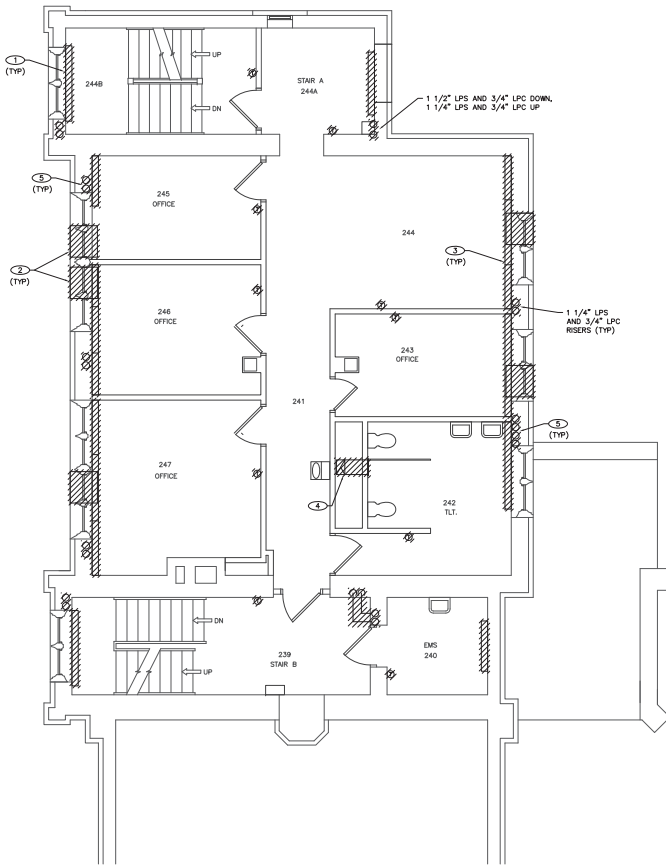
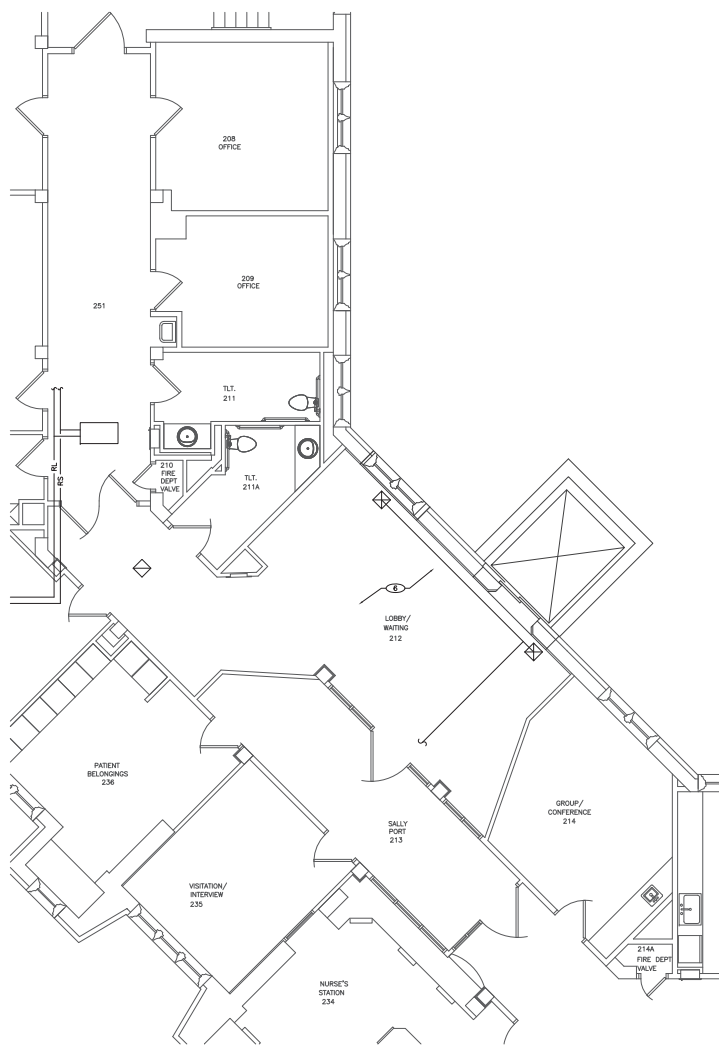
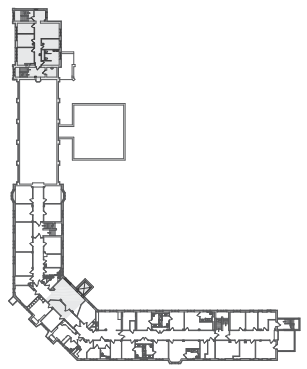


- MECHANICAL KEYNOTES: (○)**
- 1 REMOVE EXISTING FINITURE, SUPPORTS AND CONTROLS IN THEIR ENTIRETY. REMOVE ALL ASSOCIATED PIPING.
 - 2 REMOVE EXISTING PTAC, SUPPORTS AND CONTROLS IN THEIR ENTIRETY.
 - 3 REMOVE EXISTING STEAM RADIATOR, SUPPORTS AND CONTROLS IN THEIR ENTIRETY. REMOVE ALL ASSOCIATED PIPING.
 - 4 REMOVE EXISTING EXHAUST DUCTWORK, GRILLE AND SUPPORTS IN THEIR ENTIRETY.
 - 5 REMOVE EXISTING STEAM AND CONDENSATE PIPING IN ITS ENTIRETY.
 - 6 NO MECHANICAL DEMOLITION WORK REQUIRED IN THIS AREA OF SECOND FLOOR.



NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING
INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH
GENERAL CONTRACTOR.



1F ENLARGED MECHANICAL DEMOLITION PLAN - SECOND FLOOR
SCALE: 1/4" = 1'-0"

5F ENLARGED MECHANICAL DEMOLITION PLAN - SECOND FLOOR
SCALE: 1/4" = 1'-0"

SECOND FLOOR KEYPLAN
NOT TO SCALE

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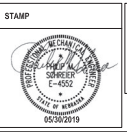
BM Documents	05/30/2019
Contract Documents 100% Submittal (CD)	05/14/2019
Contract Documents 95% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/18/2019
Design Development (DD)	12/10/2018
Schematic Design (SD)	10/05/2018
Revisions:	Date:

CONSULTANT

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FEI #: 182083
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ARCHITECT/ENGINEER OF RECORD

CLH
3102 North 20th Street
Elkhorn, Nebraska 68022
(402) 291-9961



Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title:
SECOND FLOOR MECHANICAL DEMOLITION PLANS

Approved Project Director:

Phase:
BID DOCUMENTS

FULLY SPRINKLERED

Project Title:
RENOVATE TOWER BUILDING 1

Location:
Sioux Falls, SD 57105

Issue Date:
05/06/2019

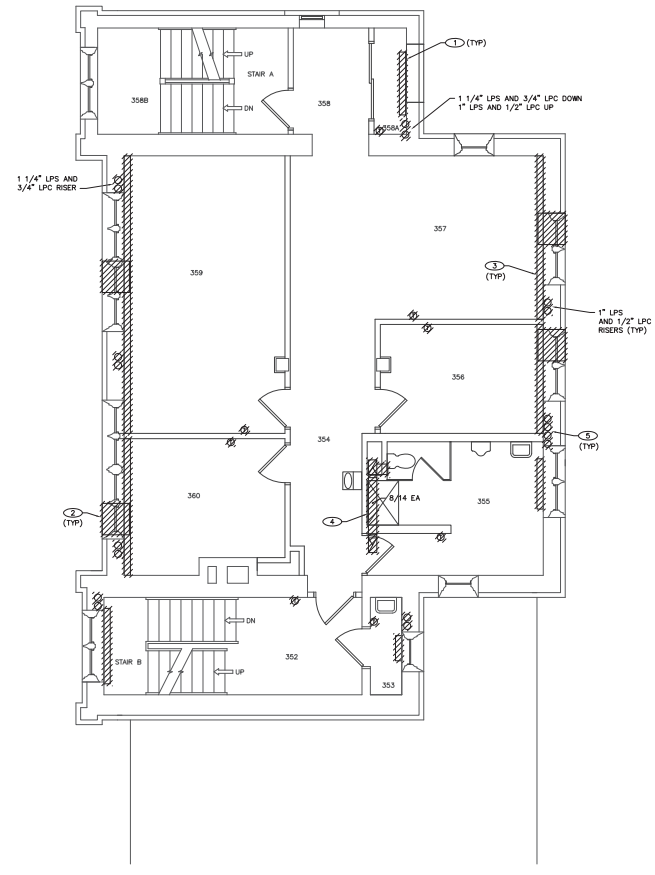
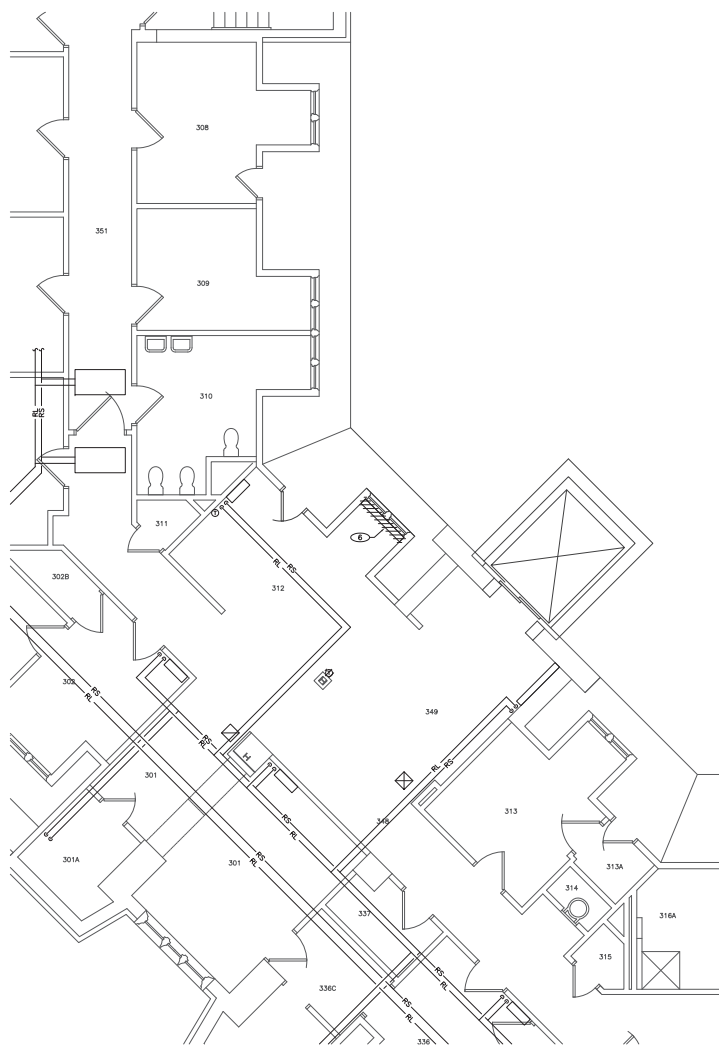
Project Number:
438-18-102

Bidding Number:
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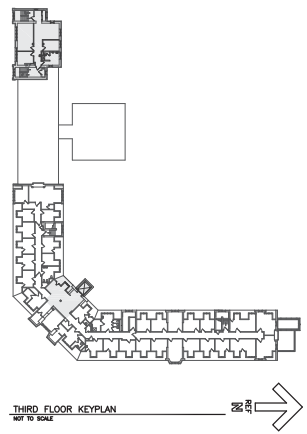
Drawing Number:
MD102

MECHANICAL KEYNOTES: (○)

- ① REMOVE EXISTING FINITURE, SUPPORTS AND CONTROLS IN THEIR ENTIRETY. REMOVE ALL ASSOCIATED PIPING.
- ② REMOVE EXISTING PTAC, SUPPORTS AND CONTROLS IN THEIR ENTIRETY.
- ③ REMOVE EXISTING STEAM RADIATOR, SUPPORTS AND CONTROLS IN THEIR ENTIRETY. REMOVE ALL ASSOCIATED PIPING.
- ④ REMOVE EXISTING EXHAUST DUCTWORK, GRILLE AND SUPPORTS IN THEIR ENTIRETY.
- ⑤ REMOVE EXISTING STEAM AND CONDENSATE PIPING IN ITS ENTIRETY.
- ⑥ REMOVE EXISTING RADIATOR, SUPPORTS AND CONTROLS IN THEIR ENTIRETY. REMOVE PIPING BACK TO MAIN AND CAP.



NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



1F ENLARGED MECHANICAL DEMOLITION PLAN - THIRD FLOOR
SCALE: 1/4" = 1'-0"

5F ENLARGED MECHANICAL DEMOLITION PLAN - THIRD FLOOR
SCALE: 1/4" = 1'-0"

THIRD FLOOR KEYPLAN
NOT TO SCALE

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VA FORM 08-4221

BM Documents	05/30/2019
Contract Documents 100% Submittal (CD)	05/14/2019
Contract Documents 95% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/18/2019
Design Development (DD)	12/10/2018
Schematic Design (SD)	10/05/2018
Revisions:	Date:

CONSULTANT

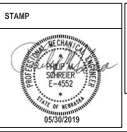
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Contract # **FEJ # 182083**
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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
THIRD FLOOR MECHANICAL DEMOLITION PLANS

Approved Project Director

Phase
BID DOCUMENTS

FULLY SPRINKLERED

Project Title
RENOVATE TOWER BUILDING 1

Location
Sioux Falls, SD 57105

Issue Date
05/06/2019

Checked
JOB

Drawn
LMB

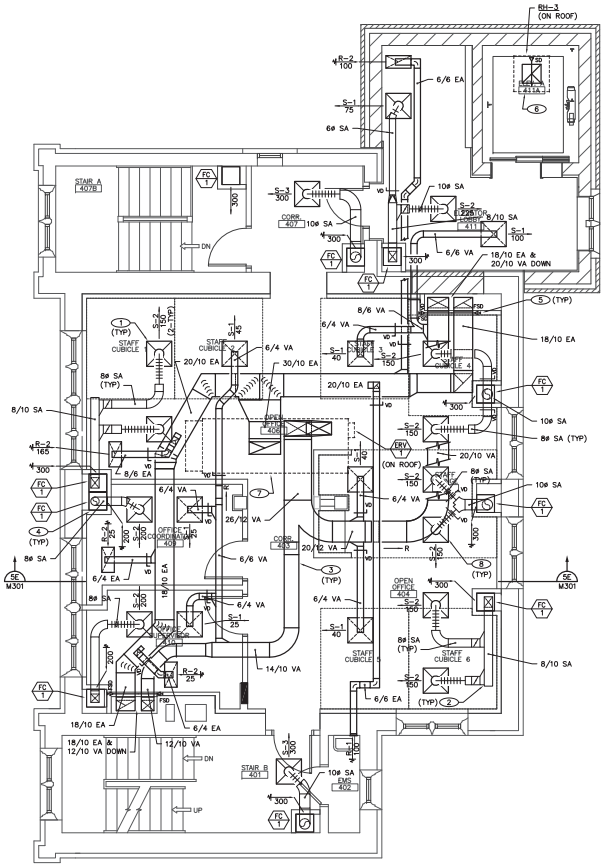
Project Number
438-18-102

Revision Number
1

Drawing Number
MD103

MECHANICAL KEYNOTES: (○)

- ① REFER TO DIFFUSER CONNECTION DETAIL 1/M501.
- ② REFER TO TYPICAL LOW PRESSURE DUCT DETAIL 2/M501.
- ③ REFER TO DUCTWORK HANGERS DETAIL 3/M501.
- ④ RETURN GRILLE INTEGRAL WITH FAN COIL UNIT.
- ⑤ REFER TO FIRE DAMPER INSTALLATION DETAIL 3/M502 AND ACCESS DOOR DETAIL 4/M502.
- ⑥ RELIEF HOOD FOR ELEVATOR SHAFT. REFER TO RELIEF HOOD DETAIL 6/M501.
- ⑦ REFER TO ROOFTOP UNIT SOUND ATTENUATION DETAIL 13/M501.
- ⑧ BRANCH DUCT SIZE SHALL MATCH DIFFUSER NECK SIZE, UNLESS NOTED OTHERWISE.



NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.

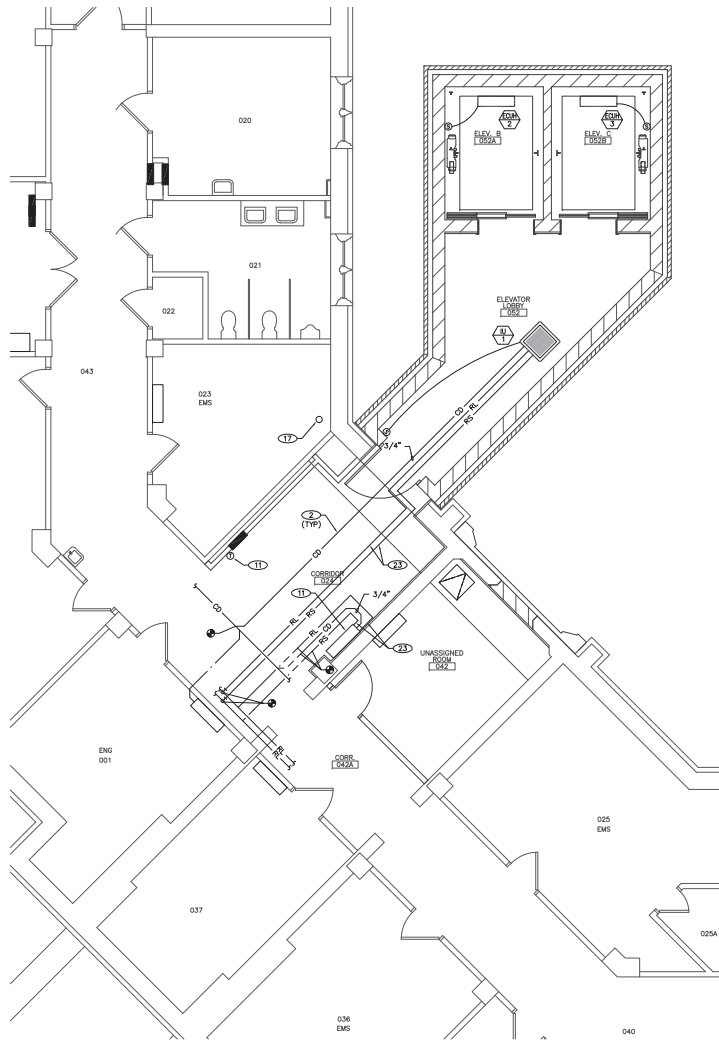


④ ENLARGED HVAC PLAN - FOURTH FLOOR
SCALE: 1/4" = 1'-0"

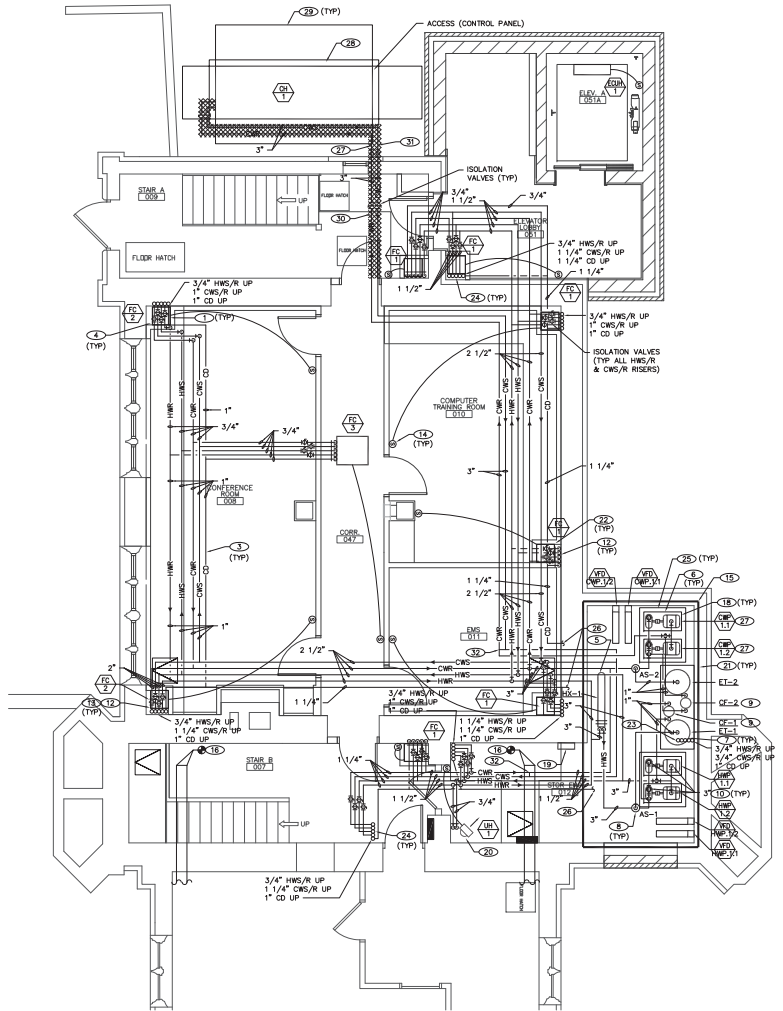
FOURTH FLOOR KEYPLAN
NOT TO SCALE

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Revisions:	Date:																														

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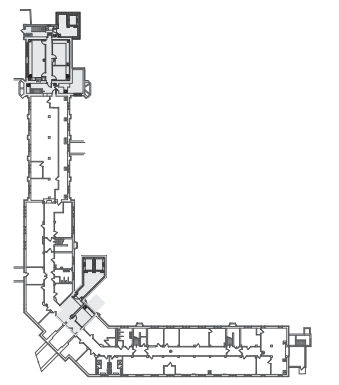
1F ENLARGED MECHANICAL PIPING PLAN - BASEMENT
SCALE: 1/4" = 1'-0"



5F ENLARGED MECHANICAL PIPING PLAN - BASEMENT
SCALE: 1/4" = 1'-0"

- MECHANICAL KEYNOTES:** ()
- REFER TO CONDENSATE DRAIN DETAIL 5/M502.
 - PROVIDE AND INSTALL CLEANOUTS FOR THE CONDENSATE PIPING AT EVERY 50 FEET AND AT EVERY CHANGE IN DIRECTION.
 - REFER TO PIPE INSULATION DETAIL 4/M501.
 - REFER TO FAN COOL PIPING INSTALLATION DETAIL 5/M501.
 - REFER TO STEAM TO HOT WATER CONVERTER DETAIL 7/M501.
 - REFER TO BASE MOUNTED END SUCTION PUMP DETAIL 8/M501.
 - REFER TO HOT WATER EXPANSION TANK & AIR SEPARATOR DETAIL 9/M501.
 - REFER TO MAKE-UP WATER CONNECTION DETAIL 11/M501.
 - REFER TO POT FEEDER DETAIL 12/M501.
 - REFER TO HOT WATER HEATING PIPING SCHEMATIC 1/M502.
 - RELOCATE EXISTING VEV UNIT AND CONTROLS TO LOCATION SHOWN. EXTEND CONDENSATE AND REFRIGERANT PIPING, AS REQUIRED.
 - ROUTE 3/4" HWS/HWR AND 3/4" CWS/CWR SERVING FAN COIL INSIDE WALL AND DOWN TO FAN COIL. PROVIDE AND INSTALL SHUTOFF VALVES AT EACH FAN COIL UNIT.
 - PIPING TO SERVE FAN COIL ABOVE: ROUTE 3/4" HWS/HWR AND 3/4" CWS/CWR UP THIS FLOOR TO FAN COIL.
 - SENSOR PROVIDED AND INSTALLED BY CONTROLS CONTRACTOR COORDINATE WITH ALL TRACES. SENSOR SHALL BE ADJUSTABLE BY OCCUPANT. VERIFY WITH COR PRIOR TO SHOP DRAWINGS.
 - SEE HOT WATER HEATING PIPING SCHEMATIC 1/M502 FOR ADDITIONAL INFORMATION.
 - PROVIDE END OF LINE DRIP. REFER TO END OF STEAM LINE DRIP TRAP DETAIL 12/M502 FOR ADDITIONAL INFORMATION.
 - RELOCATE EXISTING STEAM CONTROL VALVE IN TUNNEL.
 - INSTALL CONCRETE EQUIPMENT PAD. COORDINATE WITH GENERAL CONTRACTOR.
 - PROVIDE AND INSTALL TEMPERATURE CONTROL PANEL.
 - SEE HOT WATER UNIT HEATER DETAIL 2/M502 FOR ADDITIONAL INFORMATION.
 - SEE DETAILS 6,7,8,9,10,11/M502 FOR HYDRONIC ACCESSORIES.
 - INSTALL FAN COIL PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN ALL SERVICE CLEARANCES.
 - SIZE AND ROUTE RS/RP PIPING PER MANUFACTURER'S RECOMMENDATIONS.
 - REFER TO TYPICAL FLOOR PENETRATION DETAIL 13/M502.
 - REFER TO TYPICAL MECHANICAL PAD DETAIL 14/M502.
 - ROUTE 1 1/4" CONDENSATE DRAIN TO FLOOR DRAIN IN MECHANICAL ROOM.
 - REFER TO CHILLER PIPING DETAIL 10/M501.
 - COORDINATE WITH GENERAL CONTRACTOR FOR EQUIPMENT PAD.
 - DASHED LINE INDICATED MANUFACTURER'S RECOMMENDATIONS. MAINTAIN ALL CLEARANCES.
 - PROVIDE ELECTRIC HEAT TRACE. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION. COORDINATE WITH ELECTRICAL CONTRACTOR.
 - PROVIDE PIPE SUPPORT PER SPECIFICATIONS. SUPPORT PIPING FROM CONCRETE PAD.
 - PROVIDE CHILLED WATER BYPASS VALVE. MINIMUM FLOW SHALL BE 30 GPM.

NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



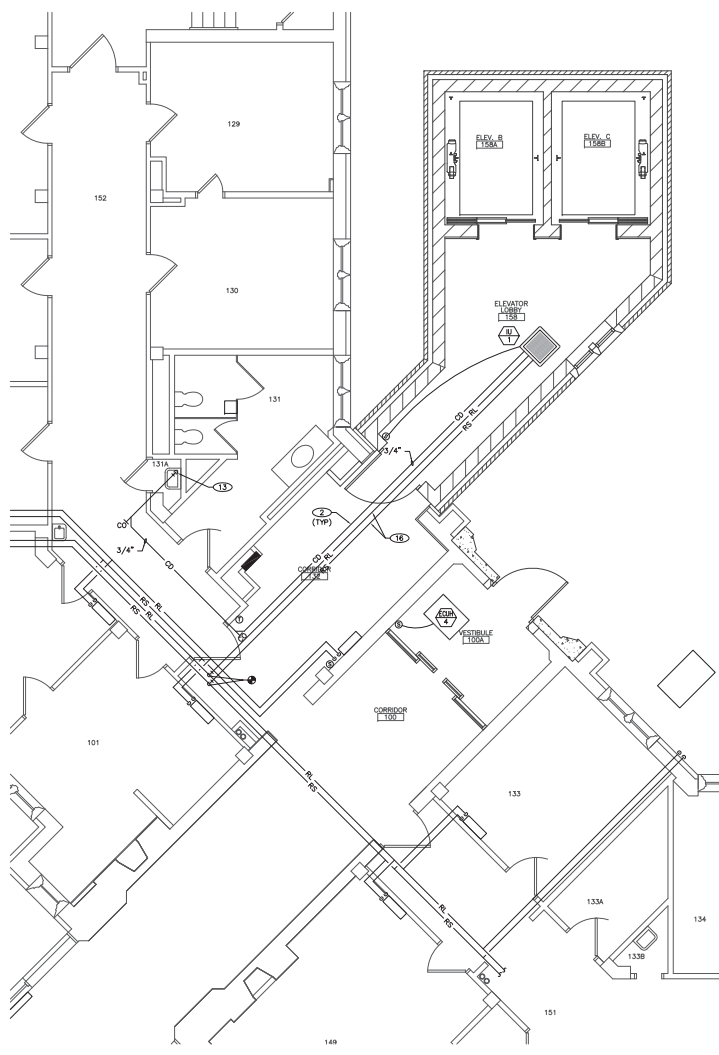
BASEMENT KEYPLAN
NOT TO SCALE

CONSULTANT FARRIS ENGINEERING OMAHA LINCOLN DENVER COLORADO SPRINGS 1125 North 20th Street, Lincoln, Nebraska 68502 (402) 291-9961 FARRIS ENGINEERING 05/30/2019		ARCHITECT/ENGINEER OF RECORD Cohn & Hill 3102 North 20th Street, Lincoln, Nebraska 68502 (402) 291-9961 FARRIS ENGINEERING 05/30/2019		Office of Construction and Facilities Management U.S. Department of Veterans Affairs Drawing Title: BASEMENT MECHANICAL PIPING PLANS Approve Project Director:		Phase BID DOCUMENTS FULLY SPRINKLERED		Project Title RENOVATE TOWER BUILDING 1 Count: Stoll Falls, SD 57105 Issue Date: 05/30/2019 Checked: JOB Drawn: LMB		Project Number 438-18-102 Revision Number: 1 Drawing Number MP100	
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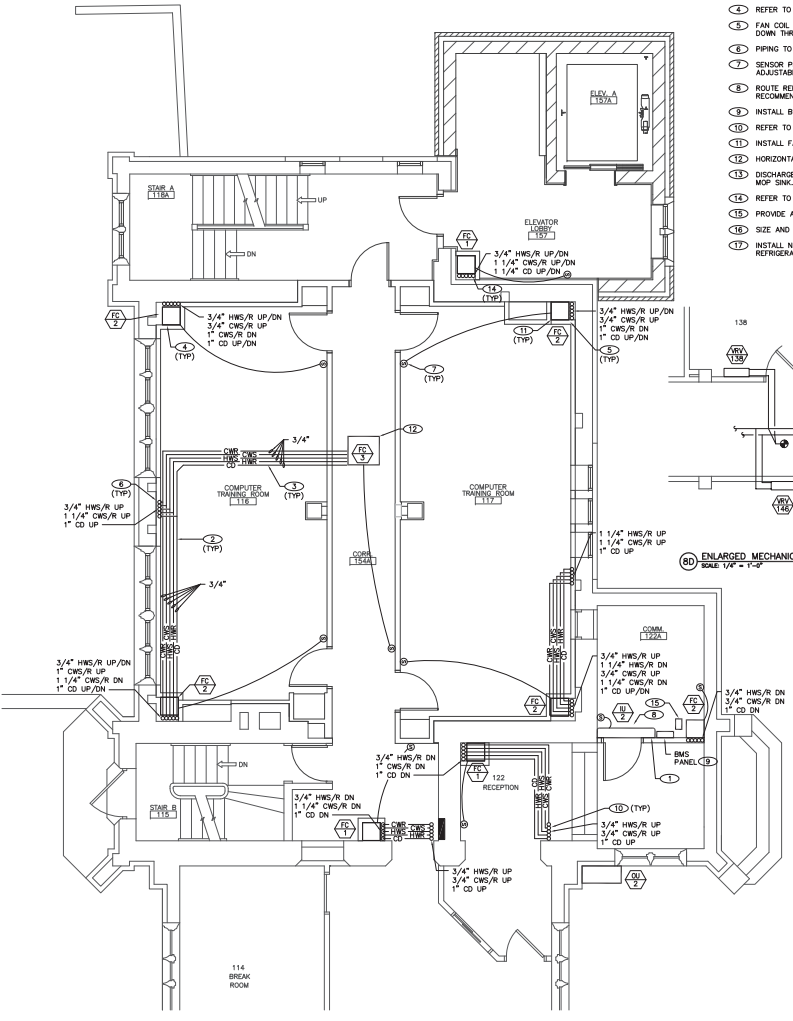
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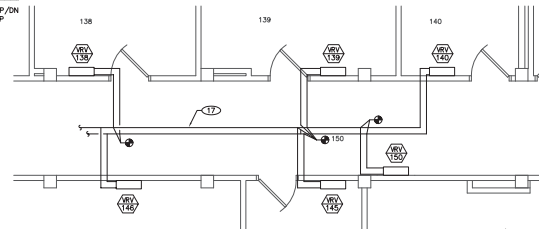
- 1 INSTALL FACTORY CONTROLLER FOR INDOOR UNIT. COORDINATE LOCATION AND INSTALLATION WITH ALL TRADES.
- 2 PROVIDE AND INSTALL CLEANOUTS FOR THE CONDENSATE PIPING AT EVERY 50 FEET AND AT EVERY CHANGE IN DIRECTION.
- 3 REFER TO PIPE INSULATION DETAIL 4/M501.
- 4 REFER TO FAN COIL PIPING INSTALLATION DETAIL 5/M501.
- 5 FAN COIL SERVED FROM BELOW. ROUTE 3/4" HWS/HWR AND 3/4" CWS/CWR SERVING FAN COIL INSIDE WALL AND DOWN THRU FLOOR. PROVIDE AND INSTALL SHUTOFF VALVES AT EACH FAN COIL UNIT.
- 6 PIPING TO SERVE FAN COIL ABOVE. ROUTE 3/4" HWS/HWR AND 3/4" CWS/CWR UP THRU FLOOR TO FAN COIL.
- 7 SENSOR PROVIDED AND INSTALLED BY CONTROLS CONTRACTOR COORDINATE WITH ALL TRADES. SENSOR SHALL BE ADJUSTABLE BY OCCUPANT. VERIFY WITH COR PRIOR TO SHOP DRAWINGS.
- 8 ROUTE REFRIGERANT PIPING FROM LL TO QLL. SIZE AND ROUTE REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS.
- 9 INSTALL BUILDING MANAGEMENT SENSOR FOR ROOM TEMPERATURE MONITORING/ALARMS.
- 10 REFER TO TYPICAL FLOOR PENETRATION DETAIL 13/M502.
- 11 INSTALL FAN COIL PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN ALL SERVICE CLEARANCES.
- 12 HORIZONTAL FAN COILS SHALL BE INSTALLED WITH SPRING ISOLATORS AND FLEXIBLE CONNECTIONS.
- 13 DISCHARGE CONDENSATE PIPING INTO MOP SINK IN JANITOR'S CLOSET. PROVIDE 1" AIR GAP ABOVE FLOOD RIM OF MOP SINK.
- 14 REFER TO CONDENSATE DRAIN DETAIL 5/M502.
- 15 PROVIDE AND INSTALL TEMPERATURE CONTROL PANEL.
- 16 SIZE AND ROUTE R5/R6 PIPING PER MANUFACTURER'S RECOMMENDATIONS.
- 17 INSTALL NEW REFRIGERANT PIPING, SIZED AND ROUTED PER MANUFACTURER'S RECOMMENDATIONS. RECHARGE REFRIGERANT SYSTEM.



1F ENLARGED MECHANICAL PIPING PLAN - FIRST FLOOR
SCALE: 1/4" = 1'-0"

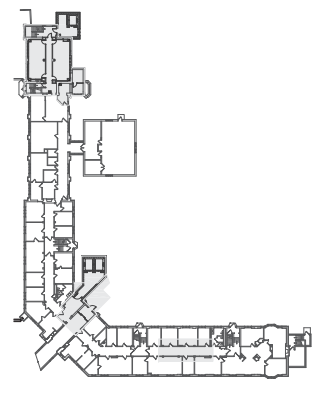


5F ENLARGED MECHANICAL PIPING PLAN - FIRST FLOOR
SCALE: 1/4" = 1'-0"



6D ENLARGED MECHANICAL DEMOLITION PLAN - FIRST FLOOR
SCALE: 1/4" = 1'-0"

NOTICE:
REFER TO DRAWING GI-110 FOR PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



FIRST FLOOR KEYPLAN
NOT TO SCALE

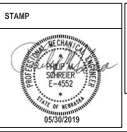
Contract Documents 95% Submittal (CD)	05/30/2019
Contract Documents 100% Submittal (CD)	05/14/2019
Contract Documents 95% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/18/2019
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Schematic Design (SD)	10/05/2018
Revisions:	Date:

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ARCHITECT/ENGINEER OF RECORD

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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title:
FIRST FLOOR MECHANICAL PIPING PLANS

Approve Project Director

Phase:
BID DOCUMENTS

Project Title:
RENOVATE TOWER BUILDING 1

Location:
Stoux Falls, SD 57105

Issue Date:
05/06/2019

Checked:
JOB

Drawn:
LMB

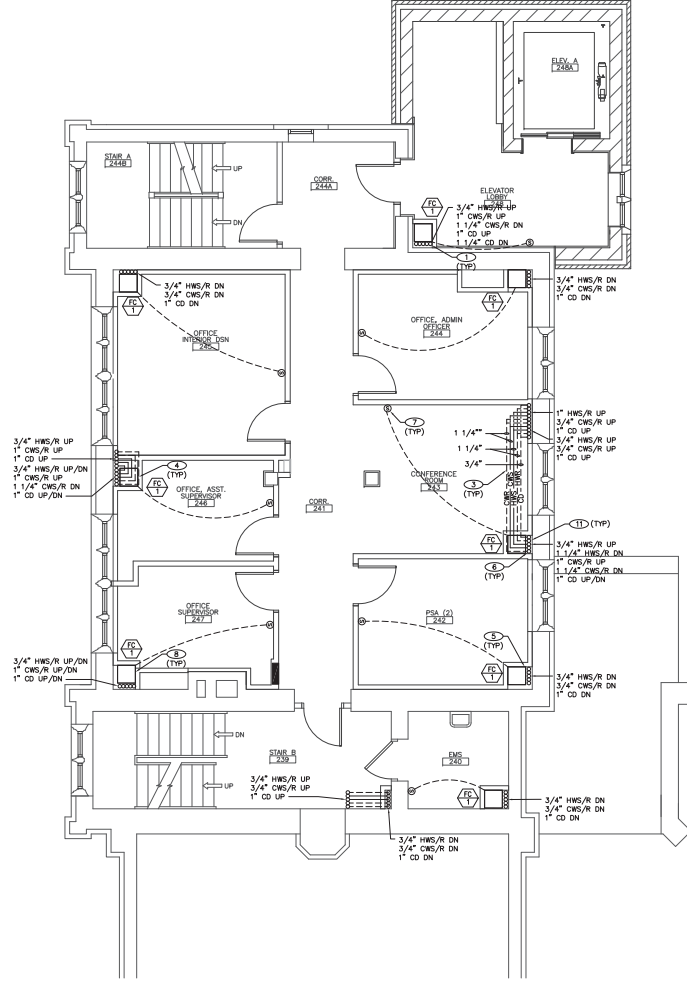
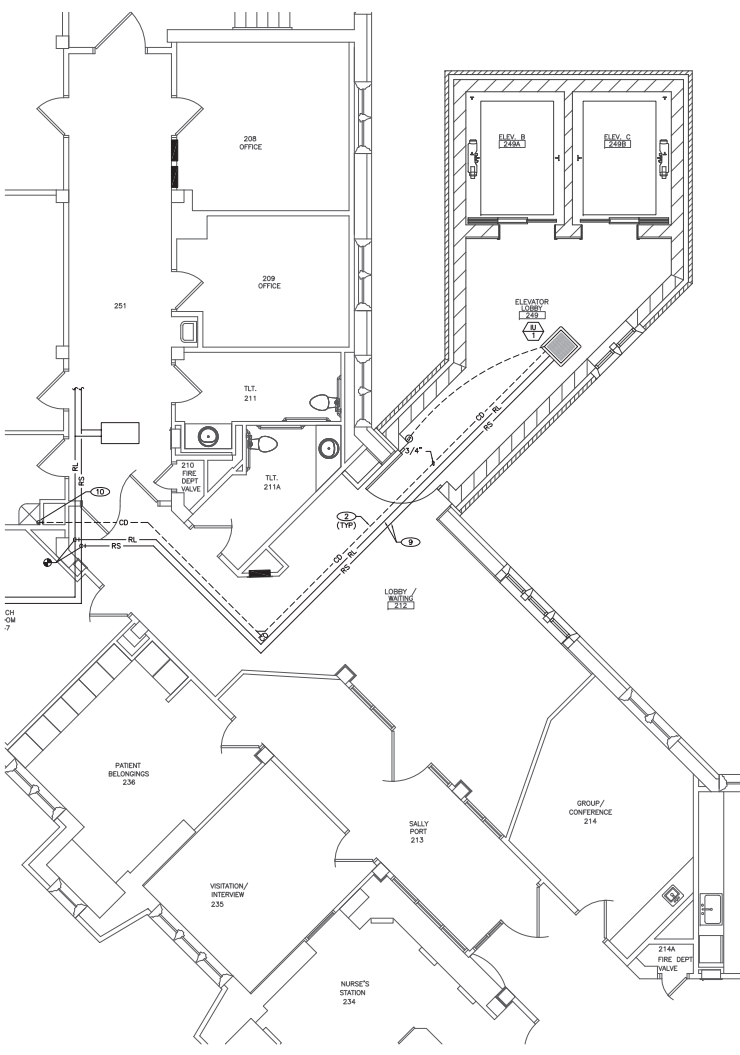
Project Number:
438-18-102

Revision Number:
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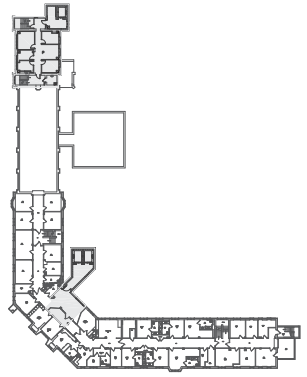
Drawing Number:
MP101

MECHANICAL KEYNOTES: (○)

- 1 REFER TO CONDENSATE DRAIN DETAIL 5/M502.
- 2 PROVIDE AND INSTALL CLEANOUTS FOR THE CONDENSATE PIPING AT EVERY 50 FEET AND AT EVERY CHANGE IN DIRECTION.
- 3 REFER TO PIPE INSULATION DETAIL 4/M501.
- 4 REFER TO FAN COIL PIPING INSTALLATION DETAIL 5/M501.
- 5 FAN COIL SERVED FROM BELOW: ROUTE 3/4" HWS/HWR AND 3/4" CWS/CWS SERVING FAN COIL INSIDE WALL AND DOWN THRU FLOOR. PROVIDE AND INSTALL SHUTOFF VALVES AT EACH FAN COIL UNIT.
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- 7 SENSOR PROVIDED AND INSTALLED BY CONTROLS CONTRACTOR COORDINATE WITH ALL TRADES. SENSOR SHALL BE ADJUSTABLE BY OCCUPANT. VERIFY WITH COR PRIOR TO SHOP DRAWINGS.
- 8 INSTALL FAN COIL PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN ALL SERVICE CLEARANCES.
- 9 SIZE AND ROUTE RS/RL PIPING PER MANUFACTURER'S RECOMMENDATIONS.
- 10 DISCHARGE CONDENSATE PIPING INTO MOP SINK IN JANITOR'S CLOSET. PROVIDE 1" AIR GAP ABOVE FLOOR FIN OF MOP SINK.
- 11 REFER TO TYPICAL FLOOR PENETRATION DETAIL 13/M502.



NOTICE:
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1F ENLARGED MECHANICAL PIPING PLAN - SECOND FLOOR
SCALE: 1/4" = 1'-0"

5F ENLARGED MECHANICAL PIPING PLAN - SECOND FLOOR
SCALE: 1/4" = 1'-0"

SECOND FLOOR KEYPLAN
NOT TO SCALE

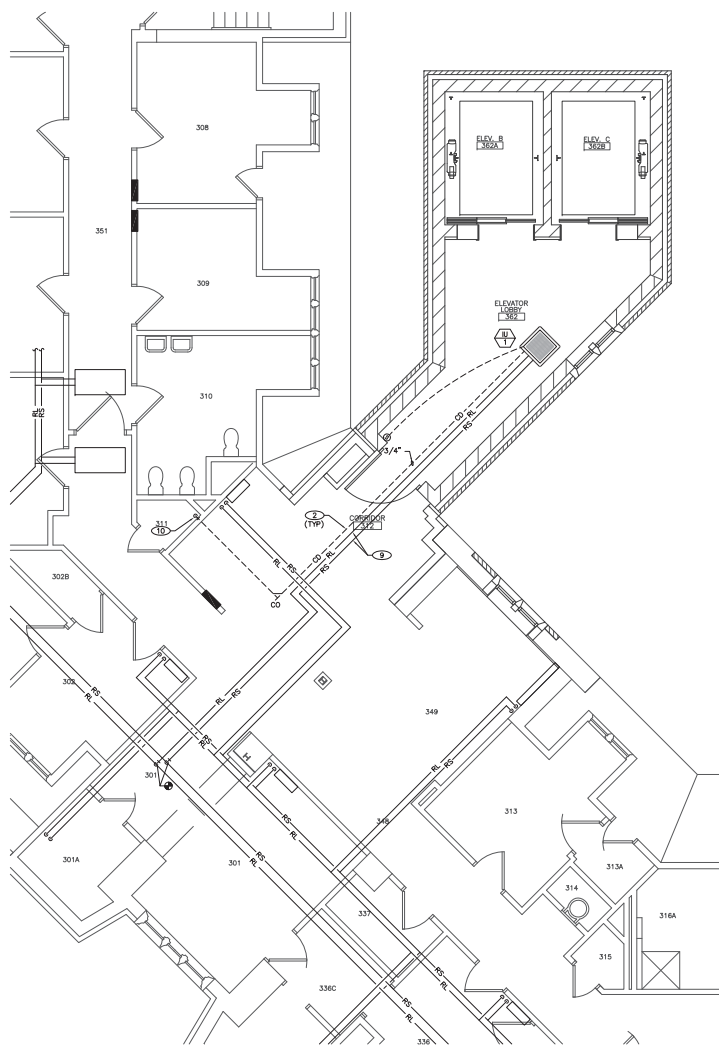
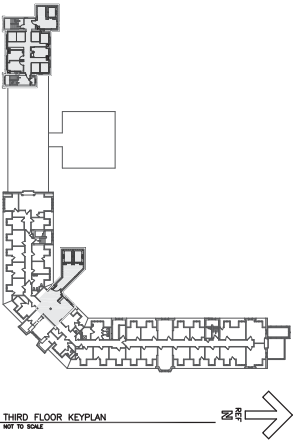
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VA FORM 08 - 6/2011

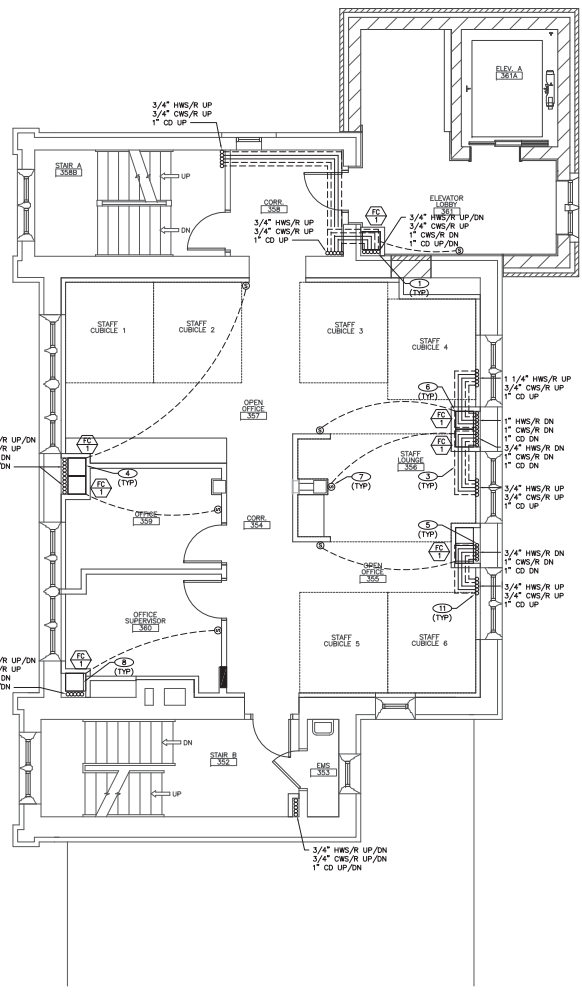
MECHANICAL KEYNOTES: (○)

- 1 REFER TO CONDENSATE DRAIN DETAIL 5/M502.
- 2 PROVIDE AND INSTALL CLEANOUTS FOR THE CONDENSATE PIPING AT EVERY 50 FEET AND AT EVERY CHANGE IN DIRECTION.
- 3 REFER TO PIPE INSULATION DETAIL 4/M501.
- 4 REFER TO FAN COIL PIPING INSTALLATION DETAIL 5/M501.
- 5 FAN COIL SERVED FROM BELOW: ROUTE 3/4" HWS/HWR AND 3/4" CWS/CWR SERVING FAN COIL INSIDE WALL AND DOWN THRU FLOOR. PROVIDE AND INSTALL SHUTOFF VALVES AT EACH FAN COIL UNIT.
- 6 PIPING TO SERVE FAN COIL ABOVE: ROUTE 3/4" HWS/HWR AND 3/4" CWS/CWR UP THRU FLOOR TO FAN COIL.
- 7 SENSOR PROVIDED AND INSTALLED BY CONTROLS CONTRACTOR COORDINATE WITH ALL TRADES. SENSOR SHALL BE ADJUSTABLE BY OCCUPANT. VERIFY WITH COR PRIOR TO SHOP DRAWINGS.
- 8 INSTALL FAN COIL PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN ALL SERVICE CLEARANCES.
- 9 SIZE AND ROUTE RS/RL PIPING PER MANUFACTURER'S RECOMMENDATIONS.
- 10 DISCHARGE CONDENSATE PIPING INTO MOP SINK IN JANITOR'S CLOSET. PROVIDE 1" AIR GAP ABOVE FLOOD RIM OF MOP SINK.
- 11 REFER TO TYPICAL FLOOR PENETRATION DETAIL 13/M502.

NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



1F ENLARGED MECHANICAL PIPING PLAN - THIRD FLOOR
SCALE 1/4" = 1'-0"

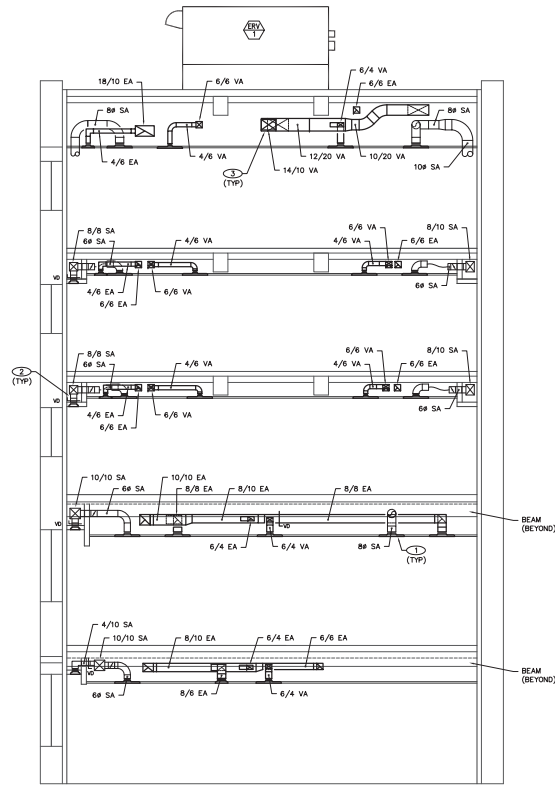


5F ENLARGED MECHANICAL PIPING PLAN - THIRD FLOOR
SCALE 1/4" = 1'-0"

CONSULTANT FARRIS ENGINEERING OMAHA LINCOLN DENVER COLORADO SPRINGS 404 W. 15th Street, Suite 100 Omaha, NE 68102 (402) 491-9991		ARCHITECT/ENGINEER OF RECORD C.H. Hill ARCHITECTS 3102 North 20th Street Elkhorn, Nebraska 68022 (402) 291-9961		STAMP 	Office of Construction and Facilities Management U.S. Department of Veterans Affairs	Drawing Title THIRD FLOOR MECHANICAL PIPING PLANS Approve: Project Director	Phase BID DOCUMENTS FULLY SPRINKLERED	Project Title RENOVATE TOWER BUILDING 1 Location: StouX Falls, SD 57105 Issue Date: 05/06/2019	Project Number 438-18-102 Drawing Number: 1 MP103
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15/2019 (10/2014) VA FORM 08 - 6/2011

- MECHANICAL KEYNOTES:** (○)
- ① REFER TO DIFFUSER CONNECTION DETAIL 1, M501.
 - ② REFER TO TYPICAL LOW PRESSURE DUCT DETAIL 2, M501.
 - ③ REFER TO DUCTWORK HANGERS DETAIL 3, M501.



MECHANICAL SECTION
SCALE: 1/4" = 1'-0"

11/20/19 10:30 AM

BM Documents	05/30/2019
Contract Documents 100% Submittal (CD)	05/14/2019
Contract Documents 95% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/10/2019
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Schematic Design (SD)	10/05/2018
Revisions:	Date:

CONSULTANT

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Office of Construction and Facilities Management

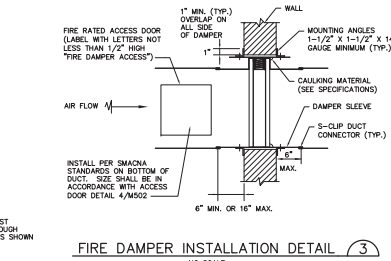
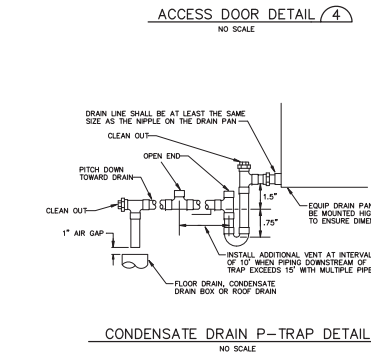
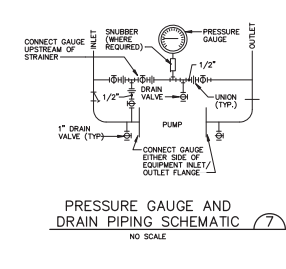
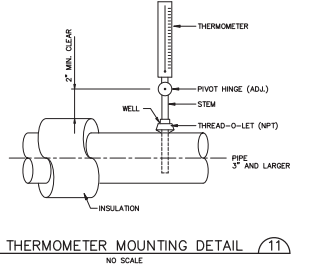
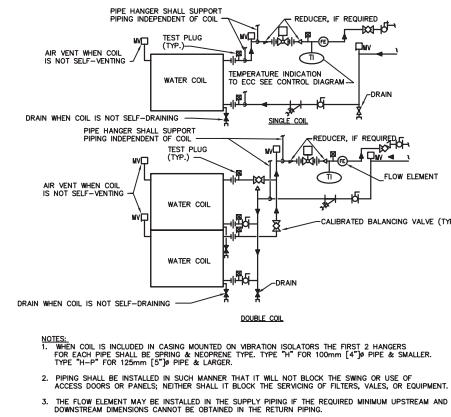
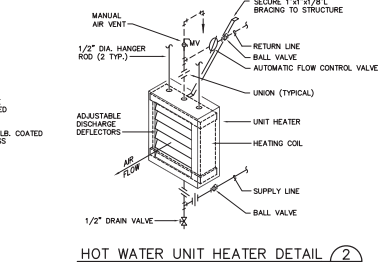
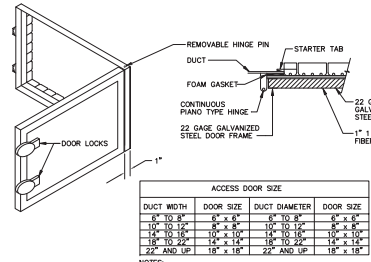
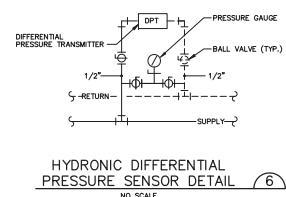
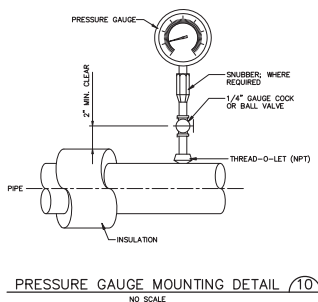
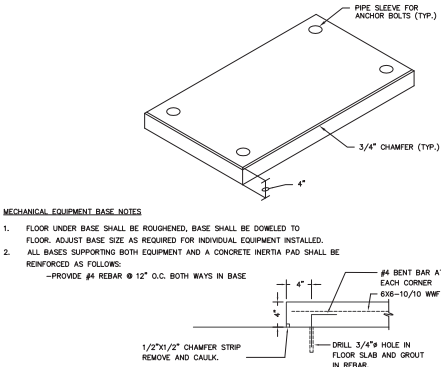
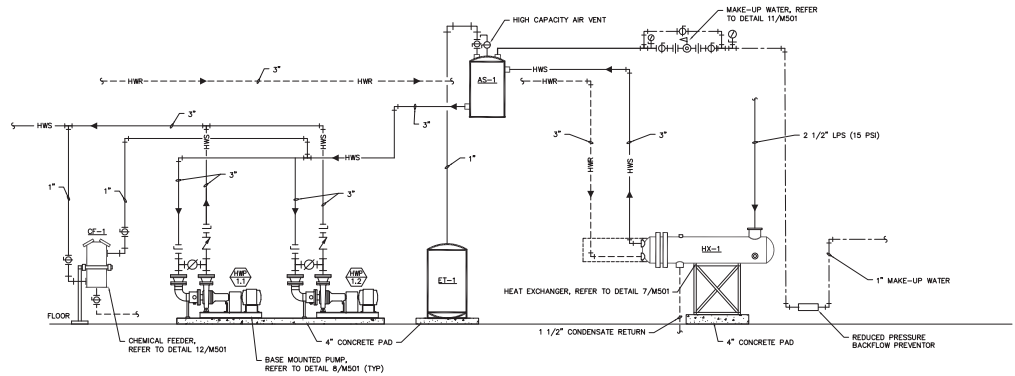
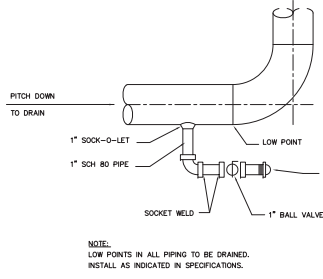
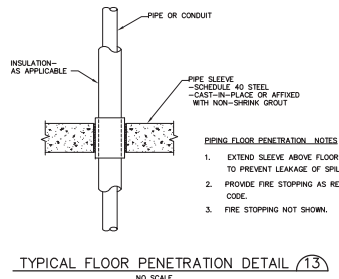
VA U.S. Department of Veterans Affairs

Drawing Title	MECHANICAL SECTIONS
Approved Project Director	

Phase	BID DOCUMENTS
FULLY SPRINKLERED	

Project Title	RENOVATE TOWER BUILDING 1
Location	Sioux Falls, SD 57105
Issue Date	05/06/2019
Checked	JOB
Drawn	LMB

Project Number	438-18-102
Submittal Number	1
Drawing Number	M301



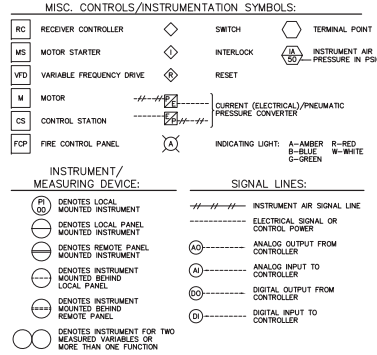
CONSULTANT FARRIS ENGINEERING OMAHA LINCOLN DENVER COLORADO SPRINGS 402-466-0000 www.farriseng.com FE# 182083 <small>This document and the information contained hereon has been prepared or accepted from without the express written permission of Farris Engineering, Inc. Unauthorized copying, reproduction or construction use are prohibited by the copyright laws.</small>		ARCHITECT/ENGINEER OF RECORD Chiharu Ishihara 3102 North 20th Street Elkhorn, Nebraska 68022 (402) 201-9491 FARRIS ENGINEERING 402-466-0000 www.farriseng.com		STAMP 	Office of Construction and Facilities Management U.S. Department of Veterans Affairs	Drawing Title MECHANICAL DETAILS Approve Project Director	Phase BID DOCUMENTS	Project Title RENOVATE TOWER BUILDING 1	Project Number 438-18-102 Drawing Number 1	
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15/2019/10/20/AM

DEVICE TYPE ABBREVIATIONS:

AARP	ALARM ACKNOWLEDGE RESET PUSHBUTTON	H	HUMIDITY/HAMIDITY SENSOR
AD	AUTOMATIC CONTROL DAMPER	HC	HAND CONTROL
AEDAS	ANALYSIS SENSOR AIR SUPPLY	HDA	HAND-OFF-AUTO
AEOX	ANALYSIS SENSOR OXYGEN	HDS	HIGH SET-FRONT
AF	AIR FLOW SWITCH	HSP	HIGH HIGH SET-POINT
AFS	AIR FLOW SENSOR	IA	INSTRUMENT AIR
AI	ANALOG INPUT	IFD	IGNITER FLAME DETECTION
ALIN	ALARM INHIBIT	IFR	IGNITER FUEL FAILURE RELAY
ALNR	ALARM NORM RELAY	IFPH	IGNITER FUEL PRESSURE HIGH
ALM	ALARM	IFPL	IGNITER FUEL PRESSURE LOW
AO	ANALOG OUTPUT	IPSH	IGNITER PRESSURE SWITCH-HIGH (NO CONTACT/OPEN AT HIGH PRESSURE)
AOR	AUTO ON RELAY	IPSL	IGNITER PRESSURE SWITCH-LOW (NO CONTACT/OPEN AT NORMAL PRESSURE)
AUR	ALARM RELAY	ISSV	IGNITER SAFETY SHUTOFF VALVE
ASPB	ALARM SILENCE PUSHBUTTON	ISSV	IGNITER SAFETY SHUTOFF VENT VALVE
BQFCV	BURNER GAS FLOW CONTROL VALVE	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BFR	BURNER FLAME FAILURE RELAY	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BPH	BURNER FUEL PRESSURE HIGH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BPL	BURNER FUEL PRESSURE LOW	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BPR	BURNER FUEL PRESSURE RELAY	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BPS	BURNER PRESSURE SWITCH-HIGH (NO CONTACT/OPEN AT HIGH PRESSURE)	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BPSL	BURNER PRESSURE SWITCH-LOW (NO CONTACT/OPEN AT NORMAL PRESSURE)	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BRO	BURNER REGISTER OPEN (LIMIT SWITCH)	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BR	BURNER STOP RELAY	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BSS	BURNER SELECTION SWITCH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BSSV	BURNER SAFETY SHUTOFF VALVE	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
BSSVV	BURNER SAFETY SHUTOFF VENT VALVE	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
CAFL	COMBUSTION AIR FLOW LOW (NO CONTACT/OPEN AT NORMAL AIR FLOW)	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
CE	CONDUCTIVITY ELEMENT	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
COZE	CO2 ELEMENT (SENSOR)	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
OR	CONTROL RELAY	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
CV	CONTROL VALVE	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
CW	CONTROL WIRE	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DA	DAMPER ACTUATOR	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DI	DIGITAL INPUT	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DO	DIGITAL OUTPUT	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPAL	DIFFERENTIAL PRESSURE ALARM HIGH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPA	DIFFERENTIAL PRESSURE ALARM LOW	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPC	DIFFERENTIAL PRESSURE CONTROLLER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPE	DIFFERENTIAL PRESSURE SENSOR	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPI	DIFFERENTIAL PRESSURE INDICATOR	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPS	DIFFERENTIAL PRESSURE SWITCH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPSH	DIFFERENTIAL PRESSURE SWITCH HIGH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPSL	DIFFERENTIAL PRESSURE SWITCH LOW	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DPT	DIFFERENTIAL PRESSURE TRANSMITTER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
DTC	DATA TERMINAL CABINET	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
ESDR	EMERGENCY SHUTDOWN RELAY	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
ESPB	EMERGENCY STOP PUSHBUTTON	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
ESR	EMERGENCY STOP RELAY	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
ESPB	EMERGENCY STOP RESET PUSHBUTTON	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
ETW4H	EXPANSION TANK WATER LEVEL HIGH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
ETWL	EXPANSION TANK WATER LEVEL LOW	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FD	FORCED DRAFT	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FDCC	FORCED DRAFT FAN DAMPER CLOSED	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FDFSC	FORCED DRAFT FAN SELECTION SWITCH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FDMGR	FORCED DRAFT FAN MOTOR STARTER RELAY	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FDVDO	FORCED DRAFT FAN VANES OPEN (LIMIT SWITCH)	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FE	FLOW ELEMENT (SENSOR)	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FBR	FUE GAS RECIRCULATION DAMPER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FORD	FUE GAS RECIRCULATION DAMPER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FI	FLOW INDICATOR	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FC	FLOW INDICATOR CONTROLLER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FID	FLOW INDICATOR TRANSMITTER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FLS	FLAME SCANNER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FM	FLOW METER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FPHR	FURNACE PRESSURE HIGH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FPL	FURNACE PRESSURE HIGH/LOW RELAY	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FPL	FURNACE PRESSURE LOW	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FQIT	FLOW QUANTITY INDICATING TRANSMITTER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FS	FLOW SWITCH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FSH	FLOW SWITCH-HIGH (NO CONTACT/OPEN ON HIGH FLOW)	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FSL	FLOW SWITCH-LOW (NO CONTACT/CLOSE ON RISE TO NORMAL FLOW)	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FT	FLOW TRANSMITTER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
FT	FLOW TRANSDUCER	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
GPH	GENERATOR PRESSURE HIGH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
GRD	GROUND	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
GSL	GAS SUPPLY PRESSURE LOW	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
GSH	GAS SUPPLY PRESSURE HIGH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
GSV	GAS SHUTOFF VALVE	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
GWL	GENERATOR WATER FLOW LOW	ISW	IGNITER SAFETY SHUTOFF VENT VALVE
GWTH	GENERATOR WATER TEMPERATURE HIGH	ISW	IGNITER SAFETY SHUTOFF VENT VALVE

CONTROLS/INSTRUMENTATION SUPPLEMENTAL LEGEND



INSTALLATION NOTES

1. THE CONTROL SYSTEM MAIN CONTROL PANEL SHALL BE LOCATED AND INSTALLED BY JO WITH OWNER'S REPRESENTATIVE.
2. CONTROL POINTS IN AND AROUND THE MAIN BUILDING MECHANICAL ROOM SHALL BE TIED TO THE CONTROL SYSTEM DIRECTLY THROUGH THE MAIN CONTROL PANEL OR THROUGH THE USE OF APPLICATION SPECIFIC CONTROLLERS OR UNITARY CONTROLLERS. CONTROLLERS SHALL BE ACCESSIBLE TO OPERATOR AND MOUNTED WITHIN 72-INCHES FROM OPERATING FLOOR, PLATFORM OR MEZZANINE.
3. CONTROL OF EQUIPMENT, CONTROL DAMPERS, ETC. BY PROGRAMMABLE CONTROLLERS LOCATED IN THE VICINITY OF THE EQUIPMENT AND NETWORKED TO THE MAIN CONTROLLER.

ABBREVIATIONS

CALC = CALCULATION	RM = ROOM	TRAN = TRANSMITTER
TRND = TRENCH	EXH = EXHAUST	CH = CHILLER
COND = CONDENSER	DIFF = DIFFERENTIAL	BLU = BLUE
EFFC = EFFICIENCY	PRESS = PRESSURE	STM = STEAM
TOTAL = TOTALIZATION	SW = SWITCH	STM COND = STEAM CONDENSATE
CD = CONTROL DAMPER	AHU = AIR HANDLING UNIT	ERV = ENERGY RECOVERY VENTILATOR

13/2019 (REVISED)

13/2019 (REVISED)

Contract Documents 100% Submittal (CD)	05/30/2019
Contract Documents 95% Submittal (CD)	05/14/2019
Contract Documents 90% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/18/2019
Design Development (DD)	12/10/2018
Schematic Design (SD)	10/05/2018
Revit/Revit	Dwg

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Office of Construction and Facilities Management
 VA U.S. Department of Veterans Affairs

Drawing Title: **MECHANICAL CONTROL DIAGRAMS**

Approved Project Director

Phase: **BID DOCUMENTS**

FULLY SPRINKLERED

Project Title: **RENOVATE TOWER BUILDING 1**

Location: **Stouxs Falls, SD 57105**

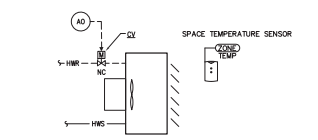
Project Number: **438-18-102**

Revision Number: **1**

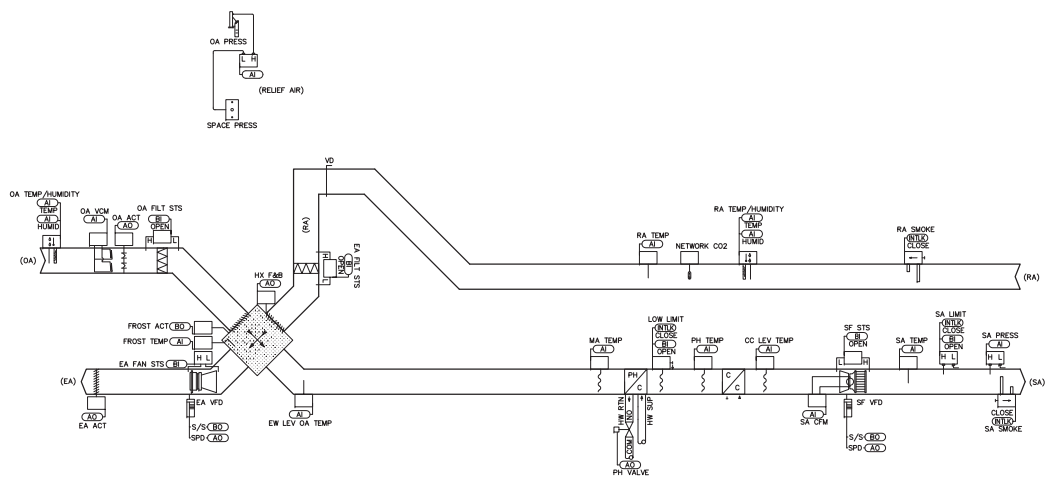
Drawing Number: **M601**

Issue Date: 05/30/2019

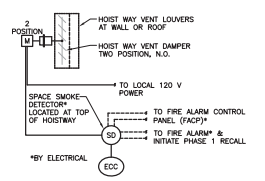
Checked: []
 Drawn: LMB



CABINET/UNIT HEATER CONTROL DIAGRAM
NO SCALE

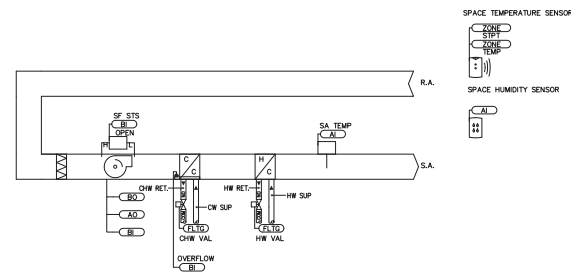


ERV CONTROL DIAGRAM
NO SCALE

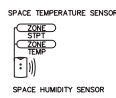


- NOTES:**
1. THE DAMPER SHALL REMAIN CLOSED DURING NORMAL OPERATION AND OPEN UPON LOSS OF POWER FROM A SIGNAL FROM THE SMOKE DETECTOR, LOCATED AT THE TOP OF THE HOISTWAY. COORDINATE NUMBER OF CONTACTS WITH THE ELECTRICAL AND FIRE PROTECTION DESIGNS.
 2. SHOW DAMPER LOCATION AND SIZE ON THE DRAWINGS.
 3. PROVIDE A BINARY EDC POINT TO SOUND AN ALARM AT EDC.
 4. REMOTE ALARM SHALL BE ACTIVATED WHEN THE HOISTWAY SMOKE DETECTOR DETECTS SMOKE.

HOISTWAY VENT DAMPER (HVD) CONTROLS
NO SCALE



FAN COIL CONTROL DIAGRAM
NO SCALE



CONSULTANT FARRIS ENGINEERING OMAHA LINCOLN DENVER COLORADO SPRINGS 3102 North 201st Street, Elkhorn, Nebraska 68022 (402) 291-9961		ARCHITECT/ENGINEER OF RECORD Chilly Hill 3102 North 201st Street, Elkhorn, Nebraska 68022 (402) 291-9961		STAMP 		Office of Construction and Facilities Management U.S. Department of Veterans Affairs		MECHANICAL CONTROL DIAGRAMS Approved Project Director		Phase BID DOCUMENTS		Project Title RENOVATE TOWER BUILDING 1		Project Number 438-18-102	
Contract Documents 100% Submittal (CD) 05/30/2019 Contract Documents 35% Submittal (CD) 04/11/2019 Design Development (DD) 02/18/2019 Schematic Design (SD) 12/10/2018 Revit/Revit 10/05/2018		DATE		DATE		DATE		DATE		DATE		DATE		DATE	
Issue Date 05/06/2019		Checked JOB		Drawn LMB		Project Location Sioux Falls, SD 57105		Project Name M602		Project Number 438-18-102		Project Title RENOVATE TOWER BUILDING 1		Project Number 438-18-102	

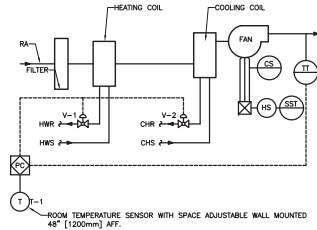
15/2019 (REVISED)

CONTROLLER		FAN COIL - 2 FLOW - SYSTEM POINTS LIST										ALARMS		NOTES			
SYSTEM POINT DESCRIPTION		GRAPHIC	HARDWARE INPUT	HARDWARE OUTPUT	SOFTWARE POINT	HARDWARE INTERLOCK	WIRELESS	NETWORK	DEFAULT VALUE	HIGH RANGING LIMIT	LOW RANGING LIMIT	BINARY	LATCH/DIAGNOSTIC		SENSOR TYPE	COMMUNICATED VALVE	DIAGNOSTICS
SPACE HUMIDITY SENSOR LOCAL		X	AI							X							
SPACE TEMPERATURE LOCAL		X	AI				X			X				X			
SPACE TEMPERATURE SETPOINT LOCAL		X	AI				X			X				X			
SUPPLY AIR TEMPERATURE LOCAL		X	AI						X	X				X			
CONDENSATE OVERFLOW DETECTION LOCAL		X	BI								X						
SUPPLY FAN STATUS		X	BI								X		X				
SUPPLY FAN SPEED		X	AO						X	X	X						
SUPPLY FAN START/STOP		X	BO										X				
COOLING VALVE		X	FLTG														
HEATING VALVE		X	FLTG														
OCCUPIED COOLING SETPOINT			X						74.0 deg. F								
OCCUPIED HEATING SETPOINT			X						70.0 deg. F								
OCCUPIED STANDBY COOLING SETPOINT			X						80.0 deg. F								
OCCUPIED STANDBY HEATING SETPOINT			X						65.0 deg. F								
UNOCCUPIED COOLING SETPOINT			X						85.0 deg. F								
UNOCCUPIED HEATING SETPOINT			X						60.0 deg. F								
OCCUPIED BYPASS TIMER			X						2 HRS								
DISCHARGE AIR TEMPERATURE CONTROL POINTS		X							45.0 deg. F-150.0 deg. F	36.0 deg. F							
BAS COMMUNICATION STATES		X											X				
MAINTENANCE REQUIRED			X						800 HRS								
CONTROLLER SPARE HARDWARE POINTS																	
ANALOG INPUT(S)			6														
BINARY INPUT(S)			6														
UNIVERSAL INPUT(S)			1														
BINARY OUTPUT(S)			5														
GENERAL NOTES																	

FAN COIL SEQUENCE OF OPERATION (PATIENT ROOMS)

FAN COIL UNIT SHALL OPERATE ON A SCHEDULE AS SET BY THE EOC. FAN SHALL RUN CONTINUOUSLY. FAN STATUS SHALL BE MONITORED AND AN ALARM MESSAGE SHALL BE GENERATED IN THE EVENT THE UNIT FAILS TO RUN. THE ADJUSTABLE ROOM TEMP SET POINT WILL BE 70-75 WITH 0.5 HEATING/COOLING OFFSETS. VALVE V-1 & V-2 WILL NOT BE OPEN SIMULTANEOUSLY. ROOM OCCUPANT WILL HAVE ABILITY OF ADJUSTING ROOM TEMPERATURE BETWEEN 70-75.

FAN COIL SEQUENCE OF OPERATION (NONPATIENT ROOMS)
 FAN COIL SHALL OPERATE ON A SCHEDULE AS SET BY EOC. FAN SHALL RUN CONTINUOUSLY IN OCCUPIED MODE. FAN STATUS SHALL BE MONITORED AND AN ALARM MESSAGE SHALL BE GENERATED IN THE EVENT THE UNIT FAILS TO RUN. THE ADJUSTABLE ROOM TEMP SET POINTS BOTH V-1 & V-2 SHALL BE CLOSED. UPON RISE IN TEMPERATURE ABOVE 75 °F ALL SHALL MODULATE UPON TO MAINTAIN 75 °F UPON FALL IN TEMPERATURE BELOW 70 °F HEATING VALVE V-1 SHALL MODULATE TO OPEN TO MAINTAIN 70 °F.



FOUR PIPE FAN COIL UNIT CONTROLS
NO SCALE

HOT WATER UNIT HEATERS

- A. A WALL MOUNTED DDC SENSOR SHALL CYCLE UNIT FAN MOTOR AND MODULATE HOT WATER VALVE TO MAINTAIN ADJUSTABLE HEATING SETPOINT. SETPOINT ADJUSTMENT BY DDC SYSTEM ONLY.
- 1. PROVIDE SWITCH FOR SUMMER FAN OPERATION.

BUILDING NO.	1	SYSTEMS	HOT WATER UNIT HEATER	GRAPHIC DISPLAY	POINT DESCRIPTION	HOT WATER UNIT HEATERS	SPACE TEMPERATURE	UNIT STATUS	FAN STATUS	HOT WATER VALVE	REMARKS

SEQUENCE OF OPERATIONS

FAN COIL
 BUILDING AUTOMATION SYSTEM INTERFACE:
 THE BUILDING AUTOMATION SYSTEM (BAS) WILL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARM-UP / PRE-COOL, UNOCCUPIED COOLING MODES. IF A BMS IS NOT PRESENT OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER WILL OPERATE USING DEFAULT MODES AND SETPOINTS.
 OCCUPIED MODE:
 DURING OCCUPIED PERIODS THE SUPPLY FAN WILL RUN CONTINUOUSLY. THE CHILLED WATER AND HOT WATER VALVE WILL MODULATE TO MAINTAIN AN ACTIVE SPACE TEMPERATURE SETPOINT.
 UNOCCUPIED MODE:
 WHEN THE SPACE TEMPERATURE IS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) THE SUPPLY FAN WILL START AND THE HOT WATER VALVE WILL OPEN. WHEN THE SPACE TEMPERATURE RISES ABOVE 75.0 DEG. F (ADJ.) THE SUPPLY FAN WILL STOP AND THE HOT WATER VALVE WILL CLOSE. WHEN THE SPACE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.) THE SUPPLY FAN WILL START AND THE CHILLED WATER VALVE WILL OPEN. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT OF 65.0 DEG. F (ADJ.) MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN WILL STOP. THE CHILLED WATER VALVE WILL CLOSE.
 OPTIMAL START:
 THE BAS WILL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL START OCCURS.
 MORNING WARM-UP MODE:
 DURING OPTIMAL START IF THE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT A MORNING WARM-UP MODE WILL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT WILL EMULATE THE HEATING AND SUPPLY FAN. WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT (ADJ.) THE UNIT WILL TRANSITION TO THE OCCUPIED MODE.
 PRE-COOL MODE:
 THE BAS WILL MONITOR THE SPACE TEMPERATURE. IF THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE-COOL MODE WILL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT WILL EMULATE THE FAN AND COOLING. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.) THE UNIT WILL TRANSITION TO THE OCCUPIED MODE.
 OPTIMAL STOP:
 THE BAS WILL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL STOP OCCURS. WHEN THE OPTIMAL STOP MODE IS ACTIVE THE UNIT CONTROLLER WILL MAINTAIN THE SPACE TEMPERATURE TO THE SPACE TEMPERATURE OFFSET SETPOINT.
 OCCUPIED BYPASS:
 THE BAS WILL MONITOR THE STATUS OF THE 'ON' AND 'CANCEL' BUTTONS OF THE SPACE TEMPERATURE SENSOR. WHEN AN OCCUPIED BYPASS MODE IS RECEIVED FROM A SPACE SENSOR THE UNIT WILL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT WILL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINT (ADJ.).
 SPACE TEMPERATURE CONTROL:
 A ZONE TEMPERATURE CONTROLER CAN BE USED IN THE OCCUPIED, OCCUPIED BYPASS, AND OCCUPIED STANDBY MODES. IT MAINTAINS ZONE TEMPERATURE BY CONTROLLING THE DISCHARGE AIR TEMPERATURE TO CONTROL THE ZONE TEMPERATURE. THE DISCHARGE AIR TEMPERATURE SHALL BE MAINTAINED BETWEEN THE OCCUPIED COOLING SETPOINT OF 74.0 DEG. F (ADJ.) AND THE OCCUPIED HEATING SETPOINT OF 71.0 DEG. F (ADJ.). THE UNIT WILL TRANSITION FROM THE OCCUPIED COOLING MODE TO OCCUPIED HEATING MODE WHEN THE OCCUPIED COOLING SETPOINT OF 74.0 DEG. F (ADJ.) IS REACHED. THE UNIT WILL TRANSITION TO THE HEATING MODE WHEN THE SPACE TEMPERATURE DROPS BELOW THE OCCUPIED HEATING SETPOINT OF 71.0 DEG. F (ADJ.).
 OCCUPIED HUMIDITY CONTROL:
 IF THE RELATIVE HUMIDITY IS GREATER THAN THE HUMIDITY SETPOINT, THE CHILLED WATER VALVE WILL MODULATE TO MAINTAIN SPACE RELATIVE HUMIDITY AND THE REHEAT VALVE WILL MODULATE TO MAINTAIN THE SPACE TEMPERATURE. IF THE RELATIVE HUMIDITY SETPOINT IS REACHED, THE CHILLED WATER VALVE WILL FALLS BELOW THE RELATIVE HUMIDITY SETPOINT MINUS THE RELATIVE HUMIDITY OFFSET. IF THE SPACE RELATIVE HUMIDITY SETPOINT FALLS BELOW THE DEHUMIDIFICATION SETPOINT WILL BE TERMINATED AND AN ALARM WILL BE ANNUNCIATED AT THE BAS.
 SUPPLY FAN OPERATION:
 THE SUPPLY FAN WILL CYCLE ON DEMAND DURING THE UNOCCUPIED MODE. WHEN THE CONTROLLER IS IN THE UNOCCUPIED MODE, THE SUPPLY FAN WILL OPERATE ON A SCHEDULE AS SET BY THE EOC. FAN SHALL RUN CONTINUOUSLY TO MAINTAIN SPACE TEMPERATURE. THE SUPPLY FAN STATUS WILL BE MONITORED BY THE EOC MOTOR CONTROLLER. IF THE SUPPLY FAN FAILS TO OPERATE, THE SUPPLY FAN WILL BE ANNUNCIATED AT THE BAS. A MANUAL RESET WILL BE REQUIRED TO RESTART THE FAN.
 CONDENSATE OVERFLOW MONITORING:
 IF THE CONDENSATE LEVEL REACHES THE TRIP POINT, A CONDENSATE OVERFLOW MONITORING WILL BE ANNUNCIATED AT THE BAS. PREVENTIVE MAINTENANCE SHALL BE PERFORMED TO PREVENT OVERFLOW AND CAUSING WATER DAMAGE TO THE BUILDING. THE FAN WILL BE DISABLED AND THE CHILLED WATER VALVE WILL CLOSE.
 FILTER TIMER:
 THE FAN-RUN TIME (HRS) WILL BE COMPARED TO THE FILTER MAINTENANCE TIMER SETPOINT. ONCE THE SETPOINT IS REACHED A FILTER TIMER ALARM DIAGNOSTIC WILL BE ANNUNCIATED AT THE BAS. WHEN THE DIAGNOSTIC IS CLEARED, THE FILTER-MAINTENANCE TIMER IS RESET TO ZERO AND THE TIMER BEGINS ACCUMULATING FAN-RUN TIME AGAIN.

ELECTRIC CABINET UNIT HEATER

- 1. A WALL MOUNTED DDC SENSOR SHALL CYCLE ON THE FAN AND HEATER TO MAINTAIN SETPOINT.

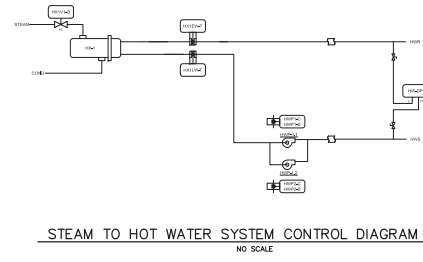
BUILDING NO.	1	SYSTEMS	ELECTRIC CABINET UNIT HEATER	GRAPHIC DISPLAY	POINT DESCRIPTION	ELECTRIC CABINET UNIT HEATER	SPACE TEMPERATURE	REMARKS

ENERGY RECOVERY VENTILATOR

- A. ENERGY RECOVERY VENTILATOR:
 1. GENERAL: ENERGY RECOVERY VENTILATOR CONTROLS ARE DEFINED IN SECTION 23 7200. BMS CONTRACTOR SHALL INSTALL ALL DEVICES NOT FACTORY INSTALLED. ALL REQUIRED CONTROL DEVICES NOT FURNISHED UNDER SECTION 23 7200 SHALL BE FURNISHED UNDER THIS SECTION.
 2. UNIT SHALL PROVIDE ROOM NEUTRAL AIR WITH 55 DEG F LEAVING AIR TEMPERATURE AT THE DIRECT EXPANSION (DX) COIL AND 70 DEG F LEAVING AIR TEMPERATURE AT THE HOT-GAS REHEAT COIL IN COOLING MODE. MICROPROCESSOR CONTROLLER SHALL STAGE COMPRESSORS AND REHEAT COILS AS REQUIRED. IN HEATING MODE, THE HOT WATER HEATING COIL SHALL MODULATE AS REQUIRED TO MAINTAIN ADJUSTABLE DISCHARGE AIR SET POINT. THE MAXIMUM RELATIVE HUMIDITY OF THE SUPPLY AIR SHALL BE 50% (ADJUSTABLE).
 3. AIR-COOLED CONDENSER FAN SHALL ENERGIZE TO MAINTAIN COMPRESSOR HEAD PRESSURE WITHIN MANUFACTURER'S RECOMMENDATIONS.
 4. SEVEN-DAY PROGRAMMING SHALL BE PROVIDED TO ENABLE FANS THROUGH THE BUILDING DDC SYSTEM ACCORDING TO OWNER'S SCHEDULE.
 a. OCCUPIED OPERATION: ERV FANS SHALL BE ENABLED TO OPERATE CONTINUOUSLY, AND COMPRESSORS, HEATING COILS AND REHEAT COILS SHALL BE STAGED TO MAINTAIN OCCUPIED COOLING OR HEATING SET POINT AS INDICATED BY BMS DISCHARGE AIR SENSOR. THE OUTSIDE AIR DAMPER AND EXHAUST DAMPER SHALL OPEN DURING OCCUPIED PERIODS.
 b. UNOCCUPIED OPERATION: ERV FANS SHALL CYCLE, AND COMPRESSORS, HEATING COILS AND REHEAT COILS SHALL BE STAGED TO MAINTAIN UNOCCUPIED COOLING OR HEATING SET POINT AS INDICATED BY BMS DISCHARGE AIR SENSOR. THE OUTSIDE AIR DAMPER AND EXHAUST DAMPER SHALL REMAIN CLOSED DURING UNOCCUPIED PERIODS.
 5. WHEN OUTSIDE AIR TEMPERATURE IS BELOW 35 DEG F SUPPLY FAN SHALL NOT START UNTIL THE EXHAUST FAN HAS OPERATED FOR 5 MINUTES (ADJUSTABLE).
 6. WHEN THE ERV UNIT IS OPERATING IN AN OUTSIDE AIR COOLING MODE, THE HEAT RECOVERY WHEEL SHALL ROTATE AS LONG AS THE OUTSIDE AIR ENTHALPY IS HIGHER THAN THE EXHAUST/RELIEF ENTHALPY. IF OUTSIDE AIR ENTHALPY IS EQUAL OR LOWER THAN THE EXHAUST/RELIEF ENTHALPY, THE WHEEL SHALL NOT ROTATE.
 7. WHEN THE ERV UNIT IS OPERATING IN AN OUTSIDE AIR HEATING MODE, THE HEAT RECOVERY WHEEL SHALL ROTATE AS LONG AS THE OUTSIDE AIR TEMPERATURE IS LOWER THAN THE EXHAUST/RELIEF AIR TEMPERATURE. IF OUTSIDE AIR TEMPERATURE IS EQUAL OR HIGHER THAN THE EXHAUST/RELIEF AIR TEMPERATURE, THE WHEEL SHALL NOT ROTATE.
 8. A FACTORY-INSTALLED FROST PROTECTION SYSTEM SHALL BE ENABLED WHEN EXHAUST AIR TEMPERATURE FALLS BELOW 35 DEG F. AN ALARM SHALL ACTIVATE IF EXHAUST AIR TEMPERATURE FALLS BELOW 32 DEG F.
 9. INTERLOCK CONTROLS:
 a. OUTSIDE DAMPER SHALL BE FULLY OPEN BEFORE SUPPLY FAN WILL START.
 b. EXHAUST/RELIEF DAMPER SHALL BE FULLY OPEN BEFORE EXHAUST/RELIEF FAN WILL START.
 c. DIRTY FILTER SWITCH: PROVIDE PRESSURE SWITCH TO INDICATE DIRTY FILTER AT EACH UNIT.

BUILDING NO.	1	SYSTEMS	ENERGY RECOVERY VENTILATOR	GRAPHIC DISPLAY	POINT DESCRIPTION	ENERGY RECOVERY VENTILATOR	SUPPLY FAN	OUTSIDE AIR TEMPERATURE	WHEEL DISCHARGE AIR TEMPERATURE	WHEEL EXHAUST RELATIVE HUMIDITY	EXHAUST FAN	RETURN AIR TEMPERATURE	RETURN AIR RELATIVE HUMIDITY	EXHAUST AIR TEMPERATURE	DIRTY FILTER	WHEEL ROTATION	HOT WATER HEATING COIL	ABSOLUTE COMPRESSOR	REGENERATION DAMPER	OUTSIDE AIR DAMPER	EXHAUST AIR DAMPER	ENABLE/DISABLE	REMARKS	

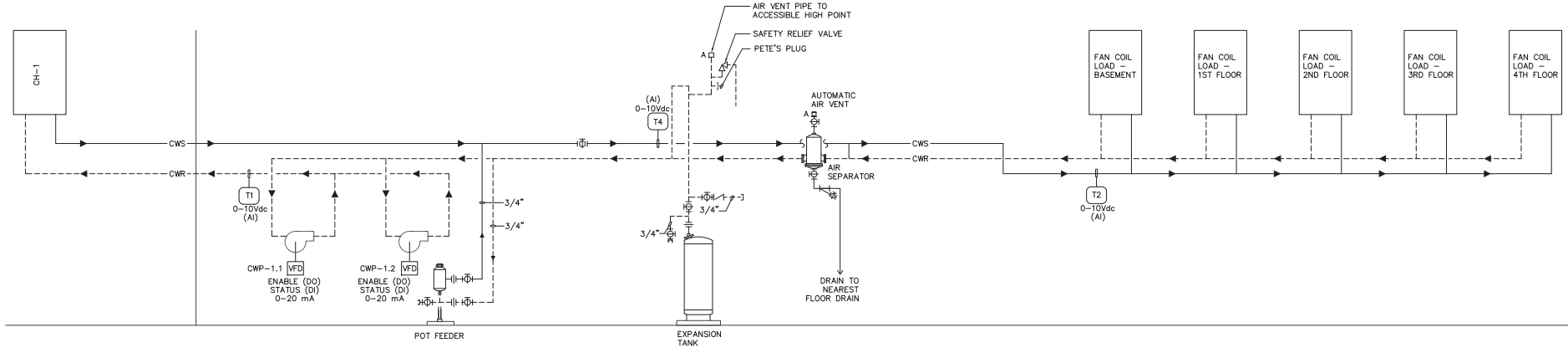
STEAM TO HOT WATER SYSTEM CONTROL DIAGRAM AND SEQUENCE



SYSTEM/POINT DESCRIPTION	LABEL	DEVICE TYPE	QUANTITY	GRAPHIC DISPLAY	POINT TYPE	ALARM	TREND	SAMPLE RATE (S)
HOT WATER SYSTEM								
Hot Water System Enable	HV_EWA	Software Point (I/O, setpoint)	1	Y	SW			
Steam Control Valve	HV1V-C	Actuator - Control Valve	1	Y	AO	X		
Hot Water Return Temperature	HV1EW-T	Sensor - Temperature (Hydronic)	1	Y	AI	X	120	
Hot Water Supply Temperature	HV1LW-T	Sensor - Temperature (Hydronic)	1	Y	AI	X	120	
Hot Water Supply Temp. Setpoint	HV1LW-STP	Software Point (I/O, setpoint)	1	Y	SW			
Hot Water Pump Start/Stop	HV1P-C	Relay - Equipment Start/Stop	2	Y	BO	X		
Hot Water Pump Status	HV1P-C	Sensor - Equipment Status (Current)	2	Y	BI	X	COV	
Hot Water Differential Pressure	HV1DP	Sensor - Pressure (Hydronic)	1	Y	AI	X	120	
Hot Water DRP, Pressure Setpoint	HV1DP-STP	Software Point (I/O, setpoint)	1	Y	SW			

NOTES:
 1. FIELD VERIFY EXACT QUANTITIES OF DEVICES
 2. AN "X" UNDER THE LABEL COLUMN DENOTES AN INDIVIDUAL EQUIPMENT NUMBER
 3. B=BINARY INPUT, BO=BINARY OUTPUT, AI=ANALOG INPUT
 AO=ANALOG OUTPUT, SW=SOFTWARE POINT, COV=CHANGE OF VALUE

CONSULTANT FARRIS ENGINEERING 3102 North 202nd Street Elkton, Nebraska 68522 (402) 294-9441 FAX: (402) 294-9441 www.farris.com FEI # 182083	ARCHITECT/ENGINEER OF RECORD Cohni Hill 3102 North 202nd Street Elkton, Nebraska 68522 (402) 294-9441 www.farris.com	Office of Construction and Facilities Management VA U.S. Department of Veterans Affairs	Mechanical Control Diagrams Approved Project Director	Phase BID DOCUMENTS	Project Title RENOVATE TOWER BUILDING 1	Project Number 430-10-102
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CHILLED WATER PUMPING SYSTEM - CONTROL DIAGRAM
NO SCALE

FIRE ALARM SHUTDOWN OF FIRE/SMOKE DAMPERS AND ENERGY RECOVERY UNIT - CONTROL SEQUENCE

THE SEQUENCE OF OPERATION SHALL BE SUCH THAT, WHEN THE FIRE ALARM SYSTEM IS ACTIVATED, FIRE ALARM RELAY(S) THROUGH ITS AUXILIARY CONTACTS SHALL CLOSE THE FIRE/SMOKE DAMPERS AND SHUT DOWN THE ENERGY RECOVERY UNIT.

WHEN THE FIRE ALARM SYSTEM IS RESET TO NORMAL OPERATION, THE FIRE/SMOKE DAMPERS SHALL RETURN TO OPEN POSITION AND THE ENERGY RECOVERY UNIT SHALL RESTART.

COORDINATE ALL INSTALLATION OF FIRE ALARM SHUTDOWN CONTROLS WITH THE ELECTRICAL CONTRACTOR.

CHILLED WATER SYSTEM - CONTROL SEQUENCE

CHILLED WATER PUMP CONTROL: THE MOTOR STARTERS FOR THE CHILLED WATER PUMPS SHALL BE CONTROLLED BY THE DDC CONTROL SYSTEM. PROVIDE A START/STOP DIGITAL OUT (DO) CONTROL POINT, AND A STATUS ALARM FOR EACH PUMP.

CHILLER WATER TEMPERATURE RESET SHALL BE PROVIDED BASED ON THE RETURN WATER TEMPERATURE. PROVIDE A STOP/START (DO) CONTROL POINT FOR THE CHILLER.

HAND-OFF-AUTO: WHEN THE SWITCH ON THE STARTER IS IN THE "OFF" POSITION, THE PUMP SHALL BE SHUT OFF. WHEN THE SWITCH IS IN THE "AUTO" POSITION, THE PUMP SHALL OPERATE AS DIRECTED BY THE DDC CONTROLLER.

WHEN THE OUTSIDE AMBIENT TEMPERATURE EXCEEDS 55 (ADJUSTABLE) DEG F, THE DDC CONTROLLER SHALL SEND START SIGNAL TO CHILLER. THE DDC CONTROLLER SHALL START EITHER PUMP. ONCE WATER FLOW HAS BEEN PROVEN THROUGH THE FLOW SWITCH, THE CHILLER CONTROLLER SHALL START THE COMPRESSOR. THE DDC CONTROLLER SHALL ALTERNATE THE OPERATION OF THE CHILLER WATER PUMPS ON A WEEKLY BASIS.

CHILLED WATER PUMPS SHALL BE INTERLOCKED WITH CHILLERS.

THE CHILLER CONTROLLER SHALL MAINTAIN LEAVING CHILLED WATER TEMPERATURE OF 42 DEG F, AND ACTIVATE THE REQUIRED NUMBER OF COMPRESSORS TO MEET CHILLED WATER SET-POINT.

LOSS OF POWER: UPON LOSS OF POWER, THE CHILLER AND ASSOCIATED CHILLED WATER PUMPS SHALL SHUT DOWN AND AN ALARM CONDITION SHALL ACTIVATE. UPON A RETURN OF POWER, OPERATORS WILL MANUALLY RESTART CHILLED WATER PUMPS AND CHILLER FROM DDC FRONT-END. THE CHILLED WATER SYSTEM IS NOT CONNECTED TO THE EMERGENCY POWER SYSTEM.

FLOW SWITCH: CONTRACTOR SHALL FIELD MOUNT AND WIRE CHILLED WATER FLOW SWITCH TO THE CHILLER.

PROVIDE THREE-WAY VALVES TO MAINTAIN CONSTANT FLOW THROUGH THE ENTIRE LOOP.

THE CHILLER CONTROLLER SHALL MAINTAIN LEAVING CHILLED WATER TEMPERATURE OF 42 DEG F, AND ACTIVATE THE REQUIRED NUMBER OF COMPRESSORS TO MEET CHILLED WATER SET-POINT.

CHILLER CONTROL: PROVIDE A BUILDING MANAGEMENT SYSTEM INTERFACE CARD FOR THE CHILLER THAT WILL GIVE THE DDC CONTROLLER THE ABILITY TO MONITOR CHILLED WATER LEAVING/ENTERING TEMPERATURES, REFRIGERANT LEAVING/ENTERING TEMPERATURES, MOTOR AMPS, GIVE THE ABILITY TO UNLOAD THE CHILLER (DEMAND LIMITING), AND MONITOR OTHER SYSTEM ALARM CONDITIONS WITHIN THE CHILLER CONTROLLER.

THE CHILLER CONTROLLER SHALL MAINTAIN LEAVING CHILLED WATER TEMPERATURE OF 42 DEG F, AND ACTIVATE THE REQUIRED NUMBER OF COMPRESSORS TO MEET CHILLED WATER SET-POINT.

BUILDER NO. 1	HARDWARE				SOFTWARE			
	OUTPUT		INPUT		ALARMS		APPLICATION PROGRAMS	
SYSTEMS)	DIGITAL	ANALOG	DIGITAL	ANALOG	DIGITAL	ANALOG		
CHILLED WATER SYSTEM								
OCCUPANCY TIME								
CRITICAL ALARM DISPLAY								
GRAPHIC DISPLAY								
POINT DESCRIPTION								
CHILLED WATER PUMP								
CHILLED WATER PUMP								
CHILLED WATER SUPPLY								
CHILLED WATER RETURN								
CHILLER OIL								

SUMP PUMP -SP-1, SP-2, SP-3 CONTROL SEQUENCE

SP-1, SP-2, SP-3 LOCATED IN PIT. PROVIDE A STATUS ALARM POINT TO SEND A SIGNAL TO THE DDC CONTROLLER WHEN THE HIGH WATER ALARM CONDITION OCCURS. PROVIDE A WATER LEVEL SENSOR IN EACH SUMP PUMP BASIN TO SIGNAL THAT A PUMP FAILURE HAS OCCURRED DUE TO THE WATER LEVEL EXCEEDING A PREDETERMINED LEVEL.

CHILLED WATER PUMPING SYSTEM - CONTROL SEQUENCE

PROVIDE VARIABLE FREQUENCY DRIVES (VFD) FOR THE PUMPS. 4-20MA SIGNALS, AND VFD STATUS/ALARMS. PROVIDE A DIFFERENTIAL PRESSURE SENSOR FOR CONTROLLING THE VFD'S. PROVIDE CHILLED WATER TEMPERATURE SENSORS FOR THE CHILLED WATER LOOP.

BUILDER NO. 1	HARDWARE				SOFTWARE			
SYSTEMS)	DIGITAL	ANALOG	DIGITAL	ANALOG	DIGITAL	ANALOG		
DUCTLESS SPLIT SYSTEM UNIT								
OCCUPANCY TIME								
GRAPHIC DISPLAY								
POINT DESCRIPTION								
DUCTLESS SPLIT SYSTEM UNIT								
SPACE AIR TEMPERATURE								
SPACE SET-POINT								

VARIABLE REFRIGERANT SYSTEM

- A. VARIABLE REFRIGERANT SYSTEM:
1. THE VARIABLE REFRIGERANT SYSTEM SHALL BE PROVIDED WITH FACTORY MOUNTED CONTROLS EXCLUDING THE WALL THERMOSTAT PROVIDED BY THE TEMPERATURE CONTROL CONTRACTOR. THE WALL THERMOSTAT SHALL COMMUNICATE TO THE VRS THE WALL TEMPERATURE. THE WALL THERMOSTAT WILL CONTROL THE SEQUENCE AND OCCUPIED/UNOCCUPIED SET POINTS. THE FACTORY AND FIELD MOUNTED CONTROLS SHALL COMMUNICATE VIA BACNET MSTP TO THE BUILDING WEB BASED BUILDING MANAGEMENT SYSTEM.
 2. OCCUPIED OPERATION: FAN SHALL RUN CONTINUOUSLY ON A CALL FOR HEATING OR COOLING. THE HEAT PUMP UNIT SHALL CYCLE.
 3. UNOCCUPIED OPERATION: FAN SHALL CYCLE ON A CALL FOR HEATING OR COOLING. THE FAN SHALL CYCLE ALONG WITH THE HEAT PUMP UNIT.

DUCTLESS SPLIT SYSTEM UNIT

- A. UNIT SHALL BE FURNISHED WITH MANUFACTURER'S INSTALLED CONTROL PACKAGE AND A REMOTE CONTROLLER. THE CONTROLLER SHALL BE CAPABLE OF MONITORING AND SETTING DESIRED ROOM TEMPERATURE, TEMPERATURE SETPOINT, FAN ON/OFF SPEED CONTROL AND NIGHT SETBACK CONTROL.
- B. DDC SENSOR IN ROOM SHALL MONITOR SPACE TEMPERATURE. PROVIDE AN ALARM AT THE FRONT END IF ROOM TEMPERATURE IS OUT OF RANGE (COORDINATE WITH OWNER ON ACCEPTABLE TEMPERATURE RANGES).

BUILDER NO. 1	HARDWARE				SOFTWARE			
SYSTEMS)	DIGITAL	ANALOG	DIGITAL	ANALOG	DIGITAL	ANALOG		
VARIABLE REFRIGERANT SYSTEM								
OCCUPANCY TIME								
GRAPHIC DISPLAY								
POINT DESCRIPTION								
VARIABLE REFRIGERANT SYSTEM								
SPACE TEMPERATURE								
SPACE PLUMBING								
SUPPLY AIR TEMPERATURE								
HEAT COOL MODE								
FAN SPEED								
FAN CONTROL								
DEMAND/SETPOINT								

BUILDER NO. 1	HARDWARE				SOFTWARE			
SYSTEMS)	DIGITAL	ANALOG	DIGITAL	ANALOG	DIGITAL	ANALOG		
MISCELLANEOUS								
OCCUPANCY TIME								
GRAPHIC DISPLAY								
POINT DESCRIPTION								
UNIT HEATER ON/1								
SUMP PUMP-SP-1								
SUMP PUMP-SP-2								
SUMP PUMP-SP-3								

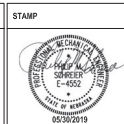
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CONSULTANT

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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

MECHANICAL CONTROL DIAGRAMS

Approved Project Director

Phase BID DOCUMENTS

FULLY SPRINKLERED

Project Title RENOVATE TOWER BUILDING 1

Location Sioux Falls, SD 57105

Issue Date 05/30/2019

Checked [] **Job** [] **Drawn** [] **LMB** []

Project Number 438-18-102

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03/2019 (REVISED) FARRIS ENGINEERING, IOWA, DENVER, COLORADO SPRINGS

ENERGY RECOVERY VENTILATION UNIT SCHEDULE														WEIGHT	MANUFACTURER & MODEL NO.	REMARKS						
MARK	SERVES	DESIGN CONDITIONS						COOLING MODE AT DESIGN				HEATING MODE AT DESIGN										
		SUPPLY CFM	EXHAUST CFM	WINTER L.A.T. (DB)	WINTER L.A.T. (WB)	WINTER L.A.T. (WB)	WINTER L.A.T. (WB)	REHEAT L.A.T. (DB)	REHEAT L.A.T. (WB)	REHEAT L.A.T. (WB)	REHEAT L.A.T. (WB)	EER	E.A.T.	L.A.T.	E.W.T.	L.W.T.	CAPACITY MBH	GPM				
ERV01	2300	12	2300	12	80°F F	16.1°F F	48.4°F F	52.7°F F	53.2°F F	9.6	9.6	80.2°F F	80.4°F F	12.7	44.0°F F	71.4°F F	160.0°F F	160.0°F F	95.4	5.1	TRANE CASH18	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

- REMARKS:
- SEE MECHANICAL/ELECTRICAL COORDINATION SCHEDULE FOR ELECTRICAL DATA.
 - UNIT SHALL BE ABLE TO COOL WITH AMBIENT TEMPERATURES AS LOW AS 35°F.
 - REFRIGERANT SHALL BE R410A.
 - PROVIDE INTEGRAL ELECTRICAL DISCONNECT WITH UNIT.
 - CONTROLS BY REMOTE DDC SENSOR. PROVIDE RELAY AS NECESSARY.
 - PROVIDE CLEARING MOUNTING BRACKETS.
 - 40% PROPYLENE GLYCOL SOLUTION.

AIR-COOLED CHILLER SCHEDULE														WEIGHT	MANUFACTURER & MODEL NO.	REMARKS					
MARK	SERVES	COMPRESSOR TYPE	CAPACITY TONS	AMBIENT TEMP.	AIR EER	PLV EER	EWT DEG F	LWT DEG F	DESIGN FLOW GPM	MIN. FLOW GPM	COMPRESSORS						CONDENSER FANS				
											NO.	CIRCUITS	STEPS	RELAYS	NO.	VV (EA)	FLA (EA)				
CH-1	BUILDING 1 TOWER	SCROLL	31.21	95°F F	9.58	15.31	54.00	82.00	40.00	2	1	2	53.07330	3	3.613	6.57	89.0	63.0	2630	TRANE COOL15	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

- REMARKS:
- SEE MECHANICAL/ELECTRICAL COORDINATION SCHEDULE FOR ELECTRICAL DATA.
 - UNIT SHALL BE ABLE TO COOL WITH AMBIENT TEMPERATURES AS LOW AS 35°F.
 - REFRIGERANT SHALL BE R410A.
 - PROVIDE INTEGRAL ELECTRICAL DISCONNECT WITH UNIT.
 - CONTROLS BY REMOTE DDC SENSOR. PROVIDE RELAY AS NECESSARY.
 - PROVIDE CLEARING MOUNTING BRACKETS.
 - 40% PROPYLENE GLYCOL SOLUTION.

STEAM TO HOT WATER CONVERTOR SCHEDULE														WEIGHT	MANUFACTURER & MODEL NO.	REMARKS
MARK	SERVES	HEATING HOT WATER	GPM	E.W.T.	L.W.T.	TUBE SIDE (WATER)		SHELL SIDE (STEAM)		NUMBER OF PASSES	FOUL FACTOR	PRESS. PSID	LEHR			
						MIN. SURFACE AREA (SQ. FT.)	MAX. SURFACE AREA (SQ. FT.)	NO.	INCHES							
HWT	BUILDING 1 TOWER	HEATING HOT WATER	100.0	140°F F	180°F F	1.24	46.56	2.00	0.00019	19	2056.69	105.92	BELL & GOSSETT SO 8-62	1		

- REMARKS:
- PROVIDE FLAT AND THERMOSTATIC TRAP, STRAINER AND STEEL SUPPORT STRUCTURE. SIZE TRAP FOR TWO TIMES LISTED FLOW RATE.
 - PROVIDE INTEGRAL ELECTRICAL DISCONNECT WITH UNIT.
 - CONTROLS BY REMOTE DDC SENSOR. PROVIDE RELAY AS NECESSARY.
 - PROVIDE CLEARING MOUNTING BRACKETS.
 - 40% PROPYLENE GLYCOL SOLUTION.

SPLIT SYSTEM UNIT SCHEDULE														WEIGHT	MANUFACTURER & MODEL NO.	REMARKS
INDOOR UNIT MARK	OUTDOOR UNIT MARK	CLG (MBH) TOTAL	VOLTAGE	PHASE	INDOOR UNIT T/CA	OUTDOOR UNIT T/CA	WEIGHT (LBS)		INDOOR UNIT MCA	OUTDOOR UNIT MCA	INDOOR UNIT MODEL NO.	OUTDOOR UNIT MODEL NO.				
							INDOOR UNIT	OUTDOOR UNIT								
IU-2	OU-2	40.0	208	1	1	18	18	MITSUBISHI	53	163	P16-A20FA	P16-A20FA	1, 2, 3, 4, 5, 6, 7			

- REMARKS:
- SEE MECHANICAL/ELECTRICAL COORDINATION SCHEDULE FOR ELECTRICAL DATA.
 - UNIT SHALL BE ABLE TO COOL WITH AMBIENT TEMPERATURES AS LOW AS 35°F.
 - REFRIGERANT SHALL BE R410A.
 - PROVIDE INTEGRAL ELECTRICAL DISCONNECT WITH UNIT.
 - CONTROLS BY REMOTE DDC SENSOR. PROVIDE RELAY AS NECESSARY.
 - PROVIDE CLEARING MOUNTING BRACKETS.
 - 40% PROPYLENE GLYCOL SOLUTION.

HYDRONIC SYSTEM SPECIALTIES SCHEDULE													
MARK	SERVES	TYPE	GPM	HEAD (FT)	GALL.	CONNECTION (IN)	DRY WEIGHT (LBS)	MANUFACTURER & MODEL NO.	REMARKS				
CF-1	HEATING HOT WATER SYSTEM	MANUAL CHEMICAL FEEDER	-	-	5	3/4"	33	JLWINGERT SHD	1				
CF-2	CHILLED WATER SYSTEM	CHEMICAL FEEDER	-	-	5	3/4"	33	JLWINGERT SHD	1				
AS-1	HEATING HOT WATER SYSTEM	AIR SEPARATOR	100	0.8	-	3"	114	BELL & GOSSETT CRSH2 10P	2, 3				
AS-2	CHILLED WATER SYSTEM	AIR SEPARATOR	80	0.8	-	2-1/2"	99	BELL & GOSSETT CRSH2 10P	2, 3				
ET-1	HEATING HOT WATER SYSTEM	EXPANSION TANK	-	-	44.4	12"	145	BELL & GOSSETT D40	4, 5				
ET-2	CHILLED WATER SYSTEM	EXPANSION TANK	-	-	35.0	12"	103	BELL & GOSSETT D40	4, 5				

- REMARKS:
- PROVIDE WITH REMOVABLE UPPER HEAD FOR FILLING AND CLEANING.
 - PROVIDE WITH HIGH CAPACITY AUTOMATIC AIR VENT.
 - ASME CONSTRUCTION. BLOODON VALVE. 304 STAINLESS STEEL. COALSIDE MEDIUM.
 - ASME CONSTRUCTION WITH HEAVY DUTY CAP/RING.
 - ACCEPTANCE VOLUME +11.5 GALLONS.

VARIABLE FREQUENCY DRIVE SCHEDULE				
MARK	SERVES	TYPE	CONTROL SIGNAL	REMARKS
VFD-CWP-1.1	CWP-1.1	PULSE WIDTH MODULATION	4-20 MA	1, 2, 3, 4
VFD-CWP-1.2	CWP-1.2	PULSE WIDTH MODULATION	4-20 MA	1, 2, 3, 4
VFD-HWP-1.1	HWP-1.1	PULSE WIDTH MODULATION	4-20 MA	1, 2, 3, 4
VFD-HWP-1.2	HWP-1.2	PULSE WIDTH MODULATION	4-20 MA	1, 2, 3, 4

- REMARKS:
- SEE MECHANICAL/ELECTRICAL COORDINATION SCHEDULE FOR ELECTRICAL DATA.
 - UNIT SHALL HAVE INTEGRAL LOCKABLE DISCONNECT.
 - ALL MOTORS WITH VFD'S SHALL BE INVERTOR RATED. PREMIUM EFFICIENCY AND PROVIDED WITH SHFT GROUNDING RITS.
 - PROVIDED BY TEMPERATURE CONTROLS CONTRACTOR. INSTALLED BY ELECTRICAL CONTRACTOR.

MECHANICAL / ELECTRICAL COORDINATION SCHEDULE									
MARK	DESCRIPTION	RATING	FURNISH BY	INSTALL BY	DISCONNECT				REMARKS
					TYPE	SIZE	ENCL.	TYPE	
E	ELECTRICAL CONTRACTOR	HP	HORSEPOWER	LV	NEHA 0X	V	VOLTAGE	VF	VARIABLE FREQUENCY DRIVE
M	MECHANICAL CONTRACTOR	MM	MINOR MANUFACTURERS	MM	RECOMMENDATION	MM	MINOR MANUFACTURERS	MM	MINOR MANUFACTURERS
C	COMBINATION STARTER AND SAFETY SWITCH	MM	RECOMMENDATION	MM	RECOMMENDATION	MM	RECOMMENDATION	MM	RECOMMENDATION
CB	CIRCUIT BREAKER	MM	RECOMMENDATION	MM	RECOMMENDATION	MM	RECOMMENDATION	MM	RECOMMENDATION
FV	FULL VOLTAGE	MM	RECOMMENDATION	MM	RECOMMENDATION	MM	RECOMMENDATION	MM	RECOMMENDATION
FLA	FULL LOAD AMPS	MM	RECOMMENDATION	MM	RECOMMENDATION	MM	RECOMMENDATION	MM	RECOMMENDATION

MARK	DESCRIPTION	RATING	FURNISH BY	INSTALL BY	DISCONNECT				REMARKS		
					TYPE	SIZE	ENCL.	TYPE			
ERV01	ENERGY RECOVERY VENTILATOR	53.5 FLA	3PH 3	MM	-	-	-	-	2,000	-	
FC-1	FAN COIL	3.6 FLA	3PH 3	MM	-	-	-	-	2,000	-	
FC-2	FAN COIL	3.6 FLA	3PH 3	MM	-	-	-	-	2,000	-	
FC-3	FAN COIL	3.6 FLA	3PH 3	MM	-	-	-	-	2,000	-	
B-1	INDOOR FAN COIL UNIT	433 FLA	208 1	EE	SH	20	NR	NE	-	5,000	
B-2	INDOOR FAN COIL UNIT	433 FLA	208 1	EE	SH	20	NR	NE	-	5,000	
OU-2	OUTDOOR UNIT	14 FLA	208 1	EE	SS	30	NR	3R	-	5,000	
CHW-1	CHILLED WATER PUMP	50 HP	3PH 3	ME	-	-	-	-	ME	VFD	7,000
HWP-1	HEATING HOT WATER PUMP	50 HP	3PH 3	ME	-	-	-	-	ME	VFD	7,000
CH-1	CHILLER	52.5 KW	3PH 3	EE	SS	400	NR	3R	MM	-	10,000
UHW-1	UNIT HEATER	18 WATTS	3PH 3	MM	-	-	-	-	-	-	5,000
ECABW-1	ELECTRIC CABINET UNIT HEATER	50 KW	3PH 3	MM	-	-	-	-	-	-	5,000
ECABW-2	ELECTRIC CABINET UNIT HEATER	50 KW	3PH 3	MM	-	-	-	-	-	-	5,000
ECABW-3	ELECTRIC CABINET UNIT HEATER	50 KW	3PH 3	MM	-	-	-	-	-	-	5,000
ECABW-4	ELECTRIC CABINET UNIT HEATER	50 KW	3PH 3	MM	-	-	-	-	-	-	5,000
SP-1	SUMP PUMP	3/4 HP	120 1	-	-	-	-	-	-	-	2
SP-2	SUMP PUMP	3/4 HP	120 1	-	-	-	-	-	-	-	2
SP-3	SUMP PUMP	3/4 HP	120 1	-	-	-	-	-	-	-	2

- REMARKS:
- SEE MECHANICAL/ELECTRICAL COORDINATION SCHEDULE FOR ELECTRICAL DATA.
 - CHILLED WATER COOLING COIL CONDITIONS ARE NOT DRYER WB EAT, AND 44°F EWT.
 - HOT WATER HEATING COIL CONDITIONS ARE 208 VAC, 1 AND 100°F EAT.
 - PROVIDE INTEGRAL ELECTRICAL DISCONNECT WITH UNIT.
 - PROVIDE UNIT WITH ECH HIGH STATIC MOTOR, STAINLESS STEEL DRUM PAN AND HIGH LEVEL CONDENSATE SWITCH.
 - PROVIDE SUPPLY AIR OUT COLLAR. REFER TO PLANS FOR ADDITIONAL INFORMATION.
 - PROVIDE UNIT WITH FACTORY SUPPLY AIR GRILLE AND FACTORY RETURN AIR GRILLE/ACCESS PANEL. REFER TO PLANS FOR ADDITIONAL INFORMATION.
 - COORDINATE COLOR OF GRILLE/ACCESS PANELS WITH ARCHITECT.
 - 40% PROPYLENE GLYCOL SOLUTION.

FAN COIL UNIT SCHEDULE													
MARK	TYPE	CFM	COOLING CAP MBH		HEATING CAP MBH		HEATING COIL		MANUFACTURER & MODEL NO.	REMARKS			
			TOTAL	SENSIBLE	GPM	PD (FT)	GPM	PD (FT)					
FC-1	VERTICAL	300	6.17	6.70	1.80	1.59	16.98	0.95	0.95	TRANE FOC030	1, 2, 3, 4, 5, 6, 7, 8, 9		
FC-2	VERTICAL	400	8.55	8.37	2.40	1.90	22.40	1.12	1.20	TRANE FOC040	1, 2, 3, 4, 5, 6, 7, 8, 9		
FC-3	HORIZONTAL	300	6.17	6.70	1.80	1.59	16.98	0.95	0.95	TRANE FOC030	1, 2, 3, 4, 5, 6, 7, 8, 9		

- REMARKS:
- SEE MECHANICAL/ELECTRICAL COORDINATION SCHEDULE FOR ELECTRICAL DATA.
 - CHILLED WATER COOLING COIL CONDITIONS ARE NOT DRYER WB EAT, AND 44°F EWT.
 - HOT WATER HEATING COIL CONDITIONS ARE 208 VAC, 1 AND 100°F EAT.
 - PROVIDE INTEGRAL ELECTRICAL DISCONNECT WITH UNIT.
 - PROVIDE UNIT WITH ECH HIGH STATIC MOTOR, STAINLESS STEEL DRUM PAN AND HIGH LEVEL CONDENSATE SWITCH.
 - PROVIDE SUPPLY AIR OUT COLLAR. REFER TO PLANS FOR ADDITIONAL INFORMATION.
 - PROVIDE UNIT WITH FACTORY SUPPLY AIR GRILLE AND FACTORY RETURN AIR GRILLE/ACCESS PANEL. REFER TO PLANS FOR ADDITIONAL INFORMATION.
 - COORDINATE COLOR OF GRILLE/ACCESS PANELS WITH ARCHITECT.
 - 40% PROPYLENE GLYCOL SOLUTION.

HOT WATER UNIT HEATER SCHEDULE													
MARK	TYPE	ARRANGEMENT	CFM	E.W.T.	HEATING CAP MBH	GPM	P.D. FT.	FAN RPM	MANUFACTURER & MODEL NO.	REMARKS			
UH-1	EXPOSED	HORIZONTAL	500	180°F F	15.0	1.7	0.83	1550	TRANE UH5018	1, 2, 3, 4, 5			

- REMARKS:
- SEE MECHANICAL/ELECTRICAL COORDINATION SCHEDULE FOR ELECTRICAL DATA.
 - PROVIDE INTEGRAL ELECTRICAL DISCONNECT.
 - CONTROLS BY REMOTE DDC SENSOR. PROVIDE RELAY AS NECESSARY.
 - PROVIDE CLEARING MOUNTING BRACKETS.
 - 40% PROPYLENE GLYCOL SOLUTION.

GRAVITY RELIEF HOOD SCHEDULE													
MARK	SERVES	THROAT SIZE	CFM	MAX. S.F. DROP (IN W.C.)	MAX. THROUGH (INCHES)	MANUFACTURER & MODEL NO.	REMARKS						
RH-1	ELEVATOR SHUNT	16"x20"	-	-	-	GREENBECK	1, 2						
RH-2	ELEVATOR SHUNT	16"x20"	-	-	-	GREENBECK	1, 2						
RH-3	ELEVATOR SHUNT	16"x20"	-	-	-	GREENBECK	1, 2						

- REMARKS:
- PROVIDE 24" ROOF CURBS & BIRDSCREEN.
 - COORDINATE WITH ARCHITECT FOR FINISH COLOR.

REGISTER - GRILLE - DIFFUSER SCHEDULE													
MARK	FUNCTION	TYPE	CFM	MAX. INCH	SIZE (INCH)	BORER OR FRAME	MATERIAL	FINISH	ACCESS	MANUFACTURER & MODEL NO.	REMARKS		
GR-1	SUPPLY	SQUARE FACE REGISTER, FINE	6-175	25	10" Ø	LAY-IN	ALUMINUM	STRIP WHITE	-	KRUEGER SERIES 1400	1, 2, 3		
GR-2	SUPPLY	SQUARE FACE REGISTER, FINE	131+200	25	10" Ø	LAY-IN	ALUMINUM	STRIP WHITE	-	KRUEGER SERIES 600	1, 2, 3		
GR-3	SUPPLY	SQUARE FACE REGISTER, FINE	251+400	25	10" Ø	LAY-IN	ALUMINUM	STRIP WHITE	-	KRUEGER SERIES 600	1, 2, 3		
GR-4	SUPPLY	DOUBLE DEFLECTOR	0-150	25	10" Ø	SURFACE MOUNT	ALUMINUM	STRIP WHITE	-	KRUEGER SERIES 600	1, 2, 3		
GR-5	RETURN	RECEP DEFLECTOR, 20" SLATS	0-150	25	10" Ø	SURFACE MOUNT	ALUMINUM	STRIP WHITE	-	KRUEGER SERIES 600	1, 2, 3		
GR-6	RETURN	PERF PANEL, 12"x24" FACE	0-175	25	10" Ø	LAY-IN	ALUMINUM	STRIP WHITE	-	KRUEGER SERIES 600	1, 2, 3		
GR-7	RETURN	PERF PANEL, 12"x24" FACE	175+400	25	10" Ø	LAY-IN	ALUMINUM	STRIP WHITE	-	KRUEGER SERIES 600	1, 2, 3		

- REMARKS:
- PROVIDE SPECIFIC (RHS SYSTEM) DATA FOR EACH UNIT WITH SHOP DRAWINGS.
 - COORDINATE BORER OR FRAME TYPE WITH CEILING TYPE. SEE ARCHITECTURAL CEILING PLANS.
 - COORDINATE COLOR WITH ARCHITECT.

ELECTRIC CABINET UNIT HEATER SCHEDULE													
MARK	TYPE	ARRANGEMENT	CFM	HEATING CAP. (KW)	MANUFACTURER & MODEL NO.	REMARKS							
ECABW-1	WALL SURFACE	FRONT INLETOULET	250	5.0	BERCO CUBUS SERIES	1, 2, 3, 4							
ECABW-2	WALL SURFACE	FRONT INLETOULET	250	5.0	BERCO CUBUS SERIES	1, 2, 3, 4							
ECABW-3	WALL SURFACE	FRONT INLETOULET	250	5.0	BERCO CUBUS SERIES	1, 2, 3, 4							
ECABW-4	CEILING RECESSED	FRONT INLETOULET	250	5.0	BERCO CUBUS SERIES	1, 2, 3, 4, 5							

- REMARKS:
- SEE MECHANICAL/ELECTRICAL COORDINATION SCHEDULE FOR ELECTRICAL DATA.
 - PROVIDE INTEGRAL ELECTRICAL DISCONNECT.
 - COORDINATE COLOR WITH ARCHITECT.
 - CONTROLS BY REMOTE DDC SENSOR. PROVIDE RELAY AS NECESSARY.
 - PROVIDE RECESS TRIM KIT.

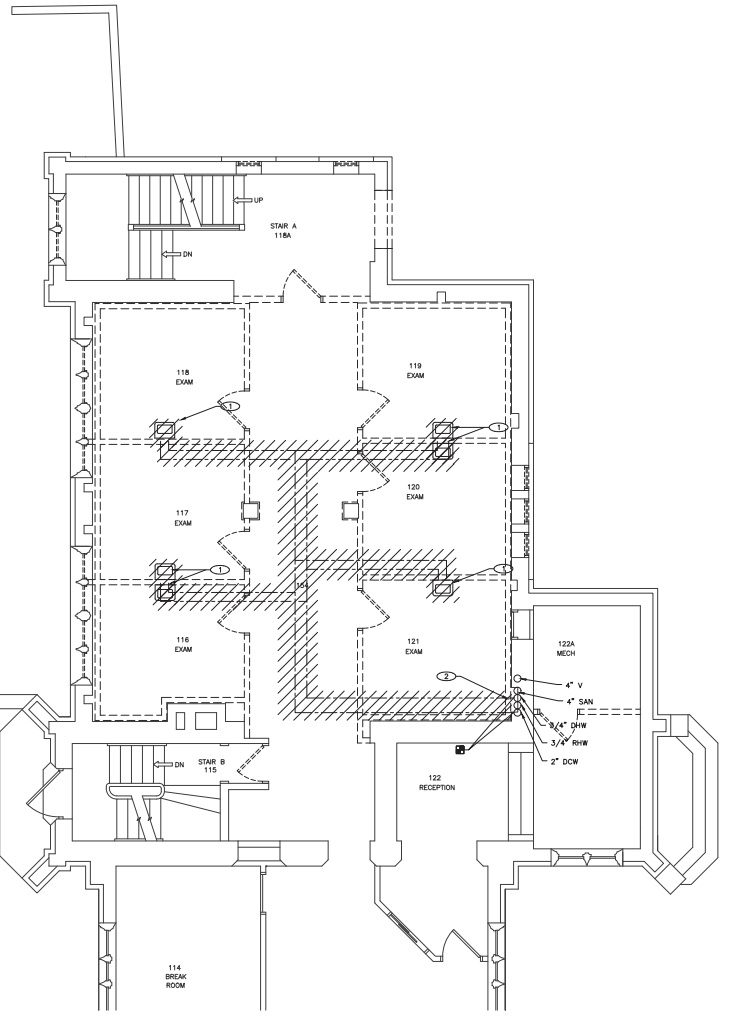
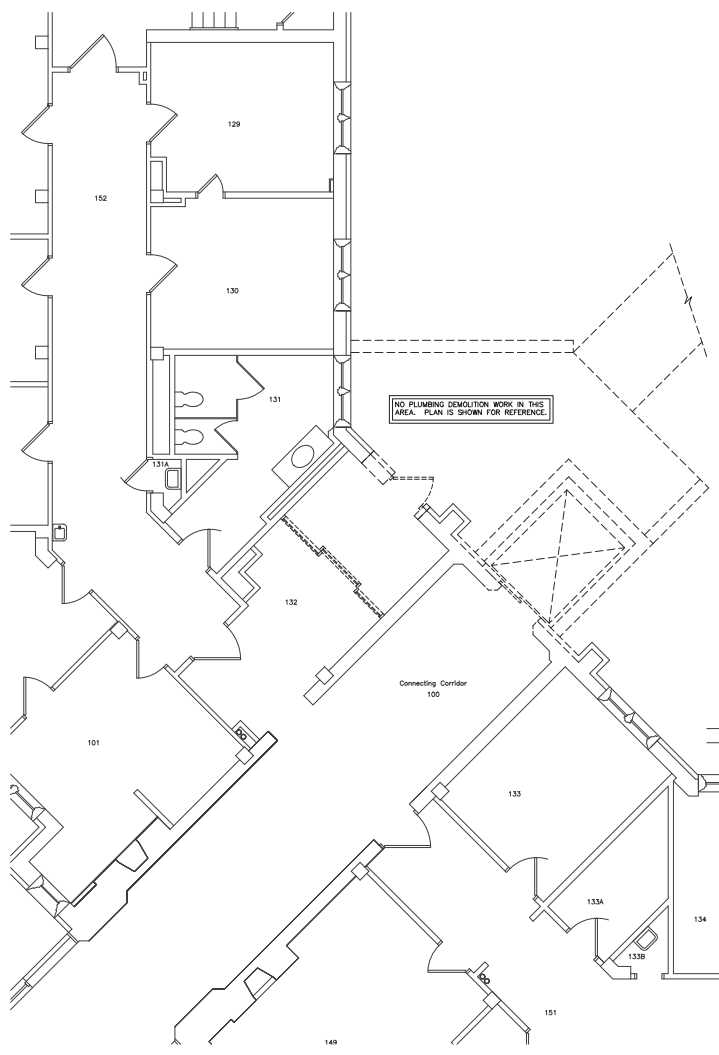
PUMP SCHEDULE													
MARK	SERVES	TYPE	GPM	HEAD FT.	RPM	MANUFACTURER & MODEL NO.	REMARKS						
CHW-1	CHILLED WATER	BASE MOUNTED END SECTION	85	75	1750	BELL & GOSSETT EX150 L50C	1, 2, 3, 4, 5						
HWP-1	HEATING HOT WATER	BASE MOUNTED END SECTION	100	75	1750	BELL & GOSSETT EX150 L50C	1, 2, 3, 4, 5						

- REMARKS:
- SEE MECHANICAL/ELECTRICAL COORDINATION SCHEDULE FOR ELECTRICAL DATA.
 - PROVIDE WITH PREMIUM EFFICIENCY INVERTER VFD MOTOR.
 - PROVIDE FACTORY INSTALLED MOTOR WITH SHFT GROUNDING RITS.
 - PROVIDE ANTI-SHAFT COLLING GUARDS.
 - BASED ON 40% PROPYLENE GLYCOL SOLUTION.

HOT WATER HEATING COIL SCHEDULE													
MARK	SERVES	FACE VELOCITY (FPM)	CFM	E.A.T.	L.A.T.	MAX. AIR P.D.	MIN. ROWS	TOTAL CAP. MBH	MAX. FINISH	GPM	MAX. P.D. (FT)	REMARKS	
HU-1	ERV-1	550	2250	45°F F	71°F F	0.28	2	65.4	10	5.1	0.30	1, 2, 3, 4, 5, 6	

- REMARKS:
- HOT WATER PERFORMANCE BASED ON 180°F EWT, AND 180°F LWT.
 - 40% PROPYLENE GLYCOL SOLUTION.
 - PROVIDE STEEL BASE RAIL WITH ALL LIMITS.
 - COIL SHALL OPERATE AS WATER HEATING COIL.
 - COIL AIR PRESSURE DROP LISTED FOR MAXIMUM AIR HANDLING UNIT AFFLOW.
 - FURNISH PRESSURE-INDEPENDENT CONTROL VALVES FOR ALL COILS.

- PLUMBING KEYNOTES: (○)**
- ① REMOVE SINK, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPE BACK AT MAIN/RISERS. PATCH FLOOR TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT BACK AT MAIN/RISERS.
 - ② REMOVE DOMESTIC WATER PIPE SERVING EXAM ROOM SINKS. CAP PIPING AT EXISTING RISER.



NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



1F ENLARGED PLUMBING DEMOLITION PLAN - FIRST FLOOR
SCALE: 1/4" = 1'-0"

1F ENLARGED PLUMBING DEMOLITION PLAN - FIRST FLOOR
SCALE: 1/4" = 1'-0"

FIRST FLOOR KEYPLAN
1/8" = 1'-0"

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Bid Documents	05/30/2019
Contract Documents 100% Submittal (CD)	05/14/2019
Contract Documents 95% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/18/2019
Design Development (DD)	12/10/2018
Schematic Design (SD)	10/09/2018
Revisions:	Date:

CONSULTANT

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Contract # **FE # 182083**

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OMAHA | LINCOLN | DENVER | COLORADO SPRINGS



Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
FIRST FLOOR PLUMBING DEMOLITION PLANS

Approved: Project Director

Phase
BID DOCUMENTS

FULLY SPRINKLERED

Project Title
RENOVATE TOWER BUILDING 1

Location
Sioux Falls, SD 57105

Issue Date
05/30/2019

Checked
JOB

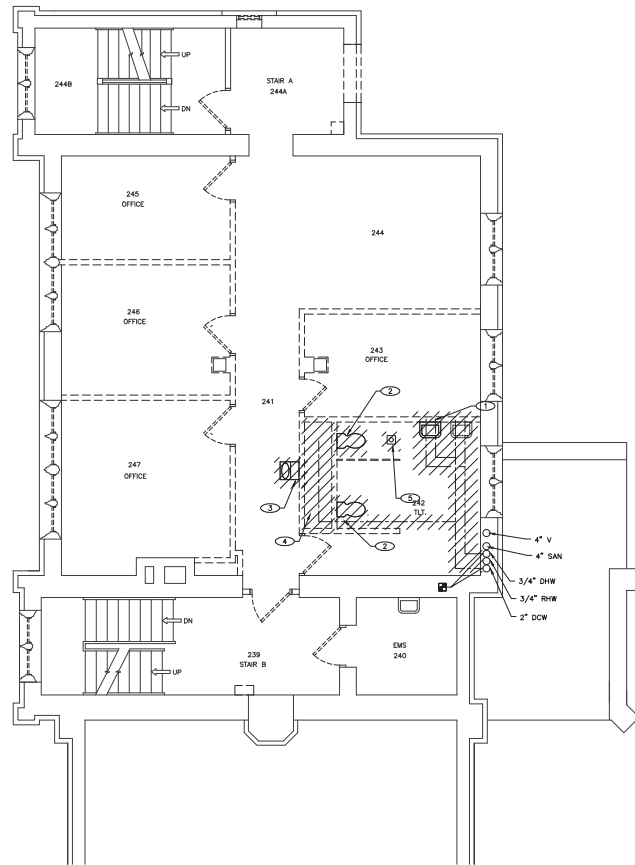
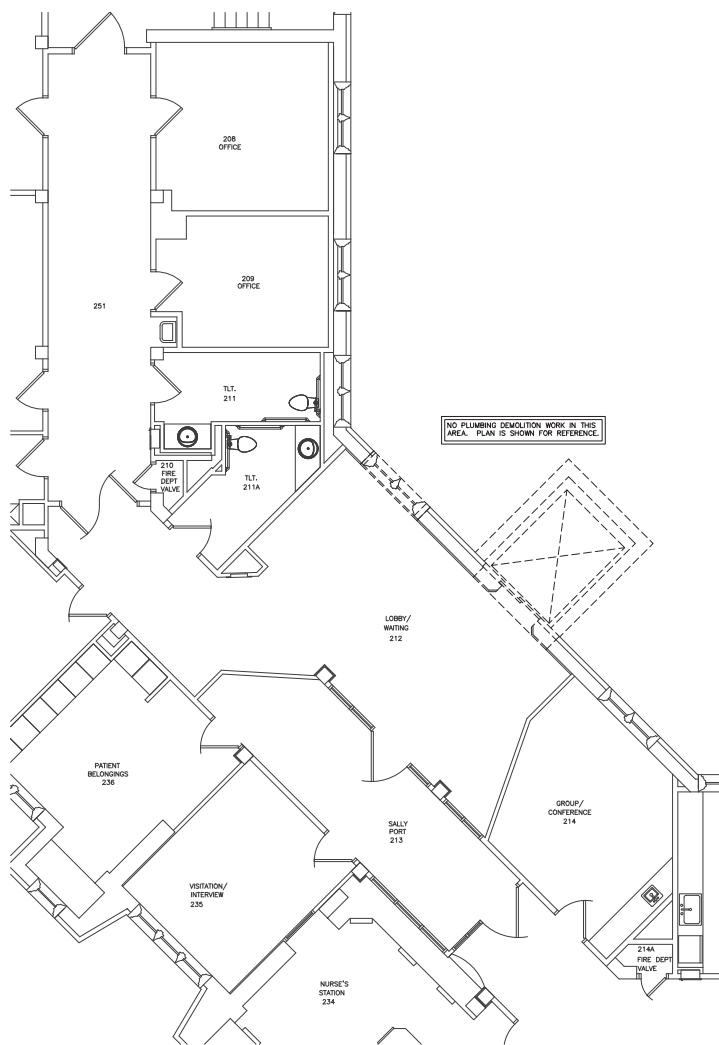
Drawn
CJB

Project Number
438-18-102

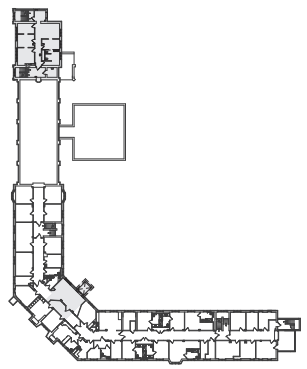
Building Number
1

Drawing Number
PD101

- PLUMBING KEYNOTES: (C)**
- 1 REMOVE LAVATORY, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT PIPING PIPING BACK AT MAIN/RISERS.
 - 2 REMOVE WATER CLOSET, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT PIPING PIPING BACK AT MAIN/RISERS.
 - 3 REMOVE ELECTRIC WATER COOLER, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT PIPING PIPING BACK AT MAIN/RISERS.
 - 4 REMOVE EXISTING PIPING IN CHASE ASSOCIATED WITH PLUMBING FIXTURES BEING REMOVED.
 - 5 REMOVE FLOOR DRAIN, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING.



NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



1F ENLARGED PLUMBING DEMOLITION PLAN - SECOND FLOOR
SCALE: 1/4" = 1'-0"

2F ENLARGED PLUMBING DEMOLITION PLAN - SECOND FLOOR
SCALE: 1/4" = 1'-0"

SECOND FLOOR KEYPLAN
SCALE: 1/8" = 1'-0"

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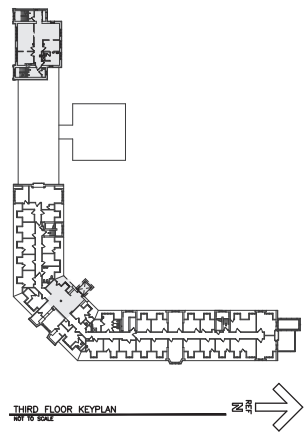
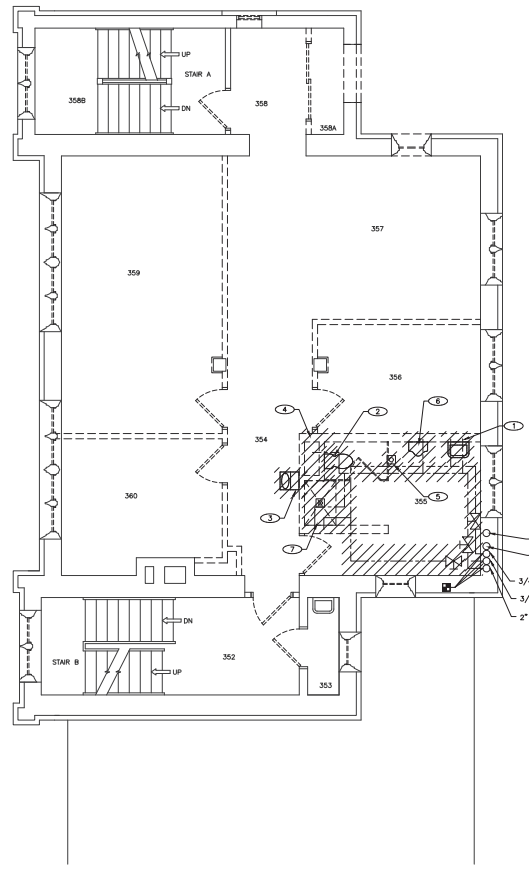
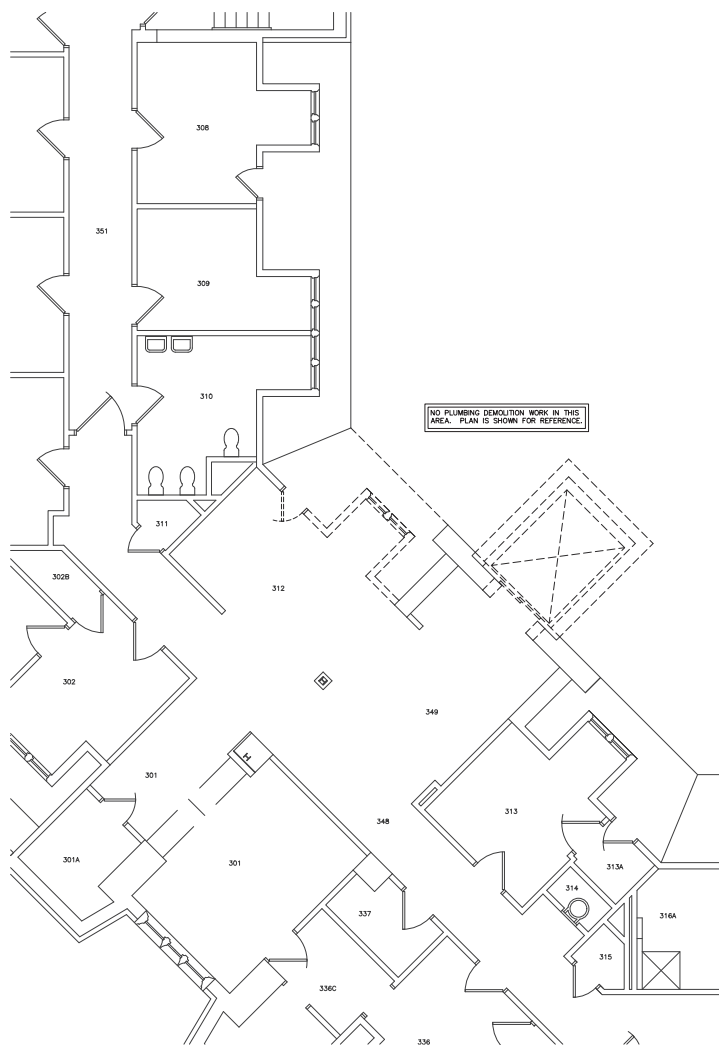
<table border="1"> <tr> <td> </td> <td> </td> </tr> <tr> <td>Bid Documents</td> <td>05/30/2019</td> </tr> <tr> <td>Contract Documents 100% Submittal (CD)</td> <td>05/14/2019</td> </tr> <tr> <td>Contract Documents 90% Submittal (CD)</td> <td>04/11/2019</td> </tr> <tr> <td>Contract Documents 35% Submittal (CD)</td> <td>02/18/2019</td> </tr> <tr> <td>Design Development (DD)</td> <td>12/10/2018</td> </tr> <tr> <td>Schematic Design (SD)</td> <td>10/09/2018</td> </tr> <tr> <td>Revisions:</td> <td>Date:</td> </tr> </table>				Bid Documents	05/30/2019	Contract Documents 100% Submittal (CD)	05/14/2019	Contract Documents 90% Submittal (CD)	04/11/2019	Contract Documents 35% Submittal (CD)	02/18/2019	Design Development (DD)	12/10/2018	Schematic Design (SD)	10/09/2018	Revisions:	Date:	<table border="1"> <tr> <td colspan="2">CONSULTANT</td> </tr> <tr> <td></td> <td>FARRIS ENGINEERING OMAHA LINCOLN DENVER COLORADO SPRINGS CORPORATE FEI # 182083 www.farris-engineering.com</td> </tr> </table>		CONSULTANT			FARRIS ENGINEERING OMAHA LINCOLN DENVER COLORADO SPRINGS CORPORATE FEI # 182083 www.farris-engineering.com	<table border="1"> <tr> <td colspan="2">ARCHITECT/ENGINEER OF RECORD</td> </tr> <tr> <td></td> <td>C.H. HILL 3105 North 200th Street Elkhorn, Nebraska 68022 (402) 291-6941</td> </tr> </table>		ARCHITECT/ENGINEER OF RECORD			C.H. HILL 3105 North 200th Street Elkhorn, Nebraska 68022 (402) 291-6941	<table border="1"> <tr> <td colspan="2">STAMP</td> </tr> <tr> <td></td> <td>05/30/2019</td> </tr> </table>		STAMP			05/30/2019	<table border="1"> <tr> <td colspan="2">Office of Construction and Facilities Management</td> </tr> <tr> <td colspan="2">U.S. Department of Veterans Affairs</td> </tr> </table>		Office of Construction and Facilities Management		U.S. Department of Veterans Affairs		<table border="1"> <tr> <td colspan="2">Drawing Title</td> </tr> <tr> <td colspan="2">SECOND FLOOR PLUMBING DEMOLITION PLANS</td> </tr> <tr> <td colspan="2">Approved: Project Director</td> </tr> </table>		Drawing Title		SECOND FLOOR PLUMBING DEMOLITION PLANS		Approved: Project Director		<table border="1"> <tr> <td colspan="2">Phase</td> </tr> <tr> <td colspan="2">BID DOCUMENTS</td> </tr> </table>		Phase		BID DOCUMENTS		<table border="1"> <tr> <td colspan="2">Project Title</td> </tr> <tr> <td colspan="2">RENOVATE TOWER BUILDING 1</td> </tr> <tr> <td colspan="2">Project Number</td> </tr> <tr> <td colspan="2">438-18-102</td> </tr> <tr> <td colspan="2">Building Number</td> </tr> <tr> <td colspan="2">1</td> </tr> <tr> <td colspan="2">Drawing Number</td> </tr> <tr> <td colspan="2">PD102</td> </tr> </table>		Project Title		RENOVATE TOWER BUILDING 1		Project Number		438-18-102		Building Number		1		Drawing Number		PD102	
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PLUMBING KEYNOTES: (C)

- 1 REMOVE LAVATORY, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT PIPING BACK AT MAIN/RISERS.
- 2 REMOVE WATER CLOSET, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT PIPING BACK AT MAIN/RISERS.
- 3 REMOVE ELECTRIC WATER COOLER, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT PIPING BACK AT MAIN/RISERS.
- 4 REMOVE EXISTING PIPING IN CHASE ASSOCIATED WITH PLUMBING FIXTURES BEING REMOVED.
- 5 REMOVE FLOOR DRAIN, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING.
- 6 REMOVE URINAL, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT PIPING BACK AT MAIN/RISERS.
- 7 REMOVE SHOWER, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT PIPING BACK AT MAIN/RISERS.

NO PLUMBING DEMOLITION WORK IN THIS AREA. PLAN IS SHOWN FOR REFERENCE.

NOTICE:
REFER TO DRAWING G1-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



1F ENLARGED PLUMBING DEMOLITION PLAN - THIRD FLOOR
SCALE 1/4" = 1'-0"

6F ENLARGED PLUMBING DEMOLITION PLAN - THIRD FLOOR
SCALE 1/4" = 1'-0"

THIRD FLOOR KEYPLAN
SCALE 1/8" = 1'-0"

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Bid Documents	05/30/2019
Contract Documents 100% Submittal (CD)	05/14/2019
Contract Documents 95% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/18/2019
Design Development (DD)	12/10/2018
Schematic Design (SD)	10/09/2018
Revisions:	Date:

CONSULTANT

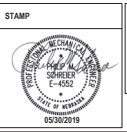
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Office of Construction and Facilities Management
VA U.S. Department of Veterans Affairs

Drawing Title
THIRD FLOOR PLUMBING DEMOLITION PLANS

Approved: Project Director

Phase
BID DOCUMENTS

FULLY SPRINKLERED

Project Title
RENOVATE TOWER BUILDING 1

Location
Sioux Falls, SD 57105

Issue Date
05/30/2019

Checked
JOB

Drawn
CJB

Project Number
438-18-102

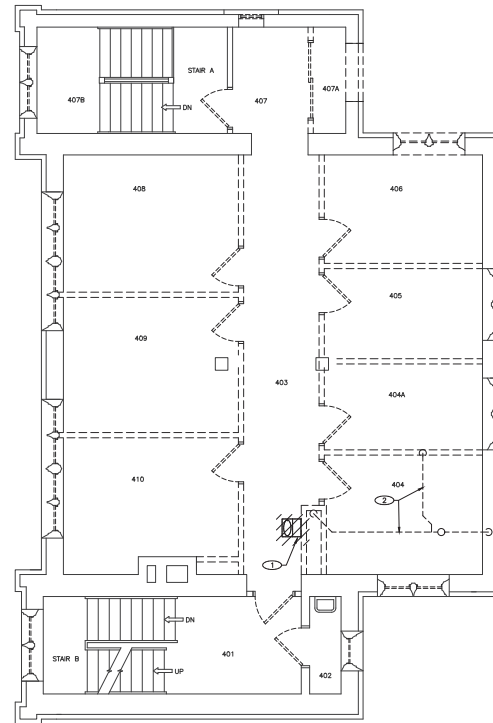
Building Number
1

Drawing Number
PD103

PLUMBING KEYNOTES: (○)

① REMOVE ELECTRIC WATER COOLER, ASSOCIATED PIPING AND ACCESSORIES IN ITS ENTIRETY. CAP SANITARY PIPING BACK AT MAIN/RISERS AND PATCH FLOOR PENETRATION TO MATCH EXISTING. CAP DOMESTIC WATER AND VENT PIPING BACK AT MAIN/RISERS.

② EXISTING VENT PIPING TO REMAIN.



NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



4F ENLARGED PLUMBING DEMOLITION PLAN - FOURTH FLOOR
SCALE: 1/4" = 1'-0"

FOURTH FLOOR KEYPLAN
SCALE: 1/8" = 1'-0"

Bid Documents	05/30/2019
Contract Documents 100% Submittal (CD)	05/14/2019
Contract Documents 95% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/18/2019
Design Development (DD)	12/10/2018
Schematic Design (SD)	10/09/2018
Revisions:	Date:

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STAMP

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
FOURTH FLOOR PLUMBING DEMOLITION PLANS

Approved: Project Director

Phase
BID DOCUMENTS

FULLY SPRINKLERED

Project Title
RENOVATE TOWER BUILDING 1

Location
Sioux Falls, SD 57105

Issue Date
05/30/2019

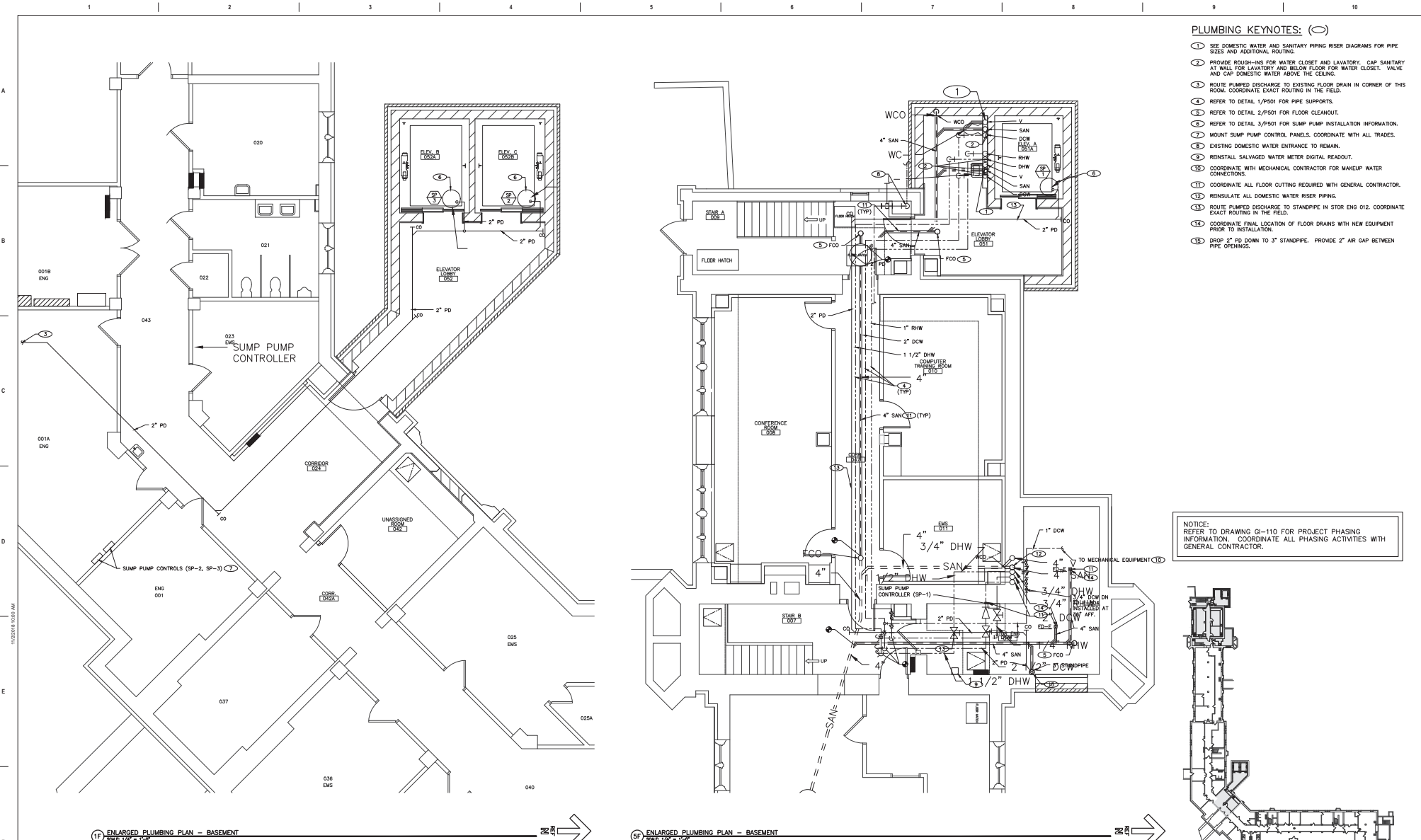
Checked
JOB

Drawn
CJB

Project Number
438-18-102

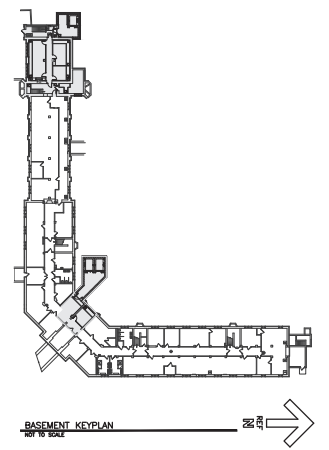
Building Number
1

Drawing Number
PD104



- PLUMBING KEYNOTES:** ()
- 1 SEE DOMESTIC WATER AND SANITARY PIPING RISER DIAGRAMS FOR PIPE SIZES AND ADDITIONAL ROUTING.
 - 2 PROVIDE ROUGH-INS FOR WATER CLOSET AND LAVATORY. CAP SANITARY AT WALL FOR LAVATORY AND BELOW FLOOR FOR WATER CLOSET. VALVE AND CAP DOMESTIC WATER ABOVE THE CEILING.
 - 3 ROUTE PUMPED DISCHARGE TO EXISTING FLOOR DRAIN IN CORNER OF THIS ROOM. COORDINATE EXACT ROUTING IN THE FIELD.
 - 4 REFER TO DETAIL 1/P501 FOR PIPE SUPPORTS.
 - 5 REFER TO DETAIL 2/P501 FOR FLOOR CLEANOUT.
 - 6 REFER TO DETAIL 3/P501 FOR SUMP PUMP INSTALLATION INFORMATION.
 - 7 MOUNT SUMP PUMP CONTROL PANELS. COORDINATE WITH ALL TRADES.
 - 8 EXISTING DOMESTIC WATER ENTRANCE TO REMAIN.
 - 9 REINSTALL SALVAGED WATER METER DIGITAL READOUT.
 - 10 COORDINATE WITH MECHANICAL CONTRACTOR FOR MAKEUP WATER CONNECTIONS.
 - 11 COORDINATE ALL FLOOR CUTTING REQUIRED WITH GENERAL CONTRACTOR.
 - 12 REINSULATE ALL DOMESTIC WATER RISER PIPING.
 - 13 ROUTE PUMPED DISCHARGE TO STANDPIPE IN STOR ENG 012. COORDINATE EXACT ROUTING IN THE FIELD.
 - 14 COORDINATE FINAL LOCATION OF FLOOR DRAINS WITH NEW EQUIPMENT PRIOR TO INSTALLATION.
 - 15 DROP 2\"/>

NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



1F ENLARGED PLUMBING PLAN - BASEMENT
SCALE 1/4" = 1'-0"

5F ENLARGED PLUMBING PLAN - BASEMENT
SCALE 1/4" = 1'-0"

BASEMENT KEYPLAN
1/8" = 1'-0"

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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title: **BASEMENT PLUMBING PLANS**

Phase: **BID DOCUMENTS**

Approved: Project Director

Project Title: **RENOVATE TOWER BUILDING 1**

Location: **Sioux Falls, SD 57105**

Issue Date: 05/30/2019

Checked: []
Job: []

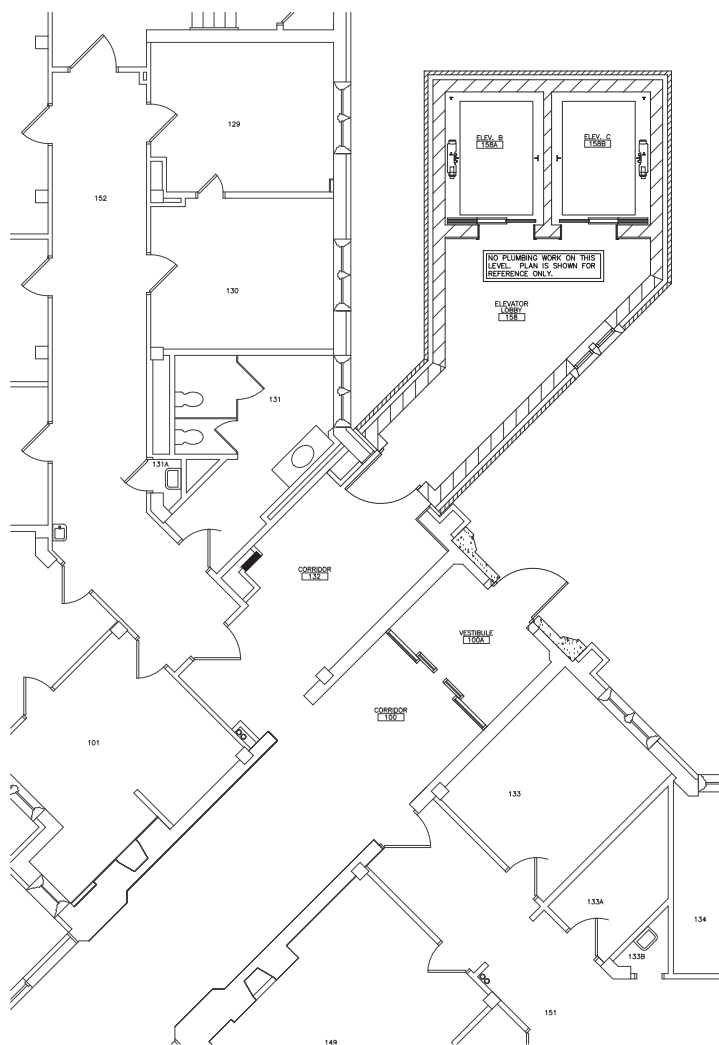
Drawn: []
CJB: []

Project Number: **438-18-102**

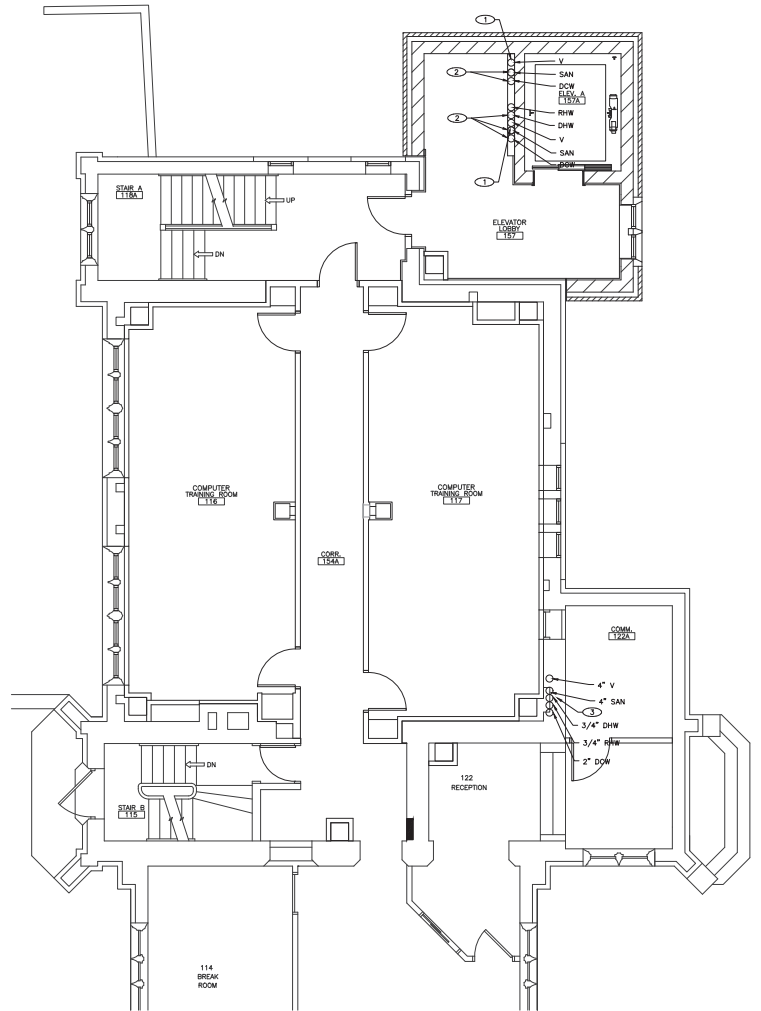
Building Number: **1**

Drawing Number: **PL100**

- PLUMBING KEYNOTES: (○)**
- 1 SEE DOMESTIC WATER AND SANITARY PIPING RISER DIAGRAMS FOR PIPE SIZES AND ADDITIONAL ROUTING.
 - 2 PROVIDE ROUGH-INS FOR WATER CLOSET AND LAVATORY. CAP SANITARY BEHIND WALL FOR LAVATORY AND CAP SANITARY PIPING ON FLOOR BELOW FOR WATER CLOSET. VALVE AND CAP DOMESTIC WATER ABOVE CEILING.
 - 3 REINSULATE ALL DOMESTIC WATER RISER PIPING.



1F ENLARGED PLUMBING PLAN - FIRST FLOOR
SCALE: 1/4" = 1'-0"



1F ENLARGED PLUMBING PLAN - FIRST FLOOR
SCALE: 1/4" = 1'-0"

NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



FIRST FLOOR KEYPLAN
SCALE: 1/8" = 1'-0"

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Contract Documents 35% Submittal (CD)	02/18/2019
Design Development (DD)	12/10/2018
Schematic Design (SD)	10/09/2018
Revisions:	Date:

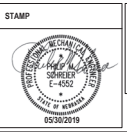
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(402) 291-6941

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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
FIRST FLOOR PLUMBING PLANS

Approved: Project Director

Phase
BID DOCUMENTS

FULLY SPRINKLERED

Project Title
RENOVATE TOWER BUILDING 1

Location
Sioux Falls, SD 57105

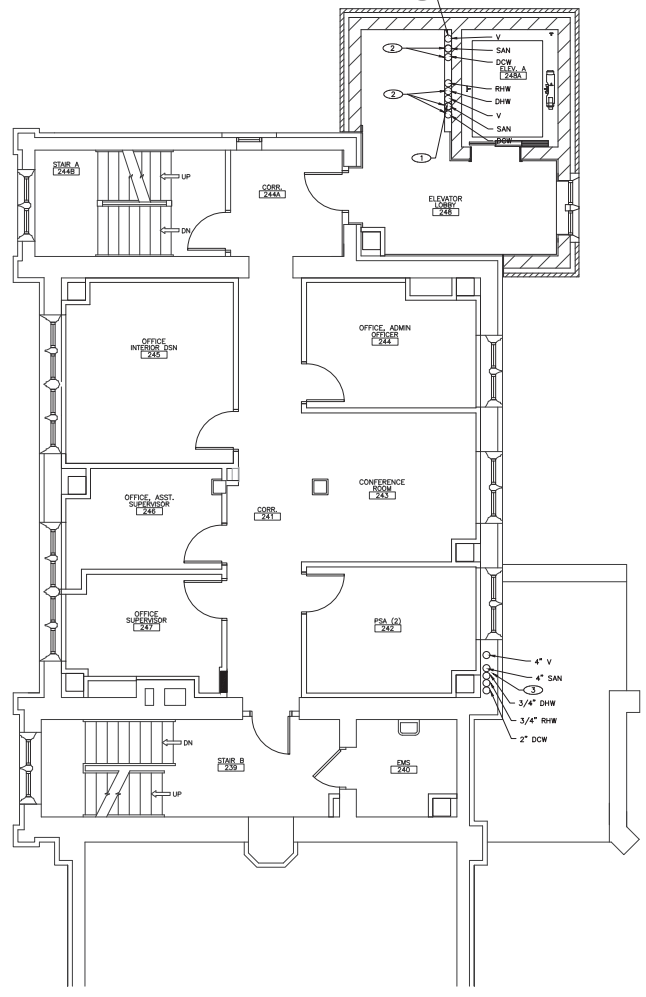
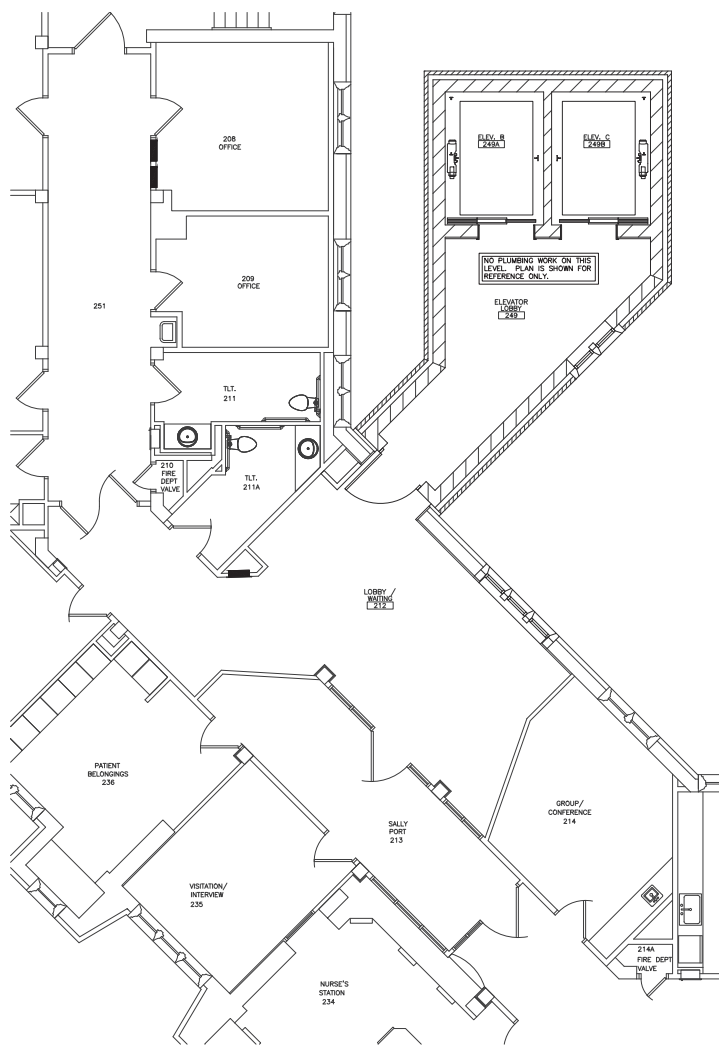
Issue Date
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Project Number
438-18-102

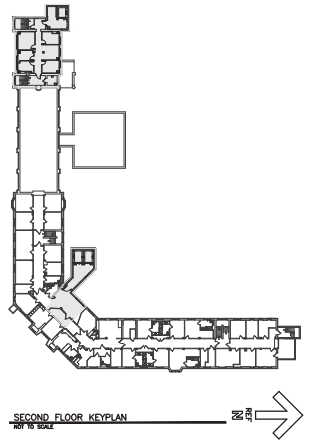
Building Number
1

Drawing Number
PL101

- PLUMBING KEYNOTES: (C)**
- SEE DOMESTIC WATER AND SANITARY PIPING RISER DIAGRAMS FOR PIPE SIZES AND ADDITIONAL ROUTING.
 - PROVIDE ROUGH-INS FOR WATER CLOSET AND LAVATORY. CAP SANITARY BEHIND WALL FOR LAVATORY AND CAP SANITARY ON FLOOR BELOW FOR WATER CLOSET. VALVE AND CAP DOMESTIC WATER ABOVE CEILING.
 - REINSULATE ALL DOMESTIC WATER RISER PIPING.



NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



1F ENLARGED PLUMBING PLAN - SECOND FLOOR
SCALE: 1/4" = 1'-0"

6F ENLARGED PLUMBING PLAN - SECOND FLOOR
SCALE: 1/4" = 1'-0"

SECOND FLOOR KEYPLAN
1/8" = 1'-0"

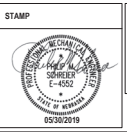
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Revisions:	Date:

CONSULTANT

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FEI # 182083

ARCHITECT/ENGINEER OF RECORD

CH2M HILL
3105 North 200th Street
Elkhorn, Nebraska 68022
(402) 291-6941



Office of Construction and Facilities Management
VA U.S. Department of Veterans Affairs

Drawing Title
SECOND FLOOR PLUMBING PLANS
Approved: Project Director

Phase
BID DOCUMENTS
FULLY SPRINKLERED

Project Title
RENOVATE TOWER BUILDING 1

Location
Sioux Falls, SD 57105

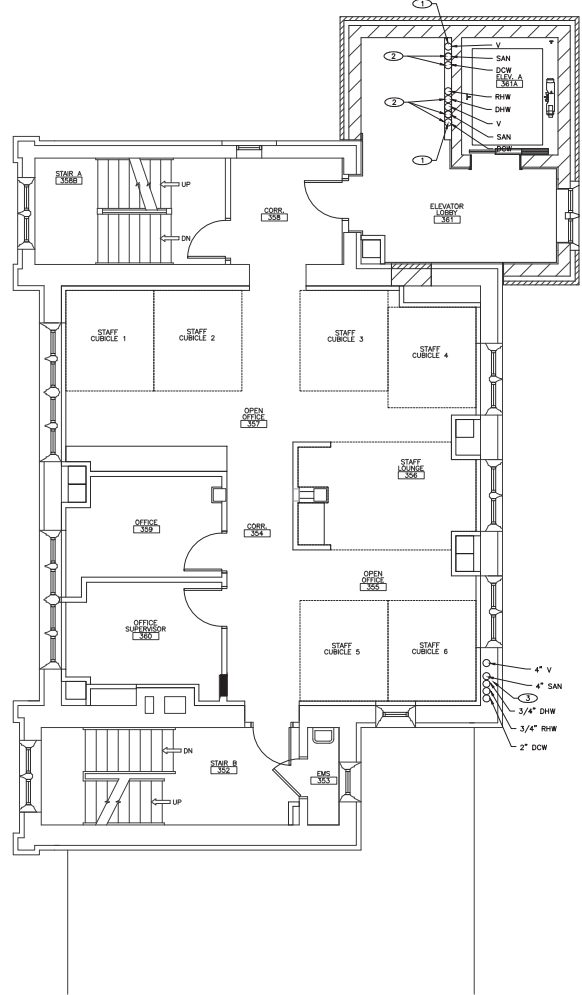
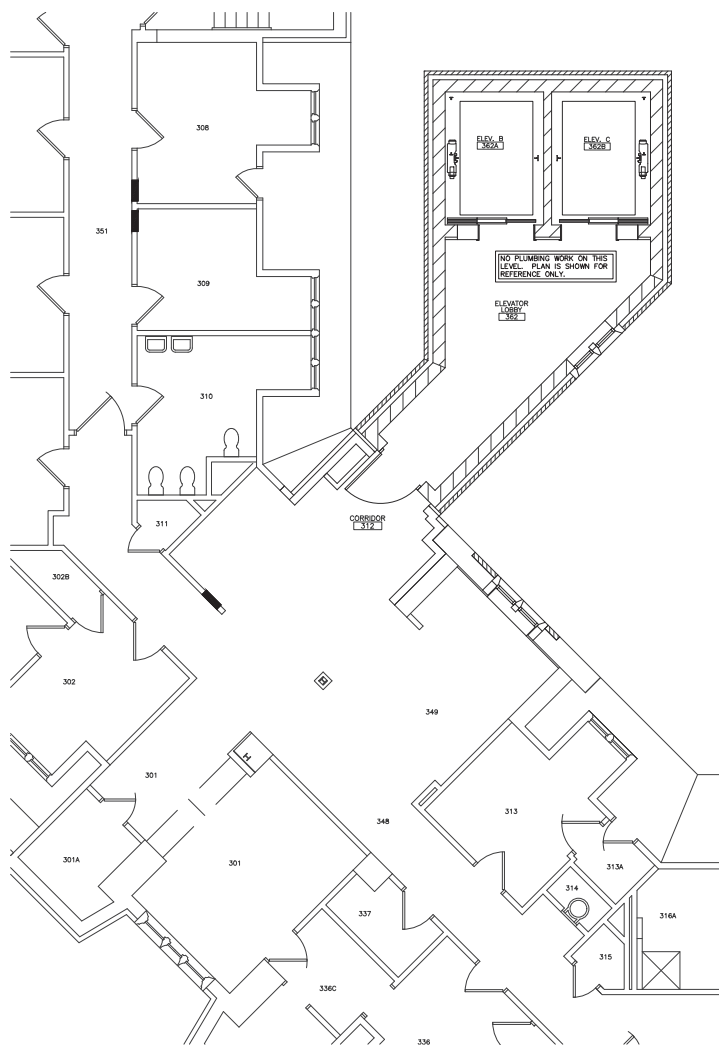
Issue Date
05/30/2019

Project Number
438-18-102

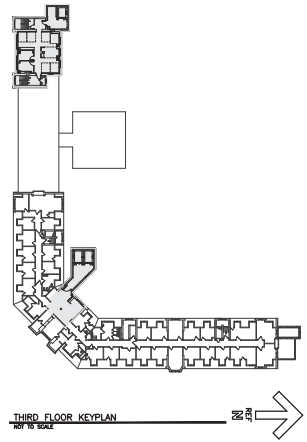
Building Number
1

Drawing Number
PL 102

- PLUMBING KEYNOTES: (C)**
- 1 SEE DOMESTIC WATER AND SANITARY PIPING RISER DIAGRAMS FOR PIPE SIZES AND ADDITIONAL ROUTING.
 - 2 PROVIDE ROUGH-INS FOR WATER CLOSET AND LAVATORY. CAP SANITARY BEHIND WALL FOR LAVATORY AND CAP SANITARY ON FLOOR BELOW FOR WATER CLOSET. VALVE AND CAP DOMESTIC WATER ABOVE CEILING.
 - 3 REINSULATE ALL DOMESTIC WATER RISER PIPING.



NOTICE:
REFER TO DRAWING GI-110 FOR PROJECT PHASING INFORMATION. COORDINATE ALL PHASING ACTIVITIES WITH GENERAL CONTRACTOR.



1F ENLARGED PLUMBING PLAN - THIRD FLOOR
SCALE: 1/8\"/>

6F ENLARGED PLUMBING PLAN - THIRD FLOOR
SCALE: 1/8\"/>

THIRD FLOOR KEYPLAN
SCALE: 1/8\"/>

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Bid Documents	05/30/2019
Contract Documents 100% Submittal (CD)	05/14/2019
Contract Documents 95% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/18/2019
Design Development (DD)	12/10/2018
Schematic Design (SD)	10/05/2018
Revisions:	Date:

CONSULTANT

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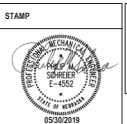
Contract # 182083
Date: 05/30/2019

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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
THIRD FLOOR PLUMBING PLANS

Approved: Project Director

Phase
BID DOCUMENTS

FULLY SPRINKLERED

Project Title
RENOVATE TOWER BUILDING 1

Location
Sioux Falls, SD 57105

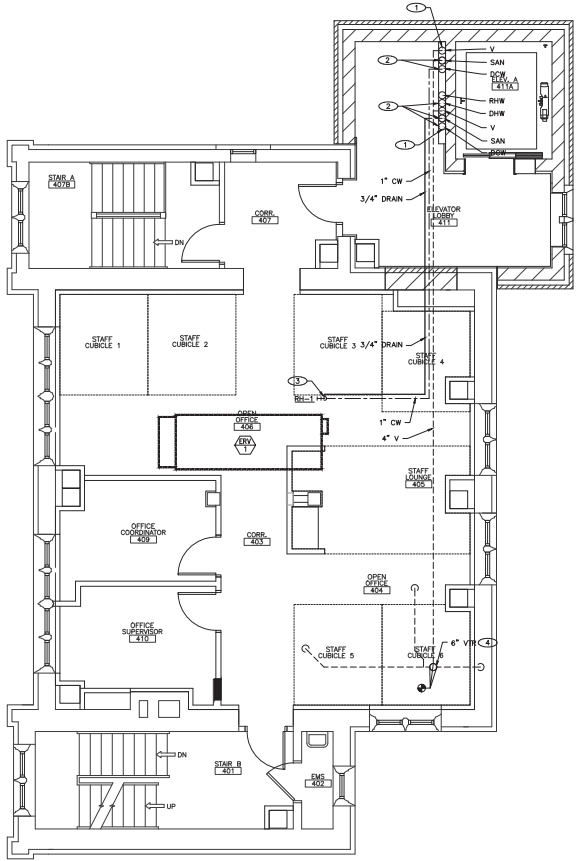
Issue Date: 05/30/2019

Checked: JOB
Drawn: CJB

Project Number: 438-18-102
Building Number: 1
Drawing Number: **PL103**

PLUMBING KEYNOTES: (C)

- ① SEE DOMESTIC WATER AND SANITARY PIPING RISER DIAGRAMS FOR PIPE SIZES AND ADDITIONAL ROUTING.
- ② PROVIDE ROUGH-INS FOR WATER CLOSET AND LAVATORY. CAP SANITARY BEHIND WALL FOR LAVATORY AND CAP SANITARY ON FLOOR BEHIND FOR WATER CLOSET. VALVE AND CAP DOMESTIC WATER ABOVE CEILING.
- ③ 1" DOW UP THROUGH ROOF TO ROOF HYDRANT BOLLER WOODFORD RHYMANS OR EQUIVALENT. SEAL PENETRATION WATER TIGHT. INSTALL ROOF HYDRANT WITH DRAIN. ROUTE 3/4" DRAIN TO SANITARY STACK. COORDINATE EXACT LOCATION WITH SECL-1.
- ④ SEE VENT THROUGH ROOF DETAIL 4/P501 FOR ADDITIONAL INFORMATION.



NOTICE:
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ENLARGED PLUMBING PLAN - FOURTH FLOOR
SCALE: 1/4" = 1'-0"

FOURTH FLOOR KEYPLAN
SCALE: 1/8" = 1'-0"

11/20/2018 10:50 AM

03/28/2018 09:45 AM

Revisions:	
Design Development (DD)	12/10/2018
Schematic Design (SD)	10/09/2018
Contract Documents 95% Submittal (CD)	04/11/2019
Contract Documents 35% Submittal (CD)	02/18/2019
Contract Documents 100% Submittal (CD)	05/14/2019
Bid Documents	05/30/2019

CONSULTANT

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FEI #: 182083

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STAMP

Professional Engineer
State of Nebraska
05/30/2019

Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title
FOURTH FLOOR PLUMBING PLANS

Approved: Project Director

Phase
BID DOCUMENTS

FULLY SPRINKLERED

Project Title
RENOVATE TOWER BUILDING 1

Location
Sioux Falls, SD 57105

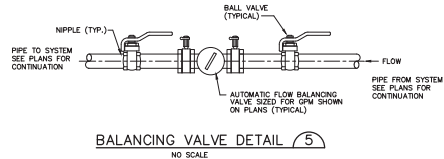
Issue Date: 05/30/2019

Checked: JOB
Drawn: CJB

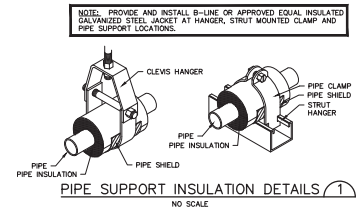
Project Number
438-18-102

Building Number
1

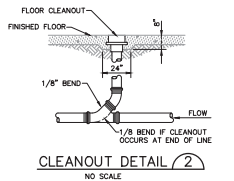
Drawing Number
PL104



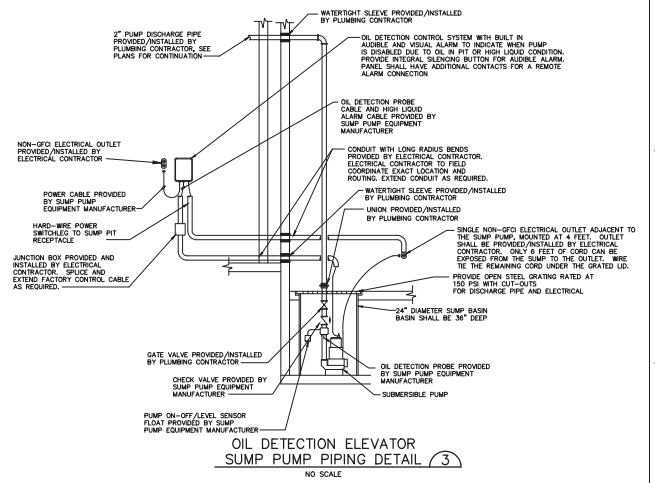
BALANCING VALVE DETAIL 5
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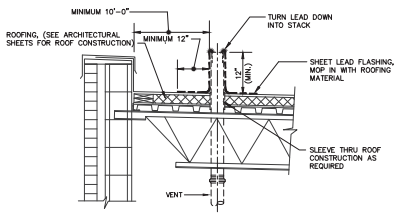
PIPE SUPPORT INSULATION DETAILS 1
NO SCALE



CLEANOUT DETAIL 2
NO SCALE



**OIL DETECTION ELEVATOR
SUMP PUMP PIPING DETAIL 3**
NO SCALE



VENT THRU ROOF DETAIL 4
NO SCALE

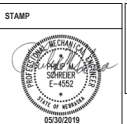
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Revisions:	Date:

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Office of
Construction and
Facilities
Management

VA U.S. Department
of Veterans Affairs

Drawing Title
PLUMBING DETAILS

Approved: Project Director

Phase
BID DOCUMENTS

FULLY SPRINKLERED

Project Title
RENOVATE TOWER BUILDING 1

Location
Sioux Falls, SD 57105

Project Number
438-18-102

Building Number
1

Drawing Number
P501

11/20/2019 10:50 AM
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