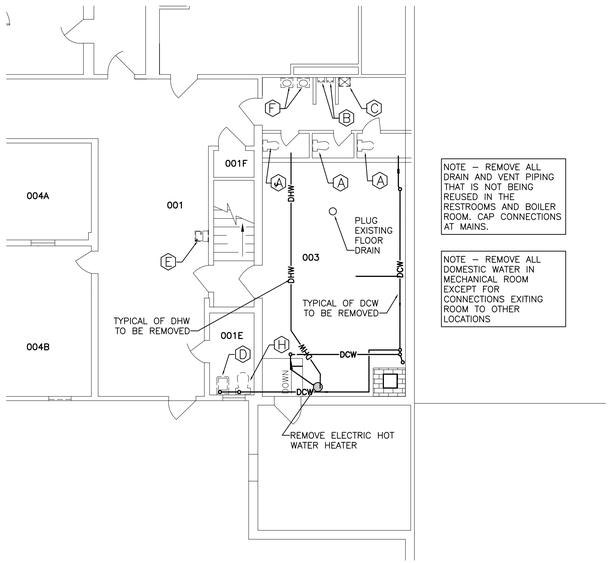
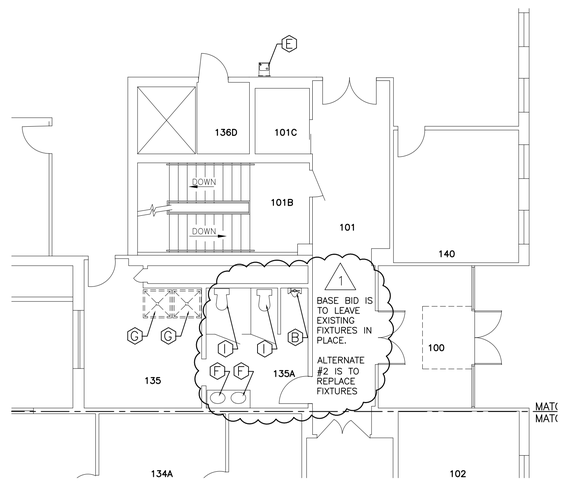


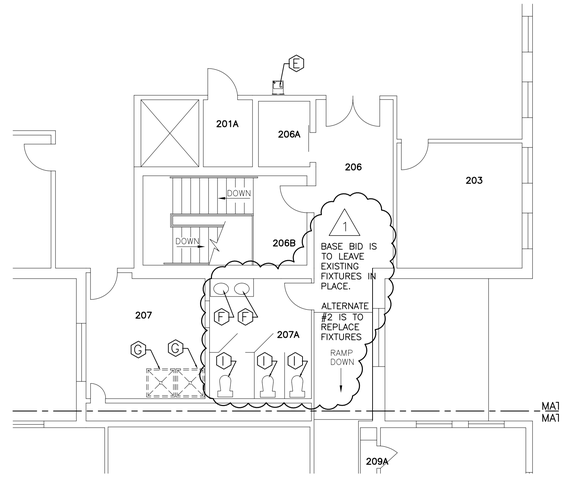
1 PLUMBING REMOVAL PARTIAL PLAN
LOWER LEVEL – SOUTH END

SCALE: 1/8" = 1'–0"



2 PLUMBING REMOVAL PARTIAL PLAN
FIRST FLOOR – NORTHWEST WING

SCALE: 1/8" = 1'–0"



3 PLUMBING REMOVAL PARTIAL PLAN
SECOND FLOOR – NORTHWEST WING

SCALE: 1/8" = 1'–0"

REMOVAL AND DEMOLITION KEY NOTES

(A) REMOVE FLOOR–MOUNTED TANK–TYPE WATER CLOSET
REMOVE ALL WATER CLOSET ACCESSORIES.
DISCONNECT AND CAP COLD WATER & DRAIN AT MAIN TAKEOFF.

(B) REMOVE WALL–HUNG URINAL AND FLUSH VALVE.
REMOVE ALL URINAL ACCESSORIES.
DISCONNECT AND CAP WATER AND DRAIN AT MAIN TAKEOFF

(C) REMOVE MOP BASIN AND FAUCET.
REMOVE ALL MOP BASIN ACCESSORIES.
DISCONNECT AND CAP COLD & HOT WATER AND DRAIN AT MAIN TAKEOFF

(D) REMOVE WALL–HUNG LAVATORY AND FAUCET.
REMOVE ALL LAVATORY ACCESSORIES.
DISCONNECT AND CAP COLD & HOT WATER AND DRAIN AT MAIN TAKEOFF.

(E) REMOVE WALL–HUNG DRINKING FOUNTAIN,
DISCONNECT COLD WATER & DRAIN FOR RECONNECTION TO NEW DRINKING FOUNTAIN

(F) REMOVE COUNTER–MOUNTED LAVATORY AND FAUCET.
REMOVE ALL LAVATORY ACCESSORIES.
DISCONNECT AND CAP COLD & HOT WATER AND DRAIN AT MAIN TAKEOFF.

(G) REMOVE SHOWER AND FAUCET.
REMOVE ALL SHOWER ACCESSORIES.
DISCONNECT AND CAP COLD & HOT WATER AND DRAIN AT MAIN TAKEOFF.

(H) REMOVE FLOOR–MOUNTED WATER CLOSET & FLUSH VALVE
REMOVE ALL WATER CLOSET ACCESSORIES.
DISCONNECT AND CAP COLD WATER & DRAIN AT MAIN TAKEOFF.

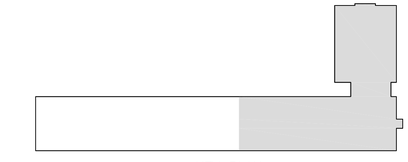
(I) REMOVE WALL–HUNG WATER CLOSET & FLUSH VALVE
REMOVE ALL WATER CLOSET ACCESSORIES.
DISCONNECT AND CAP COLD WATER & DRAIN AT MAIN TAKEOFF.

REMOVAL AND DEMOLITION GENERAL NOTES

1) THE INTENTION OF THIS DRAWING AND NOTES IS TO SHOW THE GENERAL LOCATION AND DESCRIPTION OF ITEMS TO BE REMOVED. IT DOES NOT INCLUDE ALL THE DETAILS AND ACCESSORIES ASSOCIATED WITH THE ITEM TO BE REMOVED – IT WILL BE THE CONTRACTORS RESPONSIBILITY TO REMOVE ALL ACCESSORIES NORMALLY ASSOCIATED WITH THE ITEM DESIGNATED.

2) THE CONTRACTOR IS TO REMOVE ALL DEMOLISHED MATERIALS AND EQUIPMENT FROM THE JOBSITE. CONTRACTOR IS TO DISPOSE OF ALL MATERIAL AND EQUIPMENT PER EPA STANDARDS.

1/8" = 1'–0" 0' 2' 4' 6' 8' 16' 24' 32'



KEY PLAN
NO SCALE

Kurt F. Magnusson 10257 LICENSED PROFESSIONAL ENGINEER STATE OF MAINE

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
(207) 846-1441
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE FACILITIES ENGINEERING DFE CAMP KEYES

No.	PLAN REVISIONS	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: KM
DRAWN BY: KM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/8" = 1'–0"
DFE PROJECT NO: 235R18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordija Capital Projects Group
16 Tannery Lane, Suite 23
Conway, New Hampshire 03818
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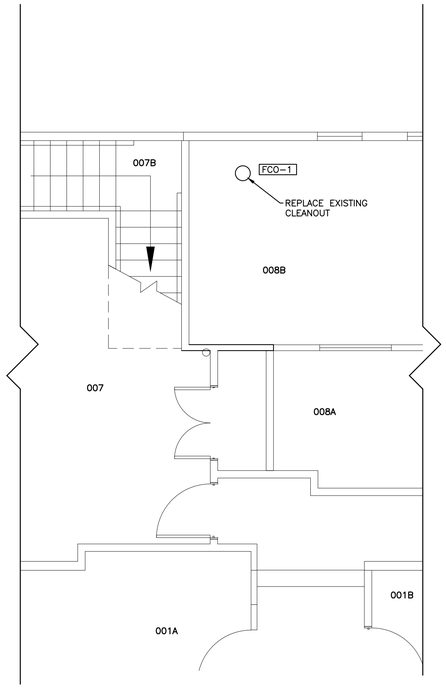
CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

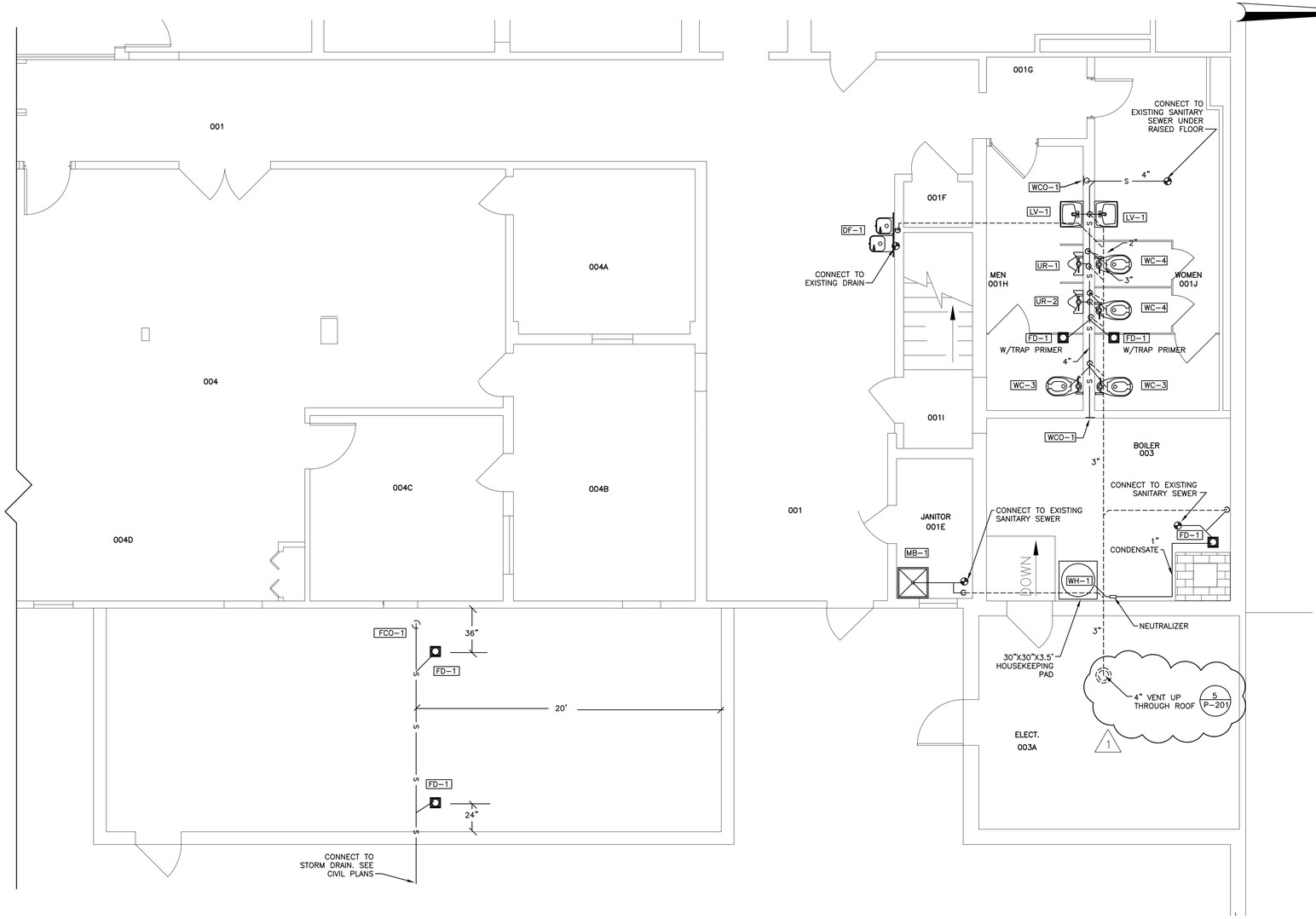
PLUMBING REMOVAL PLANS
NORTH END & NORTHWEST WING

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

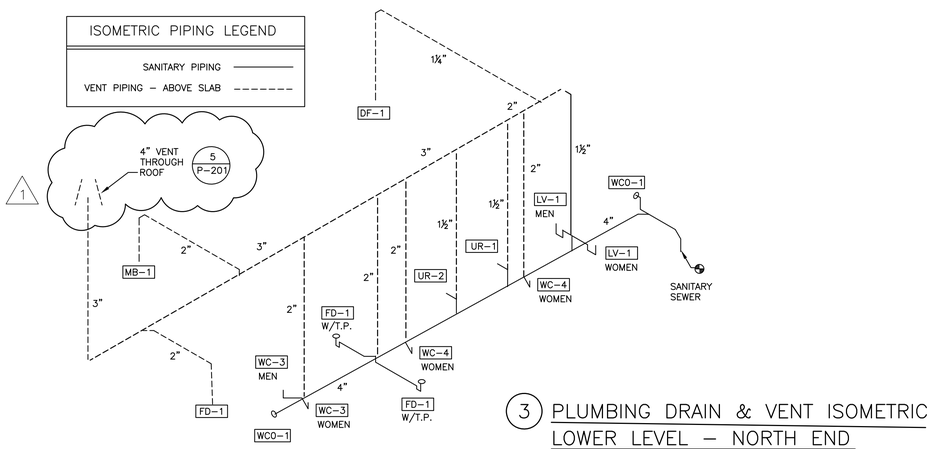
SHEET ID:
PD–101
SHEET: 60 OF 126



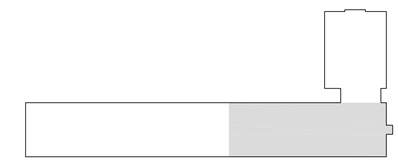
1 REPLACEMENT FLOOR CLEAOUT
LOWER LEVEL – ROOM 008B
SCALE: 1/4" = 1'-0"



2 PLUMBING DRAIN & VENT PIPING PLAN
LOWER LEVEL – NORTH END
SCALE: 1/4" = 1'-0"



3 PLUMBING DRAIN & VENT ISOMETRIC
LOWER LEVEL – NORTH END
SCALE: NONE



KEY PLAN
NO SCALE

1/4" = 1'-0" 0' 1' 2' 3' 4' 8' 12' 16'

STATE OF MAINE
Kurt F. Magnusson
10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
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DFE CAMP KEYES

PLAN REVISIONS

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1	GENERAL REVISIONS	1.28.19	

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SCALE: 1/4" = 1'-0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordjia Capital Projects Group
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Camden, Maine 04843
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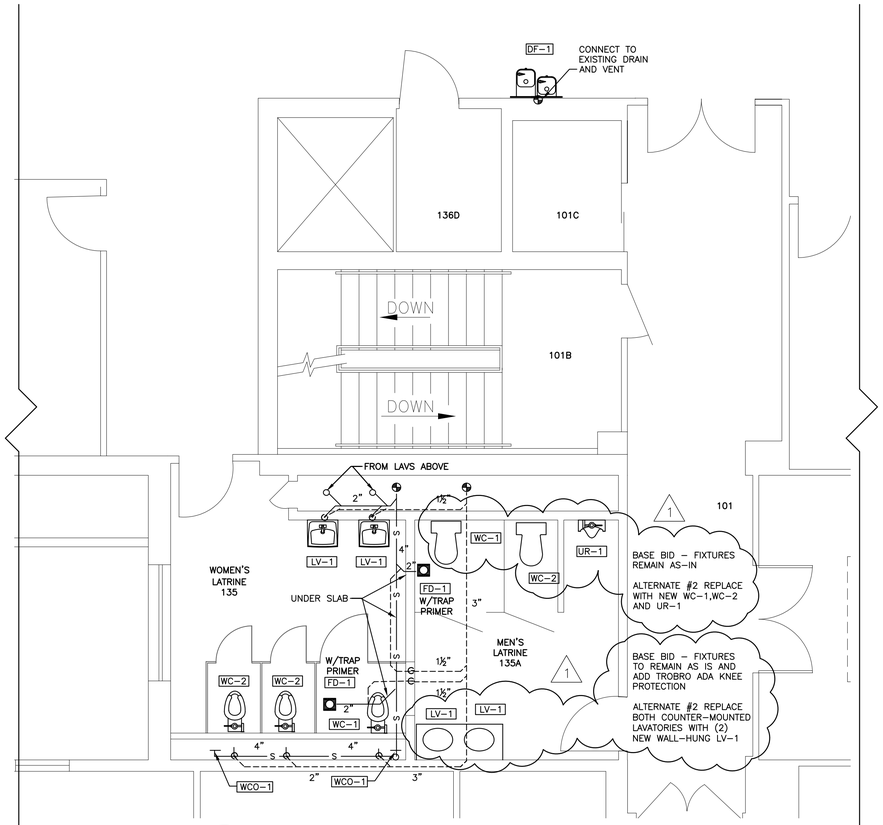
CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PLUMBING DRAIN & VENT PIPING PLAN
LOWER LEVEL – NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

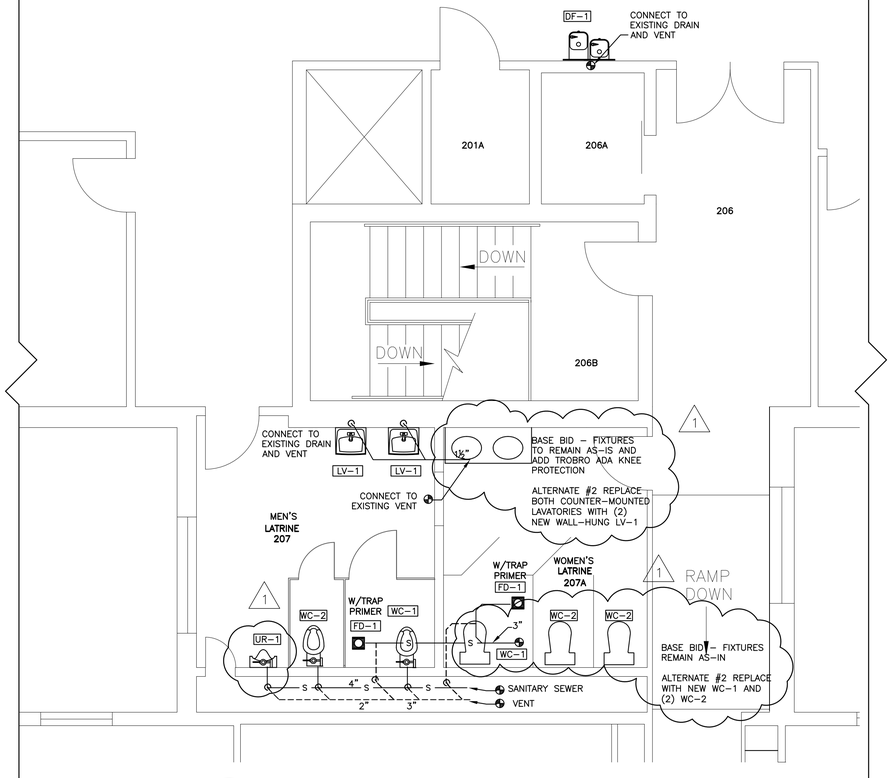
SHEET ID: P-101
SHEET: 61 OF 126

January 28, 2019 – 7:38 am
X:\Projects\1813 Camp Keyes Bldg 7\Addenda\1813 Bldg 7 P101-P104 & P201 (01-23-2019).dwg



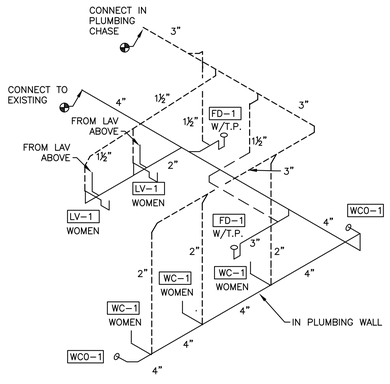
1 PLUMBING DRAIN & VENT PARTIAL PLAN
FIRST FLOOR – NORTHWEST WING

SCALE: 1/4" = 1'–0"



2 PLUMBING DRAIN & VENT PARTIAL PLAN
SECOND FLOOR – NORTHWEST WING

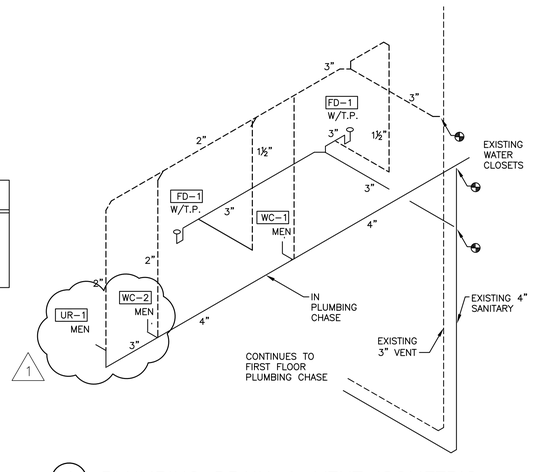
SCALE: 1/4" = 1'–0"



3 PLUMBING DRAIN & VENT ISOMETRIC
FIRST FLOOR – NORTHWEST WING

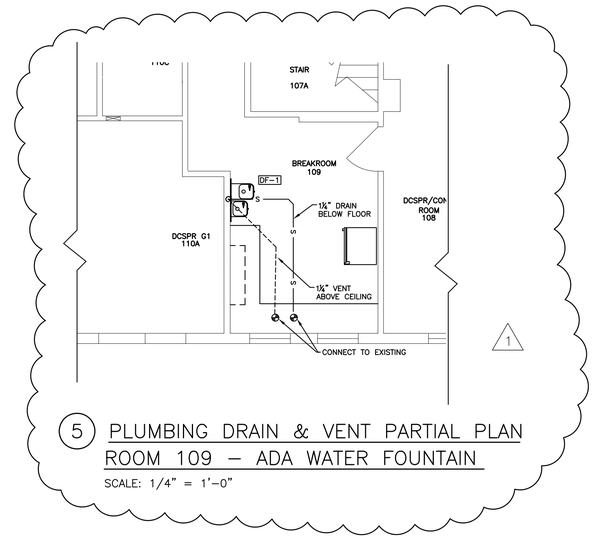
SCALE: NONE

ISOMETRIC PIPING LEGEND	
SANITARY PIPING	———
VENT PIPING – BELOW SLAB	— — —
VENT PIPING – ABOVE SLAB	– – – –



4 PLUMBING DRAIN & VENT ISOMETRIC
SECOND FLOOR – NORTHWEST WING

SCALE: NONE



5 PLUMBING DRAIN & VENT PARTIAL PLAN
ROOM 109 – ADA WATER FOUNTAIN

SCALE: 1/4" = 1'–0"

1/4" = 1'–0" 0' 1' 2' 3' 4' 8' 12' 16'

STATE OF MAINE
Kurt F. Magnusson 10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
(207) 846-1441
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE OF PUBLIC WORKS
DFE
CAMP KEYES
FACILITIES ENGINEERING

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY:
DRAWN BY: KFM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/4" = 1'–0"
DFE PROJECT NO: 23SR18–458–D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordjia Capital Projects Group
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Camden, Maine 04843
207–236–9970 / rnolan@cordjiacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PLUMBING DRAIN & VENT PLANS
FIRST & SECOND FLOOR–NW WING

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
P–102
SHEET: 62 OF 126

January 28, 2019 – 8:44 am
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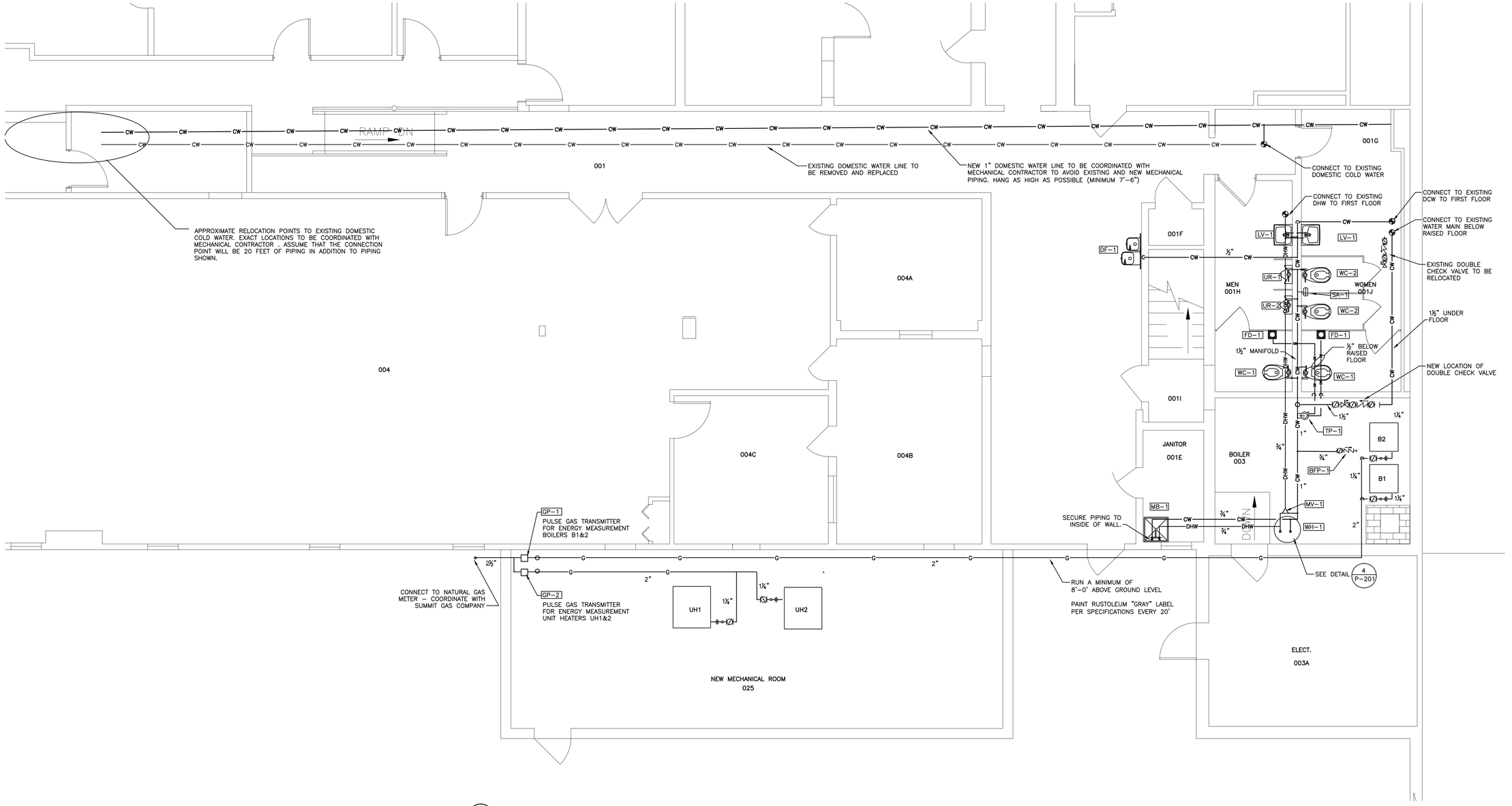
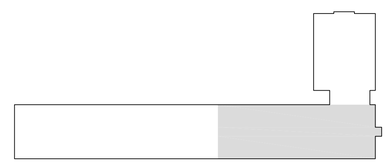


1 PLUMBING WATER & GAS PIPING PLAN LOWER LEVEL NORTH END

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

1/4" = 1'-0" 0' 1' 2' 3' 4' 8' 12' 16'



KEY PLAN
NO SCALE

DIRECTORATE OF FACILITIES ENGINEERING
DFE CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: KM
DRAWN BY:
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/4" = 1'-0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PLUMBING WATER & GAS PIPING PLAN
LOWER LEVEL NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID: P-103
SHEET: 63 OF 126

STATE OF MAINE
Kurt F. Magnusson
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REGISTERED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
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10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
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CELEBRATING 50 YEARS IN BUSINESS

January 28, 2019 - 7:39 am
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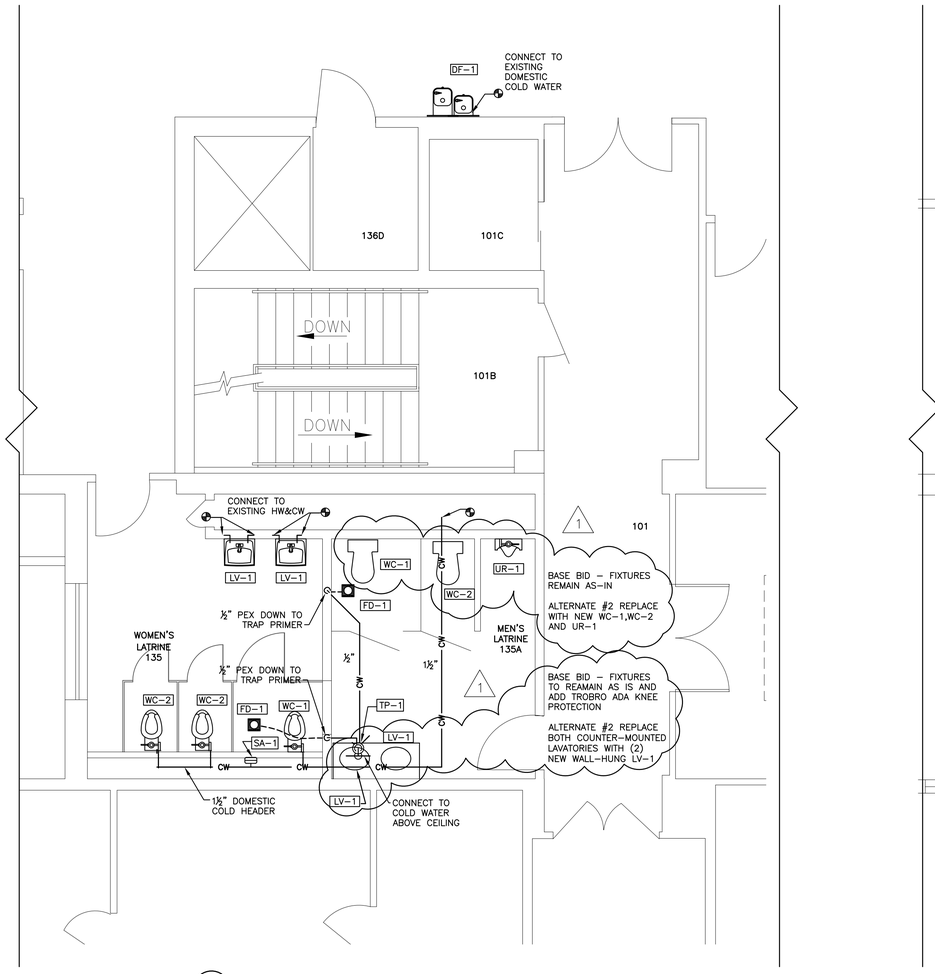
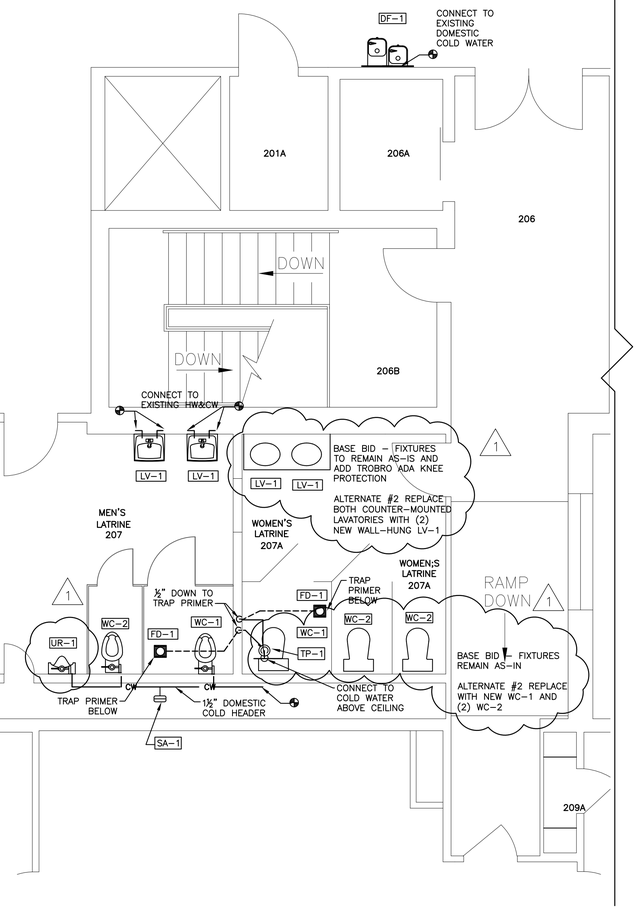
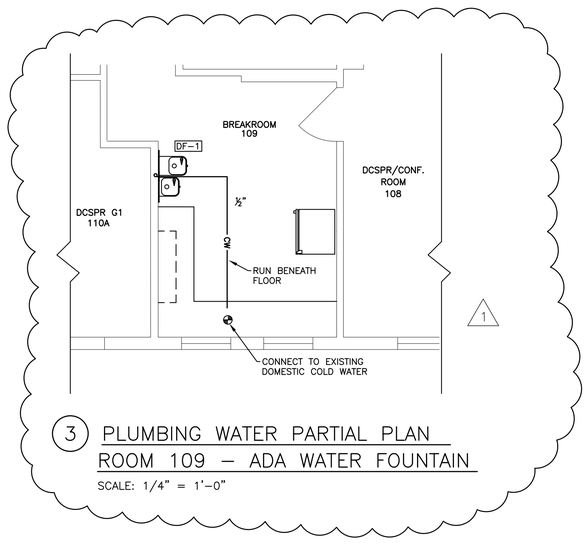


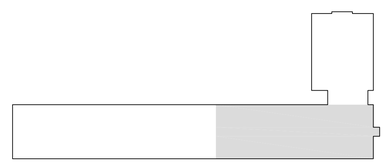
1 PLUMBING WATER PARTIAL PLAN
FIRST FLOOR – NORTHWEST WING
SCALE: 1/4" = 1'–0"



2 PLUMBING WATER PARTIAL PLAN
SECOND FLOOR – NORTHWEST WING
SCALE: 1/4" = 1'–0"



3 PLUMBING WATER PARTIAL PLAN
ROOM 109 – ADA WATER FOUNTAIN
SCALE: 1/4" = 1'–0"



KEY PLAN
NO SCALE

1/4" = 1'–0" 0' 1' 2' 3' 4' 8' 12' 16'

STATE OF MAINE
Kurt F. Magnusson 10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
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CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE FACILITIES ENGINEERING
DFE
CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY:
DRAWN BY: KM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/4" = 1'-0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordjia Capital Projects Group
16 Tannery Lane, Suite 23
Camden, Maine 04843
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PLUMBING WATER PARTIAL PLANS
FIRST & SECOND FLOORS – NNW WING

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
P–104
SHEET:64 OF 126

LEGEND

120	120 DEG F HOT WATER	IDW	INDIRECT WASTE	S S S	SANITARY / WASTE PIPING ABOVE SLAB
@	AT	IM	ICE MAKER		
A	AMPS, AQUASTAT	LT	LAUNDRY TUB	S S S	SANITARY/ WASTE PIPING BELOW SLAB
ADA	AMERICANS WITH DISABILITIES ACT	LV	LAVATORY		VENT PIPING ABOVE SLAB
AFF	ABOVE FINISHED FLOOR	M	METER		
AP	ACCESS PANEL	MTD	MOUNTED		VENT PIPING BELOW SLAB
BFP	BACKFLOW PREVENTER	MV	MIXING VALVE		
BLV	BALL VALVE	NB	NICKEL BRONZE		
BV	BALANCE VALVE	PC	PLUMBING CONTRACTOR	CW CW	DOMESTIC COLD WATER PIPING
CNTR	COUNTER	PDI	PLUMBING & DRAINAGE INSTITUTE	DHW DHW	DOMESTIC 120 HOT WATER PIPING
CO	CLEANOUT	PG	PRESSURE GAUGE	G	GAS PIPING ABOVE SLAB
CONT	CONTINUATION	PH	PHASE	A	COMPRESSED AIR PIPING
COORD	COORDINATION	PRV	PRESSURE REDUCING VALVE		BALL VALVE
COTG	CLEANOUT TO GRADE	PSI	POUNDS PER SQUARE INCH		CHECK VALVE
CW	COLD WATER, CLOTHES WASHER	RAW	RISE AT WALL		
C&HW	COLD & HOT WATER	RD	ROOF DRAIN	RV	RELIEF VALVE
DAW	DROP AT WALL	RH	RIGHT HAND		PRESSURE REDUCING VALVE
DCP	DOMESTIC CIRCULATING PUMP	RIC	RISE IN CHASE		
DEG	DEGREES	RIW	RISE IN WALL		THERMOMETER
DIC	DROP IN CHASE	RUC	RUN UNDER COUNTER		
DIW	DROP IN WALL	RUF	RUN UNDER FLOOR		PRESSURE GAUGE
DN	DOWN	RV	RELIEF VALVE		
DN&U	DOWN AND UP	S	SANITARY WASTE		DROP/RISE IN LINE
DNIW	DOWN IN WALL	SA	SHOCK ABSORBER		
DO	DRAWOFF	SH	SHOWER		LINE UP TO FLOOR ABOVE
DW	DISHWASHER	SK	SINK		
EA	EACH	SS	STAINLESS STEEL		TEE –DROP
ET	EXPANSION TANK	T	THERMOMETER		
FCO	FLOOR CLEANOUT	T.P.	TRAP PRIMER		SHOCK ABSORBER
FD	FLOOR DRAIN	TYP	TYPICAL		
FFE	FINISHED FLOOR ELEVATION	UIC	UP IN CHASE		UNION
FV	FLUSHVALVE	U&DNIC	UP & DOWN IN CHASE		
G	GAS (FUEL)	U&DNIW	UP & DOWN IN WALL		MIXING VALVE
GAL	GALLONS	UIW	UP IN WALL		
GC	GENERAL CONTRACTOR	V	VENT		FLOOR CLEANOUT
GHT	GARDEN HOSE THREAD	VB	VACUUM BREAKER		
GPF	GALLONS PER FLUSH	VC	VITREOUS CHINA		FLOOR DRAIN
GV	GATE VALVE	VIF	VERIFY IN FIELD		
GW	GEAR WASHER	VRV	VACUUM RELIEF VALVE		VENT THROUGH ROOF
HB	HOSE BIB	VTR	VENT THRU ROOF		
HC	HEATING CONTRACTOR	W	WASTE		HOSE BIB
HW	HOT WATER	W/	WITH		
HWR	HOT WATER RETURN	WC	WATER CLOSET, WATER COLUMN	XX–1	PLUMBING FIXTURE/ EQUIPMENT NUMBER TAG
IE	INVERT ELEVATION	WCO	WALL CLEANOUT		
		WSI	WARM SIDE OF INSULATION		CONNECT TO EXISTING

PLUMBING FIXTURE SCHEDULE

TAG	FIXTURE	COLD WATER	HOT WATER	SAN/ WASTE	VENT	REMARKS
DF–1	DRINKING FOUNTAIN ADA	1/2"	–	1¼"	1¼"	DUAL HEIGHT ELECTRIC COOLING
LV–1	LAVATORY, WALL HUNG ADA	1/2"	1/2"	1¼"x 1½"	1½"	VC, SINGLE HANDLE FAUCET, 0.5 GPM W/ ADA GUARD 34" TO RIM
MB–1	MOP BASIN	3/4"	3/4"	3"	1½"	TWO HANDLE VB FAUCET, MOLDED STONE
UR–1	URINAL, WALL–MOUNT ADA	1"	–	2"	1½"	V.C, MANUAL FLUSHOMETER 17" TO RIM
UR–2	URINAL, WALL–MOUNT	1"	–	2"	1½"	V.C, MANUAL FLUSHOMETER
WC–1	WATER CLOSET WALL–MOUNT ADA	1"	–	4"	2"	V.C MANUAL FLUSHOMETER 16 1/2" HEIGHT
WC–2	WATER CLOSET WALL–MOUNT	1"	–	4"	2"	WITH MANUAL FLUSHOMETER
WC–3	WATER CLOSET FLOOR–MOUNT ADA	1"	–	4"	2"	V.C MANUAL FLUSHOMETER 16 1/2" HEIGHT
WC–4	WATER CLOSET FLOOR–MOUNT	1"	–	4"	2"	WITH MANUAL FLUSHOMETER

DRAIN SPECIALTIES SCHEDULE

TAG	ITEM	WASTE	VENT	REMARKS
FCO–1	ROUND, FINISHED AREA FLOOR CLEANOUT	SIZE OF PIPE	–	ADJUSTABLE
WCO–1	ROUND, FINISHED AREA WALL CLEANOUT	SIZE OF PIPE	–	ADJUSTABLE
FD–1	GENERAL ROUND FLOOR DRAIN	3"	1½"	ADJUSTABLE WITH TRAP PRIMER

WATER SPECIALTIES SCHEDULE

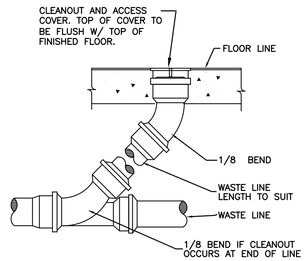
TAG	ITEM	CW	HW	OUTLET	REMARKS
BFP–1	BOILER MAKE–UP BACKFLOW PREVENTER	3/4"	–	–	
MV–1	MIXING VALVE	3/4"	3/4"	3/4"	
SA–1	SHOCK ABSORBER	3/4"		–	P.D.I. B
TP–1	TRAP SEAL PRIMER	1/2"	–	–	WITH 4–PORT DISTRIBUTION

HOT WATER HEATER SCHEDULE

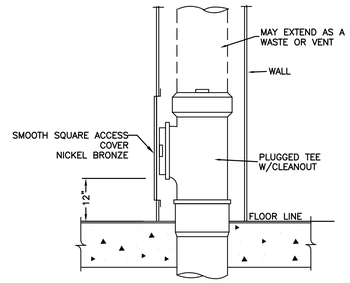
TAG	ITEM	CAPACITY	EFFCIENCY	1ST HOUR	WEIGHT
WH–1	HYBRID HEATER HEAT PUMP & ELECTRIC	66 GALLONS	3.44 ENERGY FACTOR	62.5 GALLONS	289 LBS

GAS ENERGY METER SCHEDULE

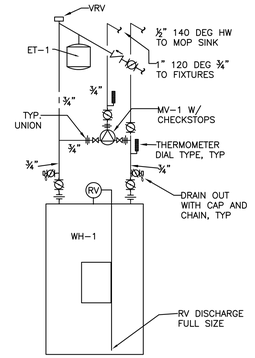
TAG	ITEM	CAPACITY	REMARKS
GP–1	GAS ENERGY PULSE TRANSMITTER	800 MBH	PULSIMATIC TRANSMITTER PULSE KIT HONEYWELL AMERICAN MODEL AL800 GAS METER
GP–2	GAS ENERGY PULSE TRANSMITTER	800 MBH	PULSIMATIC TRANSMITTER PULSE KIT HONEYWELL AMERICAN MODEL AL800 GAS METER



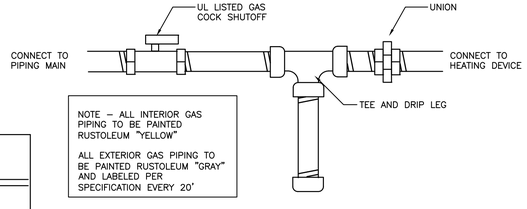
1 TYP — FLOOR CLEAN OUT FCO–1 DETAIL
SCALE: NONE



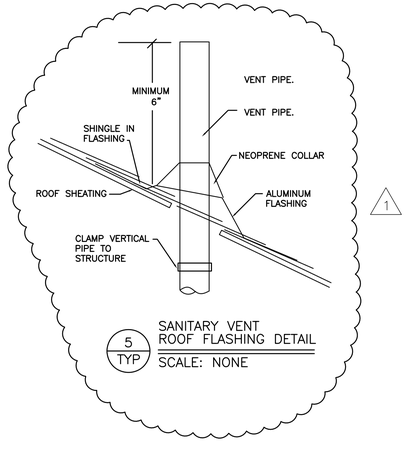
2 TYP — WALL CLEANOUT WCO–1 DETAIL
SCALE: NONE



4 P103 — HOT WATER TANK DETAIL
SCALE: NONE



3 P103 — GAS CONNECTION DETAIL
SCALE: NONE



5 TYP — SANITARY VENT ROOF FLASHING DETAIL
SCALE: NONE

NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE STATE PLUMBING CODE, LOCAL CODES AND ORDINANCES, NATIONAL FIRE CODE (NFPA), OR THESE PLANS OR SPECIFICATIONS, WHICHEVER IS MORE STRICT.

2. ALL DRAWINGS ARE SCHEMATIC ONLY, AND ARE INTENDED TO INDICATE THE INTENT, EXTENT, AND GENERAL ARRANGEMENT OF WORK. THEY ARE NOT MEANT TO SHOW EVERY FITTING, CHANGE OF DIRECTION OR EVERY SITUATION. VERIFY LOCATIONS IN THE FIELD. WORK INDICATED SHALL BE FURNISHED COMPLETE TO PERFORM THE FUNCTION INTENDED.

3. CAREFULLY COORDINATE THE SPACE REQUIREMENTS AND LOCATION OF PIPING WITH THE OTHER TRADE CONTRACTORS. IF COORDINATION FAILS, CONFLICTS WILL BE DECIDED IN FAVOR OF THE OTHER CONTRACTORS WITH THIS CONTRACTOR RELOCATING HIS PIPING AND EQUIPMENT AT NO EXPENSE TO THE OWNER.

4. ALL PLUMBING FIXTURES SHALL BE VENTED.

5. THIS CONTRACTOR SHALL MAKE ALL FINAL PLUMBING CONNECTIONS TO EQUIPMENT/ FIXTURES PROVIDED BY OTHER CONTRACTORS.

6. FOR PIPE SIZES NOT SHOWN ON FLOOR PLANS, REFER TO: ADJACENT OR ENLARGED PLUMBING PLANS, THEN APPROPRIATE SCHEDULES, DETAILS, SPECIFICATIONS, EQUIPMENT CONNECTION SIZES AND MINIMUM CODE REQUIREMENTS. FOR OTHERWISE INDETERMINABLE PIPE SEGMENTS, THE SIZE SHALL BE THE SAME AS THE LARGEST ADJACENT SEGMENT. WHERE PIPE SIZES ARE ERRONEOUSLY SHOWN TO DECREASE THEN INCREASE, THE SMALLER SEGMENT SHALL BE INCREASED TO MATCH THE LARGER SEGMENT. WHEN A CONFLICT EXISTS, THE LARGER SIZE SHALL GOVERN. PIPE SIZES ARE NOMINAL (NOT O.D.) UNLESS SPECIFICALLY NOTED OTHERWISE.

7. ALL PIPING SHALL RUN CONCEALED ABOVE CEILINGS, IN WALLS, IN SOFFITS AND IN CHASES UNLESS NOTED OTHERWISE. SPECIAL CARE SHALL BE TAKEN WHEN DROPPING 3" NOMINAL PIPE IN 3–½" WALL CAVITIES TO ENSURE CORRECT FIT AND ALIGNMENT.

8. ALL PLUMBING SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE. ALL PIPING CONTAINING LIQUID 2" AND LARGER SHALL BE SUPPORTED FROM THE TOP CHORD OF BAR JOISTS UNLESS PERMISSION TO DO OTHERWISE IS OBTAINED FROM THE STRUCTURAL CONSULTANT. ALL PIPING DROPS TO FIXTURES SHALL BE ANCHORED SOLID TO WALLS WITH A STEEL SUPPORT BRACKET WITH ADJUSTABLE CLIP.

9. ALL WATER PIPING SHALL BE INSTALLED PARALLEL TO BUILDING LINES AND PITCHED TO LOW POINTS. PROVIDE DRAW–OFFS AT LOW POINTS. PIPING SHALL BE RUN NEATLY GROUPED TOGETHER WHEN PRACTICAL. ALLOW ROOM BETWEEN ALL PIPING AND OTHER OBSTRUCTIONS TO ALLOW FOR THE INSTALLATION OF THE SPECIFIED PIPE INSULATION.

10. ALL PIPING THROUGH CONCRETE WALLS AND MASONRY PARTITIONS SHALL HAVE STEEL PIPE SLEEVES. OPENINGS BETWEEN PIPES AND SLEEVES SHALL BE CAULKED AND SEALED SMOKE AND WATER TIGHT. ALL PIPE PENETRATIONS THROUGH A FIRE RATED WALL OR FLOOR SHALL HAVE A UL RATED FIRE STOP SYSTEM RATED TO MATCH THE RATING OF THE WALL, AS PER THE NFPA.

11. ALL WALL FIXTURES SHALL BE CARRIER MOUNTED UNLESS OTHERWISE SPECIFIED.

12. ALL DOMESTIC WATER PIPING SHALL BE INSULATED UNLESS OTHERWISE SPECIFIED.

13. RUN ALL PIPING ON WARM SIDE OF BUILDING INSULATION. NO WATER, OR WASTE LINES SHALL BE RUN IN EXTERIOR WALLS, UNLESS DIRECTLY INDICATED.

14. PROVIDE SHOCK ABSORBERS WHERE SHOWN ON DRAWINGS, AND ON TOPS OF RISERS TO ALL FLUSH VALVES, DISHWASHERS AND CLOTHESWASHERS. SIZES SHALL CONFORM TO P.D.I. STANDARDS.

15. ALL SANITARY WASTE PIPING LESS THAN 4" SHALL PITCH DOWN AT ¼" PER L.F. ALL 4" AND LARGER PIPING SHALL PITCH AT ⅛" PER L.F. WHENEVER POSSIBLE. NO SANITARY/ WASTE PIPING UNDER SLAB SHALL BE LESS THAN 2" IN DIAMETER.

16. ALL DOMESTIC COPPER WATER PIPING SHALL BE TYPE "K" OR "L" COPPER, TYPE "M" IS PROHIBITED.

MECHANICAL SYSTEMS ENGINEERS
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CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE OF PUBLIC WORKS — DFE — CAMP KEYES FACILITIES ENGINEERING

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY:
DRAWN BY: KM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: NO SCALE
DFE PROJECT NO: 23SR18–458–D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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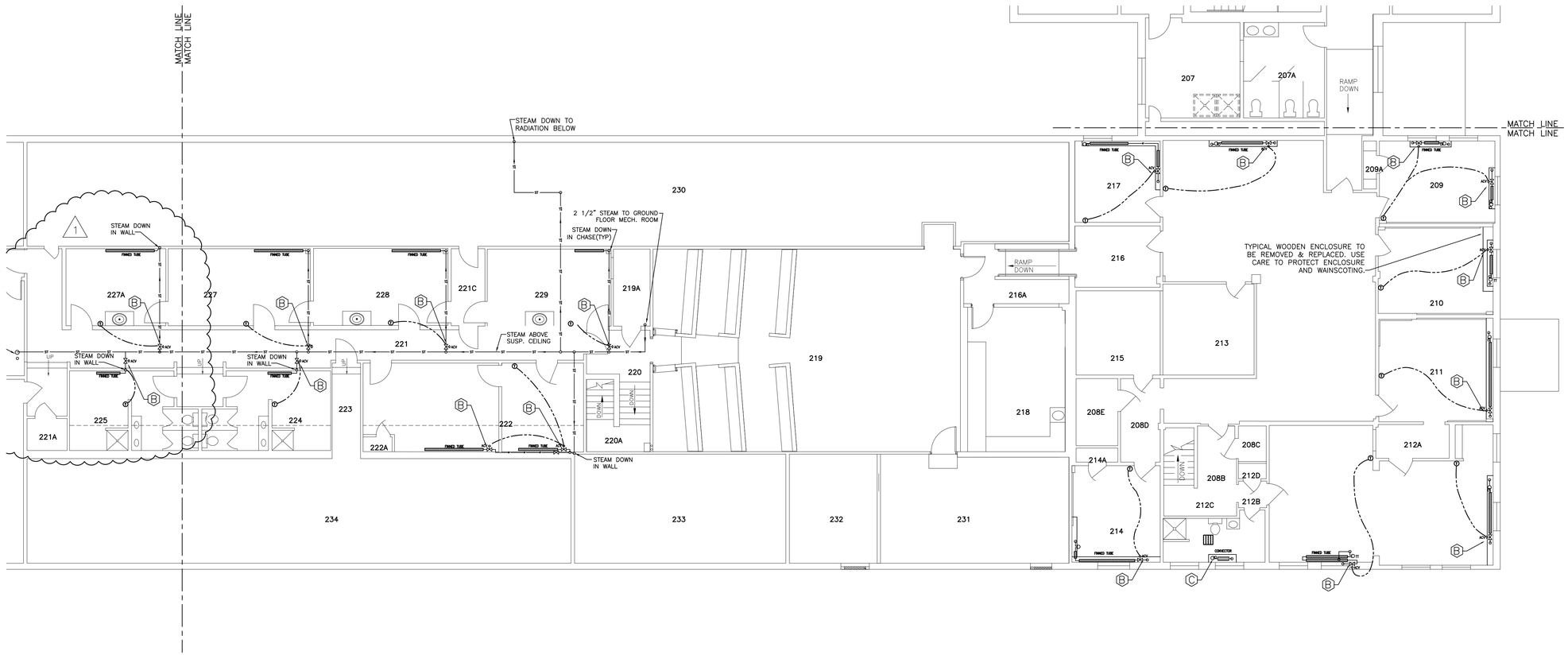
CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PLUMBING
LEGENDS, NOTES & DETAILS

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID: P–201
SHEET: 65 OF 126



1 MECHANICAL STEAM SYSTEM REMOVAL PLAN SECOND FLOOR – NORTH END

SCALE: 1/8" = 1'–0"

LEGEND & KEYED NOTES

- (A) UNIT HEATER, FLOAT TRAP AND SHUTOFF VALVES
- (B) CONTROL VALVE, THERMOSTAT AND CONTROL WIRING
- (C) THERMOSTATIC TRAP
- (D) END OF MAIN DRIP — END OF MAIN DRIP
- (E) VALVE, FLOAT & THERMOSTATIC TRAP, TEMPERATURE TRAP

FINNED TUBE — C.I. RAD — CONVECTOR

CR	CONDENSATE RETURN
CWR	CONDENSATE RETURN BOILER ROOM
ST	STEAM SUPPLY
CV	CONDENSATE VENT
DHW	DOMESTIC HOT WATER
DCW	DOMESTIC COLD WATER
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
OIL	OIL PIPING

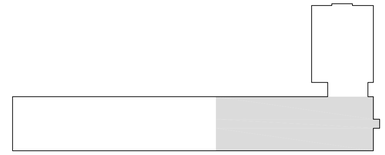
STEAM SYSTEM REMOVAL GENERAL NOTES

1) THE INTENTION OF THIS DRAWING AND NOTES IS TO SHOW THE GENERAL LOCATION AND DESCRIPTION OF ITEMS TO BE REMOVED. IT DOES NOT INCLUDE ALL THE DETAILS AND ACCESSORIES ASSOCIATED WITH THE ITEM TO BE REMOVED – IT WILL BE THE CONTRACTORS RESPONSIBILITY TO REMOVE ALL ACCESSORIES NORMALLY ASSOCIATED WITH THE ITEM DESIGNATED.

2) THE CONTRACTOR IS TO REMOVE ALL DEMOLISHED MATERIALS AND EQUIPMENT FROM THE JOBSITE. CONTRACTOR IS TO DISPOSE OF ALL MATERIAL AND EQUIPMENT PER EPA STANDARDS.

3) THE CONTRACTOR IS RESPONSIBLE TO REMOVE FROM THE JOBSITE ALL MATERIALS AND EQUIPMENT ASSOCIATED WITH THE EXISTING STEAM HEATING SYSTEM. ITEMS TO BE REMOVED INCLUDE; BUT ARE NOT LIMITED TO:
A) ALL STEAM SUPPLY PIPING.
B) ALL CONDENSATE PIPING.
C) ALL STEAM TRAPS.
D) ALL STEAM CONTROL VALVES,
E) ALL STEAM ACCESSORIES.
F) ALL HANGERS AND SUPPORTS ASSOCIATED WITH THE STEAM SYSTEM
G) ALL STEAM VENT LINES
H) THE STEAM BOILER. AND ASSOCIATED ACCESSORIES.
I) BOILER FEED PUMPS, RECEIVERS AND ACCESSORIES
J) CONDENSATE PUMPS AND RECEIVERS.
K) STEAM TO HOT WATER HEAT EXCHANGERS.
L) HOT WATER HEATING PUMPS NOT BEING REUSED.
M) ALL STEAM FINNED TUBE, CONVECTORS, AND UNIT HEATERS.
N) STEAM BOILER MAKE–UP WATER PIPING.
O) INSULATION ON PIPING (NON–ASBESTOS INSULATION ONLY).
P) ALL CONTROLS AND CONTROL WIRING

1/8" = 1'–0" 0' 2' 4' 6' 8' 16' 24' 32'



KEY PLAN
NO SCALE

STATE OF MAINE
Kurt F. Magnusson 10257
PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
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DIRECTORATE FACILITIES ENGINEERING — DFE — CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.

DESIGNED BY: KFM
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CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/8" = 1'–0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordija Capital Projects Group
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL STEAM REMOVAL PLAN
SECOND FLOOR – NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
MD–106
SHEET: 71 OF 126

January 28, 2019 – 7:17 am
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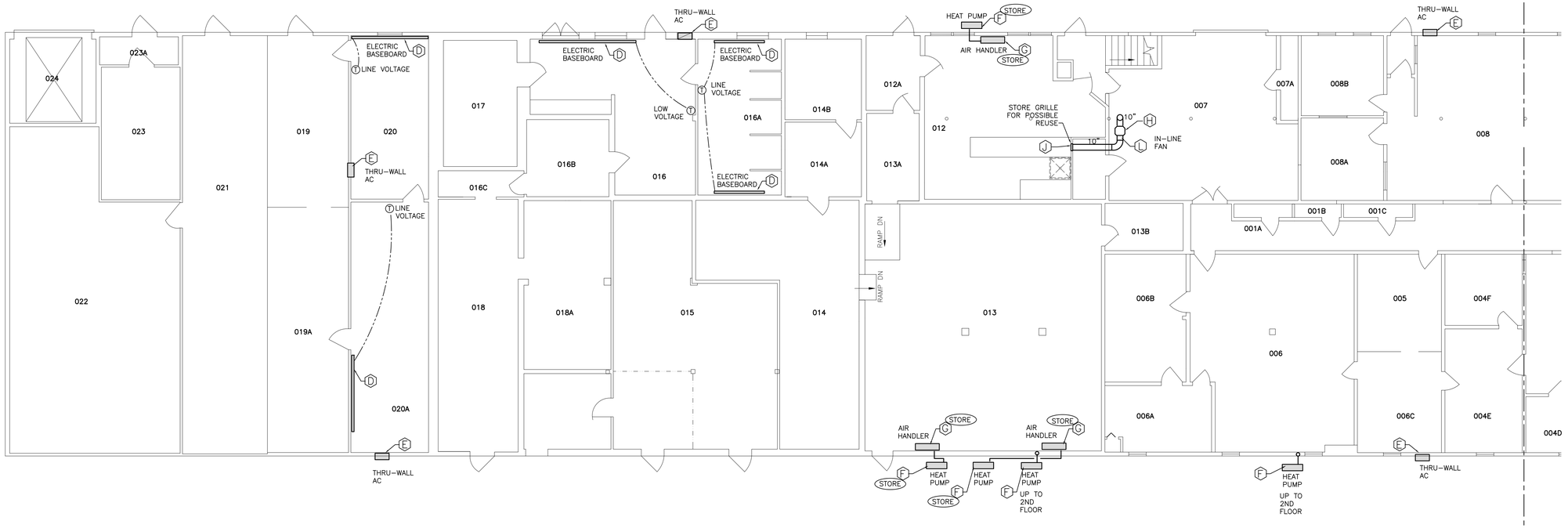

1 MECHANICAL HVAC REMOVAL PLAN LOWER LEVEL – SOUTH END

SCALE: 1/8" = 1'–0"

REMOVAL AND DEMOLITION KEYED NOTES

- (A) REMOVE HOT WATER COIL. DISCONNECT HOT WATER SUPPLY AND RETURN LINES. REMOVE CONTROL VALVE AND ACCESSORIES. REMOVE DUCTWORK TRANSITIONS AND DUCTWORK NOT BEING REUSED.
- (B) REMOVE ROOF–MOUNTED FAN. EXISTING ROOF CURB TO REMAIN AS–IS FOR REUSE.
- (C) REMOVE 68"x24" OUTSIDE AIR GOOSENECK. RE–INSTALL ON EXTENDED DUCT.
- (D) ELECTRIC BASEBOARD HEAT TO BE REMOVED BY ELECTRICAL CONTRACTOR. REMOVE ASSOCIATED THERMOSTAT AND CONTROL WIRING.
- (E) REMOVE THROUGH–WALL AIR CONDITIONING UNIT.
- (F) REMOVE HEAT PUMP MINI–SPLIT OUTDOOR UNIT. REMOVE ASSOCIATED WALL–BRACKET OR GROUND PAD. REMOVE ALL REFRIGERANT PER EPA STANDARDS. REMOVE ALL REFRIGERANT PIPING FROM HEAT PUMP TO AIR HANDLER.
- (F) STORE: REMOVE HEAT PUMP MINI–SPLIT OUTDOOR UNIT. REMOVE ASSOCIATED WALL–BRACKET OR GROUND–PAD. REMOVE ALL REFRIGERANT PER EPA STANDARDS. REMOVE ALL REFRIGERANT PIPING FROM HEAT PUMP TO AIR HANDLER. CAP GAS AND LIQUID LINE MOISTURE–TIGHT (FLARE JOINT CAP). PLACE ALL REMOVED INDOOR & OUTDOOR UNITS ON PALLETS AND PACKAGE FOR OVER–THE ROAD TRANSPORT TO A OWNER DESIGNATED LOCATION WITHIN CAMP KEYES.
- (G) REMOVE HEAT PUMP MINI–SPLIT SPLIT AIR HANDLER. REMOVE ASSOCIATED WALL–BRACKET. REMOVE ALL CONDENSATE PIPING NOT BEING REUSED..
- (G) STORE: REMOVE HEAT PUMP MINI–SPLIT AIR HANDLER. REMOVE ASSOCIATED WALL–BRACKET. CAP GAS AND LIQUID LINE MOISTURE–TIGHT (FLARE JOINT CAP). REMOVE CONDENSATE PIPING. TRANSPORT OUTDOOR UNIT TO OWNER DESIGNATED LOCATION WITHIN CAMP KEYES.
- (H) REMOVE THROUGH–WALL FAN AND FAN SWITCH.
- (I) REMOVE CEILING–MOUNTED ELECTRIC HEATER.
- (J) REMOVE CEILING OR WALL–MOUNTED RETURN. EXHAUST OR SUPPLY GRILLE. REMOVE ASSOCIATED BRANCH DUCT.
- (K) REMOVE ENERGY RECOVERY UNIT
- (L) REMOVE DUCTWORK MAIN. REMOVE ENTIRE MAIN AND BRANCH DUCTS.

STORE: THIS COMMENT ON THE DRAWINGS INDICATES THE MAJOR COMPONENTS OF THE MINI–SPLIT SYSTEMS THAT ARE TO BE REMOVED, PACKED, AND DELIVERED FOR STORAGE.

REMOVAL AND DEMOLITION GENERAL NOTES

1) THE INTENTION OF THIS DRAWING AND NOTES IS TO SHOW THE GENERAL LOCATION AND DESCRIPTION OF ITEMS TO BE REMOVED. IT DOES NOT INCLUDE ALL THE DETAILS AND ACCESSORIES ASSOCIATED WITH THE ITEM TO BE REMOVED – IT WILL BE THE CONTRACTORS RESPONSIBILITY TO REMOVE ALL ACCESSORIES NORMALLY ASSOCIATED WITH THE ITEM DESIGNATED.
2) THE CONTRACTOR IS TO REMOVE ALL DEMOLISHED MATERIALS AND EQUIPMENT FROM THE JOBSITE. CONTRACTOR IS TO DEPOSE OF ALL MATERIAL AND EQUIPMENT PER EPA STANDARDS. (1)
3) ALL REFRIGERANTS MUST BE RECOVERED PER EPA STANDARDS AND REMOVED FROM THE JOBSITE. THE CONTRACTOR PERFORMING THE REMOVAL, PUMPING AND CAPPING OF REFRIGERANT LINES SHALL PROVIDE DOCUMENTATION THEY HAVE PASSED AN EPA APPROVED SECTION 608 TECHNICIAN CERTIFICATION (TYPE II) TEST PRIOR TO REMOVAL OF THE HVAC UNITS.
4) MATERIALS AND EQUIPMENT THAT ARE DESIGNATED (STORE) SHALL BE PACKED ON PALETTES AND SHRINK WRAPPED FOR OVER–THE–ROAD TRANSPORT AND DELIVERED TO A LOCATION WITHIN CAMP KEYES SPECIFIED BY THE OWNER,

CONTROL AND BALANCING VALVE REMOVAL NOTES

1) REMOVE CONTROL VALVES, BALANCING VALVES BALL VALVES AND STRAINERS FOR CONNECTIONS THAT ARE SHOWN TO BE REPLACED ON DRAWING M108.
2) EXISTING FIN–TUBE RADIATION, UNIT HEATERS AND CONVECTORS ARE TO REMAIN IN–PLACE AN IN–USE.

1/8" = 1'–0" 0' 2' 4' 6' 8' 16' 24' 32'

KEY PLAN
NO SCALE

STATE OF MAINE
Kurt F. Magnusson
10257
PROFESSIONAL ENGINEER

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STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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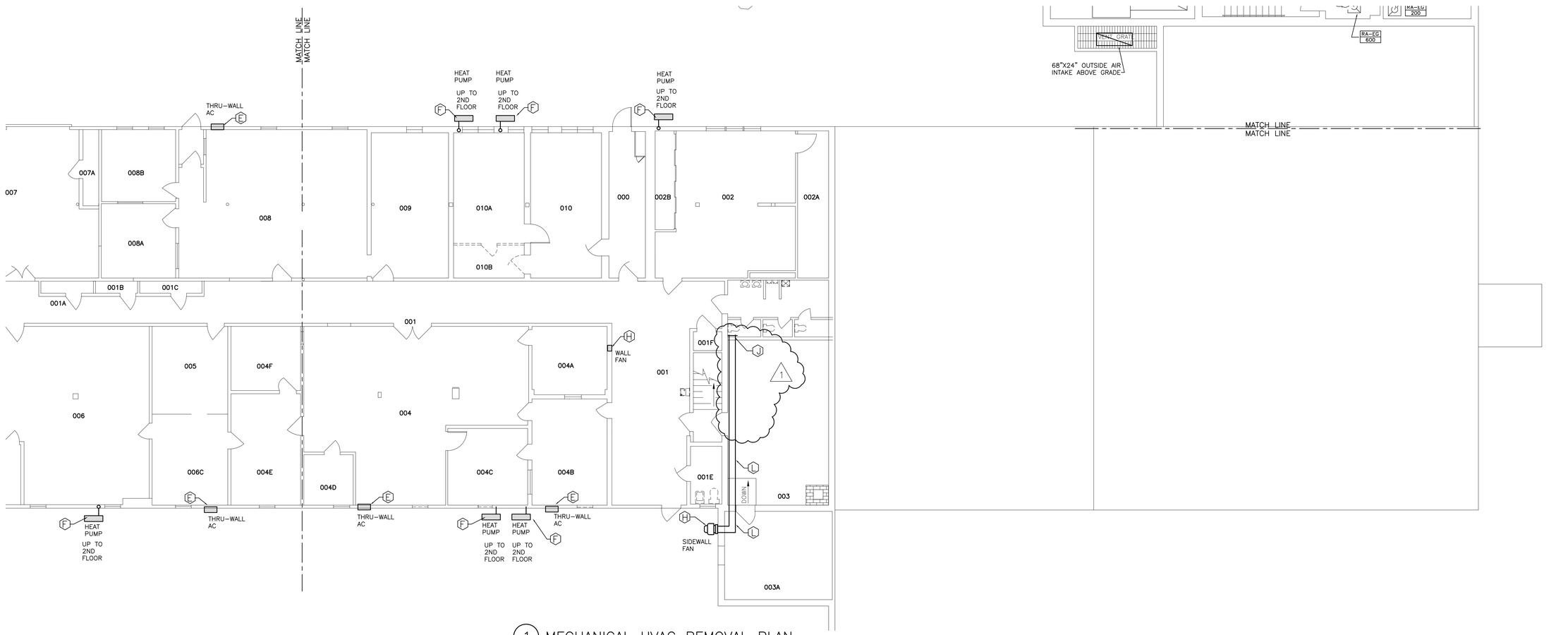
CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL HVAC REMOVAL PLAN
LOWER LEVEL SOUTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
MD–107
SHEET: 72 OF 126



1 MECHANICAL HVAC REMOVAL PLAN LOWER LEVEL – NORTH END

SCALE: 1/8" = 1'–0"

REMOVAL AND DEMOLITION KEYED NOTES

(A) REMOVE HOT WATER COIL.
DISCONNECT HOT WATER SUPPLY AND RETURN LINES
REMOVE CONTROL VALVE AND ACCESSORIES.
REMOVE DUCTWORK TRANSITIONS AND DUCTWORK NOT BEING REUSED.

(B) REMOVE ROOF–MOUNTED FAN.
EXISTING ROOF CURB TO REMAIN AS–IS FOR REUSE.

(C) REMOVE 68"X24" OUTSIDE AIR GOOSENECK.
RE–INSTALL ON EXTENDED DUCT.

(D) ELECTRIC BASEBOARD HEAT TO BE REMOVED BY ELECTRICAL CONTRACTOR.
REMOVE ASSOCIATED THERMOSTAT AND CONTROL WIRING.

(E) REMOVE THROUGH–WALL AIR CONDITIONING UNIT.

(F) REMOVE HEAT PUMP MINI–SPLIT OUTDOOR UNIT.
REMOVE ASSOCIATED WALL–BRACKET OR GROUND PAD.
REMOVE ALL REFRIGERANT PER EPA STANDARDS.
REMOVE ALL REFRIGERANT PIPING FROM HEAT PUMP TO AIR HANDLER.

(F) STORE REMOVE HEAT PUMP MINI–SPLIT OUTDOOR UNIT.
REMOVE ASSOCIATED WALL–BRACKET OR GROUND–PAD.
REMOVE ALL REFRIGERANT PER EPA STANDARDS.
REMOVE ALL REFRIGERANT PIPING FROM HEAT PUMP TO AIR HANDLER.
CAP GAS AND LIQUID LINE MOISTURE–TIGHT (FLARE JOINT CAP).
PLACE ALL REMOVED INDOOR & OUTDOOR UNITS ON PALLETS
AND PACKAGE FOR OVER–THE ROAD TRANSPORT TO A
OWNER DESIGNATED LOCATION WITHIN CAMP KEYES.

(G) REMOVE HEAT PUMP MINI–SPLIT SPLIT AIR HANDLER.
REMOVE ASSOCIATED WALL–BRACKET.
REMOVE ALL CONDENSATE PIPING NOT BEING REUSED..

(G) STORE REMOVE HEAT PUMP MINI–SPLIT AIR HANDLER.
REMOVE ASSOCIATED WALL–BRACKET.
CAP GAS AND LIQUID LINE MOISTURE–TIGHT (FLARE JOINT CAP).
REMOVE CONDENSATE PIPING
TRANSPORT OUTDOOR UNIT TO OWNER DESIGNATED LOCATION WITHIN CAMP KEYES.

(H) REMOVE THROUGH–WALL FAN AND FAN SWITCH.

(I) REMOVE CEILING–MOUNTED ELECTRIC HEATER.

(J) REMOVE CEILING OR WALL–MOUNTED RETURN. EXHAUST OR SUPPLY GRILLE
REMOVE ASSOCIATED BRANCH DUCT.

(K) REMOVE ENERGY RECOVERY UNIT

(L) REMOVE DUCTWORK MAIN. REMOVE ENTIRE MAIN AND BRANCH DUCTS.

(STORE) THIS COMMENT ON THE DRAWINGS INDICATES THE MAJOR COMPONENTS OF THE MINI–SPLIT SYSTEMS THAT ARE TO BE REMOVED, PACKED, AND DELIVERED FOR STORAGE.

REMOVAL AND DEMOLITION GENERAL NOTES

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4) MATERIALS AND EQUIPMENT THAT ARE DESIGNATED (STORE) SHALL BE PACKED ON PALETTES AND SHRINK WRAPPED FOR OVER–THE–ROAD TRANSPORT AND DELIVERED TO A LOCATION WITHIN CAMP KEYES SPECIFIED BY THE OWNER,

CONTROL AND BALANCING VALVE REMOVAL NOTES

1) REMOVE CONTROL VALVES, BALANCING VALVES BALL VALVES AND STRAINERS FOR CONNECTIONS THAT ARE SHOWN TO BE REPLACED ON DRAWING M108.

2) EXISTING FIN–TUBE RADIATION, UNIT HEATERS AND CONVECTORS ARE TO REMAIN IN–PLACE AN IN–USE.

KEY PLAN
NO SCALE

1/8" = 1'–0"

0' 2' 4' 6' 8' 16' 24' 32'

STATE OF MAINE
Kurt F. Magnusson 10257
PROFESSIONAL ENGINEER

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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL HVAC REMOVAL PLAN
LOWER LEVEL – NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
MD–108
SHEET: 73 OF 126

January 28, 2019 – 7:18 am
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1 MECHANICAL HVAC REMOVAL PLAN FIRST FLOOR – SOUTH END

SCALE: 1/8" = 1'–0"

REMOVAL AND DEMOLITION KEYED NOTES

- (A) REMOVE HOT WATER COIL. DISCONNECT HOT WATER SUPPLY AND RETURN LINES REMOVE CONTROL VALVE AND ACCESSORIES. REMOVE DUCTWORK TRANSITIONS AND DUCTWORK NOT BEING REUSED.
- (B) REMOVE ROOF–MOUNTED FAN. EXISTING ROOF CURB TO REMAIN AS–IS FOR REUSE.
- (C) REMOVE 68"X24" OUTSIDE AIR GOOSENECK. RE–INSTALL ON EXTENDED DUCT.
- (D) ELECTRIC BASEBOARD HEAT TO BE REMOVED BY ELECTRICAL CONTRACTOR. REMOVE ASSOCIATED THERMOSTAT AND CONTROL WIRING.
- (E) REMOVE THROUGH–WALL AIR CONDITIONING UNIT.
- (F) REMOVE HEAT PUMP MINI–SPLIT OUTDOOR UNIT. REMOVE ASSOCIATED WALL–BRACKET OR GROUND PAD. REMOVE ALL REFRIGERANT PER EPA STANDARDS. REMOVE ALL REFRIGERANT PIPING FROM HEAT PUMP TO AIR HANDLER.
- (F) STORE — REMOVE HEAT PUMP MINI–SPLIT OUTDOOR UNIT. REMOVE ASSOCIATED WALL–BRACKET OR GROUND–PAD. REMOVE ALL REFRIGERANT PER EPA STANDARDS. REMOVE ALL REFRIGERANT PIPING FROM HEAT PUMP TO AIR HANDLER. CAP GAS AND LIQUID LINE MOISTURE–TIGHT (FLARE JOINT CAP). PLACE ALL REMOVED INDOOR & OUTDOOR UNITS ON PALLETS AND PACKAGE FOR OVER–THE ROAD TRANSPORT TO A OWNER DESIGNATED LOCATION WITHIN CAMP KEYES.
- (G) REMOVE HEAT PUMP MINI–SPLIT SPLIT AIR HANDLER. REMOVE ASSOCIATED WALL–BRACKET. REMOVE ALL CONDENSATE PIPING NOT BEING REUSED..
- (G) STORE — REMOVE HEAT PUMP MINI–SPLIT AIR HANDLER. REMOVE ASSOCIATED WALL–BRACKET. CAP GAS AND LIQUID LINE MOISTURE–TIGHT (FLARE JOINT CAP). REMOVE CONDENSATE PIPING TRANSPORT OUTDOOR UNIT TO OWNER DESIGNATED LOCATION WITHIN CAMP KEYES.
- (H) REMOVE THROUGH–WALL FAN AND FAN SWITCH.
- (I) REMOVE CEILING–MOUNTED ELECTRIC HEATER.
- (J) REMOVE CEILING OR WALL–MOUNTED RETURN. EXHAUST OR SUPPLY GRILLE REMOVE ASSOCIATED BRANCH DUCT.
- (K) REMOVE ENERGY RECOVERY UNIT
- (L) REMOVE DUCTWORK MAIN. REMOVE ENTIRE MAIN AND BRANCH DUCTS.

(STORE) THIS COMMENT ON THE DRAWINGS INDICATES THE MAJOR COMPONENTS OF THE MINI–SPLIT SYSTEMS THAT ARE TO BE REMOVED, PACKED, AND DELIVERED FOR STORAGE.

REMOVAL AND DEMOLITION GENERAL NOTES

1) THE INTENTION OF THIS DRAWING AND NOTES IS TO SHOW THE GENERAL LOCATION AND DESCRIPTION OF ITEMS TO BE REMOVED. IT DOES NOT INCLUDE ALL THE DETAILS AND ACCESSORIES ASSOCIATED WITH THE ITEM TO BE REMOVED – IT WILL BE THE CONTRACTORS RESPONSIBILITY TO REMOVE ALL ACCESSORIES NORMALLY ASSOCIATED WITH THE ITEM DESIGNATED.
2) THE CONTRACTOR IS TO REMOVE ALL DEMOLISHED MATERIALS AND EQUIPMENT FROM THE JOBSITE. CONTRACTOR IS TO DEPOSE OF ALL MATERIAL AND EQUIPMENT PER EPA STANDARDS.
3) ALL REFRIGERANTS MUST BE RECOVERED PER EPA STANDARDS AND REMOVED FROM THE JOBSITE. THE CONTRACTOR PERFORMING THE REMOVAL, PUMPING AND CAPPING OF REFRIGERANT LINES SHALL PROVIDE DOCUMENTATION THEY HAVE PASSED AN EPA APPROVED SECTION 608 TECHNICIAN CERTIFICATION (TYPE II) TEST PRIOR TO REMOVAL OF THE HVAC UNITS.
4) MATERIALS AND EQUIPMENT THAT ARE DESIGNATED (STORE) SHALL BE PACKED ON PALETTES AND SHRINK WRAPPED FOR OVER–THE–ROAD TRANSPORT AND DELIVERED TO A LOCATION WITHIN CAMP KEYES SPECIFIED BY THE OWNER.

CONTROL AND BALANCING VALVE REMOVAL NOTES

1) REMOVE CONTROL VALVES, BALANCING VALVES BALL VALVES AND STRAINERS FOR CONNECTIONS THAT ARE SHOWN TO BE REPLACED ON DRAWING M108.
2) EXISTING FIN–TUBE RADIATION, UNIT HEATERS AND CONVECTORS ARE TO REMAIN IN–PLACE AN IN–USE.

1/8" = 1'–0" 0' 2' 4' 6' 8' 16' 24' 32'

KEY PLAN NO SCALE

STATE OF MAINE PROFESSIONAL ENGINEER Kurt F. Magnusson 10257 LICENSED

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
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DIRECTORATE FACILITIES ENGINEERING DFE CAMP KEYES

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Rev#	Description	Date	Appr.
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DRAWN BY: KM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/8" = 1'–0"
DFE PROJECT NO: 235R18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordija Capital Projects Group
16 Tannery Lane, Suite 23
Gorham, Maine 04038
207-236-9970 / mdigle@cordijacpg.com

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MECHANICAL HVAC REMOVAL PLAN
FIRST FLOOR – SOUTH END

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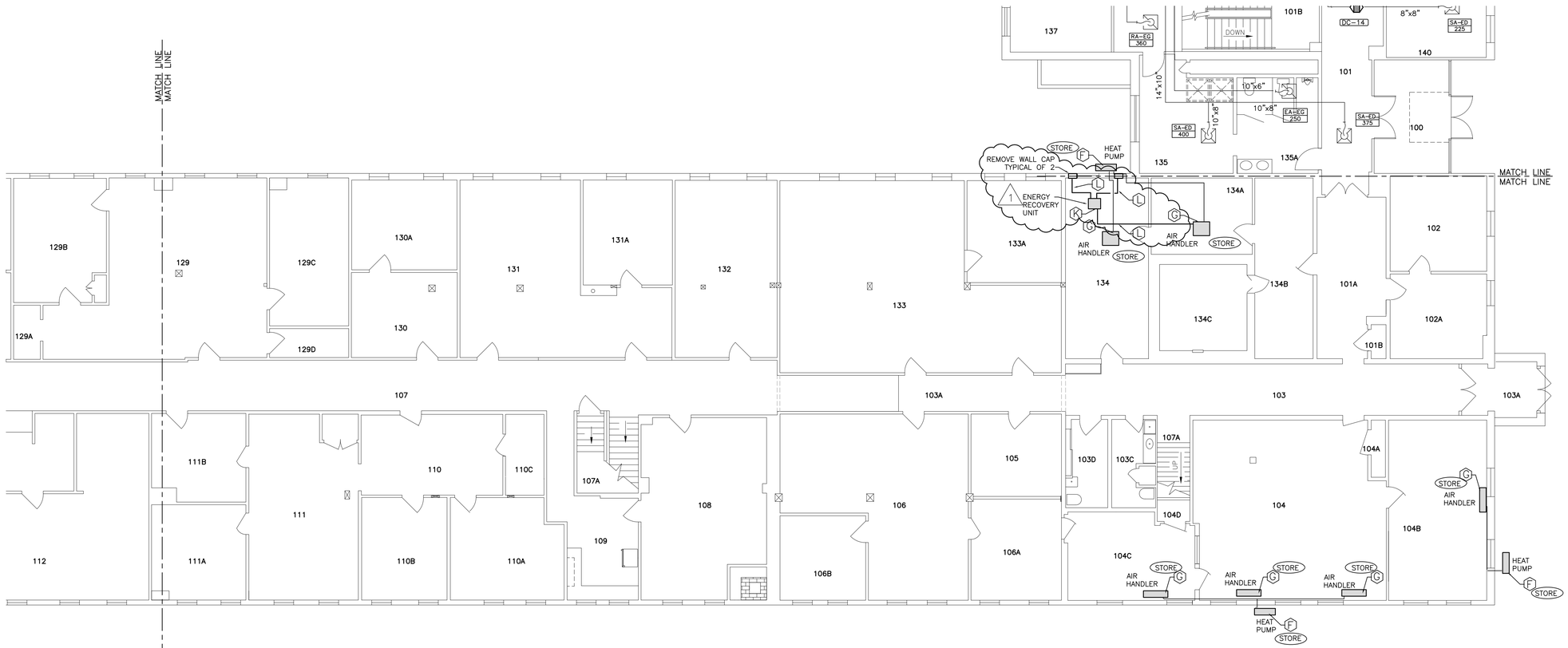

1 MECHANICAL HVAC REMOVAL PLAN
FIRST FLOOR – NORTH END

SCALE: 1/8" = 1'–0"

REMOVAL AND DEMOLITION KEYED NOTES

(A) REMOVE HOT WATER COIL.
DISCONNECT HOT WATER SUPPLY AND RETURN LINES
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(E) REMOVE THROUGH–WALL AIR CONDITIONING UNIT.

(F) REMOVE HEAT PUMP MINI–SPLIT OUTDOOR UNIT.
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STORE REMOVE ASSOCIATED WALL–BRACKET OR GROUND–PAD.
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REMOVE ALL REFRIGERANT PIPING FROM HEAT PUMP TO AIR HANDLER.
CAP GAS AND LIQUID LINE MOISTURE–TIGHT (FLARE JOINT CAP).
PLACE ALL REMOVED INDOOR & OUTDOOR UNITS ON PALLETS
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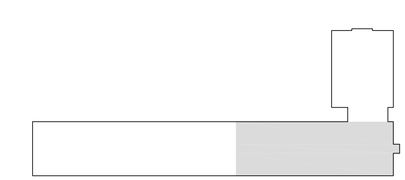

KEY PLAN
NO SCALE

MECHANICAL SYSTEMS ENGINEERS
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Cordjia Capital Projects Group
16 Tannery Lane, Suite 23
Lewiston, Maine 04243
207-236-9970 / mdigle@cordjiacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL HVAC REMOVAL PLAN
FIRST FLOOR – NORTH END

PLAN PROGRESS
- ☐ DRAFT
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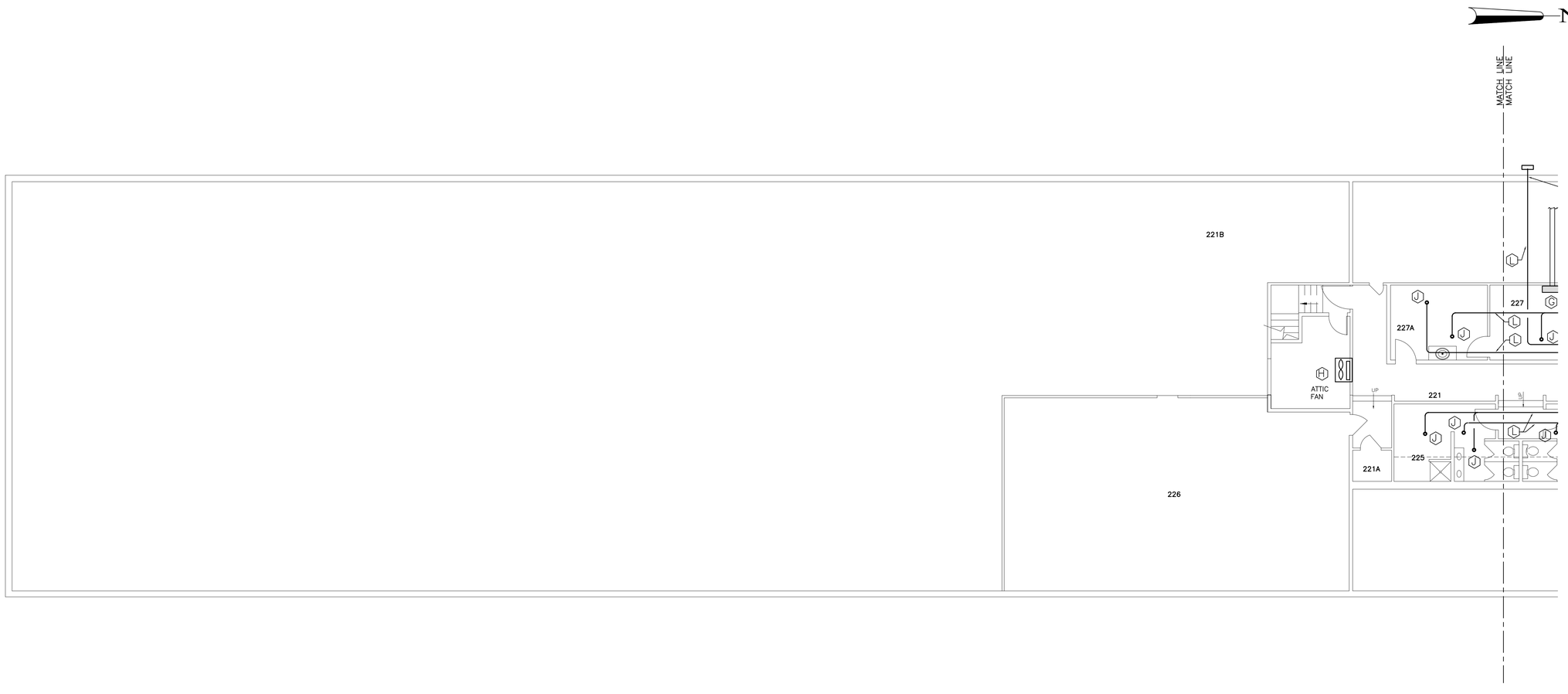
MD–110
SHEET: 75 OF 126

STATE OF MAINE Kurt F. Magnusson 10257 LICENSED PROFESSIONAL ENGINEER



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STATE OF MAINE Kurt F. Magnusson 10257 LICENSED PROFESSIONAL ENGINEER

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DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordjia Capital Projects Group
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Conway, New Hampshire 03818
207-236-9970 / mdoigle@cordjiacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL HVAC REMOVAL PLAN
SECOND FLOOR – SOUTH END

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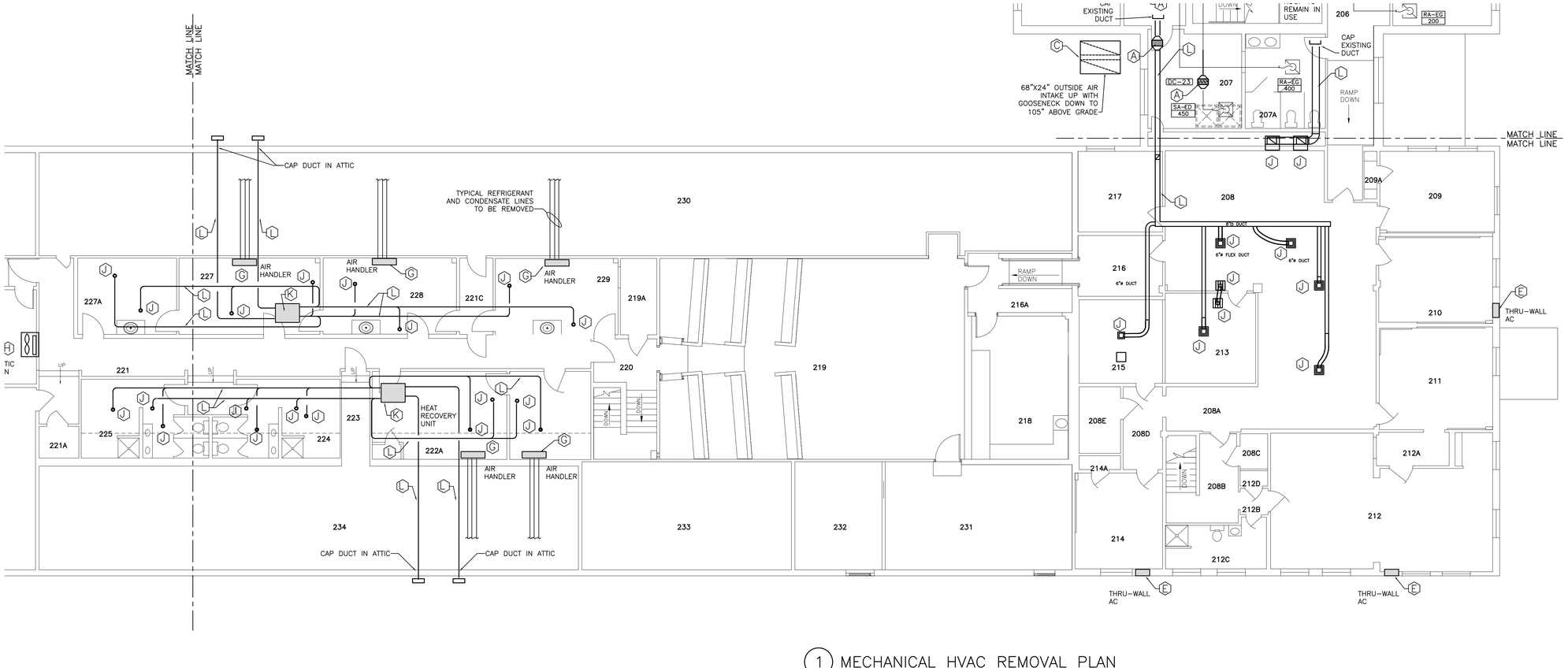

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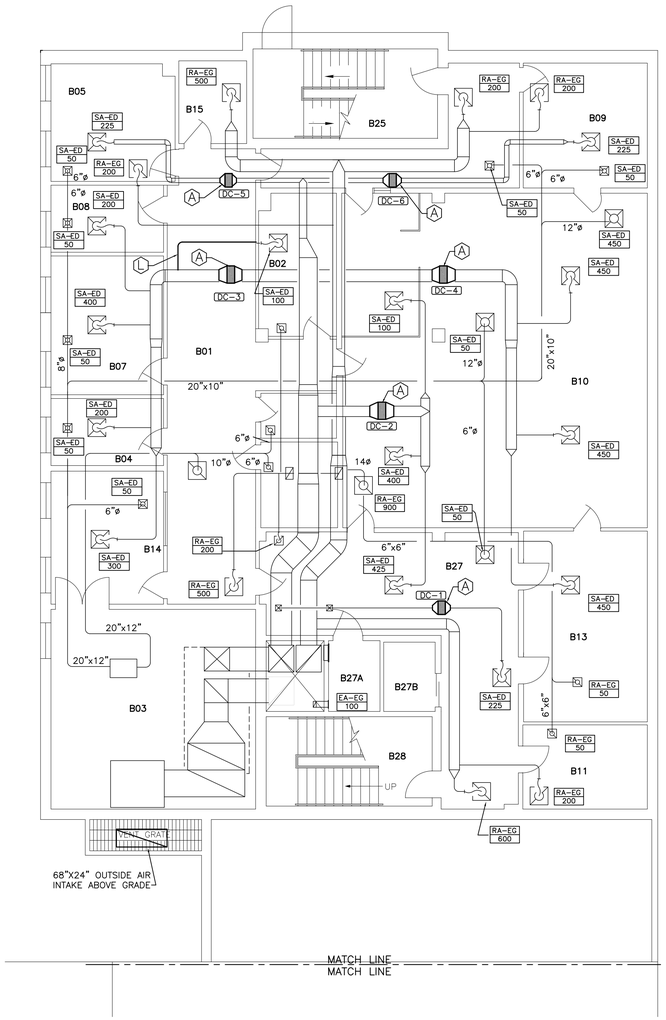
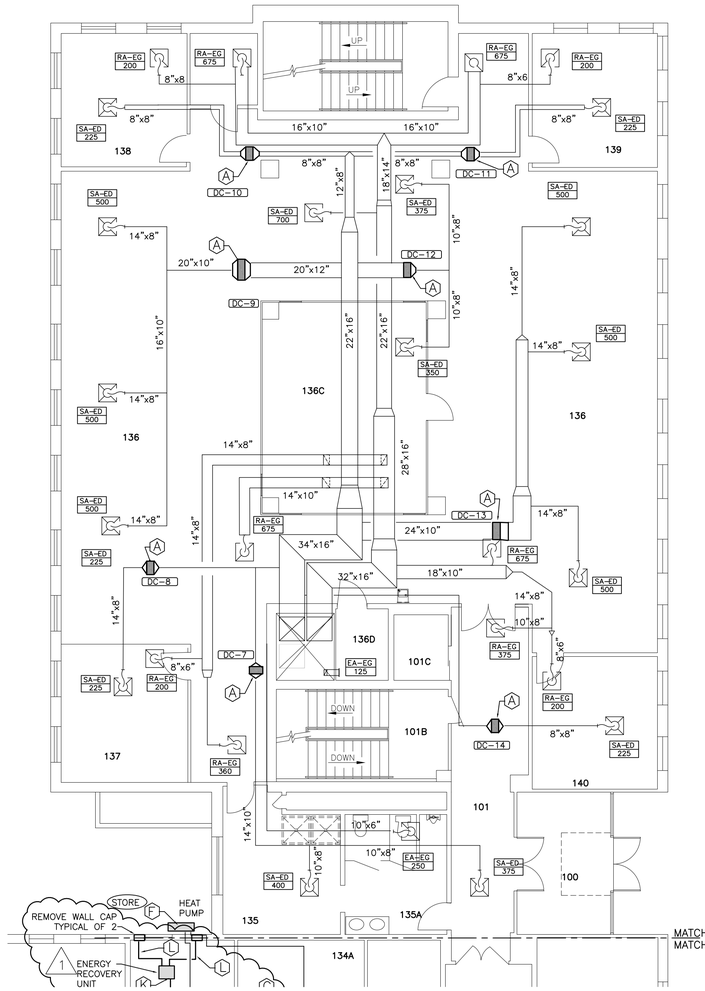


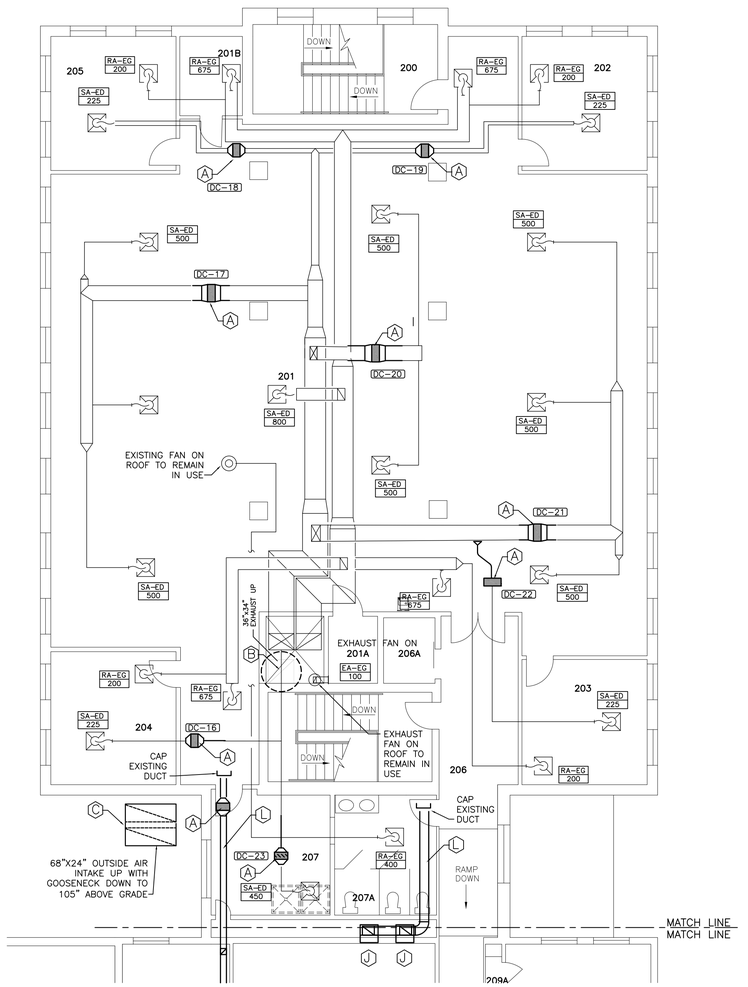
1 MECHANICAL HVAC REMOVAL PLAN
LOWER LEVEL – NORTHWEST WING

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



2 MECHANICAL HVAC REMOVAL PLAN
FIRST FLOOR – NORTHWEST WING

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



3 MECHANICAL HVAC REMOVAL PLAN
SECOND FLOOR – NORTHWEST WING

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

REMOVAL AND DEMOLITION KEYED NOTES

(A) REMOVE HOT WATER COIL.
DISCONNECT HOT WATER SUPPLY AND RETURN LINES
REMOVE CONTROL VALVE AND ACCESSORIES.
REMOVE DUCTWORK TRANSITIONS AND DUCTWORK NOT BEING REUSED.

(B) REMOVE ROOF–MOUNTED FAN.
EXISTING ROOF CURB TO REMAIN AS–IS FOR REUSE.

(C) REMOVE 68"X24" OUTSIDE AIR GOOSENECK.
RE–INSTALL ON EXTENDED DUCT.

(D) ELECTRIC BASEBOARD HEAT TO BE REMOVED BY ELECTRICAL CONTRACTOR.
REMOVE ASSOCIATED THERMOSTAT AND CONTROL WIRING.

(E) REMOVE THROUGH–WALL AIR CONDITIONING UNIT.

(F) REMOVE HEAT PUMP MINI–SPLIT OUTDOOR UNIT.
REMOVE ASSOCIATED WALL–BRACKET OR GROUND PAD.
REMOVE ALL REFRIGERANT PER EPA STANDARDS.
REMOVE ALL REFRIGERANT PIPING FROM HEAT PUMP TO AIR HANDLER.

(F) REMOVE HEAT PUMP MINI–SPLIT OUTDOOR UNIT.
STORE REMOVE ASSOCIATED WALL–BRACKET OR GROUND–PAD.
REMOVE ALL REFRIGERANT PER EPA STANDARDS.
REMOVE ALL REFRIGERANT PIPING FROM HEAT PUMP TO AIR HANDLER.
CAP GAS AND LIQUID LINE MOISTURE–TIGHT (FLARE JOINT CAP).
PLACE ALL REMOVED INDOOR & OUTDOOR UNITS ON PALLETS
AND PACKAGE FOR OVER–THE ROAD TRANSPORT TO A
OWNER DESIGNATED LOCATION WITHIN CAMP KEYES.

(G) REMOVE HEAT PUMP MINI–SPLIT AIR HANDLER.
REMOVE ASSOCIATED WALL–BRACKET.
REMOVE ALL CONDENSATE PIPING NOT BEING REUSED..

(G) REMOVE HEAT PUMP MINI–SPLIT AIR HANDLER.
STORE REMOVE ASSOCIATED WALL–BRACKET.
CAP GAS AND LIQUID LINE MOISTURE–TIGHT (FLARE JOINT CAP).
REMOVE CONDENSATE PIPING
TRANSPORT OUTDOOR UNIT TO OWNER DESIGNATED LOCATION WITHIN CAMP KEYES.

(H) REMOVE THROUGH–WALL FAN AND FAN SWITCH.

(I) REMOVE CEILING–MOUNTED ELECTRIC HEATER.

(J) REMOVE CEILING OR WALL–MOUNTED RETURN. EXHAUST OR SUPPLY GRILLE
REMOVE ASSOCIATED BRANCH DUCT.

(K) REMOVE ENERGY RECOVERY UNIT

(L) REMOVE DUCTWORK MAIN. REMOVE ENTIRE MAIN AND BRANCH DUCTS.

STORE THIS COMMENT ON THE DRAWINGS INDICATES THE MAJOR COMPONENTS OF THE MINI–SPLIT SYSTEMS THAT ARE TO BE REMOVED, PACKED, AND DELIVERED FOR STORAGE.

REMOVAL AND DEMOLITION GENERAL NOTES

1) THE INTENTION OF THIS DRAWING AND NOTES IS TO SHOW THE GENERAL LOCATION AND DESCRIPTION OF ITEMS TO BE REMOVED. IT DOES NOT INCLUDE ALL THE DETAILS AND ACCESSORIES ASSOCIATED WITH THE ITEM TO BE REMOVED – IT WILL BE THE CONTRACTORS RESPONSIBILITY TO REMOVE ALL ACCESSORIES NORMALLY ASSOCIATED WITH THE ITEM DESIGNATED.

2) THE CONTRACTOR IS TO REMOVE ALL DEMOLISHED MATERIALS AND EQUIPMENT FROM THE JOBSITE. CONTRACTOR IS TO DEPOSE OF ALL MATERIAL AND EQUIPMENT PER EPA STANDARDS.

3) ALL REFRIGERANTS MUST BE RECOVERED PER EPA STANDARDS AND REMOVED FROM THE JOBSITE. THE CONTRACTOR PERFORMING THE REMOVAL, PUMPING AND CAPPING OF REFRIGERANT LINES SHALL PROVIDE DOCUMENTATION THEY HAVE PASSED AN EPA APPROVED SECTION 608 TECHNICIAN CERTIFICATION (TYPE II) TEST PRIOR TO REMOVAL OF THE HVAC UNITS.

4) MATERIALS AND EQUIPMENT THAT ARE DESIGNATED STORE SHALL BE PACKED ON PALETTES AND SHRINK WRAPPED FOR OVER–THE–ROAD TRANSPORT AND DELIVERED TO A LOCATION WITHIN CAMP KEYES SPECIFIED BY THE OWNER.

CONTROL AND BALANCING VALVE REMOVAL NOTES

1) REMOVE CONTROL VALVES, BALANCING VALVES BALL VALVES AND STRAINERS FOR CONNECTIONS THAT ARE SHOWN TO BE REPLACED ON DRAWING M108.

2) EXISTING FIN–TUBE RADIATION, UNIT HEATERS AND CONVECTORS ARE TO REMAIN IN–PLACE AN IN–USE.

1/8" = 1'–0" 0' 2' 4' 6' 8' 16' 24' 32'

KEY PLAN
NO SCALE

STATE OF MAINE
Kurt F. Magnusson
10257
LICENSED PROFESSIONAL ENGINEER

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DIRECTORATE FACILITIES ENGINEERING
DFE CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY:
DRAWN BY: KM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
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DFE PROJECT NO: 235R18-458-0

STATE OF MAINE
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL HVAC REMOVAL PLAN
NORTHWEST WING

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
MD–113
SHEET: 78 OF 126

GENERAL NOTES

1. MECHANICAL CONTRACTOR SHALL COORDINATE WORK WITH ALL OTHER TRADES.
2. ALL PIPING AND DUCTWORK SHALL BE RUN CONCEALED AND ON THE WARM SIDE OF THE BUILDING INSULATION UNLESS SHOWN OTHERWISE.
3. PIPING AND DUCTWORK IS SHOWN DIAGRAMATICALLY. EXACT LOCATIONS TO BE ADJUSTED AS REQUIRED TO CONFORM TO FIELD CONDITIONS.
4. ALL DUCT SIZES INDICATED ARE OUTSIDE (SHEET METAL) DIMENSIONS.
5. ALL CUTTING AND PATCHING BY THE GENERAL CONTRACTOR.
6. ALL SQUARE DUCT ELBOWS OVER 12 INCHES IN WIDTH TO HAVE TURNING VANES.
7. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF ALL CEILING REGISTERS, DIFFUSERS AND GRILLES.
8. ALL DUCT COILS, FIRE DAMPERS, MOTORIZED DAMPERS AND DUCT SMOKE DETECTORS SHALL HAVE DUCT ACCESS DOORS AS LARGE AS POSSIBLE UP TO 12"X12".
9. DUCT BRANCHES TO INDIVIDUAL DIFFUSERS SHALL BE THE SAME SIZE AS THE DIFFUSER NECK.
10. ALL DIMENSIONS ASSOCIATED WITH EXISTING CONDITIONS ARE APPROXIMATE AND ARE TO BE FIELD VERIFIED.
11. HEATING SYSTEM IS BASED ON 180°F. WATER LEAVING THE BOILER.
12. ALL BRANCH WATER PIPING TO INDIVIDUAL TERMINAL HEATING UNITS OR ZONES SHALL BE NOT LESS THAN 3/4 INCHES IN SIZE UNLESS NOTED OTHERWISE.
13. ALL REDUCTIONS IN WATER PIPE SIZES IN THE DIRECTION OF FLOW SHALL BE ACCOMPLISHED WITH INVERTED ECCENTRIC REDUCING FITTINGS. DO NOT USE REDUCING TEES.
14. PROVIDE AUTOMATIC AIR VENTS AT ALL LOCATIONS WHERE WATER PIPING DROPS IN THE DIRECTION OF FLOW, AT ALL HIGH POINTS IN THE SYSTEM AND ELSEWHERE AS SHOWN. 1
15. PROVIDE DRAINS WITH A BALL COCK, HOSE THREADS AND METAL CAPS AND CHAIN AT ALL LOW POINTS IN THE WATER PIPING SYSTEM.
16. ALL REMOVED MATERIALS SHALL REMAIN THE PROPERTY OF THE OWNER UNTIL SUCH TIME THE OWNER'S AUTHORIZED REPRESENTATIVE HAS REVIEWED THE REMOVED ITEMS AND TAKEN WHAT THE OWNER WISHES TO RETAIN. ALL REMAINING ITEMS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE IMMEDIATELY REMOVED FROM THE PREMISES BY THE CONTRACTOR.

SYMBOLS AND ABBREVIATIONS

ABV	AUTOMATIC BALANCING VALVE
AC	AIR CONDITIONING
AD	ACCESS DOOR
ADJ	ADJUSTABLE
AFF	ABOVE FINISH FLOOR
AH	AIR HANDLER
AP	ACCES PANEL
APD	AIR PRESSURE DROP
ATC	AUTOMATIC TEMP. CONTROL
ATFP	ANTI-TERRORISM FORCE PROTECTION
AV	AUTOMATIC VENT
B	BOILER
BD	BACKDRAFT DAMPER
BV	BALL VALVE
C	CONVECTOR
CAR	CONSTANT AIRFLOW REGULATOR
CD	CONDENSATE DRAIN
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CTE	CONNECT TO EXISTING
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONTROL VALVE
D	DRAIN
DIC	DOWN IN CORNER/CHASE
DHC	DUCT HEATING COIL
DIFF	DIFFUSER
DIW	DOWN IN WALL
DO	DRAW-OFF
DSD	DUCT SMOKE DETECTOR
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB
EF	EXHAUST FAN
EG	EXHAUST GRILLE
ER	EXHAUST REGISTER
ERV	ENERGY RECOVERY VENTILATOR
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB
EWT	ENTERING WATER TEMPERATURE
FC	FLEXIBLE CONNECTOR
FCV	FLOW CONTROL VALVE
FD	FIRE DAMPER
FP	FINNED PIPE
FS	FLOW SENSOR
FMS	FLOW MEASURING STATION
FV	FACE VELOCITY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HC	HEATING CONTRACTOR
HWR	HOT WATER RETURN
HWS	HOT WATER SUPPLY
H&V	HEATING & VENTILATING
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
IER	INVERTED ECCENTRIC REDUCER
L	LOUVER
LAT	LEAVING AIR TEMPERATURE
LDB	LEAVING DRY BULB
LWB	LEAVING WET BULB
LWCO	LOW WATER CUT-OFF
MBH	THOUSAND BTU PER HOUR
MBV	MANUAL BALANCING VALVE
MD	MANUAL DAMPER
MOD	MOTOR OPERATED DAMPER
MV	MANUAL VENT
NG	NATURAL GAS
NTS	NOT TO SCALE
OA	OUTDOOR AIR
OD	OUTSIDE DIMENSION
P	PUMP
PG	PRESSURE GAUGE
PP	POLYPROPYLENE PIPE
PRV	PRESSURE REDUCING VALVE
R	RETURN
RA	RETURN AIR
RG	RETURN/RELIEF GRILLE
RIC	RETURN IN COVER
RIS	RUBBER-IN-SHEAR
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
RR	RETURN REGISTER
RV	RELIEF VALVE
S	SUPPLY
SA	SUPPLY AIR
SD	SMOKE DAMPER
SFM	SIGHT FLOW MONITOR
SG	SUPPLY GRILLE
SP	STATIC PRESSURE
SR	SUPPLY REGISTER
SV	SAFETY VALVE
T	THERMOMETER
TC	TEMPERATURE CONTROL PANEL
TCG	TRANSFER CEILING GRILLE
TG	TRANSFER GRILLE
TSP	TOTAL STATIC PRESSURE
T'STAT	THERMOSTAT
TV	TURNING VANE
UC	UNDERCUT
UH	UNIT HEATER
UIC	UP IN CHASE
V	VENT
VI	VIBRATION ISOLATOR
VRV	VARIABLE REFRIGERANT VOLUME
WPD	WATER PRESSURE DROP
WTD	WATER TEMPERATURE DROP

HWR — HOT WATER RETURN PIPING
HWS — HOT WATER SUPPLY PIPING
COLD WATER PIPING
RG — REFRIGERANT GAS PIPING
RL — REFRIGERANT LIQUID PIPING
RS — REFRIGERANT SUCTION PIPING
E — EXISTING PIPING
PIPING TO BE REMOVED
D — DRAIN PIPING
UNION
HOSE CONNECTION
FLANGE
GATE VALVE
GLOBE VALVE
CHECK VALVE
BALANCING VALVE
CONTROL VALVE (TWO WAY)
CONTROL VALVE (THREE WAY)
PRESSURE REDUCING VALVE
FLOW CONTROL VALVE
BALL VALVE
STRAINER
ECCENTRIC REDUCER
INVERTED ECCENTRIC REDUCER
C# — CONVECTOR NUMBER
L# — LOUVER NUMBER
S — TEMPERATURE SENSOR
T — THERMOSTAT
T — THERMOSTAT WITH GUARD
CONNECT TO EXISTING
MANUAL DAMPER
FLEXIBLE DUCT
LAY-IN DIFFUSER
SUPPLY AIR DUCT
RETURN / RELIEF AIR DUCT

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DIRECTORATE FACILITIES ENGINEERING — DFE — CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

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DRAWN BY: REM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: NONE
DFE PROJECT NO: 23SR18-458-D

STATE OF MAINE
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL
SYMBOLS AND ABBREVIATIONS

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M-001
SHEET: 79 OF 126

January 28, 2019 - 7:21 am
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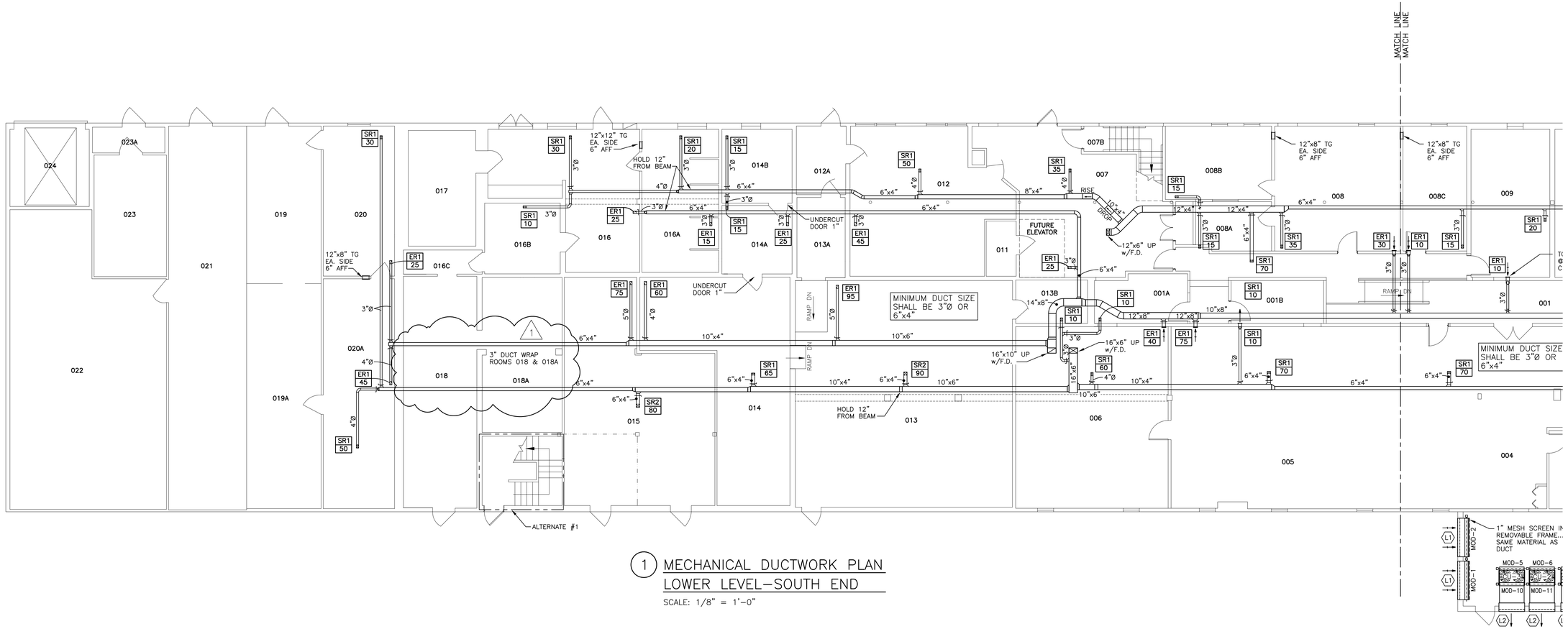

(1) MECHANICAL DUCTWORK PLAN LOWER LEVEL–SOUTH END

SCALE: 1/8" = 1'–0"

1/8" = 1'–0"

KEY PLAN
NO SCALE

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
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SHEET ID:
M–101
SHEET: 80 OF 126

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL DUCTWORK PLAN
LOWER LEVEL–SOUTH END

PLAN REVISIONS

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SCALE: 1/8" = 1'–0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
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DFE CAMP KEYES

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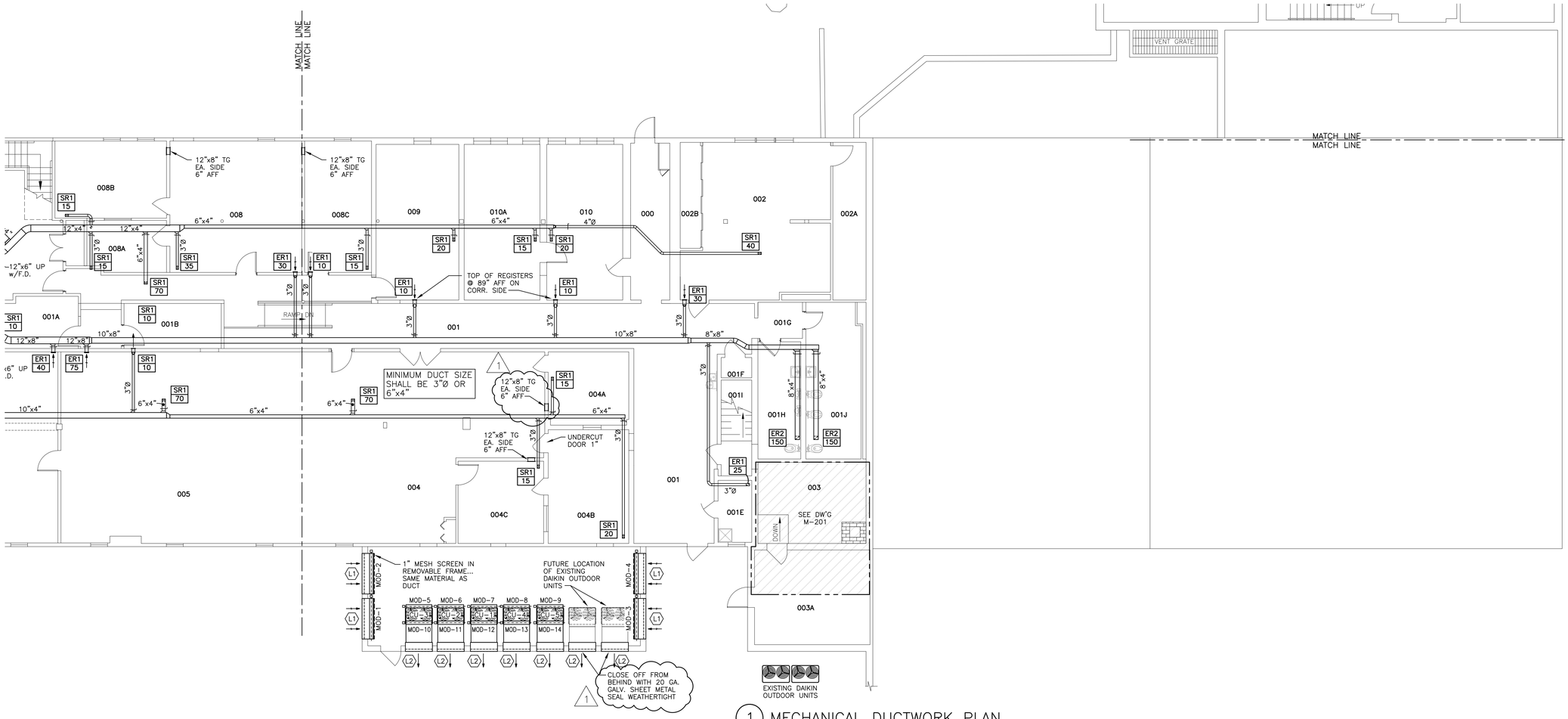
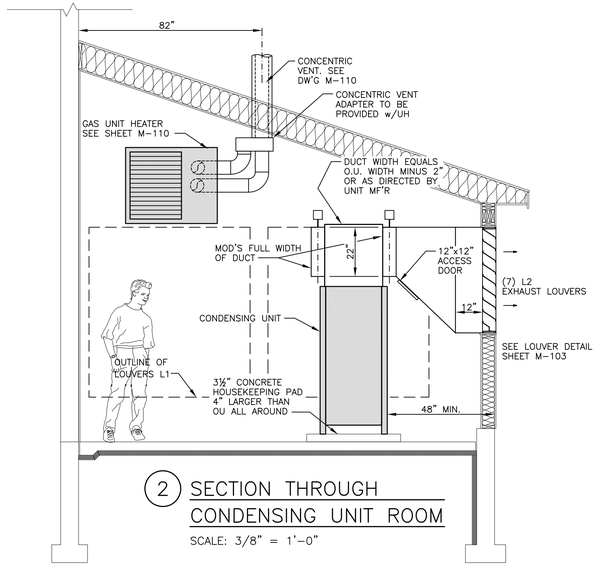


1 MECHANICAL DUCTWORK PLAN
LOWER LEVEL–NORTH END

SCALE: 1/8" = 1'–0"



2 SECTION THROUGH
CONDENSING UNIT ROOM

SCALE: 3/8" = 1'–0"

3/8" = 1'–0" 0 1' 2' 3' 4' 5' 6' 12'

1/8" = 1'–0" 0' 2' 4' 6' 8' 16' 24' 32'

KEY PLAN
NO SCALE

DIRECTORATE FACILITIES ENGINEERING DFE CAMP KEYES

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1	REVISIONS PER FEDERAL RFP	1.28.19	

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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL DUCTWORK PLAN
LOWER LEVEL–NORTH END

PLAN PROGRESS
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- ☐ 35% REVIEW
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- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
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SHEET ID:
M–102
SHEET: 81 OF 126

STATE OF MAINE PROFESSIONAL ENGINEER Kurt F. Magnusson 10257

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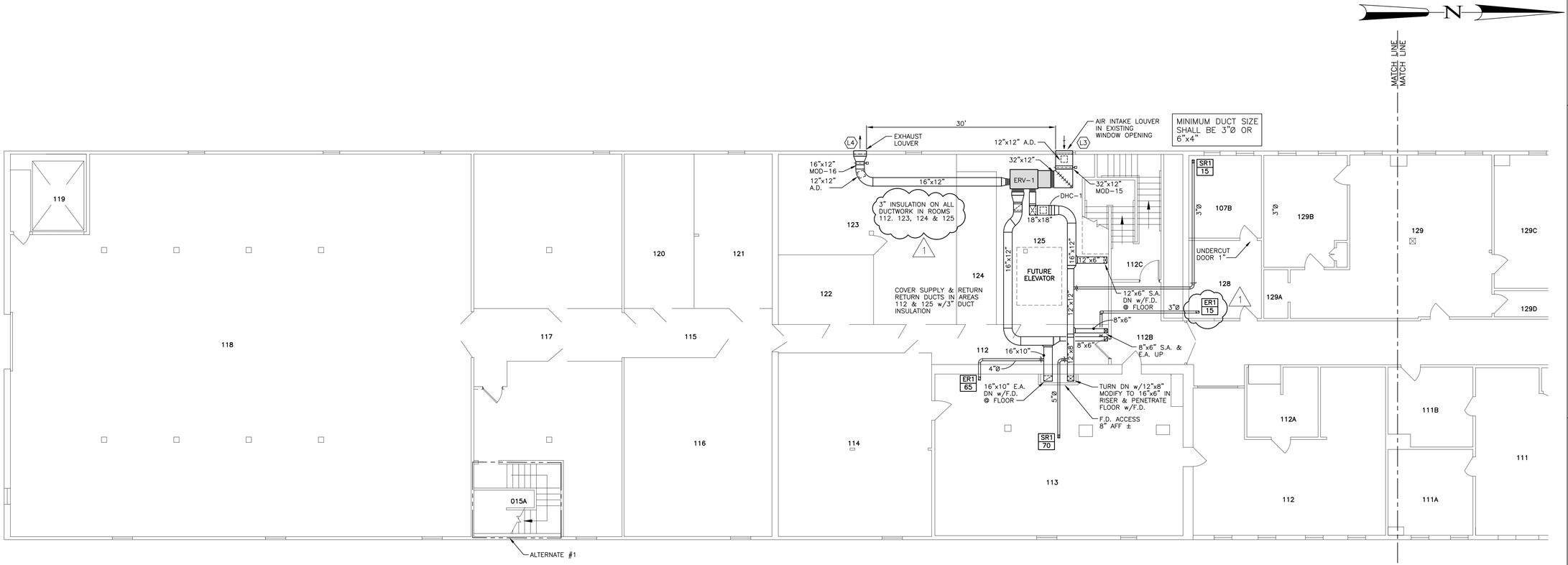
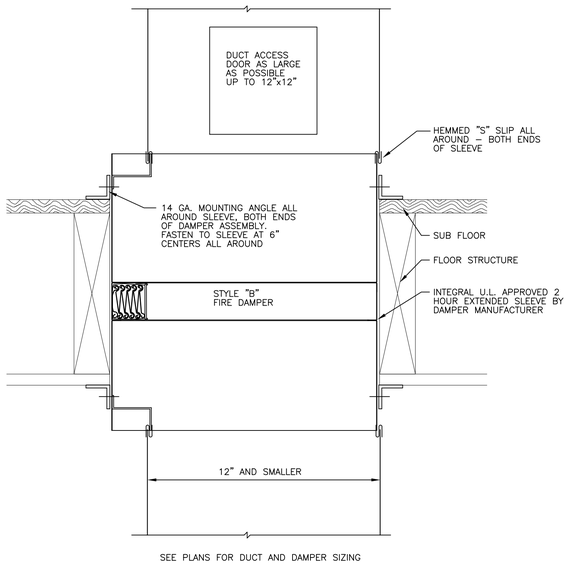


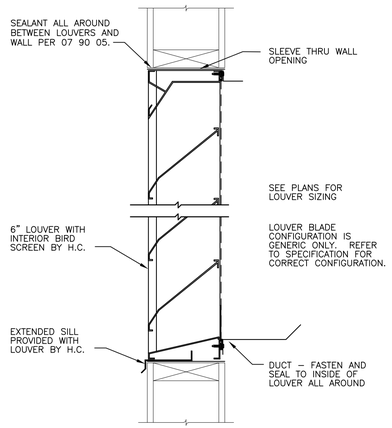
1 MECHANICAL DUCTWORK PLAN FIRST FLOOR–SOUTH END

SCALE: 1/8" = 1'–0"



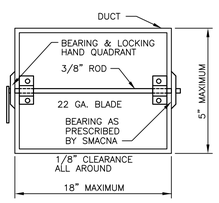
2 FLOOR FIRE DAMPER STYLE "B"

NO SCALE



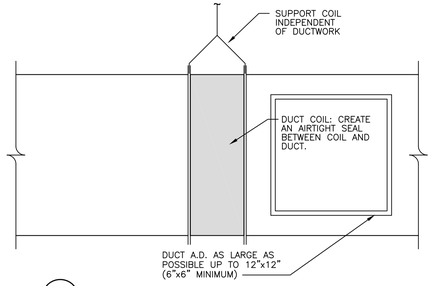
3 EXTERIOR LOUVER DETAIL FOR FRAME WALLS

NO SCALE



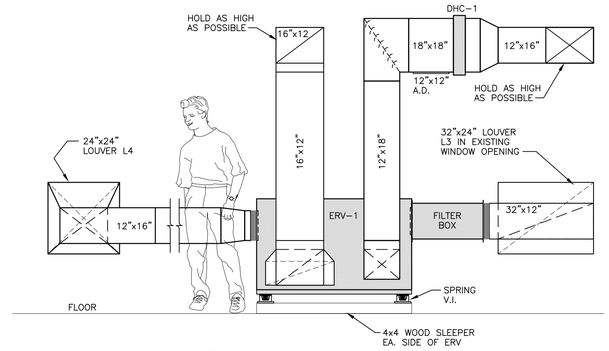
4 SHOP FABRICATED MANUAL DAMPER

NO SCALE



5 DUCT HEATING COIL MOUNTING

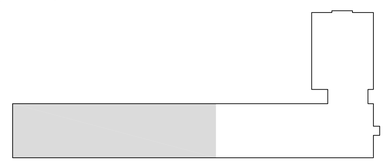
NO SCALE



6 ELEVATION OF ERV–1

SCALE: ½" = 1'–0"

1/8" = 1'–0" 0' 2' 4' 6' 8' 16' 24' 32'



KEY PLAN
NO SCALE

DIRECTORATE FACILITIES ENGINEERING
DFE CAMP KEYES

PLAN REVISIONS

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STATE OF MAINE
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL DUCTWORK PLAN
FIRST FLOOR – SOUTH END

PLAN PROGRESS
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SHEET ID: M–103
SHEET: 82 OF 126

MECHANICAL SYSTEMS ENGINEERS
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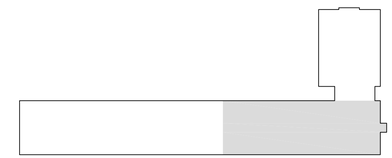
CELEBRATING 50 YEARS IN BUSINESS

STATE OF MAINE Kurt F. Magnusson 10257 LICENSED PROFESSIONAL ENGINEER

1 MECHANICAL DUCTWORK PLAN
FIRST FLOOR–NORTH END

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

1/8" = 1'-0" 0' 2' 4' 6' 8' 16' 24' 32'



KEY PLAN
NO SCALE

STATE OF MAINE
Kurt F. Magnusson
10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
(207) 846-1441
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE FACILITIES ENGINEERING DFE CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: REM
DRAWN BY: REM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/8" = 1'-0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

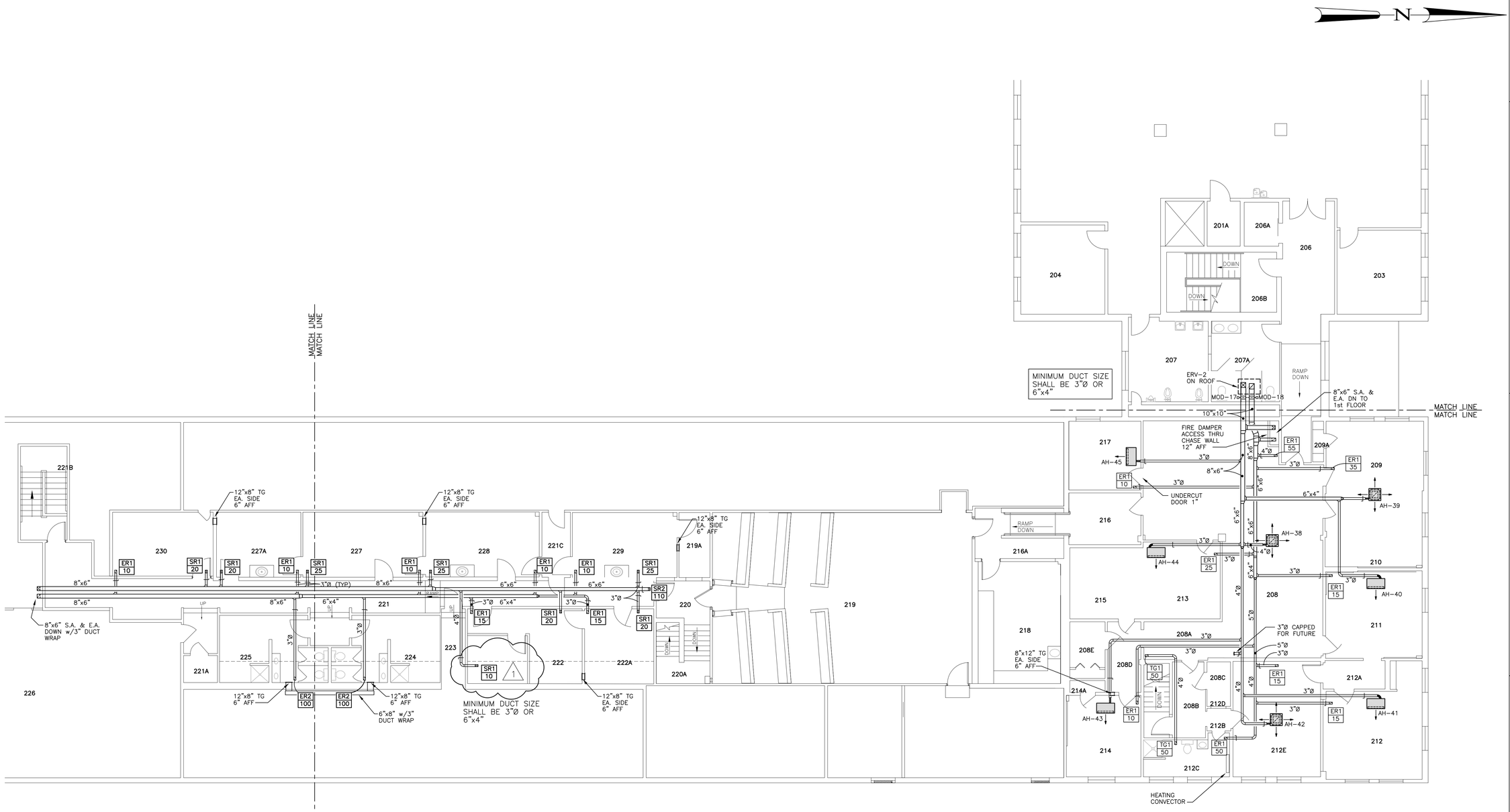
Cordija Capital Projects Group
16 Tannery Lane, Suite 23
Monmouth, ME 04259
207-236-9970 / mdaigle@cordijacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL DUCTWORK PLAN
FIRST FLOOR–NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M-104
SHEET: 83 OF 126



1 MECHANICAL DUCTWORK PLAN
SECOND FLOOR–NORTH END

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

1/8" = 1'-0" 0' 2' 4' 6' 8' 16' 24' 32'

KEY PLAN
NO SCALE

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
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- ☐ RECORD DRAWINGS

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL DUCTWORK PLAN
SECOND FLOOR–NORTH END

SHEET ID: M-106
SHEET: 85 OF 126

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: REM
DRAWN BY: REM
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STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
Cordija Capital Projects Group
16 Tannery Lane, Suite 23
Gorham, Maine 04038
207-236-9370 / mdaigle@cordjacpg.com

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FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

Kurt F. Magnusson 10257 PROFESSIONAL ENGINEER STATE OF MAINE

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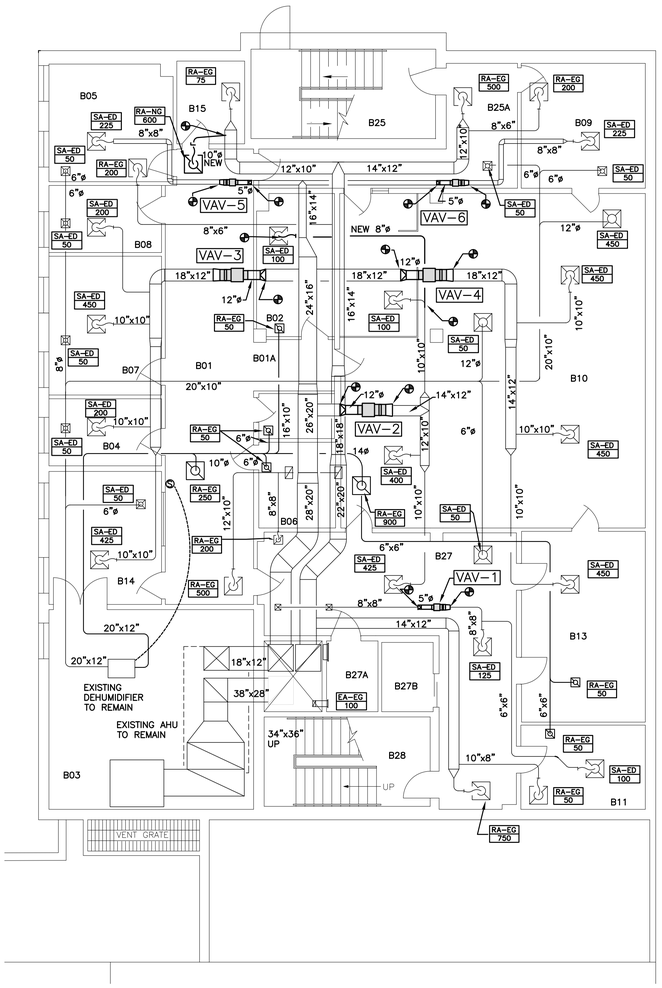
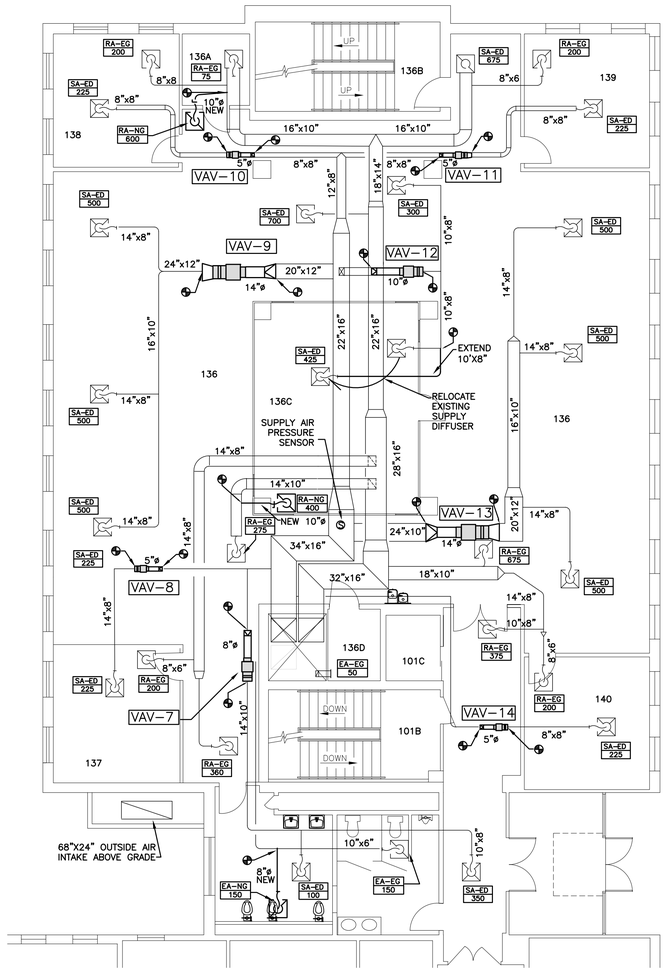


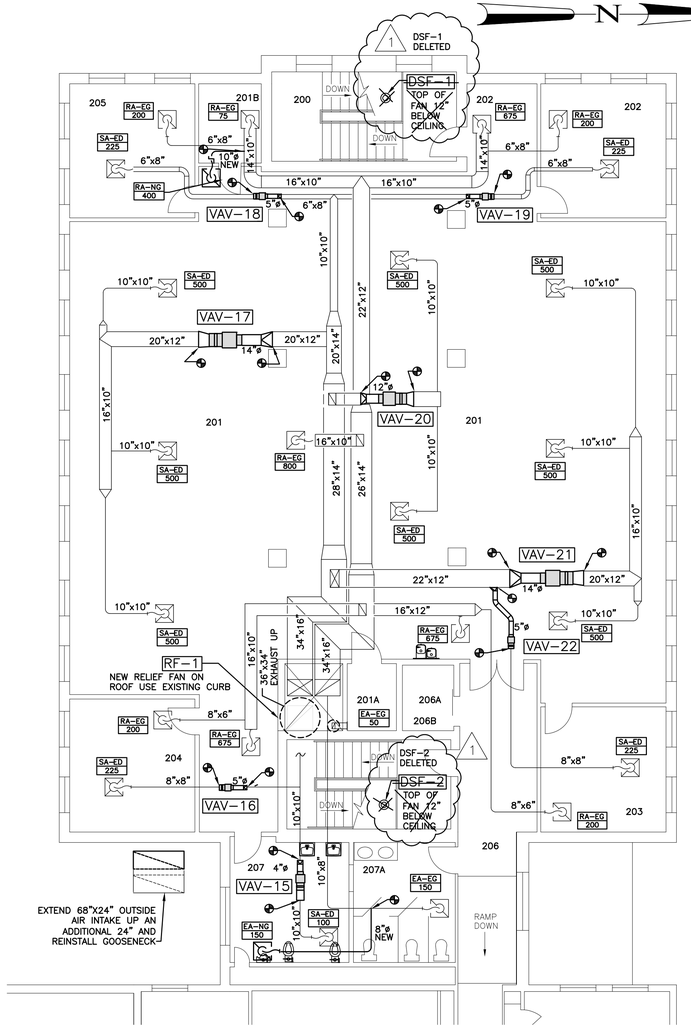
1 MECHANICAL DUCTWORK PLAN
LOWER LEVEL – NORTH WEST WING

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



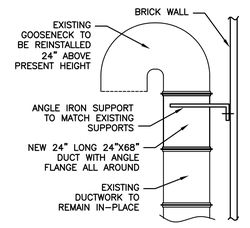
2 MECHANICAL DUCTWORK PLAN
FIRST FLOOR – NORTH WEST WING

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



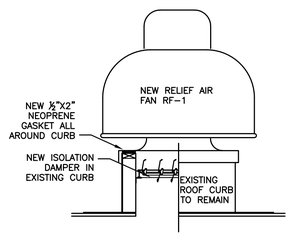
3 MECHANICAL DUCTWORK PLAN
SECOND FLOOR NORTH WEST WING

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



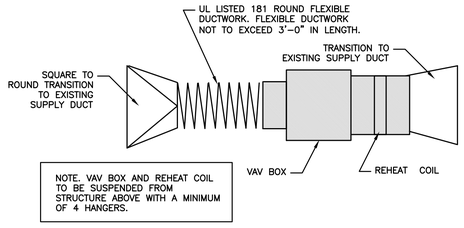
4 OUTSIDE AIR DUCT
ELEVATION VIEW

NO SCALE



5 RELIEF FAN RF-1 DETAIL

NO SCALE



6 VAV BOX DETAIL

NO SCALE

SHEETMETAL LEGEND

- CONNECT TO EXISTING AT THIS LOCATION
- EXISTING CEILING–MOUNTED DIFFUSER WITH VOLUME DAMPER TO REMAIN IN–PLACE AND IN–USE
- EXISTING CEILING–MOUNTED RETURN OR EXHAUST GRILLE TO REMAIN IN–PLACE AND IN–USE
- NEW CEILING RETURN OR EXHAUST GRILLE
- EXISTING DUCTWORK TO REMAIN IN–PLACE AND IN–USE
- TO REMAIN IN–PLACE AND IN–USE
- SA–ED SUPPLY AIR – EXISTING DIFFUSER
- RA–EG RETURN AIR – EXISTING GRILLE
- EA–EG EXHAUST AIR – EXISTING GRILLE
- RA–NG RETURN AIR – NEW GRILLE
- EA–NG EXHAUST AIR – NEW GRILLE
- XX–XX / X DESIGN AIRFLOW CFM

SHEETMETAL GENERAL NOTES

1) ALL DUCTWORK IS SHOWN DIAGRAMMATICALLY AND DOES NOT INDICATE ALL THE OFFSETS THAT MAY BE REQUIRED FOR INSTALLATION.
2) ALL DUCTWORK IS TO BE FABRICATED AND INSTALLED PER SMACNA LOW PRESSURE DUCTWORK STANDARDS.
3) FLEXIBLE DUCT CONNECTIONS SHALL NOT EXCEED 6'–0" AND THE FLEXIBLE DUCTWORK SHALL MEET UL 181 STANDARDS. MAXIMUM BEND PER RUN – 90 DEGREES.
4) SQUARE ELBOWS REQUIRE TURNING VANES.
5) RETURN AIR & EXHAUST AIR GRILLES NOTED TO BE NEW SHALL BE 24"X24" LAY–PANEL WITH 45 DEG. LOUVERS WITH ¾" SPACING. GRILLE AREA IN PANEL TO BE 16"X16" WITH NECK SIZE THE BRANCH DUCT SIZE

⅛" = 1'-0" 0' 2' 4' 6' 8' 16' 24' 32'

KEY PLAN
NO SCALE

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CELEBRATING 50 YEARS IN BUSINESS

STATE OF MAINE
Kurt F. Magnusson 10257
LICENSED PROFESSIONAL ENGINEER

DIRECTORATE OF FACILITIES ENGINEERING
DFE
CAMP KEYES

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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL DUCTWORK PLANS
NORTHWEST WING – DUCWORK

PLAN PROGRESS
- ☐ DRAFT
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SHEET ID:
M–107
SHEET:86 OF 126

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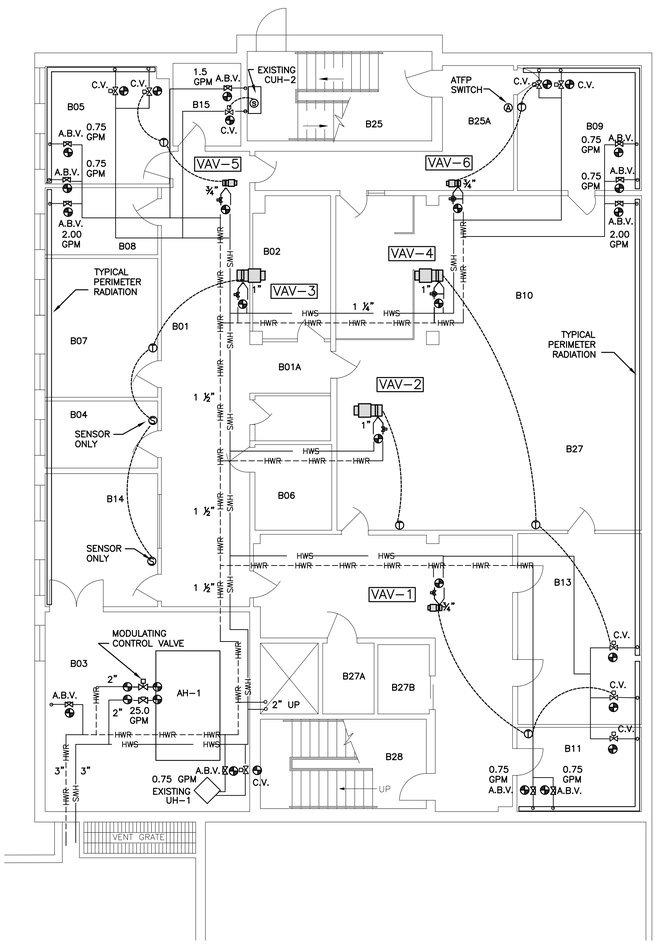
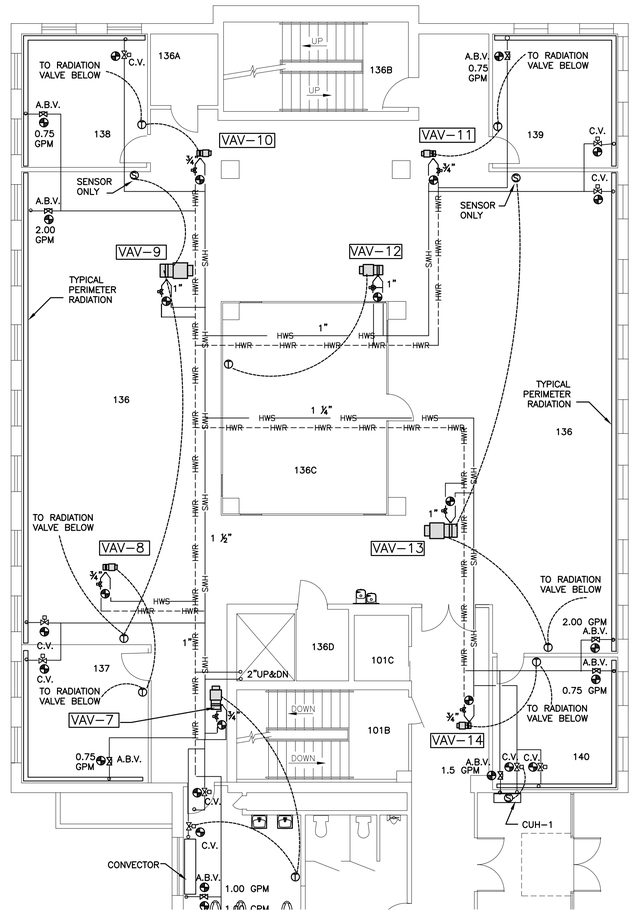


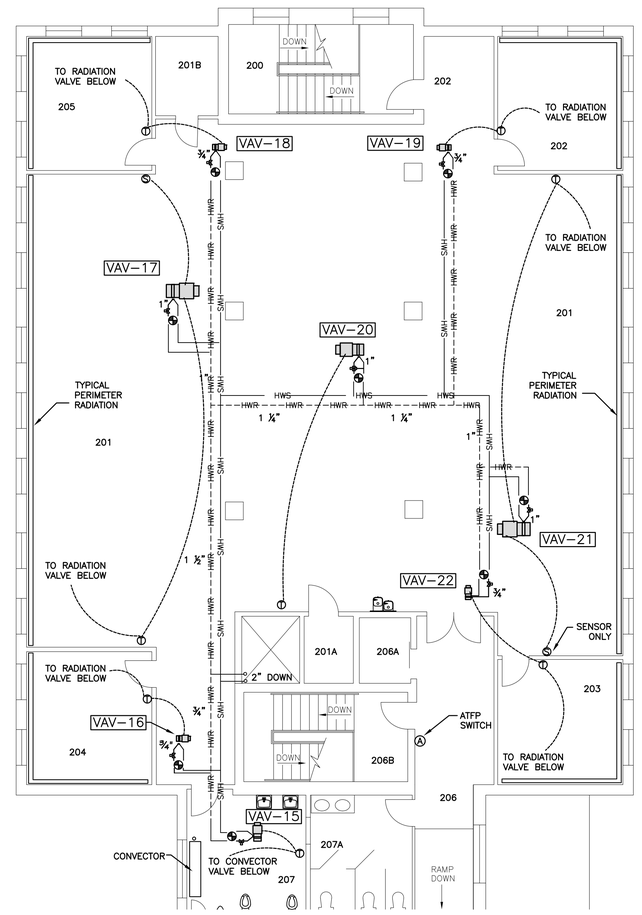
1 MECHANICAL PIPING PLAN
LOWER LEVEL – NORTH WEST WING

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



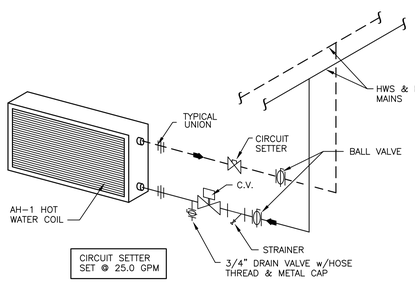
2 MECHANICAL PIPING PLAN
FIRST FLOOR – NORTH WEST WING

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

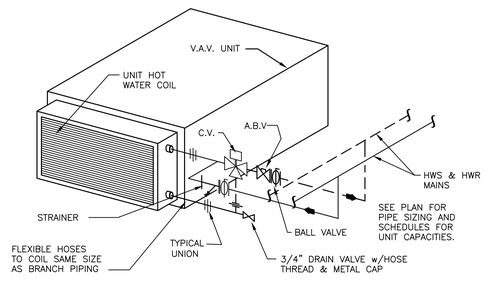


3 MECHANICAL PIPING PLAN
SECOND FLOOR– NORTH WEST WING

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



4 CONNECTION TO
AH–1 HOT WATER COIL



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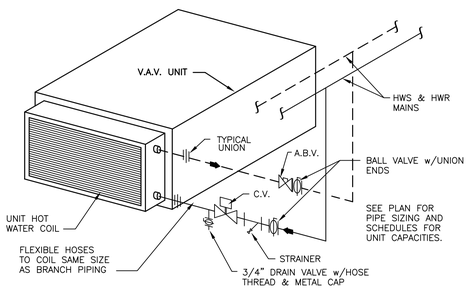
5 CONNECTION TO
VAV REHEAT COILS
VAV–4,12,&20



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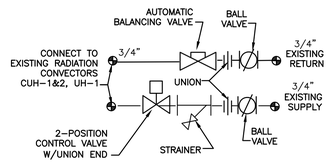
6 CONNECTION TO
VAV REHEAT COILS
EXCEPT VAV–4,12,&20



7 CONNECTION TO
CABINET UNIT CUH–1&2
FINNED TUBE RADIATION
CONVECTORS

PIPING GENERAL NOTES

1) ALL PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT INDICATE ALL THE OFFSETS THAT MAY BE REQUIRED FOR INSTALLATION.
2) AT THE CONNECTION TO ALL VAV BOX REHEAT COILS PROVIDE AND INSTALL NEW BALL VALVES, CIRCUIT SETTER. STRAINER, 2–POSITION OR 3–WAY MODULATING VALVE AND HOSE KIT.
3) AT THE CONNECTION TO THE EXISTING FIN TUBE RADIATION PROVIDE AND INSTALL NEW BALL VALVES, CIRCUIT SETTER, STRAINER AND 2–POSITION CONTROL VALVE.

A.B.V — NEW AUTOMATIC BALANCING VALVE, UNION & BALL VALVE

C.V. — NEW CONTROL VALVE, UNION, STRAINER & BALL VALVE

KEY PLAN
NO SCALE

1/8" = 1'-0" 0' 2' 4' 6' 8' 16' 24' 32'

STATE OF MAINE
Kurt F. Magnusson
10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
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CAMP KEYES

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Cordjia Capital Projects Group
16 Tannery Lane, Suite 23
Gardiner, Maine 04345
207-236-9970 / mdaigle@cordjiacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL PIPING PLANS
NORTHWEST WING – PIPING

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
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SHEET ID:
M–108
SHEET: 87 OF 126

January 28, 2019 – 7:25 am
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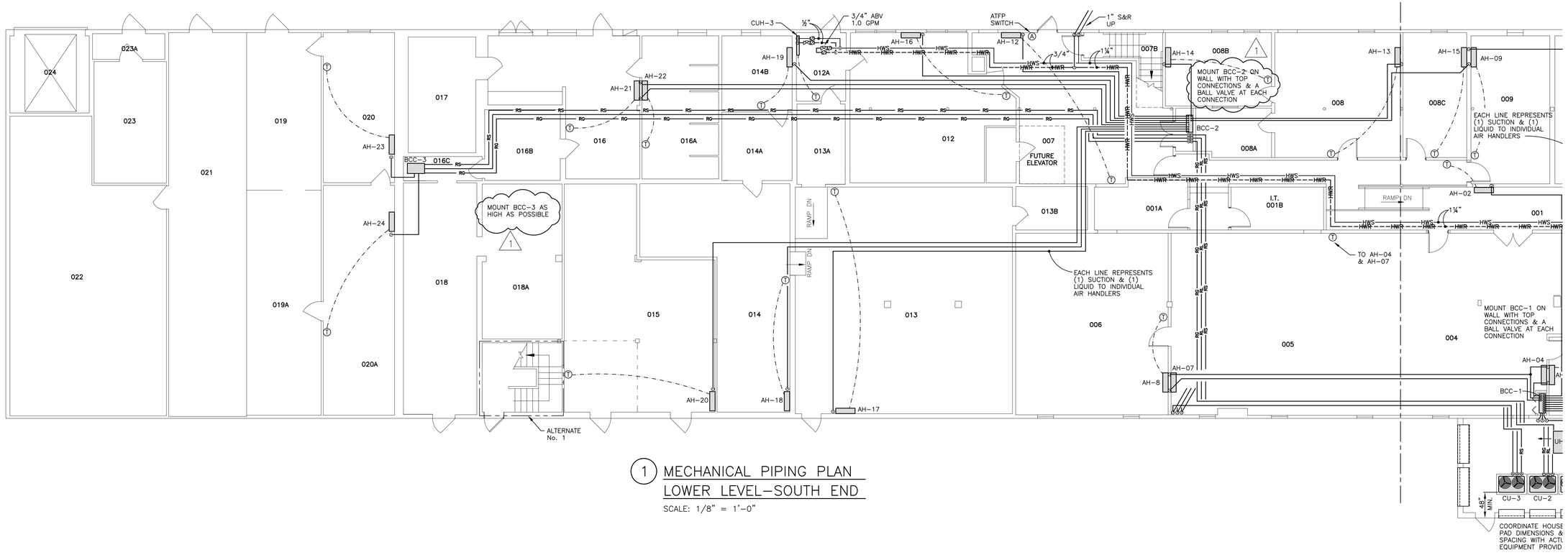
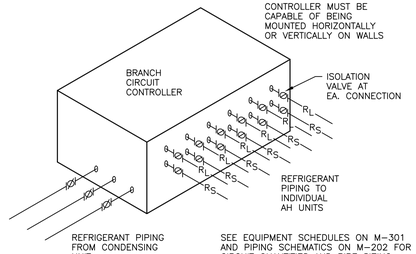


1 MECHANICAL PIPING PLAN
LOWER LEVEL–SOUTH END

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

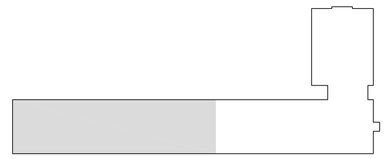


2 BRANCH CIRCUIT CONTROLLER
PIPING DIAGRAM

NO SCALE

1/8" = 1'-0"

0' 2' 4' 6' 8' 16' 24' 32'



KEY PLAN
NO SCALE

STATE OF MAINE
Kurt F. Magnusson 10257
PROFESSIONAL ENGINEER
LICENSED

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL PIPING PLAN
LOWER LEVEL–SOUTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
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SHEET ID:
M–109
SHEET: 88 OF 126

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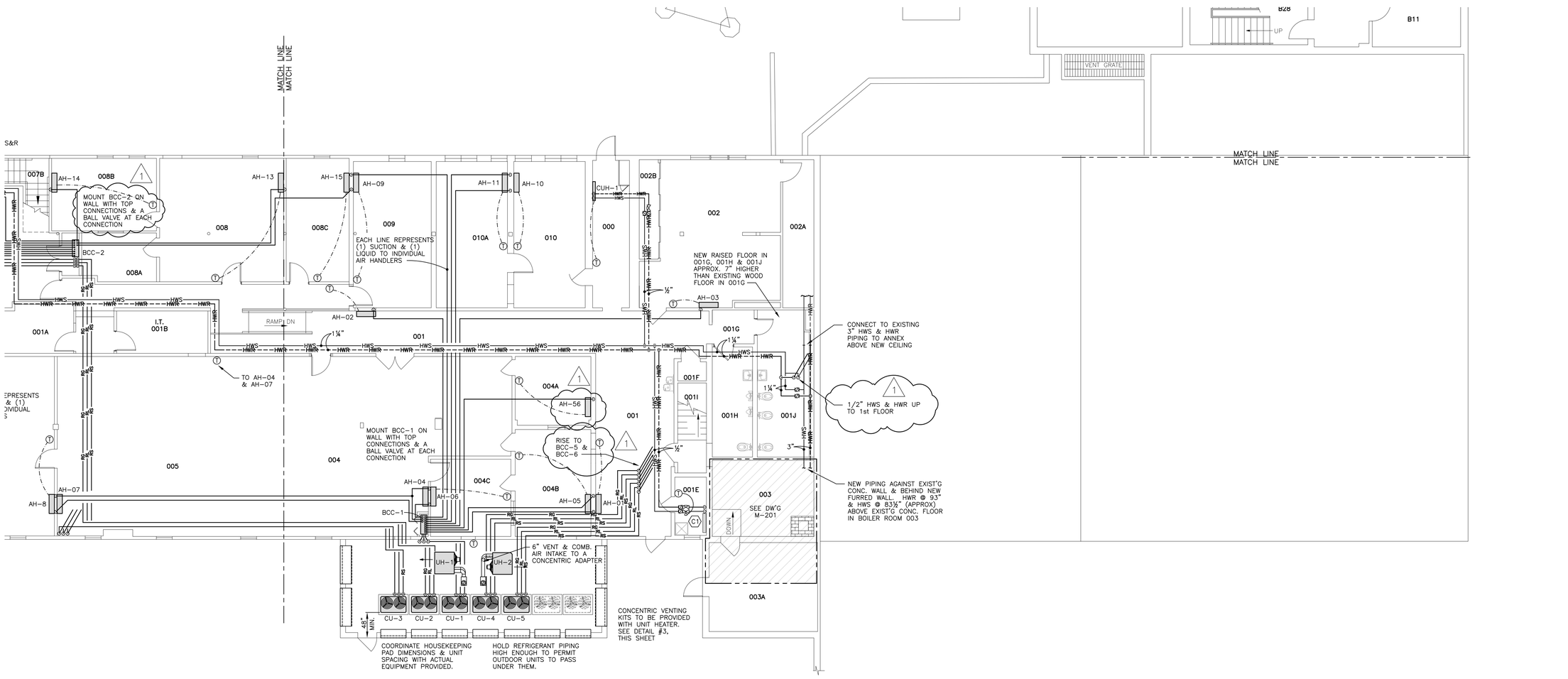
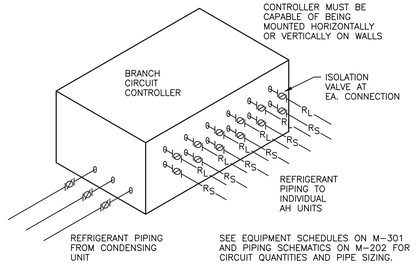


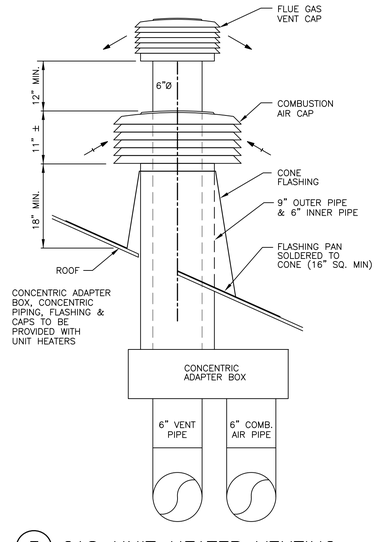
1 MECHANICAL PIPING PLAN LOWER LEVEL–NORTH END

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



2 BRANCH CIRCUIT CONTROLLER PIPING DIAGRAM

NO SCALE

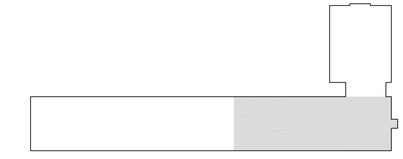


3 GAS UNIT HEATER VENTING

NO SCALE

1/8" = 1'-0"

0' 2' 4' 6' 8' 16' 24' 32'



KEY PLAN
NO SCALE

STATE OF MAINE
Kurt F. Magnusson
10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL PIPING PLAN
LOWER LEVEL–NORTH END

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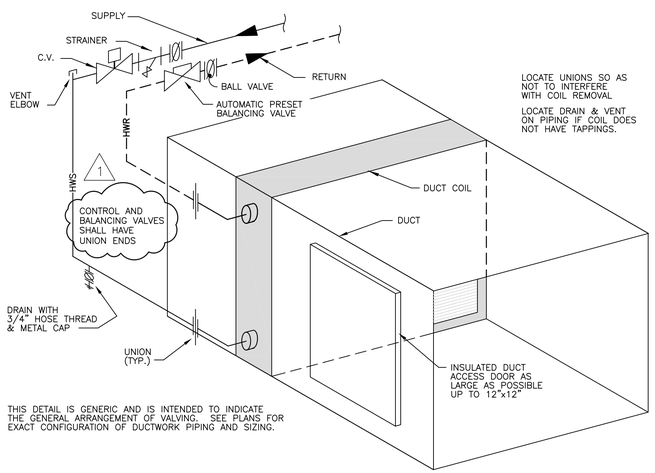
1 MECHANICAL PIPING PLAN
FIRST FLOOR–SOUTH END

SCALE: 1/8" = 1'–0"



2 DUCT HOT WATER COIL PIPING

NO SCALE

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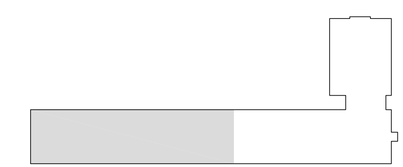

KEY PLAN
NO SCALE

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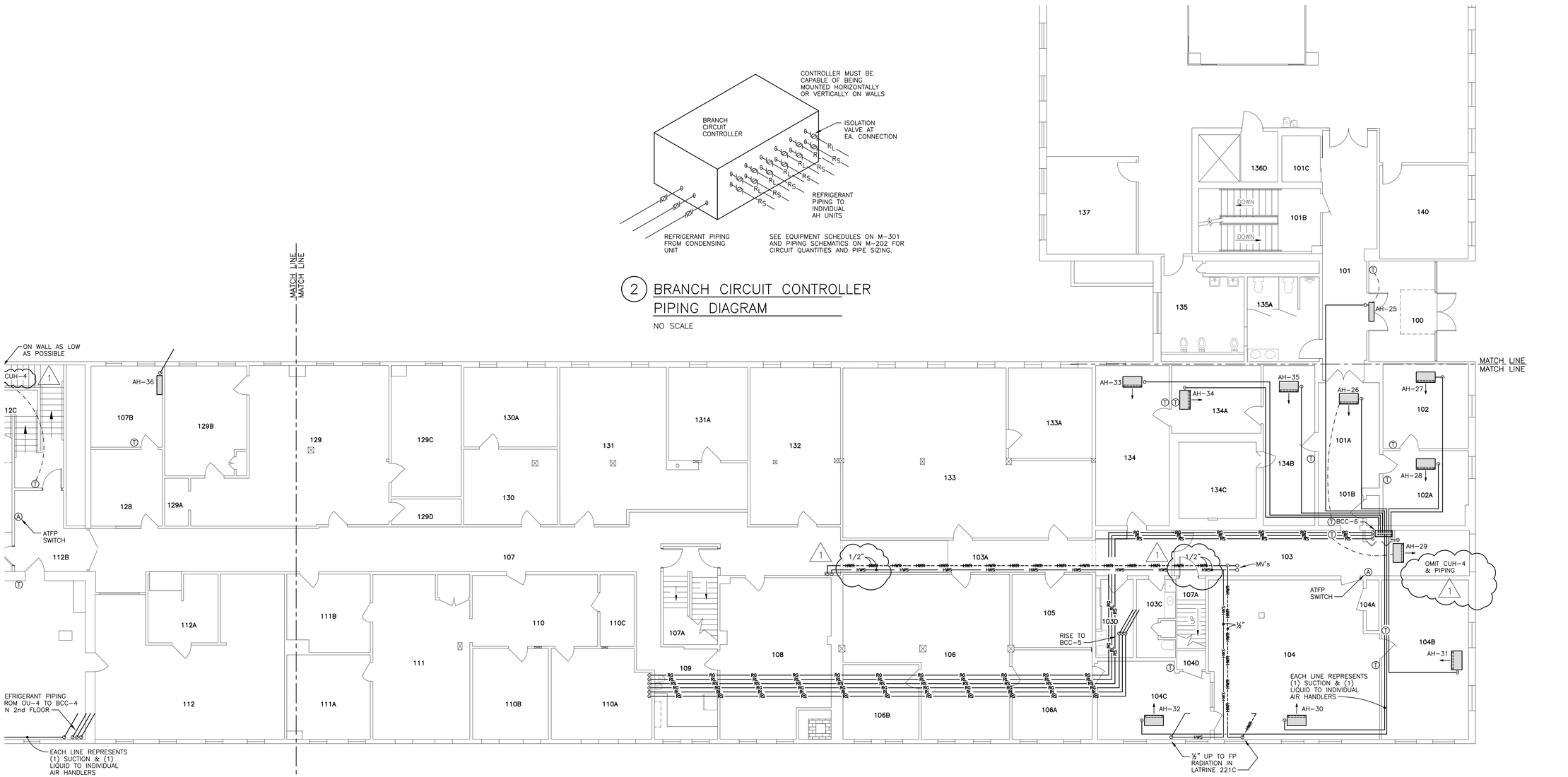
SHEET: 90 OF 126

January 28, 2019 - 7:28 am
X:\Projects\1813 Camp Keyes Bldg 7\Addendo\1813 Bldg 7 M109-M114 (01-24-2019).dwg

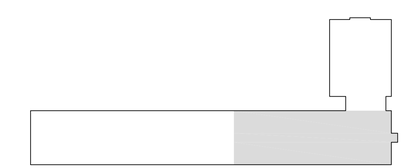
2 BRANCH CIRCUIT CONTROLLER PIPING DIAGRAM

NO SCALE



1 MECHANICAL PIPING PLAN FIRST FLOOR–NORTH END

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



KEY PLAN
NO SCALE

1/8" = 1'-0" 0' 2' 4' 6' 8' 16' 24' 32'

STATE OF MAINE
Kurt F. Magnusson
10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
(207) 846-1441
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE OF FACILITIES ENGINEERING
DFE CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: REM
DRAWN BY: REM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/8" = 1'-0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
Cordjia Capital Projects Group
16 Tannery Lane, Suite 23
Gorham, Maine 04038
207-236-9970 / mdaigle@cordjiacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL PIPING PLAN
FIRST FLOOR–NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M–112
SHEET: 91 OF 126

January 28, 2019 – 7:29 am
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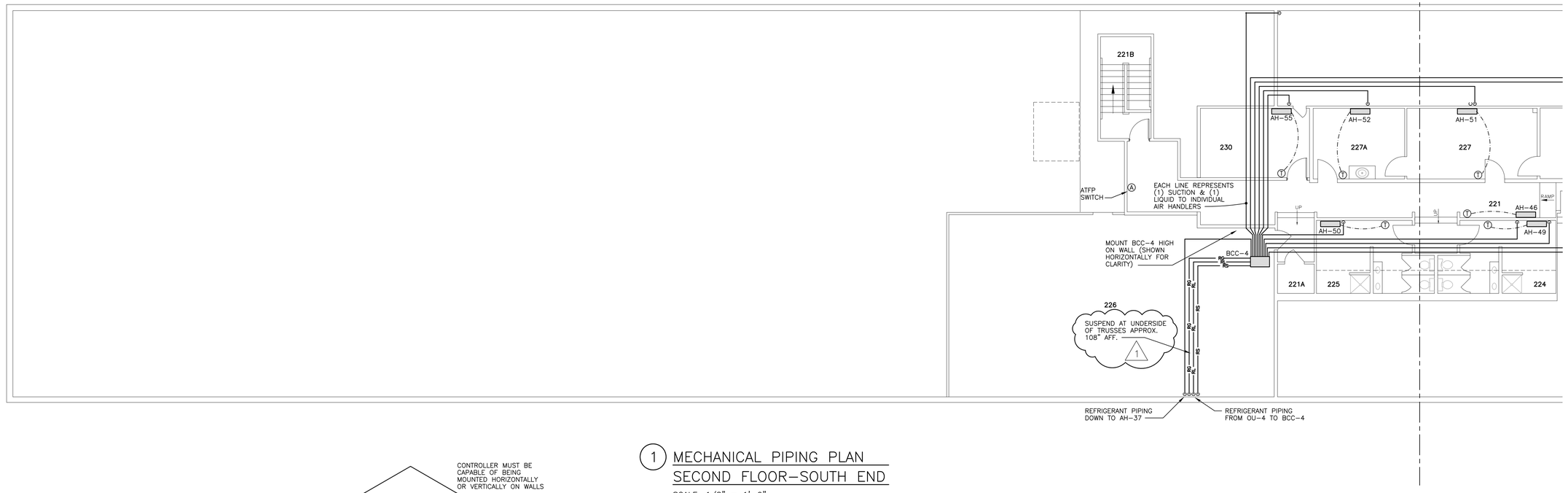
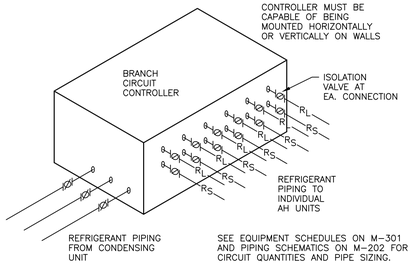


1 MECHANICAL PIPING PLAN
SECOND FLOOR–SOUTH END

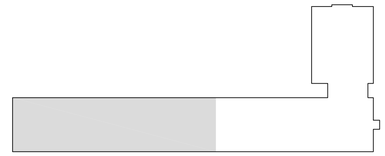
SCALE: 1/8" = 1'–0"



2 BRANCH CIRCUIT CONTROLLER PIPING DIAGRAM

NO SCALE

1/8" = 1'–0" 0' 2' 4' 6' 8' 16' 24' 32'



KEY PLAN
NO SCALE

STATE OF MAINE
Kurt F. Magnusson
10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
(207) 846-1441
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE FACILITIES ENGINEERING
DFE CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: REM
DRAWN BY: REM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/8" = 1'-0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
Cordja Capital Projects Group
16 Tannery Lane, Suite 23
Gorham, Maine 04038
207-236-9970 / mdaigle@cordjacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL PIPING PLAN
SECOND FLOOR–SOUTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M–113
SHEET: 92 OF 126

January 28, 2019 - 7:29 am
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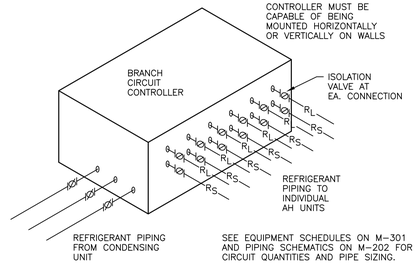
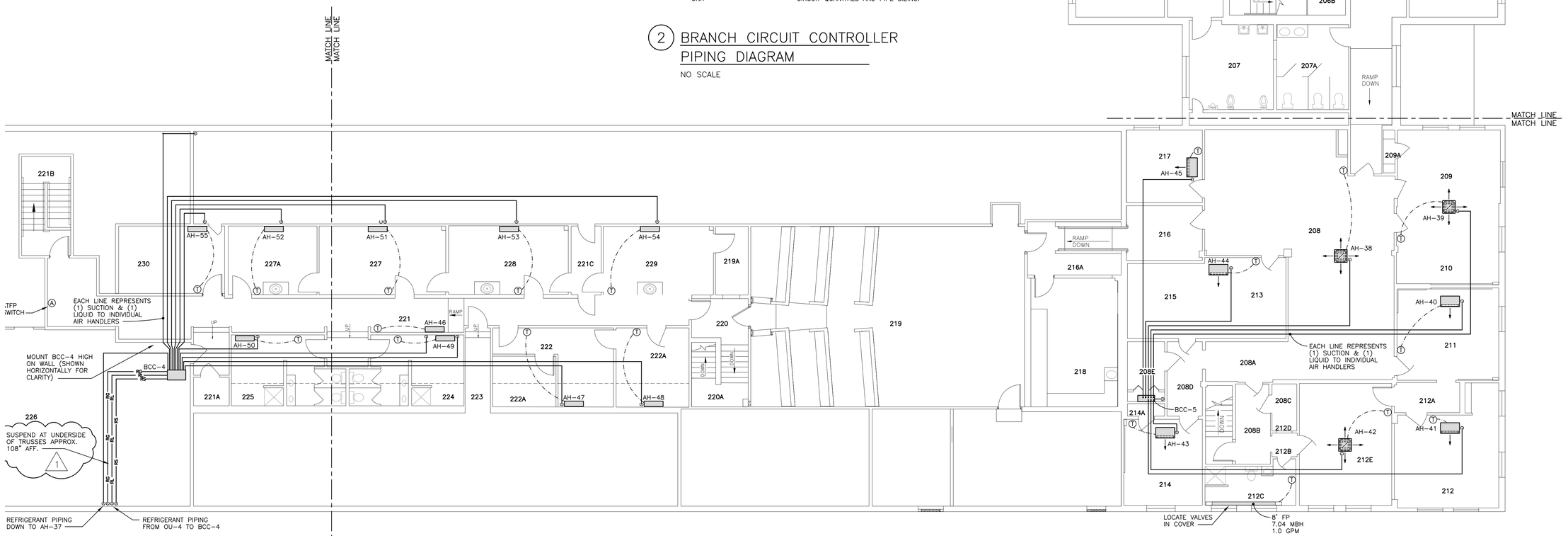


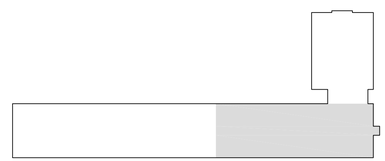
2 BRANCH CIRCUIT CONTROLLER PIPING DIAGRAM

NO SCALE



1 MECHANICAL PIPING PLAN SECOND FLOOR–NORTH END

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



KEY PLAN
NO SCALE

1/8" = 1'-0"

0' 2' 4' 6' 8' 16' 24' 32'

STATE OF MAINE
Kurt F. Magnusson
10257
REGISTERED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
(207) 846-1441
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE FACILITIES ENGINEERING DFE CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: REM
DRAWN BY: REM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/8" = 1'-0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
Cordija Capital Projects Group
16 Tannery Lane, Suite 23
Gorham, Maine 04038
207-236-9970 / mdingle@cordijacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL PIPING PLAN
SECOND FLOOR–NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID: M-114
SHEET: 93 OF 126

January 28, 2019 - 7:29 am
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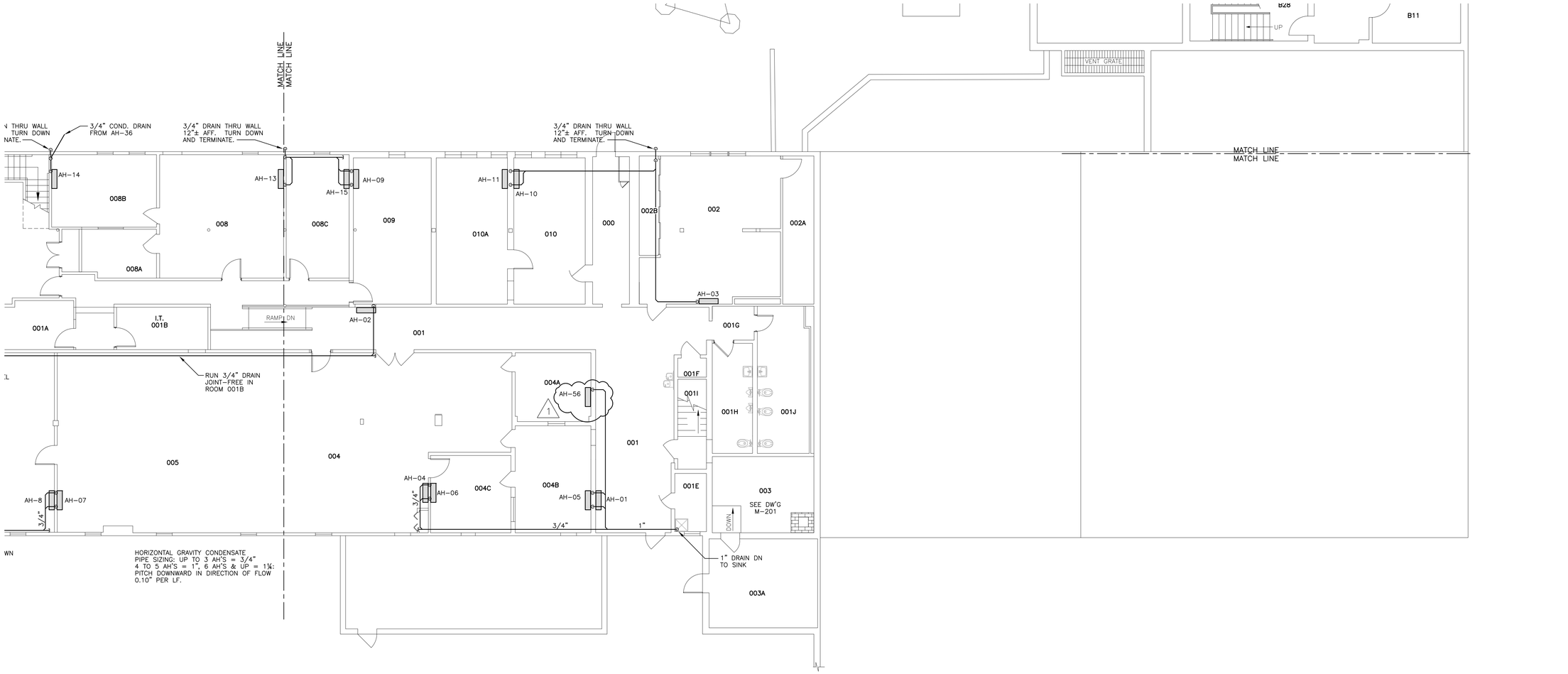
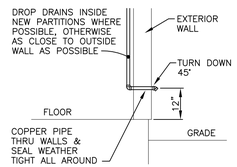


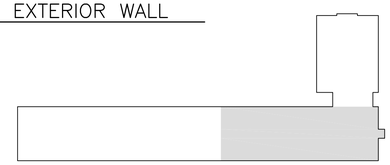
1 MECHANICAL CONDENSATE DRAIN PLAN LOWER LEVEL–NORTH END

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



2 TYPICAL CONDENSATE DRAIN THROUGH EXTERIOR WALL

NO SCALE



KEY PLAN
NO SCALE

1/8" = 1'-0" 0' 2' 4' 6' 8' 16' 24' 32'

STATE OF MAINE
Kurt F. Magnusson
10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
(207) 846-1441
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE OF FACILITIES ENGINEERING
DFE
CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: REM
DRAWN BY: REM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: 1/8" = 1'-0"
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordija Capital Projects Group
16 Tannery Lane, Suite 23
Gorham, Maine 04038
207-236-9970 / mdaigle@cordjacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL CONDENSATE PLAN
LOWER LEVEL–NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M–116
SHEET: 95 OF 126

January 28, 2019 - 7:30 am
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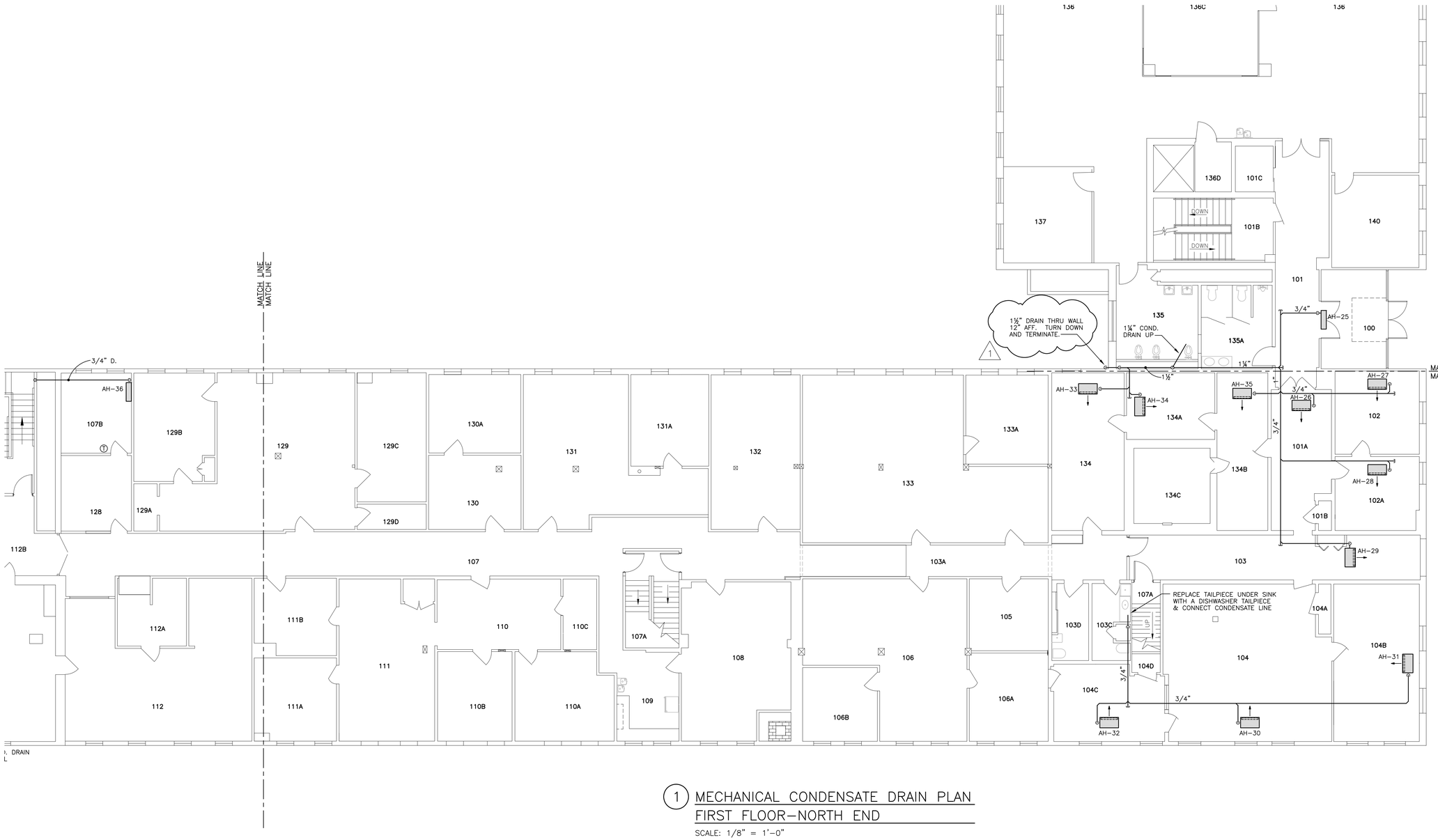
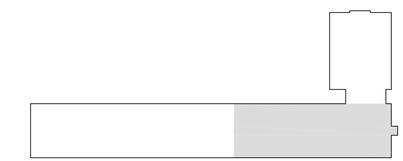


1 MECHANICAL CONDENSATE DRAIN PLAN FIRST FLOOR–NORTH END

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

1/8" = 1'-0" 0' 2' 4' 6' 8' 16' 24' 32'



KEY PLAN
NO SCALE

STATE OF MAINE
Kurt F. Magnusson 10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
(207) 846-1441
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE FACILITIES ENGINEERING
DFE CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

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DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordija Capital Projects Group
16 Tannery Lane, Suite 23
Commercial Mills, Maine 04043
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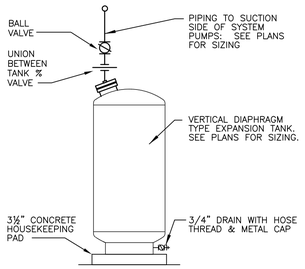
CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL CONDENSATE PLAN
FIRST FLOOR–NORTH END

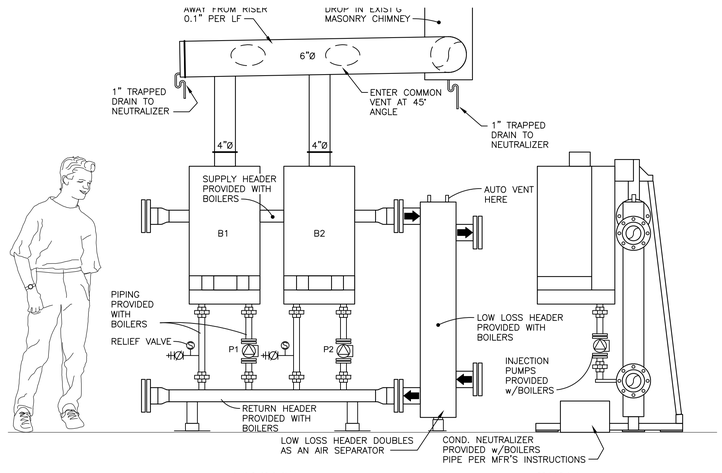
PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M–118
SHEET: 97 OF 126



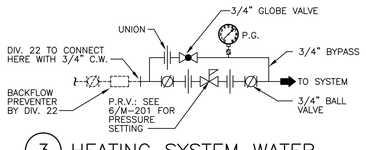
1 DIAPHRAGM TYPE EXPANSION TANK

NO SCALE



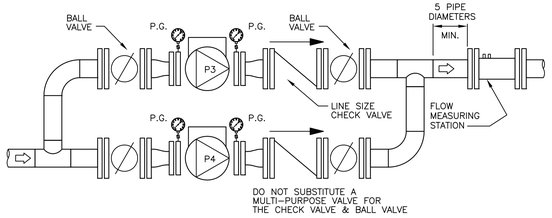
2 BOILER PIPING AND VENTING DIAGRAM

NO SCALE



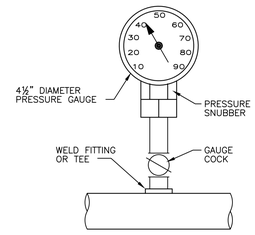
3 HEATING SYSTEM WATER MAKE-UP DETAIL

NO SCALE



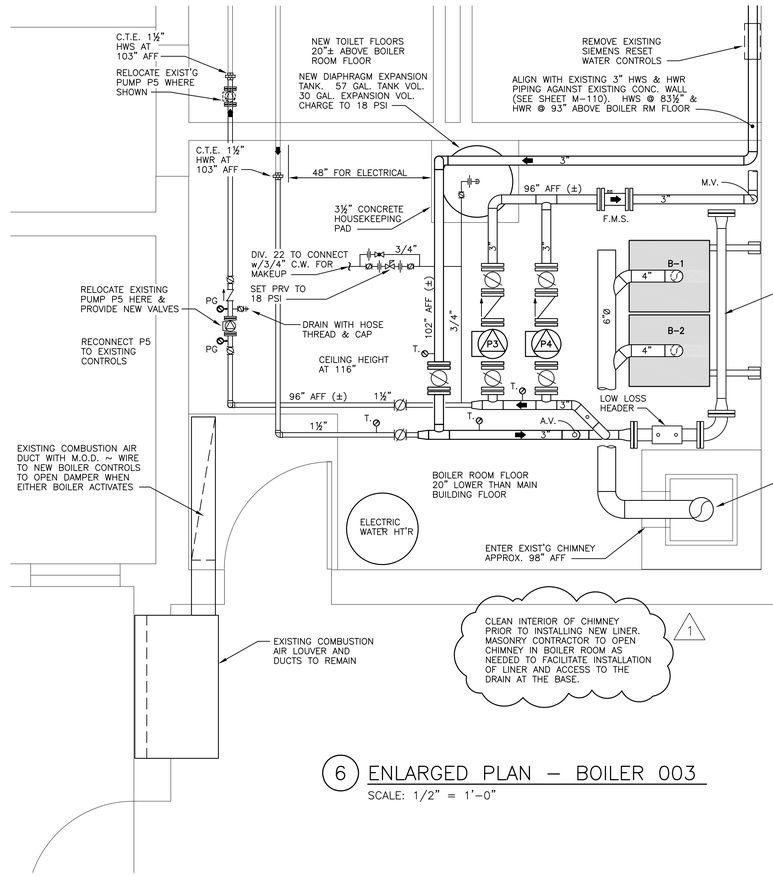
4 GENERAL DIAGRAM – PUMPS P3 & P4

NO SCALE



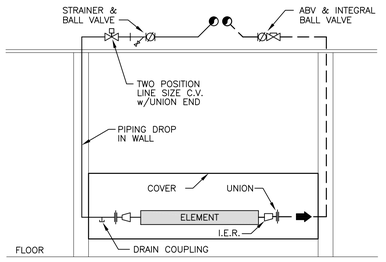
5 WATER PRESSURE GAUGE

NO SCALE



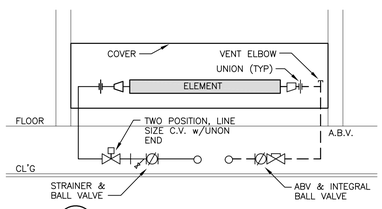
6 ENLARGED PLAN – BOILER 003

SCALE: 1/2" = 1'-0"



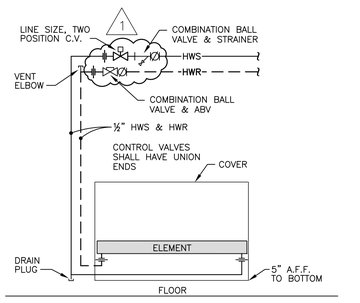
7 DOWNFEED FINNED PIPE OPPOSITE END FEED

NO SCALE ANNEX BUILDING



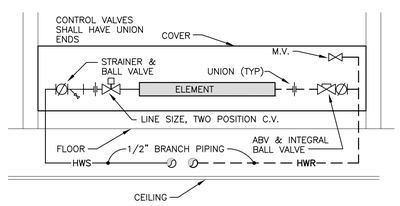
8 UPFEED FINNED PIPE OPPOSITE END FEED

NO SCALE ANNEX BUILDING



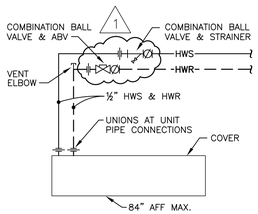
9 DOWNFEED CONVECTOR PIPING

NO SCALE



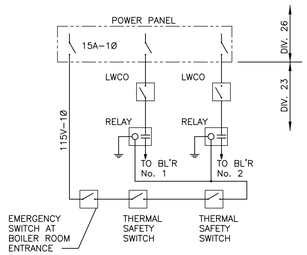
10 UPFEED FINNED PIPE OPPOSITE END FEED

NO SCALE ROOM 212C



11 CABINET UNIT HEATER PIPING

NO SCALE



12 BOILER POWER WIRING

NO SCALE

13 EXISTING SIEMENS RESET WATER CONTROLS TO BE REMOVED

NO SCALE

½" = 1'-0" 0 12" 24" 48" 72" 96"

STATE OF MAINE
Kurt F. Magnusson 10257
PROFESSIONAL ENGINEER
LICENSED

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
10 FOREST FALLS DRIVE, YARMOUTH, MAINE 04096
(207) 846-1441
FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
CELEBRATING 50 YEARS IN BUSINESS

DIRECTORATE OF FACILITIES ENGINEERING
DFE
CAMP KEYES

PLAN REVISIONS			
Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: REM
DRAWN BY: REM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: AS NOTED
DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordija Capital Projects Group
16 Tannery Lane, Suite 23
Gorham, Maine 04038
207-236-9970 / mdaigle@cordijacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

ENLARGED BOILER ROOM 003
MECHANICAL PLAN AND DETAILS

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M-201
SHEET: 99 OF 126

January 28, 2019 - 7:32 am
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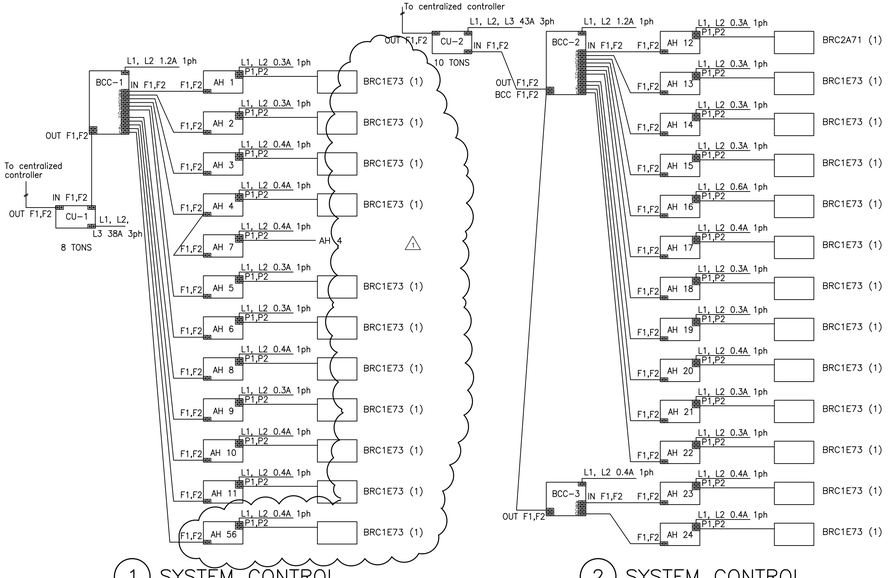
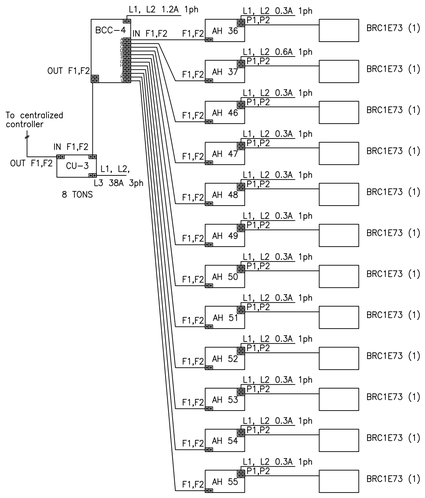


1 SYSTEM CONTROL DIAGRAM CU–1

NO SCALE

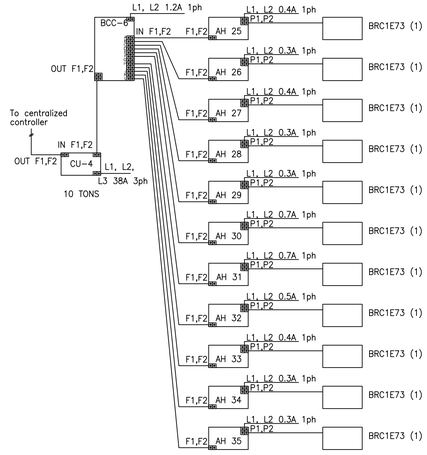
2 SYSTEM CONTROL DIAGRAM CU–2

NO SCALE



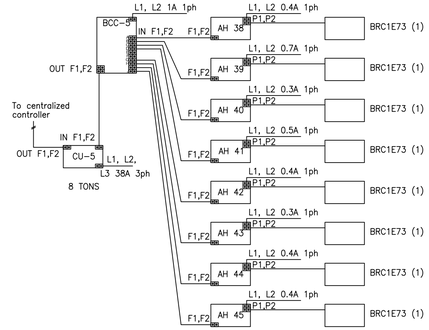
3 SYSTEM CONTROL DIAGRAM CU–3

NO SCALE



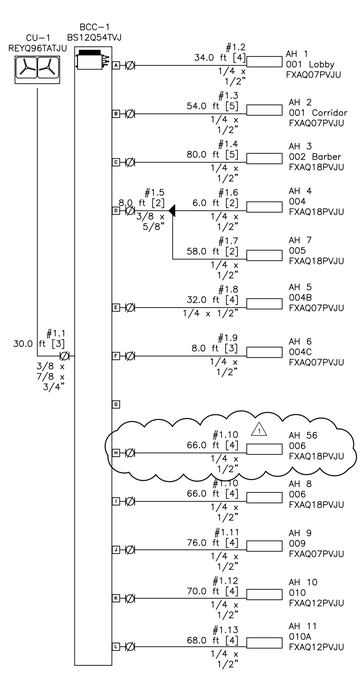
4 SYSTEM CONTROL DIAGRAM CU–4

NO SCALE



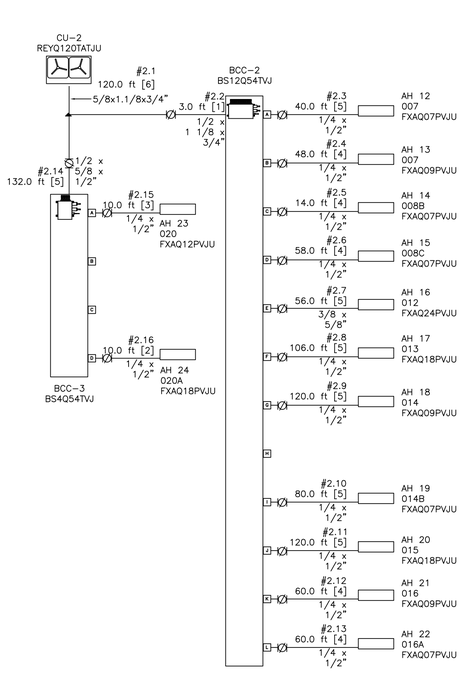
5 SYSTEM CONTROL DIAGRAM CU–5

NO SCALE



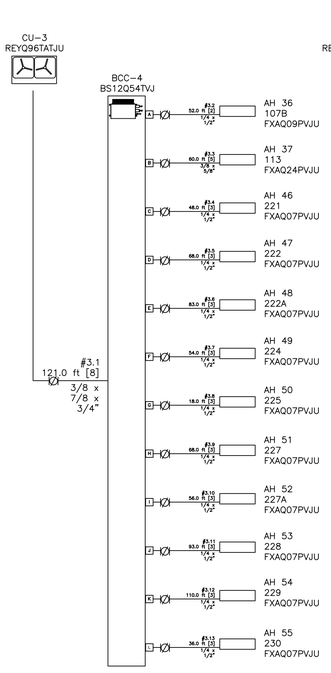
6 SYSTEM PIPING DIAGRAM OU–1

NO SCALE



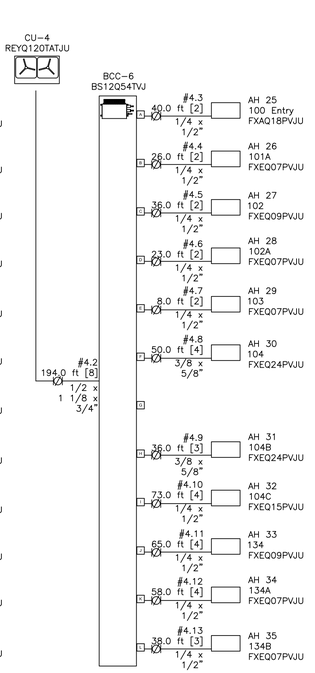
7 SYSTEM PIPING DIAGRAM CU–2

NO SCALE



8 SYSTEM PIPING DIAGRAM OU–3

NO SCALE



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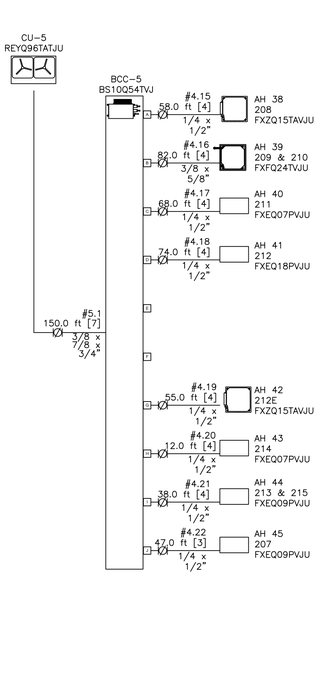
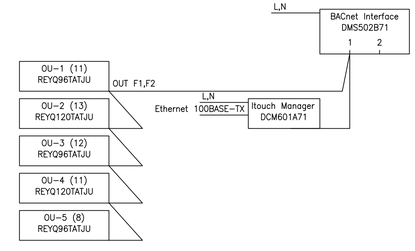


10 SYSTEM PIPING DIAGRAM OU–5

NO SCALE



11 VRV SYSTEM CENTRALIZED CONTROL GROUP DIAGRAM

NO SCALE

ALL EQUIPMENT AND MODEL NUMBERS THIS SHEET ARE BASED ON DAIKIN

DIRECTORATE OF FACILITIES ENGINEERING
DFE
CAMP KEYES

PLAN REVISIONS

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DFE PROJECT NO: 23SR18-458-0

STATE OF MAINE
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PIPING AND CONTROL DIAGRAMS
VRV HEAT PUMP SYSTEMS

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M–202
SHEET:100 OF 126

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January 28, 2019 - 7:32 am
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GENERAL SHEET NOTES

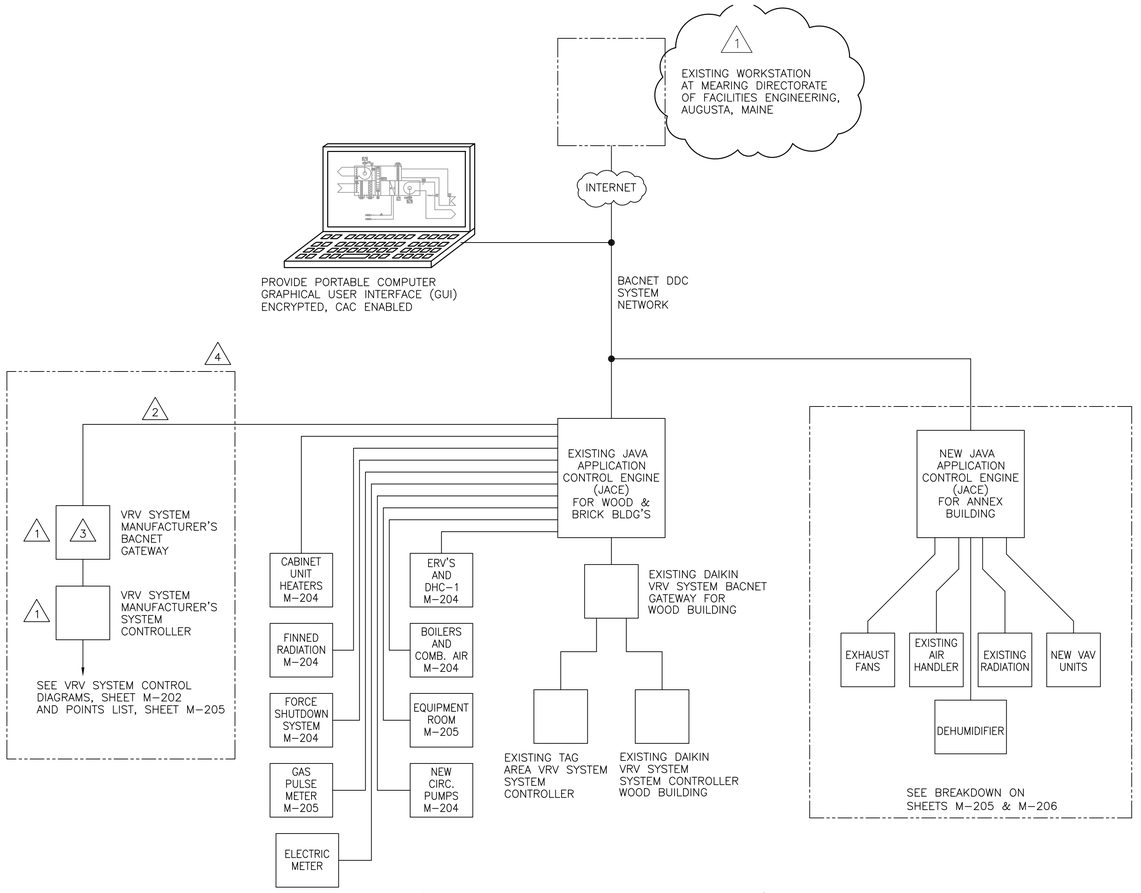
1. DFE PROJECT MANAGER IS RESPONSIBLE FOR IDENTIFYING LAN LOCAL COMMUNICATIONS.
2. CONTRACTOR IS RESPONSIBLE FOR CONNECTING JACE TO GOVERNMENT'S LAN USING CAT #6 IN CONDUIT.
3. NETWORK CONTROLLER LOCATION(S) TO BE DETERMINED IN THE FIELD.
4. CONTRACTOR TO VERIFY EXACT COMPONENTS REQUIRED TO MEET THE INTENT OF THE OPERATIONS.
5. CONTRACTOR IS RESPONSIBLE FOR 3 FOOT MINIMUM LOOP AT THE JACE CONNECTION AND 8' MIN AT THE LAN ROOM CONNECTION USING CAT #6.
6. CONTRACTOR TO PROVIDE SUBMITTAL WITH LAYOUT AND CONTROLS.
7. CONTRACTOR TO VERIFY SEQUENCE OF OPERATION ON ALL EQUIPMENT.

GENERAL NOTES (ALL CONTROLS DRAWINGS)

1. GRAPHICS SHALL BE DISPLAYED AND ALARMS SHALL BE ANNUNCIATED ON THE EXISTING GRAPHICAL USER INTERFACE (GUI) COMPUTER IN AUGUSTA AND ON PORTABLE COMPUTER PROVIDED AS PART OF THIS PROJECT
2. SETIINGS, MODES AND SET POINTS, THAT ARE INDICATED BELOW AS BEING ADJUSTABLE, SHALL BE ADJUSTABLE BY THE BUILDING OPERATORS THROUGH THE GUI WITHOUT THE NEED TO CHANGE OR EDIT PROGRAMMING.
3. THE GRAPHICAL USER INTERFACE (GUI) SHALL DISPLAY THE FOLLOWING VALUES; MOTOR RUN TIME TOTALS, CURRENT RATE OF ENERGY DELIVERY (GALLONS, KW/KWH, AND BTU/HR), TOTAL ENERGY DELIVERED DURING THE PAST HOUR, THE PAST DAY, THE PAST WEEK, THE PAST MONTH, THE PAST QUARTER, SEMI-ANNUALLY, AND THE PAST YEAR COMPARED TO THE PREVIOUS YEAR. DATA SHALL BE PROVIDED BOTH IN TABULAR FORM AND GRAPHICALLY WITH VISUAL GAUGES AND COUNTERS ON AN ENERGY SCREEN, INCLUDING OUTSIDE AIR TEMPERATURE AND CALCULATED HEATING AND COOLING DEGREE DAYS.
4. ANALOG DATA SHALL BE TRENDED AT REGULAR INTERVALS, DETERMINED BY THE EXPECTED RATE OF CHANGE OF THE DATA, AND SHALL BE ARCHIVED AND STORED ON THE GUI COMPUTER. TREND DATA SHALL BE CONFIGURED AND STORED TO SATISFY MEARNG REQUIREMENTS FOR FUTURE MEASUREMENT AND VERIFICATION.
5. BINARY DATA SHALL BE TRENDED ON A CHANGE OF STATE BASIS AND SHALL BE ARCHIVED AND STORED ON THE GUI COMPUTER. TREND DATA SHALL BE CONFIGURED AND STORED TO SATISFY MEARNG REQUIREMENTS FOR FUTURE EXPORTING FOR MEASUREMENT AND VERIFICATION.
6. COORDINATE FINAL GUI COMPUTER LOCATION WITH OWNER.
7. CONTROL UNITS, GUI AND NETWORK DEVICES SHALL BE CONNECTED TO AN EXISTING EMERGENCY POWER CIRCUIT. (WHERE APPLICABLE).
8. ALL LOW-VOLTAGE AND CONTROL WIRING SHALL BE RUN IN CONDUIT. CONDUIT SHALL BE RUN CONCEALED IN WALLS EXCEPT FOR NEW AND EXISTING MASONRY WALLS WITHOUT FURRING AND GWB.
9. CONTROLS CONTRACTOR SHALL DEMONSTRATE TO OWNER VIA GUI PRESENTATION THAT ALL CONTROL POINTS ARE OPERATING, TRENDING, ADJUSTABLE, DOWNLOADABLE, POPULATAING TABLES (PER NOTE 3 ABOVE) AND GUI'S.

VRF SYSTEM KEY NOTES (THIS SHEET ONLY)

1. VRF SYSTEM CONTROLLER SHALL BE LOCATED AT THE OWNER'S DIRECTION.
2. PROVIDE QUANTITY OF JACE UNITS TO SUIT FINAL DDC SYSTEM
3. PROVIDE VRF SYSTEM MANUFACTURER'S BACNET INTERFACE HARDWARE AND SOFTWARE AS REQUIRED TO ACHIEVE FULL INTEGRATION WITH CONNECTED EQUIPMENT.
4. PROVIDE LOW VOLTAGE AND CONTROL WIRING AND DEVICES REQUIRED TO CONNECT VRF SYSTEM COMPONENTS IN ACCORDANCE WITH VRF SYSTEM MANUFACTURER'S WRITTEN INSTRUCTIONS. VRF SYSTEM START-UP AND PROGRAMMING



DIRECT DIGITAL CONTROL SYSTEM ARCHITECTURE

NO SCALE

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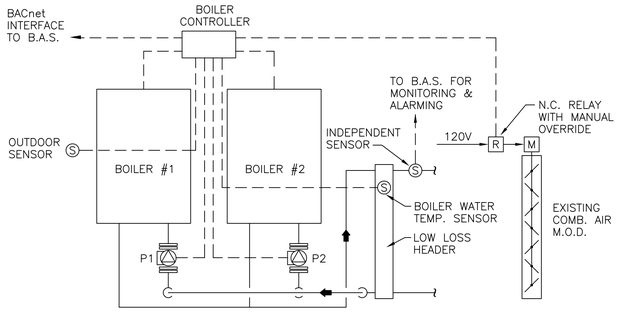


BOILER ROOM COMBUSTION AIR SEQUENCE OF OPERATION

EXISTING COMBUSTION AIR DUCTWORK AND MOTORIZED DAMPERS SHALL REMAIN IN PLACE. CONNECT NEW BOILER CONTROLS TO EXISTING DAMPER OPERATORS TO OPEN WHEN EITHER BOILER FIRES.

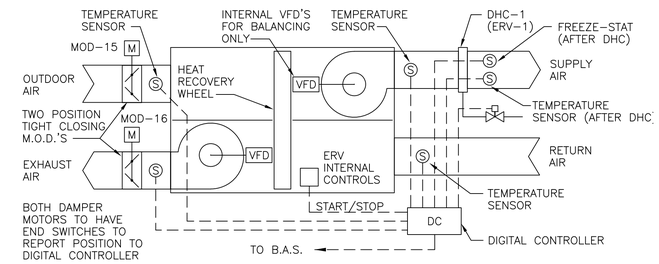
BOILER SEQUENCE OF OPERATION

A. BOILERS SHALL FUNCTION ON INTERNAL CONTROLS TO MAINTAIN TEMPERATURE TO THE HEATING SYSTEM AS PRESCRIBED BY THE RESET WATER SCHEDULE PROGRAMMED INTO THEM.
B. PROVIDE, INSTALL AND WIRE AN OUTDOOR AIR TEMPERATURE SENSOR (ON A NORTH WALL SHADED FROM SUNSHINE AND REFLECTION FROM SNOW) TO THE BOILER CONTROLS.
C. SEE SPECIFICATION 23 52 16, "CONDENSING BOILERS" FOR BOILER COMPONENTS AND INTERNAL SEQUENCE OF OPERATION.
D. EACH BOILER SHALL CYCLE ITS OWN INJECTION PUMP (P1 AND P2) TO INJECT HEAT INTO THE MAIN SYSTEM.
E. CONNECT BOILER CONTROLS TO BAS USING BACNET PROTOCOL TO PERMIT MONITORING OF BOILER OPERATION AND ALARMING OF LOW TEMPERATURE.
F. PROVIDE A TEMPERATURE SENSOR IN THE MAIN SUPPLY HEADER FROM THE BOILERS TO PROVIDE INDEPENDENT MONITORING OF SUPPLY WATER TEMPERATURE THROUGH THE BAS AND SIGNAL AN ALARM SHOULD TEMPERATURE FALL 5°F. BELOW SETPOINT OF THE RESET WATER SCHEDULE.

EXTERNAL BOILER CONTROLS POINTS LIST

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
BOILER INTERNAL CONTROLS	X	X				X		X		1
OUTDOOR AIR TEMPERATURE	X	X	X			X		X		
DISCHARGE WATER TEMPERATURE	X		X			X		X		

NOTES:
1. BOILER CONTROLS TO FEED A BACnet SIGNAL TO THE B.A.S. FOR REMOTE MONITORING AND SETTING OF INTERNAL CONTROLS INCLUDING BOILER STATUS (LEAD/LAG), SUPPLY TEMPERATURE, RETURN TEMPERATURE, ETC. , RUN TIME, GAS VALVE STATUS, PUMPS P1 & P2



ENERGY RECOVERY UNITS (ERV) AND DUCT HEATING COIL #1 SEQUENCE OF OPERATION

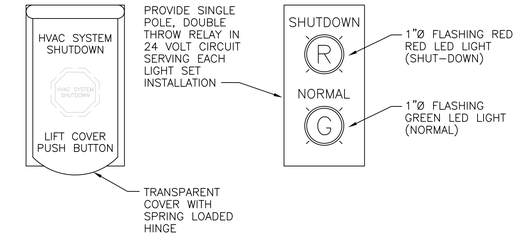
A. UNITS SHALL HAVE INTERNAL CONTROLS TO MAINTAIN DISCHARGE TEMPERATURE AND DEFROST CYCLES. REFERENCE SPECIFICATION SECTION 23 72 00 , "AIR-TO-AIR ENERGY RECOVERY EQUIPMENT".
B. UNITS SHALL HAVE THE CAPABILITY OF CONNECTING TO THE BAS VIA BAC-NET.
C. UNITS SHALL BE CONNECTED TO THE BAS TO OPERATE ON THE SAME OCCUPIED / UNOCCUPIED CYCLES AS THE HEAT PUMP SYSTEMS ASSOCIATED WITH EACH UNIT.
   1. ERV-1 ASSOCIATED WITH OUTDOOR UNITS 1, 2 & 3
   2. ERV-2 ASSOCIATED WITH OUTDOOR UNIT 4
D. WHEN OCCUPIED CYCLES ARE ACTIVATED EACH ERV SHALL START AND THE OUTDOOR AND EXHAUST AIR DAMPERS SHALL OPEN. UNITS SHALL RUN CONTINUOUSLY AND THE HEAT RECOVERY WHEEL SPEED SHALL MODULATE TO MAINTAIN SET DISCHARGE TEMPERATURE. TEMPERATURE SHALL BE ADJUSTABLE BOTH AT THE UNITS AND THROUGH THE BAS. SEE DRAWINGS FOR CONTROL POINT SCHEDULE.
E. SHOULD UNIT CONTROLS GO INTO DEFROST MODE THE OUTDOOR AIR INTAKE DAMPER SHALL CLOSE AND THE SUPPLY FAN STOP. WHEEL AND EXHAUST FAN SHALL CONTINUE TO OPERATE UNTIL CYCLE IS COMPLETE WHEN THE OUTDOOR AIR DAMPER SHALL OPEN AND THE SUPPLY FAN START AGAIN.
F. ERV-1 SHALL HAVE A DUCT HEATING COIL TO BOOST THE DISCHARGE AIR FROM THE ERV TO ROOM TEMPERATURE PLUS 2°F. (ADJUSTABLE THROUGH BAS). A TWO WAY MODULATING VALVE ON THE HOT WATER SUPPLY PIPING TO THE COIL SHALL MODULATE TO MAINTAIN DISCHARGE TEMPERATURE. DISCHARGE TEMPERATURE SHALL BE MONITORED THROUGH THE BAS. SHOULD DISCHARGE TEMPERATURE FALL TO 60°F. A LOW TEMPERATURE ALARM SHALL BE SIGNALED AT THE BAS. SHOULD DISCHARGE TEMPERATURE FALL TO 40°F. A FREEZE WARNING BE SIGNALED AT THE BAS, ERV-1 SHALL SHUT DOWN AND THE OUTDOOR AIR & EXHAUST AIR DAMPERS SHALL CLOSE. THE VALVE ON THE HOT WATER SUPPLY TO THE COIL SHALL REMAIN OPEN.
G. FORCE PROTECTION SHUTDOWN: IN THE EVENT THE FORCE PROTECTION SHUTDOWN SWITCH IS ACTIVATED (SEE DETAIL THIS SHEET) THE SUPPLY AND EXHAUST FANS SHALL STOP AND THE OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE AND REMAIN CLOSED UNTIL THE FORCE PROTECTION SWITCH IS MANUALLY RELEASED.
H. ALL TEMPERATURE SETPOINTS SHALL BE ADJUSTABLE.

ERV AND DHC-1 POINTS LIST

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
ADJUSTABILITY OF DHC-1 DISCHARGE TEMP	X		X						X	
CONTROL VALVE ON HWS TO DHC-1	X	X				X			X	
EXHAUST AIR DAMPER POSITION	X			X	X				X	
EXHAUST AIR TEMPERATURE	X	X							X	
EXHAUST FAN CURRENT SENSOR (STATUS)	X			X		X			X	2, 3
EXHAUST FAN START / STOP	X				X				X	1
OUTDOOR AIR DAMPER POSITION	X			X	X				X	
OUTDOR AIR TEMPERATURE SENSOR	X	X							X	
RETURN AIR TEMPERATURE	X	X							X	
SUPPLY AIR TEMPERATURE AFTER DHC-1	X	X							X	
SUPPLY AIR TEMPERATURE AT ERV OUTLET	X	X							X	
SUPPLY FAN CURRENT SENSOR (STATUS)	X			X		X			X	2, 3
SUPPLY FAN START / STOP	X				X				X	1

NOTES:
1. UNIT RECEIVES START / STOP SIGNAL FROM B.A.S.
2. GENERATE ALARM AT GUI IF MOTOR FAILS TO SHOW PROOF OF OPERATION
3. PROVIDE RUN-TIME TOTALIZATION AND DISPLAY DATA ON GUI

BUTTON SPECIFICATION: BUTTON SHALL BE STI SERIES 2000 STOPPER STATION OR APPROVED EQUAL. BUTTON AND SHELL SHALL BE YELLOW. BUTTON SHALL BE OCTAGONAL, PUSH TO ACTIVATE, TURN TO RESET TYPE. BUTTON SHALL BE UL LISTED. PROVIDE PROTECTION COVER, STI MINI STOPPER II COVER WITHOUT HORN OR APPROVED EQUAL. THE BUTTON SHALL HAVE TWO SETS OF FORM "C" CONTACTS RATED AT 10A, 120/250 VAC, 1/2 HP, 30 VDC, 6A. THEY SHALL BE LABELLED 'HVAC SYSTEM SHUTDOWN" AND THE PROTECTIVE COVER LABELLED 'HVAC SYSTEM SHUTDOWN. LIFT COVER PUSH BUTTON".



ATFP SHUTDOWN BUTTON DETAIL

NO SCALE

SEQUENCE OF OPERATION – FORCE SHUTDOWN SHUT-DOWN SWITCH (ATFP)

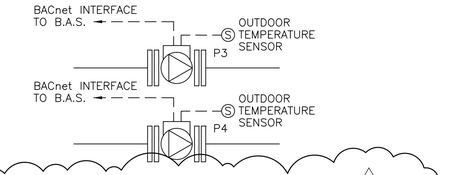
THE EMERGENCY STOP BUTTON SHALL OVERRIDE ALL OTHER BUILDING CONTROL FUNCTIONS AS FOLLOWS:

A. PROVIDE AN EMERGENCY HVAC DISABLE SWITCH FOR ATFP FORCE PROTECTION. FINAL LOCATIONS TO BE AS FOLLOWS:
   1. ROOM B25A
   2. ROOM 007
   3. ROOM 107
   4. ROOM 112B
   5. ROOM 206
   6. ROOM 221
B. ON ACTIVATION OF ANY EMERGENCY SWITCH, BUILDING HVAC EQUIPMENT SUPPLIED DIRECTLY WITH OUTSIDE AIR AND /OR EXHAUST FANS SHALL BE SHUT DOWN AND RELATED OUTSIDE AIR AND EXHAUST AIR DAMPERS SHALL CLOSE WITHIN 30 SECONDS. THIS INCLUDES ERV-1, ERV-2 AND THE EXISTING AIR HANDLER IN THE ANNEX BUILDING.
C. INDIVIDUAL TERMINAL HEAT PUMP UNITS SHALL CONTINUE TO OPERATE WITHOUT OUTSIDE AIR.
D. A CRITICAL ALARM SHALL BE GENERATED AT THE GUI.
E. EACH EMERGENCY SWITCH SHALL BE MANUALLY RESET VIA THE GUI AND WHEN RESET THE BACS SHALL SOFT START THE HVAC EQUIPMENT SEQUENTIALLY BY PROVIDING ADJUSTABLE TIME-DELAY BETWEEN EQUIPMENT STARTS.
F. REFER TO SPECIFIC EQUIPMENT CONTROL DIAGRAMS FOR ADDITIONAL FORCE PROTECTION SHUT-DOWN PROTOCOLS.
G. WHEN A FORCE PROTECTION SWITCH IS ACTIVATED, A RED LED INDICATOR LAMP SHALL BE ILLUMINATED. OTHERWISE A GREEN LED INDICATOR LAMP SHALL BE ILLUMINATED.

GLOBAL BUILDING POINTS LIST

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
OUTSIDE AIR TEMPERATURE	X	X							X	4
OUTSIDE AIR RELATIVE HUMIDITY	X	X							X	4
FIRE ALARM CONTROL PANEL	X		X		X	X	X		X	1
MASS NOTIFICATION PANEL	X		X		X	X	X		X	1
FORCE PROTECTION SHUT DOWN SWITCH	X		X		X				X	2, 4
FORCE PROTECTION NORMAL - GREEN	X			X					X	3, 4
FORCE PROTECTION ACTIVATED - RED	X			X		X			X	3, 4

NOTES:
1. GENERATE AN ALARM ON THE GUI WHEN FIRE ALARM SYSTEM OR MASS NOTIFICATION SYSTEM IS ENABLED
2. GENERATE ALARM IF FORCE PROTECTION SHUT DOWN SWITCH (ATFP) IS PRESSED.
3. FOR INDICATOR LIGHT PANEL DETAIL, REFER TO DETAIL THIS SHEET
4. LOCATE DEVICES IN ROOMS IDENTIFIED IN DESCRIPTION OF OPERATION.



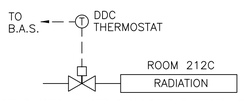
CIRCULATING PUMPS P3 AND P4 SEQUENCE OF OPERATION

A. PUMPS SHALL OPERATE FROM INTERNAL CONTROLS AND REGULATE THEIR OWN SPEED BASED ON SYSTEM PRESSURES. PUMPS SHALL HAVE INTERNAL OR B.A.S. LEAD/LAG CONTROL PROTOCOLS. PUMPS SHALL NOT REQUIRE EXTERNAL VFD'S. SEE SPECIFICATION 23 21 23, "HYDRONIC PUMPS" FOR ADDITIONAL INFORMATION REGARDING PUMP CONTROLS.
B. CONNECT PUMP CONTROLS TO THE OUTDOOR AIR SENSOR CONTROLLING THE BOILERS.
C. PROVIDE COMMUNICATING WIRING BETWEEN THE TWO PUMPS TO PERMIT LEAD/LAG CONTROLS.
D. CONNECT PUMPS TO THE BAS USING BACNET PROTOCOL TO PERMIT MONITORING OF PUMP OPERATION AND ALARMING UPON FAILURE.

PUMPS P3 AND P4 CONTROLS POINTS LIST

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
OUTDOOR AIR TEMPERATURE	X	X				X			X	
PUMP 3 ON/OFF	X				X	X			X	1
PUMP 4 ON/OFF	X				X	X			X	1
PUMP 3 SPEED	X			X		X			X	1
PUMP 4 SPEED	X			X		X			X	1
LEAD/LAG PROGRAMMING	X			X		X			X	1
NO FLOW / PUMP FAILURE	X		X		X	X			X	1

NOTES:
1. PUMP INTERNAL CONTROLS TO FEED DATA TO B.A.S VIA BACnet FOR REMOTE MONITORING OF INTERNAL CONTROLS.



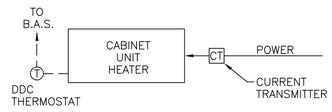
FINNED RADIATION AND CONVECTOR SEQUENCE OF OPERATION

A. PROVIDE A DDC THERMOSTAT WITH SETPOINT AND TEMPERATURE DISPLAY. ON CALL FOR HEAT THE THERMOSTAT SHALL OPEN A TWO POSITION VALVE ON THE HOT WATER SUPPLY PIPE TO UNIT WHEN SPACE TEMPERATURE IS SATISFIED THE VALVE SHALL CLOSE.
B. THE BAS SHALL HAVE THE FOLLOWING CAPABILITIES:
   1. TEMPERATURE SETPOINT
   2. ROOM TEMPERATURE STATUS
   3. SETTING OF ALLOWABLE TEMPERATURE RANGE (HIGH AND LOW).

FINNED RADIATION AND CONVECTORS POINTS LIST

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
SPACE TEMPERATURE	X				X	X			X	
SPACE TEMPERATURE SETPOINT	X			X					X	1
VALVE POSITION	X			X	X				X	2

NOTES:
1. LIMITS SETPOINT RANGE AT THE THERMOSTAT
2. REPORTS POSITION OF VALVE (OPEN/CLOSED)



CABINET UNIT HEATERS SEQUENCE OF OPERATION

A. CABINET UNIT HEATERS COME WITH INTERNAL CONTROLS AND ABILITY TO CONNECT TO EXTERNAL THERMOSTATS. PROVIDE A DDC TEMPERATURE SENSOR WITH NO SETPOINT OR TEMPERATURE DISPLAY. ON CALL FOR HEAT THE SENSOR SHALL SIGNAL THE CABINET UNIT HEATER TO START. AN INTERNAL AQUASTAT ON THE HOT WATER SUPPLY PIPE TO THE COIL SHALL ALLOW THE FAN TO START WHEN WATER TEMPERATURE TO THE COIL REACHES SETPOINT (PRESET AT THE FACTORY). WHEN SPACE TEMPERATURE IS SATISFIED THE UNIT SHALL BE SIGNALED TO STOP. TEMPERATURE SETPOINT AND ROOM TEMPERATURE STATUS SHALL BE ACCESSED FROM THE BAS.

CABINET UNIT HEATERS POINTS LIST

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
SPACE TEMPERATURE	X				X	X			X	
SPACE TEMPERATURE SETPOINT	X			X					X	1

NOTES:
1. UNIT CONTROL IS ENERGIZED BY THE THERMOSTAT AND FAN RUNS WHEN INTERNAL AQUASTAT SENSES HOT WATER IN HWS

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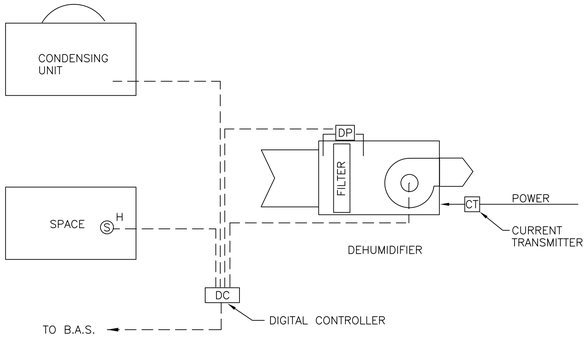
M-204
SHEET:102 OF 126

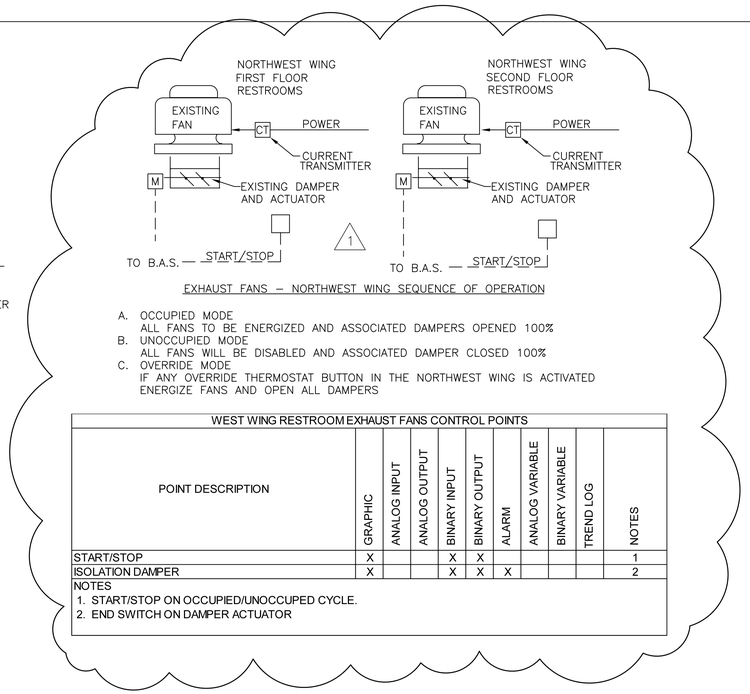


DEHUMIDIFIER – NOTHWEST WING LOWER LEVEL SEQUENCE OF OPERATION

A. OCCUPIED AND UNOCCUPIED MODE:
   WHEN THE LOWER LEVEL SPACE WALL–MOUNTED HUMIDITY SENSOR MEASURES RELATIVE HUMIDITY GREATER THAN 60% (ADJUSTABLE ON BMS) ENERGIZE THE INDOOR AIR HANDLER AND OUTDOOR CONDENSING UNIT.
B. STANDBY STATUS WILL BE NO AIR HANDLER OR CONDENSING UNIT OPERATION.
C. CONDENSER REHEAT IS CONTROLLED BY THE INTERNAL CONTROLS OF THE DEHUMIDIFIER.

NORTH WEST WING DEHUMIDIFIER CONTROL POINTS										
POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
START/STOP	X			X	X					1
ROOM WALL-MOUNTED HUMIDITY SENSOR	X			X	X	X				
FILTER STATUS	X			X	X					
NOTES 1. ENABLED 24/7.										

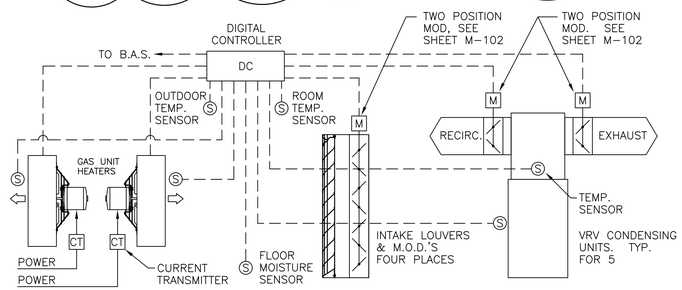
GAS PULSE METER CONTROL POINTS										
POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
COMUNICATION WITH CENTRAL ENERGY METER	X			X	X					1,2
NOTES: 1. LOCATED IN NEW ADDITION EQUIPMENT ROOM 2. PULSE OUTPUT										



EXHAUST FANS – NORTHWEST WING SEQUENCE OF OPERATION

A. OCCUPIED MODE
   ALL FANS TO BE ENERGIZED AND ASSOCIATED DAMPERS OPENED 100%
B. UNOCCUPIED MODE
   ALL FANS WILL BE DISABLED AND ASSOCIATED DAMPER CLOSED 100%
C. OVERRIDE MODE
   IF ANY OVERRIDE THERMOSTAT BUTTON IN THE NORTHWEST WING IS ACTIVATED ENERGIZE FANS AND OPEN ALL DAMPERS

WEST WING RESTROOM EXHAUST FANS CONTROL POINTS										
POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
START/STOP	X			X	X					1
ISOLATION DAMPER	X			X	X	X				2
NOTES 1. START/STOP ON OCCUPIED/UNOCCUPED CYCLE. 2. END SWITCH ON DAMPER ACTUATOR										



GAS FIRED UNIT HEATERS AND EQUIPMENT ROOM SEQUENCE OF OPERATION

A. THE DDC SYSTEM SHALL MONITOR THE OPERATING MODE (HEAT OR COOL) OF THE VRV SYSTEM VIA THE VRV MANUFACTURER'S BACNET GATEWAY.
B. IF THE VRV SYSTEM CONDENSING UNITS ARE IN THE COOLING MODE (HEAT REJECTION) THE VRV SYSTEM AIR INTAKE DAMPERS SHALL BE OPEN. THE CONDENSING UNIT EXHAUST AIR DAMPERS SHALL BE OPEN AND THE CONDENSING UNIT RECIRCULATING AIR DAMPERS SHALL BE CLOSED.
C. IF THE VRV SYSTEM OUTDOOR (CONDENSING) UNITS ARE IN THE HEATING MODE (HEAT ABSORPTION) AND OUTSIDE AIR TEMPERATURE IS ABOVE 25°F. (ADJUSTABLE THROUGH THE DDC CONTROLS) THE VRV SYSTEM AIR INTAKE DAMPERS SHALL BE OPEN. THE CONDENSING UNIT EXHAUST AIR DAMPERS SHALL BE OPEN AND THE CONDENSING UNIT RECIRCULATING AIR DAMPERS SHALL BE CLOSED.
D. WHEN OUTSIDE AIR TEMPERATURE FALLS BELOW 25°F. (ADJUSTABLE THROUGH THE DDC CONTROLS) THE VRV SYSTEM AIR INTAKE DAMPERS SHALL CLOSE. THE CONDENSING UNIT EXHAUST AIR DAMPERS SHALL CLOSE AND THE CONDENSING UNIT RECIRCULATING AIR DAMPERS SHALL OPEN.
E. MECHANICAL ROOM SPACE TEMPERATURE SHALL BE MAINTAINED AT 25°F. BY CYCLING FOUR STAGES OF HEATING (2 STAGES AT EACH GAS FIRED UNIT HEATER) USING LEAD–1/LEAD–2/LAG–1/LAG–2 SEQUENCING. THE LEAD UNIT HEATER SHALL ROTATE EACH MONTH FOR EQUAL WEAR ON THE EQUIPMENT. EQUIPMENT RUN TIME TOTAL SHALL BE DISPLAYED ON THE GUI.
F. REFER TO NOTES ASSOCIATED WITH POINTS LIST FOR SYSTEM ALARMS TO BE REPORTED TO THE GUI.
G. ALL TEMERATURE SETPOINTS SHALL BE ADJUSTABLE.

EQUIPMENT ROOM GAS UNIT HEATERS AND DAMPERS										
POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
CURRENT TRANSMITTER (2)	X		X						X	
DISCHARGE TEMP. (EA. OUTDOOR UNIT)	X	X				X	X		X	
DISCHARGE TEMP. (EA. UNIT HEATER)	X	X				X	X		X	
EQUIPMENT ROOM FLOOR MOISTURE SENSOR	X			X		X	X		X	2
EQUIPMENT ROOM SPACE TEMPERATURE	X	X				X	X		X	4
INLET TEMP. SENSOR (EA. OUTDOOR UNIT)	X		X			X	X		X	
OU-X EXHAUST AIR DAMPER	X			X	X				X	1,6
OU-X RECIRCULATION AIR DAMPER	X			X	X				X	1,6
UH-X ALARM/FAULT	X			X		X			X	4,5
UH-X HEATING STAGE 1	X				X				X	4,6
UH-X HEATING STAGE 2	X				X				X	4,6
VRF SYSTEM INTAKE DAMPERS	X			X	X				X	6
NOTES: 1. POINT TYPICAL FOR EACH CONDENSING UNIT. 2. GENERATE MAINTENANCE ALARM AT GUI IF WATER IS SENSED ON FLOOR AT INTAKE LOUVER 3. GENERATE ALARM AT GUI IF SPACE TEMPERATURE DROPS BELOW 15°F. 4. POINT TYPICAL FOR TWO GAS FIRED UNIT HEATERS. 5. GENERATE ALARM AT GUI IF UNIT HEATER CONTROLLER INDICATED AN ALARM CONDITION. 6. TOTALIZE RUN TIME AND DISPLAY RUN TIME ON GUI GRAPHICS										

VRV SYSTEMS SEQUENCE OF OPERATION

A. EACH CONDENSING UNIT AND ASSOCIATED INDOOR AIR HANDLERS SHALL BE CONTROLLED BY EQUIPMENT PROVIDED BY THE MANUFACTURER OF THE VRV SYSTEMS. CONTROLS SHALL CONSIST OF (BUT NOT LIMITED TO) THE FOLLOWING:
   1. REMOTE WALL MOUNTED THERMOSTATS FOR EACH AIR HANDLER (OR GROUP OF AIR HANDLERS) AS INDICATED ON DRAWINGS.
   2. A CENTRALIZED CONTROLLER WITH GUI TO INDICATE...
      a) STATUS OF EACH SYSTEM
      b) TEMPERATURE SETPOINTS OF EACH THERMOSTAT
      c) ACTUAL SPACE CONDITIONS
      d) AUTOMATIC TEMPERATURE CHANGEOVER FROM HEATING TO COOLING FOR EACH SPACE.
B. SYSTEM MANAGER WHICH SHALL SERVE AS A BACNET INTERFACE FOR AN EXTERNAL BUILDING AUTOMATION SYSTEM (BAS) FOR REMOTE MONITORING, SETPOINT ADJUSTMENT, ALARMING AND CONTROL OF THE VRV SYSTEMS. SEE SYSTEM DIAGRAMS ON SHEET M–202 AND POINTS LIST BELOW.
C. CONDENSING UNITS SHALL HAVE INTERNAL CONTROLS TO VARY REFRIGERANT VOLUME TO AIR HANDLERS BASED ON LOAD CONDITIONS, ANTI–CYCLING, DEFROST, ETC.
D. PROVIDE A MEANS OF OVERRIDING THE OCCUPIED/UNOCCUPIED SEQUENCE AT THE BAS AT EACH ROOM THERMOSTAT FOR A PERIOD OF TIME TO BE SET AT THE BAS. THE SETPOINT DIFFERENCES BETWEEN OCCUPIED AND OCCUPIED TIMES AND TEMPERATURES SHALL BE DETERMINED AT THE BAS.
E. ALL POINTS LISTED BELOW SHALL BE DISPLAYED ON THE BAS G.U.I.

VRV SYSTEM BACnet/IP SERVER GATEWAY POINTS LIST

SYSTEM CONFIGURATION POINTS LINKED TO iTM (INTELLIGENT TOUCH MANAGER) CONTROL LOGIC (ONE SET OF POINTS PER iTM):	
POINT NAME	POINT DESCRIPTION
ENABLE iTM SCHEDULE OPERATION	ENABLE OR DISABLE iTM SCHEDULE OPERATION
ENABLE iTM AUTO CHANGEOVER OPERATION	ENABLE OR DISABLE iTM AUTO CHANGEOVER LOGIC.
TIMED OVERRIDE MINUTES	SET OVERRIDE TIME IN MINUTES
SYSTEM FORCED OFF	THE FORCED SYSTEM STOP COMMAND WILL FORCE THE INDOOR UNIT TO STOP RUNNING. REMOTE CONTROLLERS WILL BE LOCKED OUT FROM RESTARTING INDOOR UNITS DURING THE FORCED SYSTEM STOP EVENT.

INDOOR UNIT MONITORING POINTS (ONE SET OF POINTS PER INDOOR UNIT):	
POINT NAME	POINT DESCRIPTION
UNIT ON_OFF STATUS	MONITORS IF THE INDOOR UNIT FAN IS ON OR OFF
ALARM STATUS	MONITORS WHETHER OR NOT THE INDOOR UNIT IS OPERATING NORMALLY, AND ISSUES AN ALARM IF THE INDOOR UNIT HAS A MALFUNCTION. ERROR CODE IS SHOWN IN THE DESCRIPTION.
ROOM TEMPERATURE	MONITORS AND DISPLAYS THE ROOM TEMPERATURE.
UNIT ON DETAILS	INDOOR UNIT DETAILS OPERATION OFF - NORMAL (ON) - OVERRIDE - SETBACK
FILTER SIGN STATUS	MONITORS FILTER RUN TIME AND PROVIDES SERVICE ALERT.
INDOOR FAN STATUS	MONITORS IF THE INDOOR UNIT FAN IS ON OR OFF
COMMUNICATION STATUS	MONITOR IF THE COMMUNICATION IS NORMAL OR IN ALARM
THERMO-ON STATUS	MONITORS WHETHER OR NOT THE INDOOR UNIT IS ACTIVELY COOLING OR HEATING.
COMPRESSOR STATUS	MONITORS IF THE COMPRESSOR OF THE OUTDOOR UNIT IS ON/OFF/DEFROST
AUX HEATER STATUS	MONITORS IF THE EXTERNAL HEATER (IF PROVIDED) CONTROLLED BY THE INDOOR UNIT IS OPERATING.
CHANGEOVER OPTION	MONITOR IF iTM CHANGEOVER LOGIC IS ACTIVE.

INDOOR UNIT MONITORING AND CONTROL POINTS (ONE SET OF POINTS PER INDOOR UNIT):	
POINT NAME	POINT DESCRIPTION
OCCUPANCY MODE	SET THE OCCUPANCY OF THE INDOOR UNIT OCCUPIED , UNOCCUPIED OR STANDBY
OPERATION MODE	SET COOL - HEAT -FAN -DRY OPERATION MODE. FOR THE INDOOR UNIT AND MONITORS THE LATEST MODE
OCC COOLING SETPOINT	SETS THE OCCUPIED COOLING SETPOINT OF THE INDOOR UNIT AND MONITORS THE LATEST SETPOINT VALUE.
OCC HEATING SETPOINT	SETS THE OCCUPIED HEATING SETPOINT OF THE INDOOR UNIT AND MONITORS THE LATEST SETPOINT VALUE.
UNOCC COOLING SETPOINT	SETS THE UNOCCUPIED COOLING SETPOINT OF THE INDOOR UNIT AND MONITORS THE LATEST SETPOINT VALUE.
UNOCC HEATING SETPOINT	SETS THE OCCUPIED HEATING SETPOINT OF THE INDOOR UNIT AND MONITORS THE LATEST SETPOINT VALUE.
MAX COOLING SETPOINT	SETS THE MAXIMUM COOLING SETPOINT OF THE INDOOR UNIT AND MONITORS THE LATEST SETPOINT VALUE.
MIN COOLING SETPOINT	SETS THE MINIMUM COOLING SETPOINT OF THE INDOOR UNIT AND MONITORS THE LATEST SETPOINT VALUE.
MAX HEATING SETPOINT	SETS THE MAXIMUM HEATING SETPOINT OF THE INDOOR UNIT AND MONITORS THE LATEST SETPOINT VALUE.
MIN HEATING SETPOINT	SETS THE MINIMUM HEATING SETPOINT OF THE INDOOR UNIT AND MONITORS THE LATEST SETPOINT VALUE.
MIN SETPOINT DIFFERENTIAL (COOLING & HEATING)	SET THE MINIMUM DIFFERENTIAL VALUE BETWEEN COOLING AND HEATING SETPOINT AND MONITOR THE LATEST DIFFERENTIAL VALUE.
COOLING & HEATING SETPOINT TRACKING MODE	ENABLE OR DISABLE iTM SETPOINT TRACKING MODE.
FAN SPEED	SETS THE INDOOR UNIT FAN SPEED AND MONITORS THE LATEST SETTING
TIMED OVERRIDE OPERATION	ENABLE OR DISABLE iTM OVERRIDE TIMER
REMOTE CONTROLLER PROHIBIT (ON_OFF)	PERMITS OR PROHIBITS THE REMOTE CONTROLLER TO CONTROL THE INDOOR UNIT'S ON/OFF.
REMOTE CONTROLLER PROHIBIT (OPERATION MODE)	PERMITS OR PROHIBITS THE REMOTE CONTROLLER TO CONTROL THE INDOOR UNIT'S OPERATION MODE.
REMOTE CONTROLLER PROHIBIT (SETPOINT)	PERMITS OR PROHIBITS THE REMOTE CONTROLLER TO CONTROL THE INDOOR UNIT'S SETPOINT.
FILTER SIGN RESET	CLEARS THE FILTER SIGN STATUS.
FORCED THERMO-OFF	FORCE THE INDOOR UNIT TO STOP ACTIVELY COOLING OR HEATING.

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DIRECTORATE OF FACILITIES ENGINEERING
DFE
CAMP KEYES

PLAN REVISIONS

	Revn	Description	Date	Appr.
	1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: REM
DRAWN BY: REM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: NONE
DFE PROJECT NO: 23SR18-458-D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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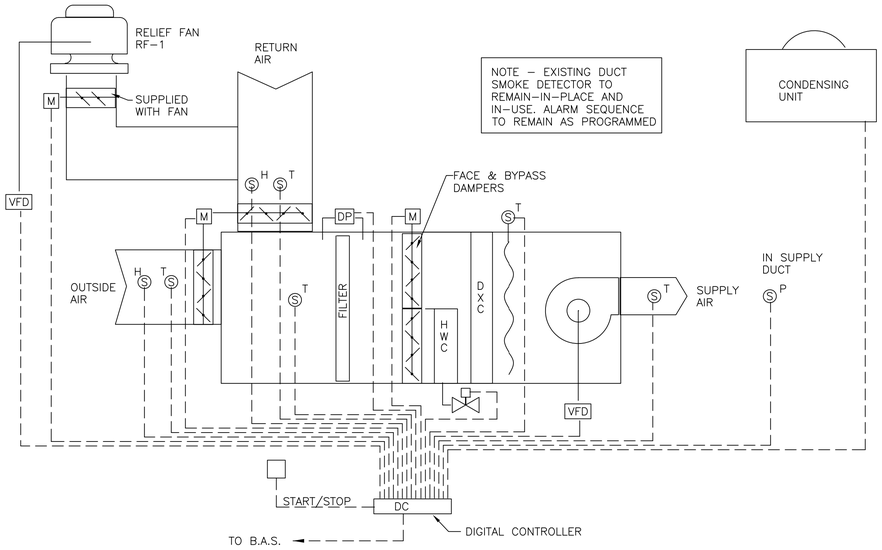
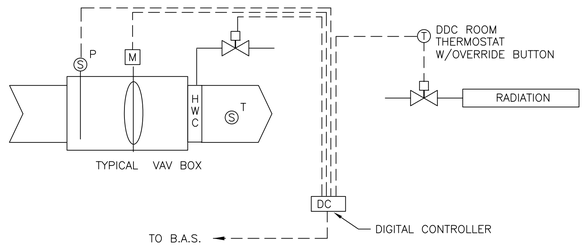
CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

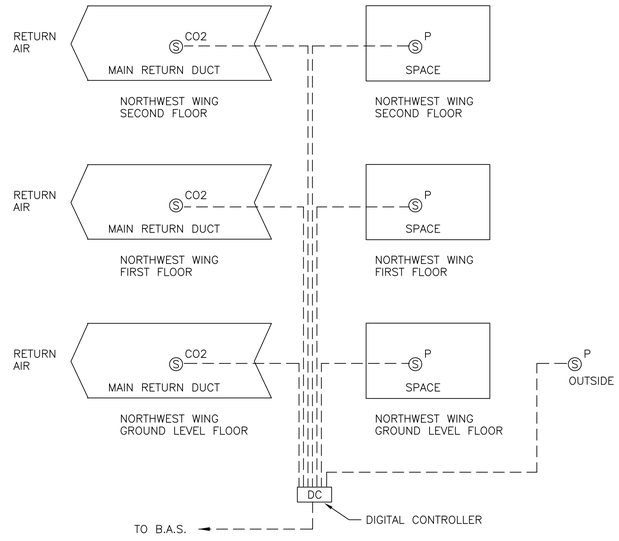
MECHANICAL SEQUENCE OF OPERATION AND CONTROL DIAGRAMS

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M–205
SHEET:103 OF 126







AIR HANDLER – NORTHWEST WING SEQUENCE OF OPERATION

A. OCCUPIED MODE

ENABLE SUPPLY FAN AND CONTROL FAN SPEED VIA THE EXISTING VFD TO MAINTAIN A CONSTANT PRESSURE SET AT 0.75"W.C. (ADJUSTABLE).

MAINTAIN A CONSTANT SUPPLY AIR TEMPERATURE OF 55–60 DEG. F (ADJUSTABLE). FIRST STAGE TO BE THE ECONOMIZER CYCLE MIXING OUTDOOR AIR WITH RETURN AIR. THE MIX OF RETURN AIR TO OUTSIDE AIR TO BE DETERMINED BY OUTSIDE ENTHALPY/INSIDE AIR ENTHALPY COMPARATIVE ALGORITHM CALCULATION. SECOND STAGE COOLING TO BE FIRST STAGE DX COOLING, THIRD STAGE COOLING TO BE SECOND STAGE DX COOLING. ON A CALL FOR HEATING ENABLE MODULATING HEATING COIL VALVE IN AIR HANDLER WHEN OUTDOOR TEMPERATURE IS ABOVE 40 DEG. F. (ADJUSTABLE) – BELOW 40 DEG. F, OUTDOOR TEMPERATURE OPEN VALVE 100% AND MODULATED FACE AND BYPASS DAMPERS TO MAINTAIN SUPPLY AIR TEMPERATURE AT SETPOINT.

B. UNOCCUPIED MODE

DISABLE AIR HANDLING UNIT, CONDENSING UNIT AND HEATING VALVE. CLOSE ALL DAMPERS.

C. OVERRIDE MODE

ALL WALL SENSORS WILL HAVE OCCUPIED OVERRIDE BUTTON. ENABLE OCCUPIED CYCLE FOR 4 HOURS (ADJUSTABLE).

D. SAFETY MODE – SMOKE DETECTOR

IF THE SMOKE DETECTOR ALARM CONDITION IS DETECTED DISABLE AIR HANDLING UNIT, CONDENSING UNIT AND CLOSE ALL DAMPERS.

E. SAFETY MODE – EMERGENCY SHUTDOWN

WHEN ANY OF THE SIX BUILDING EMERGENCY SHUTDOWN BUTTONS IS ACTIVATED DISABLE AIR HANDLING UNIT, CONDENSING UNIT AND CLOSE ALL DAMPERS.

F, SAFETY MODE – HOT WATER COIL FREEZE PROTECTION

UPON DETECTION OF POSSIBLE FREEZING CONDITIONS AT THE FULL–FACE SENSOR AT THE DISCHARGE OF THE HEATING COIL OPEN THE HEATING VALVE TO THE FULL OPEN POSITION AND ACTIVATE THE FACE AND BYPASS DAMPER TO ACCOMPLISH 100% BYPASS OF THE HEATING COIL.

WEST WING AIR HANDLER AND CONDENSER CONTROL POINTS

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
START/STOP	X	X	X							
OUTSIDE AIR INTAKE TEMPERATURE	X	X	X						X	
OUTSIDE AIR HUMIDITY	X	X	X						X	
RETURN AIR TEMPERATURE	X	X	X						X	
RETURN AIR HUMIDITY	X	X	X						X	
SUPPLY AIR TEMPERATURE SETPOINT	X	X	X						X	
SUPPLY AIR TEMPERATURE COMMAND	X	X	X						X	
SUPPLY AIR TEMPERATURE	X	X	X						X	
MIXED AIR TEMPERATURE COMMAND	X	X	X						X	1
MIXED AIR TEMPERATURE	X	X	X						X	
RELIEF FAN VFD STATUS	X	X	X			X			X	
RELIEF FAN ISOLATION DAMPER STATUS	X			X	X					2
FILTER DIFFERENTIAL PRESSURE SETPOINT	X			X	X					
FILTER DIFFERENTIAL STATUS	X			X	X					
COIL LEAVING TEMPERATURE SENSOR	X	X	X			X			X	
OUTSIDE AIR DAMPER POSITION	X	X	X							
RETURN AIR DAMPER POSITION	X	X	X							
SUPPLY AIR PRESSURE SETPOINT	X			X	X				X	
SUPPLY AIR PRESSURE	X			X	X				X	
SUPPLY AIR VFD STATUS	X	X	X						X	
CONDENSING UNIT COMMAND									X	
HOT WATER CONTROL VALVE STATUS	X	X	X						X	

NOTES
1. RESULT OF ALGORITHM CALCULATION
2. END SWITCH ON DAMPER

VAV BOXES – NORTHWEST WING SEQUENCE OF OPERATION

A. OCCUPIED MODE

WHEN IN COOLING MODE MODULATE THE DAMPER ABOVE MINIMUM POSITION TO MAINTAIN ROOM SETPOINT.

WHEN IN HEATING MODE DAMPER TO BE IN MINIMUM POSITION (UNLESS OVERRIDDEN BY THE CO2 CONTROL SEQUENCE) ALSO MAINTAIN A MINIMUM DISCHARGE TEMPERATURE OF 65 DEG F. (ADJUSTABLE). FIRST STAGE HEATING TO ENERGIZE ASSOCIATED 2–POSITION RADIATION VALVE. SECOND STAGE HEATING TO MODULATE HEATING COIL CONTROL VALVE TO MAINTAIN ROOM SETPOINT.

B. UNOCCUPIED MODE

VAV AND AIR HANDLING SYSTEM WILL BE DISABLED AND HEATING TEMPERATURE (ADJUSTABLE) MAINTAINED BY THE RADIATION.

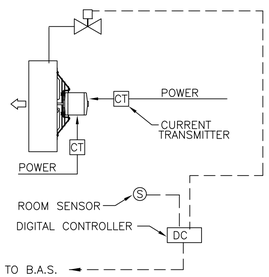
C. OVERRIDE MODE

ALL WALL SENSORS WILL HAVE OCCUPIED OVERRIDE BUTTON. ENABLE OCCUPIED CYCLE FOR ONLY THE VAV BOXES ON THE FLOOR WITH THE OVERRIDE CALL,

VARIABLE AIR VOLUME BOX VAV-1 THROUGH 22 AND ASSOCIATED RADIATION CONTROL POINTS

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
MINIMUM DAMPER POSTION SETPOINT - CFM	X	X	X						X	
MAXIMUM DAMPER POSITION SETPOINT- CFM	X	X	X						X	
COMMAND DAMPER SETPOINT - CFM	X	X	X						X	1
ACTUAL CFM	X	X	X				X		X	
HOT WATER CONTROL VALVE POSITION	X	X	X				X		X	
DISCHARGE AIR TEMPERATURE	X	X	X				X		X	
ROOM THERMOSTAT SETPOINT	X	X	X						X	2
OVERIDE BUTTON ACTIVATED	X			X	X					
ROOM AIR TEMPERATURE AT THERMOSTAT	X	X	X				X		X	
RADIATION CONTROL VALVE COMMAND				X	X				X	
RADIATION CONTROL VALVE POSITION				X	X	X			X	

NOTES
1. RESULTS OF ALGORITHM
2. LIMITS SET ON A PER THERMOSTAT BASIS



UH–1 – NORTHWEST WING SEQUENCE OF OPERATION

ON A CALL FOR HEAT ENERGIZE CONTROL VALVE & FAN

WEST WING UNIT HEATER UH-1 CONTROL POINTS

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
SENSOR SETPOINT	X			X	X					1
FAN STATUS			X						X	
ROOM TEMPERATURE	X			X	X	X			X	

NOTES
1. ENABLED 24/7.

SPACE CO2 LEVEL & BUILDING PRESSURE – NORTHWEST WING SEQUENCE OF OPERATION

A. OCCUPIED MODE

SET AN INCREASE OF THE MINIMUM DAMPER POSITION OF VAV BOXES BASED ON MAINTAINING A MAXIMUM CO2 LEVEL OF 1000 PPM (ADJUSTABLE). MODULATE THE MINIMUM DAMPER POSITION. THIS IS TO BE DONE ON A FLOOR–BY–FLOOR BASIS WITH ALL BOXES ON AN INDIVIDUAL FLOOR PROPORTIONALLY INCREASING DAMPER POSITION.

THE OUTSIDE AIR DAMPER (UNLESS OVERRIDDEN BY THE ECONOMIZER CONTROL) TO BE A MAXIMUM OF 20% OPEN AND MODULATE DOWN TO MAINTAIN A MAXIMUM OF 800 PPM (ADJUSTABLE)

AVERAGE THE 3 ROOM PRESSURE CONTROLS AND COMPARE TO THE AMBIENT OUTSIDE PRESSURE TO MAINTAIN A POSITIVE PRESSURE IN THE BUILDING OF 0.05"W.C. (ADJUSTABLE) VIA MODULATING THE VFD OF RELIEF FAN RF–1

B. UNOCCUPIED MODE

ALL DAMPERS TO BE CLOSED AND RF–1 TO BE DISABLED.

C. OVERRIDE MODE

ALL WALL SENSORS WILL HAVE OCCUPIED OVERRIDE BUTTON. ENABLE OCCUPIED CYCLE FOR ONLY THE VAV BOXES ON THE FLOOR WITH THE OVERRIDE CALL HOURS

WEST WING CO2 AND BUILDING PRESSURE CONTROL POINTS

POINT DESCRIPTION	GRAPHIC	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	ALARM	ANALOG VARIABLE	BINARY VARIABLE	TREND LOG	NOTES
RETURN CO2 LEVEL EACH FLOOR	X	X	X			X			X	
RETURN CO2 LEVEL AVE OF 3 FLOORS	X	X	X			X			X	
RETURN CO2 SETPOINT EACH FLOOR	X	X	X						X	
RETURN CO2 SETPONT AVERAGE	X	X	X						X	
SPACE PRESSURE EACH FLOOR	X	X	X						X	
SPACE PRESSURE AVERAGE	X	X	X						X	
OUTSIDE PRESSURE	X	X	X						X	
COMMAND PRESSURE DIFFERENTIAL	X	X	X						X	1

NOTES
1. SET AT POSITIVE PRESSURE 0.05" ADJUSTABLE

DIRECTORATE FACILITIES ENGINEERING DFE CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

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CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: NONE
DFE PROJECT NO: 23SP18-458-D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL SEQUENCE OF OPERATION AND CONTROL DIAGRAMS

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M–206
SHEET:104 OF 126

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X:\Projects\1813 Camp Keyes Bldg 7\Addendo\1813 Bldg 7 M206 (01-23-2019).dwg

COMPRESSOR/CONDENSER UNIT SCHEDULE

TAG	AREA SERVED	NOM. TONS	COOLING BTU	COOLING ABMIENT	COOLING KW	COOLING EER	HEATING BTU	HEATING ABMIENT	HEATING KW	HEATING COP17	CONDENSER FAN QUAN.	CONDENSER FAN TOTAL CFM	ELECTRIC (TOTAL LOAD) POWER	MCA	BRK'R	REFRIGERANT TYPE	SYSTEM LBS	WEIGHT LBS	REMARKS
CU-1	SEE AIR HANDLER SCHEDULE	8.0	97,800	95°	5.59	14.6 / 12.6	96,702	20°	7.69	2.52 / 2.25	2	5,827	208V-60-3Ø	38.0	45	R410A	40.7	703	SINGLE POWER CONNECTION
CU-2	SEE AIR HANDLER SCHEDULE	10.0	118,790	95°	8.21	13.1 / 12.3	99,703	20°	12.40	2.46 / 2.25	2	6,286	208V-60-3Ø	43.0	50	R410A	71.4	703	SINGLE POWER CONNECTION
CU-3	SEE AIR HANDLER SCHEDULE	8.0	90,615	95°	5.59	14.6 / 12.6	93,413	20°	7.69	2.52 / 2.25	2	5,827	208V-60-3Ø	38.0	45	R410A	48.7	703	SINGLE POWER CONNECTION
CU-4	SEE AIR HANDLER SCHEDULE	10.0	117,586	95°	8.21	13.1 / 12.3	102,617	20°	12.40	2.46 / 2.25	2	6,286	208V-60-3Ø	43.0	50	R410A	44.8	703	SINGLE POWER CONNECTION
CU-5	SEE AIR HANDLER SCHEDULE	8.0	93,518	95°	5.59	14.6 / 12.6	96,871	20°	7.69	2.52 / 2.25	2	5,827	208V-60-3Ø	38.0	45	R410A	40.2	703	SINGLE POWER CONNECTION

BASIS OF DESIGN: DAIKIN

ENERGY RECOVERY VENTILATOR SCHEDULE

TAG	AREA SERVED	SUPPLY AIR CFM	SUPPLY AIR ESP	SUPPLY AIR HP	RETURN / EXHAUST AIR CFM	RETURN / EXHAUST AIR ESP	RETURN / EXHAUST AIR HP	WINTER OUTDOOR DB	WINTER OUTDOOR WB	WINTER RETURN DB	WINTER RETURN WB	WINTER SUPPLY DB	WINTER SUPPLY WB	SUMMER OUTDOOR DB	SUMMER OUTDOOR WB	SUMMER RETURN DB	SUMMER RETURN WB	SUMMER SUPPLY DB	SUMMER SUPPLY WB	WHEEL MOTOR	ELECTRIC	WEIGHT	REMARKS
ERV-1	WOOD BLD'G	1,375	1.10"	1 1/2	1,310	1.00"	1 1/2	0.0	-1.0	70.0	58.5	51.5	48.2	94.0	80.0	75.0	62.0	80.0	67.5	>1.0 AMP	208V-60-3Ø	550	HORIZONTAL AIRFLOW
ERV-2	BRICK BLD'G	480	0.75"	3/4	455	0.65"	3/4	0.0	-1.0	70.0	58.5	54.1	50.0	94.0	80.0	75.0	62.0	79.3	66.8	>1.0 AMP	208V-60-3Ø	500	VERTICAL AIRFLOW

BASIS OF DESIGN: SEMCO

GAS UNIT HEATER SCHEDULE

TAG	TYPE	AREA SERVED	FUEL	E.A.T.	INPUT MBH	OUTPUT MBH	CFM	MOTOR HP	FAN RPM	FAN RPM	ELECTRIC POWER	ELECTRIC WATTS	ELECTRIC FLA	ELECTRIC MOP	WEIGHT	REMARKS
UH-1	HORIZONTAL	OUTDOOOR UNIT ROOM	NAT.	0°	350.00	290.50	4,483	1/2	1,050	1,550	115V-60-1Ø	1,050	11.0	20	295	SEPARATED COMBUSTION
UH-2	HORIZONTAL	OUTDOOOR UNIT ROOM	NAT.	0°	350.00	290.50	4,483	1/2	1,050	1,100	115V-60-1Ø	1,050	11.0	20	295	SEPARATED COMBUSTION

BASIS OF DESIGN: REZNOR

AIR HANDLER SCHEDULE

TAG	AREA SERVED	CU NO.	NOM. TONS	CFM	FAN KW	ELECTRIC POWER	ELECTRIC MCA	COOLING BTU	HEATING BTU	REFRIGERANT TYPE	REFRIGERANT LIQUID	REFRIGERANT GAS	OUTDOOR AIR CFM	WEIGHT LBS	REMARKS
AH-01	001	CU-1	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-02	001	CU-1	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-03	002	CU-1	1.50	500	0.043	208V-60-1Ø	0.50	18,000	20,000	R410A	1/4	1/2	N/A	31	DUCTLESS WALL MOUNTED
AH-04	004	CU-1	1.50	500	0.043	208V-60-1Ø	0.50	18,000	20,000	R410A	1/4	1/2	N/A	31	DUCTLESS WALL MOUNTED
AH-05	004B	CU-1	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-06	004C	CU-1	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-07	005	CU-1	1.50	500	0.043	208V-60-1Ø	0.50	18,000	20,000	R410A	1/4	1/2	N/A	31	DUCTLESS WALL MOUNTED
AH-08	006	CU-1	1.50	500	0.043	208V-60-1Ø	0.50	18,000	20,000	R410A	1/4	1/2	N/A	31	DUCTLESS WALL MOUNTED
AH-09	009	CU-1	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-10	010	CU-1	1.00	290	0.040	208V-60-1Ø	0.40	12,000	13,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-11	010A	CU-1	1.00	290	0.040	208V-60-1Ø	0.40	12,000	13,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-12	007	CU-2	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-13	008	CU-2	0.80	280	0.040	208V-60-1Ø	0.40	9,500	10,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-14	008B	CU-2	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-15	008C	CU-2	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-16	012	CU-2	2.00	635	0.043	208V-60-1Ø	0.60	2,400	26,500	R410A	3/8	5/8	N/A	31	DUCTLESS WALL MOUNTED
AH-17	013	CU-2	1.50	500	0.043	208V-60-1Ø	0.50	18,000	20,000	R410A	1/4	1/2	N/A	31	DUCTLESS WALL MOUNTED
AH-18	014	CU-2	0.80	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-19	014B	CU-2	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-20	015	CU-2	1.50	500	0.043	208V-60-1Ø	0.50	18,000	20,000	R410A	1/4	1/2	N/A	31	DUCTLESS WALL MOUNTED
AH-21	016	CU-2	0.80	280	0.040	208V-60-1Ø	0.40	9,500	10,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-22	016A	CU-2	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-23	020	CU-2	1.00	290	0.040	208V-60-1Ø	0.40	12,000	13,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-24	020A	CU-2	1.50	500	0.043	208V-60-1Ø	0.50	18,000	20,000	R410A	1/4	1/2	N/A	31	DUCTLESS WALL MOUNTED
AH-25	100	CU-4	1.50	500	0.043	208V-60-1Ø	0.50	18,000	20,000	R410A	1/4	1/2	N/A	31	DUCTLESS WALL MOUNTED
AH-26	101A	CU-4	0.60	212	0.087	208V-60-1Ø	0.30	7,500	8,500	R410A	1/4	1/2	15	18	CEILING CASSETTE - 1 WAY
AH-27	102	CU-4	0.80	245	0.087	208V-60-1Ø	0.40	9,500	10,500	R410A	1/4	1/2	25	18	CEILING CASSETTE - 1 WAY
AH-28	102A	CU-4	0.60	212	0.087	208V-60-1Ø	0.30	7,500	8,500	R410A	1/4	1/2	15	18	CEILING CASSETTE - 1 WAY
AH-29	103	CU-4	0.60	212	0.087	208V-60-1Ø	0.30	7,500	8,500	R410A	1/4	1/2	25	18	CEILING CASSETTE - 1 WAY
AH-30	104	CU-4	2.00	530	0.117	208V-60-1Ø	0.70	24,000	27,000	R410A	3/8	5/8	55	22	CEILING CASSETTE - 1 WAY
AH-31	104B	CU-4	2.00	530	0.117	208V-60-1Ø	0.70	24,000	27,000	R410A	3/8	5/8	55	22	CEILING CASSETTE - 1 WAY
AH-32	104C	CU-4	1.30	345	0.087	208V-60-1Ø	0.50	15,000	17,000	R410A	1/4	1/2	25	18	CEILING CASSETTE - 1 WAY
AH-33	134	CU-4	0.80	245	0.087	208V-60-1Ø	0.40	9,500	10,500	R410A	1/4	1/2	25	18	CEILING CASSETTE - 1 WAY
AH-34	134A	CU-4	0.60	212	0.087	208V-60-1Ø	0.30	7,500	8,500	R410A	1/4	1/2	15	18	CEILING CASSETTE - 1 WAY
AH-35	134B	CU-4	0.60	212	0.087	208V-60-1Ø	0.30	7,500	8,500	R410A	1/4	1/2	20	18	CEILING CASSETTE - 1 WAY
AH-36	107B	CU-3	0.80	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-37	113	CU-3	2.00	635	0.043	208V-60-1Ø	0.60	2,400	26,500	R410A	3/8	5/8	N/A	31	DUCTLESS WALL MOUNTED
AH-38	208	CU-5	1.30	405	0.055	208V-60-1Ø	0.40	15,000	17,000	R410A	1/4	1/2	90	36	CEILING CASSETTE - 4 WAY
AH-39	209 & 210	CU-5	2.00	777	0.056	208V-60-1Ø	0.70	24,000	27,000	R410A	3/8	5/8	40	48	CEILING CASSETTE - 4 WAY
AH-40	211	CU-5	0.60	212	0.087	208V-60-1Ø	0.30	7,500	8,500	R410A	1/4	1/2	20	18	CEILING CASSETTE - 1 WAY
AH-41	212	CU-5	1.50	494	0.010	208V-60-1Ø	0.50	18,000	20,000	R410A	1/4	1/2	20	51	CEILING CASSETTE - 1 WAY
AH-42	212E	CU-5	1.30	405	0.055	208V-60-1Ø	0.40	15,000	17,000	R410A	1/4	1/2	90	36	CEILING CASSETTE - 4 WAY
AH-43	214	CU-5	0.60	212	0.087	208V-60-1Ø	0.30	7,500	8,500	R410A	1/4	1/2	15	18	CEILING CASSETTE - 1 WAY
AH-44	213 & 215	CU-5	0.80	245	0.087	208V-60-1Ø	0.40	9,500	10,500	R410A	1/4	1/2	15	18	CEILING CASSETTE - 1 WAY
AH-45	217	CU-5	0.80	245	0.087	208V-60-1Ø	0.40	9,500	10,500	R410A	1/4	1/2	15	18	CEILING CASSETTE - 1 WAY
AH-46	221	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-47	222	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-48	222A	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-49	224	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-50	225	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-51	227	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-52	227A	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-53	228	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-54	229	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-55	230	CU-3	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED
AH-56	004A	CU-1	0.60	260	0.040	208V-60-1Ø	0.40	7,500	8,500	R410A	1/4	1/2	N/A	26	DUCTLESS WALL MOUNTED

BASIS OF DESIGN: DAIKIN

COOLING CAPACITIES BASED ON 80°/67°F. ENTERING AIR & 95 °F. AT THE CONDENSER (OUTDOOR UNIT)
HEATING CAPACITIES BASED ON 70°F. INDOOR AND 20°F. AT THE CONDENSER (OUTDOOR UNIT)

BRANCH CIRCUIT CONTROLLER SCHEDULE

TAG	AIR HANDLERS SERVED	OUTDOOR UNIT	POWER	COOLING KW	HEATING KW	MCA	CIRCUITS USED	CIRCUITS PORTS	REFRIGERANT TYPE	WEIGHT LBS	REMARKS
BCC-1	AH-1 --> AH-11 & AH-56	CU-1	208V-60-1Ø	0.130	0.130	1.20	10	12	R410A	106	MAIN SELECTOR
BCC-2	AH-12 --> AH-22	CU-2	208V-60-1Ø	0.130	0.130	1.20	11	12	R410A	106	MAIN SELECTOR
BCC-3	AH-23 & AH-24	CU-2	208V-60-1Ø	0.040	0.040	0.40	2	4	R410A	49	MAIN SELECTOR
BCC-4	AH-36, AH-37, AH-46 --> AH-55	CU-3	208V-60-1Ø	0.130	0.130	1.20	12	12	R410A	106	MAIN SELECTOR
BCC-5	AH-38 --> AH-45	CU-5	208V-60-1Ø	0.110	0.110	1.20	8	10	R410A	101	MAIN SELECTOR
BCC-6	AH-25 --> AH-35	CU-4	208V-60-1Ø	0.130	0.130	1.20	11	12	R410A	106	MAIN SELECTOR

BASIS OF DESIGN: DAIKIN

CABINET UNIT HEATER SCHEDULE

TAG	AREA SERVED	TYPE	E.W.T.	E.A.T.	MBH	GPM	WPD	CFM	ELECTRIC POWER	ELECTRIC WATTS	WEIGHT	REMARKS
CUH-1	000 CORRIDOR	VERTICAL	180°	65°	3.81	1.00	0.58'	42	115V-60-1Ø	30	15	WALL MOUNTED
CUH-2	B25 STAIR	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	EXISTING
CUH-3	012A ENTRY	VERTICAL	180°	65°	3.81	1.00	0.58'	42	115V-60-1Ø	30	15	WALL MOUNTED
CUH-4	007B STAIR 5	VERTICAL	180°	65°	7.80	1.00	0.27'	88	115V-60-1Ø	40	18	WALL MOUNTED

BASIS OF DESIGN: MYSON HI-LINE

MOUNT UNITS 84" AFF TO BOTTOM

FINNED PIPE SCHEDULE

TAG	TYPE	ELEMENT	LENGTH	AWT	BTU/LF	GPM	REMARKS
FP	14" COVER	3/4" COPPER TUBE 3.1/4" x 3.1/4" FINS	SEE PLANS	170°	880	0.88 PER MBH 1.0 MINIMUM	SLOPING TOP COVER 18" AFF TO TOP

SINGLE DUCT TERMINAL VARIABLE AIR VOLUME UNIT SCHEDULE

TAG	UNIT SIZE	VALVE CFM MAX.	VALVE CFM MIN.	VALVE FPM	HEATING COIL CFM	ROWS	F.V.	EAT	LAT	MBH	EWT	GPM	WTD	WPD	S.P.	REMARKS
VAV-1	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	0.050	SINGLE DUCT TERMINAL
VAV-2	12	1,225	360	1,560	360	1	734.6	55	107.0	20.30	180°	1.75	23.2	1.46	0.200	SINGLE DUCT TERMINAL
VAV-3	12	1,245	370	1,585	370	1	746.6	55	106.6	20.70	180°	1.75	23.7	1.71	0.210	SINGLE DUCT TERMINAL
VAV-4	12	1,350	390	1,719	390	1	809.6	55	107.0	21.99	180°	2.25	19.5	2.39	0.230	SINGLE DUCT TERMINAL
VAV-5	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	0.050	SINGLE DUCT TERMINAL
VAV-6	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	0.050	SINGLE DUCT TERMINAL
VAV-7	8	450	150	1,289	150	1	581.8	55	118.0	10.25	180°	1.00	20.5	1.87	0.150	SINGLE DUCT TERMINAL
VAV-8	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	1.23	0.050	SINGLE DUCT TERMINAL
VAV9	14	1,500	500	1,403	500	1	627.2	55	107.0	28.20	180°	2.25	25.1	1.23	0.100	SINGLE DUCT TERMINAL
VAV-10	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	0.050	SINGLE DUCT TERMINAL
VAV-11	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	0.050	SINGLE DUCT TERMINAL
VAV-12	10	725	230	1,329	230	1	615.0	55	118.9	15.95	180°	1.00	13.0	1.87	0.130	SINGLE DUCT TERMINAL
VAV-13	14	1,500	500	1,403	500	1	627.2	55	107.0	28.20	180°	2.25	25.1	1.23	0.100	SINGLE DUCT TERMINAL
VAV-14	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	0.050	SINGLE DUCT TERMINAL
VAV-15	4	100	100	1,146	100	1	177.2	55	120.0	7.05	180°	0.50	28.2	0.75	0.070	SINGLE DUCT TERMINAL
VAV-16	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	0.050	SINGLE DUCT TERMINAL
VAV-17	14	1,500	500	1,403	500	1	627.2	55	107.0	28.20	180°	2.25	25.1	1.23	0.100	SINGLE DUCT TERMINAL
VAV-18	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	0.050	SINGLE DUCT TERMINAL
VAV-19	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	0.050	SINGLE DUCT TERMINAL
VAV-20	12	1,000	333	1,273	333	1	599.7	55	106.5	18.61	180°	1.25	29.8	0.92	0.140	SINGLE DUCT TERMINAL
VAV-21	14	1,500	500	1,403	500	1	627.2	55	107.0	28.20	180°	2.25	25.1	1.23	0.100	SINGLE DUCT TERMINAL
VAV-22	5	225	65	1,650	65	1	398.8	55	107.0	3.67	180°	0.25	29.4	0.07	TBD	SINGLE DUCT TERMINAL

BASIS OF DESIGN: TRANE CO.

PUMP SCHEDULE

TAG	TYPE	AREA SERVED	GPM	HEAD	HP	RPM	WATTS	ELECTRIC	REMARKS
P1	IN-LINE	BOILER #1 INJECTION PUMP	35	15'	1/2	N/A	335	115V-60-1P	INVERTER MOTOR (PROVIDED WITH BOILER)
P2	IN-LINE	BOILER #2 INJECTION PUMP	35	15'	1/2	N/A	335	115V-60-1P	INVERTER MOTOR (PROVIDED WITH BOILER)
P3	IN-LINE	HYDRONIC HEATING SYSTEMS	90	38'	1.3/4	900 --> 3,300	40 --> 1,550	230V-60-1P	INVERTER MOTOR, VARIABLE SPEED
P4	IN-LINE	HYDRONIC HEATING SYSTEMS	90	38'	1.3/4	900 --> 3,300	40 --> 1,550	230V-60-1P	INVERTER MOTOR, VARIABLE SPEED
P5	IN-LINE	TAG CONFERENCE HTG COIL	21	30'	2/5	3,250	540	115V-60-1P	EXISTING PUMP, STANDARD MOTOR

BASIS OF DESIGN (P3, P4 & P5): WILO

FAN SCHEDULE

OMIT DSF-1 & DSF-2

TAG	AREA SERVED	TYPE	CFM	SP	SONES	RPM	WATTS	HP	ELECTRIC	WEIGHT	REMARKS
RF-1	ANNEX BUILDING EXHAUST	ROOF CENT.	13,500	3/4"	19.3	475	- - - - -	5	208V-60-3Ø	495	OPERATE FROM ATC SYSTEM
~~DSF-1~~	~~ANNEX WEST STAIRWELL~~	~~DESTRATIFICATION~~	~~406~~	~~N/A~~	~~0.5~~	~~N/A~~	~~11~~	- - - - -	~~115V-60-1Ø~~	~~14~~	~~OPERATE FROM ATC SYSTEM~~
~~DSF-2~~	~~ANNEX EAST STAIRWELL~~	~~DESTRATIFICATION~~	~~406~~	~~N/A~~	~~0.5~~	~~N/A~~	~~11~~	- - - - -	~~115V-60-1Ø~~	~~14~~	~~OPERATE FROM ATC SYSTEM~~

SONE RATINGS ARE MAXIMUMS NOT TO BE EXCEEDED   HVI SONE RATINGS WILL NOT BE ACCEPTED   PROVIDE ADAPTER CURB FOR RF-1 TO FIT EXISTING

BASIS OF DESIGN: GREENHECK

DUCT HEATING COIL SCHEDULE

TAG	TYPE	SIZE	CFM	ROWS	APD	EAT	LAT	EWT	MBH	GPM	WPD	REMARKS
DHC-1	HOT WATER SERPENTINE	18" x 18"	1,325	1	0.11"	45°	74°	180°	41.67	2.00	1.17'	SLIP-IN DUCT MOUNTING

BASIS OF DESIGN: TRANE CO.

LOUVER SCHEDULE

TAG	SERVICE	MAX. CFM	DIMENSIONS WIDTH	DIMENSIONS HEIGHT	DIMENSIONS DEPTH	FREE AREA	QUAN.	S.P.	REMARKS
L1	INTAKE	10,360	72"	76"	6"	21.00 SF	4	0.055"	NEW EQUIPMENT ROOM
L2	EXHAUST	6,286	48"	48"	6"	8.58 SF	6	0.130"	NEW EQUIPMENT ROOM
L3	INTAKE	1,325	32"	24'	6"	2.62 SF	1	0.055"	ERV-1
L4	EXHAUST	1,325	24"	24'	6"	1.92 SF	1	0.120"	ERV-1

BOILER SCHEDULE

TAG	GROSS MBH	NET AHRI MBH	HP	FUEL	RELIEF VALVE	WATER CONTENT	ELECTRIC AMPS	ELECTRIC VOLTAGE	REMARKS
B-1	399.0	323.0	11.9	NAT. GAS	40 psig	4.0 GAL	5	120V-60-1Ø	CONDENSING GAS BOILER
B-2	399.0	323.0	11.9	NAT. GAS	40 psig	4.0 GAL	5	120V-60-1Ø	CONDENSING GAS BOILER

BASIS OF DESIGN: VIESSMANN

CONVECTOR SCHEDULE

TAG	TYPE	MBH	AWT	MIN GPM	LENGTH	HEIGHT	DEPTH	REMARKS
C-1	SURFACE MOUNT	1.60	170°	0.50	24"	14"	4"	FLAT TOP, BOTTOM INLET

MOTORIZED DAMPER SCHEDULE

TAG	SERVICE	SIZE	ACTUATOR	ELECTRIC	REMARKS
MOD-1	EQUIPMENT ROOM INTAKE	72"x76"	BY A.T.C.	120V	LOW LEAK
MOD-2	EQUIPMENT ROOM INTAKE	72"x76"	BY A.T.C.	120V	LOW LEAK
MOD-3	EQUIPMENT ROOM INTAKE	72"x76"	BY A.T.C.	120V	LOW LEAK
MOD-4	EQUIPMENT ROOM INTAKE	72"x76"	BY A.T.C.	120V	LOW LEAK
MOD-5	CU-3 RECIRCULATING	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-6	CU-2 RECIRCULATING	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-7	CU-1 RECIRCULATING	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-8	CU-4 RECIRCULATING	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-9	CU-5 RECIRCULATING	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-10	CU-3 EXHAUST	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-11	CU-2 EXHAUST	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-12	CU-1 EXHAUST	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-13	CU-4 EXHAUST	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-14	CU-5 EXHAUST	46"x22"	BY A.T.C.	120V	LOW LEAK
MOD-15	ERV-1 INTAKE AIR	32"x12"	BY A.T.C.	120V	LOW LEAK, FAST ACTING
MOD-16	ERV-1 EXHAUST AIR	16"x12"	BY A.T.C.	120V	LOW LEAK, FAST ACTING
MOD-17	ERV-2 SUPPLY AIR	10"x10"	BY A.T.C.	120V	LOW LEAK, FAST ACTING
MOD-18	ERV-2 RETURN AIR	10"x10"	BY A.T.C.	120V	LOW LEAK, FAST ACTING

DIMENSIONS OF MOD-2 ARE SUBJECT TO OUTDOOR UNIT MANUFACTURER REQUIREMENTS

AIR TERMINAL SCHEDULE

TAG	SIZE	MAX CFM	MAX NC	MAX SP	REMARKS
ER1	6" x 4"	75	20	0.100"	EXHAUST REGISTER
ER2	8" x 6"	180	20	0.100"	EXHAUST REGISTER
SR1	6" x 4"	75	20	0.090"	DOUBLE DEFLECTION SUPPLY REGISTER
SR2	6" x 6"	130	20	0.080"	DOUBLE DEFLECTION SUPPLY REGISTER
TG1	6" x 4"	90	20	0.130"	TRANSFER GRILLE
TG2	6" x 6"	130	20	0.100"	TRANSFER GRILLE

MAXIMUM NC LEVELS ARE FOR HORIZONTAL THROW   BASIS OF DESIGN: TITUS

STATE OF MAINE
Kurt F. Magnusson
10257
LICENSED PROFESSIONAL ENGINEER

MECHANICAL SYSTEMS ENGINEERS
ROYAL RIVER CENTER, UNIT 10B
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FACEBOOK: MECHANICAL SYSTEMS ENGINEERS
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DIRECTORATE
DFE
CAMP KEYES
FACILITIES ENGINEERING

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

DESIGNED BY: REM
DRAWN BY: REM
CHECKED BY: KFM/MAD
DATE: 12/28/2018
SCALE: NONE
DFE PROJECT NO: 23SR18-458-D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordjia Capital Projects Group
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207-236-9970 / mdaigle@cordjiacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

MECHANICAL EQUIPMENT SCHEDULES

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

SHEET ID:
M-301

January 28, 2019 – 7:37 am
X:\Projects\1813 Camp Keyes Bldg 7\Addenda\1813 Bldg 7 M301 (01-24-2019).dwg

NOTES:

1. SEE E-000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

REMOVAL NOTES:

(A) REMOVE ELECTRIC BASEBOARD AND WIRING BACK TO SOURCE.

(B) REMOVE LINE VOLTAGE THERMOSTAT AND WIRING.

(C) REMOVE THRU WALL A/C UNIT. UNPLUG AND RETAIN WALL RECEPTACLE.

(D) REMOVE HEAT PUMP, SAFETY SWITCH DICONNECT, CONDUIT AND WIRING BACK TO SOURCE.

(E) REMOVE AIR HANDLER AND WIRING BACK TO SOURCE.

(F) RELOCATE THE SEVEN (7) HALLWAY LIGHTS IN CORRIDOR 001 AS REQUIRED TO ACCOMODATE NEW MECHANICAL DUCTWORK.

(G) DOOR BEING REMOVED. REMOVE PULL STATION AND EXIT SIGN IN THIS AREA.

(H) REMOVE ALL RECEPTACLES AND WIRING FROM WALLS BEING DEMOLISHED. PROVIDE ADDITIONAL WIRING AS REQUIRED TO MAINTAIN DEVICES ON EXISTING WALLS TO REMAIN.

(I) DEMO EXISTING GARAGE DOOR OPENER AND ALL WIRING AND CONTROLS BACK TO SOURCE.

(J) RELOCATE COMPRESSOR TO CORRIDOR. SEE E100 FOR NEW LOCATION.

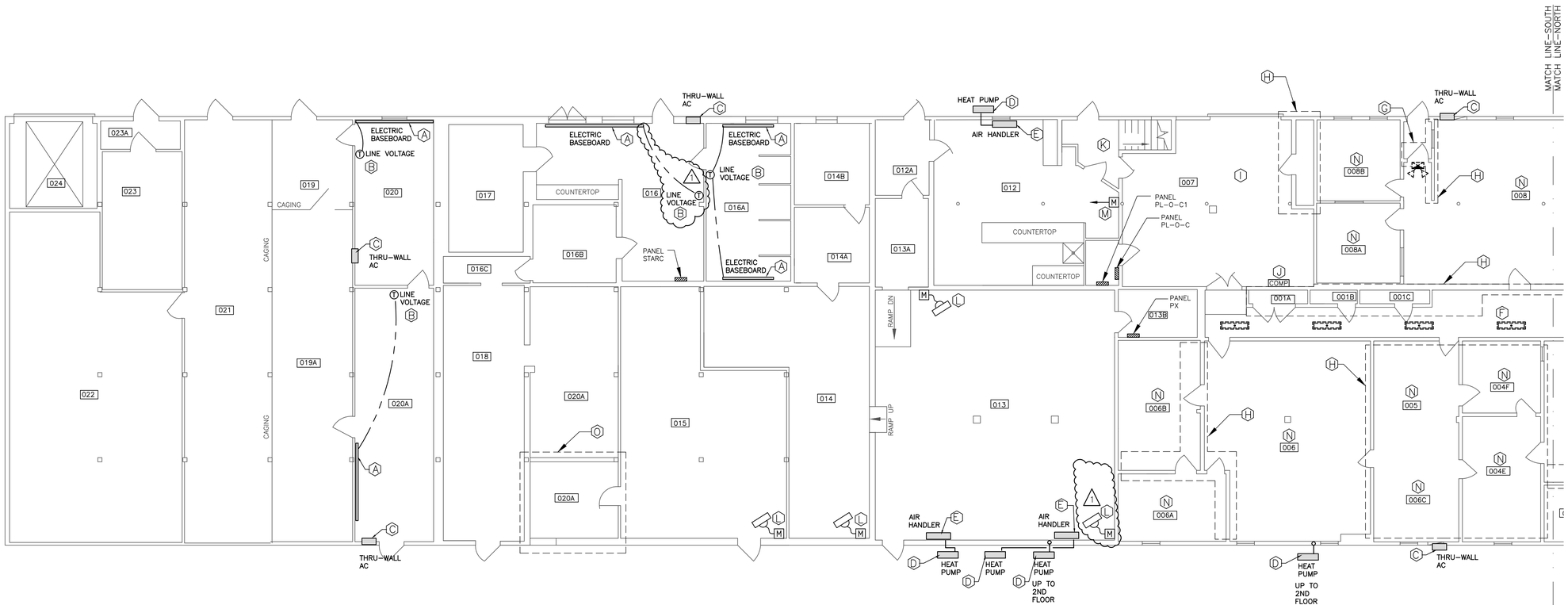
(K) STAIRWELL AND WALLS BEING DEMOLISHED IN THIS AREA. REMOVE ALL LIGHTING AND EXIT SINGS IN THIS AREA. REMOVE ANY RECEPTACLES AND RELOCATE ANY WIRING IN WALLS TO BE DEMOLISHED. RELOCATE PULL STATION TO NEW DOOR. (SEE E100 FOR LOCATION).

(L) REMOVE SYSTEM UNIT HEATER DISCONNECT AND WIRING BACK TO SOURCE.

(M) REMOVE FAN DISCONNECT AND WIRING BACK TO SOURCE.

(N) DEMO ALL LIGHTING IN THIS ROOM.

(O) ALL WORK ASSOCIATED WITH INSTALLATION OF NEW STAIR 6 SHALL BE FURNISHED AS BID ALTERNATE NO. 1.



1 ELECTRICAL REMOVALS PLAN – LOWER LEVEL – SOUTH END

SCALE: 1/8"=1'

DIRECTORATE OF FACILITIES ENGINEERING — DFE — CAMP KEYES

PLAN REVISIONS

		Date	Appr.
1	GENERAL REVISIONS	1.28.19	

Rev# Description

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
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DESIGNED BY: TMD
DRAWN BY: JMD
CHECKED BY: TMD/MAD
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SCALE: AS NOTED
DFE PROJECT NO: 23SR18-458-D

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

ELECTRICAL REMOVALS PLAN
LOWER LEVEL – SOUTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE — TIMOTHY D. MATTHEWS — No. 9199 — LICENSED PROFESSIONAL ENGINEER

SWIFTCURRENT
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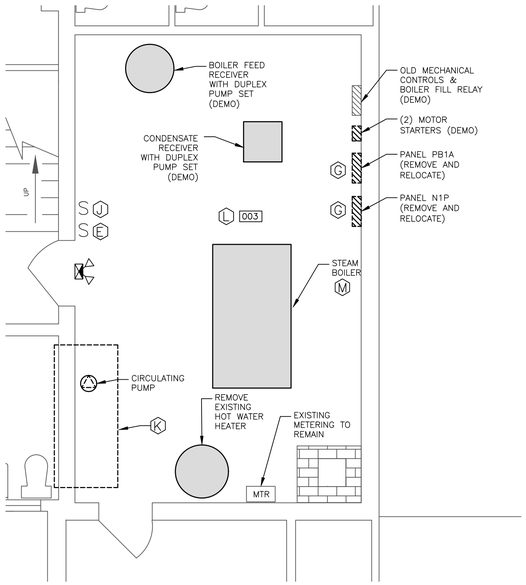
SHEET ID: ED-100
SHEET: 107 OF 126



2 ELECTRICAL REMOVALS – EXISTING BOILER ROOM

SCALE: 1/4"=1'

NOTES:

1. SEE E-000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

REMOVAL NOTES:

(A) DEMOLISH ALL ELECTRICAL WIRING TO EQUIPMENT BEING DEMOLISHED IN THIS AREA BACK TO SOURCE. REMOVE ALL LIGHTS AND RECEPTACLES FROM THIS AREA AND RELOCATE LIGHT SWITCH ADJACENT TO DOOR IN ELECTRIC ROOM.

(B) REMOVE THRU WALL A/C UNIT. UNPLUG AND RETAIN WALL RECEPTACLE.

(C) REMOVE HEAT PUMP, SAFETY SWITCH DISCONNECT, CONDUIT AND WIRING BACK TO SOURCE.

(D) REMOVE FAN AND WIRING AND CONDUIT BACK TO SOURCE.

(E) REMOVE AND RELOCATE LIGHT SWITCH. SEE E101 FOR NEW LOCATION.

(F) REMOVE ALL RECEPTACLES AND WIRING FROM WALLS BEING DEMOLISHED. PROVIDE ADDITIONAL WIRING AS REQUIRED TO MAINTAIN DEVICES ON EXISTING WALLS TO REMAIN.

(G) RELOCATE PANELS EAST AS REQUIRED TO ACCOMODATE NEW BOILER ROOM LAYOUT.

(H) RELOCATE THE SEVEN (7) HALLWAY LIGHTS IN CORRIDOR 001 AS REQUIRED TO ACCOMMODATE NEW MECHANICAL DUCTWORK.

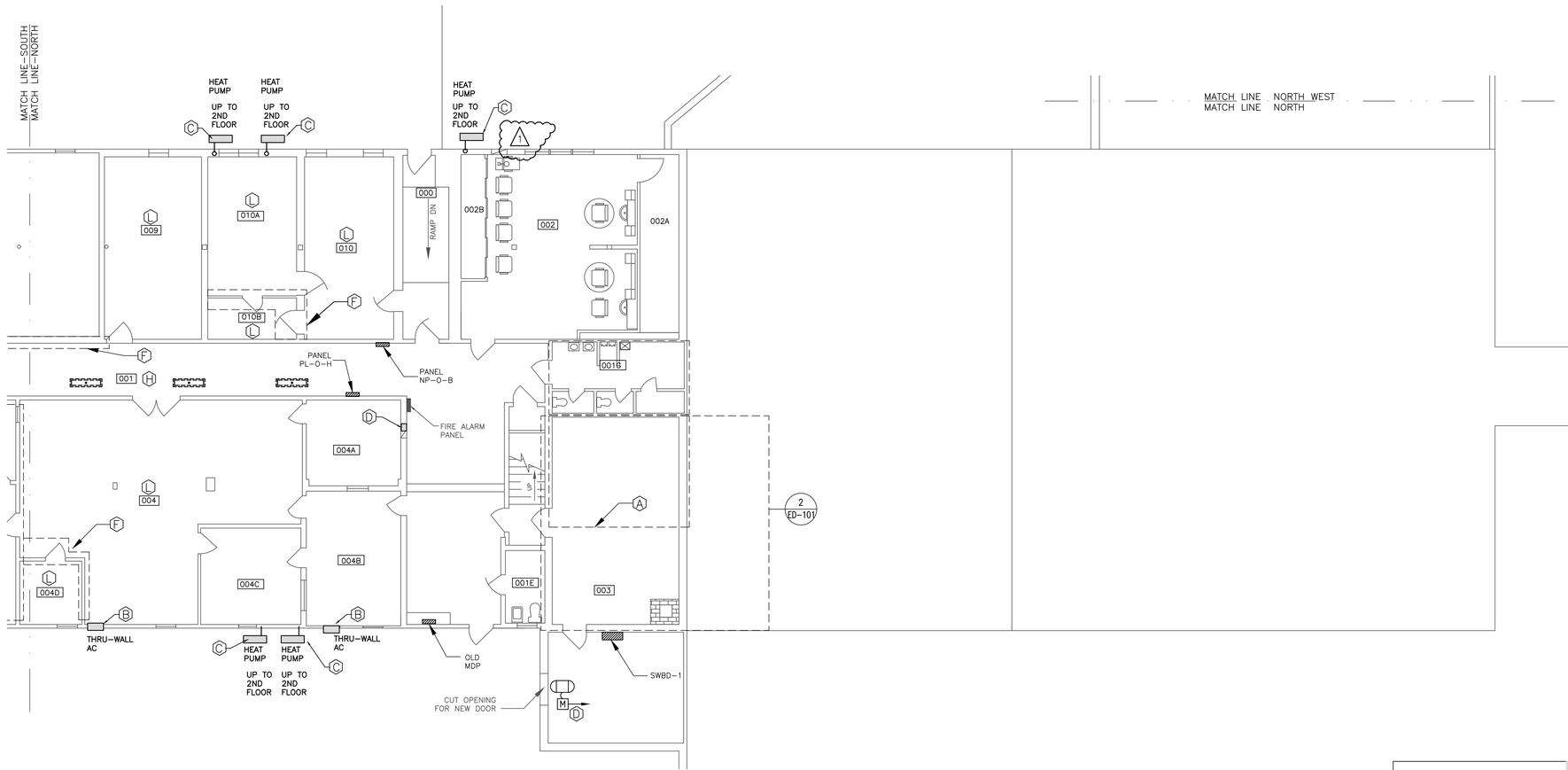
(I) REMOVE EXIT SIGN WITH INTEGRAL EMERGENCY LIGHT. REINSTALL AS SHOWN ON E101.

(J) REMOVE EMERGENCY BOILER SWITCH. FOR BOILER BEING REPLACED.

(K) COORDINATE WITH MECHANICAL, EQUIPMENT CONTROL, AND WIRING TO BE REMOVED FROM THIS AREA.

(L) DEMO ALL LIGHTING IN THIS ROOM.

(M) REMOVE ALL WIRING, CONDUIT AND ELECTRICAL DEVICES FOR THE STEAM BOILER AND AUXILIARY SYSTEMS.



1 ELECTRICAL REMOVALS PLAN – LOWER LEVEL – NORTH END

SCALE: 1/8"=1'

DIRECTORATE OF FACILITIES ENGINEERING — DFE — CAMP KEYES

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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DESIGNED BY: TMD
DRAWN BY: JMD
CHECKED BY: TMD/MAD
DATE: 12/28/2018
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DFE PROJECT NO: 23SR18-458-D

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

ELECTRICAL REMOVALS PLAN
LOWER LEVEL – NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE — TIMOTHY D. MATTHEWS — No. 9199 — LICENSED PROFESSIONAL ENGINEER

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Tel: (207) 847-9280

SHEET ID: ED-101
SHEET: 108 OF 126

NOTES:

1. SEE E-000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

REMOVAL NOTES:

(A) REMOVE HEAT PUMP, SAFETY SWITCH DISCONNECT, CONDUIT AND WIRING BACK TO SOURCE.

(B) REMOVE AIR HANDLER AND WIRING BACK TO SOURCE.

(C) DEMO EXISTING LIGHTING, RECEPTACLES, & FIRE ALARM DEVICES IN THIS ROOM. RETAIN CIRCUIT FOR LIGHTING NEW SPACES.

(D) DEMO EXISTING LIGHTING IN THIS AREA. CIRCUIT RETAIN WIRING FOR NEW FIXTURES.

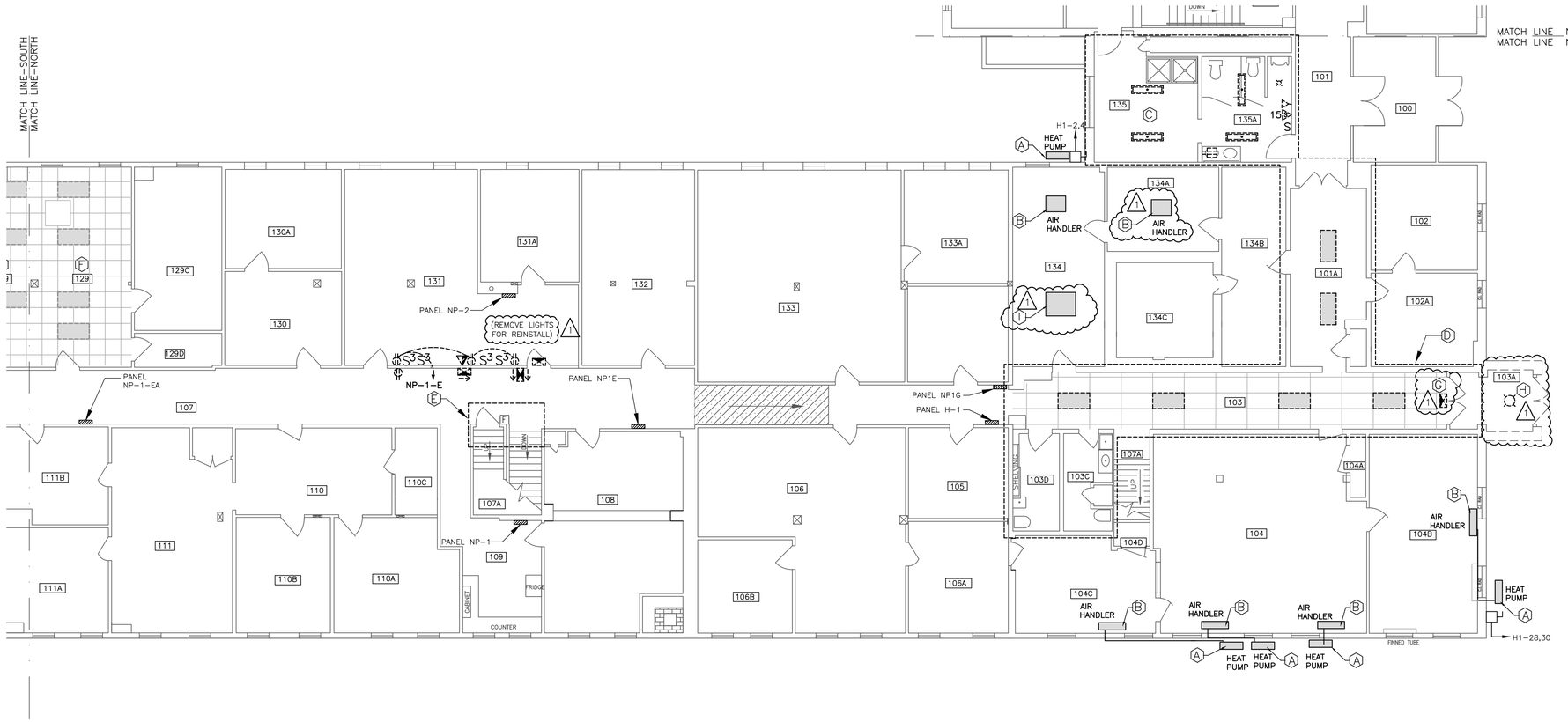
(E) RELOCATE PULL STATION AND ANY OTHER DEVICES REQUIRED TO INSTALL NEW WALL SHOWN ON E111.

(F) REMOVE LIGHTS AND CEILING EQUIPMENT IN THIS ROOM. RETAIN FOR REINSTALL.

(G) DEMO EXISTING EXIT SIGN.

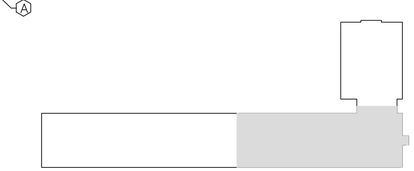
1 (H) ENTRY BEING DEMOLISHED. REMOVE ALL ELECTRICAL INCLUDING BUT NOT LIMITED TO LIGHTING, POWER DOOR OPERATIONS, SECURITY WIRING.

(I) DEMO EXISTING ERV AND WIRING BACK TO SOURCE.



1 ELECTRICAL REMOVALS PLAN – FIRST LEVEL – NORTH END

SCALE: 1/8"=1'



DIRECTORATE OF FACILITIES ENGINEERING — DFE — CAMP KEYES

PLAN REVISIONS

	GENERAL REVISIONS	Date	Appr.
1		1.28.19	

Rev#	Description	Date	Appr.

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CHECKED BY: TMD/MAD
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DFE PROJECT NO: 23SR18-458-D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

ELECTRICAL REMOVALS PLAN
FIRST FLOOR – NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE — TIMOTHY D. MATTHEWS — No. 9199 — LICENSED PROFESSIONAL ENGINEER

SHEET ID:
ED-111
SHEET: 110 OF 126

SWIFTCURRENT
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Tel: (207) 847-9280

NOTES:

1. SEE E-000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

REMOVAL NOTES:

(A) REMOVE LIGHTING AND SMOKE DETECTORS IN CORRIDOR. CEILING BEING REPLACED.

(B) WALL BEING REMOVED TO EXPAND DATA ROOM. REMOVE AND REINSTALL LIGHT AS REQUIRED FOR NEW CEILING. RELOCATE LIGHT SWITCH. SEE E121 FOR LOCATION.

(C) REMOVE THRU WALL A/C UNIT. UNPLUG AND RETAIN WALL RECEPTACLE.

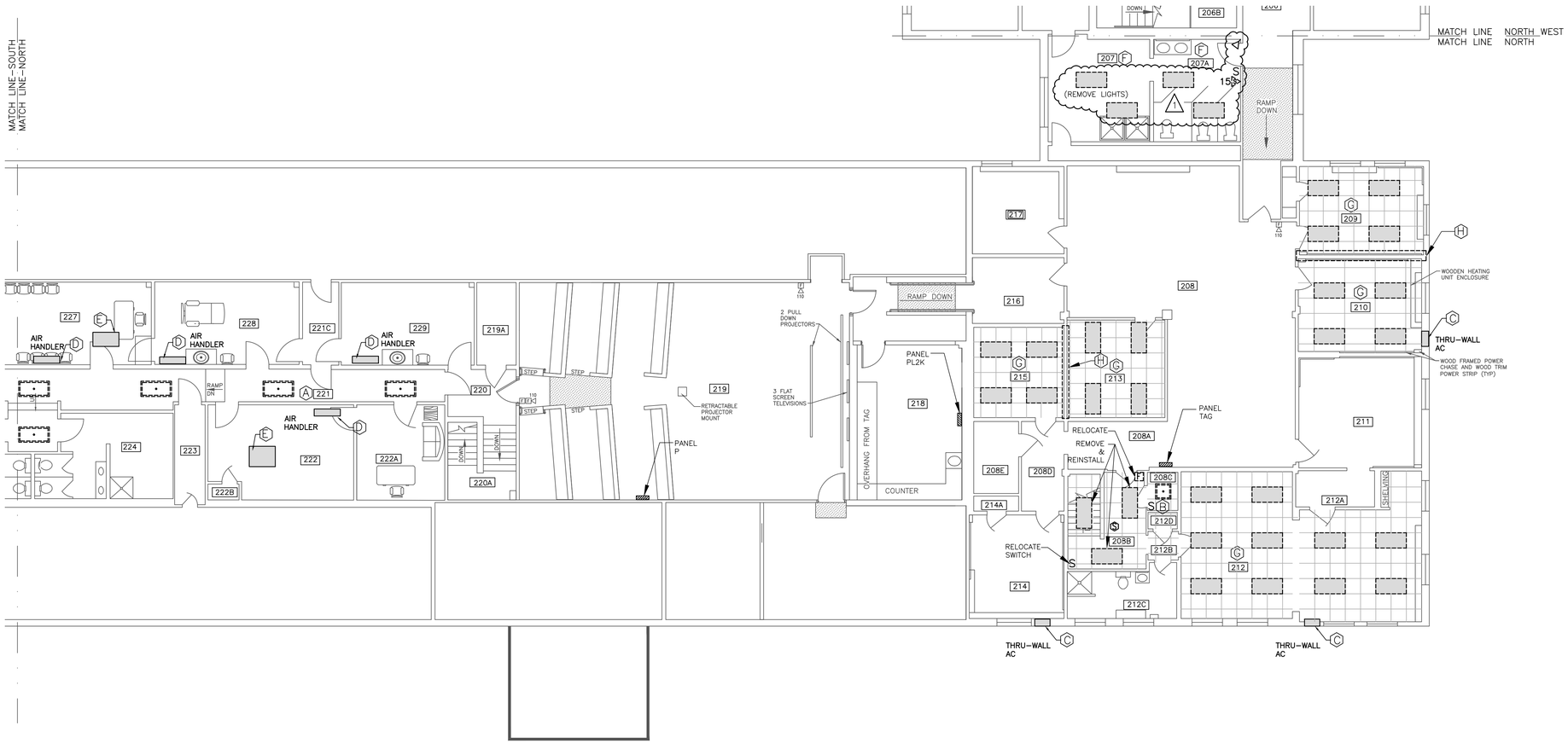
(D) REMOVE AIR HANDLER, CONDUIT, AND WIRING BACK TO SOURCE.

(E) REMOVE ERV AND WIRING BACK TO SOURCE.

(F) REMOVE FAN AND WIRING AND CONDUIT BACK TO SOURCE.

(G) REMOVE LIGHTS AND CEILING EQUIPMENT IN THIS ROOM. RETAIN FOR REINSTALL.

(H) REMOVE ALL RECEPTACLES AND WIRING FROM WALLS BEING DEMOLISHED. PROVIDE ADDITIONAL WIRING AS REQUIRED TO MAINTAIN DEVICES ON EXISTING WALLS TO REMAIN.



1 ELECTRICAL REMOVALS PLAN – SECOND LEVEL – NORTH END

SCALE: 1/8"=1'

PLAN REVISIONS

Rev#	Description	Date	Appr.
1	GENERAL REVISIONS	1.28.19	

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DRAWN BY: JMD
CHECKED BY: TMD/MAD
DATE: 12/28/2018
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DFE PROJECT NO: 23SR18-458-D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

ELECTRICAL REMOVALS PLAN
SECOND FLOOR – NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

TIMOTHY D. MATTHEWS No. 9199 LICENSED PROFESSIONAL ENGINEER

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Tel: (207) 847-9280

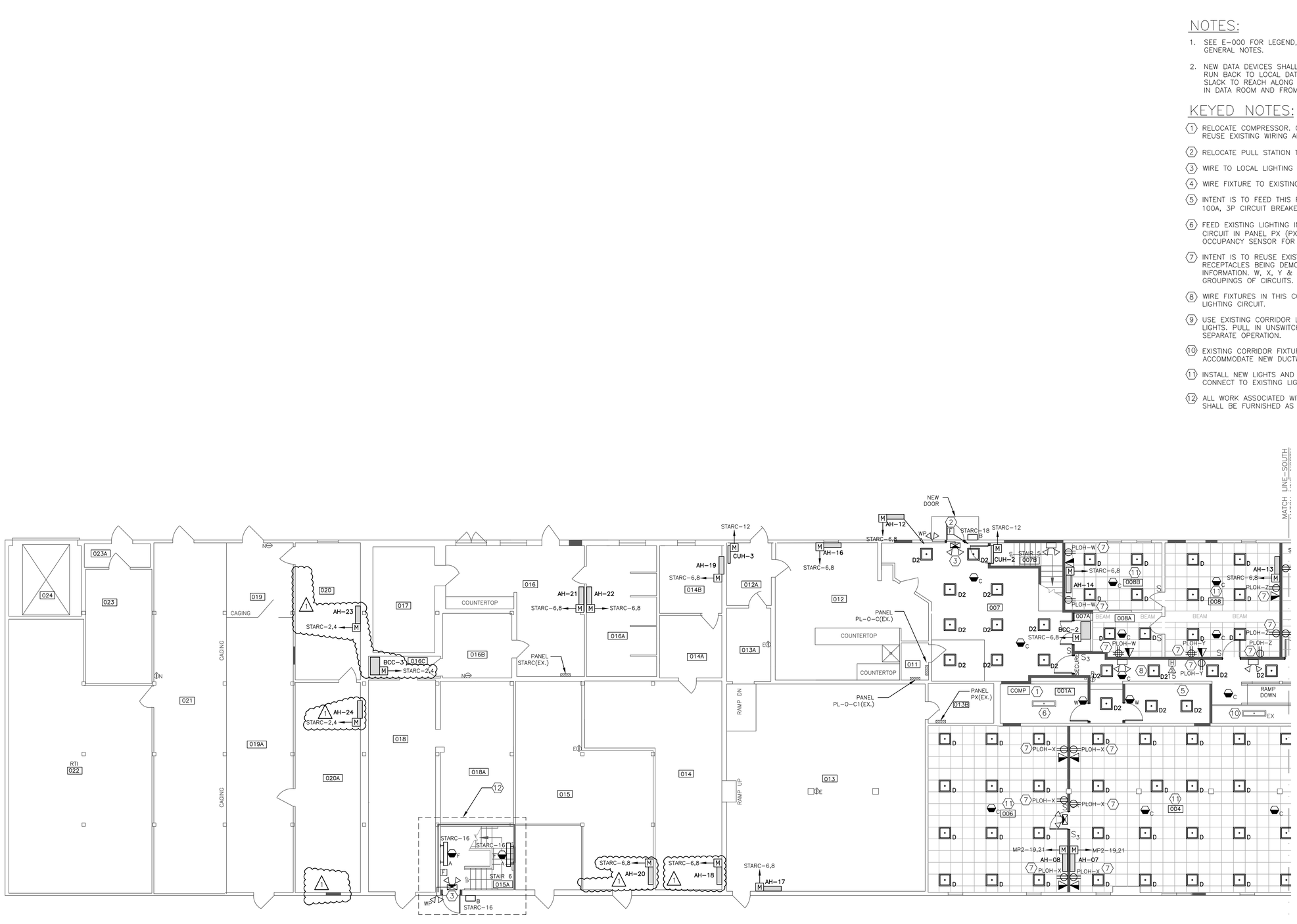
SHEET ID: ED-121
SHEET: 112 OF 126

NOTES:

1. SEE E–000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. NEW DATA DEVICES SHALL HAVE (1)VOICE/(1)DATA. RUN BACK TO LOCAL DATA ROOM. PROVIDE ENOUGH SLACK TO REACH ALONG CEILING TO FURTHEST POINT IN DATA ROOM AND FROM THERE TO FLOOR.

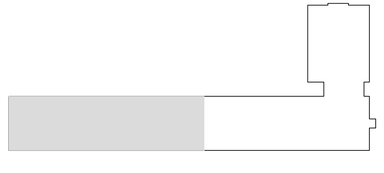
KEYED NOTES:

1. RELOCATE COMPRESSOR. CONTROLS, STROBES AND HORN, REUSE EXISTING WIRING AND DISCONNECT.
2. RELOCATE PULL STATION TO NEW DOOR (SEE ED100).
3. WIRE TO LOCAL LIGHTING CIRCUIT.
4. WIRE FIXTURE TO EXISTING LOCAL LIGHTING CIRCUIT.
5. INTENT IS TO FEED THIS FUTURE IT ROOM FROM A NEW 100A, 3P CIRCUIT BREAKER IN SWBD–1. (BY OTHERS)
6. FEED EXISTING LIGHTING IN THIS AREA FROM "SPARE" CIRCUIT IN PANEL PX (PX–6). ADD WALL MOUNTED OCCUPANCY SENSOR FOR CONTROL.
7. INTENT IS TO REUSE EXISTING CIRCUITS CURRENTLY FEEDING RECEPTACLES BEING DEMOLISHED. SEE ED–100 FOR MORE INFORMATION. W, X, Y & Z ARE SHOWN TO SHOW GROUPINGS OF CIRCUITS. CONFIRM CIRCUITS IN FIELD.
8. WIRE FIXTURES IN THIS CORRIDOR TO EXISTING CORRIDOR LIGHTING CIRCUIT.
9. USE EXISTING CORRIDOR LIGHTING CIRCUIT FOR IT ROOM LIGHTS. PULL IN UNSWITCHED LEG AS REQUIRED FOR SEPARATE OPERATION.
10. EXISTING CORRIDOR FIXTURE RELOCATED AS REQUIRED TO ACCOMMODATE NEW DUCTWORK.
11. INSTALL NEW LIGHTS AND CONTROLS IN THIS ROOM. CONNECT TO EXISTING LIGHTING CIRCUIT.
12. ALL WORK ASSOCIATED WITH INSTALLATION OF NEW STAIR 6 SHALL BE FURNISHED AS BID ALTERNATE NO. 1.



1 PROPOSED ELECTRICAL PLAN – LOWER LEVEL – SOUTH END

SCALE: 1/8"=1'



DIRECTORATE OF FACILITIES ENGINEERING — DFE — CAMP KEYES

PLAN REVISIONS

	GENERAL REVISIONS	Date	Appr.
1		1.28.19	

Rev#	Description

DESIGNED BY: TMD
DRAWN BY: JMD
CHECKED BY: TMD/MAD
DATE: 12/28/2018
SCALE: AS NOTED
DFE PROJECT NO: 23SR18–458–D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PROPOSED ELECTRICAL PLAN
LOWER LEVEL – SOUTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE — TIMOTHY D. MATTHEWS No. 9199 — LICENSED PROFESSIONAL ENGINEER

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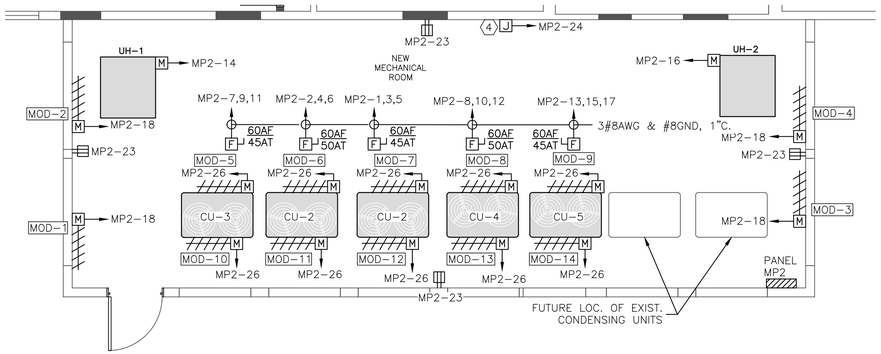
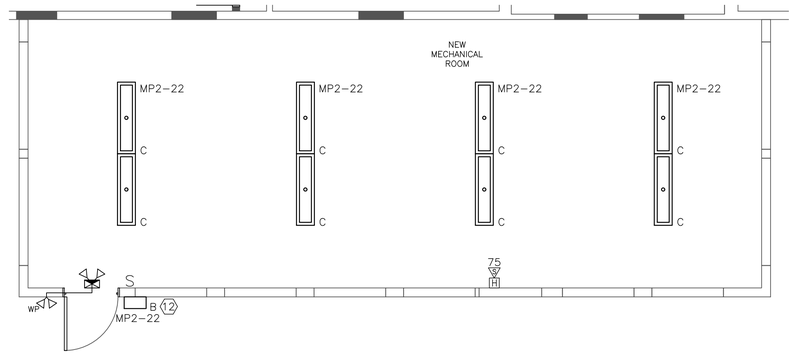
SHEET ID: E–100
SHEET: 114 OF 126



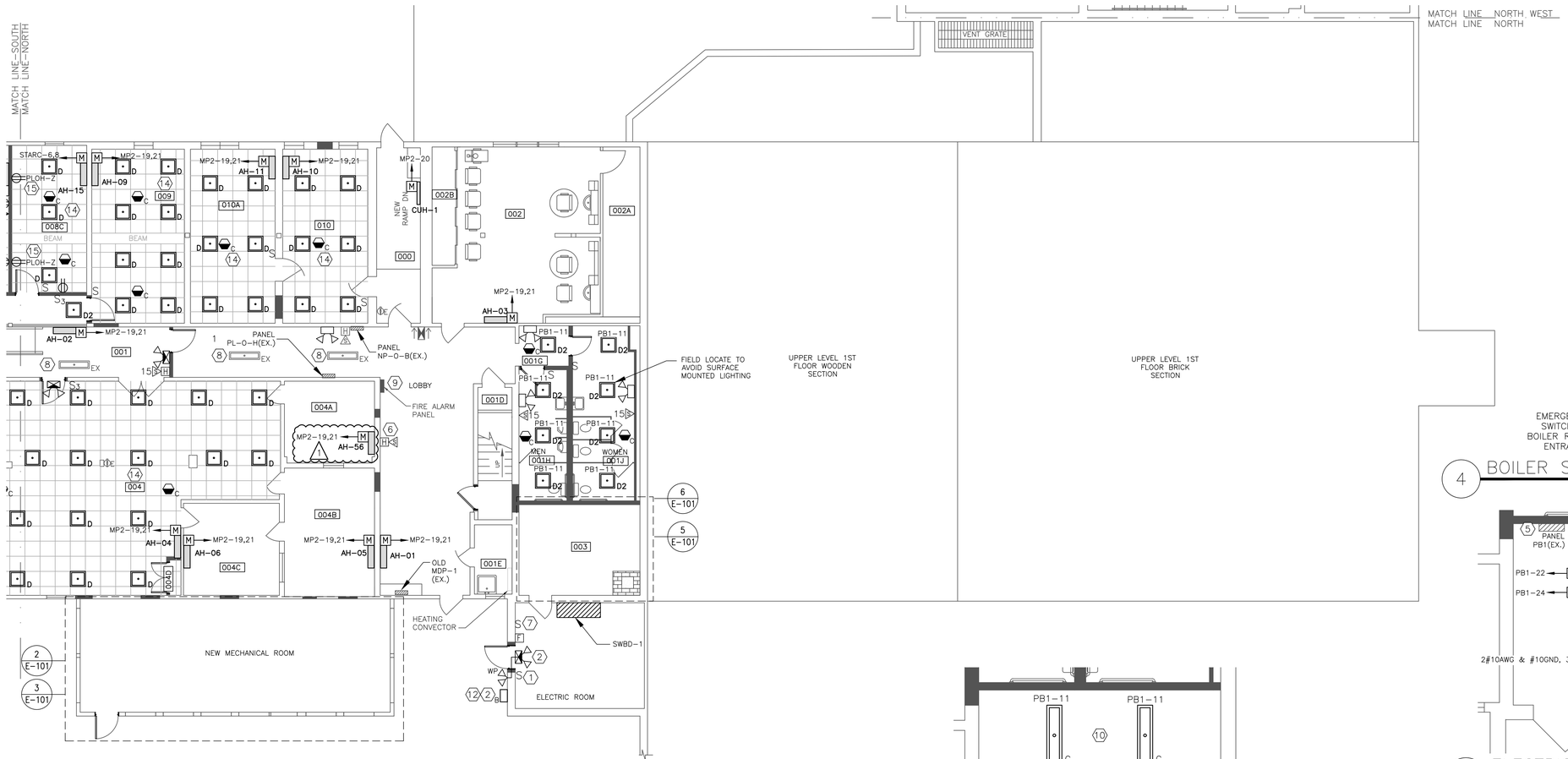
2 ELECTRICAL DETAIL – MECHANICAL ROOM

SCALE: 1/4"=1'



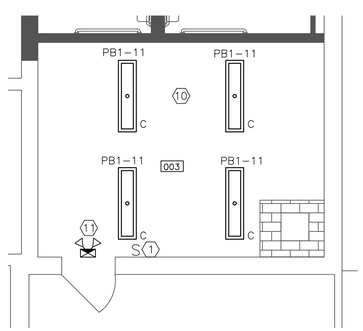
3 LIGHTING DETAIL – MECHANICAL ROOM

SCALE: 1/4"=1'



1 PROPOSED ELECTRICAL PLAN – LOWER LEVEL – NORTH END

SCALE: 1/8"=1'



6 ELECTRICAL DETAIL – BOILER ROOM

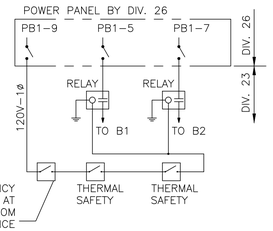
SCALE: 1/4"=1'

NOTES:

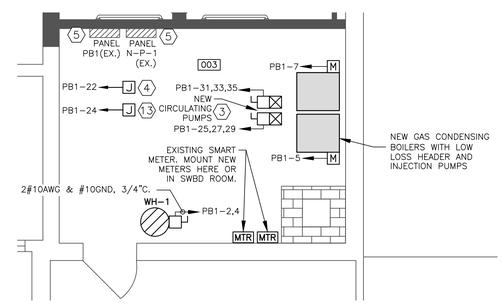
1. SEE E–000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

KEYED NOTES:

1. RELOCATE LIGHT SWITCH AND ASSOCIATED CONDUIT AND WIRE. RECONNECT TO EXISTING WIRING.
2. CONNECT TO EXISTING LIGHTING CIRCUIT.
3. INTENT IS TO DISCONNECT EXISTING PUMPS. REMOVE CONDUIT AND WIRING AND RE–WIRE TO NEW LOCATION AS SHOWN FROM EXISTING BREAKER.
4. MECHANICAL CONTROLS CIRCUIT. LOCATE AS PER MECHANICAL CONTRACTOR.
5. RELOCATE EXISTING PANELS TO NEW LOCATION. RELOCATE EXISTING CIRCUIT WIRING THAT REMAINS BACK TO NEW LOCATION.
6. NEW HORN STROBE.
7. NEW EMERGENCY BOILER SWITCH (SEE DETAIL).
8. EXISTING CORRIDOR FIXTURE RELOCATED AS REQUIRED TO ACCOMMODATE NEW DUCTWORK.
9. FARADAY MODEL MPC 7000 FIRE ALARM CONTROL PANEL. COORDINATE ALL NEW EQUIPMENT OR OLD EQUIPMENT BEING REMOVED AND RELOCATED WITH EXISTING PANEL. INTENT IS TO MAINTAIN EXISTING ZONE WIRING AND SUPPLEMENT WITH NEW DEVICES WHERE SHOWN. CONTRACTOR SHALL FURNISH ALL DEVICES, WIRING, CONDUIT, POWER SUPPLIES, TESTING, PROGRAMMING REQUIRED FOR A COMPLETE OPERATIONAL SYSTEM.
10. COORDINATE LOCATIONS OF FIXTURES IN FIELD WITH DUCTWORK AND PIPING.
11. REINSTALL EXISTING COMBINATION EXIT/EMERGENCY LIGHT HERE.
12. CONTROLLED BY PHOTOCELL.
13. BUILDING AUTOMATION CONTROLS CIRCUIT. LOCATE AS PER DIVISION 25 CONTRACTOR.
14. INSTALL NEW LIGHTS AND CONTROLS IN THIS ROOM. CONNECT TO EXISTING LIGHTING CIRCUIT.
15. INTENT IS TO REUSE EXISTING CIRCUITS CURRENTLY FEEDING RECEPTACLES BEING DEMOLISHED. SEE ED–100 FOR MORE INFORMATION. Z SHOWN TO SHOW GROUPING RECEPTACLES ON SAME CIRCUIT. CONFIRM CIRCUIT NUMBER IN FIELD.



4 BOILER SAFETY INTERLOCK POWER WIRING



5 ELECTRICAL DETAIL – BOILER ROOM

SCALE: 1/4"=1'

DIRECTORATE OF FACILITIES ENGINEERING DFE CAMP KEYES

PLAN REVISIONS

	GENERAL REVISIONS	Date	Appr.
1		1.28.19	

Rev#	Description

DESIGNED BY: TMD
DRAWN BY: JMD
CHECKED BY: TMD/MAD
DATE: 12/28/2018
SCALE: AS NOTED
DFE PROJECT NO: 23SR18–458–D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordjia Capital Projects Group
16 Tannery Lane, Suite 23
Gardiner, Maine 04345
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PROPOSED ELECTRICAL PLAN
LOWER LEVEL – NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE TIMOTHY D. MATTHEWS No. 9199 LICENSED PROFESSIONAL ENGINEER

SWIFTCURRENT Engineering Services
10 Forest Falls Dr. Unit 4B
Yarmouth, ME 04096
Tel: (207) 847–9280

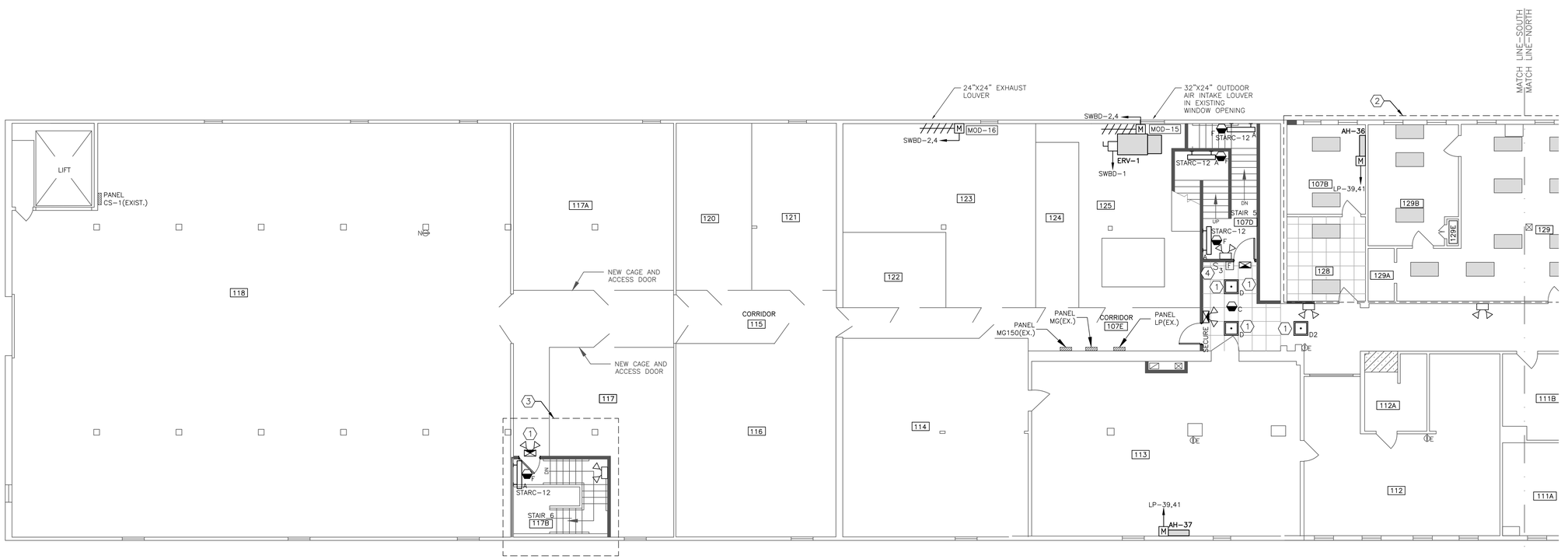
SHEET ID: E–101
SHEET: 115 OF 126

NOTES:

1. SEE E-000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

KEYED NOTES:

1. WIRE TO LOCAL CORRIDOR LIGHTING CIRCUIT.
2. REMOVE AND REPLACE LIGHTING FOR STRUCTURAL UPGRADES IN THIS AREA.
3. ALL WORK ASSOCIATED WITH INSTALLATION OF NEW STAIR 6 SHALL BE FURNISHED AS BID ALTERNATE NO. 1.
4. 3-WAY SWITCH FOR CORRIDOR FIXTURES.



1 PROPOSED ELECTRICAL PLAN – FIRST FLOOR – SOUTH END

SCALE: 1/8"=1'

DIRECTORATE OF FACILITIES ENGINEERING — DFE — CAMP KEYES

PLAN REVISIONS

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1		GENERAL REVISIONS	1.28.19	

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STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PROPOSED ELECTRICAL PLAN
FIRST FLOOR – SOUTH WING

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE — TIMOTHY D. MATTHEWS No. 9199 — LICENSED PROFESSIONAL ENGINEER

SWIFTCURRENT
Engineering Services
10 Forest Falls Dr. Unit 4B
Yarmouth, ME 04096
Tel: (207) 847-9280

SHEET ID: E-110
SHEET: 116 OF 126

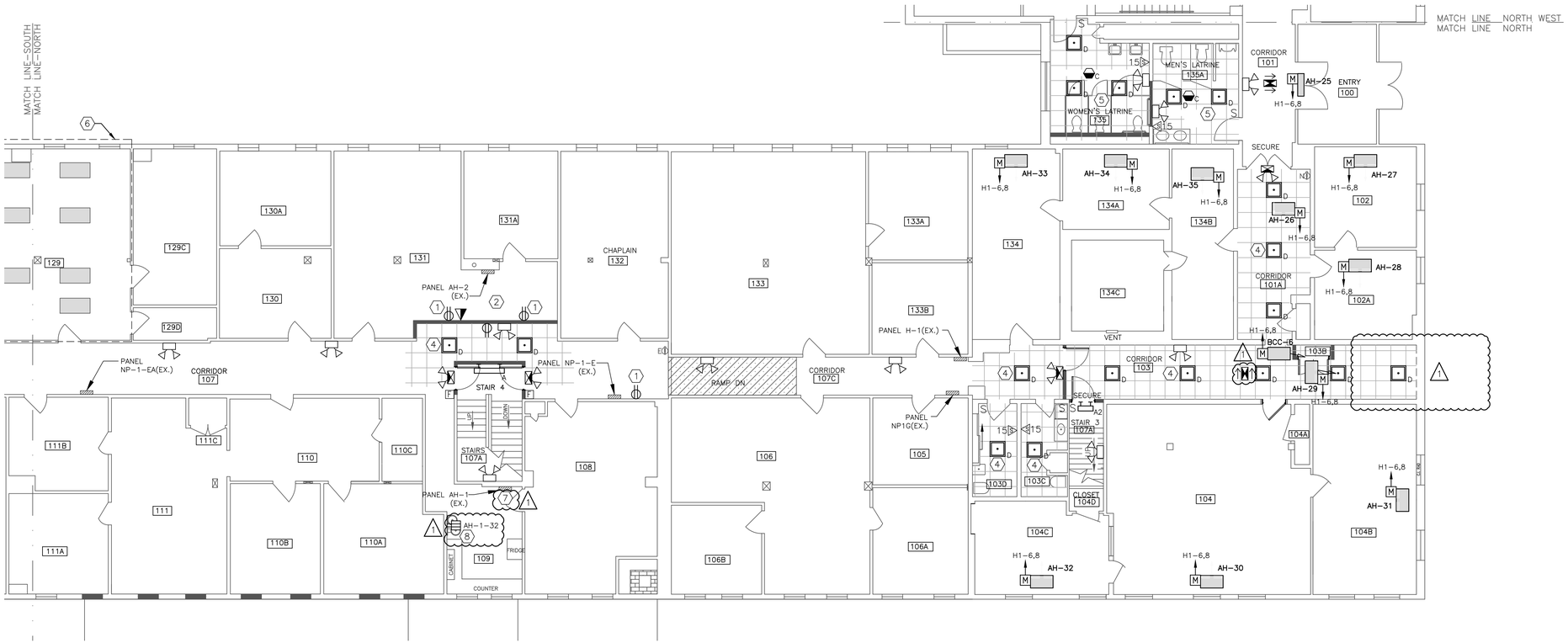
NOTES:

1. SEE E–000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

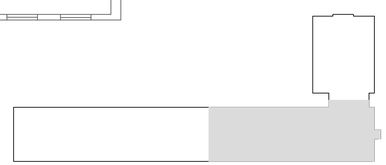
KEYED NOTES:

1. RELOCATE EXISTING RECEPTACLE. REWIRE TO EXISTING CIRCUIT.
2. CEILING IN THIS AREA TO BE RECONFIGURED DUE TO RELOCATION OF WALL. RELOCATE EFFECTED LIGHT FIXTURES WITHIN GRID AS REQUIRED.
3. REUSE EXISTING SWITCH.
4. CEILING IN THIS AREA BEING REPLACED. REPLACE EXISTING LIGHT WITH NEW FIXTURE AND REWIRE TO EXISTING CIRCUIT AND CONTROLS.
5. REUSE EXISTING BATHROOM LIGHTING CIRCUIT FOR NEW FIXTURES. CUT IN NEW SWITCHES FOR SEPARATE ROOM OPERATION.
6. REMOVE AND REPLACE LIGHTING FOR STRUCTURAL UPGRADES IN THIS AREA.

1 7. FURNISH NEW SQUARE D BREAKER 20A, 1P GFI FOR NEW DRINKING FOUNTAIN.
8. FURNISH GFI PROTECTED RECEPTACLE FOR DRINKING FOUNTAIN. COORDINATE MOUNTING HEIGHT WITH EQUIPMENT FURNISHED.



1 PROPOSED ELECTRICAL PLAN – FIRST FLOOR – NORTH END
SCALE: 1/8"=1'



DIRECTORATE OF FACILITIES ENGINEERING
DFE
CAMP KEYES

PLAN REVISIONS

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DFE PROJECT NO: 23SR18–458–D

STATE OF MAINE
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PROPOSED ELECTRICAL PLAN
FIRST FLOOR – NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE
TIMOTHY D. MATTHEWS
No. 9199
LICENSED PROFESSIONAL ENGINEER

SWIFTCURRENT
Engineering Services
10 Forest Falls Dr. Unit 4B
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Tel: (207) 847–9280

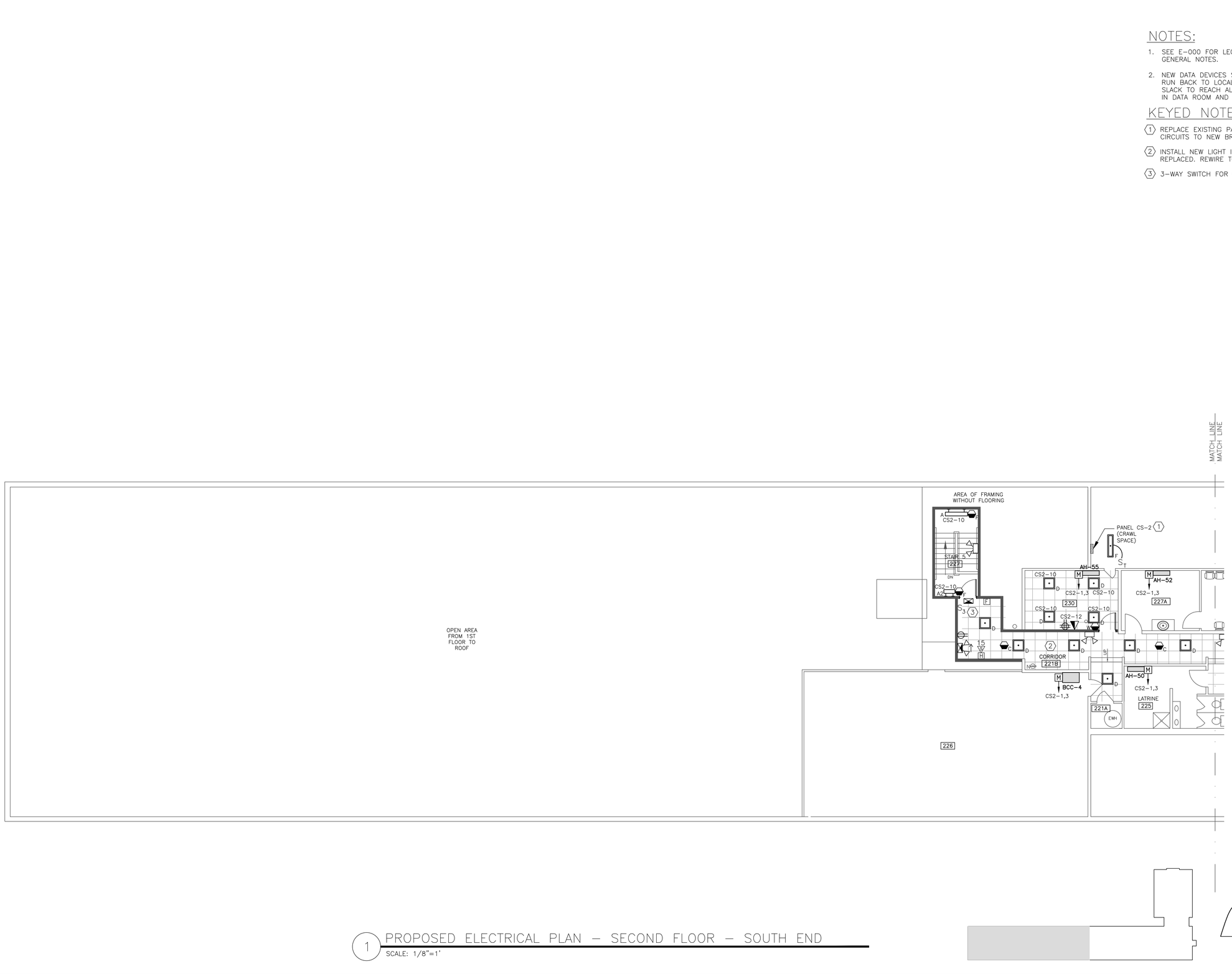
SHEET ID:
E–111
SHEET: 117 OF 126

NOTES:

1. SEE E-000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. NEW DATA DEVICES SHALL HAVE (1)VOICE/(1)DATA. RUN BACK TO LOCAL DATA ROOM. PROVIDE ENOUGH SLACK TO REACH ALONG CEILING TO FURTHEST POINT IN DATA ROOM AND FROM THERE TO FLOOR.

KEYED NOTES:

1. REPLACE EXISTING PANEL WITH NEW. RECONNECT EXISTING CIRCUITS TO NEW BREAKERS.
2. INSTALL NEW LIGHT IN CORRIDOR WHERE CEILING BEING REPLACED. REWIRE TO EXISTING CIRCUIT.
3. 3-WAY SWITCH FOR CORRIDOR FIXTURES.



1 PROPOSED ELECTRICAL PLAN – SECOND FLOOR – SOUTH END

SCALE: 1/8"=1'

DIRECTORATE OF FACILITIES ENGINEERING — DFE — CAMP KEYES

PLAN REVISIONS

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STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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Gorham, Maine 04038
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DESIGNED BY: TMD
DRAWN BY: JMD
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DFE PROJECT NO: 23SR18-458-D

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PROPOSED ELECTRICAL PLAN
SECOND FLOOR – SOUTH END

PLAN PROGRESS

- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE — TIMOTHY D. MATTHEWS No. 9199 — LICENSED PROFESSIONAL ENGINEER

SWIFTCURRENT
Engineering Services
10 Forest Falls Dr. Unit 4B
Yarmouth, ME 04096
Tel: (207) 847-9280

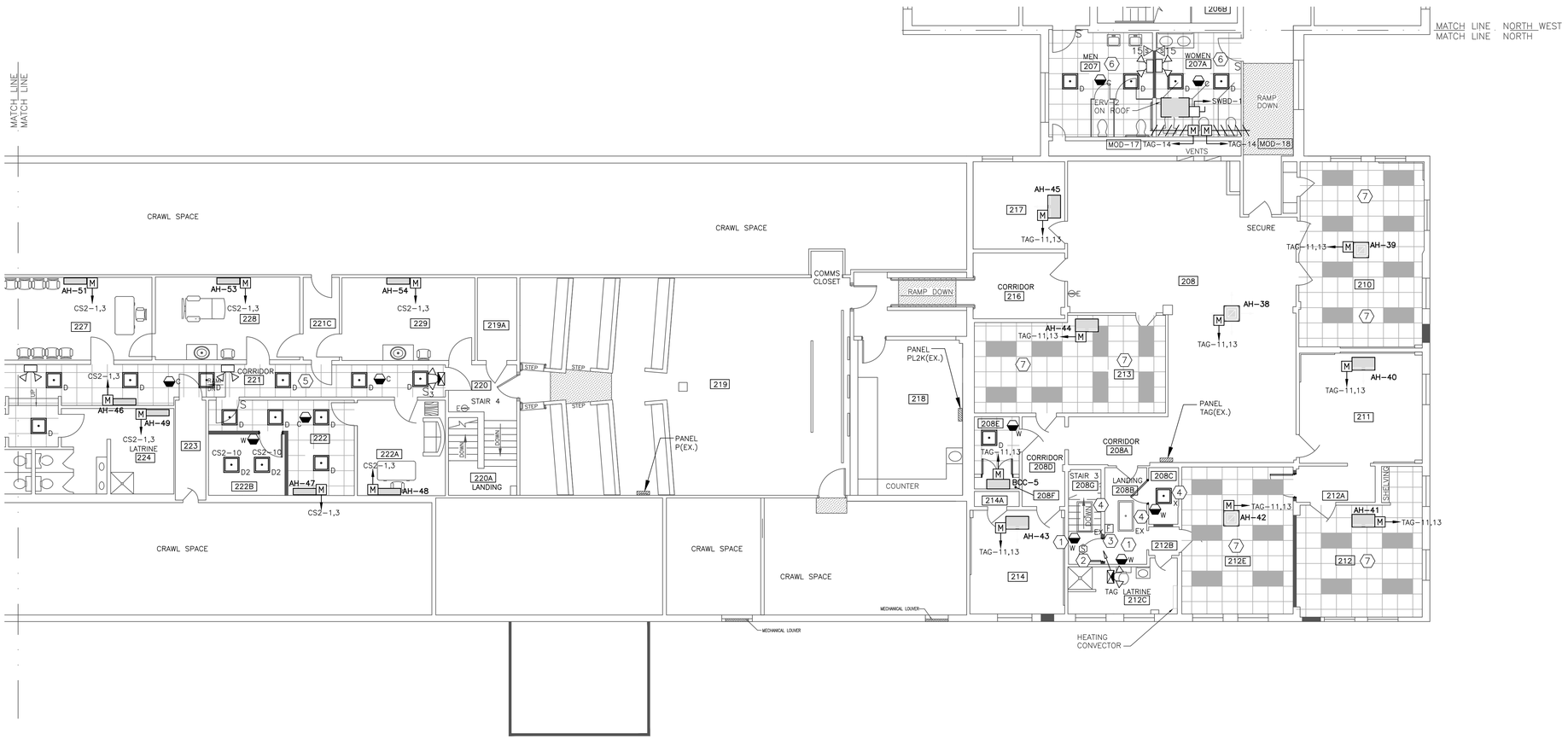
SHEET ID: E-120

NOTES:

1. SEE E-000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

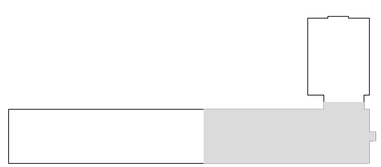
KEYED NOTES:

1. SPLIT THE CONTROL OF THE LIGHT FIXTURES IN THE NEW CORRIDOR AND STAIRWELL. FURNISH NEW OCCUPANCY SENSOR TO OPERATE LIGHTS.
2. RELOCATE EXISTING SMOKE DETECTOR INTO NEW STAIRWELL.
3. RELOCATE EXISTING FIRE ALARM PULL STATION.
4. REMOVE/REINSTALL LIGHT. RELOCATE SWITCH.
5. INSTALL NEW LIGHT IN CORRIDOR WHERE CEILING BEING REPLACED. REWIRE TO EXISTING CIRCUIT.
6. REUSE EXISTING BATHROOM LIGHTING CIRCUIT FOR NEW FIXTURE. CUT IN NEW SWITCHES FOR SEPARATE ROOM OPERATION.
7. RESET EXISTING FIXTURES IN APPROXIMATELY SAME LOCATIONS COORDINATE WITH SPRINKLER.



1 PROPOSED ELECTRICAL PLAN – SECOND FLOOR – NORTH END

SCALE: 1/8"=1'



PLAN REVISIONS			
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STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PROPOSED ELECTRICAL PLAN
SECOND FLOOR – NORTH END

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

TIMOTHY D. MATTHEWS No. 9199 LICENSED PROFESSIONAL ENGINEER

SWIFTCURRENT
Engineering Services
10 Forest Falls Dr. Unit 4B
Yarmouth, ME 04096
Tel: (207) 847-9280

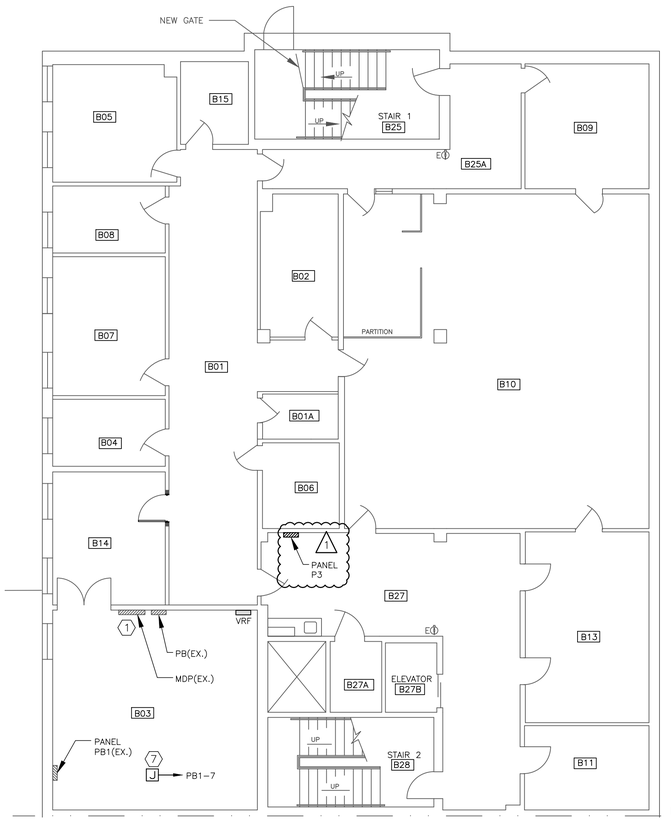
SHEET ID: E-121
SHEET: 119 OF 126

NOTES:

1. SEE E-000 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. NEW DATA DEVICES SHALL HAVE (1)VOICE/(1)DATA. RUN BACK TO LOCAL DATA ROOM. PROVIDE ENOUGH SLACK TO REACH ALONG CEILING TO FURTHEST POINT IN DATA ROOM AND FROM THERE TO FLOOR.

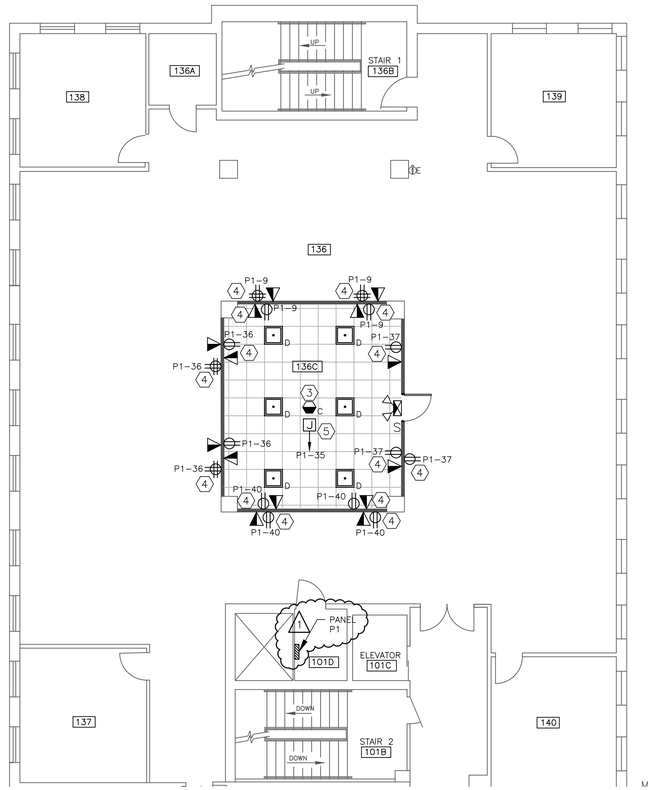
KEYED NOTES:

1. INTENT IS TO REPLACE 20A, 3P BREAKER IN PANEL MDP WITH NEW 100A, 3P BREAKER FOR FUTURE IT ROOM PANEL TO BE FURNISHED BY OTHERS OUTSIDE OF SCOPE.
2. NEW RF-1 REPLACING EF-3 ON ROOF. RECONNECT FAN AND INSTALL VFD FURNISHED BY DIVISION 25 CONTROLS TO EXISTING CIRCUIT.
3. INSTALL NEW LIGHTS AND REWIRE AS REQUIRED TO CONTROL SEPARATELY FROM FIXTURES IN AREA 136.
4. CIRCUITS SHOWN ARE FROM PANEL SCHEDULE. VERIFY IN FIELD. INTENT IS TO REUSE EXISTING CIRCUITS.
5. EXISTING CEILING POWER CIRCUIT. IN JUNCTION BOX ABOVE CEILING FOR FUTURE USE.
6. NOT USED.
7. FURNISH 120V POWER AS REQUIRED FOR BUILDING AUTOMATION SYSTEM.



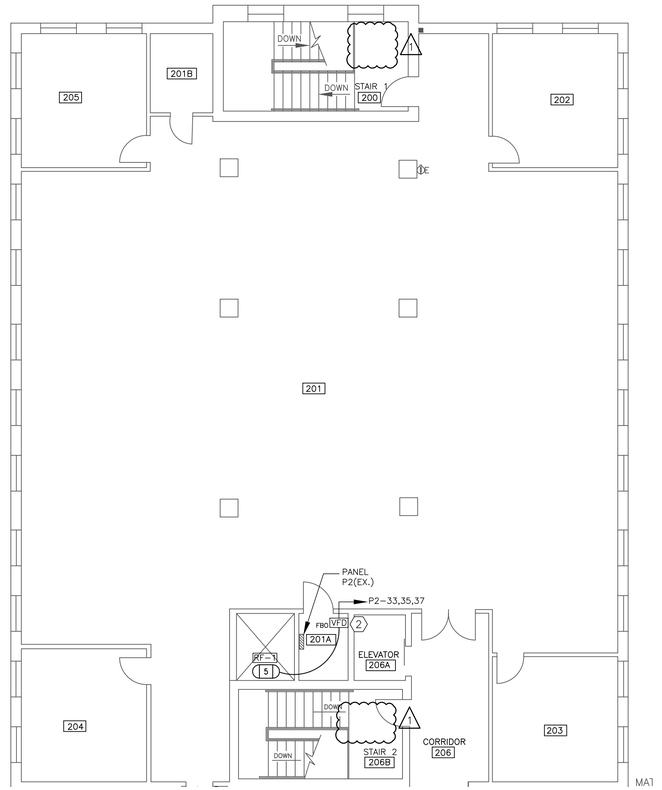
PROPOSED ELECTRICAL PLAN – LOWER LEVEL – NORTH WEST WING

1 SCALE: 1/8"=1'



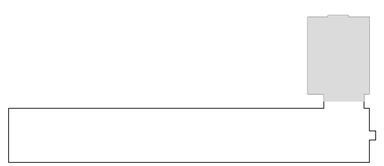
PROPOSED ELECTRICAL PLAN – FIRST FLOOR – NORTH WEST WING

2 SCALE: 1/8"=1'



PROPOSED ELECTRICAL PLAN – SECOND FLOOR – NORTH WEST WING

3 SCALE: 1/8"=1'



DIRECTORATE OF FACILITIES ENGINEERING — DFE — CAMP KEYES

PLAN REVISIONS

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STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordjia Capital Projects Group
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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

PROPOSED ELECTRICAL PLAN
1st, 2nd, 3rd FLOOR – N.W. WING

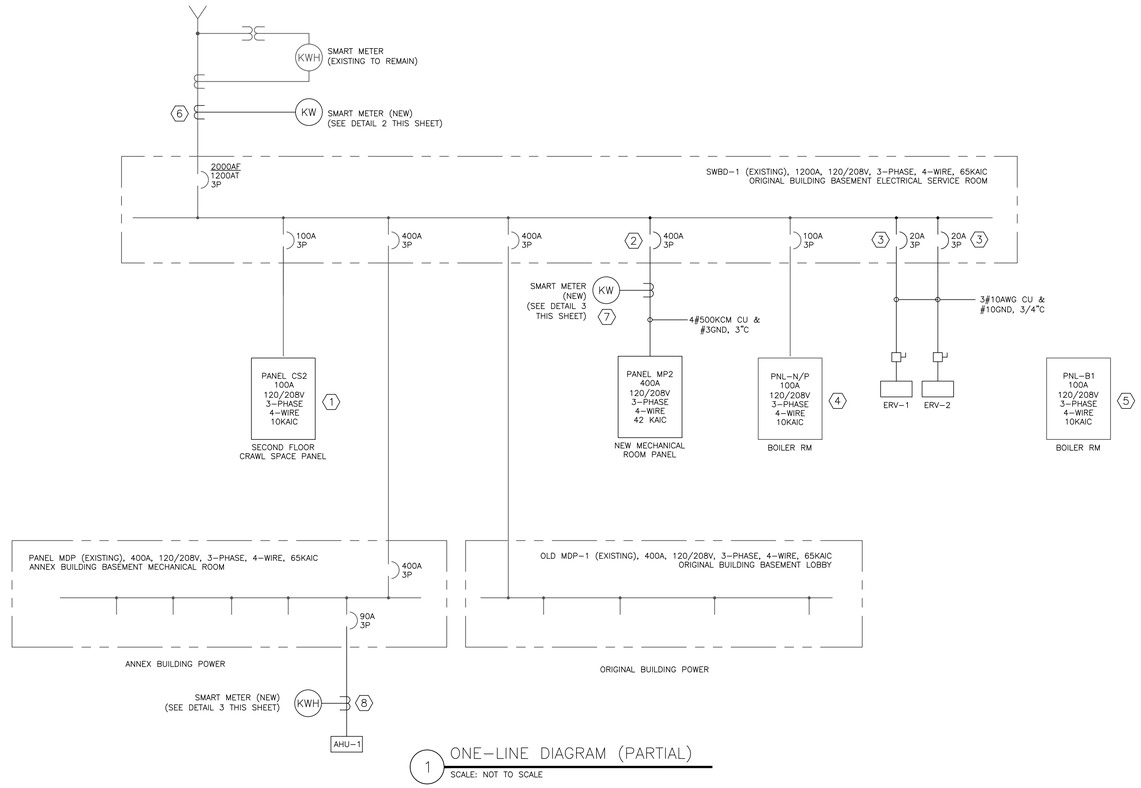
PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE — TIMOTHY D. MATTHEWS No. 9199 — LICENSED PROFESSIONAL ENGINEER

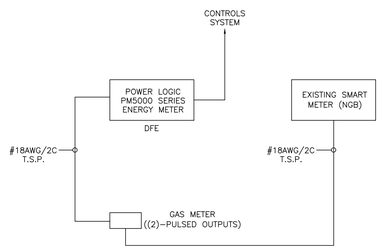
N

SWIFTCURRENT
Engineering Services
10 Forest Falls Dr. Unit 4B
Yarmouth, ME 04096
Tel: (207) 847-9280

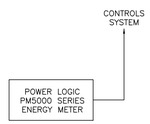
SHEET ID: E-122
SHEET: 120 OF 126



1 ONE-LINE DIAGRAM (PARTIAL)
SCALE: NOT TO SCALE



2 POWER METER DIAGRAM – LAYOUT "A"
SCALE: NOT TO SCALE



3 POWER METER DIAGRAM – LAYOUT "B"
SCALE: NOT TO SCALE

NOTES:

1. SEE E0.0 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. ONE-LINE DIAGRAM IS PARTIAL AND BASED ON FIELD LABELING. IT IS PROVIDED ONLY FOR INFORMATIONAL PURPOSES. CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION DURING CONSTRUCTION.

KEYED NOTES:

1. REPLACE PANEL CS2 IN CRAWL SPACE OF SECOND FLOOR DENTAL AREA. REUSE EXISTING CIRCUIT.
2. FURNISH NEW 400A, 3P BREAKER IN EXISTING SQUARE D, QED STYLE SWITCHBOARD. BREAKER SHALL BE SQUARE D MODEL LH36400.
3. FURNISH NEW 20A, 3P BREAKERS IN EXISTING SQUARE D, QED STLE SWITCHBOARD TO FEED NEW ERV UNITS.
4. RELOCATE EXISTING PANEL N/P IN BOILER ROOM. RE-FEED FROM EXISTING BREAKER AND RE-ROUTE CIRCUIT TO NEW LOCATION.
5. RELOCATE PANEL B1 IN BOILER ROOM. IDENTIFY THE BREAKER FEEDING THIS PANEL. RE-FEED FROM EXISTING BREAKER AND RE-ROUTE CIRCUIT TO NEW LOCATION.
6. FURNISH NEW POWERLOGIC PM5000 POWER METER AND CT/PT EQUIPMENT TO MEASURE MAIN POWER IN. UNIT SHALL BE CAPABLE OF READING PULSES FROM THE WATER AND GAS METERS. MECHANICAL CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING WIRING FROM REMOTE WATER AND GAS METERS AND CONNECTION FROM POWER METER TO MECHANICAL CONTROLLER/LOGGER.
7. FURNISH NEW POWERLOGIC PM5000 POWER METER AND CT/PT TO EQUIPMENT TO MEASURE POWER ON NEW PANEL MP2.
8. EXISTING CIRCUIT FOR AHU-1. FURNISH NEW POWERLOGIC PM5000 POWER METER AND CT/PT TO CIRCUIT TO MEASURE POWER USED BY AHU-1.

DIRECTORATE OF FACILITIES ENGINEERING
DFE
CAMP KEYES

PLAN REVISIONS

1	ADDENDA #1	1.28.19		
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STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

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CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

ELECTRICAL ONE-LINE DIAGRAM

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
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STATE OF MAINE
TIMOTHY D. MATTHEWS
No. 9199
LICENSED
PROFESSIONAL ENGINEER

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10 Forest Falls Dr. Unit 4B
Yarmouth, ME 04096
Tel: (207) 847-9280

SHEET ID:
E-200
SHEET:121 OF 126

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
LTS RM 104	*			1	20	A	20	2	*			LTS RM 102, 103, 105
LTS RM 111 & 112		*		3	20	B	20	4		*		LTS RM 100, 101, 102 113
RECEPTS RM 113			*	5	20	C	20	6			*	RECEPTS RM 112 DPA NORTH WALL
RECEPTS RM 111	*			7	20	A	20	8	*			RECEPTS RM 100 LOBBY 106
RECEPTS WEST CUBICAL WALL		1.1		9	20	B	20	10		*		RECEPTS ROOM 112 TO EAST WALL
RECEPTS RM 105			*	11	20	C	20	12			*	RECEPTS RM 103
RECEPTS RM 104 – SO. WALL	*			13	20	A	20	14	*			SPARE
RECEPTS IN CEILING RM 112		*		15	20	B	20	16		*		RECEPTS IN CEILING RM 112
RECEPTS IN CEILING RM 112			*	17	20	C	20	18			*	RECEPTS IN CEILING RM 112
RECEPTS IN CEILING RM 112	*			19	20	A	20	20	*			RECEPTS IN CEILING RM 112
RECEPTS IN CEILING RM 112		*		21	20	B	20	22		*		RECEPTS IN CEILING RM 104
RECEPTS IN CEILING RM 112			*	23	20	C	20	24			*	RECEPTS IN CEILING RM 104
RECEPTS IN CEILING RM 112	*			25	20	A	20	26	*			RECEPTS IN CEILING RM 104
RECEPTS IN CEILING RM 104		*		27	20	B	20	28		*		CUH–1
RECEPTS IN CEILING RM 104			*	29	20	C	20	30			*	TEL. BOARD RECEPT
RECEPTS IN CEILING RM 104	*			31	20	A	30	32	*			WH–1
BATTERY PACK		*		33	20	B		34		*		
RECEPTS IN CEILING CUBICAL			0.2	35	20	C	20	36			1.1	RECEPTS SOUTH CUBICAL WALL
RECEPTS NORTH CUBICAL WALL	0.6			37	20	A	20	38	*			SPARE
SPARE		*		39	20	B	20	40		0.8		RECEPTS EAST CUBICAL WALL
SPARE			*	41	20	C		42			*	SPACE
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A–PHASE	###	PANEL P1
MAIN BREAKER: ***A BUS AMPS: ***A	TOTAL KVA B–PHASE	###	
MOUNTING: SURFACE	TOTAL KVA C–PHASE	###	LOCATION ANNEX 1ST FLR ELEC. RM.
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING PANEL BOARD.

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
LTS RM 209, 206	*			1	20	A	20	2	*			LTS RM 201
LTS RM 210 208		*		3	20	B	20	4		*		LTS RM 211, 200, 214
RECEPTS RM 211			*	5	20	C	20	6			*	RECEPTS RM 210, 209
RECEPTS RM 208	*			7	20	A	20	8	*			RECEPTS RM 208, 203
RECEPTS RM 201		*		9	20	B	20	10		*		RECEPTS RM 206
RECEPTS RM 209			*	11	20	C	20	12			*	RECEPTS RM 205
RECEPTS TEL. BOARD	*			13	20	A	20	14	*			EF–1
EF–2		*		15	20	B	20	16		*		RECEPTS CEILING RM 210, 209 POWER POLE
RECEPTS CEILING RM 210, 209 POWER POLE			*	17	20	C	20	18			*	RECEPTS CEILING RM 210, 209 POWER POLE
RECEPTS CEILING RM 210, 209 POWER POLE	*			19	20	A	20	20	*			RECEPTS CEILING RM 210, 209 POWER POLE
RECEPTS CEILING RM 210, 209 POWER POLE		*		21	20	B	20	22		*		RECEPTS CEILING RM 201 POWER POLE
RECEPTS CEILING RM 209 POWER POLE			*	23	20	C	20	24			*	RECEPTS CEILING RM 201 POWER POLE
RECEPTS CEILING RM 209 POWER POLE	*			25	20	A	20	26	*			RECEPTS CEILING RM 201 POWER POLE
RECEPTS CEILING RM 209 POWER POLE		*		27	20	B	20	28		*		RECEPTS CEILING RM 209 POWER POLE
POWER POLE			*	29	20	C	20	30			*	RECEPTS CEILING RM 209 POWER POLE
WATER COOLER	*			31	20	A	20	32	*			RECEPTS CEILING RM 209 POWER POLE
RF–1 〈2〉		2.1		33	20	B	20	34		*		BATTERY PACK
			2.1	35		C	20	36			0.6	DSF–1 〈2〉
	2.1			37		A	20	38	0.6			DSF–2 〈2〉
SPACE		*		39		B	20	40		*		SPARE
SPACE			*	41		C		42			*	SPACE
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A–PHASE	###	PANEL P2
MAIN LUGS ONLY BUS AMPS: 100A	TOTAL KVA B–PHASE	###	
MOUNTING: SURFACE	TOTAL KVA C–PHASE	###	LOCATION ANNEX 2ND FLR. ELEC. RM.
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING PANEL BOARD. TYPE PRL1A

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
LTS RM B04	*			1	20	A	20	2	*			LTS RMS B07, B15, B09, B13
LTS RM B10		*		3	20	B	20	4		*		LTS RMS B08, B01, B14
LTS RM B12, B05, B02, B01, REC – FURNITURE			*	5	20	C	20	6			*	RECEPTS RMS B05, B11, B10 FURNITURE
RECEPTS RM B09, B10	*			7	20	A	20	8	*			SET B RADIO RECEPT
RECEPTS RM B10		*		9	20	B	20	10		*		RECEPTS B13, B05 FURNITURE
RECEPTS – B04, B12 FURNITURE			*	11	20	C	20	12			*	RECEPTS B06, B10 FURNITURE
SET A RADIO RECEPTS	*			13	20	A	20	14	*			RECEPTS MECH RM
RECEPTS IN CEILING RM B10		*		15	20	B	20	16		*		RECEPTS IN CEILING/FLOOR RM B10
RECEPTS IN CEILING/FLOOR RM B10			*	17	30	C	20	18			*	RECEPTS IN CEILING RM B10 60"
	*			19		A	20	20	*			QUAD
		*		21		B	20	22		*		RECEPTS IN CEILING/FLOOR RM B10
RECEPTS IN CEILING/FLOOR RM B10			*	23	20	C	20	24			*	RECEPTS IN CEILING RM B04
RECEPTS IN CEILING/FLOOR RM B10	*			25	20	A	20	26	*			RECEPTS IN CEILING RM B04
RECEPTS IN CEILING/FLOOR RM B10 & B04		*		27	20	B	20	28		*		MONITORS
PANEL PB–1			*	29	60	C	20	30			*	CUH–1, UH–1(ANNEX)
	*			31		A	20	32	*			PROJECTORS
		*		33		B	20	34		*		EXITS
LTS & SCREENS			*	35	20	C	20	36			*	ELEVATOR PIT
ELEVATOR CAB	*			37	20	A	20	38	*			LANDIS & STAEFA CONTROL PANEL
ELEVATOR SHUNT		*		39	20	B	20	40		*		TEL. BOARD RECEPT.
ELEVATOR CLOSET NEMA			*	41	15	C	20	42			*	SETC. RADIO RECEPT & TOWER
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A–PHASE	###	PANEL PB
MAIN LUGS ONLY BUS AMPS: 100A	TOTAL KVA B–PHASE	###	
MOUNTING: SURFACE	TOTAL KVA C–PHASE	###	LOCATION ANNEX MECH RM.
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING PANEL BOARD. TYPE PRL1A

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
CU–1	4.6			1	45	A	50	2	5.2			CU–2
		4.6		3		B		4		5.2		
			4.6	5		C		6			5.2	
CU–3	4.6			7	45	A	50	8	5.2			CU–4
		4.6		9		B		10		5.2		
			4.6	11		C		12			5.2	
CU–5	4.6			13	45	A	20	14	1.3			UH–1 (THIS ROOM)
		4.6		15		B	20	16		1.3		UH–2
			4.6	17		C	20	18			0.1	MOD–1,2,3,4
BCC–1; AH–1,2,3,4,5,6,7,8,9, 10,11	0.6			19	20	A	20	20	0.1			CUH–1 (THIS ROOM)
		0.6		21		B	20	22		0.3		MECH. RM LTS
MECHANICAL RM. RECEPTS			0.8	23	20	C	20	24			1.0	MECH. CONTROLS
SPARE	*			25	20	A	20	26	0.1			MOD–5,6,7,8,9,10,11,12,13,14
SPARE		*		27	20	B	20	28		*		SPARE
SPARE			*	29	20	C	20	30			*	SPARE
SPACE	*			31		A		32	*			SPACE
SPACE		*		33		B		34		*		SPACE
SPACE			*	35		C		36			*	SPACE
SPACE	*			37		A		38	*			SPACE
SPACE		*		39		B		40		*		SPACE
SPACE			*	41		C		42			*	SPACE
SUBTOTAL	14.4	14.4	14.6						11.8	12.0	11.5	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A–PHASE	26.2	PANEL MP2
MAIN BREAKER: 400A BUS AMPS: 400A	TOTAL KVA B–PHASE	26.4	
MOUNTING: SURFACE	TOTAL KVA C–PHASE	25.1	LOCATION OUTDOOR UNIT ROOM
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	78.7	

NOTES: NEW PANEL BOARD.

NOTES:

1. ALL PANEL DIRECTORIES SHOWN ARE FROM PANEL DIRECTORIES OBSERVED IN THE FIELD. ALL CIRCUITING MUST BE CONFIRMED IN THE FIELD DURING CONSTRUCTION.
2. PROVIDE SPACE COVERS IN ANY PANELS WHERE THE WORK PROVIDED RESULTS IN VACANT SPACES.

KEYED NOTES:

〈1〉 CIRCUIT BECOMES SPARE. SEE DEMO PLAN FOR EQUIPMENT TO BE REMOVED.

〈2〉 REUSE EXISTING "SPARE" CIRCUIT BREAKER TO POWER NEW EQUIPMENT LISTED.

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
KIT. GFI	*			1	20	A	20	2	*			REC.B–26–3
REC.B–26–4		*		3	20	B	20	4		*		T.V. OVER SINK
SPARE			*	5	20	C	20	6			*	SPARE
SPACE	*			7		A		8	*			SPACE
SPACE		*		9		B		10		*		SPACE
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A–PHASE	###	PANEL P3
MAIN LUGS ONLY BUS AMPS: 100A	TOTAL KVA B–PHASE	###	
MOUNTING: RECESSED	TOTAL KVA C–PHASE	###	LOCATION ANNEX 2ND FLR. KITCHENETTE
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING PANEL BOARD. TYPE PRL1A.

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
RECEPTS/PHONES FRONT ENTRY. 1ST FL	*			1	20	A	30	2	*			RADIO RACK
LIGHT PHONE CLOSET		*		3	20	B	30	4		*		RADIO RACK
RECEPT/PHONE RACK – THIS RM			*	5	20	C	20	6			*	O/S WALL PACKS
CONTROLS 〈2〉	1.0			7	20	A	20	8	*			LS 30 UPS (WIRE MANAGER)
SPARE		*		9	20	B	20	10		*		DOWN HALL OUTLET ACCESS
SPARE			*	11	20	C	20	12			*	DOWN HALL FRIDGE
SPARE	*			13	20	A	20	14	*			OVERHEAD OUTLET
RM B15 STRIP 1		*		15	20	B	20	16		*		OVERHEAD OUTLET
RM B15 STRIP 2			*	17	20	C	20	18			*	RADIO EQUIP RECEPT
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A–PHASE	###	PANEL PB1
MAIN LUGS ONLY BUS AMPS: 125A	TOTAL KVA B–PHASE	###	
MOUNTING: ********	TOTAL KVA C–PHASE	###	LOCATION ANNEX MECH. RM.
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING SIEMENS PANEL BOARD. TYPE P1. CAT NO. P1C18ML125ATS

SWIFTCURRENT
Engineering Services
10 Forest Falls Dr. Unit 4B
Yarmouth, ME 04096
Tel: (207) 847-9280

DIRECTORATE OF PUBLIC WORKS DFE CAMP KEYES FACILITIES ENGINEERING

PLAN REVISIONS

	GENERAL REVISIONS	Date	Appr.
1		1.28.19	

Rev#	Description	Date	Appr.

DESIGNED BY: TMD
DRAWN BY: JMD
CHECKED BY: TMD/MAD
DATE: 12/28/2018
SCALE: AS NOTED
DFE PROJECT NO: 23SR18–458–D

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

Cordjia Capital Projects Group
16 Tannery Lane, Suite 23
Gorham, Maine 04038
207–236–9970 / rmcdigle@cordjiacpg.com

CAMP KEYES REUTILIZATION PROJECT
CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

ELECTRICAL PANEL SCHEDULES

PLAN PROGRESS
- ☐ DRAFT
- ☐ 35% REVIEW
- ☐ 65% REVIEW
- ☐ 95% REVIEW
- ☐ FINAL REVIEW
- ■ FOR BIDDING
- ☐ ISSUED FOR CONSTRUCTION
- ☐ RECORD DRAWINGS

STATE OF MAINE TIMOTHY D. MATTHEWS No. 9199 LICENSED PROFESSIONAL ENGINEER

SHEET ID: E–204
SHEET: 125 OF 126

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
PANEL AH-2	*			1	100	A	40	2	*			9KW HEATERS UPSTAIRS
		*		3		B		4		*		
			*	5		C		6			*	
VRV & BSU #7	*			7	15	A	15	8	*			VRV & BSU #8
		*		9		B		10		*		
VRV & BSU #9			*	11	15	C	15	12			*	VRV & BSU #10
	*			13		A		14	*			
VRV & BSU #11		*		15	15	B	15	16		*		VRV & BSU #12
			*	17		C		18			*	
VRV & BSU #13	*			19	15	A	15	20	*			VRV & BSU #14
		*		21		B		22		*		
VRV & BSU #15			*	23	15	C	15	24			*	VRV & BSU #16
	*			25		A		26	*			
VRV & BSU #17		*		27	15	B	20	28		*		AHE-1
			*	29		C	20	30			*	HEAT TAPE
SPACE	*			31		A	20	32	*			DRINKING FOUNTAIN
SPACE		*		33		B		34		*		SPACE
SPACE			*	35		C		36			*	SPACE
SPACE	*			37		A		38	*			SPACE
SPACE		*		39		B		40		*		SPACE
SPACE			*	41		C		42			*	SPACE
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A-PHASE	###	PANEL AH-1
MAIN LUGS ONLY BUS AMPS: 200A	TOTAL KVA B-PHASE	###	
MOUNTING: SURFACE	TOTAL KVA C-PHASE	###	LOCATION ROOM 131
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING SQUARE D PANEL BOARD, TYPE 1 ENCLOSURE. SERIES S01 QOC42UF.

DIRECTORY	KVA LOAD A	KVA LOAD B	KVA LOAD C	CKT #	BKR AMPS	PHASE	BKR AMPS	CKT #	KVA LOAD A	KVA LOAD B	KVA LOAD C	DIRECTORY
VRV & BSU #1	*			1	15	A	15	2	*			VRV & BSU #18
		*		3		B		4		*		
VRV & BSU #8			*	5	15	C	15	6			*	VRV & BSU #2
	*			7		A		8	*			
VRV & BSU #5		*		9	15	B	15	10		*		VRV & BSU #4
			*	11		C		12			*	
VRV & BSU #19	*			13	15	A	15	14	*			VRV & BSU #6
		*		15		B		16		*		
VRV & BSU #21			*	17	15	C	15	18			*	VRV & BSU #20
	*			19		A		20	*			
HEAT TAPE		*		21	20	B	40	22		*		8 KW HEATER
HEAT TAPE			*	23	20	C		24			*	
AHE-2	*			25	20	A		26	*			
SPACE		*		27		B		28		*		SPACE
SPACE			*	29		C		30			*	SPACE
SPACE	*			31		A		32	*			SPACE
SPACE		*		33		B		34		*		SPACE
SPACE			*	35		C		36			*	SPACE
SPACE	*			37		A		38	*			SPACE
SPACE		*		39		B		40		*		SPACE
SPACE			*	41		C		42			*	SPACE
SUBTOTAL	###	###	###						###	###	###	SUBTOTAL

VOLTAGE: 208Y/120V PHASE: 3 POLES: 4	TOTAL KVA A-PHASE	###	PANEL AH-2
MAIN LUGS ONLY BUS AMPS: 200A	TOTAL KVA B-PHASE	###	
MOUNTING: SURFACE	TOTAL KVA C-PHASE	###	LOCATION ROOM 109
SHORT CIRCUIT RATING: *KAIC	TOTAL KVA	###	

NOTES: EXISTING SQUARE D PANEL BOARD, TYPE 1 ENCLOSURE. SERIES S01 QOC42UF.

NOTES:

1. ALL PANEL DIRECTORIES SHOWN ARE FROM PANEL DIRECTORIES OBSERVED IN THE FIELD. ALL CIRCUITING MUST BE CONFIRMED IN THE FIELD DURING CONSTRUCTION.
2. PROVIDE SPACE COVERS IN ANY PANELS WHERE THE WORK PROVIDED RESULTS IN VACANT SPACES.

KEYED NOTES:

1. (1) FURNISH NEW BREAKER IN EXISTING PANEL.

DIRECTORATE OF PUBLIC WORKS FACILITIES ENGINEERING DFE CAMP KEYES

PLAN REVISIONS

	GENERAL REVISIONS	1.28.19							Appr.
1								Date	
								Description	

STATE OF MAINE
DEPARTMENT OF DEFENSE, VETERANS AND EMERGENCY MANAGEMENT

DESIGNED BY: TMD
DRAWN BY: JMD
CHECKED BY: TMD/MAD
DATE: 12/28/2018
SCALE: AS NOTED
DFE PROJECT NO: 23SR18-458-D

Cordjia Capital Projects Group
16 Tannery Lane, Suite 23
Camden, Maine 04843
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CAMP KEYES, AUGUSTA, MAINE
BUILDING NO. 7 RENOVATIONS

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LICENSED PROFESSIONAL ENGINEER

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SHEET ID:
E-205
SHEET: 126 OF 126