

FIRE / SMOKE BARRIER DESIGNATIONS	
THE SYMBOLS SHOWN ARE FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL VERIFY RATINGS WITH THE LATEST SET OF ARCHITECTURAL PLANS AND FURNISH ALL MATERIALS REQUIRED TO COMPLY WITH THOSE RATINGS WHETHER SHOWN OR NOT.	
ALL FLOOR ASSEMBLIES SHALL BE DESIGNATED AS 2 HOUR FIRE BARRIER(S), UNLESS NOTED OTHERWISE ON THE PLANS. RATINGS WERE ACQUIRED FROM THE ARCHITECTURAL PLANS.	
1 HOUR FIRE BARRIER	----
2 HOUR FIRE BARRIER	-----
SMOKE BARRIER	=====

- MECHANICAL DEMOLITION NOTES:**
- THE DRAWINGS ARE INTENDED TO INDICATE THE SCOPE OF DEMOLITION WORK REQUIRED AND DO NOT INDICATE EVERY PIPE, DUCT, OR PIECE OF EQUIPMENT THAT MUST BE REMOVED. ACCESSIBILITY OF EQUIPMENT AND SYSTEMS IS NOT SHOWN NOR SHOULD IT BE INFERRED. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING A BID AND VERIFY EXISTING CONDITIONS.
 - CONTRACTOR IS RESPONSIBLE FOR ALL COST ASSOCIATED WITH CEILING SYSTEM DISASSEMBLY AND REASSEMBLY TO ACCOMMODATE THIS WORK. CONTRACTOR TO SALVAGE, STORE, AND REINSTALL ALL CEILING MOUNTED DEVICES.
 - CONTRACTOR TO COORDINATE WITH OWNER FOR ALL MECHANICAL SERVICE OUTAGES. EXISTING WATER DRAIN SYSTEM ONLY TO MAKE SWITCHOVERS AND CONNECTIONS. OBTAIN PERMISSION FROM OWNER AT LEAST 72 HOURS BEFORE PARTIALLY OR COMPLETELY DRAINING SYSTEM. MINIMIZE OUTAGE DURING OPERATION.
 - CONTRACTOR IS RESPONSIBLE FOR PATCHING ALL PENETRATIONS CREATED BY REMOVAL OF EQUIPMENT, DUCTWORK, PIPING, ETC. TO MATCH EXISTING. REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK. PATCH TO MATCH ORIGINAL CONSTRUCTION. VERIFY ALTERNATIVE OR SPECIAL REPAIR METHODS WITH ARCHITECT/ENGINEER BEFORE PROCEEDING WITH DEMOLITION.
 - CONTRACTOR IS RESPONSIBLE FOR ALL MODIFICATIONS TO THE EXISTING HVAC PIPING AND DUCTWORK NECESSARY TO PERMIT THE INSTALLATION OF NEW WORK.
 - PROVIDE TEMPORARY CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION.
 - WHEN WORK MUST BE PERFORMED ON OPERATING EQUIPMENT, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS.
 - EXTEND EXISTING INSTALLATIONS USING MATERIAL AND METHODS COMPATIBLE WITH EXISTING MECHANICAL INSTALLATIONS, OR AS SPECIFIED FOR INTENDED SERVICE.
 - ALL SYSTEM CHANGEOVERS BE COMPLETED IN OVERTIME, NOT DURING NORMAL WORKING HOURS.
 - REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION.
 - REMOVE ABANDONED DUCTS AND PIPING TO SOURCE OF SUPPLY AND/OR MAIN LINES AND CAP OR MAKE READY FOR RECONNECTION IF SERVICE IS EXTENDED AS PART OF NEW WORK.
 - DISCONNECT AND REMOVE MECHANICAL DEVICES AND EQUIPMENT SERVING EQUIPMENT THAT HAS BEEN REMOVED.
 - MAINTAIN ACCESS TO EXISTING MECHANICAL INSTALLATIONS WHICH REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE ACCESS PANEL AS APPROPRIATE.
 - MECHANICAL ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.
 - MECHANICAL CONTRACTOR IS RESPONSIBLE FOR BLEEDING AIR THAT MAY HAVE ENTERED THE SYSTEM DURING CONSTRUCTION FROM EXISTING AND NEW PIPING BEFORE WATER SYSTEMS BECOME OPERATIONAL.

- GENERAL MECHANICAL NOTES:**
- DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT ACTUAL INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
 - DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. READ ALL SPECIFICATIONS. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
 - LAYOUT AND COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH ANY FABRICATION OR EQUIPMENT ORDERS.
 - CONTRACTOR IS RESPONSIBLE FOR REVIEW OF SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKING REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
 - ANY CHANGES THAT ARE REQUIRED TO ELIMINATE CONFLICTS AND RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO THE OWNER.
 - CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALLS, PARTITIONS, FLOORS AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN THE ROOMS.
 - CONTRACTOR IS RESPONSIBLE FOR ALL COST ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT DIFFERENT THAN THE BASIS OF DESIGN.
 - REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES.
 - TERMINAL AIR BOX (TAB) NUMBER OR REHEAT COIL NUMBER IS SHOWN ADJACENT TO THERMOSTAT ONLY WHEN THE TAB OR COIL WHICH THE THERMOSTAT IS CONTROLLING IS AMBIGUOUS.
 - ALIGN LIGHT SWITCHES AND TEMPERATURE SENSORS WHEN IN CLOSE PROXIMITY TO EACH OTHER.
 - PROVIDE ACCESS DOORS AT ALL DUCT MOUNTED EQUIPMENT.

DESIGN CODES:

DESCRIPTION:	YEAR:
INTERNATIONAL BUILDING CODE	2012
INTERNATIONAL MECHANICAL CODE	2012
INTERNATIONAL PLUMBING CODE	2012
INTERNATIONAL FIRE CODE	2012
INTERNATIONAL ENERGY CONSERVATION CODE	2012

CONTACT PERSONS

DESCRIPTION:	PERSON:
PROJECT MANAGER	DAVID LARSON
MECHANICAL ENGINEER	NATE JACQUES

PIPING SYMBOLS LIST

SYMBOL:	DESCRIPTION:
---	EXISTING TO REMAIN
----	EXISTING TO BE REMOVED
---	NEW
—CW—	COLD WATER - POTABLE
—CWR—	CHILLED WATER RETURN
—CWS—	CHILLED WATER SUPPLY
—COND—	CONDENSATE (GRAVITY DRAIN)
—D—	DRAIN LINE
—HWR—	HEATING WATER RETURN
—HWS—	HEATING WATER SUPPLY
—LPC—	LOW PRESSURE CONDENSATE
—PC—	PUMPED CONDENSATE
—V—	VENT
—S15—	STEAM - NUMBER INDICATES PRESSURE IN PSIG.
—NCW—	NON-POTABLE COLD WATER
—	PIPE CAP
—	PIPE DOWN
—	PIPE UP OR UP/DOWN
—	PITCH PIPE IN DIRECTION
—	DIRECTION OF FLOW IN PIPE
—	NEW CONNECTION
—	UNION/LANGE
—	SHUTOFF VALVE NORMALLY OPEN
—	SHUTOFF VALVE NORMALLY CLOSED
—	THROTTLING VALVE
—0.5	BALANCING VALVE (NO. INDICATES GPM)
—	CONTROL VALVE (TWO-WAY)
—	CHECK VALVE
—	SAFETY/RELIEF VALVE
—	PRESSURE REDUCING VALVE (LIQUID/GAS)
—	PRESSURE REDUCING VALVE (STEAM)
—	VACUUM BREAKER
—	"WYE" - STRAINER
—	"WYE" - STRAINER W/SHUTOFF VALVE AND HOSE CONNECTION WITH CAP
—	FLEXIBLE CONNECTION
—	PRESSURE/TEMPERATURE TEST PLUG
—	REDUCER - REFERENCE SPECIFICATION FOR CONCENTRIC/ECCENTRIC AND FOT/FOB
—	METER
—	PRESSURE GAUGE (FURNISHED WITH BALL VALVE)
—	SUCTION DIFFUSER WITH SUPPORT FOOT
—	AUTOMATIC AIR VENT
—	MANUAL AIR VENT W/ BALL VALVE
—	DRAIN VALVE WITH HOSE CONNECTION, CAP AND BALL VALVE
—	TRIPLE DUTY VALVE
—	TEMPERATURE SENSOR WITH WELL
—	THERMOMETER WITH WELL (FILLED TYPE)
—	FLOW SWITCH
—	FLOW METER
—	F&T STEAM TRAP (REFER TO SCHEDULE)
—	INVERTED BUCKET STEAM TRAP (REFER TO SCHEDULE)
—	ALIGNMENT GUIDE
—	PIPE ANCHOR
—	EXPANSION JOINT
—	THERMOSTAT/SENSOR
—	PUMP
—	WATER METER
—	DIFFERENTIAL PRESSURE SWITCH
—	CURRENT SWITCH
—	FLOW METER
—	CONDUCTIVITY PROBE
—	ANALOG INPUT
—	ANALOG OUTPUT
—	DIGITAL INPUT
—	DIGITAL OUTPUT
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
E.C.	ELECTRICAL CONTRACTOR
FCU	FAN COIL UNIT
G.C.	GENERAL CONTRACTOR
H.C.	HEATING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
NC	NEW CONNECTION
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
P.C.	PLUMBING CONTRACTOR
PS	PRESSURE SWITCH
V.C.	VENTILATION CONTRACTOR

Revisions:	Date
REVISED FOR BIDDING	10/27/15

CONSULTANTS:
HEALTHCARE PLANNERS: VOA ARCHITECTS
MEPPF + TECH + STRUCT: KJWW CONSULTING ENGINEERS
CIVIL ENGINEER: JD ENGINEERING
COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

ARCHITECT:



MICHAEL ROTH & ASSOCIATES, ARCHITECTS & PLANNERS, INC.
 200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title
PIPING COVER SHEET

Approved: Project Director

Project Title **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**

Location
BONHAM, TEXAS

Date
APRIL 13, 2015

Checked
LINPEA

Drawn
NATJAC

Project Number
549-130

Building Number
1

Drawing Number
MP001

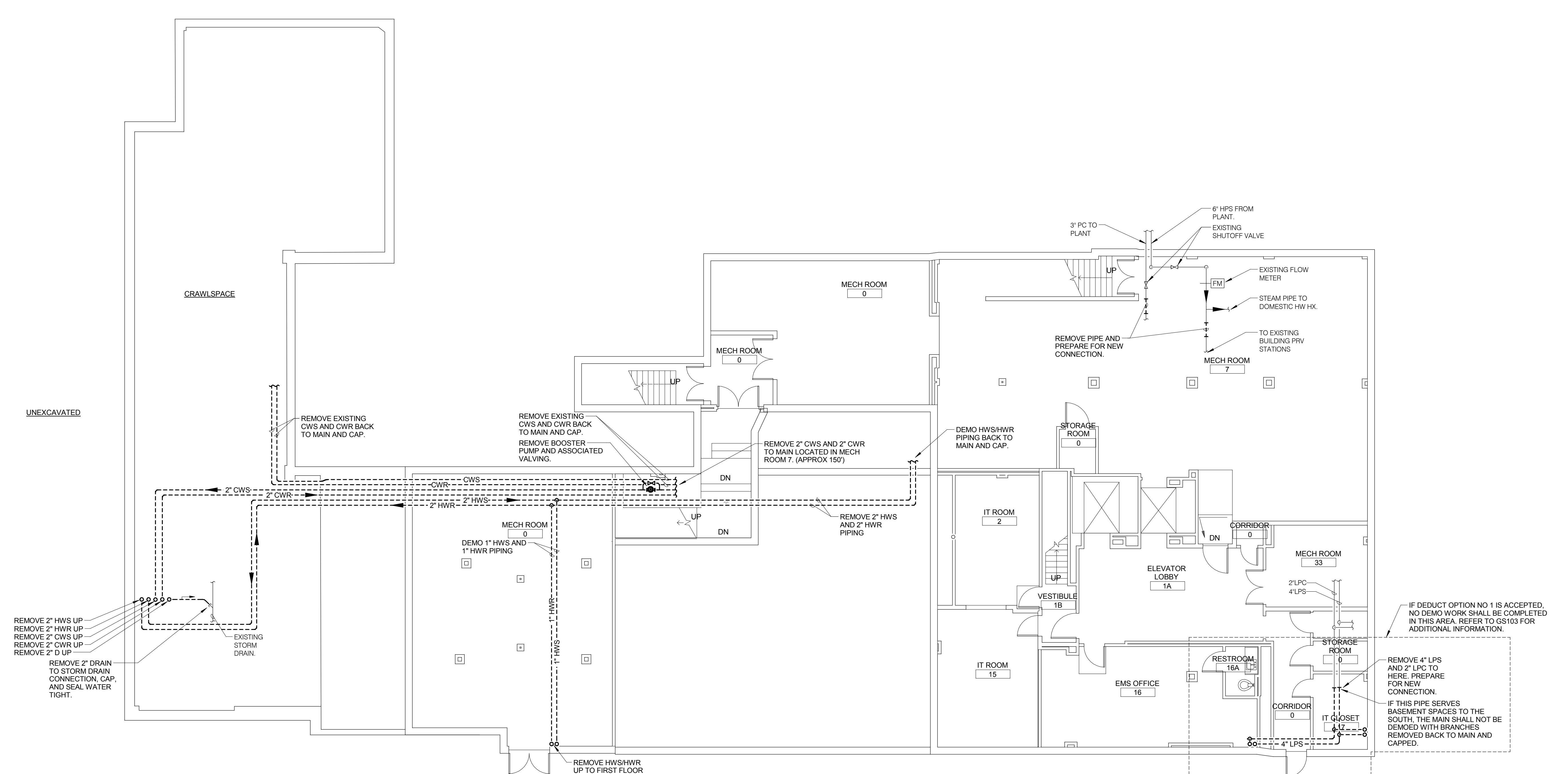
Dwg. 72 of 142

Office of Facilities Management



Department of Veterans Affairs

GENERAL NOTES:
 1. EXISTING CONDITIONS ARE SHOWN BASED ON FILED OBSERVATIONS AND EXISTING DOCUMENTS. CONTRACTOR SHALL FIELD VERIFY CONDITIONS AND CONTACT ENGINEER IF ANY DISCREPANCIES ARISE PRIOR TO COMPLETING WORK.



1 BASEMENT FLOOR PLAN - PIPING - DEMO
 1/8" = 1'-0"


REVISED FOR BIDDING	10/27/15
Revisions:	Date

CONSULTANTS:
 HEALTHCARE PLANNERS: VOA ARCHITECTS
 MEPFP + TECH + STRUCT: KJWW CONSULTING ENGINEERS
 CIVIL ENGINEER: JD ENGINEERING
 COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
 INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

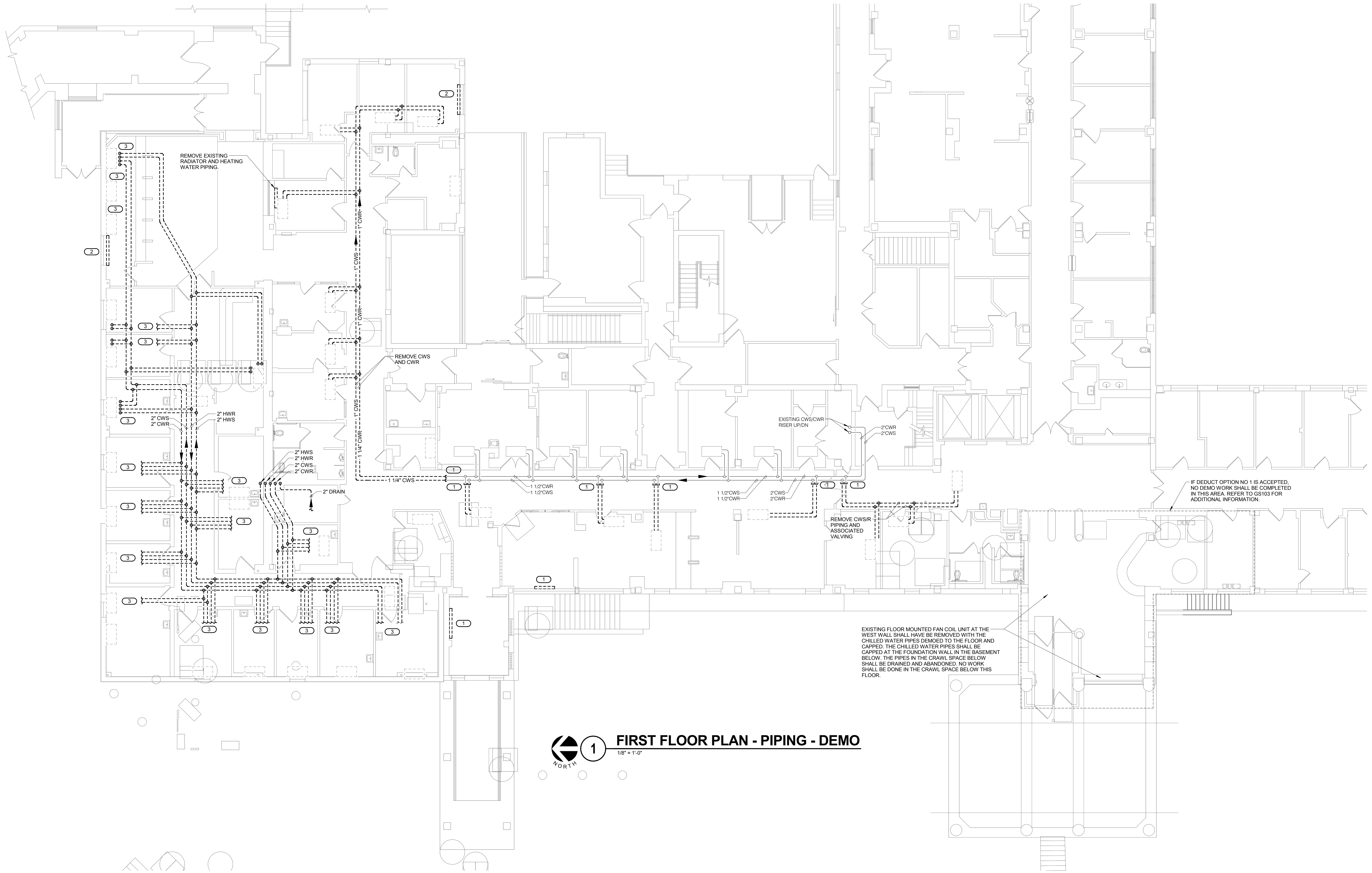
ARCHITECT:
 **MICHAEL ROTH & ASSOCIATES, ARCHITECTS & PLANNERS, INC.**
 200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title
BASEMENT FLOOR PLAN - PIPING - DEMO
 Approved: Project Director

Project Title **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**
 Location **BONHAM, TEXAS**
 Date **APRIL 13, 2015**
 Checked **LINPEA**
 Drawn **NATJAC**
 Project Number **549-130**
 Building Number **1**
 Drawing Number **MP101**
 Dwg. 73 of 142

Office of Facilities Management


- GENERAL NOTES:**
- EXISTING CONDITIONS ARE SHOWN BASED ON FIELD OBSERVATIONS AND EXISTING DOCUMENTS. CONTRACTOR SHALL FIELD VERIFY CONDITIONS AND CONTACT ENGINEER IF ANY DISCREPANCIES ARISE PRIOR TO COMPLETING WORK.
 - FAN COIL UNITS DEMOED UNDER VENTILATION CONTRACTORS SCOPE.
- KEYNOTES:** (#)
- REMOVE CWS/CWR PIPING AND ASSOCIATED VALVING BACK TO MAIN AND CAP.
 - REMOVE STEAM RADIANT HEATER AND ASSOCIATED PIPING BACK TO MAIN.
 - REMOVE HWS/R AND CWS/R SERVING FCU.



1 FIRST FLOOR PLAN - PIPING - DEMO
1/8" = 1'-0"

three eighths inch = one foot
 one quarter inch = one foot
 one eighth inch = one foot
 three sixteenths inch = one foot
 one half inch = one foot
 one inch = one foot
 three quarters inch = one foot
 one and one half inches = one foot
 one and one quarter inches = one foot
 one and three eighths inches = one foot
 one and one half inches = one foot
 one and three quarters inches = one foot
 two inches = one foot
 three inches = one foot
 four inches = one foot
 five inches = one foot
 six inches = one foot
 seven inches = one foot
 eight inches = one foot
 nine inches = one foot
 ten inches = one foot
 eleven inches = one foot
 twelve inches = one foot

REVISED FOR BIDDING	10/27/15
Revisions:	Date

CONSULTANTS:

HEALTHCARE PLANNERS: VOA ARCHITECTS
MEPP + TECH + STRUCT: KJWW CONSULTING ENGINEERS
CIVIL ENGINEER: JD ENGINEERING
COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

ARCHITECT:

MICHAEL ROTH & ASSOCIATES, ARCHITECTS & PLANNERS, INC.
 200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title
FIRST FLOOR PLAN - PIPING - DEMO

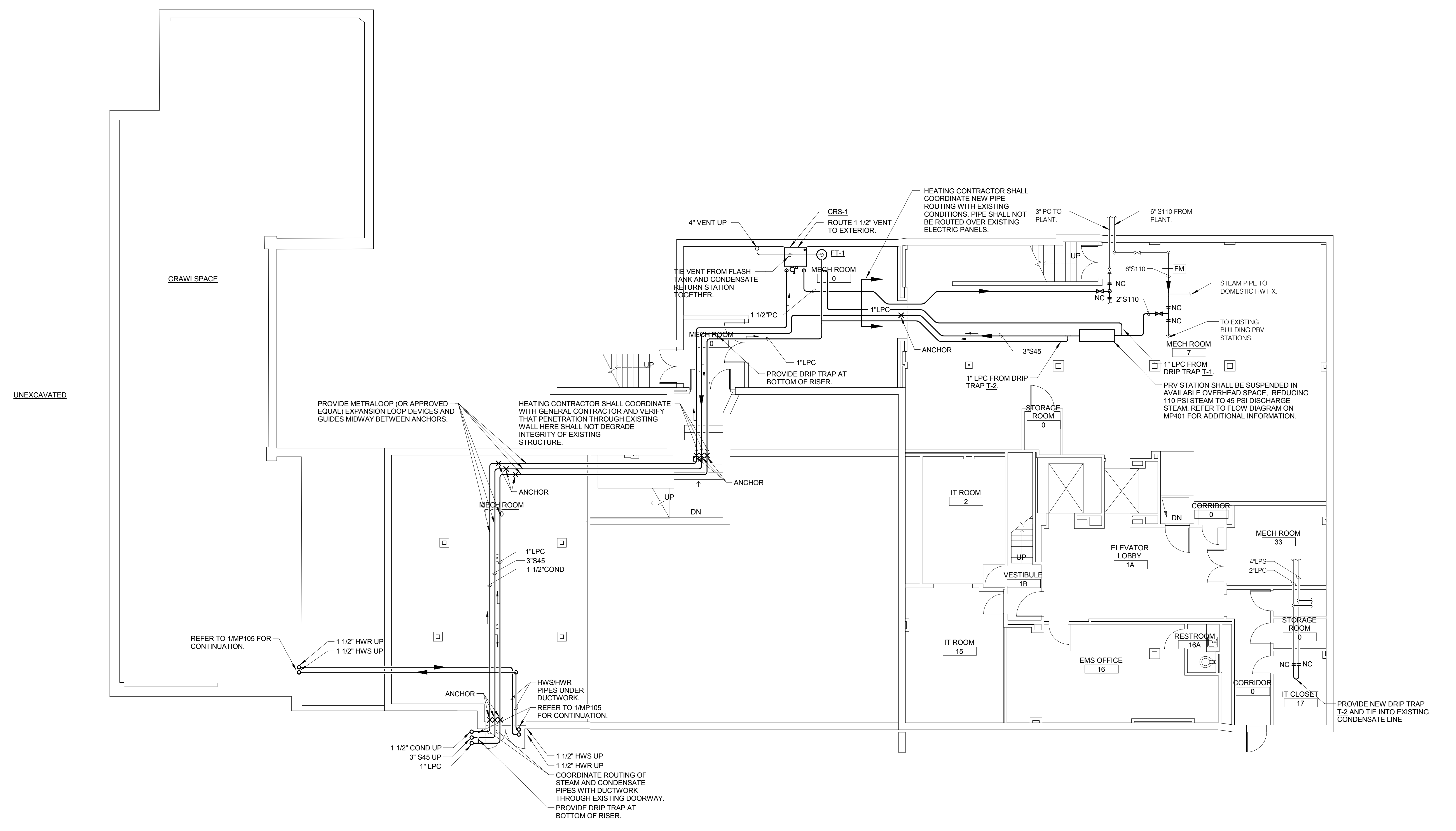
Approved: Project Director

Project Title	RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER	Project Number	549-130
Location	BONHAM, TEXAS	Building Number	1
Date	APRIL 13, 2015	Checked	LINPEA
Drawn	NATJAC	Drawing Number	MP102
			Dwg. 74 of 142

Office of Facilities Management

Department of Veterans Affairs

- GENERAL NOTES:**
1. REFER TO 7MP301 FOR SAFETY VALVE DISCHARGE PIPING DETAIL.
 2. REFER TO 8MP301 FOR STEAM MAIN DRIP CONNECTION DETAIL.
 3. REFER TO MP401 AND MP402 FOR FLOW DIAGRAMS AND MP501 FOR PIPING SCHEDULES.
 4. REFER TO MP601 FOR CONTROL DIAGRAMS.
 5. REFER TO 1MP302 FOR ALIGNMENT GUIDE DETAIL.
 6. REFER TO 2MP302 FOR PIPE ANCHOR DETAIL.



1 BASEMENT FLOOR PLAN - PIPING
1/8" = 1'-0"

REVISED FOR BIDDING	10/27/15
Revisions:	Date

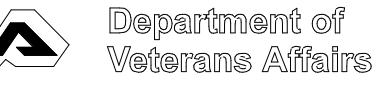
CONSULTANTS:
HEALTHCARE PLANNERS: VOA ARCHITECTS
MEPP + TECH + STRUCT: KJWW CONSULTING ENGINEERS
CIVIL ENGINEER: JD ENGINEERING
COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

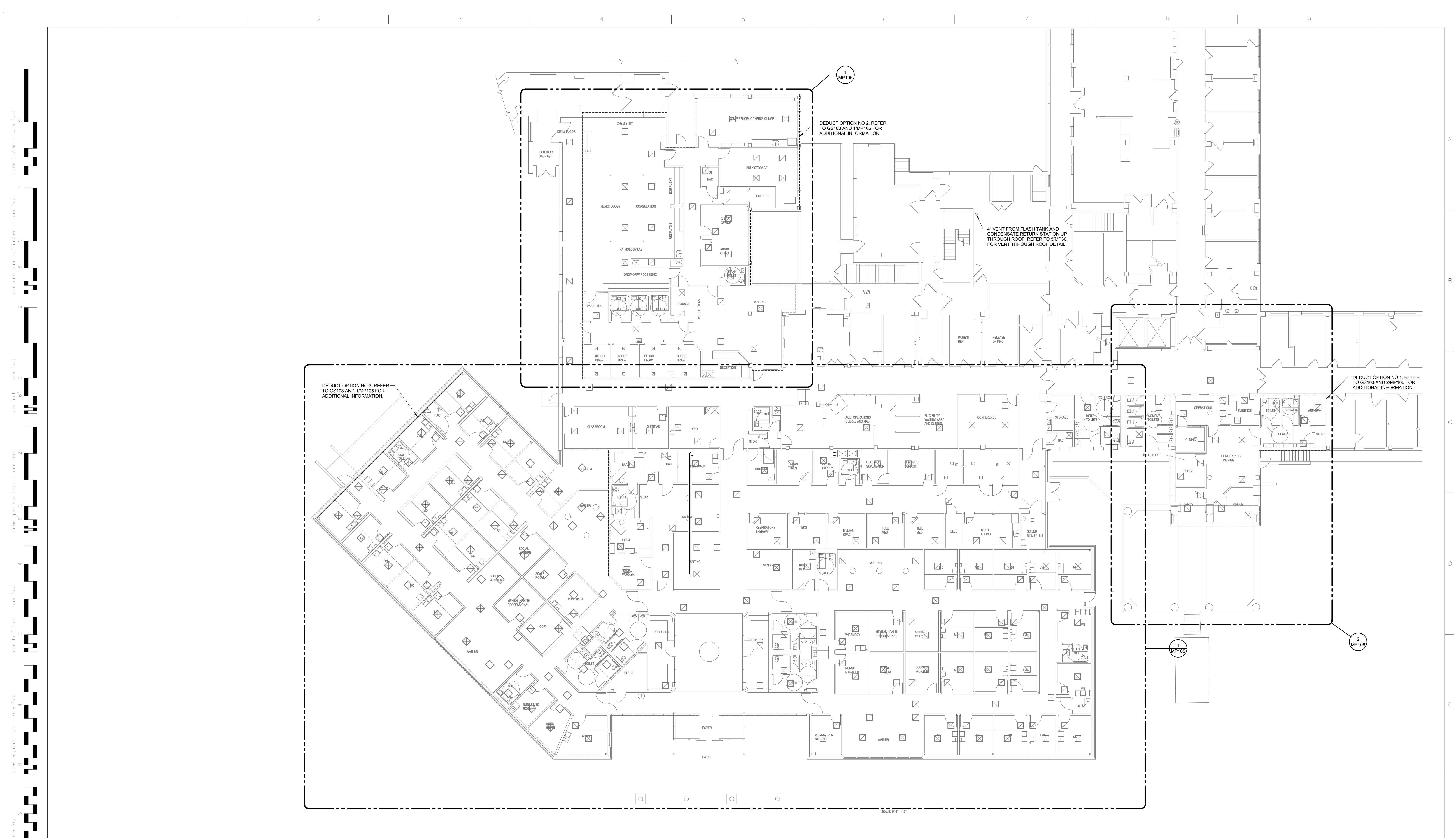
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Drawing Title
BASEMENT FLOOR PLAN - PIPING
 Approved: Project Director

Project Title **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**
 Project Number 549-130
 Building Number 1
 Drawing Number MP103
 Dwg. 75 of 142

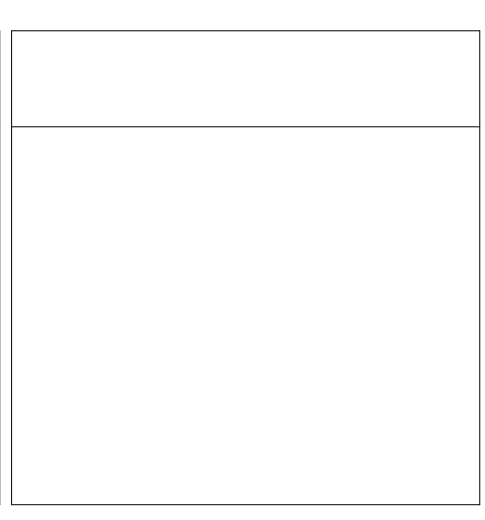
Office of Facilities Management




1 OVERALL FIRST FLOOR PLAN - ADDITION AND RENOVATION - PIPING
 3/32" = 1'-0"

REVISED FOR BIDDING	10/27/15
Revisions:	Date

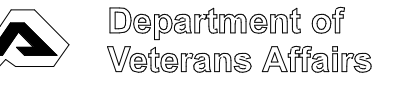
CONSULTANTS:
 HEALTHCARE PLANNERS: VOA ARCHITECTS
 MEPFP + TECH + STRUCT: KJWW CONSULTING ENGINEERS
 CIVIL ENGINEER: JD ENGINEERING
 COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
 INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.



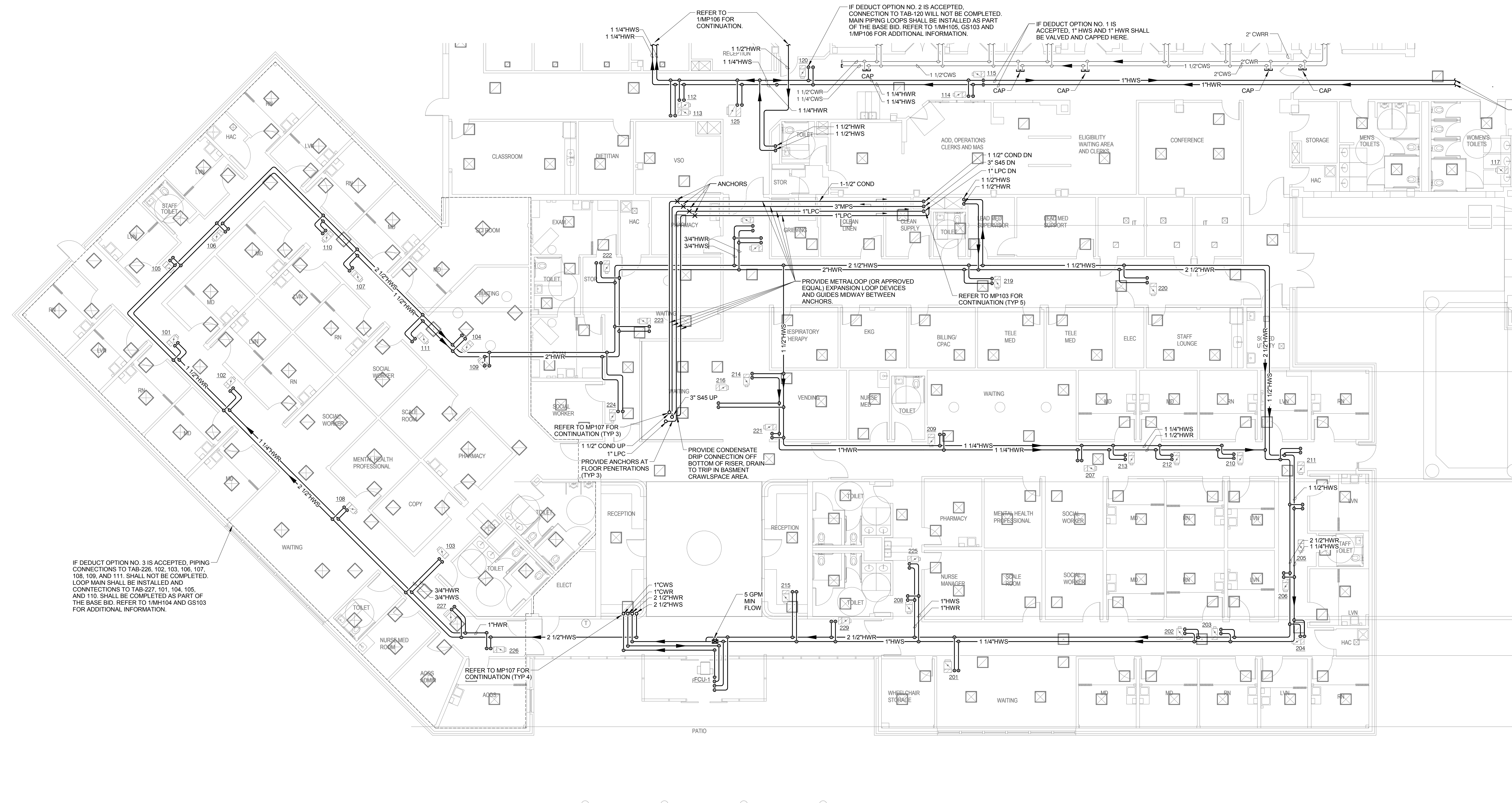
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 200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title
 OVERALL FIRST FLOOR PLAN - ADDITION AND RENOVATION - PIPING
Approved: Project Director

Project Title RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER
Location BONHAM, TEXAS
Date APRIL 13, 2015
Checked LINPEA
Drawn NATJAC
Project Number 549-130
Building Number 1
Drawing Number MP104
 Dwg. 76 of 142

Office of Facilities Management
 Department of Veterans Affairs

- GENERAL NOTES:
1. HEATING WATER SYSTEM UTILIZES A REVERSE RETURN DESIGN.
 2. REFER TO 3MP301 FOR PIPE THROUGH NON-FIRED RATED WALL DETAIL.
 3. REFER TO 4MP301 FOR PIPE SUPPORT DETAIL.
 4. REFER TO 1MP302 FOR ALIGNMENT GUIDE DETAIL.
 5. REFER TO 2MP302 FOR PIPE ANCHOR DETAIL.
 6. REFER TO 4MP302 FOR RATED FIRE BARRIER PENETRATION DETAIL.
 7. REFER TO MP601 AND MP402 FOR FLOW DIAGRAMS AND MP601 FOR PIPING SCHEDULES.
 8. REFER TO MP601 FOR CONTROL DIAGRAMS.
 9. HWS/HWR PIPE PUNDOUTS TO VALV BOXES SHALL BE 3/4" UNLESS NOTED OTHERWISE.
 10. REFER TO 1MP302 FOR ALIGNMENT GUIDE DETAIL.
 11. REFER TO 2MP302 FOR PIPE ANCHOR DETAIL.



three inches = one foot
 one and one half inches = one foot
 one inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 three quarters inch = one foot
 one half inch = one foot
 three eighths inch = one foot
 one quarter inch = one foot
 one eighth inch = one foot
 one quarter inch = one foot
 one eighth inch = one foot
 one eighth inch = one foot

IF DEDUCT OPTION NO. 3 IS ACCEPTED, PIPING CONNECTIONS TO TAB-226, 102, 103, 106, 107, 108, 109, AND 111, SHALL NOT BE COMPLETED. LOOP MAIN SHALL BE INSTALLED AND CONNECTIONS TO TAB-227, 101, 104, 105, AND 110, SHALL BE COMPLETED AS PART OF THE BASE BID. REFER TO 1MH104 AND GS103 FOR ADDITIONAL INFORMATION.

1 FIRST FLOOR PLAN - AMBULATORY CARE - PIPING
 1/8" = 1'-0"

REVISED FOR BIDDING	10/27/15
Revisions:	Date

CONSULTANTS:
 HEALTHCARE PLANNERS: VOA ARCHITECTS
 MEPFP + TECH + STRUCT: KJWW CONSULTING ENGINEERS
 CIVIL ENGINEER: JD ENGINEERING
 COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
 INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

ARCHITECT:

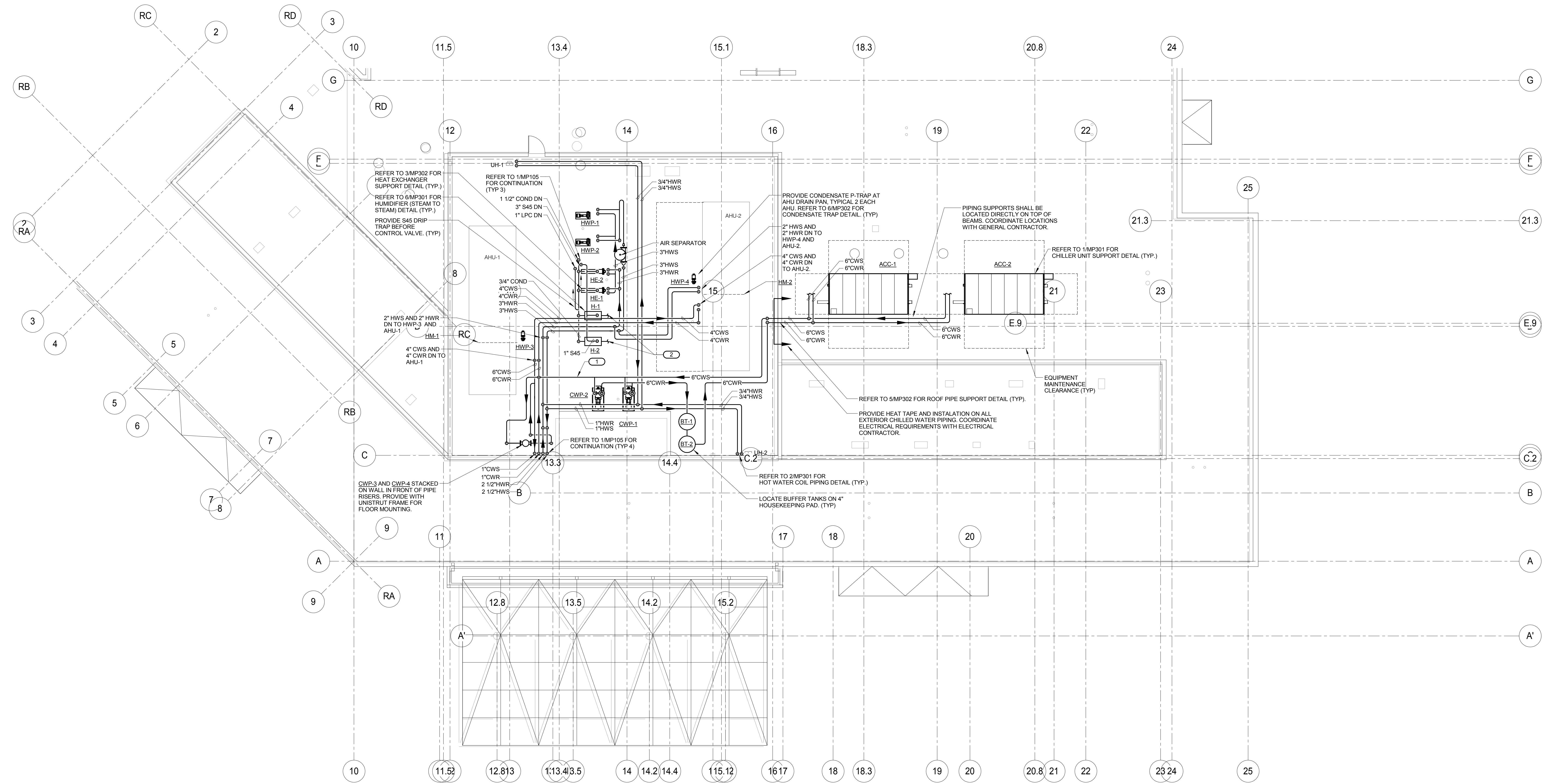
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 200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title
FIRST FLOOR PLAN - AMBULATORY CARE - PIPING
 Approved: Project Director

Project Title **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**
 Project Number 549-130
 Building Number 1
 Drawing Number MP105
 Dwg. 77 of 142

Office of Facilities Management
 Department of Veterans Affairs

- GENERAL NOTES:**
- REFER TO MP401 AND MP402 FOR FLOW DIAGRAMS AND MP501 FOR PIPING SCHEDULES.
 - REFER TO MP901 FOR CONTROL DIAGRAMS.
 - REFER TO 1MP302 FOR ALIGNMENT GUIDE DETAIL.
 - REFER TO 2MP302 FOR PIPE ANCHOR DETAIL.
- KEYNOTES:**
- 6" DECOUPLE LINE
 - 3" STEAM HUMIDIFIER PIPES SHALL BE COPPER, STAINLESS STEEL OR SCH 40 STEEL PIPE, ROUTED TO HM-1 AND HM-2 IN AIR HANDLERS, SLOPED BACK TO HUMIDIFIER.



1 PENTHOUSE AND ROOF PLAN - PIPING
 1/8" = 1'-0"

REVISIONS:	Date

CONSULTANTS:

HEALTHCARE PLANNERS: VOA ARCHITECTS
 MEPFP + TECH + STRUCT: KJWW CONSULTING ENGINEERS
 CIVIL ENGINEER: JD ENGINEERING
 COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
 INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

ARCHITECT:

MICHAEL ROTH & ASSOCIATES, ARCHITECTS & PLANNERS, INC.
 200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title
PENTHOUSE AND ROOF PLAN - PIPING

Approved: Project Director

Project Title **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**

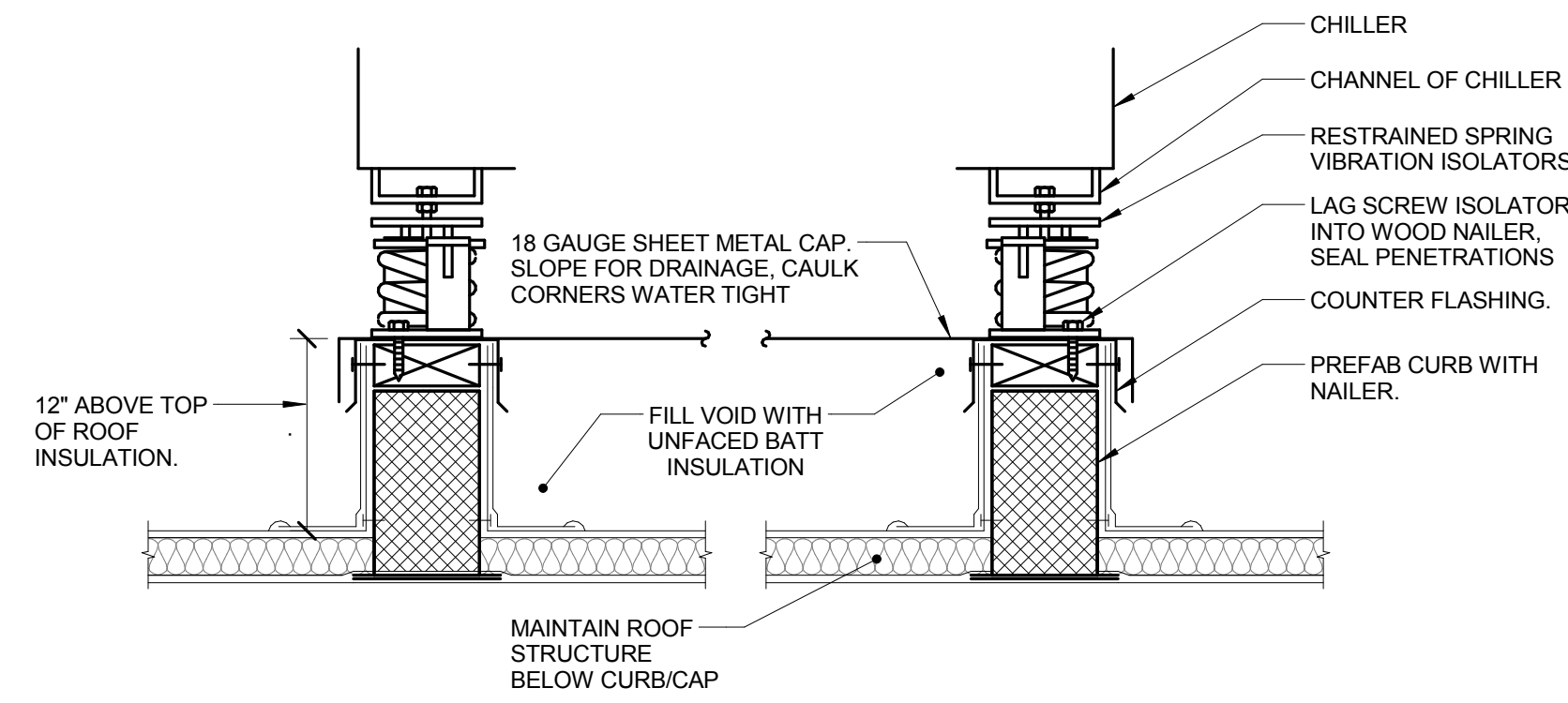
Project Number 549-130
 Building Number 1
 Drawing Number MP107
 Dwg. 79 of 142

Office of Facilities Management

Department of Veterans Affairs

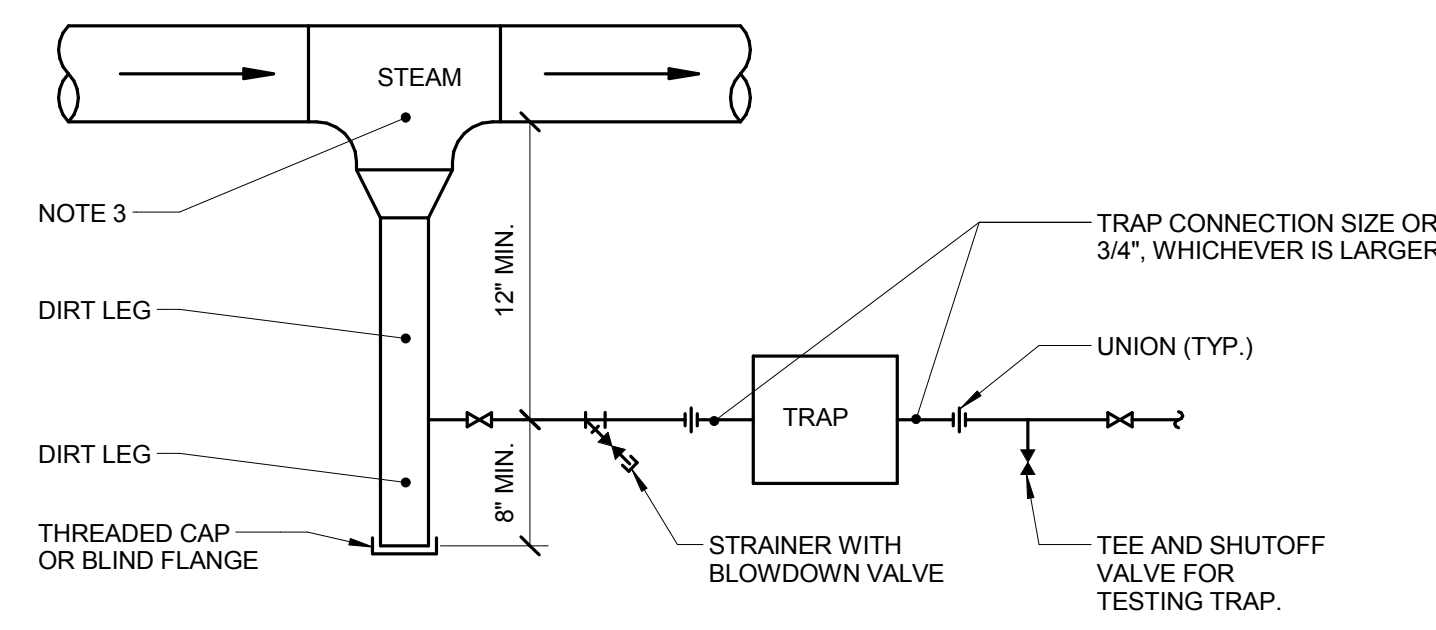
Scale indicators on the left margin:

- three eighths inch = one foot
- one eighth inch = one foot
- one quarter inch = one foot
- one half inch = one foot
- three quarters inch = one foot
- one inch = one foot
- one and one half inches = one foot
- two inches = one foot
- three inches = one foot



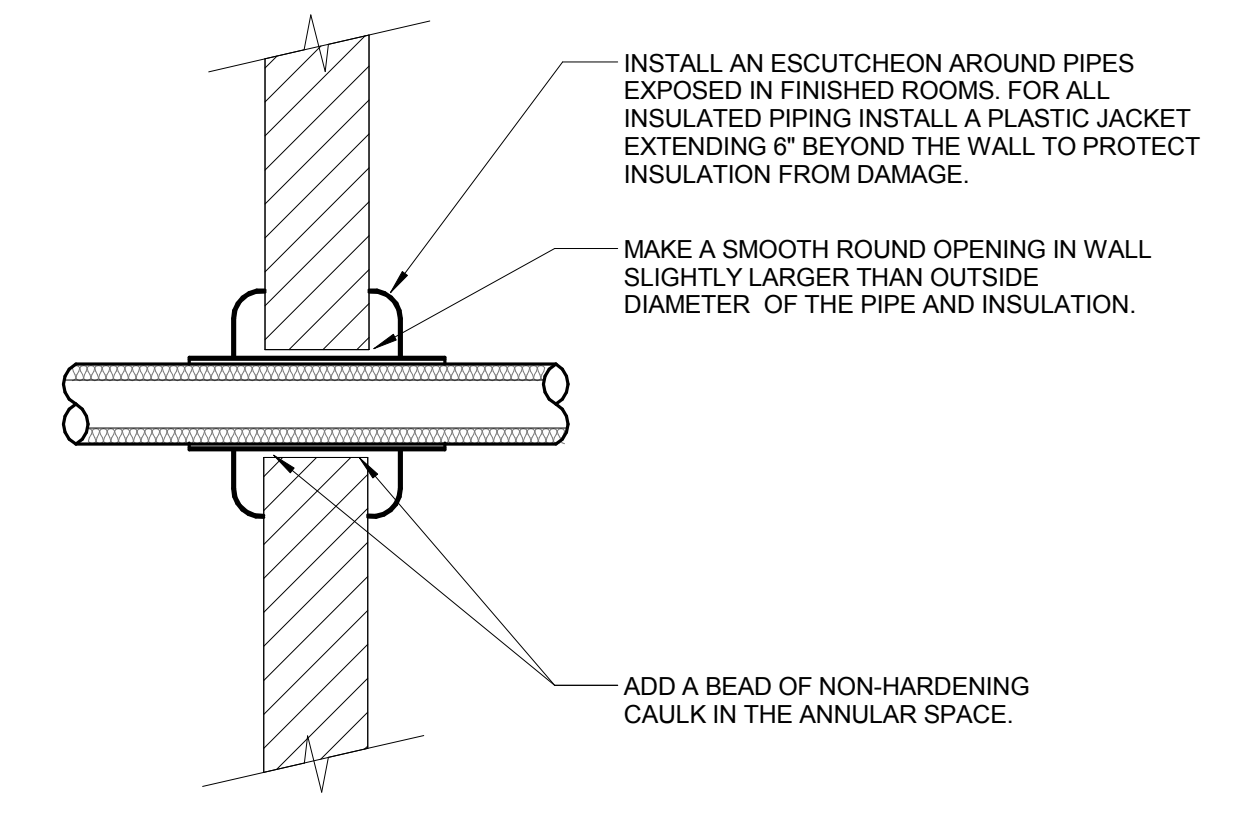
1 CHILLER UNIT SUPPORT

NO SCALE
 NOTES:
 1. PROVIDE FULL PERIMETER CURB WITH SHEET METAL CAP AND SEAL WATER-TIGHT.



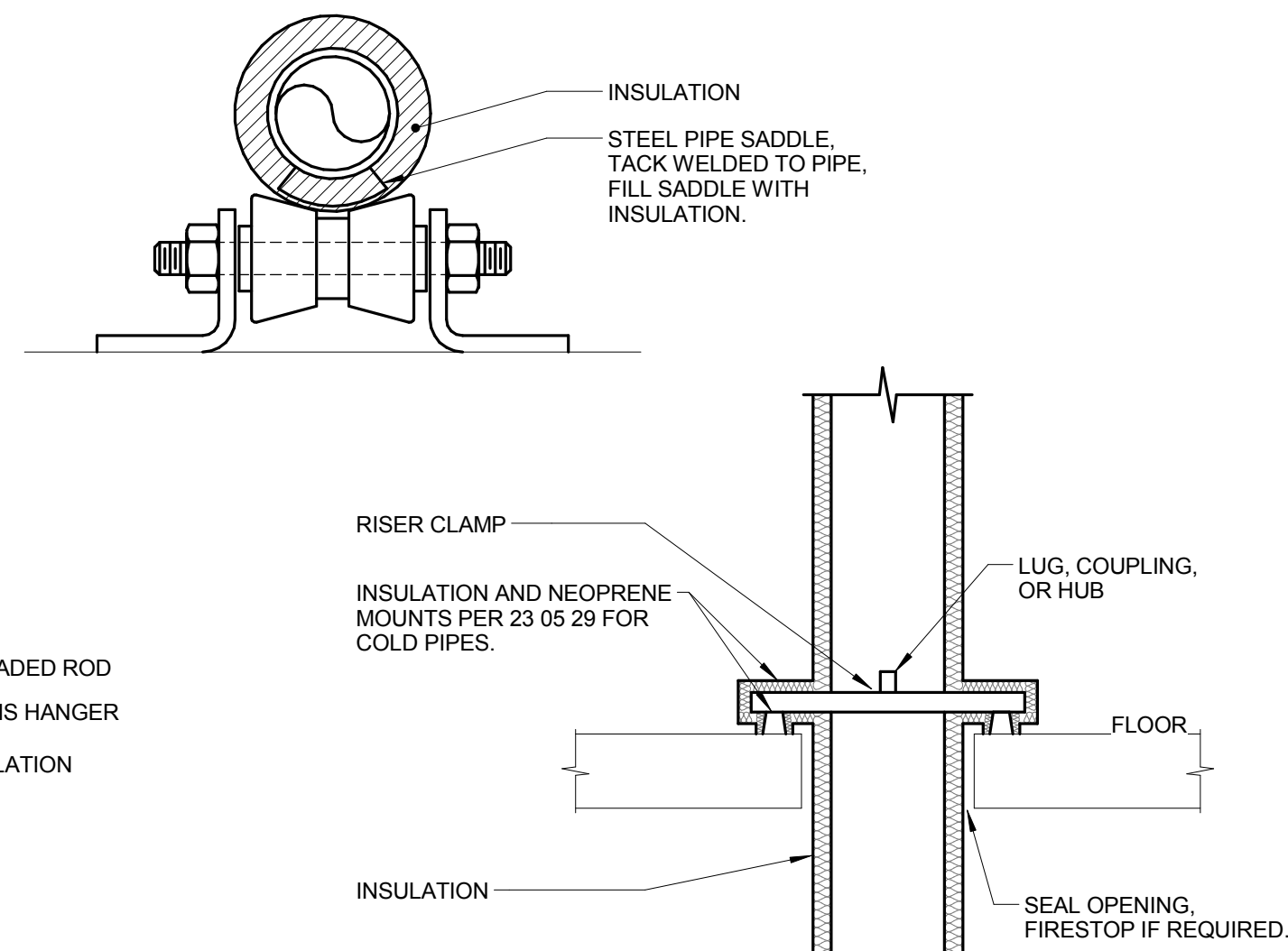
2 STEAM MAIN DRIP CONNECTION

NO SCALE
 NOTES:
 1. DRIP AND DIRT LEGS SHALL BE AT LEAST TWICE THE DIAMETER OF THE TRAP INLET.
 2. INSTALL LEGS OF STRAINERS IN HORIZONTAL POSITION TO MINIMIZE CONDENSATE HOLDING.
 3. TEE SHALL BE FULL SIZE FOR 4\"/>



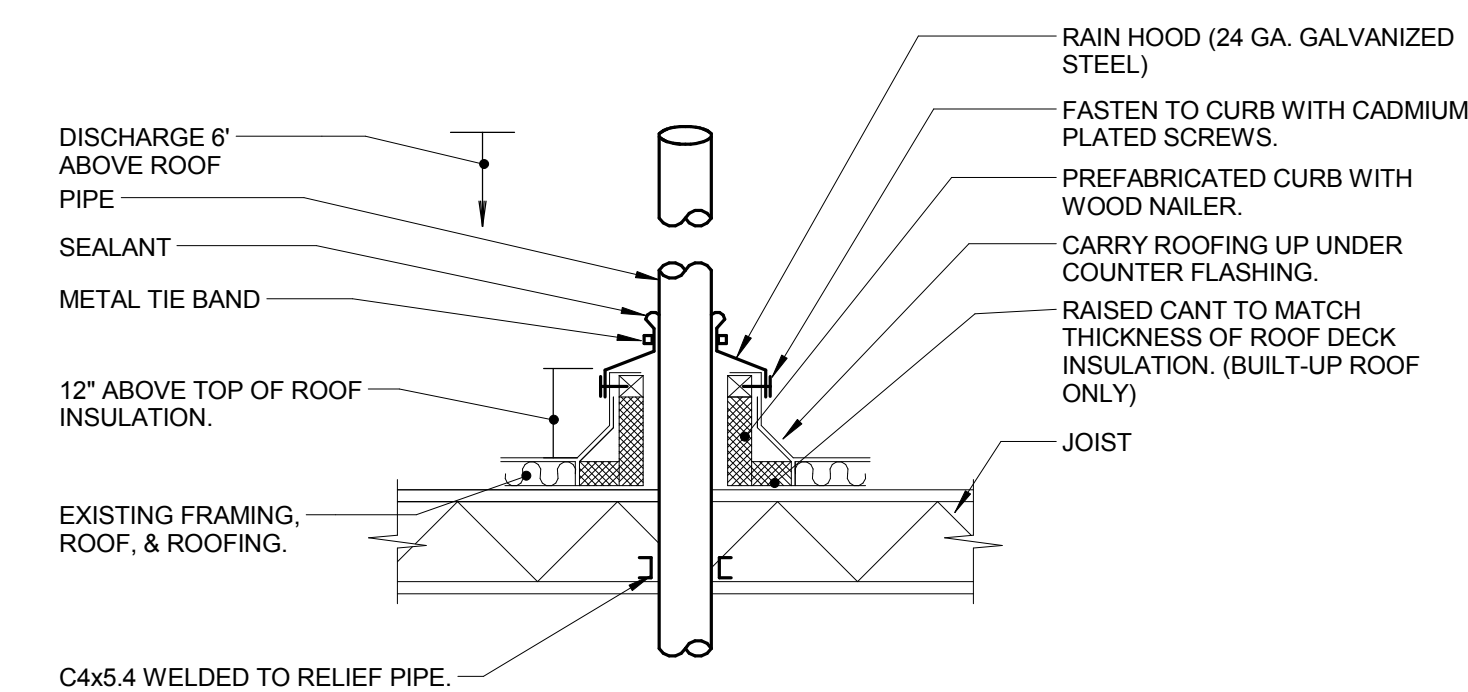
3 PIPE THROUGH NON-FIRE RATED WALL

NO SCALE
 NOTES:
 1. THIS DETAIL APPLIES TO ALL PIPES. THE INTENTION IS TO CONTINUE THE INSULATION AND VAPOR BARRIER THROUGH ALL PENETRATIONS. PERMIT THERMAL EXPANSION WITHOUT DAMAGING INSULATION, AND TO SEAL AIRTIGHT AROUND INSULATED AND UNINSULATED PIPES FOR NOISE TRANSMISSION CONTROL.
 2. FLOOR OPENINGS ARE SIMILAR SEE SPECIFICATION SECTION 23 05 11 FOR DIFFERENCES BETWEEN FLOOR AND WALL PENETRATIONS.
 3. SEE SPECIFICATION SECTION 23 05 11 FOR ADDITIONAL INFORMATION.



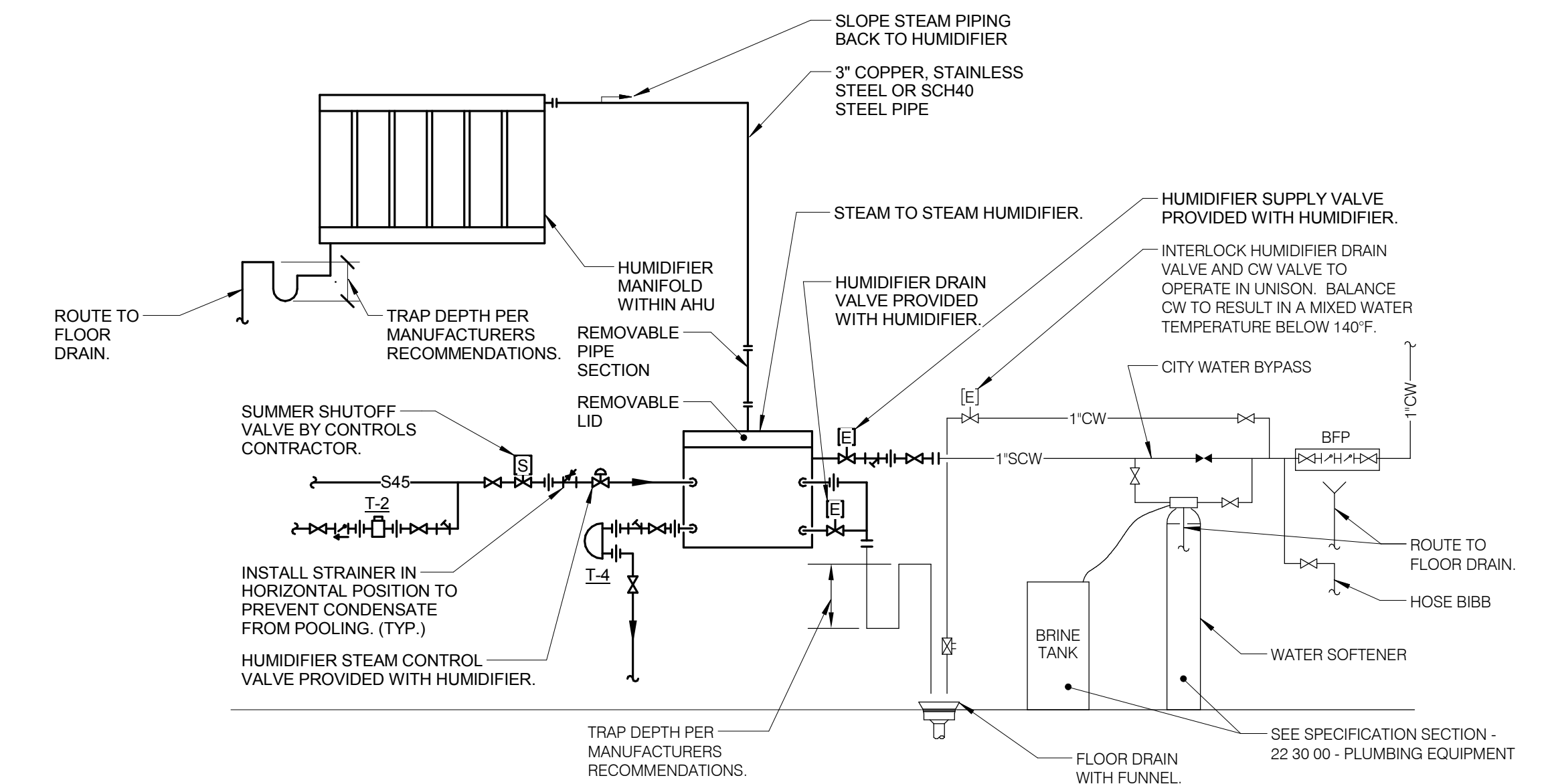
4 PIPE SUPPORT DETAIL

NO SCALE
 NOTES:
 1. REFER TO SPECIFICATION SECTIONS 23 05 11 & 23 07 11.



5 FLASH AND CONDENSATE TANK VENT DISCHARGE PIPING

NO SCALE
 NOTES:
 1. LOCATE THIS DISCHARGE ON ROOF OF LOADING DOCK.



6 HUMIDIFIER (STEAM TO STEAM) DETAIL

NO SCALE
 NOTES:
 1. WORK IN LIGHT TEXT AND LINE WEIGHT BY PLUMBING CONTRACTOR.


REVISED FOR BIDDING	10/27/15
Revisions:	Date

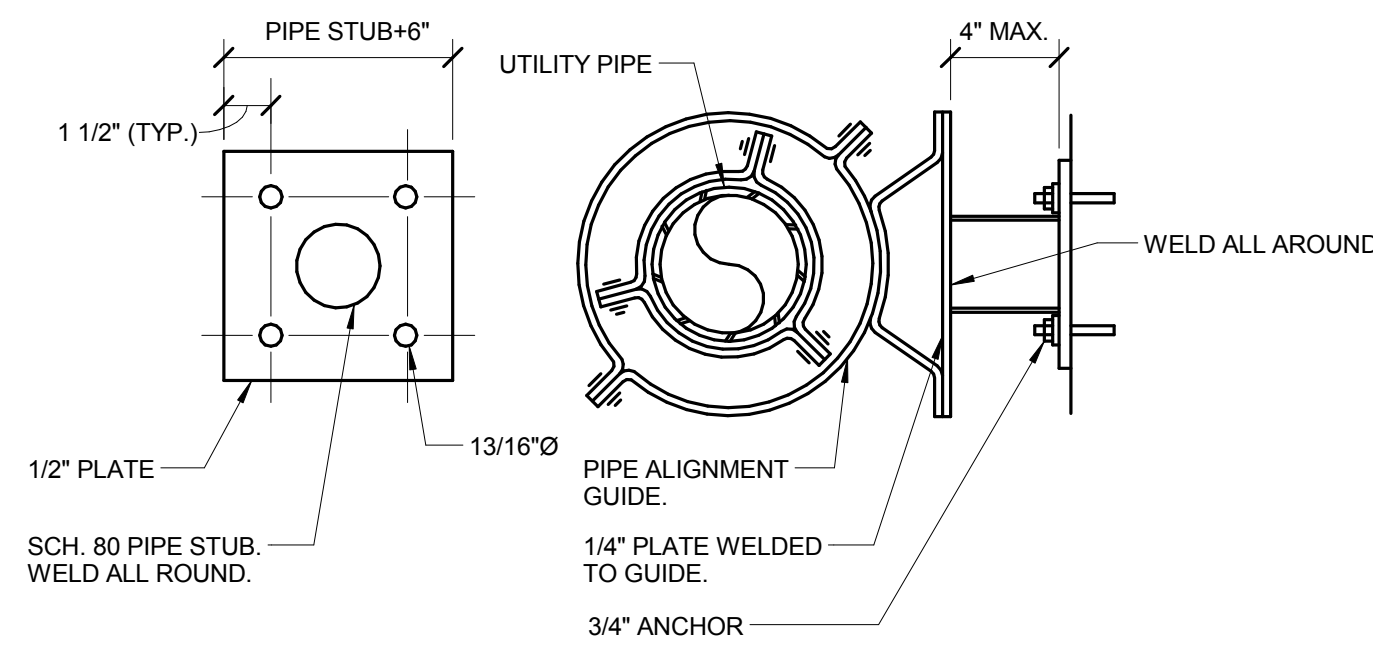
CONSULTANTS:
 HEALTHCARE PLANNERS: VOA ARCHITECTS
 MEPFP + TECH + STRUCT: KJWW CONSULTING ENGINEERS
 CIVIL ENGINEER: JD ENGINEERING
 COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
 INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

ARCHITECT:
 **MICHAEL ROTH & ASSOCIATES, ARCHITECTS & PLANNERS, INC.**
 200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title
DETAILS - PIPING
 Approved: Project Director

Project Title **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**
 Project Number **549-130**
 Building Number **1**
 Drawing Number **MP301**
 Date **APRIL 13, 2015**
 Checked **LINPEA**
 Drawn **NATJAC**
 Dwg. 80 of 142

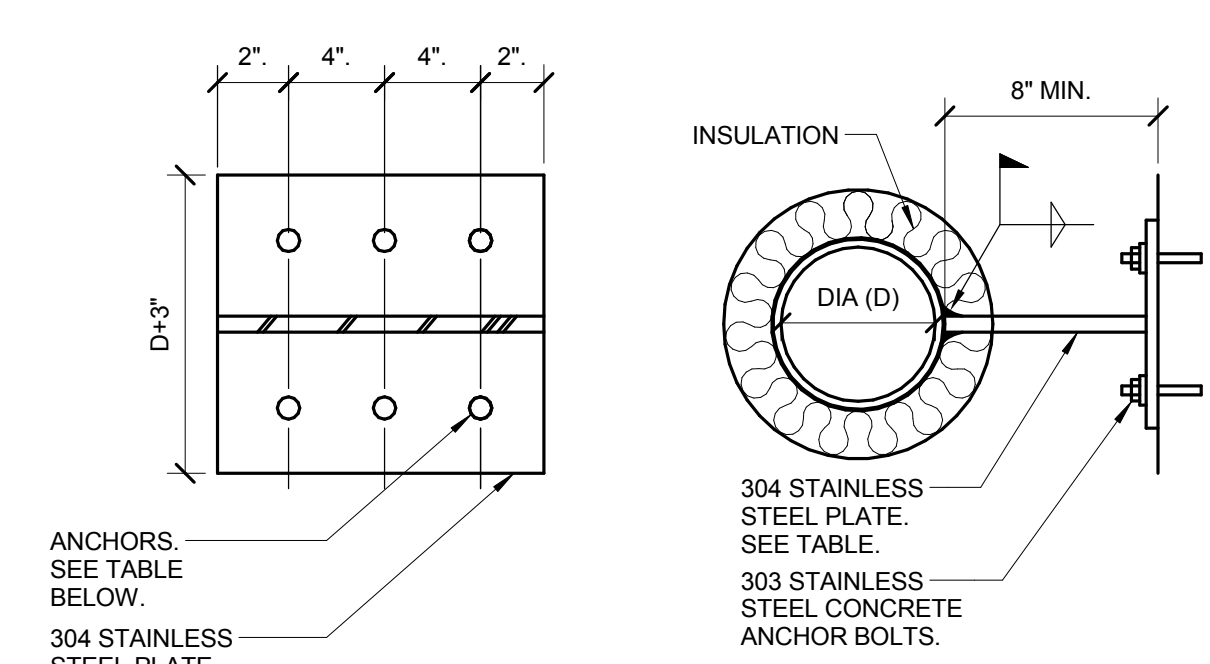
Office of Facilities Management




UTILITY PIPE	PIPE STUB	ANCHOR HOLLOW CMU	ANCHOR SOLID CMU/CONC.
6"Ø OR LESS	4"Ø	"HILTI HIT HY-20 RED"	"HILTI HIT HY-150"

1 ALIGNMENT GUIDE DETAIL

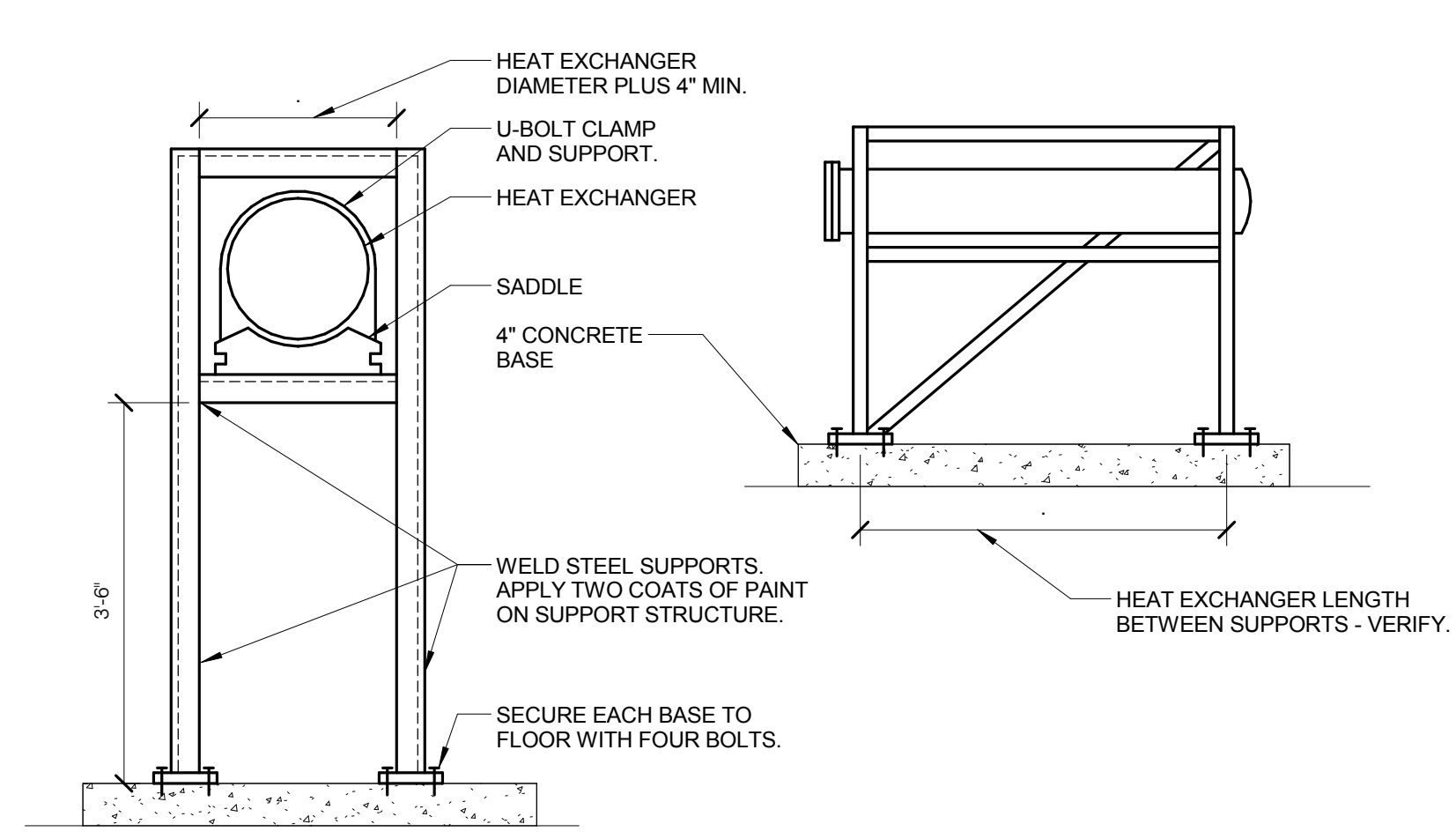
NO SCALE
 NOTES:
 1. MATERIAL - CARBON STEEL IN DRY AREAS, ALL STAINLESS STEEL IN TUNNELS AND CORROSIVE AREAS.



PIPE DIAMETER (D)	RED HEAD #	LOAD RATING SHEAR	PLATE THICKNESS	NUMBER OF ANCHORS
3-6"	WW5834	12000	3/8"	6

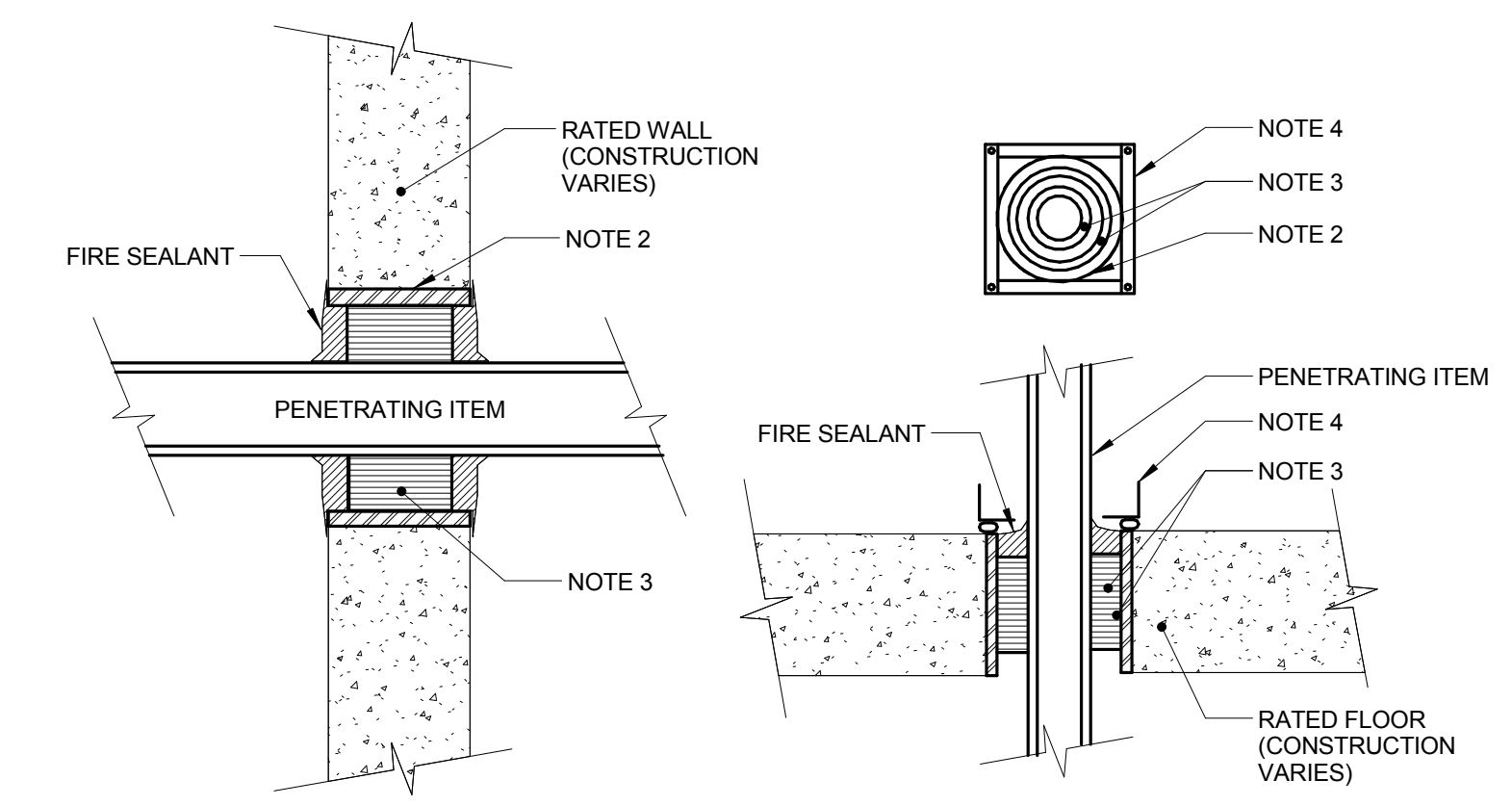
2 PIPE ANCHOR DETAIL

NO SCALE



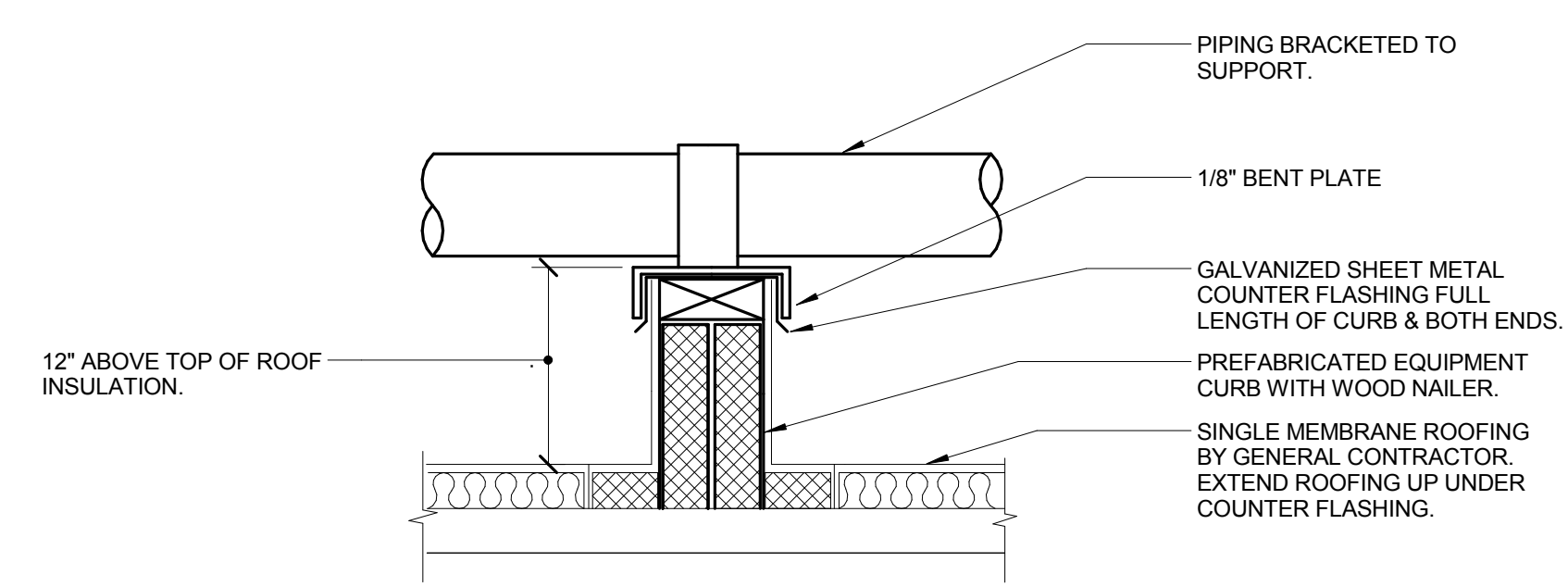
3 HEAT EXCHANGER SUPPORT DETAIL

NO SCALE



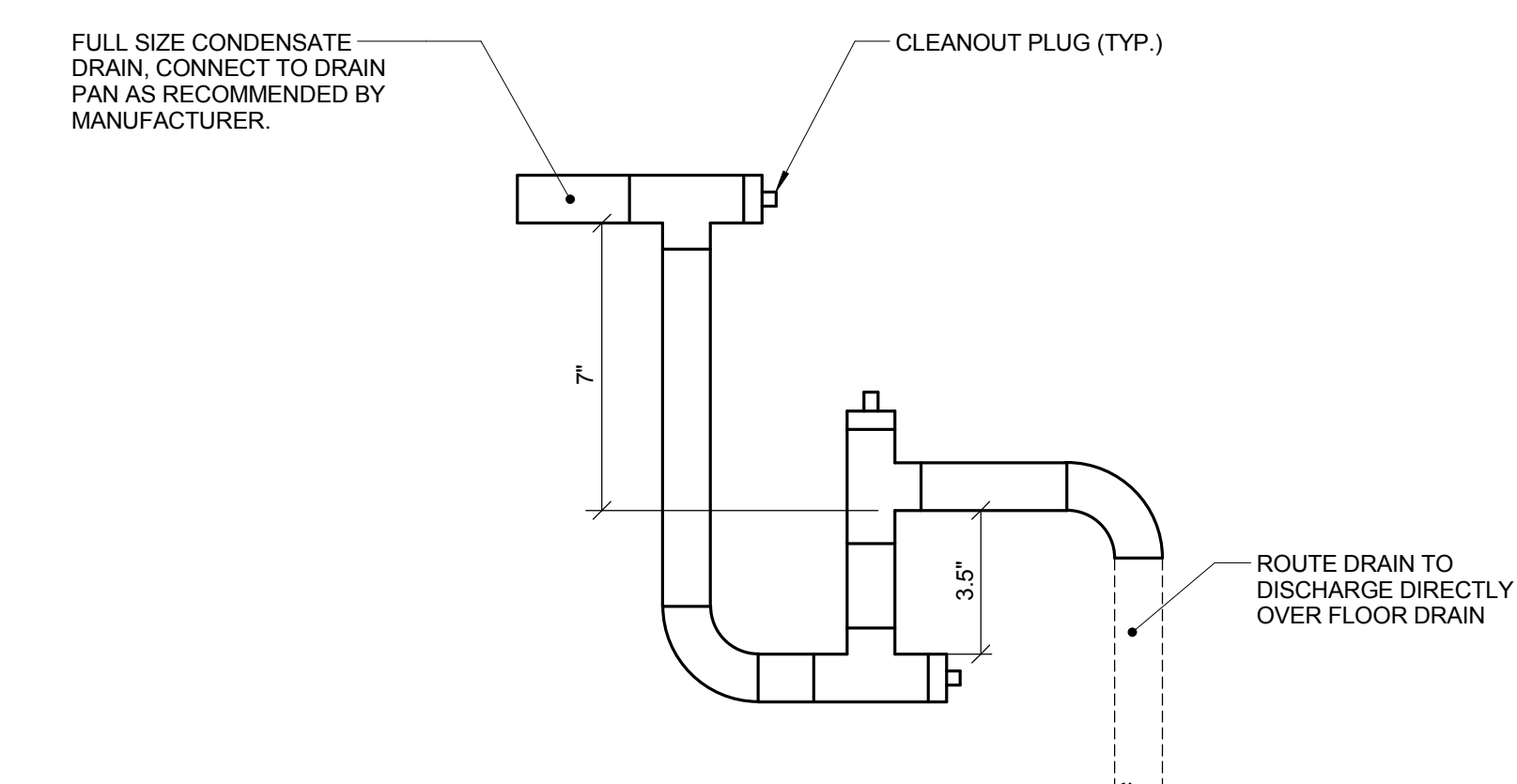
4 RATED FIRE BARRIER PENETRATION

NO SCALE
 NOTES:
 1. THIS GENERAL DETAIL APPLIES TO ALL ITEMS PENETRATING FIRE RATED WALLS OR FLOORS. THE INTENT IS TO MAINTAIN THE FIRE RATING AND TO ALLOW LONGITUDINAL MOVEMENT. REFER TO SPECIFICATION SECTION 07 84 00 AND 23 05 03 FOR SELECTION OF THROUGH PENETRATION FIRE STOPPING.
 2. SCHEDULE 5 PIPE SLEEVE EMBEDDED IN WALL OR FLOOR, OR SMOOTH CORE DRILL. EACH CONTRACTOR FURNISHES SLEEVE TO G.C. COORDINATES SLEEVE LOCATIONS AND DEBURS SLEEVE. G.C. BUILDS SLEEVE INTO WALL OR FLOOR ALLOWING NO GAP AROUND SLEEVE. IF SLEEVE IS NOT PROVIDED WHEN WALL OR FLOOR IS BUILT, CONTRACTOR SHALL INSTALL SLEEVE. SLEEVE SIZE SHALL ALLOW ANNUAL SPACE REQUIRED BY THE SELECTED FIRE STOP SYSTEM.
 3. INSTALL BACKING MATERIAL, SUCH AS MINERAL WOOL SAFING, AS REQUIRED FOR FIRE STOP SYSTEM. INSTALL IN ACCORDANCE WITH FIRE STOP SYSTEM APPLICATION LISTING. SECURE TO WALL OR FLOOR TO ALLOW LONGITUDINAL MOVEMENT OF PENETRATING ITEM WITHOUT MOVEMENT OF FIRE BARRIER.
 4. WATER-TIGHT WELDED 1"x1" 20 GAUGE MINIMUM GALVANIZED SHEET METAL ANGLE FRAME, BY CONTRACTOR IN EQUIPMENT ROOMS FOR WATER STOP. PLACE A BEAD OF WATERPROOF SEALANT BETWEEN FLOOR AND BOTTOM OF ANGLE FRAME. SECURE TO FLOOR WITH MASONRY ANCHORS IN CORNERS AND ON 12" MAXIMUM CENTERS. MULTIPLE PENETRATING ITEMS MAY BE ENCLOSED IN ONE FRAME.



5 ROOF PIPE SUPPORT DETAIL

NO SCALE
 NOTES:
 1. PIPING SUPPORTS SHALL BE LOCATED DIRECTLY ON TOP OF BEAMS. COORDINATE LOCATIONS WITH GENERAL CONTRACTOR.



6 CONDENSATE TRAP DETAIL (DRAW-THROUGH)

NO SCALE

REVISED FOR BIDDING	10/27/15
Revisions:	Date

CONSULTANTS:
 HEALTHCARE PLANNERS: VOA ARCHITECTS
 MEPFP + TECH + STRUCT: KJWW CONSULTING ENGINEERS
 CIVIL ENGINEER: JD ENGINEERING
 COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
 INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

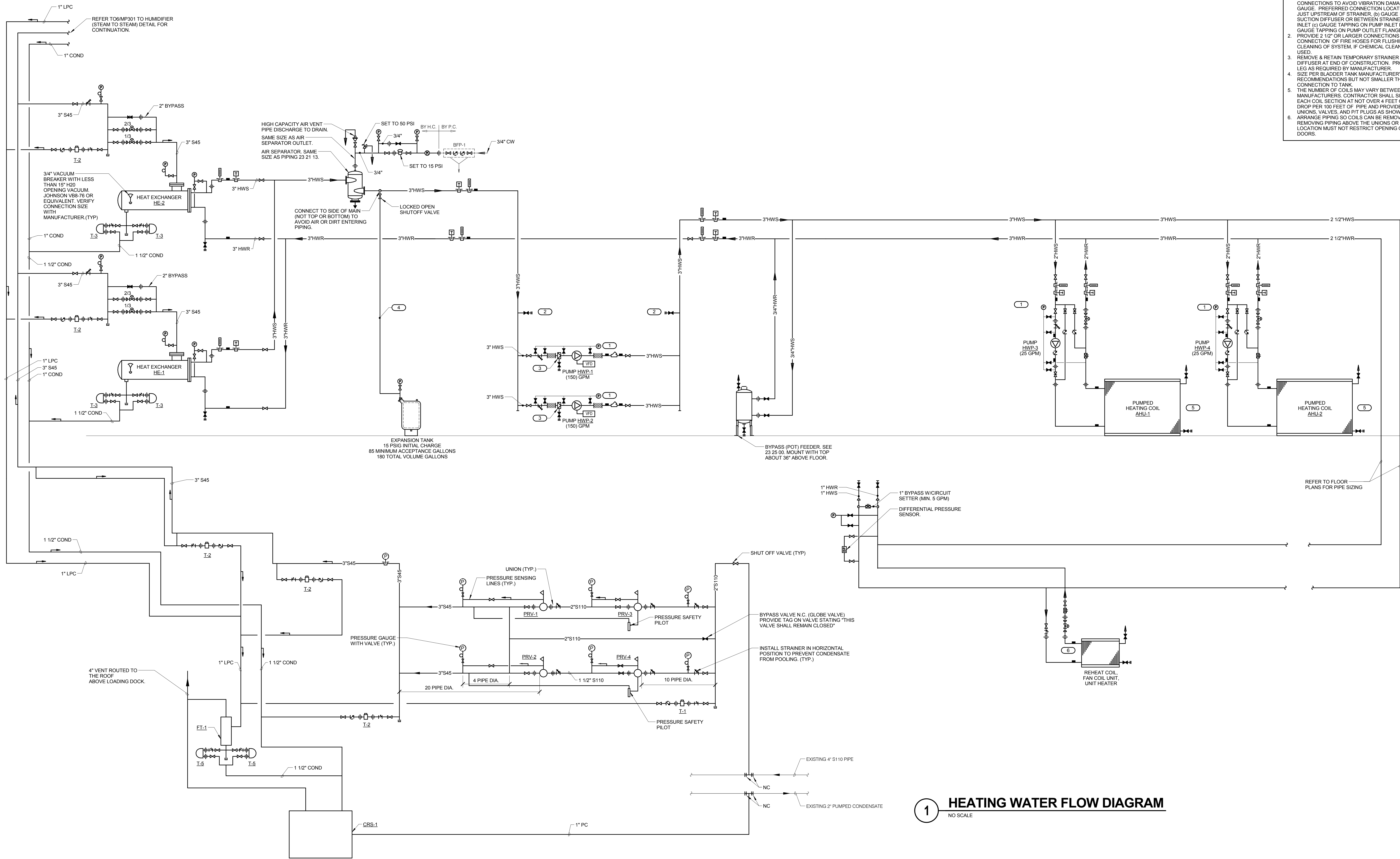
ARCHITECT:

MICHAEL ROTH & ASSOCIATES, ARCHITECTS & PLANNERS, INC.
 200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title
DETAILS - PIPING
 Approved: Project Director

Project Title **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**
 Project Number **549-130**
 Building Number **1**
 Drawing Number **MP302**
 Dwg. 81 of 142

Office of Facilities Management



- KEYNOTES**
1. PRESSURE GAUGE WITH SNUBBER PER SPECIFICATIONS. INSTALL WITH MOUNTING ON WALL, STAND, OR VIBRATION-FREE PIPE ABOVE BRACKET PUMP FLEXIBLE CONNECTOR. INSTALL FLEXIBLE COPPER TUBING TO PIPING CONNECTIONS TO AVOID VIBRATION DAMAGE TO THE GAUGE. PREFERRED CONNECTION LOCATIONS ARE: (a) JUST UPSTREAM OF STRAINER, (b) GAUGE PORT ON SUCTION DIFFUSER OR BETWEEN STRAINER AND PUMP INLET (c) GAUGE TAPPING ON PUMP INLET FLANGE (d) GAUGE TAPPING ON PUMP OUTLET FLANGE.
 2. PROVIDE 2 1/2" OR LARGER CONNECTIONS FOR CONNECTION OF FIRE HOSES FOR FLUSHING AND CLEANING OF SYSTEM. IF CHEMICAL CLEANING IS NOT USED.
 3. REMOVE & RETAIN TEMPORARY STRAINER FROM SUCTION DIFFUSER AT END OF CONSTRUCTION. PROVIDE SUPPORT LEG AS REQUIRED BY MANUFACTURER.
 4. SIZE PER BLADDER TANK MANUFACTURER'S RECOMMENDATIONS BUT NOT SMALLER THAN CONNECTION TO TANK.
 5. THE NUMBER OF COILS MAY VARY BETWEEN MANUFACTURERS. CONTRACTOR SHALL SIZE PIPING TO EACH COIL SECTION AT NOT OVER 4 FEET OF PRESSURE DROP PER 100 FEET OF PIPE AND PROVIDE ADDITIONAL UNIONS, VALVES, AND FITTINGS AS SHOWN FOR COILS.
 6. ARRANGE PIPING SO COILS CAN BE REMOVED WITHOUT REMOVING PIPING ABOVE THE UNIONS OR FLANGES. PIPE LOCATION MUST NOT RESTRICT OPENING OF ACCESS DOORS.

1 HEATING WATER FLOW DIAGRAM
NO SCALE

Revisions	Date
REVISED FOR BIDDING	10/27/15

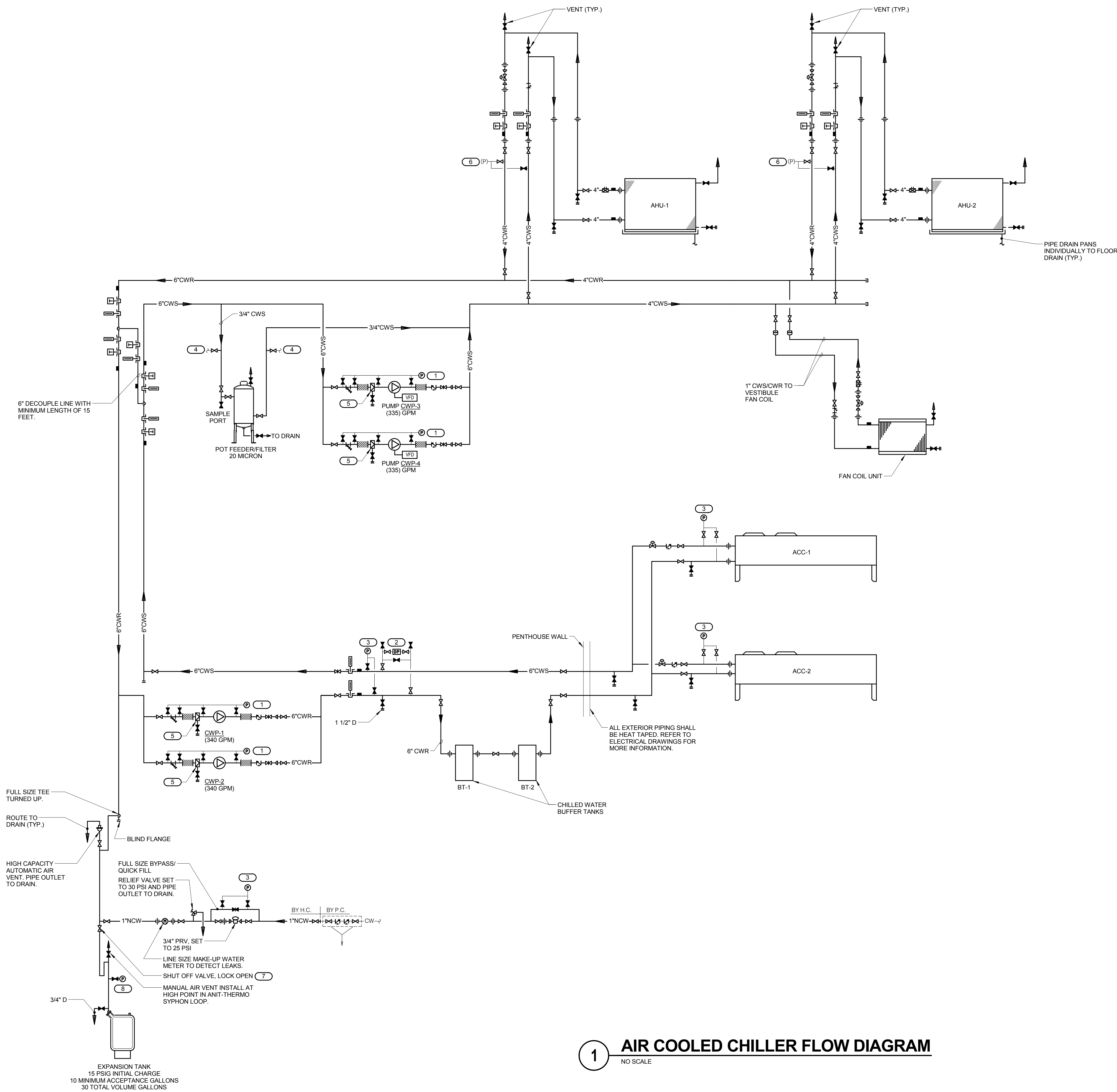
CONSULTANTS:
HEALTHCARE PLANNERS: VOA ARCHITECTS
MEPPP + TECH + STRUCT: KJWW CONSULTING ENGINEERS
CIVIL ENGINEER: JD ENGINEERING
COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

ARCHITECT:
MICHAEL ROTH & ASSOCIATES, ARCHITECTS & PLANNERS, INC.
 200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title: **FLOW DIAGRAM - PIPING**
 Approved: Project Director

Project Title: **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**
 Project Number: 549-130
 Building Number: 1
 Drawing Number: MP401
 Date: APRIL 13, 2015
 Checked: LINPEA
 Drawn: NATJAC
 Dwg. 82 of 142

Office of Facilities Management
 Department of Veterans Affairs



- KEYNOTES**
- PRESSURE GAUGE WITH SNUBBER PER SPECIFICATIONS. MOUNT ON WALL, STAND, OR VIBRATION-FREE PIPE BRACKET ABOVE PUMP. INSTALL FLEXIBLE COPPER TUBING TO PIPING CONNECTIONS TO AVOID VIBRATION DAMAGE TO THE GAUGE. GAUGE SHALL BE GLYCERIN FILLED. PREFERRED CONNECTION LOCATIONS ARE: (a) JUST UPSTREAM OF STRAINER, (b) GAUGE PORT ON SUCTION DIFFUSER OR BETWEEN STRAINER & PUMP INLET, (c) GAUGE TAPPING ON PUMP INLET FLANGE, (d) GAUGE TAPPING ON PUMP OUTLET FLANGE.
 - FLOW SWITCH (DIFFERENTIAL PRESSURE SHOWN) FURNISHED BY CHILLER MANUFACTURER. FIELD INSTALLED.
 - PRESSURE GAUGES SHALL BE GLYCERIN FILLED.
 - TO CHEMICAL FEED PIPING, BY CHEMICAL SUPPLIER. VERIFY NUMBER, SIZE, & LOCATION OF CONNECTIONS WITH MANUFACTURER.
 - REMOVE & RETAIN TEMPORARY STRAINER FROM SUCTION DIFFUSER AT END OF CONSTRUCTION. PROVIDE SUPPORT LEG AS REQUIRED BY MANUFACTURER.
 - DIFFERENTIAL PRESSURE SENSOR USED TO CONTROL VFD'S. PIPE PER MANUFACTURER'S RECOMMENDATIONS. MINIMUM OF 2 LOCATIONS REQUIRED IN SYSTEM. VERIFY FINAL LOCATION WITH ENGINEER.
 - PROVIDE SIGN TO NOT SHUT DURING SYSTEM OPERATION.
 - PRESSURE GAUGES SHALL BE GLYCERIN FILLED.

1 AIR COOLED CHILLER FLOW DIAGRAM
NO SCALE

REVISED FOR BIDDING	10/27/15
Revisions:	Date

CONSULTANTS:
HEALTHCARE PLANNERS: VOA ARCHITECTS
MEFPF + TECH + STRUCT: KJWW CONSULTING ENGINEERS
CIVIL ENGINEER: JD ENGINEERING
COST ESTIMATING: MOSS CONSTRUCTION COST MANAGEMENT
INDUSTRIAL HYGIENE: JOHN A. JURGIEL & ASSOCIATES, INC.

ARCHITECT:
MICHAEL ROTH & ASSOCIATES, ARCHITECTS & PLANNERS, INC.
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Drawing Title
FLOW DIAGRAM - PIPING
 Approved: Project Director

Project Title **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**
 Project Number **549-130**
 Building Number **1**
 Drawing Number **MP402**
 Date **APRIL 13, 2015**
 Checked **LINPEA**
 Drawn **NATJAC**
 Dwg. 83 of 142

Office of Facilities Management
 Department of Veterans Affairs

CHILLER SCHEDULE (AIR COOLED)

NOTE: 1. REFER TO SPECIFICATION SECTION 23 05 12, 23 05 41, AND 23 04 00 FOR ADDITIONAL INFORMATION.

TAG NAME	AREA SERVED	REFRIGERANT TYPE	DESIGN TONS	STAGES OF UNLOADING	CAPACITY/PERFORMANCE				EVAPORATOR PERFORMANCE				VIBRATION ISOLATION NOTE 1				ELECTRICAL				REMARKS													
					MAX. KW/TON AT % LOAD BASED ON WATER CONDITIONS LISTED.				IPLV	EWT 'F	LWT 'F	GPM	MAX. PRESS. DROP FT. HEAD	FOULING FACTOR	TYPE	DEFL.	63	125	250	500		1000	2000	4000	VOLTAGE	PHASES	MCA	MOCP	DISCONNECT		CONTROLLER/STARTER		MANUFACTURER	MODEL
					100	75	50	25																					BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	TYPE (NOTE C)		
ACC-1	CHILLED WATER SYSTEM	R410a	113.0	4	9.6	13.5	16.3	17.2	15.1	48	40	340.0	15.80	0.00010	SP	0.75	67	69	67	65	62	59	56	480	3	307.0	350	MFR	NF	MFR	FV	DAIKIN	AGZ130D	NOTE 1
ACC-2	CHILLED WATER SYSTEM	R410a	113.0	4	9.6	13.5	16.3	17.2	15.1	48	40	340.0	15.80	0.00010	SP	0.75	67	69	67	65	62	59	56	480	3	307.0	350	MFR	NF	MFR	FV	DAIKIN	AGZ130D	NOTE 1

FLASH TANK SCHEDULE

SYMBOL	AREA SERVED	INLET (IN.)	VENT (IN.)	DRAIN (IN.)	TANK HEIGHT (IN.)	MANUFACTURER	MODEL	REMARKS
FT-1	ADDITIONAL				36'-0"		AFT	

UNIT HEATER SCHEDULE - HOT WATER

TAG NAME	AREA SERVED	CONFIGURATION	CFM	MBH	GPM	EWT 'F	LWT 'F	W.P.D. FT. HEAD	HP	RPM	VOLTAGE	PHASES	DISCONNECT		CONTROLLER/STARTER		MANUFACTURER	MODEL	NOTES
													BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	CONTROL			
													BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	CONTROL			
UH-1	PENTHOUSE	HORIZONTAL	900	36	3.6	180	160	0.1	0.17	1150	120	1	MFR	NF	MFR	FV	TRANE	UHS	
UH-2	PENTHOUSE	HORIZONTAL	900	36	3.6	180	160	0.1	0.17	1150	120	1	MFR	NF	MFR	FV	TRANE	UHS	

CHILLED WATER BUFFER TANK SCHEDULE

NOTES: 1. IDE WITH 4" x 6" HANDHOLE. 2. ASME STAMPED IN ACCORDANCE WITH SECTION VIII OF THE ASME CODE. 3. PROVIDE WITH 5-YEAR WARRANTY. 4. VERTICAL CARBON STEEL, HEAVY GAUGE STEEL JACKET CONSTRUCTION. 5. PROVIDE WITH DRAIN AND AIR VENT.

TAG NAME	SERVICE	TANK CAPACITY (GALLONS)	DIMENSIONS (DIAMETER X HEIGHT)	WORKING PRESSURE	INLET/OUTLET SIZE	MANUFACTURER	MODEL	NOTES
BT-1	CHILLED WATER SYSTEM	300	36" x 72"	125 PSIG	6" CHEMLINE	CHEMLINE	CWB	NOTE 1,2,3,4 & 5
BT-2	CHILLED WATER SYSTEM	300	36" x 72"	125 PSIG	6" FLANGED CONNECTIONS	CHEMLINE	CWB	NOTE 1,2,3,4 & 5

CONDENSATE RETURN STATION SCHEDULE

TAG NAME	AREA SERVED	CONFIGURATION	LB/HR	CONDENSATE TEMPERATURE 'F	PUMP CAPACITY PER PUMP	RECEIVER CAPACITY GALLONS	DISCHARGE PRESSURE (PSI)	RECEIVER PRESSURE RATING (PSIG)	HP PER PUMP	VOLTAGE	PHASES	DISCONNECT		CONTROLLER/STARTER		MANUFACTURER	MODEL	NOTE
												BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	SCCR			
												BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	SCCR			
CRS-1	NEW ADDITION	DUPLEX	2500	212 'F	12 GPM	20	30	0	3/4	120 V	1	MFR	NF	MFR	0	DOMESTIC PUMP	CC	

SCHEDULE GENERAL NOTES:

Key Name	SCHEDULE GENERAL NOTES
A.	DISCONNECT AND CONTROLLER STARTER FURNISHED AND INSTALLED BY:
	MFR = MANUFACTURER
	EC = ELECTRICAL CONTRACTOR
B.	DISCONNECT TYPE:
	NF = NON-FUSED
C.	CONTROLLER STARTER TYPE:
	FV = FULL VOLTAGE
	VFD = VARIABLE FREQUENCY DRIVE
D.	NO EQUIPMENT SHALL BE SELECTED ABOVE 90% OF MOTOR NAME PLATE RATING.

GENERAL SHEET NOTE:

1. REFER TO MH501 FOR AIR HANDLER AND OTHER VENTILATION EQUIPMENT SCHEDULES.

PUMP SCHEDULE

SYMBOL	AREA SERVED	GPM	PUMP FT. HEAD AT DESIGN	MINIMUM PUMP EFFICIENCY	INLET/IMPELLER SIZE IN.	VIBRATION ISOLATION		HP (NOTE D)	RPM	VOLTAGE	PHASES	DISCONNECT		CONTROLLER/STARTER		MANUFACTURER	MODEL	COMMENTS
						TYPE	DEFLECTION					BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	TYPE (NOTE C)			
						TYPE	DEFLECTION					BY (NOTE A)	TYPE (NOTE B)	BY (NOTE A)	TYPE (NOTE C)			
CWP-1	PRIMARY LOOP	340	40	60	10.38	S	0.8	10	1150	480	3	MFR	NF	EC	FV	B & G	1510	
CWP-2	PRIMARY LOOP	340	40	60	10.38	S	0.8	10	1150	480	3	MFR	NF	EC	FV	B & G	1510	
CWP-3	SECONDARY LOOP	335	35	55	7.00	HP	-	7.5	1150	480	3	MFR	NF	EC	VFD	B & G	SERIES 80	
CWP-4	SECONDARY LOOP	335	35	55	7.00	HP	-	7.5	1150	480	3	MFR	NF	EC	VFD	B & G	SERIES 80	
HWP-1	HEATING WATER SYSTEM	150	80	68	9.00	D, W, L	-	7.5	1750	480	3	MFR	NF	EC	VFD	B & G	1510	
HWP-2	HEATING WATER SYSTEM	150	80	69	9.00	D, W, L	-	7.5	1750	480	3	MFR	NF	EC	VFD	B & G	1510	
HWP-3	AHU-1	25	25	43	5.25	HP	-	0.75	1750	480	3	MFR	NF	EC	FV	B & G	90	
HWP-4	AHU-2	25	25	43	5.25	HP	-	0.75	1750	480	3	MFR	NF	EC	FV	B & G	90	

TRAP SCHEDULE

NOTES: 1. CAPACITY LISTED IS FOR EACH TRAP AND INCLUDES SAFETY FACTOR. 2. SIDE INLET AND OUTLET INVERTED BUCKET TRAP, 250 PSIG RATED, CAST IRON BODY, ALL INTERNAL COMPONENTS OF STAINLESS STEEL AND REPLACEABLE IN-LINE. 3. ACCEPTABLE MANUFACTURERS ALSO INCLUDE SARCO, ARMSTRONG, HOFFMAN. REFER TO MP401 FOR TRAP PIPING DETAILS. 4. SIDE INLET AND OULET, STAINLESS STEEL FLOAT MECHANISM AND VALVE, CAST IRON BODY, BALANCED PRESSURE THERMOSTATIC AIR VENT, ALL INTERNALS REPLACEABLE IN-LINE.

TAG NAME	AREA SERVED	TYPE	SAFETY FACTOR	SIZE	CAPACITY LB/HR (NOTE 1)	PRESSURE DIFFERENTIAL	MANUFACTURER	MODEL	NOTES
T-1	110 PSI DRIP	I.B.	2	3/4"	10	75 PSI	SPENCE	81S	NOTES 2 & 3
T-2	45 PSI DRIP	I.B.	2	3/4"	10	20 PSI	SPENCE	81S	NOTES 2 & 3
T-3	HE-1, HE-2	F & T	1.25	1"	2000	0.25" W.C.	SPENCE	FTN	NOTES 3 & 4
T-4	H-1, H-2	F & T	1.25	3/4"	350	0.25" W.C.	SPENCE	FTN	NOTES 3 & 4
T-5	FLASH TANK	I.B.	2	3/4"	100	30 PSI	SPENCE	81S	NOTES 2 & 3

HEAT EXCHANGER SCHEDULE - STEAM TO WATER

SYMBOL	AREA SERVED	WATER				STEAM				MANUFACTURER	MODEL	COMMENTS
		GPM	W.P.D. FT. HEAD	EWT 'F	LWT 'F	PSIG (NOTE 1)	LB/HR	HEATING SURFACE FT ²	FOULING FACTOR			
HE-1	HEATING WATER SYSTEM	150 GPM	2.2 FT	150 'F	180 'F	15	1600	32 ft ²	0.001	B & G	SU	
HE-2	HEATING WATER SYSTEM	150 GPM	2.2 FT	150 'F	180 'F	15	1600	32 ft ²	0.001	B & G	SU	

PRESSURE REDUCING VALVE SCHEDULE

TAG NAME	AREA SERVED	LB/HR	INLET PRESSURE PSI	OUTLET PRESSURE PSI	VALVE SIZE	MANUFACTURER	MODEL	NOTES
PRV-1	ADDITION 1/3 VALVE	765	110	45	3/4"	SPENCE	E	
PRV-2	ADDITION 2/3 VALVE	1530	110	45	1 1/4"	SPENCE	E	
PRV-3	ADDITION 1/3 VALVE	765	110	45	3/4"	SPENCE	E	PROVIDE WITH SAFETY PILOT
PRV-4	ADDITION 2/3 VALVE	1530	110	45	1 1/4"	SPENCE	E	PROVIDE WITH SAFETY PILOT

HUMIDIFIER SCHEDULE - STEAM TO STEAM

NOTES: 1. PROVIDE UNIT WITH 24" TALL LEGS TO ELEVATE UNIT FOR CONDENSATE DRAINAGE. 2. PROVIDE STAINLESS STEEL PIPE BETWEEN STEAM GENERATOR AND HUMIDIFIER. INSTALL WATER TIGHT SEAL TRAP AT DISCHARGE FROM HUMIDIFIER MANIFOLD. 3. STEAM PRESSURE INDICATED IS THE PRESSURE AVAILABLE DOWNSTREAM OF THE CONTROL VALVE.

SYMBOL	SERVICE	CAPACITY LB/HR	DISCHARGE STEAM PSIG	VOLT-PHASE	DISCONNECT		MANUFACTURER	MODEL	REMARKS
					BY	TYPE			
					BY	TYPE			
H-1	AHU-1	275	5	120-1	MFR	NF	DRISTEEM	STS	NOTE 1, 2 & 3
H-2	AHU-2	275	5	120-1	MFR	NF	DRISTEEM	STS	NOTE 1, 2 & 3

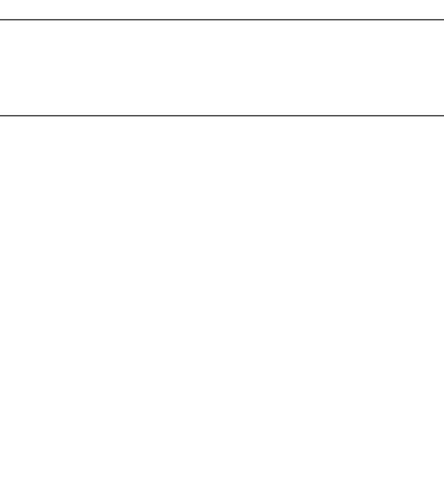
HUMIDIFIER MANIFOLD SCHEDULE

TAG NAME	SERVICE	CFM	CAPACITY LB/HR	STEAM PRESSUR (PSI)	DUCT SIZE (IN)	ABSORPTION DISTANCE MAX (IN)	MANUFACTURER	MODEL
HM-1	AHU-1	13,000	275	5	98x54	12	DRISTEEM	ULTRA-SORB
HM-2	AHU-2	13,000	275	5	98x54	12	DRISTEEM	ULTRA-SORB

Revisions:	Date
REVISED FOR BIDDING	10/27/15

CONSULTANTS:

HEALTHCARE PLANNERS: VOA ARCHITECTS
MEPPF + TECH + STRUCT: KJWW CONSULTING ENGINEERS
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ARCHITECT:

MICHAEL ROTH & ASSOCIATES, ARCHITECTS & PLANNERS, INC.

200 SOUTH HANLEY ROAD, STE. 1105, CLAYTON, MISSOURI 63105, 314-862-2112

Drawing Title
PIPING SCHEDULES

Approved: Project Director

Project Title
RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER

Location
BONHAM, TEXAS

Date
APRIL 13, 2015

Checked
LINPEA

Drawn
NATJAC

Project Number
549-130

Building Number
1

Drawing Number
MP501

Dwg. 84 of 142

Office of Facilities Management

Department of Veterans Affairs

CHILLER PLANT REPORT GENERATION:
 FMCS SHALL MONITOR THE FOLLOWING POINTS ON 10 MINUTE (ADJ.) INTERVALS WITHIN A SINGLE TREND. THE TREND SHALL RUN FOR A 100 DAY (ADJ.) DURATION AT WHICH POINT THE NEWEST VALUES SHALL OVERWRITE THE OLDEST VALUES:

- DATE
- TIME
- GLOBAL OUTSIDE AIR TEMPERATURE [F]
- GLOBAL OUTSIDE AIR DEWPOINT [F]
- CHILLED WATER SUPPLY TEMPERATURE [F]
- CHILLED WATER RETURN TEMPERATURE [F]
- TOTAL CHILLED WATER FLOWRATE [GPM]
- TOTAL CHILLED WATER SYSTEM LOAD [TONS]
- CURRENT DRAW FROM EACH CHILLER [AMP]

THIS INFORMATION SHALL BE ACCESSIBLE TO VIEW IN EITHER TABULAR OR GRAPHICAL FORM ON THE FMCS OPERATOR WORKSTATION.

ONCE PER MONTH, THE FMCS SHALL RECORD THE LARGEST CHILLED WATER SYSTEM LOAD (IN TONS) WHICH OCCURRED DURING THAT MONTH. THE DATE, TIME, OUTSIDE AIR TEMPERATURE, OUTSIDE AIR DEWPOINT, CHILLED WATER SUPPLY & RETURN TEMPERATURE AND CHILLED WATER FLOWRATE THAT COINCIDED WITH THAT EVENT SHALL ALSO BE RECORDED. THIS INFORMATION SHALL BE STORED TO A MEMORY LOCATION ON THE FMCS OPERATOR WORKSTATION THAT IS MAINTAINED (NOT AUTOMATICALLY OVERWRITTEN).

CHILLER PLANT REPORT GENERATION

SEQUENCE OF OPERATION:
 TWO 100% CAPACITY AIR COOLED CHILLERS, TWO 100% CAPACITY CHILLED WATER PRIMARY PUMPS, AND TWO 100% CAPACITY CHILLED WATER SECONDARY PUMPS ARE PROVIDED IN THE SYSTEM. ONE AIR COOLED CHILLER, ONE CHILLED WATER PRIMARY PUMP, AND ONE CHILLED WATER SECONDARY PUMP ARE REDUNDANT.

THE CHILLER MANUFACTURER SHALL PROVIDE A FACTORY MOUNTED CHILLER CONTROL PANEL. ALL AVAILABLE DATA PROVIDED/MONITORED BY THE CHILLER CONTROL PANEL SHALL BE AVAILABLE TO MONITOR CHILLER POINTS SHOWN ON THIS DIAGRAM.

CHILLER OPERATION SHALL BE CONTROLLED BY THE CHILLER CONTROL PANEL AND SHALL BE ENABLED TO OPERATE WHEN THE OUTSIDE AIR TEMP RISES ABOVE 48F (ADJ.) FOR 15 MINUTES (ADJ.). WHEN OUTSIDE AIR TEMP DROPS BELOW 48F (ADJ.) FOR 15 MINUTES (ADJ.) CHILLER OPERATION SHALL BE DISABLED. CHILLER SHALL NOT OPERATE UNTIL THE CHILLED WATER VALVE IN THE SYSTEM HAS A CALL FOR COOLING AND BEGINS TO OPEN. THE FMCS SHALL ROTATE LEAD/STANDBY CHILLER ON A WEEKLY BASIS. INCLUDE GRAPHIC TOGGLE ON OPERATOR WORKSTATION GRAPHICAL SCREEN TO ALLOW OPERATOR TO MANUALLY SELECT WHICH CHILLER IS LEAD AND WHICH IS STANDBY.

WHEN A CHILLER HAS BEEN ENABLED TO RUN IT SHALL SEND A PRIMARY PUMP START REQUEST TO THE FMCS. THE FMCS SHALL ENERGIZE THE LEAD PRIMARY PUMP. AFTER SAFETIES HAVE BEEN SATISFIED, CHILLER SHALL BE ENERGIZED AND SHALL MAINTAIN CHILLED WATER SUPPLY (CWS) TEMPERATURE OF 42F (ADJ.) VIA INTERNAL CONTROLS. WHEN THE FMCS COMMANDS A CHILLER TO SHUTDOWN, THE CHILLER CONTROLS SHALL DISABLE CHILLED WATER PUMPS. THE FMCS SHALL ROTATE LEAD/STANDBY PRIMARY PUMPS ON A WEEKLY BASIS. INCLUDE GRAPHIC TOGGLE ON OPERATOR WORKSTATION GRAPHICAL SCREEN TO ALLOW OPERATOR TO MANUALLY SELECT WHICH PUMP IS LEAD AND WHICH IS STANDBY.

ONLY ONE SECONDARY PUMP SHALL RUN AT A TIME. THE SECOND PUMP IS FULLY REDUNDANT. THE FMCS SHALL ROTATE LEAD/STANDBY PRIMARY PUMPS ON A WEEKLY BASIS. GRAPHIC TOGGLE ON OPERATOR WORKSTATION GRAPHICAL SCREEN TO ALLOW OPERATOR TO MANUALLY SELECT WHICH PUMP IS LEAD AND WHICH IS STANDBY.

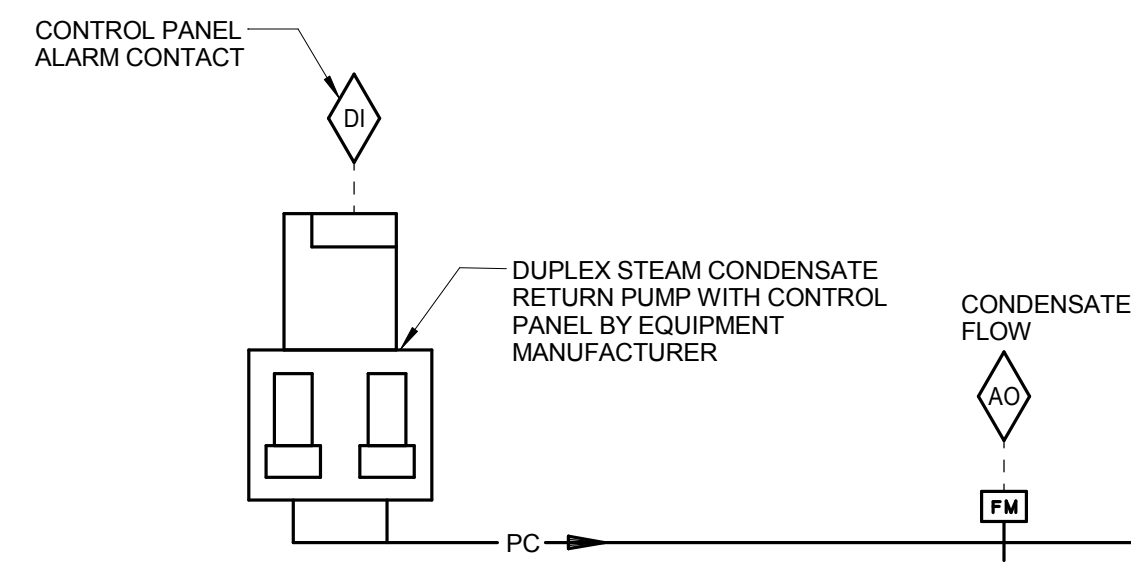
THE FMCS SHALL MODULATE OUTPUT TO THE SECONDARY PUMP VFD AS REQUIRED TO MAINTAIN DP SETPOINT AT THE LOCATION OF THE DP TRANSMITTER. DP TRANSMITTER SIGNAL SHALL BE WIRED DIRECTLY TO THE CONTROLLER SERVING PUMP VFD (SIGNAL SHALL NOT BE TRANSMITTED ACROSS THE FMCS NETWORK). FMCS SHALL RESET THE DP SETPOINT UNTIL ONE MODULATING CONTROL VALVE IS 95% OPEN. IN NO CASE SHALL DP SETPOINT EXCEED 10 PSIG (ADJ.) OR DROP BELOW 2 PSIG.

FREEZE PROTECTION OF OUTDOOR PIPING:
 WHEN DA TEMP DROPS BELOW 34F, FMCS SHALL CLOSE CONTACTOR TO ALLOW HEAT TRACING OF OUTDOOR PIPING AND CHILLER TO BE ENERGIZED. WHEN DA TEMP RISES ABOVE 38F (ADJ.) FOR 15 MINUTES (ADJ.), FMCS SHALL OPEN CONTACTOR TO PREVENT HEAT TRACING OF OUTDOOR PIPING AND CHILLER FROM BEING ENERGIZED.

CHILLER SAFETIES:
 CONTRACTOR PROVIDING FMCS SHALL COORDINATE ALL SAFETY AND INTERLOCK REQUIREMENTS WITH CHILLER MANUFACTURER. CONTRACTOR SHALL PROVIDE THE INSTALLATION AND WIRING OF CHILLED WATER FLOW SWITCHES, AND OTHER COMPONENTS PROVIDED WITH CHILLER AS REQUIRED FOR PROPER OPERATION.

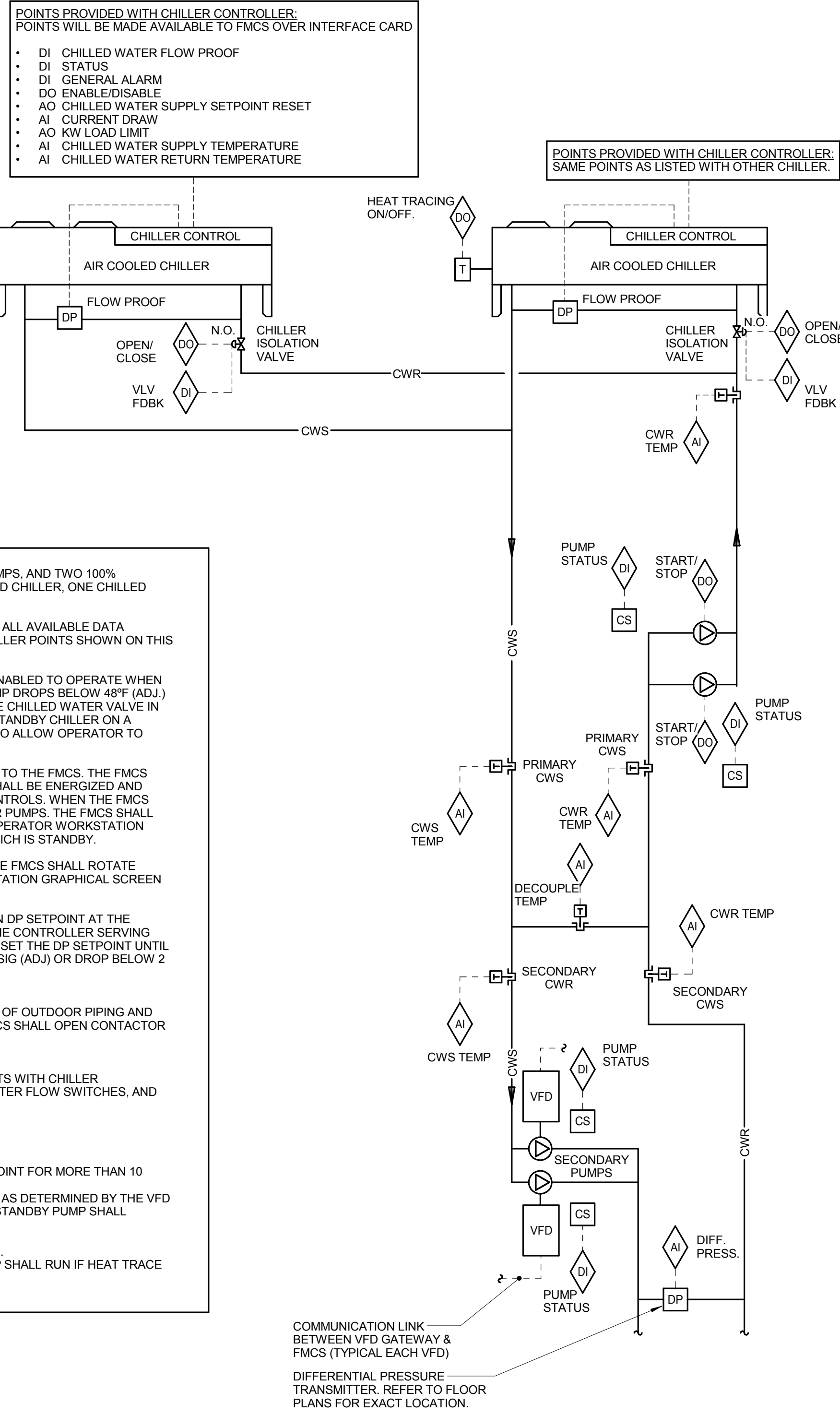
ALARMS, INTERLOCKS & SAFETIES:
 AN ALARM SHALL BE INDICATED AT THE FMCS WHEN THE FOLLOWING OCCUR:
 • AN ALARM IS INDICATED AT THE CHILLER CONTROL PANEL
 • IF CHILLED WATER SUPPLY TEMPERATURE IS MORE THAN 5F (ADJ.) ABOVE OR BELOW SETPOINT FOR MORE THAN 10 MINUTES (ADJ.)
 • SHOULD THE FMCS COMMAND THE LEAD PUMP TO OPERATE AND THE PUMP FAILS TO DO SO AS DETERMINED BY THE VFD STATUS, AN ALARM SHALL BE INDICATED AT THE FMCS OPERATOR WORKSTATION AND THE STANDBY PUMP SHALL AUTOMATICALLY START.
 • AN ALARM CONDITION OCCUR AT ANY VFD OR PUMP.
 • IF SYSTEM DIFFERENTIAL PRESSURE IS NOT MAINTAINED FOR MORE THAN 15 MINUTES (ADJ.)
 • AN ALARM IS INDICATED IF THE HEAT TRACE SYSTEM FAILS. THE LEAD CHILLED WATER PUMP SHALL RUN IF HEAT TRACE FAILS, FAULTS, OR GOES INTO ALARM.

1 AIR COOLED CHILLER CONTROLS - PRIMARY/SECONDARY
 NO SCALE



SEQUENCE OF OPERATION:
 OPERATION OF CONDENSATE RETURN PUMPS SHALL BE CONTROLLED BY MANUFACTURER'S SUPPLIED CONTROL PANEL (REFER TO SECTION 23 FOR ADDITIONAL INFORMATION).

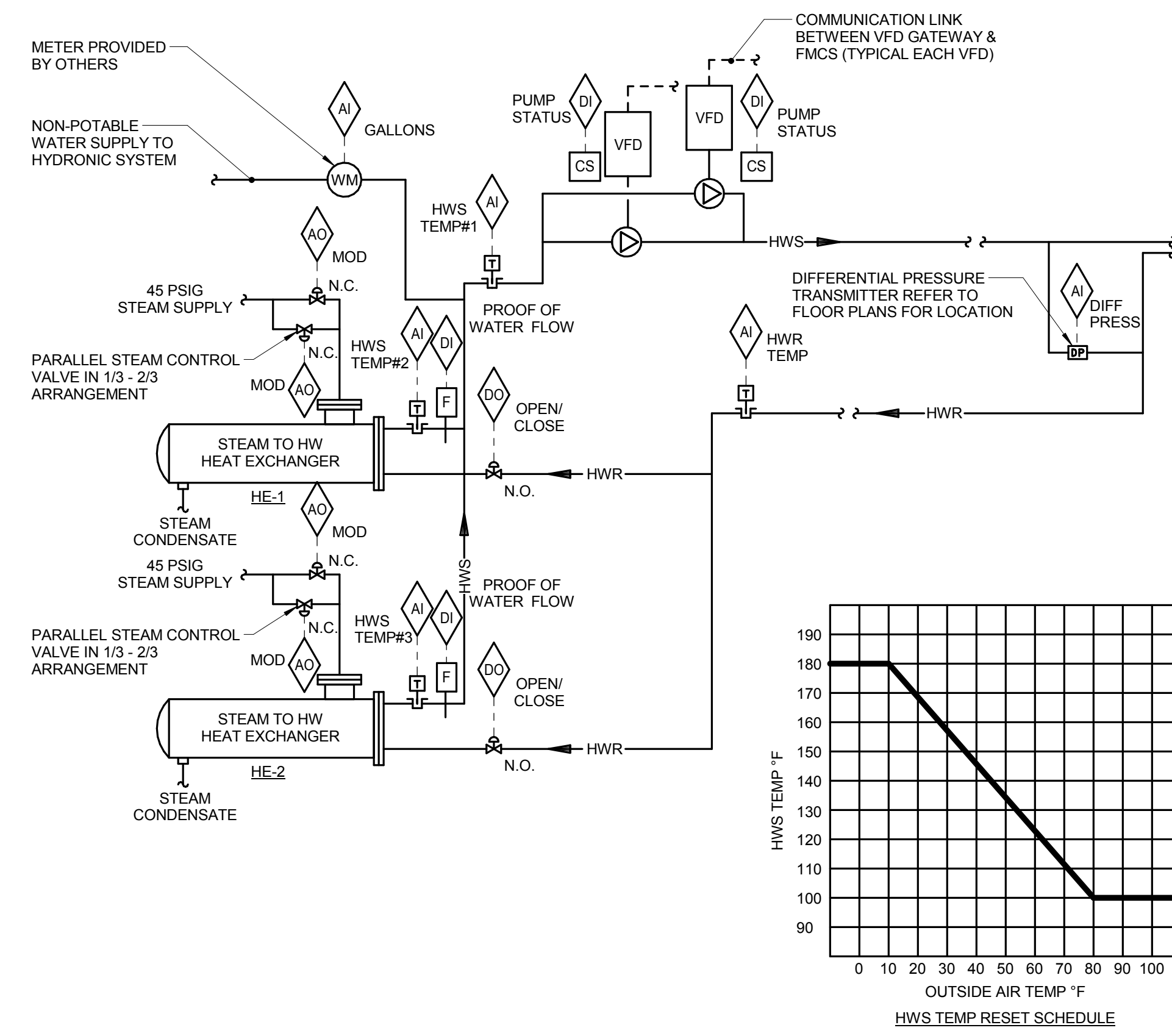
ALARMS, INTERLOCKS & SAFETIES:
 FMCS SHALL MONITOR THE ALARM CONTACT PROVIDED WITH CONDENSATE RETURN PUMP. AN ALARM AT ANY CONTROL PANEL SHALL ALSO BE INDICATED AT THE OPERATOR WORKSTATION. FMCS SHALL MONITOR CUMULATIVE FLOW FROM THE CONDENSATE METER.



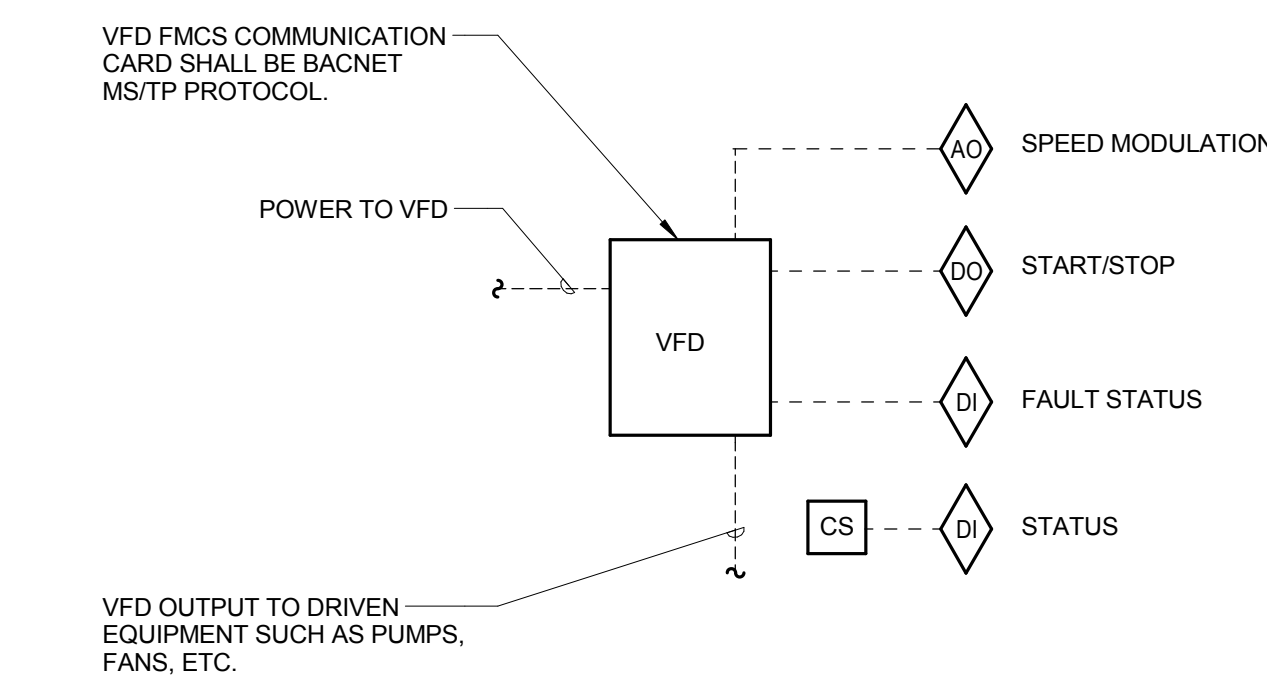
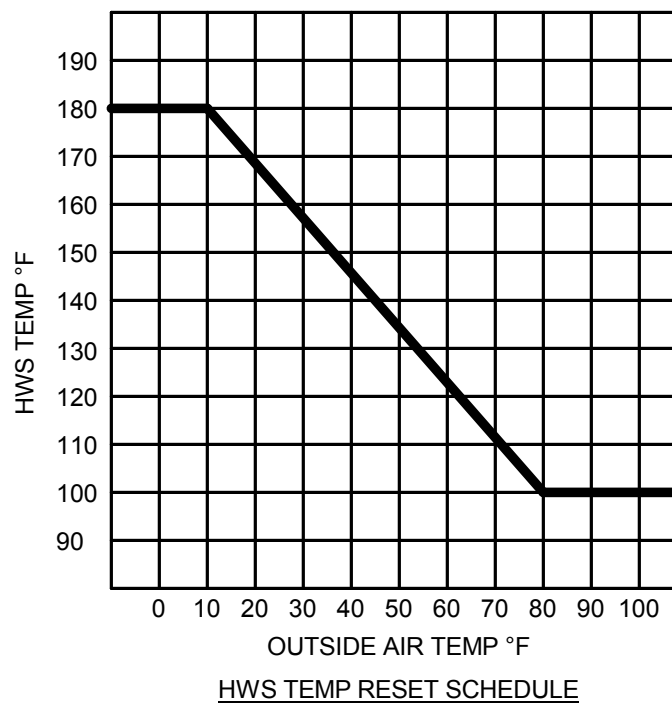
SEQUENCE OF OPERATION:
 OPERATION OF STEAM-TO-STEAM GENERATOR SHALL BE CONTROLLED BY MANUFACTURER SUPPLIED CONTROL PANEL. FMCS SHALL PROVIDE STEAM SET POINT (ADJ.)

ALARMS, INTERLOCKS & SAFETIES:
 FMCS SHALL MONITOR ALARM CONTACTS PROVIDED WITH CONTROLLER. FMCS SHALL INDICATE AN ALARM AT THE FMCS OPERATOR INTERFACE IN THE EVENT IT RECEIVES ONE OF THE FOLLOWING SIGNALS:
 • PRIMARY LOW WATER
 • SECONDARY LOW WATER
 • HIGH PRESSURE
 • HIGH WATER ALARM

4 STEAM-TO-STEAM GENERATOR CONTROL
 12" = 1'-0"



2 MULTIPLE HX HEATING HOT WATER CONTROL
 12" = 1'-0"



SEQUENCE OF OPERATION:
 FMCS SHALL CONTROL EACH VFD AS DESCRIBED IN THE SEQUENCE OF OPERATION OF THE EQUIPMENT. DRIVE SHALL BE EQUIPPED BY THE VFD MANUFACTURER WITH A COMMUNICATION CARD THAT IS COMPATIBLE WITH THE FMCS CONTROL SYSTEM. TCC SHALL PROVIDE HARD WIRING AND PROGRAMMING AS REQUIRED FOR THE FMCS TO COMMUNICATE WITH EACH VFD AS DESCRIBED BELOW.

THE FOLLOWING VFD CONTROL PANEL POINTS (TO INCLUDE BUT NOT LIMITED TO) SHALL BE CONTROLLED BY THE FMCS AND DISPLAYED ON THE ENGINEER CONTROL CENTER (ECC) GRAPHICAL SCREEN:
 • AO - SPEED MODULATION
 • DO - START/STOP
 • DI - STATUS (VIA CS)
 • DI - FAULT STATUS

TCC SHALL PROVIDE A CURRENT SENSING RELAY ON ANY VFD EQUIPPED WITH A BYPASS WHERE THE VFD STATUS OUTPUT DOES NOT INDICATE THE MOTOR IS RUNNING WHEN THE VFD IS OPERATING IN BYPASS MODE.

ALARMS, INTERLOCKS & SAFETIES:
 AN ALARM SHALL BE INDICATED TO THE FMCS OPERATOR WORKSTATION IN THE EVENT A FAULT OR ERROR CONDITION OCCURS AT ANY VFD.
 TCC SHALL PROGRAM VFD TO ENSURE MOTOR RPM DOES NOT DROP BELOW MINIMUM REQUIRED BY MOTOR MANUFACTURER.

5 VARIABLE FREQUENCY DRIVE CONTROL - GENERAL
 12" = 1'-0"

GENERAL CONTROL NOTES:

- REFER TO EQUIPMENT SCHEDULES TO CROSS REFERENCE WHICH CONTROL DIAGRAMS APPLY TO WHICH ITEMS OF EQUIPMENT.
- EACH D.I., D.O., A.I., AND A.O. POINT SHOWN FOR ALL CONTROL DIAGRAMS SHALL BE DISCRETE FROM ALL OTHER POINTS EXCEPT AS SPECIFICALLY NOTED.
- ALL WIRING, CONTROL COMPONENTS, DEVICES AND PROGRAMMING SHOWN ON THESE CONTROL DRAWINGS SHALL BE PROVIDED BY THE TCC UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL ACTUATORS SHALL BE OF THE ELECTRICAL TYPE FOR THIS PROJECT.
- ALL MODULATING VALVE ACTUATORS SHOWN WITH POSITION FEEDBACK SHALL HAVE THE VALVE POSITION DISPLAYED ON GRAPHICAL SCREEN ADJACENT TO THE VALVE COMMAND SIGNAL. DISPLAYED VALVE POSITION SHALL BE FROM THE FEEDBACK DEVICE/CIRCUIT (OUTPUT SIGNAL FROM THE FMCS TO THE ACTUATOR IS NOT ACCEPTABLE).
- MODULATING SIGNALS SHALL BE DISPLAYED AS % OPEN (SIGNALS DISPLAYED AS % CLOSED ARE NOT ACCEPTABLE).
- PRESSURE TRANSMITTERS WHOSE SIGNAL IS UTILIZED FOR MAINTAINING DIFFERENTIAL PRESSURE OF ANY PUMPED WATER SYSTEM (E.G. HEATING HOT WATER AND THE LIKE) SHALL BE WIRED DIRECTLY TO THE CONTROLLER WHICH MODULATES PUMP SPEED. SIGNAL SHALL BE COMPLETELY INDEPENDENT OF THE FMCS NETWORK.
- ALL CONTROL COMPONENTS SUCH AS RELAYS, SWITCHES, DDC CONTROLLERS, ETC. SHALL BE MOUNTED IN STEEL ENCLOSURES WITH STEEL MOUNTING BACKPLATES PER SPECIFICATION 23 09 23.
- EACH CONTROL PANEL SHALL HAVE A LAMINATED COPY OF THE APPLICABLE SEQUENCE OF OPERATION AND CONTROL DIAGRAM INDICATING THE POINTS, COMPONENTS AND OPERATION OF EQUIPMENT ASSOCIATED WITH EACH PANEL. REFER TO SECTION 23 09 23 FOR ADDITIONAL REQUIREMENTS.
- TCC SHALL PROVIDE CONDUIT RUNS AS REQUIRED FOR OUTDOOR EQUIPMENT THAT IS BEING MONITORED OR CONTROLLED BY THE FMCS.
- CONTROL DIAGRAMS ARE SCHEMATIC IN NATURE AND DO NOT SHOW ALL REQUIRED CONTROL DEVICES AND COMPONENTS. REFER TO FLOOR PLANS, FLOW DIAGRAMS AND DETAILS FOR ADDITIONAL CONTROL DEVICES, COMPONENTS AND REQUIREMENTS NOT SHOWN ON THESE CONTROL DRAWINGS.
- TCC SHALL PROVIDE ALL CONTROL COMPONENTS AND ACCESSORIES AS REQUIRED FOR EQUIPMENT TO BE CONTROLLED AS DESCRIBED IN THE SEQUENCE OF OPERATION REGARDLESS OF WHETHER ALL CONTROL COMPONENTS OR POINTS ARE SHOWN IN THE ASSOCIATED CONTROL DIAGRAM.

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Drawing Title
CONTROL DIAGRAM - PIPING

Approved: Project Director

Project Title **RENOVATE AND EXPAND AMBULATORY CARE AND LAB. SAM RAYBURN MEMORIAL VETERANS CENTER**

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Drawn **NATJAC**

Dwg. 85 of 142

Office of Facilities Management

Department of Veterans Affairs