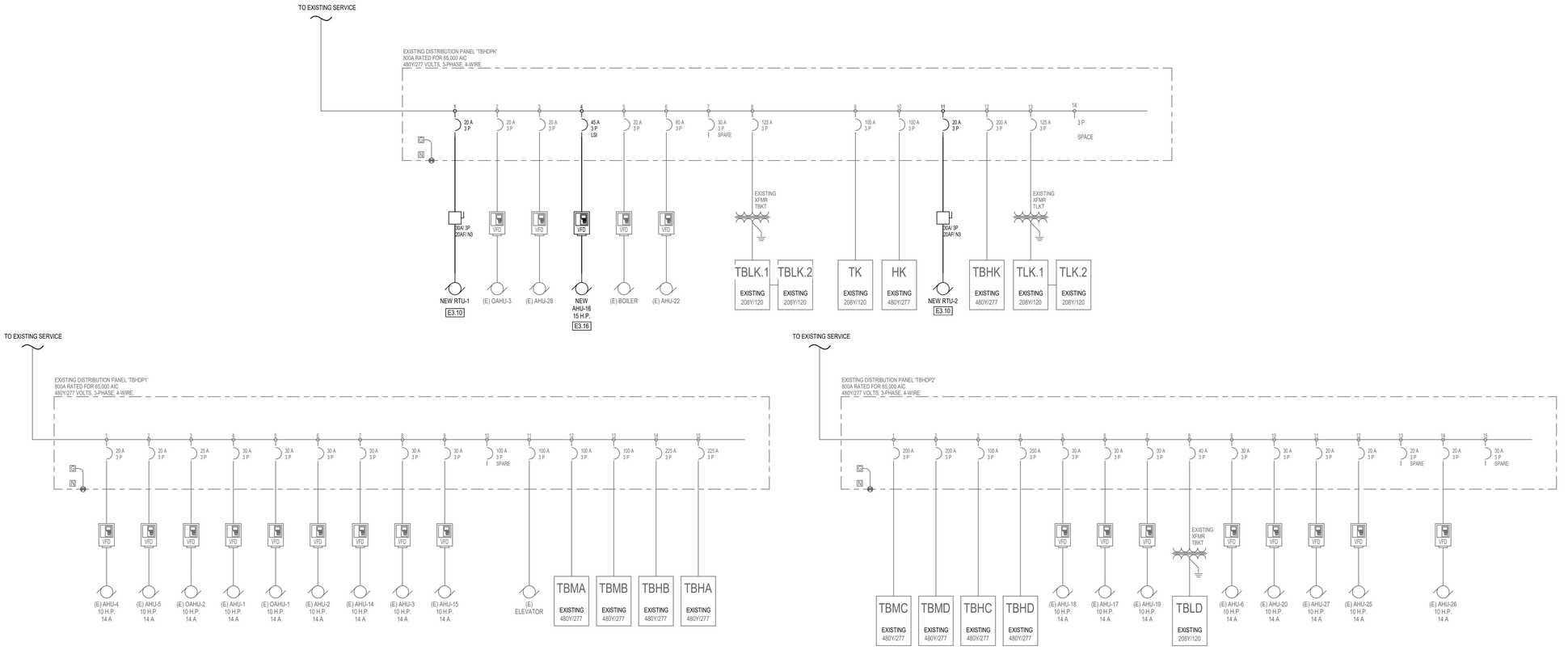
A. CONTRACTOR SHALL INSTALL FEEDERS BASED ON THE OVERCURRENT DEVICE RATING UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO THE FEEDER SCHEDULE TO OBTAIN AND INSTALL THE FEEDERS REQUIRED.

B. SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION AND CALCULATION. THE LABEL SHALL BE 2" X 3" IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF THE CALCULATION.

☐ ELECTRICAL KEYED NOTES

E3.10 PROVIDE POWER FOR NEW ROOF TOP UNIT. PROVIDE NEW 20A 3 POLE BREAKER. PROVIDE NEW WIRE AND CONDUIT BACK TO PANEL. COORDINATE WITH MECHANICAL CONTRACTOR.

E3.16 REPLACE EXISTING AIR HANDLING UNIT AHU-16, WITH NEW UNIT AS PART OF ALTERNATE 1. DEMOLISH EXISTING BREAKER AND REPLACE WITH NEW 45A 3 POLE BREAKER. PROVIDE NEW WIRE AND CONDUIT BACK TO PANEL. CIRCUIT NUMBER PROVIDED FOR REFERENCE ONLY. FIELD VERIFY CIRCUIT NUMBER. COORDINATE WITH MECHANICAL CONTRACTOR.



1 PROPOSED ELECTRICAL ONE LINE DIAGRAM
NOT TO SCALE

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REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: PROPOSED ELECTRICAL ONE-LINE DIAGRAM

SHEET NUMBER: E4.02

5/29/2026 8:28:42 AM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

Panelboard TBMA

65000 A AIC Rating
New
X Existing

480/277 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 100 A MCB -- 100 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
1	776 VA	M	CVB-1-2	12	20 A	1 2	20 A	12	EXISTING CVB-2-4	--	1000 VA	1
1	1000 VA	--	(E) CVB-10-2	12	20 A	3 4	20 A	12	EXISTING CVB-2-6	--	1000 VA	1
1	776 VA	M	CVB-1-5	12	20 A	5 6	20 A	12	EXISTING CVB-2-7	--	1000 VA	1
1	582 VA	M	CVB-1-6	12	20 A	7 8	20 A	12	CVB-2-8	M	582 VA	1
						9 10	20 A	12	CVB-2-9	M	582 VA	1
1	1330 VA	--	EXISTING SF-4	12	20 A	11 12	20 A	12	EXISTING CVB-2-10	--	1000 VA	1
						13 14	20 A	12	EXISTING CVB-2-11	--	1000 VA	1
						15 16						
1	914 VA	--	EXISTING SF-1	12	20 A	17 18	20 A	12	EXISTING SF-14	--	1745 VA	1
						19 20						
						21 22	20 A	12	EXISTING CVB-2-12	--	1000 VA	1
1	1745 VA	--	EXISTING SF-2	12	20 A	23 24	20 A	12	EXISTING CVB-2-13	--	1000 VA	1
						25 26	20 A	12	EXISTING CVB-1-1/1-3	--	1000 VA	1
1	776 VA	M	CVB-1-7	12	20 A	27 28	20 A	12	EXISTING CVB-3-1	--	1000 VA	1
1	776 VA	M	CVB-1-8	12	20 A	29 30	20 A	12	EXISTING CVB-3-2	--	1000 VA	1
1	582 VA	M	CVB-1-9	12	20 A	31 32	20 A	12	EXISTING CVB-3-3	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-10	12	20 A	33 34	20 A	12	EXISTING CVB-2-1/2-2	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-11	12	20 A	35 36	20 A	12	EXISTING CVB-2-3/2-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-12	12	20 A	37 38	20 A	12	EXISTING CVB-17-2	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-13	12	20 A	39 40	20 A	12	EXISTING CVB-17-3	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-1-14	12	20 A	41 42	20 A	12	EXISTING CVB-17-4	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-1	12	20 A	43 44	20 A	12	EXISTING CVB-17-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-2	12	20 A	45 46	20 A	12	EXISTING CVB-17-6	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-3	12	20 A	47 48	20 A	12	EXISTING CVB-17-7	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-4	12	20 A	49 50	20 A	12	EXISTING CVB-17-8	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-5	12	20 A	51 52	20 A	12	EXISTING CVB-18-7	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-22-7	12	20 A	53 54	20 A	12	EXISTING CVB-18-8	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-1	12	20 A	55 56	20 A	12	EXISTING CVB-18-9	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-2	12	20 A	57 58	20 A	12	EXISTING CVB-18-10	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-3	12	20 A	59 60	20 A	12	EXISTING CVB-18-13	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-4	12	20 A	61 62	20 A	12	EXISTING CVB-19-1	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-5	12	20 A	63 64	20 A	12	EXISTING CVB-19-2	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-18-6	12	20 A	65 66	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	67 68	20 A	12	EXISTING LOAD	--	1000 VA	1
	0 VA	--	EXISTING SPARE	12	20 A	69 70	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	71 72	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	73 74	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	75 76	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	77 78	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	79 80	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	81 82	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	83 84	20 A	12	EXISTING SPARE	--	0 VA	

NEC REF:	Load Type	Conn.	Fct.	Diversity	NEC REF:	Load Type	Conn.	Fct.	Diversity
220.47	(R)Receptacle				210.20A	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.50	(MT)Lrg. Motor			
	(M)Misc.	6208 VA	100.00%	6208 VA		(SP)Sub Pnl.			
					630.11B	(W) Welders			

Total Connected Load: 56942 VA VA = 68 A
Total Load (Diversified): 56942 VA VA = 68 A
Location of Panel:

PANEL SCHEDULE NOTES:
1. EXISTING LOAD.

Panelboard TBMB

65000 A AIC Rating
New
X Existing

480/277 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 150 A MCB -- 150 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
1	1000 VA	--	EXIST. CVB-6-1	12	20 A	1 2	20 A	12	CVB-4-2	M	776 VA	1
1	776 VA	M	CVB-6-2	12	20 A	3 4	20 A	12	CVB-4-3	M	776 VA	1
1	776 VA	M	CVB-6-3	12	20 A	5 6	20 A	12	CVB-4-4	M	776 VA	1
						7 8						
1	1000 VA	--	EXIST. EWH-2	12	20 A	9 10	20 A	12	EXISTING SF-16/SF-17	--	3822 VA	1
						11 12						
						13 14	20 A	12	Spare	--	0 VA	
	0 VA	--	Spare	12	20 A	15 16	20 A	12	CVB-4-5	M	582 VA	1
						17 18	20 A	12	CVB-4-6	M	776 VA	1
1	776 VA	M	CVB-6-4	12	20 A	19 20	20 A	12	CVB-4-7	M	582 VA	1
1	776 VA	M	CVB-6-5	12	20 A	21 22	20 A	12	CVB-4-8	M	776 VA	1
1	776 VA	M	CVB-6-6	12	20 A	23 24	20 A	12	CVB-4-9	M	582 VA	1
1	776 VA	M	CVB-6-7	12	20 A	25 26	20 A	12	EXISTING CVB-4-10	--	1000 VA	1
1	776 VA	M	CVB-6-8	12	20 A	27 28	20 A	12	EXISTING CVB-3-4	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-6-9	12	20 A	29 30	20 A	12	EXISTING CVB-3-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-6-10	12	20 A	31 32	20 A	12	EXISTING CVB-3-6	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-6-11	12	20 A	33 34	20 A	12	EXISTING CVB-3-7	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-6-12	12	20 A	35 36	20 A	12	EXISTING CVB-3-8	--	1000 VA	1
1	582 VA	M	CVB-4-1	12	20 A	37 38	20 A	12	EXISTING CVB-18-12	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-19-9A	12	20 A	39 40	20 A	12	EXISTING CVB-19-3	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-19-9B	12	20 A	41 42	20 A	12	EXISTING CVB-19-4	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-19-10	12	20 A	43 44	20 A	12	EXISTING CVB-19-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-19-11	12	20 A	45 46	20 A	12	EXISTING CVB-19-6	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-14	12	20 A	47 48	20 A	12	EXISTING CVB-19-7	--	1000 VA	1
	0 VA	--	EXISTING SPARE	12	20 A	49 50	20 A	12	EXISTING CVB-19-8	--	1000 VA	1
	0 VA	--	EXISTING SPARE	12	20 A	51 52	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	53 54	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	55 56	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	57 58	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	59 60	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	61 62	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	63 64	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	65 66	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	67 68	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	69 70	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	71 72	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	73 74	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	75 76	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	77 78	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	79 80	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	81 82	20 A	12	EXISTING SPARE	--	0 VA	
	0 VA	--	EXISTING SPARE	12	20 A	83 84	20 A	12	EXISTING SPARE	--	0 VA	

NEC REF:	Load Type	Conn.	Fct.	Diversity	NEC REF:	Load Type	Conn.	Fct.	Diversity
220.47	(R)Receptacle				210.20A	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.50	(MT)Lrg. Motor			
	(M)Misc.	11640 VA	100.00%	11640 VA		(SP)Sub Pnl.			
					630.11B	(W) Welders			

Total Connected Load: 39462 VA VA = 47 A
Total Load (Diversified): 39462 VA VA = 47 A
Location of Panel:

PANEL SCHEDULE NOTES:
1. EXISTING LOAD.

Panelboard TBMC

65000 A AIC Rating
New
X Existing

480/277 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 200 A MCB -- 200 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
1	1000 VA	--	EXISTING CVB-7-1	12	20 A	1 2	20 A	12	CVB-8-1	M	776 VA	1
1	776 VA	M	CVB-7-2	12	20 A	3 4	20 A	12	CVB-8-15	M	776 VA	1
1	1000 VA	--	EXISTING CVB-7-3	12	20 A	5 6	20 A	12	CVB-8-3	M	776 VA	1
1	582 VA	M	CVB-7-4	12	20 A	7 8						
						9 10	20 A	12	EXISTING SF-5	--	2500 VA	1
1	2500 VA	--	EXISTING SF-13	12	20 A	11 12						
						13 14						
						15 16	20 A	12	EXISTING SF-6	--	2500 VA	1
1	2500 VA	--	EXISTING SF-18	12	20 A	17 18						
						19 20						
						21 22	30 A	10	EXISTING AHU-7	--	17451 VA	1
1	2500 VA	--	EXISTING SF-19	12	20 A	23 24						
						25 26						
1	1000 VA	--	EXISTING CVB-7-5	12	20 A	27 28	50 A	8	EXISTING AHU-8	--	22437 VA	1
1	776 VA	M	CVB-7-6	12	20 A	29 30						
1	1000 VA	--	EXISTING CVB-7-7	12	20 A	31 32						
1	582 VA	M	CVB-7-8	12	20 A	33 34	50 A	8	EXISTING AHU-9	--	22437 VA	1
1	1000 VA	--	EXISTING CVB-7-9	12	20 A	35 36						
1	776 VA	M	CVB-7-10	12	20 A	37 38	20 A	12	CVB-8-5	M	776 VA	1
1	1000 VA	--	EXISTING CVB-7-11	12	20 A	39 40	20 A	12	CVB-8-6	M	776 VA	1
1	582 VA	M	CVB-7-12	12	20 A	41 42	20 A	12	CVB-8-7	M	776 VA	1
1	776 VA	M	CVB-7-13	12	20 A	43 44	20 A	12	EXISTING LOAD	--	0 VA	1
1	776 VA	M	CVB-9-1	12	20 A	45 46	20 A	12	CVB-8-11	M	776 VA	1
1	776 VA	M	CVB-9-2	12	20 A	47 48	20 A	12	CVB-8-10	M	776 VA	1
1	776 VA	M	CVB-8-4	12	20 A	49 50	20 A	12	CVB-8-9	M	776 VA	1
1	776 VA	M	CVB-9-5	12	20 A	51 52	20 A	12	CVB-8-12	M	776 VA	1
1	776 VA	M	CVB-9-7	12	20 A	53 54	20 A	12	CVB-8-13	M	776 VA	1
1	582 VA	M	CVB-8-9	12	20 A	55 56	20 A	12	CVB-8-14	M	776 VA	1
1	776 VA	M	CVB-9-11	12	20 A	57 58	20 A	12	CVB-8-2	M	776 VA	1
1	1000 VA	--	EXISTING CVB-20-15	12	20 A	59 60	20 A	12	EXISTING LOAD	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-2	12	20 A	61 62	20 A	12	CVB-8-16	M	776 VA	1
1	1000 VA	--	EXISTING CVB-20-4	12	20 A	63 64	20 A	12	EXISTING CVB-20-3	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-6	12	20 A	65 66	20 A	12	EXISTING CVB-20-5	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-8	12	20 A	67 68	20 A	12	EXISTING CVB-20-7	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-10	12	20 A	69 70	20 A	12	EXISTING CVB-20-9	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-12	12	20 A	71 72	20 A	12	EXISTING CVB-20-11	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-20-13	12	20 A	73 74	20 A	12	EXISTING CVB-9-10	--	1000 VA	1
1	776 VA	M	CVB-9-4	12	20 A	75 76	20 A	12	EXISTING CVB-9-12	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-9-6	12	20 A	77 78	20 A	12	EXISTING CVB-9-13	--	1000 VA	1
1	1000 VA	--	EXISTING CVB-9-8	12	20 A	79 80	20 A	12	EXISTING CVB-20-11	--	1000 VA	1
1	0 VA	--	EXISTING LOAD	12	20 A	81 82	20 A	12	EXISTING LOAD	--	0 VA	1
1	0 VA	--	EXISTING LOAD	12	20 A	83 84	20 A	12	EXISTING LOAD	--	0 VA	1

NEC REF:	Load Type	Conn.	Fct.	Diversity	NEC REF:	Load Type	Conn.	Fct.	Diversity
220.47	(R)Receptacle				210.20A	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.50	(MT)Lrg. Motor			
	(M)Misc.	21728 VA	100.00%	21728 VA		(SP)Sub Pnl.			
					630.11B	(W) Welders			

Total Connected Load: 122553 VA VA = 147 A
Total Load (Diversified): 122553 VA VA = 147 A
Location of Panel:

PANEL SCHEDULE NOTES:
1. EXISTING LOAD.

Panelboard TBMD

65000 A AIC Rating
New
X Existing

480/277 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 200 A MCB -- 200 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
1	1000 VA	--	(E) CVB-10-1	12	20 A	1 2	20 A	12	CVB-12-1	M	776 VA	1
1	1000 VA	--	(E) CVB-10-2	12	20 A	3 4	20 A	12	CVB-12-2	M	776 VA	1
1	1000 VA	--	(E) CVB-10-3	12	20 A	5 6	20 A	12	CVB-12-3	M	776 VA	1
1	582 VA	M	CVB-10-4	12	20 A	7 8	20 A	12	CVB-12-9	M	582 VA	1
1	582 VA	M	CVB-10-5	12	20 A	9 10	20 A	12	CVB-12-8	M	776 VA	1
1	1000 VA	--	(E) CVB-10-6	12	20 A	11 12	20 A	12	CVB-12-6	M	776 VA	1
1	1000 VA	--	(E) CVB-10-7	12	20 A	13 14						
						15 16	20 A	12	(E) SF-8	--	1330 VA	1
1	2500 VA	--	(E) SF-20	12	20 A	17 18						
						19 20						
						21 22	20 A	12	(E) SF-23	--	2500 VA	1
1	2500 VA	--	(E) SF-7	12	20 A	23 24						
						25 26						
						27 28	20 A	12	(E) SF-27	--	2500 VA	1
1	22437 VA	--	(E) AHU-21	12	20 A	29 30						
						31 32	20 A	12	CVB-12-7	M	776 VA	1
1	1000 VA	--	(E) CVB-10-8	12	20 A	33 34	20 A	12	CVB-12-4	M	776 VA	1
						35 36	20 A	12	Spare	--	0 VA	
1	0 VA	--	EXISTING LOAD	12	20 A	37 38	20 A	12	Spare	--	0 VA	
						39 40	20 A	12	CVB-12-5	M	776 VA	1
1	1000 VA	--	(E) CVB-11-4	12	20 A	41 42	20 A	12	(E) CVB-11-1	--	1000 VA	1
	0 VA	--	Spare	12	20 A	43 44						
	0 VA	--	Spare	12	20 A	45 46	20 A	12	(E) SF-22	--	2500 VA	1
	0 VA	--	Spare	12	20 A	47 48						
	0 VA	--	Spare	12	20 A	49 50	20 A	12	CVB-13-1	M	776 VA	1
	0 VA	--	Spare	12	20 A	51 52	20 A	12	CVB-13-2	M	776 VA	1
1	1000 VA	--	(E) CVB-11-7	12	20 A	53 54	20 A	12	CVB-13-3	M	776 VA	1
1	1000 VA	--	(E) CVB-11-8	12	20 A	55 56	20 A	12	CVB-13-5	M	776 VA	1
1	1000 VA	--	(E) CVB-11-9	12	20 A	57 58	20 A	12	CVB-13-7/CVB-13-9	M	1358 VA	1
1	1000 VA	--	(E) CVB-11-10	12	20 A	59 60	20 A	12	CVB-13-4	M	776 VA	1
	0 VA	--	Spare	12	20 A	61 62	20 A	12	CVB-13-6	M	776 VA	1
1	1000 VA	--	(E) CVB-21-1	12	20 A	63 64	20 A	12	CVB-13-8	M	776 VA	1
	0 VA	--	Spare	12	20 A	65 66	20 A	12	(E) CVB-21-8	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-6	12	20 A	67 68	20 A	12	(E) CVB-21-10	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-2	12	20 A	69 70	20 A	12	(E) CVB-21-12	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-3	12	20 A	71 72	20 A	12	(E) CVB-21-15	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-13	12	20 A	73 74	20 A	12	(E) CVB-21-7	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-14	12	20 A	75 76	20 A	12	(E) CVB-21-9	--	1000 VA	1
1	1000 VA	--	(E) CVB-21-14	12	20 A	77 78	20 A	12	(E) CVB-21-11	--	1000 VA	1
						79 80						
1	17451 VA	--	(E) AHU-10	10	30 A	81 82	30 A	10	(E) AHU-11	--	11634 VA	1
						83 84						

NEC REF:	Load Type	Conn.	Fct.	Diversity	NEC REF:	Load Type	Conn.	Fct.	Diversity
220.47	(R)Receptacle				210.20A	(L)Lighting			
220.56	(K)Kitchen					(EL)Ext. Ltg.			
220.60	(C)Cooling			0 VA	620.14	(E)Elevators			
220.60	(H)Heating			0 VA		(WH)Wat. Htr.			
220.60	(F)Fans				220.50	(MT)Lrg. Motor			
	(M)Misc.	14744 VA	100.00%	14744 VA		(SP)Sub Pnl.			
					630.11B	(W) Welders			

Total Connected Load: 106096 VA VA = 128 A
Total Load (Diversified): 106096 VA VA = 128 A
Location of Panel:

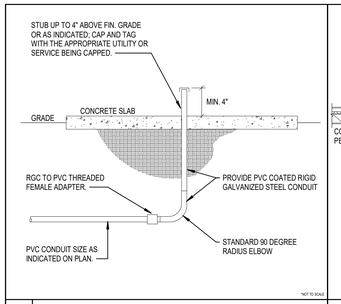
PANEL SCHEDULE NOTES:
1. EXISTING LOAD.

Panelboard TLK1

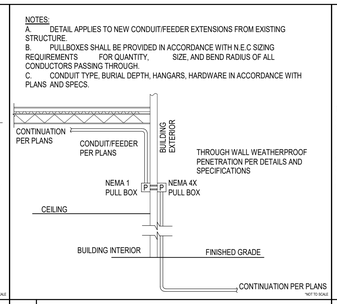
10000 A AIC Rating
New
X Existing

120/208 Wye Volt, 3 Phase, 4 Wire | 2 Section | Type 1 -Nema Rating | Mains Type: MCB | 225 A MCB -- 225 A BUS (Copper) -- | LUGS: -- -- | Mounting Stye: SURFACE

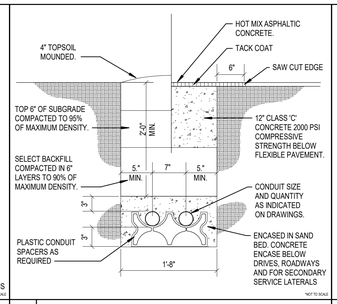
NOTE	LOAD (VA)	TYPE	DESCRIPTION	WIRE	CB	CKT	CB	WIRE	DESCRIPTION	TYPE	LOAD (VA)	NOTE
	0 VA	--	EXISTING SHUNT TRIP	12	--	1 2	20 A	12	EXISTING EXHAUST HOOD	--	1000 VA	1
1	1000 VA	--	EXISTING PIZZA OVEN	12	20 A	3 4	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	5 6	20 A	12	EXISTING EXHAUST HOOD	--	1000 VA	1
1	1000 VA	--	EXISTING EXHAUST HOOD	12	20 A	7 8	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	9 10	20 A	12	EXISTING CONVECTION...	--	1000 VA	1
1	1000 VA	--	EXISTING EXHAUST HOOD	12	20 A	11 12	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	13 14	20 A	12	EXISTING CONVECTION...	--	1000 VA	1
1	1000 VA	--	EXISTING CONVECTOR OVEN	12	20 A	15 16	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	17 18	20 A	12	EXISTING CONVECTION...	--	1000 VA	1
1	1000 VA	--	EXISTING CONVECTOR OVEN	12	20 A	19 20	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	21 22	20 A	12	EXISTING FIRE PROT....	--	500 VA	1
1	1000 VA	--	EXISTING CONVECTOR OVEN	12	20 A	23 24	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	25 26	20 A	12	EXISTING FIRE PROT....	--	500 VA	1
1	500 VA	--	EXISTING FIRE PROT....	12	20 A	27 28	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	29 30	20 A	12	EXISTING WARMING LAMP	--	1000 VA	1
1	500 VA	--	EXISTING FIRE PROT....	12	20 A	31 32	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	33 34	20 A	12	EXISTING WARMING LAMP	--	1000 VA	1
1	1000 VA	--	EXISTING WARMING LAMP	12	20 A	35 36	--	12	EXISTING SHUNT TRIP	--	0 VA	
	0 VA	--	EXISTING SHUNT TRIP	12	--	37 38	20 A	12	EXISTING FRYER FILTER	--	1000 VA	1
1	1000 VA	--	EXISTING LOAD	12	20 A	39 40	--	12	EXISTING SHUNT TRIP	--	0 VA	
1	1000 VA	--	EXISTING LOAD	12	20 A	41 42	20 A	12	EXISTING LOAD	--	1000 VA	1
	0 VA	--	EXISTING SHUNT TRIP	12	--	43 44						
1	1000 VA	--	EXISTING BRAISING PAN	12	20 A	45 46	20 A	12	EXISTING SPARE	--	0 VA	
						47 48						
1	2000 VA	--	EXISTING HEATED CABINET	12	20 A	49 50						
						51 52	20 A	12	EXISTING SPARE	--	0 VA	
1	2000 VA	--	EXISTING HEATED CABINET	12	20 A	53 54						
						55 56						
1	10000 VA	--	EXISTING LOAD CENTER	4	70 A	57 58	20 A	12	EXISTING DISPOSAL	--	1700 VA	1
						59 60						
						61 62	--	12	EXISTING SPACE	--	0 VA	
1	1700 VA	--	EXISTING DISPOSAL	12



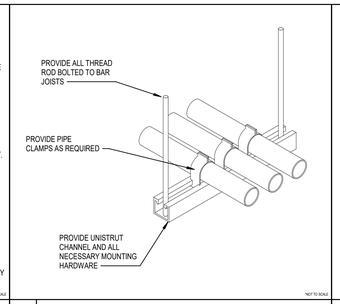
5 CONDUIT STUB-UP E1604



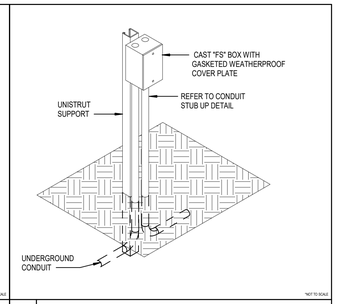
4 EXISTING BUILDING PENETRATION E1604



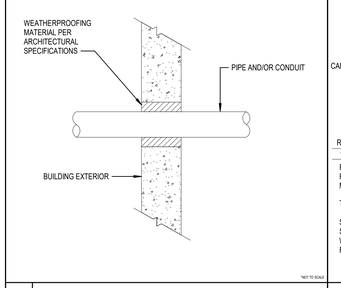
3 CONDUIT BURIAL E1604



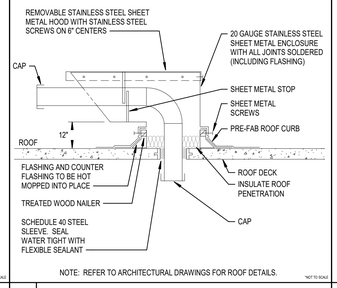
2 UNISTRUT CONDUIT E1604



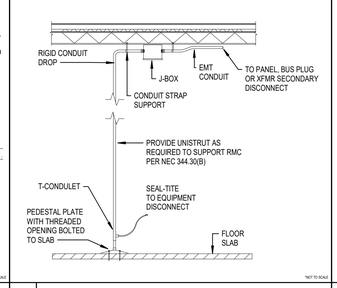
1 JUNCTION BOX MOUNTING E1602



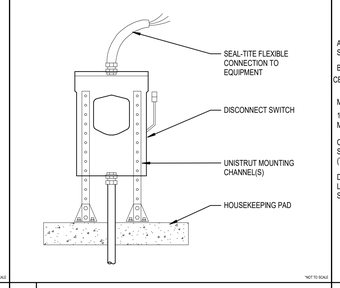
10 PIPE AND/OR CONDUIT PENETRATION E1604



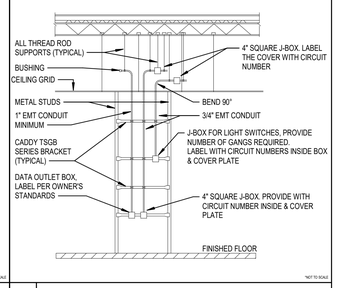
9 ROOF CONDUIT PENETRATION E1604



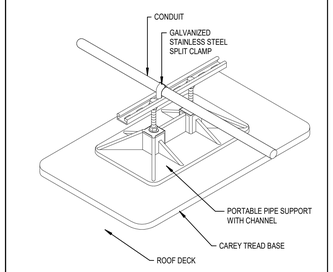
8 RIGID CONDUIT DROP TO EQ. DISCONNECT E1602



7 DISCONNECT SWITCH MOUNTING AT CONCRETE PAD E1604



6 CONDUIT ROUGH-IN 1 E1602



11 ROOF CONDUIT SUPPORT E1602

FEEDER SCHEDULE
COPPER ONLY

RATING	SETS	CONDUCTOR SIZE	CONDUIT
30A	1	4#10, 1#10 G.	3/4"
40A	1	4#8, 1#10 G.	1"
50A	1	4#8, 1#10 G.	1"
60A	1	4#6, 1#10 G.	1"
70A	1	4#4, 1#8 G.	1 1/4"
80A	1	4#4, 1#8 G.	1 1/4"
90A	1	4#3, 1#8 G.	1 1/4"
100A	1	4#3, 1#8 G.	1 1/4"
125A	1	4#1, 1#6 G.	1 1/2"
150A	1	4#1/0, 1#6 G.	1 1/2"
175A	1	4#2/0, 1#6 G.	2"
200A	1	4#3/0, 1#6 G.	2"
225A	1	4#4/0, 1#4 G.	2 1/2"
250A	1	4#250, 1#4 G.	2 1/2"
300A	1	4#350, 1#4 G.	3"
350A	1	4#500, 1#3 G.	3 1/2"
400A	1	4#600, 1#3 G.	4"
450A	2	4#4/0, 1#2 G.	2 1/2"
500A	2	4#250, 1#2G.	2 1/2"
600A	2	4#350, 1#1G.	3"
700A	2	4#500, 1#1/0G.	4"
800A	2	4#600, 1#1/0G.	4"
1000A	3	4#500, 1#2/0G.	4"
1200A	4	4#350, 1#3/0G.	3"
1600A	4	4#600, 1#4/0G.	4"
	5	4#500, 1#4/0G.	4"
2000A	5	4#600, 1#250 G.	4"
	6	4#500, 1#250 G.	4"
2500A	6	4#600, 1#350 G.	4"
	7	4#500, 1#350 G.	4"
3000A	8	4#500, 1#400 G.	4"
3500A	9	4#600, 1#500 G.	4"
	10	4#500, 1#500 G.	4"
4000A	10	4#600, 1#500 G.	4"
	11	4#500, 1#500 G.	4"
5000A	12	4#600, 1#750 G.	4"
	14	4#500, 1#750 G.	4"

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
2. GROUND NOT REQUIRED AT SERVICE LATERAL.

1-PHASE 3-WIRE FEEDER SCHEDULE
COPPER ONLY

RATING	SETS	CONDUCTOR SIZE	CONDUIT
30A	1	3#10, 1#10 G.	3/4"
40A	1	3#8, 1#10 G.	3/4"
50A	1	3#8, 1#10 G.	3/4"
60A	1	3#6, 1#10 G.	1"
70A	1	3#4, 1#8 G.	1"
80A	1	3#4, 1#8 G.	1"
90A	1	3#3, 1#8 G.	1 1/4"
100A	1	3#3, 1#8 G.	1 1/4"
125A	1	3#1, 1#6 G.	1 1/4"
150A	1	3#1/0, 1#6 G.	1 1/2"
175A	1	3#2/0, 1#6 G.	1 1/2"
200A	1	3#3/0, 1#6 G.	2"
225A	1	3#4/0, 1#4 G.	2"
250A	1	3#250, 1#4 G.	2 1/2"
300A	1	3#350, 1#4 G.	2 1/2"
350A	1	3#500, 1#3 G.	3"
400A	1	3#600, 1#3 G.	3 1/2"
450A	2	3#4/0, 1#2 G.	2"
500A	2	3#250, 1#2G.	2 1/2"
600A	2	3#350, 1#1G.	3"
700A	2	3#500, 1#1/0G.	3 1/2"
800A	2	3#600, 1#1/0G.	3 1/2"
1000A	3	3#500, 1#2/0G.	3"
1200A	4	3#350, 1#3/0G.	3"
1600A	4	3#600, 1#4/0G.	3 1/2"
	5	3#500, 1#4/0G.	3"
2000A	5	3#600, 1#250G.	3 1/2"
	6	3#500, 1#250G.	3"
2500A	6	3#600, 1#350G.	3 1/2"
	7	3#500, 1#350G.	3 1/2"
3000A	8	3#500, 1#400G.	3 1/2"
3500A	9	3#600, 1#500G.	3 1/2"
	10	3#500, 1#500G.	3 1/2"
4000A	10	3#600, 1#500G.	3 1/2"
	11	3#500, 1#500G.	3 1/2"

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
2. GROUND NOT REQUIRED AT SERVICE LATERAL.

Load Analysis - Tomball HS
480 / 277 , 3 -PHASE, 4 -WIRE **Date: 5/1/2025**

DESCRIPTION		NEC	KVA
EXISTING			
ESTIMATED EXIST. BLDG. LOAD:	321,539 S.F X 10.0 W/S.F		3215.4
DEMOLISHED LOAD			
AHU-16:	-22,437 VA		-22.4
NEW HVAC LOADS:			
AHU-16:	21,814 VA		21.8
RTU 1,2:	9,640 VA		9.6
		TOTAL =	3230.9
		TOTAL AMPS:	3886.2
		SERVICE SIZE:	4000.0
		SPARE AMPACITY:	113.8

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
ADAM C. JONES, 110009, LICENSED PROFESSIONAL ENGINEER, STATE OF TEXAS

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade
30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: ELECTRICAL DETAILS AND SCHEDULES
SHEET NUMBER: E6.01

5/28/2026 2:19:04 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

ABBREVIATIONS

A

A	AIR (COMPRESSED)
ABV	ABOVE
A/C	AIR CONDITIONING
AC	ALTERNATING CURRENT, AIR COMPRESSOR
ACCH	AIR COOLED CHILLER
ACCU	AIR COOLED CONDENSING UNIT
AD	ACCESS DOOR, AREA DRAIN
ADJ	ADJUSTABLE
AF	AIR FILTER
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHRI	AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE
AHU	AIR HANDLING UNIT
AL	ALUMINUM
AMB	AMBIENT
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARCH	ARCHITECT, ARCHITECTURAL
AS	AIR SEPARATOR
ASHP	AIR SOURCE HEAT PUMP
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
AVG	AVERAGE
AWS	AMERICAN WELDING SOCIETY
AUX	AUXILIARY

B

B	BOILER
BC	BELOW COUNTER
B/C	BACK OF CURB
BFF	BELOW FINISHED FLOOR
BFV	BUTTERFLY VALVE
BLDG	BUILDING
BM	BENCHMARK
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STRUCTURE
BP	BACKFLOW PREVENTER
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE

C

C	CELSIUS
CAB	CABINET
CD	CONDENSATE DRAIN LINE
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CH	CHILLER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CHW	CHILLED WATER
CHWP	CHILLED WATER PUMP
CI	CAST IRON
CIRC	CIRCULATING
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
COMB	COMBINATION
COMP	COMPRESSOR
CONC	CONCRETE, CONCENTRIC
COND	CONDENSER, CONDENSATE
CONN	CONNECTION
CONT	CONTINUOUS,CONTINUATION
CTR	CENTER
CU	COPPER
CV	CONSTANT VOLUME

D

D	DEPTH, DRAIN, DRYER
DB	DRY BULB
DC	DIRECT CURRENT
DDC	DIRECT DIGITAL CONTROL
DOMB	DUAL DUCT MIXING BOX
DESIG	DESIGNATION
DTL	DETAIL
DIA	DIAMETER
DIFF	DIFFUSER
DIM	DIMENSION
DISC	DISCONNECT
DN	DOWN
DPR	DAMPER
DW	DISHWASHER
DWG	DRAWING
DX	DIRECT EXPANSION

E

EA	EACH
EAT	ENTERING AIR TEMPERATURE
EC	ELECTRICAL CONTRACTOR
ECC	ECCENTRIC
EDB	ENTERING DRY BULB
EDH	ELECTRIC DUCT HEATER
EF	EXHAUST FAN
EFF	EFFICIENCY
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
EMERG	EMERGENCY
ENCL	ENCLOSURE
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETD	EXISTING TO BE DEMOLISHED
ETR	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EVAP	EVAPORATOR
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
EX	EXPLOSION PROOF
EXT	EXTERNAL
EXTG	EXISTING

F

F	FAHRENHEIT, FIRE
FBO	FURNISHED BY OTHERS
FCU	FAN COIL UNIT
FD	FLOOR DRAIN, FIRE DAMPER
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR
FPTU	FAN POWERED TERMINAL UNIT
FT	FOOT, FEET
FUT	FUTURE

G

G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GLV	GLOBE VALVE
GND	GROUND
GPM	GALLONS PER MINUTE
GUH	GAS UNIT HEATER
GV	GATE VALVE

H

HDT	HORIZONTAL DRAW THROUGH
HORIZ	HORIZONTAL
HP	HORSEPOWER, HEAT PUMP
HSTAT	HUMIDISTAT
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HW	HOT WATER
HWP	HEATING WATER PUMP
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
HX	HEAT EXCHANGER
HZ	HERTZ

I

ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INFRARED HEATER
IN	INCH
INSUL	INSULATION
INT	INTERNAL, INTERIOR

K

KEC	KITCHEN EQUIPMENT CONTRACTOR
KO	KNOCKOUT
KVA	KILOVOLT- AMPS
KW	KILOWATT

L

L	LENGTH
LAT	LEAVING AIR TEMPERATURE
LF	LINEAR FEET
LP	LOW PRESSURE
LRA	LOCKED ROTOR AMPS
LVL	LEVEL
LWB	LEAVING WET BULB
LWCO	LOW WATER CUT OFF
LWT	LEAVING WATER TEMPERATURE

M

MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBTUH	THOUSAND OF BTU'S
MC	MECHANICAL CONTRACTOR
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MI	MALLEABLE IRON
MIN	MINIMUM
MP	MEDIUM PRESSURE
MTD	MOUNTED
MU	MAKE-UP
MVD	MANUAL VOLUME DAMPER
MSAH	MINI-SPLIT AIR HANDLER
MSCU	MINI-SPLIT CONDENSING UNIT
MZ	MULTI-ZONE

N

N.C.	NORMALLY CLOSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NO.	NUMBER
NTS	NOT TO SCALE

O

OA	OUTSIDE AIR
OAF	OUTSIDE AIR FAN
OAHU	OUTSIDE AIR HANDLING UNIT
OBD	OPPOSED BLADE DAMPER
OC	ON CENTER
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN
OFCU	OUTSIDE AIR FAN COIL UNIT
OPG	OPENING
OS&Y	OUTSIDE SCREW AND YOKE

P

PG	PRESSURE GAUGE
PP	POLYPROPYLENE
PPM	PART PER MILLION
PRI	PRIMARY
PRS	PRESSURE REDUCING STATION
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE

Q

QTY	QUANTITY

R

RA	RETURN AIR
RAD	REFRIGERATED AIR DRYER
RAF	RETURN AIR FAN
RAG	RETURN AIR GRILLE
RAT	RETURN AIR TEMPERATURE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
RE	REFERENCE, REFER
RED	REDUCER
REFR	REFRIGERATOR
REG	REGISTER
REINF	REINFORCING
REQD	REQUIRED
REV	REVISION, REVISE
RH	RELATIVE HUMIDITY
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID
RLA	RUNNING LOAD AMPS
RM	ROOM
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOFTOP UNIT
RV	RELIEF VALVE

S

SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SAG	SUPPLY AIR GRILLE
SAR	SUPPLY AIR REGISTER
SC	STEAM CONDENSATE
SCHED	SCHEDULED
SEC	SECONDARY
SECT	SECTION
SENS	SENSIBLE
SF	SQUARE FEET
SFCS	SPRINKLER FLOOR CONTROL STATION
SH	SHOWER
SHT	SHEET
SIM	SIMILAR
SM	SHEETMETAL
SP	STATIC PRESSURE, SUMP PUMP
SPEC	SPECIFICATION
SPR	SPRINKLER
SQ	SQUARE
SS	STAINLESS STEEL
SSSC	SOLID STATE SPEED CONTROL
STD	STANDARD
STL	STEEL
STM	STEAM
STR	STRAINER
SURF	SURFACE
SUSP	SUSPEND
SV	SANITARY VENT
SW	SOFT WATER
SZ	SINGLE ZONE

T

TC	TEMPERATURE CONTROL
TDH	TOTAL DYNAMIC HEAD
TF	TRANSFER FAN
TH BLK	THRUST BLOCK
THERM	THERMOMETER
TMV	THERMOSTATIC MIXING VALVE
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TW	TEMPERED HOT WATER
TYP	TYPICAL

U

UCD	UNDER CUT DOOR
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES, INC
UNO	UNLESS NOTED OTHERWISE
U/F	UNDERFLOOR
U/S	UNDERSLAB

V

V	VOLT
VA	VOLT- AMPERE
VAC	VACUUM
VAV	VARIABLE AIR VOLUME
VB	VALVE BOX, VACUUM BREAKER
VD	VOLUME DAMPER
VDT	VERTICAL DRAW THROUGH
VEL	VELOCITY
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VIB	VALVE IN BOX
VOV	VALVE ON VERTICAL
VP	VACUUM PUMP
VRF	VARIABLE REFRIGERANT FLOW
VVR	VARIABLE AIR VOLUME REHEAT

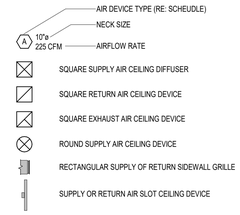
W

W	WATT, WIDTH
W/	WITH
W/O	WITHOUT
WB	WET BULB
WM	WATER METER
WP	WEATHERPROOF
WPD	WATER PRESSURE DROP
WSHP	WATER SOURCE HEAT PUMP
WWF	WELDED WIRE FABRIC

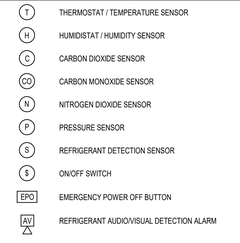
Z

Z	ZONE

AIR DEVICE TYPES



WALL MOUNTED SENSOR AND DEVICE TYPES



CONTROLS SCHEMATIC SYMBOLS LEGEND

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

PIPING TYPES

CD	CONDENSATE DRAIN LINE	REF	REFRIGERANT PIPING SIZED BY MFR.
CHS	CHILLED WATER SUPPLY	HPS	HIGH PRESSURE STEAM SUPPLY
CHR	CHILLED WATER RETURN	HPR	HIGH PRESSURE CONDENSATE RETURN
HWS	HOT WATER SUPPLY	LPS	LOW PRESSURE STEAM SUPPLY
HWR	HOT WATER RETURN	LPR	LOW PRESSURE CONDENSATE RETURN
CWS	CONDENSER WATER SUPPLY	PCR	PUMPED CONDENSATE RETURN
CWR	CONDENSER WATER RETURN		

DESIGN CRITERIA

LOCATION:
30330 Quinn Rd, Tomball, TX 77375

ELEVATION: 152 FEET

DESIGN CONDITIONS:

HEATING DB:	29.8 °F (ASHRAE 99.6%)
COOLING DB / WB:	98.1°F / 75.9 °F (ASHRAE 0.4%)
DEHUMIDIFICATION DP / DB:	78.7 °F / 82.5 °F (ASHRAE 0.4%)

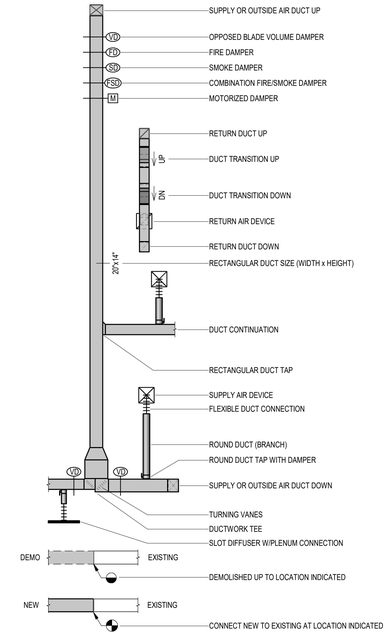
SPACE INDOOR DESIGN TEMPERATURE:

HEATING DB:	70 °F
COOLING DB:	75 °F
RELATIVE HUMIDITY	55%

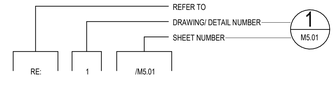
BUILDING CODES & STANDARDS

APPLICABLE CODES:
2021 INTERNATIONAL BUILDING CODE
2021 INTERNATIONAL FIRE CODE
2021 INTERNATIONAL MECHANICAL CODE
2021 INTERNATIONAL ENERGY CONSERVATION CODE
2021 NATIONAL ELECTRICAL CODE

DUCTWORK



DRAWING/DETAIL REFERENCE KEY



DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SYMBOL LEGEND

SHEET NUMBER: M0.01

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

DEMOLITION & RENOVATION MECHANICAL GENERAL NOTES

A. MECHANICAL DEMOLITION DRAWINGS ARE GENERALLY DIAGRAMMATIC AND IT IS THE INTENT AND MEANING OF THE CONTRACT DOCUMENTS THAT ALL MECHANICAL SYSTEMS SHALL REMAIN UNLESS NOTED TO BE REMOVED OR DEMOLISHED. VERIFY EXACT LOCATIONS AND CONDITIONS AND COORDINATE WITH GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO REMOVING ANY EXISTING ITEMS. DO NOT ABANDON ANY ITEMS IN PLACE.

B. EQUIPMENT, DUCTWORK, PIPING, ETC. INDICATED AS EXISTING (E) SHALL REMAIN AND BE RE-USED IN EXISTING LOCATIONS. IF EXISTING ITEMS CONFLICT WITH NEW CONSTRUCTION, CONTRACTOR SHALL RELOCATE, REWORK, REROUTE, RECONNECT, AND REINSTALL COMPLETELY AS REQUIRED AS IF NEW AT NO ADDITIONAL COST. COORDINATE WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE, ETC. PRIOR TO RELOCATION. REFER TO APPLICABLE NOTES FOR NEW ITEMS.

C. EQUIPMENT, DUCTWORK, PIPING ETC. INDICATED AS EXISTING TO BE DEMOLISHED (D) SHALL BE REMOVED IN THEIR ENTIRETY. ALL APPURTENANCES, RELATED COMPONENTS, INCLUDING ALL DUCTWORK, PIPING, SUPPORTS, HANGERS, CONTROLS, ETC. ASSOCIATED WITH EACH ITEM SHALL BE REMOVED UNLESS NOTED OTHERWISE. CAP ALL DUCTWORK AND PIPING AS REQUIRED SERVING EACH ITEM AT BUILDING MAINS. VERIFY EXACT LOCATIONS AND CONDITIONS AND COORDINATE WITH GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO REMOVING ANY EXISTING ITEMS. DO NOT ABANDON ANY ITEMS IN PLACE.

D. WHERE CONSTRUCTION, EXISTING DUCTWORK, MECHANICAL / PLUMBING / FIRE SPRINKLER PIPING, ELECTRICAL CONDUIT, CABLING, ETC. WHICH MUST REMAIN AS PART OF AN ACTIVE SYSTEM CONFLICTS WITH NEW CONSTRUCTION, CONTRACTOR SHALL RELOCATE, REWORK, REROUTE, RECONNECT, AND REINSTALL COMPLETELY AS REQUIRED AS IF NEW AT NO ADDITIONAL COST. COORDINATE WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE, ETC. PRIOR TO RELOCATION. REFER TO APPLICABLE NOTES FOR NEW ITEMS.

E. CONTRACTOR SHALL COORDINATE WITH EACH TRADE CONTRACTOR FOR REMOVAL OF EXISTING ELECTRICAL AND PLUMBING SERVICES INCLUDING ALL CONDUIT, WIRING, PIPING, INSULATION, APPURTENANCES, RELATED COMPONENTS, ETC. ASSOCIATED WITH REMOVAL OF EXISTING MECHANICAL EQUIPMENT. VERIFY EXACT LOCATIONS AND CONDITIONS AND COORDINATE WITH GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO REMOVING ANY EXISTING ITEMS. DO NOT ABANDON ANY ITEMS IN PLACE.

F. THESE DRAWINGS WERE PREPARED FROM THE BEST INFORMATION AVAILABLE. ORIGINAL DRAWINGS, FIELD OBSERVATIONS, ETC., BUT MAY NOT INDICATE THE EXACT LOCATION OF ALL EXISTING MECHANICAL COMPONENTS. THE CONTRACTOR SHALL CAREFULLY INVESTIGATE THE EXISTING CONDITIONS SURROUNDING THE INSTALLATION OF THEIR WORK PRIOR TO PROCEEDING WITH THE INSTALLATION. MODIFICATIONS REQUIRED DUE TO EXISTING CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER / OWNER FOR REVIEW BY WAY OF SHOP DRAWINGS OR SKETCHES DETAILING THE EXISTING CONDITIONS AND THE PROPOSED REVISION.

G. CONTRACTOR SHALL BE RESPONSIBLE TO VISIT THE JOBSITE, COMPLETELY REVIEW CONTRACT DOCUMENTS, AND FIELD VERIFY EXTENT OF WORK AND EXACT LOCATIONS AND CONDITIONS OF ALL NEW AND EXISTING CONSTRUCTION, ELEVATIONS, SERVICE POINTS, ETC. AS REQUIRED FOR A COMPLETE AND CORRECTLY OPERATING SYSTEM. CONTACTOR SHALL COORDINATE WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE, AND REPORT IN WRITING ANY CONFLICTS, PROBLEMS, OR ANY CONDITION THAT MAY ADVERSELY AFFECT THE PROPER EXECUTION OF THE WORK THAT IS NOT INDICATED ON THE DRAWINGS. THIS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR MAKING ANY CORRECTIONS OR ALTERATIONS DEEMED NECESSARY TO COMPLETE THE WORK AND SHALL INCLUDE ALL ASSOCIATED COSTS IN THEIR BID WITH NO ADDITIONAL EXPENSE.

H. CONTRACTOR SHALL COORDINATE ALL CUTTING AND PATCHING OF EXISTING WALLS, CEILINGS, ROOF AND FLOOR REQUIRED FOR THEIR WORK WITH GENERAL CONTRACTOR, STRUCTURAL ENGINEER, AND OWNER'S REPRESENTATIVE. ALL PENETRATIONS SHALL BE SEALED AND RESTORED TO THE ORIGINAL CONDITIONS, STRUCTURAL PROPERTIES, AND FINISHED IN SAME MATERIALS AND MANNER AS ADJACENT AREAS. ALL ROOF PENETRATIONS, ROOF PIPE SUPPORTS, FLASHINGS, ETC. SHALL BE MADE WATERTIGHT AND AS RECOMMENDED BY THE ROOF MANUFACTURER. ALL EXISTING PENETRATIONS WHICH ARE NOT TO BE REUSED SHALL BE PROPERLY SEALED OFF TO MAINTAIN THE STRUCTURAL, WATERPROOF, AND FIREPROOF INTEGRITY OF THE WALL, FLOOR, OR ROOF SYSTEM PENETRATED.

J. COORDINATE ALL RENOVATIONS / REMODEL / DEMOLITION WORK WITH THE OWNER'S REPRESENTATIVE, BUILDING ENGINEER / MAINTENANCE PERSONNEL AND OTHER TRADES PERFORMING WORK IN THE BUILDING PRIOR TO THE REMOVAL OF ANY ITEMS OF MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT, FIXTURES, OR SYSTEMS THAT WILL AFFECT OTHER SYSTEM WITHIN THE AREA OF CONSTRUCTION, OR OTHER AREAS OF THE BUILDING. CONTRACTOR SHALL NOTE THAT THE BUILDING IS OCCUPIED, AND WILL REMAIN SO DURING CONSTRUCTION; AND, THEREFORE, UTILITIES / BUILDING SYSTEMS MUST REMAIN IN OPERATION. ANY REQUIRED OUTAGES MUST BE COORDINATED WITH GENERAL CONTRACTOR, OWNER'S REPRESENTATIVE AND BUILDING ENGINEER / MAINTENANCE PERSONNEL. PROVIDE TEMPORARY CONNECTIONS OF UTILITIES AND AIR CONDITIONING AS NECESSARY TO FACILITATE THE PHASING OF CONSTRUCTION.

K. ALL WORK SHALL BE SCHEDULED AND PERFORMED IN STRICT COORDINATION WITH CONSTRUCTION PHASING AND WITH OWNERS' SCHEDULES, OCCUPANCIES, ETC. PROVIDE ADDITIONAL VALVES, TAPS, TEMPORARY DUCTWORK, PIPING, ETC. AS NECESSARY TO PROVIDE UNINTERRUPTED SERVICE TO AREAS OUTSIDE OF THE PHASE IN WHICH WORK IS BEING PERFORMED. ALL NECESSARY SHUTDOWNS OR OUT OF PHASE WORK SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND OWNER'S REPRESENTATIVE.

L. PRIOR TO THE REMOVAL OF ANY MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT, FIXTURES, OR SYSTEMS, THE CONTRACTOR MUST VERIFY THE ORIGIN AND TERMINATION OF THOSE SYSTEM AND CONFIRM THAT THE ITEMS BEING REMOVED DO NOT SERVE ANY ITEMS THAT ARE TO REMAIN (INCLUDING THOSE IN AREAS OUTSIDE THE CONTRACT LIMITS). WHEN RENOVATION / REMODEL / DEMOLITION WORK IS PERFORMED, THE CONTRACTOR SHALL EXERCISE CARE IN PROTECTING EXISTING ITEMS TO REMAIN AND EXISTING ITEMS TO BE REMOVED AND RELOCATED. PROTECT ALL EXISTING BUILDING COMPONENTS, WALLS, FLOORS, FINISHES, FURNISHINGS, ADJACENT EQUIPMENT, LIGHTING, ETC. ANY ITEMS DAMAGED OR WHERE FINISHES HAVE BEEN MARRIED, SHALL BE REPAIRED AND REFINISHED TO ORIGINAL CONDITION AT NO COST TO THE OWNER. ALL ITEMS SOILED IN THE PROGRESS OF THE WORK SHALL BE CLEANED TO THEIR PRE- EXISTING CONDITIONS.

M. ALL EXISTING EQUIPMENT REMOVED SHALL BE PROTECTED FROM DAMAGE IN SO FAR AS PRACTICAL. THESE ITEMS SHALL BE STORED ON SITE FOR A MINIMUM OF TWO (2) WEEKS UNLESS INDICTED OTHERWISE BY THE OWNER'S REPRESENTATIVE TO ALLOW INSPECTION BY THE OWNER. ALL ITEMS RETAINED BY THE OWNER SHALL BE TAGGED AND STORED ON SITE UNTIL DIRECTED OTHERWISE BY OWNER. ALL ITEMS NOT RETAINED BY THE OWNER SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE AND DISPOSED OF PROPERLY.

N. REWORK AND REPAIR ALL DUCTWORK AND PIPING INSULATION DAMAGED OR REMOVED DURING RENOVATION / REMODEL / DEMOLITION AS REQUIRED TO MATCH EXISTING.

O. EQUIPMENT INGRESS AND EGRESS ROUTES FOR THE RENOVATION WORK SHALL BE COORDINATED WITH THE OWNER. COORDINATE TIMES, DATES, AND DURATIONS WITH OWNER A MINIMUM OF 2 WEEKS IN ADVANCE TO ENSURE THERE ARE NO CONFLICTS IN USAGE OF EQUIPMENT/SPACES.

P. ALL EXISTING EQUIPMENT THAT INCLUDES A REFRIGERATION CIRCUIT THAT IS TO BE DEMOLISHED OR RELOCATED SHALL HAVE THE REFRIGERANT CHARGE RECOVERED PRIOR TO DEMOLITION OR RELOCATION. REFRIGERANT RECOVERY SHALL COMPLY WITH EPA, STATE, AND LOCAL JURISDICTION REQUIREMENTS. RECOVERED REFRIGERANTS SHALL NOT BE USED IN ANY SYSTEM, NEW OR EXISTING, UNLESS THE REFRIGERANT HAS BEEN RECLAIMED AND FOUND TO MEET THE PURITY REQUIREMENTS OF AHRI 700.

Q. EXISTING EQUIPMENT BEING RELOCATED SHALL BE VERIFIED TO BE IN PROPER OPERATING CONDITION PRIOR TO EQUIPMENT RELOCATION. VERIFICATION SHALL BE PERFORMED BY EQUIPMENT MANUFACTURER'S AUTHORIZED SERVICE REPRESENTATIVE. IF EXISTING EQUIPMENT IS FOUND TO BE DEFICIENT, THE SERVICE REPRESENTATIVE SHALL NOTIFY THE ENGINEER AND OWNER AND PROVIDE RECOMMENDATIONS TO RESTORE EQUIPMENT TO PROPER OPERATING CONDITION.

MECHANICAL GENERAL NOTES

A. MECHANICAL DRAWINGS AND SPECIFICATIONS ARE DIAGRAMMATIC IN NATURE AND INTENDED TO DESCRIBE AND ILLUSTRATE SYSTEMS THAT WILL NOT INTERFERE WITH THE ARCHITECTURAL / STRUCTURAL CONDITIONS OF THE BUILDING AND WILL FIT INTO AVAILABLE SPACES. CONTRACTOR SHALL COORDINATE ALL WORK TO CONFORM TO THE ARCHITECTURAL, STRUCTURAL, FINISH CONDITIONS, EQUIPMENT MANUFACTURER / FIXTURE CUTSHEETS AND WITH OTHER TRADES, TO AVOID OBSTRUCTIONS, AND TO ALLOW THE PROPER INSTALLATION OF EACH ITEM. EQUIPMENT SIZES, DIMENSIONS, AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE MANUFACTURER'S DRAWINGS AND CUTSHEETS PRIOR TO FABRICATING OF DUCTWORK, PIPING, OR POURING OF CONCRETE HOUSEKEEPING PADS. CONTRACTOR SHALL OBTAIN ALL ARCHITECTURAL DRAWINGS AND STRUCTURAL DATA, LOCATIONS OF PIERS, BEAMS, COLUMNS, JOISTS, ETC., FROM STRUCTURAL DRAWINGS AND PROVIDE OFFSETS, RELOCATIONS, ETC., AS REQUIRED TO MEET THIS INTENT AT NO ADDITIONAL COST. PROVIDE ALL NECESSARY PIPING, DUCTWORK, FITTING, INSULATION, AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.

B. CONTRACTOR SHALL BE RESPONSIBLE TO EXAMINE ALL THE CONTRACT DOCUMENTS CAREFULLY BEFORE SUBMITTING THEIR BID. WITH PARTICULAR ATTENTION TO ERRORS, OMISSIONS, CONFLICTS WITH PROVISIONS OF LAWS AND CODES HAVING JURISDICTION, CONFLICTS BETWEEN DRAWINGS OR DRAWINGS AND SPECIFICATIONS, AND AMBIGUOUS DEFINITION OF THE EXTENT OF COVERAGE BETWEEN CONTRACTS. ANY SUCH DISCREPANCY SHALL BE BROUGHT IMMEDIATELY TO ATTENTION FOR CORRECTION. SHOULD ANY OF THESE ERRORS, OMISSIONS, CONFLICTS, OR AMBIGUITIES EXIST, THE CONTRACTOR SHALL HAVE THEM EXPLAINED AND AT THEIR EXPENSE, SUPPLY THE PROPER MATERIALS AND LABOR TO MAKE GOOD ANY DAMAGE OR DEFECTS IN THEIR WORK OR THE RESULTS OBTAINED THEREFORE, CAUSED BY SUCH DISCREPANCY. THE CONTRACTOR SHALL MAKE A CAREFUL EXAMINATION OF THE PREMISES AND THOROUGHLY FAMILIARIZE THEMSELF WITH THE REQUIREMENTS OF THE CONTRACT. UPON COMMENCEMENT OF THE CONSTRUCTION FOR THE WORK INCLUDED IN THIS CONTRACT, THE CONTRACTOR SHALL BE DEEMED TO HAVE MADE SUCH A STUDY OR EXAMINATION AND ACCEPTS ALL CONDITIONS.

C. WHEREVER CONFLICTS OCCUR BETWEEN DIFFERENT PARTS OF THE CONTRACT DOCUMENTS (SUCH AS DRAWINGS AND SPECIFICATIONS), THE GREATER QUANTITY, THE BETTER QUALITY, THE LARGER SIZE, OR THE VALUE WITH THE GREATEST COST IMPACT SHALL PREVAIL UNLESS THE ARCHITECT INFORMS THE CONTRACTOR OTHERWISE IN WRITING. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING DATA: DIMENSIONS, GAUGE THICKNESS, TEMPERATURES, PRESSURE, BTUH, SCHEDULE / TIME DURATION, ELECTRICAL RATING, MATERIAL, SAFETY RATING, ENERGY EFFICIENCY, ETC.

D. CONTRACTOR SHALL PROVIDE A MECHANICAL INSTALLATION THAT IS COMPLETE AND ALL ITEMS AND APPURTENANCES NECESSARY, REASONABLY INCIDENTAL, OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM IS NOT SPECIFICALLY CALLED OUT OR SHOWN. THE CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIALS, LABOR, SUPERVISION AND SERVICE NECESSARY SO AS TO PROVIDE A COMPLETE, FUNCTIONING MECHANICAL SYSTEM.

E. ALL EQUIPMENT, PIPING, DUCTWORK, ETC. SHALL BE LOCATED APPROXIMATELY IN GENERAL LOCATIONS SHOWN AND SHALL CONFORM TO ALL ARCHITECTURAL AND STRUCTURAL CONDITIONS. PROVIDE ANY ADDITIONAL SUPPORTS, HANGERS, OPENINGS, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS. PIPING THAT ACCESS PANELS ARE NOT BLOCKED. EXPERIENCED CRAFTSMEN SHALL MAKE THE INSTALLATION OF ALL EQUIPMENT IN A NEAT WORKMANSHIP-LIKE MANNER. EQUIPMENT SHALL BE AS SCHEDULED OR APPROVED EQUAL. EQUIPMENT SHALL BE INSTALLED IN FULL ACCORDANCE WITH ALL APPLICABLE CODES HAVING JURISDICTION. COORDINATE BETWEEN ALL TRADES PRIOR TO STARTING ANY WORK. PROVIDE ADEQUATE CLEARANCE FOR PROPER OPERATION, SERVICE/ MAINTENANCE, AIR FLOW, ETC. PIPING AND DUCTWORK ARE NOT PERMITTED IN ELECTRICAL, ELEVATOR MACHINE, TELECOM, IT, AND COMMUNICATION ROOMS. ALL ELEVATIONS INDICATED IN THIS WAY (8' – 4") ARE THE ELEVATIONS FROM THE FINISHED FLOOR DIRECTLY BELOW TO THE BOTTOM OF THE BARE PIPE OR DUCT.

F. EXECUTE ALL WORK FOLLOWING LOCAL, STATE AND/OR NATIONAL CODES, ORDINANCES AND REGULATIONS GOVERNING THE PARTICULAR CLASS OF WORK INVOLVED. THE GOVERNING CODES ARE MINIMUM REQUIREMENTS. THE DRAWINGS AND/OR SPECIFICATIONS SHALL PREVAIL WHERE THE DRAWINGS ARE/OR ACCOMPANYING SPECIFICATIONS EXCEED THE CODE REQUIREMENTS.

G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FILING AND PAYING ALL FEES AND OBTAINING NECESSARY PERMITS AND CERTIFICATES OF INSPECTION. THE CONTRACTOR SHALL DELIVER ALL CERTIFICATES OF INSPECTION TO OWNER/CONSTRUCTION MANAGER INCLUDING COPIES WITH MAINTENANCE MANUALS.

H. CONTRACTOR SHALL PROVIDE DETAILED AND DIMENSIONED HVAC DUCTWORK AND PIPING FABRICATION SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER, DURING THE INSTALLATIONS OF THE WORK, THE CONTRACTOR SHALL KEEP DETAILED RECORDS OF ANY AND ALL CHANGES MADE FROM THE WORK AS ACTUALLY INSTALLED. THESE RECORD DRAWINGS SHALL BE NOTED "AS-BUILT", AND SUBMITTED TO THE ARCHITECT / ENGINEER FOR REVIEW WITH ALL O&M MANUALS.

I. PROPERLY SUPPORT ALL EQUIPMENT, DUCTWORK AND PIPING WITHIN THE BUILDING AND PROVIDE ADEQUATE PROVISIONS FOR SLOPE AND ANCHORAGE. CONTRACTOR SHALL USE HANGERS, RODS AND INSERTS LISTED BY UNDERWRITERS' LABORATORIES FOR THE SERVICE INTENDED, SECURELY SUPPORTED BY STRUCTURAL MEMBERS WHICH IN TURN ARE SUPPORTED DIRECTLY FROM THE BUILDING STRUCTURE.

J. CLEARANCE REQUIREMENTS BETWEEN MECHANICAL COMPONENTS AND SWITCHBOARDS, PANELBOARDS, POWER PANELS, MOTOR CONTROL CENTERS AND TRANSFORMERS SHALL CONFORM TO THE LATEST VERSION OF THE NATIONAL ELECTRICAL CODE.

K. DUCTWORK AND PIPING SHALL BE INSTALLED CONCEALED ABOVE CEILINGS, INSIDES CHASES / WALLS, ETC. IN GENERAL LOCATIONS SHOWN, UNLESS NOTED OTHERWISE. CONFORM TO ALL ARCHITECTURAL, STRUCTURAL, AND FINISH CONDITIONS OF THE BUILDING. WHEREVER CONDITIONS ARISE WHICH WILL CAUSE NORMALLY CONCEALED MATERIALS TO BE EXPOSED, IMMEDIATELY CALL THIS TO THE ATTENTION OF THE ARCHITECT AND STOP WORK IN THOSE AREAS UNTIL THE ARCHITECT DIRECTS THE RESUMPTION OF THE WORK AND THE PROCEDURES TO BE FOLLOWED. ALL DUCTWORK, PIPING AND ASSOCIATED ACCESSORIES IN OCCUPIED AREAS THAT ARE EXPOSED TO VIEW SHALL BE PAINTED. REFER TO ARCHITECT FOR COLOR. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE DIMENSIONS. IN ANY CASE WHERE A PIPE OR DUCT SHOWN ON THE PLAN SHEET DIFFERS FROM THAT SHOWN IN A SCHEMATIC OR DETAIL, PROVIDE THE LARGER OF THE TWO SIZES SHOWN.

L. SLOPE AND ARRANGE HVAC PIPING TO ESTABLISH HIGH POINTS FOR AIR ELIMINATION AND LOW POINTS TO PERMIT PROPER DRAINAGE. PROVIDE AIR VENTS AT HIGH POINTS AND DRAIN VALVES AT LOW POINTS. ALL PIPING SHOWN ON FLOOR PLANS SHALL BE ROUTED ABOVE THE CEILING ON THE FLOOR WHERE IT IS SHOWN, UNLESS OTHERWISE NOTED. ARRANGE PIPING CONNECTIONS TO ALL EQUIPMENT TO ALLOW EASY REMOVAL OF EQUIPMENT, COILS, FANS, MOTORS, FILTERS, ACCESS PANELS, ETC. PROVIDE UNIONS, FLANGES, AND VALVES AT CONNECTIONS. ALL EXTERIOR PIPING SHALL BE INSULATED AND JACKETED. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. PIPING RUN-OUTS TO TERMINAL UNITS SHALL BE 3/4" UNLESS OTHERWISE NOTED. MINIMUM PIPE SIZE FOR THE PROJECT SHALL BE 3/4".

M. WALL MOUNTED THERMOSTATS / HUMIDISTATS / SENSORS SHALL BE MOUNTED AT 42" A.F.F. APPROX. WHERE INDICATED ON PLANS, UNLESS OTHERWISE NOTED. SENSOR LOCATION SHALL BE MAX 12" FROM END OF WALL AND/OR DOOR JAMB. COORDINATE EXACT LOCATIONS WITH ARCHITECT, ELECTRICAL CONTRACTOR, AND BETWEEN OTHER TRADES PRIOR TO MOUNTING. DO NOT MOUNT ABOVE DIMMERS. THERMOSTATS ON EXTERIOR WALLS OR WALLS SEPARATING CONDITIONED SPACE FROM UNCONDITIONED SPACE SHALL BE INSULATED. THERMOSTATS / HUMIDISTATS / SENSORS SHALL NOT BE INSTALLED ON DECORATIVE WALLS.

N. FIRE, SMOKE, AND FIRE/SMOKE DAMPERS SHALL BE INSTALLED AS INDICATED AND WHERE OTHERWISE REQUIRED BY LOCAL CODES AND ORDINANCES. REFER TO ARCHITECTURAL DRAWINGS / BUILDING CODE SUMMARY / LIFE SAFETY PLANS FOR LOCATIONS OF ALL FIRE RESISTANT / RATED WALLS, CEILINGS, CHASES, SHAFTS, SMOKE COMPARTMENTS, AND LOCATIONS OF EGRESS CORRIDORS. DAMPER SIZES INDICATED ARE CLEAR INSIDE AIRSTREAM DIMENSIONS. PROVIDE MEANS TO ADEQUATELY SERVICE THE DAMPER'S FUSIBLE LINKS. PROVIDE 12" X 12" MINIMUM METAL ACCESS DOORS IN ALL GYPBOARD AND PLASTER CEILINGS. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND UL LISTING FOR SERVICE INTENDED. PROVIDE METAL SLEEVES AS REQUIRED. PROVIDE ACCESS DOORS IN DUCTWORK AT ALL FIRE, SMOKE, AND FIRE/SMOKE DAMPERS. ALL SMOKE AND FIRE/SMOKE DAMPERS REQUIRE INTEGRAL SMOKE DETECTORS AND SHALL BE INSTALLED BY THE MECHANCIAL CONTRACTOR. IDENTIFY ACCESS DOORS IN ACCORDANCE WITH SPECIFICATIONS AND CODE.

O. ALL DUCTWORK AND ASSOCIATED ACCESSORIES SHALL BE CONSTRUCTED TO MEET THE LATEST SMACNA STANDARDS FOR HVAC DUCT CONSTRUCTION. IN NO CASE SHALL THE DUCTWORK BE LESS THAN 26 GAUGE FOR LOW PRESSURE DUCTWORK AND 24 GAUGE FOR MEDIUM PRESSURE DUCTWORK. ALL DUCTWORK SHALL BE CONSTRUCTED TO SEAL CLASS 'A' AS REFERENCED IN SMACNA STANDARDS. ALL NON-WELDED JOINTS AND SEAMS SHALL BE SEALED. THIS INCLUDES BUT IS NOT LIMITED TO TRANSVERSE JOINTS, LONGITUDINAL SEAMS, DUCT WALL PENETRATIONS, SPIN-INS, TAPS, AND OTHER BRANCH CONNECTIONS, ACCESS DOORS, ACCESS PANELS, AND DUCT CONNECTIONS TO EQUIPMENT. OPENINGS FOR ROTATING SHAFTS SHALL ALSO BE SEALED WITH BUSHINGS. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

P. ALL OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR DUCTWORK AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND SHALL BE INSULATED WITH A MINIMUM OF R-8 INSULATION WHERE LOCATED OUTSIDE THE BUILDING. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

Q. CEILING-MOUNTED AIR DEVICES SHALL BE LOCATED APPROXIMATELY AS SHOWN. COORDINATE FRAME MOUNTING TYPES FOR AIR DEVICES WITH CEILING TYPES INDICATED ON ARCHITECTURAL REFLECTED CEILING PLAN. ALL CEILING DIFFUSERS TO BE 4-WAY TYPE, UNLESS NOTED OTHERWISE BY AIRFLOW ARROWS ON FLOOR PLAN. INSULATE THE BACKSIDE OF ALL CEILING AIR DEVICES. REFER TO PLANS AND AIR DEVICE SCHEDULE FOR SIZE OF DUCT RUNOUT AND AIR DEVICE CONNECTION SIZE. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR LOCATIONS, OF ALL CEILING FEATURES, LIGHTS, AIR DEVICES, FINISHES, CEILING HEIGHTS AND ELECTRICAL DRAWINGS FOR SPEAKERS, DETECTORS, POWER OUTLETS, ETC, AND FIRE PROTECTION SHOP DRAWINGS FOR FIRE SPRINKLER HEADS. COORDINATE FINAL LOCATIONS WITH EXISTING CONDITIONS AND BETWEEN TRADES PRIOR TO MOUNTING. ALL CEILING MOUNTED AND WALL MOUNTED AIR DEVICE FINISHES SHALL MATCH ADJACENT ARCHITECTURAL SURFACE UNLESS OTHERWISE INDICATED. CONTRACTOR SHALL COORDINATE COLOR WITH OWNER.

R. BRANCH DUCT RUN-OUTS TO AIR DEVICES SHALL BE SAME SIZE AS NECK, UNLESS NOTED OTHERWISE. PROVIDE A SPIN-IN TAP WITH MANUAL VOLUME DAMPER AT MAIN DUCT TAP AND EXTEND AS SHOWN. EXTEND FLEX DUCTWORK A MAXIMUM OF 5'-0" FROM AIR DEVICES. INSTALL AS STRAIGHT AS POSSIBLE WITH LONG RADIUS BENDS WITH CLAMPS TO BE USED AT BOTH ENDS. ALL DAMPERS LOCATED ABOVE INACCESSIBLE CEILINGS SHALL BE PROVIDED WITH REMOTE DAMPER OPERATORS.

S. TURNING VANES SHALL BE INSTALLED IN ALL MITERED ELBOWS AND AIR EXTRACTORS. PROVIDE ADEQUATE ACCESS AND MEANS TO ADJUST / BALANCE ALL AIR EXTRACTORS. TURNING VANES SHALL BE CONSTRUCTED TO MEET THE LATEST SMACNA STANDARDS FOR HVAC DUCT CONSTRUCTION.

T. MEDIUM PRESSURE BRANCH DUCT RUN-OUTS TO AIR TERMINAL UNITS SHALL BE SAME SIZE AS AIR TERMINAL UNIT INLET, UNLESS NOTED OTHERWISE. INCREASE DUCT SIZE BY 2" IF THE DISTANCE BETWEEN THE MAIN DUCT AND THE TERMINAL UNIT INLET IS GREATER THAN 6'-0" AND / OR UTILIZES MORE THAN 2-90 DEGREE ELBOWS. PROVIDE A SPIN-IN FLARED CONICAL TAP AT MEDIUM PRESSURE DUCT MAIN AND EXTEND AS SHOWN. FLEXIBLE DUCTWORK SHALL NOT BE USED TO MAKE CHANGES IN DIRECTION IN MEDIUM PRESSURE DUCT.

U. ACCESS PANELS SHALL BE PROVIDED FOR EACH LOCATION WHERE EQUIPMENT, MANUAL VALVES, AUTOMATIC CONTROL VALVES, AUTOMATIC DAMPER MECHANISMS, FIRE/SMOKE DAMPERS, ETC., ARE INSTALLED BEHND FURRINGS, CHASES, OR ABOVE INACCESSIBLE CEILINGS. SIZE AND POSITION EACH ACCESS PANEL SO THAT THE CONCEALED EQUIPMENT CAN BE PROPERLY SERVICED, MINIMUM SIZE SHALL BE 18" X 18" UNLESS FIELD CONDITIONS DICTATE OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS / SPECIFICATIONS AND COORDINATE WITH GENERAL CONTRACTOR FOR EXACT LOCATION, CONDITIONS, SIZES, FINISHES, ETC.

V. PROVIDE REMOTE DAMPER OPERATORS FOR EACH LOCATION WHERE VOLUME DAMPERS ARE INSTALLED BEHIND FURRINGS, CHASES, OR ABOVE INACCESSIBLE CEILINGS. SIZE AND POSITION REMOTE DAMPER OPERATOR SO THAT THE CONCEALED VOLUME DAMPERS CAN BE ADJUSTED. REMOTE OPERATOR SHALL BE A STRAIGHT SOLID SHAFT EXTENSION IN-LINE FOR DIRECT CONNECTION TO VOLUME DAMPER SHAFT WITHOUT GEAR MECHANISM, UNLESS OTHERWISE INDICATED ON THE DRAWINGS. COORDINATE WITH ARCHITECT AND GENERAL CONTRACTOR FOR APPROVAL, EXACT LOCATION, CONDITIONS, SIZES, FINISHES, ETC.

W. HVAC SYSTEMS SHALL BE INSTALLED COMPLETE WITH ALL BALANCING AND REGULATING DEVICES NECESSARY FOR THE TAB CONTRACTOR TO PERFORM THEIR WORK. COORDINATE WITH THE TAB CONTRACTOR TO DETERMINE THEIR EXACT REQUIREMENTS. ALL HVAC SYSTEMS SHALL BE STARTED PER MANUFACTURER'S START-UP INSTRUCTIONS. REPLACE FILTERS, BELTS, SHEAVES, DAMPERS, VALVES, STARTERS AND HEATERS AS NECESSARY PRIOR TO TAB.

X. CONTRACTOR SHALL PROVIDE ALL TESTING, ADJUSTING, AND BALANCING WORK TO INCLUDE, BUT NOT LIMITED TO, ADJUSTMENT OF DAMPERS, BALANCE AIR DEVICES. VERIFY CORRECT SETPOINT AND CALIBRATION OF THERMOSTATS. VERIFY ALL SEQUENCE OF OPERATION, STAGING OF COOLING/ HEATING AS APPLICABLE, BALANCE OF CONDENSER AND HEATING WATER SYSTEMS, PUMPS, BOILERS, COOLING TOWERS, NOTE DEFICIENCIES IN MECHANICAL SYSTEM, ETC. FOR A CORRECTLY OPERATING MECHANICAL SYSTEM. CONTRACTOR SHALL REPLACE ALL FILTERS AND CLEAN ALL STRAINERS. TESTING AND BALANCING SUBCONTRACTOR MUST BE A MEMBER IN GOOD STANDING OF AABC AND SUBMIT REPORT ON AABC OR SMACNA FORMS FOR APPROVAL BY THE ENGINEER. PROVIDE A TEST AND BALANCE REPORT TO THE MECHANICAL INSPECTOR AT TIME OF HEATING FINAL INSPECTION. TAB CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR TO LOCATE DP SENSORS IN PIPING FOR PUMPING SYSTEMS AND STATIC PRESSURE SENSORS IN DUCTWORK FOR FAN SYSTEMS.

Y. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR FOR ALL ELECTRICAL POWER REQUIREMENTS. CONTRACTOR SHALL ENSURE THE FURNISHING AND INSTALLATION OF ALL BRANCH ELECTRICAL CIRCUIT WIRING, CONDUITS, PROTECTIVE DEVICES, DISCONNECTS, AND ACCESSORIES FOR ALL ELECTRICAL EQUIPMENT AND DEVICES FURNISHED UNDER THIS CONTRACT, INCLUDING TO INCLUDE, BUT NOT LIMITED TO CONTROL PANELS, SMOKE DETECTORS, CONTROL / MOTORIZED DAMPER, PRESSURE MONITORS, FIRE/SMOKE DAMPERS, VARIABLE FREQUENCY DRIVES, VAV TERMINALS (24V TRANSFORMER) AND ALL OTHER 120V CONTROLS AS REQUIRED FOR A COMPLETE CONTROL SYSTEM WHETHER SHOWN TO BE PERFORMED BY OTHER OR NOT. ALL ELECTRICAL WORK SHALL BE INSTALLED IN FULL ACCORDANCE WITH REQUIREMENTS OF ELECTRICAL SPECIFICATIONS AND THE NATIONAL ELECTRICAL CODE.

Z. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING FINISHES AND FURNISHINGS FROM DAMAGE DURING WORK.

AA. CONTRACTOR TO PROVIDE TEMPORARY SPACE CONDITIONING DURING ALL HVAC EQUIPMENT OUTAGES AND PRIOR TO HVAC EQUIPMENT START-UP.

BB. COMMISSIONING OF THE MECHANICAL SYSTEMS ON THIS PROJECT IS PART OF THE SCOPE OF WORK. DOCUMENTATION AND TESTING OF THESE SYSTEMS, AS WELL AS TRAINING OF THE OWNER'S OPERATION / MAINTENANCE PERSONNEL, IS REQUIRED IN COOPERATION WITH THE OWNER'S REPRESENTATIVE AND THE COMMISSIONING AGENT. PROJECT CLOSEOUT IS DEPENDENT ON SUCCESSFUL COMPLETION OF ALL COMMISSIONING PROCEDURES, DOCUMENTATION, AND ISSUE CLOSURE.

CC. ALL PIPES, DUCTS, AND OTHER EQUIPMENT SHALL BE PROPERLY



1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA A

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.3 EXISTING FAN-POWERED TERMINAL BOX SHALL BE REMOVED AS PART OF ALTERNATE 2. ASSOCIATED EXISTING DUCTWORK TO REMAIN.

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M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.11 EXISTING VFD TO REMAIN.

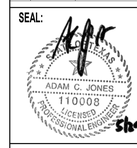
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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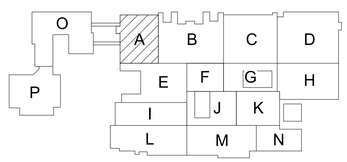
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SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA A

SHEET NUMBER: M2.11A

KEY PLAN



PN

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MECHANICAL KEYED NOTES

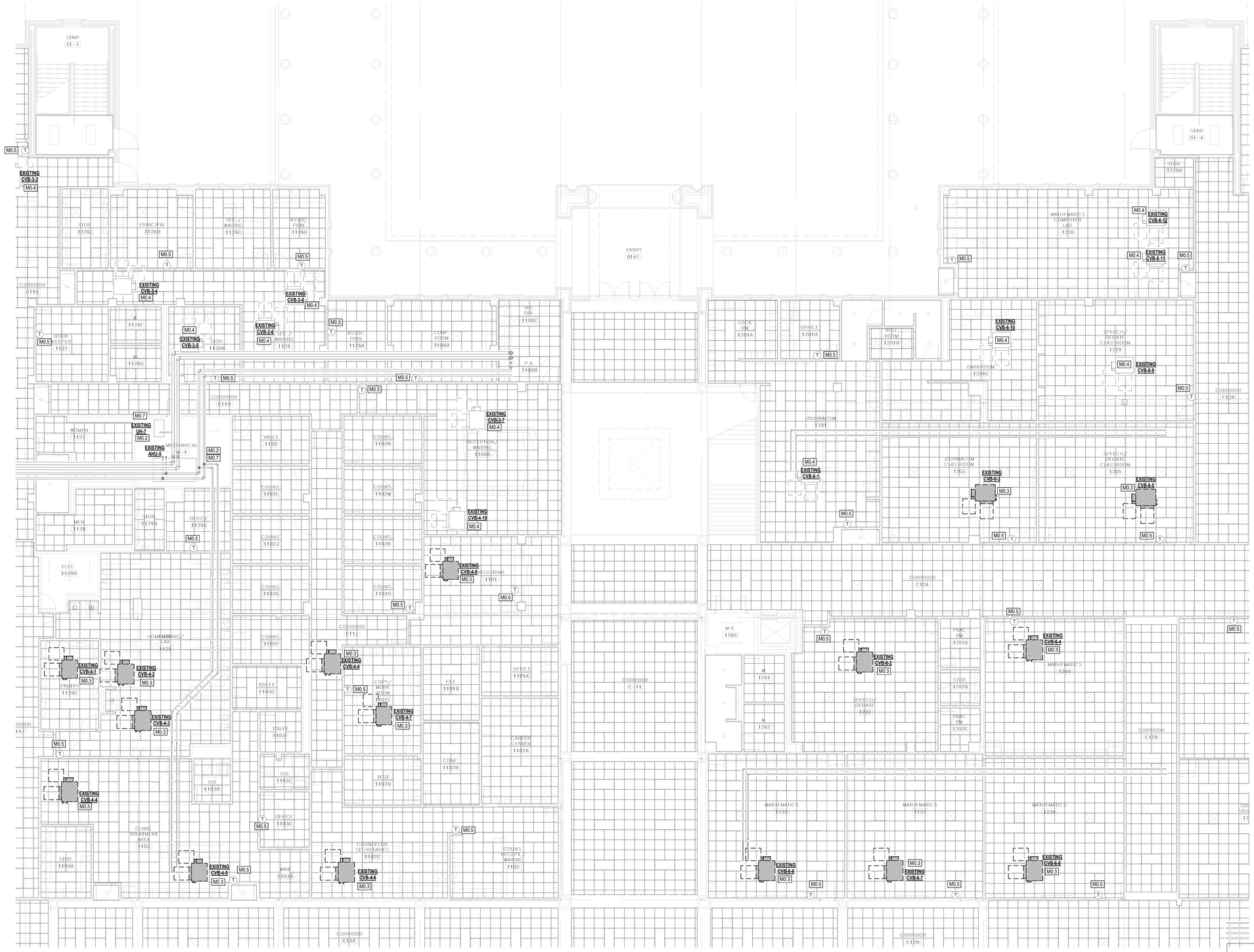
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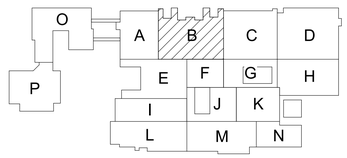
M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.



1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA B

1/8" = 1'-0"

KEY PLAN



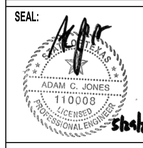
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SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA B

SHEET NUMBER: M2.11B

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.11 EXISTING VFD TO REMAIN.

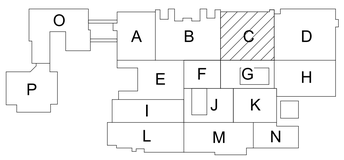
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA C

1/8" = 1'-0"

PN

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SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA C

SHEET NUMBER: M2.11C

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

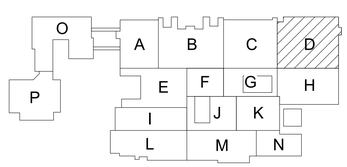
M0.11 EXISTING VFD TO REMAIN.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA D**
1/8" = 1'-0"

KEY PLAN



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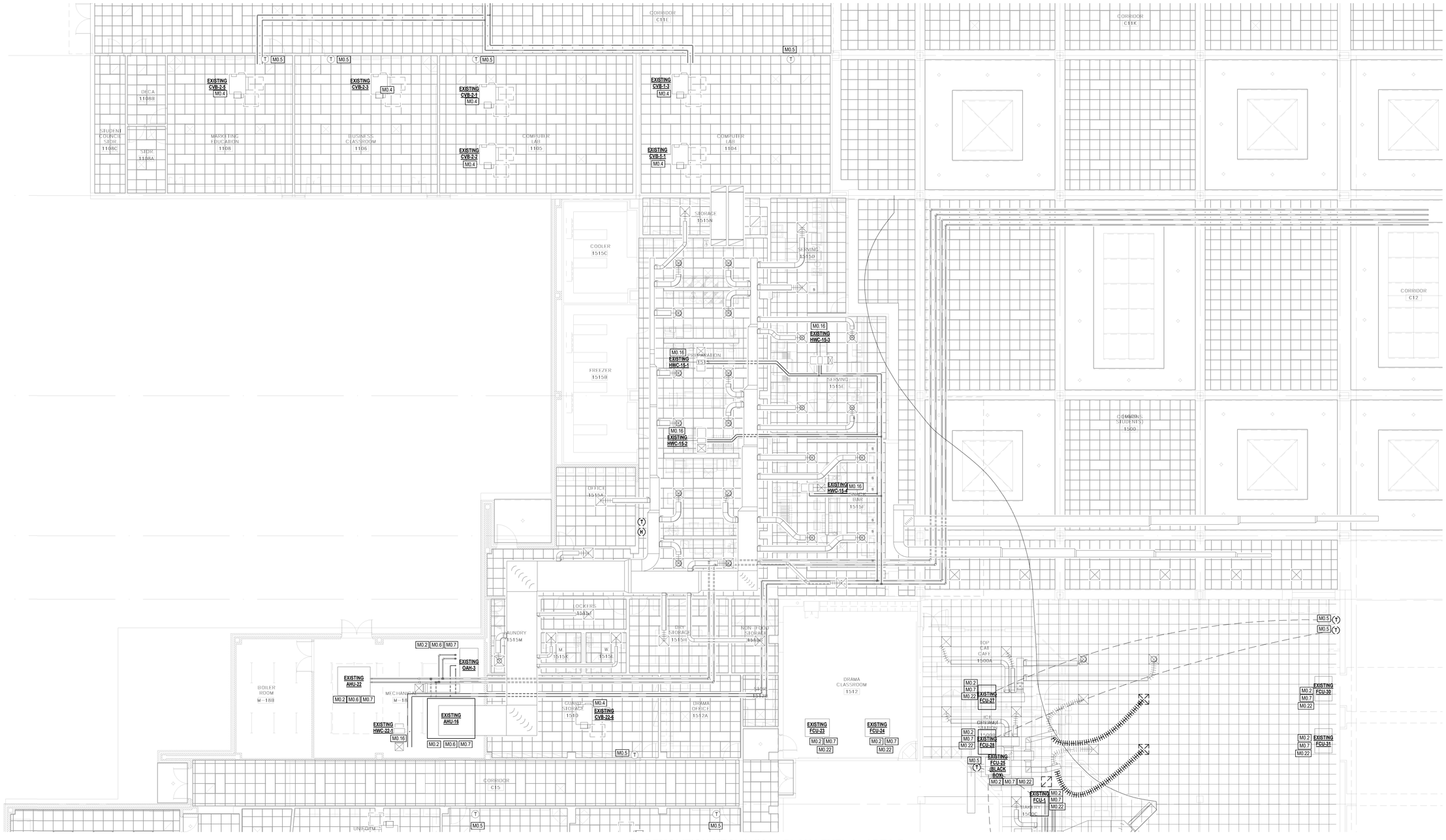
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SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA D

SHEET NUMBER: M2.11D

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1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA E

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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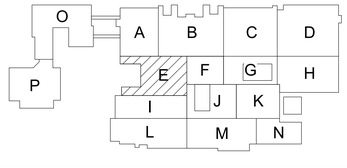
M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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PN N

KEY PLAN

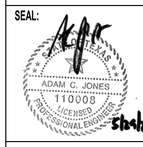


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SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA E

SHEET NUMBER: M2.11E

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MECHANICAL KEYED NOTES

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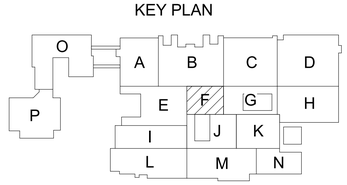
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1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA F**
1/8" = 1'-0"

KEY PLAN



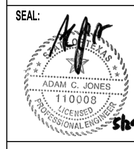
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SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA F

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M0.3 EXISTING FAN-POWERED TERMINAL BOX SHALL BE REMOVED AS PART OF ALTERNATE 2. ASSOCIATED EXISTING DUCTWORK TO REMAIN.

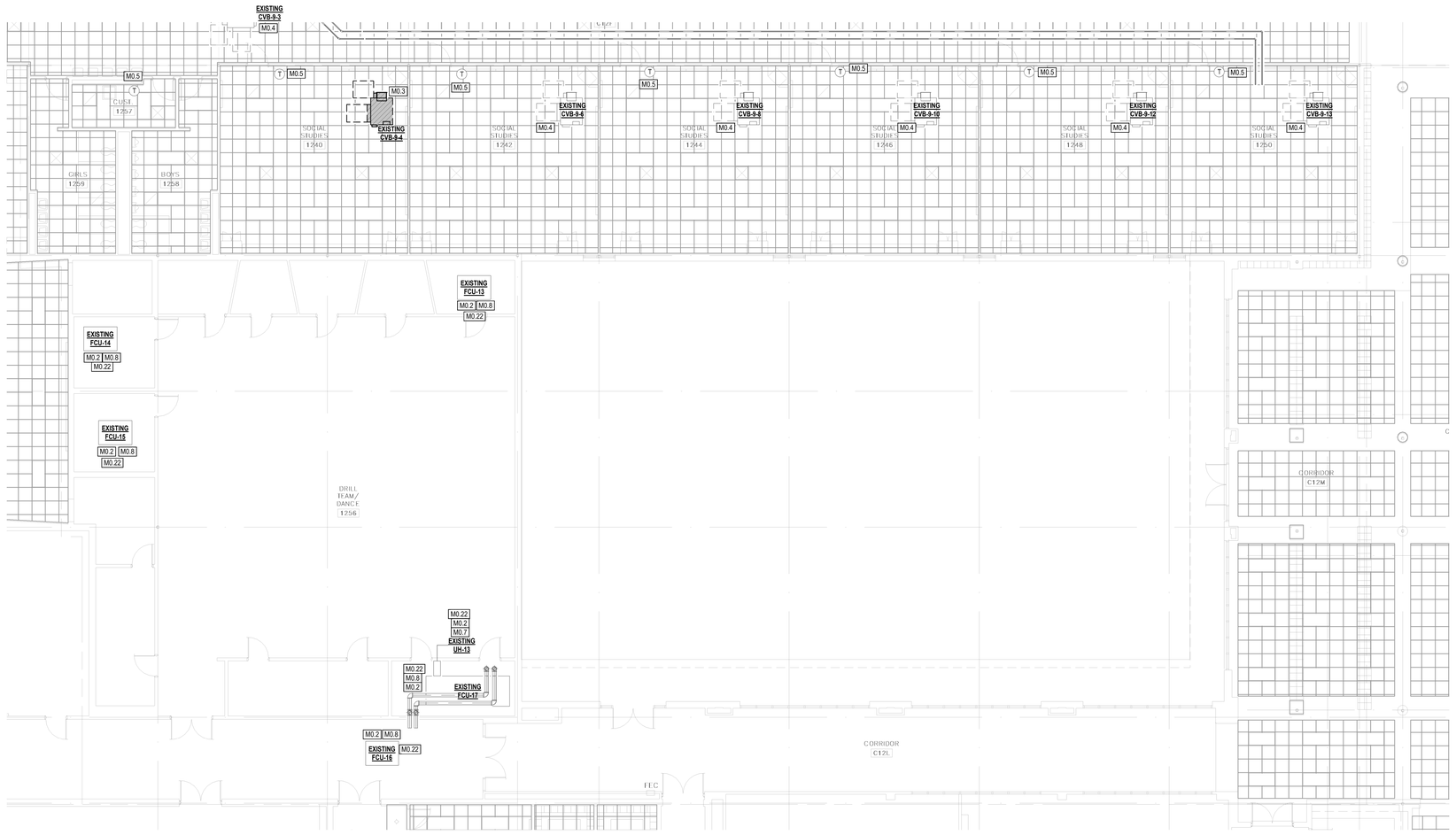
M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



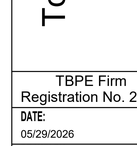
1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA G**
1/8" = 1'-0"

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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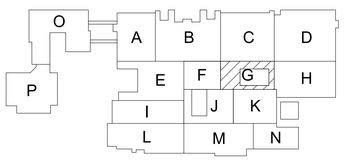
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PROJECT NUMBER 260018.001

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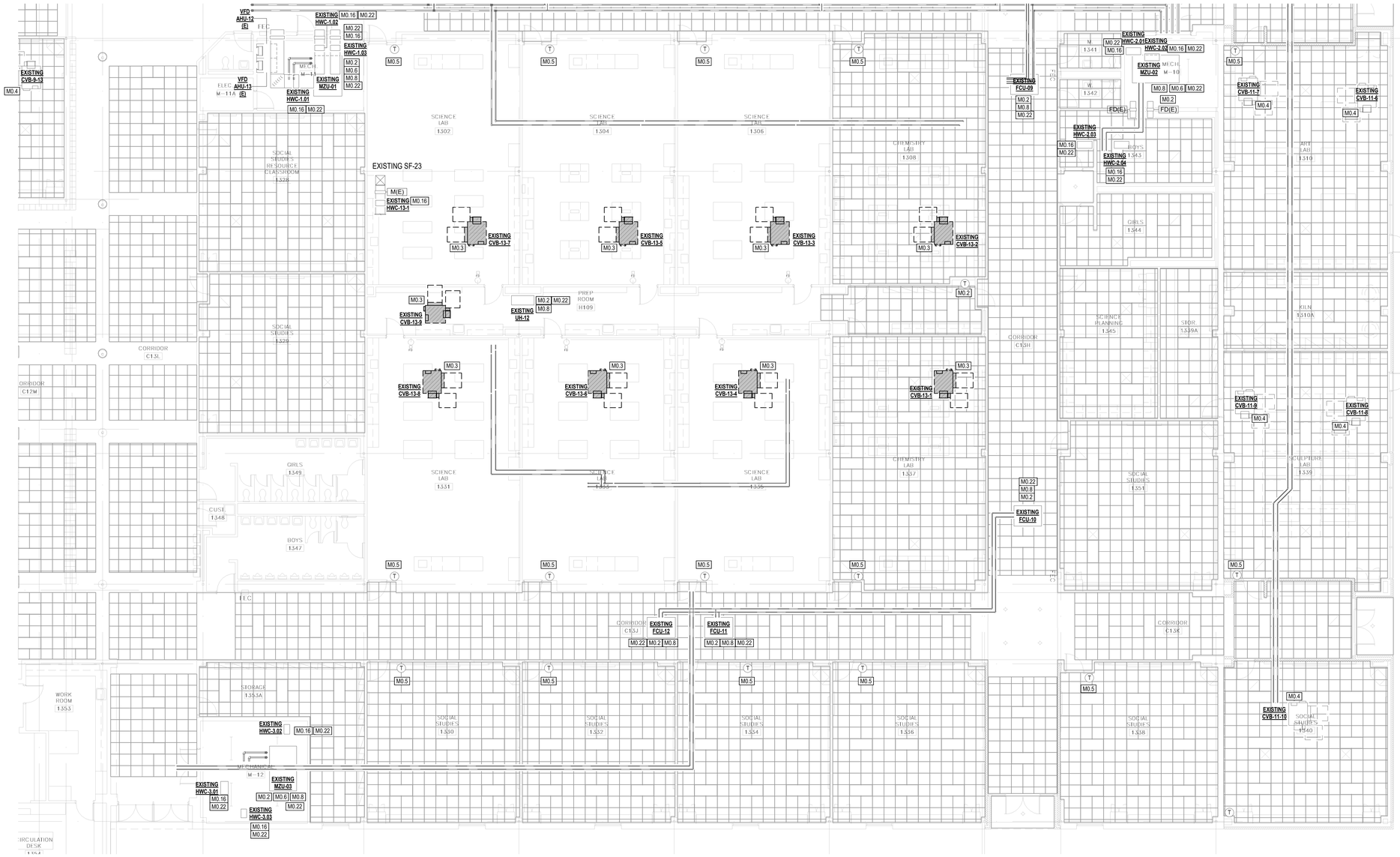
SHEET NUMBER: M2.11G

KEY PLAN



PN

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1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA H

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.3 EXISTING FAN-POWERED TERMINAL BOX SHALL BE REMOVED AS PART OF ALTERNATE 2. ASSOCIATED EXISTING DUCTWORK TO REMAIN.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

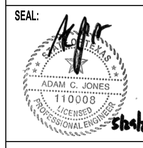
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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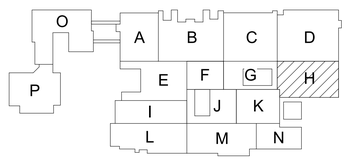
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA H

SHEET NUMBER: M2.11H

KEY PLAN



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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

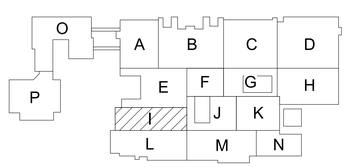
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M2.6 EXISTING PIPING TO REMAIN.



1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA I**
1/8" = 1'-0"

KEY PLAN



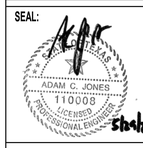
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30330 Quinn Rd.
Tomball, TX, 77375

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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA I

SHEET NUMBER: M2.11I

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MECHANICAL KEYED NOTES

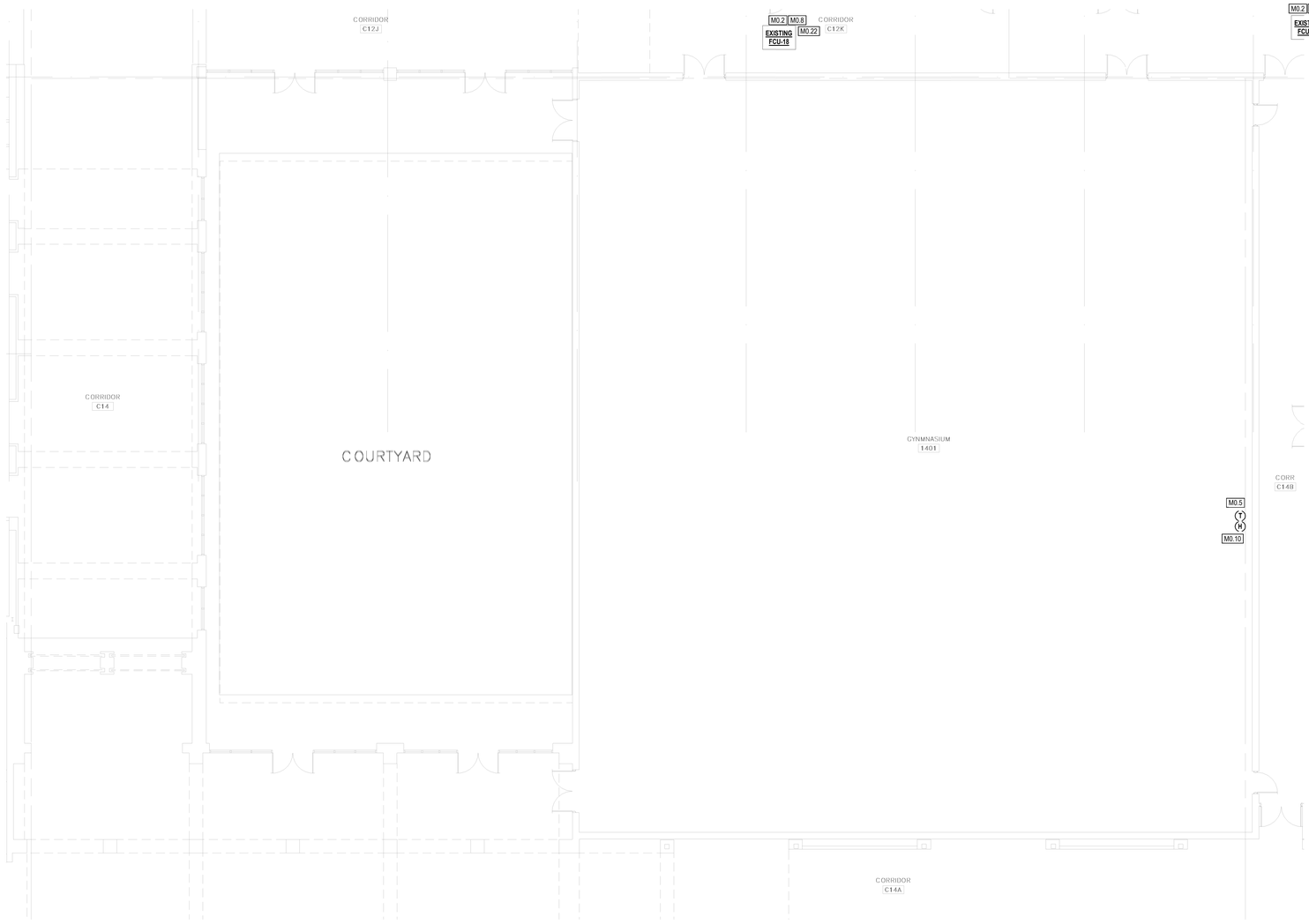
M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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M0.8 EXISTING UNITS ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.10 EXISTING HUMIDITY SENSOR AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



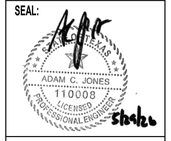
1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA J**
1/8" = 1'-0"

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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

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PROJECT NUMBER 260018.001

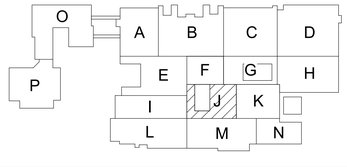
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DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA J

SHEET NUMBER:

M2.11J

KEY PLAN



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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNITS ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

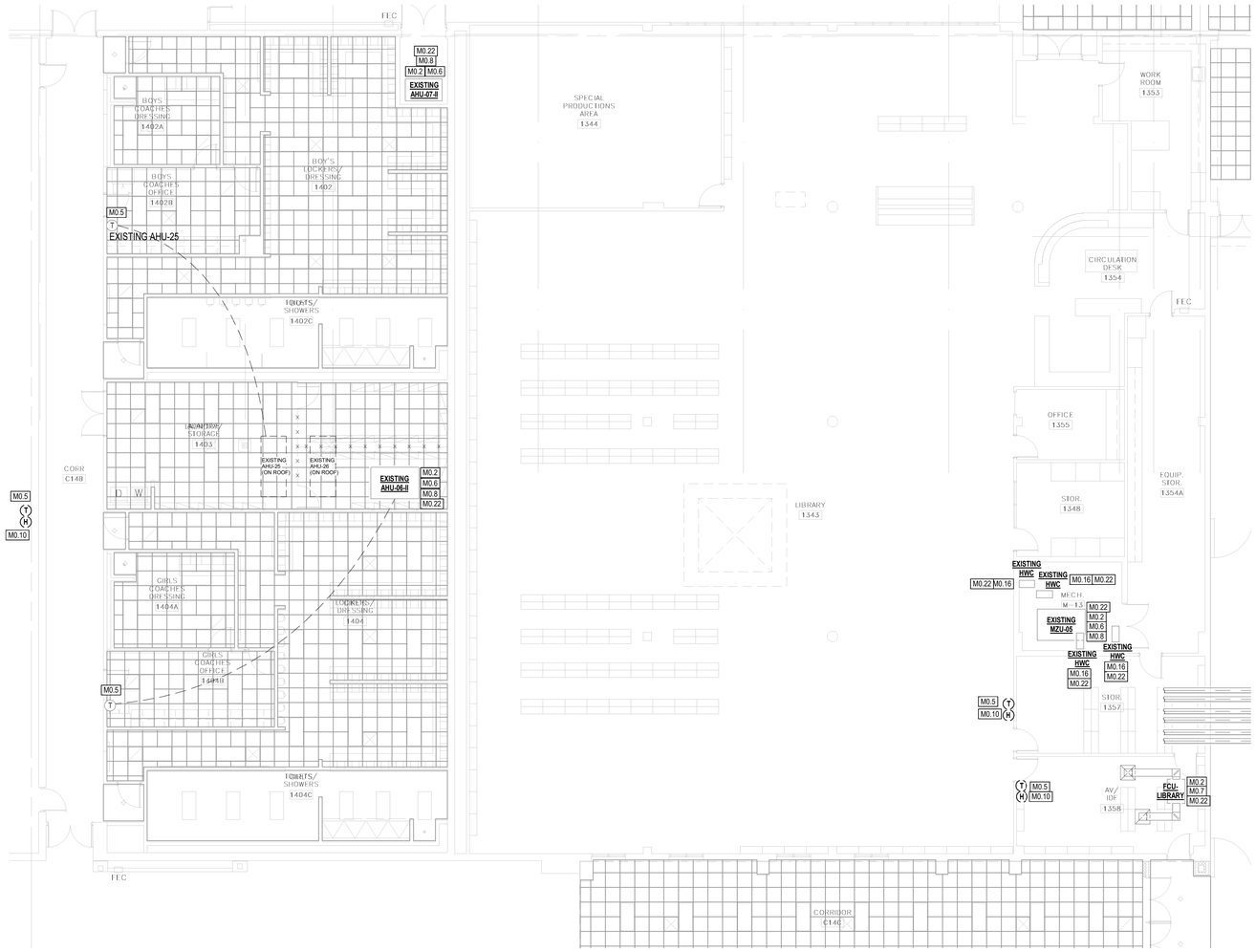
M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.10 EXISTING HUMIDITY SENSOR AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

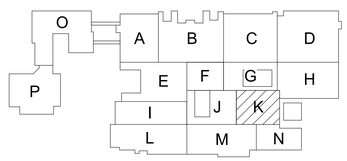
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



1 **DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA K**
1/8" = 1'-0"

KEY PLAN



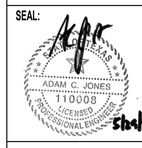
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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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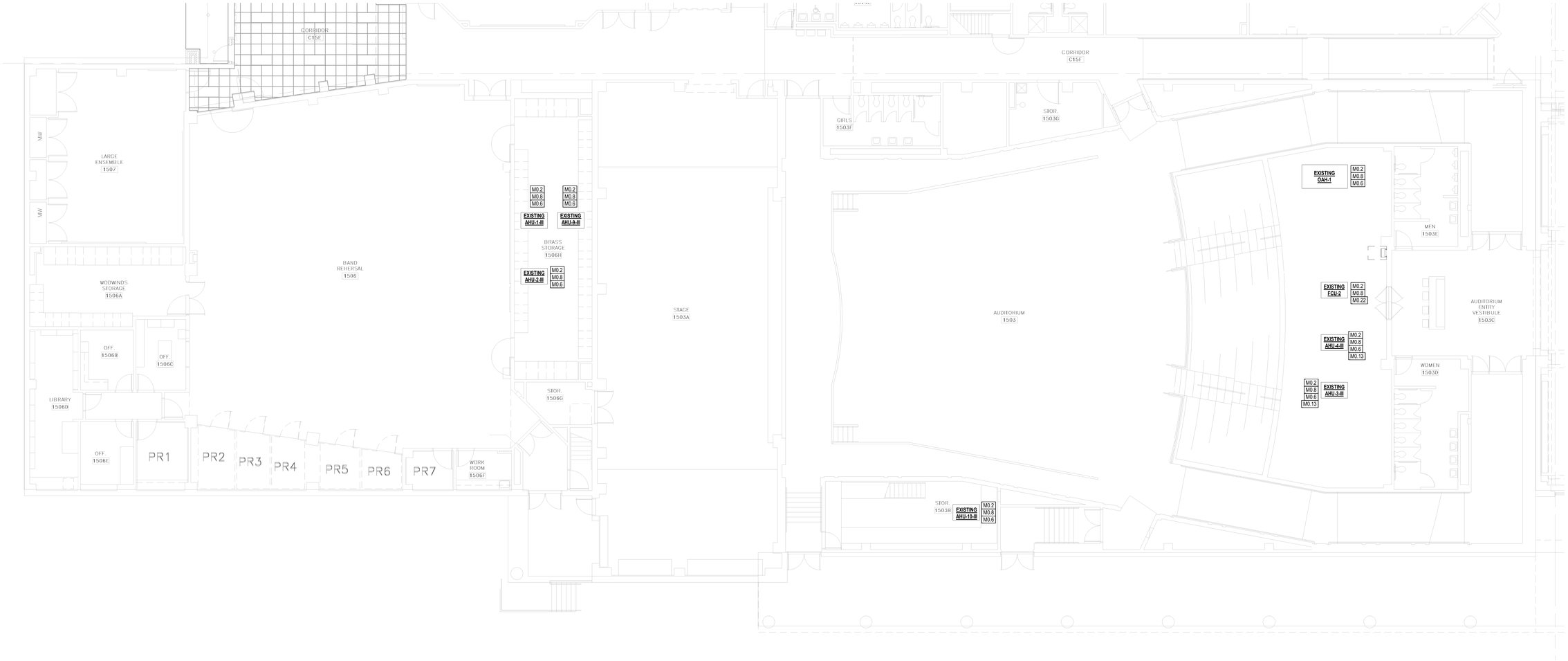
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PROJECT NUMBER 260018.001

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SHEET NUMBER: M2.11K

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt



1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA L

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

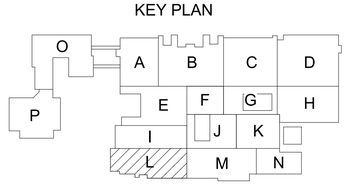
M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.13 EXISTING SENSORS IN RETURN AIR DUCTS TO BE REMOVED AND REPLACED WITH A WALL MOUNTED THERMOSTAT. REFER TO M2.21L FOR NEW APPROXIMATE THERMOSTAT LOCATION.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

KEY PLAN



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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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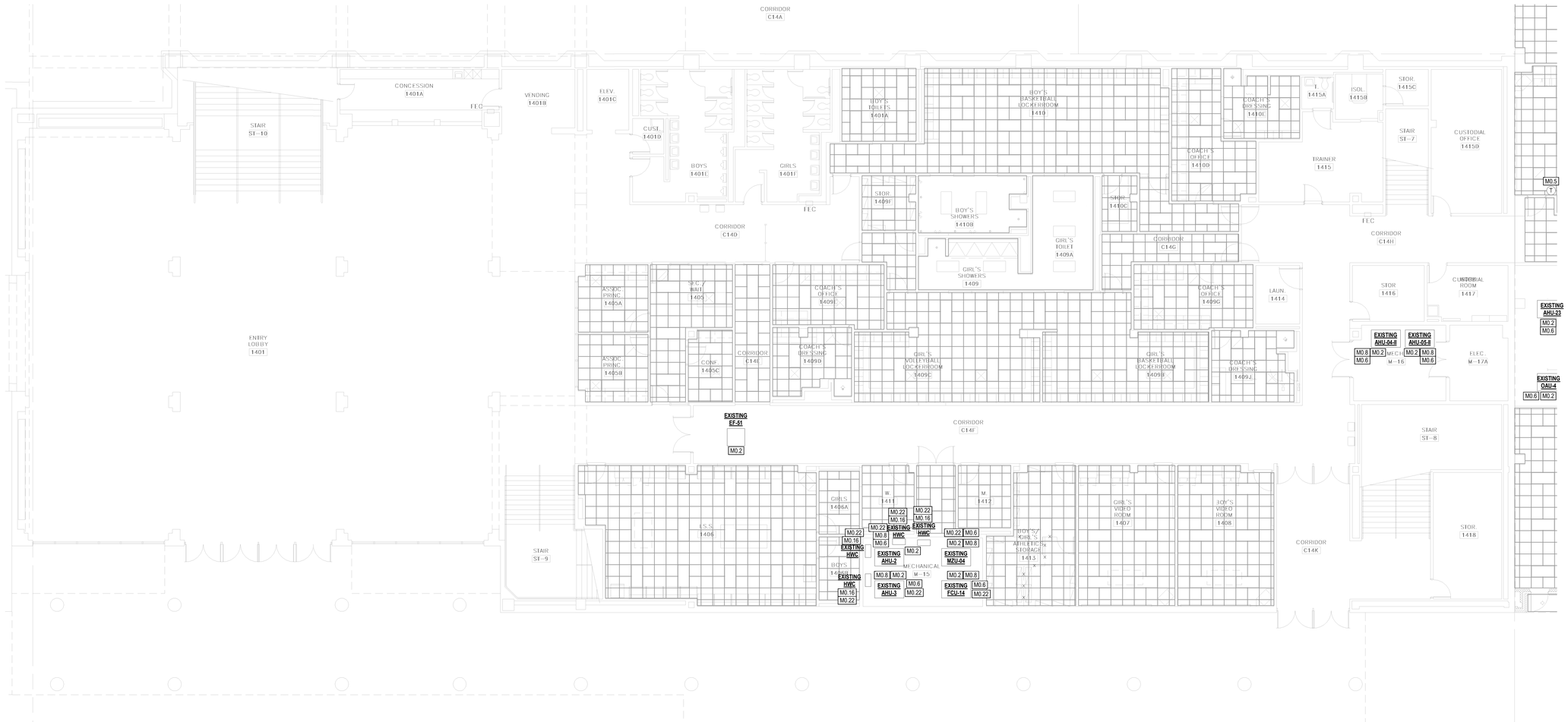
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA L

SHEET NUMBER: M2.11L

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1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA M

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

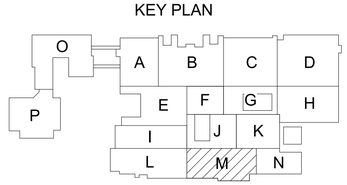
M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

KEY PLAN



PN

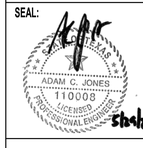
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30330 Quinn Rd.
Tomball, TX, 77375

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SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA M

SHEET NUMBER: M2.11M

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MECHANICAL KEYED NOTES

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M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

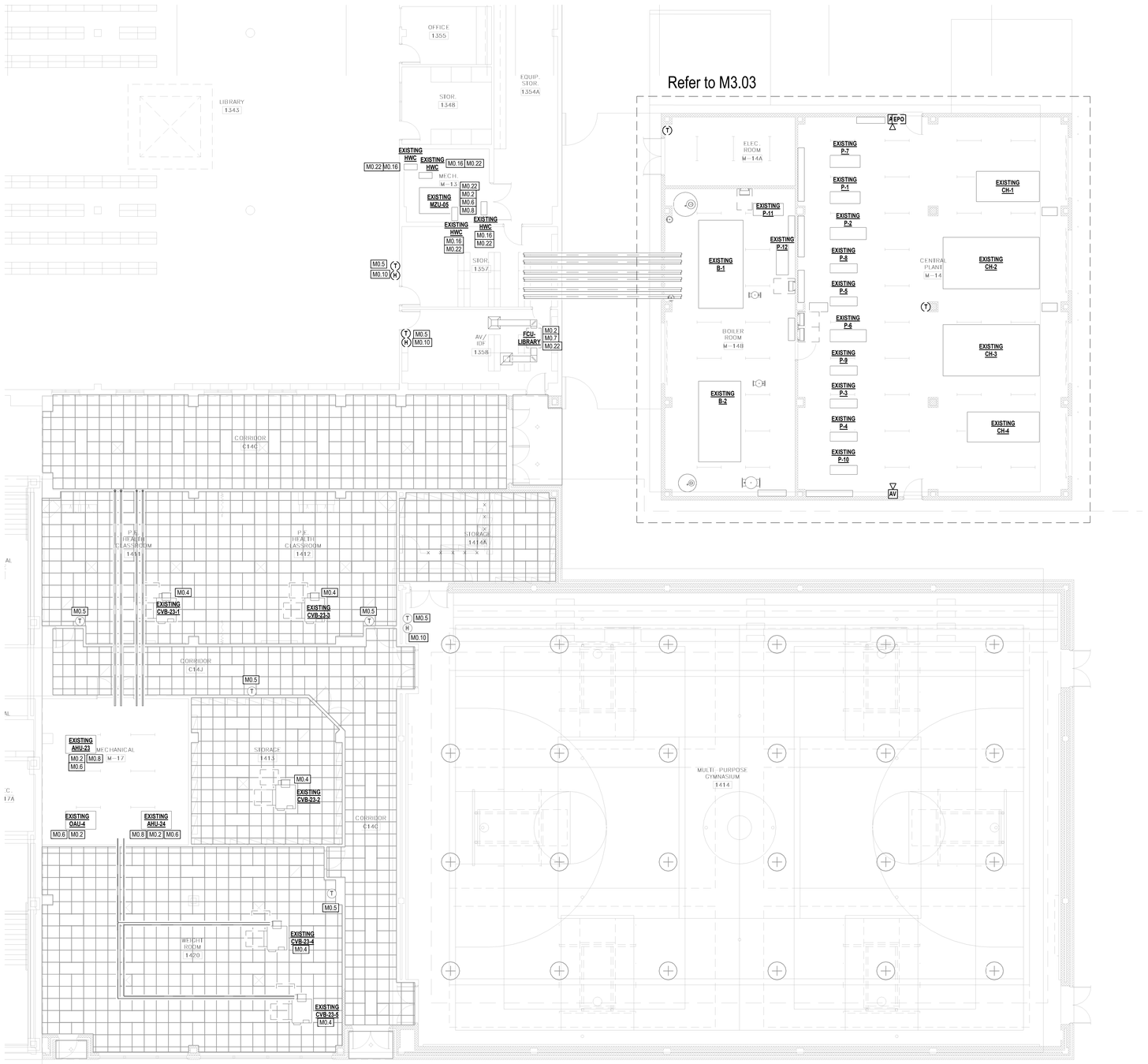
M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.10 EXISTING HUMIDITY SENSOR AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

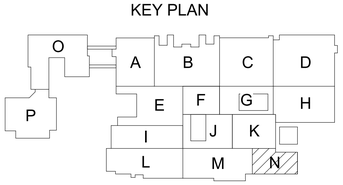
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



1 DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA N

1/8" = 1'-0"

KEY PLAN



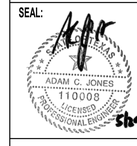
PN

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	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE:

DEMOLITION MECHANICAL PLAN LEVEL 1 - AREA N

SHEET NUMBER:

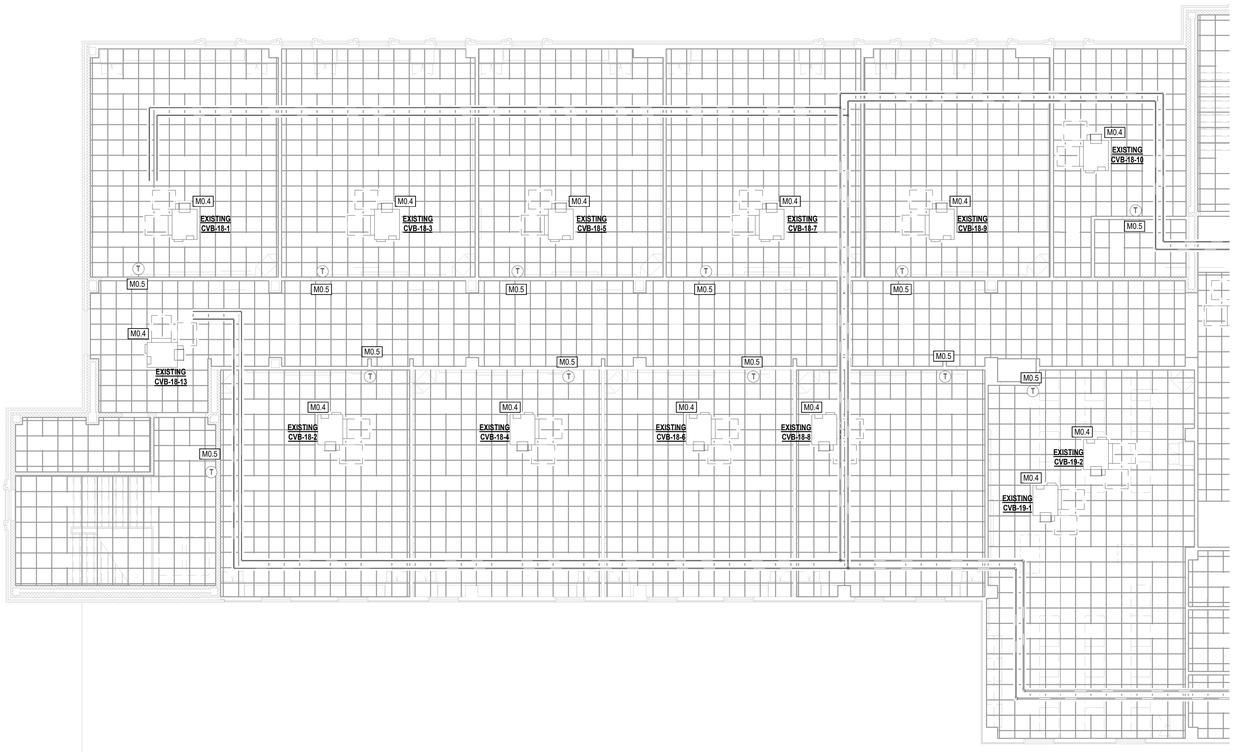
M2.11N

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

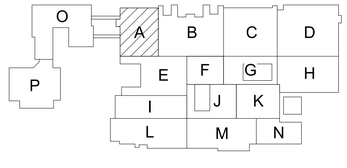
M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.



1 DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA A
1/8" = 1'-0"

KEY PLAN



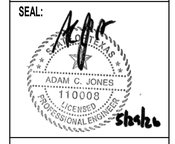
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Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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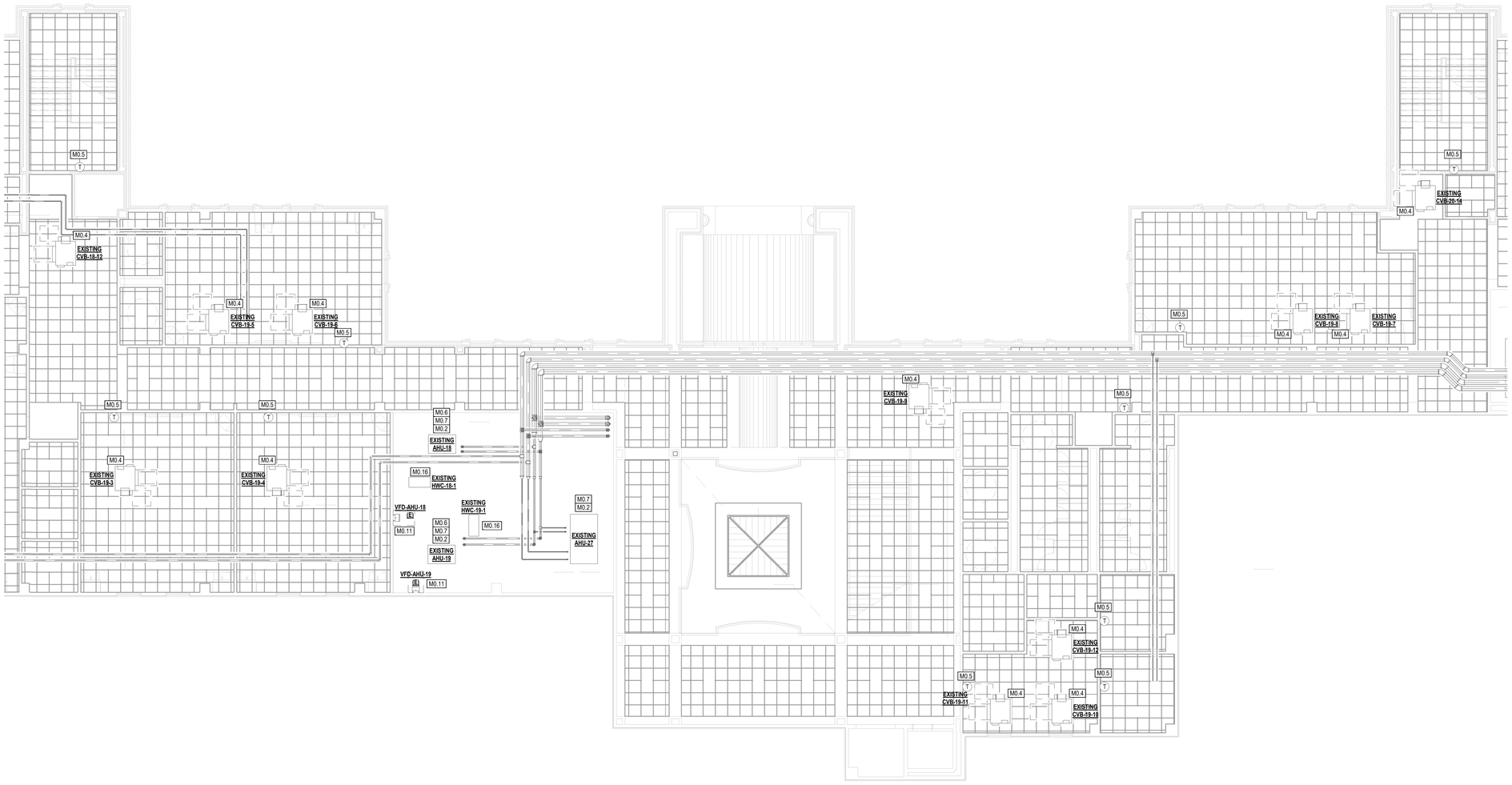
CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA A

SHEET NUMBER: M2.12A

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt



1 DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA B

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.11 EXISTING VFD TO REMAIN.

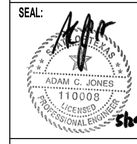
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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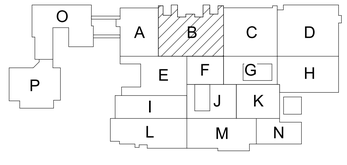
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA B

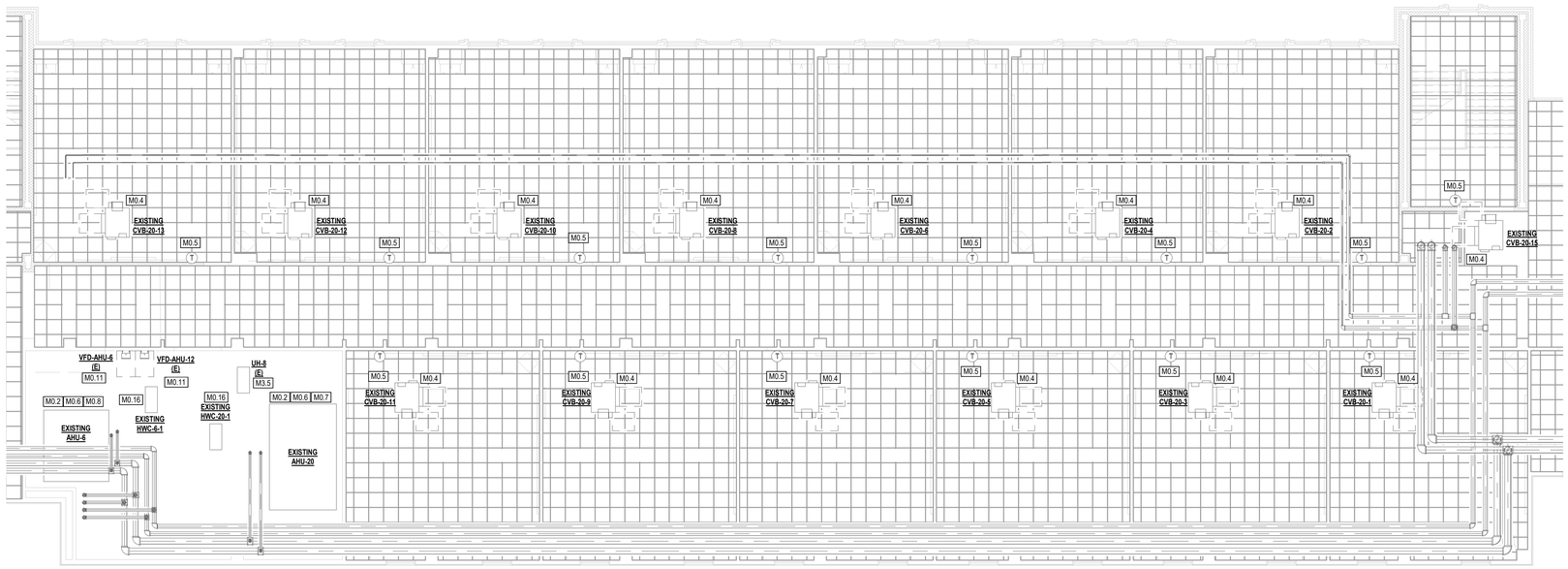
SHEET NUMBER: M2.12B

KEY PLAN



PN

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt



1 DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA C

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.11 EXISTING VFD TO REMAIN.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

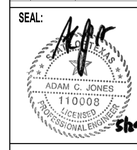
M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

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Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

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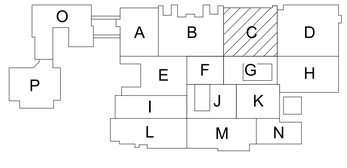
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DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA C

SHEET NUMBER:

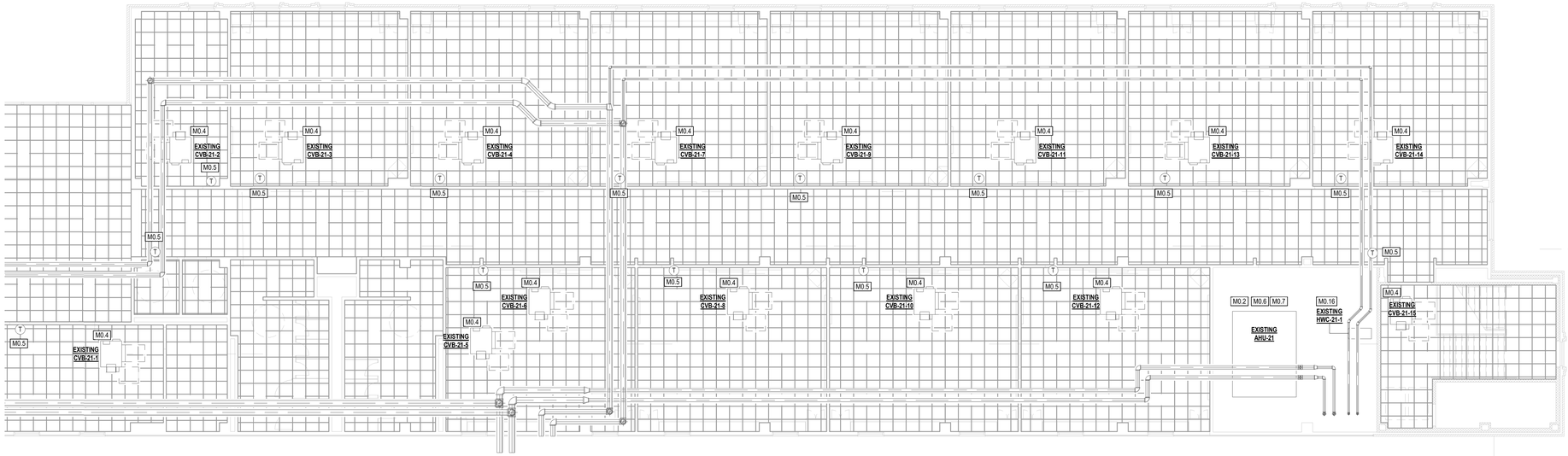
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KEY PLAN



PN

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt



1 DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA D

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.4 EXISTING FAN POWERED TERMINAL BOX AND ASSOCIATED DUCTWORK AND PIPING TO REMAIN. ASSOCIATED SENSORS, CONTROL VALVES, AND CONTROLS TO BE REMOVED AND REPLACED. REFER TO ASSOCIATED MECHANICAL SHEET AND CONTROL DIAGRAM FOR SCOPE OF WORK AND NEW CONTROL SEQUENCE. TYPICAL TO ALL FAN POWERED TERMINAL BOXES UNLESS NOTED OTHERWISE.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

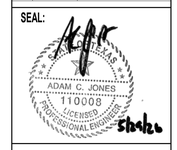
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
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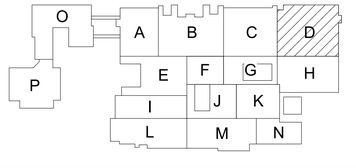
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA D

SHEET NUMBER: M2.12D

KEY PLAN



PN

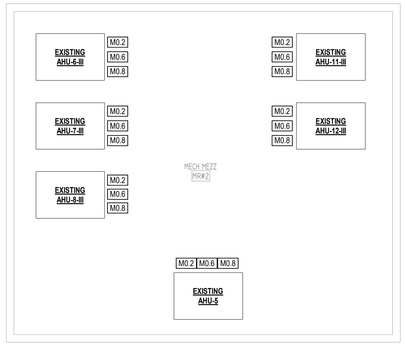
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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.



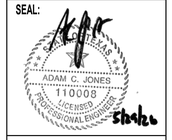
1 **DEMOLITION ENLARGED MECHANICAL PLAN - MR#2 MECH MEZZ**
1/4" = 1'-0"

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30330 Quinn Rd.
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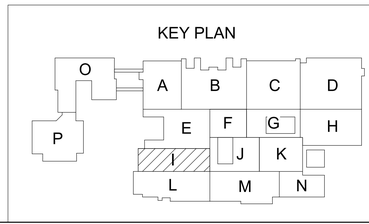
SHEET TITLE:

DEMOLITION MECHANICAL PLAN LEVEL 2 - MECH MEZZ MR#2

SHEET NUMBER:

M2.12I

KEY PLAN



PN

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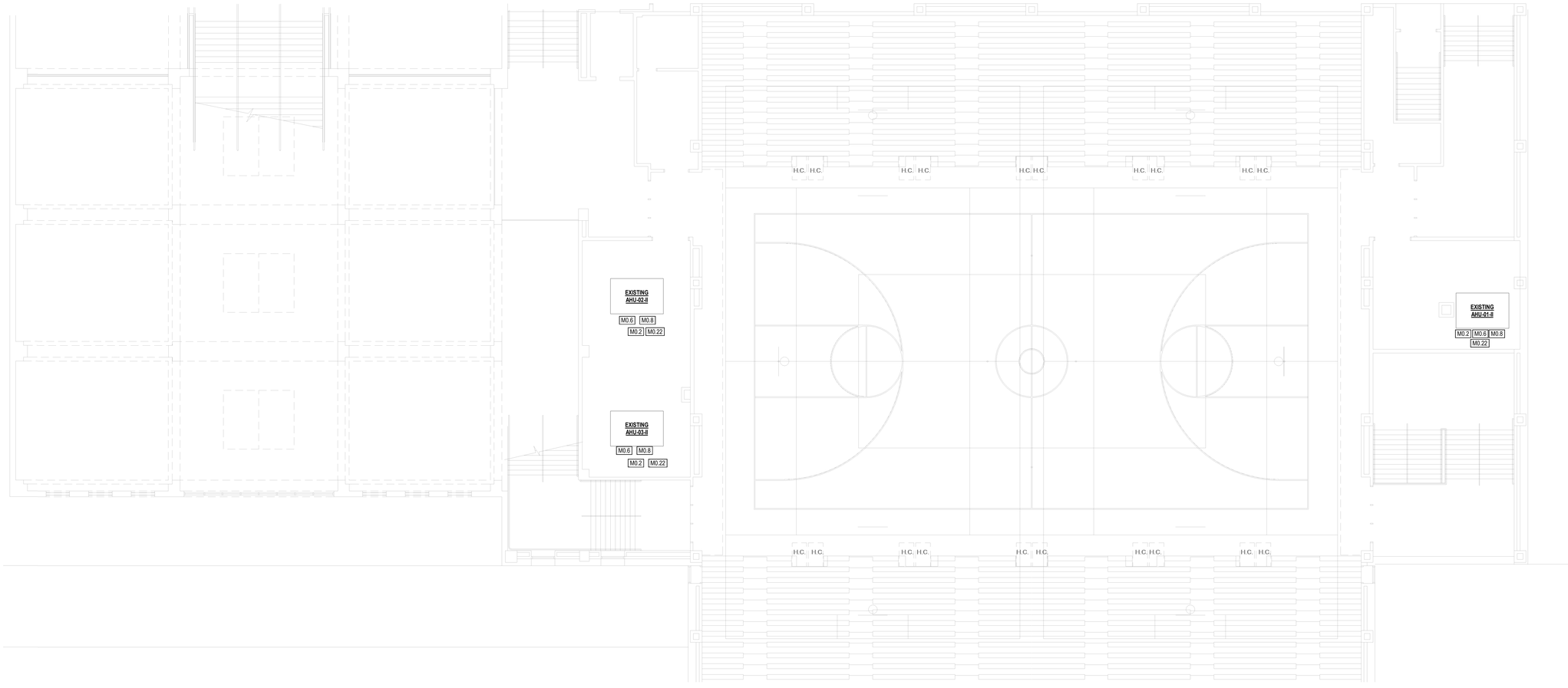
MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



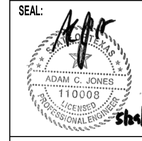
1 **DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA M**
1/8" = 1'-0"

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Tomball, TX, 77375

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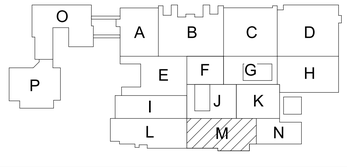
SHEET TITLE:

DEMOLITION MECHANICAL PLAN LEVEL 2 - AREA M

SHEET NUMBER:

M2.12M

KEY PLAN



PN

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

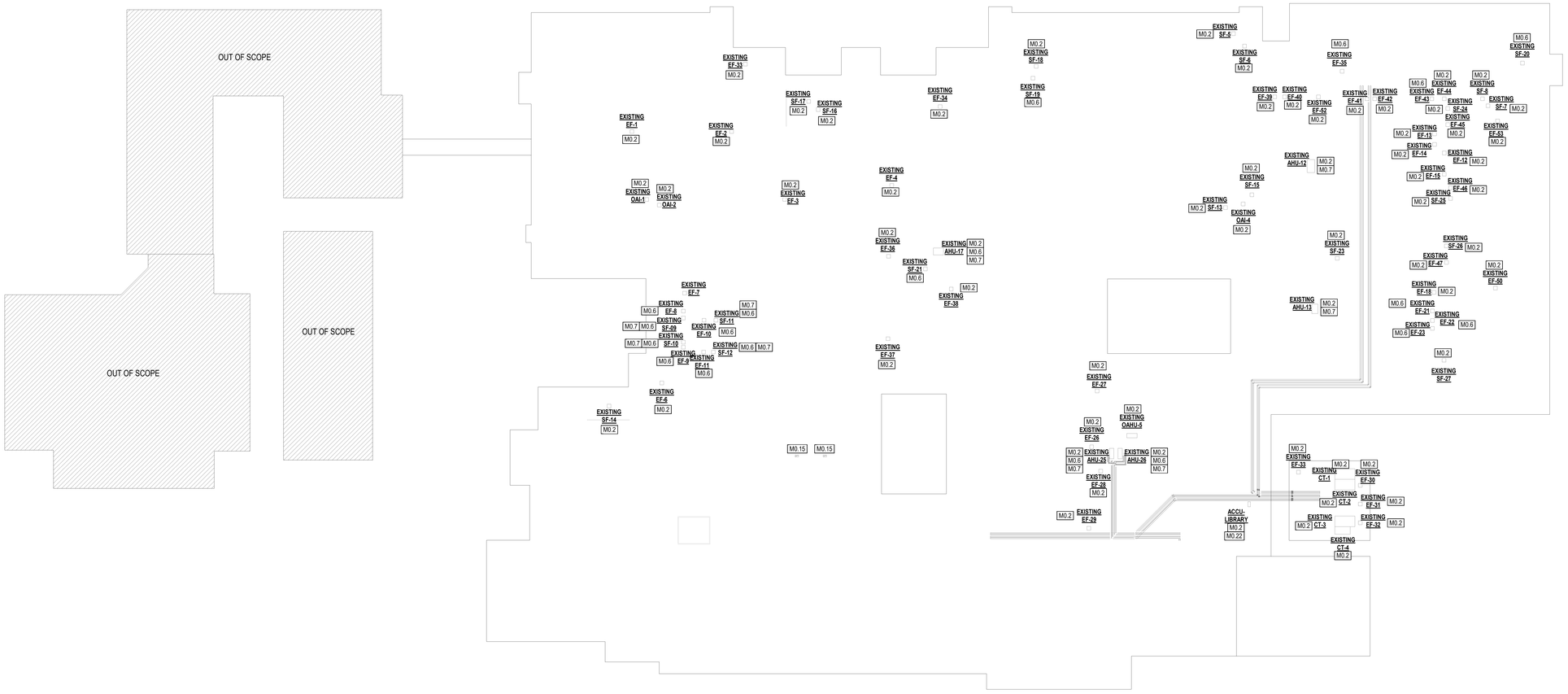
M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

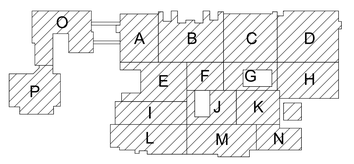
M0.15 LOCATE EXISTING OUTSIDE AIR INTAKE FOR CAFETERIA 1500D AND CAP EXISTING CURB AS PART OF ALTERNATE 1.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.



1 **DEMOLITION MECHANICAL ROOF PLAN**
1" = 40'-0"

KEY PLAN



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	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL ROOF PLAN

SHEET NUMBER: M2.13

5/28/2026 5:13:38 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M2.6 EXISTING PIPING TO REMAIN.

M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

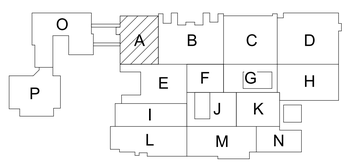
M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2. SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.



1 MECHANICAL PLAN LEVEL 1 - AREA A

1/8" = 1'-0"

KEY PLAN



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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA A

SHEET NUMBER: M2.21A

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

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M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

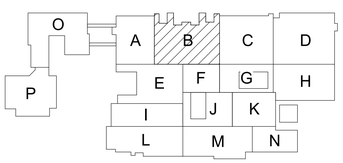
M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2. SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.

1 MECHANICAL PLAN LEVEL 1 - AREA B

1/8" = 1'-0"

KEY PLAN



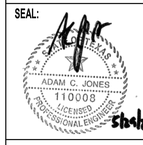
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30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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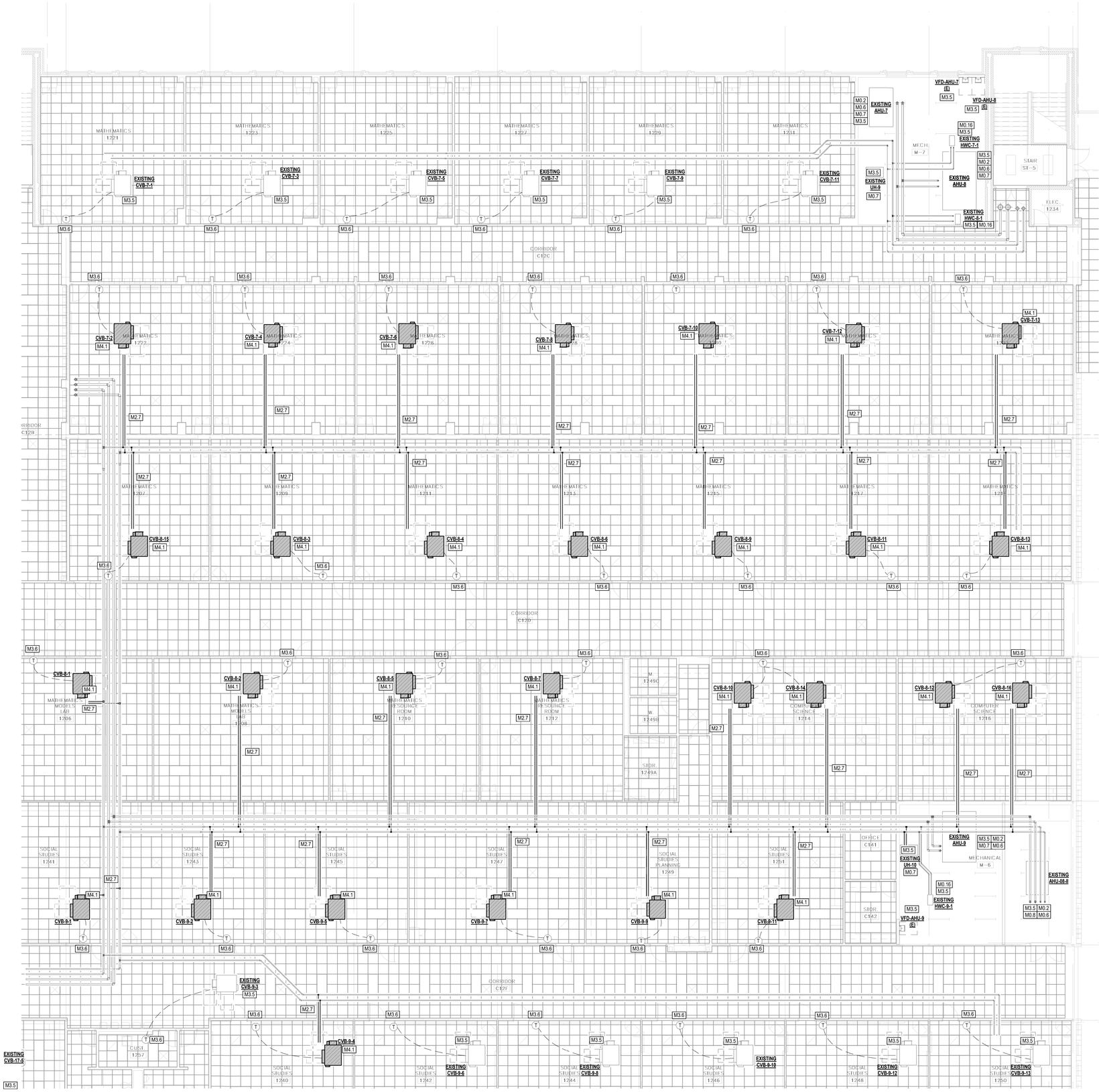
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA B

SHEET NUMBER: M2.21B

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt



1 MECHANICAL PLAN LEVEL 1 - AREA C

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

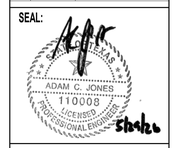
M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2, SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.

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30330 Quinn Rd.
Tomball, TX, 77375

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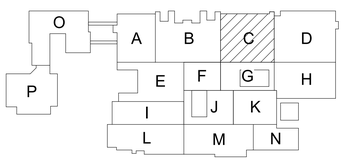
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA C

SHEET NUMBER: M2.21C

KEY PLAN



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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

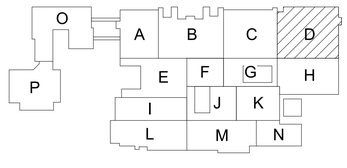
M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2. SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.

1 **MECHANICAL PLAN LEVEL 1 - AREA D**
1/8" = 1'-0"

KEY PLAN



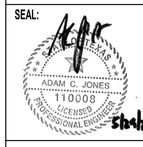
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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
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TBPE Firm Registration No. 2234

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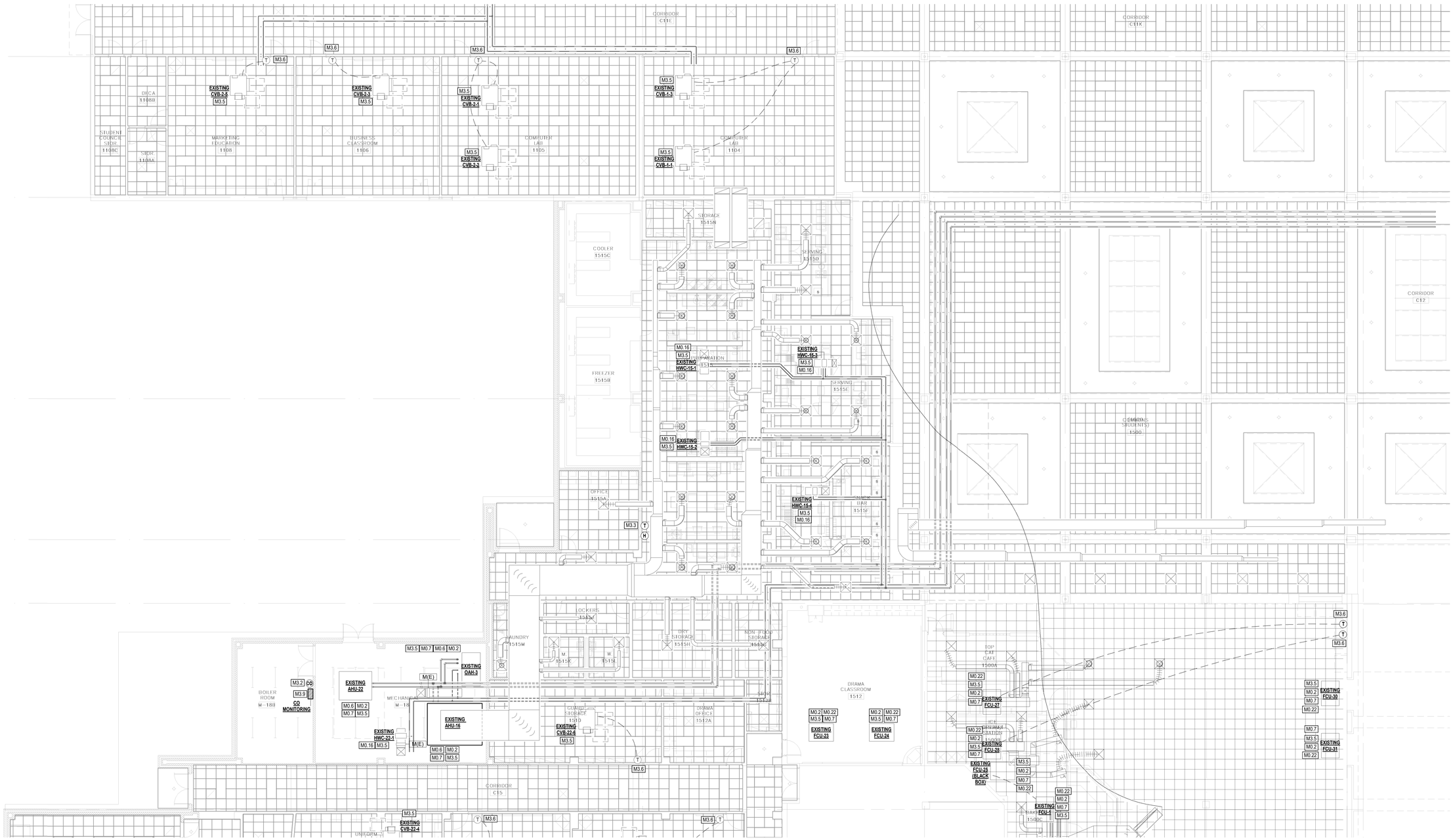
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA D

SHEET NUMBER: M2.21D

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1 MECHANICAL PLAN LEVEL 1 - AREA E

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M3.2 PROVIDE CARBON MONOXIDE SENSOR (MACURCO CM-6 OR APPROVED EQUAL) AT APPROXIMATELY THIS LOCATION. MOUNT AT SAME ELEVATION AS LIGHT SWITCHES. SENSOR SHALL MONITOR CARBON MONOXIDE LEVELS IN BOILER ROOM AS DESCRIBED IN HOT WATER SYSTEM CONTROL SEQUENCE

MECHANICAL KEYED NOTES

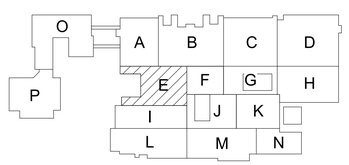
M3.3 PROVIDE COMBINATION TEMPERATURE/HUMIDITY SENSOR AT APPROXIMATE LOCATION SHOWN. SENSOR SHALL BE INSTALLED AT SAME ELEVATION AS LIGHT SWITCHES. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M3.9 PROVIDE CARBON MONOXIDE MONITORING CONTROL PANEL AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

KEY PLAN



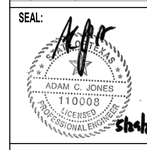
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30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA E

SHEET NUMBER: M2.21E

5/28/2026 5:20:29 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

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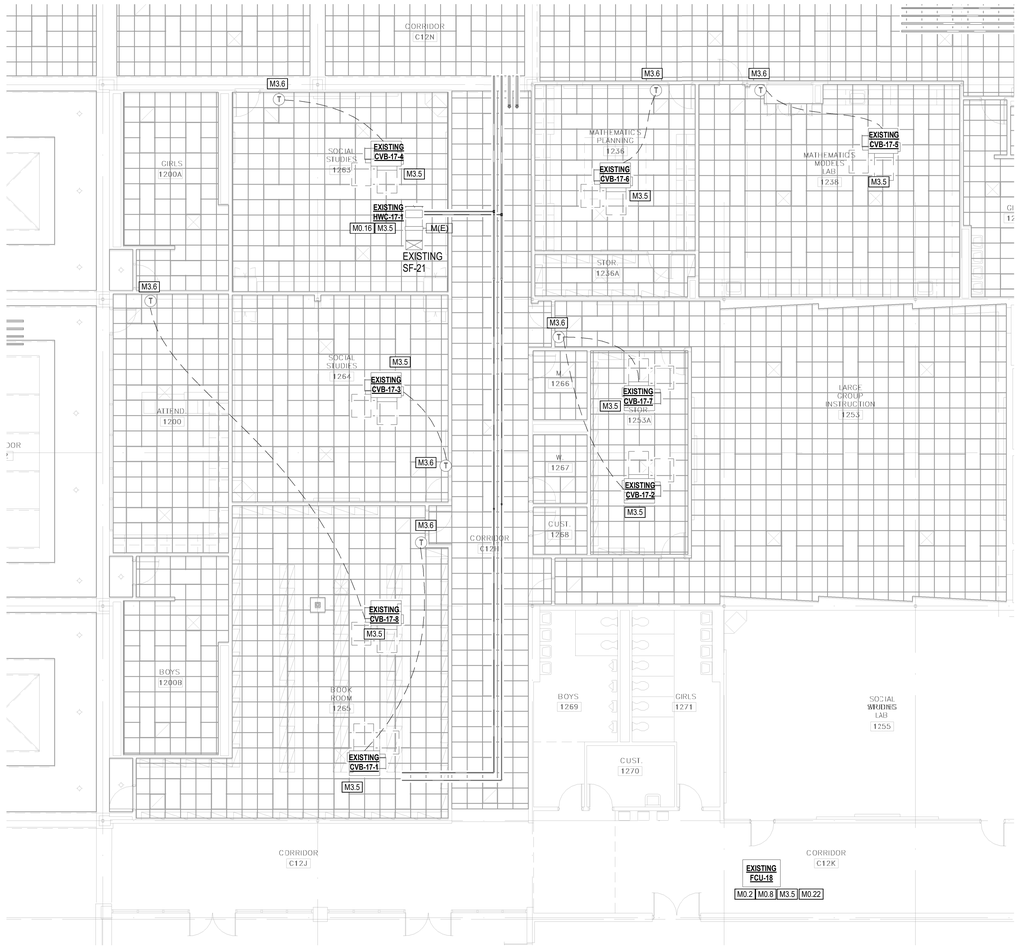
M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

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1 MECHANICAL PLAN LEVEL 1 - AREA F

1/8" = 1'-0"

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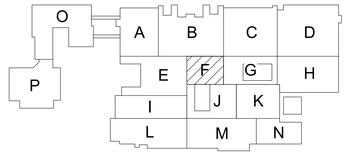
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA F

SHEET NUMBER: M2.21F

KEY PLAN



PN

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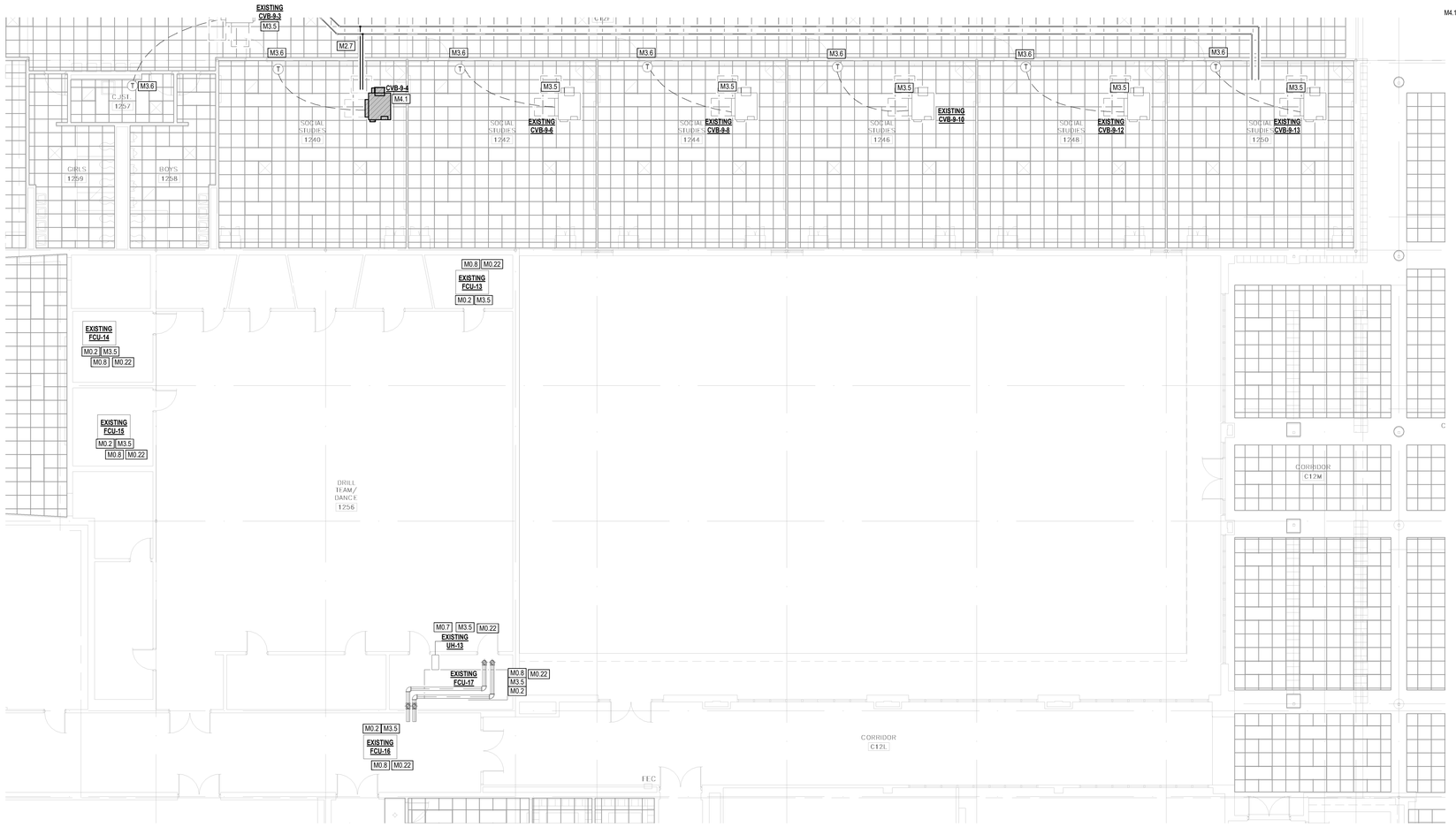
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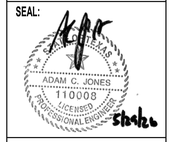
1 **MECHANICAL PLAN LEVEL 1 - AREA G**
1/8" = 1'-0"

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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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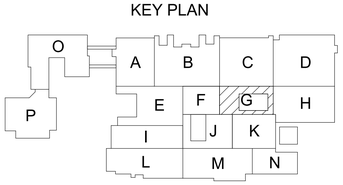
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA G

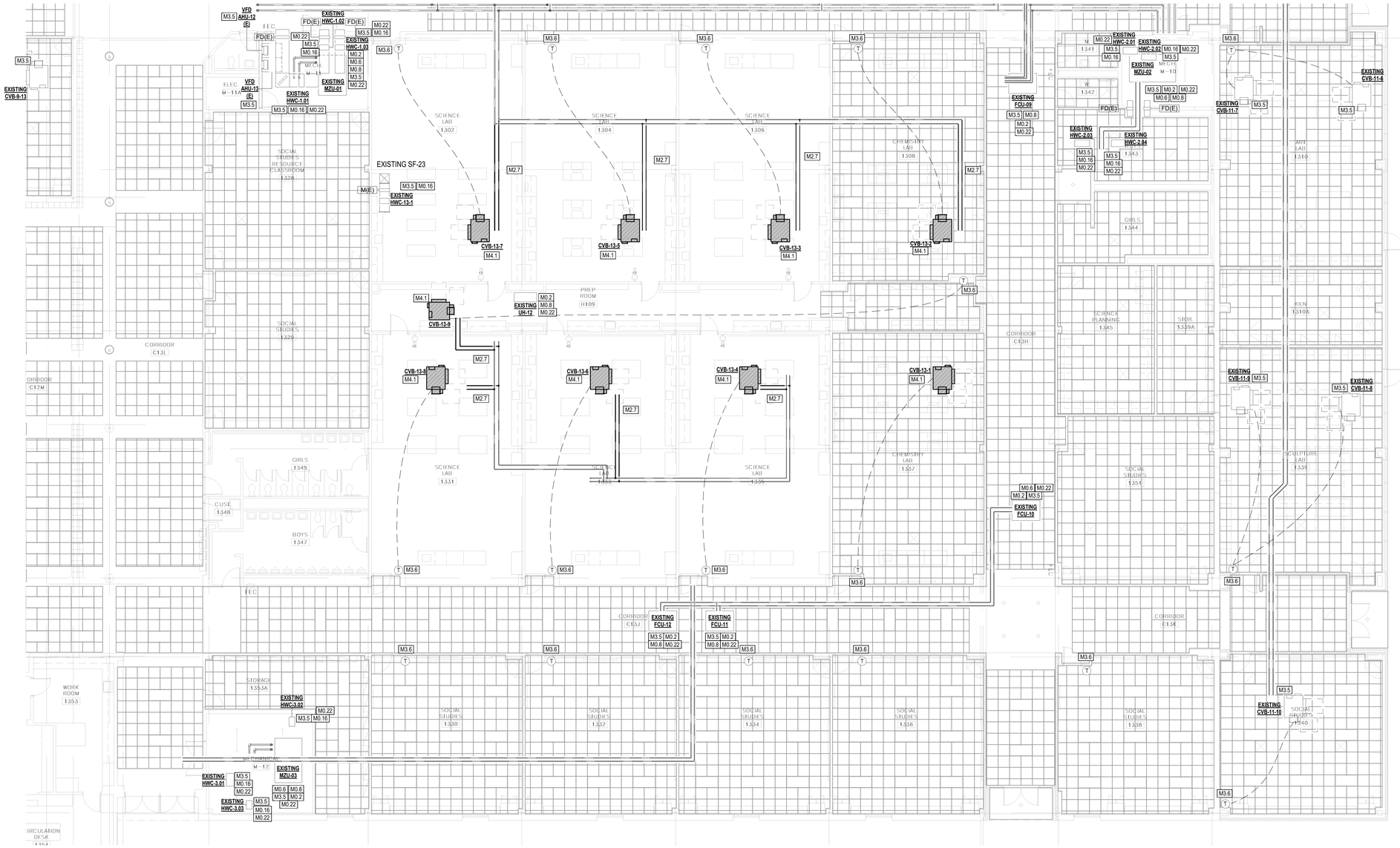
SHEET NUMBER: M2.21G

KEY PLAN



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1 **MECHANICAL PLAN LEVEL 1 - AREA H**
1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

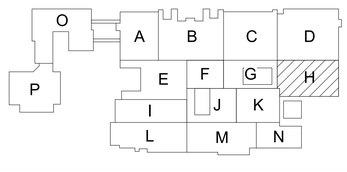
M2.7 CONNECT NEW 3/4" HOT WATER HYDRONIC PIPING FROM NEW FAN POWERED TERMINAL UNITS TO EXISTING HOT WATER MAINS AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL PIPE ROUTING WITH EXISTING CONDITIONS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M4.1 PROVIDE FAN POWERED TERMINAL UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 2. SUPPORT UNIT FROM STRUCTURE. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE WITH ADJACENT PIPING, WALLS, CONDUIT, STRUCTURAL MEMBERS, ETC. RE: DETAIL 10/M6.01.

KEY PLAN

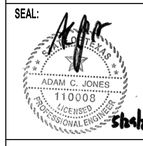


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30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA H

SHEET NUMBER: M2.21H

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

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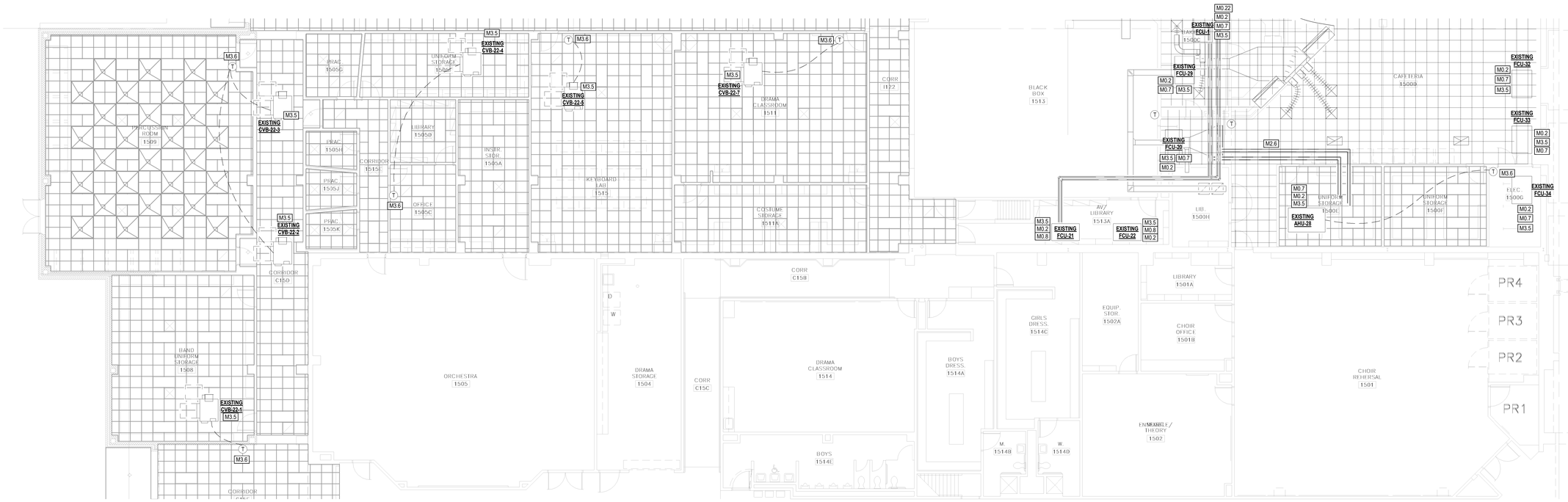
M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

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M2.6 EXISTING PIPING TO REMAIN.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

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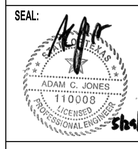
1 **MECHANICAL PLAN LEVEL 1 - AREA I**
1/8" = 1'-0"

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SEAL:



Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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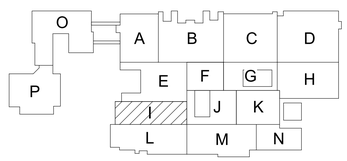
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA I

SHEET NUMBER: M2.21I

KEY PLAN



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MECHANICAL KEYED NOTES

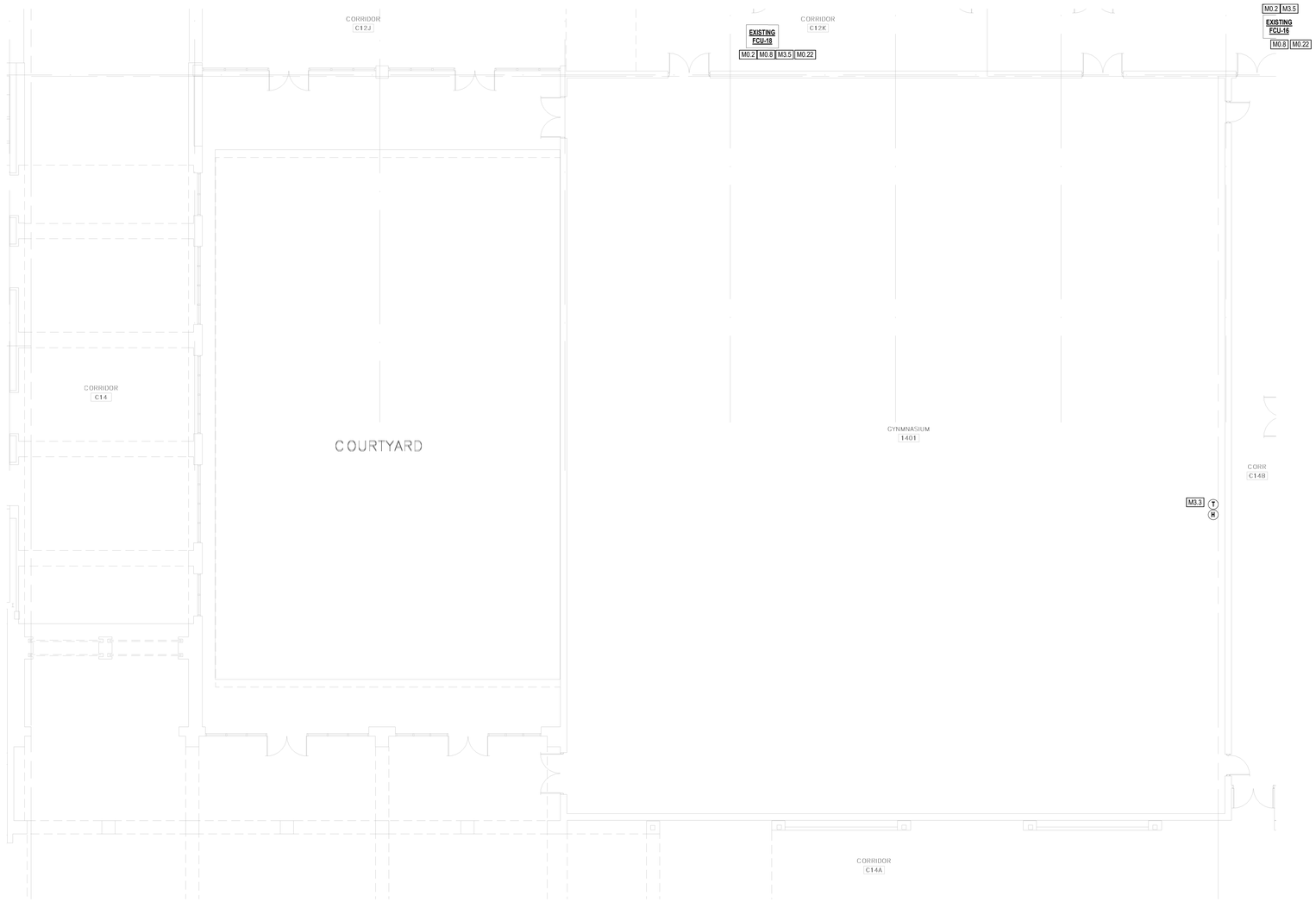
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M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

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M3.3 PROVIDE COMBINATION TEMPERATURE/HUMIDITY SENSOR AT APPROXIMATE LOCATION SHOWN. SENSOR SHALL BE INSTALLED AT SAME ELEVATION AS LIGHT SWITCHES. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.



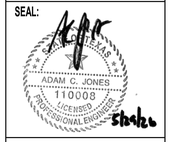
1 **MECHANICAL PLAN LEVEL 1 - AREA J**
1/8" = 1'-0"

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Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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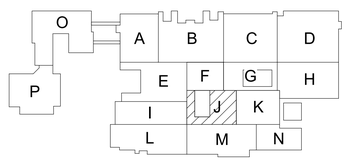
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA J

SHEET NUMBER: M2.21J

KEY PLAN



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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

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M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.14 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN.

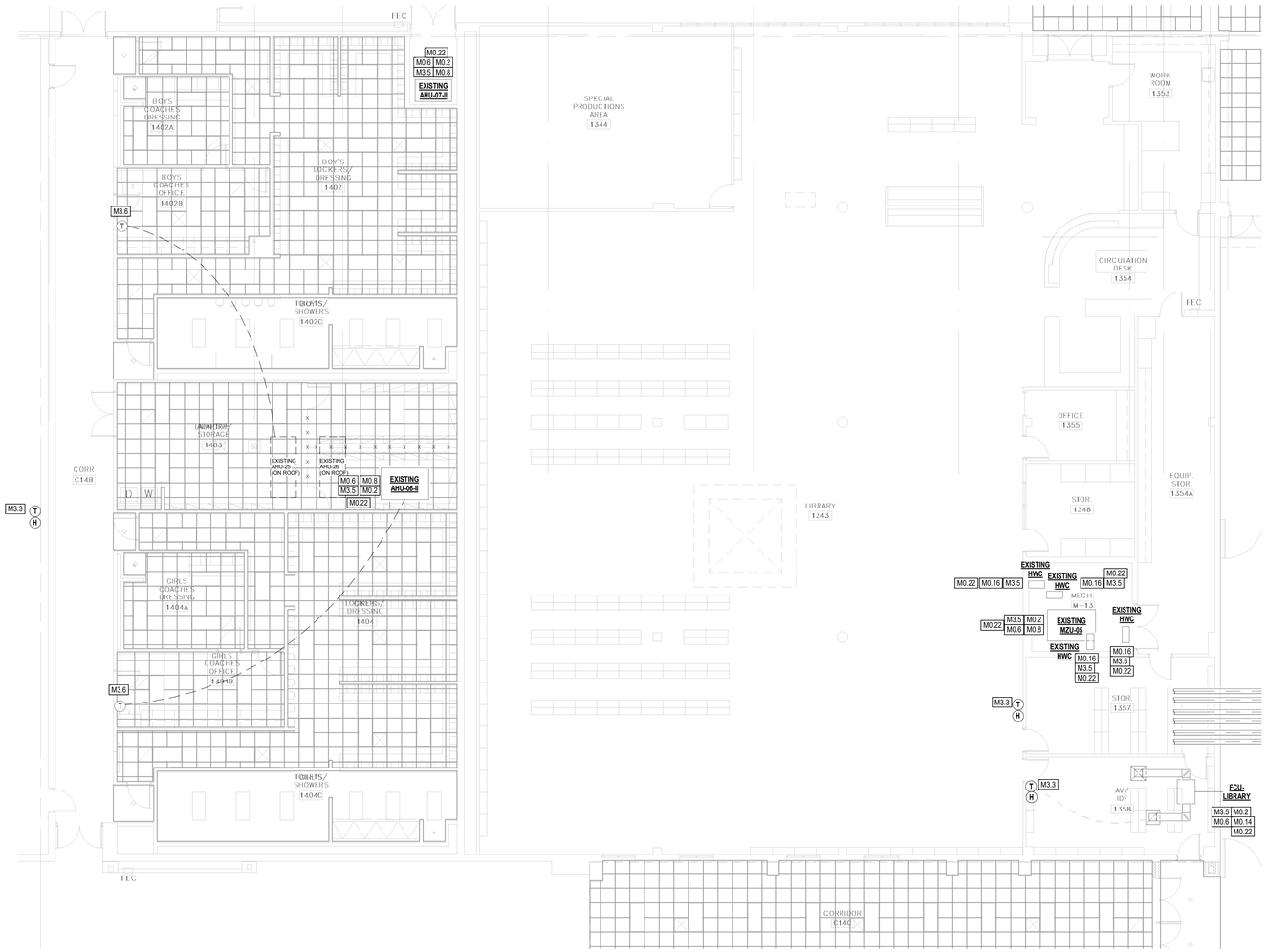
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

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1 MECHANICAL PLAN LEVEL 1 - AREA K

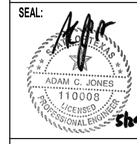
1/8" = 1'-0"

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Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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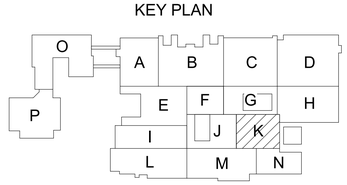
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA K

SHEET NUMBER: M2.21K

KEY PLAN



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MECHANICAL KEYED NOTES

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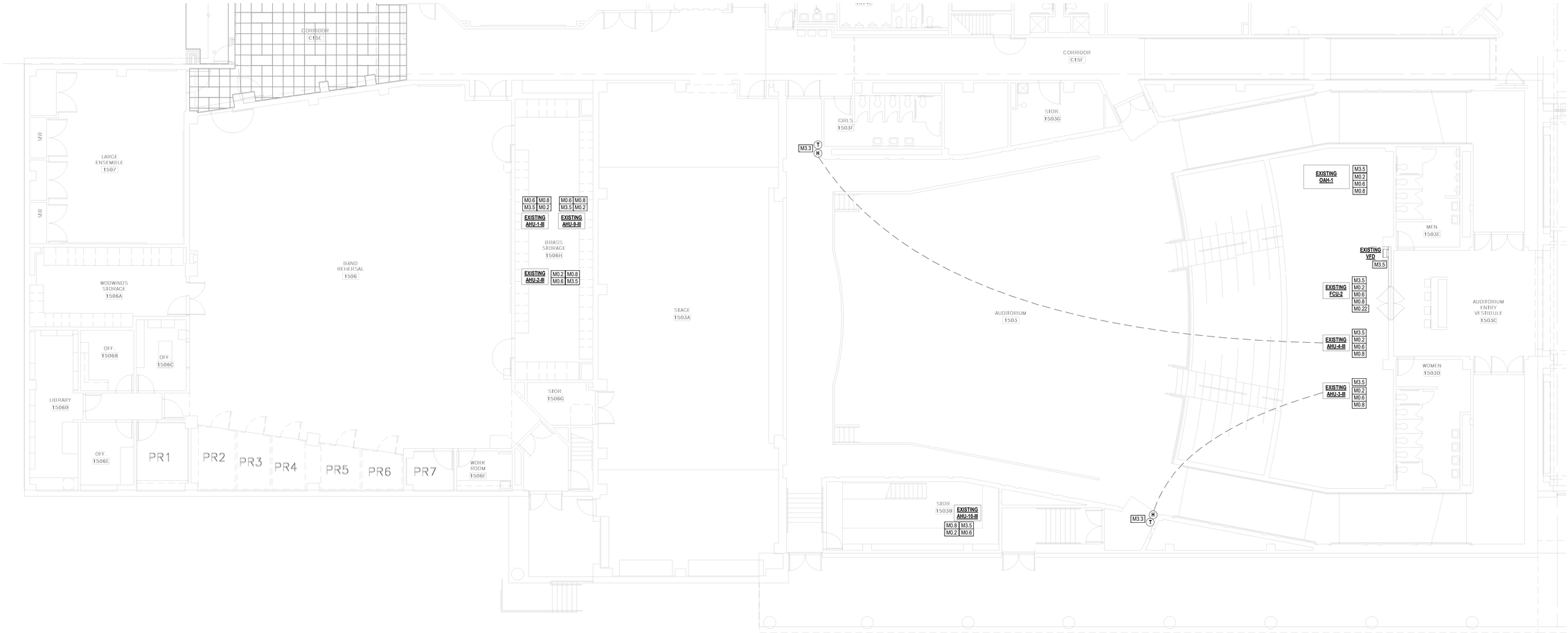
M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

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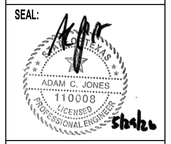
1 **MECHANICAL PLAN LEVEL 1 - AREA L**
1/8" = 1'-0"

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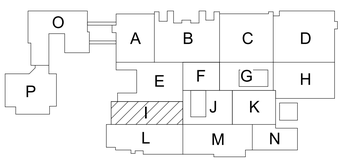
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA L

SHEET NUMBER: M2.21L

KEY PLAN



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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

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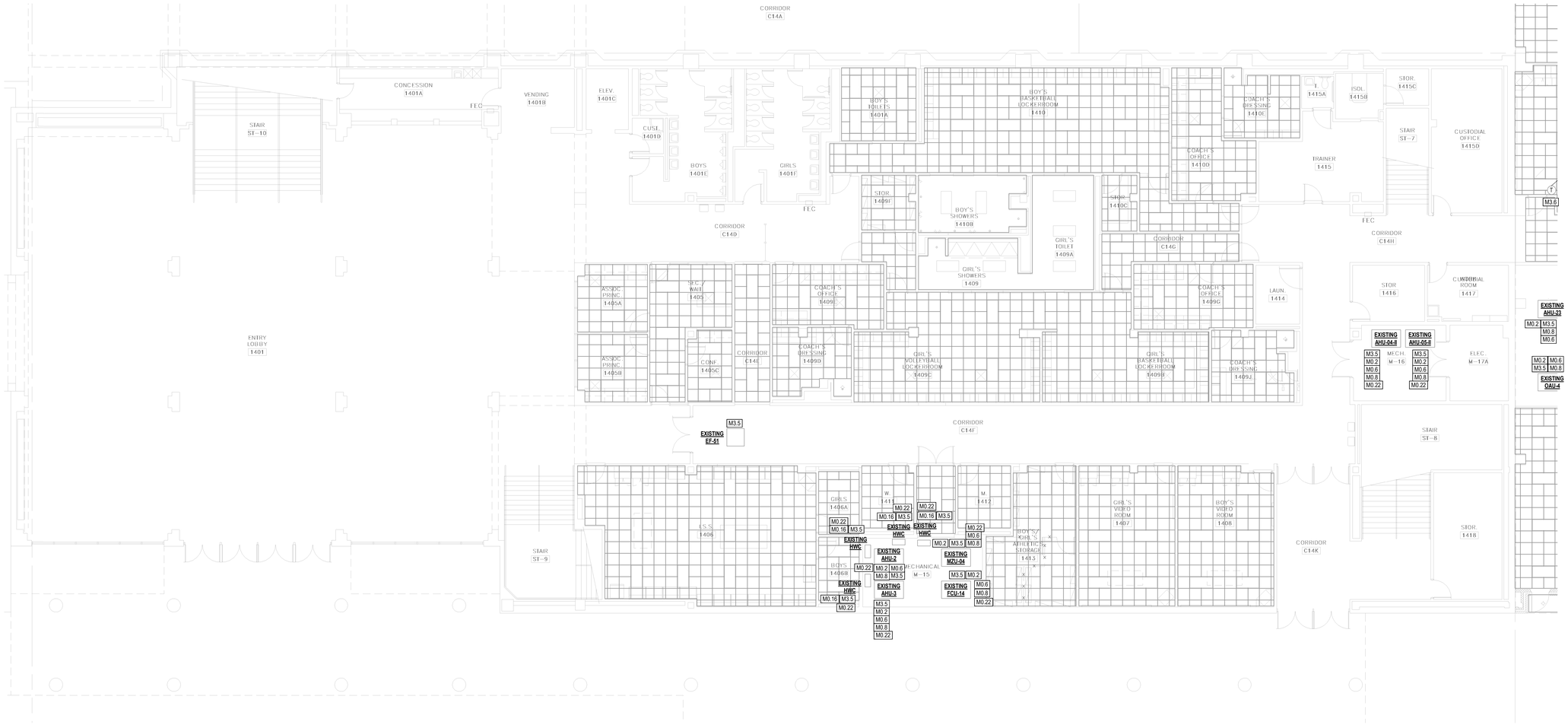
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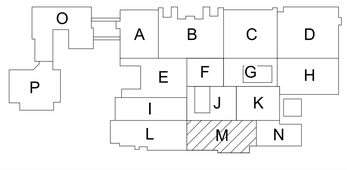
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1 MECHANICAL PLAN LEVEL 1 - AREA M

1/8" = 1'-0"

KEY PLAN



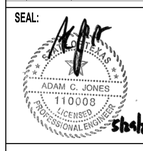
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SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA M

SHEET NUMBER: M2.21M

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

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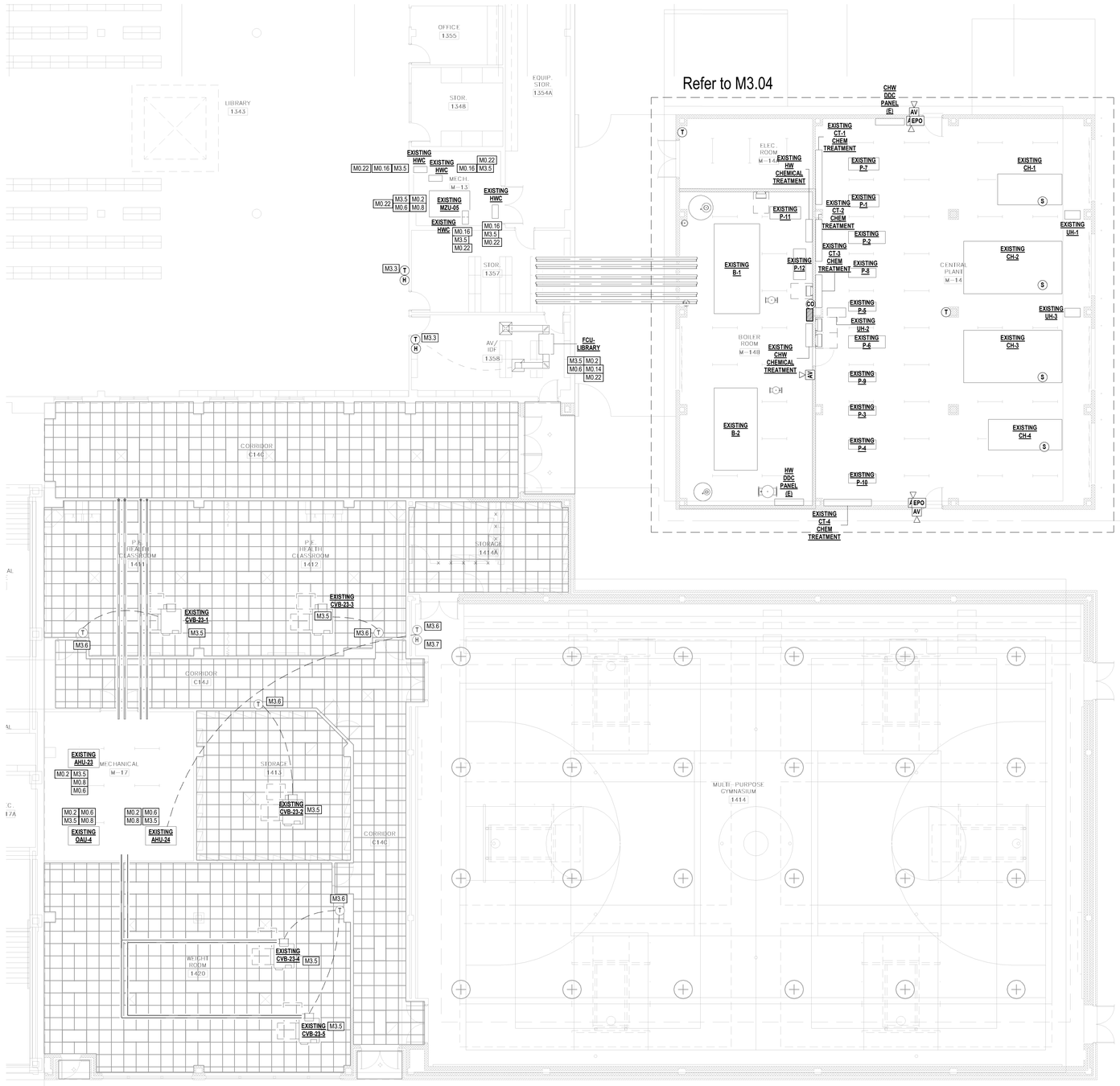
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M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

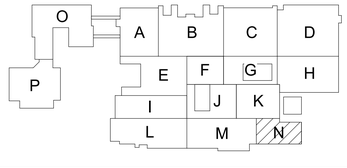
M3.7 PROVIDE NEW HUMIDISTAT IN SAME LOCATION AS EXISTING HUMIDISTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.



1 MECHANICAL PLAN LEVEL 1 - AREA N

1/8" = 1'-0"

KEY PLAN



PN

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - AREA N

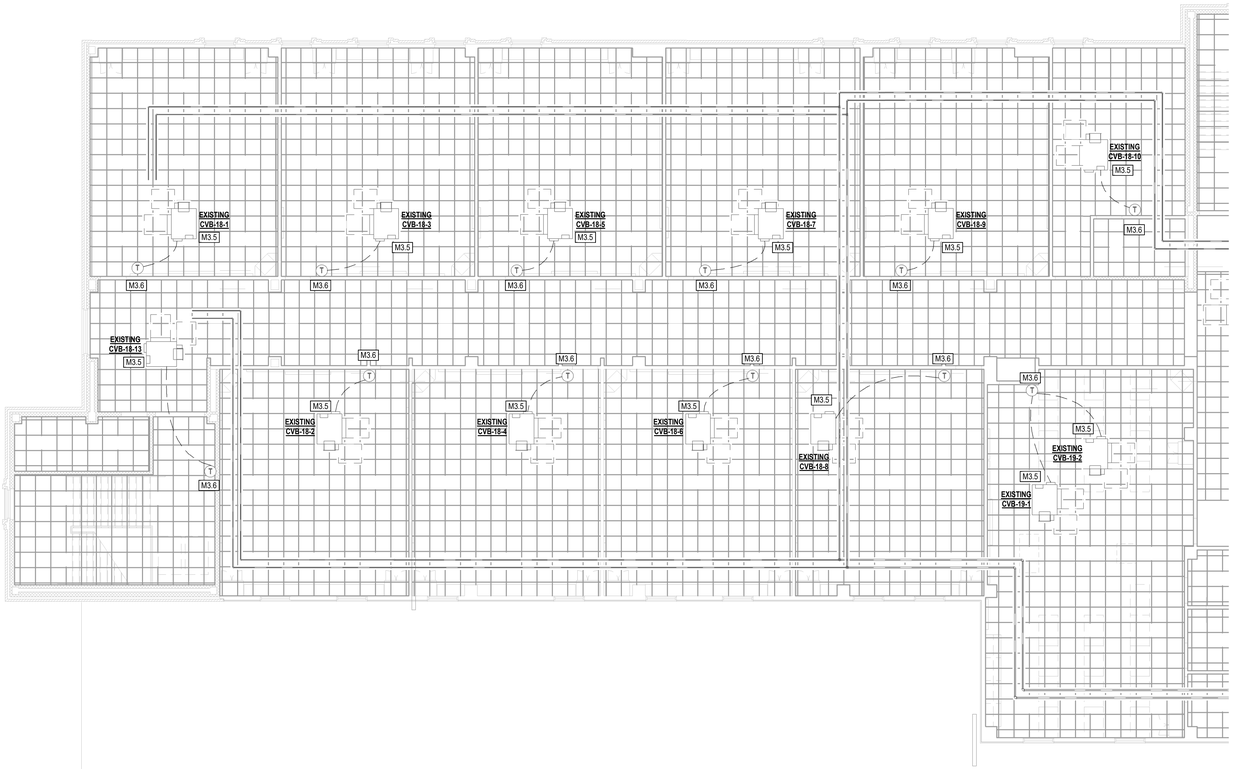
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MECHANICAL KEYED NOTES

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.



1 **MECHANICAL PLAN LEVEL 2 - AREA A**
1/8" = 1'-0"

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SEAL:



Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
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DATE: 05/29/2026

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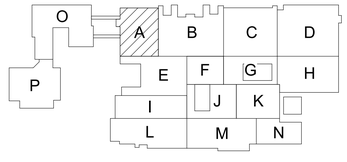
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PROJECT NUMBER 260018.001

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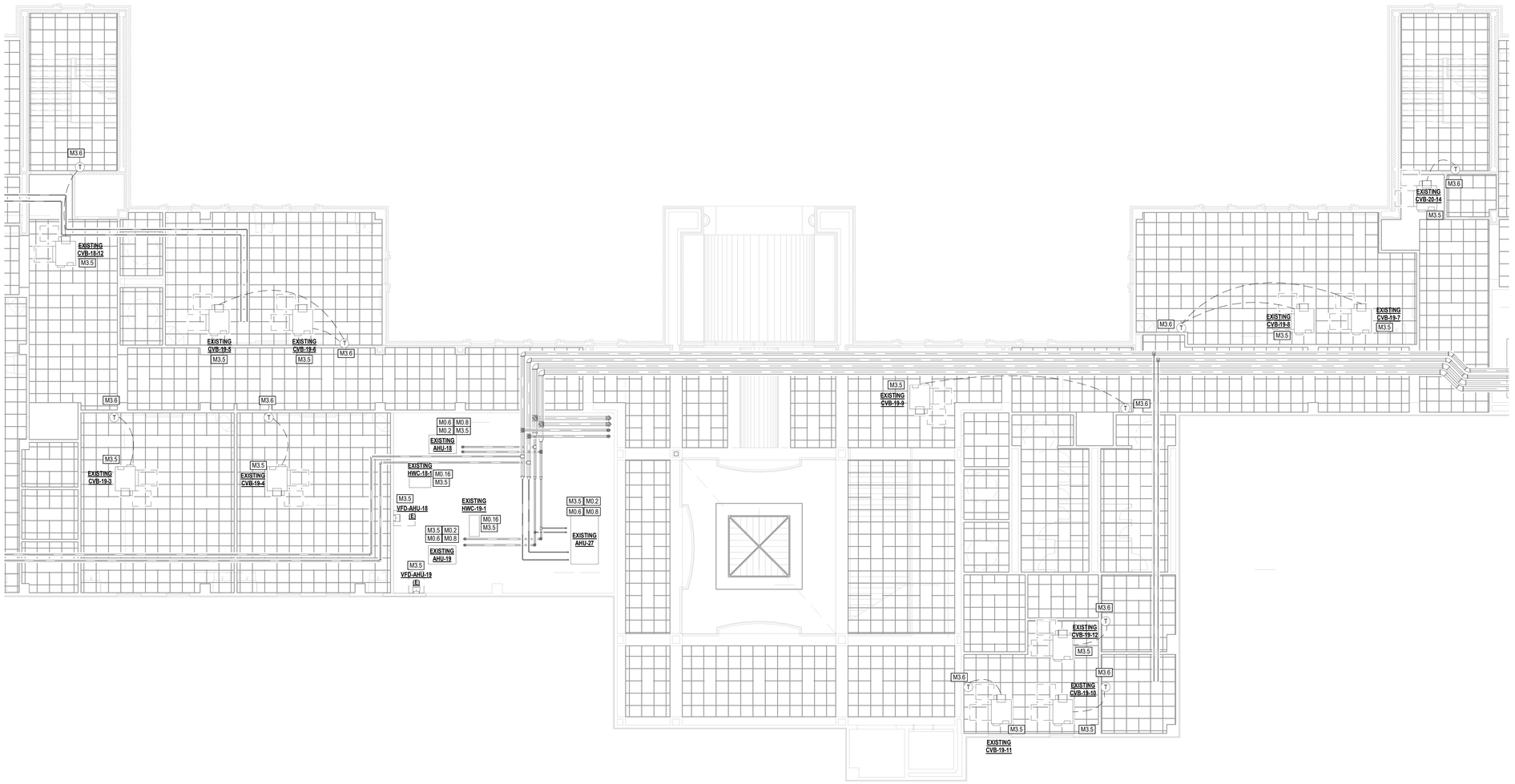
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KEY PLAN



PN

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1 MECHANICAL PLAN LEVEL 2 - AREA B

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

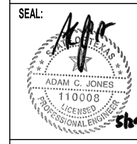
M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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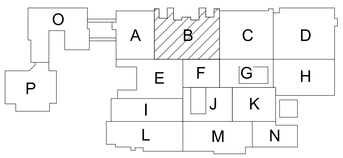
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 2 - AREA B

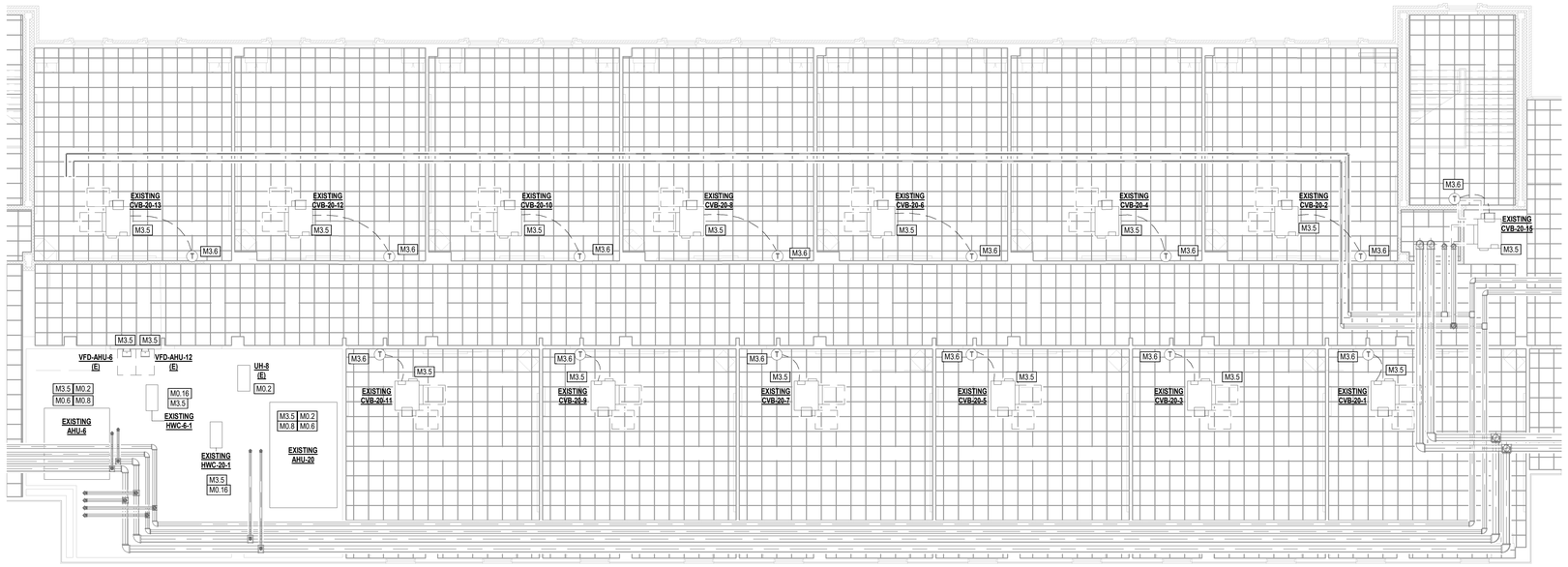
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KEY PLAN



PN

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1 MECHANICAL PLAN LEVEL 2 - AREA C

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

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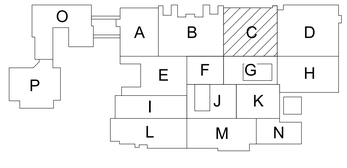
SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

KEY PLAN



PN

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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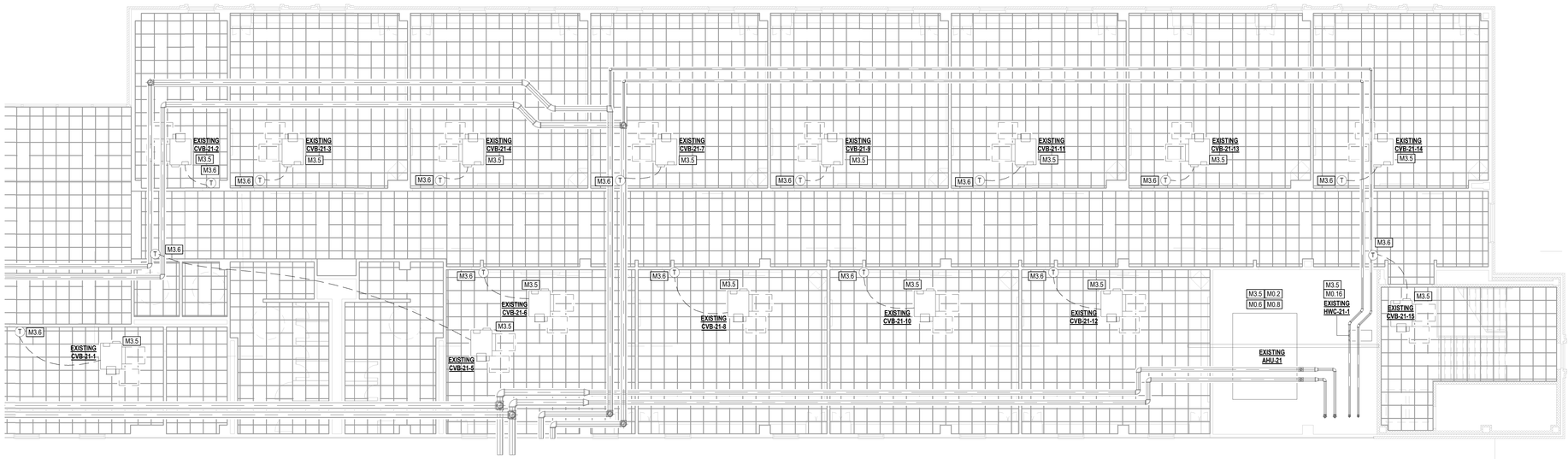
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 2 - AREA C

SHEET NUMBER: M2.22C

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1 **MECHANICAL PLAN LEVEL 2 - AREA D**
1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

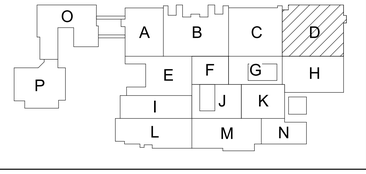
M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

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KEY PLAN



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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 2 - AREA D

SHEET NUMBER: M2.22D

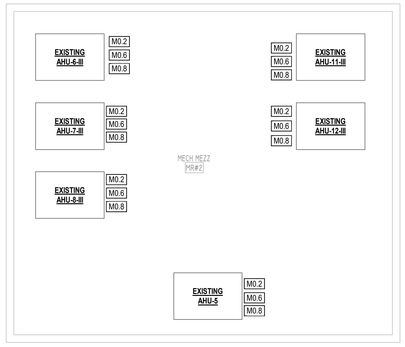
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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.



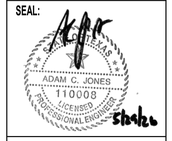
1 **ENLARGED MECHANICAL PLAN - MR#2 MECH MEZZ**
1/4" = 1'-0"

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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

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PROJECT NUMBER 260018.001

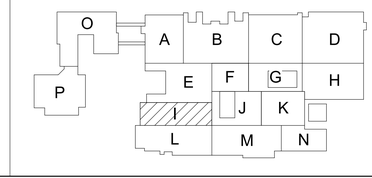
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MECHANICAL PLAN
LEVEL 2 - MECH MEZZ
MR#2

SHEET NUMBER:

M2.22I

KEY PLAN



PN

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MECHANICAL KEYED NOTES

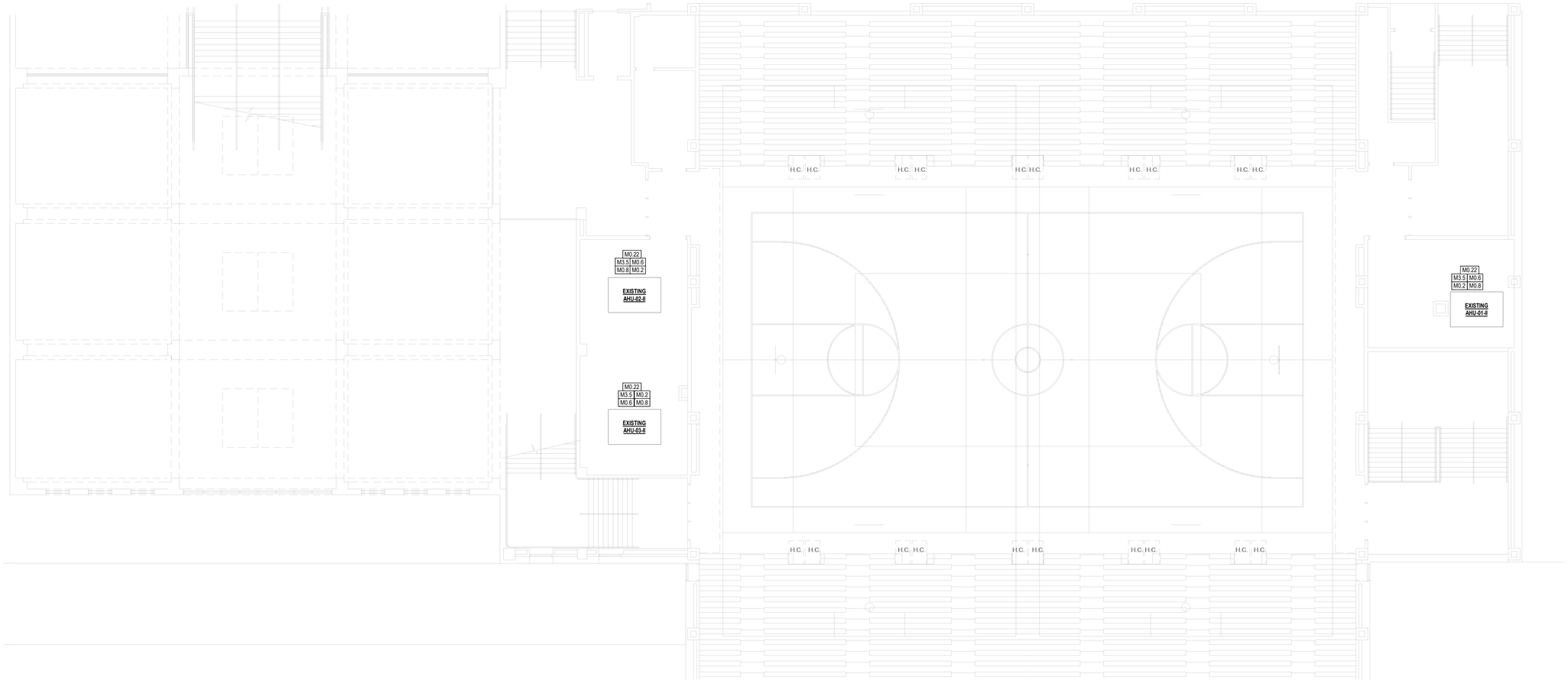
M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.8 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE AND VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.



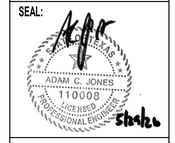
1 **MECHANICAL PLAN LEVEL 2 - AREA M**
1/8" = 1'-0"

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Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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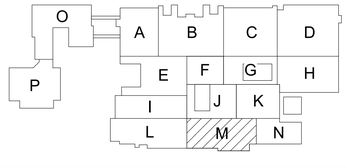
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 2 - AREA M

SHEET NUMBER: M2.22M

KEY PLAN



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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

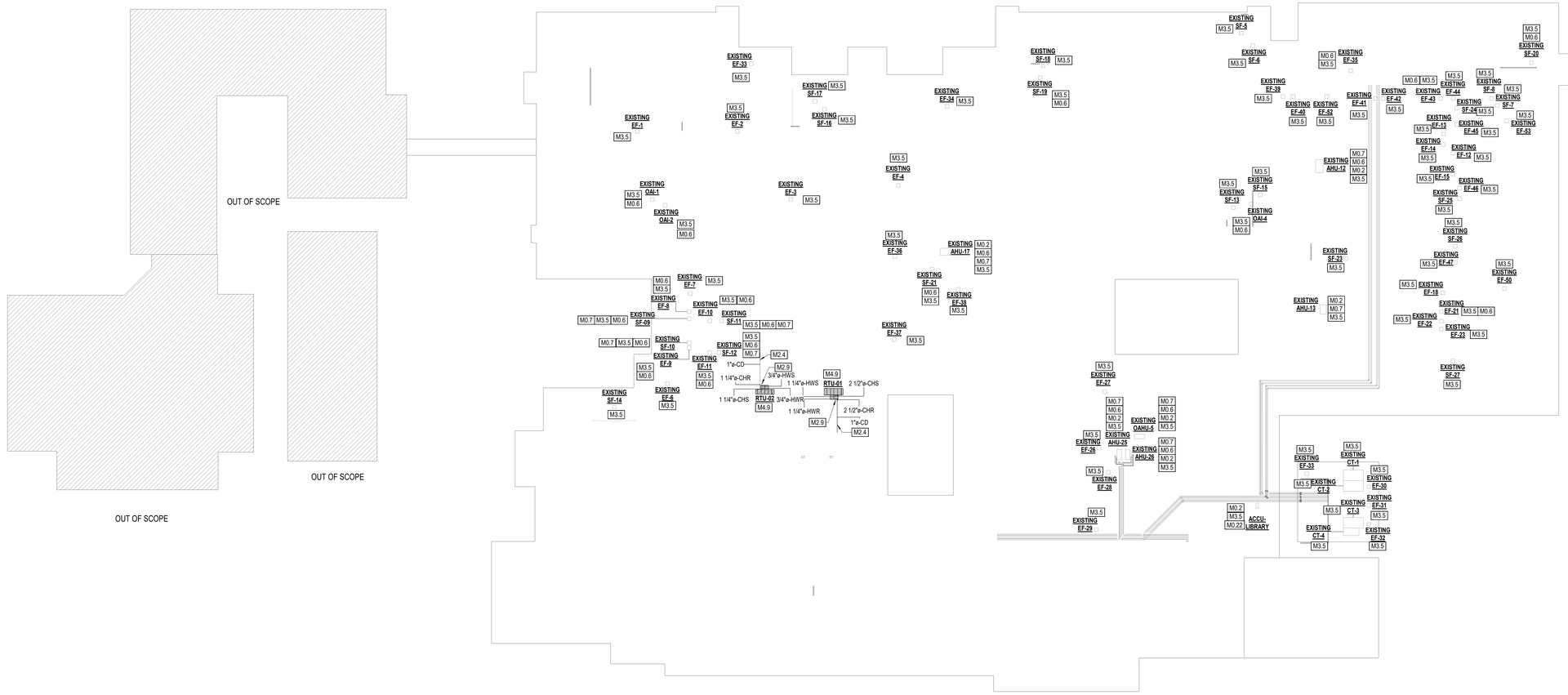
M0.22 FIELD VERIFY ALL CONTROL POINT VALUES (INCLUDING BUT NOT LIMITED TO CFMS, GPMS, PIPE SIZING, FPM, ETC)NECESSARY TO ACHIEVE NECESSARY CONTROLS UPGRADE FOR EQUIPMENT PRIOR TO INTEGRATION WITH NEW BAS.

M2.4 ROUTE CONDENSATE DRAIN LINE FROM ROOFTOP UNIT TO NEAREST ROOF DRAIN. SIZE AS INDICATED. FIELD COORDINATE EXACT ROUTING. PROVIDE PIPE ROOF SUPPORTS AT A MAXIMUM OF 10' O.C. RE: DETAIL 14/M6.01.

M2.9 ROUTE NEW ROOF UNIT HYDRONIC PIPING DOWN INTO BUILDING AND CONNECT TO EXISTING PIPING. COORDINATE ROOF PENETRATIONS AND ROUTING WITH EXISTING STRUCTURAL ELEMENTS. RE: M3.02. FOR APPROXIMATE ROUTING. FIELD VERIFY FINAL ROUTING. RE: DETAIL 11,12,13/M6.01.

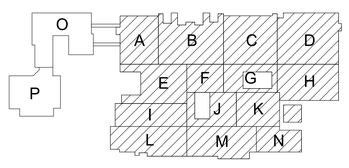
M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M4.9 PROVIDE ROOF MOUNTED AIR HANDLING UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 1. PROVIDE UNIT WITH ROOF CURB TO MATCH ROOF SLOPE. PROVIDE ALL CLEARANCES AROUND UNIT AS REQUIRED BY EQUIPMENT MANUFACTURER. COORDINATE FINAL LOCATION WITH STRUCTURAL. COORDINATE ROOF PENETRATIONS AND ROUTING WITH EXISTING STRUCTURAL ELEMENTS. RE: DETAIL 09/M6.01.



1 **MECHANICAL ROOF PLAN**
1" = 40'-0"

KEY PLAN



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Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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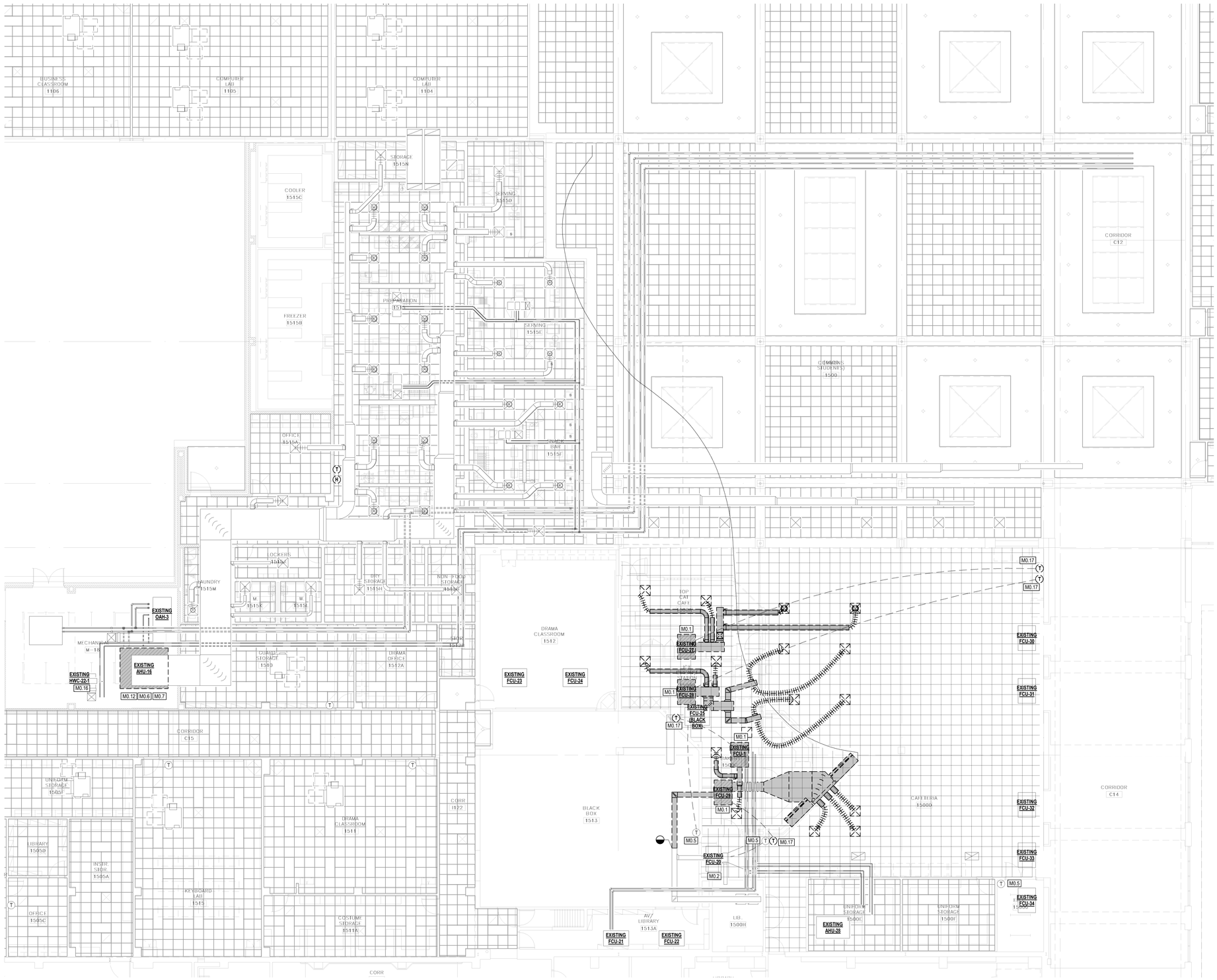
CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL ROOF PLAN

SHEET NUMBER: M2.23

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1 DEMOLITION MECHANICAL PLAN LEVEL 1 - KITCHEN

1/8" = 1'-0"

MECHANICAL KEYED NOTES

M0.1 EXISTING EQUIPMENT AND ALL ASSOCIATED DUCTWORK, DIFFUSERS, PIPING, CONTROLS, ELECTRICAL, VALVES, HANGERS, SUPPORTS, AND ACCESSORIES SHALL BE REMOVED IN ITS ENTIRETY AS PART OF ALTERNATE 1.

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNITS ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.12 EXISTING AIR HANDLING UNIT AND ALL ASSOCIATED MOTOR STARTERS, CONTROLS, ELECTRICAL, VALVES, AND ACCESSORIES SHALL BE REMOVED IN ITS ENTIRETY AS PART OF ALTERNATE 1.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

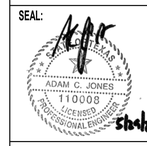
M0.17 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY.

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No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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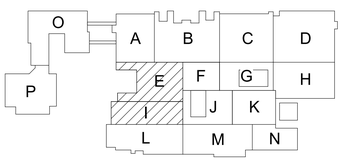
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PROJECT NUMBER 260018.001

SHEET TITLE: DEMOLITION MECHANICAL PLAN LEVEL 1 - KITCHEN/CAFETERIA - ALT 1

SHEET NUMBER: M3.01

KEY PLAN



PN

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

MECHANICAL KEYED NOTES

M0.6 EXISTING UNIT'S ASSOCIATED DUCTWORK TO REMAIN. ASSOCIATED DAMPER ACTUATORS TO BE REMOVED AND REPLACED.

M0.7 EXISTING UNIT'S ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED.

M0.15 LOCATE EXISTING OUTSIDE AIR INTAKE FOR CAFETERIA 1500D AND CAP EXISTING CURB AS PART OF ALTERNATE 1.

M0.16 EXISTING HOT WATER COIL AND ASSOCIATED PIPING TO REMAIN. ASSOCIATED VALVE ACTUATORS TO BE REMOVED AND REPLACED WITH NEW.

M1.1 PROVIDE SPIN-IN FITTING WITH LOCKING QUADRANT BUTTERFLY DAMPER FOR ALL ROUND DUCT CONNECTIONS TO RECTANGULAR DUCT. TYPICAL. RE: 06/M6.01.

M1.3 DUCTWORK TO ROUTE UP THROUGH ROOF TO NEW ROOF MOUNTED AIR HANDLING UNIT FOR ALTERNATE 1. COORDINATE ROOF PENETRATIONS AND ROUTING WITH EXISTING STRUCTURAL ELEMENTS.

M1.4 EXISTING DIFFUSER TO REMAIN. RE-BALANCE TO CFM INDICATED AS PART OF ALTERNATE 1.

M1.5 PROVIDE DUCT MOUNTED HOT WATER COIL AS SCHEDULED AS PART OF ALTERNATE 1. TRIM EXISTING DUCTWORK AND PROVIDE TRANSITIONS AS NECESSARY. INTERLOCK HOT WATER COIL WITH AHU-16

M2.8 RECONNECT EXISTING CHILLED AND HOT WATER HYDRONIC PIPING TO NEW UNIT. TRIM/EXTEND EXISTING PIPING AS NECESSARY. ROUTE COOLING COIL CONDENSATE DRAIN LINE TO FLOOR DRAIN WITHIN MECHANICAL ROOM. SIZE AS INDICATED ON DRAWING. FIELD COORDINATE ROUTING AND EXACT LOCATION OF FLOOR DRAIN. RE: DETAIL 14/M6.01.

M3.3 PROVIDE COMBINATION TEMPERATURE/HUMIDITY SENSOR AT APPROXIMATE LOCATION SHOWN. SENSOR SHALL BE INSTALLED AT SAME ELEVATION AS LIGHT SWITCHES. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

M3.4 PROVIDE WALL MOUNTED CO2 SENSOR AT APPROXIMATE LOCATION SHOWN. CO2 SENSOR SHALL BE INSTALLED AT SAME ELEVATION AS LIGHT SWITCHES. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS. CO2 SENSOR SHALL MONITOR SPACE CO2 CONCENTRATION AND SHALL BE UTILIZED TO CONTROL OUTSIDE AIRFLOW SETPOINT AS INDICATED IN THE ASSOCIATED AIR HANDLING UNIT SEQUENCE OF OPERATIONS.

M3.10 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. INTERLOCK WITH NEW AHU-16 AS PART OF ALTERNATE 1. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

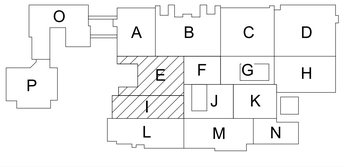
M4.4 PROVIDE AIR HANDLING UNIT AT APPROXIMATE LOCATION SHOWN AS PART OF ALTERNATE 1. PROVIDE ALL CLEARANCES AS REQUIRED BY EQUIPMENT MANUFACTURER. INSTALL UNIT ON EXISTING HIGH HOUSEKEEPING PAD. TRIM/EXTEND PAD AS NECESSARY. CONNECT EXISTING DUCTWORK TO NEW AHU. PROVIDE TRANSITIONS AS NECESSARY.

M4.7 PROVIDE VARIABLE FREQUENCY DRIVE AT SAME LOCATION AS EXISTING MOTOR STARTER AS PART OF ALTERNATE 1. COORDINATE FINAL LOCATION WITH ELECTRICAL AND CONTROLS CONTRACTORS.

1 **MECHANICAL PLAN LEVEL 1 - KITCHEN**
1/8" = 1'-0"

PN

KEY PLAN

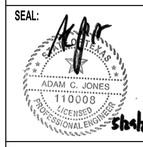


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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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SHEET TITLE: MECHANICAL PLAN LEVEL 1 - KITCHEN/CAFETERIA - ALT 1

SHEET NUMBER: M3.02

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MECHANICAL KEYED NOTES

M0.2 EXISTING UNIT TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. TYPICAL ALL EQUIPMENT UNLESS NOTED OTHER WISE. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

M0.5 EXISTING THERMOSTAT AND ALL ASSOCIATED WIRING SHALL BE REMOVED IN THEIR ENTIRETY AND REPLACED WITH NEW. APPLICABLE TO ALL SENSORS UNLESS NOTED OTHERWISE.

M0.20 EXISTING FREON MONITORING SYSTEM TO BE REMOVED. OWNER TO HAVE FIRST RIGHT TO ANY FREON MONITORING EQUIPMENT AND ASSOCIATED CONTROLS BEING REMOVED.

M0.21 EXISTING CHILLER TO REMAIN. ASSOCIATED SENSORS AND END DEVICES TO BE REMOVED AND REPLACED. OWNER TO HAVE FIRST RIGHT TO ANY PARTS/CONTROL POINTS BEING REMOVED. REFER TO ASSOCIATED CONTROL DIAGRAM FOR EQUIPMENT CONTROL POINTS.

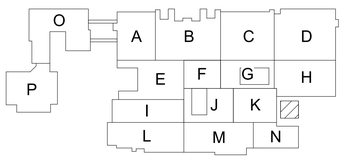


1 DEMOLITION MECHANICAL PLAN LEVEL 1 - CENTRAL PLANT

1/4" = 1'-0"

PN N

KEY PLAN

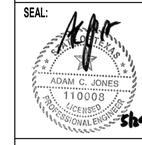


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SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

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SHEET TITLE: DEMOLITION MECHANICAL PLAN - CENTRAL PLANT

SHEET NUMBER: M3.03

5/28/2026 5:35:26 PM
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MECHANICAL KEYED NOTES

M3.2 PROVIDE CARBON MONOXIDE SENSOR (MACURCO CM-6 OR APPROVED EQUAL) AT APPROXIMATELY THIS LOCATION. MOUNT AT SAME ELEVATION AS LIGHT SWITCHES. SENSOR SHALL MONITOR CARBON MONOXIDE LEVELS IN BOILER ROOM AS DESCRIBED IN HOT WATER SYSTEM CONTROL SEQUENCE

M3.5 INTEGRATE EXISTING EQUIPMENT INTO NEW BUILDING CONTROLS. TYPICAL FOR ALL EQUIPMENT UNLESS NOTED OTHERWISE. REFER TO EXISTING SCHEDULE FOR CORRESPONDING UNIT CONTROL SEQUENCE.

M3.6 PROVIDE NEW THERMOSTAT IN SAME LOCATION AS EXISTING THERMOSTAT AT APPROXIMATE LOCATION SHOWN. INTERLOCK THERMOSTAT WITH INDICATED EQUIPMENT. INTEGRATE INTO NEW BUILDING CONTROLS.

M3.8 INTEGRATE EXISTING CHEMICAL TREATMENT INTO NEW BUILDING CONTROLS. PROVIDE BACNET INTEGRATION WITH ALARMS AND MONITORING SYSTEM STATUS.

M3.9 PROVIDE CARBON MONOXIDE MONITORING CONTROL PANEL AT APPROXIMATE LOCATION SHOWN. COORDINATE FINAL LOCATION WITH ARCHITECT AND OTHER TRADES TO AVOID CONFLICTS.

M5.11 PROVIDE AN "OFF ONLY" GLASS BREAK TYPE EMERGENCY SWITCH TO DE-ENERGIZE CHILLERS, PUMPS, AND ELECTRICAL EQUIPMENT WITHIN CHILLER ROOM. EMERGENCY SWITCH SHALL HAVE MANUAL RESET ONLY INSTALL SWITCH WITHIN 2'-0" OF THE DOOR.

M5.12 PROVIDE AN "ON ONLY" GLASS BREAK TYPE EMERGENCY SWITCH WHICH SHALL ENERGIZE EMERGENCY EXHAUST FAN AND INITIATE AUDIBLE/VISUAL ALARMS. EMERGENCY SWITCH SHALL HAVE MANUAL RESET ONLY. INSTALL SWITCH WITHIN 2'-0" OF THE DOOR.

M5.13 PROVIDE REFRIGERANT SENSOR (CAPABLE OF SENSING MULTIPLE REFRIGERANTS) TO ENERGIZE EMERGENCY EXHAUST FAN FOR EMERGENCY VENTILATION AND ACTIVATE AUDIBLE/VISUAL ALARMS AND DE-ENERGIZE CHILLERS, PUMPS, AND ELECTRICAL EQUIPMENT IN CHILLER ROOM WHEN THE CONCENTRATION OF REFRIGERANT VAPOR EXCEEDS THE QUANTITY ALLOWED BY MECHANICAL CODE.

M5.14 PROVIDE AUDIBLE AND VISUAL REFRIGERANT ALARM FOR REFRIGERANT LEAK DETECTION SYSTEM.

M5.15 PROVIDE VISUAL REFRIGERANT ALARM FOR REFRIGERANT LEAK DETECTION SYSTEM.



1 ENLARGED MECHANICAL PLAN - CENTRAL PLANT

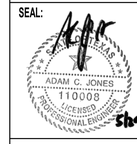
1/4" = 1'-0"

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No.	DATE	DESCRIPTION
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Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

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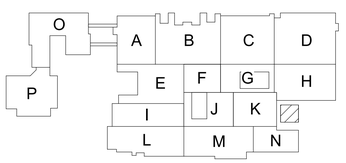
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL PLAN LEVEL 1 - CENTRAL PLANT

SHEET NUMBER: M3.04

KEY PLAN



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EXISTING AIR HANDLING UNIT SCHEDULE

	MARK	EXISTING AHU-1	EXISTING AHU-2	EXISTING AHU-3	EXISTING AHU-4	EXISTING AHU-5	EXISTING AHU-6	EXISTING AHU-7	EXISTING AHU-8	EXISTING AHU-9	EXISTING AHU-10	EXISTING AHU-11	EXISTING AHU-12	EXISTING AHU-13	EXISTING AHU-14	EXISTING AHU-15	EXISTING AHU-16	EXISTING AHU-17
	LOCATION	MECHANICAL M-1	MECHANICAL M-1	MECHANICAL M-2	MECHANICAL M-2	MECHANICAL M-4	MECHANICAL M-21	MECHANICAL M-7	MECHANICAL M-7	MECHANICAL M-6	MECHANICAL M-8	MECHANICAL M-8	ROOF ABOVE 1314B	ROOF ABOVE H109	MECHANICAL M-3	MECHANICAL M-3	MECHANICAL M-18	ROOF ABOVE COR.-C12H
FAN	DESIGN SUPPLY AIR FLOW RATE (CFM)	14975	14240	7365	10935	3280	13445	13000	19260	16415	10850	10835	11370	12510	10830	12220	15130	11845
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	5,990	5,700	2,950	4,375	1,315	5,380	5,200	7,705	6,570	4,340	4,335	4,550	5,005	4,335	4,890	6,055	4,740
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	3125	2600	1290	2155	0	3860	4490	4375	3870	2655	1695	2510	2855	3345	4715	2345	2260
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	1,565	1,300	645	1,080	0	1,930	2,245	2,190	1,935	1,330	850	1,255	1,430	1,675	2,360	1,175	1,130
	EXT. S.P. (IN. W.G.)	1.4	1	0.8	1.3	1.2	1.5	1.2	1.6	1.3	1.2	1.5	1	1	1	1.1	0.9	0.8
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	15	15	7.5	10	5	15	15	20	20	15	10	15	15	15	15	20	10
	VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
	EAT DB (°F)	80.2	79	77.1	79.4	75	82	82.2	80.1	80.4	80.6	79.6	80.1	80.3	82.1	83.9	75.8	80.2
	EAT WB (°F)	67.7	66	64.4	66.2	62.5	69.5	69.8	67.8	67.4	67.9	66.3	67.3	67.5	69.6	70.8	63.3	66.8
	LAT DB (°F)	54.9	54.6	55.2	54.8	56.5	54.4	55.1	56	54.3	54	54.2	54.8	54.7	54.4	54.2	56.2	53.8
	LAT WB (°F)	54.1	53.8	54.4	54	55.7	53.5	54.3	55.2	53.5	53	53.4	54	53.9	53.6	53.3	55.3	53
	EWT/LWT (°F)	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
	COIL WATER FLOW RATE (GPM)	113	92	37	68	11	109	108	127	117	81	71	78	87	92	115	61	81
	PIPE SIZE (IN.)	3"	3"	2"	2-1/2"	1-1/4"	3"	3"	3"	3"	3"	2-1/2"	3"	3"	3"	3"	2-1/2"	3"
	MAX. WATER P.D. (FT. HD.)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)																	
	EAT (°F)	-	-	-	-	72	-	-	-	-	-	-	-	-	55	55	-	-
	LAT (°F)	-	-	-	-	100	-	-	-	-	-	-	-	-	95	95	-	-
	EWT (°F)	-	-	-	-	160	-	-	-	-	-	-	-	-	160	160	-	-
	COIL WATER FLOW RATE (GPM)	-	-	-	-	18.3	-	-	-	-	-	-	-	-	25	35	-	-
	PIPE SIZE (IN.)	-	-	-	-	1-1/2"	-	-	-	-	-	-	-	-	2"	2"	-	-
	MAX. WATER P.D. (FT. HD.)	-	-	-	-	10	-	-	-	-	-	-	-	-	10	10	-	-
MANUFACTURER		TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE
MODEL NUMBER		MCCA035	MCCA030	MCCA017	MCCA025	MCCA008	MCCA030	MCCA030	MCCA040	MCCA035	MCCA025	MCCA025			MCCA025	MCCA025	MCCA035	
UNIT TYPE		VAV AHU W/ EF	VAV AHU	VAV AHU W/ EF	VAV AHU W/ EF	SZ AHU	VAV AHU W/ EF	VAV AHU	VAV AHU W/ EF	VAV AHU	VAV AHU	VAV AHU	VAV AHU	VAV AHU	SZ AHU	SZ AHU	SZ AHU	VAV-AHU
NOTES		1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 3	1, 3	1, 3	1,2

NOTES:
1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. TWO-WAY CHILLED WATER AND HEATING WATER CONTROL VALVES.
3. THREE-WAY CHILLED WATER AND HEATING WATER CONTROL VALVES.

EXISTING AIR HANDLING UNIT SCHEDULE

	MARK	EXISTING AHU-18	EXISTING AHU-19	EXISTING AHU-20	EXISTING AHU-21	EXISTING AHU-22	EXISTING AHU-23	EXISTING AHU-24	EXISTING AHU-25	EXISTING AHU-26	EXISTING AHU-27	EXISTING AHU-28	EXISTING OAHU-1	EXISTING OAHU-2	EXISTING OAHU-3	EXISTING OAHU-4	EXISTING OAHU-5
	LOCATION	MECHANICAL M-20	MECHANICAL M-20	MECHANICAL M-21	MECHANICAL M-22	MECHANICAL M-17	MECHANICAL M-17	ROOF ABOVE M-17	ROOF ABOVE RM.1403	ROOF ABOVE RM. 1403	MECHANICAL M-20	1500E	MECHANICAL M-3	MECHANICAL M-3	MECHANICAL M-18	MECHANICAL M-17	ROOF ABOVE RM.1403
FAN	DESIGN SUPPLY AIR FLOW RATE (CFM)	12500	12775	17670	19900	11495	5690	10120	3215	2370	4115	945	3345	4715	2345	1130	1410
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	5,000	5,110	7,070	7,960	4,600	2,280	4,050	1,290	950	1,650	380	3,345	4,715	2,345	1,130	1130
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	4180	2105	4180	4020	2490	1110	1130	765	645	0	0	3345	4715	2345	1130	1410
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	2,090	1,055	2,090	2,010	1,245	555	565	385	325	0	0	1675	2360	1175	565	705
	EXT. S.P. (IN. W.G.)	1.4	1.2	1.6	1.6	0.9	0.8	0.9	0.7	0.7	0.7	0.5	0.1	0.1	0.1	0.1	0.1
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	15	15	20	20	15	7.5	15	5	3	5	1	5	5	3	2	2
	VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	500	500	500	500	500	500	500	500	500	500	500	450	450	450	450	450
	EAT DB (°F)	77.8	80.4	81.7	79.4	79.3	79.6	77.5	80.4	81.2	78.9	75	98	98	98	98	98
	EAT WB (°F)	65	67.6	68.7	66.8	66.1	66.4	65.9	67	68	63.3	62.5	78	78	78	78	78
	LAT DB (°F)	54.4	54.1	54.6	54.9	54	54.3	57	54.7	55.2	56.5	56.5	55	55	55	55	55
	LAT WB (°F)	53.5	53.3	53.8	54.1	53.2	53.4	56.2	53.9	54.4	55.7	55.7	54	54	54	54	54
	EWT (°F)	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
	COIL WATER FLOW RATE (GPM)	72	92	135	130	75	37	52	22	17	16	4	23	28	18	15	15
	PIPE SIZE (IN.)	2-1/2"	3"	3"	3"	2-1/2"	2"	2"	1-1/2"	1-1/2"	1-1/4"	3/4"	1-1/2"	2"	1-1/2"	1-1/4"	1-1/4"
	MAX. WATER P.D. (FT. HD.)	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)												-	-	-	-	-
	EAT (°F)	-	-	-	-	-	-	57.3	57.5	55	75	75	27	27	27	27	27
	LAT (°F)	-	-	-	-	-	-	95	95	95	95	95	55.0	55.0	55.0	55.0	55.0
	EWT (°F)	-	-	-	-	-	-	160	160	160	160	160	160.0	160.0	160.0	160.0	160.0
	COIL WATER FLOW RATE (GPM)	-	-	-	-	-	-	22	11	8	7	2	10	15	7	5	5
	PIPE SIZE (IN.)							1-1/2"	1-1/4"	1-1/4"	1"	3/4"	1-1/4"	1-1/4"	1"	1"	1"
	MAX. WATER P.D. (FT. HD.)	-	-	-	-	-	-	10	10	10	10	10	10	10	10	10	10
MANUFACTURER		TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE	TRANE
MODEL NUMBER		MCCA025	MCCA030	MCCA040	MCCA040	MCAA	MCAA012	MCAA025	MCAA025		MCCA010		MCCA008	MCCA012	MCCA006	MCCA003	
UNIT TYPE		VAV AHU	VAV AHU	VAV AHU	VAV AHU	VAV AHU	VAV AHU	SZ AHU	SZ AHU W/ EF	SZ AHU W/ EF	SZ AHU	SZ AHU	OUTSIDE AIR	OUTSIDE AIR W/ EF	OUTSIDE AIR	OUTSIDE AIR	
NOTES		1, 2	1,2	1,2	1,2	1,3	1,2	1,2	1,2	1,2	1,2	1,2	1,3	1,3	1,3	1,2	1,2

NOTES:
1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. TWO-WAY CHILLED WATER AND HEATING WATER CONTROL VALVES.
3. THREE-WAY CHILLED WATER AND HEATING WATER CONTROL VALVES.

EXISTING CVB SCHEDULE

MARK	PRIMARY AIR CFM		INLET SIZE	HOT WATER GPM
	MAX.	MIN.		
EXISTING CVB-1-1	1,000	225	10"Ø	2.7
EXISTING CVB-1-2	1,265	285	12"Ø	3.4
EXISTING CVB-1-3	1,000	225	10"Ø	2.7
EXISTING CVB-1-4	1455	325	12"Ø	3.9
EXISTING CVB-1-5	1465	330	12"Ø	3.9
EXISTING CVB-1-6	680	150	8"Ø	1.8
EXISTING CVB-1-7	1305	295	12"Ø	3.5
EXISTING CVB-1-8	1140	255	12"Ø	3.0
EXISTING CVB-1-9	480	110	6"Ø	1.3
EXISTING CVB-1-10	1140	255	12"Ø	3.0
EXISTING CVB-1-11	1315	295	12"Ø	3.5
EXISTING CVB-1-12	1365	305	12"Ø	3.6
EXISTING CVB-1-13	1180	265	12"Ø	3.1
EXISTING CVB-1-14	435	100	6"Ø	1.2
EXISTING CVB-2-1	1000	185	10"Ø	2.6
EXISTING CVB-2-2	1000	185	10"Ø	2.6
EXISTING CVB-2-3	1130	210	12"Ø	2.9
EXISTING CVB-2-4	1010	185	10"Ø	2.6
EXISTING CVB-2-5	1450	265	12"Ø	3.7
EXISTING CVB-2-6	950	170	10"Ø	2.5
EXISTING CVB-2-7	950	170	10"Ø	2.5
EXISTING CVB-2-8	970	180	10"Ø	2.5
EXISTING CVB-2-9	970	180	10"Ø	2.5
EXISTING CVB-2-10	1030	190	10"Ø	2.7
EXISTING CVB-2-11	950	170	10"Ø	2.5
EXISTING CVB-2-12	950	170	10"Ø	2.5
EXISTING CVB-2-13	1195	220	12"Ø	3.0
EXISTING CVB-3-1	1195	225	12"Ø	3.1
EXISTING CVB-3-2	1370	260	12"Ø	3.5
EXISTING CVB-3-3	1440	270	12"Ø	3.7
EXISTING CVB-3-4	355	65	6"Ø	3.7
EXISTING CVB-3-5	370	70	6"Ø	1.0
EXISTING CVB-3-6	765	145	10"Ø	2.0
EXISTING CVB-3-7	1165	220	12"Ø	3.0
EXISTING CVB-3-8	725	135	10"Ø	1.9
EXISTING CVB-4-1	820	165	10"Ø	2.1
EXISTING CVB-4-2	1410	285	12"Ø	3.7
EXISTING CVB-4-3	1410	285	12"Ø	3.7
EXISTING CVB-4-4	1495	305	12"Ø	3.9
EXISTING CVB-4-5	680	140	8"Ø	1.8
EXISTING CVB-4-6	1415	290	12"Ø	3.7
EXISTING CVB-4-7	800	160	10"Ø	2.1
EXISTING CVB-4-8	1440	290	12"Ø	3.7
EXISTING CVB-4-9	830	170	10"Ø	2.2
EXISTING CVB-4-10	655	135	8"Ø	1.7
EXISTING CVB-6-1	1350	410	12"Ø	3.8
EXISTING CVB-6-2	1075	330	10"Ø	3.1
EXISTING CVB-6-3	1150	350	12"Ø	3.3
EXISTING CVB-6-4	1405	430	12"Ø	4.0
EXISTING CVB-6-5	1150	350	12"Ø	3.3
EXISTING CVB-6-6	1030	315	10"Ø	2.9
EXISTING CVB-6-7	1030	315	10"Ø	2.9
EXISTING CVB-6-8	1020	310	10"Ø	2.9
EXISTING CVB-6-9	1370	420	12"Ø	3.9
EXISTING CVB-6-10	775	235	10"Ø	2.2
EXISTING CVB-6-11	1360	415	12"Ø	3.9
EXISTING CVB-6-12	730	225	10"Ø	2.0
EXISTING CVB-7-1	1060	370	10"Ø	3.1
EXISTING CVB-7-2	1035	360	10"Ø	3.0
EXISTING CVB-7-3	1060	370	10"Ø	3.1
EXISTING CVB-7-4	710	250	8"Ø	2.1
EXISTING CVB-7-5	1060	370	10"Ø	3.1
EXISTING CVB-7-6	1035	360	10"Ø	3.0
EXISTING CVB-7-7	1060	370	10"Ø	3.1
EXISTING CVB-7-8	710	250	8"Ø	2.1
EXISTING CVB-7-9	1060	370	10"Ø	3.1
EXISTING CVB-7-10	1035	360	10"Ø	3.0
EXISTING CVB-7-11	1060	370	10"Ø	3.1
EXISTING CVB-7-12	710	250	8"Ø	2.1
EXISTING CVB-7-13	1285	450	12"Ø	2.1
EXISTING CVB-8-1	1300	295	12"Ø	3.4
EXISTING CVB-8-2	1300	295	12"Ø	3.4
EXISTING CVB-8-3	1440	330	12"Ø	3.8
EXISTING CVB-8-4	1130	260	12"Ø	3.0
EXISTING CVB-8-5	1460	335	12"Ø	3.9
EXISTING CVB-8-6	1130	260	12"Ø	3.0
EXISTING CVB-8-7	1250	285	12"Ø	3.3
EXISTING CVB-8-9	1130	260	12"Ø	3.0
EXISTING CVB-8-10	1495	340	12"Ø	4.0
EXISTING CVB-8-11	1130	260	12"Ø	3.0
EXISTING CVB-8-12	1495	340	12"Ø	4.0
EXISTING CVB-8-13	1130	260	12"Ø	3.0
EXISTING CVB-8-14	1220	280	12"Ø	3.3
EXISTING CVB-8-15	1440	330	12"Ø	3.8
EXISTING CVB-8-16	1220	280	12"Ø	3.3
EXISTING CVB-9-1	1030	245	12"Ø	2.7
EXISTING CVB-9-2	1030	245	12"Ø	2.7
EXISTING CVB-9-3	995	235	10"Ø	2.6
EXISTING CVB-9-4	1030	220	10"Ø	2.5
EXISTING CVB-9-5	1040	245	12"Ø	2.7
EXISTING CVB-9-6	1495	355	12"Ø	4.0
EXISTING CVB-9-7	1100	260	12"Ø	2.9
EXISTING CVB-9-8	1030	220	10"Ø	2.5
EXISTING CVB-9-9	980	235	12"Ø	2.6
EXISTING CVB-9-10	1495	355	12"Ø	4.0
EXISTING CVB-9-11	1500	355	12"Ø	4.0
EXISTING CVB-9-12	1495	355	12"Ø	4.0
EXISTING CVB-9-13	1030	220	10"Ø	2.5
EXISTING CVB-10-1	1140	335	12"Ø	3.2
EXISTING CVB-10-2	1410	415	12"Ø	4.0
EXISTING CVB-10-3	1455	430	12"Ø	4.1
EXISTING CVB-10-4	920	270	10"Ø	2.6
EXISTING CVB-10-5	910	270	10"Ø	2.5
EXISTING CVB-10-6	1140	335	12"Ø	3.2
EXISTING CVB-10-7	1180	425	12"Ø	4.0
EXISTING CVB-10-8	1450	430	12"Ø	4.1
EXISTING CVB-11-1	980	185	10"Ø	2.5
EXISTING CVB-11-2	1150	215	12"Ø	3.0
EXISTING CVB-11-3	850	160	10"Ø	2.2
EXISTING CVB-11-4	850	160	10"Ø	2.2
EXISTING CVB-11-5	1235	230	12"Ø	3.2
EXISTING CVB-11-6	1250	235	12"Ø	3.2
EXISTING CVB-11-7	1250	235	12"Ø	3.2
EXISTING CVB-11-8	850	160	10"Ø	2.2
EXISTING CVB-11-9	1230	230	12"Ø	3.1
EXISTING CVB-11-10	1190	220	12"Ø	3.0
EXISTING CVB-12-1	1330	290	12"Ø	3.5
EXISTING CVB-12-2	1340	295	12"Ø	3.6
EXISTING CVB-12-3	1310	285	12"Ø	3.5
EXISTING CVB-12-4	1320	290	12"Ø	3.5
EXISTING CVB-12-5	1310	285	12"Ø	3.5
EXISTING CVB-12-6	1320	290	12"Ø	3.5
EXISTING CVB-12-7	1310	285	12"Ø	3.5
EXISTING CVB-12-8	1320	290	12"Ø	3.5
EXISTING CVB-12-9	810	180	10"Ø	2.1
EXISTING CVB-13-1	1310	295	12"Ø	3.5
EXISTING CVB-13-2	1310	295	12"Ø	3.5
EXISTING CVB-13-3	1310	295	12"Ø	3.5
EXISTING CVB-13-4	1310	295	12"Ø	3.5
EXISTING CVB-13-5	1310	295	12"Ø	3.5
EXISTING CVB-13-6	1310	295	12"Ø	3.5
EXISTING CVB-13-7	1310	295	12"Ø	3.5
EXISTING CVB-13-8	1310	295	12"Ø	3.5
EXISTING CVB-13-9	830	190	10"Ø	2.2
EXISTING CVB-17-1	890	195	10"Ø	2.3
EXISTING CVB-17-2	1375	300	12"Ø	3.6
EXISTING CVB-17-3	980	215	10"Ø	2.6
EXISTING CVB-17-4	1470	320	12"Ø	3.9
EXISTING CVB-17-5	1150	250	12"Ø	3.0
EXISTING CVB-17-6	1395	305	12"Ø	3.7
EXISTING CVB-17-7	1130	250	12"Ø	3.0
EXISTING CVB-17-8	1235	270	12"Ø	3.3
EXISTING CVB-18-1	1190	285	12"Ø	3.2
EXISTING CVB-18-2	965	260	10"Ø	2.6
EXISTING CVB-18-3	1440	345	12"Ø	3.8
EXISTING CVB-18-4	1470	350	12"Ø	3.9
EXISTING CVB-18-5	1150	275	12"Ø	3.1
EXISTING CVB-18-6	1470	350	12"Ø	3.9
EXISTING CVB-18-7	1150	275	12"Ø	3.1
EXISTING CVB-18-8	1470	350	12"Ø	3.9
EXISTING CVB-18-9	1290	310	12"Ø	3.5
EXISTING CVB-18-10	890	210	10"Ø	2.4
EXISTING CVB-18-12	830	195	10"Ø	2.2
EXISTING CVB-18-13	965	230	10"Ø	2.6
EXISTING CVB-19-1	1275	215	12"Ø	3.2
EXISTING CVB-19-2	1400	235	12"Ø	3.5
EXISTING CVB-19-3	1375	235	12"Ø	3.5
EXISTING CVB-19-4	1375	235	12"Ø	3.5
EXISTING CVB-19-5	1325	225	12"Ø	3.4
EXISTING CVB-19-6	760	130	10"Ø	1.9
EXISTING CVB-19-7	1210	205	12"Ø	3.0
EXISTING CVB-19-8	1210	205	12"Ø	3.0
EXISTING CVB-19-9	1500	255	12"Ø	3.8
EXISTING CVB-19-10	215	35	6"Ø	0.5
EXISTING CVB-19-11	655	110	8"Ø	1.6
EXISTING CVB-19-12	190	35	6"Ø	0.5
EXISTING CVB-20-1	1480	375	12"Ø	4.0
EXISTING CVB-20-2	1340	340	12"Ø	3.6
EXISTING CVB-20-3	1480	375	12"Ø	4.0
EXISTING CVB-20-4	1340	340	12"Ø	3.6
EXISTING CVB-20-5	1130	290	12"Ø	3.1
EXISTING CVB-20-6	1340	340	12"Ø	3.6
EXISTING CVB-20-7	1480	375	12"Ø	4.0
EXISTING CVB-20-8	1340	340	12"Ø	3.6
EXISTING CVB-20-9	1130	290	12"Ø	3.1
EXISTING CVB-20-10	1340	340	12"Ø	3.6
EXISTING CVB-20-11	1480	375	12"Ø	3.6
EXISTING CVB-20-12	1340	340	12"Ø	3.6
EXISTING CVB-20-13	1390	355	12"Ø	3.8
EXISTING CVB-20-14	830	210	10"Ø	2.2
EXISTING CVB-20-15	830	150	10"Ø	2.2
EXISTING CVB-21-1	1045	205	10"Ø	2.7
EXISTING CVB-21-2	1125	220	12"Ø	2.9
EXISTING CVB-21-3	1350	270	12"Ø	3.5
EXISTING CVB-21-4	1350	270	12"Ø	3.5
EXISTING CVB-21-5	1335	265	12"Ø	3.5
EXISTING CVB-21-6	1500	300	12"Ø	3.9
EXISTING CVB-21-7	1350	270	12"Ø	3.5
EXISTING CVB-21-8	1500	300	12"Ø	3.9
EXISTING CVB-21-9	1350	270	12"Ø	3.5
EXISTING CVB-21-10	1500	300	12"Ø	3.9
EXISTING CVB-21-11	1350	270	12"Ø	3.5
EXISTING CVB-21-12	1500	300	12"Ø	3.9
EXISTING CVB-21-13	1350	270	12"Ø	3.5
EXISTING CVB-21-14	1380	275	12"Ø	3.6
EXISTING CVB-21-15	1385	275	12"Ø	3.6
EXISTING CVB-22-1	1040	200	10"Ø	2.7
EXISTING CVB-22-2	980	190	10"Ø	2.5
EXISTING CVB-22-3	1360	260	12"Ø	3.5
EXISTING CVB-22-4	1490	285	12"Ø	3.8
EXISTING CVB-22-5	1420	275	12"Ø	3.7
EXISTING CVB-22-6	1440	275	12"Ø	3.7
EXISTING CVB-22-7	1405	270	12"Ø	3.6
EXISTING CVB-23-1	980	205	10"Ø	2.6
EXISTING CVB-23-2	1020	210	10"Ø	2.7
EXISTING CVB-23-3	1310	270	12"Ø	3.4
EXISTING CVB-23-4	1190	250	12"Ø	3.1
EXISTING CVB-23-5	1190	250	12"Ø	3.1

NOTES
1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M5.01

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EXISTING AIR HANDLING UNIT SCHEDULE (OLD PHASE II)

	MARK	EXISTING AHU-01-II	EXISTING AHU-02-II	EXISTING AHU-03-II	EXISTING AHU-04-II	EXISTING AHU-05-II	EXISTING AHU-06-II	EXISTING AHU-07-II	EXISTING AHU-08	MZU-01	MZU-02	MZU-03	MZU-04	MZU-05
FAN	LOCATION	AREA M LV 2	AREA M LV 2	AREA M LV 2	MECH M-16	MECH M-16	LAUNDRY/STORAGE 1403	AREA K LV 1	MECH M-8	MECH M-11	MECH M-10	MECH M-12	MECH M-15	MECH M-13
	DESIGN SUPPLY AIR FLOW RATE (CFM)													
	MINIMUM SUPPLY AIR FLOW RATE (CFM)													
	DESIGN OUTDOOR AIR FLOW RATE (CFM)													
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	0	0	0	0	0	0	0	0	0	0	0	0	0
	EXT. S.P. (IN. W.G.)													
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	10												
	VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)													
	EAT DB (°F)	80.2	79	77.1	79.4	75	82	82.2	80.1	80.4	80.6	79.6	80.1	80.3
	EAT WB (°F)	67.7	66	64.4	66.2	62.5	69.5	69.8	67.8	67.4	67.9	66.3	67.3	67.5
	LAT DB (°F)	54.9	54.6	55.2	54.8	56.5	54.4	55.1	56	54.3	54	54.2	54.8	54.7
	LAT WB (°F)	54.1	53.8	54.4	54	55.7	53.5	54.3	55.2	53.5	53	53.4	54	53.9
	EWT/LWT (°F)	45	45	45	45	45	45	45	45	45	45	45	45	45
	COIL WATER FLOW RATE (GPM)	113	92	37	68	11	109	108	127	117	81	71	78	87
	PIPE SIZE (IN.)	3"	3"	2"	2-1/2"	1-1/4"	3"	3"	3"	3"	3"	2-1/2"	3"	3"
	MAX. WATER P.D. (FT. HD.)	20	20	20	20	20	20	20	20	20	20	20	20	20
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)													
	EAT (°F)													
	LAT (°F)													
	EWT (°F)	-	-	-	-	-	-	-	-	-	-	-	-	-
	COIL WATER FLOW RATE (GPM)													
	PIPE SIZE (IN.)													
	MAX. WATER P.D. (FT. HD.)													
MANUFACTURER		YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK
MODEL NUMBER		CS446SVLP	CS336SVLP	CS270SVLP			CS74SVLP	CS50SVLP	CS74SVLP	CS113MLP	CS113MLP	CS156MLP	CS74MLP	CS113MLP
UNIT TYPE		SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	MZ AHU	MZ AHU	MZ AHU	MZ AHU	MZ AHU
NOTES		OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II	OLD PH II

NOTES:

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY. FIELD VERIFY EXISTING CFMS AND GPMS PRIOR TO INTEGRATION INTO NEW BAS.

EXISTING AIR HANDLING UNIT SCHEDULE (OLD PHASE III)

	MARK	AHU-1-III	AHU-2-III	AHU-3-III	AHU-4-III	AHU-5-III	AHU-6-III	AHU-7-III	AHU-8-III	AHU-9-III	AHU-10-III	AHU-11-III	AHU-12-III	OAHU-1-III
FAN	LOCATION	MR #4	MR #4	MR #1	MR #1	MR #2	MR #2	MR #2	MR #2	MR #4	STOR 1503B	MR #2	MR #2	MR #1
	DESIGN SUPPLY AIR FLOW RATE (CFM)	6565	2905	10170	10120	8480	3245	3830	5035	1250	2490	1100	1105	5425
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	2,630	1,165	4,070	4,050	3,395	1,300	1,535	2,015	500	1,000	440	445	2,170
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	0	0	0	0	0	0	0	0	0	0	0	0	0
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	0	0	0	0	0	0	0	0	0	0	0	0	0
	EXT. S.P. (IN. W.G.)	-	-	-	-	-	-	-	-	-	-	-	-	-
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	5	2	7.5	10	7.5	3	3	5	2	2	1	2	5
	VOLTS/PHASE/HERTZ	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60	480/3/60
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	450	380	501	498	515	425	501	503	391	450	459	461	457
	EAT DB (°F)	84	79	75	75	79	87	79	79	79	75	81	81	95
	EAT WB (°F)	69	65.4	63.8	63.8	65.5	69.9	65.9	65.9	66.4	62.5	66.6	67.1	80
	LAT DB (°F)	-	-	-	-	-	-	-	-	-	-	-	-	-
	LAT WB (°F)	54	54	52	53	53	54	-	-	52	55	52	52	56
	EWT (°F)	45	45	45	45	45	45	45	45	45	45	45	45	45
	COIL WATER FLOW RATE (GPM)	60	19	63	62	62	32	30	40	10	10	10	10	96
	PIPE SIZE (IN.)	2-1/2"	1-1/2"	2-1/2"	2-1/2"	2-1/2"	2"	2"	2"	1-1/4"	1-1/4"	1-1/4"	1-1/4"	0.5
	MAX. WATER P.D. (FT. HD.)	10	10	10	10	10	10	10	10	10	10	10	10	10
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)	450	380	501	498	515	425	501	504	391		459	461	456
	EAT (°F)	63.5	67.7	69.3	69.3	68.1	63.4	66.5	66.8	66		60.7	64.3	20
	LAT (°F)	-	-	-	-	-	-	-	-	-		-	-	-
	EWT (°F)	160	160	160	160	160	160	160	160	160		160	160	160
	COIL WATER FLOW RATE (GPM)	22	9	28	28	25	12	12	15	5		5	5	22
	PIPE SIZE (IN.)	1-1/2"	1-1/4"	2"	2"	2"	1-1/4"	1-1/4"	1-1/4"	1"		1"	1"	1-1/2"
	MAX. WATER P.D. (FT. HD.)	5	5	5	5	5	5	5	5	5		5	5	5
MANUFACTURER		YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK	YORK
MODEL NUMBER		AP150FSFC18X18	AP80FSFC12X12	AP215FSFC20X15	AP215FSFC20X15	AP170FSVCAF	AP80FSVCAF	AP80FSVCAF	AP105FSVCAF	AP35FSFCII9X6	AP60FSSCAF	AP35FSVCFF	AP35FSVCFF	AP120FSFC15X15
UNIT TYPE		SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	SZ AHU	OUTSIDE AIR
NOTES		OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III	OLD PH III

NOTES:

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY. FIELD VERIFY EXISTING CFMS AND GPMS PRIOR TO INTEGRATION INTO NEW BAS.

EXISTING HOT WATER COIL SCHEDULE

MARK	LOCATION	SERVES	AIR				WATER				MIN FACE AREA (SQ.FT)	NOTES
			CFM	MIN HEATING CAPACITY (BTUH)	ENTERING AIR TEMP (F)	PRESSURE DROP (IN. W.C.)	GPM	ENTERING WATER TEMP (F)	PRESSURE DROP (FT)	CONNECTING PIPE SIZE (IN.)		
HWC-1-1	-	AHU-1	3125	94500	27	0.25	10	160	10	1-1/4"	4.5	1,2,3
HWC-2-1	-	AHU-2	2600	80290	27	0.25	8	160	10	1-1/4"	3.8	1,2,3
HWC-3-1	-	AHU-3	1290	3900	27	0.25	4	160	10	1"	1.9	1,2,3
HWC-4-1	-	AHU-4	2155	65170	27	0.25	7	160	10	1"	3.1	1,2,3
HWC-6-1	-	AHU-6	1860	119690	27	0.25	12	160	10	1-1/4"	5.7	1,2,3
HWC-7-1	-	AHU-7	4490	133510	27	0.25	13	160	10	1-1/4"	6.3	1,2,3
HWC-8-1	-	AHU-8	4375	129880	27	0.25	13	160	10	1-1/4"	6.2	1,2,3
HWC-9-1	MECHANICAL M-6	AHU-9	3870	117030	27	0.25	12	160	10	1-1/4"	5.5	1,2,3
HWC-10-1	-	AHU-10	2655	77265	27	0.25	8	160	10	1-1/4"	3.7	1,2,3
HWC-10-2	CORRIDOR C13	CORRIDOR C13	535	26000	27	0.25	3	160	10	3/4"	0.8	1,2,4
HWC-11-1		AHU-11	1695	54280	27	0.25	6	160	10	1"	2.6	1,2,3
HWC-12-1	SOC. STUDIES1311	SF-22	2510	-	27	0.25		160	10	1/2"		1
HWC-15-1	PREPERATION 1515	KITCHEN HOOD	2700	125300	27	0.25	13	160	10	1-1/4"	3.9	1,2,3
HWC-15-2	PREPERATION 1515	KITCHEN HOOD	2700	125300	27	0.25	13	160	10	1-1/4"	3.9	1,2,3
HWC-15-3	SERVING 1515E	KITCHEN HOOD	1080	50150	27	0.25	5	160	10	1"	1.6	1,2,3
HWC-15-4	SNACK BAR 1515F	KITCHEN HOOD	2070	96130	27	0.25	10	160	10	1-1/4"	3	1,2,3
HWC	MECHANICAL M-18	AHU-16			27	0.25		160				1,4
HWC-17-1	-	AHU-17	2660	80440	27	0.25	8	160	10	1-1/4"	3.9	1,2,3
HWC-18-1	-	AHU-18	480	126400	27	0.25	12.6	160	10	1-1/4"	6	1,2,3
HWC-19-1	-	AHU-19	2105	47830	27	0.25	5	160	10	1"	2.3	1,2,3
HWC-20-1	-	AHU-20	4180	159820	27	0.25	16	160	10	1-1/4"	7.6	1,2,3
HWC-21-1	-	AHU-21	4020	119450	27	0.25	12	160	10	1-1/4"	5.7	1,2,3
HWC-22-1	-	AHU-22	2490	75300	27	0.25	8	160	10	1-1/4"	3.5	1,2,3
HWC-23-1		AHU-23	1110	34475	27	0.25	4	160	10	1"	1.6	1,2,3
HWC-E-1	MECHANICAL M-12	SOC. STU. 1330	1500	55080	27	0.25	6	160	10	1"	2.2	1,2,4
HWC-E-2	STORAGE 1353A	SOC. STU. 1332	940	34520	27	0.25	4	160	10	1"	1.4	1,2,4
HWC-E-3	STORAGE 1353A	SOC. STU. 1334	940	34520	27	0.25	4	160	10	1"	1.4	1,2,4
HWC-E-4	STORAGE 1353A	SOC. STU. 1336	940	34520	27	0.25	4	160	10	1"	1.4	1,2,4
HWC-E-5	STORAGE 1353A	SOC. STU. 1338	1210	44435	27	0.25	5	160	10	1"	1.8	1,2,4
HWC-01.01	MECHANICAL M-11	MZ-01	12"X28"	94500	27	0.25		160		1/2"		1,4
HWC-01.02	MECHANICAL M-11	MZ-01	12"X20"		27	0.25		160				1,4
HWC-01.03	MECHANICAL M-11	MZ-01	12"X28"		27	0.25		160				1,4
HWC-2.01	MECHANICAL M-12	MZ-02	12"x12"		27	0.25		160				1,4
HWC-2.02	MECHANICAL M-12	MZ-02	12"x12"		27	0.25		160				1,4
HWC-2.03	MECHANICAL M-12	MZ-02			27	0.25		160				1,4
HWC-2.04	MECHANICAL M-12	MZ-02			27	0.25		160				1,4
HWC-3.01	MECHANICAL M-12	MZ-03			27	0.25		160				1,4
HWC-3.02	MECHANICAL M-12	MZ-03			27	0.25		160				1,4
HWC-3.03		MZ-03			27	0.25		160				1,4
HWC		MZ-04			27	0.25		160				1,4
HWC		MZ-05			27	0.25		160				1,4

NOTES

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. CONTROLLED VIA DUCT MOUNTED TEMPERATURE SENSOR LOCATED DOWNSTREAM OF COIL. LOCATE AND REPLACE WITH NEW AND INTEGRATE INTO NEW CONTROLS SYSTEM.
3. CONTROLLED VIA TEMPERATURE SENSOR LOCATED IN ROOM BEING SERVED. LOCATE AND REPLACE WITH NEW AND INTEGRATE INTO NEW CONTROLS SYSTEM.
4. FILED VERIFY EXISTING CONTROL POINT VALUES PRIOR TO RE-BALANCING AND INTEGRATING INTO BAS.

EXISTING UNIT HEATER SCHEDULE

MARK	LOCATION	TYPE	FAN				HOT WATER COIL						ELECTRIC COIL		MANUFACTURER	MODEL	NOTES
			CFM	FPM	HORSE POWER	VOLTS/PHASE/HERTZ	CAPACITY (MBH)	ENTERING AIR TEMP (F)	GPM	COIL SIZE	ENTERING WATER PRESSURE TE...	PRESSURE DROP (FT)	KW	VOLTS/PHASE/HERTZ			
UH-1	CENTRAL PLANT RM M-14	ELECTRIC	666	640	1/20	277/1/60	-	-	-	-	-	-	7.5	277/1/60	TPI	G1GUH07RA1T	1,2,5
UH-2	CENTRAL PLANT RM M-14	ELECTRIC	666	640	1/20	277/1/60	-	-	-	-	-	-	10	277/1/60	TPI	G1GUH07RA1T	1,2,5
UH-3	CENTRAL PLANT RM M-14	ELECTRIC	666	640	1/20	277/1/60	-	-	-	-	-	-	7.5	277/1/60	TPI	G1GUH07RA1T	1,2,5
UH-4	MEN 1600C	ELECTRIC	-	-	-	277/1/60	-	-	-	-	-	-	5	208/1/60	REDD-I	81RCH-5	1,3,5
UH-5	WOMEN 1600D	ELECTRIC	-	-	-	277/1/60	-	-	-	-	-	-	5	208/1/60	REDD-I	81RCH-5	1,3,5
UH-6	MECH M-1	HOT WATER	2900		1/3	115/1/60	148	160	14.8	1-1/4"		250	-	-	STERLING	HS-204	1,4,5,6
UH-7	MECH M-4	HOT WATER	4200		1/3	115/1/60	209.1	160	20.91	1-1/2"		250	-	-	STERLING	HS-280	1,4,5,6
UH-8	MECH M-21	HOT WATER	2200		1/3	115/1/60	104	160	10.4	1-1/4"		250	-	-	STERLING	HS-144	1,4,5,6
UH-9	MECH M-7	HOT WATER	5500		1/2	115/1/60	261.3	160	26.13	2"		250	-	-	STERLING	HS-360	1,4,5,6
UH-10	MECH M-6	HOT WATER	2200		1/3	115/1/60	104	160	10.4	1-1/4"		250	-	-	STERLING	HS-144	1,4,5,6
UH-11	MECH M-8	HOT WATER	1400		1/12	115/1/60	61	160	6.1	1"		250	-	-	STERLING	HS-84	1,4,5,6
UH-12	AREA H	HOT WATER						160				250	-	-	STERLING		1,4,5,6
UH-13	AREA M	HOT WATER						160				250	-	-	STERLING		1,4,5,6

NOTES

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. LOCATE EXISTING PENDENT MOUNTED THERMOSTAT AND REPLACE WITH NEW. INTEGRATE INTO NEW BUILDING CONTROLS.
3. LOCATE EXISTING BUILT-IN THERMOSTAT AND REPLACE WITH NEW. INTEGRATE INTO NEW BUILDING CONTROLS.
4. LOCATE EXISTING SENSORS AND REPLACE WITH NEW. INTEGRATE INTO NEW BUILDING CONTROLS.
5. PROVIDE POINTS FOR AS NECESSARY TO PROVIDE RUN STATUS TO BAS.
6. FIELD VERIFY EXISTING CONTROL POINT VALUES (CFMS, GPM, FPM ECT) PRIOR TO INTEGRATION INTO NEW BAS.

EXISTING PUMP SCHEDULE

MARK	TYPE	GPM	PIPE SIZE	HEAD (FT.)	HP	MAX RPM	VOLTS/PHASE/HERTZ	MANUFACTURER	MODEL
P-1	CHW	1000	8"	50	20	1750	480/3/60	PACO	EM23347
P-2	CHW	1000	8"	50	20	1750	480/3/60	PACO	EM2334T
P-3	CHW	700	6"	50	15	1750	480/3/60	PACO	
P-4	CHW	400	6"	50	10	1750	480/3/60	PACO	EM3770T
P-5	CHW	1550	10"	110	60	1750	480/3/60	PACO	EM4314T
P-6	CHW	1550	10"	110	60	1750	480/3/60	PACO	EM4314T
P-7	CW	1500	10"	50	30	1750	480/3/60	PACO	EM4103T
P-8	CW	1500	10"	50	30	1750	480/3/60	PACO	EM4103T
P-9	CW	1050	10"	50	20	1750	480/3/60	PACO	
P-10	CW	600	6"	50	15	1750	480/3/60	PACO	EM2333T
P-11	HW	670	6"	95	30	1750	480/3/60	PACO	
P-12	HW	670	6"	95	30	1750	480/3/60	PACO	

NOTES

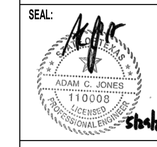
1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M5.02

5/28/2026 5:36:49 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

EXISTING FAN SCHEDULE

MARK	LOCATION	SERVES	INTERLOCK	CFM	MAX RPM	DRIVE	TYPE	SP	HP	ELEC	MANUF.	MODEL	MODEL #
EF-1	ROOF ABOVE CORR. C11B	TOILET ROOMS	AHU-1	600	1460	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-2	ROOF ABOVE MEN 1128	TOILET ROOMS	AHU-3	1000	1200	BELT	CENTRIFUGAL ROOF MOUNTED	0.38	1/4	120/1/60	LOREN-COOK	ACEB	120
EF-3	ROOF ABOVE COUNS. 1102C	TOILET 1103F	AHU-4	465	1275	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-4	ROOF ABOVE MENS 1262	M.1262 W.1261	AHU-6	450	1250	BELT	CENTRIFUGAL ROOF MOUNTED	0.37	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-5	ROOF ABOVE CORRIDOR 1249D	M.1249B W.1249C	AHU-8	240	1530	BELT	CENTRIFUGAL ROOF MOUNTED	0.37	1/4	120/1/60	LOREN-COOK	ACEB	70
EF-6	ROOF ABOVE LOCKER 1515J	M.1515K W.1515L & LAUNDRY	AHU-16	540	1335	BELT	CENTRIFUGAL ROOF MOUNTED	0.38	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-7	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	-	1400	1360	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	1/2	120/1/60	LOREN-COOK	VCR	135
EF-8	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	-	4500	1000	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	1-1/2	480/3/60	LOREN-COOK	VCR	210
EF-9	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	-	4500	1000	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	1-1/2	480/3/60	LOREN-COOK	VCR	210
EF-10	ROOF ABOVE SERVING 1515E	KITCHEN HOOD	-	1800	1065	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	1/2	120/1/60	LOREN-COOK	VCR	165
EF-11	ROOF ABOVE SNACK BAR 1515F	KITCHEN HOOD	-	3450	1000	BELT	CENTRIFUGAL ROOF MOUNTED	0.85	3/4	480/3/60	LOREN-COOK	VCR	195
EF-12	ROOF ABOVE CHEM LAB 1320	SCIENCE LAB EXH	-	2340	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-13	ROOF ABOVE CHEM LAB 1320	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-14	ROOF ABOVE CHEM LAB 1320	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-15	ROOF ABOVE CHEM LAB 1307	SCIENCE LAB EXH	-	2340	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-16	ROOF ABOVE CHEM LAB 1307	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-17	ROOF ABOVE CHEM LAB 1307	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-18	ROOF ABOVE CHEM LAB 1308	SCIENCE LAB EXH	-	2340	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-19	ROOF ABOVE CHEM LAB 1308	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-20	ROOF ABOVE CHEM LAB 1308	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-21	ROOF ABOVE CHEM LAB 1337	SCIENCE LAB EXH	-	2340	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-22	ROOF ABOVE CHEM LAB 1337	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-23	ROOF ABOVE CHEM LAB 1337	SCIENCE LAB EXH	-	980	920	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	120/1/60	LOREN-COOK	CPFB	100
EF-24	ABOVE CEILING STORAGE 1600B	STOR, RRs	-	1230	700	BELT	CENTRIFUGAL IN-LINE	0.25	1/4	120/1/60	LOREN-COOK	DB	10
EF-25	ABOVE CEILING CUSTODIAN 1600E	CUSTODIAN	-	235	1340	BELT	CENTRIFUGAL CEILING MOUNTED	0.125	1/25	120/1/60	LOREN-COOK	GC	320
EF-26	ROOF ABOVE LAUNDRY 1403	BOYS TOILETS & SHOWERS	AHU-25	820	900	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	135
EF-27	ROOF ABOVE COACH DR.1402A	BOYS COACHES	AHU-25	340	1530	BELT	CENTRIFUGAL ROOF MOUNTED	0.38	1/4	120/1/60	LOREN-COOK	ACEB	80
EF-28	ROOF ABOVE COACH DR.1404A	GIRLS RR	AHU-26	340	1240	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	80
EF-29	ROOF ABOVE CORRIDOR C14C	GIRLS RR	AHU-26	820	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.38	1/4	120/1/60	LOREN-COOK	ACEB	165
EF-30	ROOF ABOVE CENTRAL PLANT	CENTRAL PLANT	-	2100	950	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	165
EF-31	ROOF ABOVE CENTRAL PLANT	CENTRAL PLANT	-	2100	950	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	165
EF-32	ROOF ABOVE CENTRAL PLANT	CENTRAL PLANT	-	2100	950	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	165
EF-33	ROOF ABOVE CENTRAL PLANT	CENTRAL PLANT	-	1450	1540	BELT	CENTRIFUGAL ROOF MOUNTED	0.35	1/3	120/1/60	LOREN-COOK	ACEB	120
EF-34	ROOF ABOVE TOILET GROUPS	RR	EXHAUST	1590	850	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/3	120/1/60	LOREN-COOK	ACEB	165
EF-35	ROOF ABOVE MENS 2318	RR	EXHAUST	1760	1040	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/3	120/1/60	LOREN-COOK	ACEB	150
EF-36	ROOF ABOVE GIRLS 1200A	RR	EXHAUST	650	1500	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-37	ROOF ABOVE BOYS 1200B	RR	EXHAUST	650	1500	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	100
EF-38	ROOF ABOVE MENS 1266	RR	EXHAUST	340	1250	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	340
EF-39	ROOF ABOVE CHEM LAB 1320	BIOLOGY LAB	-	2340	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-40	ROOF ABOVE CHEM LAB 1307	BIOLOGY LAB	-	2340	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-41	ROOF ABOVE CORRIDOR C13B	BIOLOGY LAB	-	2540	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-42	ROOF ABOVE CORRIDOR C13B	BIOLOGY LAB	-	2540	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-43	ROOF ABOVE CORRIDOR C13B	BIOLOGY LAB	-	2540	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-44	ROOF ABOVE CORRIDOR C13B	BIOLOGY LAB	-	2540	860	BELT	CENTRIFUGAL ROOF MOUNTED	0.55	1/2	120/1/60	LOREN-COOK	ACRUB	180
EF-45	ROOF ABOVE CHEM LAB 1320	SCIENCE LAB PURGE	-	3500	540	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	245
EF-46	ROOF ABOVE CHEM LAB 1307	SCIENCE LAB PURGE	-	3500	540	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	245
EF-47	ROOF ABOVE CHEM LAB 1308	SCIENCE LAB PURGE	-	3500	540	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	245
EF-48	ROOF ABOVE CHEM LAB 1337	SCIENCE LAB PURGE	-	3500	540	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	ACRUB	245
EF-49	ROOF ABOVE SCIENCE 1326	RR	EXISTING AHU	350	1260	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	80
EF-50	ROOF ABOVE GIRLS 1344	RR	EXISTING AHU	1330	1100	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/4	120/1/60	LOREN-COOK	ACEB	135
EF-51	ABOVE CEILING CORRIDOR C14F	RESTROOM GROUP	EXISTING AHU	1685	915	BELT	CENTRIFUGAL IN-LINE	0.45	1/4	120/1/60	LOREN-COOK	SQN-B	165
EF-52	ROOF ABOVE CORRIDOR C13B	PREP ROOM	-	660	1360	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/4	120/1/60	LOREN-COOK	ACRUB	100
EF-53	ROOF ABOVE SCIENCE 1326	PREP ROOM	-	910	1170	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/4	120/1/60	LOREN-COOK	ACRUB	120
EF-54	ROOF ABOVE SCIENCE 1326	PREP ROOM	-	910	1170	BELT	CENTRIFUGAL ROOF MOUNTED	0.45	1/4	120/1/60	LOREN-COOK	ACRUB	120
EF-55	ABOVE CEILING BOYS C617C	RR	EXISTING AHU	1520	800	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1/2	120/1/60	LOREN-COOK	DB	10

NOTES

1. SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING

MARK	LOCATION	SERVES	INTERLOCK	CFM	MAX RPM	DRIVE	TYPE	SP	HP	ELEC	MANUF.	MODEL	MODEL #
SF-1	ROOF ABOVE PLANNING 1115	AHU-1	AHU-1	3125	670	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1/2	480/3/60	LOREN-COOK	ASP	150
SF-2	ROOF ABOVE PLANNING 1115	AHU-2	AHU-2	2600	820	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1	480/3/60	LOREN-COOK	ASP	120
SF-3	ROOF ABOVE ADAPTIVE 1118	AHU-3	AHU-3	1290	1040	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1/2	120/1/60	LOREN-COOK	ASP	90
SF-4	ROOF ABOVE CORRIDOR C11C	AHU-4	AHU-4	2155	790	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	3/4	480/3/60	LOREN-COOK	ASP	120
SF-5	ROOF ABOVE LANGUAGE 2215	AHU-7	AHU-7	4490	610	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1-1/2	480/3/60	LOREN-COOK	ASP	180
SF-6	ROOF ABOVE STORAGE 2215A	AHU-8	AHU-8	4375	610	BELT	CENTRIFUGAL ROOF MOUNTED	0.73	1-1/2	480/3/60	LOREN-COOK	ASP	180
SF-7	ROOF ABOVE CORRIDOR C13C	AHU-10	AHU-10	2655	870	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	1-1/2	480/3/60	LOREN-COOK	ASP	120
SF-8	ROOF ABOVE SCIENCE 1326	AHU-11	AHU-11	1695	1000	BELT	CENTRIFUGAL ROOF MOUNTED	0.75	3/4	480/3/60	LOREN-COOK	ASP	100
SF-9	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	EF-8	2700	900	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1-1/2	480/3/60	LOREN-COOK	KSP-B	120
SF-10	ROOF ABOVE PREPARATION 1515	KITCHEN HOOD	EF-9	2700	900	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1-1/2	480/3/60	LOREN-COOK	KSP-B	120
SF-11	ROOF ABOVE SERVING 1515E	KITCHEN HOOD	EF-10	1080	1120	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1/2	120/1/60	LOREN-COOK	KSP-B	90
SF-12	ROOF ABOVE SNACK BAR 1515F	KITCHEN HOOD	EF-11	2070	1160	BELT	CENTRIFUGAL ROOF MOUNTED	0.7	1	480/3/60	LOREN-COOK	KSP-B	100
SF-13	ROOF ABOVE MECH M-6	AHU-9	AHU-9	3870	680	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-14	ROOF ABOVE MECH M-18	AHU-22	AHU-22	2490	790	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1	480/3/60	LOREN-COOK	ASP	120
SF-15	ROOF ABOVE MECH M-17	AHU-23	AHU-23	1110	980	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1/3	120/1/60	LOREN-COOK	ASP	90
SF-16	ROOF ABOVE MECH M-20	AHU-18	AHU-18	4180	700	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-17	ROOF ABOVE MECH M-20	AHU-19	AHU-19	2105	765	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	3/4	480/3/60	LOREN-COOK	ASP	120
SF-18	ROOF ABOVE MECH M-21	AHU-6	AHU-6	3860	680	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-19	ROOF ABOVE MECH M-21	AHU-20	AHU-20	4180	700	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-20	ROOF ABOVE MECH M-22	AHU-21	AHU-21	4020	690	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-21	ROOF ABOVE SOC. STU. 1263	AHU-17	AHU-17	2660	830	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	120
SF-22	ROOF ABOVE SCL. LAB 1314	AHU-12	AHU-12	2510	790	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	120
SF-23	ROOF ABOVE SCL. LAB 1302	AHU-13	AHU-13	2855	830	BELT	CENTRIFUGAL ROOF MOUNTED	0.65	1-1/2	480/3/60	LOREN-COOK	ASP	120
SF-24	ROOF ABOVE CHEM. LAB 1320	SCIENCE LAB PURGE	EF-45	3180	550	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-25	ROOF ABOVE CHEM. LAB 1307	SCIENCE LAB PURGE	EF-46	3180	550	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-26	ROOF ABOVE CHEM. LAB 1308	SCIENCE LAB PURGE	EF-47	3180	550	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1-1/2	480/3/60	LOREN-COOK	ASP	150
SF-27	ROOF ABOVE CHEM. LAB 1337	SCIENCE LAB PURGE	EF-48	3180	550	BELT	CENTRIFUGAL ROOF MOUNTED	0.4	1-1/2	480/3/60	LOREN-COOK	ASP	150
AC-1	ABOVE DOORWAY PREP 1515	KITCHEN RECEIVING	-	2550	1750	BELT	CENTRIFUGAL WALL MOUNTED	0.125	1/2	120/1/60	MARS	CH	48

NOTES:

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.

FAN COIL UNIT SCHEDULE

MARK	LOCATION	SERVES	CONTROL	CFM	VOLTS/PH/H	HP	MANUFACTURER	MODEL NO	CHW	HW
FCU-01	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 B6SC2 R6 CA2	YES	YES
FCU-02	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 B6SC2 R6 CA2	YES	YES
FCU-03	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 B6SC2 L6 CA2	YES	YES
FCU-04	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 D6SC2 L6 CA2	YES	YES
FCU-05	AREA D CORRIDOR	CORRIDOR	T-STAT	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 A6SC2 L6 CA2	YES	YES
FCU-06	AREA D CORRIDOR	CORRIDOR	T-STAT	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 A6SC2 R6 CA2	YES	YES
FCU-07	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 A6SC2 R6 CA2	YES	YES
FCU-08	AREA D CORRIDOR	CORRIDOR	T-STAT	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 A6SC2 L6 CA2	YES	YES
FCU-9	AREA H	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 A6SC2 L6 CA2	YES	YES
FCU-10	AREA H	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 A6SC2 R6 CA2	YES	YES
FCU-11	AREA H	CORRIDOR	ZONE TEMP	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 A6SC2 R6 CA2	YES	YES
FCU-12	AREA H	CORRIDOR	ZONE TEMP	1200	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY12 A6SC2 L6 CA2	YES	YES
FCU-13	AREA H	CONTROL								
FCU-13	AREA G	AREA G	ZONE TEMP							
FCU-14	AREA G	AREA G	ZONE TEMP							
FCU-15	AREA G	AREA G	ZONE TEMP							
FCU-16	AREA G	AREA G	ZONE TEMP							
FCU-17	AREA G	DRILL TEAM	ZONE TEMP				PENN	SX100BC	YES	NO
FCU-1 (BAKERY)	AREA E	SERVING/CAFETERIA	ZONE TEMP						YES	YES
FCU-8 (TOP CAT CAFÉ 1500)	AREA E	SERVING/CAFETERIA	ZONE TEMP							
FCU-20	AREA I	CAFETERIA	ZONE TEMP	1500					YES (2)	YES (2)
FCU-24	AREA E	DRAMA 1512	ZONE TEMP						YES	YES
FCU-27	AREA E	SERVING/CAFETERIA	ZONE TEMP						YES	YES
FCU-28	AREA E	SERVING/CAFETERIA	ZONE TEMP						YES	YES
FCU-29	AREA E	CAFATERIA	ZONE TEMP						YES	YES
FCU-30	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-31	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-32	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-33	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-34	AREA E	CORRIDOR	ZONE TEMP	800	115/1/60	1/6	INTERNATIONAL ENVIORMENTAL...	CBY08 B6SC2 R5 CA2	YES	YES
FCU-18	AREA F	CORRIDOR	ZONE TEMP							
FCU-2	AREA L	SOUND BOOTH	ZONE TEMP						YES	NO
FCU-21	AREA I	BLACK BOX/ 1513	ZONE TEMP						YES	YES
FCU-22	AREA I	BLACK BOX/ 1513	ZONE TEMP		115/1	3/4	ROESSLER	56851267	YES	YES
FCU-25	AREA I	BLACK BOX/ 1513	ZONE TEMP		208/3/60	3/4	WILLIAMS	AH2300-W4-B62 RH	YES	YES

NOTES:

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. FILED VERIFY EXISTING CONTROL POINT VALUES PRIOR TO RE-BALANCING AND INTEGRATING INTO BAS.
3. FIELD VERIFY ANY ADDITIONAL FAN COIL UNITS NOT NOTED IN THIS SCHEDULE AND INTEGRATE ALL INTO NEW BAS.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER TEXAS

Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M5.03

5/28/2026 5:36:54 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt

EXISTING COOLING TOWER SCHEDULE

MARK	TEMP			GMP	VOLTAGE	MFGR.	MODEL NO.	HP
	ENT. WTR (F)	LEAVE WTR. (F)	WB					
CT-1	96	86	80	1500	480/3/60	MARLEY	NC830M	30
CT-2	96	86	80	1500	480/3/60	MARLEY	NC830M	30
CT-3	96	86	80	1050	480/3/60	MARLEY	NC830M	20
CT-4	96	86	80	600	480/3/60	MARLEY	NC830M	15

NOTES

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EXISTING BOILER SCHEDULE

MARK	MINIMUM (MBH)		GPM	TEMP			FAN HP	VOLTAGE	MFGR.	MODEL NO.	HP
	INPUT	OUTPUT		ENT. WTR (F)	LEAVE WTR. (F)	WB					
B-1	8370	6700	670	96	86	80	1500	480/3/60	MARLEY	NC830M	30
B-2	-	-	670	96	86	80	1500	480/3/60	MARLEY	NC830M	30

NOTES

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EXISTING CHILLER SCHEDULE

MARK	NOMINAL TONS	COOLER (FF=0.0001)				CONDENSER (FF=0.00025)			VOLTAGE	KW/TON	MANUFACTURER	MODEL
		ENT. WTR (F)	LEAVE WTR. (F)	GPM	PRESSURE DROP (FT)	ENT. WTR (F)	GPM	PRESSURE DROP (FT)				
CH-1	500	54	42	1000	80	86	1500	10	480/3/60	0.577	TRANE	CVHF485
CH-2	500	54	42	1000	80	86	1500	10	480/3/60	0.577	TRANE	CVHF485
CH-3	350	-	-	700	80	-	1050	-	480/3/60	-	CARRIER	19XVR04145A1
CH-4	200	54	42	400	80	86	600	10	480/3/60	0.718	TRANE	RTHC1B2F

NOTES

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.

EXISTING DX FAN COIL UNIT SCHEDULE

MARK	FCU-LIBRARY
SERVES	1358 IDF/AV
EXT. S.P. (IN. W.G.)	0.5
FAN MOTOR HORSEPOWER	1/3
FAN RPM	1050
TOTAL COOLING CAPACITY (MBH)	24000
VOLTS/PHASE/HERTZ	240/1/60
REFRIGERANT TYPE	R-22
MANUFACTURER	SIEMMENS
MODEL NO.	BCS3M24C00NA1P-1
NOTES	

NOTES:

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. FILED VERIFY EXISTING CFMS, MBH, TEMPERATURE SET POINTS, ECT PRIOR TO RE-BALANCING AND INTEGRATING INTO BAS.
3. PROVIDE NEW CONTROL POINTS AS NEEDED TO INTEGRATE INTO NEW BAS.

EXISTING AIR COOLED CONDENSING UNIT SCHEDULE

MARK	ACCU-LIBRARY
SERVES	FCU-LIBRARY
TOTAL COOLING CAPACITY (MBH)	24000
AMBIENT TEMP. (°F)	105
VOLTS/PHASE/HERTZ	208/230
MCA	16.1
MOCP	25
REFRIGERANT TYPE	R22
MANUFACTURER	YORK
SERIAL NUMBER	EAEM0204276
NOTES	ALL

NOTES:

1. EXISTING SCEDHULES ARE PROVIDED FOR INFORMATIONAL PURPOSES FOR CONTROL REPLACMENT AND BALANCING ONLY.
2. FILED VERIFY EXISTING CFMS, MBH, TEMPERATURE SET POINTS, ECT PRIOR TO RE-BALANCING AND INTEGRATING INTO BAS.
3. PROVIDE NEW CONTROL POINTS AS NEEDED TO INTEGRATE INTO NEW BAS.

ROOF MOUNTED AIR HANDLING UNIT SCHEDULE

	MARK	RTU-01	RTU-02
FAN	SERVES	CAFETERIA	TOP CAT CAFÉ/BAKERY
	TYPE	ROOF MOUNTED	ROOF MOUNTED
	UNIT CONFIGURATION	SZ	SZ
	DISCHARGE	VERTICAL	VERTICAL
	DESIGN SUPPLY AIR FLOW RATE (CFM)	4,690	2,265
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	3,380	910
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	3,380	300
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	1,690	150
	EXT. S.P. (IN. W.G.)	0.56	0.47
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	5/1	2/1
	VOLTS/PHASE/HERTZ	460/3/60	460/3/60
	MAX. FAN RPM	1800	1800
	FULL LOAD AMPS (FLA)	8.2	3.4
	MCA/MOP	10.25/15	4.25/ 15
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	500	500
	MINIMUM COIL ROWS	6	6
	MAX. FINS PER INCH	12	12
	COIL AIR FLOW RATE (CFM)	4,690	2,265
	EAT DB/WB (°F)	92.7/74.15	80.9/66.33
	LAT DB/WB (°F)	53.7/53.72	53.7/53.71
	TOTAL COOLING CAPACITY (MBH)	319.2	86.1
	SENSIBLE COOLING CAPACITY (MBH)	199.7	66.8
	EWT/LWT (°F)	45/ 56	45/56
	COIL WATER FLOW RATE (GPM)	58.0	15.7
	CHW BRANCH PIPING SIZE	2-1/2"	1-1/4"
	MAX. WATER P.D. (FT. HD.)	15.0	15.0
HEATING COIL	MAX. COIL FACE VELOCITY (FPM)	500	500
	MINIMUM COIL ROWS	2	2
	MAX. FINS PER INCH	11	11
	COIL AIR FLOW RATE (CFM))	3,380	1,585
	EAT (°F)	27.0	60.2
	LAT (°F)	85.0	85.0
	EWT/LWT (°F)	160/140	160/140
	HEATING CAPACITY (MBH)	211.7	42.4
	COIL WATER FLOW RATE (GPM)	21.2	4.2
	HW BRANCH PIPING SIZE	1-1/2"	1"
	MAX. WATER P.D. (FT. HD.)	15.0	15.0
MANUFACTURER		TRANE	TRANE
MODEL NUMBER		CSAA010	CSA004
DIMENSIONS		163 x 61.5 x 44	158 x 44 x 35
OPERATING WEIGHT (LBS.)		2800	2023
NOTES		ALL	ALL

NOTES:

1. EXTERNAL STATIC PRESSURE DOES NOT ACCOUNT FOR LOSSES DUE TO COIL(S), FILTERS, HOUSING, NOR ACCESSORIES.
2. PROVIDE UNIT WITH OUTDOOR AIR INTAKE HOOD WITH MODULATING MOTORIZED DAMPER.
3. PROVIDE UNIT WITH SINGLE POINT ELECTRICAL CONNECTION.
4. PROVIDE FLOAT SWITCH IN PRIMARY DRAIN PAN TO DE-ENERGIZE THE ENTIRE UNIT WHEN PRIMARY DRAIN LINE BECOMES RESTRICTED.
5. PROVIDE UNITS WITH MINIMUM MERV 13 FILTERS.
6. PROVIDE UNIT WITH 14" PREFABRICATED ROOF CURB.
7. PROVIDE UNIT OUTDOOR AIR DAMPER SIZED FOR FULL DESIGN SUPPLY AIRFLOW OF THE UNIT.
8. PROVIDE UNIT WITH DISCONNECT SWITCH.
9. PROVIDE UNIT WITH DUCT MOUNTED SMOKE DETECTORS IN SUPPLY DUCTWORK FOR ALL UNITS DISCHARGING IN EXCESS OF 2,000 CFM.
10. PROVIDE UNIT WITH A MINIMUM SHORT CIRCUIT CURRENT RATING (SCCR) OF 65,000A.
11. NEW ROOF MOUNTED AIR HANDLING UNITS TO BE PROVIDED TO REPLACE EXISTING FCUs AS PART OF ALTERNATE 1.

AIR HANDLING UNIT SCHEDULE

	MARK	AHU-16
FAN	SERVES	KITCHEN AREA E
	TYPE	SZ
	UNIT CONFIGURATION	HORIZONTAL
	DISCHARGE	VERTICAL
	DESIGN SUPPLY AIR FLOW RATE (CFM)	15,130
	MINIMUM SUPPLY AIR FLOW RATE (CFM)	6,055
	DESIGN OUTDOOR AIR FLOW RATE (CFM)	2,345
	MINIMUM OUTSIDE AIR FLOW RATE (CFM)	1,175
	EXT. S.P. (IN. W.G.)	0.90
	FAN MOTOR HORSEPOWER (HP / # OF FANS)	15/1
	VOLTS/PHASE/HERTZ	480/3/60
	MAX. FAN RPM	2,217
	FULL LOAD AMPS (FLA)	21.0
	MCA/MOP	26.25 / 45
COOLING COIL	MAX. COIL FACE VELOCITY (FPM)	500
	MINIMUM COIL ROWS	4
	MAX. FINS PER INCH	11
	COIL AIR FLOW RATE (CFM)	15,130
	EAT DB/WB (°F)	75.8/63.3
	LAT DB/WB (°F)	56.2/55.3
	TOTAL COOLING CAPACITY (MBH)	386.0
	SENSIBLE COOLING CAPACITY (MBH)	345.9
	EWT/LWT (°F)	45/56
	COIL WATER FLOW RATE (GPM)	61.0
	CHW BRANCH PIPING SIZE	2 1/2"
	MAX. WATER P.D. (FT. HD.)	20.0
MANUFACTURER		TRANE
MODEL NUMBER		CSAA035
DIMENSIONS		131.138" X 100" X 70.8"
OPERATING WEIGHT (LBS.)		4097
NOTES		ALL

NOTES:

1. PROVIDE UNIT WITH DRAW THRU DIRECT DRIVE PLENUM FAN SECTION, CHILLED WATER COIL SECTION, AND 2" FLAT FILTER SECTION.
2. EXTERNAL STATIC PRESSURE DOES NOT INCLUDE LOSSES DUE TO COILS, FILTERS, AND CASING.
3. PROVIDE UNIT WITH REMOTE MOUNTED VARIABLE FREQUENCY DRIVE.
4. PROVIDE CHILLED WATER COIL WITH 3-WAY AUTOMATIC CONTROL VALVE.
5. AHU-16 TO BE REPLACED AS PART OF ALTERNATE 1.

FAN POWERED TERMINAL UNIT SCHEDULE

MARK	PRIMARY AIR CFM		HEATING CFM	HOT WATER HEATING				INLET SIZE	VOLTS/ PHASE/ HZ	ECM HP	MFR	MODEL NO.
	MAX.	MIN.		EWT/LWT	ROWS	MBTU/H	GPM					
CVB-1-2	1,265	265	890	160/140	1	18.7	1.9	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-4	1,455	455	1020	160/140	1	23.9	2.4	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-5	1,465	465	1030	160/140	1	24.2	2.4	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-6	680	150	480	160/140	1	10.2	1.0	8"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-1-7	1,305	305	915	160/140	1	19.8	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-8	1,140	140	800	160/140	1	15.2	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-1-9	480	110	340	160/140	1	7.3	0.7	8"Ø	277/1/60	1/3	TITUS	DTFS-B
CVB-2-8	970	180	680	160/140	1	13.9	1.4	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-2-9	970	180	680	160/140	1	13.9	1.4	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-4-1	820	165	575	160/140	1	12.0	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-4-2	1,410	410	990	160/140	1	22.7	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-3	1,410	410	990	160/140	1	22.7	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-4	1,495	495	1050	160/140	1	25.0	2.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-5	680	140	480	160/140	1	10.0	1.0	8"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-4-6	1,415	415	995	160/140	1	22.8	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-7	800	160	560	160/140	1	11.7	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-4-8	1,440	440	1010	160/140	1	23.5	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-4-9	830	170	585	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-6-2	1,075	75	755	160/140	1	13.4	1.3	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-3	1,150	150	805	160/140	1	15.5	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-4	1405	405	985	160/140	1	22.5	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-5	1150	150	805	160/140	1	15.5	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-6	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-7	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-6-8	1020	20	715	160/140	1	11.9	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-7-2	1035	35	725	160/140	1	12.3	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-7-4	710	250	500	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-7-6	1035	35	725	160/140	1	12.3	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-7-8	710	250	500	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-7-10	1035	35	725	160/140	1	12.3	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-7-12	710	250	500	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-7-13	1285	285	900	160/140	1	19.2	1.9	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-1	1300	300	910	160/140	1	19.6	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-2	1300	300	910	160/140	1	19.6	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-3	1440	440	1010	160/140	1	23.5	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-4	1130	130	795	160/140	1	15.0	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-5	1460	460	1025	160/140	1	24.1	2.4	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-6	1130	130	795	160/140	1	15.0	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-7	1250	250	875	160/140	1	18.2	1.8	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-9	1130	130	795	160/140	1	15.0	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-10	1495	495	1050	160/140	1	25.0	2.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-11	1130	130	795	160/140	1	15.0	1.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-12	1495	495	1050	160/140	1	25.0	2.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-13	1130	495	795	160/140	1	20.9	2.1	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-14	1220	220	855	160/140	1	17.4	1.7	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-15	1440	440	1010	160/140	1	23.5	2.3	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-8-16	1220	220	855	160/140	1	17.4	1.7	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-1	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-2	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-4	1030	30	725	160/140	1	12.2	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-5	1040	40	730	160/140	1	12.5	1.2	10"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-7	1100	100	770	160/140	1	14.1	1.4	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-9-9	980	235	690	160/140	1	15.0	1.5	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-9-11	1500	500	1050	160/140	1	25.1	2.5	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-10-4	920	270	645	160/140	1	14.8	1.5	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-10-5	910	270	640	160/140	1	14.7	1.5	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-12-1	1330	330	935	160/140	1	20.5	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-2	1340	340	940	160/140	1	20.7	2.1	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-3	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-4	1320	320	925	160/140	1	20.2	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-5	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-6	1320	320	925	160/140	1	20.2	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-7	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-8	1320	320	925	160/140	1	20.2	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-12-9	810	180	570	160/140	1	12.2	1.2	10"Ø	277/1/60	1/3	TITUS	DTFS-C
CVB-13-1	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-2	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-3	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-4	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-5	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-6	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-7	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-8	1310	310	920	160/140	1	19.9	2.0	12"Ø	277/1/60	1/2	TITUS	DTFS-D
CVB-13-9	830	190	585	160/140	1	12.6	1.3	10"Ø	277/1/60	1/3	TITUS	DTFS-C

NOTES:

1. PROVIDE AEROCROSS MULTI-POINT CENTER AVERAGING VELOCITY SENSOR IN PRIMARY AIR INLET.
2. PROVIDE TERMINAL UNIT CASING WITH 1" INTERNALLY LINED FIBERGLASS FREE INSULATION.
3. PROVIDE TERMINAL UNIT WITH INTEGRAL DISCONNECT SWITCH.
4. PROVIDE HOT WATER REHEAT COIL WITH 2-WAY AUTOMATIC CONTROL VALVE.
5. THE MAXIMUM ALLOWABLE PRESSURE DROP ACROSS HOT WATER COILS SHALL BE 10 FT.HD.
6. UNITS TO BE REPLACED AS PART OF ALTERNATE 2.

DUCT MOUNTED HOT WATER HEATING COIL SCHEDULE

MARK	HWC-16
SERVES	AHU-16
CFM	15,130
CAPACITY (MBH)	653.6
DUCT DIMENSION WxH (INSIDE)	72 x 20
ENTERING WATER TEMPERATURE (F)	180
LEAVING WATER TEMPERATURE (F)	160
FLOW (GPM)	35
NUMBER OF ROWS	2
MANUFACTURER	TRANE
NOTES	ALL

NOTES:

1. PROVIDE HOT WATER COIL AS PART OF ALTERNATE 1.

AIR TERMINAL SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	REMARKS
A	TITUS	TMS-AA	LOUVERED FACE SUPPLY AIR DIFFUSER	24"X24" FACE, ALUMINUM CONSTRUCTION WITH FRAME FOR ASSOCIATED CEILING TYPE.
B	TITUS	PAR-AA	PERFORATED FACE RETURN / EXHAUST AIR GRILLE	24"X24" FACE, ALUMINUM CONSTRUCTION WITH FRAME FOR ASSOCIATE CEILING TYPE. PROVIDE 22"X22" NECK UNLESS OTHERWISE NOTED.

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR FINISH.
2. REFER TO MECHANICAL FLOOR PLAN FOR NECK SIZES.
3. INSULATE BACK-PAN OF ALL AIR DEVICES.
4. PROVIDE FRAME TO MATCH CEILING TYPE INDICATED ON ARCHITECTS REFLECTED CEILING PLAN.

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SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER

Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

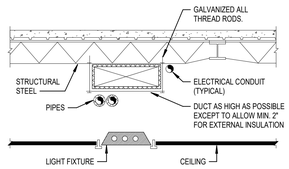
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PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL SCHEDULES

SHEET NUMBER: M5.04

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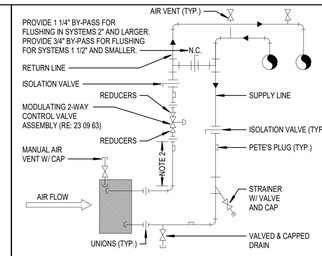


NOTES:
1. PIPES (INCLUDING SPRINKLER PIPING) AND ELECTRICAL CONDUIT CAN BE ROUTED BETWEEN JOISTS OR THROUGH JOIST WEB SPACE AS REQUIRED. DUCT SHALL BE LOCATED AS HIGH AS POSSIBLE.
2. U.L. DESIGN ASSEMBLY NUMBERS ARE SHOWN ON ARCHITECTURAL PLANS WHEN REQUIRED.
3. INSTALLATION OF ALL SERVICES MUST BE COORDINATED BY THE CONTRACTOR.

"NOT TO SCALE"

1 TYPICAL MEP INSTALLATION

M1001

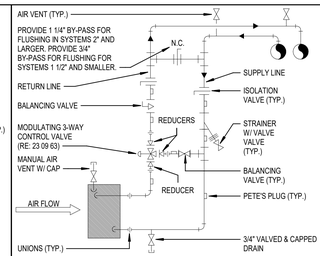


NOTES:
1. INSTALL 2-WAY CONTROL VALVE ORIENTATION PER MFGR. INSTALLATION INSTRUCTIONS.
2. PROVIDE STRAIGHT PIPE LENGTH 5 TIMES NOMINAL PIPE DIA. UPSTREAM OF CTRL. VALVE.

"NOT TO SCALE"

2 TWO-WAY CONTROL VALVE AND COIL PIPING

M1002

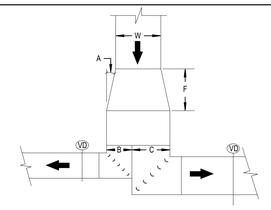


NOTE: INSTALL 3-WAY CONTROL VALVE ORIENTATION PER MFGR. INSTALLATION INSTRUCTIONS

"NOT TO SCALE"

3 3-WAY CONTROL VALVE AND COIL PIPING

M1002



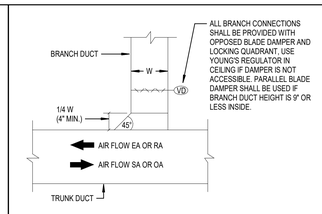
DIMENSIONAL RELATIONSHIPS
1. ANGLE 'A' TO BE 15° OR LESS (BOTH SIDES)
2. SEE FLOOR PLANS FOR B, C, & W.
3. VERTICAL DIMENSION TO BE MAINTAINED THRU F.
4. CHANGE IN VERTICAL DIMENSION TO OCCUR AFTER TURNS.

NOTES:
VOLUME DAMPERS REQUIRED FOR LOW PRESSURE DUCT SYSTEMS ONLY.

"NOT TO SCALE"

4 DUCTWORK TEE

M1008

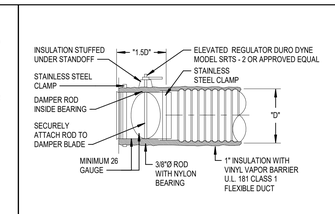


NOTES:
THIS CONNECTION SHALL BE TYPICAL FOR ALL RECTANGULAR BRANCH DUCT CONNECTIONS TO RECTANGULAR TRUNK DUCTS, INCLUDING SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST DUCTS.

"NOT TO SCALE"

5 RECTANGULAR BRANCH DUCT TAP

M1003

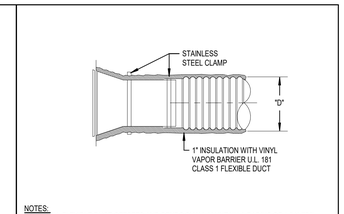


NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 5'-0".
2.TYPICAL OF ROUND DUCT CONNECTIONS TO RECTANGULAR DUCTS
3.ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

"NOT TO SCALE"

6 SPIN-IN

M1003



NOTES:
1. ALL FLEXIBLE DUCT OFFSETS AND BENDS SHALL MAINTAIN A RADIUS OF 1.5 X ("D") MINIMUM 3'-0" AND MAXIMUM 5'-0".
2. TYPICAL OF ROUND DUCT CONNECTIONS TO VAV BOXES FROM RECTANGULAR MAIN DUCTS.
3. ALL JOINTS SHALL BE SEALED WITH MASTIC AND FIBER CLOTH PER SPECIFICATIONS.

"NOT TO SCALE"

7 CONICAL SPIN-IN

M1004

NOTES:
1. SEAL ALL JOINTS PER SPECIFICATIONS.
2. FLEX DUCT SAG LIMITED TO 1/2" PER FOOT.
3. MAX 30° OFFSET ALLOWED IN FLEX DUCT ROUTING.

"NOT TO SCALE"

8 CEILING DIFFUSER CONNECTION

M1005

NOTE:
REFER TO ARCHITECTURAL FOR AND FLASHING DETAILS.

"NOT TO SCALE"

9 ROOF TOP UNIT MOUNTING

M1006

"NOT TO SCALE"

10 SERIES FAN POWERED TERMINAL UNIT

M1007

NOTE: CONTRACTOR SHALL SECURE STRUCT. ENGR. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS AT CONCRETE OR STEEL STRUCTURE.

"NOT TO SCALE"

11 PIPE HANGER

M1008

NOTE: CONTRACTOR SHALL SECURE STRUCT. ENG. APPROVAL FOR ANY AND ALL PIPE MOUNTING DETAILS AT CONCRETE OR STEEL STRUCTURE.

"NOT TO SCALE"

12 PIPE HANGER (4-PIPE)

M1008

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR FLASHING & ROOF DETAILS.
2. WHERE PIPE IS INSULATED STOP & POINT INSULATION AT SLEEVE.
3. COORDINATE WITH OWNER'S BONDED ROOFER FOR FLASHING & MOPPING IN DETAIL.

"NOT TO SCALE"

13 EXISTING ROOF PENETRATION

M1014

H = FAN INLET PRESSURE (IN. W.C.) + 1 IN.

NOTE:
MAINTAIN MINIMUM 1" AIR GAP AT FLOOR DRAIN, FLOOR SINK, OR ROOF DRAIN.

"NOT TO SCALE"

14 COOLING COIL CONDESNATE DRAIN (DRAW-THRU UNIT)

M1008

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REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE: MECHANICAL DETAILS

SHEET NUMBER: M6.01

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AI	ANALOG INPUT
AO	ANALOG OUTPUT
DI/BI	DIGITAL/BINARY INPUT
DO/BO	DIGITAL/BINARY OUTPUT
MD	ON-OFF MOTORIZED DAMPER
MMD	MODULATING TYPE MOTORIZED DAMPER
AFMS	AIR FLOW MEASURING STATION
MCV	CONTROL VALVE MODULATING TYPE
VFD	VARIABLE FREQUENCY DRIVE
CSR	CURRENT SENSING RELAY
FRZ	FREEZESTAT
HSL	HIGH STATIC LIMIT
SPT	STATIC PRESSURE TRANSMITTER
DPT	DIFFERENTIAL PRESSURE TRANSDUCER
FM	FLOW METER
FS	FLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
S	WALL SENSOR
T	THERMOSTAT
CO2	CARBON DIOXIDE SENSOR
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

1 CONTROL SCHEMATIC LEGEND
NOT TO SCALE

Outdoor Air Conditions
The sensors shall be mounted in an area on the north side of the building where the representative temperature and humidity can be monitored, both shall have sun shields. Based on the outdoor air temperature and humidity the EMCS shall calculate the outdoor air enthalpy, wet bulb and dew point temperatures. These outdoor air conditions shall be broadcast as global data points for use by other control programs. These shall be displayed on all major air and water systems graphics.

Emergency Generator Monitoring
The EMCS shall monitor the run status and alarm output of the generator. The EMCS shall display the values and trend log all Change of State (COS) events. The EMCS shall report alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner.

Sump Pumps and Sump Pits Monitoring
The EMCS shall monitor the run status of the pumps and alarm outputs on the water level indicators. The EMCS shall display the values and trend log all Change of State (COS) events. The EMCS shall report alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner.

Heating and Cooling System Controls for Vestibules
Vestibules that are only provided with heating shall have the source of heating disabled when the outdoor air temperature is greater than 45°F. Vestibules that are provided with both heating and cooling shall be controlled by a local thermostat to maintain a maximum heating setpoint of 60°F and a minimum cooling setpoint of 85°F.

Heating and Cooling System Controls for Operable Openings
All doors from a conditioned space to the outdoors and all other operable openings from a conditioned space to the outdoors that are larger than 40 square feet shall be provided with a door contact to report the position of the door or opening. When the door or operable opening is detected to be open the associated zone or system serving the space shall have the space temperature setpoints reset to a minimum cooling setpoint of 90°F and a maximum heating setoint of 55°F. Temperature setpoints shall be reset within 5 minutes of reporting open.

Building Domestic Water Metering
The EMCS shall monitor the building domestic water meter, which is to be furnished by the EMCS contractor and installed by Division 22 contractor at the service entry to the building. This flow meter shall be provided regardless of any water metering provisions on site. The EMCS shall display and trend log the following: the monthly usage, yearly usage, accumulative total usage, and alarm when excessive flow is measured. The EMCS shall report alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner.

Cooling Tower Water Metering
The EMCS shall monitor the cooling tower makeup and discharge water meters. The EMCS shall display and trend log the following: the monthly usage, yearly usage, accumulative total usage, and alarm when excessive flow is measured. The EMCS shall report alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner.

IDF and MDF Room Monitoring
The EMCS shall monitor the space temperature and humidity in the IDF and MDF rooms. The primary cooling for IDF and MDF rooms will be supplied by the packaged computer room units. The EMCS shall report high/low temperature/humidity alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner. Alarms shall be sent if the space conditions deviate from the following, temperature between 60 °F and 80 °F (adj), humidity between 40% RH and 70% RH (adj), for more than 10 minutes.

Walk-in Freezer/Cooler Alarm
Remote bulb temperature sensors shall be mounted in both the freezers and coolers. Alarms shall be configured by the controls contractor. Alarms shall be sent to the computers, email addresses, and/or text message compatible devices designated by the Owner when temperature either rises above or falls below operator adjustable setpoints (28°F (adjustable) for freezer and 35°F (adjustable) for cooler).

HVAC Ventilation Emergency Shutdown Switch
A mushroom button type, local override switch shall be installed to deactivate the building's ventilation and exhaust systems in case of emergency. All 100% outside air conditioning units or outside air supply fans shall be deactivated and all outside air dampers shall be closed. All exhaust and relief fans shall be deactivated and their associated isolation dampers shall be closed. Once depressed, the switch must be manually reset to allow the ventilation and exhaust systems to resume normal operation. The final location of the switch shall be determined by the Owner.

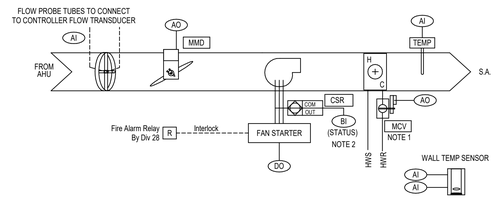
Emergency HVAC Shutdown Switch
A mushroom button type, local override switch shall be installed to deactivate the building's HVAC systems in case of emergency. The final location of the switch shall be determined by the Owner.

HVAC Override Switch
A mushroom button type, local override switch shall be installed to override the building's HVAC systems in case of emergency. The final location of the switch shall be determined by the Owner.

Elevator Machine Room Monitoring
The EMCS shall monitor the space temperature in the machine rooms. The primary cooling for these rooms will be supplied by the packaged AC units. The EMCS shall report high/low temperature alarms to the computers, email addresses, and/or text message compatible devices designated by the Owner. Alarms shall be sent if the space conditions deviate from the following, temperature between 60 °F and 80 °F (adj), for more than 10 minutes.

Demanding Limiting Programming
Provide programming that will initiate demand limiting, manually by the system operator or automatically by schedule or a remote signal from a utility provider or other approved entity. Once initiated, the programming shall increase the cooling space temperature set points and decrease the heating space temperature set points by 4°F (adj) and automatically reduce lighting power on circuits indicated on construction documents. The rate of set point change shall be operator adjustable. The system shall include a dedicated graphics page that shows all adjusted set points (original and demand limited) and power meters being monitored to confirm demand has been affected. Refer to EMCS specification for additional information.

4 MISCELLANEOUS SYSTEMS
NOT TO SCALE



NOTES:
1. PROVIDE 2-WAY AUTOMATIC CONTROL VALVE UNLESS OTHERWISE INDICATED ON SCHEDULE OR IN SEQUENCE OF OPERATION
2. PROVIDE FAN STATUS ONLY FOR BOXES IN CLASSROOMS.
3. HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF TERMINAL UNIT BAS GRAPHICS.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

System Off - When the system is off:
The primary air damper shall be closed.
The fan shall be off.
The heating coil valve shall be closed.
The control loops shall be disabled.

System Startup - Startup shall be initiated automatically by the EMCS:
In Unoccupied when the corresponding AHU is in UNOCCUPIED MODE.
In Occupied when the corresponding AHU is in PRE-START MODE.
In Unoccupied when the corresponding AHU is in NIGHT-SETBACK MODE.
In Occupied when the corresponding AHU is in OCCUPIED MODE.

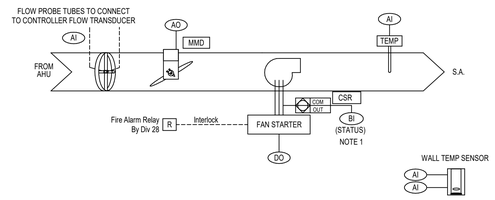
System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan shall run.
The primary air damper shall be modulated between the minimum and maximum values to maintain the space temperature within +/- 0.5 °F of the active Cooling Setpoint.
When the space temperature falls below the deadband, the primary air damper shall be modulated to the minimum flow value, the fan shall be modulated to maintain its scheduled heating airflow rate, and the hot water coil control valve shall be modulated to maintain the space temperature within +/- 0.5 °F of the active Heating Setpoint.

System Setpoints - The setpoints for the system shall be set as follows:
The Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Unoccupied Cooling Setpoint shall be set initially at 90 °F (adjustable).
The Standby Heating Setpoint shall be set initially at 68 °F (adjustable).
The Standby Cooling Setpoint shall be set initially at 76 °F (adjustable).
The minimum and maximum primary air flowrates shall set at the values given in the Mechanical Drawings.

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule for the corresponding air handling unit.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated either at the terminal unit or the corresponding air handling unit.

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature during the Occupied Mode is 5 °F above the cooling setpoint or 5 °F below the heating setpoint respectively.

2 Series Fan-Powered Terminal Unit with Hot Water Reheat - Control Schematic and Sequence of Operations (TYP. 134 EXISTING)
NOT TO SCALE



NOTES:
1. PROVIDE FAN STATUS ONLY FOR BOXES IN CLASSROOMS.
2. HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF TERMINAL UNIT BAS GRAPHICS.

System Off - When the system is off:
The primary air damper shall be closed.
The fan shall be off.
The control loops shall be disabled.

System Startup - Startup shall be initiated automatically by the EMCS:
In Unoccupied when the corresponding AHU is in UNOCCUPIED MODE.
In Occupied when the corresponding AHU is in PRE-START MODE.
In Unoccupied when the corresponding AHU is in NIGHT-SETBACK MODE.
In Occupied when the corresponding AHU is in OCCUPIED MODE.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan shall run.
The primary air damper shall be modulated between the minimum and maximum values to maintain the space temperature within +/- 0.5 °F of the active Cooling Setpoint.

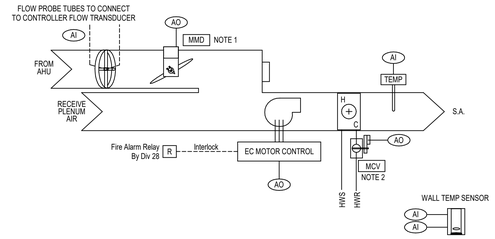
System Setpoints - The setpoints for the system shall be set as follows:
The Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Unoccupied Cooling Setpoint shall be set initially at 90 °F (adjustable).
The Standby Heating Setpoint shall be set initially at 68 °F (adjustable).
The Standby Cooling Setpoint shall be set initially at 76 °F (adjustable).
The minimum and maximum primary air flowrates shall set at the values given in the Mechanical Drawings.

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule for the corresponding air handling unit.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated either at the terminal unit or the corresponding air handling unit.

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature during the Occupied Mode is 5 °F above the cooling setpoint or 5 °F below the heating setpoint respectively.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

3 Series Fan-Powered Terminal Unit - Control Schematic and Sequence of Operations (TYP. 75 EXISTING)
NOT TO SCALE



NOTES:
1. TERMINAL UNIT CONTROLLER AND DAMPER ACTUATOR SHALL BE SHIPPED TO THE TERMINAL UNIT MANUFACTURER FOR MOUNTING AND WIRING.
2. PROVIDE 2-WAY AUTOMATIC CONTROL VALVE UNLESS OTHERWISE INDICATED ON SCHEDULE OR IN SEQUENCE OF OPERATION.
3. HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF TERMINAL UNIT BAS GRAPHICS.

System Off - When the system is off:
The primary air damper shall be closed.
The fan shall be off.
The heating coil valve shall be closed.
The control loops shall be disabled.

System Startup - Startup shall be initiated automatically by the EMCS:
In Unoccupied when the corresponding AHU is in UNOCCUPIED MODE.
In Occupied when the corresponding AHU is in PRE-START MODE.
In Unoccupied when the corresponding AHU is in NIGHT-SETBACK MODE.
In Occupied when the corresponding AHU is in OCCUPIED MODE.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan shall run.
The primary air damper shall be modulated between the minimum and maximum values to maintain the space temperature within +/- 0.5 °F of the active Cooling Setpoint.
When the space temperature falls below the deadband, the primary air damper shall be modulated to the minimum flow value, the fan shall be modulated to maintain its scheduled heating airflow rate, and the hot water coil control valve shall be modulated to maintain the space temperature within +/- 0.5 °F of the active Heating Setpoint.

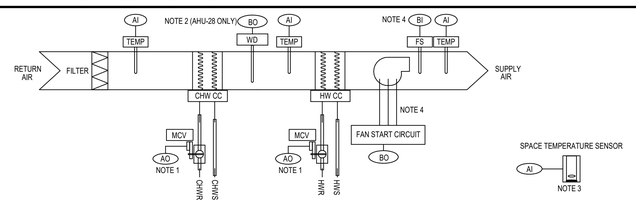
System Setpoints - The setpoints for the system shall be set as follows:
The Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Unoccupied Cooling Setpoint shall be set initially at 85 °F (adjustable).
The Standby Heating Setpoint shall be set initially at 68 °F (adjustable).
The Standby Cooling Setpoint shall be set initially at 76 °F (adjustable).
The minimum and maximum primary air flowrates shall set at the values given in the Mechanical Drawings.

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule for the corresponding air handling unit.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated either at the terminal unit or the corresponding air handling unit.

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature during the Occupied Mode is 5 °F above the cooling setpoint or 5 °F below the heating setpoint respectively.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

5 Series Fan-Powered Terminal Unit with Hot Water Reheat - Control Schematic and Sequence of Operations (Alternate 2)
NOT TO SCALE



NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. For units with cooling coils above ceilings, a cooing coil condensate drain pan float switch will de-energize the unit if the water level becomes high.
3. Refer to floor plans for location of space temperature sensor.
4. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
5. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU/FCU BAS graphics.

System Off - When the system is off:
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Time of Day Schedule.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan coil unit shall be integrated with the EMCS to monitor fan status, schedule run times, and to adjust space temperature setpoints. The outside air motorized isolation damper shall open.

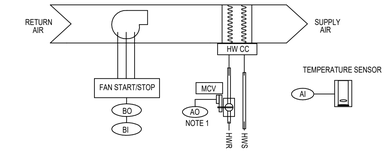
COOLING MODE: When the space temperature is above the Cooling Setpoint, the chilled water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Cooling Setpoint. The chilled water coil discharge temperature shall not be allowed to go below the chilled water coil low-limit setpoint.
HEATING MODE: When the space temperature is below the Heating Setpoint, the hot water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Heating Setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be set as follows:
The Cooling Setpoint shall be set initially at 75 °F (adjustable).
The Heating Setpoint shall be set initially at 70 °F (adjustable).
The design airflow rates shall be set at the values given in the Mechanical Drawings.
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature is 5 °F (adj.) above the cooling setpoint.
If the space temperature is 5 °F (adj.) below the heating setpoint.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

6 Fan Coil Unit - Control Schematic and Sequence of Operations (EXISTING AHU-5, 27 & 28)
NOT TO SCALE



NOTES:
1. Provide automatic control valve as indicated in mechanical schedules or control specifications.
2. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the Unit Heater BAS graphics.

System Start-up - System start-up shall be initiated:
The unit shall run according to a user definable time schedule in the following modes:

OCCUPIED MODE:
The unit shall maintain a heating setpoint of 70 °F (adjustable).

UNOCCUPIED MODE (NIGHT SETBACK):
The unit shall maintain a heating setpoint of 65 °F (adjustable).

Zone Setpoint Adjust:
The occupant shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.

Fan:
The fan shall run anytime the zone temperature drops below heating setpoint, unless shutdown on safeties.

Heating Coil Valve:
The controller shall measure the zone temperature and modulate the heating coil valve to maintain its heating setpoint.

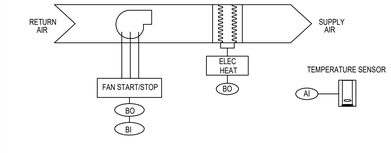
The heating shall be enabled whenever:
Outside air temperature is less than 65°F (adj.).
AND the zone temperature is below heating setpoint.
AND the fan is on.

System Alarms - The EMCS shall generate an alarm as follows:

LOW ZONE TEMP:
If the zone temperature is less than the heating setpoint by a user definable amount (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

7 Hot Water Unit Heater - Control Schematic and Sequence of Operations (EXISTING UH-6,7,8,9,10,11,12,13)
NOT TO SCALE



NOTES:
1. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the Unit Heater BAS graphics.

System Start-up - System start-up shall be initiated:
The unit shall run according to a user definable time schedule in the following modes:

OCCUPIED MODE:
The unit shall maintain a heating setpoint of 70 °F (adjustable).

UNOCCUPIED MODE (NIGHT SETBACK):
The unit shall maintain a heating setpoint of 65 °F (adjustable).

Zone Setpoint Adjust:
The occupant shall be able to adjust the zone temperature heating and cooling setpoints at the zone sensor.

Fan:
The fan shall run anytime the zone temperature drops below heating setpoint, unless shutdown on safeties.

Electric Heating Element:
The controller shall measure the zone temperature and the electric heat shall be staged to maintain the space temperature within +/- 0.5 °F of the its Heating Setpoint.

The heating shall be enabled whenever:
Outside air temperature is less than 65°F (adj.).
AND the zone temperature is below heating setpoint.
AND the fan is on.

System Alarms - The EMCS shall generate an alarm as follows:

LOW ZONE TEMP:
If the zone temperature is less than the heating setpoint by a user definable amount (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

8 Electric Unit Heater - Control Schematic and Sequence of Operations (EXISTING UH-1,2,3,4,5)
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
STATE OF TEXAS
ADAM C. JONES
110009
LICENSED
PROFESSIONAL ENGINEER
5/29/26

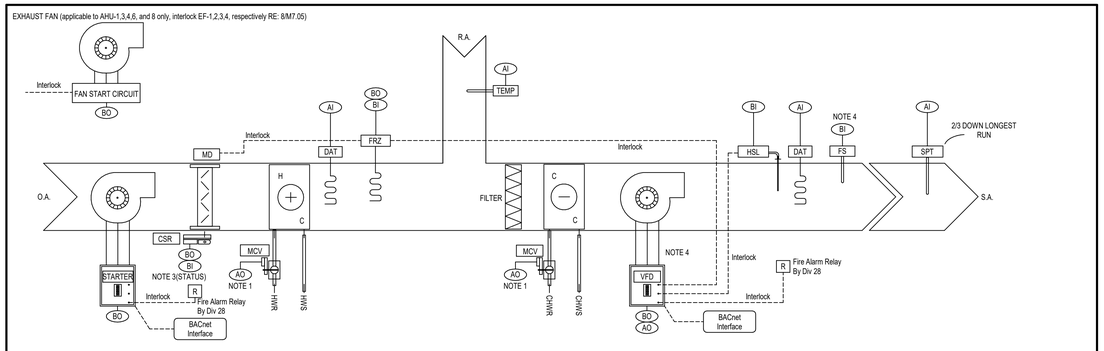
Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: MECHANICAL CONTROLS DIAGRAMS
SHEET NUMBER: M7.01

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Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt



NOTES:
1. Provide automatic coil control valve as indicated in mechanical schedules and control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Provide status for outside air damper position.
4. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
5. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics

System off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The unit supply fan shall be off.
The cooling coil valve shall be closed.
The heating coil valve shall be closed.
All control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

NIGHT-SETBACK MODE:
The system shall be enabled automatically by the EMCS based on the cooling demand of 5 (adjustable) or more associated terminal units whose space temperature has exceeded the terminal units Unoccupied Cooling Setpoint. Once enabled, the system shall operate per the **System Operation** section, as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based on the actual space occupancy. When the Time of Day schedule (TOD) is active, the system shall operate per the **System Operation** section, as detailed below, and the Demand Control Ventilation sequence shall be active.
Demand Control Ventilation - The outside air intake damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint. If the space carbon dioxide concentration for any zone served by the associated AHU is above the defined high-limit, then the OSA damper shall be modulated to maintain the scheduled maximum outside air flowrate setpoint. If the OSA damper is above 95% open and the maximum outside air flowrate setpoint cannot be met, then modulate the return air damper closed until the flowrate is achieved. Do not modulate the return air damper to less than 60% open. Once the space carbon dioxide concentration for all associated zones has been below the defined high limit for 5 minutes (adj.), the OSA damper shall be modulated to maintain the scheduled minimum outside air flowrate setpoint.
Outside Airflow and Damper Control: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.
Outside Air Damper / Return Air Damper Integration with Supply Fan VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.

System Operation - When system start-up has been initiated:
The variable speed supply fan shall start at its minimum speed. Following a confirmation of fan start status, the supply fan speed shall be modulated to maintain the supply air static pressure at setpoint. The speed of the fan shall not be adjusted by more than 20% in any one-minute period. The static pressure setpoint shall be reset via the control algorithm below to optimize the energy usage.
Supply Air Static Pressure Reset - The static pressure setpoint shall be reset up in defined increments at defined intervals until the primary air damper position to all of the associated terminal units have been below the defined value for more than the defined interval. The static pressure setpoint shall be reset down in defined increments at defined intervals until the primary air damper position to at least one (critical zone) of the associated terminal units has been above the defined value for more than the defined interval. The setpoints are detailed in the **System Setpoint** section below.
Cooling Coil - The chilled water coil control valve shall be modulated to maintain the active supply air temperature setpoint. The supply air temperature setpoint shall be reset via the control algorithm below to optimize the energy usage.
Supply Air Temperature Reset - The supply air temperature setpoint shall be reset based on the actual return air temperature, according to the defined reset schedule detailed in the **System Setpoint** section below. If the Demand Control Ventilation sequence is in maximum outdoor air flow mode, then the supply air temperature reset shall be disabled and the setpoint shall be set to the initial value.
Pre-Heating Coil - The hot water pre-heat coil control valve shall be modulated to maintain the pre-heat coil discharge air temperature at setpoint. The control shall be active when the outside air temperature is below 45 °F. (adj)
Freeze Protection - When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

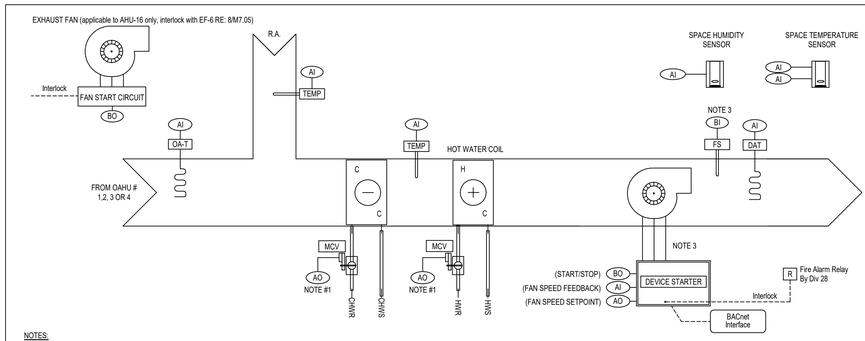
System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The supply air static pressure setpoint shall be set initially at 1.25 inches w.c. (adj) and shall have reset limits of 0.20 to 2.00 inches w.c. (adj)
The time interval for static pressure reset shall be set at 10 minutes (adj).
The static pressure reset increment shall be set at 0.05 inches w.c. (adj).
The terminal unit primary damper position setpoint shall be 90% open. (adj)
The time interval for terminal unit primary damper position shall be set at 15 minutes. (adj)
The supply air temperature setpoint shall be set initially at 54 °F. (adj)
The supply air temperature setpoint shall be reset to 54 °F (adj) when the return air temperature is at 78 °F. (adj)
The supply air temperature setpoint shall be reset to 58 °F (adj) when the return air temperature is at 72 °F. (adj)
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.5 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm if:
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If the space carbon dioxide level for any associated zone exceeds its high-limit for more than 20 minutes (adj) or exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 **VAV Air Handling Unit - Control Schematic and Sequence of Operations (EXISTING AHU-1-4, 6-13, and 17-23)**
NOT TO SCALE



NOTES:
1. Provide automatic coil control valve as indicated in mechanical schedules and control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.
Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.
System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.
OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.
OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.
DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.
ECONOMIZER MODE: The EMCS shall enable airside Economizer Mode whenever the outside air enthalpy is less than 28.0 btu/lb, the outside air dry bulb temperature is less than 75°F, and the space temperature sensor calls for cooling. The EMCS shall modulate the outside air and return air dampers such that the unit provides 100% outside air for space cooling and shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint. Economizer Mode shall be integrated with the cooling coil control valve such that the cooling coil control valve is required to maintain the chilled water coil discharge air temperature setpoint. If the outside air dry bulb temperature is below chilled water coil discharge air temperature setpoint, the EMCS shall begin to modulate the return air damper open as required to maintain a mixed air temperature of 53°F (adj). If the outside air enthalpy exceeds 28.0 btu/lb or the outside air temperature exceeds 75°F, Economizer Mode shall be disabled. DCV and preheat shall be disabled during Economizer Mode.
COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active coil discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.
HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.
DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).
PREHEAT COIL: The EMCS shall modulate the hot water pre-heat control valve to maintain the pre-heat coil discharge air temperature setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

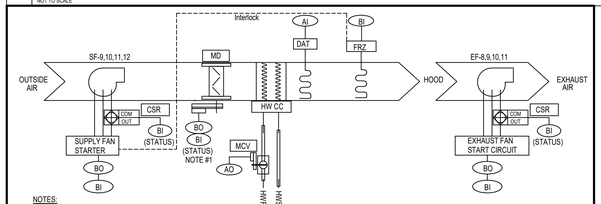
System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

2 **Single Zone VAV AHU Chilled Water Cooling, Hot Water Heating (EXISTING AHU-14,15,16, & 24)- Control Schematic and Sequence of Operations**
NOT TO SCALE



NOTES:
1. Provide status for outside air damper position.
2. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the EF/SF BAS graphics.

Space Occupancy:
Each unit will have an occupancy/vacancy schedule -- all schedules are operator assignable from the central site.

Fan Control:
When the zone becomes occupied the BMCS will open the unit dampers and enable the supply fan. Damper end switch will ensure the dampers are in the open position before the supply fan can run in either the Hand or Auto position of the motor starter. Exhaust fan will run whenever the supply fan is operating.

Discharge Temperature Control:
When the zone becomes occupied, the unit controller will determine, based on the discharge temperature, whether heating is required.
If heating is required, a heating request will be sent to the boiler manager (see Hot Water System Sequence of Operations). The hot water valve will be modulated to maintain the discharge temperature setpoint 70°F. (adjustable) – typical.

Freeze Protection:
A duct mounted double pole single throw, averaging type freeze protection switch will monitor the discharge air temperature from the heating coil. If the discharge air temperature drops below setpoint 38°F (locally adjustable), the freeze protection switch N.O. switch will close indicating an alarm condition to the BMCS, the N.C. switch will open de-energizing the supply fan. The BMCS will close the outside air damper open the heating water valve and start the required central plant equipment. Re-enabling the unit will require manual reset of the freeze protection switch at the unit.

Unoccupied Control:
During the unoccupied time period, equipment will be off.

Equipment Off Conditions:
When the equipment is in the unoccupied period, the hot water valve and outside air damper will be closed and the fans de-energized.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

3 **Kitchen Hood Supply and Exhaust - Control Schematic and Sequence of Operations (EXISTING SF,9,10,11,12 and EF-8,9,10,11)**
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

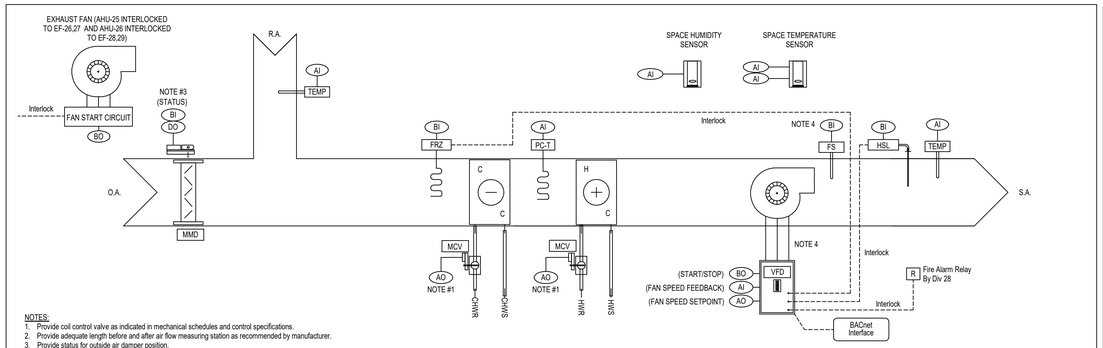
SEAL:
TEXAS
ADAM C. JONES
110008
LICENSED
PROFESSIONAL ENGINEER

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade
30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: MECHANICAL CONTROLS DIAGRAMS
SHEET NUMBER: M7.02

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NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Provide status for outside air damper position.
4. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
5. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics.

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.
OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.
OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.
DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.
ECONOMIZER MODE: The EMCS shall enable airside Economizer Mode whenever the outside air enthalpy is less than 28.0 btu/lb, the outside air dry bulb temperature is less than 75°F, and the space temperature sensor calls for cooling. The EMCS shall modulate the outside air and return air dampers such that the unit provides 100% outside air for space cooling and shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint. Economizer Mode shall be integrated with the cooling coil to modulate the chilled water control valve as required to maintain the chilled water coil discharge air temperature setpoint. If the outside air dry bulb temperature is below chilled water coil discharge air temperature setpoint, the EMCS shall begin to modulate the return air damper open as required to maintain a mixed air temperature of 53°F (adj). If the outside air enthalpy exceeds 28.0 btu/lb or the outside air temperature exceeds 75°F, Economizer Mode shall be disabled. DCV and preheat shall be disabled during Economizer Mode.
COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active coil discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.
HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.

DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).
PREHEAT COIL: The EMCS shall modulate the hot water pre-heat control valve to maintain the pre-heat coil discharge air temperature setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

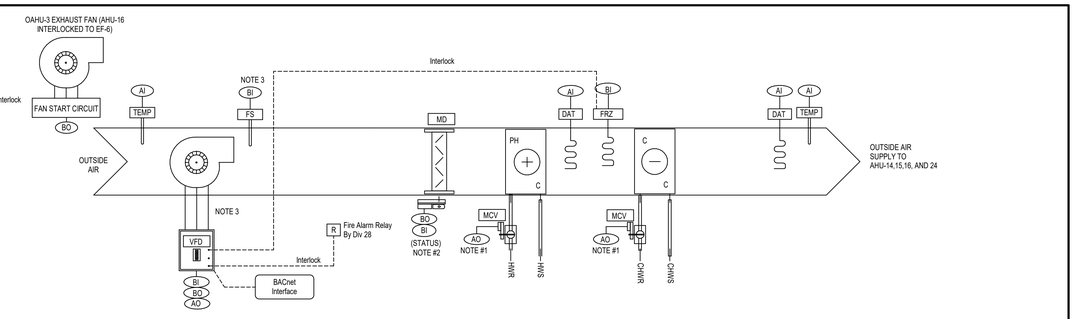
System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 Single Zone VAV AHU Chilled Water Cooling, Hot Water Heating (EXISTING AHU-25, 26) - Control Schematic and Sequence of Operations
NOT TO SCALE



NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. Provide status for outside air damper position.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the OAHU BAS graphics

SYSTEM OFF - WHEN THE SYSTEM IS OFF:
The outside air damper shall be closed.
The unit supply fan shall be off.
The cooling coil valve shall be closed.
The preheating coil valve shall be closed.
All control loops shall be disabled.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the TIme of Day (TOD) occupancy schedule. Once enabled, the system shall operate per the **System Operation** section, as detailed below.

NIGHT-SETBACK MODE:
The outside air handling system shall not operate during unoccupied hours unless started by a manual command at the EMCS.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based whenever any of the associated AHU's it serves has an active call for ventilation air. When the Time of Day schedule (TOD) is active, the system shall operate per the **System Operation** section, as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply fan shall start at its minimum speed. Following a conformation of fan start status, the supply fan speed shall be modulated to maintain the supply air static pressure at setpoint. The speed of the fan shall not be adjusted by more than 20% in any one-minute period.

The chilled water coil control valve shall be modulated to maintain the supply air temperature at setpoint. The control shall be active when the outside air temperature is above 55 °F. (adj)

The hot water pre-heat coil control valve shall be modulated to maintain the pre-heat coil discharge air temperature at setpoint. The control shall be active when the outside air temperature is below 53 °F. (adj)

Freeze Protection: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

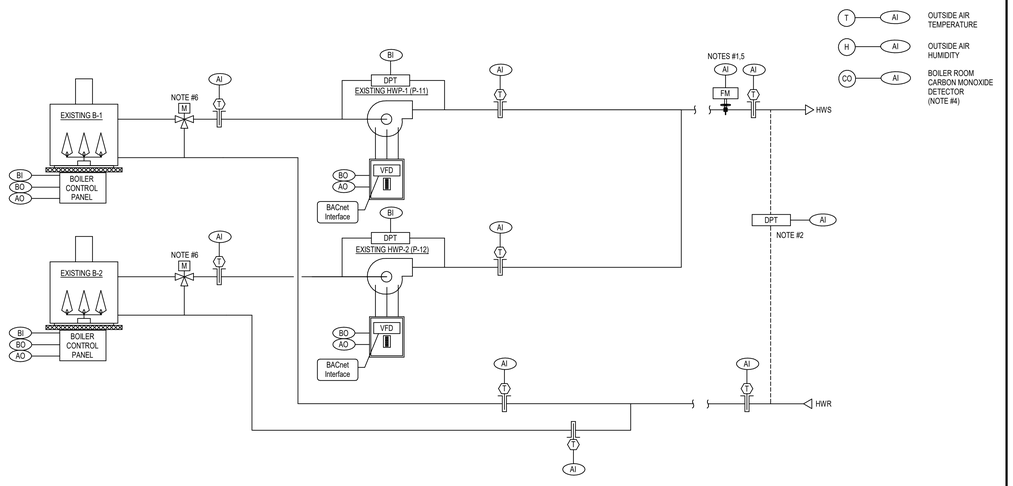
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design maximum supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be the VFD speed required to obtain the design minimum supply airflow value from the unit schedule on the Mechanical Drawings.
The supply air static pressure setpoint shall be 1.0 inches w.c. (adj)
The supply air temperature setpoint shall be set initially at 55 °F. (adj)
The pre-heat setpoint shall be set to 53 °F (adj)
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm if:
If the supply duct static pressure exceeds the high-limit setpoint.
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If the preheat air temperature is below the freezestat trip point, initially set at 37 °F. (adj)
If the filter differential pressure exceeds the trip point initially set at 1.0 inch w.c. (adj)
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating. The alarms, except the fan failure alarm, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

2 Outside Air Handling Unit - Control Schematic and Sequence of Operations (EXISTING OAHU-1,2,3 & 4)
NOT TO SCALE



NOTES:
1. Division 23 to install Thred-o-lets for all devices installed in piping.
2. Field verify differential pressure transmitter in accessible location approximately 2/3 down main loop.
3. EMCS contractor shall be responsible for point-to-point ethernet connection between boiler controllers.
4. EMCS contractor shall be responsible for wiring carbon monoxide detector to auxiliary input at lead boiler controller.
5. Ensure installation location of flow meter meets or exceeds the manufacturer's published placement requirements to meet the specified meter accuracy.
6. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the Boiler/Pump BAS graphics

System Off - When the system is off:
The boilers shall be off.
The pumps shall be off.
The bypass valve shall be closed.
The boiler isolation valves shall be closed.
The control loops shall be disabled.

System Startup - System startup shall be initiated:
Manually by an Operator command on the heating water system graphic at the EMCS.
Automatically by the EMCS, when a call for heating has been received.

System Operation - When system start-up has been initiated:
The outside air temperature must be below the outside air lockout setpoint before the heating water system can be activated. The number of heating requests required and the length of time the requests must be received before activating the heating water system shall be adjustable. The boilers and pumps shall be lead/lag and rotated weekly at a time and on a day of the week when the heating water system is not in operation. Rotation shall be based on accumulated runtime for each type of equipment.

When the heating water system is activated, the boiler system controller shall open the motorized isolation valve on the lead boiler. When the valve end switch has been proven open, the EMCS shall enable the lead pump. A current switch shall prove the pump status at the EMCS, which shall generate an alarm, if the switch is not made within 45 seconds (adjustable). There shall also be a 10 second (adjustable) de-bounce time to prevent nuisance alarms from a bouncing switch. If the pump run status is not proven, the EMCS shall discontinue the enable signal to the pump and rotate pumps. The EMCS shall then energize a lag pump to run in the same manner as described above. That pump shall become the lead pump.

After the pump status has been proven, the EMCS shall send a signal to enable the lead boiler to fire provided all safeties have been met. A contact in the boiler control panel will provide status to the EMCS. If the heating water supply temperature is less than 100 °F (adjustable) or a heating water pump status is not indicating a heating water pump is running, the EMCS control module will broadcast that heating water is not available.

Whenever the boilers are de-activated, the heating water pump will continue to run for 5 minutes (adjustable) to avoid excessive temperature buildup in the boiler.

The boiler room shall be provided with a manual reset type carbon monoxide (CO) detector. The CO detector shall be interlocked with the boiler control panel such that the burners will not operate when the measured level of carbon monoxide in the room rises above 50 ppm. The boiler control panel should also disable the burners in the event that there is a loss of power to the CO detector.

The EMCS shall receive inputs from temperature sensors located in the boiler heating water supply and return piping. The heating water supply setpoint shall be reset based on the outdoor air temperature, the limits shall be 170 °F when the outdoor air is at 35 °F and 110 °F when the outdoor air temperature is 65 °F (all adjustable). The boiler system controller shall enable the lag boiler if the heating water supply temperature is more than 5 °F (adjustable) below setpoint for 10 minutes (adjustable). If the heating water supply temperature is not more than 5 °F (adjustable) below setpoint and the heating water delta-T is less than 5 °F for 10 minutes (adjustable) the lag boiler shall be disabled.

A differential pressure sensor across the heating water supply and return lines shall monitor building differential pressure. The EMCS shall modulate the speed of the operating heating water pumps to maintain the building heating water differential pressure at setpoint (adjustable). If the differential pressure is 2 psi below setpoint and the active pumps output are above the pump stage-up setpoint for 15 minutes (adjustable), a lag pump shall be enabled. When more than one pump is operating and the active pumps output are below the pump stage-down setpoint for 15 minutes (adjustable), the lag pump shall be de-energized. All active pumps shall be modulated with the same ramp signal.

The EMCS shall monitor the position of all of the heating water valves at the units that the plant serves and the differential pressure setpoint shall be reset based on achieving a target valve position of 90%. There shall be a dead band of 5% to prevent hunting of the reset program. The differential pressure setpoint shall not change by more than 1 psi per 5 minute (adj.) interval. The target valve position, the reset time, the dead band, and the rate of change values shall be operator adjustable.

While only one boiler is in operation, the corresponding flow rate sensor shall be used to maintain the boiler minimum flow rate by modulating the bypass valve open. The heating water flow rate shall not change by more than 10% per minute.

System Setpoints - The setpoints for the system shall be set as follows:
The outside air temperature lockout setpoint shall be 65 °F (adjustable).
The boiler minimum flow rate setpoint shall be --- gpm (adjustable).
The heating water system differential pressure setpoint shall be initially set at 12 psi (adjustable) and shall have reset limits of 8 psi to 16 psi (adjustable).
The pump stage-up setpoint shall be 95% (adjustable).
The pump stage-down setpoint shall be 50% (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

4 Hot Water System - All Condensing - Variable Primary Flow with Headered Pumps - Control Schematic and Sequence of Operations (EXISTING P-11, P-12 and B-1, B-2)
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:

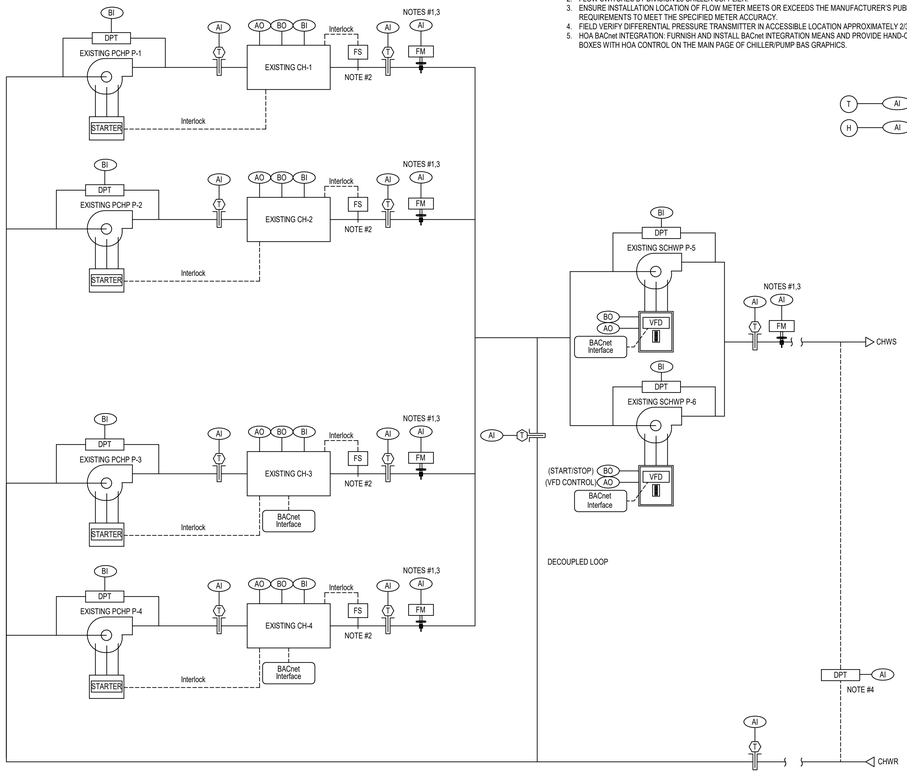

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: MECHANICAL CONTROLS DIAGRAMS
SHEET NUMBER: M7.03

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System Off - When the system is off:
The chillers shall be off.
The pumps shall be off.
The control loops shall be disabled.

System Startup - System startup shall be initiated:
Manually by an Operator command on the chiller graphic at the EMCS.
Automatically by the EMCS, when a call for cooling has been received.

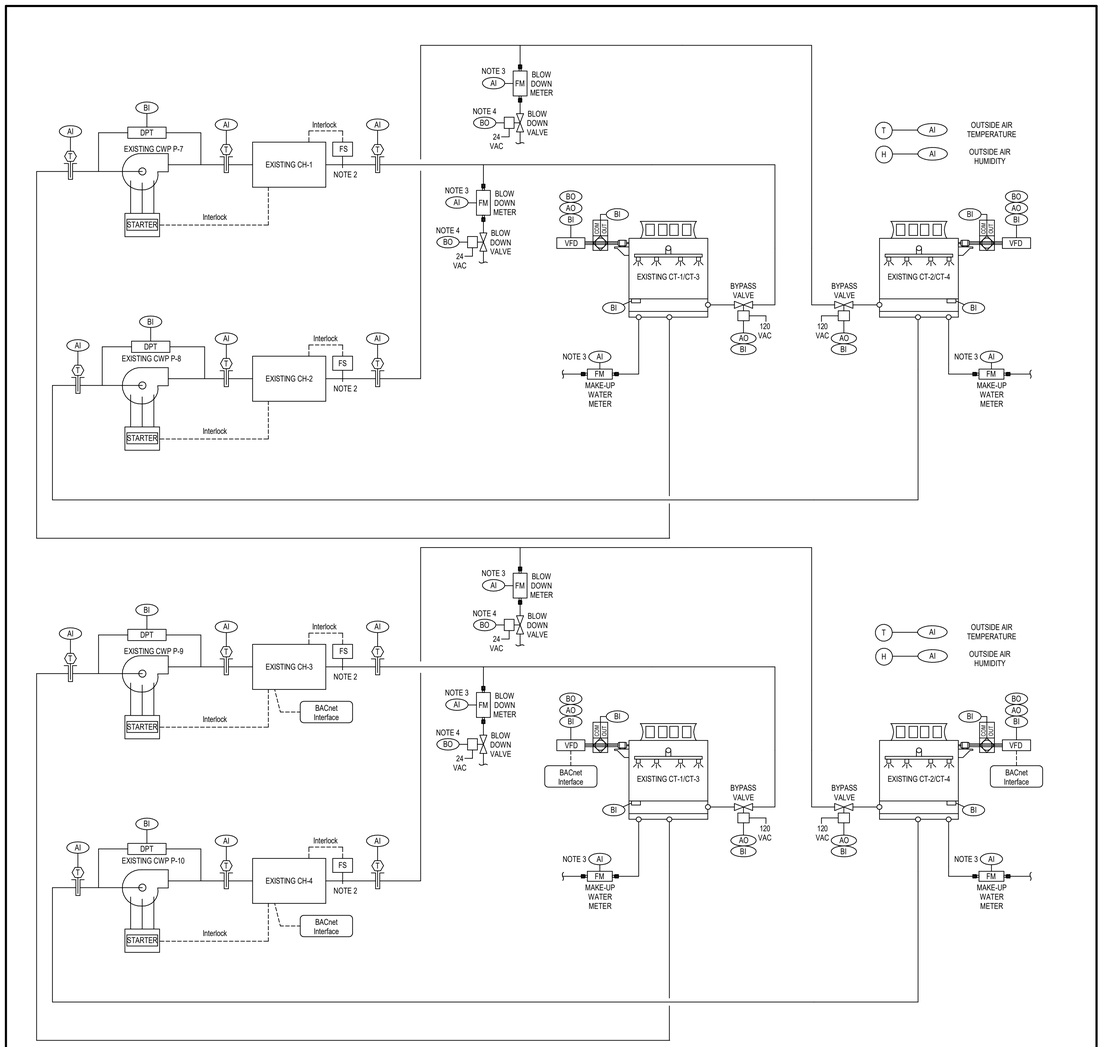
System Operation - When system start-up has been initiated:
The outside air temperature must be above the outside air lockout setpoint, before the chiller can be activated. The number of cooling requests required and the length of time the requests must be received before activating the chiller plant shall be adjustable. The chiller/pump systems shall be lead/lag and rotated weekly at a time and on a day of the week when the chiller plant is not in operation. Rotation shall be based on accumulated runtime for each type of equipment.
When the chiller plant is activated, the lead secondary pump shall be enabled. A differential pressure sensor monitoring the pressure between the building CHWS and CHWR piping shall be used to modulate the speed of the secondary pumps. A PID control loop shall modulate the speed of the secondary CHW pumps from their minimum speed to their maximum speed as the differential pressure deviates from setpoint. If the differential pressure is 2 psi below setpoint and the active pumps output are above the pump stage-up setpoint for 15 minutes (adjustable), the lag secondary pump shall be enabled. When more than one secondary pump is operating and the active secondary pumps output are below the pump stage-down setpoint for 15 minutes (adjustable), the lag secondary pump shall be de-energized. All active secondary pumps shall be modulated with the same ramp signal.
The EMCS shall enable the lead chiller primary pump. A current switch shall prove the pump status at the EMCS, which shall generate an alarm, if the switch is not made within 45 seconds (adjustable). There shall also be a 10 second (adjustable) de-bounce time to prevent nuisance alarms from a bouncing switch. If the pump run status is not proven, the EMCS shall discontinue the enable signal to the pump and rotate chiller systems. The EMCS shall then energize the lag chiller primary pump to run in the same manner as described above. The lag chiller system shall become the lead chiller system.
When the lead primary pump status is proven, the EMCS shall enable the lead chiller. A flow switch in the chilled water piping shall complete the circuit to the chiller factory installed controller proving that evaporator flow has been established. If the chiller alarm input closes (indicating that the chiller has alarm), the EMCS shall generate an alarm, discontinue the enable signal to the lead chiller system and energize the lag chiller system to run in the same manner as described above. The lag chiller system shall become the lead chiller system. The chiller shall run to maintain the supply water temperature setpoint.

The EMCS shall monitor temperature inputs from sensors mounted in the common supply and return piping and flow meters mounted in the chiller supply piping, and calculate the Building Load in Tons. The combined total Nominal Capacity in Tons of all operating chillers shall be the Total Capacity.
If the value of ((Building Load / Total Capacity) * 100) is greater than the stage-up setpoint for 10 minutes (adjustable) or the CHW supply temperature rises greater than 4 °F (adjustable) above setpoint, the lag chiller system shall be enabled into operation. If the value of ((Building Load / Total Capacity) * 100) is less than the stage-down setpoint for 10 minutes (adjustable), the lag chiller system shall be disabled.
The EMCS shall monitor the position of all of the chilled water valves at the units that the plant serves and the differential pressure setpoint shall be reset based on achieving a target valve position of 90%. There shall be a dead band of 5% to prevent hunting of the reset program. The differential pressure setpoint shall not change by more than 1 psi per 5 minute (adj.) interval. The target valve position, the reset time, the deadband, and the rate of change values shall be adjustable.
When a chiller system is to be disabled, the EMCS shall discontinue the command for the chiller system to run. The EMCS shall continue to run the associated primary pump until the chiller status has indicated that it is off. Then the EMCS shall discontinue the command for the primary pump to run.
When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water valves to 50% open (adj.) for flow through the AHU coils and the lead secondary pump shall be activated to run at its minimum referenced speed value until ambient temperature has risen above the freeze protection setpoint for 10 minutes (adj.).
The EMCS shall monitor the outside air temperature and humidity. The EMCS shall calculate the outside air enthalpy, wet bulb temperature, and dew point temperature. These values shall be displayed on all air and water systems graphics.

System Setpoints - The setpoints for the system shall be set as follows:
The outside air temperature lockout setpoint shall be 50 °F (adjustable).
The chiller leaving water temperature setpoint shall be 42 °F (adjustable).
The chiller stage-up setpoint shall be 90% (adjustable).
The chiller stage-down setpoint shall be 50% (adjustable).
The chilled water system differential pressure shall be initially set at 12 psi (adj.) and shall have reset limits of 8 psi to 16 psi (adjustable).
The pump stage-up setpoint shall be 95% (adjustable).
The pump stage-down setpoint shall be 50% (adjustable).
The outdoor air temperature freeze protection setpoint shall be 37 °F (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 **Chilled Water System - Water Cooled - Decoupled Loop - Control Schematic and Sequence of Operations (EXISTING P-1,2,3,4,5,6 and CH-1,2,3,4)**
NOT TO SCALE



NOTES:
1. DIVISION 23 TO INSTALL THRED-O-LETS FOR ALL DEVICES INSTALLED IN PIPING.
2. FLOW SWITCHES BY DIVISION 23 CHILLER SUPPLIER.
3. ENSURE INSTALLATION LOCATION OF FLOW METER MEETS OR EXCEEDS THE MANUFACTURER'S PUBLISHED PLACEMENT REQUIREMENTS TO MEET THE SPECIFIED METER ACCURACY.
4. 24 VAC CONTROL POWER FOR VALVE SHALL BE PROVIDED BY THE CONDENSER WATER CHEMICAL TREATMENT SYSTEM.
5. HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF COOLING TOWER/CHILLER/PUMP BAS GRAPHICS.

System Off - When the system is off:
The chillers shall be off.
The pumps shall be off.
The fans shall be off.
The tower bypass valves shall be closed.
The tower isolation valves shall be closed.
The control loops shall be disabled.

System Startup - System startup shall be initiated:
Automatically by the EMCS, when the chiller plant is enabled.

System Operation - When system start-up has been initiated:
The cooling tower cells shall be lead/lag and rotated weekly at a time and on a day of the week when the chiller plant is not in operation. Rotation shall be based on accumulated runtime for each type of equipment.

When the condenser water system is activated, the EMCS shall open the tower isolation valve on the lead tower cell. When the valve end switch has been proven open, the EMCS shall send an enable signal to the condenser water pump associated with the lead chiller system. A differential pressure switch shall prove the pump status at the EMCS, which shall generate an alarm, if the switch is not made within 40 seconds (adjustable). There shall also be a 20 second (adjustable) de-bounce time to prevent nuisance alarms from a bouncing switch. If the pump run status is not proven, the EMCS shall discontinue the enable signal to the pump and rotate chiller/pump systems. The EMCS shall then energize the condenser water pump associated with the lag chiller/pump system to run in the same manner as described above. That pump shall become the lead pump.

When the lead pump status is proven, the EMCS shall enable the associated chiller. A flow switch in the condenser water piping shall complete the circuit to the chiller factory installed controller proving that flow has been established. If the chiller alarm input closes (indicating that the chiller has alarm), the EMCS shall generate an alarm, discontinue the enable signal to the lead chiller/pump system. The failed chiller and associated pump shall be removed from service. The lag chiller/pump system shall become the lead system. The speed reference of the condenser water pumps shall be determined by TAB and set by the EMCS.

When the lead chiller/pump system status is proven, the EMCS shall enable the lead cooling tower cell fan. The quantity of cooling tower cells enabled shall match the quantity of operating chiller/pumps systems. When the lag chiller/pump system is operating, the lag cooling tower cell and associated tower fan, isolation valve, and bypass valve shall be enabled.

A temperature sensor monitoring the common tower leaving water shall be used to modulate the speed of the tower fans. A PID control loop shall modulate the speed of the fans from their minimum speed to their maximum speed as the temperature deviates from setpoint. All active tower fans shall be modulated with the same ramp signal. The EMCS shall reset the condenser water temperature setpoint based on the outside air wet bulb conditions. The setpoint shall be set as follows: (current outside air wet bulb temperature) + (tower approach). The reset shall be updated every 15 minutes.

When a cooling tower cell is enabled and the temperature falls below the tower bypass valve setpoint, the EMCS shall modulate its bypass valve open to maintain the active tower leaving water temperature setpoint.

When a chiller is to be disabled, the EMCS shall first discontinue the command for the chiler to run. The EMCS shall continue to run its associated condenser water pump until the chiller status has indicated that it is off. After the chiller status has proven disabled for 5 minutes (adj.), the associated condenser water pump shall be disabled, the lag cooling tower cell fan shall be disabled and the lag cooling tower cell isolation valve shall be indexed to the fully closed position.

The EMCS shall monitor the outside air temperature and humidity. The EMCS shall calculate the outside air enthalpy, wet bulb temperature, and dew point temperature. These values shall be displayed on all air and water systems graphics.

A basin level sensor shall disable the CW pumps if the level falls below the design height.

If the outdoor air dry bulb temperature drops below the freeze protection setpoint, the EMCS shall close all cooling tower cell isolation valves and all tower by-pass valves shall be indexed to the fully open position. The EMCS shall enable the lead condenser water pump to circulate water through the piping loop. During freeze protection operation, condenser water pump operation shall be rotated between the lead condenser water pump and the lag condenser water pump at 15 minute (adj.) intervals. Condenser water shall bypass the cooling towers to the cold water basin where the electric immersion heater system shall maintain the condenser water temperature above its freezing point. When the outdoor air temperature has risen above the freeze protection setpoint for 10 minutes (adj.), the system shall return to normal operating conditions.

System Setpoints - The setpoints for the system shall be set as follows:
The tower leaving water temperature setpoint shall be set as follows: (current outside air wet bulb temperature) + (tower approach).
The tower leaving water temperature setpoint shall also have a low-limit setpoint of 55 °F (adjustable).
The tower approach shall be 10 °F (adjustable).
The tower bypass valve setpoint shall be set as follows: (current tower leaving water temperature setpoint) - 4 °F (adjustable).
The outdoor air temperature freeze protection setpoint shall be 37 °F (adjustable).

System Alarms - The EMCS shall generate an alarm as follows:
Bypass valve failure: Commanded open but the status is closed.
Fan failure: Commanded on but the status is off.
Pump failure: Commanded on but the status is off.
Chiller alarm: When the chiller controller alarm input closes.
Vibration cutout switch: When tower vibration cutout switch signals a tower fan shutdown.
Oil level switch: When sensor indicates low oil level.
Overflow sensor: When overflow sensor signals excessive water level.
High tower leaving water temperature: If greater than 90 °F (adjustable).
Low tower leaving water temperature: If less than 37 °F (adjustable).
High condenser water return temp: If greater than 100 °F (adjustable).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

2 **Condenser Water System - Chiller Plant - Dedicated Pumps - Control Schematic and Sequence of Operations (EXISTING P-7,8,9,10, CH-1,2,3,4, and CT-1,2,3,4)**
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
ADAM C. JONES 110009 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: MECHANICAL CONTROLS DIAGRAMS
SHEET NUMBER: M7.04

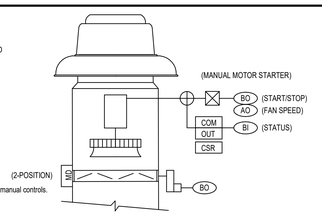
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EXHAUST FANS W/ 60 MIN NO-HOLD TIMER (LOCATED NEAR STRIKE SIDE OF DOOR)

EXHAUST FANS W/ 60 MIN NO-HOLD TIMER (LOCATED NEAR TEACHER'S WORKSTATION)

60 MIN NO HOLD TIMER (SCIENCE PREP ROOM: EXISTING EF-52,53,54)

60 MIN NO HOLD TIMER (SCIENCE LAB: EXISTING EF-12,15,18,21,39,40,41,42,43,44.)



SYSTEM OFF - WHEN THE SYSTEM IS OFF:
Manually controlled exhaust fans shall remain operational via their local manual controls.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator command at local manual control.

MANUALLY CONTROLLED EXHAUST FANS:
The EMCS shall monitor the status of each exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. Upon activation of the building unoccupied mode, the automatically controlled building exhaust fans shall be de-energized. The exhaust fan shall be provided with a relay to the 60-minute no-hold timer located as indicated above. When the timer is engaged the exhaust fan shall operate at its scheduled airflow rate until the timer times out. When the timer disengages, the exhaust fan shall be de-energized.

Fan Status:
The controller shall monitor the fan status.

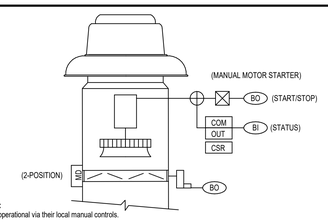
Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).
Purge Event: Emergency purge push button activated.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

1 Exhaust Fans w/ Local Emergency Switch - Control Schematic and Sequence of Operations
NOT TO SCALE

INTERLOCK WITH LIGHT SWITCH (FIELD VERIFY LOCATIONS)



SYSTEM OFF - WHEN THE SYSTEM IS OFF:
Manually controlled exhaust fans shall remain operational via their local manual controls.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator command at local manual control.

MANUALLY CONTROLLED EXHAUST FANS: Manually controlled exhaust fans shall utilize two-position motorized damper interlocked with their manual motor starter. The EMCS shall monitor the status of each manually controlled exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. When the associated light switch is switched on, the motorized damper shall open and the exhaust fan shall be energized. When the light switch is switched off, the exhaust fan shall be energized and the motorized damper shall close.

Fan Status:
The controller shall monitor the fan status.

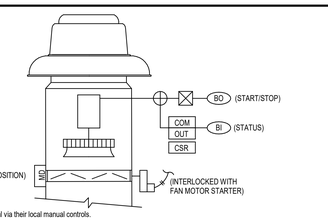
Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

2 Manually Controlled Exhaust/Supply Fans - Control Schematic and Sequence of Operations (EXISTING EF-24,33-38,49-51,55)
NOT TO SCALE

INTERLOCK WITH HOOD SWITCH



SYSTEM OFF - WHEN THE SYSTEM IS OFF:
Manually controlled exhaust fans shall remain operational via their local manual controls.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator command at local manual control.

MANUALLY CONTROLLED EXHAUST FANS: Manually controlled exhaust fans shall utilize two-position motorized damper interlocked with their manual motor starter. The EMCS shall monitor the status of each manually controlled exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. When the associated hood switch is switched on, the motorized damper shall open and the exhaust fan shall be energized. When the hood switch is switched off, the exhaust fan shall be de-energized and the motorized damper shall close.

Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

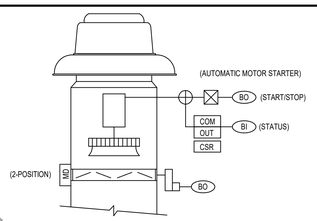
HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

3 Manually Controlled Exhaust/Supply Fans - Control Schematic and Sequence of Operations(EF-13,14,16,17,19,20,22,23 (E))
NOT TO SCALE

ZONE TEMP AI
ZONE SETPOINT ADJUST AI
WALL SENSOR

The space temperature setpoint shall be initially set at 70 °F (adj.)



SYSTEM OFF - When the system is off:
Exhaust fans shall be off

SYSTEM START-UP - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on the associated space temperature setpoint.

AUTOMATICALLY CONTROLLED (TEMP. BASED) EXHAUST FANS: Upon activation of building occupied mode and start-up of the air handling system, the EMCS shall allow exhaust fans to be energized based on the associated space temperature setpoint, and their respective two-position motorized dampers shall open. The EMCS shall monitor the status of each exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. Upon activation of the building unoccupied mode, the automatically controlled building exhaust fans shall be de-energized.

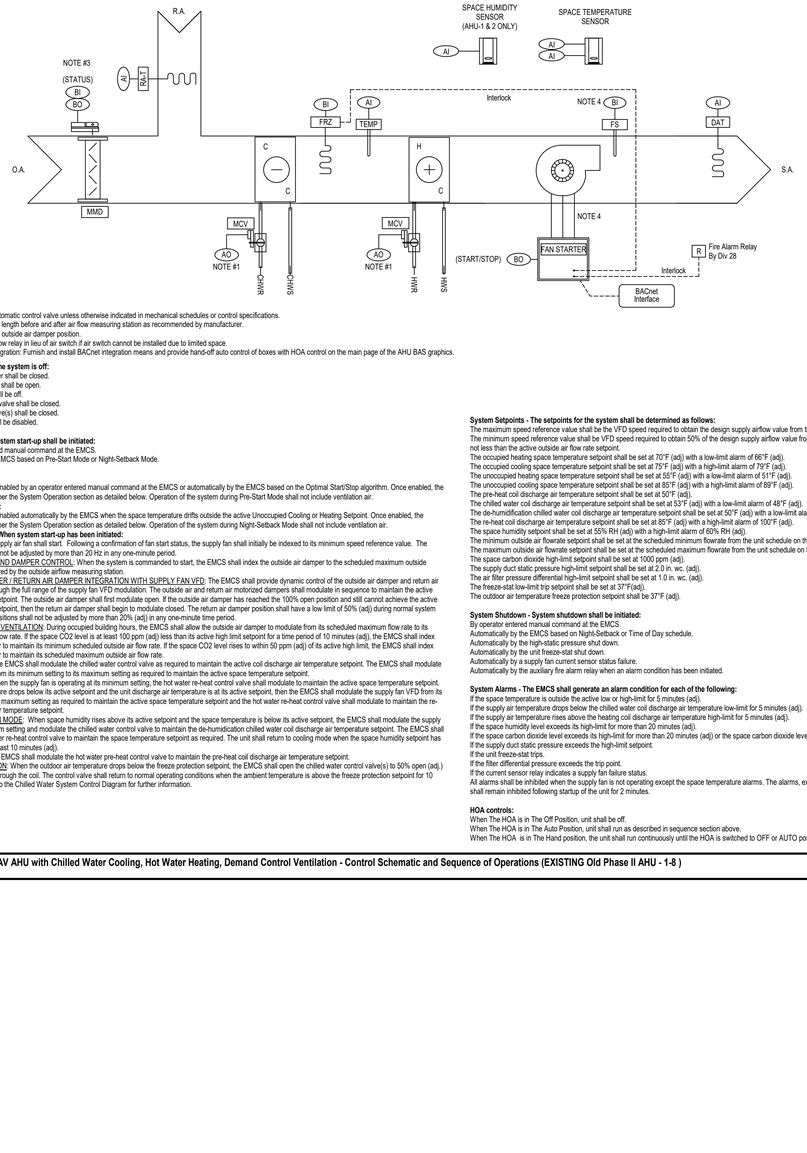
Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

4 Automatically Controlled Temperature Based Exhaust Fans with Local Override Switch - Control Schematic and Sequence of Operations (Electrical Room Ventilation, EXISTING EF-33)
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated in mechanical schedules or control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. Provide status for outside air damper position.
4. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
5. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics.

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.
OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.
OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.
DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.
COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active cool discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.
HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.
DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).
PREHEAT COIL: The EMCS shall modulate the hot water pre-heat control valve to maintain the pre-heat coil discharge air temperature setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

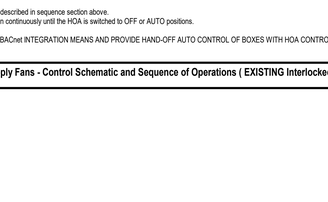
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

5 Single Zone VAV AHU with Chilled Water Cooling, Hot Water Heating, Demand Control Ventilation - Control Schematic and Sequence of Operations (EXISTING Old Phase II AHU - 1-8)
NOT TO SCALE

AUTOMATICALLY CONTROLLED EXHAUST FANS (TOILET ROOMS, LOCKER ROOMS, ETC.)



SYSTEM OFF - When the system is off:
Automatically controlled exhaust fans shall be off and their 2-position dampers closed.

SYSTEM START-UP - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.

AUTOMATICALLY CONTROLLED EXHAUST FANS: Upon activation of building occupied mode and start-up of the air handling system, the EMCS shall energize all automatically controlled exhaust fans and open their respective two-position motorized dampers. The EMCS shall monitor the status of each automatically controlled exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. Upon activation of the building unoccupied mode, the automatically controlled building exhaust fans shall be de-energized.

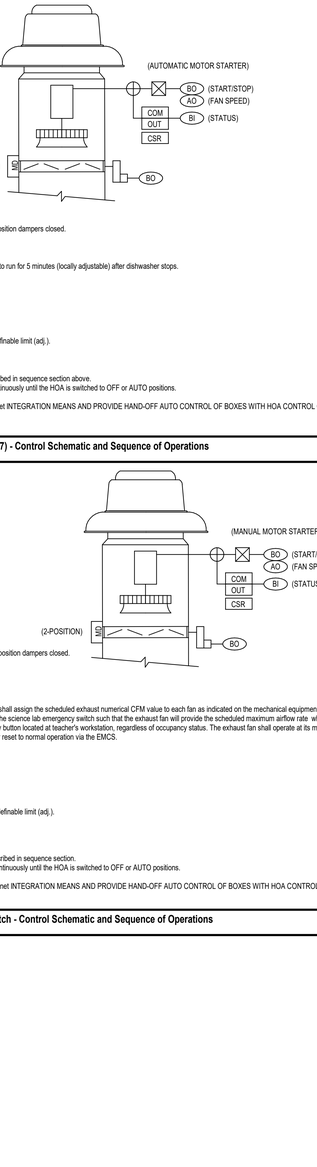
Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

6 Automatically Controlled Exhaust/Supply Fans - Control Schematic and Sequence of Operations(Old Phase EF-43, SF-20, SF-21
NOT TO SCALE



SYSTEM OFF - When the system is off:
Automatically controlled exhaust fans shall be off and their 2-position dampers closed.

SYSTEM START-UP - System start-up shall be initiated:
Whenever dishwasher is operating.
An adjustable off delay timer will ensure that the fan continues to run for 5 minutes (locally adjustable) after dishwasher stops.

Fan Status:
The controller shall monitor the fan status.

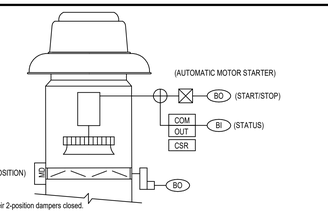
Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

7 Dishwasher Exhaust Fan (EXISTING EF-7) - Control Schematic and Sequence of Operations
NOT TO SCALE

INTERLOCK WITH AHU/FCU/OAHU (REFER TO CONTROL DIAGRAMS 1/M7.02, 1.2/M7.03, AND 4.5/M7.06 FOR EF AND ASSOCIATED UNIT INTERLOCK CONFIGURATIONS)



SYSTEM OFF - When the system is off:
Automatically controlled exhaust fans shall be off and their 2-position dampers closed.

SYSTEM START-UP - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.

AUTOMATICALLY CONTROLLED EXHAUST FANS: Upon activation of building occupied mode and start-up of the air handling system, the EMCS shall energize all interlocked automatically controlled exhaust fans and open their respective two-position motorized dampers. The EMCS shall monitor the status of each automatically controlled exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. Upon activation of the building unoccupied mode, the automatically controlled building exhaust fans shall be de-energized.

Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).
Purge Event: Emergency purge push button activated.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

8 Automatically Controlled Exhaust/Supply Fans - Control Schematic and Sequence of Operations (EXISTING Interlocked Units)
NOT TO SCALE

EXHAUST FANS W/ LOCAL EMERGENCY SWITCH (SCIENCE PURGE FAN: EXISTING EF-45,46,47,48)

LOCAL EMERGENCY SWITCH

SYSTEM OFF - When the system is off:
Automatically controlled exhaust fans shall be off and their 2-position dampers closed.

SYSTEM START-UP - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
By the local emergency switch.

The EMCS shall monitor the status of each exhaust fan and shall assign the scheduled exhaust numerical CFM value to each fan as indicated on the mechanical equipment schedules. The exhaust fan shall be provided with a relay to the science lab emergency switch such that the exhaust fan will provide the scheduled maximum airflow rate when an emergency purge event is activated from the local emergency button located at teacher's workstation, regardless of occupancy status. The exhaust fan shall operate at its maximum scheduled airflow rate indefinitely until manually overridden or reset to normal operation via the EMCS.

Fan Status:
The controller shall monitor the fan status.

Alarms shall be provided as follows:
Fan Failure: Commanded on, but the status is off.
Fan in Hand: Commanded off, but the status is on.
Fan Runtime Exceeded: Fan status runtime exceeds a user definable limit (adj.).
Purge Event: Emergency purge push button activated.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

HOA BACnet INTEGRATION: FURNISH AND INSTALL BACnet INTEGRATION MEANS AND PROVIDE HAND-OFF AUTO CONTROL OF BOXES WITH HOA CONTROL ON THE MAIN PAGE OF FAN BAS GRAPHICS.

9 Exhaust Fans w/ Local Emergency Switch - Control Schematic and Sequence of Operations
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:



Tomball ISD Chiller Package 1(b) - Tomball HS - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

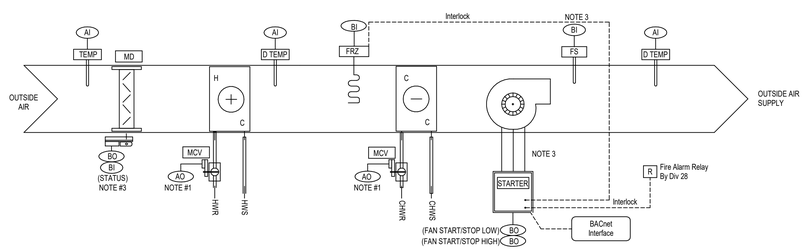
CHECKED BY: DBR

PROJECT NUMBER 260018.001

SHEET TITLE:
MECHANICAL CONTROLS DIAGRAMS

SHEET NUMBER:
M7.05

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SYSTEM OFF - WHEN THE SYSTEM IS OFF:
The outside air damper shall be closed.
The unit supply fan shall be off.
The cooling coil valve shall be closed.
The preheating coil valve shall be closed.
All control loops shall be disabled.

SYSTEM START-UP - SYSTEM START-UP SHALL BE INITIATED:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the TIme of Day (TOD) occupancy schedule. Once enabled, the system shall operate per the **System Operation** section, as detailed below.

NIGHT-SETBACK MODE:
The outside air handling system shall not operate during unoccupied hours unless started by a manual command at the EMCS.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based whenever any of the associated AHU's it serves has an active call for ventilation air. When the Time of Day schedule (TOD) is active, the system shall operate per the **System Operation** section, as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply fan shall start at its minimum speed. Following a conformation of fan start status, the supply fan speed shall be modulated to maintain the supply air static pressure at setpoint. The speed of the fan shall not be adjusted by more than 20% in any one-minute period.

The chilled water coil control valve shall be modulated to maintain the supply air temperature at setpoint. The control shall be active when the outside air temperature is above 55 °F. (adj)

The hot water pre-heat coil control valve shall be modulated to maintain the pre-heat coil discharge air temperature at setpoint. The control shall be active when the outside air temperature is below 53 °F. (adj)

Freeze Protection: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

NOTES:
1. Provide coil control valve as indicated in mechanical schedules and control specifications.
2. Provide status for outside air damper position.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the OAHU BAS graphics.

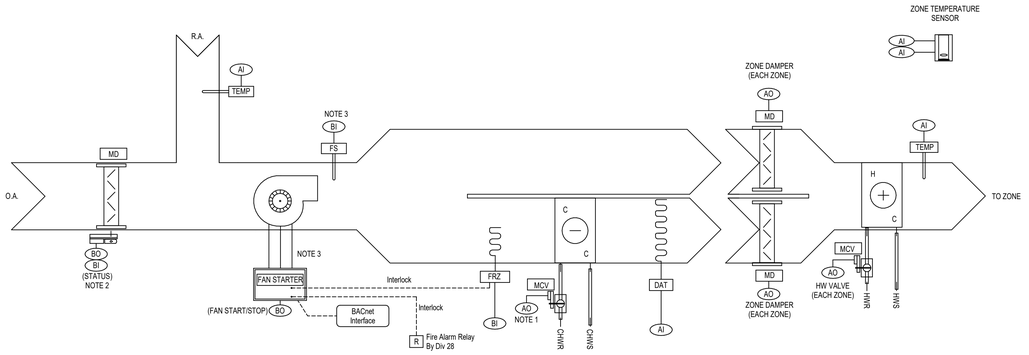
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design maximum supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be the VFD speed required to obtain the design minimum supply airflow value from the unit schedule on the Mechanical Drawings.
The supply air static pressure setpoint shall be 1.0 inches w.c. (adj)
The supply air temperature setpoint shall be set initially at 55 °F. (adj)
The pre-heat setpoint shall be set to 53 °F (adj)
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm if:
If the supply duct static pressure exceeds the high-limit setpoint.
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If the preheat air temperature is below the freezestat trip point, initially set at 37 °F. (adj)
If the filter differential pressure exceeds the trip point initially set at 1.0 inch w.c. (adj)
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating. The alarms, except the fan failure alarm, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 **Outdoor Air Handling Unit - Control Schematic and Sequence of Operations (EXISTING Old Phase III OAHU-1)**
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated on schedules or in sequence of operation.
2. Provide status for outside air damper position.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the MZU BAS graphics.

System Mode - The system shall be controlled by one of the following four modes:
UNOCCUPIED, PRE-START, NIGHT-SETBACK, OCCUPIED

UNOCCUPIED MODE:
The associated outside air supply fan shall be disabled.
The unit supply fan shall be off.
The cooling coil valve shall be closed.
The heating coil valve shall be closed.
All control loops shall be disabled.

PRE-START MODE:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section, as detailed below.

NIGHT-SETBACK MODE:
The system shall be enabled automatically by the EMCS based on the cooling demand of 5 (adjustable) or more associated zones whose space temperature has exceeded the Unoccupied Cooling Setpoint. Once enabled, the system shall operate per the System Operation section, as detailed below.

OCCUPIED MODE:
The system shall be enabled automatically by the EMCS based on the actual space occupancy. When the Time of Day schedule (TOD) is active, the system shall operate per the System Operation section, as detailed below, and the Demand Control Ventilation sequence shall be active.

System Operation - When system start-up has been initiated:
Fan Control
When the AHU is requested to run by the associated zone, the EMCS shall send a 24 VAC electric signal to a relay at the air handling unit VFD/fan starter which shall complete the auto side of the control circuit and start the fan. A switch shall prove status to the EMCS and shall alarm at the central site if the switch is not made within 40 seconds (adjustable). There shall also be a 20 second (adjustable) de-bounce time to prevent nuisance alarms from a bouncing current switch. The associated outdoor air unit shall be energized only during an occupied mode.

Temperature Control
A discharge temperature sensor shall monitor the air temperature leaving the CHW coil. The EMCS shall output a signal to modulate the CHW valve to maintain the discharge air temperature setpoint. CHW coil discharge air temperature shall be 54°F (adjustable). As the zones require cooling the EMCS shall modulate the zone dampers to maintain setpoint. If heating is required, the HW coil shall be opened to maintain setpoint. If the space temperature falls to its occupied heating setpoint, while not in dehumidification mode, the face and by-pass damper shall be modulated to by-pass the cooling coil and the open command to the chilled water shall be discontinued.

Humidity Control
A humidity sensor in the space of each zone shall monitor the humidity at all times. The user shall be able to select humidity control based upon average, high, or low select of the zones served by the AHU. In the event that the humidity setpoint has been exceeded, the EMCS shall reduce the VFD hertz level to 40hz and modulate the chilled water control valve fully open for maximum dehumidification. The leaving cooling coil air temperature shall be a maximum 55°F (adjustable). At this time, the EMCS shall modulate the heating water control valve to maintain the space temperature setpoint (adjustable). If heating water is unavailable while de-humidification is required, the unit shall signal an alarm that heating hot water is unavailable.

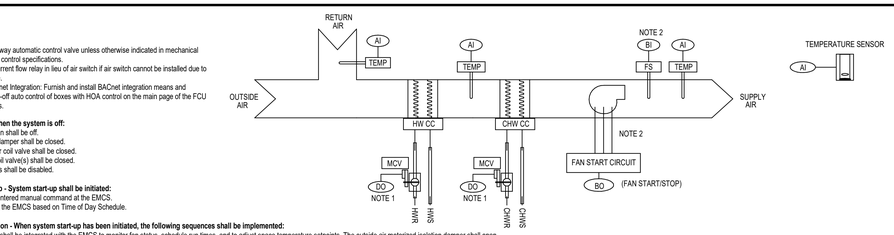
System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS or Automatically by the EMCS when in UNOCCUPIED MODE.

System Setpoints - The setpoints for the system shall be determined as follows:
The cooling coil discharge air temperature setpoint shall be set initially at 54 °F. (adj)
The Zone Occupied Heating Setpoint shall be set initially at 70 °F (adjustable).
The Zone Occupied Cooling Setpoint shall be set initially at 74 °F (adjustable).
The Zone Unoccupied Heating Setpoint shall be set initially at 55 °F (adjustable).
The Zone Unoccupied Cooling Setpoint shall be set initially at 85 °F (adjustable).
The chilled water coil low-limit setpoint shall be set initially at 53 °F (adjustable).
The heating coil high-limit setpoint shall be set initially at 120 °F (adjustable).
The Zone Humidity high-limit setpoint shall be set initially at 60% RH (adjustable).
The outside air flowrate setpoint shall be set at the scheduled flowrate.

System Alarms - The EMCS shall generate an alarm if:
If the duct static is outside the low or high alarm limits, initially set at 0.5 and 2.0 in w.c. (adj)
If the supply air temperature is outside the limits, which shall be set at +/- 5 °F around setpoint.
If the filter differential pressure exceeds the trip point initially set at 1.0 inch w.c. (adj)
If heating water is unavailable while de-humidification is required
All alarms shall be inhibited when the supply fan is not operating.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

2 **Multizone Air Handling Unit - Control Schematic and Sequence of Operations (TYP. 31 EXISTING and EXISTING MZ01 through MZ05 (Old Phase II Zones))**
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated in mechanical schedules or control specifications.
2. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
3. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the FCU BAS graphics.

System Off - When the system is off:
The supply air fan shall be off.
The outside air damper shall be closed.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Time of Day Schedule.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan coil unit shall be integrated with the EMCS to monitor fan status, schedule run times, and to adjust space temperature setpoints. The outside air motorized isolation damper shall open.

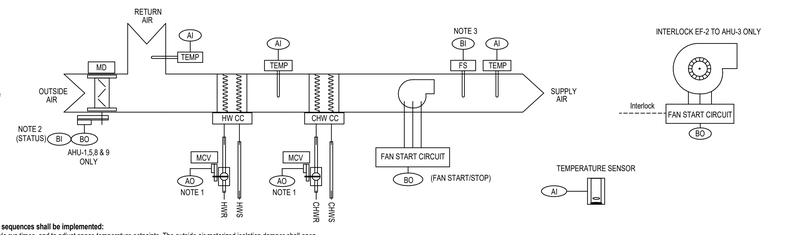
COOLING MODE: When the space temperature is above the Cooling Setpoint, the chilled water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Cooling Setpoint. The chilled water coil discharge temperature shall not be allowed to go below the chilled water coil low-limit setpoint.
HEATING MODE: When the space temperature is below the Heating Setpoint, the hot water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Heating Setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be set as follows:
The Cooling Setpoint shall be set initially at 75 °F (adjustable).
The Heating Setpoint shall be set initially at 70 °F (adjustable).
The design airflow rates shall be set at the values given in the Mechanical Drawings.
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature is 5 °F (adj.) above the cooling setpoint.
If the space temperature is 5 °F (adj.) below the heating setpoint.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

3 **EXISTING Fan Coil Unit - Control Schematic and Sequence of Operations**
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated in mechanical schedules or control specifications.
2. Provide status for outside air damper position.
3. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
4. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU/FCU BAS graphics.

System Off - When the system is off:
The supply air fan shall be off.
The outside air damper shall be closed.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Time of Day Schedule.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan coil unit shall be integrated with the EMCS to monitor fan status, schedule run times, and to adjust space temperature setpoints. The outside air motorized isolation damper shall open.

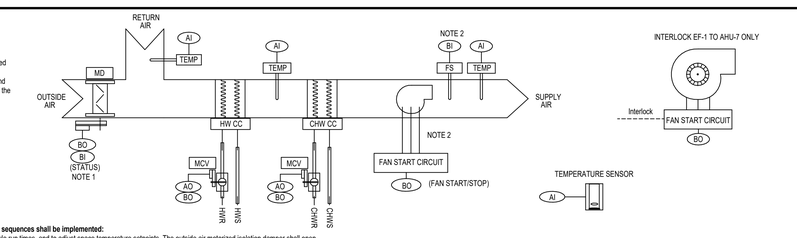
COOLING MODE: When the space temperature is above the Cooling Setpoint, the chilled water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Cooling Setpoint. The chilled water coil discharge temperature shall not be allowed to go below the chilled water coil low-limit setpoint.
HEATING MODE: When the space temperature is below the Heating Setpoint, the hot water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Heating Setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be set as follows:
The Cooling Setpoint shall be set initially at 75 °F (adjustable).
The Heating Setpoint shall be set initially at 70 °F (adjustable).
The design airflow rates shall be set at the values given in the Mechanical Drawings.
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature is 5 °F (adj.) above the cooling setpoint.
If the space temperature is 5 °F (adj.) below the heating setpoint.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

4 **Single Zone Unit - Control Schematic and Sequence of Operations (EXISTING Old Phase III AHU-1,3,4,5,8 & FCU-2)**
NOT TO SCALE



NOTES:
1. Provide status for outside air damper position.
2. Provide current flow relay in lieu of air switch if air switch cannot be installed due to limited space.
3. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU/FCU BAS graphics.

System Off - When the system is off:
The supply air fan shall be off.
The outside air damper shall be closed.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Time of Day Schedule.

System Operation - When system start-up has been initiated, the following sequences shall be implemented:
The fan coil unit shall be integrated with the EMCS to monitor fan status, schedule run times, and to adjust space temperature setpoints. The outside air motorized isolation damper shall open.

COOLING MODE: When the space temperature is above the Cooling Setpoint, the chilled water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Cooling Setpoint. The chilled water coil discharge temperature shall not be allowed to go below the chilled water coil low-limit setpoint.
HEATING MODE: When the space temperature is below the Heating Setpoint, the hot water coil control valve shall be modulated between 0-100%, to maintain the space temperature within +/- 0.5 °F of the Heating Setpoint.
FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be set as follows:
The Cooling Setpoint shall be set initially at 75 °F (adjustable).
The Heating Setpoint shall be set initially at 70 °F (adjustable).
The design airflow rates shall be set at the values given in the Mechanical Drawings.
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Alarms - The EMCS shall generate an alarm as follows:
If the space temperature is 5 °F (adj.) above the cooling setpoint.
If the space temperature is 5 °F (adj.) below the heating setpoint.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

5 **Single Zone Unit - Control Schematic and Sequence of Operations (EXISTING Old Phase III AHU-2,6,7,10,11,12, FCU-1 & 3)**
NOT TO SCALE

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
ADAM C. JONES
110005
LICENSED
PROFESSIONAL ENGINEER
5/28/26

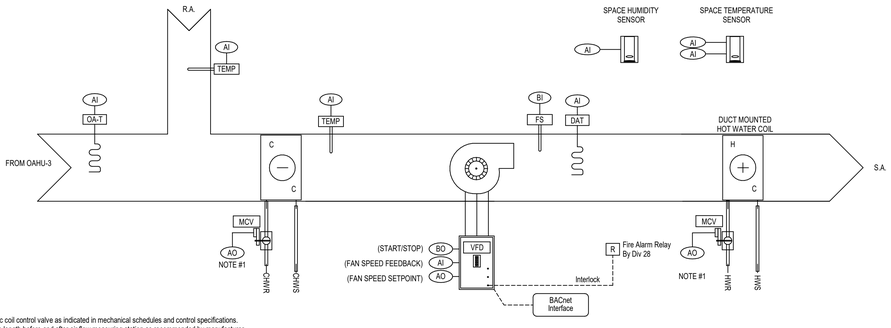
Tomball ISD Chiller Package 1(b) - Controls Upgrade

30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026
DRAWN BY: DBR
CHECKED BY: DBR
PROJECT NUMBER 260018.001
SHEET TITLE: MECHANICAL CONTROLS DIAGRAMS
SHEET NUMBER: M7.06

5/28/2026 5:37:35 PM
Autodesk Docs://260018.001-Tomball ISD-Chiller Pkg 2-Tomball HS/260018.001_Tomball ISD-Chiller Pkg 2_Tomball HS_MEP25.rvt



NOTES:
1. Provide automatic coil control valve as indicated in mechanical schedules and control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the AHU BAS graphics.

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve(s) shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be Initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.

OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.

OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.

DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.

ECONOMIZER MODE: The EMCS shall enable airside Economizer Mode whenever the outside air enthalpy is less than 28.0 btu/lb, the outside air dry bulb temperature is less than 75°F, and the space temperature sensor calls for cooling. The EMCS shall modulate the outside air and return air dampers such that the unit provides 100% outside air for space cooling and shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint. Economizer Mode shall be integrated with the cooling coil to modulate the chilled water control valve as required to maintain the chilled water coil discharge air temperature setpoint. If the outside air dry bulb temperature is below chilled water coil discharge air temperature setpoint, the EMCS shall begin to modulate the return air damper open as required to maintain a mixed air temperature of 53°F (adj). If the outside air enthalpy exceeds 28.0 btu/lb or the outside air temperature exceeds 75°F, Economizer Mode shall be disabled. DCV and preheat shall be disabled during Economizer Mode.

COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active coil discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.

HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.

DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).

PREHEAT COIL: The EMCS shall modulate the hot water pre-heat control valve to maintain the pre-heat coil discharge air temperature setpoint.

FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

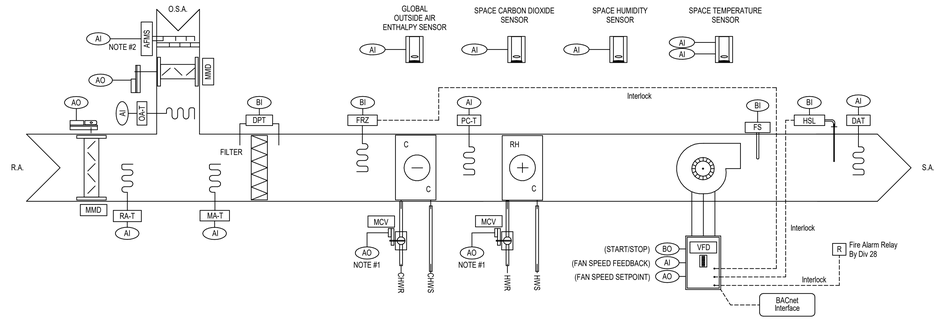
System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The pre-heat coil discharge air temperature setpoint shall be set at 50°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

1 **Single Zone VAV AHU with Chilled Water Cooling, Hot Water Heating, De-Humidification, Demand Control Ventilation - Control Schematic and Sequence of Operations (AHU-16 (ALTERNATE 1))**
NOT TO SCALE



NOTES:
1. Provide 2-way automatic control valve unless otherwise indicated in mechanical schedules or control specifications.
2. Provide adequate length before and after air flow measuring station as recommended by manufacturer.
3. HOA BACnet Integration: Furnish and install BACnet integration means and provide hand-off auto control of boxes with HOA control on the main page of the RTU BAS graphics.

System Off - When the system is off:
The outside air damper shall be closed.
The return air damper shall be open.
The supply air fan shall be off.
The chilled water coil valve shall be closed.
The hot water coil valve shall be closed.
The control loops shall be disabled.

System Start-up - System start-up shall be initiated:
By an operator entered manual command at the EMCS.
Automatically by the EMCS based on Pre-Start Mode or Night-Setback Mode.

Pre-Start Mode:
The system shall be enabled by an operator entered manual command at the EMCS or automatically by the EMCS based on the Optimal Start/Stop algorithm. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Pre-Start Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

Night-Setback Mode:
The system shall be enabled automatically by the EMCS when the space temperature drifts outside the active Unoccupied Cooling or Heating Setpoint. Once enabled, the system shall operate per the System Operation section as detailed below. Operation of the system during Night-Setback Mode shall not include ventilation air, with the exception that Economizer mode shall be permitted to operate per the System Operation section as detailed below.

System Operation - When system start-up has been initiated:
The variable speed supply air fan shall start. Following a confirmation of fan start status, the supply fan shall initially be indexed to its minimum speed reference value. The speed of the fan shall not be adjusted by more than 20 Hz in any one-minute period.

OUTSIDE AIR CFM AND DAMPER CONTROL: When the system is commanded to start, the EMCS shall index the outside air damper to the scheduled maximum outside airflow rate as measured by the outside airflow measuring station.

OUTSIDE AIR DAMPER / RETURN AIR DAMPER INTEGRATION WITH SUPPLY FAN VFD: The EMCS shall provide dynamic control of the outside air damper and return air damper positions through the full range of the supply fan VFD modulation. The outside air and return air motorized dampers shall modulate in sequence to maintain the active outside air flow rate setpoint. The outside air damper shall first modulate open. If the outside air damper has reached the 100% open position and still cannot achieve the active outside air flow rate setpoint, then the return air damper shall begin to modulate closed. The return air damper position shall have a low limit of 50% (adj) during normal system operation. Damper positions shall not be adjusted by more than 20% (adj) in any one-minute time period.

DEMAND CONTROL VENTILATION: During occupied building hours, the EMCS shall allow the outside air damper to modulate from its scheduled maximum flow rate to its scheduled minimum flow rate. If the space CO2 level is at least 100 ppm (adj) less than its active high limit setpoint for a time period of 10 minutes (adj), the EMCS shall index the outside air damper to maintain its minimum scheduled outside air flow rate. If the space CO2 level rises to within 50 ppm (adj) of its active high limit, the EMCS shall index the outside air damper to maintain its scheduled maximum outside air flow rate.

ECONOMIZER MODE: The EMCS shall enable airside Economizer Mode whenever the outside air enthalpy is less than 28.0 btu/lb, the outside air dry bulb temperature is less than 75°F, and the space temperature sensor calls for cooling. The EMCS shall modulate the outside air and return air dampers such that the unit provides 100% outside air for space cooling and shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint. Economizer Mode shall be integrated with the cooling coil to modulate the chilled water control valve as required to maintain the chilled water coil discharge air temperature setpoint. If the outside air dry bulb temperature is below chilled water coil discharge air temperature setpoint, the EMCS shall begin to modulate the return air damper open as required to maintain a mixed air temperature of 53°F (adj). If the outside air enthalpy exceeds 28.0 btu/lb or the outside air temperature exceeds 75°F, Economizer Mode shall be disabled. DCV shall be disabled during Economizer Mode.

COOLING MODE: The EMCS shall modulate the chilled water control valve as required to maintain the active coil discharge air temperature setpoint. The EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint.

HEATING MODE: When the supply fan is operating at its minimum setting, the hot water re-heat control valve shall modulate to maintain the active space temperature setpoint. If the space temperature drops below its active setpoint and the unit discharge air temperature is at its active setpoint, then the EMCS shall modulate the supply fan VFD from its minimum setting to its maximum setting as required to maintain the active space temperature setpoint and the hot water re-heat control valve shall modulate to maintain the re-heat coil discharge air temperature setpoint.

DE-HUMIDIFICATION MODE: When space humidity rises above its active setpoint and the space temperature is below its active setpoint, the EMCS shall modulate the supply fan VFD to its minimum setting and modulate the chilled water control valve to maintain the de-humidication chilled water coil discharge air temperature setpoint. The EMCS shall modulate the hot water re-heat control valve to maintain the space temperature setpoint as required. The unit shall return to cooling mode when the space humidity setpoint has been satisfied for at least 10 minutes (adj).

FREEZE PROTECTION: When the outdoor air temperature drops below the freeze protection setpoint, the EMCS shall open the chilled water control valve(s) to 50% open (adj.) for water circulation through the coil. The control valve shall return to normal operating conditions when the ambient temperature is above the freeze protection setpoint for 10 minutes (adj.). Refer to the Chilled Water System Control Diagram for further information.

System Setpoints - The setpoints for the system shall be determined as follows:
The maximum speed reference value shall be the VFD speed required to obtain the design supply airflow value from the unit schedule on the Mechanical Drawings.
The minimum speed reference value shall be VFD speed required to obtain 50% of the design supply airflow value from the unit schedule on the mechanical drawings but not less than the active outside air flow rate setpoint.
The occupied heating space temperature setpoint shall be set at 70°F (adj) with a low-limit alarm of 66°F (adj).
The occupied cooling space temperature setpoint shall be set at 75°F (adj) with a high-limit alarm of 79°F (adj).
The unoccupied heating space temperature setpoint shall be set at 55°F (adj) with a low-limit alarm of 51°F (adj).
The unoccupied cooling space temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 89°F (adj).
The chilled water coil discharge air temperature setpoint shall be set at 53°F (adj) with a low-limit alarm of 48°F (adj).
The de-humidification chilled water coil discharge air temperature setpoint shall be set at 50°F (adj) with a low-limit alarm of 45°F (adj).
The re-heat coil discharge air temperature setpoint shall be set at 85°F (adj) with a high-limit alarm of 100°F (adj).
The space humidity setpoint shall be set at 55% RH (adj) with a high-limit alarm of 60% RH (adj).
The minimum outside air flowrate setpoint shall be set at the scheduled minimum flowrate from the unit schedule on the mechanical drawings.
The maximum outside air flowrate setpoint shall be set at the scheduled maximum flowrate from the unit schedule on the mechanical drawings.
The space carbon dioxide high-limit setpoint shall be set at 1000 ppm (adj).
The supply duct static pressure high-limit setpoint shall be set at 2.0 in. wc. (adj).
The air filter pressure differential high-limit setpoint shall be set at 1.0 in. wc. (adj).
The freeze-stat low-limit trip setpoint shall be set at 37°F(adj).
The outdoor air temperature freeze protection setpoint shall be 37°F (adj).

System Shutdown - System shutdown shall be initiated:
By operator entered manual command at the EMCS.
Automatically by the EMCS based on Night-Setback or Time of Day schedule.
Automatically by the high-static pressure shut down.
Automatically by the unit freeze-stat shut down.
Automatically by a supply fan current sensor status failure.
Automatically by the auxiliary fire alarm relay when an alarm condition has been initiated.

System Alarms - The EMCS shall generate an alarm condition for each of the following:
If the space temperature is outside the active low or high-limit for 5 minutes (adj).
If the supply air temperature drops below the chilled water coil discharge air temperature low-limit for 5 minutes (adj).
If the supply air temperature rises above the heating coil discharge air temperature high-limit for 5 minutes (adj).
If the space humidity level exceeds its high-limit for more than 20 minutes (adj).
If the space carbon dioxide level exceeds its high-limit for more than 20 minutes (adj) or the space carbon dioxide level exceeds the high-limit by 10% or more.
If the supply duct static pressure exceeds the high-limit setpoint.
If the unit freeze-stat trips.
If the filter differential pressure exceeds the trip point.
If the current sensor relay indicates a supply fan failure status.
All alarms shall be inhibited when the supply fan is not operating except the space temperature alarms. The alarms, except the fan failure and the space temperature alarms, shall remain inhibited following startup of the unit for 2 minutes.

HOA controls:
When The HOA is in The Off Position, unit shall be off.
When The HOA is in The Auto Position, unit shall run as described in sequence section above.
When The HOA is in The Hand position, the unit shall run continuously until the HOA is switched to OFF or AUTO positions.

"NOT TO SCALE"

2 **SINGLE ZONE VAV AHU CHILLED WATER COOLING, HOT WATER HEATING, DE-HUMIDIFICATION, ECONOMIZER, DEMAND CONTROL VENTILATION - CONTROL SCHEMATIC AND SEQUENCE OF OPERATIONS (RTU-01 AND 02 (ALTERNATE 1))**
CONTROLS

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/29/2026	ISSUE FOR PROPOSAL

SEAL:
ADAM C. JONES
110009
LICENSED
PROFESSIONAL ENGINEER
5/29/26

Tomball ISD Chiller Package 1(b) -Tomball HS - Controls Upgrade
30330 Quinn Rd.
Tomball, TX, 77375

TBPE Firm Registration No. 2234

DATE: 05/29/2026

DRAWN BY: DBR

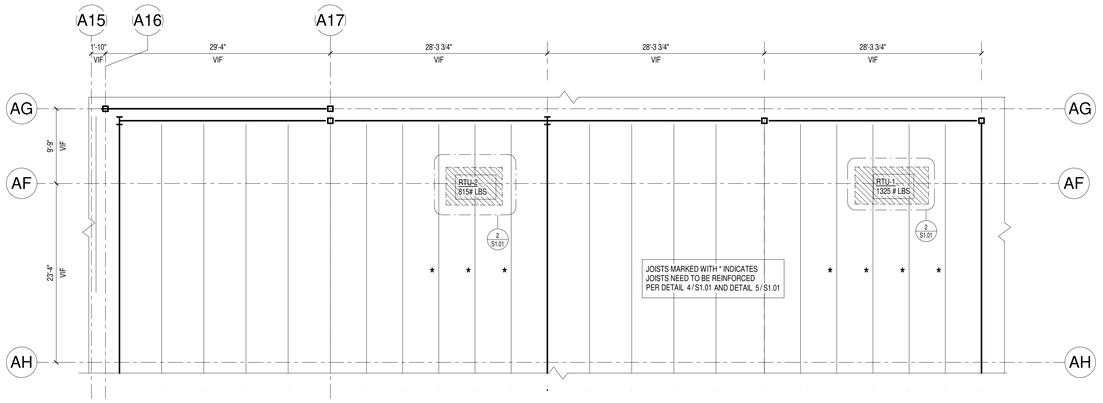
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PROJECT NUMBER 260018.001

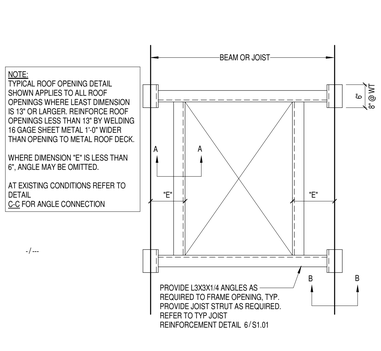
SHEET TITLE:
MECHANICAL CONTROLS DIAGRAMS

SHEET NUMBER:
M7.07

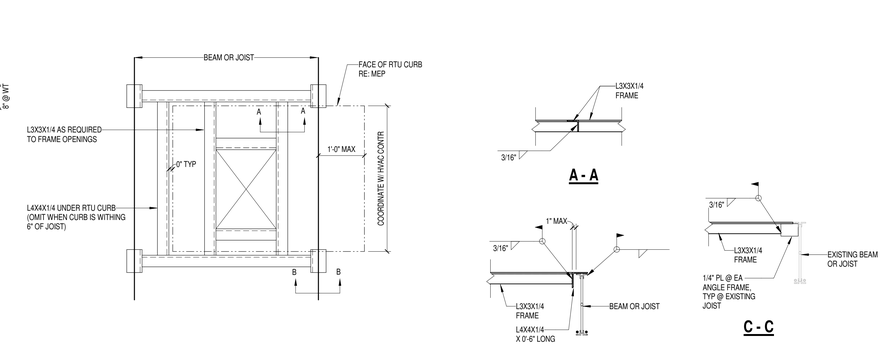
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1 RTU SUPPORT DIAGRAM
1/8" = 1'-0"

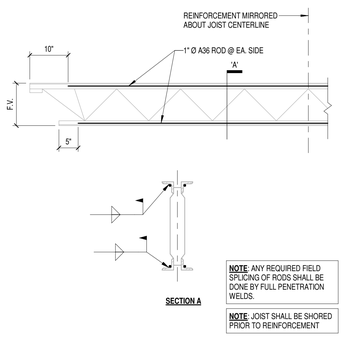


TYPICAL ROOF OPENING - PLAN VIEW

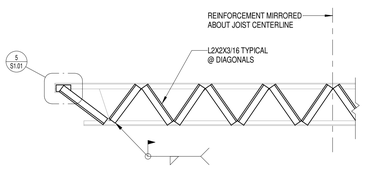


TYPICAL RTU SUPPORT DETAILS

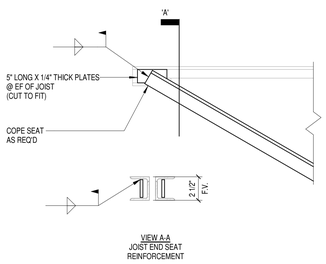
2 TYPICAL RTU CURB OPENING
3/4" = 1'-0"



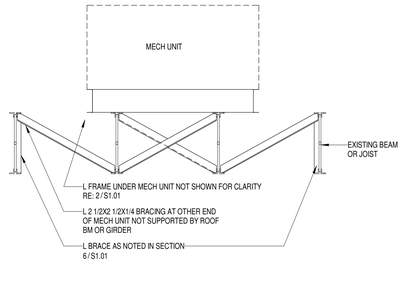
4 EXISTING JOIST SEAT REINFORCING
3/4" = 1'-0"

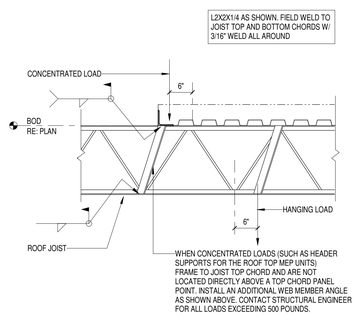


5 EXISTING JOIST SEAT REINFORCING
1 1/2" = 1'-0"



3 JOIST BRIDGING UNDER RTU
3/4" = 1'-0"





6 TYPICAL OFFSET LOAD JOIST SUPPORT
3/4" = 1'-0"

STRUCTURAL CONCEPT, STANDARDS AND LOADS

A. **DESIGN CONCEPT:**
1. THE STRUCTURE AS SHOWN HAS BEEN DESIGNED IN ACCORDANCE WITH THE BUILDING CODE REQUIREMENTS AND DESIGN STANDARDS TO SUPPORT THE FINAL BUILDING SERVICE LOADS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADDITIONAL SUPPORTS FOR THE STRUCTURE IF NECESSITATED BY THE CONSTRUCTION SEQUENCE OR METHODS OF FABRICATION, HANDLING, ERECTION, AND OTHER CONSTRUCTION OPERATIONS.

B. **BUILDING CODES AND DESIGN STANDARDS:**
1. INTERNATIONAL BUILDING CODE, **IBC 2021** EDITION.
2. AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE); MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, **ASCE 7-16**, AS AMENDED.
3. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, **15TH EDITION** (ASD), 2017, AS AMENDED.
4. AMERICAN WELDING SOCIETY (AWS).

C. GRAVITY LOADS:
1. SUPER IMPOSED LOADS ARE GIVEN IN POUNDS PER SQUARE FOOT (PSF)

BUILDING AREA	DEAD LOAD (PSF)	LIVE LOAD (PSF)
ROOF	20	20
MECHANICAL AREAS	10	150 (**)

** EQUIPMENT WEIGHT IF LARGER

D. **LATERAL DESIGN LOADS (ENCLOSED STRUCTURE):**
1. WIND LOADS FOR AN BASIC DESIGN WIND SPEED OF **129** MPH (ASD WIND SPEED OF **100** MPH), 3-SECOND GUST, WITH EXPOSURE **C** AND A RISK CATEGORY **II**.

STRUCTURAL STEEL

A. ROLLED SHAPES:
1. ALL STRUCTURAL STEEL FOR ALL THE HORIZONTAL FRAMING MEMBER SHALL CONFORM TO ASTM A992, GRADE 50, UNLESS OTHERWISE NOTED.
2. ALL STRUCTURAL STEEL FOR HOLLOW STRUCTURAL SECTIONS SHALL CONFORM TO ASTM A500, GRADE B WITH A MINIMUM YIELD OF 46 KSI, UNLESS OTHERWISE NOTED.
3. ALL STRUCTURAL STEEL FOR PIPE SHALL CONFORM TO ASTM A53, TYPE E OR S, GRADE B, UNLESS OTHERWISE NOTED.
4. ALL STRUCTURAL STEEL FOR ANGLES, PLATES AND MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36, UNLESS OTHERWISE NOTED.
5. ALL EXPOSED STEEL TO BE HOT DIPPED GALVANIZED.

B. CONNECTIONS:
1. THE DESIGN OF STRUCTURAL STEEL CONNECTIONS IS THE RESPONSIBILITY OF THE CONTRACTOR AND THE STEEL FABRICATOR. THE DESIGN OF THE CONNECTION SHALL BE PERFORMED BY A REGISTERED PROFESSIONAL ENGINEER EMPLOYED BY THE STEEL FABRICATOR REGISTERED, IN THE JURISDICTION THAT THE PROJECT IS BEING CONSTRUCTED. THE DETAILS AND CALCULATIONS SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
   - ALL WELD SIZES AND LENGTHS
   - ALL BOLT SIZES, LOCATIONS, QUANTITIES AND GRADES
   - ALL PLATE AND ANGLE SIZES, THICKNESS AND DIMENSIONS
   - ALL WORK POINT LOCATIONS AND RELATED INFORMATION.
2. PROVIDE STANDARD BOLTED CONNECTIONS CONFORMING TO AISC BOLTED CONNECTIONS, USING ASTM A325 OR A490 BOLTS, FOR THE BEAM END SHEARS INDICATED IN THE DOCUMENTS. PROVIDE MINIMUM OF TWO BOLTS FOR ALL CONNECTIONS.
3. ALL WELDED CONNECTIONS SHALL CONFORM TO AWS UNLESS OTHERWISE NOTED.
4. SURVEY ALL PLANS, DETAILS, SECTIONS, SCHEDULES AND SPECIFICATIONS FOR SPECIAL CONNECTIONS.
5. WHERE FILLET WELD IS NOT SHOWN ON DETAIL, ITS SIZE SHALL BE ASSUMED TO BE THE PLATE THICKNESS OF THE THINNEST PIECE MINUS 1/16"

C. WELDS:
1. CONFORM TO "CODE FOR WELDING IN BUILDING CONSTRUCTION" BY THE AMERICAN WELDING SOCIETY, LATEST EDITION.
2. WELDS ON INDICATED ON DRAWINGS ARE TO BE FILLET ALL AROUND AS PRESCRIBED BY AISC SPECIFICATION. PROVIDE WELDING OF CONTINUOUS MEMBERS OF 2 INCHES OF 3/16" INCH FILLET STITCH WELDS AT 12 INCHES OC, STAGGERED EACH SIDE, UNLESS OTHERWISE NOTED.
3. FIELD PAINT ALL WELDS W/ "GALVILITE" BY Z.R.C. OR APPROVED EQUAL ARC WELDING ELECTRODES.
4. METAL DECK - E80XX
5. STRUCTURAL STUDS - E6022 OR E6011, 3/32" RODS.
6. ALL OTHER - E70XX LOW HYDROGEN, 250 DEGREE MIN. OVEN TEMP.
7. SIZE - ALL FILLETS ARE 1/16" LESS THAN MINIMUM THICKNESS TO BE WELDED.
8. PROVIDE ULTRASONIC INSPECTION BY THE TESTING LABORATORY FOR ALL WELDS INDICATED AS PENETRATION WELDS.

GENERAL NOTES FOR CONSTRUCTION

A. CONSTRUCTION METHODS, PROCEDURES AND SEQUENCES ARE THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTOR SHALL TAKE ALL THE NECESSARY MEANS TO MAINTAIN AND PROTECT THE STRUCTURAL INTEGRITY OF ALL CONSTRUCTION AT ALL STAGES.

B. ALL PROPOSED SUBSTITUTIONS MUST BE EQUAL OR BETTER AND SHALL BE REVIEWED BY THE ARCHITECT/ENGINEER PRIOR TO ANY PERTINENT WORK AND PRIOR TO THE AWARD OF THE CONTRACT.

C. NOT ALL OPENINGS AND OTHER COMPONENTS THAT ARE REQUIRED HAVE BEEN SHOWN IN THE STRUCTURAL DRAWINGS. COORDINATE WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS AND VERIFY THE LOCATIONS AND SIZES OF ALL CHASES, INSERTS, OPENINGS, SLEEVES, FINISHES, DEPRESSIONS, PADS AND OTHER PROJECT REQUIREMENTS. FLOOR PLAN WILL BE FURNISHED FOR THAT PURPOSE.

D. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE MECHANICAL, ELECTRICAL, PLUMBING AND ARCHITECTURAL DRAWINGS TO DETERMINE WHERE OPENINGS ARE REQUIRED IN REINFORCED CONCRETE BEAMS, SLABS AND WALLS.

E. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, DETAILING ALL THE OPENINGS, INCLUDING ADDED REINFORCEMENT AS SHOWN ON THE TYPICAL WALL, SLAB AND BEAM OPENING DETAILS FOR REVIEW.

F. ADDITIONAL REINFORCEMENT ABOVE THAT SHOWN IN THE TYPICAL SLAB AND BEAM OPENING DETAILS MAY BE REQUIRED AND WILL BE REVIEWED ON THE SHOP DRAWINGS.

G. USE THE MANUFACTURER'S CERTIFIED DRAWINGS AND SPECIFICATIONS FOR THE EQUIPMENT ANCHORAGE AND DETAILS.

H. ALL CONSTRUCTION JOINTS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE INCORPORATED INTO THE STRUCTURE. ADDITIONAL CONSTRUCTION JOINTS TO FACILITATE CONSTRUCTION SHALL BE LOCATED AND DETAILED ON THE SHOP DRAWINGS FOR REVIEW.

I. HORIZONTAL CONSTRUCTION JOINTS SHALL NOT BE PERMITTED IN BEAMS UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.

J. ALL CONSTRUCTION AND CONTROL JOINTS FOR BEAMS WHICH ARE EXPOSED TO VIEW ARE TO BE LOCATED TO COINCIDE WITH THE ARCHITECTURAL RUSTICATION JOINTS AS SHOWN ON THE BUILDING ELEVATION SHEETS OR AS REVIEWED IN WRITING.

K. SHOP DRAWINGS:
1. THE TERM "SHOP DRAWINGS" INCLUDES FABRICATION, MANUFACTURING, ERECTION AND SETTING DRAWINGS, BROCHURES, CERTIFICATES, AND PRODUCT DATA DESCRIBING MATERIALS AND EQUIPMENT. SHOP DRAWINGS SHALL INCLUDE ALL PERTINENT INFORMATION REQUIRED FOR THE ENGINEER TO FULLY EVALUATE THE MATERIALS BEING REPRESENTED BY THE SUBMITTAL INCLUDING THE PHYSICAL PROPERTIES, DIMENSIONS, LOCATIONS AND METHOD OF INSTALLATION.
2. SHOP DRAWINGS WILL BEAR THE REVIEW STAMP OF THE CONTRACTOR INDICATING THAT HE HAS REVIEWED THE DRAWINGS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS; COORDINATED ITEMS INCLUDED IN THE SUBMITTAL WITH RELATED ITEMS; AND VERIFIED AND COORDINATED DIMENSIONS.
3. REPRODUCTIONS OF THE ENGINEERING DRAWINGS WILL NOT BE ACCEPTABLE AS SHOP DRAWINGS.
4. ANY SHOP DRAWING NOT CONFORMING TO THESE REQUIREMENTS WILL BE CAUSE FOR REJECTION AND WILL BE RETURNED WITHOUT ANY FURTHER ACTION.
5. STRUCTURAL SUBMITTALS REQUIRED FOR APPROVAL INCLUDE, BUT ARE NOT LIMITED TO:
   - CONCRETE ACCESSORIES (MANUFACTURERS PRODUCT DATA)
   - STEEL REINFORCING
   - CONCRETE MIX DESIGN
   - CONTROL JOINT LAYOUT
   - CONCRETE MATERIAL CERTIFICATES
   - STRUCTURAL STEEL FRAMING
   - STRUCTURAL STEEL CONNECTION CALCULATIONS
   - STEEL ROOF DECK
   - COLD FORMED METAL FRAMING
   - COLD FORMED METAL FRAMING CALCULATIONS
   - MISC. STEEL FABRICATIONS
6. DELEGATED STRUCTURAL DESIGN OF COMPONENTS:
   - SEE APPLICABLE SECTIONS OF GENERAL NOTES FOR THE APPROPRIATE DESIGN RESPONSIBILITIES OF THE SUPPLIER AND IT'S LICENSED ENGINEER.

L. THESE NOTES APPLY TO STRUCTURAL DOCUMENTS SEALED BY THE STRUCTURAL ENGINEER AND ARE INTENDED TO BE COMPLEMENTARY TO AND USED IN CONJUNCTION WITH THE PLANS AND SPECIFICATIONS, INCLUDING THOSE PREPARED BY OTHER DISCIPLINES. CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE ARCHITECT/STRUCTURAL ENGINEER IMMEDIATELY. ANY SUCH DISCREPANCIES SHALL BE RESOLVED TO THE MORE STRINGENT REQUIREMENTS, UNLESS OTHERWISE AUTHORIZED BY THE STRUCTURAL ENGINEER.

M. ANY DISCREPANCIES ON THE STRUCTURAL DOCUMENTS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT/STRUCTURAL ENGINEER PRIOR TO SUBMISSION OF BIDS OR PROPOSALS, OR IF NOT REASONABLE DISCERNABLE DURING PREPARATION OF BIDS AND PROPOSALS, BEFORE COMMENCING THE WORK IN QUESTIONS. NO FIELD CHANGES OR DEVIATIONS FROM THE DESIGN ARE TO BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ARCHITECT AND/OR STRUCTURAL ENGINEER. NO CHANGE ORDER CONSIDERATION WILL BE GIVEN TO CHANGES FOR WHICH THE ARCHITECT AND/OR ENGINEER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM.

N. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONSTRUCTION, INCLUDING EXISTING WORK, PRIOR TO COMMENCING WORK. ANY DISCREPANCIES SHALL BE REPORT IMMEDIATELY TO THE ARCHITECT/STRUCTURAL ENGINEER.

DBR
SERVICE | QUALITY | INTEGRITY | SUSTAINABILITY

REVISION:

No.	DATE	DESCRIPTION
	05/22/2026	ISSUE FOR PROPOSAL

FRED DALLY 90904 REGISTERED PROFESSIONAL ENGINEER
05/22/2026

TOMBALL HIGH SCHOOL RTU ADDITIONS

DATE: 05/26/2026
DRAWN BY: JY
CHECKED BY: LMM
PROJECT NUMBER 26-126-00
SHEET TITLE: PLANS & DETAILS
SHEET NUMBER: S1.01

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Texas Registered Engineering Firm F-003428

D+A PROJECT NO. 26-126

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