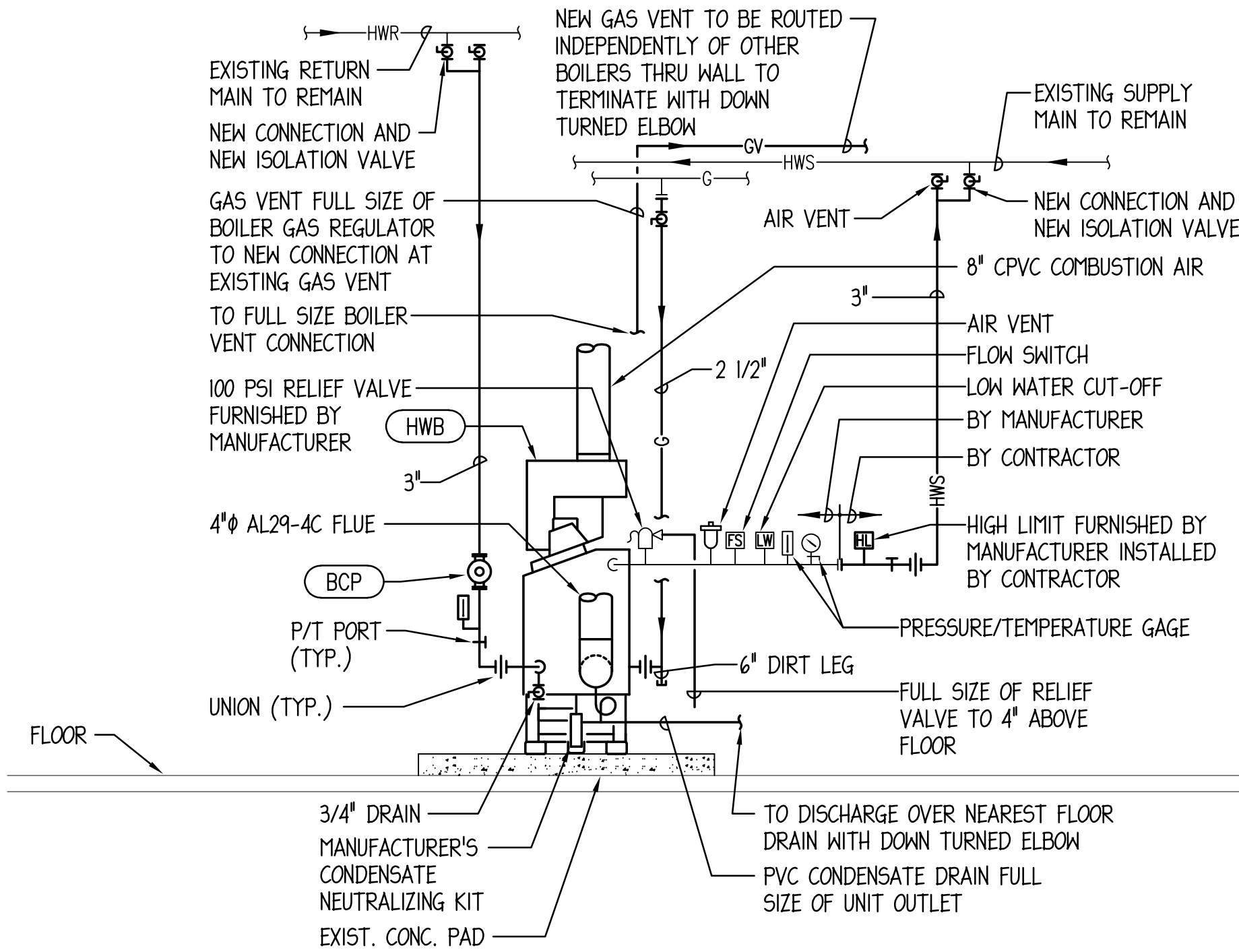


### FIRE ALARM NOTE

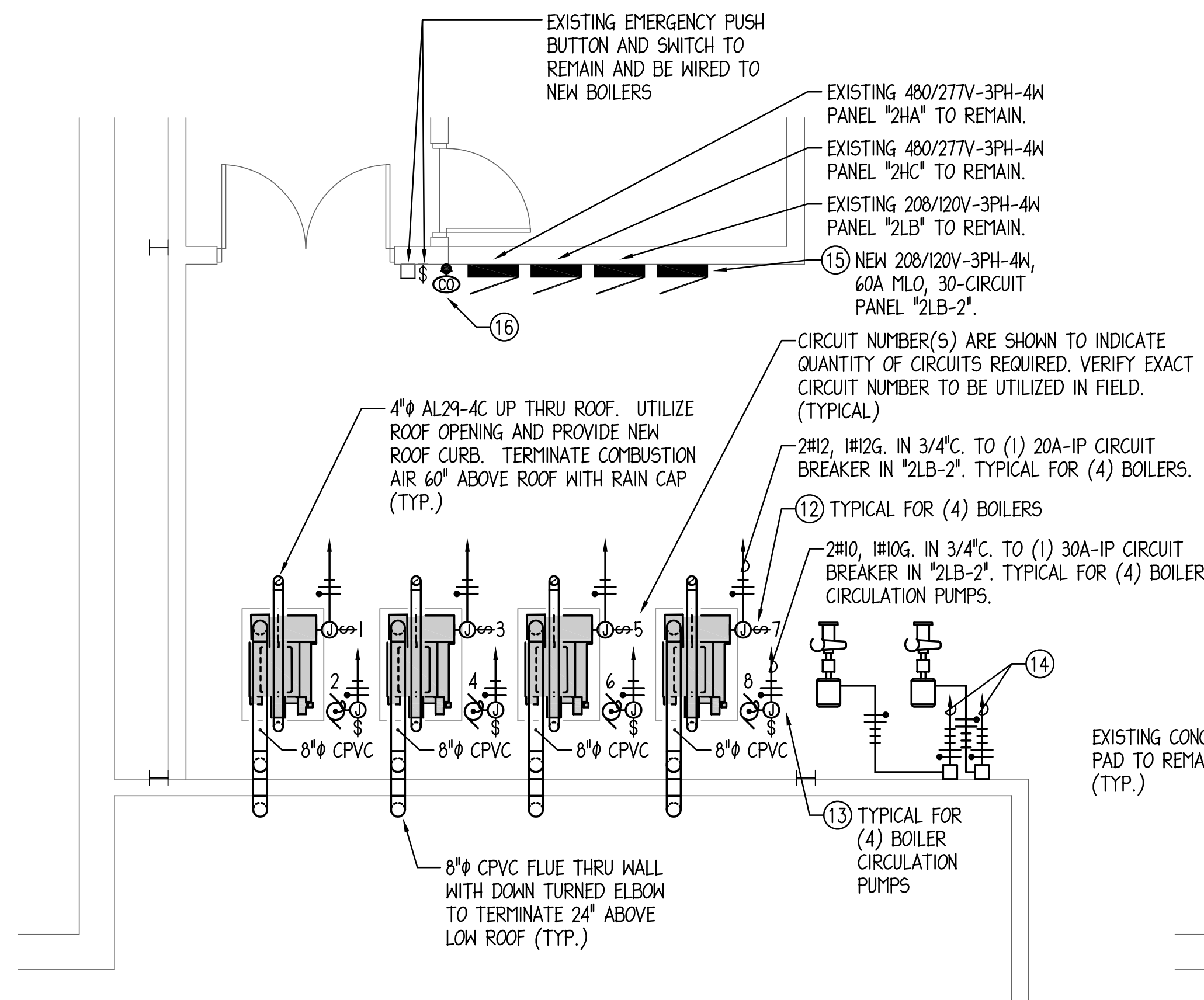
ALL NEW FIRE ALARM DEVICES SHALL BE COMPATIBLE WITH EXISTING FIRE ALARM SYSTEM. PROVIDE ALL EXPANSION MODULES, POWER SUPPLIES, WIRING AND LABOR TO EXPAND SYSTEM TO ACCEPT NEW DEVICES SHOWN. INCLUDE ALL PROGRAMMING AND TESTING AS REQUIRED.

INSTALLING CONTRACTOR SHALL SUBMIT PRODUCT DATA, CALCULATIONS AND SHOP DRAWINGS INDICATING DEVICE LOCATIONS AND ADDRESSABLE IDENTIFICATIONS TO LOCAL AUTHORITY HAVING JURISDICTION FOR REVIEW AND APPROVAL.

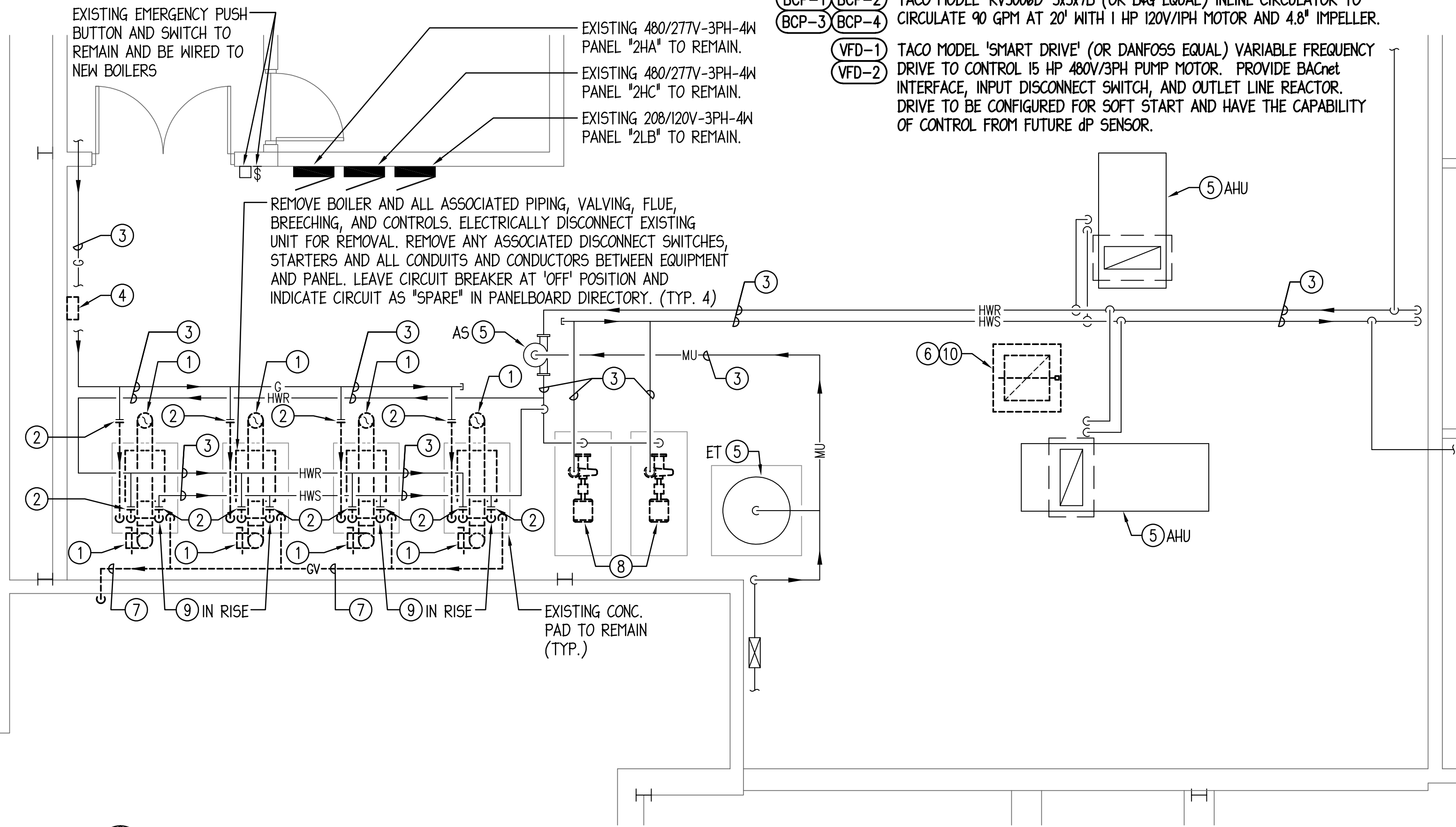
ALL FIRE ALARM WORK SHALL BE CARRIED OUT BY FOX VALLEY FIRE & SAFETY (847-695-5990) LOCATED IN ELGIN, ILLINOIS.



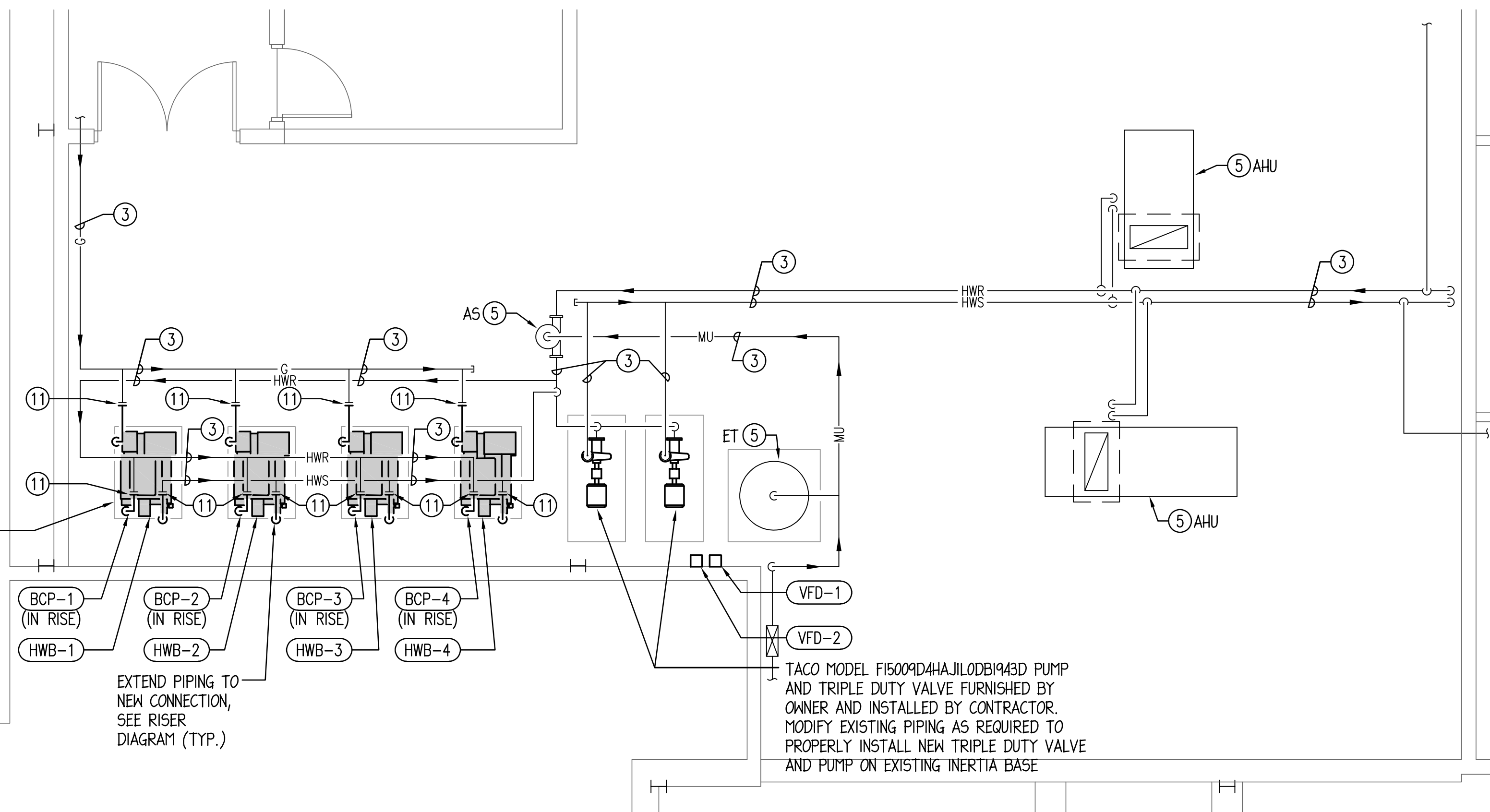
**SCHEMATIC DIAGRAM OF CONNECTIONS TO CENTRAL HEATING PLANT EQUIPMENT**  
NO SCALE



**MECHANICAL ROOM VENTILATION AND ELECTRICAL PLAN**  
1/4" = 1'-0"



**MECHANICAL ROOM HVAC DEMOLITION PLAN**  
1/4" = 1'-0"



**MECHANICAL ROOM PIPING PLAN**  
1/4" = 1'-0"

### EQUIPMENT SCHEDULE:

(HWB-1) HYDROTHERM MODEL 'KN-10' HOT WATER BOILER WITH 1,000 MBH HEATING INPUT. BOILER TO OPERATE AT 120V/1PH WITH 13.1 AMP DRAW. PROVIDE CSD-1 BURNER AND CONTROLS SIZED FOR 7" W.C. INLET PRESSURE, FLOW SWITCH, HIGH LIMIT SWITCH, LOW WATER CUT OFF, AIR VENT, CONDENSATE NEUTRALIZING CARTRIDGE, 100 PSI RELIEF VALVE, AND BAS INTERFACE COMPATIBLE WITH EXISTING TRANE SUMMIT BAS SYSTEM.  
ALT. BID #: PATTERSON-KELLY MODEL 'SONIC' OR LOCHINVAR MODEL 'CREST' HOT WATER BOILER WITH SIMILAR CAPACITY AND ACCESSORIES AS BASE BID.

(BCP-1) (BCP-2) TACO MODEL 'KV3006D' 3x3x7B (OR B4G EQUAL) INLINE CIRCULATOR TO CIRCULATE 90 GPM AT 20' WITH 1 HP 120V/1PH MOTOR AND 4.8" IMPELLER.  
(BCP-3) (BCP-4)

(VFD-1) TACO MODEL 'SMART DRIVE' (OR DANFOSS EQUAL) VARIABLE FREQUENCY DRIVE TO CONTROL 15 HP 480V/3PH PUMP MOTOR. PROVIDE BACnet INTERFACE, INPUT DISCONNECT SWITCH, AND OUTLET LINE REACTOR. DRIVE TO BE CONFIGURED FOR SOFT START AND HAVE THE CAPABILITY OF CONTROL FROM FUTURE dP SENSOR.  
(VFD-2)

### DRAWING NOTES: (TYPICAL FOR THIS DRAWING ONLY)

- REMOVE ALL DUCTWORK, DIFFUSERS, REGISTERS, HANGERS, INSULATION, ETC. SHOWN DASHED.
- NEW CONNECTION TO BE MADE AT THIS LOCATION. REMOVE ALL PIPING, VALVING, HANGERS, INSULATION, ETC. SHOWN DASHED BEYOND THIS POINT.
- EXISTING PIPING AND VALVING TO REMAIN.
- REMOVE TEMPERATURE CONTROL PANEL AND ALL ASSOCIATED PNEUMATIC PIPING, CONDUIT, VALVING, AND CONTROLS.
- EXISTING HVAC EQUIPMENT TO REMAIN.
- REMOVE EXISTING COMBUSTION AIR HOOD AND ALL ASSOCIATED DUCTWORK, GRILLES, DAMPERS, INSULATION, CONTROLS, ETC. PROVIDE DOUBLE WALL SHEET METAL CAP INSULATED 2" THICK WITH R-14 RIGID BOARD INSULATION AT EXISTING ROOF CURB TO REMAIN. SEAL WEATHER TIGHT.
- REMOVE ALL PIPING, VALVING, HANGERS, INSULATION, ETC. SHOWN DASHED.
- REMOVE BASE MOUNTED PUMP AND ALL ASSOCIATED PIPING AND VALVING. EXISTING INERTIA PAD TO REMAIN. REMOVE ANY ASSOCIATED DISCONNECT SWITCHES, STARTERS AND ALL CONDUITS AND CONDUCTORS BETWEEN EQUIPMENT AND PANEL. LEAVE CIRCUIT BREAKER AT 'OFF' POSITION AND INDICATE CIRCUIT AS 'SPARE' IN PANELBOARD DIRECTORY.
- REMOVE INLINE PUMP AND ALL ASSOCIATED PIPING, VALVING, INSULATION, HANGERS, SUPPORTS, ETC. REMOVE ANY ASSOCIATED DISCONNECT SWITCHES, STARTERS AND ALL CONDUITS AND CONDUCTORS BETWEEN EQUIPMENT AND PANEL. LEAVE CIRCUIT BREAKER AT 'OFF' POSITION AND INDICATE CIRCUIT AS 'SPARE' IN PANELBOARD DIRECTORY.
- CAREFULLY REMOVE EXISTING HOOD MOUNTED SENSORS AND RE-INSTALL NEW RIGID SUPPORT FROM NEW CURB CAP.
- MAKE NEW CONNECTION TO EXISTING PIPING AT THIS LOCATION.
- PROVIDE 120VAC. 20AMP. 1-POLE MOTOR RATED TOGGLE DISCONNECT SWITCH CAPABLE OF BEING LOCKED IN THE OPEN POSITION. INSTALL SWITCH ADJACENT TO BOILER. COORDINATE EXACT LOCATION IN THE FIELD.
- PROVIDE 120VAC. 30AMP. COMBINATION MOTOR STARTER/SAFETY SWITCH, FVNR IN NEMA 1 ENCLOSURE. INCLUDE CONTROL TRANSFORMER, (1) N.O., (1) N.C. CONTROL CONTACTS AND PILOT LIGHT.
- WIRE 4#8, 1#10G. IN 1 1/4"C. TO (1) NEW 40A-3P CIRCUIT BREAKER OF TYPE AND AIC RATING TO MATCH EXISTING PANEL '2HC'. UTILIZE AVAILABLE BUSSED SPACE FOR INSTALLATION OF NEW CIRCUIT BREAKER. PROVIDE UPDATED PANEL DIRECTORY TO REFLECT CHANGES. FIELD VERIFY EXACT REQUIREMENTS.
- WIRE 4#8, 1#10G. IN 1 1/4"C. TO (1) NEW 60A-3P CIRCUIT BREAKER OF TYPE AND AIC RATING TO MATCH EXISTING PANEL '2LB'. REMOVE SPARE CIRCUIT BREAKERS MADE AVAILABLE FROM DEMOLITION WORK TO MAKE ROOM FOR INSTALLATION OF NEW CIRCUIT BREAKER. PROVIDE UPDATED PANEL DIRECTORY TO REFLECT CHANGES. FIELD VERIFY EXACT REQUIREMENTS.
- PROVIDE NEW CARBON MONOXIDE DETECTOR MONITORED BY FIRE ALARM SYSTEM. DETECTOR SHALL HAVE INTEGRAL SOUNDER OR BE MOUNTED ON A SOUNDER BASE, GENERATE A DISTINCT TONE IN A FOUR-PULSE TEMPORAL PATTERN, DIFFERENT FROM OTHER ALARM SIGNALS. DETECTOR SHALL ANNUNCIATE ONLY AT THE DEVICE, FIRE COMMAND PANEL AND FIRE ALARM ANNUNCIATOR PANELS.

### INSTALLATION

#### PHASING NOTE:

NO MORE THAN (2) BOILERS SHALL BE OUT OF SERVICE AT ANY GIVEN TIME. CONTRACTOR TO INSTALL, START, AND VERIFY OPERATION OF 2 NEW BOILER PRIOR TO REMOVAL OF REMAINING BOILERS.

**McHENRY COUNTY COLLEGE - BUILDING 'B' 2020 BOLER REPLACEMENT**

8900 US HWY 14 - BLDG. 'B' CRYSTAL LAKE, IL 60012

05/29/2020 BID DOCUMENTS

DATE DESCRIPTION  
Mechanical - Electrical Engineers  
1216 Tower Road  
Schaumburg, Illinois 60173  
847.882.2010  
Fax 847.882.2201

**ENGINEERING GROUP LLC**

Sheet Title  
MECHANICAL/ELECTRICAL PLANS AND DETAILS

PROJ. MGR: 20/10  
DRAWN BY: 20/10  
CHECKED BY: 20/10  
**ME-1**

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NAME: 155042020E-1.dwg BY: KGC DATE: MAY 29, 2020 TIME: 12:40 PM



NAME: 1550420ME-2.dwg BY:KGC DATE: MAY 22, 2020 TIME: 2:36 PM

GENERAL REMODELING NOTES - ALL CONTRACTORS

1.

ALL WORK SHOWN ON DRAWINGS SHALL BE CONSIDERED NEW AND IN CONTRACT UNLESS SPECIFICALLY INDICATED OTHERWISE.

2.

DRAWINGS ARE GENERALLY DIAGRAMMATIC. ROUTING OF PIPING, DUCTWORK, CONDUITS, RACEWAYS, ETC., AS SHOWN ON DRAWINGS, DOES NOT INTEND TO SHOW EVERY RISE, DROP, OFFSET, FITTING NOR EVERY STRUCTURAL ELEMENT THAT MAY BE ENCOUNTERED DURING THE INSTALLATION OF THIS WORK. EACH CONTRACTOR SHALL MAKE ANY REQUIRED CHANGES FROM THE GENERAL ROUTING SHOWN ON THESE DRAWINGS, SUCH AS OFFSETS, BENDS OR CHANGES IN ELEVATION DUE TO COORDINATION WITH THE WORK OF OTHER TRADES AND BUILDING CONSTRUCTION. ALL CHANGES SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER OR DELAY IN COMPLETION DATE OF THE PROJECT.

3.

IT IS INTENDED THAT EQUIPMENT SHALL BE LOCATED SYMMETRICALLY WITH THE ARCHITECTURAL ELEMENTS OF THE BUILDING, NOTWITHSTANDING THE FACT THAT LOCATIONS INDICATED BY THESE DRAWINGS MAY BE DISTORTED FOR CLARNESS OF PRESENTATION.

4.

CONTRACTOR SHALL CHECK DRAWINGS OF OTHER TRADES TO VERIFY THAT SPACES IN WHICH THEIR WORK WILL BE INSTALLED ARE CLEAR OF OBSTRUCTIONS. WORK SHALL BE INSTALLED TO MAINTAIN MAXIMUM HEADROOM AND SPACE CONDITIONS AT ALL POINTS IN THE BUILDING. WHERE HEADROOM OR SPACE CONDITIONS APPEAR INADEQUATE, CONTRACTOR SHALL NOTIFY OWNER/ARCHITECT/ENGINEER BEFORE PROCEEDING WITH THE INSTALLATION OF THEIR WORK.

5.

CONTRACTOR SHALL FURNISH OTHER TRADES ADVANCE INFORMATION AND/OR SHOP DRAWINGS ON LOCATIONS AND SIZES OF PIPING, DUCTWORK, CONDUIT, RACEWAYS, EQUIPMENT, FRAMES, BOXES, SLEEVES AND OPENINGS, ETC. NEEDED FOR THEIR WORK TO PERMIT OTHER TRADES AFFECTED TO INSTALL THEIR WORK PROPERLY AND WITHOUT DELAY.

6.

WHERE THERE IS EVIDENCE THAT WORK OF ONE TRADE WILL INTERFERE WITH WORK OF OTHER TRADES, ALL TRADES SHALL MEET ON JOB SITE TO WORK OUT SPACE CONDITIONS AND MAKE SATISFACTORY ADJUSTMENTS TO INSTALLATION OF THE NEW WORK. CONTRACTORS SHALL VERIFY EXACT LOCATIONS OF ALL DEVICES AND EQUIPMENT WITH FIELD CONDITIONS, SHOP DRAWINGS, AND WORK OF OTHER TRADES PRIOR TO ROUGH-IN. EACH CONTRACTOR SHALL BE RESPONSIBLE, AT THEIR OWN EXPENSE, FOR THE REMOVAL AND REINSTALLATION OF ANY PART OF THEIR WORK IF SAME WAS INSTALLED WITHOUT CONSULTING WITH OTHER TRADES BEFORE INSTALLING THEIR WORK.

7.

CONTRACTOR SHALL PROVIDE SLEEVES IN BEAMS, FLOORS, COLUMNS AND WALLS AS SHOWN ON THE DRAWINGS, AS REQUIRED BY JOB SITE CONDITIONS, AND/OR AS SPECIFIED, WHEN INSTALLING THEIR WORK. ALL BEAMS AND COLUMNS WHICH ARE REQUIRED TO BE SLEEVED SHALL BE CUT AND REINFORCED AS REQUIRED BY FIELD CONDITIONS AND LOCATIONS AND SIZES SHALL BE CHECKED AND APPROVED BY ARCHITECT BEFORE CONTRACTOR CUTS ANY STRUCTURAL BUILDING MEMBER.

8.

THE SEQUENCE FOR THE INSTALLATION OF ALL WORK SHALL BE COORDINATED BETWEEN ALL CONTRACTORS ON THE PROJECT AND IN STRICT ACCORDANCE WITH ARCHITECT/ENGINEER AND OWNERS STIPULATION AS DIRECTED.

9.

CONTRACTOR SHALL REFER TO THE ARCHITECTURAL AND STRUCTURAL CONTRACT DRAWINGS (BEFORE SUBMITTING THEIR BIDS) TO FAMILIARIZE THEMSELVES WITH THE EXTENT OF THE GENERAL CONTRACTOR'S WORK, CEILING HEIGHTS AND CLEARANCE FOR INSTALLING THEIR WORK.

10.

CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ALL CORING, CUTTING, PATCHING, REPAIRING, REFINISHING AND REMOVAL/REPLACEMENT OF NEW OR EXISTING BUILDING CONSTRUCTION REQUIRED TO ACCOMMODATE THE INSTALLATION OR REMOVAL OF THEIR WORK. ALL PATCHING, REPAIRING AND REFINISHING WORK SHALL BE PERFORMED BY THOSE REGULARLY INVOLVED IN THAT TRADE AND SHALL MATCH THE ADJACENT CONSTRUCTION AS CLOSELY AS POSSIBLE. CARE SHALL BE TAKEN SO AS NOT TO DAMAGE ANY EXISTING BUILDING CONSTRUCTION OR ITEMS THAT ARE TO REMAIN. ANY EXISTING FINISHES THAT ARE DAMAGED DURING THE INSTALLATION OF NEW WORK OR REMOVAL OF EXISTING WORK SHALL BE REPAIRED, REPLACED AND PAID FOR BY THE INSTALLING CONTRACTOR, TO THE SATISFACTION OF THE ARCHITECT AND OWNER. REFER TO ARCHITECTURAL DRAWINGS FOR EXISTING BUILDING CONSTRUCTION THAT IS TO REMAIN AND, THEREFORE, SUBJECT TO PATCHING, REPAIRING, REFINISHING, AND REMOVAL/REPLACEMENT. (NOTE: CONTRACTOR SHALL VERIFY EXISTING BUILDING'S ROOF WARRANTY AND EMPLOY OTHER SUBCONTRACTOR(S) AS REQUIRED BY ROOF MANUFACTURER'S REPRESENTATIVE SO AS NOT TO VOID OWNER'S ROOF WARRANTY.)

11.

SOME OF THE EXISTING ITEMS AND EQUIPMENT SCHEDULED TO BE REMOVED SHALL BE TURNED OVER TO THE OWNER. ANY ITEMS THAT THE OWNER WANTS TO RETAIN SHALL BE REMOVED CAREFULLY SO AS NOT TO DAMAGE THEM. ALL OTHER ITEMS TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED FROM THE SITE.

12.

CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR OWN CLEAN-UP DURING CONSTRUCTION. IF CONTRACTOR FAILS TO PROVIDE SUCH CLEAN-UP, THE ARCHITECT/ENGINEER WILL DIRECT ANOTHER CONTRACTOR TO PERFORM THE CLEAN-UP AND THE NEGLIGENT CONTRACTOR SHALL PAY THE ASSOCIATED BACK-CHARGES AS DEEMED APPROPRIATE BY THE ARCHITECT/ENGINEER.

13.

CONTRACTOR SHALL INSTALL ALL AUXILIARY SUPPORTING STEEL AS REQUIRED FOR THE SUPPORTING OF THEIR PIPING, DUCTWORK, CONDUIT, TANKS, EQUIPMENT, ETC. ALL SUPPORTING STEEL FOR ITEMS ABOVE A SUSPENDED CEILING SHALL BE FROM BUILDING STRUCTURAL MEMBERS ONLY.

14.

IT IS MANDATORY THAT THE COMPLETE EXISTING BUILDING REMAIN IN CONTINUOUS AND NON-INTERRUPTED OPERATION DURING REMODELING/ALTERING OF SAID EXISTING BUILDING. THE SPECIFIC AREA(S) BEING REMODELED/ALTERED AT ANY SCHEDULED TIME ARE OBVIOUSLY EXCLUSIVE OF THIS STATEMENT. SERVICES TO EXISTING BUILDING SHALL BE KEPT IN CONTINUOUS OPERATION INCLUDING POWER, SIGNAL SYSTEMS, LIGHTING, TELEPHONE, HEATING, COOLING, VENTILATING, TEMPERATURE CONTROL, SEWERS AND HOT AND COLD WATER. ANY ABSOLUTELY NECESSARY INTERRUPTION OF THESE SERVICES TO ACCOMPLISH CONTRACT WORK SHALL BE ARRANGED WITH THE OWNER A MINIMUM OF TEN (10) WORKING DAYS IN ADVANCE. SUCH INTERRUPTIONS SHALL BE KEPT TO AN ABSOLUTE MINIMUM AS FAR AS TIME INTERVAL IS INVOLVED AND TEMPORARY SERVICES SHALL BE FURNISHED AND INSTALLED UNDER THIS CONTRACT WHERE NECESSARY TO ACCOMPLISH THIS PURPOSE. TEMPORARIES SHALL BE REMOVED BY THE CONTRACTOR ONLY AFTER NEW PERMANENT SERVICES ARE INSTALLED AND FULLY OPERATIONAL.

15.

UNLESS INDICATED OTHERWISE, THE ARCHITECT/ENGINEER MAKES NO REPRESENTATION AS TO WHETHER OR NOT ANY HAZARDOUS OR CONTAMINATED MATERIALS (INCLUDING BUT NOT LIMITED TO ASBESTOS, PCB'S, CONTAMINATED SOILS, ETC.) ARE PRESENT WITHIN THE EXISTING BUILDING OR ON THE SITE. WORK SHOWN ON THE DRAWINGS AND/OR INDICATED IN THE SPECIFICATIONS SHALL NOT BE CONSTRUED TO CALL FOR CONTACT WITH ANY OF THESE MATERIALS. IF THESE MATERIALS ARE ENCOUNTERED OR SUSPECTED, THE CONTRACTOR SHALL NOT DISTURB THEM AND SHALL CONTACT THE ARCHITECT/ENGINEER IMMEDIATELY.
16.

WHERE WORK CALLED FOR ON THE DRAWINGS OR IN THE SPECIFICATIONS INVOLVES THE REMOVAL OR RELOCATION OF PIPING OR EQUIPMENT CONTAINING REFRIGERANT, ALL REFRIGERANT SHALL BE RECOVERED BY APPROVED METHODS PER EPA REGULATIONS.

17.

CONTRACTOR SHALL STORE ALL MATERIALS AND EQUIPMENT SHIPPED TO THE SITE IN A PROTECTED AREA. IF MATERIAL IS STORED OUTSIDE OF THE BUILDING, IT MUST BE STORED OFF THE GROUND A MINIMUM OF SIX INCHES (6") SET ON 6 X 6 PLANKS AND/OR WOOD PALLETS. ALL MATERIAL AND EQUIPMENT MUST BE COMPLETELY COVERED WITH WATERPROOF TARPS OR VISQUIN. ALL PIPING AND DUCTWORK WILL HAVE THE ENDS CLOSED TO KEEP OUT DIRT AND OTHER DEBRIS. NO EQUIPMENT WILL BE ALLOWED TO BE STORED OUTSIDE THE BUILDING ON THE SITE UNLESS IT IS SUPPORTED OFF THE GROUND AND COMPLETELY PROTECTED WITH WEATHERPROOF COVERS.

18.

THE DRAWINGS, SCHEDULES AND SPECIFICATIONS HAVE BEEN PREPARED USING ONE MANUFACTURER FOR EACH PIECE OF EQUIPMENT AS THE BASIS FOR DIMENSIONAL DESIGN. IF THE CONTRACTOR PURCHASES EQUIPMENT FROM A SPECIFIED ACCEPTABLE MANUFACTURER, BUT NOT THE SCHEDULED MANUFACTURER USED FOR THE BASE DESIGN, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CHECKING ALL THE DIMENSIONS OF THE EQUIPMENT TO VERIFY THAT IT WILL FIT IN THE SPACE SHOWN ON THE DRAWINGS. MINOR DEVIATIONS IN DIMENSIONS WILL BE PERMITTED, PROVIDED THE RATINGS MEET THOSE SHOWN ON THE DRAWINGS AND EQUIPMENT WILL PHYSICALLY FIT INTO THE SPACE ALLOCATED WITH SUITABLE ACCESS AROUND EQUIPMENT FOR OPERATION AND MAINTENANCE OF THE EQUIPMENT. WHEN EQUIPMENT SUBMITTED FOR REVIEW DOES NOT MEET THE PHYSICAL SIZE OR ARRANGEMENT OF THAT SCHEDULED AND SPECIFIED, CONTRACTOR SHALL PAY FOR ALL ALTERATIONS REQUIRED TO ACCOMMODATE SUCH EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR WILL ALSO PAY ALL COSTS FOR ADDITIONAL WORK REQUIRED BY OTHER CONTRACTORS, OWNER, ARCHITECT OR ENGINEER TO MAKE CHANGES WHICH WOULD ALLOW THE EQUIPMENT TO FIT IN THE SPACE AND FUNCTION AS INTENDED.

19.

CONTRACTOR AND/OR MANUFACTURER SHALL VERIFY THAT THE CHARACTERISTICS OF THE EQUIPMENT HE SUBMITS FOR REVIEW MEET THE CAPACITY AND DUTY SPECIFIED. WHEN EQUIPMENT SUBMITTED FOR REVIEW REQUIRES MODIFICATIONS TO THE WORK OF OTHER CONTRACTORS, SUBMITTING CONTRACTOR SHALL PAY FOR ALL COSTS FOR ADDITIONAL WORK REQUIRED BY OTHER CONTRACTORS, OWNER, ARCHITECT OR ENGINEER TO MAKE CHANGES WHICH WOULD ALLOW THE EQUIPMENT FUNCTION SAFELY AND PROPERLY.

20.

CONTRACTOR SHALL FIELD VERIFY THE SIZE OF EXISTING OPENINGS, WINDOWS, DOORS, CORRIDORS, ROOMS, ETC. FOR ACCESS OF THE NEW EQUIPMENT INTO OR REMOVAL OF EXISTING EQUIPMENT FROM THE BUILDING. IF OPENINGS ARE TOO SMALL FOR ACCESS THEN CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROVIDE NEW OR ENLARGED OPENINGS AND RESTORE SAME TO ORIGINAL SIZE AND CONDITION. CONTRACTOR MAY ELECT TO ORDER THE EQUIPMENT DISASSEMBLED AND/OR WITH SPLIT HOUSING FOR ENTRANCE INTO THE EXISTING SPACE OR BUILDING. CONTRACTOR SHALL REASSEMBLE EQUIPMENT AFTER IT IS IN THE SPACE AT HIS OWN EXPENSE.

21.

CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND THEIR ASSOCIATED FEES.

22.

CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF SHOP DRAWINGS OF ALL EQUIPMENT, TEMPERATURE CONTROL SYSTEM, BOILERS, VALVING, FLUE PIPING, PANELBOARDS, ELECTRICAL DEVICES TO ENGINEER FOR APPROVAL PRIOR TO ORDERING ANY ITEMS OR FABRICATING ANY DUCTWORK/PIPING.

23.

CONTRACTOR SHALL PROVIDE OWNER TRAINING ON ALL EQUIPMENT AND BUILDING SYSTEMS PROVIDED/ALTERED BY HIS WORK. TRAINING SHALL BE ACCOMPLISHED DURING TIME DEDICATED FOR THAT PURPOSE, NOT IN CONJUNCTION WITH SERVICE WORK. SEE SPECIAL TEMPERATURE CONTROL TRAINING INSTRUCTIONS ELSEWHERE.

24.

AT COMPLETION OF PROJECT, CONTRACTOR SHALL SUBMIT ELECTRONIC COPIES OF OPERATION AND MAINTENANCE MANUALS FOR ALL WORK PROVIDED BY HIM ON PROJECT. MANUALS SHALL BE CLEARLY ORGANIZED AND CONTAIN COPIES OF APPROVED EQUIPMENT, SHOP DRAWINGS, EQUIPMENT PARTS LISTS, SERVICE CONTACTS, CONTRACTOR AND MANUFACTURER WARRANTIES, AND "AS BUILT" FLOOR PLANS.

25.

CONTRACTOR SHALL PROVIDE WARRANTY FOR ALL MATERIAL AND GUARANTEE ALL WORKMANSHIP PROVIDED BY HIM FOR 1 (ONE) YEAR FROM SUBSTANTIAL COMPLETION OF WORK INVOLVED.

26.

CONTRACTOR SHALL MAINTAIN A CURRENT LICENSE THROUGHOUT ALL PHASES OF CONSTRUCTION WITH THE CODE ENFORCING BODY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO COORDINATE ALL INSPECTIONS WITH CODE ENFORCING BODY.

27.

IDENTIFY ALL PIPING AND DUCTWORK WITH PLASTIC LABELS INDICATING CONTENTS AND FLOW DIRECTION. MARKERS TO BE PLACED AT A MAXIMUM OF 50 FT. INTERVALS AT BRANCH CONNECTIONS, AND AT BOTH SIDES OF WALL/FLOOR PENETRATIONS. IDENTIFY VALVES, EQUIPMENT, AND PANELS WITH ENGRAVED 3-LAYER PLASTIC LAMINATED TAGS OR SIGNS.
- GENERAL NOTES - HVAC WORK:
1.

ALL NEW WORK AND MATERIALS SHALL CONFORM TO COMMUNITY COLLEGE CODE AND MCHENRY COUNTY COLLEGE BUILDING STANDARDS.

2.

CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS AND INSPECTIONS AND PAYING THEIR ASSOCIATED FEES.

3.

NOISE AND VIBRATION WILL NOT BE TOLERATED. CONTRACTOR SHALL BID ON FURNISHING EVERY DETAIL TO ASSURE THIS END.

4.

PATCH AND REFINISH ALL DAMAGED INSULATED SURFACES OF ALL EXISTING PIPING AND ASSOCIATED FITTINGS TO MATCH EXISTING WHERE NEW CONNECTIONS ARE BEING MADE.

5.

CONTRACTORS SHALL PROVIDE A ONE YEAR WARRANTY ON ALL MATERIALS, EQUIPMENT AND LABOR FROM DATE OF SUBSTANTIAL COMPLETION OF WORK EXCEPT AS FOLLOWS:

a.

PROVIDE 10 YEAR PARTS AND LABOR WARRANTY FOR BOILER HEAT EXCHANGERS.

b.

THE FLUE AND STACK PIPING SHALL BE WARRANTED AGAINST FUNCTIONAL FAILURE DUE TO DEFECTS IN MATERIAL AND MANUFACTURER'S WORKMANSHIP FOR A PERIOD OF 10 YEARS FROM THE DATE OF DELIVERY.

6.

COMBUSTION AIR PIPING SHALL BE SCH. 40 PVC WITH SOLVENT WELDED JOINTS/COUPLINGS.

7.

FLUE PIPING SHALL BE AL29-4C DOUBLE WALL GAS VENT AS MANUFACTURED BY SCHEBLER, SELKIRK - METALBESTOS, AMPCO, OR METALFAB. THE FACTORY BUILT SYSTEM SHALL BE MADE IN ACCORDANCE WITH NFPA 211. THIS STACK SYSTEM SHALL BE DESIGNED AND INSTALLED TO BE GAS TIGHT. IT SHALL BE UL LISTED TO WITHSTAND UP TO 15" W.C. POSITIVE PRESSURES. THIS SYSTEM SHALL BE DESIGNED TO COMPENSATE FOR ALL FLUE GAS INDUCED THERMAL EXPANSIONS. AIR GAP BETWEEN INNER AND OUTER PIPE SHALL BE 1 INCH THICK. CLEARANCES TO COMBUSTIBLE MATERIALS SHALL BE PER INSTALLATION INSTRUCTIONS. THE JOINT ASSEMBLY SHALL BE A MALE/FEMALE SLIP-TYPE JOINTING WITH MECHANICALLY GASKETED FLANGE TO FLANGE AND V-BAND ASSEMBLY (CAULKED OR SCREWED JOINTS ARE NOT ACCEPTABLE). AN INTERNAL SLEEVE SERVES FOR READILY ALIGNMENT AS WELL AS LONG TERM JOINT SEAL PROTECTION FROM CONDENSATE, WATER AND FLUE GAS TEMPERATURE. THE DOUBLE WALL STACK HAS AN INNER GAS CARRYING PIPE OF 24 GAUGE TYPE AL29-4C. THE OUTER JACKET SHALL BE 24 GAUGE 304 STAINLESS STEEL. THE MATERIALS AND CONSTRUCTION OF THE MODULAR SECTIONS AND ACCESSORIES SHALL BE AS SPECIFIED BY THE TERMS OF THE PRODUCT'S UL LISTING. PITCH FLUE PIPING TOWARD BOILER AS REQUIRED BY FLUE MANUFACTURER'S INSTALLATION INSTRUCTION, BUT NOT LESS THAN 1/4" PER FOOT.

8.

HOT WATER HEATING SUPPLY AND RETURN PIPING SHALL BE SCHEDULE 40 BLACK STEEL OR TYPE "L" COPPER, INSULATED WITH 1" THICK FIBERGLASS WITH ALL SERVICE JACKET. PROVIDE DIELECTRIC NIPPLES OR BRASS VALVES BETWEEN DISSIMILAR PIPE MATERIALS.

9.

NATURAL GAS PIPING SHALL BE SCHEDULE 40 BLACK AND CONFORM WITH ASTM STANDARDS WELDED FOR PIPE SIZES 2 1/2" AND OVER AND SCREWED FOR PIPE SIZES 2" AND UNDER.

10.

ALL PIPING SHALL BE SUSPENDED WITH CLEVIS AND/OR TRAPEZE PIPE HANGERS. INSULATED PIPING SHALL REST ON SHEET METAL INSULATION SHIELDS. ANCHORS SHALL BE DRILLED INTO EXISTING FLOOR CONSTRUCTION.

11.

PITCH ALL SUPPLY AND RETURN WATER LINES TO DRAIN COMPLETELY THROUGH LOWER EQUIPMENT, UNIONS, OR DRAIN VALVES. INSTALL A 1/2" DRAIN VALVE WITH HOSE THREAD OUTLET IN ALL MAIN PIPING RUNS WHICH WOULD NOT BE ABLE TO DRAIN THRU A LOWER PIECE OF EQUIPMENT. PROVIDE MANUAL AIR VENTS IN ALL PIPE DROPS IN DIRECTION OF FLOW.

12.

ALL HOT WATER SUPPLY AND HOT WATER RETURN PIPING SHALL BE INSTALLED TO COMPENSATE FOR EXPANSION OF THE PIPE BY INSTALLING PIPE ANCHORS, GUIDES, EXPANSION JOINTS OR LOOPS AND PIPE OFFSETS AS REQUIRED BY FIELD CONDITIONS OR AS SHOWN ON THE DRAWINGS.

13.

FLUSH, CLEAN, PRESSURE TEST AND CHARGE ALL NEW PIPING SYSTEMS AND EXTENSION TO PIPING SYSTEMS. TESTING SHALL BE MINIMUM 50 PSI HIGHER THAN NORMAL OPERATING PRESSURE OF SYSTEM.

14.

BALL OR BUTTERFLY VALVES SHALL BE STOCKHAM, MILWAUKEE, OR NIBCO WITH BRONZE BODY, STAINLESS STEEL BALL, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE, SOLDER OR ENDS WITH UNION.

15.

ALL CIRCUIT SETTERS SHALL BE BELL AND GOSSETT.

16.

VENT GAS SHUT-OFF VALVE AT EACH PIECE OF EQUIPMENT AND PRESSURE REGULATORS WHERE REQUIRED. PROVIDE ALL PRESSURE REGULATORS WITHIN THE BUILDING FULL SIZE TO BUILDING EXTERIOR.

17.

BALANCE HOT WATER HEATING SYSTEM TO ACCOMPLISH WATER FLOW SHOWN AT ALL TERMINALS AS SHOWN ON DRAWINGS AND SUBMIT TEST REPORT FOR REVIEW BY OWNER AND ENGINEER.

18.

FLUSH/CLEAN ALL PORTIONS OF NEW SYSTEM WITH HOH C-312 (OR EQUAL) CLEANER ADMINISTERED IN ACCORDANCE WITH CHEMICAL TREATMENT SUB-CONTRACTOR'S RECOMMENDATIONS. WHERE NEW SYSTEMS CONNECT TO EXISTING, TEMPORARY HOSE SHALL LOOP SUPPLY/RETURN PIPING TO FLUSH ENTIRE SYSTEM. PROVIDE NEW HYDRONIC CHEMICAL INHIBITORS AS REQUIRED TO MAINTAIN INTEGRITY OF EXISTING HYDRONIC SYSTEM - COORDINATE WITH OWNER.
- HVAC SYMBOLS AND ABBREVIATIONS
- |      |                               |      |                                |
|------|-------------------------------|------|--------------------------------|
| AS   | AIR SEPARATOR                 | HWR  | HOT WATER RETURN               |
| BAS  | BUILDING AUTOMATION SYSTEM    | HWS  | HOT WATER SUPPLY               |
| BTU  | BRITISH THERMAL UNIT          | LWT  | LEAVING WATER TEMPERATURE      |
| BTUH | BRITISH THERMAL UNIT PER HOUR | MCA  | MINIMUM CIRCUIT AMPS           |
| DB   | DRY BULB                      | MOC  | MAXIMUM OVERCURRENT PROTECTION |
| DN.  | DOWN                          | PD   | PRESSURE DROP                  |
| EAT  | ENTERING AIR TEMPERATURE      | PH   | PHASE                          |
| ET   | EXPANSION TANK                | PSI  | POUNDS PER SQUARE INCH         |
| EWT  | ENTERING WATER TEMPERATURE    | RP1  | REVOLUTIONS PER MINUTE         |
| F    | FAHRENHEIT                    | TC   | TEMPERATURE CONTROL            |
| GPM  | GALLONS PER MINUTE            | TYP. | TYPICAL                        |
| HP   | HORSEPOWER                    | WB   | WET BULB                       |
| HWB  | HOT WATER BOILER              | W.C. | WATER COLUMN                   |
| HWP  | HOT WATER CIRCULATING PUMP    | WG   | WATER GAUGE                    |
- |  |     |  |
|--|-----|--|
|  | HWS | HOT WATER SUPPLY   |
|  | HWR | HOT WATER RETURN   |
|  | MU  | MAKE-UP WATER  |
|  | G   | NATURAL GAS  |
|  | D   | DRAIN LINE   |
|  |     | BALL VALVE (2" & SMALLER)<br>BUTTERFLY VALVE (2 1/2" & LARGER)   |
|  |     | CIRCUIT BALANCING VALVE W/BALANCING PORTS (8" AND UNDER)<br>CIRCUIT FLOW INDICATOR W/BALANCING PORTS AND MEMORY STOP BUTTERFLY VALVE FOR BALANCING (10" AND ABOVE) |
|  |     | PRESSURE RELIEF VALVE (PIPE TO FLOOR DRAIN)  |
|  |     | DRAIN VALVE WITH HOSE THREADED OUTLET  |
|  |     | PIPE UNION (OR FLANGES IF 2 1/2" OR LARGER PIPE)   |
|  |     | PRESSURE GAUGE AND NEEDLE VALVE  |
|  |     | THERMOMETER (WITH PIPE WELL)   |
|  |     | THERMOMETER WELL   |
|  |     | PRESSURE/TEMPERATURE PLUG WITH CAP   |
- GENERAL NOTES - TEMPERATURE CONTROL:
1.

ALL WORK SHALL CONFORM TO THE LATEST EDITION OF NATIONAL ELECTRIC CODE AND COMMUNITY COLLEGE BUILDING CODE.

2.

BAS LOW VOLTAGE WIRING SHALL BE U/L LISTED, LOW SMOKE PRODUCING, PLENUM RATED. WIRING SHALL BE IN CONDUIT WHERE EXPOSED IN EQUIPMENT ROOMS OR CONCEALED IN WALLS, CHASES, OR ABOVE NON-ACCESSIBLE CEILINGS. LOW VOLTAGE PLENUM RATED WIRING MAY BE INSTALLED WITHOUT CONDUIT ABOVE ACCESSIBLE LAY-IN CEILING SPACES ONLY.

3.

ALL CONDUIT SHALL BE LOCATED SO AS NOT TO INTERFERE WITH ANY EQUIPMENT SERVICE ACCESS AREAS. CONDUIT FOUND BLOCKING ACCESS AREAS SHALL BE REROUTED AT INSTALLING CONTRACTOR'S EXPENSE.

4.

GENERAL REQUIREMENTS:

A.

APPROVED INSTALLING CONTRACTOR: TRANE CHICAGO, 7100 MADISON, WILLOWBROOK, IL 60521, 630-734-3200.

B.

CONTRACTOR TO EXTEND AND MODIFY EXISTING WEB-BASED TRANE SUMMIT SYSTEM TO SERVE ALL NEW EQUIPMENT AND COMPONENTS.

C.

CONTRACTOR SHALL REMOVE ALL EXISTING RELAYS, DEVICES, AND CONTROL CONDUIT THROUGHOUT THE BUILDING WHICH SERVED EQUIPMENT OR DEVICES REMOVED EITHER IN THE PAST OR AS PART OF THIS PROJECT.

D.

CONTRACTOR SHALL PROVIDE ON SITE OWNER TRAINING FOR 2 PEOPLE FOR A TOTAL OF 2 HOURS INITIALLY AND ANOTHER 1/2 DAY (4 HOURS) AT TIMES OF OWNER'S CHOOSING WITHIN THE FIRST YEAR. TRAINING SHALL BE ACCOMPLISHED DURING TIME DEDICATED FOR THAT PURPOSE, NOT IN CONJUNCTION WITH SERVICE WORK.

5.

SEQUENCE OF OPERATION: REVISED HOT WATER BOILER SYSTEM

1.

GENERAL:

a.

STARTING/STOPPING OF SYSTEM SHALL OPERATE AS CURRENTLY CONFIGURED. SECONDARY HOT WATER PUMPS SHALL START/STOP/SEQUENCE AS CURRENTLY CONFIGURED AND BAS SHALL SEND SIGNAL TO BOILER CONTROLLER TO START BOILER SYSTEM. PROVIDE ANY NEW RELAY/WIRING/ETC. REQUIRED TO MAINTAIN EXISTING SEQUENCE.

b.

NEW BOILER SYSTEM SHALL BE FURNISHED WITH BACnet INTERFACE. TEMPERATURE CONTROL CONTRACTOR TO MAP ALL AVAILABLE POINTS TO GRAPHIC SCREEN.

c.

SYSTEM GRAPHICS SCREEN WILL BE MODIFIED AS REQUIRED TO PROPERLY REFLECT MODIFICATION TO PIPING/EQUIPMENT UNDER THIS PROJECT.

2.

BOILER SYSTEM OPERATION:

a.

STARTING OF SYSTEM SHALL START LEAD BOILER CIRCULATION PUMP. UPON PROOF OF FLOW BASED ON FLOW SWITCH OR CURRENT SENSOR AT PUMP, ASSOCIATED LEAD BOILER SHALL BE ENABLED AND START ON LOW FIRE. LAG HOT WATER BOILERS SHALL BE ENABLED, BUT REMAIN OFF UNTIL BOILER IS CALLED TO FIRE BY BOILER SEQUENCING PANEL. UPON PROOF OF FLOW IN PRIMARY BOILER LOOP, CONTROL OF SYSTEM SHALL REVERT TO HOT WATER SUPPLY TEMPERATURE CONTROLLER.

b.

BOILER MANUFACTURER'S BACnet SEQUENCING CONTROLLER SHALL START/STOP/MODULATE BOILERS AS REQUIRED TO MAINTAIN HIGHEST EFFICIENCY OF SYSTEM WHILE MAINTAINING HOT WATER SYSTEM TEMPERATURE SETPOINT. BOILER SEQUENCING CONTROLLER SHALL START LAG BOILER CIRCULATION PUMPS PRIOR TO FIRING ANY LAG BOILER.

c.

IF FLOW HAS NOT BEEN ESTABLISHED AFTER 30 SECONDS OF SIGNAL TO START LEAD BOILER, NEXT LAG BOILER SHALL BE STARTED AND THE BAS SYSTEM SHALL SIGNAL ALARM.

d.

WHEN ANY BOILER STOPS, ITS ASSOC. CIRCULATION PUMP SHALL REMAIN IN OPERATION FOR 10 MINUTES (ADJ.) BEFORE STOPPING.

4.

HOT WATER SUPPLY TEMPERATURE SETPOINT OPTIMIZATION. HOT WATER SUPPLY TEMPERATURE SETPOINT SHALL BE CONTROLLED IN ONE OF TWO SELECTABLE WAYS FROM THE BAS SYSTEM:

a.

METHOD 1: HOT WATER TEMPERATURE SHALL BE RESET AS REQUIRED TO KEEP THE 'CRITICAL ZONE' CONTROL VALVE 'X6' OPEN. THE 'CRITICAL ZONE' SHALL BE DETERMINED BY POLLING ALL VAV/FPB/AHU VALVES THRU THE BAS SYSTEM TO SEE WHICH ZONE REQUIRES THE MOST HEATING.

b.

METHOD 2 - OUTSIDE AIR TEMPERATURE RESET: THE HOT WATER SUPPLY TEMPERATURE SHALL BE LINEARLY MODULATED FROM 180 DEGREES F (ADJ.) AT 0 DEGREES F (ADJ.) OUTSIDE AIR TEMPERATURE TO 120 DEGREES F (ADJ.) AT 65 DEGREES (ADJ.) OUTSIDE AIR TEMPERATURE. TEMPERATURE CONTROL CONTRACTOR SHALL PROVIDE NEW O.A. SENSOR ON SHADED NORTHERN FACE OF BUILDING IF NO O.A. SENSOR CURRENTLY EXISTS.

c.

SYSTEM GRAPHIC SHALL BE MODIFIED TO PROVIDE A 'VIRTUAL SWITCH' TO ALLOW MAINTENANCE STAFF TO SELECT METHOD OF HOT WATER OPTIMIZATION.

	STRAINER
	STRAINER WITH BLOWDOWN VALVE
	DIRECTION OF FLOW
	PITCH
	PIPE ELBOW (TURNED UP)
	PIPE ELBOW (TURNED DOWN)
	PIPE TEE DOWN (DROP)
	PIPE TEE UP
	PIPE TEE UP OR ANGLE
	PIPE TEE DOWN OR ANGLE
	NEW CONNECTION
	GAS PRESSURE REGULATOR
	EQUIPMENT TAG
	ROUND
	PIPING, DUCTWORK, OR EQUIPMENT TO BE REMOVED

McHENRY COUNTY COLLEGE - BUILDING 'B' 2020 BOILER REPLACEMENT

8900 US HWY 14 - BLDG. 'B' CRYSTAL LAKE, IL 60012

05/29/2020 BID DOCUMENTS  
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Sheet Title  
MECHANICAL/ELECTRICAL  
NOTES, SYMBOLS, AND  
LEGEND

PROJ. MGR: 20/0  
DRAWN BY: 20/0  
CHECKED BY: 20/0

ME-2

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ELECTRICAL SPECIFICATIONS

1. ALL WORK SHALL CONFORM TO THE LATEST EDITION OF NATIONAL ELECTRIC CODE AND ILLINOIS PUBLIC COMMUNITY COLLEGE BUILDING CODE.
2. PROVIDE ALL PERMITS AND INSPECTION FEES.
3. PROVIDE A ONE YEAR WARRANTY ON ALL MATERIALS, EQUIPMENT AND LABOR FROM DATE OF SUBSTANTIAL COMPLETION OF WORK.
4. PROVIDE ALL HIS OWN RIGGING, SCAFFOLDING, RUBBISH REMOVAL AND LEAVE SPACE BROOM CLEAN.
5. MINIMUM SIZE CONDUIT SHALL BE 3/4" E.M.T. PROVIDE IMC FOR CONDUITS 2" AND LARGER OR WHERE EXPOSED TO WET OR DAMP LOCATIONS. E.M.T. FITTINGS SHALL BE COMPRESSION TYPE. IMC SHALL BE THREADED CONNECTIONS. TRANSITION TO LIQUID TIGHT FLEXIBLE METAL CONDUIT FOR FINAL CONNECTION (LAST 6 FEET MAXIMUM) OF CONDUCTORS SERVING EQUIPMENT SUBJECT TO VIBRATION.
6. CONDUITS SHALL BE INSTALLED PERPENDICULAR AND PARALLEL TO BUILDING LINES. ALL CONDUIT INSTALLED OVERHEAD SHALL BE RIGIDLY SUPPORTED FROM THE STRUCTURE ABOVE AND NOT FROM ANY PART OF THE ROOFING SYSTEM OR CEILING SYSTEM. CEILING SYSTEM TO INCLUDE T-BAR GRID, SUPPORT WIRES, ETC.
7. MINIMUM SIZE CONDUCTOR SHALL BE #12 THIN, OR THIN WHERE REQUIRED, WITH #14 USED FOR CONTROL WIRING. CONDUCTOR MATERIAL SHALL BE COPPER ONLY.
8. PROVIDE EQUIPMENT GROUNDING CONDUCTOR IN ALL RACEWAYS.
9. CONDUCTOR SIZES #14AWG, #12AWG AND #10AWG SHALL BE SOLID, CONDUCTOR SIZE #8AWG AND LARGER SHALL BE STRANDED. ALL CONDUCTORS SHALL BE COLOR CODED.
10. CONTRACTOR SHALL PROVIDE ALL NECESSARY CUTTING AND PATCHING INCLUDING SLEEVES AND INSERTS.
11. ALL NEW CIRCUIT BREAKERS SHALL BE BOLT-ON BREAKERS COMPATIBLE WITH EXISTING PANELBOARD. PROVIDE UPDATED TYPEWRITTEN DIRECTORIES IN ALL PANELS.
12. BEFORE SUBMITTING HIS BID, THE CONTRACTOR SHALL VISIT THE SITE TO ASCERTAIN ALL WORK INVOLVED IN THE PROJECT.
13. CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS ON THE PROJECT.
14. CONTRACTOR SHALL MAKE NECESSARY MODIFICATIONS AND ADJUSTMENTS TO ALL ELECTRICAL ITEMS AND EQUIPMENT AS MAY BE REQUIRED BY THIS WORK.
15. ALL ELECTRICAL EQUIPMENT MUST MAINTAIN WORKING CLEARANCES AS REQUIRED BY NEC.
16. FLEXIBLE RACEWAY SYSTEMS SHALL NOT BE USED TO PENETRATE ROOFS, FLOORS AND AIR/MOISTURE BARRIERS.
17. RACEWAY SYSTEMS SHALL NOT BE ROUTED THRU OR IN HVAC DUCTS.
18. NEW FIRE ALARM CABLING SHALL BE PLENUM RATED CABLE OF TYPE COMPATIBLE WITH EXISTING BUILDING FIRE ALARM SYSTEM.
19. NEW FIRE ALARM DEVICE(S) SHALL BE UL LISTED AND OF TYPE AND MANUFACTURER TO MATCH EXISTING. NEW FIRE ALARM DEVICE(S) SHALL BE INTEGRATED INTO EXISTING FIRE ALARM SYSTEM.
20. NEW FIRE ALARM CABLES SHALL BE IN CONDUIT EXCEPT WHERE LOCATED ABOVE ACCESSIBLE CEILINGS. FIRE ALARM CONDUITS SHALL BE 1/2" MINIMUM. JUNCTION BOXES SERVING FIRE ALARM DEVICES SHALL BE RED. PROVIDE #18 AWG MINIMUM SIZE CONDUCTOR FOR INITIATING CIRCUITS AND #12 AWG MINIMUM SIZE CONDUCTOR FOR NOTIFICATION CIRCUITS.
21. STARTERS  
ACCEPTABLE MANUFACTURERS: EATON, SQUARE D, OR SIEMENS

SINGLE-PHASE MOTOR STARTERS: MANUAL TYPE, TOGGLE OPERATED WITH ONE SOLID STATE OVERLOAD ELEMENT AND NEON PILOT LIGHT. SURFACE TYPE IN UNFINISHED AREAS, RECESSED WITH STAINLESS STEEL COVER IN FINISHED AREAS. TWO AUXILIARY CONTACTS FOR CONNECTION TO BUILDING CONTROL SYSTEM.

THREE-PHASE MOTOR STARTERS: FULL VOLTAGE NON-REVERSING TYPE WITH THREE SOLID STATE OVERLOAD ELEMENTS AND MANUAL RESET. 120 VOLT COIL, MANUAL RESET, AND MINIMUM TWO FIELD ADJUSTABLE AUXILIARY CONTACTS. CONTROL TRANSFORMER OBTAINS 120 VOLTS WITH ONE SECONDARY LINE FUSED AND OTHER LINE GROUNDED. HAND/OFF/AUTO SELECTOR SWITCH, START/STOP PUSH BUTTONS, AND PUSH-TO-TEST PILOT LIGHTS IN COVER. AUXILIARY CONTACTS FOR CONNECTION TO BUILDING CONTROL SYSTEM.

PROVIDE PLASTIC ENGRAVED NAME PLATE ON EXTERIOR INDICATING FUSE SIZE, THERMAL OVERLOAD, AND LOAD SERVED.

ENCLOSURES: EXTERIOR USE NEMA 3R OR STAINLESS STEEL. ELSEWHERE USE NEMA TYPE 1 UNLESS NOTED OTHERWISE.

22. PANELBOARDS  
ACCEPTABLE MANUFACTURERS: EATON, SQUARE D, OR SIEMENS

CONTRACTOR SHALL FURNISH AND INSTALL ALL PANELBOARDS AND CABINETS AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.

PANELBOARDS SHALL BE DEAD FRONT, WITH CAPACITY AND VOLTAGE CHARACTERISTICS AS SHOWN ON THE SCHEDULES. MAIN AND NEUTRAL BUS BARS SHALL BE COPPER AND BASED ON A CURRENT DENSITY OF NOT MORE THAN 1000 AMPERES PER SQUARE INCH CROSS SECTION AND SHALL BE FULL CAPACITY FOR THE ENTIRE LENGTH OF THE PANEL. BUSSING SHALL BE SEQUENCED SO AS TO PERMIT THE INSTALLATION OF FUSIBLE SWITCHES OR 1, 2, AND 3 POLE BREAKERS AT ANY LOCATION. LUGS SHALL BE SUITABLE FOR COPPER CABLE. GROUND BARS SHALL BE COPPER.

CIRCUIT BREAKERS SHALL BE QUICK-MAKE/QUICK-BREAK, HACR RATED, TRIP INDICATING AND AMBIENT COMPENSATED, WITH COMMON TRIP ON MULTI-POLE BREAKERS. CIRCUIT BREAKERS SHALL BE BOLT-ON CONNECTED TO THE PANELBOARD, MINIMUM INTERRUPTING CAPACITY SHALL BE 10,000 AIC FOR 120/208 VOLT CIRCUIT BREAKERS. (PLUG-IN BREAKERS ARE NOT APPROVED.)

PANELBOARD BOXES SHALL BE CODE GAUGE, GALVANIZED SHEET STEEL, WITH 4 INCH MINIMUM SIDE GUTTERS AND 5 INCH MINIMUM END GUTTERS. PANELBOARD BOXES SHALL NOT EXCEED 78 INCHES ABOVE FINISHED FLOOR.

EACH BRANCH CIRCUIT SHALL BE DISTINCTLY NUMBERED. PANELBOARD WIRING SHALL BE TAGGED AT EACH BREAKER WITH PROPER CIRCUIT NUMBERING. WRAP AROUND TAPES (BRADY TAGS) WILL BE ACCEPTABLE.

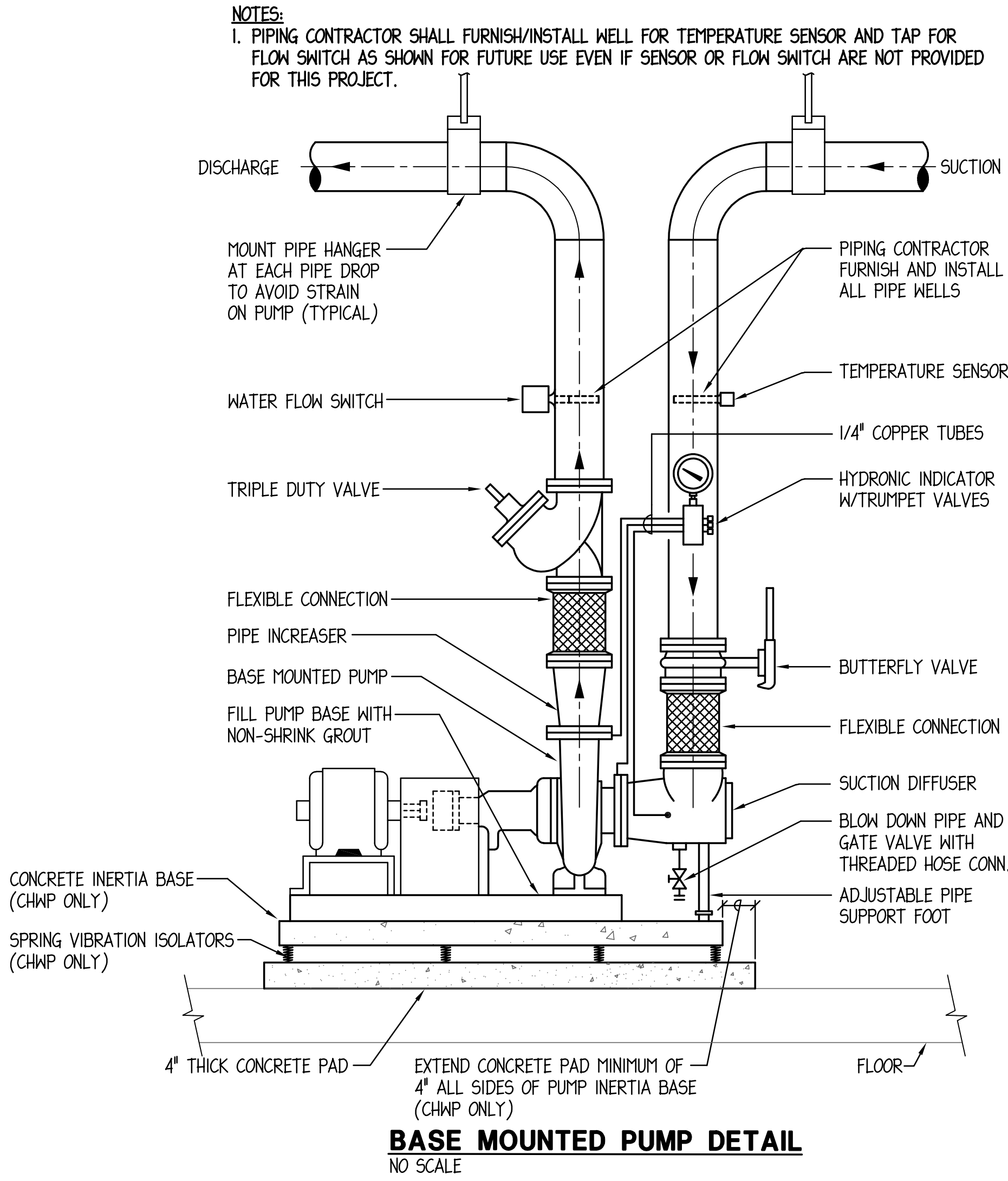
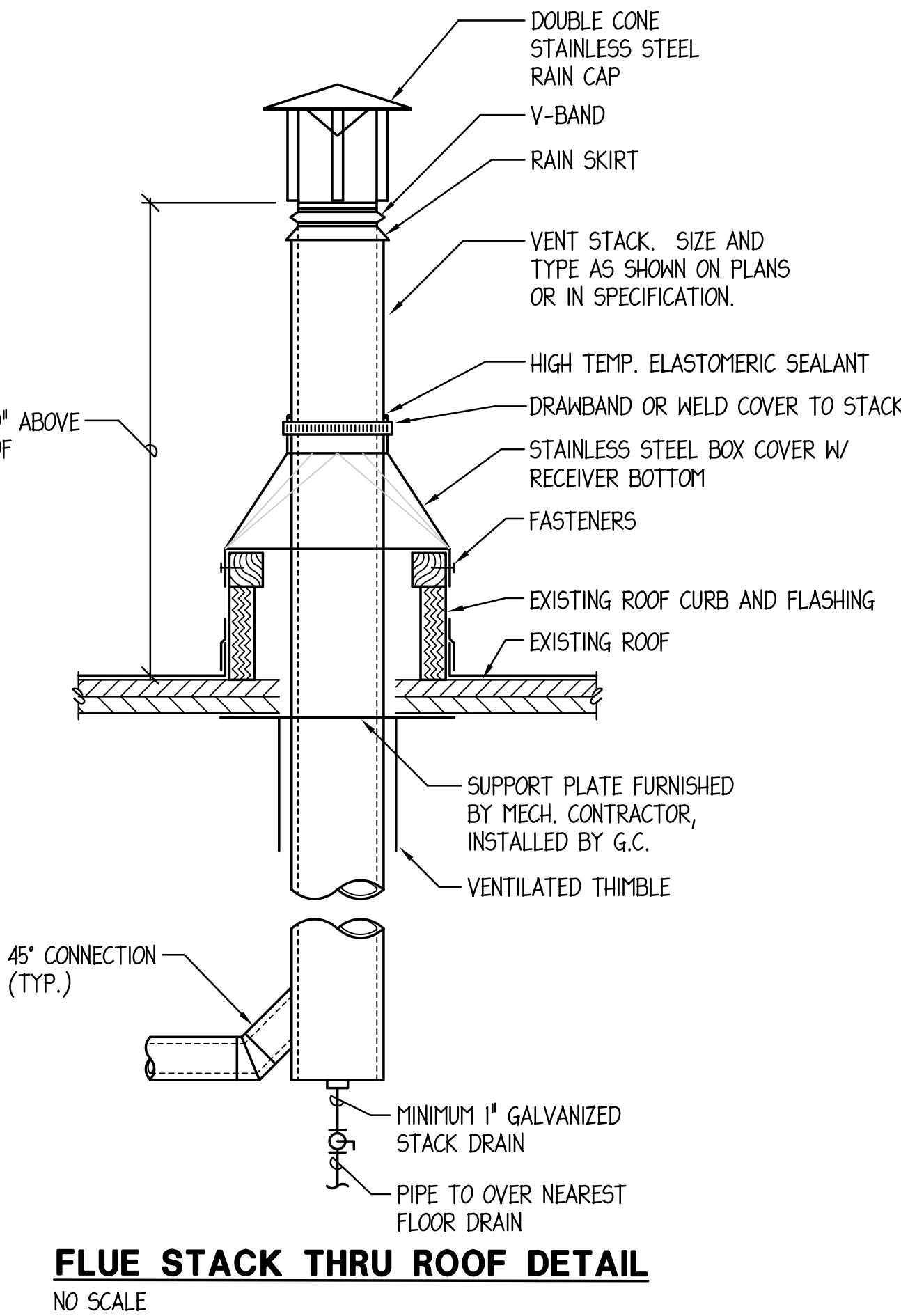
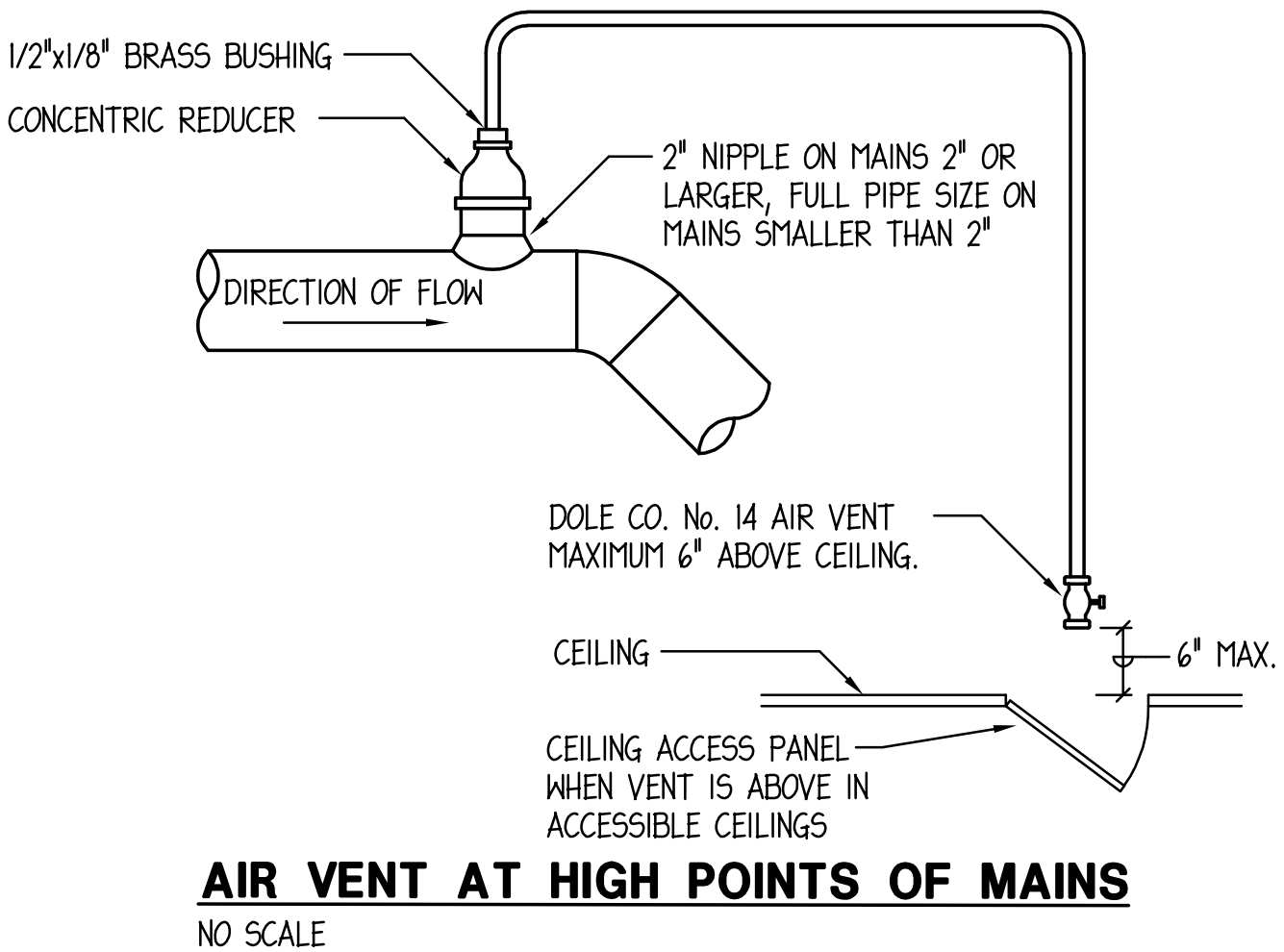
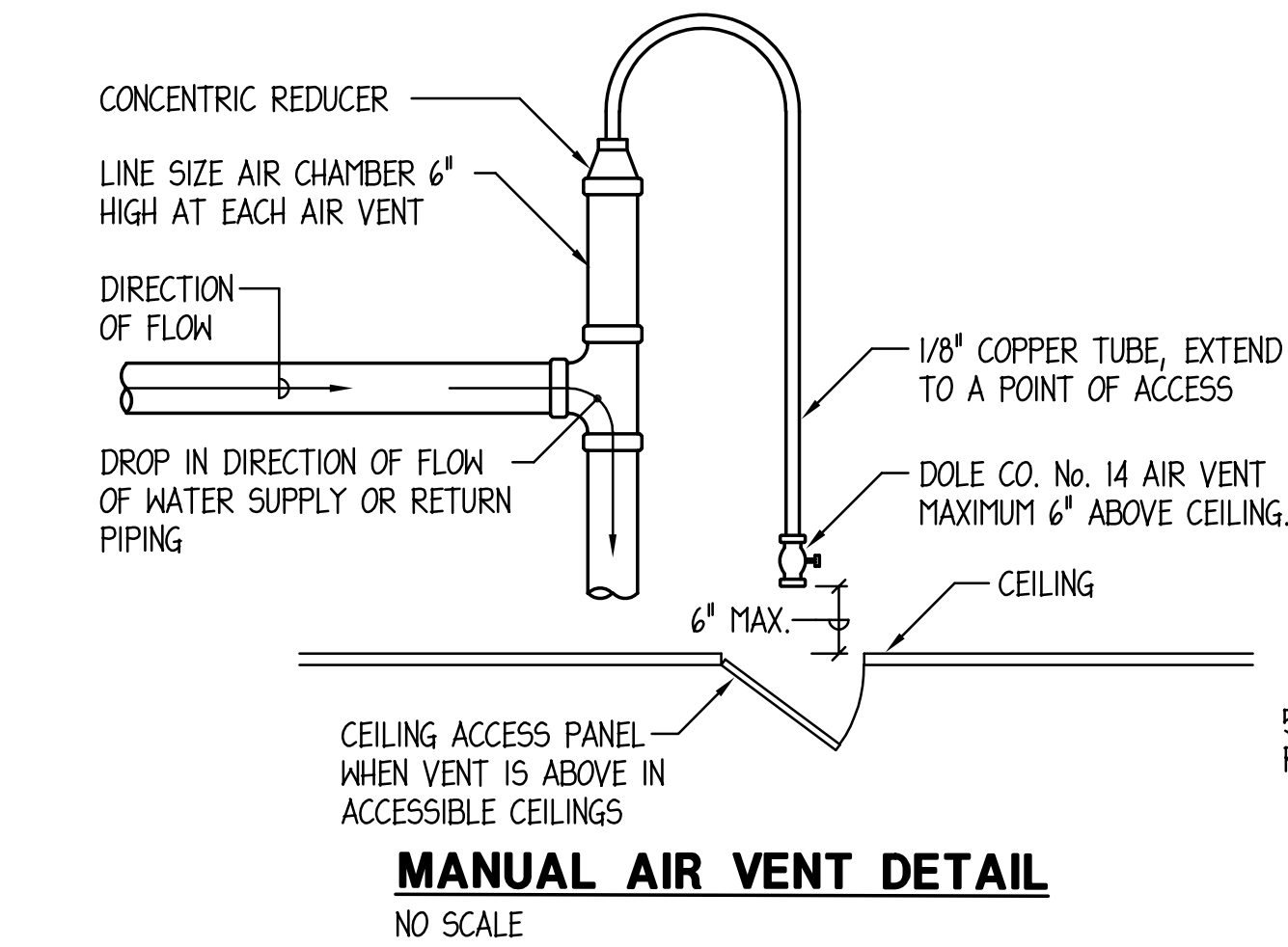
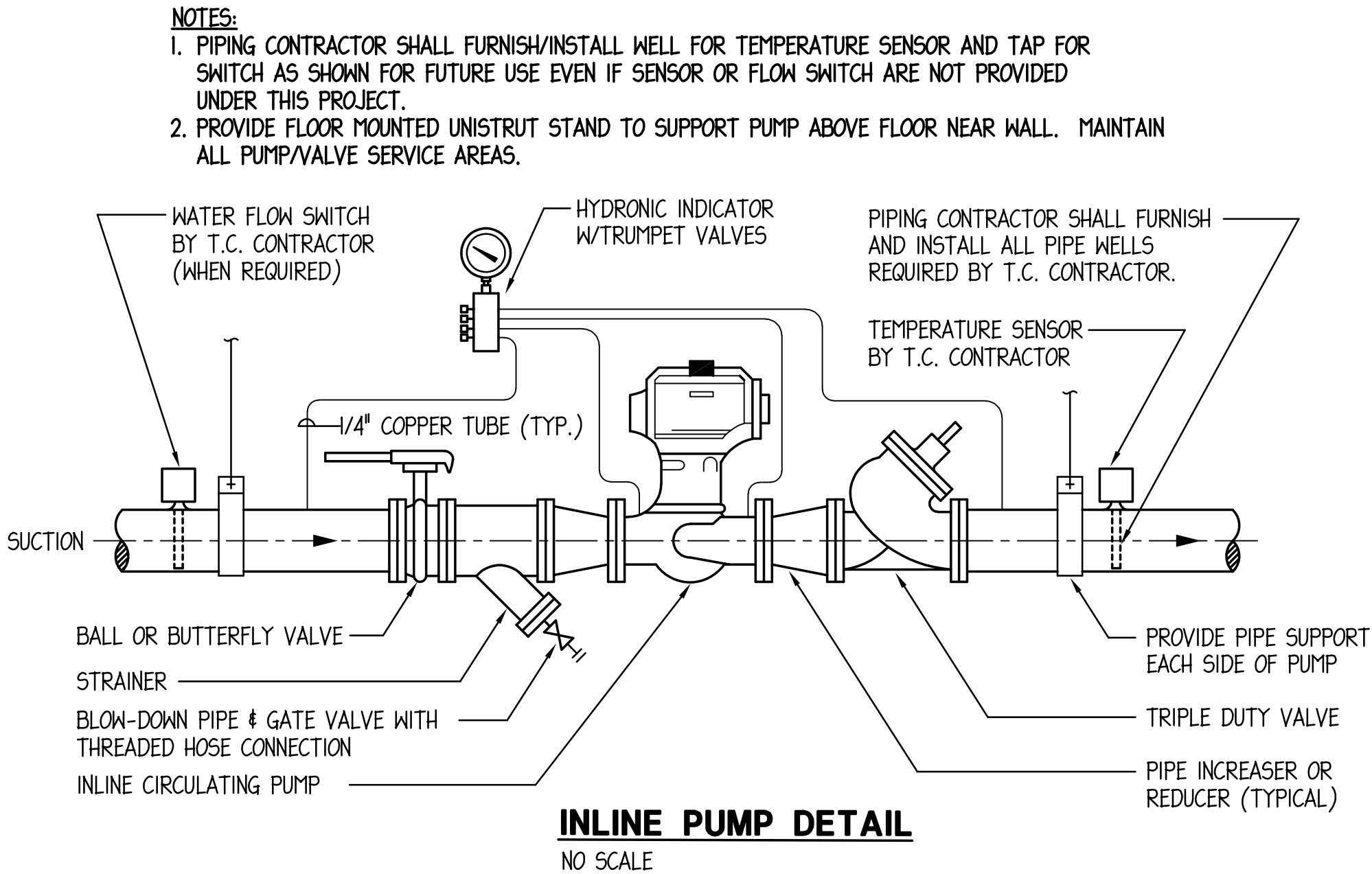
PANELBOARDS SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND AS MAY BE MODIFIED BY THE LOCAL ELECTRICAL CODE, UNDERWRITERS LABORATORIES, AND NEMA, AND SHALL DISPLAY A SERVICE ENTRANCE LABEL WHERE APPLICABLE. EACH PANELBOARD SHALL BE LEFT WITH A TYPEWRITTEN DIRECTORY IDENTIFYING EACH LOAD AFFIXED TO THE INSIDE COVER OF THE PANELBOARD.

PROVIDE A PERMANENT IDENTIFICATION NAMEPLATE ON ALL PANELBOARDS AND DISTRIBUTION PANELS.

CONTRACTOR TO SUBMIT SHOP DRAWINGS ON THIS ITEM.

ELECTRICAL SYMBOL LIST (NOTE: NOT ALL SYMBOLS ARE USED IN THE PROJECT.)

- EMERGENCY FUEL SHUT-OFF MUSHROOM SWITCH.
- MANUAL MOTOR STARTER, THERMAL OVERLOAD TOGGLE SWITCH.
- 20A, 2P, 3 WIRE, GROUNDING TYPE, 125V. COMMERCIAL-GRADE, DUPLEX RECEPTACLE NEMA 5-20R. INSTALLED +16" A.F.F. UNLESS NOTED OTHERWISE.  
- "GFI" DENOTES RECEPTACLE EQUIPPED WITH INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER.  
- "WP" DENOTES RECEPTACLE WITH WHILE-IN-USE WEATHERPROOF COVER.
- COMBINATION MOTOR STARTER WITH FUSED DISCONNECT, AMPERE RATING, NUMBER OF POLES, FUSE SIZE AND NEMA STARTER SIZE AS INDICATED.
- SWITCH FRAME SIZE.
- NUMBER OF FUSIBLE POLES.
- FUSE SIZE.
- NEMA ENCLOSURE RATING. (NEMA 1 STANDARD, 3R OUTDOORS AND WET LOCATIONS U.N.O.)
- FUSIBLE SWITCH RATING TAG.
- NEMA STARTER SIZE.
- MOTOR CONNECTION, HORSEPOWER, VOLTAGE AND PHASE AS NOTED.
- CEILING JUNCTION BOX.
- WALL MOUNTED JUNCTION BOX.
- JUNCTION BOX WITH FLEXIBLE CONDUIT AND FINAL CONNECTION TO EQUIPMENT.
- CONDUIT ROUTED CONCEALED IN WALLS AND CEILING. HASH MARKS DENOTE QUANTITY OF #12 CONDUCTORS OR AS NOTED.
- CONDUIT ROUTED EXPOSED. INSTALL PARALLEL TO WALLS AND CEILINGS. HASH MARKS DENOTE QUANTITY OF #12 CONDUCTORS OR AS NOTED.
- CONDUIT ROUTED BELOW GRADE. HASH MARK DENOTES QUANTITY OF #12 CONDUCTORS OR AS NOTED.
- DENOTES CONDUIT, 3/4" MINIMUM
- DENOTES INSULATED GROUND WIRE, #12 AWG MINIMUM
- LONG TICK MARK DENOTES NEUTRAL CONDUCTOR, #10 AWG MINIMUM
- SHORT TICK MARK DENOTES LINE (HOT) OR SWITCH LEG CONDUCTOR, #12 AWG MINIMUM.
- CIRCUIT BREAKER PANELBOARD.



McHENRY COUNTY  
COLLEGE - BUILDING  
'B' 2020 BOLER  
REPLACEMENT

8900 US HWY 14 - BLG. 'B'  
CRYSTAL LAKE, IL 60012

05/29/2020 BID DOCUMENTS  
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Sheet Title  
MECHANICAL/ELECTRICAL  
NOTES, SYMBOLS, DETAILS,  
AND LEGEND

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ME-3