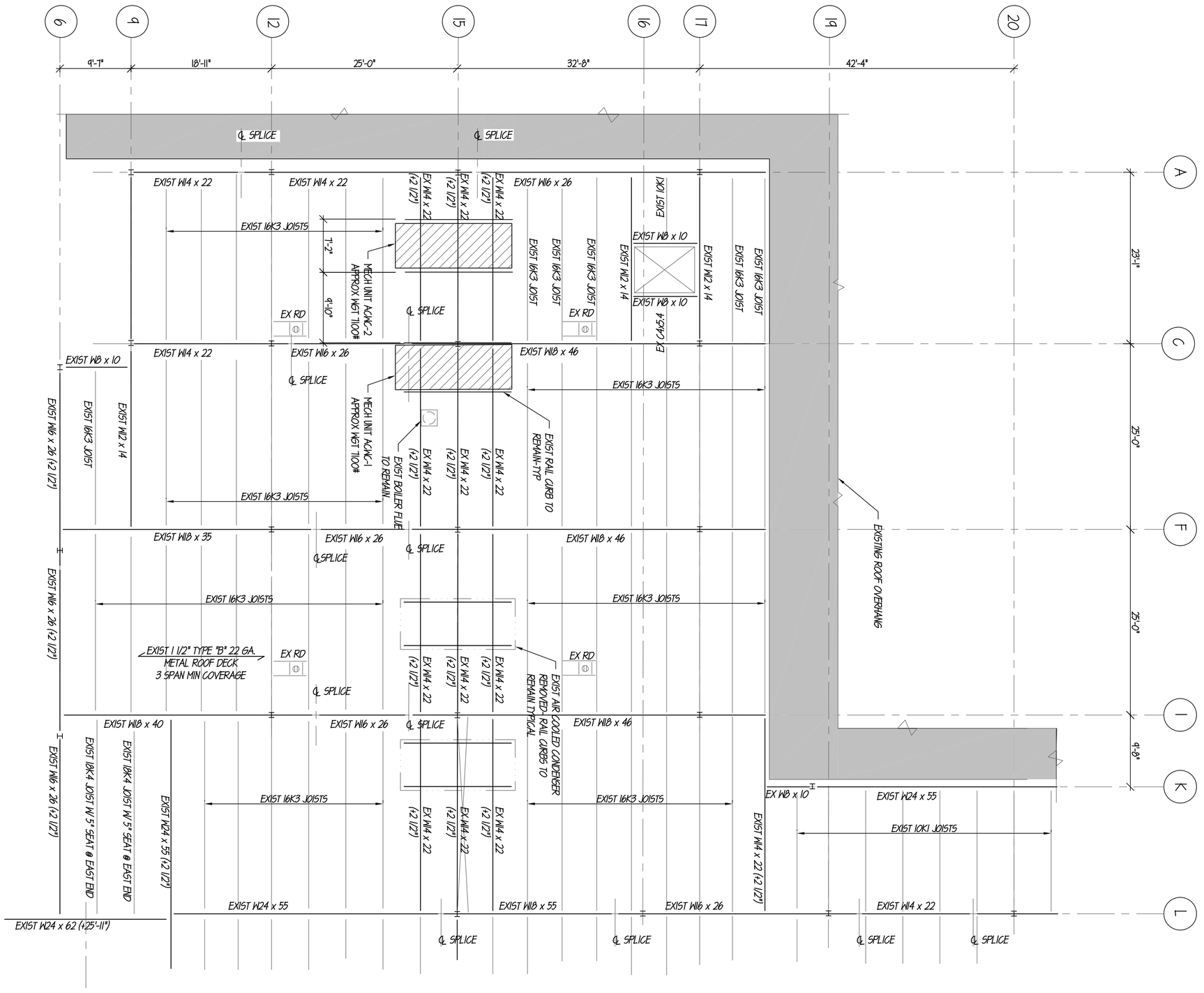
1 EXISTING ROOF FRAMING PLAN - BASE BID

1/8" = 1'-0"

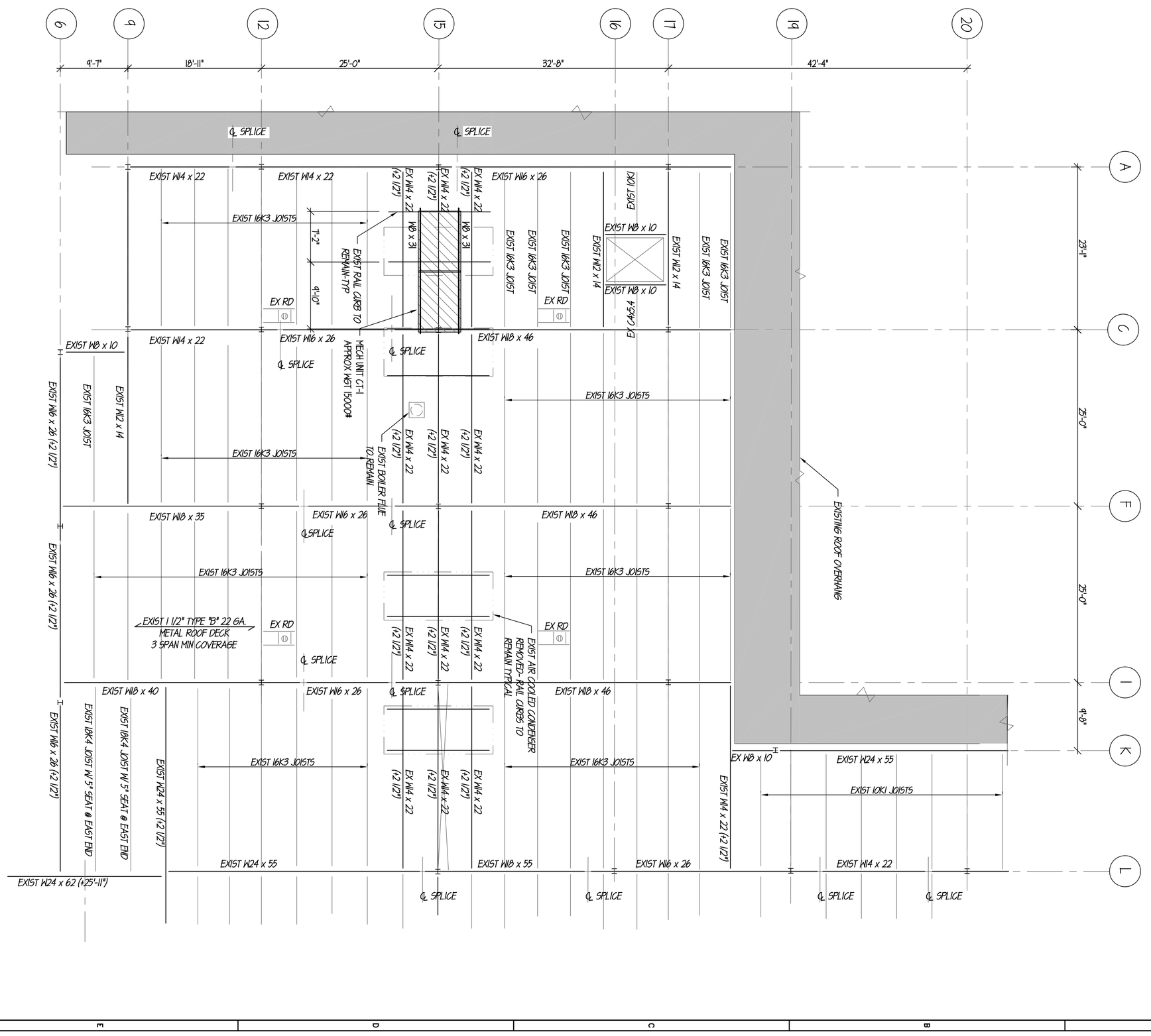
EXISTING JOIST BEARING +26'-1 1/2"



1 EXISTING ROOF FRAMING PLAN - ALTERNATE BID #2

1/8" = 1'-0"

EXISTING JOIST BEARING +26'-1 1/2"



1550-A-3

S-1

Issue Date: 16 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

Revisions:
23 JUNE 2014 - BID DOCUMENTS

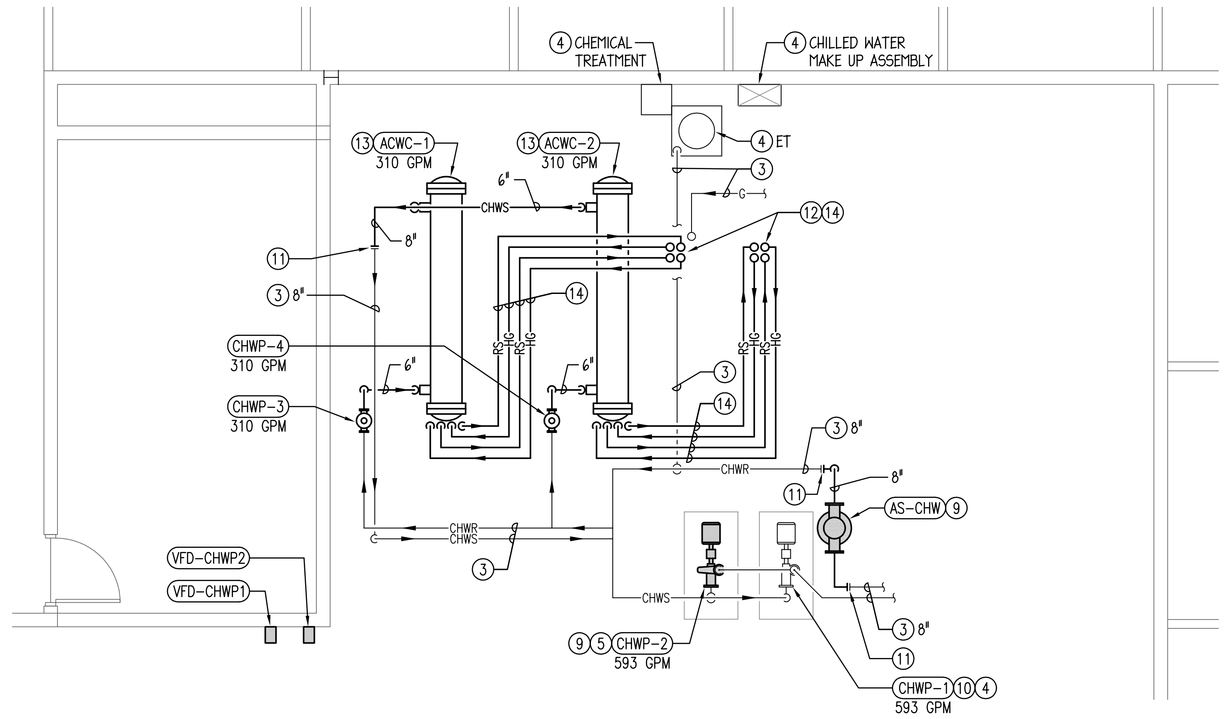
McHenry County College - Building 'B' Chiller Replacement
8900 US Hwy 14 - Building 'B'
Crystal Lake, Illinois 60012

BASE BID & ALT BID #2
EXISTING ROOF FRAMING PLAN

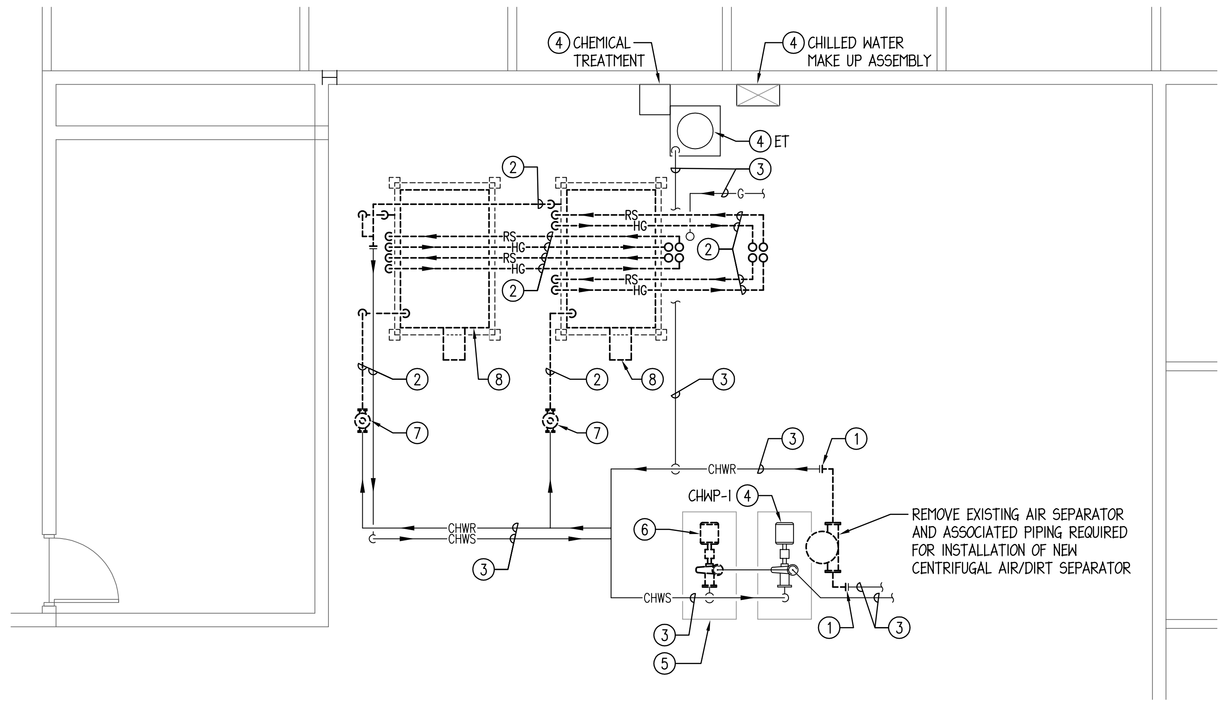
Consultants:
Mechanical - Electrical - Structural Engineers
1216 Tower Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
20/10 ENGINEERING GROUP LLC

DRAWING NOTES: (TYPICAL FOR THIS DRAWING ONLY)

1. NEW CONNECTION TO BE MADE AT THIS LOCATION. REMOVE ALL PIPING, VALVING, HANGERS, INSULATION, ETC. SHOWN DASHED BEYOND THIS POINT.
2. REMOVE ALL PIPING, VALVING, HANGERS, INSULATION, ETC. SHOWN DASHED.
3. EXISTING PIPING AND VALVING TO REMAIN.
4. EXISTING HVAC EQUIPMENT TO REMAIN.
5. EXISTING SPRING ISOLATED INERTIA BASE TO REMAIN AND BE MODIFIED TO PROPERLY ACCEPT NEW EQUIPMENT. REPLACE SPRINGS IF REQUIRED BY NEW EQUIPMENT WEIGHTS/SIZES.
6. REMOVE BASE MOUNTED PUMP.
7. REMOVE INLINE PUMP AND ALL ASSOCIATED PIPING, VALVING, INSULATION, HANGERS, SUPPORTS, ETC.
8. REMOVE CHILLER, AND ALL ASSOCIATED PIPING, VALVING, AND CONTROLS. REMOVE INERTIA BASE AND ALL ASSOCIATED SUPPORTS.
9. MODIFY EXISTING PIPING AS REQUIRED TO PROPERLY INSTALL NEW EQUIPMENT.
10. BALANCE EXISTING CHILLED WATER PUMP TO FLOW RATE INDICATED.
11. MAKE NEW CONNECTION TO EXISTING PIPING AT THIS LOCATION.
12. PIPE OF SIZE INDICATED UP THRU EXISTING ROOF PORTAL. PROVIDE NEW ABS PLASTIC WEATHER PROOF CAP AND SUPPORT NEW PIPING ABOVE AND BELOW ROOF.
13. REMOTE EVAPORATOR/COOLER SECTION.
14. REFRIGERANT PIPING SIZE IN STRICT ACCORDANCE WITH CHILLER MANUFACTURER'S INSTRUCTION.



N 1 BASE BID: MECHANICAL ROOM HVAC PLAN
1/4" = 1'-0"



N 2 BASE BID: MECHANICAL ROOM HVAC DEMOLITION PLAN
1/4" = 1'-0"

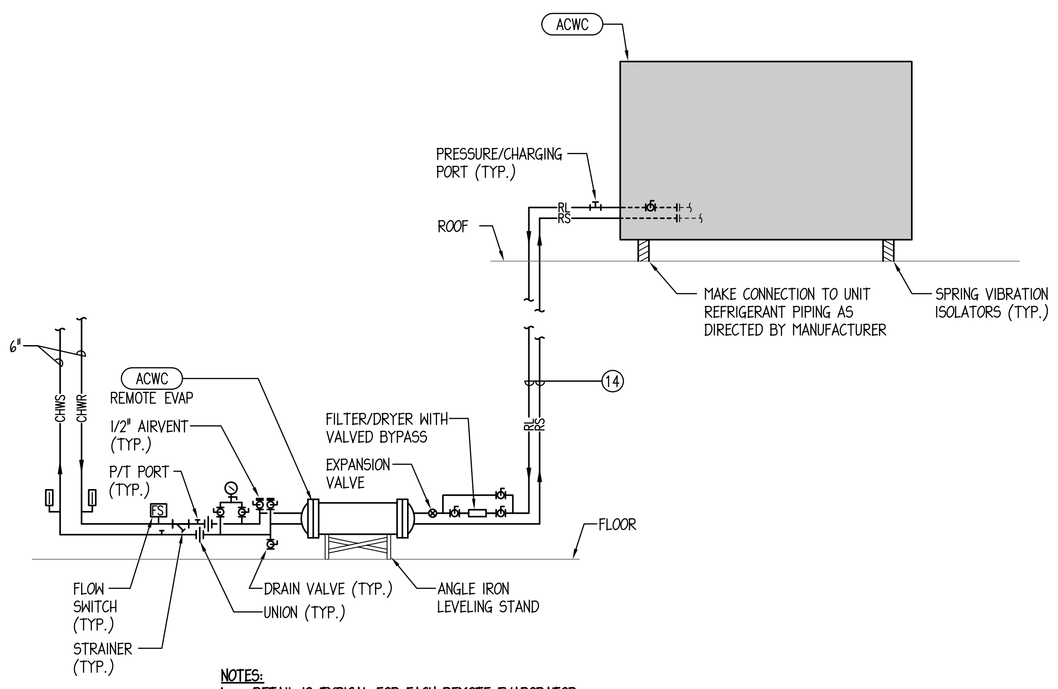
BIDDING NOTES:

BASE BID: PROVIDE ALL WORK SHOWN ON THIS SHEET.
ALT. BID #2: DELETE THIS SHEET IN IT'S ENTIRETY.

BIDDING NOTES:

TEMPERATURE CONTROLS: ALL TEMPERATURE CONTROL WORK SHALL BE BY TRANE CONTROLS UNDER SEPARATE BAS CONTRACT.

ALT. BID 1: PROVIDE NEW DIFFERENTIAL PRESSURE SENSOR IN CHILLED WATER PIPING SYSTEM (AT LOCATION OF T.C. CONTRACTORS CHOOSING) AND REPLACE THE FOLLOWING 3-WAY CHILLED WATER VALVES WITH 2-WAY VALVES AS FOLLOWS (FIELD VERIFY ALL EXISTING SIZES):
AHU-1: 4", 127.2 GPM
AHU-2: 2", 76.1 GPM
AHU-3: 3", 79.5 GPM
AHU-4: 4", 156.1 GPM
AHU-5: 2", 70.8 GPM
AHU-6: 2-1/2", 83.7 GPM
CAP UNUSED BYPASS PIPING FORMERLY SERVING 3-WAY VALVE AT MAIN. NEW CONTROL VALVES TO BE FURNISHED AND WIRED BY T.C. CONTRACTOR AND INSTALLED BY HVAC CONTRACTOR.



NOTES:
1. DETAIL IS TYPICAL FOR EACH REMOTE EVAPORATOR.
2. SIZE ALL REFRIGERANT PIPING IN ACCORDANCE WITH CHILLER MANUFACTURER'S INSTRUCTION. PROVIDE DOUBLE SUCTION RISERS IF REQUIRED.
3. PROVIDE ALL REFRIGERANT PIPING ACCESSORIES AND VALVES AS INSTRUCTED AND/OR FURNISHED BY CHILLER MANUFACTURER.
4. ALL VALVING SHOWN IS TO BE PROVIDED FOR EACH REFRIGERANT CIRCUIT.

REMOTE EVAPORATOR INSTALLATION DETAIL
NONE

VARIABLE FREQUENCY DRIVES

EQUIPMENT TAG	LOCATION	EQUIPMENT SERVED	MANUFACTURER	MODEL	MOUNTING	SIZE (IN.) H W D	MAX. DRIVE OUTPUT CURRENT	MOTOR HP (MAX.)	MOTOR RPM	MOTOR FREQ (Hz)	MOTOR PHASE	MOTOR VOLT	NOTES
VFD-1	MECH. ROOM	CHWP-1	TACO	SMART DRIVE	WALL MOUNTED	18.9 x 9.5 x 10.2	II	7 1/2	1750	60	3	480	1,2
VFD-2	MECH. ROOM	CHWP-2	TACO	SMART DRIVE	WALL MOUNTED	18.9 x 9.5 x 10.2	II	7 1/2	1750	60	3	480	1,2

NOTES: 1. OTHER ACCEPTABLE MANUFACTURERS: APPROVED EQUAL. 2. PROVIDE NEMA 1 ENCLOSURE, INPUT DISCONNECT SWITCH, OUTPUT LINE REACTOR, AND BACnet INTERFACE.

HYDRONIC ACCESSORIES SCHEDULE

EQUIPMENT TAG	EQUIPMENT TYPE	LOCATION	SERVICE	MANUFACTURER	MODEL	TYPE	CAPACITY/SIZE	MAXIMUM PRESSURE DROP (FT.)	FILL (PSI)	OPERATING (PSI)	NOTES
AS-CHW	AIR/DIRT SEPARATOR	MECH ROOM	CHILLED WATER SYSTEM	TACO	4908ADR-42	TANGENTIAL W/STRAINER	593 GPM/ 8" INLET, 8" OUTLET	1.0	--	--	1,2

NOTES: 1. OTHER ACCEPTABLE MANUFACTURERS: BAG, SPIROTHERM. 2. REMOVABLE MEDIA AND FLANGED OR GROOVED CONNECTIONS.

PUMP SCHEDULE

EQUIPMENT TAG	LOCATION	SERVICE	MANUFACTURER	MODEL	TYPE	GPM	HEAD (FT.)	IMP. DIA. (IN.)	RPM	MINIMUM EFFICIENCY	TRIPLE DUTY VALVE TYPE	TRIPLE DUTY VALVE SIZE	TRIPLE DUTY VALVE P.D. (FT.)	MOTOR HP	MOTOR PHASE	MOTOR VOLT	NOTES
CHWP-2	MECH ROOM	CHILLED WATER SYSTEM	TACO	FI4075	BASE MOUNTED	593	30	6.9	1750	82%	STRAIGHT	5	6.4	7 1/2	3	480	1,2
CHWP-3	MECH ROOM	CHILLED WATER SYSTEM	TACO	KV3007	INLINE	310	18	6.0	1750	58%	STRAIGHT	4	6.1	3	3	480	1,2
CHWP-4	MECH ROOM	CHILLED WATER SYSTEM	TACO	KV3007	INLINE	310	18	6.0	1750	58%	STRAIGHT	4	6.1	3	3	480	1,2

NOTES: 1. OTHER ACCEPTABLE MANUFACTURERS: BAG, ARMSTRONG. 2. PREMIUM EFFICIENCY MOTORS.

AIR COOLED WATER CHILLER SCHEDULE

EQUIPMENT TAG	LOCATION	AREA SERVED	MANUFACTURER	MODEL	TYPE	DESIGN DUTY (TONS)	DIMENSIONS (LxWxH)	OPERATING WEIGHT (LBS)	REFRIGERANT TYPE	REFRIGERANT CHARGE (LBS)	COMPRESSORS NO.	COMPRESSORS NOMINAL TONS EACH	COMPRESSORS MIN. LOAD	COMPRESSORS INDEPENDENT CIRCUITS	EVAPORATOR EWT (°F)	EVAPORATOR LWT (°F)	EVAPORATOR GPM	EVAPORATOR PD (FT.)	EVAPORATOR FOULING FACTOR	CONDENSER FANS EAT (°F)	CONDENSER FANS QUANTITY	CONDENSER FANS HP (EA.)	CONDENSER FANS RPM	ELECTRICAL DATA MCA	ELECTRICAL DATA MOCP	ELECTRICAL DATA PHASE	ELECTRICAL DATA VOLT	NOTES
ACWC-1	ROOF	CHILLED WATER SYSTEM	CARRIER	30RBI150	SCROLL	150	188"x88"x89"	7100	R-410A	56/52 EA. CIRCUIT	6	(3) @ 25 (3) @ 25	17%	2	55	45	310	8.0	0.0001	95	6	2	1140	303.2	350	3	480	1,2,3,4
ACWC-2	ROOF	CHILLED WATER SYSTEM	CARRIER	30RBI150	SCROLL	150	188"x88"x89"	7100	R-410A	56/52 EA. CIRCUIT	6	(3) @ 25 (3) @ 25	17%	2	55	45	310	8.0	0.0001	95	6	2	1140	303.2	350	3	480	1,2,3,4

NOTES: 1. OTHER ACCEPTABLE MANUFACTURERS: McQUAY, TRANE. 2. REMOTE EVAPORATOR. 3. PROVIDE THE FOLLOWING FACTORY INSTALLED OPTIONS: COMPRESSOR SUCTION SERVICE VALVES, SUCTION LINE INSULATION, ENERGY MANAGEMENT MODULE, CONVENIENCE OUTLET, NON-FUSED DISCONNECT, CONDENSER COIL GRILLES, LOW SOUND ENCLOSURE, SPRING ISOLATORS, AND BACnet INTERFACE COMPATIBLE WITH CAMPUS-WIDE TEMPERATURE CONTROL SYSTEM. 4. ALT. BID #3: VFD DRIVEN CONDENSER FANS AND CONTROLS TO ACHIEVE AN ILPV OF 16.8 EER.

Consultants:
Mechanical - Electrical - Structural Engineers
1216 E. Tower Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
ENGINEERING GROUP LLC

MECHANICAL ROOM HVAC PLANS AND RISER DIAGRAM

McHenry County College - Building 'B' Chiller Replacement
8900 U.S. Hwy. 14
Crystal Lake, Illinois 60012

Revisions:
23 JUNE 2014 - BID DOCUMENTS

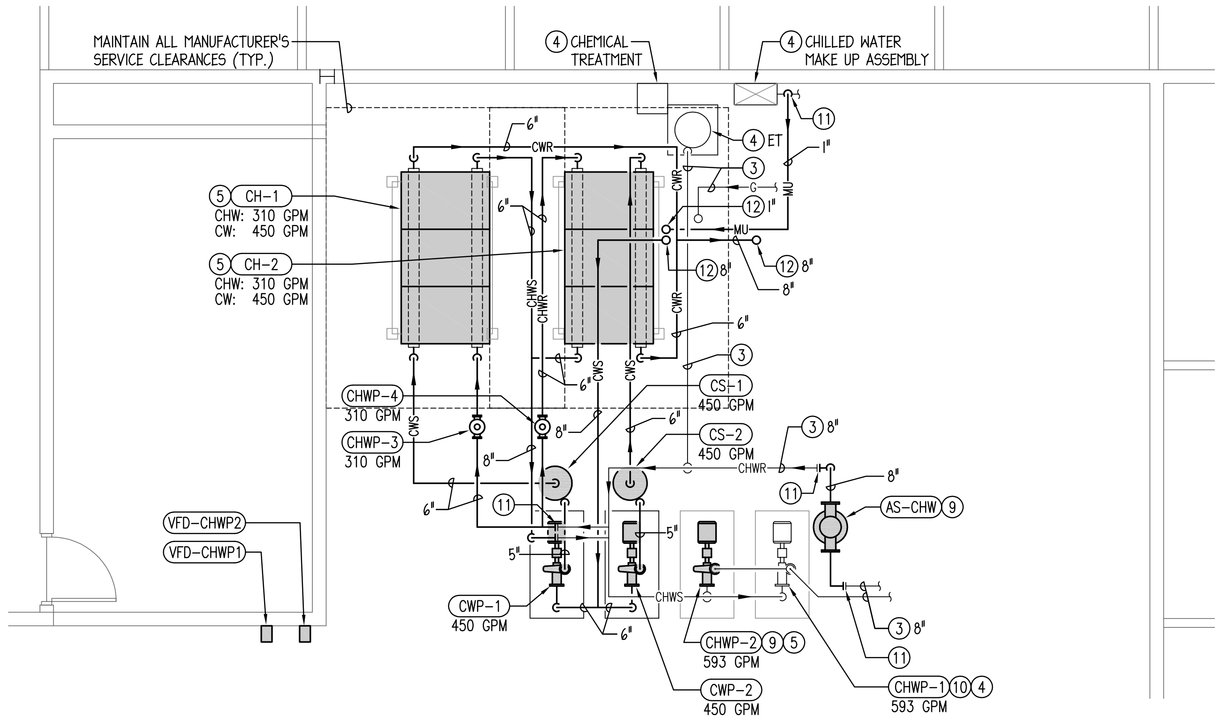
Issue Date: 18 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

HV-1

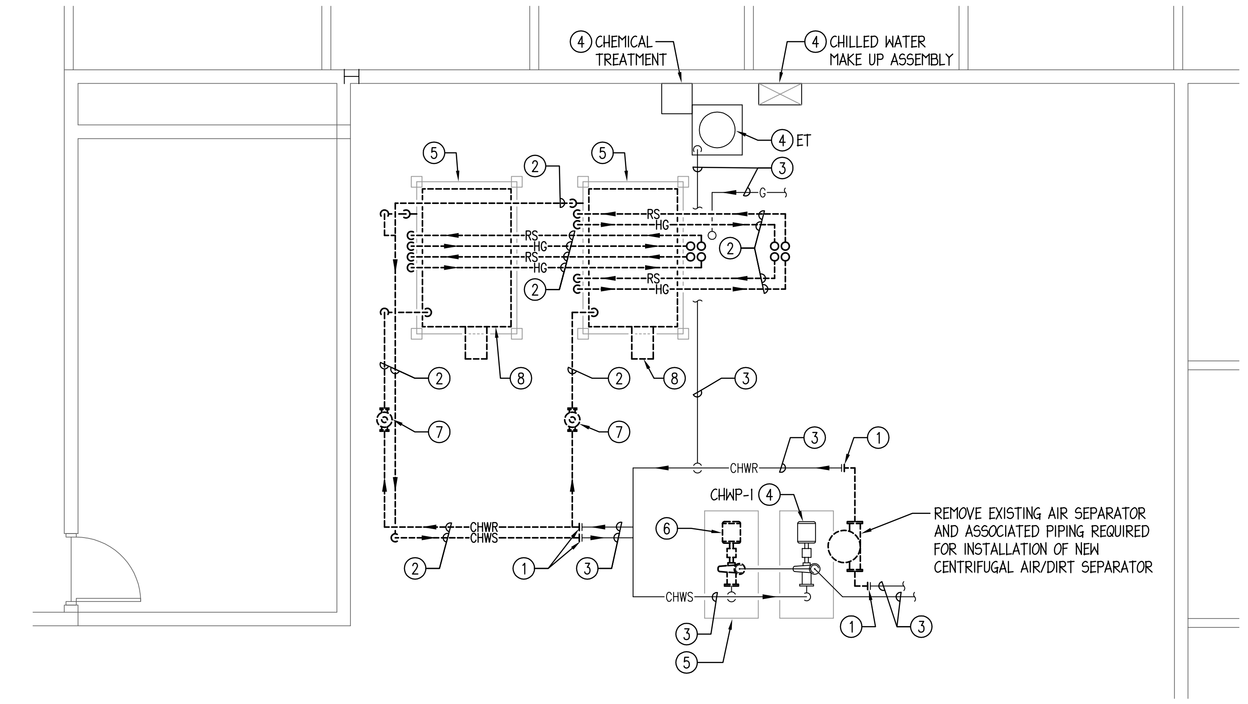
NAME: 1550A3hv-1_BASE.dwg BY:KGC DATE: JUN 10, 2014 TIME: 9:30 AM

DRAWING NOTES: (TYPICAL FOR THIS DRAWING ONLY)

1. NEW CONNECTION TO BE MADE AT THIS LOCATION. REMOVE ALL PIPING, VALVING, HANGERS, INSULATION, ETC. SHOWN DASHED BEYOND THIS POINT.
2. REMOVE ALL PIPING, VALVING, HANGERS, INSULATION, ETC. SHOWN DASHED.
3. EXISTING PIPING AND VALVING TO REMAIN.
4. EXISTING HVAC EQUIPMENT TO REMAIN.
5. EXISTING SPRING ISOLATED INERTIA BASE TO REMAIN AND BE MODIFIED TO PROPERLY ACCEPT NEW EQUIPMENT. REPLACE SPRINGS IF REQUIRED BY NEW EQUIPMENT WEIGHTS/SIZES.
6. REMOVE BASE MOUNTED PUMP.
7. REMOVE INLINE PUMP AND ALL ASSOCIATED PIPING, VALVING, INSULATION, HANGERS, SUPPORTS, ETC.
8. REMOVE CHILLER, AND ALL ASSOCIATED PIPING, VALVING, AND CONTROLS.
9. MODIFY EXISTING PIPING AS REQUIRED TO PROPERLY INSTALL NEW EQUIPMENT.
10. BALANCE EXISTING CHILLED WATER PUMP TO FLOW RATE INDICATED.
11. MAKE NEW CONNECTION TO EXISTING PIPING AT THIS LOCATION.
12. PIPE OF SIZE INDICATED UP THRU EXISTING ROOF PORTAL. PROVIDE NEW ABS PLASTIC WEATHER PROOF CAP AND SUPPORT NEW PIPING ABOVE AND BELOW ROOF.
13. PIPE OVER TO NEAREST FLOOR DRAIN.
14. PROVIDE PASSIVATION OF UNIT AS DIRECTED BY MANUFACTURER.
15. SEE DETAIL ON SHEET HV-4.



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



N 2 MECHANICAL ROOM HVAC DEMOLITION PLAN
1/4" = 1'-0"

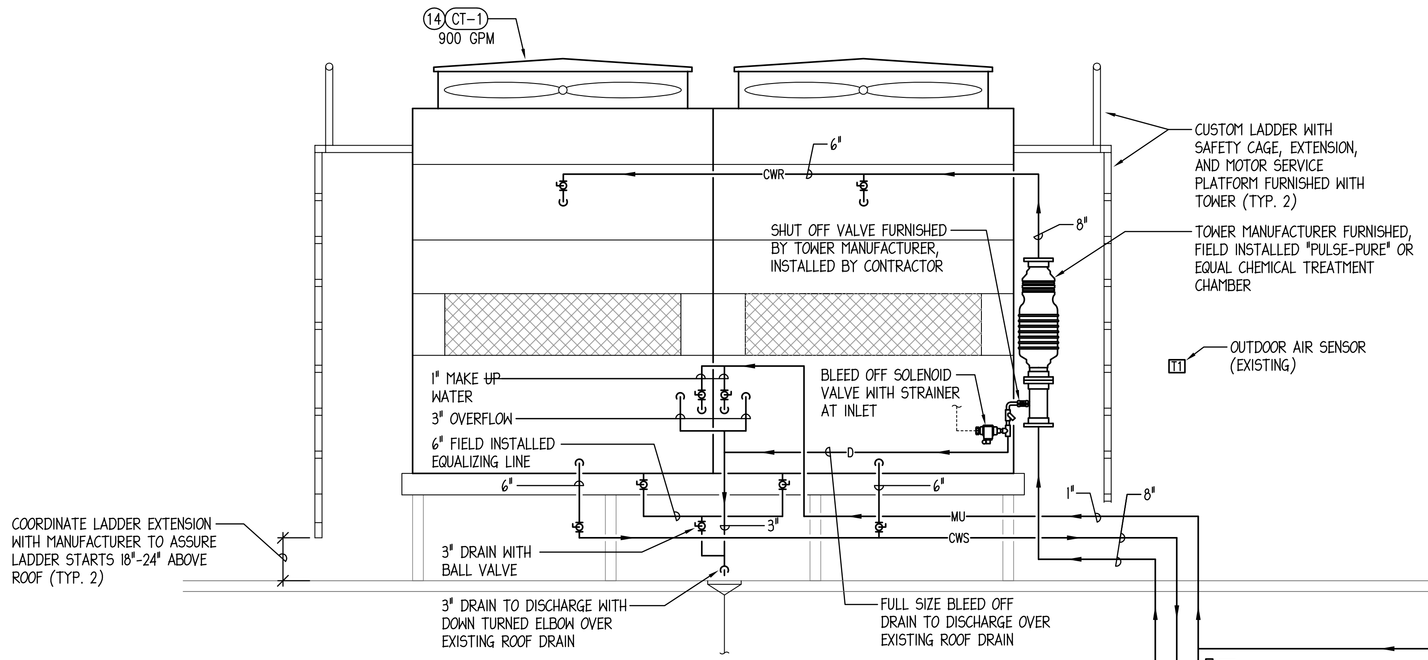
BIDDING NOTES:

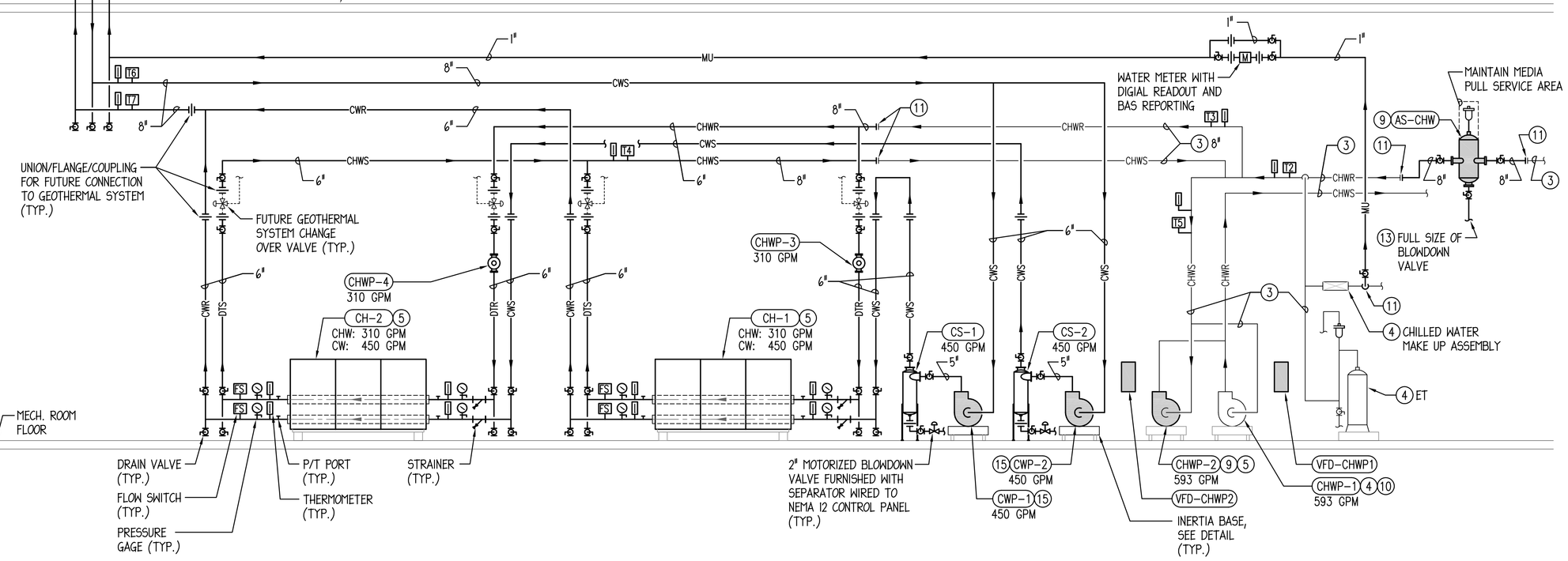
BASE BID: DELETE THIS SHEET IN IT'S ENTIRETY.
ALT. BID #2: PROVIDE ALL WORK SHOWN ON THIS SHEET.

BIDDING NOTES:

TEMPERATURE CONTROLS: ALL TEMPERATURE CONTROL WORK SHALL BE BY TRANE CONTROLS UNDER SEPARATE BAS CONTRACT.

ALT. BID 1: PROVIDE NEW DIFFERENTIAL PRESSURE SENSOR IN CHILLED WATER PIPING SYSTEM (AT LOCATION OF T.C. CONTRACTORS CHOOSING) AND REPLACE THE FOLLOWING 3-WAY CHILLED WATER VALVES WITH 2-WAY VALVES AS FOLLOWS (FIELD VERIFY ALL EXISTING SIZES):
AHU-1: 4", 127.2 GPM
AHU-2: 2", 76.1 GPM
AHU-3: 3", 79.5 GPM
AHU-4: 4", 156.1 GPM
AHU-5: 2", 70.8 GPM
AHU-6: 2-1/2", 83.7 GPM
CAP UNUSED BYPASS PIPING FORMERLY SERVING 3-WAY VALVE AT MAIN. NEW CONTROL VALVES TO BE FURNISHED AND WIRED BY T.C. CONTRACTOR AND INSTALLED BY HVAC CONTRACTOR.





SCHEMATIC PIPING DIAGRAM
NO SCALE

Consultants:
Mechanical - Electrical - Structural Engineers
1216 E. Dundee Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
ENGINEERING GROUP LLC

ALT. BID #2: MECHANICAL ROOM HVAC PLANS AND RISER DIAGRAM

McHenry County College - Building 'B' Chiller Replacement
8900 U.S. Hwy. 14
Crystal Lake, Illinois 60012

Revisions:
23 JUNE 2014 - BID DOCUMENTS

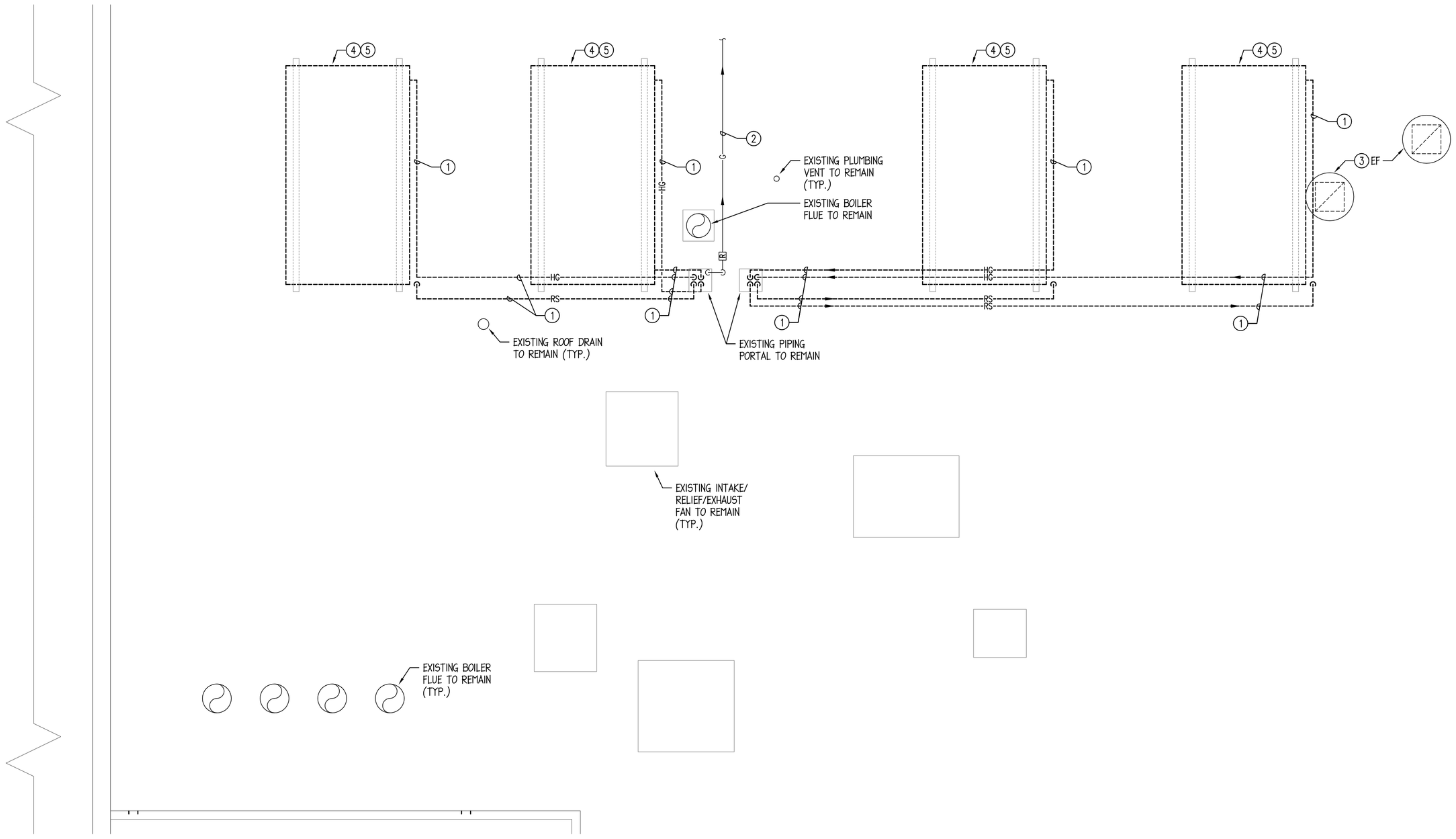
Issue Date: 16 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

HV-2

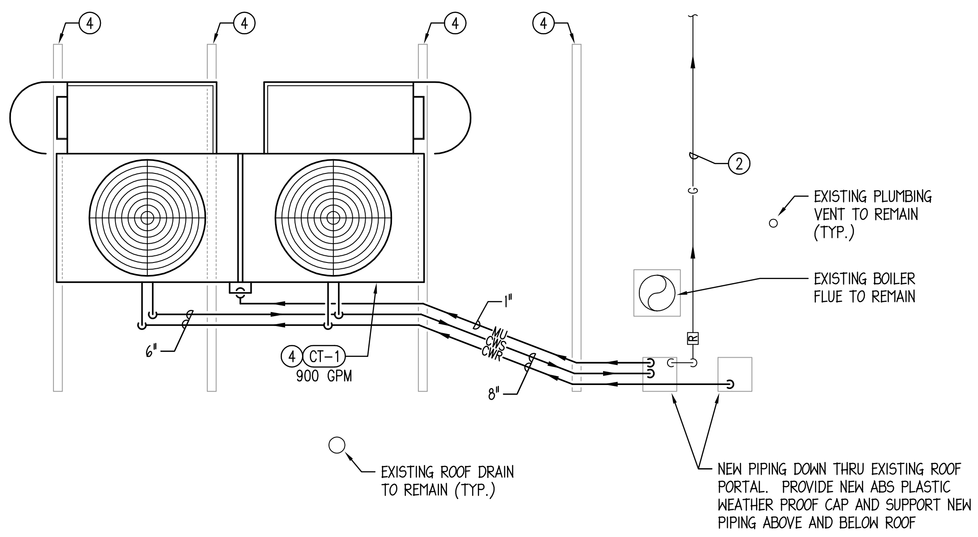
NAME: 1550A3hv-1_BASE.dwg BY:KCC DATE: JUN 10, 2014 TIME: 9:30 AM

DRAWING NOTES: (TYPICAL FOR THIS DRAWING ONLY)

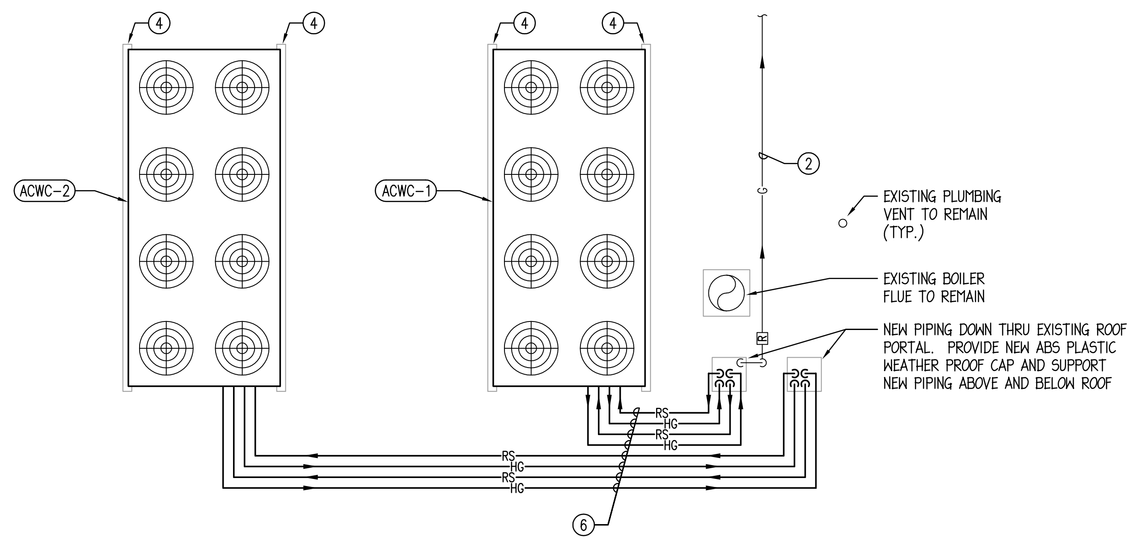
1. REMOVE ALL PIPING, VALVING, HANGERS, INSULATION, ETC. SHOWN DASHED.
2. EXISTING PIPING AND VALVING TO REMAIN.
3. EXISTING HVAC EQUIPMENT TO REMAIN.
4. EXISTING ROOF SUPPORTS TO REMAIN AND BE MODIFIED TO PROPERLY ACCEPT NEW EQUIPMENT.
5. REMOVE AIR COOLED CONDENSER AND ALL ASSOCIATED PIPING, VALVING, AND CONTROLS.
6. REFRIGERANT PIPING SIZE IN STRICT ACCORDANCE WITH CHILLER MANUFACTURER'S INSTRUCTION.



N 1 BASE BID & ALT. BID #2: HVAC ROOF DEMOLITION PLAN
1/4" = 1'-0"



N 2 ALT. BID #2: HVAC ROOF PLAN
1/4" = 1'-0"



N 2 BASE BID: HVAC ROOF PLAN
1/4" = 1'-0"

Consultants:
Mechanical - Electrical - Structural Engineers
1216 Tower Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
ENGINEERING GROUP LLC

HVAC DEMOLITION AND NEW WORK ROOF PLANS

McHenry County College - Building 'B' Chiller Replacement
8900 US Hwy 14
Crystal Lake, Illinois 60012

Revisions:
23 JUNE 2014 - BID DOCUMENTS

Issue Date: 18 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

HV-3

NAME: I550A3B03.dwg BY: KWE DATE: MAY 29, 2014 TIME: 6:00 PM

GENERAL NOTES - TEMPERATURE CONTROL:

1. ALL WORK SHALL CONFORM TO THE LATEST EDITION OF NATIONAL ELECTRIC CODE AND CITY OF CRYSTAL LAKE BUILDING CODE.
2. PROVIDE ALL HARDWARE, SOFTWARE, AND PROGRAMMING AS REQUIRED TO EXTEND EXISTING WEB-BASED TRANE SUMMIT BUILDING CONTROL SYSTEM TO SERVE NEW EQUIPMENT AND SYSTEMS.
3. 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.
4. CONTRACTOR SHALL REMOVE ALL EXISTING THERMOSTATS, RELAYS, DEVICES, AND CONTROL TUBING/CONDUIT THROUGHOUT THE BUILDING WHICH SERVED EQUIPMENT OR DEVICES REMOVED EITHER IN THE PAST OR AS PART OF THIS PROJECT.
5. CONTROL SYSTEM SHALL BE COMPLETE AS REQUIRED TO PROVIDE SEQUENCES OF OPERATION AND POINTS LIST AS SPECIFIED ELSEWHERE ON THESE DRAWINGS.
6. TEMPERATURE CONTROL CABINETS SHALL HAVE SCHEMATIC DIAGRAM OF SYSTEM MOUNTED ON FACE OF CABINET OR ADJACENT TO CABINET UNDER PLEXIGLAS.
7. CONTRACTOR SHALL PROVIDE ON SITE OWNER TRAINING FOR 2 PEOPLE FOR A TOTAL OF 1 DAY (8 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.
8. ALL BAS DEVICE 120V. POWER WIRING SHALL BE MINIMUM #12 AWG BY BAS CONTRACTOR FROM SPARE CIRCUITS PROVIDED BY ELECTRICAL CONTRACTOR IN LIGHTING PANELS.
9. BAS DEVICE POWER AND CONTROL WIRING SHALL BE IN SEPARATE CONDUIT SYSTEMS. PROVIDE APPROPRIATE FLEXIBLE WHIPS WHERE REQUIRED FOR FINAL CONNECTIONS TO ROTATING EQUIPMENT. ALL CONDUITS SHALL BE SIZED TO PROVIDE MINIMUM 25% SPARE CAPACITY FOR FUTURE USE BASED ON FILL CAPACITIES INDICATED BY NATIONAL ELECTRIC CODE.
10. 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.
11. IDENTIFY ALL CONTROL WIRING AND EQUIPMENT. CONTROL WIRE SHALL HAVE TERMINATION IDENTIFICATION ON EACH WIRE FOR EASE OF TRACING.
12. DRAWINGS ARE GENERALLY DIAGRAMMATIC AND INTEND TO SHOW APPROXIMATE LOCATIONS OF CERTAIN DEVICES CONTROLLED EQUIPMENT. THEY DO NOT INTEND TO SHOW EVERY SENSOR, CONTROLLER, DEVICE OR CONDUIT THAT MAY BE REQUIRED NOR EVERY STRUCTURAL ELEMENT THAT MAY BE ENCOUNTERED DURING THE INSTALLATION OF THIS WORK. THE CONTRACTOR SHALL CONFIRM ACTUAL LOCATIONS OF CONTROLLED EQUIPMENT AND DESIGN ACTUAL ROUTING OF CONDUITS WHICH SHALL INCLUDE ANY OFFSETS, BENDS OR CHANGES IN ELEVATION REQUIRED DUE TO COORDINATION WITH THE WORK OF OTHER TRADES AND BUILDING CONSTRUCTION. ANY CHANGES REQUIRED DUE TO FAILURE TO COORDINATE WITH OTHER TRADES SHALL BE MADE WITHOUT ADDITIONAL COST TO THE OWNER OR DELAY IN COMPLETION DATE OF THE PROJECT.
13. BAS CONTRACTOR SHALL REFER TO MECHANICAL CONTRACT DRAWINGS FOR LOCATION, SIZE, WATER AND/OR FLOW RATES, AND OTHER INFORMATION PERTAINING TO FLOW SWITCHES, CONTROL VALVES, OUTSIDE AIR, RECIRC, AND EXHAUST AUTOMATIC CONTROL DAMPERS, AND OTHER AIR AND WATER MONITORING DEVICES WHICH HE SHALL FURNISH AND MAKE FINAL CONNECTIONS THERETO. MECHANICAL CONTRACTOR SHALL PROVIDE ALL WELLS AND OPENINGS FOR THESE ITEMS AND INSTALL THEM IN THE REQUIRED PIPING AND DUCTWORK SYSTEMS.
14. THE EXACT LOCATION OF ALL THERMOSTATS ARE DIAGRAMMATIC. EXACT LOCATION SHALL BE DETERMINED AFTER REFERRING TO APPROVED FURNITURE AND CASEWORK PLANS AND CONSULTING WITH THE ARCHITECT.
15. APPROVED INSTALLING CONTRACTORS: JOHN REICHARDT, TRANE CONTROLS, INC., 7100 MADISON, WILLOWBROOK, IL 60527, 630-734-3200. NO SUBSTITUTIONS.

BIDDING NOTES:

TEMPERATURE CONTROLS: ALL TEMPERATURE CONTROL WORK SHALL BE BY TRANE CONTROLS UNDER SEPARATE BAS CONTRACT.

ALT. BID 1: PROVIDE NEW DIFFERENTIAL PRESSURE SENSOR IN CHILLED WATER PIPING SYSTEM (AT LOCATION OF T.C. CONTRACTORS CHOOSING) AND REPLACE THE FOLLOWING 3-WAY CHILLED WATER VALVES WITH 2-WAY VALVES AS FOLLOWS (FIELD VERIFY ALL EXISTING SIZES):
AHU-1: 4", 127.2 GPM
AHU-2: 2", 76.1 GPM
AHU-3: 3", 79.5 GPM
AHU-4: 4", 156.1 GPM
AHU-5: 2", 70.8 GPM
AHU-6: 2-1/2", 83.7 GPM
CAP UNUSED BYPASS PIPING FORMERLY SERVING 3-WAY VALVE AT MAIN. NEW CONTROL VALVES TO BE FURNISHED AND WIRED BY T.C. CONTRACTOR AND INSTALLED BY HVAC CONTRACTOR.

16. BASE BID:
SEQUENCE OF OPERATION: CHILLED WATER SYSTEM
A. SYSTEM OPERATION SHALL BE CONTROLLED BY EXISTING WEB-BASED BAS SYSTEM.
B. TWO METHODS OF SYSTEM START/STOP SHALL BE AVAILABLE:
1. MANUAL: USER SHALL SELECT MODE OF OPERATION THROUGH BAS GRAPHIC SCREEN: COOLING OR OFF.
2. AUTOMATIC:
a. SYSTEM SHALL STOP IF OUTSIDE AIR TEMPERATURE HAS BEEN BELOW 55°F (ADJ.) FOR 2 HOURS (ADJ.).
b. SYSTEM SHALL START IF OUTSIDE AIR TEMPERATURE HAS BEEN ABOVE 60°F (ADJ.) FOR 2 HOURS (ADJ.).
C. SECONDARY CHILLED WATER SYSTEM
1. LEAD CHILLED WATER PUMP SHALL BE IN CONTINUOUS OPERATION IF SYSTEM IS NOT COMMANDED OFF BY BAS SYSTEM.
2. STARTING SYSTEM SHALL START LEAD PUMP. FAILURE OF PUMP TO START SHALL ALARM BAS. LEAD/LAG STATUS OF CHILLED WATER PUMPS SHALL BE ALTERNATED WEEKLY OR BY-WEEKLY SO AS TO EQUALIZE RUN TIME ON PUMPS - CHANGE SHALL BE MADE DURING THE DAYTIME WHEN BUILDING MAINTENANCE STAFF IS ON DUTY.
3. ALT. BID: THE CHILLED WATER PUMP SHALL START AT MINIMUM SPEED AND BE MODULATED BY ITS ASSOCIATED VARIABLE FREQUENCY DRIVE TO MAINTAIN THE DIFFERENTIAL PRESSURE SETPOINT AS READ BY THE NEW DIFFERENTIAL PRESSURE SETPOINT INSTALLED AT LOCATION OF T.C. CONTRACTORS CHOICE.
D. PRIMARY CHILLED WATER SYSTEM
1. IF SYSTEM IS COMMANDED INTO COOLING MODE BY MANUAL OR AUTOMATIC SIGNAL FROM THE BAS SYSTEM THE SYSTEM START. THE LEAD CHILLER CIRCULATION PUMP SHALL START. FAILURE OF EITHER PUMP TO START SHALL ALARM BAS SYSTEM. LEAD/LAG STATUS OF CHILLERS SHALL BE ALTERNATED WEEKLY OR BY-WEEKLY SO AS TO EQUALIZE RUN TIME ON PUMPS - CHANGE SHALL BE MADE DURING THE DAYTIME WHEN BUILDING MAINTENANCE STAFF IS ON DUTY.
2. CHILLER MANUFACTURER'S CONTROLLER SHALL STAGE LEAD CHILLER COMPRESSORS THROUGH INTERNAL CONTROLS AS REQUIRED TO MAINTAIN CHILLED WATER TEMPERATURE SUPPLY TEMPERATURE SETPOINT OF 44 DEG. F (ADJ.).
3. CHILLER MANUFACTURER'S CONTROLLER SHALL START/STOP/STAGE LAG CHILLER COMPRESSORS AS REQUIRED TO MAINTAIN SECONDARY CHILLED WATER SYSTEM TEMPERATURE SUPPLY SETPOINT. IF LAG CHILLER IS CALLED TO START, IT'S ASSOCIATED CHILLER CIRCULATION PUMP SHALL START BEFORE ANY COMPRESSOR IS ALLOWED TO START.
4. IF SYSTEM IS COMMANDED OFF, CHILLERS SHALL STOP AND CHILLED WATER PUMPS SHALL REMAIN IN OPERATION FOR 10 MINS. (ADJ.) BEFORE STOPPING.
E. INPUT/OUTPUT SCHEDULE (MINIMUM DDC POINTS REQUIRED.)

1. SYSTEM METHOD (MANUAL OR AUTOMATIC)	SOFTWARE
2. OUTSIDE AIR TEMPERATURE (T1)	AI (ANALOG INPUT)
3. START/STOP TIME DELAY	AI OR SOFTWARE
4. CHILLED WATER PUMP CHWP-1 START/STOP	DO (DIGITAL OUTPUT)
5. ALT. BID: CHILLED WATER PUMP CHWP-1 SPEED	AO (ANALOG OUTPUT)
6. CHILLED WATER PUMP CHWP-1 STATUS	DI
7. CHILLED WATER PUMP CHWP-2 START/STOP	DO
8. ALT. BID: CHILLED WATER PUMP CHWP-2 SPEED	AO
9. CHILLED WATER PUMP CHWP-2 STATUS	DI
10. ALT. BID: SYSTEM PRESSURE DIFFERENTIAL	AI
11. ALT. BID: SYSTEM PRESSURE DIFFERENTIAL SETPOINT	AO OR SOFTWARE
12. SECONDARY CHILLED WATER RETURN TEMP. (T2)	AI
13. PRIMARY CHILLED WATER RETURN SUPPLY TEMP. (T3)	AI
14. PRIMARY CHILLED WATER SUPPLY TEMPERATURE (T4)	AI
15. SECONDARY CHILLED WATER SUPPLY TEMP. (T5)	AI
16. PRIMARY CHILLED WATER SUPPLY TEMP. SETPOINT	AO OR SOFTWARE
17. SECONDARY CHILLED WATER SUPPLY TEMP. SETPOINT	AO OR SOFTWARE
18. CHILLED WATER PUMP CHWP-3 START/STOP	DO
19. CHILLED WATER PUMP CHWP-3 STATUS	DI
20. CHILLED WATER PUMP CHWP-4 START/STOP	DO
21. CHILLED WATER PUMP CHWP-4 STATUS	DI
22. CHILLER CH-1 START/STOP	DO
23. CHILLER CH-1 STATUS	DI
24. CHILLER CH-1 COMPRESSOR STATUS (6 REQ'D)	DI
25. CHILLER CH-2 START/STOP	DO
26. CHILLER CH-2 STATUS	DI
27. CHILLER CH-2 COMPRESSOR STATUS (6 REQ'D)	DI
28. MAP ALL POINTS AVAILABLE FROM CHILLER BAS INTERFACE/CONTROLLER	DO/DI/AO/AI
29. COMPUTER GRAPHIC DISPLAY OF SYSTEM	--

17. ALT. BID #2:
SEQUENCE OF OPERATION: CHILLED WATER SYSTEM
A. SYSTEM OPERATION SHALL BE CONTROLLED BY EXISTING WEB-BASED BAS SYSTEM.
B. TWO METHODS OF SYSTEM START/STOP SHALL BE AVAILABLE:
1. MANUAL: USER SHALL SELECT MODE OF OPERATION THROUGH BAS GRAPHIC SCREEN: COOLING OR OFF.
2. AUTOMATIC:
a. SYSTEM SHALL STOP IF OUTSIDE AIR TEMPERATURE HAS BEEN BELOW 55°F (ADJ.) FOR 2 HOURS (ADJ.).
b. SYSTEM SHALL START IF OUTSIDE AIR TEMPERATURE HAS BEEN ABOVE 60°F (ADJ.) FOR 2 HOURS (ADJ.).
C. SECONDARY CHILLED WATER SYSTEM
1. LEAD CHILLED WATER PUMP SHALL BE IN CONTINUOUS OPERATION IF SYSTEM IS NOT COMMANDED OFF BY BAS SYSTEM.
2. STARTING SYSTEM SHALL START LEAD PUMP. FAILURE OF PUMP TO START SHALL ALARM BAS. LEAD/LAG STATUS OF CHILLED WATER PUMPS SHALL BE ALTERNATED WEEKLY OR BY-WEEKLY SO AS TO EQUALIZE RUN TIME ON PUMPS - CHANGE SHALL BE MADE DURING THE DAYTIME WHEN BUILDING MAINTENANCE STAFF IS ON DUTY.
3. ALT. BID: THE CHILLED WATER PUMP SHALL START AT MINIMUM SPEED AND BE MODULATED BY ITS ASSOCIATED VARIABLE FREQUENCY DRIVE TO MAINTAIN THE DIFFERENTIAL PRESSURE SETPOINT AS READ BY THE NEW DIFFERENTIAL PRESSURE SETPOINT INSTALLED AT LOCATION OF T.C. CONTRACTORS CHOICE.
D. PRIMARY CHILLED WATER SYSTEM
1. IF SYSTEM IS COMMANDED INTO COOLING MODE BY MANUAL OR AUTOMATIC SIGNAL FROM THE BAS SYSTEM THE SYSTEM START. THE LEAD CHILLER CIRCULATION PUMP AND ASSOCIATED CONDENSER WATER PUMP SHALL START. FAILURE OF EITHER PUMP TO START SHALL ALARM BAS SYSTEM. LEAD/LAG STATUS OF CHILLERS SHALL BE ALTERNATED WEEKLY OR BY-WEEKLY SO AS TO EQUALIZE RUN TIME ON PUMPS - CHANGE SHALL BE MADE DURING THE DAYTIME WHEN BUILDING MAINTENANCE STAFF IS ON DUTY.
2. CHILLER MANUFACTURER'S CONTROLLER SHALL STAGE LEAD CHILLER COMPRESSORS THROUGH INTERNAL CONTROLS AS REQUIRED TO MAINTAIN CHILLED WATER TEMPERATURE SUPPLY TEMPERATURE SETPOINT OF 44 DEG. F (ADJ.).
3. CHILLER MANUFACTURER'S CONTROLLER SHALL START/STOP/STAGE LAG CHILLER COMPRESSORS AS REQUIRED TO MAINTAIN SECONDARY CHILLED WATER SYSTEM TEMPERATURE SUPPLY SETPOINT. IF LAG CHILLER IS CALLED TO START, IT'S ASSOCIATED CHILLER CIRCULATION PUMP AND CONDENSER WATER PUMP SHALL START BEFORE ANY COMPRESSOR IS ALLOWED TO START.
4. IF SYSTEM IS COMMANDED OFF, CHILLERS SHALL STOP AND CHILLED WATER AND CONDENSER WATER PUMPS SHALL REMAIN IN OPERATION FOR 10 MINS. (ADJ.) BEFORE STOPPING.
E. CONDENSER WATER SYSTEM
1. IF THE CONDENSER SUPPLY WATER TEMPERATURE IS SENSED TO BE ABOVE 83 DEGREES F., THE COOLING TOWER FANS SHALL START AT LOW SPEED AND MODULATED AS REQUIRED TO MAINTAIN A 83 DEGREE F. SUPPLY WATER TEMPERATURE.
F. INPUT/OUTPUT SCHEDULE (MINIMUM DDC POINTS REQUIRED.)

1. SYSTEM METHOD (MANUAL OR AUTOMATIC)	SOFTWARE
2. OUTSIDE AIR TEMPERATURE (T1)	AI (ANALOG INPUT)
3. START/STOP TIME DELAY	AI OR SOFTWARE
4. CHILLED WATER PUMP CHWP-1 START/STOP	DO (DIGITAL OUTPUT)
5. ALT. BID: CHILLED WATER PUMP CHWP-1 SPEED	AO (ANALOG OUTPUT)
6. CHILLED WATER PUMP CHWP-1 STATUS	DI
7. CHILLED WATER PUMP CHWP-2 START/STOP	DO
8. ALT. BID: CHILLED WATER PUMP CHWP-2 SPEED	AO
9. CHILLED WATER PUMP CHWP-2 STATUS	DI
10. ALT. BID: SYSTEM PRESSURE DIFFERENTIAL	AI
11. ALT. BID: SYSTEM PRESSURE DIFFERENTIAL SETPOINT	AO OR SOFTWARE
12. SECONDARY CHILLED WATER RETURN TEMP. (T2)	AI
13. PRIMARY CHILLED WATER RETURN SUPPLY TEMP. (T3)	AI
14. PRIMARY CHILLED WATER SUPPLY TEMPERATURE (T4)	AI
15. SECONDARY CHILLED WATER SUPPLY TEMP. (T5)	AI
16. PRIMARY CHILLED WATER SUPPLY TEMP. SETPOINT	AO OR SOFTWARE
17. SECONDARY CHILLED WATER SUPPLY TEMP. SETPOINT	AO OR SOFTWARE
18. CHILLED WATER PUMP CHWP-3 START/STOP	DO
19. CHILLED WATER PUMP CHWP-3 STATUS	DI
20. CHILLED WATER PUMP CHWP-4 START/STOP	DO
21. CHILLED WATER PUMP CHWP-4 STATUS	DI
22. CONDENSER WATER PUMP CWP-1 START/STOP	DO
23. CONDENSER WATER PUMP CWP-1 STATUS	DI
24. CONDENSER WATER PUMP CWP-2 START/STOP	DO
25. CONDENSER WATER PUMP CWP-2 STATUS	DI
26. CHILLER CH-1 START/STOP	DO
27. CHILLER CH-1 STATUS	DI
28. CHILLER CH-1 COMPRESSOR STATUS (6 REQ'D)	DI
29. CHILLER CH-2 START/STOP	DO
30. CHILLER CH-2 STATUS	DI
31. CHILLER CH-2 COMPRESSOR STATUS (6 REQ'D)	DI
32. CONDENSER SUPPLY WATER TEMPERATURE (T6)	AI
33. CONDENSER SUPPLY WATER TEMPERATURE SETPOINT	AO OR SOFTWARE
34. CONDENSER WATER RETURN TEMP. (T7)	AI
35. TOWER FAN START/STOP (1 REQ'D FOR EACH FAN)	DO
36. TOWER FAN STATUS (1 REQ'D FOR EACH FAN)	DI
37. TOWER FAN SPEED (1 REQ'D FOR EACH FAN)	AO
38. MAP ALL POINTS AVAILABLE FROM CHILLER/TOWER BAS INTERFACE/CONTROLLER	DO/DI/AO/AI
39. COMPUTER GRAPHIC DISPLAY OF SYSTEM	--

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 CLEARNESS 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 ENGINEER AND OWNERS STIPULATION AS DIRECTED.
9. CONTRACTOR SHALL REFER TO THE 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.
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 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, ELECTRICAL DEVICES, TO ENGINEER FOR APPROVAL PRIOR TO ORDERING ANY ITEMS OR FABRICATING ANY 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.
24. AT COMPLETION OF PROJECT, CONTRACTOR SHALL SUBMIT 1 (ONE) PAPER COPY AND AN ELECTRONIC COPY (ON CD, DVD, OR FLASH MEMORY DRIVE) 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 WARRANTEES, AND "AS BUILT" FLOOR PLANS.
25. CONTRACTOR SHALL PROVIDE WARRANTY FOR ALL MATERIAL AND GUARANTEE ALL WORKMANSHIP PROVIDED BY HIM FOR 2 (TWO) YEARS FROM SUBSTANTIAL COMPLETION OF WORK INVOLVED.
26. CONTRACTOR SHALL MAINTAIN A CURRENT CITY OF BANNOCKBURN LICENSE THROUGHOUT ALL PHASES OF CONSTRUCTION. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO COORDINATE ALL INSPECTIONS WITH THE CITY OF BANNOCKBURN . THE CITY OF BANNOCKBURN REQUIRES MINIMUM ONE DAY PRIOR NOTICE FOR ALL INSPECTIONS.
27. IDENTIFY ALL PIPING 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 VILLAGE OF CRYSTAL LAKE 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 DUCTWORK, PIPING AND ASSOCIATED FITTINGS TO MATCH EXISTING WHERE NEW CONNECTIONS ARE BEING MADE.
5. CONTRACTORS SHALL PROVIDE A TWO YEAR WARRANTY ON ALL MATERIALS, EQUIPMENT AND LABOR FROM DATE OF SUBSTANTIAL COMPLETION OF WORK EXCEPT AS FOLLOWS: PROVIDE A 5 YEAR PARTS AND LABOR WARRANTY FOR CHILLER COMPRESSORS; PROVIDE A 5 YEAR PARTS AND LABOR WARRANTY FOR THE ENTIRE COOLING TOWER.
6. CHILLED WATER SUPPLY AND RETURN PIPING SHALL BE:
   1. SCHEDULE 40 BLACK STEEL WITH GROOVED AND SHOULDERED FITTINGS INSULATED WITH 1" THICK FIBERGLASS WITH ALL SERVICE JACKET.
   2. TYPE "L" COPPER WITH SOLDERED OR PRESSED FITTINGS INSULATED WITH 1" THICK FIBERGLASS WITH ALL SERVICE JACKET.
   3. AQUATHERM MODEL 'CLIMATHERM' SDR-11 OR SDR-17.6 POLYETHYLENE PIPING INSULATED WITH 3/8" OR 1/2" CLOSED CELL OR FIBERGLASS WITH ALL SERVICE JACKET. POLYETHYLENE PIPING TO BE COMPLETE WITH MANUFACTURER'S 10 YEAR INSURANCE POLICY.

   PROVIDE DIELECTRIC NIPPLES OR BRASS VALVES BETWEEN DISSIMILAR PIPE MATERIALS.
7. CONDENSER WATER SUPPLY AND RETURN PIPING SHALL BE:
   1. SCHEDULE 40 BLACK STEEL WITH FLANGED OR WELDED JOINTS/FITTINGS. PAINT ALL PIPING AND FITTINGS WITH (2) COATS OF RUST RESISTANT PAINT.
   2. SCHEDULE 40 BLACK STEEL WITH GROOVED ENDS AND GALVANIZED OR STAINLESS STEEL COUPLINGS RATED FOR EXTERIOR USE WITH STAINLESS STEEL BOLTS/FASTENERS. PAINT ALL PIPING WITH (2) COATS OF RUST RESISTANT PAINT PRIOR TO INSTALLING FITTINGS.
   3. AQUATHERM MODEL 'CLIMATHERM' SDR-11 OR SDR-17.6 POLYETHYLENE PIPING. POLYETHYLENE PIPING TO BE COMPLETE WITH MANUFACTURER'S 10 YEAR INSURANCE POLICY.

   PROVIDE DIELECTRIC NIPPLES OR BRASS VALVES BETWEEN DISSIMILAR PIPE MATERIALS.
8. TOWER DRAIN PIPING SHALL BE SCHEDULE 40 PVC.
9. ALL MAKE-UP WATER PIPING AND FITTINGS SHALL BE TYPE "L" COPPER, INSULATED WITH 1" FIBERGLASS PIPE INSULATION W/VAPOR BARRIER JACKET OR BARE AQUATHERM MODEL 'CLIMATHERM' SDR-11 POLYETHYLENE PIPING.
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. 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. PROVIDE CORROSION INHIBITORS/CHEMICAL TO MATCH EXISTING - COORDINATE CHEMICAL WITH COLLEGE'S PREFERRED CHEMICAL CONTRACTOR.
13. BALL 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.
14. CHECK VALVES SHALL BE STOCKHAM, MILWAUKEE, OR NIBCO WITH BRONZE BODY, AND BRONZE HORIZONTAL SWING DISC.
15. ALL CIRCUIT SETTERS SHALL BE B&G, TACO, OR GRISWOLD.
16. BALANCE CHILLED WATER AND CONDENSER WATER SYSTEM TO ACCOMPLISH WATER FLOW SHOWN AT ALL TERMINALS AS SHOWN ON DRAWINGS AND SUBMIT TEST REPORT FOR REVIEW BY OWNER AND ENGINEER. BALANCE EXISTING AHU COILS AND CIRCULATION PUMPS IF ALT. BID IS ACCEPTED.
17. ALL REFRIGERANT PIPING SHALL BE TYPE "K" COPPER WITH WROUGHT COPPER SOLDER FITTINGS AND BE SIZED PER EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. INSULATE REFRIGERANT SUCTION AND HOT GAS LINES WITH 3/4" THICK AP/ARMAFLEX. PROVIDE EXTERIOR INSULATION WITH 2 COATS UV RESISTANT FINISH.

HVAC SYMBOLS AND ABBREVIATIONS

ACC	AIR COOLED CONDENSER	DB	DRY BULB	MOCP	MAXIMUM OVERCURRENT PROTECTION
AHU	AIR HANDLING UNIT	DN.	DOWN	PH	PHASE
AS	AIR SEPARATOR	DTR	DUAL TEMPERATURE RETURN	PSI	POUNDS PER SQUARE INCH
BAS	BUILDING AUTOMATION SYSTEM	DTS	DUAL TEMPERATURE SUPPLY	RPM	REVOLUTIONS PER MINUTE
BTU	BRITISH THERMAL UNIT	EAT	ENTERING AIR TEMPERATURE	TC	TEMPERATURE CONTROL
BTUH	BRITISH THERMAL UNIT PER HOUR	EF	EXHAUST FAN	TYP.	TYPICAL
CFM	CUBIC FEET PER MINUTE	ET	EXPANSION TANK	VFD	VARIABLE FREQUENCY DRIVE
CH	CHILLER	EWT	ENTERING WATER TEMPERATURE	WB	WET BULB
CHWP	CHILLED WATER PUMP	F	FAHRENHEIT	W.C.	WATER COLUMN
CHWR	CHILLED WATER RETURN	FPM	FEET PER MINUTE	WG	WATER GAUGE
CHWS	CHILLED WATER SUPPLY	G	GAS PIPING	(symbol)	DUCT UP TO ROOF MOUNTED EXHAUST FAN OR VENTILATOR
CWP	CONDENSER WATER PUMP	GPM	GALLONS PER MINUTE	XXX-1	EQUIPMENT TAG
CWR	CONDENSER WATER RETURN	HP	HORSEPOWER	- - - -	PIPING, DUCTWORK, OR EQUIPMENT TO BE REMOVED
CWS	CONDENSER WATER SUPPLY	LWT	LEAVING WATER TEMPERATURE		
D	DRAIN LINE	MCA	MINIMUM CIRCUIT AMPS		

Symbol	Description	Symbol	Description
—MU—	MAKE-UP WATER		PIPE ANCHOR
—G—	NATURAL GAS		PIPE FLEXIBLE CONNECTION
—RS—	REFRIGERANT SUCTION	PG	PIPE ALIGNMENT GUIDE
—HG—	REFRIGERANT HOT GAS	PS	PIPE SLEEVE
—CWS—	CONDENSER WATER SUPPLY		PIPE UNION (OR FLANGES IF 2 1/2" OR LARGER PIPE)
—CWR—	CONDENSER WATER RETURN		PRESSURE GAUGE AND NEEDLE VALVE
—D—	DRAIN LINE		THERMOMETER (WITH PIPE WELL)
—DTS—	DUAL TEMPERATURE WATER SUPPLY		PRESSURE/TEMPERATURE PLUG WITH CAP
—DTR—	DUAL TEMPERATURE WATER RETURN		STRAINER
—CHWS—	CHILLED WATER SUPPLY		STRAINER WITH BLOWDOWN VALVE
—CHWR—	CHILLED WATER RETURN		DIRECTION OF FLOW
	CHECK VALVE	PITCH	PITCH OF PIPE (DOWN)
	BALL VALVE (2" & SMALLER) BUTTERFLY VALVE (2 1/2" & LARGER)		PIPE ELBOW (TURNED UP)
	3 WAY CONTROL VALVE		PIPE ELBOW (TURNED DOWN)
	2 WAY CONTROL VALVE		PIPE TEE DOWN (DROP)
	CIRCUIT BALANCING VALVE W/BALANCING PORTS		PIPE TEE UP
	PRESSURE RELIEF VALVE (PIPE TO FLOOR DRAIN)		PIPE TEE UP OR ANGLE
	DRAIN VALVE WITH HOSE THREADED OUTLET		PIPE TEE DOWN OR ANGLE
	AUTOMATIC BALL OR BUTTERFLY VALVE	NC	NEW CONNECTION
	PIPE EXPANSION JOINT	R	GAS PRESSURE REGULATOR

Consultants:
Mechanical - Electrical - Structural Engineers
1216 Tower Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
2010 ENGINEERING GROUP LLC

HVAC NOTES, SYMBOLS, AND ABBREVIATIONS

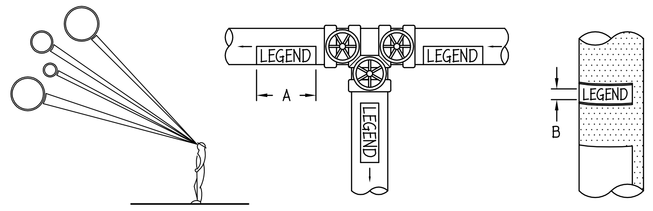
McHenry County College - Building 'B' Chiller Replacement
8900 US Hwy 14 - Building 'B'
Crystal Lake, Illinois 60012

Revisions:
23 JUNE 2014 - BID DOCUMENTS

Issue Date: 16 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

HV-4

NAME: 1550A3hv-3.dwg BY:KGC DATE: JUN 10, 2014 TIME: 12:42 PM

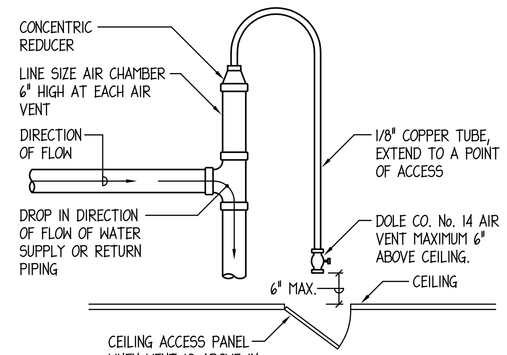


NOTE:
IDENTIFICATION MARKERS OR STRIPS TO BE PLACED ON ALL EXPOSED COVERED AND UNCOVERED PIPES AT 50'-0" INTERVALS, ADJACENT TO ALL VALVES OR BRANCHES, AND AT BOTH SIDES OF WALL/FLOOR PENETRATIONS. ARROWS OF SAME COLOR AS IDENTIFICATION MARKERS SHALL ALSO BE PLACED ON PIPES POINTING AWAY FROM MARKER INDICATING DIRECTION OF FLOW.

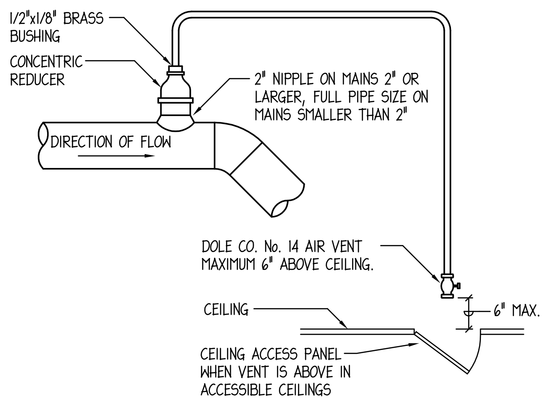
SIZE OF LEGEND LETTERS		
OUTSIDE DIAMETER OF PIPE OR COVERING	LENGTH OF COLOR FIELD A	SIZE OF LETTERS B
3/4" TO 1 1/4"	8"	1/2"
1 1/2" TO 2"	8"	3/4"
2" 1/2" TO 6"	12"	1 1/4"

SERVICE	BACKGROUND OR COLOR BAND	LETTER COLOR
CHILLED WATER SUPPLY	SAFETY GREEN	WHITE
CHILLED WATER RETURN	SAFETY GREEN	WHITE
CONDENSER WATER RETURN	SAFETY GREEN	WHITE
CONDENSER WATER SUPPLY	SAFETY GREEN	WHITE
MAKE-UP WATER	SAFETY GREEN	WHITE

TYPICAL PIPE IDENTIFICATION MARKERS
NO SCALE

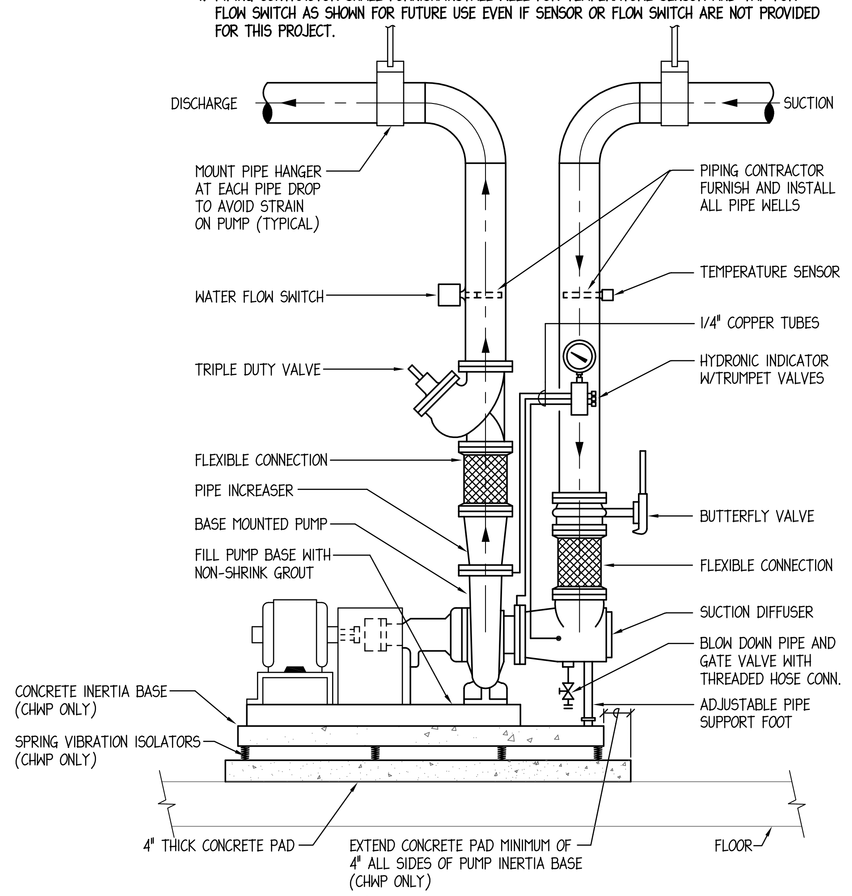


MANUAL AIR VENT DETAIL
NO SCALE

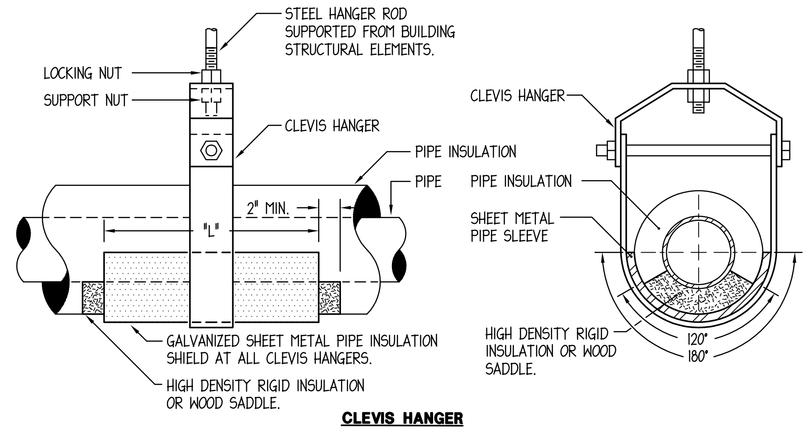


AIR VENT AT HIGH POINTS OF MAINS
NO SCALE

NOTES:
1. PIPING CONTRACTOR SHALL FURNISH/INSTALL WELL FOR TEMPERATURE SENSOR AND TAP FOR FLOW SWITCH AS SHOWN FOR FUTURE USE EVEN IF SENSOR OR FLOW SWITCH ARE NOT PROVIDED FOR THIS PROJECT.



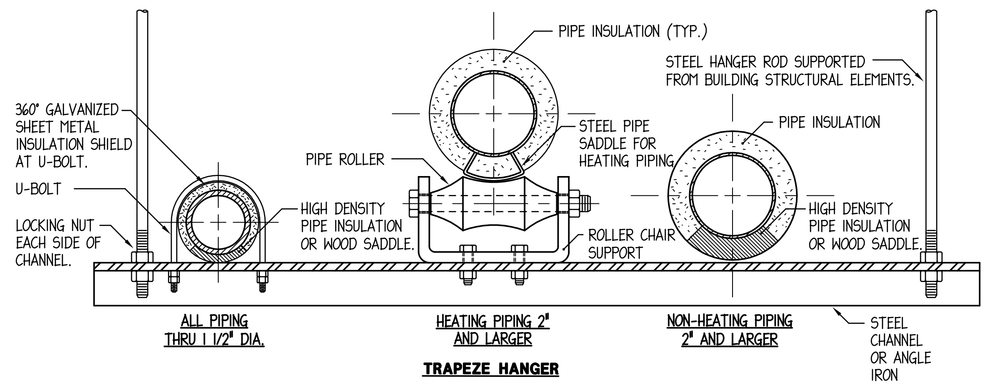
BASE MOUNTED PUMP DETAIL
NO SCALE



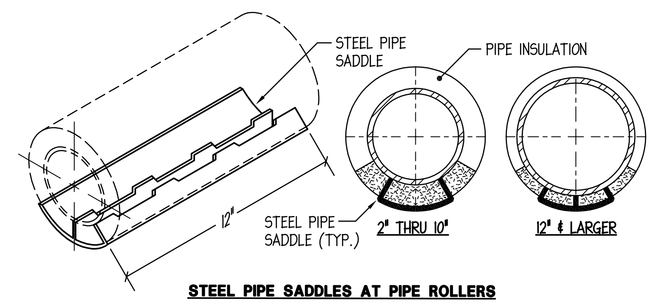
CLEVIS HANGER

PIPE INSULATION SHIELD SCHEDULE		
PIPE SIZE	LENGTH	GAUGE
UP TO 3/4"	8"	20 GA.
1" - 2"	12"	18 GA.
2 1/2" - 4"	12"	16 GA.
5" & 6"	18"	16 GA.
8" & UP	24"	14 GA.

NOTE: 1. CONFER WITH ARCHITECT AND REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION ON ACCEPTABLE METHODS AND LOCATIONS FOR HANGER SUPPORTS.



TRAPEZE HANGER



STEEL PIPE SADDLES AT PIPE ROLLERS

TYPICAL PIPE HANGER DETAILS
NO SCALE

Consultants:
Mechanical - Electrical - Structural Engineers
1216 Towne Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
ENGINEERING GROUP LLC

HVAC DETAILS

McHenry County College - Building 'B' Chiller Replacement
8900 U.S. Route 14
Crystal Lake, Illinois 60012

Revisions:
23 JUNE 2014 - BID DOCUMENTS

Issue Date: 16 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

HV-5

NAME: 1550A3BI03.dwg BY: RWE DATE: MAY 29, 2014 TIME: 6:00 PM

CHILLER/HEATER SCHEDULE

GENERAL								COMPRESSORS						EVAPORATOR								CONDENSER								ELECTRICAL					NOTES
														COOLING MODE					HEATING MODE					COOLING MODE				HEATING MODE								
EQUIPMENT TAG	LOCATION	AREA SERVED	MANUFACTURER	MODEL	TYPE	DESIGN DUTY (TONS)	REF. TYPE	CHILLER MODULES	No.	TONS EACH	MIN. CAPACITY	CIRCUIT CONFIG.	CIRCUIT CHARGE	EWT (°F)	LWT (°F)	GPM	PRESS. DROP (FT)	OPERATING EER	EWT (°F)	LWT (°F)	GPM	PRESS. DROP (FT)	OPERATING COP	EWT (°F)	LWT (°F)	GPM	PRESS. DROP (FT)	EWT (°F)	LWT (°F)	GPM	PRESS. DROP (FT)	OPERATING AMPS	MINIMUM CIRCUIT AMPS	MOCP	PHASE	VOLT	
CH-1	MECH. ROOM	BUILDING B	MUTLISTACK	M5050	MODULAR WATER COOLED SCROLL	155.1	R-410a	(3) @ 50 TONS	6	25	16%	DUAL	18 LBS	56.0	44.0	310	7.7	15.7	118.7	130	310	7.7	2.8	85.0	95.0	450	18.6	40.1	35.0	450	18.6	183.2	288	350	3	480	1,2,3,4
CH-2	MECH. ROOM	BUILDING B	MUTLISTACK	M5050	MODULAR WATER COOLED SCROLL	155.1	R-410a	(3) @ 50 TONS	6	25	16%	DUAL	18 LBS	56.0	44.0	310	7.7	15.7	118.7	130	310	7.7	2.8	85.0	95.0	450	18.6	40.1	35.0	450	18.6	183.2	288	350	3	480	1,2,3,4

NOTES:
1. OTHER ACCEPTABLE MANUFACTURERS: CLIMACOOL, ARCTICHILL.
2. THE FOLLOWING OPTIONS ARE STANDARD: STAINLESS STEEL EVAPORATOR AND CONDENSER, ELECTRONIC CHILLED WATER CONTROL, CONDENSER/EVAPORATOR SUPPLY HEADER FILTERS, STAINLESS STEEL INLET HEADERS, 5 YEAR COMPRESSOR WARRANTY, EXTENDED RANGE INSULATION/CONTROLS REQUIRED FOR PROPER OPERATION IN A GEOTHERMAL SYSTEM.
3. PROVIDE THE FOLLOWING FACTORY INSTALLED OPTIONS: LOW TEMPERATURE CHIP.
4. PROVIDE THE FOLLOWING FIELD INSTALLED ACCESSORIES: (2) FLOW SWITCHES, 4x4 SUPPORT RAILS, ACOUSTICAL PANELS, AND BAS INTERFACE COMPATIBLE WITH EXISTING SYSTEM.

OPEN COOLING TOWER SCHEDULE

EQUIPMENT TAG	LOCATION	MANUFACTURER	MODEL/ SERIES NUMBER	TYPE	DESIGN DUTY (TONS)	OPERATING WEIGHT (LBS)	DESIGN OUTSIDE AIR TEMP. (°F)		WATER DATA				FAN DATA							CONNECTIONS (PER CELL) (IN.)					MAX. OCTAVE BAND SOUND POWER LEVEL (HZ)	NOTES
							DB	WB	LWT (°F)	EWT (°F)	P.D. (PSI)	GPM	TYPE	No.	TOTAL CFM	MOTOR				MAKE UP	OVERFLOW	EQUALIZING	INLET	OUTLET		
																HP(EA.)	PHASE	VOLT	VFD						63/125/250/500/1k/2k/4k/8k	
CT-1	ROOF	EVAPCO	UT-26-817	INDUCED DRAFT	300	15,000	95.0	78.0	85.0	95.0	2.8	900	PROP.	2	65,100	10	3	480	YES	2"	3"	6"	6"	6"	62/64/58/56/53/51/50/53	1,2

NOTES:
1. OTHER ACCEPTABLE MANUFACTURERS: BAC, MARLEY.
2. PROVIDE THE FOLLOWING OPTIONS AND ACCESSORIES: ENTIRE TOWER TO BE CONSTRUCTED OF 304 STAINLESS OR GALVANIZED STEEL, MAKE-UP BRASS FLOAT ASSEMBLY, PAN STRAINER, IBC COMPLIANT UP TO IG, MOTOR DAVIT AND BASE, 304 STAINLESS STEEL COLD WATER BASIN, EXTERNAL SERVICE PLATFORM WITH LADDER, LADDER EXTENSION, LADDER SAFETY CAGE, SUPER LOW SOUND FANS, WATER SILENCERS, INVERTER CAPABLE PREMIUM EFFICIENT MOTORS, BOTTOM EQUALIZING CONNECTION IN EACH CELL, "PULSE-PURE" OR EQUAL CHEMICAL TREATMENT SYSTEM, BLOW DOWN VALVE FOR EACH CELL, AND NEMA 3R FAN VFDs WITH BACnet INTERFACE.

PUMP SCHEDULE

EQUIPMENT TAG	LOCATION	SERVICE	MANUFACTURER	MODEL	TYPE	GPM	HEAD (FT.)	IMP. DIA. (IN.)	RPM	MINIMUM EFFICIENCY	TRIPLE DUTY VALVE			MOTOR			NOTES
											TYPE	SIZE	P.D. (FT.)	HP	PHASE	VOLT	
CHWP-2	MECH ROOM	CHILLED WATER SYSTEM	TACO	FI4075	BASE MOUNTED	593	30	6.9	1750	82%	STRAIGHT	5	6.4	7 1/2	3	480	1,2
CHWP-3	MECH ROOM	CHILLED WATER SYSTEM	TACO	KV3007	INLINE	310	18	6.0	1750	58%	STRAIGHT	4	6.1	3	3	480	1,2
CHWP-4	MECH ROOM	CHILLED WATER SYSTEM	TACO	KV3007	INLINE	310	18	6.0	1750	58%	STRAIGHT	4	6.1	3	3	480	1,2
CWP-1	MECH ROOM	CONDENSER WATER SYSTEM	TACO	FI4011IC	BASE MOUNTED	450	75	9.0	1750	78%	STRAIGHT	5	4.3	15	3	480	1,2
CWP-2	MECH ROOM	CONDENSER WATER SYSTEM	TACO	FI4011IC	BASE MOUNTED	450	75	9.0	1750	78%	STRAIGHT	5	4.3	15	3	480	1,2

NOTES:
1. OTHER ACCEPTABLE MANUFACTURERS: B&G, ARMSTRONG.
2. PREMIUM EFFICIENCY MOTORS.

HYDRONIC ACCESSORIES SCHEDULE

EQUIPMENT TAG	EQUIPMENT TYPE	LOCATION	SERVICE	MANUFACTURER	MODEL	TYPE	CAPACITY/SIZE	MAXIMUM PRESSURE DROP (FT.)	FILL (PSI)	OPERATING (PSI)	NOTES
AS-CHW	AIR/DIRT SEPARATOR	MECH ROOM	CHILLED WATER SYSTEM	TACO	4908ADR-42	TANGENTIAL W/STRAINER	593 GPM/ 8" INLET, 8" OUTLET	1.0	--	--	1,2

NOTES:
1. OTHER ACCEPTABLE MANUFACTURERS: B&G, SPIROTHERM.
2. REMOVABLE MEDIA AND FLANGED OR GROOVED CONNECTIONS.

VARIABLE FREQUENCY DRIVES

EQUIPMENT TAG	LOCATION	EQUIPMENT SERVED	MANUFACTURER	MODEL	MOUNTING	SIZE (IN.) H W D	MAX. DRIVE OUTPUT CURRENT	MOTOR HP (MAX.)	RPM	FREQ (Hz)	PHASE	VOLT	NOTES
VFD-1	MECH. ROOM	CHWP-1	TACO	SMART DRIVE	WALL MOUNTED	18.9 x 9.5 x 10.2	11	7 1/2	1750	60	3	480	1,2
VFD-2	MECH. ROOM	CHWP-2	TACO	SMART DRIVE	WALL MOUNTED	18.9 x 9.5 x 10.2	11	7 1/2	1750	60	3	480	1,2

NOTES:
1. OTHER ACCEPTABLE MANUFACTURERS: APPROVED EQUAL.
2. PROVIDE NEMA 1 ENCLOSURE, INPUT DISCONNECT SWITCH, OUTPUT LINE REACTOR, AND BACnet INTERFACE.

CENTRIFUGAL SEPARATOR SCHEDULE

EQUIPMENT TAG	LOCATION	UNIT SERVED	MANUFACTURER	MODEL	TYPE	VESSEL SIZE	INLET/ OUTLET SIZE	GPM	MAX. P.D. (FT)	NOTES
CS-1	MECHANICAL ROOM	CH-1	SBS CORP.	CS-500	VERTICAL, TANGENTIAL	13"ø x 53"	5"	450	12.5	1,2,3,4,5,6,7
CS-2	MECHANICAL ROOM	CH-2	SBS CORP.	CS-500	VERTICAL, TANGENTIAL	13"ø x 53"	5"	450	12.5	1,2,3,4,5,6,7

NOTES:
1. OTHER ACCEPTABLE MANUFACTURERS: LAKOS, PUROFLUX.
2. INLET/OUTLET PRESSURE GAUGES.
3. REMOVABLE DOME FOR EASY CLEANOUT.
4. 4" X 6" INSPECTION PORT.
5. PURGE OUTLET TO BE COMPLETE WITH CLEAR PVC PIPE AND ELBOW, BRASS ISOLATION BALL VALVE, AND MOTORIZED BALL PURGE VALVE.
6. NEMA 12 PURGE FREQUENCY/DURATION CONTROL PANEL.
7. SEPARATOR SHALL REMOVE SEPARABLE SOLIDS LARGER THAN 50 MICRONS.

BIDDING NOTES:

BASE BID: DELETE THIS SHEET IN IT'S ENTIRETY.
ALT. BID #2: PROVIDE ALL EQUIPMENT SHOWN ON THIS SHEET.

Consultants:
Mechanical - Electrical - Structural Engineers
1216 Tower Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
ENGINEERING GROUP LLC

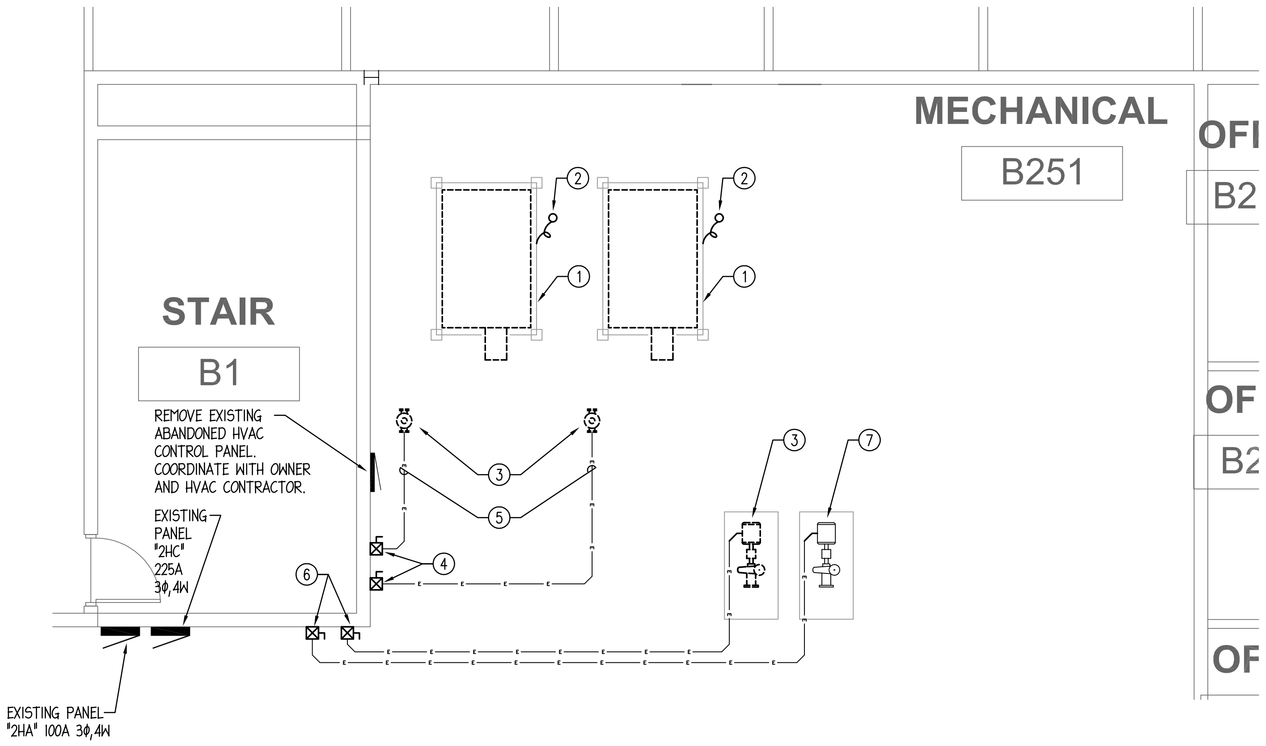
ALTERNATE BID #2: HVAC SCHEDULES

McHenry County College - Building 'B' Chiller Replacement
8900 U.S. Route 14
Crystal Lake, Illinois 60012

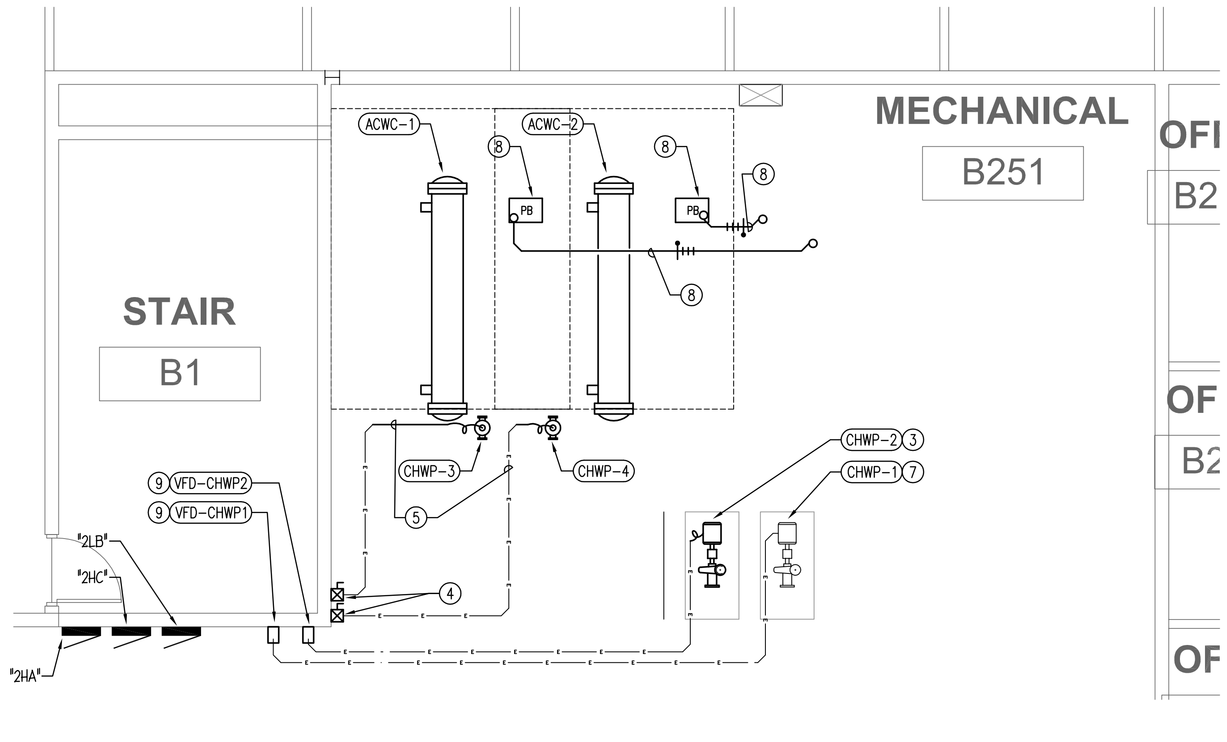
Revisions:
23 JUNE 2014 - BID DOCUMENTS

Issue Date:
18 JUNE 2014
Drawn By:
20/10
Job Number:
1550-A-3

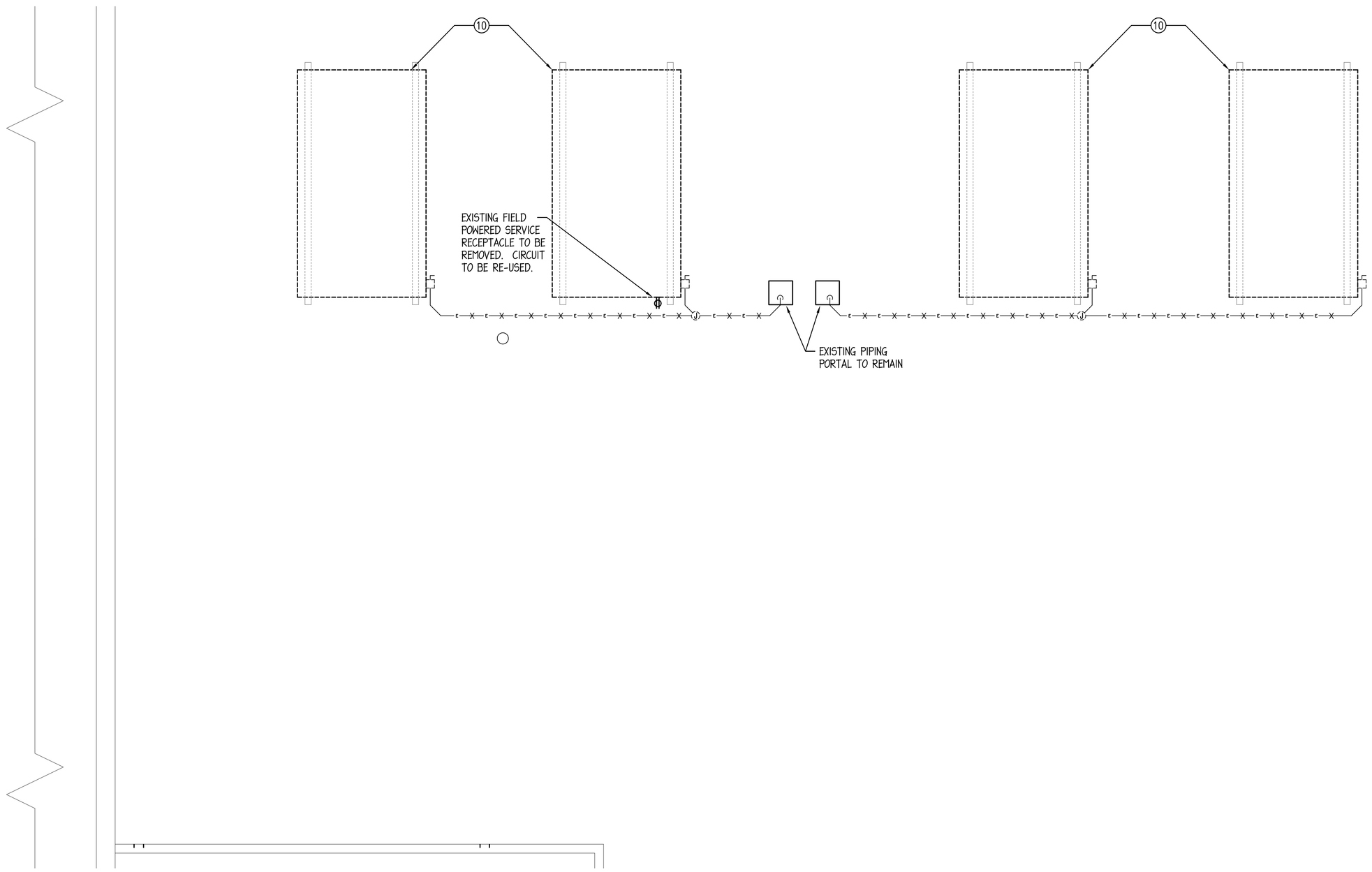
HV-6



N 1 BASE BID MECHANICAL ROOM 251 ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"



N 2 BASE BID MECHANICAL ROOM 251 ELECTRICAL PLAN
1/4" = 1'-0"



N 3 ROOF ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"

DRAWING NOTES: (TYPICAL FOR THIS DRAWING ONLY.)

1. ELECTRICALLY DISCONNECT EXISTING UNIT FOR REMOVAL. REMOVE DISCONNECT SWITCHES, AND STARTERS. ALL CONDUITS AND CONDUCTORS BETWEEN UNIT AND MAIN SWITCH BOARD ON LOWER LEVEL ARE TO REMAIN AND BE EXTENDED TO NEW UNIT. UPDATE SWITCHBOARD DIRECTORY TO REFLECT CHANGES.
2. EXISTING FEEDER FOR CHILLER DOWN THROUGH FLOOR.
3. ELECTRICALLY DISCONNECT EXISTING PUMP FOR REMOVAL. ALL CONDUITS AND CONDUCTORS BETWEEN PUMP AND PANELBOARD ARE TO REMAIN AND BE EXTENDED TO NEW UNIT. UPDATE PANELBOARD TO REFLECT CHANGES.
4. EXISTING STARTERS FOR PUMPS TO REMAIN AND BE REUSED. REPLACE FUSES WITH NEW MATCHING PUMP MANUFACTURES RECOMMENDED SIZE.
5. INTERCEPT RACEWAYS AND RE-ROUTE AND EXTEND TO NEW PUMP LOCATION.
6. EXISTING STARTERS FOR PUMPS TO BE REMOVED.
7. EXISTING PUMP TO REMAIN.
8. INTERCEPT EXISTING POWER FEED FROM SWITCHBOARD AND EXTEND AND TERMINATE AT NEW CHILLER FUSIBLE DISCONNECT ON ROOF. PROVIDE PULL BOX AT FLOOR TO ALLOW EXTENSION OF EXISTING CONDUCTORS TO NEW TERMINALS. PROVIDE SUPPORT CHANNEL STUCTURE FOR MOUNTING OF PULL BOX. EXTENDED CONDUCTORS SHALL BE OF SAME SIZE AS EXISTING 3-500KCMIL, 1-1/0G IN 3 1/2"C MINIMUM. PROVIDE CONDUCTORS AND RACEWAY FROM FUSIBLE DISCONNECT TO UNIT MOUNTED ELECTRICAL CONNECTION ENCLOSURE ON ROOF.
9. NEW VFD FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR. INSTALL IN SAME LOCATION AS REMOVED STARTERS. EXTEND/MODIFY RACEWAY AND CONDUCTORS AT VFD AND PUMP AS REQUIRED. MINIMUM SIZE TO BE 3#10, 3#12G, 3/4"C.
10. ELECTRICALLY DISCONNECT EXISTING UNIT FOR REMOVAL. REMOVE DISCONNECT SWITCHES, STARTERS, CONDUITS AND CONDUCTORS BETWEEN UNIT AND PANEL BOARD UPDATE PANELBOARD DIRECTORY TO REFLECT CHANGES.

BIDDING NOTES:

BASE BID: PROVIDE ALL WORK SHOWN ON THIS SHEET.
ALT. BID #2: DELETE THIS SHEET IN IT'S ENTIRETY.

EXISTING CONDITIONS WERE OBTAINED FROM EXISTING AS-BUILT DRAWINGS AND CURSORY FIELD OBSERVATION. THIS CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES IN THE FIELD AND REPORT THEM TO THE ENGINEER.

LEGEND:

- DENOTES DEMOLITION.
- DENOTES EXISTING TO REMAIN AND/OR BE REUSED.
- DENOTES NEW.

Consultants:
Mechanical - Electrical - Structural Engineers
1216 E. Tower Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
ENGINEERING GROUP LLC

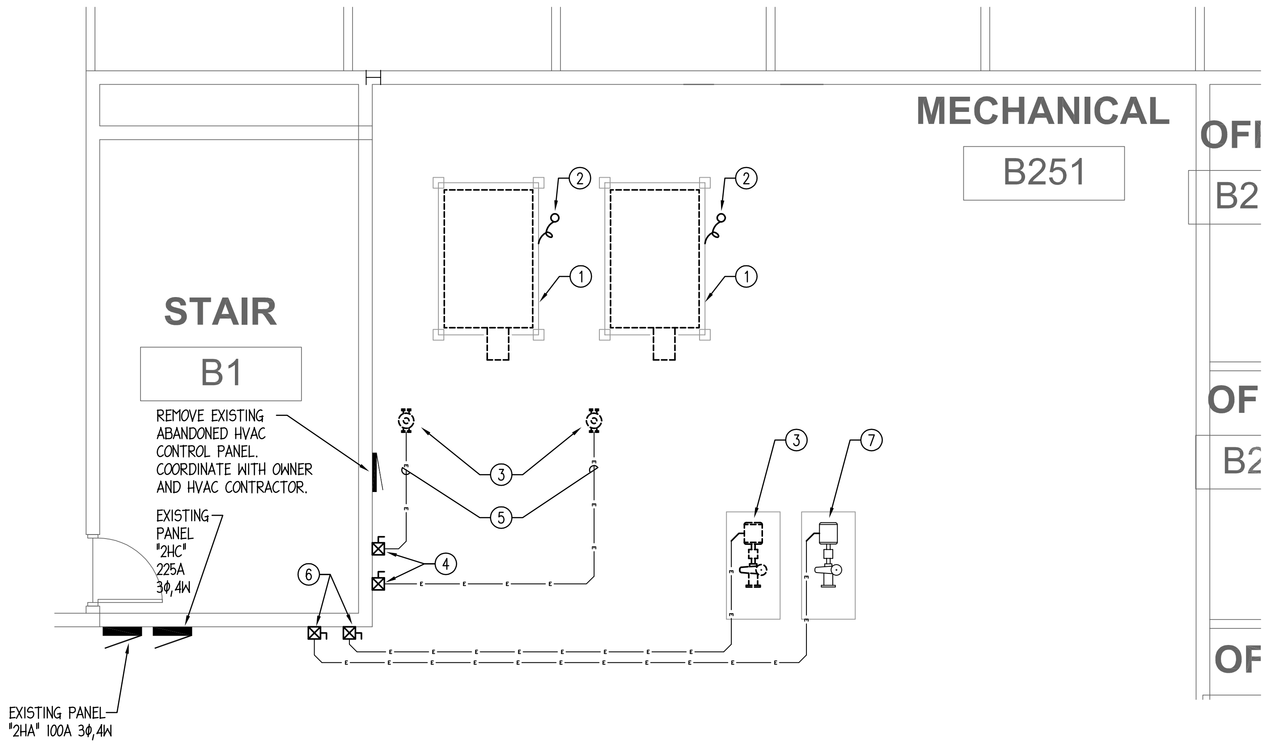
BASE BID MECHANICAL ROOM ELECTRICAL PLANS AND ROOF ELECTRICAL DEMOLITION PLAN.

McHenry County College - Building 'B' Chiller Replacement
8900 U.S. Hwy. 14
Crystal Lake, Illinois 60012

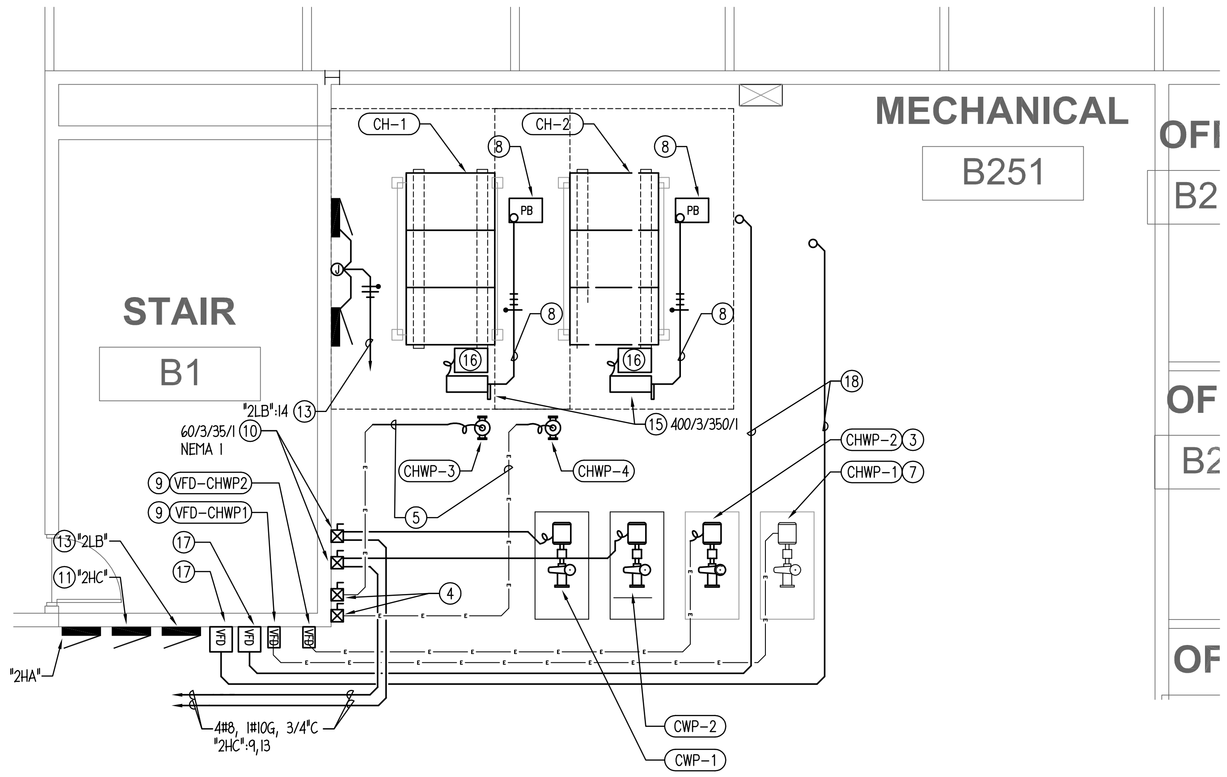
Revisions:
23 JUNE 2014 - BID DOCUMENTS

Issue Date: 18 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

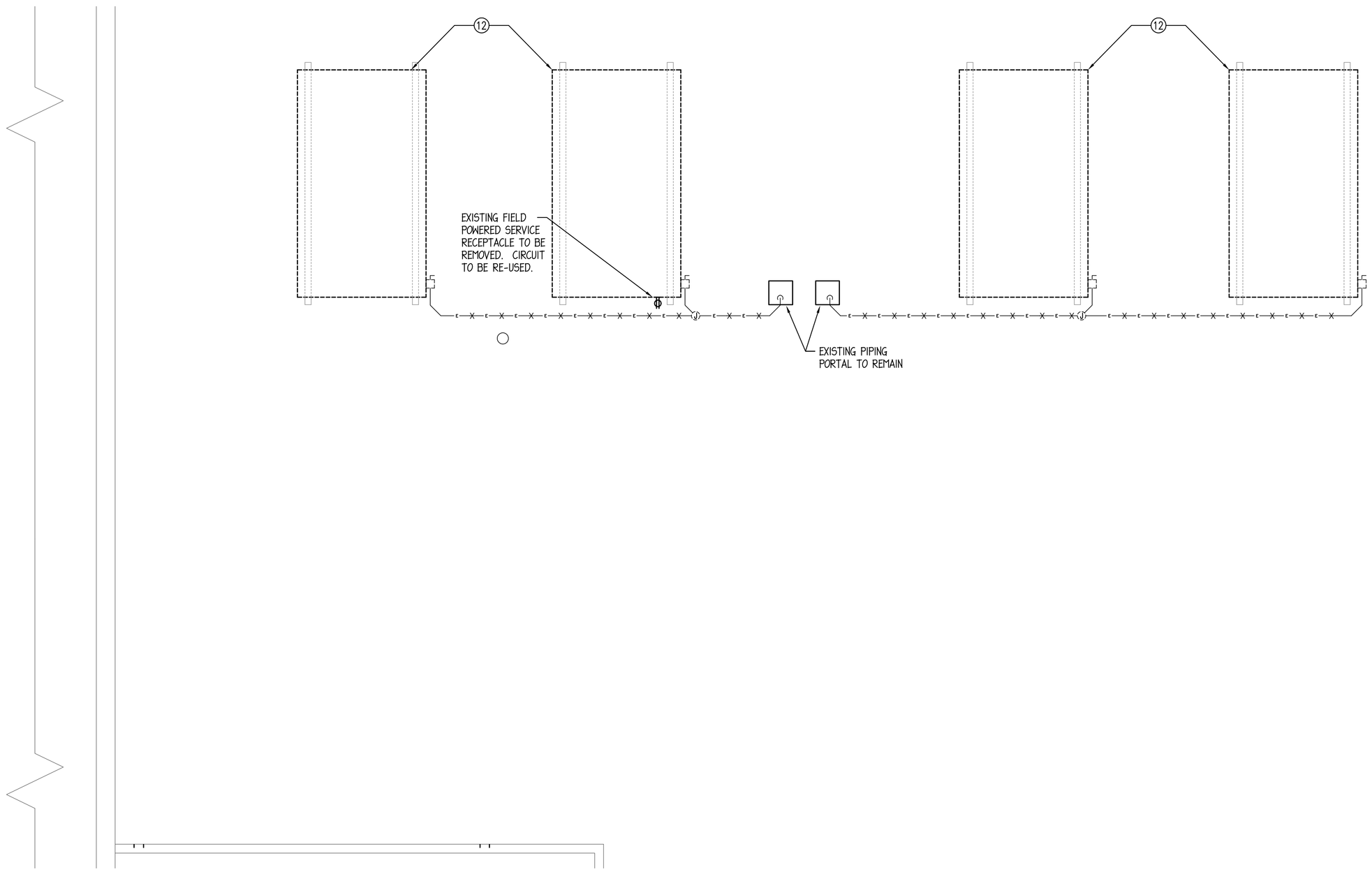
E-1



N 1 ALT. BID #2 MECHANICAL ROOM 251 ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"



N 2 ALT. BID #2 MECHANICAL ROOM 251 ELECTRICAL PLAN
1/4" = 1'-0"



N 3 ROOF ELECTRICAL DEMOLITION PLAN
1/4" = 1'-0"

DRAWING NOTES: (TYPICAL FOR THIS DRAWING ONLY.)

1. ELECTRICALLY DISCONNECT EXISTING UNIT FOR REMOVAL. REMOVE DISCONNECT SWITCHES, AND STARTERS. ALL CONDUITS AND CONDUCTORS BETWEEN UNIT AND MAIN SWITCH BOARD ON LOWER LEVEL ARE TO REMAIN AND BE EXTENDED TO NEW UNIT. UPDATE SWITCHBOARD DIRECTORY TO REFLECT CHANGES.
2. EXISTING FEEDER FOR CHILLER DOWN THROUGH FLOOR.
3. ELECTRICALLY DISCONNECT EXISTING PUMP FOR REMOVAL. ALL CONDUITS AND CONDUCTORS BETWEEN PUMP AND PANELBOARD ARE TO REMAIN AND BE EXTENDED TO NEW UNIT. UPDATE PANELBOARD TO REFLECT CHANGES.
4. EXISTING STARTERS FOR PUMPS TO REMAIN AND BE REUSED. REPLACE FUSES WITH NEW MATCHING PUMP MANUFACTURES RECOMMENDED SIZE.
5. INTERCEPT RACEWAYS AND RE-ROUTE AND EXTEND TO NEW PUMP LOCATION.
6. EXISTING STARTERS FOR PUMPS TO BE REMOVED.
7. EXISTING PUMP TO REMAIN.
8. NEW CHILLER IN SAME LOCATION AS EXISTING. INTERCEPT EXISTING POWER FEED FROM SWITCHBOARD AND EXTEND AND TERMINATE AT NEW CHILLER FUSIBLE DISCONNECT. PROVIDE PULL BOX AT FLOOR TO ALLOW EXTENSION OF EXISTING CONDUCTORS TO NEW TERMINALS. PROVIDE STEEL SUPPORT CHANNEL STRUCTURE FOR PULL BOX. EXTENDED CONDUCTORS SHALL BE OF SAME SIZE AS EXISTING 3-500KCMIL, 1-1/0G IN 3 1/2"C MINIMUM. PROVIDE CONDUCTORS AND RACEWAY FROM FUSIBLE DISCONNECT TO UNIT MOUNTED ELECTRICAL CONNECTION ENCLOSURE.
9. NEW VFD FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR. INSTALL IN SAME LOCATION AS REMOVED STARTERS. EXTEND/MODIFY RACEWAY AND CONDUCTORS AT VFD AND PUMP AS REQUIRED. MINIMUM SIZE TO BE 3#10, 3#12G, 3/4"C.
10. PROVIDE 480V COMBINATION MOTOR STARTER/SAFETY SWITCH, FVNR, SIZE AS INDICATED WITH DUAL ELEMENT FUSES SIZED PER EQUIPMENT MANUFACTURER'S RECOMMENDATION. PROVIDE WITH DOOR MOUNTED HAND-OFF-AUTO SWITCH AND PILOT LIGHT. INCLUDE CONTROL TRANSFORMER, (1) N.O., (1) N.C. CONTROL CONTACTS AND NEMA 1 ENCLOSURE.
11. PROVIDE (2) NEW 35A/3P CIRCUIT BREAKERS IN EXISTING SPACES TO SERVE NEW PUMPS. CIRCUIT BREAKERS SHALL BE BY SAME MANUFACTURE AS EXISTING PANELBOARD AND HAVE A INTERRUPTING RATING EQUAL TO THE EXISTING.
12. ELECTRICALLY DISCONNECT EXISTING UNIT FOR REMOVAL. REMOVE DISCONNECT SWITCHES, STARTERS, CONDUITS AND CONDUCTORS BETWEEN UNIT AND PANEL BOARD UPDATE PANELBOARD DIRECTORY TO REFLECT CHANGES.
13. EXISTING PANEL '2LB'. PROVIDE (1) NEW 20A/1P CIRCUIT BREAKER IN AVAILABLE SPACE 14 FOR HVAC CONTROL PANELS.
15. PROVIDE 600V, 400A FUSIBLE 3 POLE DISCONNECT WITH 350A FUSES. PROVIDE UNISTRUT SUPPORT STRUCTURE TO MOUNT SWITCH NEAR UNIT MOUNTED TERMINATION CABINET.
16. UNIT MOUNTED TERMINATION CABINET.
17. NEW VFD FOR COOLING TOWER FANS FURNISHED BY MECHANICAL CONTRACTOR AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
18. DOWN FROM COOLING TOWER FAN MOTORS.

BIDDING NOTES:

BASE BID: DELETE THIS SHEET IN IT'S ENTIRETY.
ALT. BID #2: PROVIDE ALL WORK SHOWN ON THIS SHEET.

EXISTING CONDITIONS WERE OBTAINED FROM EXISTING AS-BUILT DRAWINGS AND CURSORY FIELD OBSERVATION. THIS CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES IN THE FIELD AND REPORT THEM TO THE ENGINEER.

LEGEND:

- DENOTES DEMOLITION.
- DENOTES EXISTING TO REMAIN AND/OR BE REUSED.
- DENOTES NEW.

Consultants:
Mechanical - Electrical - Structural Engineers
1216 E. Tower Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
ENGINEERING GROUP LLC

ALTERNATE BID #2 MECHANICAL ROOM ELECTRICAL PLANS AND ROOF ELECTRICAL DEMOLITION PLAN.

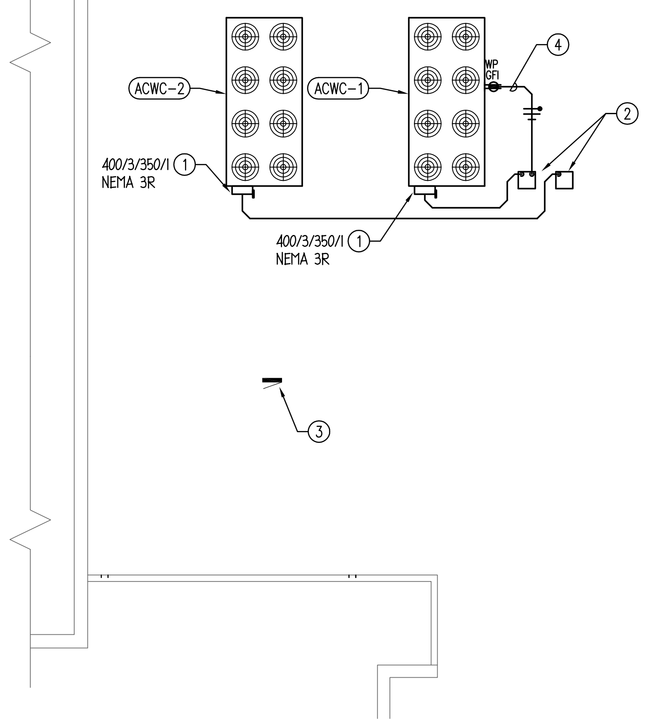
McHenry County College - Building 'B' Chiller Replacement
8900 U.S. Hwy. 14 Building 'B'
Crystal Lake, Illinois 60012

Revisions:
23 JUNE 2014 - BID DOCUMENTS

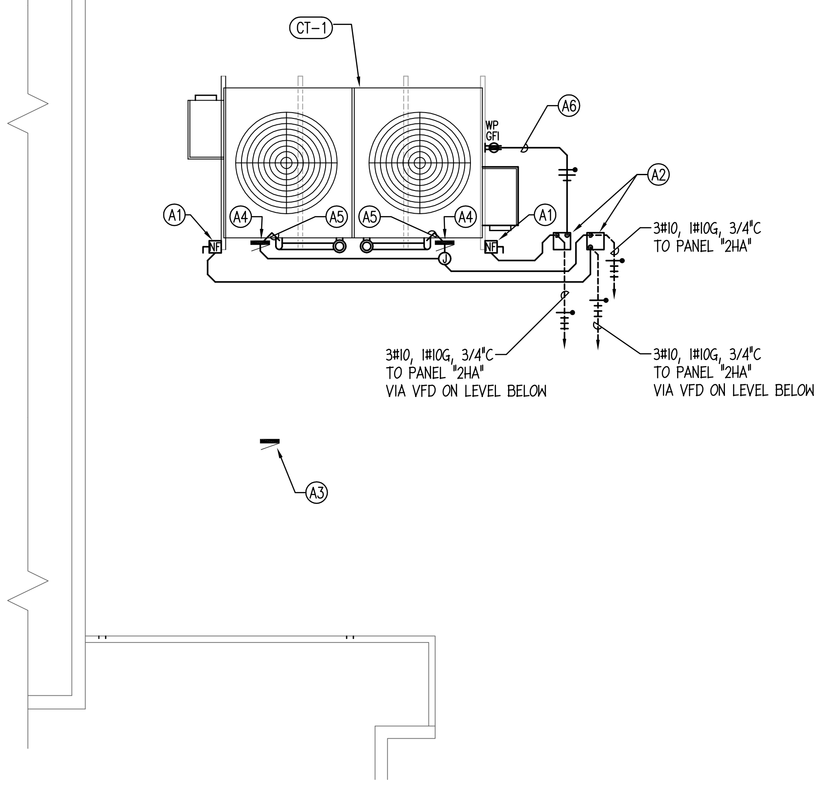
Issue Date: 18 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

E-2

NAME: 1550A3E-2.dwg BY:RJR DATE: JUN 23, 2014 TIME: 9:08 AM



1 BASE BID ELECTRICAL ROOF PLAN
1/8" = 1'-0"



2 ALTERNATE BID #2 ELECTRICAL ROOF PLAN
1/8" = 1'-0"

DRAWING NOTES: (TYPICAL FOR BASE BID ONLY.)

1. PROVIDE 600V NEMA 3R 400A FUSIBLE 3 POLE DISCONNECT WITH 350A FUSES. PROVIDE UNISTRUT SUPPORT STRUCTURE TO MOUNT SWITCH NEAR UNIT MOUNTED TERMINATION CABINET.
2. UTILIZE EXISTING ROOF PORTAL TO BRING NEW AND RE-ROUTED BRANCH CIRCUITS TO NEW EQUIPMENT. PROVIDE NEW ABS PLASTIC WEATHER PROOF CAP AND SUPPORT NEW PIPING ABOVE AND BELOW ROOF
3. EXISTING PANEL "2HA" ON LEVEL BELOW IN MECHANICAL ROOM 251B. SHOWN FOR REFERENCE ONLY.
4. INTERCEPT EXISTING 120V/20A CIRCUIT SERVING DEMOLISHED ROOF TOP RECEPTACLE AND REROUTE TO SERVE NEW GFI, WEATHERPROOF WHILE IN USED RECEPTACLE.

ALT. BID 2 DRAWING NOTES: (TYPICAL FOR THIS ALTERNATE BID 2 ONLY.)

- A1 PROVIDE 600V, 400A, 30/3/NF/3R DISCONNECT. PROVIDE SUPPORT CHANNEL STRUCTURE FOR MOUNTING DISCONNECT.
- A2 UTILIZE EXISTING ROOF PORTAL TO BRING NEW AND RE-ROUTED BRANCH CIRCUITS TO NEW EQUIPMENT. PROVIDE NEW ABS PLASTIC WEATHER PROOF CAP AND SUPPORT NEW PIPING ABOVE AND BELOW ROOF
- A3 EXISTING PANEL "2HA" ON LEVEL BELOW IN MECHANICAL ROOM 251B. REMOVE (3) 3P CIRCUIT BREAKERS MADE SPARE BY DEMOLITION OF ROOF MOUNTED AIR COOLED CONDENSER UNITS AND PROVIDE NEW BREAKERS FOR NEW LOADS
  (2) 70A/3P COOLING TOWER FANS AND VFD DRIVES.
  (1) 15A/3P COOLING TOWER PURIFICATION SYSTEM CONTROLLER.
  LABEL FOURTH BREAKER MADE AVAILABLE BY DEMOLITION OF ROOF ACCU AS SPARE.
- A4 PURIFICATION SYSTEM CONTROLLER FURNISHED WITH COOLING TOWER, WIRED COMPLETE BY ELECTRICAL CONTRACTOR.
- A5 PROVIDE CONTROL WIRE BETWEEN CONTOLLER AND PURIFICATION UNITS.
- A6 INTERCEPT EXISTING 120V/20A CIRCUIT SERVING DEMOLISHED ROOF TOP RECEPTACLE AND REROUTE TO SERVE NEW GFI, WEATHERPROOF WHILE IN USED RECEPTACLE.

NOTE

INCIDENTAL WORK MAY ALSO BE NECESSARY DUE TO CHANGES AFFECTING, SITE WORK, ELECTRICAL, OR OTHER SYSTEMS. SUCH INCIDENTAL WORK IS ALSO PART OF THIS CONTRACT. INSPECT THOSE AREAS, COORDINATE WITH OTHER TRADES, AND ASCERTAIN WORK NEEDED, AND DO THAT WORK IN ACCORD WITH THE CONTRACT REQUIREMENTS, AT NO ADDITIONAL COST. THE REMOVAL & REINSTALLATION OF EXISTING WORK TO ACCOMMODATE CHANGES TO EXISTING, OR INSTALLATION OF, ELECTRICAL, OTHER SYSTEMS IS ALSO PART OF THIS CONTRACT.

Consultants:
Mechanical - Electrical - Structural Engineers
1216 Tower Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201

BASE BID AND ALTERNATE BID #2 PARTIAL ROOF ELECTRICAL PLAN

McHenry County College - Building 'B' Chiller Replacement
8900 U.S. Highway 14
Crystal Lake, Illinois 60012

Revisions:
29 JUNE 2014 - BID DOCUMENTS

Issue Date: 18 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

E-3

NAME: 1550A3E-3.dwg BY:RJR DATE: JUN 20, 2014 TIME: 8:31 AM

ELECTRICAL SPECIFICATIONS

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL AMMENDMENTS.

2. PROVIDE ALL PERMITS AND INSPECTION FEES.

3. ALL MATERIAL AND LABOR SHALL BE GUARANTEED FOR ONE YEAR AFTER FINAL ACCEPTANCE BY THE ENGINEER AND OWNER.

4. THIS CONTRACTOR SHALL PROVIDE ALL HIS OWN RIGGING, SCAFFOLDING, RUBBISH REMOVAL AND LEAVE SPACE BROOM CLEAN.

5. MINIMUM SIZE CONDUIT SHALL BE 3/4" E.M.T.

6. MINIMUM SIZE CONDUCTOR SHALL BE #12 THHN, OR THWN WHERE REQUIRED, WITH #14 USED FOR CONTROL WIRING.

7. PROVIDE EQUIPMENT GROUNDING CONDUCTOR IN ALL RACEWAYS.

8. BRANCH CIRCUIT CONDUCTORS FOR 20 AMP RECEPTACLES AND LIGHTING CIRCUITS SHALL BE ADJUSTED FOR VOLTAGE DROP.
   A. 120/208V: 0-75' - #12AWG MINIMUM
      75'-150' - #10AWG MINIMUM
      150'-225' - # 8AWG MINIMUM
   B. 277/480V: 0-100' - #12AWG MINIMUM
      100'-200' - #10AWG MINIMUM
      200'-300' - # 8AWG MINIMUM

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. THIS CONTRACTOR SHALL PROVIDE ALL NECESSARY CUTTING AND PATCHING INCLUDING SLEEVES AND INSERTS.

11. ALL NEW CIRCUIT BREAKERS SHALL BE BOLT-ON BREAKERS (10,000 A.I.C.), COMPATIBLE WITH EXISTING PANELBOARD. PROVIDE TYPEWRITTEN DIRECTORIES IN ALL PANELS.

12. BEFORE SUBMITTING HIS BID, THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE TO ASCERTAIN ALL WORK INVOLVED IN THE PROJECT.

13. THIS CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS ON THE PROJECT.

14. THIS 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. 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. ALL CONDUIT INSTALLATION SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
   A. SINGLE PHASE 120 VOLT BRANCH CIRCUITS, COMMUNICATIONS WIRING AND OTHER SIGNALING CIRCUITS FOR INTERIOR, LOCATIONS USE EMT.
   B. THREE PHASE, 208 VOLT FEEDERS AND SINGLE PHASE, BRANCH CIRCUITS FOR INTERIOR, LOCATIONS. MAX SIZE 2" USE EMT. OVER 2" USE IMC.
   C. EXTERIOR CONDUITS ABOVE GRADE SHALL BE IMC OR RMC.
   D. EXTERIOR CONDUITS BELOW GRADE SHALL RMC OR PVC

17. SUPPORT STRUCTURES FOR ELECTRICAL EQUIPMENT SHALL BE FORMED CHANNEL STEEL AT INTERIOR LOCATIONS AND GALVANIZED STEEL OR STAINLESS AT EXTERIOR LOCATIONS. UNISTRUT OR EQUAL.

POWER SYMBOL LIST

(GFI,WP) 20A. 2P, 3 WIRE, GROUNDING TYPE, 125V. SPECIFICATION-GRADE, DUPLEX RECEPTACLE NEMA 5-20R INSTALLED 16" A.F.F. U.N.O.
(EM,TR) (IG,SPD) (AFCI)
- "EM" DENOTES RECEPTACLE WIRED TO CRITICAL BRANCH OF THE EMERGENCY SYSTEM. RECEPTACLE SHALL BE RED IN COLOR.
- "GFI" DENOTES RECEPTACLE EQUIPPED WITH INTEGRAL GROUND FAULT CIRCUIT INTERRUPTER.
- "WP" DENOTES RECEPTACLE WITH WHILE-IN-USE WEATHERPROOF COVER.
- "TR" DENOTES TAMPER RESISTANT TYPE RECEPTACLE.
- "IG" DENOTES ISOLATED GROUND TYPE RECEPTACLE.
- "SPD" DENOTES RECEPTACLE WITH INTEGRAL SURGE PROTECTIVE DEVICE.
- "AFCI" DENOTES ARC FAULT CIRCUIT INTERRUPTER.

NON-FUSED SAFETY DISCONNECT SWITCH, AMPERE RATING AND NUMBER OF POLES AS NOTED.

FUSED DISCONNECT SWITCH, AMPERE RATING, NUMBER OF POLES AND FUSE SIZE AS NOTED.

COMBINATION MOTOR STARTER WITH FUSED DISCONNECT, AMPERE RATING, NUMBER OF POLES, FUSE SIZE AND NEMA STARTER SIZE AS INDICATED.

30/3/30/3R NEMA 00
- 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.

CEILING JUNCTION BOX.

WALL MOUNTED JUNCTION BOX.

JUNCTION BOX WITH FLEXIBLE CONDUIT FOR FINAL CONNECTION TO EQUIPMENT.

CIRCUIT BREAKER PANELBOARD.

SURFACE MOUNTED (EXPOSED) CONDUIT, BACKBOX FOR DEVICE AS SHOWN.

VFD VARIABLE FREQUENCY DRIVE.

CONDUIT ROUTED CONCEALED IN WALLS AND CEILING. HASH MARKS DENOTE QUANTITY OF #12 MINIMUM AWG CONDUCTORS OR AS NOTED.

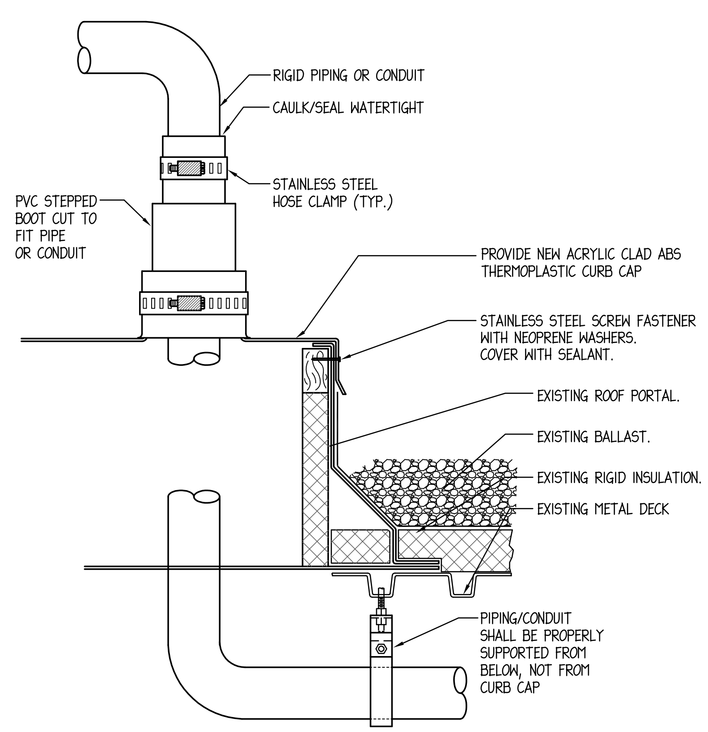
CONDUIT ROUTED EXPOSED. INSTALL PARALLEL TO WALLS AND CEILINGS. HASH MARKS DENOTE QUANTITY OF #12 MINIMUM AWG CONDUCTORS OR AS NOTED.

CONDUIT ROUTED BELOW GRADE. HASH MARK DENOTES QUANTITY OF #12 MINIMUM AWG CONDUCTORS OR AS NOTED.

- DENOTES CONDUIT HOMERUN, 3/4" MINIMUM, PANEL DESTINATION AND CIRCUIT NUMBER(S) AS INDICATED.
- SHORT TICK MARK DENOTES LINE (HOT) OR SWITCH LEG CONDUCTOR, #12 MINIMUM AWG.
- LONG TICK MARK DENOTES NEUTRAL CONDUCTOR, #10 AWG MINIMUM.
- DENOTES INSULATED GROUND WIRE, #12 AWG MINIMUM.

ELECTRICAL ABBREVIATIONS

A	AMPERES	HP	HORSEPOWER
AFCI	ARC FAULT CIRCUIT INTERRUPTER	KCM	THOUSAND CIRCULAR MILS
A.F.F.	ABOVE FINISHED FLOOR	MCA	MINIMUM CIRCUIT AMPS
C	CONDUIT	V	VOLTS
CT	CURRENT TRANSFORMER	VA	VOLT - AMPERES
CU	COPPER	WP	WEATHER PROOF
EC	ELECTRICAL CONTRACTOR	1P	SINGLE POLE
EM	EMERGENCY	2P	TWO POLE
FLA	FULL LOAD AMPS	3P	THREE POLE
G, GRD.	GROUND	ϕ	PHASE
GFI	GROUND FAULT CIRCUIT INTERRUPTER		
GFPI	GROUND FAULT PROTECTIVE EQUIPMENT		



PIPING OR CONDUIT ROOF CURB DETAIL
NO SCALE

NOTE

SEE DRAWINGS HV-4 AND HV-5 FOR GENERAL NOTES, AND ADDITIONAL DETAILS APPLICABLE TO THIS TRADE'S WORK.

NOTE

INCIDENTAL WORK MAY ALSO BE NECESSARY DUE TO CHANGES AFFECTING, SITE WORK, ELECTRICAL, OR OTHER SYSTEMS. SUCH INCIDENTAL WORK IS ALSO PART OF THIS CONTRACT. INSPECT THOSE AREAS, COORDINATE WITH OTHER TRADES, AND ASCERTAIN WORK NEEDED, AND DO THAT WORK IN ACCORD WITH THE CONTRACT REQUIREMENTS, AT NO ADDITIONAL COST. THE REMOVAL & REINSTALLATION OF EXISTING WORK TO ACCOMMODATE CHANGES TO EXISTING, OR INSTALLATION OF, ELECTRICAL, OTHER SYSTEMS IS ALSO PART OF THIS CONTRACT.

Consultants:
Mechanical - Electrical - Structural Engineers
1216 Tower Road
Schaumburg, Illinois 60173
847.882.2010
Fax 847.882.2201
ENGINEERING GROUP LLC

ELECTRICAL SPECIFICATIONS, SYMBOLS AND ABBREVIATIONS

McHenry County College - Building 'B' Chiller Replacement
8900 U.S. Highway 14
Crystal Lake, Illinois 60012

Revisions:
23 JUNE 2014 - BID DOCUMENTS

Issue Date: 18 JUNE 2014
Drawn By: 20/10
Job Number: 1550-A-3

E-4