SYM.	PREP'D BY	DATE	APPROVED

HEAT PUMP SCHEDULE

INDOOR UNIT DESIGNATION			HP-1A	HP-2A	HP-3A
OUTDOOR UNIT DESIGNATION			HP-1B	HP-2B	HP-3B
LOCATION			VARIOUS	VARIOUS	VARIOUS
MINIMUM COMBINED SEER RATING PER ARI			- -	17.0	17.0
MINIMUM COMBINED EER RATING PER ARI			11	12.2	12.2
INDOOR UNIT	EVAPORATOR	TOTAL AIRFLOW (CFM)	2900	1580	1580
		OUTSIDE AIRFLOW (CFM)	530	180	120
		EXTERNAL STATIC PRESSURE (IN-WC)	.6	.6	.6
		TOTAL COOLING CAPACITY (MBH)	89	47.5	47.5
		HEAT PUMP HEATING CAPACITY AT 17° F (MBH)	50	29.2	29.2
		ELECTRIC HEATING CAPACITY (KW)	10	5.0	5.0
	ELECTRICAL	BLOWER MOTOR FLA (A)	- -	9.1	9.1
		TOTAL MCA (A)	36	27	27
		VOLTAGE	208	208	208
		PHASE	3	1	1
		FREQUENCY (Hz)	60	60	60
BASED ON			LENNOX	LENNOX	LENNOX
INDOOR UNIT MODEL			TAA090S4D-1Y	CBX32MV-048	CBX32MV-048
REFRIGERANT			R-410A	R-410A	R-410A
OUTDOOR UNIT	AMBIENT DESIGN TEMPERATURE (DEG F)		95	95	95
	ELECTRICAL	MINIMUM CIRCUIT AMPACITY (A)	38	28.5	28.5
		MAXIMUM OVERCURRENT PROTECTION (A)	60	45	45
		MINIMUM HEATING COP AT 17° F	2.25	2.5	2.5
		MINIMUM HEATING COP AT 47° F	3.3	3.32	3.32
		MINIMUM HEAT PUMP HSPF	- -	8.7	8.7
		VOLTAGE (V)	208	208	208
		PHASE	3	1	1
		FREQUENCY (Hz)	60	60	60
BASED ON			LENNOX	LENNOX	LENNOX
OUTDOOR SYSTEM MODEL			TPA090S4SN1Y	XP21-048-230	XP21-048-230
REMARKS			1, 2 & 3	1, 2 & 3	1, 2 & 3

REMARKS LEGEND:

1. PROVIDE CONDENSING UNIT SHUTOFF MOISTURE SENSOR IN AUXILLARY PORT OF INDOOR UNIT DRAIN PAN.
2. PROVIDE SECONDARY DRAIN PAN EXTENDING 4" BEYOND AIR HANDLING UNIT ON ALL SIDES.
3. PROVIDE ECM MOTOR ON INDOOR UNIT.

ENERGY RECOVERY VENTILATOR SCHEDULE

DESIGNATION		ERV-1
SUPPLY FAN	TOTAL FAN AIRFLOW (CFM)	830
	EXTERNAL STATIC PRESSURE (IN. WG)	.25
EXHAUST FAN	TOTAL FAN AIRFLOW (CFM)	700
	EXTERNAL STATIC PRESSURE (IN. WG)	.25
ENTHALPY WHEEL	OPERATING OUTSIDE AIRFLOW	830
	OPERATING EXHAUST AIRFLOW	700
	OUTDOOR EAT DB/WB (COOLING)	95/79
	OUTDOOR EAT DB/WB (HEATING)	20/16.6
	EXHAUST EAT DB/WB (COOLING)	75/63
	EXHAUST EAT DB/WB (HEATING)	70/53
	DELIVERED CONDITIONS DB/WB (COOLING)	81.5/68.9
	DELIVERED CONDITIONS DB/WB (HEATING)	50.8/42.6
FILTERS	SUPPLY (MERV)	8
	EXHAUST(MERV)	8
ELECTRICAL	MCA (A)	18.3
	MOCP (A)	25
	VOLTS (V)	115
	PHASE	1
	FREQUENCY (Hz)	60
BASED ON		GREENHECK
MODEL		MINIVENT-750
REMARKS:		1

REMARKS LEGEND:

1. PROVIDE FACTORY MOUNTED CONTROLS FOR UNITS INCLUDING ALL REQUIRED MOTOR STARTERS, PROVIDE FACTORY REMOTE PANEL INCLUDING INDICATION FOR DIRTY FILTER, HAND-OFF-AUTO SWITCH, AND 7 DAY TIME CLOCK.

ELECTRIC DOMESTIC WATER HEATER

DESIGNATION	WH-1
LOCATION	MECH ROOM
STORAGE (GALLONS)	60
TOTAL CAPACITY (KW)	6
RECOVERY RATE @ 90 DEG F (GPH)	27
ELECTRICAL	- -
VOLTS	208
PHASE	1
FREQUENCY (Hz)	60
REMARKS	1

REMARKS LEGEND:

1. PROVIDE 3.2 GALLON EXPANSION TANK OR LARGER SUCH AS AMTROL ST-8 OR SIMILAR.

AIR TERMINAL DEVICE SCHEDULE

DESIGNATION	S1	R1	E1	E1
TYPE	SUPPLY	RETURN	EXHAUST	EXHAUST
NECK SIZE	A=6"	24x24	12x12	24x24
	B=8"			
	C=10"			
	D=12"			
FRAME STYLE	LAY-IN	LAY-IN	LAY-IN	LAY-IN
AIR PATTERN	4 WAY	- -	- -	- -
MAX NC RATING	20	20	20	20
MATERIAL	STEEL	STEEL	STEEL	STEEL
FINISH	BAKED ENAMEL	BAKED ENAMEL	BAKED ENAMEL	BAKED ENAMEL
BASED ON	PRICE	PRICE	PRICE	PRICE
MODEL	SCD	81 SERIES	81 SERIES	81 SERIES

HOODED GRAVITY INTAKE AND RELIEF SCHEDULE

DESIGNATION	HGI-1	HGR-1
USAGE	INTAKE	RELIEF
AIRFLOW (CFM)	830	700
STATIC PRESSURE (IN H2O)	.034	.026
THROAT AREA (SF)	1.83	1.45
THROAT VELOCITY (FPM)	454	483
THROAT DIAMETER (IN)	20.25	16.25
SELECTION BASED ON	GREENHECK	GREENHECK
MODEL	GRSI-18	GRSR-16
REMARKS	1	1

REMARKS LEGEND:

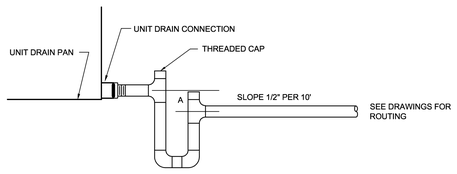
1. PROVIDE BIRD SCREEN.

ATTIC FAN SCHEDULE

DESIGNATION	AF-1	AF-2
LOCATION	ROOF	ROOF
USAGE	ATTIC VENTILATION	ATTIC VENTILATION
FAN DATA	- -	- -
AIRFLOW (SCFM)	1700	1700
EXTERNAL SP (IN-H20)	.125	.125
RPM	1725	1725
DRIVE TYPE	DIRECT	DIRECT
MOTOR DATA	- -	- -
HORSEPOWER	1/2	1/2
RPM	1750	1750
VOLTS	115	115
PHASE	60	60
HERTZ	1	1
SELECTION BASED ON	GREENHECK	GREENHECK
MODEL	LD-120-VG	LD-120-VG
REMARKS	1, 2, 3 & 4	1, 2, 3 & 4

REMARKS LEGEND:

1. PROVIDE FAN WITH INTEGRAL BACK-DRAFT DAMPER, CONTINUOUS DUTY RATED.
2. PROVIDE FAN WITH FACTORY MOUNTED DISCONNECT.
3. PROVIDE FAN WITH ECM MOTOR AND WITH ADJUSTABLE SPEED.
4. PROVIDE ATTIC MOUNTED THERMOSTATIC CONTROL. SET THERMOSTAT TO OPERATE FAN WHEN ATTIC EXCEEDS 85 DEG F.

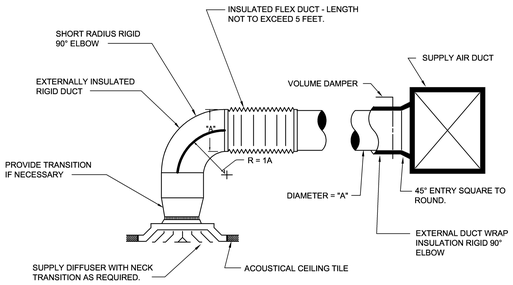


"A" = DIMENSION SHALL BE IN ACCORDANCE WITH MANUFACTURES INSTRUCTIONS, MINIMUM OF 2 INCHES.

NOTE:
CONDENSATE DRAIN PIPE SIZE SHALL BE UNIT DRAIN CONNECTION SIZE

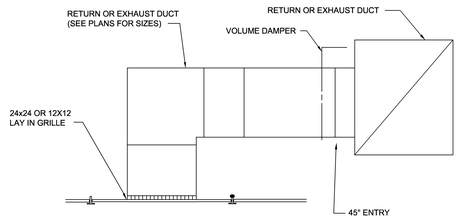
AC DRAIN FOR HEAT PUMP AIR HANDLER NEGATIVE PRESSURE DRAIN PAN

NO SCALE



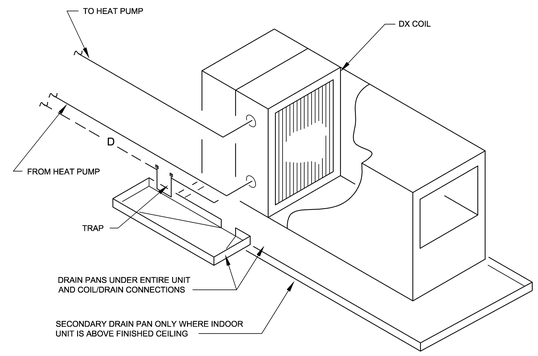
TYPICAL CEILING SUPPLY DIFFUSER CONNECTION

SCALE: NONE



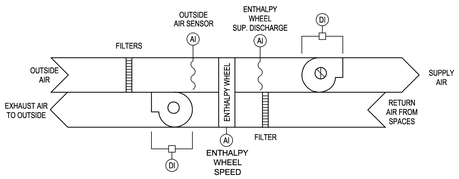
CEILING RETURN/EXHAUST GRILLE

SCALE: NONE



HEAT PUMP INDOOR UNIT DETAIL

SCALE: NONE



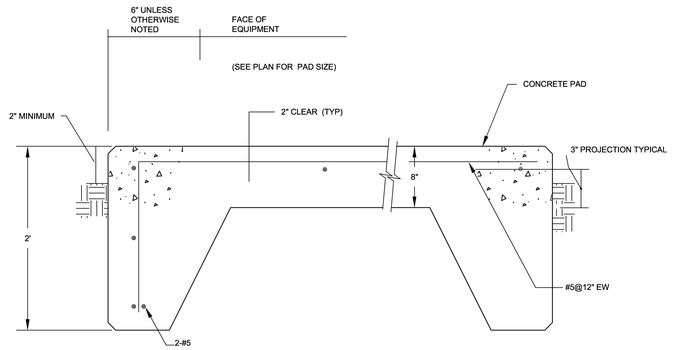
ENERGRY RECOVERY VENTILATOR CONTROL DIAGRAM

SCALE: NONE

SEQUENCE OF OPERATION:

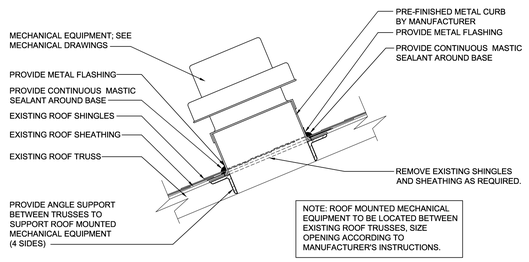
DURING THE OCCUPIED MODE, THE ENERGY RECOVERY VENTILATOR SHALL RUN CONTINUOUSLY. DURING UNOCCUPIED MODE, THE UNIT WILL BE DISABLED WHERE THE SUPPLY AND EXHAUST FANS ARE OFF AND THE WHEEL DOES NOT ROTATE.

DURING OPERATION, DIFFERENTIAL PRESSURE SENSORS SHALL BE USED TO CONFIRM STATUS OF SUPPLY AND EXHAUST FANS. A TACHOMETER SHALL BE USED TO VERIFY WHEEL OPERATION. IF AT ANY TIME THE UNIT IS COMMANDED ON AND EITHER OF THESE THREE OPERATIONAL PIECES OF THE UNIT ARE NOT FUNCTIONING, THE ENTIRE UNIT SHALL BE SHUT DOWN AND AN ALARM SENT.



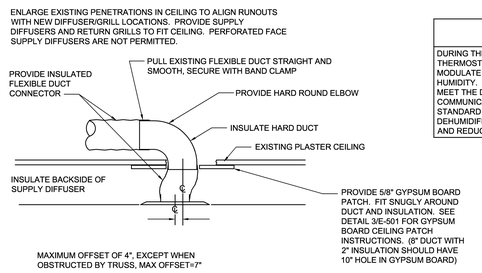
EXTERIOR EQUIPMENT PAD DETAIL

SCALE: NONE



ROOF PENETRATION DETAIL

SCALE: NONE



TYP. DUCT TAKE OFF DETAIL

SCALE: NONE

SPLIT SYSTEM HEAT PUMP SEQUENCE OF OPERATIONS

DURING THE OCCUPIED MODE, THE SPLIT SYSTEM AIR HANDLER FAN SHALL RUN CONTINUOUSLY TO SATISFY ROOM COMBINED THERMOSTAT AND HUMIDISTAT. THE SUPPLY AIR FAN ECM MOTOR SHALL REMAIN ON DURING OCCUPIED MODE AND THE SPEED SHALL MODULATE ACCORDING TO THE MANUFACTURER'S STANDARD SEQUENCE OF OPERATION TO CONTROL ROOM TEMPERATURE AND LIMIT HUMIDITY. IN THE HEATING MODE, THE THERMOSTAT SHALL NOT ENERGIZE THE AUXILIARY ELECTRIC HEAT IF THE HEAT PUMP MODE CAN MEET THE DEMAND, SUCH AS DURING WARM-UP FROM NIGHT SET BACK USING A SMART RECOVERY CAPABLE THERMOSTAT. FACTORY COMMUNICATING THERMOSTAT SHALL BE PROVIDED WITH 7 DAY PROGRAMMING TO ALLOW NIGHT/WEEKEND SET-BACK, COMMUNICATE ALL STANDARD MANUFACTURER'S ALARMS FROM THE UNITS TO THE THERMOSTAT, AND INDICATE DIRTY FILTER.THERMOSTAT SHALL INCLUDE DEHUMIDIFICATION CONTROL TO INTEGRATE WITH HEAT PUMP CONTROLLER TO REDUCE FAN SPEED TO INCREASE LATENT PERFORMANCE AND REDUCE INDOOR AIR HUMIDITY.

DISCLOSURE OF INFORMATION
Contractor shall comply as follows:

(a) The Contractor shall not release to anyone outside the Contractor's organization any unclassified information, regardless of medium (e.g., film, tape, document), pertaining to any part of this contract or any program related to this contract, unless-

(1) The Contracting Officer has given prior written approval; or

(2) The information is otherwise in the public domain before the date of release.

(b) Requests for approval shall identify the specific information to be released, the medium to be used, and the purpose for the release. The Contractor shall submit its request to the Contracting Officer at least 45 days before the proposed date for release.

(c) The Contractor agrees to include a similar requirement in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

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Richmond, Virginia 23230-1717
804.254.7242
wileywilson.com

M-106C

PROJECT NO. CP12-0091

DEPT OF NAVY — NAVAL FACILITIES ENGINEERING COMMAND

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

HVAC/DHW IMPROVEMENTS, VARIOUS FACILITIES, HADNOT POINT
BUILDING 219 SCHEDULES, DETAILS & CONTROLS

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

SIZE: E | CODE IDENT NO.: 80091 | NAVFAC DRAWING NO.: 60011369

CONSTR. CONTR NO.: N40085-12-B-0091

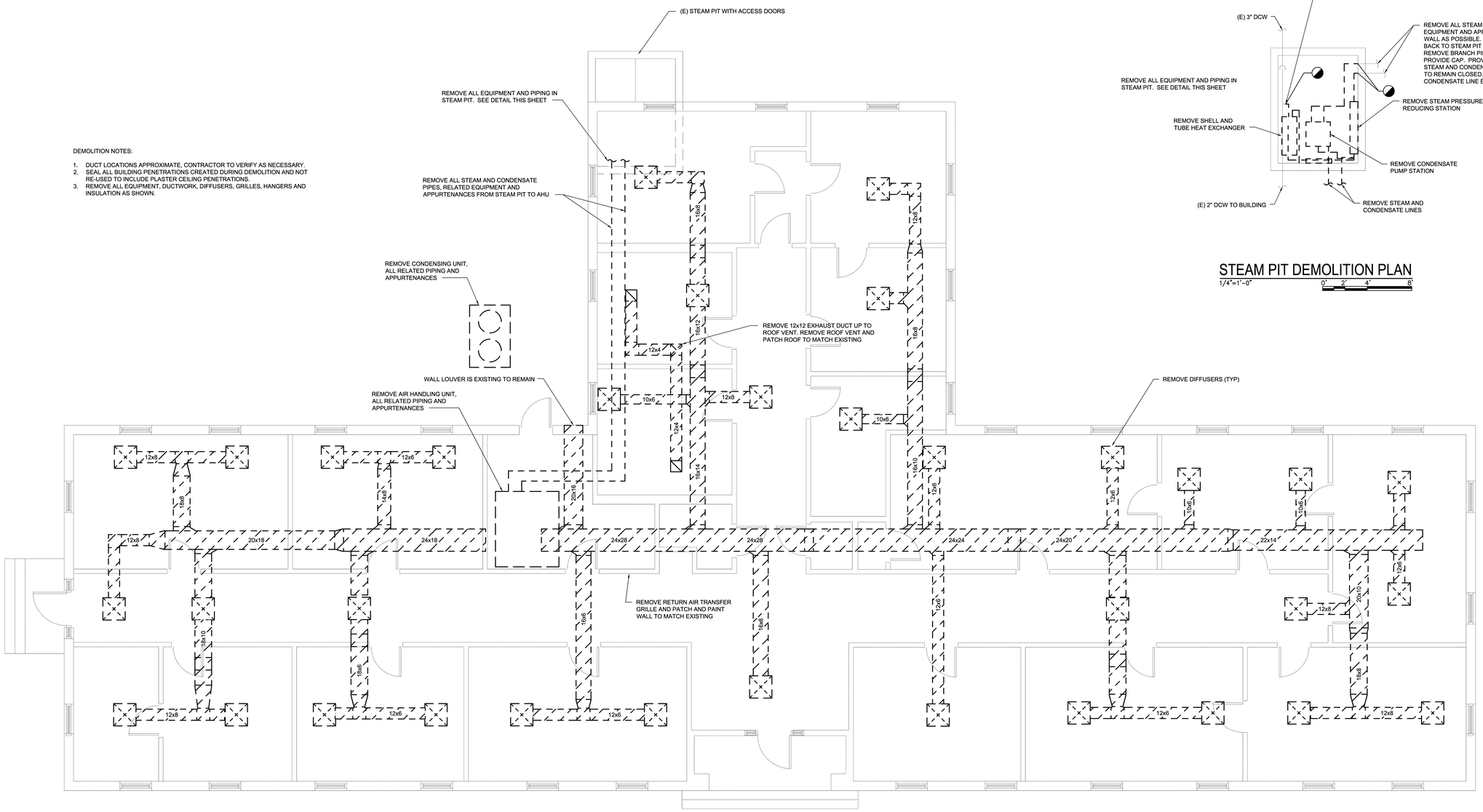
SCALE: AS SHOWN | SPEC No.: 05-12-0091 | SHEET 25 OF 84

COMMONWEALTH OF VIRGINIA
IOANNIS MASOURAS
Lic. No. 035863
8/22/12
PROFESSIONAL ENGINEER
SEAL

SYM.	PREP'D BY	DATE	APPROVED

DEMOLITION NOTES:

1. DUCT LOCATIONS APPROXIMATE, CONTRACTOR TO VERIFY AS NECESSARY.
2. SEAL ALL BUILDING PENETRATIONS CREATED DURING DEMOLITION AND NOT RE-USED TO INCLUDE PLASTER CEILING PENETRATIONS.
3. REMOVE ALL EQUIPMENT, DUCTWORK, DIFFUSERS, GRILLES, HANGERS AND INSULATION AS SHOWN.



BUILDING 317 MECHANICAL DEMOLITION PLAN
1/4"=1'-0" 0' 2' 4' 8'

STEAM PIT DEMOLITION PLAN
1/4"=1'-0" 0' 2' 4' 8'

DISCLOSURE OF INFORMATION
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M-107A

PROJECT NO. CP12-0091

DEPT OF NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

HVAC/DHW IMPROVEMENTS,
VARIOUS FACILITIES,
HADNOT POINT
BUILDING 317 MECHANICAL DEMOLITION PLAN

COMMONWEALTH OF VIRGINIA
IOANNIS MASOURAS
Lic. No. 035863
8/22/12
PROFESSIONAL ENGINEER
SEAL

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
E	80091	60011370
		CONSTR CONTR NO. N40085-12-B-0091
SCALE: AS SHOWN	SPEC No. 05-12-0091	SHEET 26 OF 84

SYM.	PREP'D BY	DATE	APPROVED

ROUTE REFRIGERANT AND SUCTION PIPING ABOVE GROUND ON SOLID CONCRETE BLOCKS, MAXIMUM 4' ON CENTER. RUN PIPING UP EXTERIOR WALL AND PENETRATE SOFFIT INTO ATTIC SPACE. PROVIDE LINE SET COVER. (TYPICAL FOR ALL HEAT PUMPS)

PROVIDE NEW EQUIPMENT PAD

HP-1B HP-2B HP-3B

ROUTE 3/4" CONDENSATE LINE AND OVERFLOW LINE TO 6" ABOVE SPLASH BLOCK. PROVIDE NEW SPLASH BLOCK (TYP OF 2)

CONNECT TO EXISTING 16x16 LOUVER

12x12 UP TO HGI-1 ON ROOF

WH-1

ERV-1

HP-3A

HP-2A

HP-1A

AF-1 ON ROOF

AF-2 ON ROOF

MVD AT CONNECTION

OFFICE 109 · OFFICE 110 · CORRIDOR 108 · HEAD 107 · OFFICE 111 · HEAD 106 · SCIF 112 · MECH 104 · OFFICE 125 · OFFICE 123 · JAN 105 · OFFICE 113 · OFFICE 114 · OFFICE 115 · MAIL 122 · OFFICE 121 · OFFICE 120 · CONFERENCE 119 · CORRIDOR 124 · OFFICE 118 · OFFICE 117 · OFFICE 116

BUILDING 317 MECHANICAL NEW WORK PLAN

1/4"=1'-0" (0' 2' 4' 8')

GENERAL NOTES:

1. THE LOCATION OF ALL DUCT, PIPING AND EQUIPMENT SHALL BE ADJUSTED TO ACCOMMODATE ANTICIPATED OR ENCOUNTERED INTERFERENCES. THESE PLANS ARE PARTIALLY DIAGRAMMATIC AND MAY NOT SHOW MINOR DETAILS AND LOCATIONS.
2. PROVIDE BALANCING DAMPER FOR EACH SUPPLY, RETURN AND EXHAUST BRANCH. BALANCE SYSTEM WITH INTERIOR DOORS OPEN. PROVIDE BALANCING DAMPER FOR EACH OUTSIDE AIR DUCT THAT CONNECTS TO THE RETURN OF EACH AIR HANDLER AND BALANCE TO AIR FLOWS INDICATED ON SCHEDULE.
3. MAXIMUM LENGTH OF ALLOWABLE FLEX DUCT IS 6'. DO NOT MAKE TURNS WITH FLEXIBLE DUCT, USE HARD ELBOWS.
4. PROVIDE 2" MERV 8 FILTER ASSEMBLY IN RETURN DUCT DOWNSTREAM OF THE OUTSIDE AIR CONNECTION.
5. MAINTAIN MANUFACTURER RECOMMENDED CLEARANCE AROUND ALL EQUIPMENT.
6. MOUNT ERV-1 AS CLOSE TO MECHANICAL ROOM CEILING AS POSSIBLE. RELOCATE EXISTING LIGHT FIXTURES AS NECESSARY.

DISCLOSURE OF INFORMATION
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(c) The Contractor agrees to include a similar requirement in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

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M-107B

PROJECT NO. CP12-0091

DEPT OF NAVY — NAVAL FACILITIES ENGINEERING COMMAND

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

HVAC/DHW IMPROVEMENTS, VARIOUS FACILITIES, HADNOT POINT

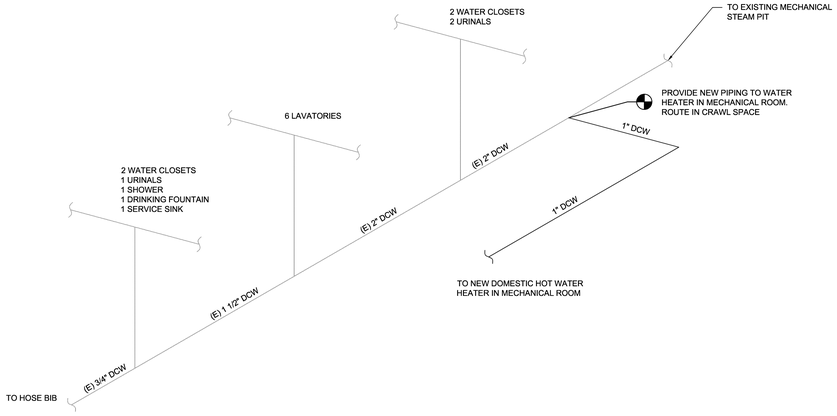
BUILDING 317 MECHANICAL NEW WORK PLAN

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED- PWO OR OICC	DATE
SATISFACTORY TO	DATE

COMMONWEALTH OF VIRGINIA — IOANNIS MASOURAS — Lic. No. 035863 — 8/02/12 — PROFESSIONAL ENGINEER — SEAL

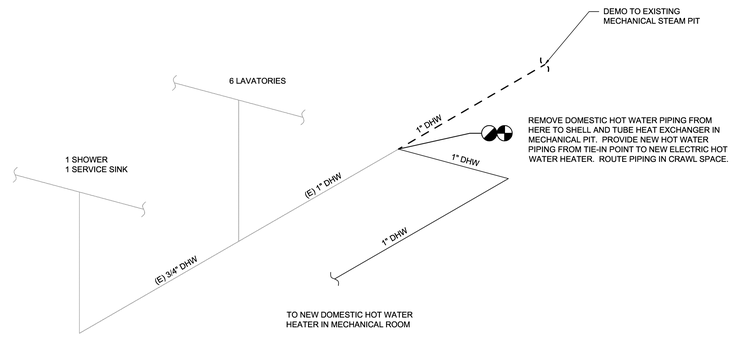
SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
E	80091	60011371
		CONSTR CONTR NO. N40085-12-B-0091
SCALE AS SHOWN	SPEC No. 05-12-0091	SHEET 27 OF 84

SYM.	PREP'D BY	DATE	APPROVED



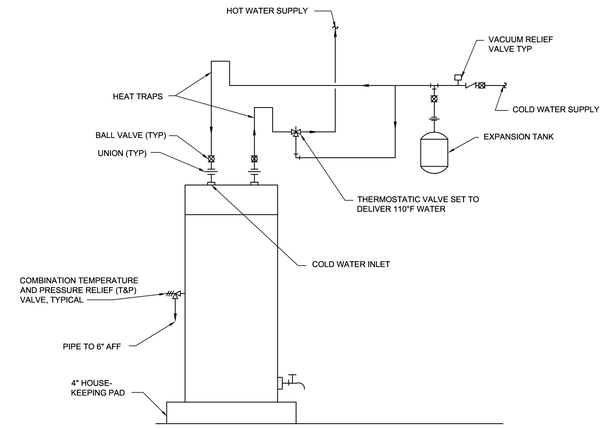
DOMESTIC COLD WATER RISER DIAGRAM

NOT TO SCALE



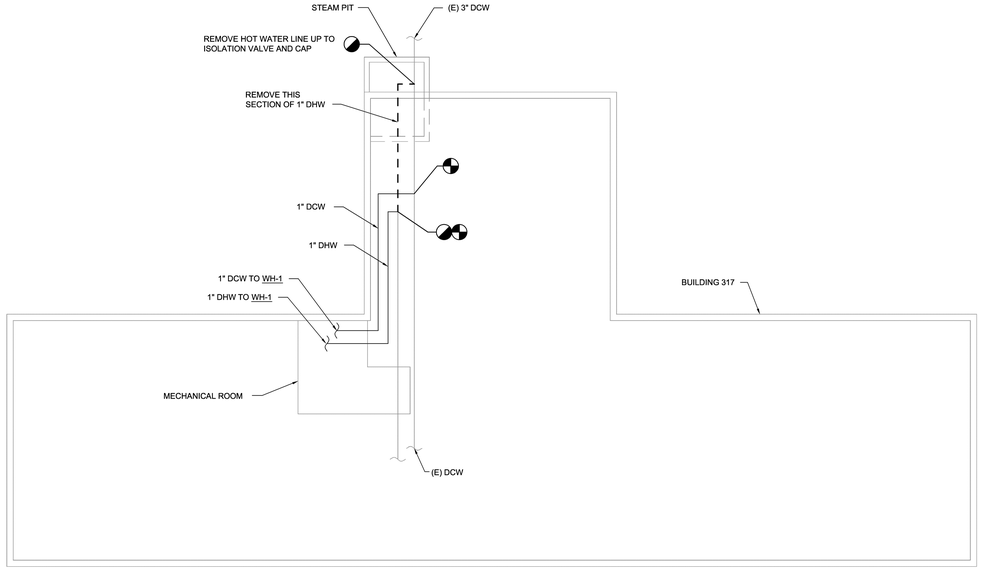
DOMESTIC HOT WATER RISER DIAGRAM

NOT TO SCALE



ELECTRIC WATER HEATER DETAIL

NOT TO SCALE



DOMESTIC WATER SITE PLAN

NOT TO SCALE

PLUMBING NOTES:

1. THE LOCATION OF ALL PIPING AND EQUIPMENT SHALL BE ADJUSTED TO ACCOMMODATE ANTICIPATED OR ENCOUNTERED INTERFERENCES. THESE PLANS ARE PARTIALLY DIAGRAMMATIC AND MAY NOT SHOW MINOR DETAILS AND LOCATIONS.
2. STORE DOMESTIC HOT WATER AT 140 DEG F AND TEMPER TO 110 DEG F BEFORE BEING SUPPLIED TO BUILDING. PROVIDE MIXING VALVE.

DISCLOSURE OF INFORMATION
Contractor shall comply as follows:
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M-107C

PROJECT NO. CP12-0091

DEPT OF NAVY — NAVAL FACILITIES ENGINEERING COMMAND

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

HVAC/DHW IMPROVEMENTS, VARIOUS FACILITIES, HADNOT POINT
BUILDING 317 PLUMBING PLAN, DIAGRAMS & DETAILS

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

COMMONWEALTH OF VIRGINIA
IOANNIS MASOURAS
Lic. No. 035863
8/22/12
PROFESSIONAL ENGINEER
SEAL

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
E	80091	60011372
		CONSTR CONTR NO. N40085-12-B-0091
SCALE: AS SHOWN	SPEC No. 05-12-0091	SHEET 28 OF 84

SYM.	PREP'D BY	DATE	APPROVED

HEAT PUMP SCHEDULE

INDOOR UNIT DESIGNATION			HP-1A	HP-2A	HP-3A
OUTDOOR UNIT DESIGNATION			HP-1B	HP-2B	HP-3B
LOCATION			VARIOUS	VARIOUS	VARIOUS
MINIMUM COMBINED SEER RATING PER ARI			17.0	17.0	17.0
MINIMUM COMBINED EER RATING PER ARI			12.2	12.2	12.2
INDOOR UNIT	EVAPORATOR	TOTAL AIRFLOW (CFM)	1580	1580	1580
		OUTSIDE AIRFLOW (CFM)	140	130	350
		EXTERNAL STATIC PRESSURE (IN-WC)	.6	.6	.6
		TOTAL COOLING CAPACITY (MBH)	47.5	47.5	47.5
		HEAT PUMP HEATING CAPACITY AT 17° F (MBH)	29.2	29.2	29.2
		ELECTRIC HEATING CAPACITY (KW)	5.0	5.0	5.0
	ELECTRICAL	BLOWER MOTOR FLA (A)	9.1	9.1	9.1
		TOTAL MCA (A)	27	27	27
		VOLTAGE	208	208	208
		PHASE	1	1	1
		FREQUENCY (Hz)	60	60	60
BASED ON			LENNOX	LENNOX	LENNOX
INDOOR UNIT MODEL			CBX32MV-048	CBX32MV-048	CBX32MV-048
REFRIGERANT			R-410A	R-410A	R-410A
OUTDOOR UNIT	AMBIENT DESIGN TEMPERATURE (DEG F)		95	95	95
	ELECTRICAL	MINIMUM CIRCUIT AMPACITY (A)	28.5	28.5	28.5
		MAXIMUM OVERCURRENT PROTECTION (A)	45	45	45
		MINIMUM HEATING COP AT 17° F	2.5	2.5	2.5
		MINIMUM HEATING COP AT 47° F	3.32	3.32	3.32
		MINIMUM HEAT PUMP HSPF	8.7	8.7	8.7
		VOLTAGE (V)	208	208	208
		PHASE	1	1	1
		FREQUENCY (Hz)	60	60	60
BASED ON			LENNOX	LENNOX	LENNOX
OUTDOOR SYSTEM MODEL			XP21-048-230	XP21-048-230	XP21-048-230
REMARKS			1, 2 & 3	1, 2 & 3	1, 2 & 3

REMARKS LEGEND

1. PROVIDE CONDENSING UNIT SHUTOFF MOISTURE SENSOR IN AUXILLARY PORT OF INDOOR UNIT DRAIN PAN.
2. PROVIDE SIDE RETURN UNIT STAND.
3. PROVIDE ECM MOTOR ON INDOOR UNIT.

ENERGY RECOVERY VENTILATOR SCHEDULE

DESIGNATION		ERV-1
SUPPLY FAN	TOTAL FAN AIRFLOW (CFM)	620
	EXTERNAL STATIC PRESSURE (IN. WG)	.5
EXHAUST FAN	TOTAL FAN AIRFLOW (CFM)	545
	EXTERNAL STATIC PRESSURE (IN. WG)	.5
ENTHALPY WHEEL	OPERATING OUTSIDE AIRFLOW	620
	OPERATING EXHAUST AIRFLOW	545
	OUTDOOR EAT DB/WB (COOLING)	95/79
	OUTDOOR EAT DB/WB (HEATING)	20/16.6
	EXHAUST EAT DB/WB (COOLING)	75/63
	EXHAUST EAT DB/WB (HEATING)	70/53
	DELIVERED CONDITIONS DB/WB (COOLING)	80.5/67.9
	DELIVERED CONDITIONS DB/WB (HEATING)	53.8/44.6
FILTERS	SUPPLY (MERV)	8
	EXHAUST(MERV)	8
ELECTRICAL	MCA (A)	18.3
	MOCP (A)	25
	VOLTS (V)	115
	PHASE	1
	FREQUENCY (Hz)	60
BASED ON		GREENHECK
MODEL		MINIVENT-750
REMARKS:		1

REMARKS LEGEND:

1. PROVIDE FACTORY MOUNTED CONTROLS FOR UNITS INCLUDING ALL REQUIRED MOTOR STARTERS, PROVIDE FACTORY REMOTE PANEL INCLUDING INDICATION FOR DIRTY FILTER, HAND-OFF-AUTO SWITCH, AND 7 DAY TIME CLOCK.

ELECTRIC DOMESTIC WATER HEATER

DESIGNATION	WH-1
LOCATION	MECH ROOM
STORAGE (GALLONS)	60
TOTAL CAPACITY (KW)	6
RECOVERY RATE @ 90 DEG F (GPH)	27
ELECTRICAL	- -
VOLTS	208
PHASE	1
FREQUENCY (Hz)	60
REMARKS	1

REMARKS LEGEND:

1. PROVIDE 3.2 GALLON EXPANSION TANK OR LARGER SUCH AS AMTROL ST-7 OR SIMILAR.

HOODED GRAVITY INTAKE SCHEDULE

DESIGNATION	HGI-1
USAGE	INTAKE
AIRFLOW (CFM)	620
STATIC PRESSURE (IN H2O)	.028
THROAT AREA (SF)	1.45
THROAT VELOCITY (FPM)	428
THROAT DIAMETER (IN)	16.25
SELECTION BASED ON	GREENHECK
MODEL	GRSI-16
REMARKS	1

REMARKS LEGEND:

1. PROVIDE BIRD SCREEN.

ATTIC FAN SCHEDULE

DESIGNATION	AF-1	AF-2
LOCATION	ROOF	ROOF
USAGE	ATTIC VENTILATION	ATTIC VENTILATION
FAN DATA	- -	- -
AIRFLOW (SCFM)	1700	1700
EXTERNAL SP (IN-H20)	.125	.125
RPM	1725	1725
DRIVE TYPE	DIRECT	DIRECT
MOTOR DATA	- -	- -
HORSEPOWER	1/2	1/2
RPM	1750	1750
VOLTS	115	115
PHASE	60	60
HERTZ	1	1
SELECTION BASED ON	GREENHECK	GREENHECK
MODEL	LD-120-VG	LD-120-VG
REMARKS	1, 2, 3 & 4	1, 2, 3 & 4

REMARKS LEGEND:

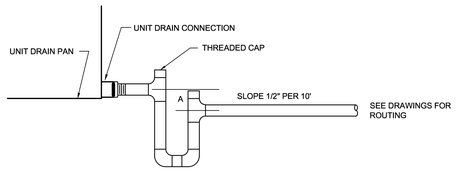
1. PROVIDE FAN WITH INTEGRAL BACK-DRAFT DAMPER, CONTINUOUS DUTY RATED.
2. PROVIDE FAN WITH FACTORY MOUNTED DISCONNECT.
3. PROVIDE FAN WITH ECM MOTOR AND WITH ADJUSTABLE SPEED.
4. PROVIDE ATTIC MOUNTED THERMOSTATIC CONTROL. SET THERMOSTAT TO OPERATE FAN WHEN ATTIC EXCEEDS 85 DEG F.

AIR TERMINAL DEVICE SCHEDULE

DESIGNATION	S1	S2	R1	E1
TYPE	SUPPLY	SUPPLY	RETURN	EXHAUST
NECK SIZE	A=6"	A=6"	24x24	12x12
	B=8"	B=8"		
	C=10"	C=10"		
	D=12"	D=12"		
FRAME STYLE	LAY-IN	LAY-IN	LAY-IN	LAY-IN
AIR PATTERN	4 WAY	4 WAY	- -	- -
MAX NC RATING	25	25	25	25
MATERIAL	STEEL	STEEL	STEEL	STEEL
FINISH	BAKED ENAMEL	BAKED ENAMEL	BAKED ENAMEL	BAKED ENAMEL
BASED ON	PRICE	PRICE	PRICE	PRICE
MODEL	SCD	VPD-HC	81 SERIES	81 SERIES
REMARKS	- -	1	- -	- -

REMARKS LEGEND:

1. PROVIDE A SELF-MODULATING DIFFUSER WITH A COOLING SET POINT OF 75 DEG F (ADJUSTABLE) AND A HEATING SET POINT OF 68 DEG F (ADJUSTABLE).

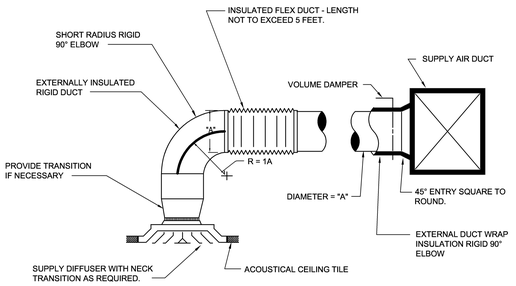


"A" = DIMENSION SHALL BE IN ACCORDANCE WITH MANUFACTURES INSTRUCTIONS, MINIMUM OF 2 INCHES.

NOTE:
CONDENSATE DRAIN PIPE SIZE SHALL BE UNIT DRAIN CONNECTION SIZE

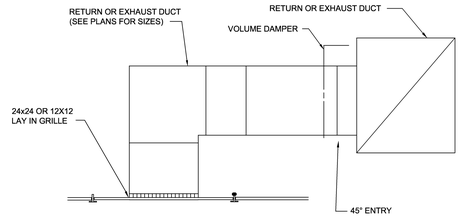
AC DRAIN FOR HEAT PUMP AIR HANDLER NEGATIVE PRESSURE DRAIN PAN

NO SCALE



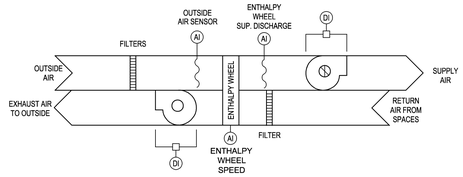
TYPICAL CEILING SUPPLY DIFFUSER CONNECTION

SCALE: NONE



CEILING RETURN/EXHAUST GRILLE

SCALE: NONE



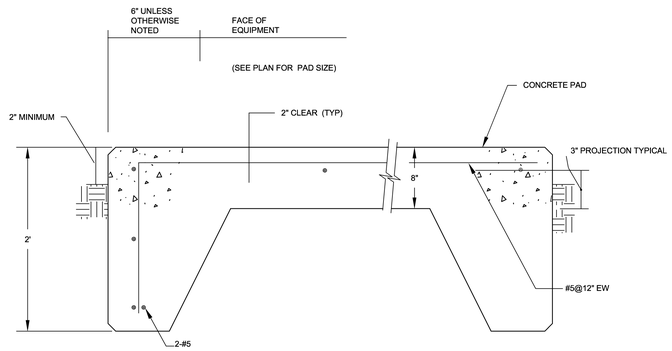
ENERGRY RECOVERY VENTILATOR CONTROL DIAGRAM

SCALE: NONE

SEQUENCE OF OPERATION:

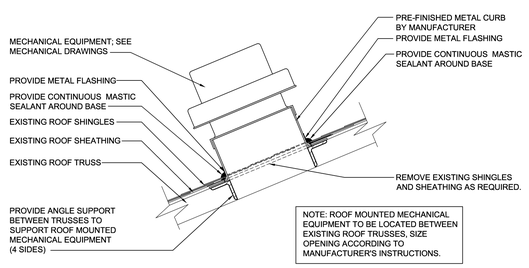
DURING THE OCCUPIED MODE, THE ENERGY RECOVERY VENTILATOR SHALL RUN CONTINUOUSLY. DURING UNOCCUPIED MODE, THE UNIT WILL BE DISABLED WHERE THE SUPPLY AND EXHAUST FANS ARE OFF AND THE WHEEL DOES NOT ROTATE.

DURING OPERATION, DIFFERENTIAL PRESSURE SENSORS SHALL BE USED TO CONFIRM STATUS OF SUPPLY AND EXHAUST FANS. A TACHOMETER SHALL BE USED TO VERIFY WHEEL OPERATION. IF AT ANY TIME THE UNIT IS COMMANDED ON AND EITHER OF THESE THREE OPERATIONAL PIECES OF THE UNIT ARE NOT FUNCTIONING, THE ENTIRE UNIT SHALL BE SHUT DOWN AND AN ALARM SENT.



EXTERIOR EQUIPMENT PAD DETAIL

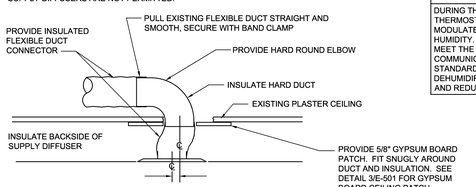
SCALE: NONE



ROOF PENETRATION DETAIL

SCALE: NONE

ENLARGE EXISTING PENETRATIONS IN CEILING TO ALIGN RUNOUTS WITH NEW DIFFUSER/GRILL LOCATIONS. PROVIDE SUPPLY DIFFUSERS AND RETURN GRILLS TO FIT CEILING. PERFORATED FACE SUPPLY DIFFUSERS ARE NOT PERMITTED.



MAXIMUM OFFSET OF 4", EXCEPT WHEN OBSTRUCTED BY TRUSS, MAX OFFSET=7"

TYP. DUCT TAKE OFF DETAIL

SCALE: NONE

SPLIT SYSTEM HEAT PUMP SEQUENCE OF OPERATIONS

DURING THE OCCUPIED MODE, THE SPLIT SYSTEM AIR HANDLER FAN SHALL RUN CONTINUOUSLY TO SATISFY ROOM COMBINED THERMOSTAT AND HUMIDISTAT. THE SUPPLY AIR FAN ECM MOTOR SHALL REMAIN ON DURING OCCUPIED MODE AND THE SPEED SHALL MODULATE ACCORDING TO THE MANUFACTURER'S STANDARD SEQUENCE OF OPERATION TO CONTROL ROOM TEMPERATURE AND LIMIT HUMIDITY. IN THE HEATING MODE, THE THERMOSTAT SHALL NOT ENERGIZE THE AUXILIARY ELECTRIC HEAT IF THE HEAT PUMP MODE CAN MEET THE DEMAND, SUCH AS DURING WARM-UP FROM NIGHT SET BACK USING A SMART RECOVERY CAPABLE THERMOSTAT. FACTORY COMMUNICATING THERMOSTAT SHALL BE PROVIDED WITH 7 DAY PROGRAMMING TO ALLOW NIGHT/WEEKEND SET-BACK, COMMUNICATE ALL STANDARD MANUFACTURER'S ALARMS FROM THE UNITS TO THE THERMOSTAT, AND INDICATE DIRTY FILTER.THERMOSTAT SHALL INCLUDE DEHUMIDIFICATION CONTROL TO INTEGRATE WITH HEAT PUMP CONTROLLER TO REDUCE FAN SPEED TO INCREASE LATENT PERFORMANCE AND REDUCE INDOOR AIR HUMIDITY.

DISCLOSURE OF INFORMATION
Contractor shall comply as follows:

(a) The Contractor shall not release to anyone outside the Contractor's organization any unclassified information, regardless of medium (e.g., film, tape, document), pertaining to any part of this contract or any program related to this contract, unless-
(1) The Contracting Officer has given prior written approval; or
(2) The information is otherwise in the public domain before the date of release.
(b) Requests for approval shall identify the specific information to be released, the medium to be used, and the purpose for the release. The Contractor shall submit its request to the Contracting Officer at least 45 days before the proposed date for release.
(c) The Contractor agrees to include a similar requirement in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

Wiley|Wilson
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M-107D

PROJECT NO. CP12-0091

DEPT OF NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

HVAC/DHW IMPROVEMENTS, VARIOUS FACILITIES, HADNOT POINT
BUILDING 317 SCHEDULES, DETAILS & CONTROLS

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

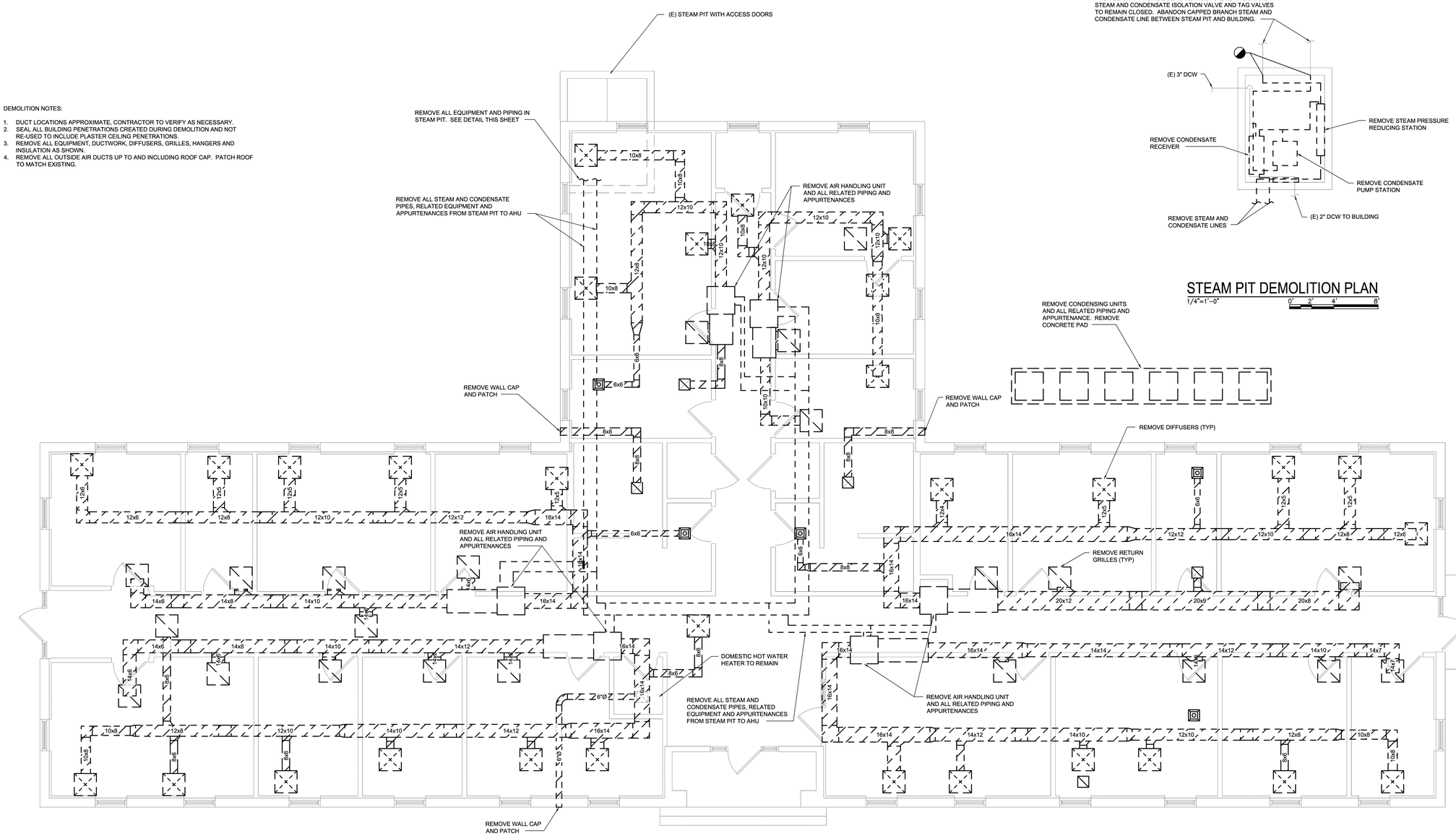
COMMONWEALTH OF VIRGINIA
IOANNIS MASOURAS
Lic. No. 035863
8/22/12
PROFESSIONAL ENGINEER
SEAL

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
E	80091	60011373
		CONSTR CONTR NO. N40085-12-B-0091
SCALE: AS SHOWN	SPEC No. 05-12-0091	SHEET 29 OF 84

SYM.	PREP'D BY	DATE	APPROVED

DEMOLITION NOTES:

1. DUCT LOCATIONS APPROXIMATE, CONTRACTOR TO VERIFY AS NECESSARY.
2. SEAL ALL BUILDING PENETRATIONS CREATED DURING DEMOLITION AND NOT RE-USED TO INCLUDE PLASTER CEILING PENETRATIONS.
3. REMOVE ALL EQUIPMENT, DUCTWORK, DIFFUSERS, GRILLES, HANGERS AND INSULATION AS SHOWN.
4. REMOVE ALL OUTSIDE AIR DUCTS UP TO AND INCLUDING ROOF CAP. PATCH ROOF TO MATCH EXISTING.



STEAM PIT DEMOLITION PLAN

1/4"=1'-0" 0' 2' 4' 8'

BUILDING 400 MECHANICAL DEMOLITION PLAN

1/4"=1'-0" 0' 2' 4' 8'

DISCLOSURE OF INFORMATION
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(c) The Contractor agrees to include a similar requirement in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

Wiley|Wilson
6606 West Broad St., Suite 500
Richmond, Virginia 23230-1717
804.254.7242
wileywilson.com

M-108A

PROJECT NO. CP12-0091

DEPT OF NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

HVAC/DHW IMPROVEMENTS,
VARIOUS FACILITIES,
HADNOT POINT

BUILDING 400 MECHANICAL DEMOLITION PLAN

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

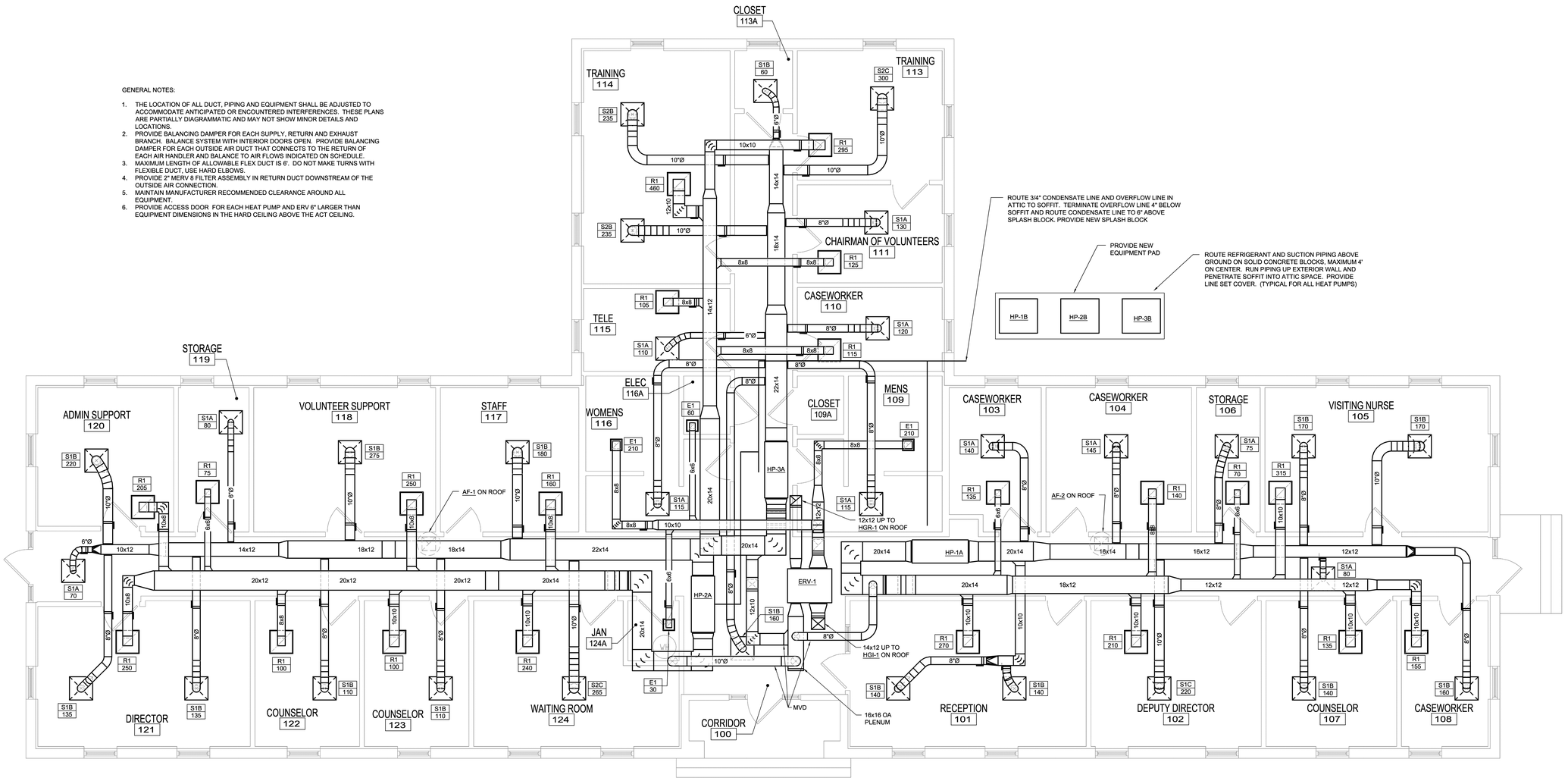
COMMONWEALTH OF VIRGINIA
IOANNIS MASOURAS
Lic. No. 035863
8/22/12
PROFESSIONAL ENGINEER
SEAL

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
E	80091	60011374
		CONSTR CONTR NO. N40085-12-B-0091
SCALE: AS SHOWN	SPEC No. 05-12-0091	SHEET 30 OF 84

SYM.	PREP'D BY	DATE	APPROVED

GENERAL NOTES:

1. THE LOCATION OF ALL DUCT, PIPING AND EQUIPMENT SHALL BE ADJUSTED TO ACCOMMODATE ANTICIPATED OR ENCOUNTERED INTERFERENCES. THESE PLANS ARE PARTIALLY DIAGRAMMATIC AND MAY NOT SHOW MINOR DETAILS AND LOCATIONS.
2. PROVIDE BALANCING DAMPER FOR EACH SUPPLY, RETURN AND EXHAUST BRANCH. BALANCE SYSTEM WITH INTERIOR DOORS OPEN. PROVIDE BALANCING DAMPER FOR EACH OUTSIDE AIR DUCT THAT CONNECTS TO THE RETURN OF EACH AIR HANDLER AND BALANCE TO AIR FLOWS INDICATED ON SCHEDULE.
3. MAXIMUM LENGTH OF ALLOWABLE FLEX DUCT IS 6'. DO NOT MAKE TURNS WITH FLEXIBLE DUCT, USE HARD ELBOWS.
4. PROVIDE 2" MERV 8 FILTER ASSEMBLY IN RETURN DUCT DOWNSTREAM OF THE OUTSIDE AIR CONNECTION.
5. MAINTAIN MANUFACTURER RECOMMENDED CLEARANCE AROUND ALL EQUIPMENT.
6. PROVIDE ACCESS DOOR FOR EACH HEAT PUMP AND ERV 6" LARGER THAN EQUIPMENT DIMENSIONS IN THE HARD CEILING ABOVE THE ACT CEILING.



BUILDING 400 MECHANICAL NEW WORK PLAN

1/4"=1'-0"

0 2 4 8

DISCLOSURE OF INFORMATION
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(2) The information is otherwise in the public domain before the date of release.
(b) Requests for approval shall identify the specific information to be released, the medium to be used, and the purpose for the release. The Contractor shall submit its request to the Contracting Officer at least 45 days before the proposed date for release.
(c) The Contractor agrees to include a similar requirement in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

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Richmond, Virginia 23230-1717
804.254.7242
wileywilson.com

M-108B

PROJECT NO. CP12-0091

DEPT OF NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

HVAC/DHW IMPROVEMENTS,
VARIOUS FACILITIES,
HADNOT POINT
BUILDING 400 MECHANICAL NEW WORK PLAN

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

COMMONWEALTH OF VIRGINIA
IOANNIS MASOURAS
Lic. No. 035863
8/22/12
PROFESSIONAL ENGINEER
SEAL

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
E	80091	60011375
		CONSTR CONTR NO. N40085-12-B-0091
SCALE: AS SHOWN	SPEC No. 05-12-0091	SHEET 31 OF 84

SYM.	PREP'D BY	DATE	APPROVED

HEAT PUMP SCHEDULE

INDOOR UNIT DESIGNATION			HP-1A	HP-2A	HP-3A
OUTDOOR UNIT DESIGNATION			HP-1B	HP-2B	HP-3B
LOCATION			VARIOUS	VARIOUS	VARIOUS
MINIMUM COMBINED SEER RATING PER ARI			17.0	17.0	17.0
MINIMUM COMBINED EER RATING PER ARI			12.2	12.2	12.2
INDOOR UNIT	EVAPORATOR	TOTAL AIRFLOW (CFM)	1580	1580	1580
		OUTSIDE AIRFLOW (CFM)	150	200	480
		EXTERNAL STATIC PRESSURE (IN-WC)	.6	.6	.6
		TOTAL COOLING CAPACITY (MBH)	47.5	47.5	47.5
		HEAT PUMP HEATING CAPACITY AT 17° F (MBH)	29.2	29.2	29.2
		ELECTRIC HEATING CAPACITY (KW)	5.0	5.0	5.0
	ELECTRICAL	BLOWER MOTOR FLA (A)	9.1	9.1	9.1
		TOTAL MCA (A)	27	27	27
		VOLTAGE	208	208	208
		PHASE	1	1	1
		FREQUENCY (Hz)	60	60	60
BASED ON			LENNOX	LENNOX	LENNOX
INDOOR UNIT MODEL			CBX32MV-048	CBX32MV-048	CBX32MV-048
REFRIGERANT			R-410A	R-410A	R-410A
OUTDOOR UNIT	AMBIENT DESIGN TEMPERATURE (DEG F)		95	95	95
	ELECTRICAL	MINIMUM CIRCUIT AMPACITY (A)	28.5	28.5	28.5
		MAXIMUM OVERCURRENT PROTECTION (A)	45	45	45
		MINIMUM HEATING COP AT 17° F	2.5	2.5	2.5
		MINIMUM HEATING COP AT 47° F	3.32	3.32	3.32
		MINIMUM HEAT PUMP HSPF	8.7	8.7	8.7
		VOLTAGE (V)	208	208	208
		PHASE	1	1	1
		FREQUENCY (Hz)	60	60	60
BASED ON			LENNOX	LENNOX	LENNOX
OUTDOOR SYSTEM MODEL			XP21-048-230	XP21-048-230	XP21-048-230
REMARKS			1, 2 & 3	1, 2 & 3	1, 2 & 3

REMARKS LEGEND:

1. PROVIDE CONDENSING UNIT SHUTOFF MOISTURE SENSOR IN AUXILLARY PORT OF INDOOR UNIT DRAIN PAN.
2. PROVIDE SECONDARY DRAIN PAN EXTENDING 4" BEYOND AIR HANDLING UNIT ON ALL SIDES.
3. PROVIDE ECM MOTOR ON INDOOR UNIT.

ENERGY RECOVERY VENTILATOR SCHEDULE

DESIGNATION		ERV-1
SUPPLY FAN	TOTAL FAN AIRFLOW (CFM)	830
	EXTERNAL STATIC PRESSURE (IN. WG)	.25
EXHAUST FAN	TOTAL FAN AIRFLOW (CFM)	510
	EXTERNAL STATIC PRESSURE (IN. WG)	.25
ENTHALPY WHEEL	OPERATING OUTSIDE AIRFLOW	830
	OPERATING EXHAUST AIRFLOW	510
	OUTDOOR EAT DB/WB (COOLING)	95/79
	OUTDOOR EAT DB/WB (HEATING)	20/16.6
	EXHAUST EAT DB/WB (COOLING)	75/63
	EXHAUST EAT DB/WB (HEATING)	70/53
	DELIVERED CONDITIONS DB/WB (COOLING)	83.8/70.9
	DELIVERED CONDITIONS DB/WB (HEATING)	44/37.6
FILTERS	SUPPLY (MERV)	8
	EXHAUST(MERV)	8
ELECTRICAL	MCA (A)	18.3
	MOCP (A)	25
	VOLTS (V)	115
	PHASE	1
	FREQUENCY (Hz)	60
BASED ON		GREENHECK
MODEL		MINIVENT-750
REMARKS:		1

REMARKS LEGEND:

1. PROVIDE FACTORY MOUNTED CONTROLS FOR UNITS INCLUDING ALL REQUIRED MOTOR STARTERS, PROVIDE FACTORY REMOTE PANEL INCLUDING INDICATION FOR DIRTY FILTER, HAND-OFF-AUTO SWITCH, AND 7 DAY TIME CLOCK.

AIR TERMINAL DEVICE SCHEDULE

DESIGNATION	S1	S2	R1	E1
TYPE	SUPPLY	SUPPLY	RETURN	EXHAUST
NECK SIZE	A=6"	A=6"	24x24	12x12
	B=8"	B=8"		
	C=10"	C=10"		
	D=12"	D=12"		
FRAME STYLE	LAY-IN	LAY-IN	LAY-IN	LAY-IN
AIR PATTERN	4 WAY	4 WAY	--	--
MAX NC RATING	25	25	25	25
MATERIAL	STEEL	STEEL	STEEL	STEEL
FINISH	BAKED ENAMEL	BAKED ENAMEL	BAKED ENAMEL	BAKED ENAMEL
BASED ON	PRICE	PRICE	PRICE	PRICE
MODEL	SCD	VPD-HC	81 SERIES	81 SERIES
REMARKS	--	1	--	--

REMARKS LEGEND:

1. PROVIDE A SELF-MODULATING DIFFUSER WITH A COOLING SET POINT OF 75 DEG F (ADJUSTABLE) AND A HEATING SET POINT OF 68 DEG F (ADJUSTABLE).

HOODED GRAVITY INTAKE AND RELIEF SCHEDULE

DESIGNATION	HGI-1	HGR-1
USAGE	INTAKE	RELIEF
AIRFLOW (CFM)	830	510
STATIC PRESSURE (IN H2O)	.034	.047
THROAT AREA (SF)	1.83	.82
THROAT VELOCITY (FPM)	454	622
THROAT DIAMETER (IN)	20.25	12.25
SELECTION BASED ON	GREENHECK	GREENHECK
MODEL	GRSI-18	GRSR-12
REMARKS	1	1

REMARKS LEGEND:

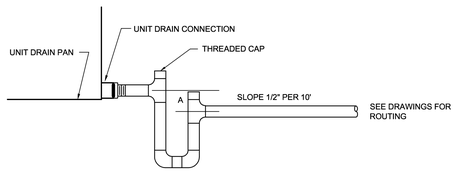
1. PROVIDE BIRD SCREEN.

ATTIC FAN SCHEDULE

DESIGNATION	AF-1	AF-2
LOCATION	ROOF	ROOF
USAGE	ATTIC VENTILATION	ATTIC VENTILATION
FAN DATA	--	--
AIRFLOW (SCFM)	1700	1700
EXTERNAL SP (IN-H20)	.125	.125
RPM	1725	1725
DRIVE TYPE	DIRECT	DIRECT
MOTOR DATA	--	--
HORSEPOWER	1/2	1/2
RPM	1750	1750
VOLTS	115	115
PHASE	60	60
HERTZ	1	1
SELECTION BASED ON	GREENHECK	GREENHECK
MODEL	LD-120-VG	LD-120-VG
REMARKS	1, 2, 3 & 4	1, 2, 3 & 4

REMARKS LEGEND:

1. PROVIDE FAN WITH INTEGRAL BACK-DRAFT DAMPER, CONTINUOUS DUTY RATED.
2. PROVIDE FAN WITH FACTORY MOUNTED DISCONNECT.
3. PROVIDE FAN WITH ECM MOTOR AND WITH ADJUSTABLE SPEED.
4. PROVIDE ATTIC MOUNTED THERMOSTATIC CONTROL. SET THERMOSTAT TO OPERATE FAN WHEN ATTIC EXCEEDS 85 DEG F.

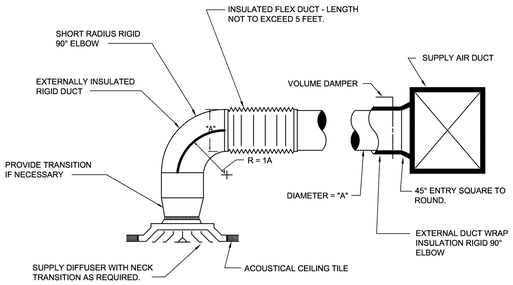


"A" = DIMENSION SHALL BE IN ACCORDANCE WITH MANUFACTURES INSTRUCTIONS, MINIMUM OF 2 INCHES.

NOTE:
CONDENSATE DRAIN PIPE SIZE SHALL BE UNIT DRAIN CONNECTION SIZE

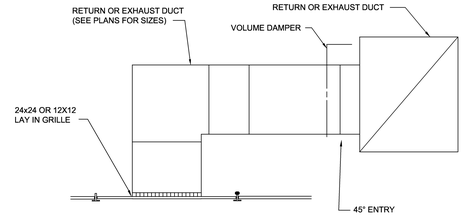
AC DRAIN FOR HEAT PUMP AIR HANDLER NEGATIVE PRESSURE DRAIN PAN

NO SCALE



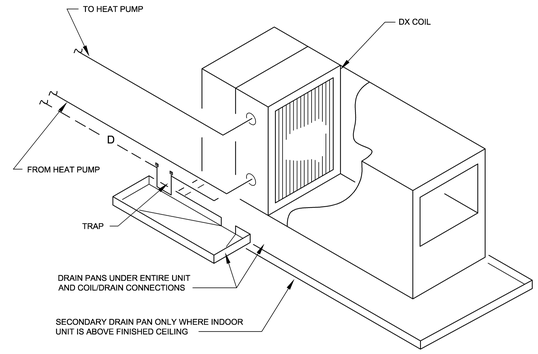
TYPICAL CEILING SUPPLY DIFFUSER CONNECTION

SCALE: NONE



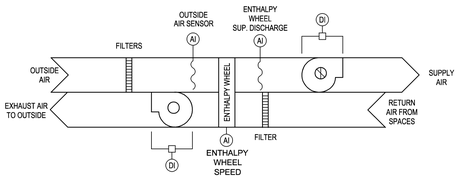
CEILING RETURN/EXHAUST GRILLE

SCALE: NONE



HEAT PUMP INDOOR UNIT DETAIL

SCALE: NONE



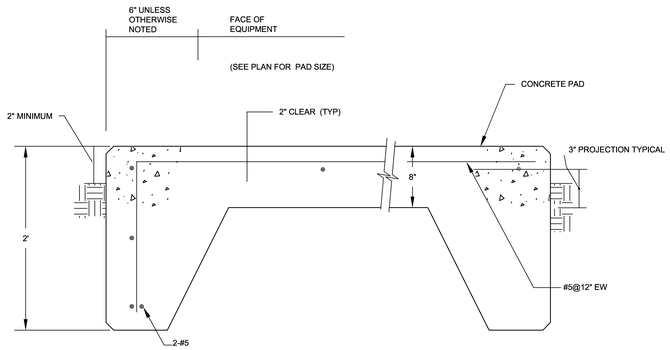
ENERGRY RECOVERY VENTILATOR CONTROL DIAGRAM

SCALE: NONE

SEQUENCE OF OPERATION:

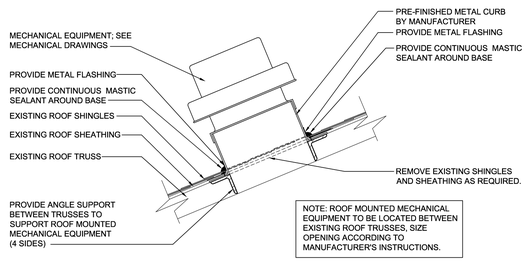
DURING THE OCCUPIED MODE, THE ENERGY RECOVERY VENTILATOR SHALL RUN CONTINUOUSLY. DURING UNOCCUPIED MODE, THE UNIT WILL BE DISABLED WHERE THE SUPPLY AND EXHAUST FANS ARE OFF AND THE WHEEL DOES NOT ROTATE.

DURING OPERATION, DIFFERENTIAL PRESSURE SENSORS SHALL BE USED TO CONFIRM STATUS OF SUPPLY AND EXHAUST FANS. A TACHOMETER SHALL BE USED TO VERIFY WHEEL OPERATION. IF AT ANY TIME THE UNIT IS COMMANDED ON AND EITHER OF THESE THREE OPERATIONAL PIECES OF THE UNIT ARE NOT FUNCTIONING, THE ENTIRE UNIT SHALL BE SHUT DOWN AND AN ALARM SENT.



EXTERIOR EQUIPMENT PAD DETAIL

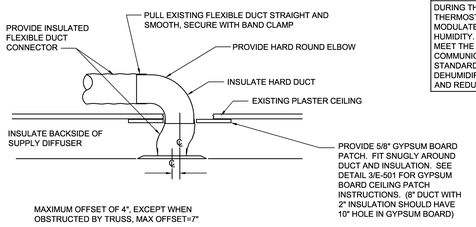
SCALE: NONE



ROOF PENETRATION DETAIL

SCALE: NONE

ENLARGE EXISTING PENETRATIONS IN CEILING TO ALIGN RUNOUTS WITH NEW DIFFUSER/GRILL LOCATIONS. PROVIDE SUPPLY DIFFUSERS AND RETURN GRILLS TO FIT CEILING. PERFORATED FACE SUPPLY DIFFUSERS ARE NOT PERMITTED.



MAXIMUM OFFSET OF 4", EXCEPT WHEN OBSTRUCTED BY TRUSS, MAX OFFSET=7"

TYP. DUCT TAKE OFF DETAIL

SCALE: NONE

SPLIT SYSTEM HEAT PUMP SEQUENCE OF OPERATIONS

DURING THE OCCUPIED MODE, THE SPLIT SYSTEM AIR HANDLER FAN SHALL RUN CONTINUOUSLY TO SATISFY ROOM COMBINED THERMOSTAT AND HUMIDISTAT. THE SUPPLY AIR FAN ECM MOTOR SHALL REMAIN ON DURING OCCUPIED MODE AND THE SPEED SHALL MODULATE ACCORDING TO THE MANUFACTURER'S STANDARD SEQUENCE OF OPERATION TO CONTROL ROOM TEMPERATURE AND LIMIT HUMIDITY. IN THE HEATING MODE, THE THERMOSTAT SHALL NOT ENERGIZE THE AUXILIARY ELECTRIC HEAT IF THE HEAT PUMP MODE CAN MEET THE DEMAND, SUCH AS DURING WARM-UP FROM NIGHT SET BACK USING A SMART RECOVERY CAPABLE THERMOSTAT. FACTORY COMMUNICATING THERMOSTAT SHALL BE PROVIDED WITH 7 DAY PROGRAMMING TO ALLOW NIGHT/WEEKEND SET-BACK, COMMUNICATE ALL STANDARD MANUFACTURER'S ALARMS FROM THE UNITS TO THE THERMOSTAT, AND INDICATE DIRTY FILTER.THERMOSTAT SHALL INCLUDE DEHUMIDIFICATION CONTROL TO INTEGRATE WITH HEAT PUMP CONTROLLER TO REDUCE FAN SPEED TO INCREASE LATENT PERFORMANCE AND REDUCE INDOOR AIR HUMIDITY.

DISCLOSURE OF INFORMATION
Contractor shall comply as follows:

(a) The Contractor shall not release to anyone outside the Contractor's organization any unclassified information, regardless of medium (e.g., film, tape, document), pertaining to any part of this contract or any program related to this contract, unless-

(1) The Contracting Officer has given prior written approval; or

(2) The information is otherwise in the public domain before the date of release.

(b) Requests for approval shall identify the specific information to be released, the medium to be used, and the purpose for the release. The Contractor shall submit its request to the Contracting Officer at least 45 days before the proposed date for release.

(c) The Contractor agrees to include a similar requirement in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

Wiley|Wilson
6606 West Broad St., Suite 500
Richmond, Virginia 23230-1717
804.254.7242
wileywilson.com

M-108C

PROJECT NO. CP12-0091

DEPT OF NAVY — NAVAL FACILITIES ENGINEERING COMMAND

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

HVAC/DHW IMPROVEMENTS, VARIOUS FACILITIES, HADNOT POINT
BUILDING 400 SCHEDULES, DETAILS & CONTROLS

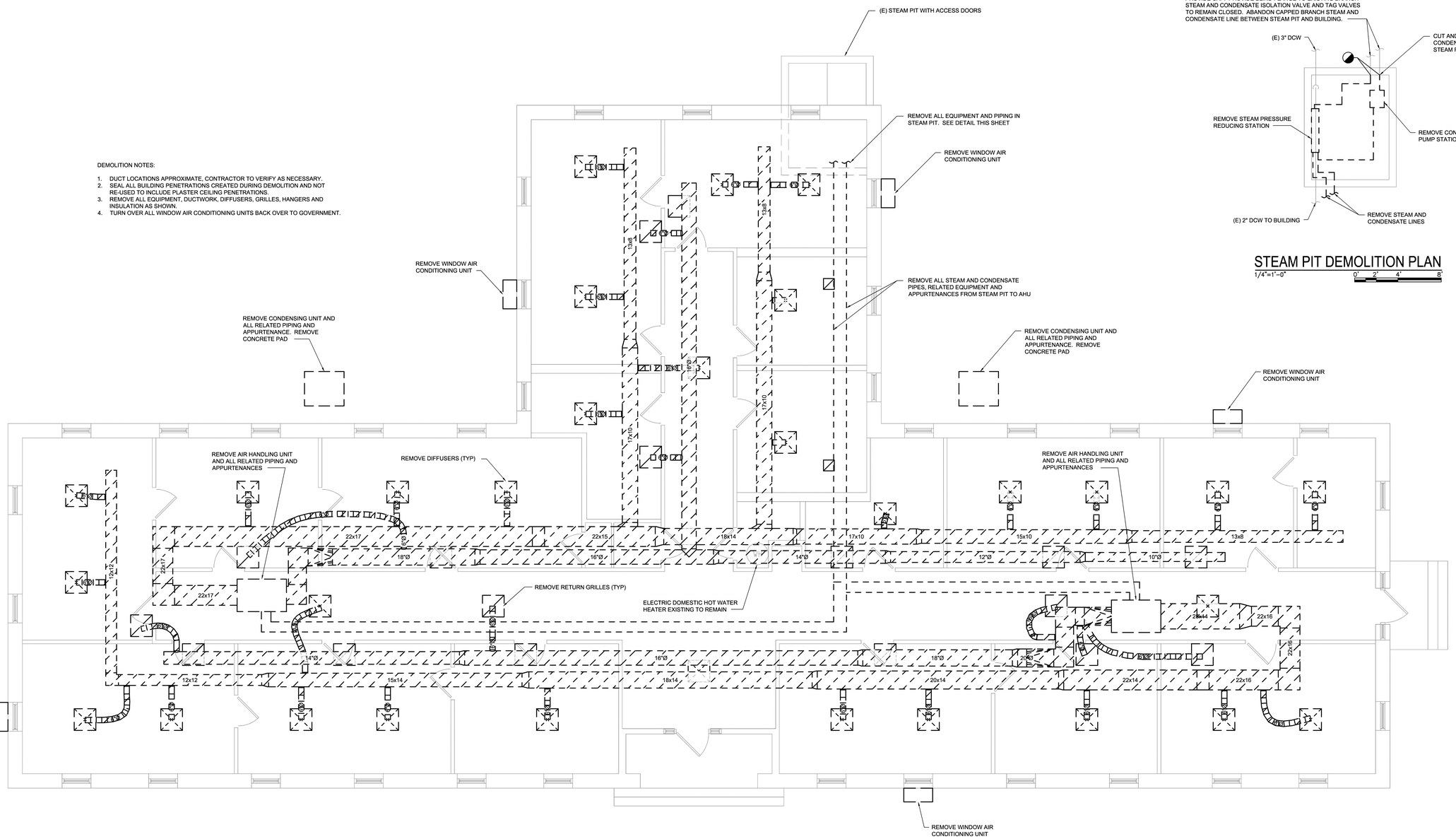
SEAL: COMMONWEALTH OF VIRGINIA — IOANNIS MASOURAS — Lic. No. 035863 — 8/22/12 — PROFESSIONAL ENGINEER

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
E	80091	60011376
		CONSTR. CONTR NO. N40085-12-B-0091
SCALE: AS SHOWN	SPEC No. 05-12-0091	SHEET 32 OF 84

SYM.	PREP'D BY	DATE	APPROVED

DEMOLITION NOTES:

1. DUCT LOCATIONS APPROXIMATE, CONTRACTOR TO VERIFY AS NECESSARY.
2. SEAL ALL BUILDING PENETRATIONS CREATED DURING DEMOLITION AND NOT RE-USED TO INCLUDE PLASTER CEILING PENETRATIONS.
3. REMOVE ALL EQUIPMENT, DUCTWORK, DIFFUSERS, GRILLES, HANGERS AND INSULATION AS SHOWN.
4. TURN OVER ALL WINDOW AIR CONDITIONING UNITS BACK OVER TO GOVERNMENT.



BUILDING 419 MECHANICAL DEMOLITION PLAN

1/4"=1'-0" 0' 2' 4' 8'

STEAM PIT DEMOLITION PLAN

1/4"=1'-0" 0' 2' 4' 8'

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M-109A

PROJECT NO. CP12-0091

DEPT OF NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

HVAC/DHW IMPROVEMENTS,
VARIOUS FACILITIES,
HADNOT POINT
BUILDING 419 MECHANICAL DEMOLITION PLAN

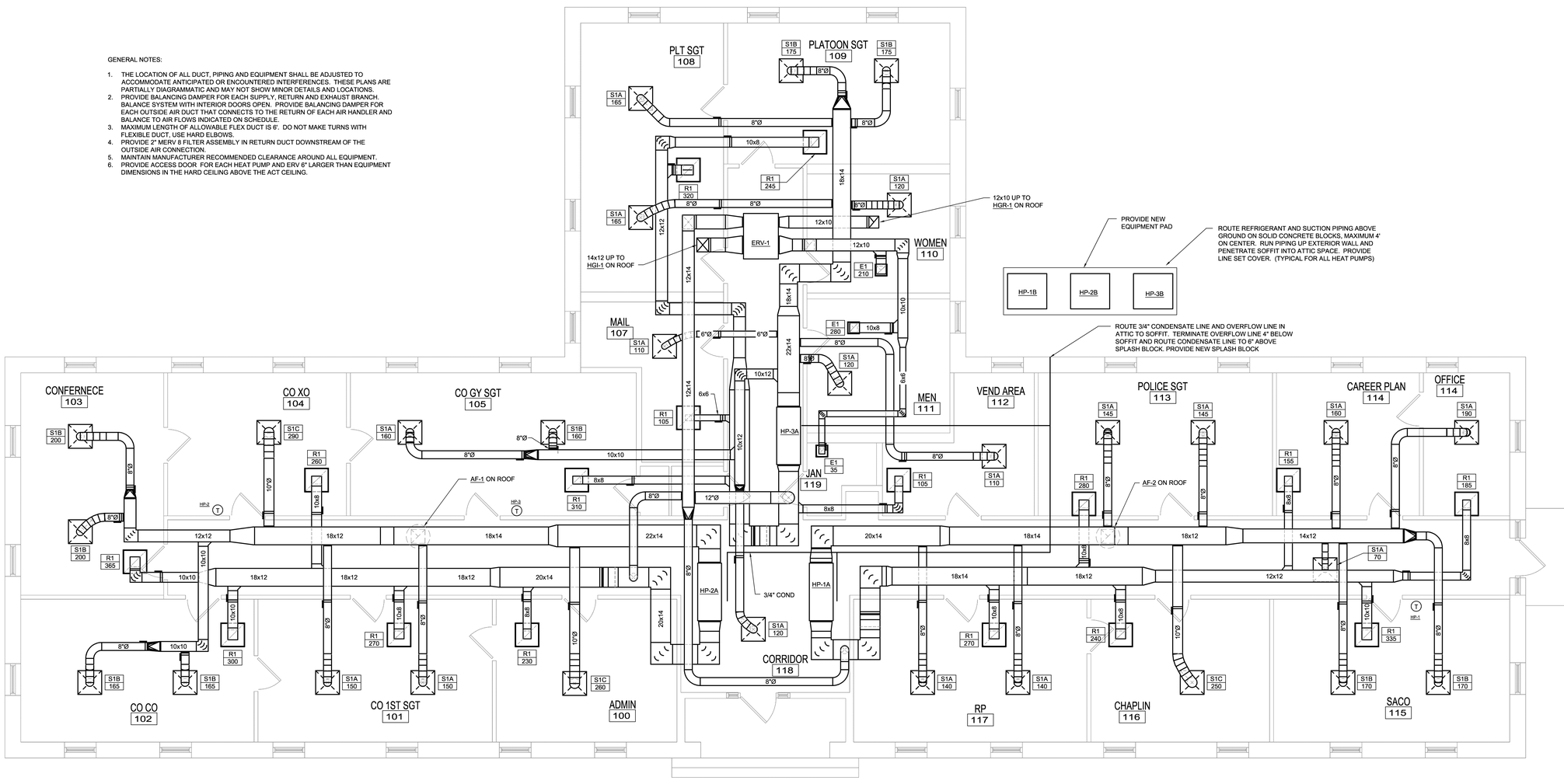
COMMONWEALTH OF VIRGINIA
IOANNIS MASOURAS
Lic. No. 035863
8/22/12
PROFESSIONAL ENGINEER
SEAL

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
E	80091	60011377
		CONSTR CONTR NO. N40085-12-B-0091
SCALE: AS SHOWN	SPEC No. 05-12-0091	SHEET 33 OF 84

SYM.	PREP'D BY	DATE	APPROVED

GENERAL NOTES:

1. THE LOCATION OF ALL DUCT, PIPING AND EQUIPMENT SHALL BE ADJUSTED TO ACCOMMODATE ANTICIPATED OR ENCOUNTERED INTERFERENCES. THESE PLANS ARE PARTIALLY DIAGRAMMATIC AND MAY NOT SHOW MINOR DETAILS AND LOCATIONS.
2. PROVIDE BALANCING DAMPER FOR EACH SUPPLY, RETURN AND EXHAUST BRANCH. BALANCE SYSTEM WITH INTERIOR DOORS OPEN. PROVIDE BALANCING DAMPER FOR EACH OUTSIDE AIR DUCT THAT CONNECTS TO THE RETURN OF EACH AIR HANDLER AND BALANCE TO AIR FLOWS INDICATED ON SCHEDULE.
3. MAXIMUM LENGTH OF ALLOWABLE FLEX DUCT IS 6'. DO NOT MAKE TURNS WITH FLEXIBLE DUCT, USE HARD ELBOWS.
4. PROVIDE 2" MERV 8 FILTER ASSEMBLY IN RETURN DUCT DOWNSTREAM OF THE OUTSIDE AIR CONNECTION.
5. MAINTAIN MANUFACTURER RECOMMENDED CLEARANCE AROUND ALL EQUIPMENT.
6. PROVIDE ACCESS DOOR FOR EACH HEAT PUMP AND ERV 6" LARGER THAN EQUIPMENT DIMENSIONS IN THE HARD CEILING ABOVE THE ACT CEILING.



BUILDING 419 MECHANICAL NEW WORK PLAN

1/4"=1'-0"

0' 2' 4' 8'

DISCLOSURE OF INFORMATION
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M-109B

PROJECT NO. CP12-0091

DEPT OF NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

HVAC/DHW IMPROVEMENTS, VARIOUS FACILITIES, HADNOT POINT
BUILDING 419 MECHANICAL NEW WORK PLAN

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

COMMONWEALTH OF VIRGINIA
IOANNIS MASOURAS
Lic. No. 035863
8/22/12
PROFESSIONAL ENGINEER
SEAL

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO.
E	80091	60011378
		CONSTR CONTR NO. N40085-12-B-0091
SCALE: AS SHOWN	SPEC No. 05-12-0091	SHEET 34 OF 84

SYM.	PREP'D BY	DATE	APPROVED

HEAT PUMP SCHEDULE

INDOOR UNIT DESIGNATION			HP-1A	HP-2A	HP-3A
OUTDOOR UNIT DESIGNATION			HP-1B	HP-2B	HP-3B
LOCATION			VARIOUS	VARIOUS	VARIOUS
MINIMUM COMBINED SEER RATING PER ARI			17.0	17.0	17.0
MINIMUM COMBINED EER RATING PER ARI			12.2	12.2	12.2
INDOOR UNIT	EVAPORATOR	TOTAL AIRFLOW (CFM)	1580	1580	1580
		OUTSIDE AIRFLOW (CFM)	115	155	495
		EXTERNAL STATIC PRESSURE (IN-WC)	.6	.6	.6
		TOTAL COOLING CAPACITY (MBH)	47.5	47.5	47.5
		HEAT PUMP HEATING CAPACITY AT 17° F (MBH)	29.2	29.2	29.2
		ELECTRIC HEATING CAPACITY (KW)	5.0	5.0	5.0
	ELECTRICAL	BLOWER MOTOR FLA (A)	9.1	9.1	9.1
		TOTAL MCA (A)	27	27	27
		VOLTAGE	208	208	208
		PHASE	1	1	1
		FREQUENCY (Hz)	60	60	60
BASED ON			LENNOX	LENNOX	LENNOX
INDOOR UNIT MODEL			CBX32MV-048	CBX32MV-048	CBX32MV-048
REFRIGERANT			R-410A	R-410A	R-410A
OUTDOOR UNIT	AMBIENT DESIGN TEMPERATURE (DEG F)		95	95	95
	ELECTRICAL	MINIMUM CIRCUIT AMPACITY (A)	28.5	28.5	28.5
		MAXIMUM OVERCURRENT PROTECTION (A)	45	45	45
		MINIMUM HEATING COP AT 17° F	2.5	2.5	2.5
		MINIMUM HEATING COP AT 47° F	3.32	3.32	3.32
		MINIMUM HEAT PUMP HSPF	8.7	8.7	8.7
		VOLTAGE (V)	208	208	208
		PHASE	1	1	1
		FREQUENCY (Hz)	60	60	60
BASED ON			LENNOX	LENNOX	LENNOX
OUTDOOR SYSTEM MODEL			XP21-048-230	XP21-048-230	XP21-048-230
REMARKS			1, 2 & 3	1, 2 & 3	1, 2 & 3

REMARKS LEGEND:

1. PROVIDE CONDENSING UNIT SHUTOFF MOISTURE SENSOR IN AUXILLARY PORT OF INDOOR UNIT DRAIN PAN.
2. PROVIDE SECONDARY DRAIN PAN EXTENDING 4" BEYOND AIR HANDLING UNIT ON ALL SIDES.
3. PROVIDE ECM MOTOR ON INDOOR UNIT.

ENERGY RECOVERY VENTILATOR SCHEDULE

DESIGNATION		ERV-1
SUPPLY FAN	TOTAL FAN AIRFLOW (CFM)	765
	EXTERNAL STATIC PRESSURE (IN. WG)	0.5
EXHAUST FAN	TOTAL FAN AIRFLOW (CFM)	525
	EXTERNAL STATIC PRESSURE (IN. WG)	0.5
ENTHALPY WHEEL	OPERATING OUTSIDE AIRFLOW	765
	OPERATING EXHAUST AIRFLOW	525
	OUTDOOR EAT DB/WB (COOLING)	95/79
	OUTDOOR EAT DB/WB (HEATING)	20/16.6
	EXHAUST EAT DB/WB (COOLING)	75/63
	EXHAUST EAT DB/WB (HEATING)	70/53
	DELIVERED CONDITIONS DB/WB (COOLING)	82.9/70.1
	DELIVERED CONDITIONS DB/WB (HEATING)	46.8/39.6
FILTERS	SUPPLY (MERV)	8
	EXHAUST(MERV)	8
ELECTRICAL	MCA (A)	18.3
	MOCP (A)	25
	VOLTS (V)	115
	PHASE	1
	FREQUENCY (Hz)	60
BASED ON		GREENHECK
MODEL		MINIVENT-750
REMARKS:		1

REMARKS LEGEND:

1. PROVIDE FACTORY MOUNTED CONTROLS FOR UNITS INCLUDING ALL REQUIRED MOTOR STARTERS, PROVIDE FACTORY REMOTE PANEL INCLUDING INDICATION FOR DIRTY FILTER, HAND-OFF-AUTO SWITCH, AND 7 DAY TIME CLOCK.

HOODED GRAVITY INTAKE AND RELIEF SCHEDULE

DESIGNATION	HGI-1	HGR-1
USAGE	INTAKE	RELIEF
AIRFLOW (CFM)	765	525
STATIC PRESSURE (IN H2O)	.043	.05
THROAT AREA (SF)	1.45	.82
THROAT VELOCITY (FPM)	528	640
THROAT DIAMETER (IN)	16.25	12.25
SELECTION BASED ON	GREENHECK	GREENHECK
MODEL	GRSI-16	GRSR-12
REMARKS	1	1

REMARKS LEGEND:

1. PROVIDE BIRD SCREEN.

ATTIC FAN SCHEDULE

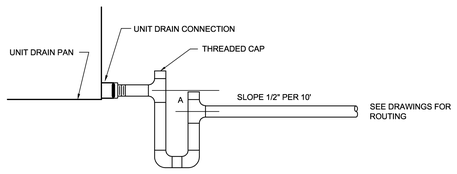
DESIGNATION	AF-1	AF-2
LOCATION	ROOF	ROOF
USAGE	ATTIC VENTILATION	ATTIC VENTILATION
FAN DATA	- -	- -
AIRFLOW (SCFM)	1700	1700
EXTERNAL SP (IN-H20)	.125	.125
RPM	1725	1725
DRIVE TYPE	DIRECT	DIRECT
MOTOR DATA	- -	- -
HORSEPOWER	1/2	1/2
RPM	1750	1750
VOLTS	115	115
PHASE	60	60
HERTZ	1	1
SELECTION BASED ON	GREENHECK	GREENHECK
MODEL	LD-120-VG	LD-120-VG
REMARKS	1, 2, 3 & 4	1, 2, 3 & 4

REMARKS LEGEND:

1. PROVIDE FAN WITH INTEGRAL BACK-DRAFT DAMPER, CONTINUOUS DUTY RATED.
2. PROVIDE FAN WITH FACTORY MOUNTED DISCONNECT.
3. PROVIDE FAN WITH ECM MOTOR AND WITH ADJUSTABLE SPEED.
4. PROVIDE ATTIC MOUNTED THERMOSTATIC CONTROL. SET THERMOSTAT TO OPERATE FAN WHEN ATTIC EXCEEDS 85 DEG F.

AIR TERMINAL DEVICE SCHEDULE

DESIGNATION	S1	R1	E1
TYPE	SUPPLY	RETURN	EXHAUST
NECK SIZE	A=6"	24x24	12x12
	B=8"		
	C=10"		
	D=12"		
FRAME STYLE	LAY-IN	LAY-IN	LAY-IN
AIR PATTERN	4 WAY	- -	- -
MAX NC RATING	20	20	20
MATERIAL	STEEL	STEEL	STEEL
FINISH	BAKED ENAMEL	BAKED ENAMEL	BAKED ENAMEL
BASED ON	PRICE	PRICE	PRICE
MODEL	SCD	81 SERIES	81 SERIES

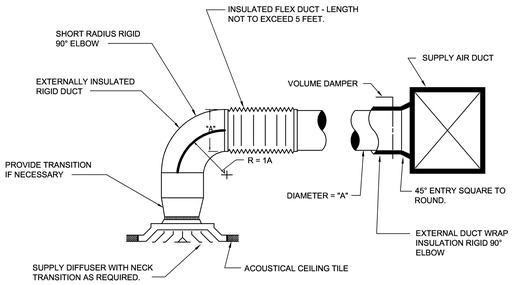


"A" = DIMENSION SHALL BE IN ACCORDANCE WITH MANUFACTURES INSTRUCTIONS, MINIMUM OF 2 INCHES.

NOTE:
CONDENSATE DRAIN PIPE SIZE SHALL BE UNIT DRAIN CONNECTION SIZE

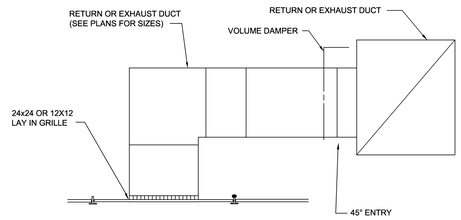
AC DRAIN FOR HEAT PUMP AIR HANDLER NEGATIVE PRESSURE DRAIN PAN

NO SCALE



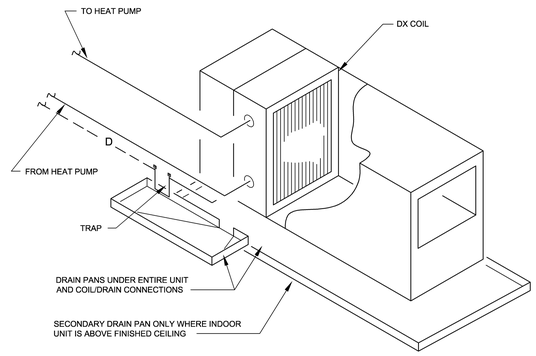
TYPICAL CEILING SUPPLY DIFFUSER CONNECTION

SCALE: NONE



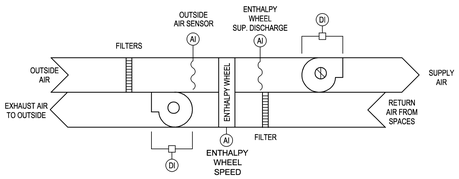
CEILING RETURN/EXHAUST GRILLE

SCALE: NONE



HEAT PUMP INDOOR UNIT DETAIL

SCALE: NONE



ENERGRY RECOVERY VENTILATOR CONTROL DIAGRAM

SCALE: NONE

SEQUENCE OF OPERATION:

DURING THE OCCUPIED MODE, THE ENERGY RECOVERY VENTILATOR SHALL RUN CONTINUOUSLY. DURING UNOCCUPIED MODE, THE UNIT WILL BE DISABLED WHERE THE SUPPLY AND EXHAUST FANS ARE OFF AND THE WHEEL DOES NOT ROTATE.

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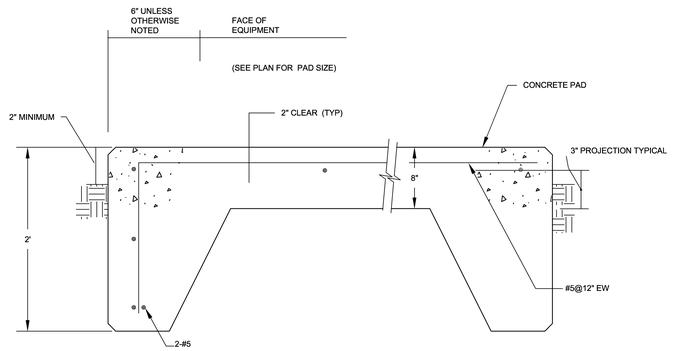
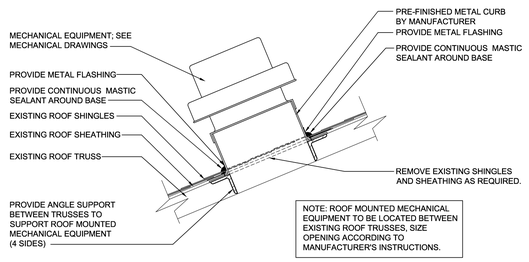


EXTERIOR EQUIPMENT PAD DETAIL

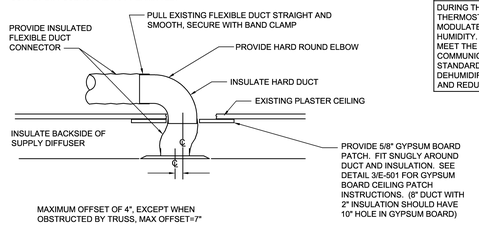
SCALE: NONE



ROOF PENETRATION DETAIL

SCALE: NONE

ENLARGE EXISTING PENETRATIONS IN CEILING TO ALIGN RUNOUTS WITH NEW DIFFUSER/GRILL LOCATIONS. PROVIDE SUPPLY DIFFUSERS AND RETURN GRILLS TO FIT CEILING. PERFORATED FACE SUPPLY DIFFUSERS ARE NOT PERMITTED.



MAXIMUM OFFSET OF 4", EXCEPT WHEN OBSTRUCTED BY TRUSS, MAX OFFSET=7"

TYP. DUCT TAKE OFF DETAIL

SCALE: NONE

SPLIT SYSTEM HEAT PUMP SEQUENCE OF OPERATIONS

DURING THE OCCUPIED MODE, THE SPLIT SYSTEM AIR HANDLER FAN SHALL RUN CONTINUOUSLY TO SATISFY ROOM COMBINED THERMOSTAT AND HUMIDISTAT. THE SUPPLY AIR FAN ECM MOTOR SHALL REMAIN ON DURING OCCUPIED MODE AND THE SPEED SHALL MODULATE ACCORDING TO THE MANUFACTURER'S STANDARD SEQUENCE OF OPERATION TO CONTROL ROOM TEMPERATURE AND LIMIT HUMIDITY. IN THE HEATING MODE, THE THERMOSTAT SHALL NOT ENERGIZE THE AUXILIARY ELECTRIC HEAT IF THE HEAT PUMP MODE CAN MEET THE DEMAND, SUCH AS DURING WARM-UP FROM NIGHT SET BACK USING A SMART RECOVERY CAPABLE THERMOSTAT. FACTORY COMMUNICATING THERMOSTAT SHALL BE PROVIDED WITH 7 DAY PROGRAMMING TO ALLOW NIGHT/WEEKEND SET-BACK, COMMUNICATE ALL STANDARD MANUFACTURER'S ALARMS FROM THE UNITS TO THE THERMOSTAT, AND INDICATE DIRTY FILTER.THERMOSTAT SHALL INCLUDE DEHUMIDIFICATION CONTROL TO INTEGRATE WITH HEAT PUMP CONTROLLER TO REDUCE FAN SPEED TO INCREASE LATENT PERFORMANCE AND REDUCE INDOOR AIR HUMIDITY.

DISCLOSURE OF INFORMATION
Contractor shall comply as follows:

(a) The Contractor shall not release to anyone outside the Contractor's organization any unclassified information, regardless of medium (e.g., film, tape, document), pertaining to any part of this contract or any program related to this contract, unless-

(1) The Contracting Officer has given prior written approval; or

(2) The information is otherwise in the public domain before the date of release.

(b) Requests for approval shall identify the specific information to be released, the medium to be used, and the purpose for the release. The Contractor shall submit its request to the Contracting Officer at least 45 days before the proposed date for release.

(c) The Contractor agrees to include a similar requirement in each subcontract under this contract. Subcontractors shall submit requests for authorization to release through the prime contractor to the Contracting Officer.

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M-109C

PROJECT NO. CP12-0091

DEPT OF NAVY — NAVAL FACILITIES ENGINEERING COMMAND

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

HVAC/DHW IMPROVEMENTS, VARIOUS FACILITIES, HADNOT POINT
BUILDING 419 SCHEDULES, DETAILS & CONTROLS

DES.	IM
DR.	SWL
CHK.	JHE
SUBMITTED BY:	
DESIGN DIR.	
APPROVED: PWO OR OICC	DATE
SATISFACTORY TO	DATE

SIZE: E | CODE IDENT NO.: 80091 | NAVFAC DRAWING NO.: 60011379

CONSTR. CONTR NO.: N40085-12-B-0091

SCALE: AS SHOWN | SPEC No.: 05-12-0091 | SHEET 35 OF 84

SEAL: COMMONWEALTH OF VIRGINIA — IOANNIS MASOURAS — Lic. No. 035863 — 8/22/12 — PROFESSIONAL ENGINEER