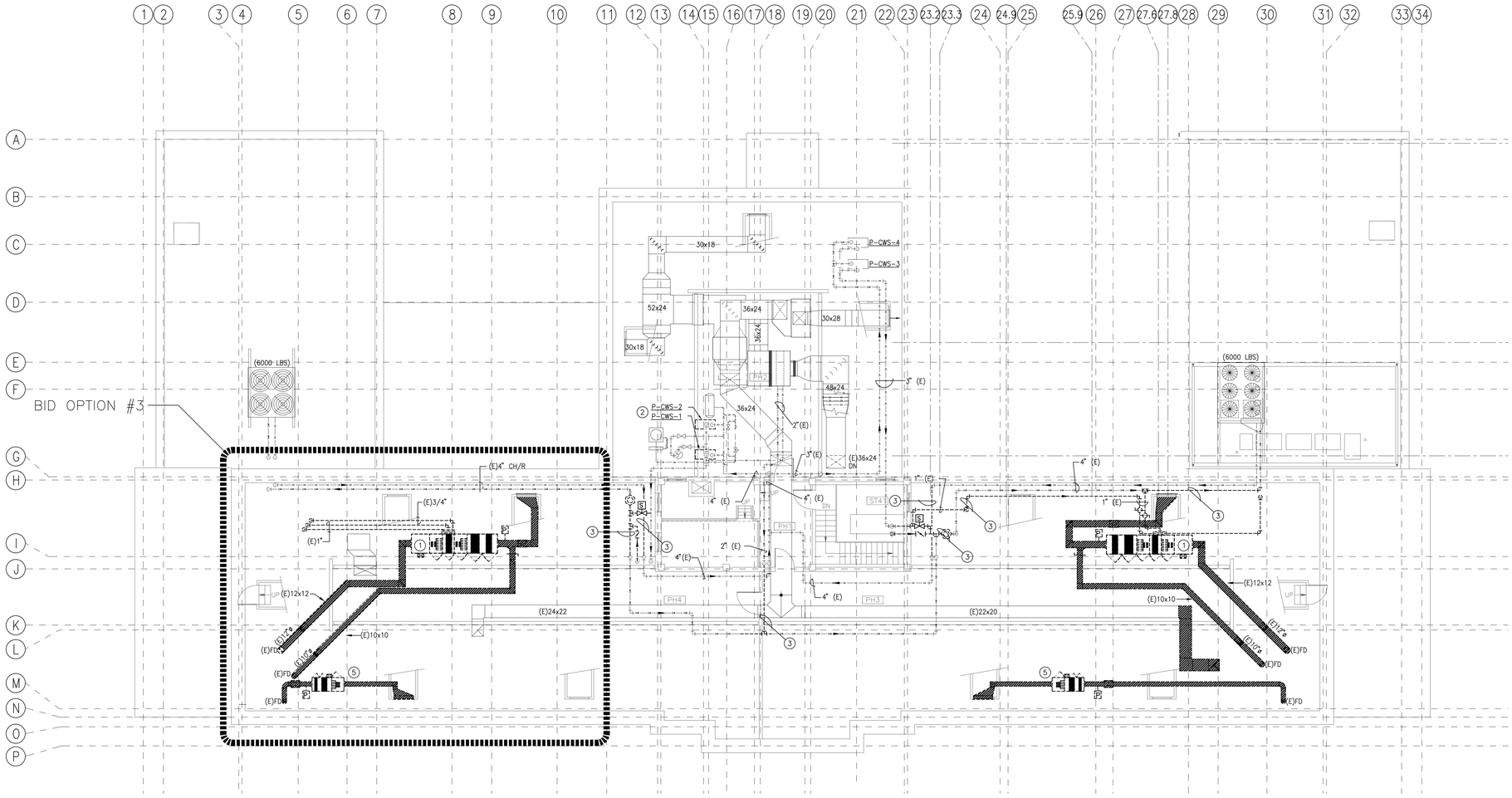
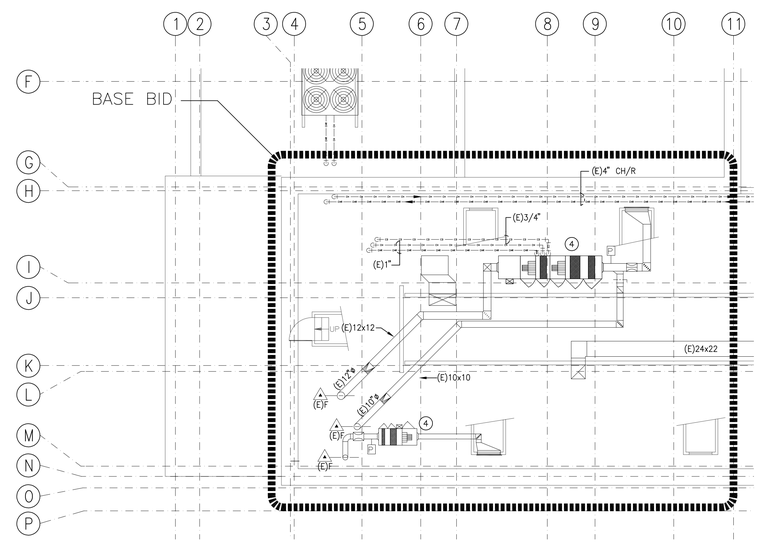


1 PENTHOUSE HVAC DEMOLITION PLAN

SCALE: 1/8" = 1'-0"



2 PENTHOUSE HVAC DEMOLITION PLAN–BASE BID

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. CONTRACTOR SHALL DEMOLISH ALL EXISTING MECHANICAL HVAC CONTROLS, HYDRONIC PIPING, EQUIPMENT AND DUCTWORK SHOWN TO BE REMOVED. EXACT LOCATIONS, SIZES, QUANITIES, AND ROUTING MAY DIFFER FROM DEMOLITION PLANS. FIELD VERIFY JOB SITE PRIOR TO BIDDING. PHASE ROOF PENETRATIONS WITH OTHER TRADES TO MAINTAIN BUILDING ENVELOPE INTEGRITY.

C. PROTECT ALL EXISTING WORK TO REMAIN FROM DAMAGE DURING CONSTRUCTION. ANY MATERIALS, SYSTEMS COMPONENTS, FINISHES AND THE LIKE, DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR REPLACED TO OWNER'S ACCEPTANCE AT CONTRACTOR'S EXPENSE.

D. ALL MATERIALS THAT ARE NOT TO BE RENOVATED OR REUSED SHALL BE DEMOLISHED, BECOME SALVAGE AND THE PROPERTY OF THE CONTRACTOR. DEMOLISHED MATERIALS SHALL BE REMOVED FROM THE PROPERTY IN A TIMELY MANNER, AND SHALL NOT BE STORED ON SITE.

E. EQUIPMENT, DUCTWORK AND PIPE SIZES SHOWN ARE FOR CONTRACTOR'S GENERAL ESTIMATING PURPOSES THESE SIZES HAVE BEEN VERIFIED FROM FIELD OBSERVATION OF GENERAL CONDITIONS WHERE PIPES AND EQUIPMENT ARE VISIBLE. NO PROVISIONS WILL BE MADE FOR DISCREPANCIES IN THESE SIZES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE SITE AND TAKE MEASUREMENTS PRIOR TO BIDDING. SEE GENERAL NOTES ON M0.1 FOR MORE INFORMATION.

F. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, FIRE PROTECTION AND COMMUNICATIONS DRAWINGS FOR ADDITIONAL DEMOLITION OF BUILDING SYSTEMS. COORDINATE PENETRATIONS THROUGH WALLS AND FLOOR/CEILINGS REQUIRED FOR REMOVAL OR INSTALLATION OF PLUMBING SYSTEMS WITH OTHER TRADES TO MINIMIZE DEMOLITION DISRUPTION.

SHEET NOTES:

1. REMOVE EXISTING ISOLATION ROOM AIR HANDLER WITH PIPE RUNOUTS, DUCT, CONTROLS, AND LOUVERS.
2. REMOVE EXISTING CWS PUMPS. TO BE REPLACED WITH NEW. COORDINATE WITH PIPE AND VALVES TO REMAIN IN SERVICE. SEE M3.4.
3. REMOVE CHILLED WATER PIPE AND PREP FOR CONNECTION UNDER NEW WORK. SEE M2.7.
4. EXISTING ISOLATION ROOM AIR HANDLER, PIPE, DUCT, CONTROLS, AND LOUVERS TO REMAIN IN SERVICE.
5. REMOVE EXISTING ISOLATION ROOM EXHAUST FAN, DUCT, CONTROLS, AND LOUVERS. THESE FANS WILL BE REINSTALLED IN A NEW LOCATION. SEE M2.7.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1-1/4")	(N)31.8MM (1-1/4")
(E)38.1MM (1-1/2")	(N)38.1MM (1-1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2-1/2")	(N)63.5MM (2-1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS	DATE

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CAD FILE NAME: 531-320_M1.6.DWG
XREF FILE NAME: 531-320_30X42TLBK.DWG 531-320_67APH.DWG

DRAWING TITLE: PENTHOUSE HVAC DEMOLITION PLAN

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

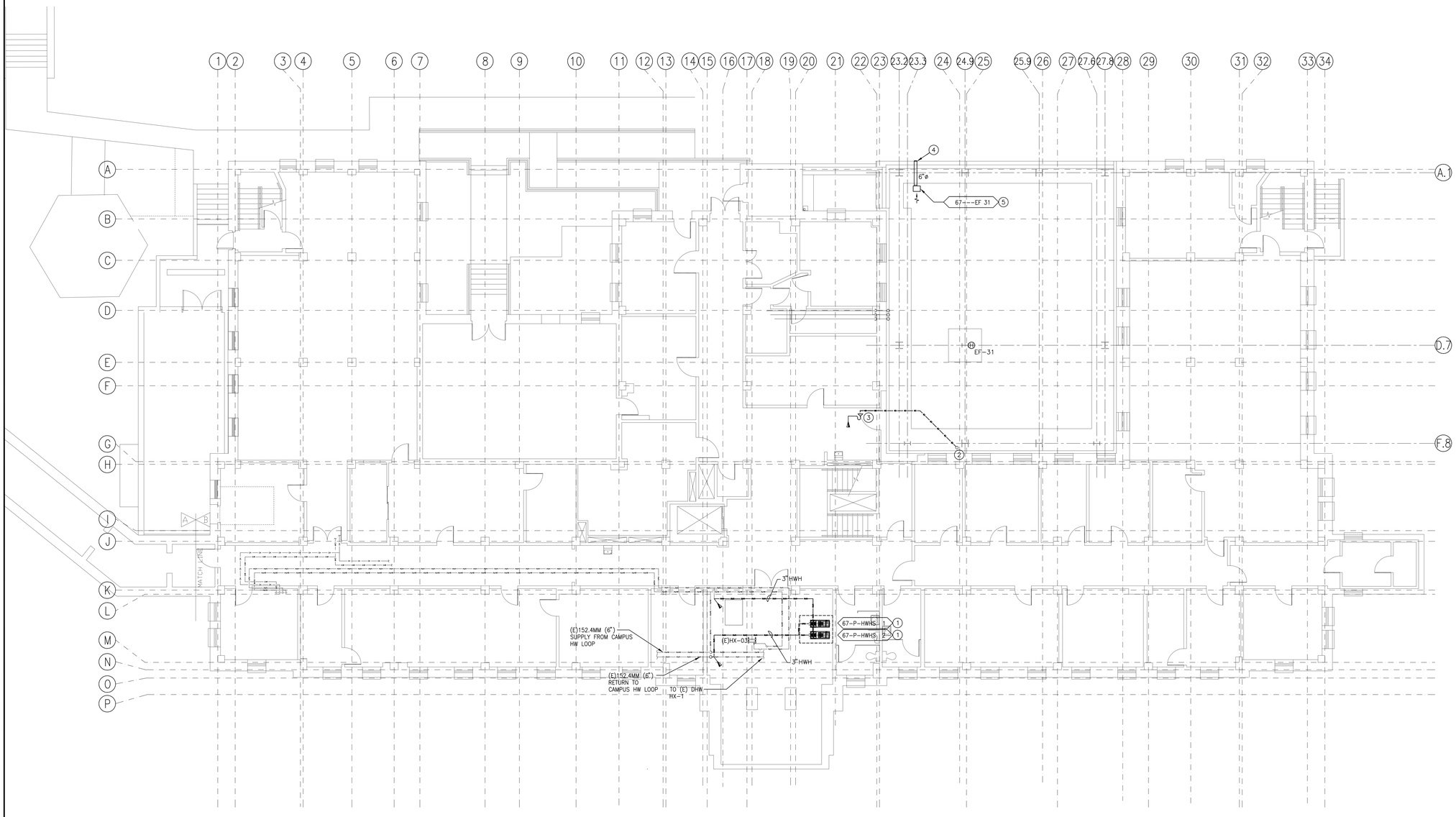
DATE: 07/12/2013
PROJECT NO. 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE
APPROVED: MEDICAL CENTER DIRECTOR

BUILDING NUMBER: 67
CHECKED: SCH
DRAWN: RP
LOCATION: VAMC BOISE, IDAHO

DRAWING NO. M1.6
DWG 78 OF 191

DEPARTMENT OF VETERANS AFFAIRS



TRUE PLAN

BASEMENT FLOOR HVAC PLAN

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. INDIVIDUAL CD RUNOUTS ARE 3/4".

C. SEE FOUR PIPE FCU SCHEDULE ON M0.2 FOR RUNOUT SIZES.

SHEET NOTES:

1. SEE INSTALLATION DETAIL #6 ON M3.1. PROVIDE 4" CONCRETE HOUSEKEEPING PAD.
2. 1-1/2" CD UP. SEE M2.2.
3. CONNECT TO EXISTING 4"SS WITH INDIRECT WASTE.
4. TERMINATE 6"ø DUCT WITH GRAVITY DAMPER WALL JACK.
5. MOUNT EXHAUST FAN AS TIGHT TO STRUCTURE AND PER MANUFACTURER'S RECOMMENDATIONS. START FAN WITH 120 VOLT HUMIDISTAT. INITIAL SET POINT 60% RH.
6. FOOTPRINT FOR HEATING WATER PUMPS 6'x5' WITH ACCESS CLEARANCE. COORDINATE WITH EXISTING EQUIPMENT.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1-1/4")	(N)31.8MM (1-1/4")
(E)38.1MM (1-1/2")	(N)38.1MM (1-1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2-1/2")	(N)63.5MM (2-1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS | DATE

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CAD FILE NAME: 531-320_M2.0.DWG

XREF FILE NAME: 531-320_30X42TLBK.DWG 531-320_67A0.DWG

DRAWING TITLE: BASEMENT FLOOR HVAC PLAN

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013

PROJECT NO.: 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

APPROVED: MEDICAL CENTER DIRECTOR

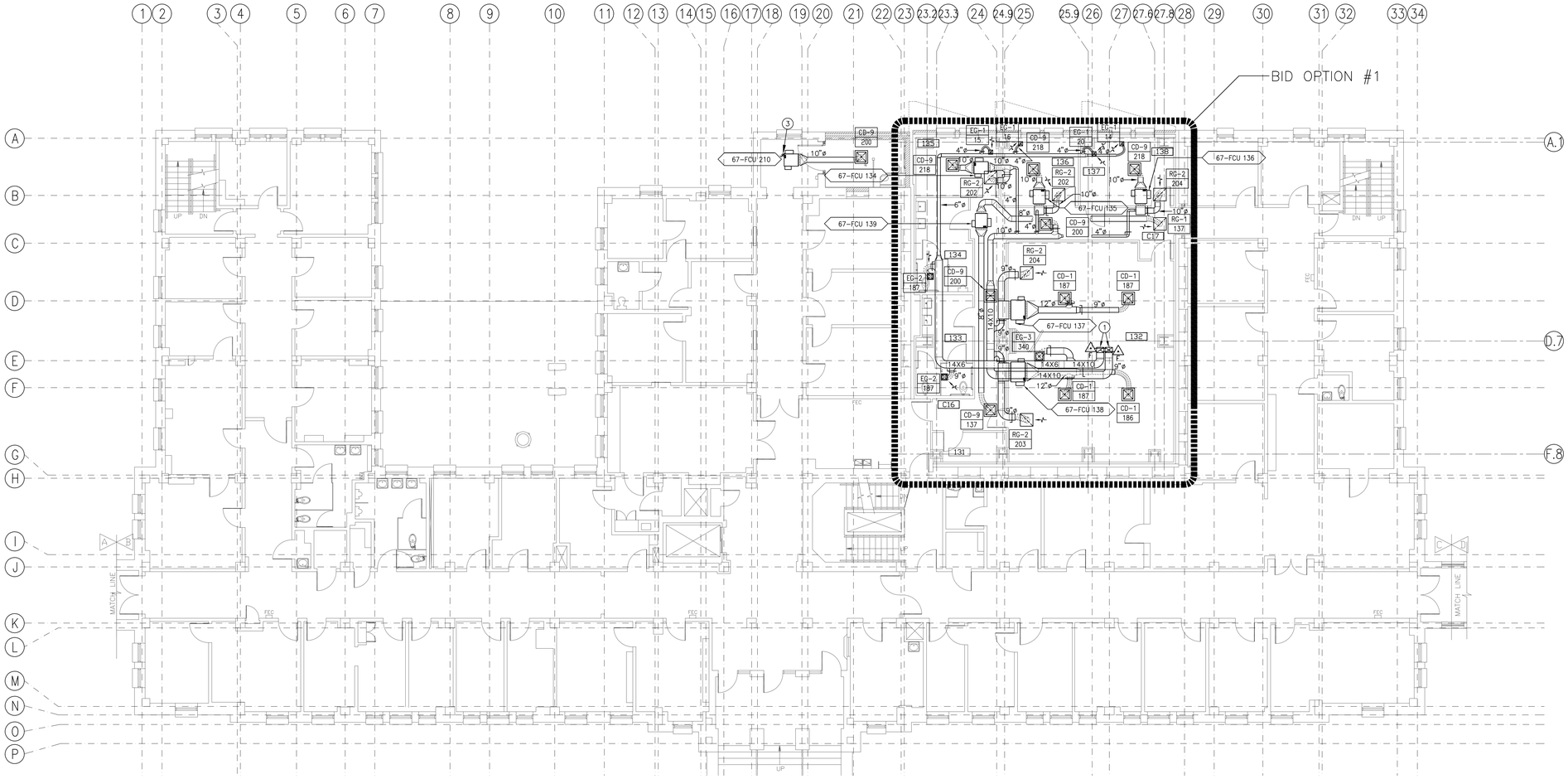
BUILDING NUMBER: 67 | CHECKED: SCH | DRAWN: RP

LOCATION: VAMC BOISE, IDAHO

DRAWING NO.: M2.0

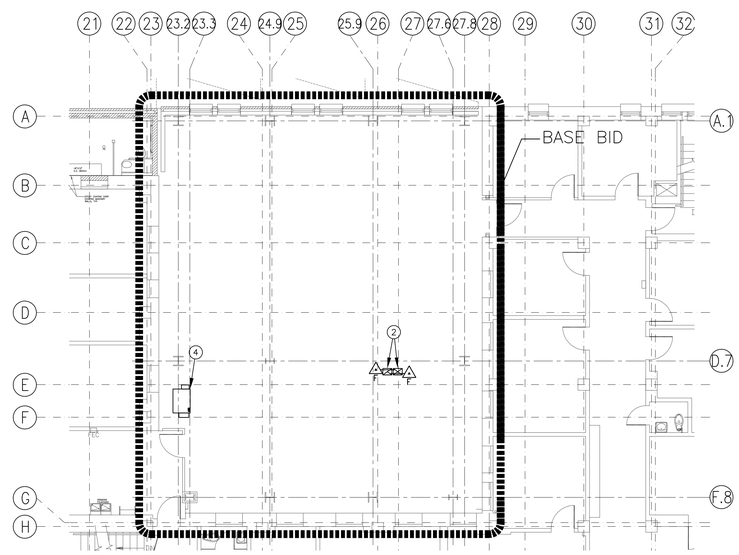
DWG 79 OF 191

DEPARTMENT OF VETERANS AFFAIRS



1 FIRST FLOOR AIRSIDE HVAC PLAN

SCALE: 1/8" = 1'-0"



2 FIRST FLOOR AIRSIDE HVAC PLAN-BASE BID

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

SHEET NOTES:

1. VENTILATION RISERS TO SECOND FLOOR. SEE M2.3 FOR CONTINUATION.
2. CAP VENTILATION RISERS AT CEILING.
3. 4" OUTSIDE AIR DUCT UP THROUGH ROOF. TERMINATE WITH GOOSENECK AND 1/4" BIRDSCREEN.
4. FAN COIL SHALL OPERATE TO MAINTAIN A MINIMUM OF 60°F IN UNOCCUPIED SPACE.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1-1/4")	(N)31.8MM (1-1/4")
(E)38.1MM (1-1/2")	(N)38.1MM (1-1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2-1/2")	(N)63.5MM (2-1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS | DATE

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CAD FILE NAME: 531-320_M2.1.DWG
XREF FILE NAME: 531-320_30X42TLBK.DWG 531-320_67A1.DWG

DRAWING TITLE: FIRST FLOOR AIRSIDE HVAC PLAN

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

APPROVED: MEDICAL CENTER DIRECTOR

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

BUILDING NUMBER: 67 | CHECKED: SCH | DRAWN: RP

LOCATION: VAMC BOISE, IDAHO

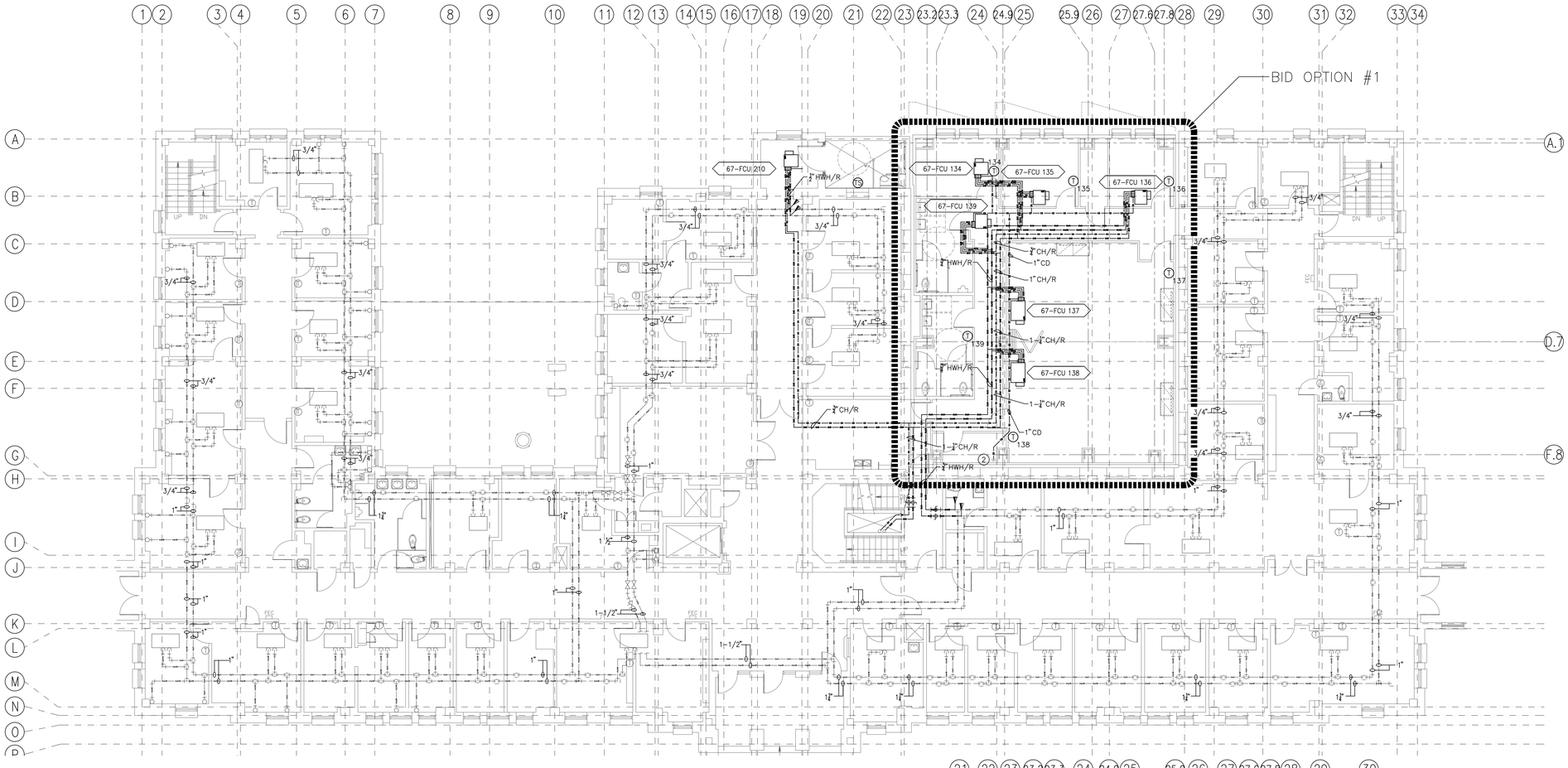
DATE: 07/12/2013

PROJECT NO.: 531-320

DRAWING NO.: M2.1

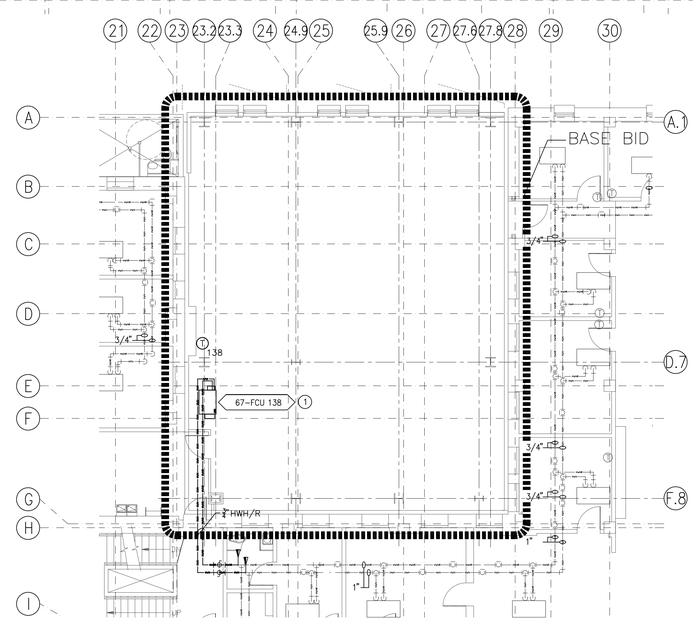
DWG 80 OF 191

DEPARTMENT OF VETERANS AFFAIRS



1 FIRST FLOOR HYDRONIC HVAC PLAN

SCALE: 1/8" = 1'-0"



2 FIRST FLOOR HYDRONIC HVAC PLAN-BASE BID

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. INDIVIDUAL CD RUNOUTS ARE 3/4".

C. SEE FOUR PIPE FCU SCHEDULE ON M0.2 FOR RUNOUT SIZES.

SHEET NOTES:

1. INSTALL 67-FCU-138 FOR SHELL SPACE HEAT. CONNECT ONLY THE HOT WATER COIL. FREE RETURN. PROVIDE MFR COLLAR MOUNTED DISCHARGE GRILLE.
2. 1-1/4" CD UP, 1-1/2" CD DN.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1-1/4")	(N)31.8MM (1-1/4")
(E)38.1MM (1-1/2")	(N)38.1MM (1-1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2-1/2")	(N)63.5MM (2-1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

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CAD FILE NAME: 531-320_M2.2.DWG
XREF FILE NAME: 531-320_30X42TLBK.DWG 531-320_67A1.DWG

DRAWING TITLE: FIRST FLOOR HYDRONIC HVAC PLAN

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013
PROJECT NO. 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE
APPROVED: MEDICAL CENTER DIRECTOR

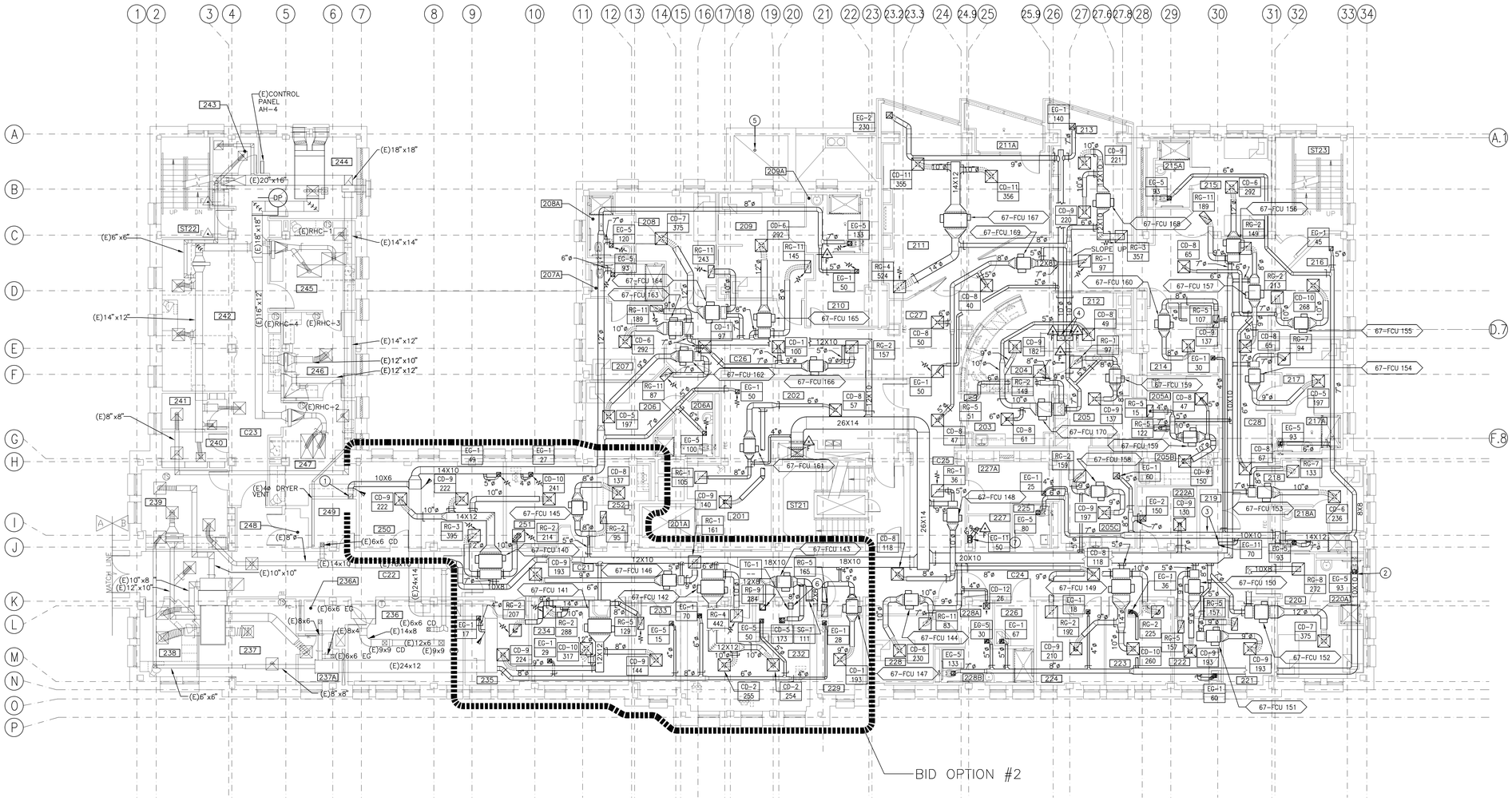
BUILDING NUMBER: 67 | CHECKED: SCH | DRAWN: RP

LOCATION: VAMC BOISE, IDAHO

DRAWING NO. M2.2

DWG 81 OF 191

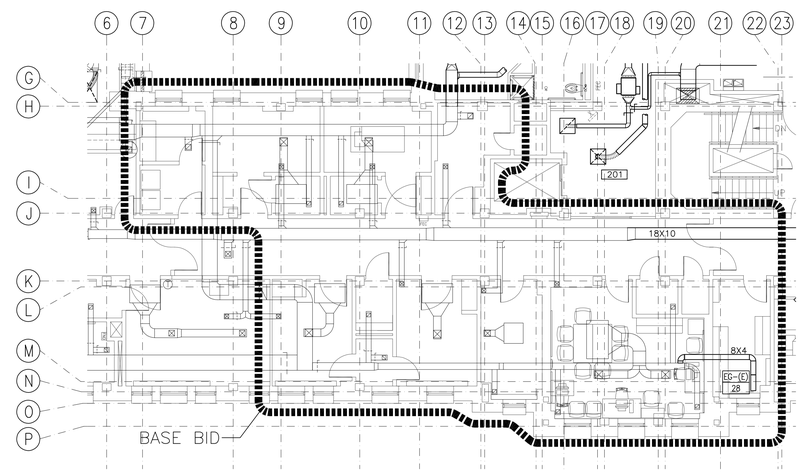
DEPARTMENT OF VETERANS AFFAIRS



TRUE PLAN

1 SECOND FLOOR AIRSIDE HVAC PLAN

SCALE: 1/8" = 1'-0"



TRUE PLAN

2 SECOND FLOOR AIRSIDE HVAC PLAN-BASE BID

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. ALL RETURN AIR MIXING WITH FRESH AIR FROM ERV SHALL BE EQUIPPED WITH DAMPERS ON EACH DUCT AND BALANCED ACCORDING TO AIR DESIGN SCHEDULE ON SHEET M0.5.

C. IN THE EVENT OF A CONFLICT OF AIRFLOW DATA BETWEEN THIS SHEET AND THE VALUE SHOWN ON M0.5, USE THE VALUE GIVEN ON SHEET M0.5.

D. 201 DEPICTS ROOM NUMBER.

SHEET NOTES:

1. PRESERVE EXISTING EXHAUST DUCT AND GRILLE. BALANCE TO 160 CFM.
2. 6X6 DUCT DOWN TO GRILLE BELOW WITH DAMPER.
3. COORDINATE DUCT AND DIFFUSER LOCATION WITH ELECTRICAL PANELS AND CONDUITS.
4. VENTILATION RISERS FROM FIRST FLOOR (SHEET M2.1) UP TO THIRD FLOOR (SHEET M2.5).
5. 4" O.S.A. DUCT DOWN TO FIRST FLOOR. SEE SHEET M2.1 FOR CONTINUATION.
6. MOUNT TRANSFER GRILLE LOW ON WALL.
7. EXHAUST GRILLE TO BE MOUNTED ON 14X8 PLENUM BOX. TRANSITION BOX AS NECESSARY TO 6"ø DUCT. EXHAUST GRILLE SHALL NOT EXCEED 12" ABOVE FINISHED FLOOR.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1-1/4")	(N)31.8MM (1-1/4")
(E)38.1MM (1-1/2")	(N)38.1MM (1-1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2-1/2")	(N)63.5MM (2-1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS	DATE

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CAD FILE NAME: 531-320_M2.3.DWG

XREF FILE NAME: 531-320_30X42TLBK.DWG 531-320_67A2.DWG

DRAWING TITLE: SECOND FLOOR AIRSIDE HVAC PLAN

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013

PROJECT NO. 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

APPROVED: MEDICAL CENTER DIRECTOR

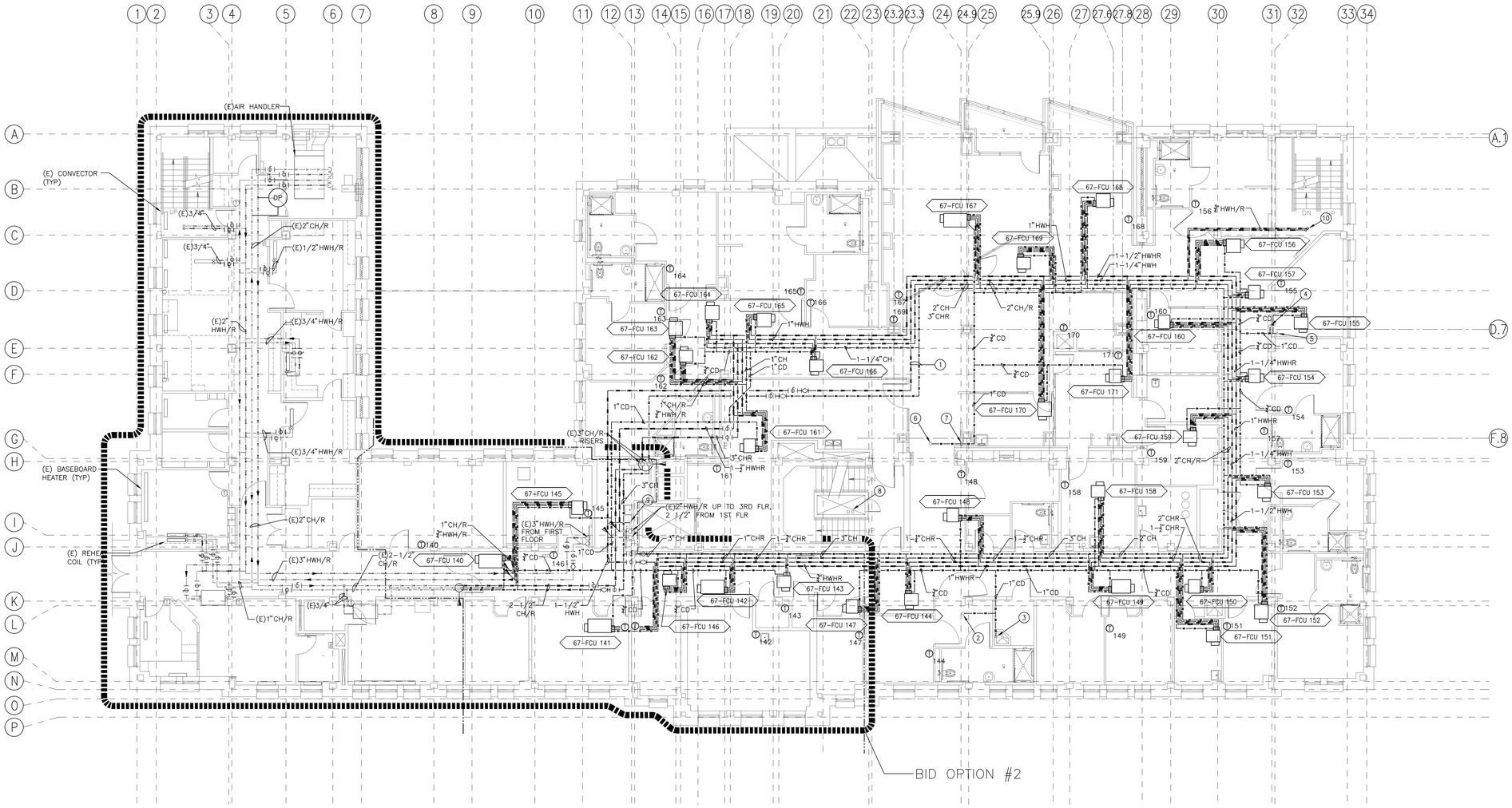
BUILDING NUMBER 67 | CHECKED SCH | DRAWN AA

LOCATION VAMC BOISE, IDAHO

DRAWING NO. M2.3

DWG 82 OF 191

DEPARTMENT OF VETERANS AFFAIRS



TRUE PLAN

1 SECOND FLOOR HYDRONIC HVAC PLAN

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. INDIVIDUAL CD RUNOUTS ARE 3/4".

C. SEE FOUR PIPE FCU SCHEDULE ON M0.2 FOR RUNOUT SIZES.

SHEET NOTES:

1. BACKFEED CH AND HWH TEMPORARILY UNTIL PHASE 3 IS COMPLETE. 2" CH & 1-1/2" HWH. REMOVE PIPE AND CAP AFTER PH3 COMPLETION.
2. 1-1/4" CD FROM THIRD FLOOR.
3. 1-1/4" CD DN TO INDIRECT DRAIN OVER MOP SINK.
4. 1" CD FROM THIRD FLOOR.
5. 1-1/4" CD DN TO INDIRECT DRAIN OVER STAND PIPE. SEE P2.2.
6. 1" CD FROM THIRD FLOOR.
7. 1-1/4" CD DN TO FIRST FLOOR. SEE M2.2.
8. EXISTING 3" CH/R RISERS UP/DN TO FIRST FLOOR AND BASEMENT.
9. 1-1/4" CD DN TO INDIRECT DRAIN OVER STAND PIPE. SEE P2.2.
10. 3/4" HWH/R UP TO CUH. SEE M2.6.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1-1/4")	(N)31.8MM (1-1/4")
(E)38.1MM (1-1/2")	(N)38.1MM (1-1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2-1/2")	(N)63.5MM (2-1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS	DATE

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CAD FILE NAME: 531-320_M2.4.DWG

XREF FILE NAME: 531-320_30X42TLBK.DWG 531-320_67A2.DWG

DRAWING TITLE: SECOND FLOOR HYDRONIC HVAC PLAN

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013

PROJECT NO. 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

APPROVED: MEDICAL CENTER DIRECTOR

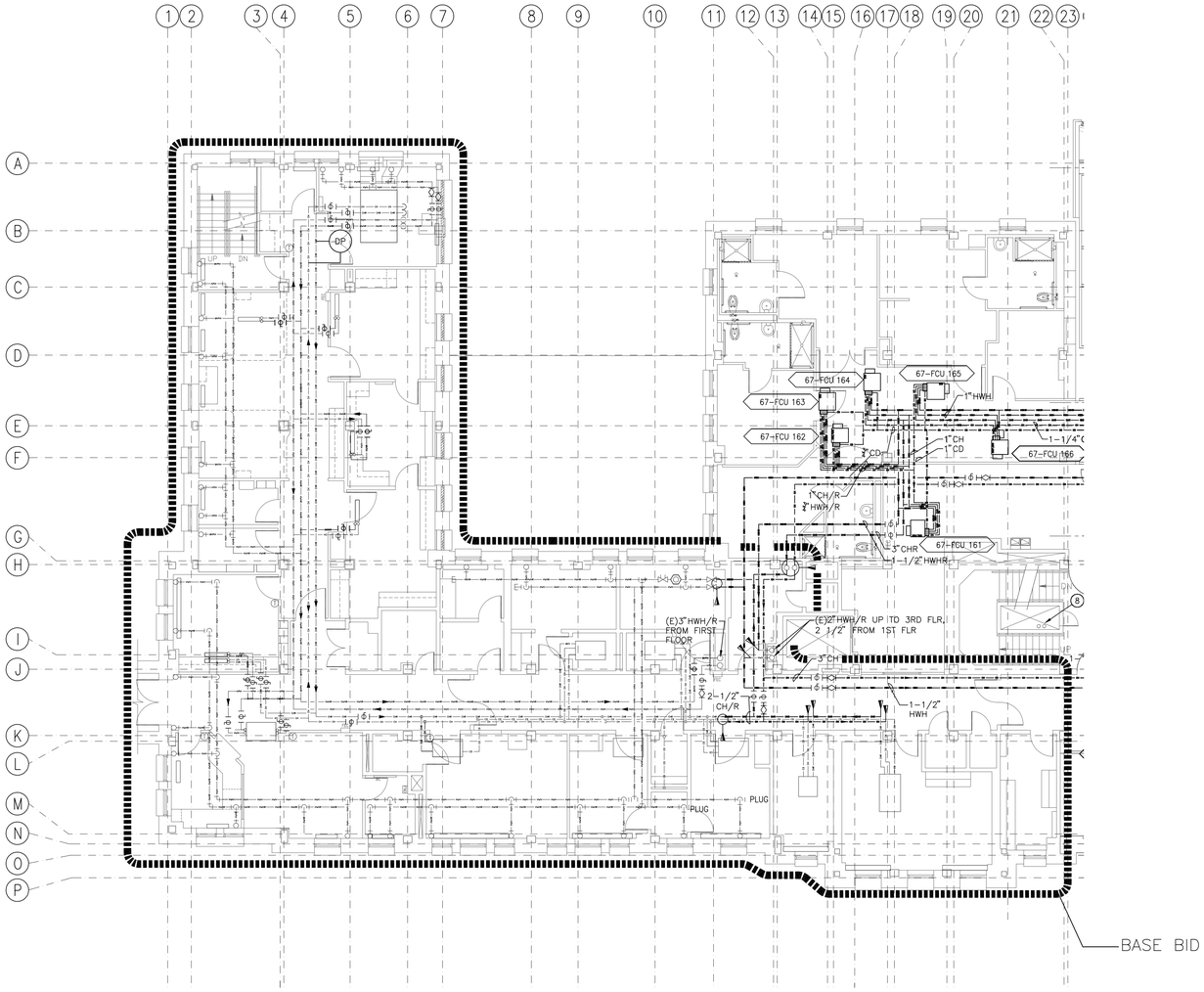
BUILDING NUMBER	CHECKED	DRAWN
67	SCH	RP

LOCATION: VAMC BOISE, IDAHO

DRAWING NO. M2.4

DWG 83 OF 191

DEPARTMENT OF VETERANS AFFAIRS



TRUE PLAN

1 SECOND FLOOR HYDRONIC HVAC PLAN–BASE BID

SCALE: 1/8" = 1'–0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. INDIVIDUAL CD RUNOUTS ARE 3/4".

C. SEE FOUR PIPE FCU SCHEDULE ON M0.2 FOR RUNOUT SIZES.

SHEET NOTES:

1. EXISTING 3" CH/R RISERS UP/DN TO FIRST FLOOR AND BASEMENT.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1–1/4")	(N)31.8MM (1–1/4")
(E)38.1MM (1–1/2")	(N)38.1MM (1–1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2–1/2")	(N)63.5MM (2–1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS	DATE

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CAD FILE NAME: 531–320_M2.4A.DWG

XREF FILE NAME: 531–320_30X42TLBK.DWG 531–320_67A2.DWG

DRAWING TITLE: SECOND FLOOR HYDRONIC HVAC PLAN–BASE BID

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

APPROVED: MEDICAL CENTER DIRECTOR

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

BUILDING NUMBER: 67 | CHECKED: SCH | DRAWN: RP

LOCATION: VAMC BOISE, IDAHO

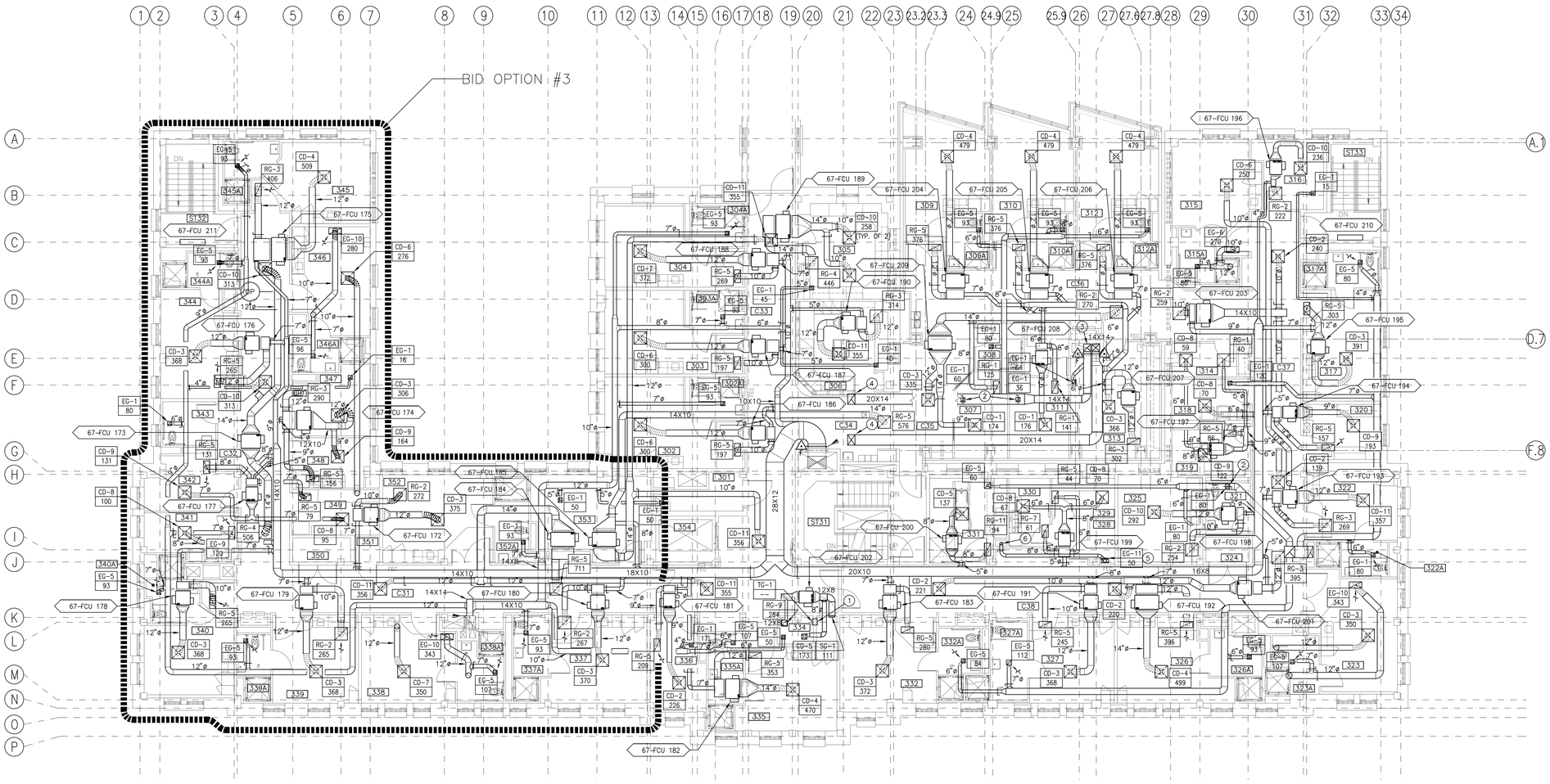
DATE: 07/12/2013

PROJECT NO.: 531–320

DRAWING NO.: M2.4A

DWG 84 OF 191

DEPARTMENT OF VETERANS AFFAIRS



TRUE PLAN

1 THIRD FLOOR AIRSIDE HVAC PLAN

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. ALL RETURN AIR MIXING WITH FRESH AIR FROM ERV SHALL BE EQUIPPED WITH DAMPERS ON EACH DUCT AND BALANCED ACCORDING TO AIR DESIGN SCHEDULE ON SHEET M0.5.

C. IN THE EVENT OF A CONFLICT OF AIRFLOW DATA BETWEEN THIS SHEET AND THE VALUE SHOWN ON M0.5, USE THE VALUE GIVEN ON SHEET M0.5.

SHEET NOTES:

1. MOUNT TRANSFER GRILLE LOW ON WALL.
2. 6X6 DUCT DOWN TO GRILLE BELOW WITH DAMPER.
3. VENTILATION RISERS FROM SECOND FLOOR (SHEET M2.3)
4. SA/EA VENTILATION RISERS UP TO PH MECH. RM. (SHEET M2.7).
5. EXHAUST GRILLE TO BE MOUNTED ON 14X8 PLENUM BOX. TRANSITION BOX AS NECESSARY TO 6"ø DUCT. EXHAUST GRILLE SHALL NOT EXCEED 12" ABOVE FINISHED FLOOR.
6. 6"ø UP FROM SECOND FLOOR SEE SHEET M2.3 FOR CONTINUATION. 6"ø UP TO ATTIC SPACE, SEE SHEET M2.7 FOR CONTINUATION.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1-1/4")	(N)31.8MM (1-1/4")
(E)38.1MM (1-1/2")	(N)38.1MM (1-1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2-1/2")	(N)63.5MM (2-1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS	DATE

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CAD FILE NAME: 531-320_M2.5.DWG

XREF FILE NAME: 531-320_30X42TLBK.DWG 531-320_67A3.DWG

DRAWING TITLE: THIRD FLOOR AIRSIDE HVAC PLAN

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013

PROJECT NO.: 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

APPROVED: MEDICAL CENTER DIRECTOR

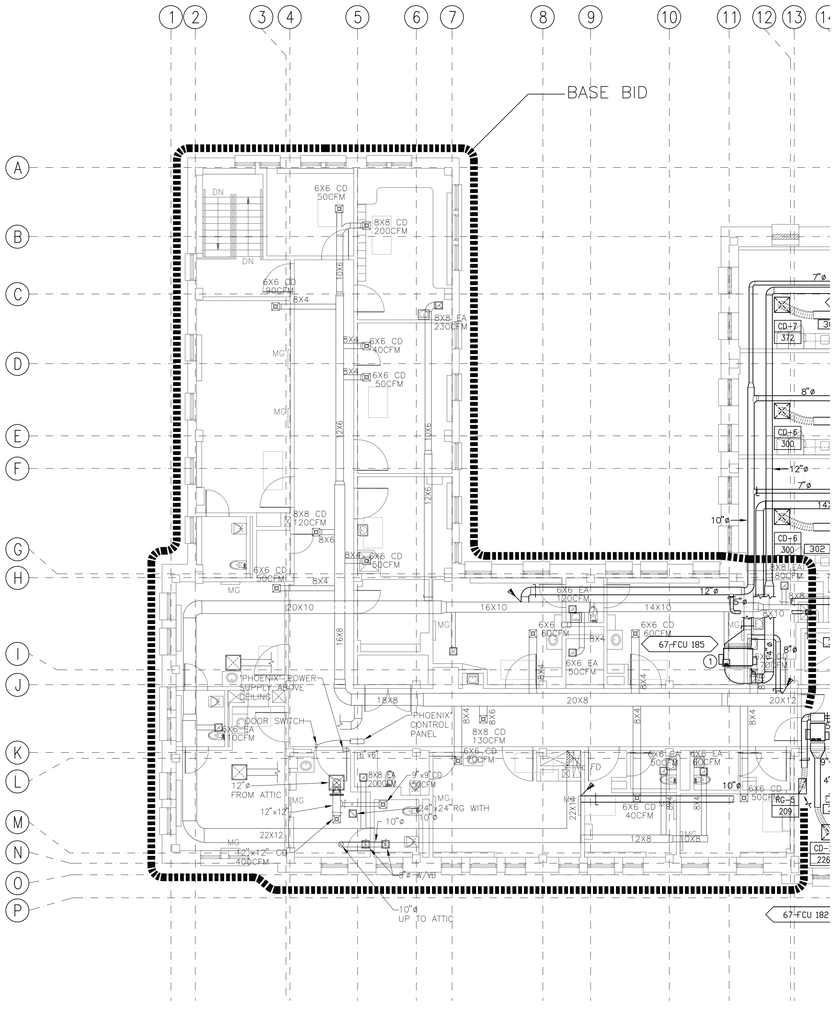
BUILDING NUMBER: 67 | CHECKED: SCH | DRAWN: AA

LOCATION: VAMC BOISE, IDAHO

DRAWING NO.: M2.5

DWG 85 OF 191

DEPARTMENT OF VETERANS AFFAIRS



TRUE PLAN

1 THIRD FLOOR AIRSIDE HVAC PLAN–BASE BID

SCALE: 1/8" = 1'–0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. ALL RETURN AIR MIXING WITH FRESH AIR FROM ERV SHALL BE EQUIPPED WITH DAMPERS ON EACH DUCT AND BALANCED ACCORDING TO AIR DESIGN SCHEDULE ON SHEET M0.5.

C. IN THE EVENT OF A CONFLICT OF AIRFLOW DATA BETWEEN THIS SHEET AND THE VALUE SHOWN ON M0.5, USE THE VALUE GIVEN ON SHEET M0.5.

SHEET NOTES:

1. COORDINATE INSTALLATION OF NEW FAN COIL WITH EXISTING EQUIPMENT. FIELD VERIFY EXACT CONDITIONS AND REQUIREMENTS.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1–1/4")	(N)31.8MM (1–1/4")
(E)38.1MM (1–1/2")	(N)38.1MM (1–1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2–1/2")	(N)63.5MM (2–1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS | DATE

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CAD FILE NAME: 531–320_M2.5A.DWG
XREF FILE NAME: 531–320_30X42TLBK.DWG 531–320_67A3.DWG

DRAWING TITLE: THIRD FLOOR AIRSIDE HVAC PLAN–BASE BID

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013
PROJECT NO.: 531–320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE
APPROVED: MEDICAL CENTER DIRECTOR

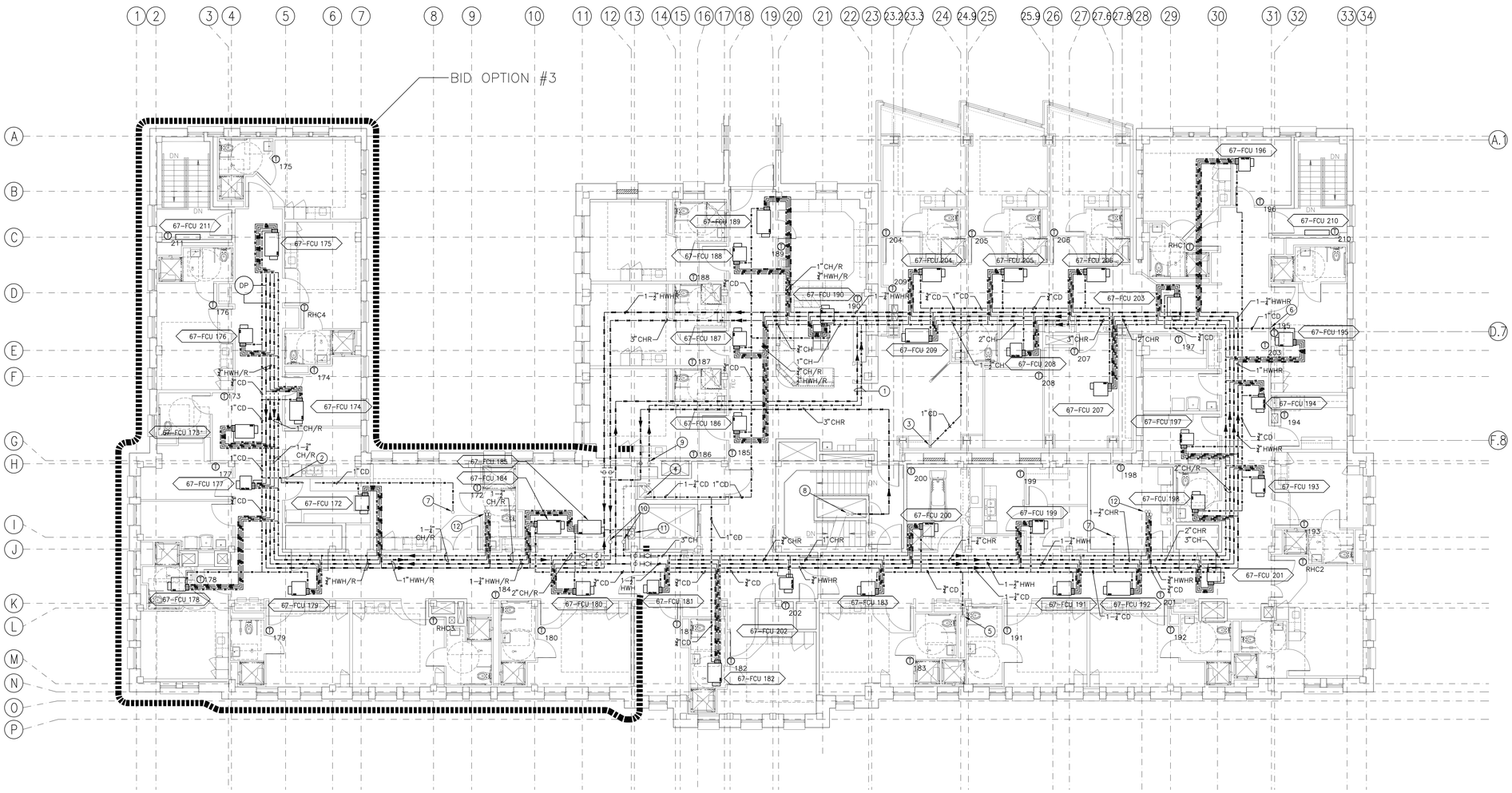
BUILDING NUMBER: 67 | CHECKED: SCH | DRAWN: AA

LOCATION: VAMC BOISE, IDAHO

DRAWING NO.: M2.5A

DWG 86 OF 191

DEPARTMENT OF VETERANS AFFAIRS



TRUE PLAN

1 THIRD FLOOR HYDRONIC HVAC PLAN

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. INDIVIDUAL CD RUNOUTS ARE 3/4".

C. SEE FOUR PIPE FCU SCHEDULE ON M0.2 FOR RUNOUT SIZES.

SHEET NOTES:

1. BACKFEED CH AND HWH TEMPORARILY UNTIL PHASE 3 IS COMPLETE. 2" CH & 1-1/2" HWH. REMOVE PIPE AND CAP AFTER PH3 COMPLETION.
2. 1-1/4" CD DN TO INDIRECT DRAIN OVER STAND PIPE IN ROOM 348. SEE P2.2.
3. 1" CD DN. SEE M2.4 FOR CONTINUATION.
4. 1-1/4" CD DN TO INDIRECT DRAIN OVER MOP SINK.
5. 1-1/4" CD DN. SEE M2.4 FOR CONTINUATION.
6. 1" CD DN. SEE M2.4 FOR CONTINUATION.
7. 1" CD UP. SEE M2.7 FOR CONTINUATION.
8. EXISTING 3" CH/R RISERS UP/DN TO FIRST FLOOR AND BASEMENT.
9. CONNECT 2" CH BACKFEED TO EXISTING 4" RISER.
10. 4" CH/R UP TO PENTHOUSE MECHANICAL ROOM. SEE M2.7 FOR CONTINUATION.
11. EXISTING 2" HWH/R UP TO PENTHOUSE MECHANICAL ROOM AND DN TO SECOND FLOOR. SEE M2.4 AND M2.7 FOR CONTINUATION.
12. 1" CH/R AND 3/4" HWH/R UP TO ISOLATION ROOM AIR HANDLER AND REHEAT COILS. SEE M2.7 FOR CONTINUATION.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1-1/4")	(N)31.8MM (1-1/4")
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(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS | DATE

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CAD FILE NAME: 531-320_M2.6.DWG

XREF FILE NAME: 531-320_30X42TLBK.DWG 531-320_67A3.DWG

DRAWING TITLE: THIRD FLOOR HYDRONIC HVAC PLAN

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013

PROJECT NO. 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

BUILDING NUMBER 67 | CHECKED SCH | DRAWN RP

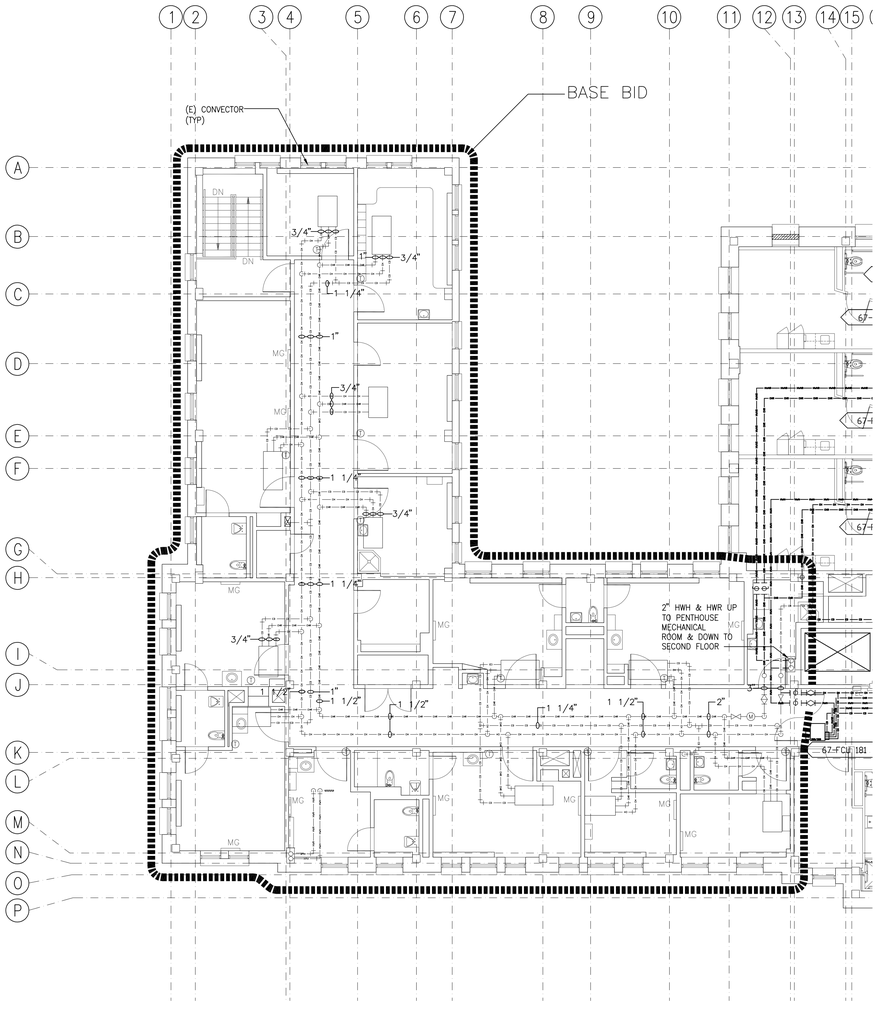
DRAWING NO. M2.6

APPROVED: MEDICAL CENTER DIRECTOR

LOCATION VAMC BOISE, IDAHO

DWG 87 OF 191

DEPARTMENT OF VETERANS AFFAIRS



TRUE PLAN

1 THIRD FLOOR HYDRONIC HVAC PLAN–BASE BID

SCALE: 1/8" = 1'–0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. INDIVIDUAL CD RUNOUTS ARE 3/4".

C. SEE FOUR PIPE FCU SCHEDULE ON M0.2 FOR RUNOUT SIZES.

SHEET NOTES:

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1–1/4")	(N)31.8MM (1–1/4")
(E)38.1MM (1–1/2")	(N)38.1MM (1–1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2–1/2")	(N)63.5MM (2–1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS | DATE

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CAD FILE NAME: 531–320_M2.6A.DWG

XREF FILE NAME: 531–320_30X42TLBK.DWG 531–320_67A3.DWG

DRAWING TITLE: THIRD FLOOR HYDRONIC HVAC PLAN–BASE BID

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

APPROVED: MEDICAL CENTER DIRECTOR

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

BUILDING NUMBER: 67 | CHECKED: SCH | DRAWN: RP

LOCATION: VAMC BOISE, IDAHO

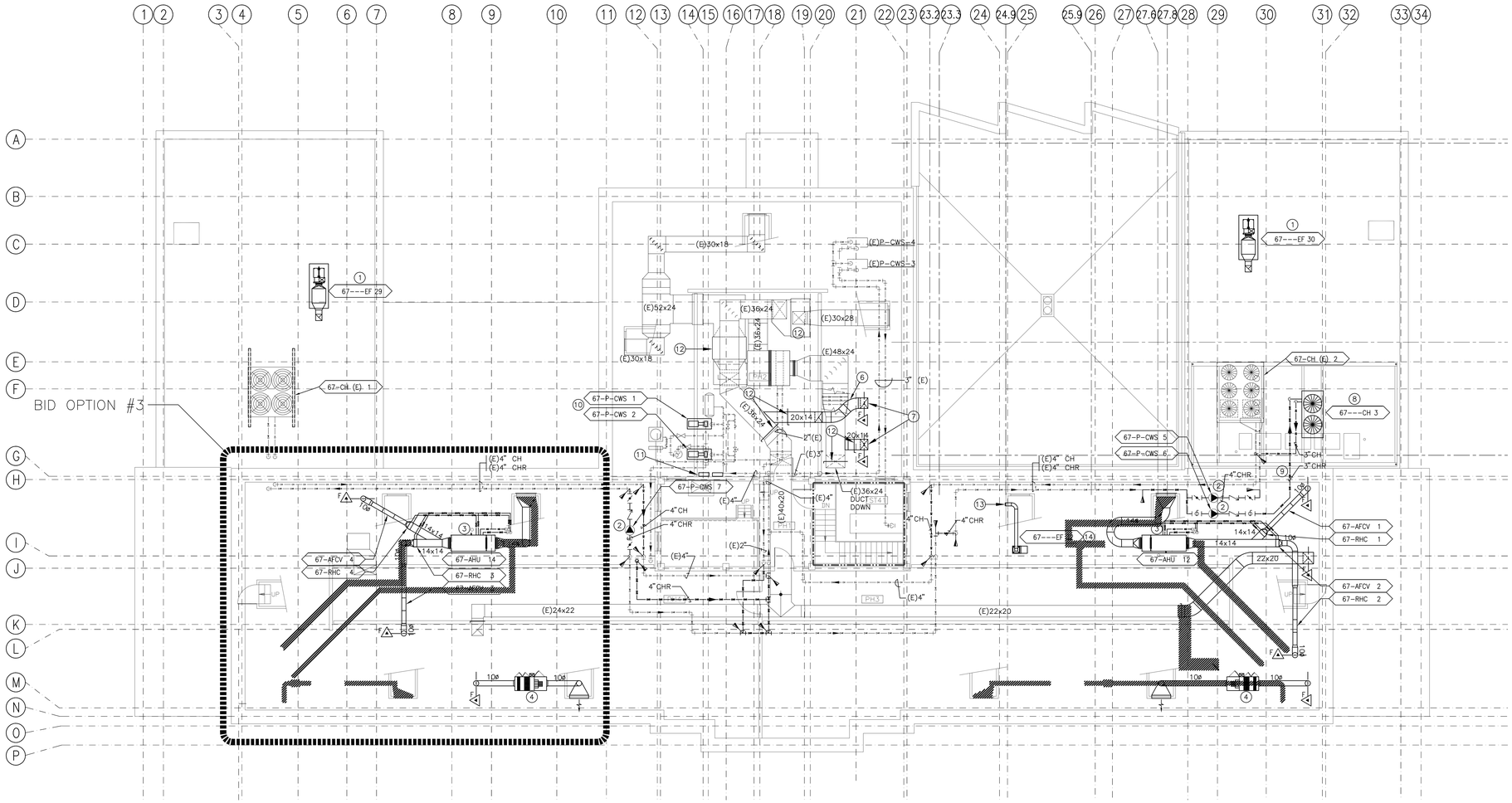
DATE: 07/12/2013

PROJECT NO.: 531–320

DRAWING NO.: M2.6A

DWG 88 OF 191

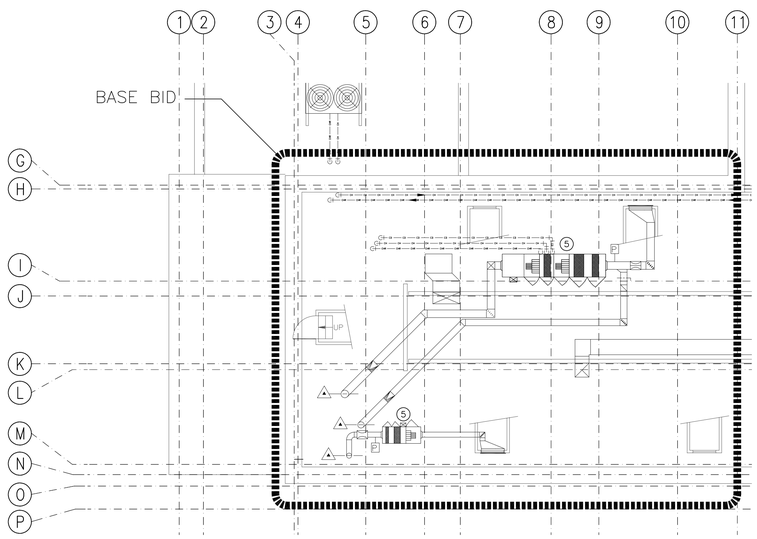
DEPARTMENT OF VETERANS AFFAIRS



TRUE PLAN

1 PENTHOUSE HVAC PLAN

SCALE: 1/8" = 1'-0"



TRUE PLAN

2 PENTHOUSE HVAC PLAN–BASE BID

SCALE: 1/8" = 1'-0"

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

B. INDIVIDUAL CD RUNOUTS ARE 3/4".

C. SEE FOUR PIPE FCU SCHEDULE ON M0.2 FOR RUNOUT SIZES.

SHEET NOTES:

1. ISOLATION ROOM EXHAUST FAN SKID MOUNTED ON EQUIPMENT RAILS. PROVIDE RPS MODEL ER–4A OR APPROVED EQUAL. INSULATE EXHAUST DUCT PER SPECIFICATIONS. FLASH ROOF PENETRATION PER ARCHITECTURAL DETAILS.
2. SUSPEND INLINE CHILLER PUMP FROM STRUCTURE. SEE DETAIL #10 ON M3.1.
3. INSTALL NEW ISOLATION ROOM AIR HANDLER ON EXISTING HOUSEKEEPING PAD. CH/R, HWH/R & CD FROM THIRD FLOOR. SEE M2.6 FOR CONTINUATION.
4. EXISTING ISOLATION ROOM EXHAUST FAN REINSTALLED IN NEW LOCATION WITH NEW DUCT, LOUVERS, DAMPERS, CONTROLS, AND 4" CONCRETE HOUSEKEEPING PAD.
5. EXISTING ISOLATION ROOM AIR HANDLER AND EXHAUST FAN TO REMAIN IN SERVICE UNDER BASE–BID. SEE M1.6
6. CROSS UNDER EXISTING SUPPLY DUCT.
7. NEW 20X14 SA/EA DN TO THIRD FLOOR. SEE M2.5 FOR CONTINUATION.
8. NEW CHILLER MOUNTED ON STUCTURAL STEEL FRAME. SEE STRUCTURAL DRAWINGS FOR NEW SUPPORTS. MOUNT ON ASHRAE TYPE 4 ISOLATORS.
9. PIPE PENETRATION THROUGH ROOF. SEE ARCHITECTURAL DRAWINGS FOR FLASHING DETAILS.
10. MOUNT NEW PUMPS ON EXISTING CONCRETE HOUSKEEPING PADS. CONNECT TO EXISTING PIPING. SEE M3.2.
11. NEW CWP VARIABLE SPEED DRIVES. MOUNT ON EXISTING WALL.
12. NEW VOLUME BALANCING DAMPERS. BALANCE EXISTING SUPPLY AND EXHAUST FANS TO ADDITIONAL AIR FLOW RATE FOR THE NEW ADDITION. BALANCE EXISTING DUCTS TO MAINTAIN EXISTING FLOW RATE.
13. TERMINATE 6"ø DUCT WITH GRAVITY DAMPER WALL JACK.
14. MOUNT INLINE EXHAUST FAN VERTICALLY.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1–1/4")	(N)31.8MM (1–1/4")
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(E)63.5MM (2–1/2")	(N)63.5MM (2–1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS | DATE

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CAD FILE NAME: 531–320_M2.7.DWG

XREF FILE NAME: 531–320_30X42TLBK.DWG X67APH.DWG

DRAWING TITLE: PENTHOUSE AIRSIDE HVAC PLAN

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013

PROJECT NO. 531–320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

APPROVED: MEDICAL CENTER DIRECTOR

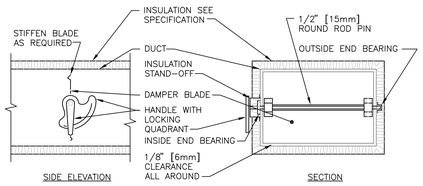
BUILDING NUMBER 67 | CHECKED SCH | DRAWN RP

LOCATION: VAMC BOISE, IDAHO

DRAWING NO. M2.7

DWG 89 OF 191

DEPARTMENT OF VETERANS AFFAIRS

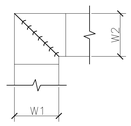


NOTE:

1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

1 VOLUME DAMPER DETAIL

NTS

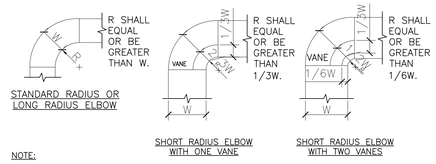


NOTE:

1. ALL VANE ELBOWS SHALL BE CONSTRUCTED AND INSTALLED AS DETAILED BY SMACNA.
2. WHEN W1 DOES NOT EQUAL W2, VANE SHALL BE SINGLE THICKNESS VANE TYPE REGARDLESS OF W DIMENSION.
3. ALL SINGLE THICKNESS VANES SHALL HAVE A 2" [50mm] RADIUS, 1 1/2" [40mm] MAXIMUM SPACE BETWEEN VANES AND A 3/4" [20mm] TRAILING EDGE.
4. WHEN W EQUALS W2 AND W1 IS GREATER THAN 20" [500mm] VANES SHALL BE DOUBLE VANE TYPE.

2 DUCTWORK SQUARE VANE ELBOWS

NTS

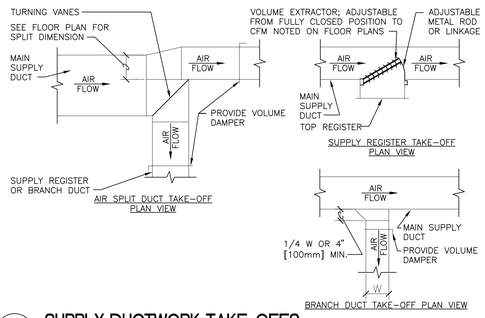


NOTE:

1. THE INTERIOR SURFACE OF ALL RADIUS ELBOWS SHALL BE MADE ROUND.
2. ALL STANDARD RADIUS ELBOWS CAN BE SUBSTITUTED WITH SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VANES SHALL BE CONSTRUCTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.

3 DUCTWORK RADIUS ELBOWS

NTS

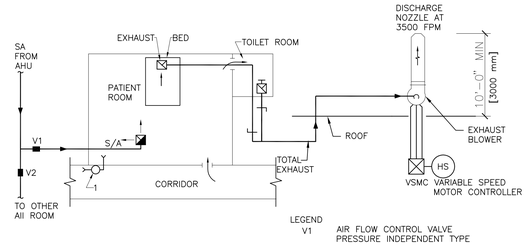


4 SUPPLY DUCTWORK TAKE-OFFS

NTS

DESIGNER'S NOTES:

1. THE SUPPLY REGISTER TAKE-OFF MAY BE USED FOR UP UP TO 25% OF THE MAIN DUCT CFM. THE BRANCH DUCT TAKE-OFF MAY BE USED FOR UP TO 15% OF THE MAIN DUCT CFM ANYTIME AND UP TO 40% WHEN THE MAIN DUCT VELOCITY IS 1000 FPM [5.1 M/S] OR LESS. THE AIR SPLIT DUCT TAKE-OFF SHALL BE USED IN ALL OTHER CASES AND MAY BE USED AT ANYTIME.
2. SHOW ALL VOLUME DAMPERS ON FLOOR PLANS.



GENERAL NOTES:

1. MAINTAIN NEGATIVE AIR PRESSURE (0.01 INCH WATER COLUMN [2.5 PASCAL]) BETWEEN THE AII ROOM AND THE CORRIDOR BY MODULATING VALVE V1. AII ROOMS SHALL HAVE A PERMANENTLY INSTALLED DEVICE AND/OR MECHANISM TO CONSTANTLY MONITOR THE DIFFERENTIAL AIR PRESSURE BETWEEN THE PATIENT ROOM AND THE CORRIDOR. DEVICE TO BE MONITORED BY DDC FOR ALARM CONDITION.
   A LOCAL VISUAL MEANS SHALL BE PROVIDED TO INDICATE WHENEVER NEGATIVE DIFFERENTIAL PRESSURE IS NOT MAINTAINED. (AIRFLOW DIRECTION INC. MODEL ADI-69-V-N)
2. MAINTAIN THE ATTACHED TOILET, IF ANY, AT NEGATIVE AIR PRESSURE WITH RESPECT TO THE AII ROOM. HOWEVER, THE DESIGN NEED NOT INCLUDE A PRESSURE DIFFERENTIAL SENSOR FOR VERIFICATION.
3. LOCATE EXHAUST AIR REGISTER OVER THE PATIENT BED ON THE CEILING. AS AN ALTERNATE, THE EXHAUST AIR REGISTER CAN BE LOCATED ON THE WALL NEAR THE PATIENT HEAD, IF FEASIBLE.
4. LOCATE THE SUPPLY AIR OUTLET TO BLOW AIR TOWARDS THE OCCUPIED AREA.
5. PROVIDE A DEDICATED EXHAUST SYSTEM FOR THE AII ROOMS WITHOUT MIXING IT WITH ANY OTHER EXHAUST.

TYPICAL AIR BALANCE EXAMPLE:

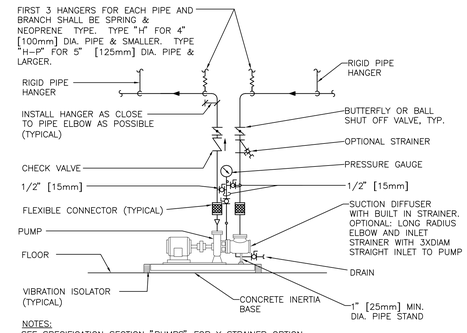
1. THE PATIENT BEDROOM IS KEPT UNDER NEGATIVE PRESSURE BY ENSURING AIR MOVEMENT INTO THE BEDROOM SPACE FROM THE ADJOINING CORRIDOR.
2. THE SUPPLY AIR SYSTEM SHALL CONSIST OF THE CONSTANT VOLUME AIR DELIVERY FROM A DEDICATED AIR HANDLING UNIT WITH DUCT MOUNTED REHEAT COIL TO THE ISOLATION SUITE AS FOLLOWS:

A – PATIENT BEDROOM	MINIMUM 12 ACPH SUPPLY AIR (ASHRAE STANDARD 170 2008). INCREASE SUPPLY AIR VOLUME, IF REQUIRED, TO MEET THE INSIDE DESIGN CONDITIONS IN COOLING AND/OR HEATING MODES. EXAMPLE: 400 CFM [190 L/S]
B – PATIENT TOILET	DO NOT SUPPLY AIR INTO THE TOILET. DRAW MAKE-UP AIR FROM THE PATIENT'S BEDROOM AND EXHAUST AT THE RATE OF 10 ACPH OR 60 CFM [28 L/S]. EXAMPLE: 60 CFM [28 L/S]

5 AIR SYSTEM FOR AIRBORNE INFECTIOUS ISOLATION ROOM (AII) (WITHOUT ANTEROOM)

NTS

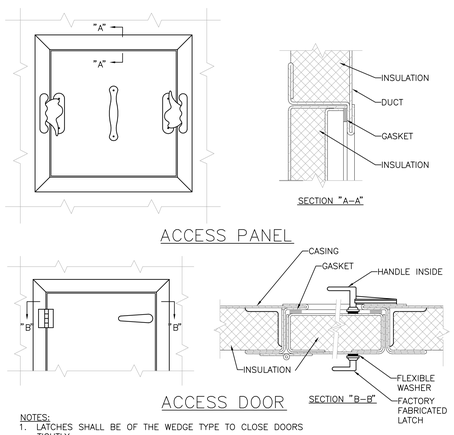
NEGATIVE PRESSURE



NOTES:
SEE SPECIFICATION SECTION "PUMPS" FOR Y STRAINER OPTION

6 SINGLE SUCTION FLOOR-MOUNTED PUMPS - CONNECTIONS WITH FLEXIBLE CONNECTORS

NTS

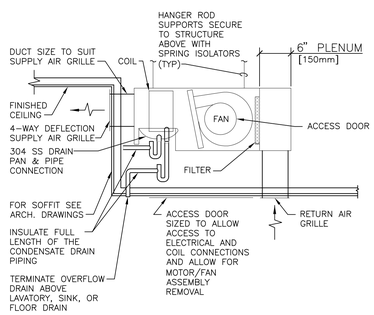


NOTES:

1. LATCHES SHALL BE OF THE WEDGE TYPE TO CLOSE DOORS TIGHTLY.
2. HINGES ON THE ACCESS DOORS SHALL HAVE NON-CORROSIVE PINS.
3. SEE SMACNA 2005, FIGURE 9-15

7 ACCESS PANEL AND DOOR DETAIL

NTS

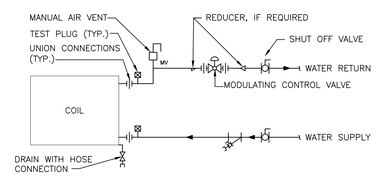


NOTES:

1. SIX INCH [150mm] PLENUM AS SHOWN SHALL BE SUPPLIED BY MANUFACTURER OF FAN COIL UNIT.
2. SEE DETAIL #9 FOR SUPPLY & RETURN PIPING CONNECTIONS.
3. PROVIDE ACCESS FOR FILTER REMOVAL.
4. SEE FAN COIL UNIT SCHEDULE FOR PIPE SIZES.
5. SUPPLY & RETURN GRILLES SHALL BE SIZED TO SUIT CONNECTIONS ON FAN COIL UNIT. DUCTWORK SHALL SUIT GRILLES AND FAN COIL UNIT FURNISHED.

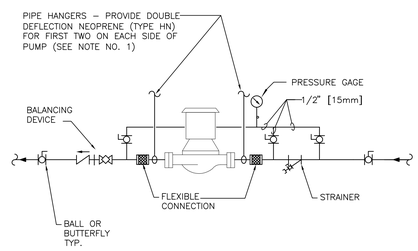
8 FAN COIL UNIT - HORIZONTAL CONCEALED

NTS



9 FAN COIL UNIT WATER COILS - PIPING CONNECTIONS

NTS



NOTES:

1. SUPPORT PUMP FROM PIPING ONLY. DO NOT SUPPORT PUMP FROM MOTOR.

10 IN-LINE PUMPS - CONNECTIONS

NTS

REVISIONS	DATE

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CAD FILE NAME: 531-320_M3.1.DWG
XREF FILE NAME: 531-320_30X42TLBK.DWG

DRAWING TITLE: HVAC DETAILS

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

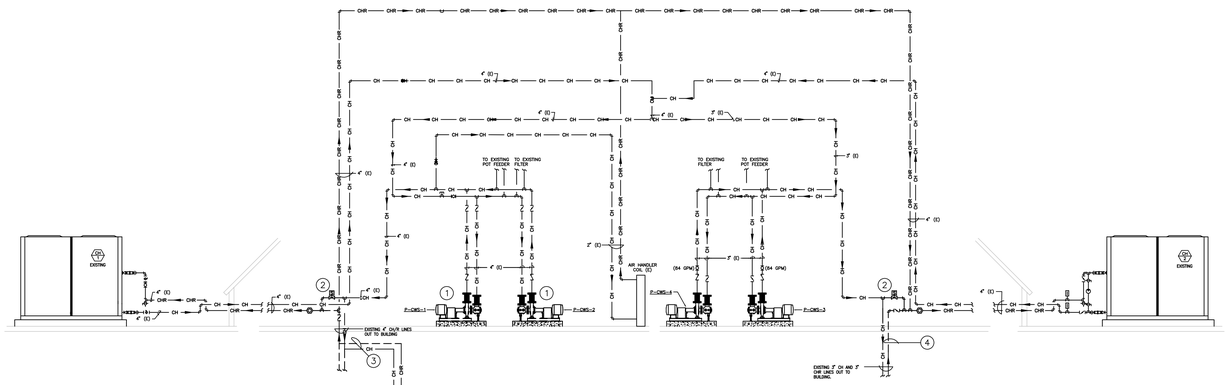
DATE: 07/12/2013
PROJECT NO.: 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE
APPROVED: MEDICAL CENTER DIRECTOR

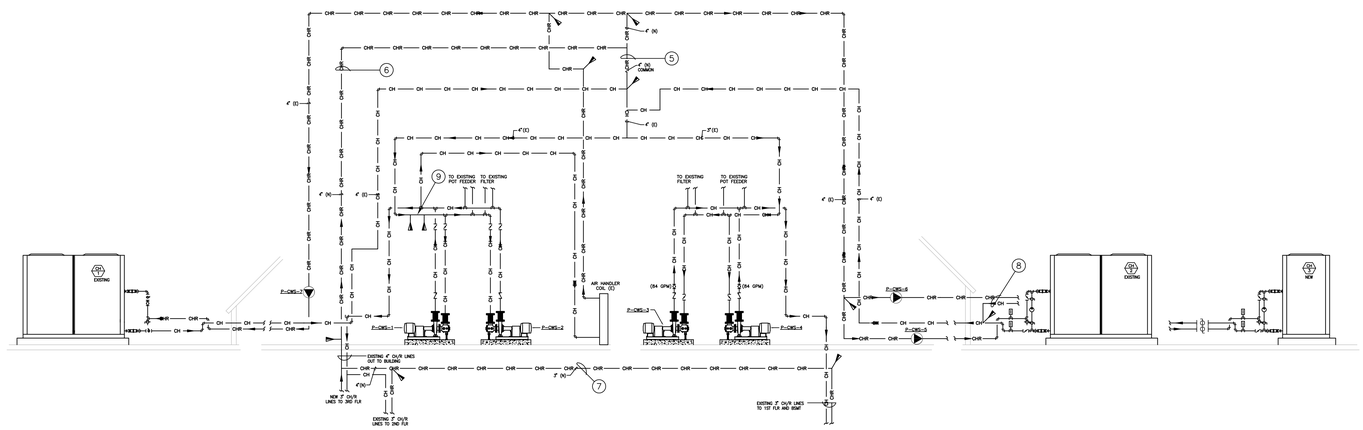
BUILDING NUMBER: 67
CHECKED: SCH
DRAWN: RP
LOCATION: VAMC BOISE, IDAHO

DRAWING NO.: M3.1
DWG 90 OF 191

DEPARTMENT OF VETERANS AFFAIRS



1 EXISTING CHILLED WATER PIPING SCHEMATIC
NTS



2 NEW CHILLED WATER PIPING SCHEMATIC
NTS

GENERAL NOTES:

A. SEE GENERAL NOTES ON M0.1 FOR FURTHER REQUIREMENTS.

SHEET NOTES:

1. REMOVE EXISTING PUMPS 67-P-CWS-1,2. REMOVE THROTTLING DUTY VALVE AND REPLACE WITH SPOOL PIECE. HOUSKEEPING PADS AND PIPING TO BE REUSED.
2. REMOVE CONTROL VALVE, BALANCE VALVE, AND BYPASS.
3. REMOVE 3RD FLOOR LATERAL FOR INTERCONNECT OF RETURNS.
4. REMOVE RISER BETWEEN 3RD FLOOR CEILING AND PENTHOUSE MECHANICAL ROOM FOR INTERCONNECT OF RETURNS.
5. NEW PRIMARY/SECONDARY PIPING CROSSOVER.
6. NEW COMBINED RETURN RISER.
7. NEW RETURN INTERCONNECT IN SECOND FLOOR CEILING.
8. NEW CH-3 PRIMARY LOOP. CONNECT TO EXISTING. INSULATE EXTERIOR PIPE TO MATCH EXISTING.
9. SPOOL PIECE REPLACEMENT OF THROTTLING DUTY VALVE.

LEGEND:

(E)12.7MM (1/2")	(N)12.7MM (1/2")
(E)19.1MM (3/4")	(N)19.1MM (3/4")
(E)25.4MM (1")	(N)25.4MM (1")
(E)31.8MM (1-1/4")	(N)31.8MM (1-1/4")
(E)38.1MM (1-1/2")	(N)38.1MM (1-1/2")
(E)50.8MM (2")	(N)50.8MM (2")
(E)63.5MM (2-1/2")	(N)63.5MM (2-1/2")
(E)76.2MM (3")	(N)76.2MM (3")
(E)101.6MM (4")	(N)101.6MM (4")
(E)152.4MM (6")	(N)152.4MM (6")

REVISIONS	DATE

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CAD FILE NAME: 531-320_M3.4.DWG

XREF FILE NAME: 531-320_30X42TLBK.DWG

DRAWING TITLE: CHILLED WATER SCHEMATIC

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013

PROJECT NO.: 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE

APPROVED: MEDICAL CENTER DIRECTOR

BUILDING NUMBER: 67

CHECKED: SCH

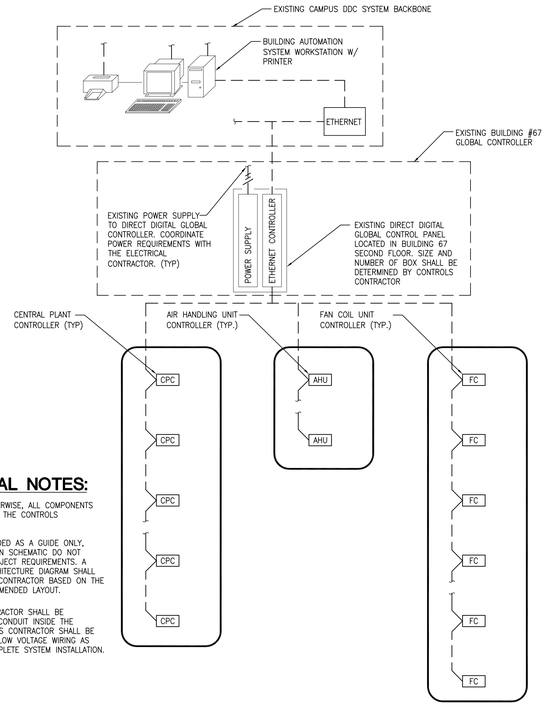
DRAWN: RP

LOCATION: VAMC BOISE, IDAHO

DRAWING NO.: M3.2

DWG 91 OF 191

DEPARTMENT OF VETERANS AFFAIRS



BAS GENERAL NOTES:

A. UNLESS SPECIFIED OTHERWISE, ALL COMPONENTS SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR.

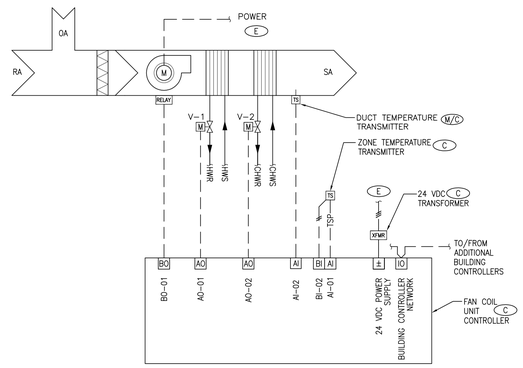
B. THIS DIAGRAM IS PROVIDED AS A GUIDE ONLY, QUANTITIES INDICATED ON SCHEMATIC DO NOT REPRESENT ACTUAL PROJECT REQUIREMENTS. A COMPLETE SYSTEM ARCHITECTURE DIAGRAM SHALL BE SUBMITTED BY THE CONTRACTOR BASED ON THE MANUFACTURERS RECOMMENDED LAYOUT.

C. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONDUIT INSIDE THE BUILDING. THE CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LOW VOLTAGE WIRING AS NECESSARY FOR A COMPLETE SYSTEM INSTALLATION.

1 BUILDING AUTOMATION SYSTEM ARCHITECTURE DIAGRAM
NTS

TYPE OF EQUIPMENT: 4 PIPE FAN COIL UNIT		CONTROL				GRAPHIC DISPLAYS									
ITEMS TO CONTROL AND MONITOR:	POINT ID		START STOP	OPEN/CLOSE	MODULATING/VARYING		STATUS	WATER PRESSURE	AIR PRESSURE	TEMPERATURE	FLOW (CFM)	HUMIDITY	SPEED PERCENTAGE	POSITION	ALARM	PERCENT
SPACE TEMPERATURE SENSOR	AI-01									■						
SUPPLY AIR TEMP	AI-02									■						
* SPACE HUMIDITY SENSOR	AI-03											■				
HEATING WATER VALVE CONTROL	AO-01				■									■		
CHILLED WATER VALVE CONTROL	AO-02				■									■		
SUPPLY FAN ENABLE/DISABLE	BO-01		■													

* PROVIDE COMBINATION TEMP AND HUMIDITY SENSORS FOR CLEAN SUPPLY STORAGE AREAS.



FAN COIL SEQUENCE OF OPERATION (PATIENT ROOMS)

FAN COIL UNIT SHALL OPERATE ON A SCHEDULE AS SET BY THE BAS. FAN SHALL RUN CONTINUOUSLY OR WITH HEATING AND COOLING AS SET BY BAS. THE ADJUSTABLE ROOM TEMP SETPOINT 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)

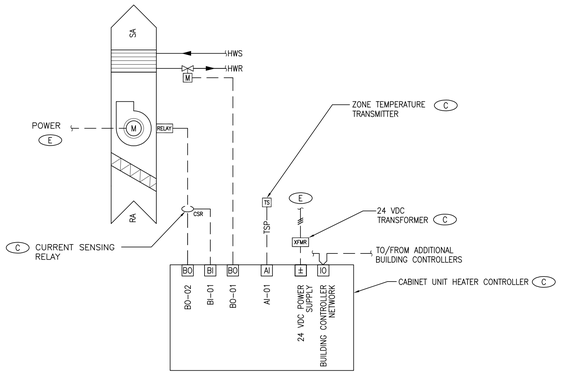
FAN COIL SHALL OPERATE ON A SCHEDULE AS SET BY BAS. FAN SHALL RUN CONTINUOUSLY IN OCCUPIED MODE, OR WITH HEATING AND COOLING AS SET BY BAS. THE ADJUSTABLE ROOM TEMP SETPOINT WILL BE 70°–75° WITH 0.5° HEATING/COOLING OFFSETS. VALVE V–1 & V–2 WILL NOT BE OPEN SIMULTANEOUSLY. ROOM OCCUPANT WILL HAVE ABILITY OF ADJUSTING ROOM TEMPERATURE BETWEEN 70°–75°.

2 4-PIPE FCU CONTROL SCHEMATIC & POINTS LIST
NTS

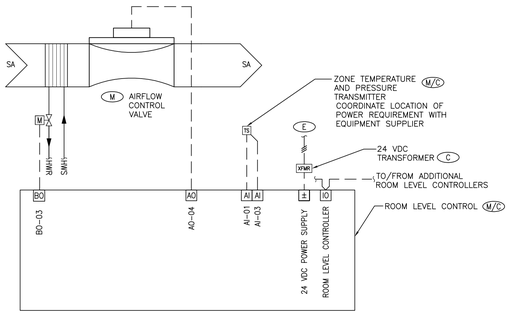
TYPE OF EQUIPMENT: CABINET UNIT HEATER		CONTROL				GRAPHIC DISPLAYS									
ITEMS TO CONTROL AND MONITOR:	POINT ID		START STOP	OPEN/CLOSE	MODULATING/VARYING		STATUS	WATER PRESSURE	AIR PRESSURE	TEMPERATURE	FLOW (CFM)	HUMIDITY	SPEED PERCENTAGE	POSITION	ALARM	PERCENT
SPACE TEMPERATURE SENSOR	AI-01									■						
SUPPLY FAN STATUS	BI-01						■								■	
HEATING WATER VALVE	BO-01				■									■		
SUPPLY FAN ENABLE/DISABLE	BO-02		■													

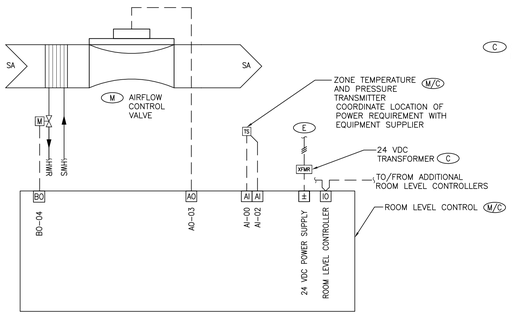
CABINET UNIT HEATER SEQUENCE OF OPERATION

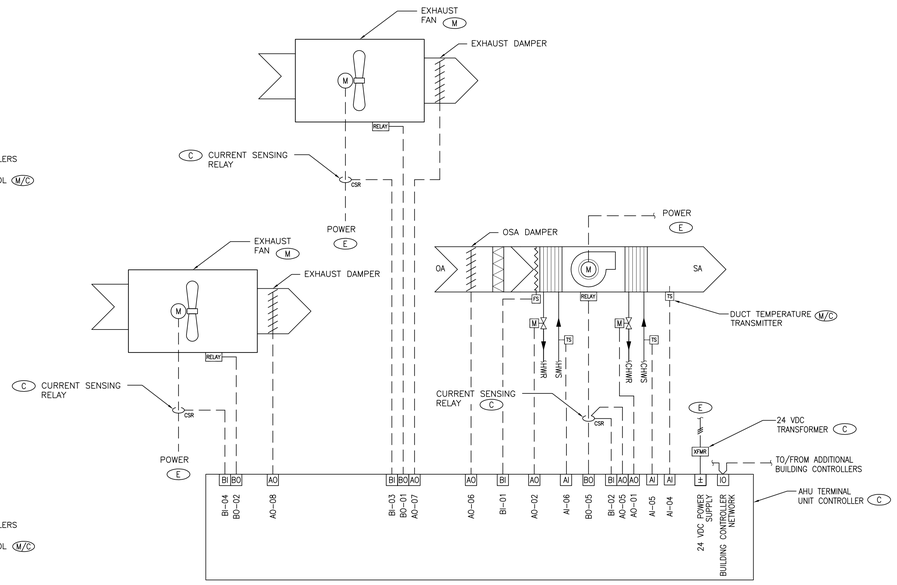
THE CABINET UNIT HEATER SHALL OPERATE ON A SCHEDULE AS SET BY THE BAS. ON A CALL FOR HEATING FROM THE SPACE THERMOSTAT THE VALVE SHALL MODULATE OPEN AND THE FAN SHALL START. WHEN THE SPACE THERMOSTAT IS SATISFIED THE VALVE SHALL CLOSE AND THE FAN SHALL STOP. INITIAL SPACE SETPOINT IS 70° (ADJUSTABLE).



3 HEATING ONLY TWO PIPE FCU CONTROL SCHEMATIC & POINTS LIST
NTS







4 ISOLATION ROOM CONTROL SCHEMATIC & POINTS LIST
NTS

TYPE OF EQUIPMENT: ISOLATION ROOM AIR HANDLER		CONTROL				GRAPHIC DISPLAYS									
ITEMS TO CONTROL AND MONITOR:	POINT ID		START STOP	OPEN/CLOSE	MODULATING/VARYING		STATUS	WATER PRESSURE	AIR PRESSURE	TEMPERATURE	FLOW (CFM)	HUMIDITY	SPEED PERCENTAGE	POSITION	ALARM	PERCENT
SPACE TEMPERATURE SENSOR ROOM 1	AI-00									■						
SPACE TEMPERATURE SENSOR ROOM 2	AI-01									■						
SPACE PRESSURE SENSOR ROOM 1	AI-02								■							
SPACE PRESSURE SENSOR ROOM 2	AI-03								■							
SUPPLY AIR TEMP	AI-04									■						
CHILLED WATER SUPPLY TEMP	AI-05									■						
HEATING WATER SUPPLY TEMP	AI-06									■						
FREEZE STAT	BI-01						■								■	
SUPPLY FAN STATUS	BI-02						■								■	
EXHAUST FAN ROOM 1 STATUS	BI-03						■								■	
EXHAUST FAN ROOM 2 STATUS	BI-04						■								■	
CHILLED WATER VALVE	AO-01				■									■		
HEATING WATER VALVE	AO-02				■									■		
ROOM 1 AIRFLOW CONTROL VALVE	AO-03				■									■		
ROOM 2 AIRFLOW CONTROL VALVE	AO-04				■									■		
EXHAUST AIR DAMPER	AO-05				■									■		
EXHAUST FAN ROOM 1 ENABLE/DISABLE	BO-01		■				■								■	
EXHAUST FAN ROOM 2 ENABLE/DISABLE	BO-02		■				■								■	
HEATING WATER VALVE	BO-03			■			■									
HEATING WATER VALVE	BO-04			■			■									
SUPPLY FAN ENABLE/DISABLE	BO-05		■													

ISOLATION ROOM AHU SEQUENCE OF OPERATION

EACH AII ROOM SHALL BE PLACED INTO ACTIVE OPERATION MANUALLY THROUGH LOCAL INPUT. WHEN OCCUPIED THE OUTSIDE AIR DAMPER AND ASSOCIATED EXHAUST AIR DAMPER SHALL OPEN, THE EXHAUST AND SUPPLY FAN'S SHALL START, AND THE AIRFLOW CONTROL VALVE SHALL MODULATE TO MAINTAIN PRESSURE DIFFERENTIAL. THE SUPPLY FAN SHALL MODULATE SPEED TO MAINTAIN SPACE STATIC PRESSURE WITH THE AIRFLOW CONTROL VALVE NEAR FULL OPEN, AND THE EXHAUST FAN SHALL RUN AT CONTINUOUS SPEED. IN UNOCCUPIED MODE THE AIRHANDLER SHALL CYCLE ON/OFF AS REQUIRED TO MAINTAIN SPACE TEMPERATURE. FREEZE STAT CLOSES OUTSIDE AIR DAMPER, SHUTS DOWN FAN, AND GENERATES AN ALARM AT THE OPERATOR WORK SATAION.

NOTE:
THE CONTROL CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL CONTROL COMUNICATION CONDUIT REQUIREMENTS AND 120 VOLT POWER REQUIREMENTS FOR ALL CONTROLS WITH THE ELECTRICAL CONTRACTOR WHO WILL INSTALL THE CONDUITS AND PROVIDE THE 120 VOLT POWER FOR THE MECHANICAL CONTROLS.

THE CONTROLS CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT POINT OF CONNECTION OF ALL CONTROL WIRING INTO THE EXISTING ENERGY MANAGEMENT SYSTEM AND WHETHER OR NOT AN ADDITIONAL BCM/MSTP IS REQUIRED IN THE GLOBAL CONTROLLER. IF AN ADDITIONAL BCM/MSTP IS REQUIRED, THE CONTROLS CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING.

REVISIONS	DATE

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CAD FILE NAME: 531–320_M3.5
XREF FILE NAME: 531–320_30X42TBLK

DRAWING TITLE: CONTROL SCHEMATICS

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013
PROJECT NO. 531–320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE
APPROVED: MEDICAL CENTER DIRECTOR

BUILDING NUMBER 67 | CHECKED SCH | DRAWN RP

LOCATION: VAMC BOISE, IDAHO

DRAWING NO. M3.3
DWG 92 OF 191

DEPARTMENT OF VETERANS AFFAIRS

TYPE OF EQUIPMENT: HEATING PUMPS			CONTROL				GRAPHIC DISPLAYS									
ITEMS TO CONTROL AND MONITOR:	POINT ID		START/STOP	OPEN/CLOSE	MODULATING/VARYING		STATUS	WATER PRESSURE	AIR PRESSURE	TEMPERATURE	FLOW (GPM)	HUMIDITY	SPEED PERCENTAGE	POSITION	ALARM	PERCENT
DIFF. PRESSURE SENSOR	AI-01							■								
PUMP STATUS	BI-01						■								■	
PUMP 1 VFD FAULT	BI-02														■	
PUMP 2 VFD FAULT	BI-03														■	
PUMP LEAD ENABLE/DISABLE	BO-01		■													
PUMP STANDBY ENABLE/DISABLE	BO-02		■													
PUMP 1 VFD	AO-01				■								■			
PUMP 2 VFD	AO-02				■								■			
*SHOW HX WITH SUPPLY AND RETURN TEMPS																

HEATING WATER PUMPS SEQUENCE OF OPERATION

A. The heating water pumps shall operate on a schedule as set by the BAS.

B. New variable speed heating water pumps <67-P-HWHS-1>, <67-P-HWHS-2>. The heating water pumps shall be enabled whenever:

1. If the outside air temperature is below 50° F.
2. To prevent short cycling, the heating water pump system shall run for and be off for a minimum of 5 minutes (adjustable).
3. Heating Water Pump Lead/Standby Operation:

a) The two variable speed pumps shall operate in a lead/standby fashion.

b) The lead pump shall run first.

c) On failure of the lead pump, the standby pump shall run and the lead pump shall turn off.

4. The designated lead pump shall rotate upon one of the following conditions (user selectable):

a) manually through a software switch

b) if pump runtime (adj.) is exceeded

5. Heating Water Differential Pressure Control transducer: Locate transducer at the end of the hydronic loop.

a) The controller shall measure differential pressure and modulate the pump VFD to maintain its differential pressure setpoint. All setpoints shall be field adjusted during the commissioning period to meet the requirements of actual field conditions.

b) The controller shall modulate pump speeds to maintain a differential pressure of 12 lbf/in2 (adj.). The VFDs minimum speed shall not drop below 20% (adj.).

2 HEATING WATER SYSTEM CONTROL SEQUENCE & POINTS LIST
NTS

TYPE OF EQUIPMENT: CHILLED WATER PLANT			CONTROL				GRAPHIC DISPLAYS									
ITEMS TO CONTROL AND MONITOR:	POINT ID		START STOP	OPEN/CLOSE	MODULATING/VARYING		STATUS	WATER PRESSURE	AIR PRESSURE	TEMPERATURE	FLOW (GPM)	HUMIDITY	SPEED PERCENTAGE	POSITION	ALARM	PERCENT
CWS TEMPERATURE	AI-01									■						
CWR TEMPERATURE	AI-02									■						
CWS FLOW RATE (2ND & 3RD FLR)	AI-03										■					
CWS FLOW RATE (BSMT & 1STD FLR)	AI-04										■					
CWS-1, CWS-2 DIFF PRESSURE SENSOR	AI-05							■								
CH-1(E) SUPPLY TEMPERATURE	AI-06									■						
CH-2(E) SUPPLY TEMPERATURE	AI-07									■						
CH-1(E) RETURN TEMPERATURE	AI-08									■						
CH-2(E) RETURN TEMPERATURE	AI-09									■						
CH-1(E) HEAD PRESSURE FOR EACH CIRCUIT	AI-10						■								■	
CH-2(E) HEAD PRESSURE FOR EACH CIRCUIT	AI-11						■								■	
P-CWS-1 STATUS	BI-01						■								■	
P-CWS-2 STATUS	BI-02						■								■	
P-CWS-3 STATUS	BI-03						■								■	
P-CWS-4 STATUS	BI-04						■								■	
P-CWS-5 STATUS	BI-05						■								■	
P-CWS-6 STATUS	BI-06						■								■	
P-CWS-7 STATUS	BI-07						■								■	
P-CWS-1 VFD FAULT	BI-08						■								■	
P-CWS-2 VFD FAULT	BI-09						■								■	
CH-1(E) GENERAL ALARM	BI-09						■								■	
CH-2(E) GENERAL ALARM	BI-10						■								■	
CH-1(E) STATUS	BI-11						■								■	
CH-1(E) COMPRESSOR STATUS FOR EACH	BI-12						■								■	
CH-2(E) STATUS	BI-13						■								■	
CH-2(E) COMPRESSOR STATUS FOR EACH	BI-14						■								■	
CH-3 STATUS	BI-15						■								■	
P-CWS-1 VFD SPEED	AO-01				■								■			
P-CWS-2 VFD SPEED	AO-02				■								■			
CH-1(E) ENABLE/DISABLE	BO-01		■				■								■	
CH-2(E) ENABLE/DISABLE	BO-02		■				■								■	
CH-3 ENABLE/DISABLE	BO-03		■				■								■	
P-CWS-1 ENABLE/DISABLE	BO-04		■				■								■	
P-CWS-2 ENABLE/DISABLE	BO-05		■				■								■	
P-CWS-3 ENABLE/DISABLE	BO-06		■				■								■	
P-CWS-4 ENABLE/DISABLE	BO-07		■				■								■	
P-CWS-5 ENABLE/DISABLE	BO-08		■				■								■	
P-CWS-6 ENABLE/DISABLE	BO-09		■				■								■	
P-CWS-7 ENABLE/DISABLE	BO-10		■				■								■	

*PROVIDE CH-3 WITH BACKNET/IP CARD AND CONNECT WITH ETHERNET TO TRANSFER ALL POSSIBLE DATA TO DDC SYSTEM.

*AS A MINIMUM EACH COMPRESSOR STATUS, EACH FAN STATUS, REFRIGERENT PRESSURES FOR EACH CIRCUIT, CWS AND CWR TEMP AND FLOW.

I. General:

A. Description: The Building 67 chilled water plant consists of two existing chillers (67-CH-1 and 67-CH-2), one new chiller (67-CH-3), new constant speed circulating pumps associated with each chiller (67-P-CWS-5, 67-P-CWS-6, 67-P-CWS-7) , existing constant speed secondary circulating pumps for the first floor (67-P-CWS-3, 67-P-CWS-4), and new variable speed secondary pumps for the second and third floors (67-P-CWS-1, 67-P-CWS-2).

B. Each chiller will operate on its own internal controls and safeties. Operation of each chiller by the chilled water plant controls is to enable/disable, monitor status, and monitor alarms.

C. Provide a dedicated controller to operate the Building 67 chilled water plant. The chilled water plant controllers will be located in the penthouse mechanical room.

D. The chilled water plant controller will be connected to the campus wide direct digital control network and will be visible on all the existing operator work stations. All set points will be adjustable at the operator work stations.

E. The chilled water plant controller shall be fully capable of stand-alone operation by maintaining the normal operating sequence in the event of a loss of communication with the campus network.

F. All set points shall be fully adjustable including upper and lower deadband values. Adjustable deadband control will not be permitted.

II. Chilled Water Plant Disabled Mode:

A. The Building 67 chilled water plant is designed to operate in occupied mode 24/7/365. Chilled water plant disabled mode shall be initiated through manual input either at the operator workstation or the local input device.

B. In disabled mode all pumps and chillers shall be off, and control valves shall be closed.

III. Chilled Water Plant Enabled Mode:

A. Each stage of the chilled water plant operation is initiated by sensing a temperature differential greater than 13 degrees between the chilled water return temperature and the weighted average supply temperature (calculated by applying a factor of 2 to the existing 60 ton chillers. Here's an example: If CH-1 has a supply water temperature of 46°, CH-2 has a supply water temperature of 44°, and CH-3 has a supply water temperature of 45° the formula is ((2x46)+(2x44)+45)/5=45°) of the chillers operating. Each stage will terminate by sensing a temperature differential less than 6 degrees between the chilled water return temperature and the weighted average supply temperature of the chillers operating. The valves and pumps associated with a chiller shall remain in the occupied mode for 5 minutes after the enable has been removed from the chiller.

B. Stage 1 – Chiller <67-CH-3> is enabled to operate on its own internal controls. Associated circulating pump <67-P-CWS-6> is operating.

C. Stage 2 – Chiller <67-CH-2> is enabled to operate on its own internal controls. Associated circulating pump <67-P-CWS-5> is operating.

D. Stage 3 – Chillers <67-CH-3> and <67-CH-2> are enabled to operate on their own internal controls. Associated circulating pumps <67-P-CWS-6> and <67-P-CWS-5> are operating.

E. Stage 4 – Chillers <67-CH-1> and <67-CH-2> are enabled to operate on their own internal controls. Associated circulating pumps <67-P-CWS-7> and <67-P-CWS-5> are operating.

F. Stage 5 – Chillers <67-CH-1> , <67-CH-3> and <67-CH-2> are enabled to operate on their own internal controls. Associated circulating pumps <67-P-CWS-7>, <67-P-CWS-6>, and <67-P-CWS-5> are operating.

IV. Chilled Water Pumps Enabled Mode:

A. Existing constant speed secondary circulating pumps for the basement & first floor <67-P-CWS-3>, <67-P-CWS-4>. The chilled water pumps shall be enabled whenever:

1. 10% of the chilled water coils basement & first floor need cooling.
2. To prevent short cycling, the chilled water pump system shall run for and be off for minimum of 5 minutes (adjustable).
3. Chilled Water Pump Lead/Standby Operation:

a) The two chilled water pumps shall operate in a lead/standby fashion.

b) The lead pump shall run first.

c) On failure of the lead pump, the standby pump shall run and the lead pump shall turn off.

5. The designated lead pump shall rotate upon one of the following conditions (user selectable):

a) manually through a software switch

b) if pump runtime (adj.) is exceeded

B. New variable speed secondary pumps for the second and third floors <67-P-CWS-1>, <67-P-CWS-2>. The chilled water pumps shall be enabled whenever:

1. 10% of the chilled water coils on the second and third floors need cooling.
2. To prevent short cycling, the chilled water pump system shall run for and be off for a minimum of 5 minutes (adjustable).
3. Chilled Water Pump Lead/Standby Operation:

a) The two variable speed chilled water pumps shall operate in a lead/standby fashion.

b) The lead pump shall run first.

c) On failure of the lead pump, the standby pump shall run and the lead pump shall turn off.

4. The designated lead pump shall rotate upon one of the following conditions (user selectable):

a) manually through a software switch

b) if pump runtime (adj.) is exceeded

5. Chilled Water Differential Pressure Control transducer: Locate transducer at the end of the hydronic loop.

a) The controller shall measure chilled water differential pressure and modulate the chilled water pump VFD to maintain its chilled water differential pressure setpoint. The following setpoints are recommended values. All setpoints shall be field adjusted during the commissioning period to meet the requirements of actual field conditions.

b) The controller shall modulate chilled water pump speeds to maintain a chilled water differential pressure of 12 lbf/in2 (adj.). The VFDs minimum speed shall not drop below 20% (adj.).

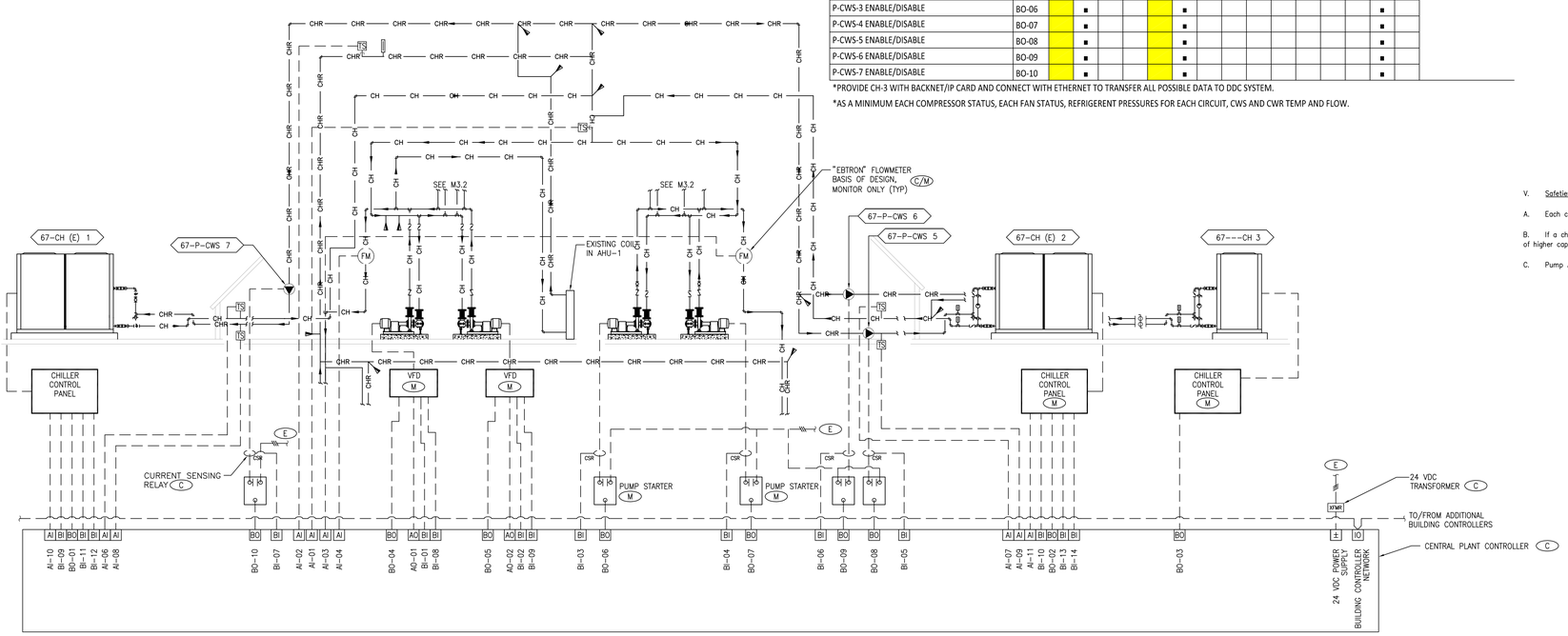
V. Safeties and Alarms:

A. Each chiller will operate on its own internal safeties and alarms.

B. If a chiller or chiller circulating pump associated with that chiller fails to operate when enabled an alarm will enunciate at the operator work stations and the next stage of higher capacity of operation shall be initiated.

C. Pump Alarms:

1. Failure: Commanded on, but the status is off.
2. Running in Hand: Commanded off, but the status is on.
3. High Chilled Water Differential Pressure: If the chilled water differential pressure is 25% (adj.) greater than setpoint.
4. Low Chilled Water Differential Pressure: If the chilled water differential pressure is 25% (adj.) less than setpoint.



1 CHILLED WATER SYSTEM CONTROL SCHEMATIC & POINTS LIST
NTS

NOTE:
THE CONTROL CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL CONTROL COMMUNICATION CONDUIT REQUIREMENTS AND 120 VOLT POWER REQUIREMENTS FOR ALL CONTROLS WITH THE ELECTRICAL CONTRACTOR WHO WILL INSTALL THE CONDUITS AND PROVIDE THE 120 VOLT POWER FOR THE MECHANICAL CONTROLS.

THE CONTROLS CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT POINT OF CONNECTION OF ALL CONTROL WIRING INTO THE EXISTING ENERGY MANAGEMENT SYSTEM AND WHETHER OR NOT AN ADDITIONAL BCM/MSTP IS REQUIRED IN THE GLOBAL CONTROLLER. IF AN ADDITIONAL BCM/MSTP IS REQUIRED, THE CONTROLS CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING.

REVISIONS | DATE

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DRAWING TITLE: CONTROL SCHEMATICS

PROJECT TITLE: BOISE VAMC BUILDING 67 EXPANSION

DATE: 07/12/2013
PROJECT NO.: 531-320

APPROVED: CHIEF OF FACILITY MANAGEMENT SERVICE
APPROVED: MEDICAL CENTER DIRECTOR

BUILDING NUMBER: 67 | CHECKED: SCH | DRAWN: RP

LOCATION: VAMC BOISE, IDAHO

DRAWING NO.: M3.4
DWG 93 OF 191

DEPARTMENT OF VETERANS AFFAIRS