

VRF SYSTEM

<u>DESCRIPTION</u>: SPLIT SYSTEM, VARIABLE REFRIGERANT HEAT RECOVERY SYSTEM CONSISTING OF MULTIPLE INDOOR AIR HANDLERS WITH MULTIPLE SPEED AIR VOLUME, UNDER CONTROL OF DDC SYSTEM. EACH INDOOR UNIT MAY BE IN HEATING OR COOLING MODE INDEPENDENT OF THE OTHER INDOOR UNITS.

HEAT PUMP INDOOR AIR HANDLER

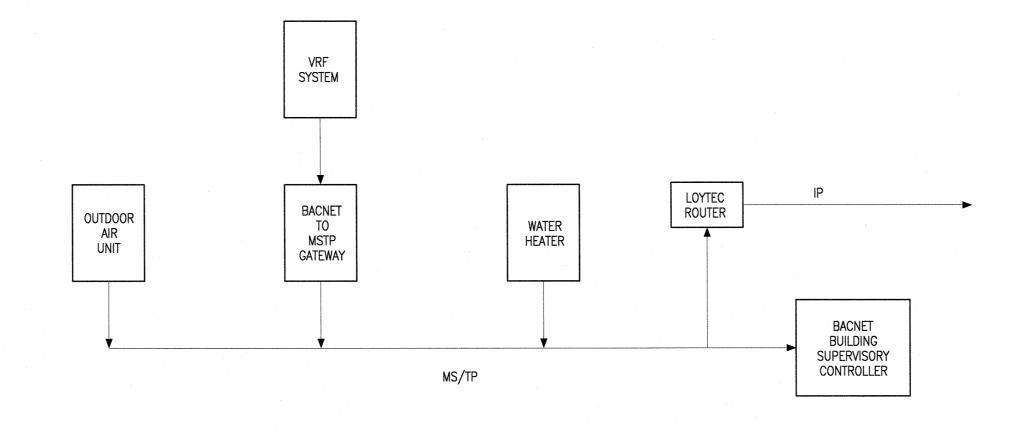
EACH INDOOR UNIT SHALL BE SCHEDULED ON BY THE BMS SYSTEM AT THE OCCUPIED TIMES DEFINED BY THE OWNER.

THE INDOOR UNITS SHALL BE SET TO AUTO MODE DURING OCCUPIED TIMES. DURING UNOCCUPIED TIMES THE INDOOR UNITS SHALL BE SET TO HEAT OR COOL BASED ON OUTSIDE AIR ENTHALPY CONDITIONS.

THE BMS SHALL SET THE OCCUPIED AND UNOCCUPIED TEMPERATURE SET-POINTS. BMS SHALL GLOBALLY SET THIS AS A SINGLE HEATING/COOLING SET POINT, WITH AN AMBIENT RESET, 70F AT 50F AMBIENT, AND 76F AT 80F AMBIENT, LINEAR IN BETWEEN.

DURING UNOCCUPIED TIMES THE BMS SHALL SEND THE OFF COMMAND TO THE INDOOR UNIT AT THE START OF UNOCCUPIED TIMES AND EVERY TWO HOURS THEREAFTER TO REINFORCE THE SETBACK CONDITIONS. THE BMS SHALL MONITOR THE ROOM TEMPERATURE AT THE REMOTE CONTROLLER IN THE SPACE AND COMMAND THE UNIT ON IF THE OWNER SPECIFIED UNOCCUPIED LIMITS ARE EXCEED. THE BMS SHALL SEND THE COOL MODE COMMAND WHEN THE TEMPERATURE UPPER LIMIT IS EXCEEDED. THE BMS SHALL SEND THE TEMPERATURE UPPER OR LOWER LIMIT AS THE SPACE TEMPERATURE SET-POINT DURING UNOCCUPIED TIME.

	SOFTWAR	RE POINTS			ALARMS	
INDOOR UNIT CONTROL POINT DESCRIPTION	NETWORK VARIABLE INPUT	NETWORK VARIABLE OUTPUT	DISPLAY	HIGH LIMIT	LOW LIMIT	ABNORMALITY
ON/OFF	x					
SET MODE	X					
SET TEMPERATURE	x		х			
MODE STATE		x	х			
ROOM TEMPERATURE		x	х	x	х	
FAN SPEED STATE		. X	х			
INDOOR UNIT NOTIFY		x	x			
ERROR CODE		х	х			x



DEDICATED OUTSIDE AIR SYSTEM UNIT <u>DESCRIPTION</u>: DEDICATED OUTSIDE AIR SYSTEM UNIT SUPPLYING 100% OUTDOOR AIR DIRECTLY TO SPACE, WITH DX COOLING, HOT GAS REHEAT, DX HEATING, ENTHALPY WHEEL AND FIXED PLATE ENERGY RECOVERY HEAT EXCHANGER. UNIT START/STOP CONTROL: START/STOP UNIT BASED ON (1) USER-DEFINED "ON/OFF" SCHEDULE. SETPOINTS SHALL BE AS FOLLOWS: 70°F (ADJ) OUTSIDE AIR COOLING SETPOINT: OUTDOOR AIR HEATING SETPOINT: 60°F (ADJ) SYSTEM CONTROL: DURING "ON/OCCUPIED" PERIODS, THE UNIT SUPPLY AND EXHAUST FAN SHALL BE ENERGIZED. DURING "OFF/UN-OCCUPIED" PERIODS, THE SUPPLY AND EXHAUST FAN ARE OFF. TEMPERATURE AND HUMIDITY CONTROL: WHEN THE DRY BULB AT THE UNIT'S TEMPERATURE SENSOR EXCEEDS THE DEHUMIDIFCATION (COOLING) SET POINT, THE COMPRESSOR WILL BE TURNED ON WITH THE REVERSING VALVE SET IN THE DEHUMIDIFCATION (COOLING) POSITION. THE SUPPLY AIR WILL BE CONDITIONED BY THE ENTHALPY WHEEL AND THE REFRIGERATION SYSTEM. WHEN THE DRY BULB AT THE UNIT'S TEMPERATURE SENSOR FALLS BELOW THE HEATING SET POINT, THE COMPRESSOR WILL BE TURNED ON WITH THE REVERSING VALVE IN THE HEATING POSITION. THE SUPPLY AIR WILL BE CONDITIONED BY THE ENTHALPY WHEEL AND THE REFRIGERATION SYSTEM. WHEN THE DRY BULB AT THE UNIT'S TEMPERATURE SENSOR IS BETWEEN THE DEHUMIDIFCATION (COOLING) AND HEATING SET POINTS, THE COMPRESSOR WILL BE TURNED OFF. THE SUPPLY AIR WILL BE CONDITIONED ONLY BY THE ENTHALPY WHEEL.

	SOFTWAF	RE POINTS	F	UNCTIONS			ALAF	RMS
INDOOR UNIT CONTROL POINT DESCRIPTION	NETWORK VARIABLE INPUT	NETWORK VARIABLE OUTPUT	SCHEDULE	TREND	DISPLAY	HIGH LIMIT	LOW LIMIT	ABNORMALITY
ON/OFF	X		х	X				<u>.</u>
SUPPLY AIR TEMPERATURE		х	х	Х	х	Х	X	
SUPPLY AIR DEWPOINT		х	х	Х	x	Х		
OUTSIDE AIR TEMPERATURE		X	×	Х	X			
OUTSIDE AIR DEWPOINT		X	х	Х	х			
RETURN AIR TEMPERATURE		х	х	Х	х	Х	Х	
ON/OFF STATUS	<i>i</i> .	X		Х	х			·
SUPPLY FAN STATUS		x			х	:		
EXHAUST FAN STATUS		X			х	:		

SEE DISCLOSURE OF INFORMATION STATEMENT ON SHEET T-1

REVISIONS

DATE APPROVED

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WWW.cbhfengineers.com © Copyright 2019 CBHF Engineers, PLLC NC# P-0506 CARO CARO	DES. GAS DR. GAS CHK. TOG SUBMITTED BY: DESIGN DIR. T H BURTON, PE	INTERIOR AND EX REPAIRS BLDG. CAMP LEJEUNE, NORTH	M116
SEAL 043801	APPROVED: DATE SATISFACTORY TO: DATE	SIZE CODE IDENT. NO. NAVFAC DRAWING NO. CONST. CONTR. NO. SCALE: NOTED SPEC. 05–18–0086	N40085-18-B-0086 SHEET 36 OF 50

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UNOCCUPIED COOL SETPOINT UNOCCUPIED HEAT SETPOINT SETPOINT OFFSET	-			X	74.0 F						Water St. 1874-1845, Francisco III (1881-1844)		NOTE 2
UNOCCUPIED HEAT SETPOINT SETPOINT OFFSET	-		Marie Company	X	71.0 F								NOTE 2
SETPOINT OFFSET	-			X	80.0 F								NOTE 2
	-			X	60.0 F	***************************************	ļ						NOTE 2
OCCUPIED BYPAGO HIVIEK				X	120 MIN	***************************************					· · · · · · · · · · · · · · · · · · ·		NOTE 2
COMPRESSOR ENABLE	-			X	AUTO								NOTE 2
HEAT / COOL MODE	+			. ^ . X	AUTO								NOTE 2
FAN MODE COMMAND	+			. ^ X	AUTO						***************************************		NOTE 2
APPLICATION MODE	-			X	AUTO	,							NOTE 2
OUTSIDE AIR DAMPER MINIMUM POSITION				X	10.00%						arrana da arrana arrana da arr		NOTE 2 NOTE 2
EFFECTIVE OCCUPANCY X				X	1.5070		1,211						NOTE 3
EFFECTIVE HEAT / COOL MODE X	-			X		,				,,			NOTE 3
EFFECTIVE SPACE TEMPERATURE X			***************************************	X		.,							NOTE 3
EFFECTIVE SPACE SETPOINT X				X									NOTE 3
LOCAL SETPOINT	<u> </u>			Х									NOTE 3
HEAT OUTPUT X	T			Х									NOTE 3
COOL OUTPUT X				Х									NOTE 3
ALARM X	1			X									NOTE 3
COMMUNICATION STATE				Х							X		
IERAL NOTES:													
OPTIONAL FEATURE 2. SNVT NETWORK INPUT VARIABLE		V-T	***************************************										

PU02 SEQUENCE OF OPERATIONS

BUILDING AUTOMATION SYSTEM INTERFACE:

THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED BYPASS, MORNING WARM-UP / PRE-COOL, OCCUPIED / UNOCCUPIED AND HEAT / COOL MODES. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS.

OCCUPIED MODE:

DURING OCCUPIED PERIODS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER SHALL OPEN TO MAINTAIN VENTILATION REQUIREMENTS WHEN CO2 LEVELS EXCEED SETPOINT. THE DX COOLING AND GAS HEAT SHALL STAGE TO MAINTAIN THE OCCUPIED SPACE TEMPERATURE SETPOINT.

UNOCCUPIED MODE:

WHEN THE SPACE TEMPERATURE IS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL START, THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED AND THE GAS HEAT SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) PLUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL STOP AND THE GAS HEAT

SHALL BE DISABLED. WHEN THE SPACE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 80.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL START AND THE DX COOLING SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT OF 80.0 DEG. F (ADJ.) MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL STOP, THE DX COOLING SHALL BE DISABLED AND THE OUTSIDE AIR DAMPER SHALL CLOSE.

OPTIMAL START: THE BAS SHALL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SETPOINTS

AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL START OCCURS. MORNING WARM-UP MODE:

DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT A MORNING WARM-UP MODE SHALL BE ACTIVATED. WHEN MORNING WARM-UP IS INITIATED THE UNIT SHALL ENABLE THE HEATING AND SUPPLY FAN. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. WHEN THE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

PRE-COOL MODE: DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE-COOL MODE SHALL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT SHALL ENABLE THE FAN AND COOLING. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

OPTIMAL STOP:

THE BAS SHALL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL STOP OCCURS, WHEN THE OPTIMAL STOP MODE IS ACTIVE THE UNIT CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE TO THE SPACE TEMPERATURE OFFSET SETPOINT.

OCCUPIED BYPASS:

THE BAS SHALL MONITOR THE STATUS OF THE "ON" AND "CANCEL" BUTTONS OF THE SPACE TEMPERATURE SENSOR. WHEN AN OCCUPIED BYPASS REQUEST IS RECEIVED FROM A SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.).

COOLING MODE:

THE UNIT CONTROLLER SHALL MONITOR SPACE TEMPERATURE AND SPACE TEMPERATURE COOLING SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR COOLING. WHEN THE SPACE TEMPERATURE RISES ABOVE THE SPACE TEMPERATURE COOLING SETPOINT, THE UNIT CONTROLLER SHALL STAGE THE COOLING ON OR OFF AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE COOLING SETPOINT. THE FIRST COMPRESSOR STAGE SHALL ENERGIZE AFTER ITS MINIMUM 3-MINUTE OFF TIME HAS EXPIRED. THE SUPPLY FAN SHALL MODULATE ABOVE MINIMUM SPEED TO MEET ZONE REQUIREMENTS. IF ADDITIONAL COOLING CAPACITY IS REQUIRED THE SECOND STAGE OF COOLING SHALL BE ENABLED. ONCE THE SPACE TEMPERATURE FALLS BELOW THE SETPOINT THE COMPRESSORS SHALL BE DEACTIVATED AND THE FAN SHALL MODULATE TO MINIMUM SPEED.

HEATING MODE:

THE UNIT CONTROLLER SHALL MONITOR SPACE TEMPERATURE AND SPACE TEMPERATURE HEATING SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR HEAT. WHEN THE SPACE TEMPERATURE DROPS BELOW THE SPACE TEMPERATURE HEATING SETPOINT, THE CONTROLLER SHALL ENABLE THE FIRST STAGE OF HEAT. IF ADDITIONAL HEATING CAPACITY IS REQUIRED THE SECOND STAGE OF HEAT SHALL BE ENABLED. THE SUPPLY FAN WILL REMAIN AT 100% DURING HEATING OPERATION. ONCE THE SPACE TEMPERATURE RISES ABOVE THE SETPOINT, THE HEATING STAGES SHALL BE DISABLED AND THE SUPPLY FAN SPEED WILL VARY ACCORDING TO VENTILATION AND COOLING MODES.

DEHUMIDIFICATION:

FACTORY INSTALLED HOT GAS REHEAT SHALL ALLOW APPLICATION OF DEHUMIDIFICATION.

DEHUMIDIFICATION SHALL BE ALLOWED ONLY WHEN THE OUTSIDE AIR TEMPERATURE IS ABOVE 40.0 DEG. F AND BELOW 100.0 DEG. F.

ON A CALL FOR DEHUMIDIFICATION, THE REHEAT VALVE SHALL ENERGIZE AND THE COMPRESSOR SHALL ENABLE. WHEN THE HUMIDITY CONTROL SETPOINT IS SATISFIED, THE VALVE SHALL BE DE-ENERGIZED AND THE COMPRESSOR SHALL BE DISABLED. IF THERE IS A CALL FOR COOLING FROM THE SPACE TEMPERATURE CONTROLLER, WHILE IN REHEAT, THE REHEAT VALVE SHALL BE DE-ENERGIZED AND THE COMPRESSOR CONTINUES TO RUN.

DEMAND CONTROL VENTILATION (DCV) OPERATION:

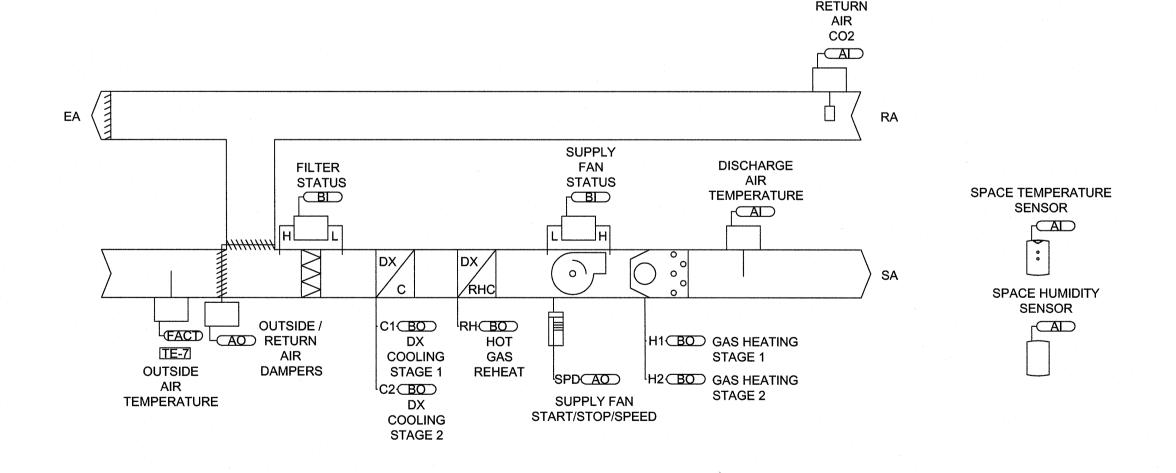
WHEN THE DEMAND CONTROL VENTILATION (DCV) THRESHOLD IS REACHED, THE OUTSIDE AIR DAMPER SHALL START TO MODULATE OPEN TO BRING IN MORE FRESH AIR TO REDUCE THE CO2 LEVEL. THE DAMPER SHALL MODULATE OPEN IN SMALL INCREMENTS, ACCOUNTING FOR CO2 LEVELS AND SUPPLY FAN SPEED, UNTIL THE CO2 LEVEL IS SATISFIED OR THE DAMPER REACHES THE FULL OPEN POSITION. ONCE THE THRESHOLD IS SATISFIED, THE DAMPER SHALL RETURN TO MINIMUM POSITION. IF THE MIXED AIR TEMPERATURE DROPS TO 40.0 DEG. F, THE CO2 SENSOR INPUT IS OVERRIDDEN AND CLOSES THE DAMPER TO MINIMUM POSITION. WHEN THE MIXED AIR TEMPERATURE RISES TO 43.0 DEG. F, CO2 OPERATION IS ONCE AGAIN RESTORED.

SUPPLY FAN OPERATION: THE SUPPLY FAN SHALL BE ENABLED WHILE IN THE OCCUPIED MODE AND CYCLED ON DURING THE UNOCCUPIED MODE. THE UNIT CONTROLLER SHALL VARY THE SUPPLY FAN SPEED TO OPTIMIZE MINIMUM FAN SPEED IN ALL COOLING MODES. A DIFFERENTIAL

PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FAN. IF THE SWITCH DOES NOT OPEN WITHIN 40 SECONDS AFTER A REQUEST FOR FAN OPERATION A FAN FAILURE ALARM SHALL BE ANNUNCIATED, THE UNIT SHALL STOP, REQUIRING A MANUAL RESET.

FILTER STATUS:

A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSES FOR 2 MINUTES AFTER A REQUEST FOR FAN OPERATION A DIRTY FILTER ALARM SHALL BE ANNUNCIATED AT THE BAS.



SEE DISCLOSURE OF INFORMATION STATEMENT ON SHEET T-1

REVISIONS

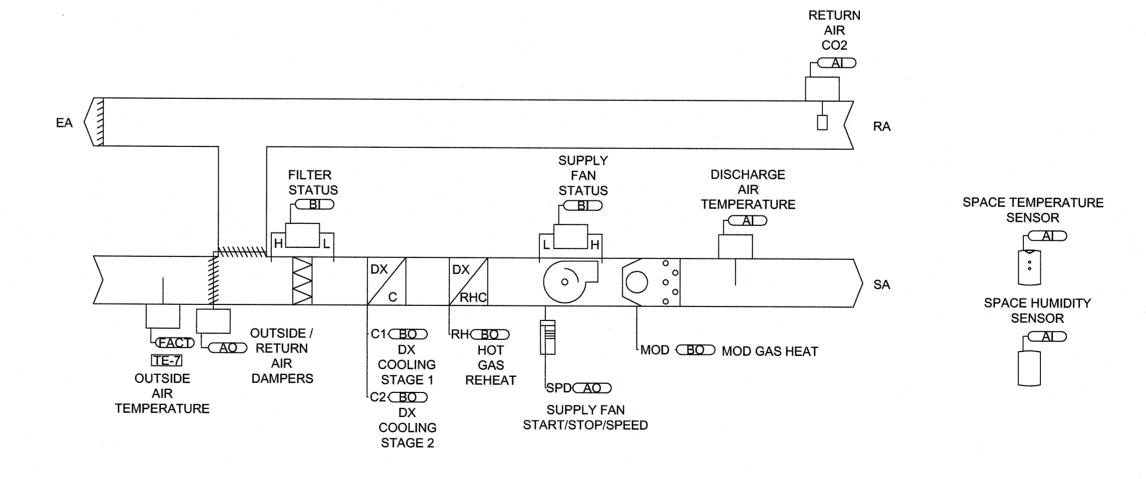
DATE APPROVED

CBHF Engineers, PLLC			ANICA ROLS		M-7
2246 Yaupon Drive Wilmington, NC 28401 Phone: 910.791.4000 Fax: 910.791.5266	TALLEY & SMITH ARCHITECTURE INC. P.O. BOX 518 SHELBY, NC 28151-0518 409 EAST MARION ST. SHELBY, NC 28150	_	EPARTMENT OF A CAME	1E	
WWW.cbhfengineers.com © Copyright 2019 CBHF Engineers, PLLC CARO SEAL	DES. GAS DR. GAS CHK. TOG SUBMITTED BY: DESIGN DIR. T H BURTON, PE		R	REP/	IOR AND EXTERIOR AIRS BLDG. M116 EJEUNE, NORTH CAROLINA
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6/24/9		SCALE:	NOTED	SPEC	. 05-18-0086 SHEET 37 OF 50

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CONTROL	LER: RELIATEL / BCI-R	,	P	TMIC	TYF	PΕ					Αl	_ARI	MS	
SYST	EM POINT DESCRIPTION		ΤŪ	PUT	L		MIT	Ę		2		ı FAIL		
		GRAPHIC	HARDWARE INPUT	HARDWARE OUTPUT	SOFTWARE POINT	DEFAULT VALUE	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION	DIAGNOSTICS	NOTES:
	SPACE TEMPERATURE (THERM)		Al		Х		Х	X			Х		DIAGNOSTIC ALARM STATUS	NOTE 2, 3
SPACE SENSOR	SPACE TEMPERATURE SETPOINT	***************************************	Al		Х	72.5 F					Х		DIAGNOSTIC ALARM STATUS	NOTE 1, 2, 3
	ON/CANCEL				Х		-							NOTE 1, 2
	OUTDOOR AIR TEMPERATURE		Al		X						Х		DIAGNOSTIC ALARM STATUS	NOTE 2, 3
-	SPACE HUMIDITY		Al		X		X	X			Х		DIAGNOSTIC ALARM STATUS	NOTE 2, 3
	SPACE RELATIVE HUMIDITY SETPOINT	***************************************	Al		X	50.00%	· · ·	, V			X		DIAGNOSTIC ALARM STATUS	NOTE 2
	RETURN AIR CO2 RETURN AIR C02 LIMIT		ΑI		X	900 0014	X	X			Х		DIAGNOSTIC ALARM STATUS	NOTE 2, 3
	SUPPLY AIR TEMPERATURE	X	Al		X	900 PPM	X	X			X		DIAGNOSTIC ALARM STATUS	NOTE 2
	EXHAUST FAN ENABLE SETPOINT		Al		 ^		^	^					DIAGNOSTIC ALARM STATUS	NOTE 3
	DIRTY FILTER		BI		X								DIAGNOSTIC ALARM STATUS	
	SUPPLY FAN STATUS		BI	***************************************						Х			DIAGNOSTIC ALARM STATUS	
HIGH P	RESSURE COMPRESSOR PROTECTION		BI							X			DIAGNOSTIC ALARM STATUS	
LOW P	RESSURE COMPRESSOR PROTECTION	And the second s	ВІ		<u> </u>					Х		-	DIAGNOSTIC ALARM STATUS	
	EMERGENCY STOP		ВІ										DIAGNOSTIC ALARM STATUS	
	SUPPLY FAN START/STOP/SPEED			AO		·								
	EXHAUST FAN START/STOP			во								***************************************		
	COMPRESSOR 1 START/STOP			во								******************		
	COMPRESSOR 2 START/STOP			ВО	***************************************									
	CONDENSER FAN A START/STOP			ВО								*************************		
	CONDENSER FAN B START/STOP			ВО				-						
	HEAT ENABLE GAS VALVE			BO AO						Х			DIAGNOSTIC ALARM STATUS	
	OAO VALVE			70									DIAGNOSTIC ALARM STATUS	
	OCCUPANCY				X									NOTE 2
	OCCUPIED COOL SETPOINT				X	74.0 F								NOTE 2
	OCCUPIED HEAT SETPOINT				Х	71.0 F								NOTE 2
	UNOCCUPIED COOL SETPOINT				Х	80.0 F								NOTE 2
	UNOCCUPIED HEAT SETPOINT				X	60.0 F								NOTE 2
	SETPOINT OFFSET				Х									NOTE 2
	OCCUPIED BYPASS TIMER				X	120 MIN								NOTE 2
	COMPRESSOR ENABLE				Х	AUTO								NOTE 2
	HEAT / COOL MODE				X	AUTO						***************************************	·	NOTE 2
·	FAN MODE COMMAND				X	AUTO								NOTE 2
	APPLICATION MODE TSIDE AIR DAMPER MINIMUM POSITION				X	AUTO 10.00%								NOTE 2
001	EFFECTIVE OCCUPANCY	X	,		X	10.00%		4. 4.		.]				NOTE 2
	EFFECTIVE HEAT / COOL MODE	X			X				• .					NOTE 3
	EFFECTIVE SPACE TEMPERATURE	X			X									NOTE 3
	EFFECTIVE SPACE SETPOINT	X			X		,			·				NOTE 3
	LOCAL SETPOINT				X									NOTE 3
	HEAT OUTPUT	Х			X									NOTE 3
	COOL OUTPUT	X			X									NOTE 3
	ALARM	Х			Х								***************************************	NOTE 3
	COMMUNICATION STATE		-		Х							X		
NERAL NOTES:														
	1. OPTIONAL FEATURE													
	2. SNVT NETWORK INPUT VARIABLE													

DATE APPROVED

THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED ON A CALL FOR DEHUMIDIFICATION, THE REHEAT VALVE SHALL ENERGIZE AND BOTH BYPASS, MORNING WARM-UP / PRE-COOL, OCCUPIED / UNOCCUPIED AND HEAT / COOL COMPRESSORS SHALL ENABLE. WHEN THE HUMIDITY CONTROL SETPOINT IS MODES. IF A BAS IS NOT PRESENT, OR COMMUNICATION IS LOST WITH THE BAS THE SATISFIED, THE VALVE SHALL BE DE-ENERGIZED AND BOTH COMPRESSORS SHALL BE DISABLED. IF THERE IS A CALL FOR 1ST STAGE COOLING WHILE IN THE DEHUMIDIFICATION MODE, NO ACTION SHALL TAKE PLACE. IF THERE IS A CALL FOR 2ND STAGE COOLING, THE REHEAT VALVE SHALL BE DE-ENERGIZED, AND THE UNIT DURING OCCUPIED PERIODS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE SHALL REVERT TO THE COOLING MODE. IF 2ND STAGE COOLING IS SATISFIED AND OUTSIDE AIR DAMPER SHALL OPEN TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS. THERE IS STILL A CALL FOR DEHUMIDIFICATION, THE REHEAT VALVE SHALL ONCE THE DX COOLING SHALL STAGE AND GAS HEAT SHALL MODULATE TO MAINTAIN THE AGAIN BE ENERGIZED. DEMAND CONTROL VENTILATION (DCV) OPERATION: WHEN THE DEMAND CONTROL VENTILATION (DCV) THRESHOLD IS REACHED, THE WHEN THE SPACE TEMPERATURE IS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0 ECONOMIZER SHALL START TO MODULATE OPEN TO BRING IN MORE FRESH AIR TO DEG. F (ADJ.) THE SUPPLY FAN SHALL START, THE OUTSIDE AIR DAMPER SHALL REMAIN REDUCE THE CO2 LEVEL. THE DAMPER SHALL MODULATE OPEN IN SMALL INCREMENTS, CLOSED AND THE GAS HEAT SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE RISES ACCOUNTING FOR CO2 LEVELS AND SUPPLY FAN SPEED, UNTIL THE CO2 LEVEL IS ABOVE THE UNOCCUPIED HEATING SETPOINT OF 60.0 DEG. F (ADJ.) PLUS THE UNOCCUPIED SATISFIED OR THE DAMPER REACHES THE FULL OPEN POSITION. IF THE MIXED AIR DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL STOP AND THE GAS HEAT TEMPERATURE DROPS TO 40.0 DEG. F, THE CO2 SENSOR INPUT IS OVERRIDDEN AND CLOSES THE DAMPER TO MINIMUM POSITION. WHEN THE MIXED AIR TEMPERATURE RISES WHEN THE SPACE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 80.0 TO 43.0 DEG. F, CO2 OPERATION IS ONCE AGAIN RESTORED. DEG. F (ADJ.) THE SUPPLY FAN SHALL START, THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED AND THE DX COOLING SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE SUPPLY FAN OPERATION: FALLS BELOW THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.) MINUS THE THE SUPPLY FAN SHALL BE ENABLED WHILE IN THE OCCUPIED MODE AND CYCLED ON UNOCCUPIED DIFFERENTIAL OF 4.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL STOP, THE DX DURING THE UNOCCUPIED MODE. THE UNIT CONTROLLER SHALL VARY THE SUPPLY FAN SPEED TO OPTIMIZE MINIMUM FAN SPEED IN ALL COOLING AND HEATING MODES. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FAN. IF THE SWITCH DOES NOT OPEN WITHIN 40 SECONDS AFTER A REQUEST FOR FAN THE BAS SHALL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SETPOINTS OPERATION A FAN FAILURE ALARM SHALL BE ANNUNCIATED, THE UNIT SHALL STOP, REQUIRING A MANUAL RESET. DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE SETPOINT A MORNING WARM-UP MODE SHALL BE ACTIVATED. WHEN MORNING WARM-UP IS ACROSS THE FILTER WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSES FOR 2 MINUTES INITIATED THE UNIT SHALL ENABLE THE HEATING AND SUPPLY FAN. THE OUTSIDE AIR AFTER A REQUEST FOR FAN OPERATION A DIRTY FILTER ALARM SHALL BE ANNUNCIATED DAMPER SHALL REMAIN CLOSED. WHEN THE SPACE TEMPERATURE REACHES THE AT THE BAS. OCCUPIED HEATING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED DURING OPTIMAL START, IF THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE-COOL MODE SHALL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT SHALL ENABLE THE FAN AND COOLING. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. WHEN THE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.), THE THE BAS SHALL MONITOR THE SCHEDULED UNOCCUPIED TIME, OCCUPIED SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL STOP OCCURS. WHEN THE OPTIMAL STOP MODE IS ACTIVE THE UNIT CONTROLLER SHALL MAINTAIN THE SPACE THE BAS SHALL MONITOR THE STATUS OF THE "ON" AND "CANCEL" BUTTONS OF THE SPACE TEMPERATURE SENSOR. WHEN AN OCCUPIED BYPASS REQUEST IS RECEIVED FROM A SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY TEMPERATURE COOLING SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR COOLING. WHEN THE SPACE TEMPERATURE RISES ABOVE THE SPACE TEMPERATURE COOLING SETPOINT, THE UNIT CONTROLLER SHALL STAGE THE COOLING ON OR OFF AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE COOLING SETPOINT. THE FIRST COMPRESSOR SHALL ENERGIZE AFTER ITS MINIMUM 3-MINUTE OFF TIME HAS EXPIRED. REQUIREMENTS. IF ADDITIONAL COOLING CAPACITY IS REQUIRED THE SECOND STAGE OF COOLING SHALL BE ENABLED. ONCE THE SPACE TEMPERATURE FALLS BELOW THE SETPOINT THE COMPRESSORS SHALL BE DEACTIVATED AND THE FAN SHALL MODULATE TEMPERATURE HEATING SETPOINT TO DETERMINE WHEN TO INITIATE REQUESTS FOR



PU01 SEQUENCE OF OPERATIONS

CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS.

AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL START OCCURS.

BUILDING AUTOMATION SYSTEM INTERFACE:

OCCUPIED SPACE TEMPERATURE SETPOINT.

OCCUPIED MODE:

UNOCCUPIED MODE:

SHALL BE DISABLED.

OPTIMAL START:

PRE-COOL MODE:

OPTIMAL STOP:

OCCUPIED BYPASS:

COOLING MODE:

TO MINIMUM SPEED.

DEHUMIDIFICATION:

HEATING MODE:

MODE.

COOLING SHALL BE DISABLED.

MORNING WARM-UP MODE:

UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.).

TEMPERATURE TO THE SPACE TEMPERATURE OFFSET SETPOINT.

MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE

THE UNIT CONTROLLER SHALL MONITOR SPACE TEMPERATURE AND SPACE

THE SUPPLY FAN SHALL MODULATE ABOVE MINIMUM SPEED TO MEET ZONE

THE UNIT CONTROLLER SHALL MONITOR SPACE TEMPERATURE AND SPACE

SUPPLY FAN SPEED SHALL VARY TO MEET ZONE HEATING REQUIREMENTS IN

ABOVE THE SETPOINT, THE HEATING CYCLE SHALL BE DISABLED.

ABOVE 40.0 DEG. F AND BELOW 100.0 DEG. F..

HEAT. WHEN THE SPACE TEMPERATURE DROPS BELOW THE SPACE TEMPERATURE HEATING SETPOINT, THE CONTROLLER SHALL ENABLE THE MODULATING HEAT BANK AT HIGH FIRE FOR 60 SECONDS, THEN THE CONTROLLER SHALL MODULATE THE HEAT BANK TO THE NECESSARY RATE TO SATISFY THE SPACE TEMPERATURE HEATING SETPOINT. THE

CONJUNCTION WITH THE HEAT BANK OUTPUT. ONCE THE SPACE TEMPERATURE RISES

FACTORY INSTALLED HOT GAS REHEAT SHALL ALLOW APPLICATION OF DEHUMIDIFICATION. DEHUMIDIFICATION SHALL BE ALLOWED ONLY WHEN THE OUTSIDE AIR TEMPERATURE IS

SEE DISCLOSURE OF INFORMATION STATEMENT ON SHEET T-1 MECHANICAL **CBHF** CONTROLS Engineers, PLLC MARINE CORPS BASE 2246 Yaupon Drive

Wilmington, NC 28401 Phone: 910.791.4000 Fax: 910.791.5266 www.cbhfengineers.com SEAL 043801 APPROVED: NGINEE

TALLEY & SMITH ARCHITECTURE INC. P.O. BOX 518 SHELBY, NC 28151-0518 409 EAST MARION ST. SHELBY, NC 28150 DES. GAS SUBMITTED BY: DESIGN DIR. T H BURTON, PE

INTERIOR AND EXTERIOR REPAIRS BLDG. M116 CAMP LEJEUNE, NORTH CAROLINA

CAMP LEJEUNE, NORTH CAROLINA

REVISIONS

DATE | SIZE | CODE IDENT. NO. | NAVFAC DRAWING NO. CONST. CONTR. NO. N40085-18-B-0086 SATISFACTORY TO: scale: NOTED | SPEC. 05-18-0086 SHEET 38 OF 50

	CAL LEGEND	0,4100	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
0	2X4 LED LIGHT FIXTURE, FLUSH MOUNTED IN LAY-IN CEILING LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)		CONDUIT, HOME RUN TO PANEL BOARD
Ō	4FT LED LIGHT FIXTURE, SURFACE OR PENDANT MOUNTED. LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)		POWER & SWITCH LEG
Ø	SURFACE LED LIGHT FIXTURE LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)		UNSWITCHED LEG
Ţ	WALL MOUNTED LED LIGHT FIXTURE LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)	Φ	RECEPTACLE, DUPLEX, 120VAC, 20A, MOUNTED 16" AFF, UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL THIS SHEET). WP - LISTED WEATHER RESISTANT TYPE DEVICE WITH WEATHERPROOF WHILE-IN-USE COVER
	DIRECT/INDIRECT FIXTURE, SUSPENDED INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)		GFI - GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A, MOUNTED 24" AFG
<u> </u>	8FT, 4FT, 2FT TRACK WITH LIGHT KIT. QTY OF TRACK HEADS PER PLANS LETTER INDICATES FIXTURE TYPE AND LAMP (SEE FIXTURE SCHEDULE)	•	RECEPTACLE, DUPLEX, 120VAC, 20A, 6" ABOVE COUNTER TOP WHEN SHOWN OR MOUNTED ±48"AFF.
	EXIT SIGN, SINGLE FACE, CEILING. LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)	#	RECEPTACLE, QUADPLEX, 120VAC, 20A, MOUNTED 16"AFF UNLESS OTHERWISE NOTED. (SEE ELECTRICAL MOUNTING HEIGHT DETAIL THIS SHEET)
igotimes	EXIT SIGN, SINGLE FACE, WALL. LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)		
_ 	EMERGENCY LIGHTING UNIT, 2-HEAD WITH BATTERY BACK-UP, WALL MOUNTED, "NOT SWITCHED". LETTER INDICATES FIXTURE TYPE (SEE FIXTURE SCHEDULE)		RECEPTACLE, DUPLEX, 120VAC, 20A RECESSED FLOOR MOUNTED.
		0	JUNCTION BOX - CEILING/ABOVE CEILING MOUNTED
PE	PHOTOCELL, REMOTE MOUNTED, 120V, 10 SECOND TIME DELAY, UL WET LOCATION, RATED FOR 1000 WATTS FOR USE WITH LAMP SOURCES SHOWN	<u> </u>	JUNCTION BOX - WALL MOUNTED
\$	SWITCH, SINGLE POLE, 120/277VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.	30A/3/4X, W/ 30AF	DISCONNECT SWITCH, FUSED, HEAVY DUTY, SIZE AS INDICATED ON DRAWINGS ##A = DISCONNECT SIZE / # = NUMBER OF POLES / # = NEMA RATING, /##AF = FUSE SIZE
\$3	3-WAY SWITCH, SINGLE POLE 120/277 VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.	30A/3/4X, W/ 30AF ┌──∐	DISCONNECT SWITCH, FUSED, HEAVY DUTY, WITH VARIABLE FREQUENCY DRIVE, SIZE AS INDICATED ON DRAWINGS ##A = DISCONNECT SIZE / # = NUMBER OF POLES / # = NEMA RATING,
\$т	TIMER SWITCH, SINGLE POLE OR 3-WAY, 120/277 VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.		/##AF = FUSE SIZE
	CEILING MOUNTED, DUAL TECHNOLOGY OCCUPANCY SENSOR, 360° COVERAGE	м\$##	MANUAL MOTOR STARTER, ELECTRICAL CONTRACTOR SHALL COORDINATE POLES AND SIZE WITH EQUIPMENT ## = AMPERAGE RATING WHEN INDICATED ON DRAWING
0\$	SURFACE WALL MOUNTED OCCUPANCY SENSOR, SINGLE BUTTON ON/OFF CONTROL, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED.	2'-6"	PANEL BOARD, SURFACE MOUNTED, RECESSED MOUNT, SIZE and RATINGS AS INDICATED ON PANEL SCHEDULE
o\$D	SURFACE WALL MOUNTED OCCUPANCY SENSOR, SINGLE BUTTON ON/OFF W/ DIMMER CONTROL, 180° COVERAGE, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED. DIMMER MUST BE COMPATIBLE WITH FIXTURE IT CONTROLS.	3'-0"	PANEL BOARD REQUIRED CLEARANCE IN FRONT OF ELECTRICAL PANEL, SEE NEC TABLE 110.26 WORKING SPACES FOR ADDITIONAL CLEARANCE CONDITIONS.
D\$	HEAVY DUTY DIMMER 1500W @ 120 VAC, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED. DIMMER MUST BE COMPATIBLE WITH FIXTURE IT CONTROLS.		TIME CLOCK 'TC1', 120V 2-POLE, DIGITAL, PROGRAMMABLE, ASTRONOMICAL TIME CLOCK RATED 20A, 250V.
D\$3	HEAVY DUTY 3-WAY DIMMER 1500W @ 120 VAC, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED. DIMMER MUST BE COMPATIBLE WITH FIXTURE IT CONTROLS.	<u>_</u>	GROUND CONNECTION.
T	COMBINATION DATA/TELEPHONE OUTLET, PROVIDE 1 1/4" CONDUIT FROM ROOM [R120] TO DEVICE LOCATION. MOUNT IN A 5 SQUARE BOX. PROVIDE 4 CAT6 CABLES COMPLETE FROM EACH DROP TO ROOM [R120] DATA RACK.	용 표	1/4" x 4" x 24" GROUND BAR.
WAP	WIRELESS ACCESS POINT, PROVIDE 1" CONDUIT FROM ROOM [R120] TO DEVICE LOCATION. 1 DATA IN A DUAL GANG 5 SQUARE BOX WITH A SINGLE GANG PLASTER RING, GOVERNMENT SHALL PROVIDE SURGE PROTECTOR AND WAP DEVICE, THE		4'x8'x3/4" FIRE RATED PLYWOOD. MOUNT 12"AFF.
	ELECTRICAL CONTRACTOR SHALL INSTALL.		(X)METER ENCLOSURE, (X) KWH METER & (X)CURRENT TRANSFORMERS, POLE MOUNTED
V/2D 3G	COMBINATION POWER/DATA/TELEPHONE BOX, RECESSED FLOOR MOUNTED . PROVIDE BRASS COVER PLATE WITH FLUSH ACCESS COVERS FOR EACH PLUG IN CONNECTION. PROVIDE PULL STRING IN CONDUIT. #V = NUMBER OF VOICE CONNECTIONS / #D = NUMBER OF DATA CONNECTIONS; 11/4"CND UNDER FLOOR TO DATA RACK IN ROOM R120 #G = GANG FLOOR BOX WITH DUPLEX RECEPTACLE, DATA, A/V INSERT		HATCHING INDICATES EXISTING ITEMS TO BE DEMOLISHED. REMOVE DEVICE, EQUIPMENT, FIXTURE INDICATED, CIRCUIT, AND CONDUIT BACK TO SOURCE UNLESS OTHERWISE NOTED.
94%	WALL MOUNTED DATA RACK		DETAIL, SECTION OR PLAN NUMBER
<u></u>	ROOF/COUPOLA/STEEPLE INTERNALLY MOUNTED CARILLON SPEAKER ARRAY, CHIME MASTER RECTANGULAR LONG THROW SPEAKER 12"x22"x17" w/ PD-60A DRIVER, 24" ROOF MOUNTED, FOUR SPEAKER, ALUMINUM BRACKET		DRAWING SHEET PLAN, DETAIL OR SECTION APPEARS ON ENLARGED PLAN ELEVATION
CHIME	CHIME MASTER SIX-SS CARILLON AND STANDARD AMPLIFIER, CHIME MASTER - CONTACT INFO - CHRISTINA CROOK chriscrook@chimemaster.com 1-800-344-7464 or TODD TIMMONS ttimmons@sc.rr.com 803-983-2561		LLL VATION

A, AMP	AMPERE	LP	LIGHTING PANEL, LIGHT POLE
AFF	ABOVE FINISHED FLOOR	LTG	LIGHTING
AFG	ABOVE FINISHED GRADE	MCB	MAIN CIRCUIT BREAKER
AHU	AIR HANDLING UNIT	MCC	MOTOR CONTROL CENTER
AIC			
	AMPERE INTERRUPTING CAPACITY	MCP	MOTOR CIRCUIT PROTECTOR
ATS	AUTOMATIC TRANSFER SWITCH	MDP	MAIN DISTRIBUTION PANEL
AWG	AMERICAN WIRE GAUGE	MFR	MANUFACTURER
BOF	BOTTOM OF FIXTURE	MH	MANHOLE
BRKR	BREAKER	MLO	MAIN LUGS ONLY
C, CND	CONDUIT	MTD	MOUNTED
CAB	CABINET	MTG	MOUNTING
CAT	CATALOG	MTS	MANUAL TRANSFER SWITCH
CL	CHLORINE	MV	MEDIUM VOLTAGE
CB		N, NEUT	
	CIRCUIT BREAKER		NEUTRAL
CCTV	CLOSED CIRCUIT TELEVISION	NA NA	NOT APPLICABLE
CKT	CIRCUIT	NC	NORMALLY CLOSED
CLG	CEILING	NEC	NATIONAL ELECTRIC CODE
CONT'D	CONTINUED	NIC	NOT IN CONTRACT
CP	CONTROL PANEL	NL	NIGHT LIGHT
CR	CONTROL RELAY, CORROSION RESISTANT	NO	NORMALLY OPEN
CS	CONTROL SWITCH	NTS	NOT TO SCALE
CV	CONTROL VALVE	P	POLE
CT	CURRENT TRANSFORMER	PA	
			PUBLIC ADDRESS
CU	COPPER	PB	PULL BOX, PUSH-BUTTON
EF	EXHAUST FAN	PF	POWER FACTOR
EGB	ELECTRIC GROUND BAR	PH,	PHASE
EMER	EMERGENCY	PLC	PROGRAMMABLE LOGIC CONTROLLER
EMT	ELECTRICAL METALLIC TUBING	PNL	PANEL
ENCL	ENCLOSURE	PP	POWER PANEL, POWER POLE
EQUIP	EQUIPMENT	PT	POTENTIAL TRANSFORMER
EWC	ELECTRIC WATER COOLER	PWR	POWER
EWH		RECPT, RCP	
	ELECTRIC WATER HEATER	1	RECEPTACLE
EPRF	EXPLOSION PROOF	REQ'D	REQUIRED
FA	FIRE ALARM	RGS	RIGID GALVANIZED STEEL CONDUIT
FAAP	FIRE ALARM ANNUNCIATOR PANEL	RM	ROOM
FACP	FIRE ALARM CONTROL PANEL	RTU	REMOTE TELEMETRY UNIT
FBO	FURNISHED BY OTHERS	DCM	DC MOTOR DRIVE
FLA	FULL LOAD AMPS	SH	SHEET
FLUOR	FLUORESCENT	SM	SURFACE MOUNT
FLR	FLOOR	SPEC	SPECIFICATION
FM	FLUSH MOUNTED	SS	
FWE		SST	SELECTOR SWITCH
	FURNISHED WITH EQUIPMENT		STAINLESS STEEL
GEN	GENERATOR	SW	SWITCH
G, GND	GROUND	SWBD	SWITCHBOARD
GB	GROUND BAR	SWGR	SWITCH GEAR
GFI	GROUND FAULT CURRENT INTERRUPTER	TEL	TELEPHONE
HH ,	HANDHOLE	TMGB	TELECOM GROUND BAR
HID	HIGH INTENSITY DISCHARGE	TPS	TWISTED PAIR SHIELDED
HOA	HAND-OFF-AUTO	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSE
HP	HORSE POWER	TYP	
HPF		UGND	TYPICAL
HPS	HIGH POWER FACTOR	UH	UNDERGROUND
	HIGH PRESSURE SODIUM		UNIT HEATER
HTR	HEATER	UON	UNLESS OTHERWISE NOTED
HV	HIGH VOLTAGE	UTIL	UTILITY
Hz	HERTZ	V	VOLTS
IMC	INTERMEDIATE METALLIC CONDUIT	VFD	VARIABLE FREQUENCY DRIVE
INCAND	INCANDESCENT	W	WIRE, WATT
JB	JUNCTION BOX	WH	WATT-HOUR
K	THOUSAND	WP	
KCMIL		WR	WEATHER PROJECTANT
KVA	THOUSAND CIRCULAR MILLS	(X)	WEATHER RESISTANT
KW	KILOVOLT AMPERE	XFMR	EXISTING DEVICE
r vv	KILOWATTS	LAPIVIK	TRANSFORMER

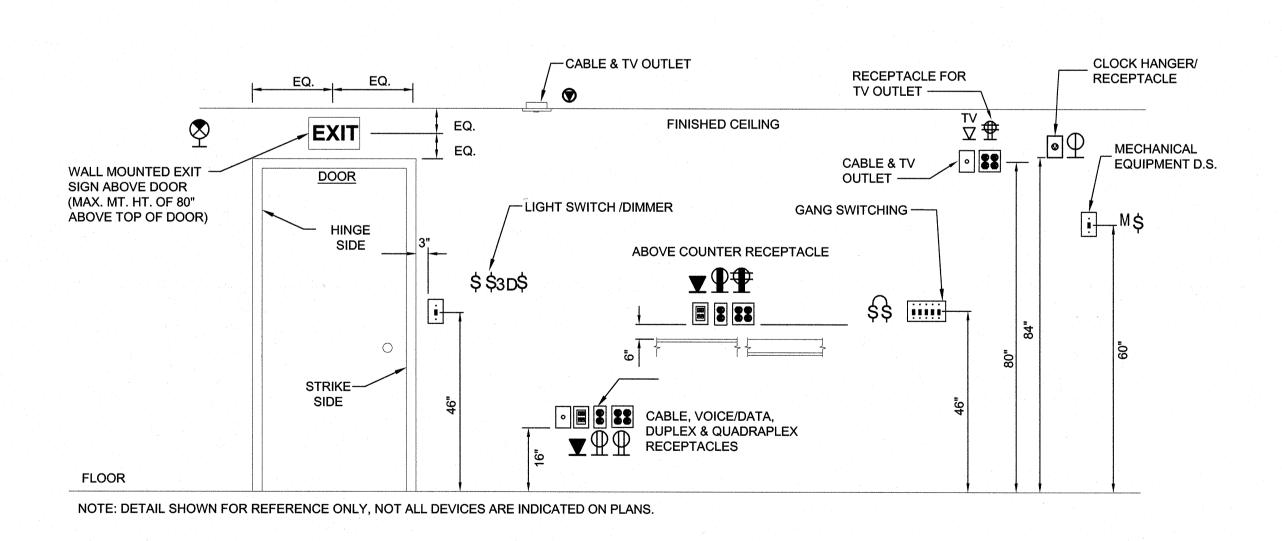
2018 INTERNATIONAL BUILDING CODE
ELECTRICAL SUMMARY
ELECTRICAL SYSTEMS AND EQUIPMENT
METHOD OF COMPLIANCE: ENERGY CODE: □ PRESCRIPTIVE □ PERFORMANCE ASHRAE 90.1: □ PRESCRIPTIVE □ PERFORMANCE
LIGHTING SCHEDULE (EACH FIXTURE TYPE) LAMP TYPE REQUIRED IN FIXTURE: SEE FIXTURE SCHEDULE NUMBER OF LAMPS IN FIXTURE: SEE FIXTURE SCHEDULE BALLAST TYPE USED IN THE FIXTURE: SEE FIXTURE SCHEDULE
LAMP TYPE REQUIRED IN FIXTURE: SEE FIXTURE SCHEDULE NUMBER OF LAMPS IN FIXTURE: SEE FIXTURE SCHEDULE BALLAST TYPE USED IN THE FIXTURE: SEE FIXTURE SCHEDULE NUMBER OF BALLASTS IN FIXTURE: SEE FIXTURE SCHEDULE TOTAL WATTAGE PER FIXTURE: SEE FIXTURE SCHEDULE TOTAL INTERIOR WATTAGE: (WHOLE BUILDING OR SPACE BY SPACE)
LAMP TYPE REQUIRED IN FIXTURE: SEE FIXTURE SCHEDULE NUMBER OF LAMPS IN FIXTURE: SEE FIXTURE SCHEDULE BALLAST TYPE USED IN THE FIXTURE: SEE FIXTURE SCHEDULE NUMBER OF BALLASTS IN FIXTURE: SEE FIXTURE SCHEDULE TOTAL WATTAGE PER FIXTURE: SEE FIXTURE SCHEDULE TOTAL INTERIOR WATTAGE: (WHOLE BUILDING OR SPACE BY SPACE) ALLOWED = 6,426 WATTS ADDITIONAL 10% = 5,783 WATTS
LAMP TYPE REQUIRED IN FIXTURE: SEE FIXTURE SCHEDULE NUMBER OF LAMPS IN FIXTURE: SEE FIXTURE SCHEDULE BALLAST TYPE USED IN THE FIXTURE: SEE FIXTURE SCHEDULE NUMBER OF BALLASTS IN FIXTURE: SEE FIXTURE SCHEDULE TOTAL WATTAGE PER FIXTURE: SEE FIXTURE SCHEDULE TOTAL INTERIOR WATTAGE: (WHOLE BUILDING OR SPACE BY SPACE) ALLOWED = 6,426 WATTS ADDITIONAL 10% = 5,783 WATTS SPECIFIED = 5,455 WATTS EXTERIOR ALLOWANCE:
LAMP TYPE REQUIRED IN FIXTURE: SEE FIXTURE SCHEDULE NUMBER OF LAMPS IN FIXTURE: SEE FIXTURE SCHEDULE BALLAST TYPE USED IN THE FIXTURE: SEE FIXTURE SCHEDULE NUMBER OF BALLASTS IN FIXTURE: SEE FIXTURE SCHEDULE TOTAL WATTAGE PER FIXTURE: SEE FIXTURE SCHEDULE TOTAL INTERIOR WATTAGE: (WHOLE BUILDING OR SPACE BY SPACE) ALLOWED = 6,426 WATTS ADDITIONAL 10% = 5,783 WATTS SPECIFIED = 5,455 WATTS

☐ 506.2.6 AUTOMATIC DAYLIGHTING CONTROL SYSTEMS

LOAD SUMMARY

REVISIONS

DATE APPROVED



LARGEST MOTOR APPROX. AMPS 10 AMPS 3 AMPS LARGEST MOTOR APPROX. AMPS x .25 21,039 VA 8,646 VA 2,862 VA 6,156 VA 1,730 VA 1,748 VA 96 VA 1,200 VA 43,477 VA 121 AMPS SUB-TOTAL HVAC DEMAND SUB-TOTAL HVAC DEMAND 4,500 VA 125 VA 1,100 VA REFRIGERATOR **MICROWAVE** 1,200 VA 10,000 VA RANGE/STOVE 600 VA 17,525 VA SUB-TOTAL EQUIPMENT DEMAND SUB-TOTAL EQUIPMENT DEMAND 49 AMPS 3 AMPS 51 AMPS ADD FOR LARGEST MOTOR TOTAL EQUIPMENT DEMAND LIGHTS (INTERIOR, BASED ON NEC 220.12) 5,455 VA LIGHTS (EXTERIOR) 252 VA 1,200 VA 6,907 VA TOTAL LIGHTING LOAD 8,634 VA 24 AMPS LIGHTING LOAD x 1.25 TOTAL DEMAND FOR LIGHTING RECEPTACLES 15,760 VA 10,000 VA FIRST 10000VA 2,880 VA 12,880 VA REMAINDER @ 50% TOTAL DEMAND FOR RECEPTACLE/POWER PANELS TOTAL DEMAND FOR RECEPTACLE/POWER PANELS TOTAL DEMAND BUILDING AMPS 232 AMPS TOTAL DEMAND BUILDING AMPS 83,416 VA TOTAL BUILDING CONNECTED LOAD 83,669 VA

ELECTRICAL DEVICES - MOUNTING HEIGHT DETAIL
NOT TO SCALE

SEE DISCLOSURE OF INFORMATION STATEMENT ON SHEET T-1 ELECTRICAL CBHF Engineers, PLLC LEGEND, ABBRV, SUMMARIES 2246 Yaupon Drive Wilmington, NC 28401 Phone: 910.791.4000 Fax: 910.791.5266 www.cbhfengineers.com MARINE CORPS BASE

CAMP LEJEUNE, NORTH CAROLINA TALLEY & SMITH ARCHITECTURE INC.
P.O. BOX 518 SHELBY, NC 28151-0518
409 EAST MARION ST. SHELBY, NC 28150 INTERIOR AND EXTERIOR REPAIRS BLDG. M116 CAMP LEJEUNE, NORTH CAROLINA SEAL F 35230 SEAL F MGINERAL SUBMITTED BY: DESIGN DIR. T H BURTON, PE APPROVED: DATE SIZE CODE IDENT. NO. NAVFAC DRAWING NO. CONST. CONTR. NO. N40085-18-B-0086

SPEC. 05-18-0086 SHEET 39 OF 50 SATISFACTORY TO: SCALE: NOTED | SPEC. 05-18-0086