DIVISION 23 CODES & STANDARDS

GENERAL

THE WORK COVERED BY THIS DIVISION CONSISTS OF PROVIDING ALL LABOR, EQUIPMENT AND MATERIALS AND PERFORMING ALL OPERATIONS NECESSARY FOR THE INSTALLATION OF THE MECHANICAL WORK AS HEREIN CALLED FOR AND SHOWN ON THE DRAWINGS.

CODES

- ALL WORK UNDER DIVISION 23 SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CODES LISTED HEREIN. THE DESIGN HAS BEEN BASED ON THE REQUIREMENTS OF THESE CODES; AND WHILE IT IS NOT THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT ALL WORK CALLED FOR COMPLIES WITH THESE CODES. HE SHALL BE RESPONSIBLE FOR CALLING TO THE ARCHITECT/ENGINEER'S ATTENTION ANY DRAWINGS OR SPECIFICATIONS THAT ARE NOT IN CONFORMANCE WITH THESE OR OTHER CODES PRIOR TO ORDERING EQUIPMENT OR INSTALLING WORK.
- COMPLY WITH REGULATIONS AND CODES OF UTILITY SUPPLIERS.
- WHERE NO SPECIFIC METHOD OR FORM OF CONSTRUCTION IS CALLED FOR IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL COMPLY WITH CODE REQUIREMENTS WHEN CARRYING OUT SUCH WORK.
- WHERE CODE CONFLICT EXISTS, GENERALLY THE MOST RESTRICTIVE REQUIREMENT APPLIES. COMPLY WITH CURRENT
- CODE EDITION, UNLESS NOTED. ADDITIONAL CODES OR STANDARDS APPLYING TO A SPECIFIC PART OF THE WORK MAY BE INCLUDED IN THAT SECTION. 6. THE FOLLOWING CODES GOVERN THE WORK:
- A. FLORIDA BUILDING CODE BUILDING 8TH EDITION (2023).
- B. FLORIDA BUILDING CODE MECHANICAL 8TH EDITION (2023). FLORIDA BUILDING CODE - ENERGY CONSERVATION - 8TH EDITION (2023).
- FLORIDA BUILDING CODE TEST PROTOCOLS FOR HIGH VELOCITY HURRICANE ZONES 8TH EDITION (2023). E. FLORIDA FIRE PREVENTION CODE - 8TH EDITION (2023). a. UNIFORM FIRE CODE (NFPA 1) - 2021 FLORIDA EDITION
- b. LIFE SAFETY CODE (NFPA 101) 2021 FLORIDA EDITION
- NATIONAL ELECTRIC CODE (NFPA 70) 2020. G. STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATION SYSTEMS (NFPA 90A).
- a. 2015 IN ACCORDANCE WITH FBC MECHANICAL EIGHTH EDITION (2023) b. 2021 IN ACCORDANCE WITH FAC 69A-3.012 STANDARDS OF THE NATIONAL FIRE PROTECTION ASSOCIATION AND OTHER STANDARDS ADOPTED.
- H. VENTILATION OF HEALTH CARE FACILITIES (ASHRAE 170) 2021 I. VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY (ASHRAE 62.1) - 2019

STANDARDS

ALL DIVISION 23 MATERIALS, INSTALLATION AND SYSTEMS SHALL MEET THE REQUIREMENTS OF THE FOLLOWING STANDARDS, INCLUDING THE LATEST ADDENDA AND AMENDMENTS, TO THE EXTENT REFERENCED:

- A. UNDERWRITERS' LABORATORIES (UL) AMERICAN NATIONAL STANDARDS INSTITUTION (ANSI)
- AMERICAN SOCIETY OF TESTING MATERIALS (ASTM) NATIONAL FIRE PROTECTION (NFPA)
- NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
- AIR CONDITIONING AND REFRIGERATION INSTITUTE (ARI)
- G. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA) H. AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS (ASHRAE)
- I. AIR MOVEMENT AND CONTROL ASSOCIATION (AMCA)
- STANDARD FOR SMOKE CONTROL SYSTEMS (NFPA 92) 2018 K. STANDARDS OF THE HYDRONIC INSTITUTE (IBR)

CONTROLS LEGEND



MECHANICAL GENERAL NOTES

THE FOLLOWING NOTES ARE TO DEMONSTRATE MINIMUM MECHANICAL CODE COMPLIANCE ONLY. CONTRACTOR IS RESPONSIBLE FOR THE FULL WRITTEN SPECIFICATIONS. IF ANY INCONSISTENCIES ARE PRESENT, THE FULL WRITTEN SPECIFICATIONS PREVAIL.

AIR DISTRIBUTION:

- EXTERNALLY INSULATE TRANSITIONS AT EQUIPMENT CONNECTIONS.
- PROVIDE DUCT FLEX CONNECTIONS FOR ALL UNITS. EXTERNALLY INSULATE FLEXIBLE CONNECTIONS. ALL EXHAUST DUCTWORK RUNOUTS SHALL BE RIGID DUCT.
- DUCT SIZES ARE SHEET METAL SIZES. NO DUCTWORK SHALL RUN PARALLEL WITH AND OVER WALLS.

EQUIPMENT

- DRAWINGS.
- 2. PROVIDE A TRAP ON ALL CONDENSATE DRAIN OUTLETS. SLOPE ALL CONDENSATE DRAIN PIPING -1/8" INCH PER
- FOOT.
- 4. PROVIDE VIBRATION ISOLATORS FOR ALL UNITS. SEE SPECIFICATIONS AND DETAILS.
- LOCATED AS REQUIRED TO PROVIDE PROPER SERVICE ACCESS IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION FOR ALL HVAC EQUIPMENT INCLUDING DAMPERS AND VALVES.
- SUPERVISION OF MANUFACTURER'S REPRESENTATIVE.

CONTROLS:

- WIRING TO PREVENT ANY INTERFERENCE.
- 2. ALL LOW VOLTAGE CONTROL WIRING SHALL COMPLY WITH SPEC AND IN ACCORDANCE WITH ELECTRICAL SPEC REQUIREMENTS.
- 3. PROVIDE ALL SOFTWARE, PROGRAMMING, GRAPHICS, AND RELATED INTERFACE TO MONITOR THE HVAC SYSTEM VIA INTERNET LOGIN.

GENERAL: AS INDICATED IN THESE PLANS AND SPECIFICATIONS AND/OR AS PROVIDED BY THE OWNER. SHOULD THE

- AFTER WHICH TIME THE CONTRACTOR HAS NO CLAIM AGAINST THE OWNER RESULTING FROM ALLEGED ERRORS. OMISSIONS, OR INACCURACIES OF THE SAID DATA.
- ADEQUATE SPACE FOR MAINTENANCE, SHALL BE REMOVED AND REPLACED WHEN SO DIRECTED BY THE ARCHITECT/ENGINEER.
- SHOWN ON THE DRAWINGS.
- AND MATERIAL WHICH ARE DAMAGED AS A RESULT OF INADEQUATE PROTECTION.
- THOROUGHLY CLEAN ALL EXPOSED PARTS OF APPARATUS AND EQUIPMENT AND REMOVE ALL OIL AND GREASE CLEAN AND SAFE CONDITION.
- ARE NOT INSTALLED EXACTLY AS SHOWN ON THE CONTRACT DOCUMENTS.

1. VERIFY COLLAR SIZES ON ALL EQUIPMENT INLETS AND OUTLETS. TRANSITION DUCTWORK AS NECESSARY

CONTRACTOR SHALL VERIFY CLEARANCE SPACE AVAILABLE, OFFSETS REQUIRED, STRUCTURAL OPENINGS, AND WORK BY OTHER TRADES PRIOR TO FABRICATION OF DUCTWORK. SUBMIT SHOP DRAWINGS ON DUCTWORK LAYOUT. COORDINATE WITH ROOF TRUSSES/STRUCTURE. PRESSURE TEST ALL DUCTWORK FOR LEAKS. SEE SPECIFICATIONS. RETURN AND EXHAUST DUCT SHALL BE TESTED UNDER NEGATIVE PRESSURE.

1. PROVIDE FULL SIZE COPPER CONDENSATE DRAINS FROM ALL UNITS TO DISPOSAL POINT INDICATED ON THE

3. CONTRACTOR SHALL INSTALL ALL EQUIPMENT, PIPING, AND DUCTWORK SUCH THAT MANUFACTURER'S RECOMMENDED CLEARANCES ARE MET FOR ALL ACCESS PANELS, MOTORS, FANS, BELTS, FILTERS AND AIR INTAKES. PROVIDE ACCESS PANELS IN ALL NON-ACCESSIBLE CONSTRUCTIONS (INCLUDING CEILING, WALLS, ETC) SIZED AND

6. ALL HVAC EQUIPMENT TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND UNDER

1. MAINTAIN A MINIMUM OF 3'-6" SEPARATION FROM THE HVAC CONTROL WIRING AND OTHER DATA, TV, OR PHONE

PRIOR TO COMMENCING ANY WORK, THE CONTRACTOR SHALL SATISFY HIMSELF AS TO THE ACCURACY OF ALL DATA CONTRACTOR DISCOVER ANY INACCURACIES, ERRORS, OR OMISSIONS IN THE DATA, HE SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN ORDER THAT PROPER ADJUSTMENTS CAN BE ANTICIPATED AND ORDERED. 2. COMMENCEMENT BY THE CONTRACTOR OF ANY WORK SHALL BE HELD AS AN ACCEPTANCE OF THE DATA BY HIM

3. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED AND COMPLETED IN A FIRST-CLASS WORKMANLIKE MANNER AND IN ACCORDANCE WITH THE BEST MODERN METHODS AND PRACTICE. ANY MATERIALS INSTALLED WHICH DO NOT PRESENT AN ORDERLY AND REASONABLY NEAT AND/OR WORKMANLIKE APPEARANCE, OR DO NOT ALLOW

IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL EQUIPMENT AND DEVICES THAT MAY REQUIRE MAINTENANCE AND OPERATION ARE MADE EASILY ACCESSIBLE, REGARDLESS OF THE DIAGRAMMATIC LOCATION

5. THE CONTRACTOR SHALL PROTECT EQUIPMENT AND MATERIAL AT ALL TIMES. HE SHALL REPLACE ALL EQUIPMENT

SPOTS. REPAINT OR TOUCH UP AS REQUIRED TO LOOK LIKE NEW. DURING PROGRESS OF WORK, CONTRACTOR IS TO CAREFULLY CLEAN UP AND LEAVE PREMISES AND ALL PORTIONS OF BUILDING FREE FROM DEBRIS AND IN A

DURING THE PROGRESS OF THE WORK, THE CONTRACTOR SHALL RECORD ON THEIR FIELD SET OF DRAWINGS (AS-BUILTS) THE EXACT LOCATION, AS INSTALLED, OF ALL PIPING, DUCTWORK, EQUIPMENT, AND OTHER SYSTEMS WHICH

A	AMPS; AREA	HG
		HHW HHD
ADV CLG	AIR CONDITIONING UNIT	HHW
ACH	AIR CHANGE PER HOUR	HHW
AFF	ABOVE FINISHED FLOOR	HP
АН		HPS HD
AI	ANALOG INPUT	HX
AL	ALUMINUM	ID
AM	AIRFLOW MONITOR	IN. W
AMS	AIRFLOW MEASURING STATION	KW
AO AP	ACCESS PANEL	
AS	AIR SEPARATOR	LB
BD	BALANCING DAMPER	LD
BFF	BELOW FINISHED FLOOR	LPS
BTU	BACKFLOW PREVENTER BRITISH THERMAL UNITS	LVG
BTUH	BTU PER HOUR	MAX
В	BOILER	MBH
C		MCF
CAC	CONTROLAIR COMPRESSOR	MD MIN
CD	CEILING DIFFUSER	NC
CF	CUBIC FEET	NIC
CFH	CUBIC FEET PER HOUR	NO
	CUBIC FEET PER MINUTE	
CBWS	CHILLED BEAM WATER SUPPLY	OAL
CBWR	CHILLED BEAM WATER RETURN	OC
CH	CHILLER	OD
		P
CHWR	CHILLED WATER RETURN	PCW
CHWS	CHILLED WATER SUPPLY	PCW
CO		PCW
CR	CUDDENSATE RETURN (STEAM)	PH
CSK	CURRENT SENSING (AMPS)	PRV
CT	COOLING TOWER; COMPRESSION TANK	PSI
CU	CONDENSING UNIT; COPPER	PT
		PVC
DC	DUST COLLECTOR	RA
DDC	DIRECT DIGITAL CONTROLS	RD
DEFL	DEFLECTION	RAG
DG		RH
DIA	DIAMETER	RI
DO	DIGITAL OUTPUT	RP
DS	DUCT SILENCER	RPM
DTW		RAR
DTWR	DUAL TEMPER WATER RETORN	RV
EA	EACH	SA
EAT	ENTERING AIR TEMPERATURE	SAR,
EDH	ELECTRIC DUCT HEATER	SCR
EF FG	EXHAUST FAN	SE
EH	EXHAUST HOOD	SG
ENT	ENTERING	SIM
ER	EXHAUST REGISTER	SP
ESP EV	EXTERNAL STATIC PRESSURE	SPEU
EWT	ENTERING WATER TEMPERATURE	SS
EXST,X, EX	EXISTING	STD
EXH		STL
		SIM
FCU	FAN COIL UNIT	TEM
FD	FIRE DAMPER, FLOOR DRAIN	TG
FEV	FUME EXHAUST VALVE	TSP
FG FH		I YP
FMS	FUNE ROOD FLOW MEASURING STATION	UG
FO	FLAT OVAL	UH
FPM	FEET PER MINUTE	V
FRP	FIBERGLASS REINFORCED PLASTIC	VAV
FJU FT	FAN SPEED GUNTRULLER FEFT	VFD VFM
FT WG	FEET OF WATER, GAUGE	VLV
FTU	FAN TERMINAL UNIT	VRF
GA	GAUGE	VRV
(-4)		1/1/11

MECHANICAL ABBREVIATIONS

GPM

(UNABRIDGED)

	MECHAN	CAL LEG
GALLONS PER MINUTE HOT GAS	\square	SUPPLY DIF
HEATING HOT WATER HEATING HOT WATER PUMP HEATING HOT WATER RETURN		
HEATING HOT WATER SUPPLY HEAT PUMP; HORSEPOWER HEAT PRESSURE SYSTEM	\square	RETURN GF
HOUR HOUR HEAT EXCHANGER	\bowtie	EXHAUST G
INSIDE DIAMETER INCHES OF WATER, GAUGE KILOWATTS KILOWATT HOUR	رورد	RECTANGU
LEAVING AIR TEMPERATURE POUND LINEAR DIFFUSER		RECTANGU
LOW PRESSURE STEAM LEAVING LEAVING WATER TEMPERATURE MAXIMUM		RECTANGU
THOUSANDS OF BTU'S THOUSANDS OF CUBIC FEET MOTORIZED DAMPER		RECTANGU
MINUTE; MINIMUM NORMALLY CLOSED NOT IN CONTRACT		RECTANGO
NORMALLY OPEN, NUMBER NOT TO SCALE OUTDOOR AIR	الكا	ROUND CRO
OUTDOOR AIR LOUVER ON CENTER OUTSIDE DIAMETER	\Box	ROUND TEE
PUMP PROCESS COOLING WATER PROCESS COOLING WATER PUMP	\mathcal{D}	ROUND ELB
PROCESS COOLING WATER RETURN PROCESS COOLING WATER SUPPLY PHASE DRESSURE	\mathcal{D}	ROUND ELB
PRESSURE REDUCING VALVE POUNDS PER SQUARE INCH PRESSURE TREATED	\mathcal{D}	ROUND ELB
POLYVINYL CHLORIDE RADIUS RETURN AIR		ROUND TAK
ROUND DIFFUSER RETURN AIR GRILLE RELATIVE HUMIDITY	II 1	ROUND TAK
REHEAT COIL REFRIGERANT LIQUID REDUCED PRESSURE	للوا	MOTODIZE
REVOLUTIONS PER MINUTE RETURN AIR REGISTER REFRIGERANT SUCTION		MOTORIZEL
SUPPLY AIR SUPPLY AIR SUPPLY AIR REGISTER	\$G>	GRAVITY DA
SMOKE DAMPER SQUARE FEET, SUPPLY FAN SOFFIT GRILLE	F	FIRE DAMPI
SIMILAR STATIC PRESSURE SPECIFICATION	\$	FIRE & SMO
SIDEWALL REGISTER STAINLESS STEEL STANDARD	\$	SMOKE DAM
STEEL STEAM SUPPLY VALVE	0	DUCT-MOU
TRANSFER GRILLE; TEMPERATURE GAUGE TOTAL STATIC PRESSURE TYPICAL	Ð	ROOM HUM
UNDERCUT DOOR - 3/4" UNDERGROUND UNIT HEATER	T	ROOM THEF
VOLTS VARIABLE AIR VOLUME VARIABLE FREQUENCY DRIVE	DUCT LEGEND	TOP AT 48"
VENTURI FLOW METER VALVE VARIABI E REFRIGERANT FLOW	NEW WORK EX	ISTING DEMO
VARIABLE REFRIGERANT VOLUME VARIABLE VOLUME UNIT	EA	RA EA

SPLIT SYSTEM DX AIR H	ANDLING UNIT SCHEDULE
MARK	AHU-1
TYPE	HEAT PUMP
NOTES	(1)(2)(3)(5)
BASIS OF DESIGN	LG
MODEL NUMBER	ARNU763B8A4
AN SECTION	
MAXIMUM SUPPLY AIR (CFM)	2,260
DUTSIDE AIR (CFM)	200
MIN ESP (IN WG)	0.23
MAX ESP (IN WG)	0.86
DRIVE	DIRECT-ECM
/OLTS / PHASE	230 / 1
MCA (AMPS)	6.5
FLA (AMPS)	5.2
MOCP (AMPS)	15
COOLING PERFORMANCE	
REFRIGERANT	R410A
REFRIGERANT CONTROL	EEV
MAX COIL FACE VELOCITY (FPM)	450
FOTAL COOLING CAPACITY (BTUH)	42,000
SENSIBLE COOLING CAPACITY (BTUH)	31,200
ENT AIR TEMP (DB/WB)	76 / 64
VG AIR TEMP (DB/WB)	15 K
IEATING PERFORMANCE	
TYPE	REFRIGERANT
TOTAL HEATING CAPACITY (BTUH)	86,000
ENT AIR TEMP (DB)	59
LVG AIR TEMP (DB)	
CONDENSING UNIT	
MARK	HP-1
BASIS OF DESIGN - MFGR.	LG
BASIS OF DESIGN - MODEL	ARUN060GSS4
	05/00

WB

WPD

WATER PRESSURE DROP

25.4

TS / PHASE CHEDULE NOTES 1) DISCONNECT BY ELECTRICAL 2) PROVIDE WITH STANDARD PRE-FILTER

GALV

GEV

GPH

MCA (AMPS)

IOCP (AMPS

GALVANIZED

GENERAL EXHAUST VALVE

GALLONS PER HOUR

3) SUCTION AND LIQUID LINES TO BE SIZED PER MANUFACTURER 4) PROVIDE WITH COMPLETE AIRZONE INTELLIGENT ZONE CONTROL SYSTEM AS FOLLOWS:

AIRZONE MAIN CONTROL BOARD FOR INTEGRATION WITH LG UNIT AZVAFCB2[XXX] WEBSERVER HUB AIRZONE CLOUD: AZX6WSPHUB

AIRZONE VAF WIRED BLUEFACE ZERO PRINCIPAL CONTROLLER: AZVAFBLUEZEROCB (QTY 1) AIRZONE VAF WIRED BLUEFACE ZERO LITE CONTROLLER: AZVAFLITECB (QTY 5)

AIRZONE VAF WIRED INTELLIGENT ROUND DAMPER (QTY 6) AIRZONE SIELDED BUS CABLE UL444 (SIZES 0.22, 0.5 AND 1.5

EA OA OA PIPING LEGEND NEW WORK EXISTING DEM CHWS CHWS CHWR PCWR PCWR STM STM

SHEET NUMBER	
M001	LEGEN
M101	FLOOR
M201	DETAIL

EXHAUST FA	N SCHE	DULE	
MARK	EF-1	EF-2	EF-3
MANUFACTURER	COOK	COOK	COOK
MODEL	GC-146	GC-146	GC-146
TYPE	CEILING	CEILING	CEILING
AIRFLOW (CFM)	70	70	70
TSP (IN WG)	0.2	0.2	0.2
MOTOR SECTION			
VOLTS-PHASE	115 / 1	115 / 1	115 / 1
AMPS	0.31	0.31	0.31
INPUT WATTS	28	28	28
DRIVE TYPE	DIRECT	DIRECT	DIRECT
MOTOR SPEED (RPM)	747	747	747
SCHEDULE NOTES	1,2,3	1,2,3	1,2,3
(1) PROVIDE INTEGRAL D	ISCONNECT	38 Br - 73	
(2) PROVIDE FAN SPEED	CONTROLLER		
(3) START/STOP TO BE IN	TEGRATED WIT	H BATHROOM OC	C. SENSOR

<u>CAL LEGEN</u>	D			
SUPPLY DIFFUSEF	2	₽	AIRTROL FITTING	
RETURN GRILLE		ID-4-	AUTOMATIC AIR VENT WITH VALVE	
EXHAUST GRILLE			AUTOMATIC BALANCING VALVE	
RECTANGULAR EL	BOW - MITERED - WITH TURNING VANES	ç	BACKFLOW PREVENTER	
RECTANGULAR EL	BOW - MITERED	ାଦ ଦ	VALVE. SEE SPECIFICATIONS FOR TYPE.	
RECTANGULAR CF	ROSS	弦	CALIBRATED BALANCING VALVE	
RECTANGULAR TE	E	Ň	CHECK VALVE	
ROUND CROSS			CONCENTRIC REDUCER	
ROUND TEE	ROUND TEE		ECCENTRIC REDUCER	
ROUND ELBOW - 1	D	×	FILL VALVE	
ROUND ELBOW - 1	.5D	000	FLEXIBLE PIPE CONNECTION	
ROUND ELBOW - 2	D	-0	PRESSURE GAUGE	
ROUND TAKEOFF	WITH DAMPER - CONICAL	Т	PRESSURE OR TEMPERATURE TEST PORT	
ROUND TAKEOFF	WITH DAMPER	V	INLINE STRAINER	
MOTORIZED DAMF	PER	$\Gamma_{\theta_{\tau}}$	INLINE STRAINER WITH BLOWDOWN VALVE WITH THREADED CONNECTION AND CAP	
GRAVITY DAMPER	GRAVITY DAMPER		PLUG VALVE	
FIRE DAMPER		X	PRESSURE REDUCING VALVE	
FIRE & SMOKE DA	MPER	ᡘᢩᢦ	RELIEF VALVE	
SMOKE DAMPER		Ś	SPEED CONTROLLER	
DUCT-MOUNTED S	SMOKE DETECTOR W/ ACCESS PANEL	X	TWO-WAY CONTROL VALVE	
ROOM HUMIDISTAT. MOUNT TOP AT 48" AFF		X	THREE-WAY CONTROL VALVE	
ROOM THERMOST TOP AT 48" AFF	AT - TEMPERATURE & HUMIDITY. MOUNT	φ	THERMOMETER	
STING DEMOLITION	۸	Y	THERMOMETER WELL	
SA SA RA	SUPPLY AIR RETURN AIR	_	UNION; DIELECTRIC WATERWAY (SEE SPECIFICATIONS)	
EA EA	EXHAUST OUTSIDE AIR	. 1		
	1		VENTURI FLOW METER	
		<-∕	DOOR GRILLE	
C CHWR	CHILLED WATER RETURN	YY	WATER METER	
WR HHWR	HEATING HOT WATER SUPPLY HEATING HOT WATER RETURN	${\color{black}}$	CONNECT TO EXISTING	
PCWS WR PCWR TM STM	PROCESSED COLD WATER SUPPLY PROCESSED COLD WATER RETURN STEAM	<u>XXX - ###</u>	UNIT SYMBOL WITH UNIT NUMBER	

SHEET NAME ID, ABBREVIATIONS, CODES, STANDARDS & SCHEDULES R PLAN & SPECIFICATIONS







MECHANICAL SPECIFICATIONS

1. GENERAL MECHANICAL: A. GENERAL

- a. THE WORK COVERED BY THIS DIVISION CONSISTS OF PROVIDING ALL LABOR. EQUIPMENT AND MATERIALS AND PERFORMING ALL OPERATIONS NECESSARY FOR THE INSTALLATION OF THE MECHANICAL WORK AS HEREIN CALLED FOR AND SHOWN ON THE DRAWINGS. REVIEW ALL OTHER CONTRACT DOCUMENTS TO BE AWARE OF CONDITIONS AFFECTING WORK HEREIN. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL BE SATISFIED AS TO THE ACCURACY OF ALL DATA INDICATED ON THE DRAWINGS AND/OR PROVIDED BY THE OWNER. SHOULD THE CONTRACTOR DISCOVER ANY INACCURACIES, ERRORS, OR OMISSIONS IN THE DATA, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER. COMMENCEMENT OF WORK BY THE CONTRACTOR SHALL BE HELD AS AN ACCEPTANCE OF THE DATA BY HIM AFTER WHICH TIME THE CONTRACTOR HAS NO CLAIM AGAINST THE OWNER RESULTING FROM ALLEGED ERRORS, OMISSIONS, OR INACCURACIES OF THE SAID DATA. MATERIALS DELIVERED TO SITE SHALL BE INSPECTED FOR DAMAGE, UNLOADED, AND STORED WITH A MINIMUM OF HANDLING. ALL MATERIAL SHALL BE STORED TO PROVIDE PROTECTION FROM THE WEATHER AND ACCIDENTAL DAMAGE. ALL WORKERS UNDER THIS SECTION MUST OPERATE WITHIN AND MAINTAIN A CLEAN AND SAFE WORKING ENVIRONMENT. GENERAL CLEANING REQUIREMENTS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL SAFETY PROTOCOLS ESTABLISHED BY THE GENERAL CONTRACTOR SHALL BE STRICTLY ADHERED TO. REPORT ANY DISCOVERED SAFETY CONCERNS WITH THE PROJECT SUPERINTENDENTS
- B. PRODUCTS a. EQUIPMENT AND MATERIALS SHALL BE NEW AND THE MOST SUITABLE GRADE FOR THE PURPOSE INTENDED. WHERE PRACTICAL, ALL THE COMPONENTS SHALL BE PRODUCTS OF A SINGLE MANUFACTURER IN ORDER TO PROVIDE PROPER COORDINATION AND RESPONSIBILITY. CATALOG NUMBERS AND MODEL NUMBERS INDICATED IN THE DRAWINGS AND SPECIFICATIONS ARE USED AS A GUIDE IN THE SELECTION OF THE EQUIPMENT AND ARE ONLY LISTED FOR THE CONTRACTOR'S CONVENIENCE. THE CONTRACTOR SHALL DETERMINE THE ACTUAL MODEL NUMBERS FOR ORDERING EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE WRITTEN DESCRIPTION OF EACH ITEM AND WITH THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. C. SHOP DRAWING SUBMITTAI
- a. SUBMIT TEST REPORTS, CERTIFICATIONS, AND VERIFICATION LETTERS AS CALLED FOR IN OTHER SECTIONS. CONTRACTOR SHALL COORDINATE THE REQUIRED TESTING AND DOCUMENTATION OF SYSTEM PERFORMANCE SUCH THAT SUFFICIENT TIME EXISTS TO PREPARE THE REPORTS, SUBMIT THE REPORTS, REVIEW THE REPORTS, AND TAKE CORRECTIVE ACTION WITHIN THE SCHEDULED CONTRACT TIME.
- D. EXECUTION a. ALL MATERIALS AND EQUIPMENT SHALL BE INSTALLED AND COMPLETED IN A FIRST-CLASS WORKMANLIKE MANNER AND IN ACCORDANCE WITH THE BEST MODERN METHODS AND PRACTICE. ANY MATERIALS INSTALLED WHICH DO NOT PRESENT AN ORDERLY AND REASONABLY NEAT AND/OR WORKMANLIKE APPEARANCE. OR DO NOT ALLOW ADEQUATE SPACE FOR MAINTENANCE. SHALL BE REMOVED AND REPLACED WHEN SO DIRECTED BY THE ARCHITECT/ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULL COORDINATION OF THE MECHANICAL SYSTEMS WITH SHOP DRAWINGS OF THE BUILDING CONSTRUCTION SO THE PROPER OPENINGS AND SLEEVES OR SUPPORTS ARE PROVIDED FOR PIPING, DUCTWORK, OR OTHER EQUIPMENT PASSING THROUGH SLABS OR WALLS. ALL WORKERS UNDER THIS SECTION MUST COORDINATE RELATED WORK NOT ONLY WITH OTHER MECHANICAL SUBCONTRACTORS AND ASSOCIATED VENDORS BUT ALSO WITH OTHER JOB TRADES, GENERAL CONTRACTOR SUPERINTENDENTS, AND REPRESENTATIVES OF THE OWNER. PROVIDE COMMUNICATION AS REQUIRED TO SUPPORT PROVISION OF COMPLETE AND COORDINATED SYSTEMS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL EQUIPMENT SUCH AS VALVES, DAMPERS, FILTERS AND SUCH OTHER APPARATUS OR EQUIPMENT THAT MAY REQUIRE MAINTENANCE AND OPERATION ARE MADE EASILY ACCESSIBLE, REGARDLESS OF THE DIAGRAMMATIC LOCATION SHOWN ON THE DRAWINGS. ALL CONNECTIONS TO FIXTURES AND EQUIPMENT SHOWN ON THE DRAWINGS SHALL BE CONSIDERED DIAGRAMMATIC UNLESS OTHERWISE INDICATED BY A SPECIFIC DETAIL ON THE DRAWINGS. THE ACTUAL CONNECTIONS SHALL BE MADE TO FULLY SUIT THE REQUIREMENTS OF EACH CASE AND ADEQUATELY PROVIDE FOR SERVICING. START OF WORK SHALL BE CONSTRUED AS ACCEPTANCE OF SUITABILITY OF WORK OF OTHERS

2. MECHANICAL DUCTWORK SHEET METAL DUCTWORK

- A. GENERAL a. THIS PROJECT INCLUDES THE PROVISION OF MECHANICAL DUCTWORK INCLUDING SUPPLY, RETURN, OUTSIDE AIR AND EXHAUST SYSTEMS. DUCTWORK SHALL BE PROVIDED BASED ON THE FLORIDA BUILDING CODE AND THE MANUFACTURER'S REQUIREMENTS. ALL SHEET METAL DUCTWORK SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE" FOR FABRICATION OF METAL DUCTWORK, UNLESS OTHERWISE NOTE. COMPLY WITH NFPA 90A "STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS". FLEXIBLE DUCTWORK SHALL MEET THE REQUIREMENTS OF UL-181.
- B. SHOP DRAWING SUBMITTAL a. SUBMIT PRODUCT DATA AS MANUFACTURER'S TECHNICAL INFORMATION INCLUDING INSTALLATION INSTRUCTIONS FOR FIELD-FABRICATED DUCTWORK, SEALANTS, INTERNAL LINER, ADHESIVES, FLEXIBLE DUCT, AND FITTINGS.
- C. PRODUCTS a. AS INDICATED ON THE DRAWINGS, PROVIDE DUCTWORK AND FITTINGS MATERIALS CONSISTING OF GALVANIZED SHEET METAL, STAINLESS STEEL, OR ALUMINUM ACCORDINGLY. ACCEPTABLE MANUFACTURERS SUBJECT TO COMPLIANCE WITH REQUIREMENTS INCLUDE ATCO 36, FLEXMASTER 8M-R6, AND THERMAFLEX M-KE R6. FOR SPECIFIC PRESSURE CLASS REQUIREMENTS OF SHEET METAL DUCTWORK, REFER TO MECHANICAL SCHEDULES ON DRAWINGS. b. GALVANIZED SHEET METAL: EXCEPT AS OTHERWISE INDICATED, FABRICATE DUCTWORK FROM GALVANIZED SHEET STEEL COMPLYING WITH ASTM A 653, LOCKFORMING QUALITY; WITH G 90 ZINC COATING IN ACCORDANCE WITH ASTM A 525; AND MILL PHOSPHATIZED FOR EXPOSED LOCATIONS. STAMP GAUGE AND MANUFACTURER'S IDENTIFICATION ON EACH SHEET. BREAK SHEETS SO THAT IDENTIFICATION IS EXPOSED.
- GAUGE: 28-GAUGE MINIMUM FOR ROUND DUCTS AND FITTINGS, 4" THROUGH 8" DIAMETER. 26-GAUGE MINIMUM 9" THROUGH 14", 24-GAUGE MINIMUM 15" THROUGH 26" ELBOWS: ONE PIECE CONSTRUCTION FOR ROUND 90° AND 45° ELBOWS.
- c. DUCT SEALANT: PROVIDE NON-HARDENING, NON-MIGRATING MASTIC OR LIQUID ELASTIC SEALANT, TYPE APPLICABLE FOR FABRICATION/INSTALLATION DETAIL, AS COMPOUNDED AND RECOMMENDED BY MANUFACTURER SPECIFICALLY FOR SEALING JOINTS AND SEAMS IN DUCTWORK. COMPLY WITH DIVISION 1 REQUIREMENTS FOR LOW VOC CONTENT.
- d. DUCTWORK SUPPORT MATERIALS: EXCEPT AS OTHERWISE INDICATED, PROVIDE HOT-DIPPED GALVANIZED STEEL FASTENERS, ANCHORS, RODS, STRAPS, TRIM AND ANGLES FOR SUPPORT OF DUCTWORK. FOR STAINLESS STEEL DUCTWORK, PROVIDE MATCHING STAINLESS STEEL SUPPORT MATERIALS. e. FLEXIBLE DUCTS: PROVIDE FLEXIBLE DUCTWORK WITH AN R-VALUE OF R-6. R-4 IS ACCEPTABLE FOR FLEXIBLE DUCTWORK INSTALLED IN CEILING RETURN PLENUMS. THE USE OF FLEXIBLE DUCTWORK FOR CONNECTION OF SUPPLY AIR AND RETURN AIR DEVICES IS ACCEPTABLE
- ONLY WHERE SHOWN ON THE DRAWINGS. CONSTRUCTION: PROVIDE REINFORCED METALIZED POLYESTER JACKET THAT IS TEAR AND PUNCTURE RESISTANT, AIRTIGHT INNER CORE WITH NO FIBERGLASS EROSION IN THE AIR STREAM AND AN ENCAPSULATED WIRE HELIX. FLEXIBLE DUCTWORK SHALL HAVE A RECOMMENDED OPERATING PRESSURE OF 6" W.G. FOR SIZES 4" THROUGH 12" DIAMETER AND 4" W.G. FOR SIZES 14" THROUGH 20" DIAMETER. ALL DIAMETERS SHALL BE SUITABLE FOR A NEGATIVE OPERATING PRESSURE OF 0.75" W.G. FLEXIBLE DUCTWORK SHALL MEET
- THE REQUIREMENTS OF UL-181, FBC MECHANICAL, SBCC, NFPA 90A AND NFPA 90B f. SUPPLY AIR DIFFUSER CONNECTIONS SHALL BE CONICAL WITH DAMPER AND ONE INCH HIGH INSULATION STAND-OFF EQUAL TO CROWN 3200 DS OR FLEXMASTER CBD-BO.
- D. EXECUTION a. DUCT ROUTING, LOCATE DUCTWORK RUNS, EXCEPT AS OTHERWISE INDICATED, VERTICALLY AND HORIZONTALLY. AVOID DIAGONAL RUNS WHEREVER POSSIBLE. LOCATE RUNS AS INDICATED BY DIAGRAMS, DETAILS AND NOTATIONS OR, IF NOT OTHERWISE INDICATED, RUN DUCTWORK IN SHORTEST ROUTE WHICH DOES NOT OBSTRUCT USEABLE SPACE OR BLOCK ACCESS FOR SERVICING BUILDING AND ITS EQUIPMENT. HOLD DUCTS CLOSE TO WALLS, OVERHEAD CONSTRUCTION, COLUMNS, AND OTHER STRUCTURAL AND PERMANENT ENCLOSURE ELEMENTS OF BUILDING. COORDINATE LAYOUT WITH STRUCTURE AND LIGHTING LAYOUTS AND SIMILAR FINISHED WORK. WHERE DUCTS PASS THROUGH FIRE-RATED FLOORS, WALLS, OR PARTITIONS, PROVIDE FIRESTOPPING BETWEEN DUCT AND SUBSTRATE. INSTALL METAL DUCTWORK IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS. FAN DISCHARGE OUTLET DUCTS SHALL BE INSTALLED CORRECTLY WITH REGARD TO "SYSTEM EFFECT" PER AMCA PUBLICATION 201. INSTALLING CONTRACTORS SHALL
- PROVIDE ALL SPECIALTIES INCLUDING DAMPERS, ACCESS DOORS, AND FLEX CONNECTORS AS REQUIRED TO SUPPORT A COMPLETE AND FUNCTIONAL INSTALLATION. b. FLEXIBLE DUCTS: FOR ANY DUCT RUN USING FLEXIBLE DUCTWORK, DO NOT EXCEED [8-0"] EXTENDED LENGTH. FLEXIBLE DUCT SHALL ONLY BE ALLOWED AS DETAILED ON THE DRAWINGS. MINIMUM LENGTH: FOR ANY DUCT RUN USING FLEXIBLE DUCTWORK, USE A MINIMUM OF 3'-0" EXTENDED LENGTH SECTION. SUPPORT FLEXIBLE DUCTS TO ELIMINATE PINCHING AND KINKING WHICH WOULD RESTRICT FLOW. BENDS SHALL BE MADE WITH AT LEAST ONE DUCT DIAMETER.

3. MECHANICAL INSULATION A. GENERAI

- a. THIS PROJECT INCLUDES THE PROVISION OF EXTERIOR INSULATION FOR MECHANICAL COMPONENTS INCLUDING DUCTWORK. DO NOT INSULATE COMPONENTS THAT ARE FACTORY INSULATED, UNLESS NOTED OTHERWISE. INSULATION SHALL BE PROVIDED BASED ON THE FLORIDA BUILDING CODE AND INSULATION MANUFACTURER'S REQUIREMENTS. PROVIDE COMPOSITE MECHANICAL INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS, AND ADHESIVE) WITH A FLAME-SPREAD RATING OF 25 OR LESS, AND A SMOKE-DEVELOPED RATING OF 50 OR LESS, AS TESTED BY ANSI/ASTM E84.
- B. SHOP DRAWING SUBMITTAL
- a. SUBMIT MANUFACTURER'S DATA SHEETS AND INSTALLATION INSTRUCTIONS ON EACH INSULATION SYSTEM INCLUDING INSULATION MATERIAL, COVERINGS, ADHESIVES, SEALERS, PROTECTIVE FINISHES, AND OTHER MATERIALS RECOMMENDED BY THE MANUFACTURER FOR THE APPLICATIONS INDICATED ON THE DRAWINGS.
- C. PRODUCTS a. PROVIDE DUCTWORK INSULATION MATERIAL AS FOLLOWS:
- 1. FLEXIBLE FIBERGLASS INSULATION: ASTM C553, TYPE I, CLASS B-3 (TEMPERATURE LESS THAN 350°F). DUCT WRAP SHALL BE 0.75 PCF DENSITY WITH UL RATED ALUMINUM FOIL VAPOR BARRIER (FSK) 2. RIGID FIBERGLASS INSULATION BOARD: ASTM C612, CLASS 1 (NON-LOAD BEARING). BOARDS SHALL BE 3 PCF DENSITY WITH UL RATED ALUMINUM FOIL VAPOR BARRIER (FSK) D. EXECUTION
- a. INSTALL THERMAL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, AND IN COMPLIANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT INSULATION SERVES INTENDED PURPOSE. INSTALL INSULATION MATERIALS WITH SMOOTH AND EVEN SURFACES AND ON CLEAN AND DRY SURFACES. REDO POORLY FITTED JOINTS. DO NOT USE MASTIC OR JOINT SEALER AS FILLER FOR GAPPING JOINTS AND EXCESSIVE VOIDS RESULTING FROM POOR WORKMANSHIP. DO NOT INSTALL INSULATION UNTIL SYSTEMS HAVE BEEN CHECKED AND FOUND FREE OF LEAKS. SURFACES SHALL BE CLEAN AND DRY BEFORE ATTEMPTING TO APPLY INSULATION.
- b. WHERE DUCTWORK IS EXPOSED, INSULATE WITH 2" THICK RIGID FIBERGLASS INSULATION WITH VAPOR BARRIER (INSTALLED R-VALUE OF 6.0 MINIMUM). PROVIDE WEATHERPROOF FINISH. PITCH THE UPPER SURFACE OF THE DUCT INSULATION TO DRAIN BY INSTALLING A 6" WIDE INSULATION BOARD (OR EQUAL) DOWN THE CENTER OF THE DUCT PRIOR TO APPLYING THE INSULATION.
- c. CLEAN AND DRY DUCTWORK PRIOR TO INSULATING. BUTT INSULATION FIRMLY TOGETHER TO ENSURE COMPLETE AND TIGHT FIT OVER SURFACES TO BE COVERED. INSTALL INSULATION MATERIALS WITH SMOOTH AND EVEN SURFACES. MAINTAIN INTEGRITY OF ALUMINUM VAPOR BARRIER WHEREVER POSSIBLE. EXTEND INSULATION WITHOUT INTERRUPTION THROUGH WALLS.

5. <u>TAB - TEST, ADJUST, BALANCE</u> A. GENERAL

- a. THIS PROJECT INCLUDES THE PROVISION OF TEST, ADJUST, BALANCE (TAB) SERVICES FOR THE SYSTEMS DESCRIBED ON THE DRAWINGS. THESE SERVICES SHALL BE PROVIDED BASED ON A FIRM CERTIFIED BY EITHER THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) OR ASSOCIATED AIR BALANCE COUNCIL (AABC). THE TAB SERVICE FIRM SHALL NOT BE THE INSTALLER OF THE SYSTEMS TO BE TESTED AND IS OTHERWISE INDEPENDENT OF THE PROJECT. COMPLY WITH EITHER NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING AND BALANCING OF ENVIRONMENTAL SYSTEMS" OR AABC'S MANUAL MN-1 "AABC NATIONAL STANDARDS" AS APPLICABLE TO THIS WORK. A NEBB OR AABC CERTIFIED PROFESSIONAL OR TECHNICIAN SHALL BE PRESENT AT THE SITE DURING ANY AND ALL TESTING.
- B. SHOP DRAWING SUBMITTAL a. PRELIMINARY SUBMITTAL - SUBMIT TAB AGENCY QUALIFICATIONS FOR PERFORMING THE DESCRIBED WORK AS WELL AS BLANK FORMS TO BE USED ON THIS PROJECT. GENERIC FORMS THAT INCLUDE DATA COLLECTION NOT RELATED TO THIS PROJECT SHALL BE DEEMED INSUFFICIENT AND THEREFORE REJECTED FOR RESUBMISSION.
- b. FINAL REPORT SUBMITTAL SUBMIT FINAL REPORT COMPLETE WITH ALL SYSTEMS TAB WORK FINISHED. NOTE ANY ISSUES DISCOVERED THAT ADVERSELY AFFECTED THE PERFORMANCE OF THIS SERVICE AS WELL AS ANY RESOLUTIONS OR SUGGESTIONS PROVIDED TO ADDRESS THE ISSUES. INCLUDE DEFICIENCY LIST. C. PRODUCTS
- a. PATCHING MATERIALS EXCEPT AS OTHERWISE INDICATED, USE SAME PRODUCTS AS USED BY ORIGINAL INSTALLER FOR PATCHING HOLES IN INSULATION, DUCTWORK AND HOUSINGS WHICH HAVE BEEN CUT OR DRILLED FOR TEST PURPOSES, INCLUDING ACCESS FOR TEST INSTRUMENTS, ATTACHING JIGS, AND SIMILAR PURPOSES.
- b. TEST INSTRUMENTS UTILIZE TEST INSTRUMENTS AND EQUIPMENT OF THE TYPE, PRECISION, AND CAPACITY AS RECOMMENDED IN THE REFERENCED STANDARD. ALL INSTRUMENTS SHALL BE IN GOOD CONDITION AND SHALL HAVE BEEN CALIBRATED WITHIN THE PREVIOUS SIX (6) MONTHS (OR MORE RECENTLY IF REQUIRED BY STANDARD).
- D. EXECUTION a. EXAMINE INSTALLED WORK AND CONDITIONS UNDER WHICH TESTING IS TO BE DONE TO ENSURE THAT WORK HAS BEEN COMPLETED, CLEANED AND IS OPERABLE. DO NOT PROCEED WITH TAB WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN MANNER ACCEPTABLE TO TESTER.
- b. PATCH HOLES IN INSULATION, DUCTWORK AND HOUSINGS WHICH HAVE BEEN CUT OR DRILLED FOR TEST PURPOSES IN MANNER RECOMMENDED BY ORIGINAL INSTALLER. MARK EQUIPMENT SETTINGS, INCLUDING DAMPER CONTROL POSITIONS, VALVE INDICATORS, FAN SPEED CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, TO SHOW FINAL SETTINGS AT COMPLETION OF TAB WORK. PROVIDE MARKINGS WITH PAINT OR OTHER SUITABLE PERMANENT IDENTIFICATION MATERIALS
- c. PREPARE TAB REPORT OF TEST RESULTS, INCLUDING INSTRUMENTATION CALIBRATION REPORTS, IN FORMAT RECOMMENDED BY APPLICABLE STANDARDS, MODIFIED AS REQUIRED TO INCLUDE ALL DATA LISTED HEREIN. PREPARE A DEFICIENCY (PUNCH) LIST FOR THE CONTRACTOR WITH A COPY TO THE ENGINEER THAT LISTS ALL ITEMS THAT ARE INCORRECTLY INSTALLED OR ARE FUNCTIONING IMPROPERLY. PROVIDE A RETEST AFTER ALL ITEMS ARE CORRECTED. INCLUDE AN EXTENDED WARRANTY OF NINETY (90) DAYS AFTER COMPLETION OF TEST AND BALANCE WORK, DURING WHICH TIME THE ENGINEER, AT HIS DISCRETION, MAY REQUEST A RECHECK, OR RESETTING OF ANY COMPONENT AS LISTED IN TEST REPORT. THE TAB COMPANY SHALL PROVIDE TECHNICIANS AND INSTRUMENTS AND
- MAKE ANY TESTS REQUIRED BY THE ENGINEER DURING THIS TIME PERIOD. E. AIRFLOW TOLERANCES
- a. AIR HANDLING: THE SUPPLY AIR, RETURN AIR AND OUTDOOR AIR QUANTITIES SHALL BE BALANCED WITHIN ±5% OF DESIGN VALUES.
- b. EXHAUST FANS: THE EXHAUST FAN QUANTITIES SHALL BE SET AS REQUIRED TO MAINTAIN THE DESIGN EXHAUST TERMINAL FLOWS WITHIN ±5% OF DESIGN VALUES. IF NO EXHAUST TERMINALS EXIST, EXHAUST FAN AIR QUANTITIES SHALL BE BALANCED WITHIN ± 10% OF DESIGN VALUES. c. TERMINAL UNITS: THE AIR QUANTITIES ASSOCIATED WITH VAV BOXES, FAN COIL UNITS, SELF-REGULATING AIR VALVES, UNIT HEATERS, AND OTHER TERMINAL UNITS SHALL BE BALANCED WITHIN ±5% OF DESIGN.
- d. CEILING DIFFUSERS, SUPPLY REGISTERS, RETURN AND EXHAUST INLETS: BALANCE TO AN AIR QUANTITY WITHIN ±10% OF THE DESIGN VALUES. WHERE THE DRAWINGS INDICATE A DESIGN PRESSURE DIFFERENTIAL FOR THE ROOM, AIR QUANTITIES SHALL BE FURTHER ADJUSTED TO A MORE RESTRICTIVE TOLERANCE AS REQUIRED TO ESTABLISH THE PRESSURE DIFFERENTIAL. F. TEMPERATURE TOLERANCES
- AIR HANDLING TEMPERATURES: THE CONTROLLED TEMPERATURES AT AHUS SHALL BE VERIFIED TO BE UNDER CONTROL WITHIN ± 1°F OF DESIGN VALUES. b. ROOM TEMPERATURES: BALANCE SYSTEMS AND CONTROLS WITHIN ±0.5°F OF INDICATED SETTINGS.

DUCTWORK ACCESSORIES

- A. PRODUCTS a. DAMPERS
 - A. CONTROL DAMPERS: PROVIDE DAMPERS WITH PARALLEL BLADES FOR 2-POSITION CONTROL OR OPPOSED BLADES FOR MODULATING CONTROL. CONSTRUCT BLADES OF 16-GA. STEEL. PROVIDE HEAVY-DUTY MOLDED SELF-LUBRICATING NYLON BEARINGS AND 1/2" DIAMETER STEEL AXLES SPACED ON 9" CENTERS. PROVIDE SPONGE RUBBER OR FELT BLADE EDGES. CONSTRUCT FRAME OF 2" X 1/2" X 1/8" STEEL CHANNEL FOR FACE AREAS 25 SQ. FT. AND UNDER; 4" X 1-1/4" X 16-GA. CHANNEL FOR FACE AREAS OVER 25 SQ. FT. PROVIDE ALUMINUM FINISH WITH ALUMINUM TOUCH-UP. TAMCO 1500SW, OR EQUAL. ACTUATORS (MOTORS) ARE PROVIDED BY CONTROL CONTRACTOR.
- b. FLEXIBLE CONNECTIONS A. GENERAL: PROVIDE FLEXIBLE DUCT CONNECTIONS WHEREVER DUCTWORK CONNECTS TO VIBRATION ISOLATED EQUIPMENT. CONSTRUCT FLEXIBLE CONNECTIONS OF NEOPRENE-COATED FLAMEPROOF FABRIC CRIMPED INTO DUCT FLANGES FOR ATTACHMENT TO DUCT AND EQUIPMENT. MAKE AIRTIGHT JOINT. PROVIDE ADEQUATE JOINT FLEXIBILITY TO ALLOW FOR THERMAL, AXIAL, TRANSVERSE, AND TORSIONAL MOVEMENT, AND ALSO CAPABLE OF ABSORBING VIBRATIONS OF CONNECTED EQUIPMENT.
- B. EXECUTION a. INSTALL FLEXIBLE CONNECTIONS IN DUCTWORK SUCH THAT THE CLEAR LENGTH OF THE CONNECTOR IS APPROXIMATELY TWO INCHES. PROVIDE THRUST RESTRAINTS AS REQUIRED. FLEXIBLE MATERIAL SHALL NOT BE SO SLACK AS TO TAKE A DEFINITE CONCAVE OR CONVEX. SHAPE DURING FAN OPERATION.

SEQUENCE OF OPERATIONS

- 1. PROVIDE THE FOLLOWING FOR MIXED AIR INDOOR UNITS WITH MULTI ZONE THERMOSTAT CONTROL
- A. GENERAL a. HEAT PUMP COOLING, HEATING CONTROL
- b. CONSTANT FAN SPEED.
- B. SAFETY CONTROL SEQUENCES: PROVIDE THE FOLLOWING SAFETY FUNCTIONS. ALL SAFETIES SHALL BE OPERATIONAL REGARDLESS OF FAN MODE (HAND, OFF, AUTO, OR BYPASS) a. CONDENSATE LEVEL ALARM: UPON INDICATION OF A HIGH LEVEL, SHUT DOWN UNIT. b. ALL OTHER SAFETIES AS REQUIRED BY MANUFACTURER SHALL BE ACTIVATED
- C. ZONE DAMPER CONTROL: ZONE DAMPERS SHALL MODULATE OPEN / CLOSE AS REQUIRED TO MAINTAIN ZONE TEMPERATURE SETPOINT.
- D. FAN CONTROL / HEAT PUMP: UNIT SHALL BE ACTIVE AND FAN SHALL RUN AS REQUIRED TO MAINTAIN SETPOINT OF ALL ZONES AS COMMANDED BY PRINCIPAL ZONE CONTROLLER (MASTER THERMOSTAT). AS ZONE DAMPERS MODULATE CLOSED, UNIT FAN & HEAT PUMP SHALL RAMP DOWN ACCORDINGLY.
- BATHROOM EXHAUST FAN CONTROL A. FAN SHALL BE INTERLOCKED WITH LIGHTING. TURN FAN ON WHEN LIGHT IS ON AND TURN FAN OFF WHEN LIGHT IS OFF. INCLUDE A TIME DELAY RELAY THAT ALLOWS THE FAN TO RUN AN ADDITIONAL 15 MIN AFTER LIGHTS ARE TURNED OFF.



KEY NOTES

- PROVIDE AIRZONE INTELLIGENT DAMPER. INTEGRAL BACKDRAFT DAMPER.
- ROUTE DRYER EXHAUST TO EXTERIOR WALL. PROVIDE WALL VENT CAP WITH INTEGRAL BACKDRAFT DAMPER.
- PROVIDE TRANSFER AIR GRILLE AT 8'-0" AFF CENTERED OVER DOORWAY PROVIDE LINEAR SLOT DIFFUSER. BOD IS 3-SLOT SDS100 WITH SDA PLENUM. SLOTS SHALL BE 1".
- PROVIDE 8" FRESH AIR INTAKE VENT / MINI LOUVER WITH FILTER.
- PROVIDE MANUAL BALANCING DAMPER.
- 10. PROVIDE HEAT PUMP. INSTALL WITH CLEARANCE FROM WALL AS REQUIRED BY MANUFACTURER
- __PROVIDE MASTER THERMOSTAT; AIRZONE WIRED BLUEFACE ZERO PRINCIPAL CONTROLLER: AZVAFBLUEZEROCB



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