BID SET AUGUST 4, 2022 PALENCIA FITNESS CENTER ADDITION ST. AUGUSTINE, FLORIDA



ARCHITECTURE & LANDSCAPE

Basham & Lucas Design Group, Inc. 7645 Gate Parkway Suite # 101 Jacksonville, Florida 32256 (904) 731-2323

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PROJECT TEAM

<u>OWNER</u>

MECHANICAL ENGINEER

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CIVIL ENGINEERING

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ELECTRICAL ENGINEER

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prepared for Sweetwater Creek Community Development District	PALENCIA FITNESS CENTER	ADDITION	St. Augustine, Florida	COVER SHEET
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BID SET

A0.0.0

ABBREVIATIONS:

ACCESS	ACCESSIBLE	FFE
ADD'L	ADDITIONAL	FIN
ALUM	ALUMINUM	FLR
BD	BOARD	FOUND
BM	BEAM	FTG
B.O.	BOTTOM OF	GC
BRG	BEARING	GWB
BS	BOTH SIDES	GYP
CJ	CONTROL JOINT	ILO
Ę	CENTERLINE	INSUL
CMU	CONCRETE MASONRY UNIT	JT
CONT	CONTINUOUS	LAV
DET	DETAIL	MANUF
DIA	DIAMETER	MET
DS	DOWNSPOUT	MFR
EQ	EQUAL	MR
ELECT	ELECTRICAL (DRAWINGS)	MTD
ELEV	ELEVATION	MTG
ENG	ENGINEERED	NA
ES	EACH SIDE	NC
EXP	EXPOSED	OC
EXT	EXTERIOR	OPP
FAMWB	FLUID APPLIED MEMBRANE WEATHER BARRIER	PE
F'GLASS	FIBERGLASS	PF
F/	FOR	PLAM

SYMBOLS	LEGEND:



REFERENCE

BUILDING SECTION REFERENCE



PLAN GRAPHIC LEGEND:

 INDICATES METAL STUD WALL
INDICATES 8" CMU
INDICATES INSULATED STUD WALL
 INDICATES ROOF GUTTER PATH
INDICATES 3'-0" WIDE ADA REQUIRED COMPLIANT ACCESSIBLE ROUTE OF TRAVEL SLOPE ALONG ACCESSIBLE ROUTE TO BE NO GREATER THAN 2%

-	-00-	-0-0	—

ALUMINUM FENCE

FINISHED FLOOR ELEVATION	PLUMB
FINISH, FINISHED, FACE OF FINISH	PT
FLOOR	PTD
FOUNDATION	PR
FOOTING	RE
GENERAL CONTRACTOR	REINF
GYPSUM WALL BOARD	R.O.
GYPSUM	SCHED
IN LIEU OF, INSTEAD	SF
INSULATION	SI
JOINT	SIM
LAVATORY	SPECS
MANUFACTURER	STD
METAL	STL
MANUFACTURER	STRUCT
MOISTURE RESISTANT	T&G
MOUNTED	т.о.
MOUNTING	TYP
NOT APPLICABLE	UNO
NO CEILING	W/
ON CENTER	WP
OPPOSITE	WWF
PRE-ENGINEERED	WD
PREFINISHED	
PLASTIC LAMINATE	

LIGHTING LEGEND:

RECESSED DOWNLIGHT 0

Δ

CEILING FAN PROVIDE BLOCKING SUPPORT AS REQUIRED. EXTENSION RODS AS REQUIRED. MOUNTING AFF UNO WALL MOUNTED DECORATIVE LIGHT FIXTURE

FLUORESCENT FIXTURE

MATERIALS LEGEND:

DETAIL – GYPSUM BOARD, STUCCO ELEVATION – STUCCO FINISH
DETAIL – RIGID INSULATION, PREFORMED FOAM
ELEVATION – BRICK VENEER
DETAIL – BRICK
ELEVATION/ PLAN – ASPHALT SHINGLES
DETAIL – SIMULATED WOOD TRIM
DETAIL – WOOD SHEATHING
DETAIL – NATURAL STONE VENEER

PLUMBING (DRAWINGS)		IPANCY F/	FGRESS				F/ FIXTI	IRF	COLI	NT	
PRESSURE TREATED	OCCUPANC	OCCUPANCY TYPE " $A-3$ "			OCCUPANCY TYPE "A-3"			111			
PAINTED	ROOM	AREA (s.f.)	AREA PER PERSON (s.f.)	OCCUPANCY (ALLOWABLE)	ROOM		AREA (s.f.)	AREA I	PER (s.f.)	OCCUPA (ALLOWA	ANCY ABLE)
PAIR	FITNESS STUDIO	2,311	50	46	EXISTING BUILDING	– BASED	ON 2004	FBC		•	
REFER TO	MOVEMENT ROOM	842	15	56	EXISTING ENTRY R	ECEPTION	448	100)	5)
REINFORCE (D)(ING)					EXISTING DIRECTOR	RS OFFICE	150	100)	2	-
ROUGH OPENING				100	EXISTING CHILD W	ATCH	3,542	20)	28	5
SCHEDULE(D)	TOTAL BUILDING OCCUPA	ANCY		102	EXISTING WELLNES	S AREA	1,001	50 1_E)	/1 67	,
SOUARE FOOT					EXISTING GROUP E		582))	12)
SOLIARE INCH(FS)					EXISTING WOMEN'S		717	50)	15)
					EXISTING BUILDING	OCCUPAN	CY			200)
STECIFICATIONS					PROPOSED BUILDI	NG – BASE	D ON 202	20 FB	C		
STANDARD					NEW MEETING ROOM)M #1	1,018	15	5	67	,
					NEW MEETING ROOM	MS #2	848	15	5	57	,
STRUCTURAL (DRAWINGS)					PROPOSED BUILDI	NG OCCUPA	NCY			124	
IONGUE & GROOVE											
TOP OF					IOIAL BOIH BUILL	DING OCCU	PANCY			324	4
TYPICAL FOR SIMILAR CONDITIONS											
UNLESS NOTED OTHERWISE					FIX	TURE RE	QUIREME	INTS			
WITH					LOCATION	GENDER	OCCUPANCY (TOTAL/2)		IRED FIX		D.F.
WORK POINT					BUILDING -	MEN	62	(1/125)	(1/200)		(1/500)
WELDED WIRE FABRIC					ADDITION (based on a-3)	WOMEN	62	(1/65)	(1/200)	N.A.	1
WOOD										· · ·	
					BUILDING -	MEN	100	(1/125)	(1/200)		(1/500)
					EXISTING (based on a-3)	WOMEN	100	(1/65)	(1/200)	— N A	1
										11.71.	
					POOL	MEN	(2,501 to 5.000 s.f)	1	1	2	
					EXISTING	WOMEN	(2,501 to	5	1	ΝΑ	
						WOWLIN	5,000 s.f)			N.A.	
						MEN		.3	3	2	
					TOTAL REQUIRED	WOMEN		8	3	N.A.	2
PROVIDE											
HEIGHT 10'-0"						MEN		2	3	2	_
					TOTAL PROVIDED	WOMEN		8	3	N.A.	2
						FAMILY		1	1		1

GENERAL (LIFESAFETY AND FLORIDA ACCESSIBILITY CODE) NOTES:

1. CONTRACTOR TO PROVIDE BUILDING ADDRESS NUMBERS THAT ARE A MINIMUM OF 6" HIGH ON THE BUILDING. LETTERS TO BE VISABLE FROM THE STREET AND MAY REQUIRE BEING LARGER THAN 6" HIGH PER (NFPA 1, 10.12.1.2).

2. LOCKS ON EXIT DOORS OR ACCESS EXIT DOORS SHALL NOT REQUIRE THE USE OF A KEY, A TOOL, OR SPECIAL KNOWLEDGE OR EFFORT FOR OPERATION FROM THE EGRESS SIDE UNLESS THEY MEET THE REQUIREMENTS OF NFPA 101, 7.2.1.5.

3. EXITS OTHER THAN THE MAIN EXTERIOR EXIT DOORS THAT ARE OBVIOUSLY CLEAR AND IDENTIFIABLE AS EXITS, SHALL BE MARKED BY AN APPROVED SIGN THAT IS READILY VISIBLE FROM ANY DIRECTION OF EXIT ACCESS PER (NFPA 101, 7.10.1.2).

4. FIREFIGHTER SAFETY WARNING SIGNS (MALTESE CROSS) SHALL BE PLACED IN ACCORDANCE WITH FS 633.027 AND FAC 69A-60.008. SEE SHEET LS1.1 FOR ADDITIONAL INFORMATION. 5. CONTRACTOR TO USE A LICENSED FIRE EXTINGUISHER CONTRACTOR FOR IDENTIFYING THE LOCATION & TYPE OF

EXTINGUISHERS USED ON SITE PER FS 633.061. 6. CONTRACTOR TO PROVIDE PROPER SIGNAGE DIRECTING CUSTOMERS AND VISITORS TO RESTROOMS AND OTHER SPACES AS REQUIRED BY FAC 216.3.

7. CONTRACTOR TO PROVIDE REQUIRED SIGNAGE. THE OCCUPANT LOAD SHALL BE POSTED IN A CONSPICIOUS PLACE NEAR THE MAIN ENTRANCE/ EXIT FROM THE ROOM. PLEASE REFER TO THE FIRE MARSHALL NOTATION ON THE PLANS AS TO THE APPROVED MAXIMUM OCCUPANT LOAD TO BE POSTED. THE POSTING SHALL READ "MAXIMUM OCCUPANT LOAD____PERSONS, BY ORDER OF THE FIRE MARSHAL" PER NFPA 101, 12.7.9.3.

8. AT TIME OF FINAL FIRE INSPECTION, CONTRACTOR TO ENSURE THAT THE FIRE DEPARTMENT ACCESS ROAD IDENTIFICATION SIGNS ARE IN PLACE.

	UUL	PE INFORMATION	<u> </u>
	APPLIC	CABLE CODES AND REGULATIONS:	
MECHANICAL		2020 FLORIDA BUILDING CODE	
PLUMBING		2020 FLORIDA BUILDING CODE	
ELECTRICAL		2017 NATIONAL ELECTRIC CODE	
ACCESSIBILITY		2020 FLORIDA BUILDING CODE	
FIRE		7th EDITION FLORIDA FIRE PREVENTION CODE	
		CODE REVIEW.	
RESIDENTS CLOB:		ASSEMBLY GROUP A-3 PER FBC 2017 8	c
OCCUPANCY CLASSIFICATION:		AS PER FIRE PREVENTION CODE (6.1.2) = NEW ASSEEMBLY (CHAPTER 12)	
BUILDING HEIGHT	YPE:	ALLOWARI E HEIGHT: BASE - 1 STORY -	40'-0"
BOILDING HEIGHT.		ACTUAL HEIGHT : 1 STORY - $24'-0$ " TA	KEN TO
		MIDPOINT OF ROOF	
		-	
BUILDING SQ.FT.:		Allowable area: base = $6,000$ s.f. (t.	ABLE 506.2)
(ENCLOSED)		ACTUAL AREA: 2,528 S.F. ENCLOSED	
		2,983 S.F. TOTAL	
		SEE SHEET A2.1.1 FOR ADDITIONAL INFO	JKMATION
		OCCUPANT LOAD CALCULATIONS:	
124 OCCUPANTS:	62 MEN	/ 62 WOMEN	
		EXISTING POOL CALCULATIONS	
BASED ON THE F	2001 COD	F AS SHOWN ON THE POOL DRAWINGS T	IF RATHER
LOADS ARE:		L AS SHOWN ON THE FOOL DRAWINGS, IT	IL DATTLIN
		SWIMMING POOL SURFACE AREA	141
		ΤΟΤΑΙ	141
AS FOLLOWS:		<u> </u>	EUN AREA ARE
AS FULLOWS:		CALCULATION BY SURFACE AREA	
SWIMMING POOL	SURFACE	CALCULATION BY SURFACE AREA	4,586 SF
SWIMMING POOL	SURFACE	CALCULATION BY SURFACE AREA	4,586 SF
SWIMMING POOL	SURFACE	CALCULATION BY SURFACE AREA AREA TOTAL	4,586 SF 4,586 SF
SWIMMING POOL	SURFACE 50 SF F	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50	4,586 SF 4,586 SF 92
SWIMMING POOL	SURFACE 50 SF F	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA	4,586 SF 4,586 SF 92
SWIMMING POOL	SURFACE 50 SF F	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. ADDITIONAL POOL DECK = 6,735 S.F.	4,586 SF 4,586 SF 92
SWIMMING POOL	SURFACE 50 SF F	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F. TOTAL POOL DECK TOTAL POOL DECK	4,586 SF 4,586 SF 92
SWIMMING POOL	SURFACE 50 SF F <u>(</u> RSON (FLC	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F TOTAL POOL DECK TOTAL POOL DECK PORDA BUILDING CODE) 4,542/15	4,586 SF 4,586 SF 92
SWIMMING POOL 15 SF PER PEF 30 SF PER PEF	SURFACE 50 SF F <u>(</u> RSON (FLC RSON (FIR	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F TOTAL POOL DECK TOTAL POOL DECK PRIDE POOL DECK = 7,402 S.F ORIDA BUILDING CODE) 4,542/15 RE PREVENETION CODE)	4,586 SF 4,586 SF 92
AS FOLLOWS: SWIMMING POOL 15 SF PER PEF 30 SF PER PEF	SURFACE 50 SF F <u>(</u> RSON (FLC RSON (FIR	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F TOTAL POOL DECK TOTAL POOL DECK POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F TOTAL POOL DECK PORIDA BUILDING CODE) 4,542/15 RE PREVENETION CODE) 5,582/30	4,586 SF 4,586 SF 92
AS FOLLOWS: SWIMMING POOL 15 SF PER PEF 30 SF PER PEF THE COVERED AR	SURFACE 50 SF F <u>(</u> RSON (FLC RSON (FIR RSON (FIR	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F. - ADDITIONAL POOL DECK = 667 S.F. ORIDA BUILDING CODE) 4,542/15 RE PREVENETION CODE) 5,582/30	4,586 SF 4,586 SF 92
AS FOLLOWS: SWIMMING POOL 15 SF PER PEF 30 SF PER PEF THE COVERED AR BUIDLING OCCUPA	SURFACE 50 SF F <u>C</u> RSON (FLC RSON (FIR REAS OF T ANCY – S	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F. - ADDITIONAL POOL DECK = 667 S.F. ORIDA BUILDING CODE) 4,542/15 RE PREVENETION CODE) 5,582/30	4,586 SF 92 92
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AS FOLLOWS: SWIMMING POOL 15 SF PER PEF 30 SF PER PEF THE COVERED AR BUIDLING OCCUPA	SURFACE 50 SF F <u>(</u> SON (FLC RSON (FIR REAS OF T ANCY – S CRITERIA POOL DEC SWIMMIN	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F TOTAL POOL DECK TOTAL POOL DECK PREVENETION CODE) 4,542/15 RE PREVENETION CODE) 5,582/30	4,586 SF 92 92 0F THE A 7,402 SF
AS FOLLOWS: SWIMMING POOL 15 SF PER PEF 30 SF PER PEF THE COVERED AR BUIDLING OCCUPA	SURFACE 50 SF F <u>G</u> RSON (FLG RSON (FIR REAS OF T ANCY – S CRITERIA POOL DEG POOL DEG SWIMMIN	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F TOTAL POOL DECK TOTAL POOL DECK PREVENETION CODE) 4,542/15 RE PREVENETION CODE) 5,582/30 THE BUILDING WERE CALCULATED AS PART EE BUILDING WERE CALCULATED AS PART EE BUILDING OCCUPANCY CHART ABOVE A: ECK AREA < 3 TIMES POOL SURFACE AREA	4,586 SF 92 92 0F THE 0F THE 7,402 SF 4,582 SF
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AS FOLLOWS: SWIMMING POOL 15 SF PER PEF 30 SF PER PEF THE COVERED AR BUIDLING OCCUPA	SURFACE 50 SF F <u>(</u> SON (FLC RSON (FIR REAS OF T ANCY – S CRITERIA POOL DEC POOL DEC SWIMMIN 7,302 SINC ADDITIO	CALCULATION BY SURFACE AREA AREA TOTAL PER PERSON 4,586/50 CALCULATION BY POOL DECK AREA POOL DECK AREA; - EXISTING POOL DECK = 6,735 S.F. - ADDITIONAL POOL DECK = 667 S.F TOTAL POOL DECK TOTAL POOL DECK PREVENETION CODE) 4,542/15 SE PREVENETION CODE) 5,582/30 CHE BUILDING WERE CALCULATED AS PART SEE BUILDING OCCUPANCY CHART ABOVE X: ECK AREA < 3 TIMES POOL SURFACE AREA	4,586 SF 92 92 0F THE 0F THE 7,402 SF 4,582 SF
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ALL SIGNS TO BE VERIFIED AND APPROVED BY THE OWNER. ALL HARDWARE AND ATTACHMENT DEVICES SHALL BE STAINLESS STEEL, UNLESS NOTED OTHERWISE. ALL SIGN DRAWINGS SUBMITTED BY THE ARCHITECT ARE NOT INTENDED FOR CONSTRUCTION AND ARE CONCEPTUAL IN NATURE ONLY. SIGN VENDOR SHALL BE RESPONSIBLE FOR ALL ADDITIONAL FILES AND INFORMATION REGARDING THE MANUFACTURING AND INSTALLATION OF SIGNS. THE SIGN VENDOR AND / OR CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH ALL LOCAL, STATE AND NATIONAL DESIGN CRITERIA, STANDARDS AND CODES. THIS INCLUDES VERBIAGE, ACCESSIBILITY COMPLIANCE, STRUCTURAL INTEGRITY, ZONING AND PERMITTING.



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prepared for Sweetwater Creek Community Development District	ENCIA FITNESS CENT	ADDITION	St. Augustine, Florida	CLUBHOUSE LIFE SAFETY PLAN

BUILDING OCCUPANCY F/ EGRESS OCCUPANCY TYPE "A-3"								
ROOM	AREA (s.f.)	AREA PER PERSON (s.f.)	OCCUPANCY (ALLOWABLE)					
MEETING ROOM #1	1,018	15	67					
MEETING ROOM #2	848 15		57					
TOTAL BUILDING OCCUPANCY	124							



EMERGENCY WALL MOUNTED LIGHT

EMERGENCY RECESSED DOWNLIGHT

EMERGENCY FLUORESCENT FIXTURE

EXIT SIGN

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DOOR EGRESS WIDTH

.2" PER PERSON .2 X 124 (OCCUPANT LOAD) = 25" OR 2'-1" OF REQUIRED EGRESS WIDTH, 216" OR 18'-0" OF PROVIDED EGRESS WIDTH

WALL LEGEND:

INDICATES 8" CMU

INDICATES STUD WALL INDICATES SOUND ATTENUATION BLANKET

ABBREVIATIONS

F.E. = FIRE EXTINGUISHER 5 LBS. CAPACITY – 3A : B/C UL RATING

T.D. = XXX' T.D. = EXIT TRAVEL DISTANCE FOR ASSEMBLY OCCUPANCY W/ SPRINKLER SYSTEM AS PER TABLE 1016.1 = 250'

NOTE: AS PER TABLE 1015.1, AN OCCUCPANCY LOAD OF LESS THAN 50 ONLY REQUIRES ONE EXIT

O.L. = OCCUPANT LOAD

LIFE SAFETY PLAN

FLOOR UNIT AREA: ENCLOSED – 2,528 S.F. COVERED – 455 S.F. TOTAL – 2,983 S.F.

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

REFER TO SITE PLAN, SHEET A1.1.1 FOR EXTENT SIDEWALKS & OTHER SITE RELATED INFORMATION

BASHAM CAS & LU DESIGN GROUP, INC. 7645 GATE PARKWAY SUITE 101 JACKSONVILLE, FLORIDA 32256 (904) 731-2323 • bashamlucas.com LN: AA26000586 | LC26000508 NOTFORTION , NOTFORTION , NOTFORTION , MATIL DRAWN BY MTTL CHECKED BY 08-04-2022 DATE JOB NO. 21-57 A0.BID SET





DO NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING CLARIFICATION FROM THE ARCHITECT

IN THE EVENT OF ANY DISCREPANCIES FOUND IN THE DRAWINGS OR CONFLICTS BETWEEN THE DRAWINGS AND THOSE OF THE ENGINEERS, THE SHALL BE REQUIRED TO NOTIFY THE ARCHITECT

ALL EXTERIOR WALLS ARE 8" C.M.U (U.NO.) AND ALL INTERIOR WALLS ARE 3 §" METAL STUDS (U.N.O.).

ALL INTERIOR AND EXTERIOR DIMENSIONS GIVEN ARE FROM FACE OF BLOCK, STUD OR COLUMN CENTERLINE TO FACE OF BLOCK, STUD OR COLUMN

ALL DOORS TO BE LOCATED 6" FROM ADJACENT WALL OF COUNTER OR CENTERED IN WALL (U.N.O.) SEE SHEET A5.1.1 FOR DOOR AND WINDOW

- VERIFY LOCATIONS w/ LOCAL FIRE MARSHALL.
- 3. ACCESS. HI-LOW DRINKING FOUNTAIN

- 10. ALUMINUM LADDER TO MECH ATTIC
- 12. REUSE EXISTING 4'-0'' WIDE GATE FOR EMERGENCEY EXIST FROM POOL DECK







WALL	_ LEG	EN[):
	INDICATES	NEW	STI

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

KEY NOTES: (#))

- 1. DEMOLISH EXISTING CMU WALL AS REQUIRED FOR NEW CONSTRUCTION
- 2. DEMOLISH EXISTING FLOORING AS REQUIRED FOR NEW CONSTRUCTION
- 3. DEMOLISH EXISTING DOOR AND FRAME AND ENLARGE OPENING AS INDICATED.
- 4. DISMANTLE EXISTING WALL AN DBASE CABINETS, CLEAN AND TURN OVER TO THE OWNER. TRANSPORT MATERIAL TO LOCATION DESIGNATED BY THE OWNER
- 5. DISMANTLE EXISTING SUSPENDED CEILING PANELS AND TRACK, CLEAN AND REUSE WHERE POSSIBLE.

GENERAL NOTES:

- 1. DESCRIPTION: DEMOLITION OF PORTIONS OFTHE EXISTING BUILDING AND SALVAGE OF MATERIAL AS INDICATED.
- 2. REMOVE DEMOLISHED MATERIAL DAILY.
- 3. PROVIDE DUST FILTERS AT EXISTING HVAC UNITS DURING DEMOLITION OPERATIONS. REMOVE DUST FILTERS AND REPLACE WITH NEW FILTERS MATCHING OWNER'S BUILDING SYSTEM, AT CONCLUSION OF DEMOLITION OPERATIONS.
- 4. PROVIDE TEMPORARY PARTITIONS FOR CONTROL OF DUST AND NOISE.

REV	DESCRIPTION DESCRIPTION	BY BY BY BY BY BY BY BY BY BY BY BY BY B
PALENCIA FITNESS CENTER	ADDITION St. Augustine, Florida	FLOOR PLAN
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- STUD WALL
- EXISTING STUD WALL
- S EXISTING STUD WALL REMOVED

NOTE: FOR ALL AREAS WHERE AN ACOUSTICAL CEILING IS SHOWN, PROVIDED 5" GYP. BD. TO THE BOTTOM OF THE WOOD TRUSSES TO SERVE AS A THERMAL BARRIER BETWEEN THE OCCUPIABLE SPACES AND THE SPRAY FOAM INSUALTION.

1. SUSPENDED 2x2 ACOUSTICAL CEILING IN THIS AREA, RE: I.D. SHEETS FOR SPEC.

DESCRIPTION

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- 2. GYP. BD. CEILING IN THIS AREA.
- 3. TIMBER KNEE WALL BRACKETS
- 4. TIMBER TRUSS

HVAC SUPPLY AIR DIFFUSER

HVAC RETURN AIR DIFFUSER

- 5. TRACK FOR OPERABLE WALL
- 6. STAINED 1X6 PINE T&G. INSTALL LAYER OF $\frac{1}{2}$ SHEATHING TO BOTTOM OF TRUSSES IN ORDER TO ACHIEVE A LEVEL SURFACE AND PATTERN AS INDICATED.
- 7. RECESSED ELECTRONIC PROJECTION SCREEN B DA-LITE, MODEL ADVANTAGE ELECTROL, 50"x80" 16:10 WIDE FORMAT
- 8. 22"x30" CEILING ACCESS PANEL W/ HIDDEN FLANGE
- 9. TIMBER BEAM
- 10. STAINED 2x6 T&G DECKING
- 11. STUCCO SOFFIT

ENCLOSED COVERED TOTAL

– 2,528 S.F. – 455 S.F. – 2,983 S.F.

12 A4.1.1

2 (A4.1.1) 6 (A3.1.1)

----- LINE OF WALLS BELOW

ROOF CONSTRUCTION: CONCRETE ROOF TILES (MATCH EXISTING) OVER 1x2 PT FURRING STRIPS ON UNDERLAYMENT ON WOOD SHEATHING ON WOOD TRUSSES (RE. STRUCT.) TYP.

ROOF PLAN

SCALE: 3/32"=1'-0"

ROOFING GENERAL NOTES:

- REFER TO MECHANICAL AND PLUMBING PLANS FOR ROOF PENETRATION LOCATIONS. PAINT ALL ROOF PENETRATION TO MATCH ROOFING MATERIAL.
- 2. REFER TO BUILDING AND WALL SECTIONS FOR OVERHANG LENGTHS AND TRUSS PROFILES.
- 3. - DENOTES GUTTER WITH DOWNSPOUT. TIE ALL DOWNSPOUTS INTO STORM SEWER, RE: CIVIL

COVERED

ROOF PLAN -NEW BLDG FLOOR UNIT AREA: – 2,528 S.F. – 455 S.F. – 2,983 S.F. ENCLOSED

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

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prepared for Sweetwater Creek Community Development District	PALENCIA FITNESS CENTER	ADDITION	St. Augustine, Florida	ROOF PLAN
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)()(OR (SCH	EDU	LE				
		DOO	R			FRAME	H'WARE		DETAILS		
MARK	SIZE	MAT.	TYPE	GLASS	FINISH	MAT.	SEE SPECS	HEAD	JAMB	THRES	REMARKS
	EXISTING BUILDING										
004A	3'-0" × 8'-0"	WOOD	4	_	PAINT	WOOD	6	7/A5.1.1	8/A5.1.1	3/A5.1.1	
004B	PR 3'-0" x 8'-0"	WOOD	5	_	PAINT	WOOD	5	7/A5.1.1	8/A5.1.1	3/A5.1.1	
004C	PR 3'-0" x 8'-0"	WOOD	5	_	PAINT	WOOD	5	7/A5.1.1	8/A5.1.1	3/A5.1.1	
004D	3'-0" x 8'-0"	CLAD/GLASS	3	INSUL	PREFIN	WOOD	2	X/A5.1.X	X/A5.1.X	X/A5.1.X	EXTERIOR
ſ	PROPOSED BUILDING		1			I			1	•	
100A	3'-0" × 8'-0"	ALUM CLAD /GLASS	1	INSUL	PREFIN	WOOD	2	13/A5.1.2	16/A5.1.2	15/A5.1.2	SIDE LITES EACH SIDE EXTERIOR
100B	3'-0" × 8'-0"	WOOD	2	TEMP	PAINT	WOOD	4	7/A5.1.1	8/A5.1.1	3/A5.1.1	
100C	3'-0" x 8'-0"	WOOD	2	TEMP	PAINT	WOOD	4	7/A5.1.1	8/A5.1.1	3/A5.1.1	
100D	3'-0" x 8'-0"	ALUM CLAD /GLASS	3	INSUL	PREFIN	WOOD	3	13/A5.1.2	16/A5.1.2	15/A5.1.2	EXTERIOR
102A	3'-0" x 8'-0"	WOOD	4	_	PAINT	WOOD	6	7/A5.1.1	8/A5.1.1	3/A5.1.1	
102B	PR 3'-0" x 8'-0"	WOOD	5	_	PAINT	WOOD	5	7/A5.1.1	8/A5.1.1	3/A5.1.1	
102C	10'-0" x 5'-4"	ALUM	6	_	PREFIN		7	_	_	_	BY OPERABLE WALL MANUF
102D	10'-0" x 27'-1"	ALUM	7	_	PREFIN		7	13/A4.1.1	_	_	OPERABLE WALL - MODERN FOLD, ACOUSTI-SEAL 931
104A	PR 3'-0" x 8'-0"	ALUM/GLASS	8	INSUL	PREFIN	ALUM	1	10/A5.1.2	11/A5.1.2	12/A5.1.2	SIDE LITES EACH SIDE EXTERIOR
104B	PR 3'-0" x 8'-0"	ALUM/GLASS	8	INSUL	PREFIN	ALUM	1	10/A5.1.2	11/A5.1.2	12/A5.1.2	SIDE LITES EACH SIDE EXTERIOR
105A	PR 3'-0" x 8'-0"	WOOD	5	_	PAINT	WOOD	5	7/A5.1.1	8/A5.1.1	3/A5.1.1	
105B	PR 3'-0" x 8'-0"	WOOD	5	_	PAINT	WOOD	5	7/A5.1.1	8/A5.1.1	3/A5.1.1	

DOOR ELEVATIONS

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DOOR NOTES:

- 1. SEE SCHEDULE FOR ALL DOOR, FRAME, AND HARDWARE FINISHES
- 2. HARDWARE GROUPS LISTED ARE FOR BASIS OF DESIGN AND BASIC INTENT PROVIDE SHOP DRAWING.
- 3. DOOR THRESHOLD: WHERE INTERIOR FLOOR FINISHES VARY IN MATERIAL AND / OR HEIGHT ON EACH SIDE OF DOOR PROVIDE TRANSITION TYPE MEETING ACCESSIBILITY REQUIREMENTS
- 4. ALL DOOR HARDWARE SHALL BE ADA COMPLIANT

WINDOW NOTES:

- 1. THE DIMENSION SHOWN REPRESENT ROUGH
- OPENING (R.O.) CONTRACTOR SHALL FIELD VERIFY ALL OPENINGS PRIOR TO WINDOW/LOUVER FABRICATION - SUBMIT SHOP DRAWINGS FOR APPROVAL.
- 2. APPLIED MUNTINS ON EACH SIDE OF GLASS.

WINDOW AND LOUVER SCHEDULE

	SIZE		DEMADINS		DETAILS	
MARK	W × H	STILE	REMARKS	HEAD	JAMB	SILL
А	2'-8" × 5'-8" (MO)	SINGLE FIXED W/ WOOD SHUTTERS	MATCH EXISTING MUNTIN GRID	5/A5.1.2	7/A5.1.2	6/A5.1.2
В	6'-8" × 5'-8" (MO)	TRIPLE FIXED	MATCH EXISTING MUNTIN GRID	5/A5.1.2	7/A5.1.2	6/A5.1.2
С	2'-6" × 3'-0" (RO)	PRE-FIN ALUM LOUVER	NEEDS MINIMUM 2.25 S.F. GROSS AREA INTAKE LOUVER – RE: MECH	1/A5.1.2	3/A5.1.2	2/A5.1.2

WINDOW / LOUVER ELEVATIONS

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RM.		FLOOR			Ψ <i>r</i>	<u>4</u> LLJ	1	
NO.		FLOOR	BASE	NORTH WALL	EAST WALL	SOUTH WALL	WEST WALL	
ØØ4A		Lyt-1	VB-1	WC-1	PNT-1	PNT-1	PNT-1	GWB/ACT
ØØ4B	NEW STORAGE	LVT-1	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	GWB
ØØ4C		LvT-1	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	GWB
100	CORRIDOR	Lvt-1/Lvt-2	VB-1	WC-1	PNT-1	PNT-1	PNT-1	GWB/ACT
101	ELECT/AV	LVT-3	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	GWB
1Ø2	MEETING ROOM #1	LVT-3	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	GWB/ACT
1Ø3	STORAGE	LVT-3	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	GWB
104	COVERED VERANDA	REF. ARCH. DWGS.	•	1	•	1		1
105	MEETING ROOM #2	LVT-3	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	GWB/ACT
106	STORAGE	LVT-3	VB-1	PNT-1	PNT-1	PNT-1	PNT-1	GWB
				•		•		
ROC	M FINISH LEGENE					PALENCIA ADE	DITION	
,				+u =				
SHAW (REBEC rebecc LVT-2:	LUXURY VINYL TILE MANUFACTURER: SHAW CON STYLE: BRANCHING OUT 5M STYLE NUMBER: 4256V COLOR: FOREST WALNUT 50 SIZE: 6" X 48" CONTRACT REP: CCA CROSBY :a.crosby@shawinc.com	ITRACT 1M 6703		WT-1: WALL TILE MANUFACTI STONE STYLE: CA CERAMIC COLOR: TO SKU: DECO TR-1: TRIM TILE MANUFACT STONE	URER: BEDROSIANS SABLANCA MATTE TILE DRRES CASTOR5M TURER: BEDROSIANS	TILE #		
LVT-3	MANUFACTURER: PATCRAFT STYLE: MARK MAKING 1509 COLOR: ALMOND-V2 00150 SIZE: 6" X 48" INSTALLATION PATTERN: HE	ERRINGBONE		STYLE: JC SIZE: ½" X ITEM COD	DLLY WHITE TRIM - M 5" E: DECCASWHIJOLM IC LAMINATE			
	RESILIENT SHEET/ROLL MANUFACTURER: PATCRAFT STYLE: BOUNCE BACK COLOR: DARK OAK Ø1823 SIZE: 70" × 49' NOTE: THIS IS OPTION 1 FOR ROOMS THAT THE CLIENT H REQUESTED TO SEE PRICIN	R THE MEETING AS IG FOR.		PLAM-1: PLASTIC MANUFAC COLOR: COLOR *	LAMINATE TURER: NEVAMAR KNOA BLEND MUZOO28PV			
PATCR KENNY kenny.ki	2AFT REP: KING ng®patcraft.com			WC-1: WALLCO STYLE: 8				
LVT-3 OPT 2:	VINYL SHEET/ROLL MANUFACTURER: ECOSURFA DISTR: SPARTAN SURFACES STYLE: CROSSINGS RX COLOR: 3184 DUKE SIZE: T2" X 30 LF NOTE: THIS IS OPTION 2 FOF ROOMS THAT THE CLIENT H REQUESTED TO SEE PRICIN	R THE MEETING AS IG FOR.		WOLF GORDON RI LES COLE, (813) T les.cole@wolfgord	05EED R 9273 EP: 186-0678 Non.com			
SPARTAN BILL TRIP billøtrimb	l SURFACES REP: MBLE lecontractsurfaces.com			GR-1: GROMMET MANUFAC NAME: STI SIZE: 10" 1 FINISH: PC	TURER: MOCKETT.CO RASBOURG SOLID B DIA. X 1" DLISHED STAINLESS	M RASS PULL STEEL (PSS)		
	PAINT							
PNT-1:	MAIN PAINT MANUFACTURER: SHERWIN COLOR: *SW7120 DOLLOP FINISH: EGGSHELL	WILLIAMS OF CREAM		HW-1: CABINET MANUFAC NAME: T-E FINISH: VEI CEILING	FULL TURER: MOCKETT.CO BAR DRAWER & CAB NETIAN NICKEL (177)	M BINET PULL		
PNT-2:	ACCENT PAINT MANUFACTURER: SHERWIN COLOR: *SW6106 KILIM BE FINISH: SEMI-GLOSS	WILLIAMS EIGE		ACT-1 ACOUSTICA MFR: ARME NAME: 2×2 GRID: ARM STAIN	AL CEILING TILE STRONG DUNE #1774, TEGULAT 1STRONG & WHITE	2		
	SOLID SURFACE							
SS-1:	SOLID SURFACE MANUFACTURER: WILSONAF COLOR: GULFCOAST COLOR #: 923966	रा		ST-1: WOOD ST, MANUFAC COLOR: E COLOR *: SPECIES:	AIN TURER: MINWAX ESPRESSO MW273 WHITE BIRCH STAIN	GRADE		
	BASE			_				
∨B-1:	VINYL BASE MANUFACTURER: FLEXCO STYLE: TP BASE 2000 COLOR: 04 COFFEE BEAN							

		-						
		PL	UMBING LE	GEND				
IG	NOTES	ITEM	MANUFACTURER	NAME	MODEL NO.	REMARKS		
		Pl	KOHLER	ARTIFACTS KITCHEN SINK FAUCET	K-99261-2BZ	OIL-RUBBED BRONZE		
		P 2	KOHLER	POISE UNDERMOUNT SINGLE-BOWL BAR SINK	K-3391-NA	OIL-RUBBED BRONZE		
		FIN	IISH NOTES					
		1. 4 2. C	ALL INTERIOR TR CONTRACTOR TO AS SPECIFIED IN	IM TO BE STAINED ST-1 PROVIDE FINISH SAMPLE SUBMITTALS TO INTER FINISH LEGEND, PRIOR TO ORDER PLACEMENT	RIOR DESIGNER FOR ,	ALL MATERIALS		
		-						
		PLAN NOTES						
		1. F 2. ,	REFER TO FINISH ALL FLOORING M NSTALLATION U.C	FLOOR PLAN FOR FINISH PATTERNS IATERIAL TO BE INSTALLED IN ACCORDANCE WI D.N.	TH THE MANUFACTUR	ERS RECOMMENDATIONS FOR		

- 3. REFER TO THE REFLECTED CEILING PLANS FOR CEILING FINISH REQUIREMENTS
- 4. PROVIDE TRANSITION STRIPS WHERE DIFFERENT FLOOR MATERIALS MEET U.O.N.

MILLWORK NOTES

- 1. CABINET CONSTRUCTION: AWI PREMIUM GRADE.
- 2. ALL MILLWORK CONSTRUCTION TO BE PREMIUM GRADE CABINET WITH ADJUSTABLE WITH SHELF SUPPORTS INSTALLED IN DRILLED HOLES (MIN. 5MM DIAMETER, DUAL PINS).
- 3. REFER TO HAFELE AMERICA ITEM #282.47.402 FOR TYPICAL STANDARDS AND BRACKETS SHELF SUPPORTS.
- 4. ALL MILLWORK INTERIOR TO BE WHITE MELAMINE UNLESS OTHERWISE NOTED.
- 5. CONTRACTOR TO PROVIDE MILLWORK SHOP DRAWINGS TO INTERIOR DESIGNER FOR ALL MILLWORK.

TRIM PROFILES	NOTE: ALL TRIM TO BE STAIN GRADE AND FINISHED	
5 = 1 = 6		NO. DATE DESCRIPTION BY
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Ten Ten		
CASING CROWN MOLDING		THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF BASHAM & LUCAS DESIGN GROUP AND SHALL REMAIN THEIR PROPERTY. THE USE OF THE DRAWING IS RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND
		PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.
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		$\begin{array}{c} BASHAW\\ \mathscr{X} I I I C A S \end{array}$
		DESIGN GROUP, INC.
		JACKSONVILLE, FLORIDA 32256 (904) 731-2323 • bashamlucas.com
		LN: AA26000586 LC26000508
		DRAWN BY MTL
		DATE 08-04-2022
		IDU.1
		BID SET

				GENERAL CEILING NOTE	5	REFLECTED CEILING LE
RER LIGHT LIGHT	MODEL NO. FA16024 FM21026	B.O.F. N/A N/A	FINISH BRONZE WALNUT	1. ALL CEILING HEIGHTS ARE REFERENCED FROM FINISHED FLOOR ELEVATION RELAT TO SPACE INDICATED. 2. COORDINATE LIGHT FIXTURE LOCATION W. DUCTWORK LOCATIONS. 3. EXISTING CEILING & MECHANICAL CONDIT	IVE /	• RECESSED LED D
				3. EXISTING CEILING & MECHANICAL CONDIT VERIFIED PRIOR TO CONSTRUCTION. DISC COORDINATED WITH ENGINEER AND/OR IN	IONS TO BE FIELD CREPANCIES TO BE ITERIOR DESIGNER.	
AT	ACH TO STRUCTURE			ATTACH TO STRUCTURE		
3 ⁵ AT	3" MTL STUD BRACING - ACH TO CEILING STRUCTURE					
				REF. ARCH. & STRUCTURAL DWGS FOR ROOM DIVIDER DETAILS		
—— Ас	TLAY-IN CEILING			ACT LAY-IN CEILING		
GW	3 ON 3 % MTL STUDS			GWB ON 3 ½' MTL STUDS		
		3 SE	CTION			
		SCAL	E: 1" = 1'−O"			
			REF. AF	RCH. DWGS.		NOT IN SCOPE
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K	\times	MEETING ROOM #2	$\langle \times \rangle$			
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REVISIONS DESCRIPTION THIS DRAWING IS AN INSTRUMENT OF SERVICE AND THE PROPERTY OF BASHAM & LUCAS DESIGN GROUP AND SHALL REMAIN THEIR PROPERTY. THE USE OF THE DRAWING IS RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE TO SUCH USE. K Z PLAN C EILING \mathcal{O} Z \mathcal{O} Č Ω [I] REFLE St TERIOR Z N BASHAM & LUCAS DESIGN GROUP, INC. 7645 GATE PARKWAY SUITE 101 JACKSONVILLE, FLORIDA 32256 (904) 731-2323 • bashamlucas.com LN: AA26000586 | LC26000508 MTL DRAWN BY CHECKED BY MTL DATE 08-04-2022 JOB NO. 21-57 ID2.0

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SCALE: 1 1/2" = 1'-Ø"

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DESIGN CRITERIA

THE STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE 7TH EDITION. REFERENCE TO OTHER STANDARD SPECIFICATIONS OR CODES SHALL MEAN THE LATEST PUBLICATION.

FOUNDATIONS ARE DESIGNED FOR AN ALLOWABLE BEARING PRESSURE OF 2,500 PSF.

SUPERIMPOSED LIVE LOADS:	
ROOFS AND CANOPIES: (REDUCIBLE	20 PSI
X	,

VIND LOADS:	
ULTIMATE WIND SPEED	
NOMINAL WIND SPEED	103 MPH
MEAN ROOF HEIGHT	25 FT
RISK CATEGORY	II
WIND EXPOSURE	C
ENCLOSURE CLASSIFICATION	ENCLOSED
INTERNAL PRESSURE COEFFICIENT	$ \pm 0.18$
DIRECTIONALITY FACTOR (Kd)	
SHAPE FACTORS	PER CODE

THIS BUILDING IS NOT LOCATED IN THE WIND BORNE DEBRIS REGION. IMPACT RESISTANT GLAZING IS NOT REQUIRED.

<u>CONCRETE</u>

ALL CONCRETE PROPORTIONING, MIXING, TRANSPORTATION, PLACING, AND CURING SHALL CONFORM TO ACI 301.

ALL CONCRETE SHALL BE LABORATORY DESIGNED AND CONTROLLED TO MEET THE REQUIREMENTS OF ACI 318 AND THE PROJECT'S DESIGN BUILDING CODE.

USE OF CALCIUM CHLORIDE, CHLORIDE IONS, OR OTHER SALTS IS CONCRETE IS PROHIBITED.

CONCRETE SH	ALL CONFORM TO THE	FOLLOWING:	
F'c @ 28 DAYS	TYPE AGGREGATE	LOCATION	W/C RATIO (MAX)
4,000	NORMAL WEIGHT	SLAB-ON-GRADE	0.50
3,000	NORMAL WEIGHT	FOOTINGS	0.55
3,000	NORMAL WEIGHT	ALL OTHER CONCRETE	0.55

THE AIR CONTENT IN ALL CONCRETE EXPOSED TO WEATHER SHALL BE BETWEEN 1% & 4%.

CONCRETE PROTECTION FOR REINFORCEMENT SHALL BE AS NOTED BELOW, OR PER LATEST ACI 318 FOR CONDITIONS OTHER THAN THOSE LISTED:

CONCRETE CAST AGAINST EARTH	. 3"
BEAMS AND COLUMNS	1 1/2"
SLABS ON GRADE	.2" FROM TOP
FORMED CONCRETE EXPOSED TO EARTH OR WEATHER	. 2"
SLABS & WALLS NOT EXPOSED TO EARTH OR WEATHER	.1"

CHAMFER ALL EXPOSED CORNER 3/4" MINIMUM.

ALL HOOKS CALLED FOR IN STRUCTURAL DRAWINGS SHALL BE ACI STANDARD HOOKS, UNO.

REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60 UNO.

ALL WELDED WIRE MESH SHALL CONFORM TO ASTM A185. LAP TWO SQUARES AT SPLICES. DO NOT WELD REINFORCING STEEL UNLESS APPROVED IN WRITING BY THE STRUCTURAL ENGINEER.

TIE ALL REINFORCING STEEL AND EMBEDS SECURELY IN PLACE PRIOR TO PLACING CONCRETE. THE CONTRACTOR SHALL PROVIDE SUPPORTS TO MAINTAIN THE REOUIRED REINFORCING POSITION. "WET STICKING" DOWELS INTO CONCRETE IS NOT PERMITTED.

THE CONTRACTOR SHALL COMPARE THE STRUCTURAL PLANS AND DETAILS WITH THE ARCHITECTURAL PLANS AND DETAILS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO THE COMMENCEMENT OF SHOP DRAWINGS.

THE CONTRACTOR SHALL PROVIDE AN ALLOWANCE OF 1% OF TOTAL REINFORCING STEEL FOR THE PROJECT TO BE FABRICATED AND PLACED DURING CONSTRUCTION AT THE DIRECTION OF THE STRUCTURAL ENGINEER, IN ADDITION TO THE REINFORCING STEEL REQUIRED BY THE STRUCTURAL DRAWINGS. THE OWNER SHALL RECEIVE CREDIT FOR ANY UNUSED QUANTITY AT THE END OF THE PROJECT.

ALL REINFORCING SHALL HAVE AN ACI CLASS B SPLICE AT BAR LAPS.

MASONRY

PROVIDE HOLLOW, LOAD BEARING CONCRETE MASONRY UNITS CONFORMING TO ASTM C90, TYPE I WITH A MINIMUM DENSITY OF 105 PCF.

CMU SHALL HAVE A MINIMUM ASSEMBLY COMPRESSIVE STRENGTH (Fm) OF 2.000 PSI.

THE 28-DAY GROUT COMPRESSIVE STRENGTH SHALL BE 3,000 PSI MINIMUM

MORTAR SHALL BE TYPE "S" OR "M".

LAP ALL REINFORCING 48 BAR DIAMETERS IN BOND BEAMS AND 72 BAR DIAMETERS IN VERTICAL WALL REINFORCING AND MASONRY BEAMS.

ALL CMU WALLS SHALL BE LAID IN RUNNING BOND.

STANDARD JOINT REINFORCING SHALL BE PROVIDED AT 16" OC VERTICALLY IN SUPPORTED WALLS. JOINT REINFORCING SHALL BE PROVIDED AT 8" OC VERTICALLY IN CANTILEVERED WALLS. JOINT REINFORCING TYPE SHALL BE SPECIFIED BY ARCHITECT.

UNLESS NOTED OTHERWISE ON PLAN SHEETS, REINFORCE ALL EXTERIOR AND LOAD BEARING CMU WALLS W/ A #5 FULL HEIGHT VERTICAL BAR CENTERED IN WALL AT 32" OC. ADDITIONALLY, PROVIDE A #5 VERTICAL FULL HEIGHT AT EACH WALL END AND CORNER. SEE TYPICAL CMU REINFORCING DETAIL FOR OTHER REINFORCING REQUIREMENTS. ALL CMU CELLS RECEIVING REINFORCING SHALL BE GROUTED SOLID.

UNLESS PROVIDED ON ARCHITECTURAL DRAWINGS, PROVIDE VERTICAL CONTROL JOINTS AT A MAXIMUM SPACING OF 25'-0" OC. JOINTS SHOULD NOT BE PLACED WITHIN 5'-0" FROM BUILDING CORNERS AND NOT CLOSER THAN 1'-4" TO OPENING EDGES AND MAJOR BEAM OR JOIST BEARING LOCATIONS. CONTRACTOR SHALL SUBMIT JOINT LAYOUT TO ARCHITECT FOR APPROVAL IF JOINT LOCATIONS ARE NOT SHOWN ON ARCHITECTURAL DRAWINGS.

BOND BEAMS, CMU LINTELS, MASONRY BENEATH STEEL BEAM AND JOIST BEARINGS, AND OTHER STRUCTURAL ELEMENTS SHALL EXTEND UNINTERRUPTED ACROSS CONTROL JOINTS.

FILL ALL CELLS BELOW FINISHED GRADE.

16" U-BLOCK OR BOND BEAM SHALL CONSIST OF TWO 8" KNOCK-OUT BLOCKS.

BARS SPECIFIED TO BE EACH FACE SHALL BE HELD IN PLACE WITH SPACERS AND SHALL BE LOCATED 2 3/8" FROM EACH FACE TO THE CENTER OF THE BAR.

MASONRY WORK SHALL BE INSPECTED IN ACCORDANCE WITH ACI 530 QUALITY ASSURANCE LEVEL 2

FOUNDATIONS

A GEOTECHNICAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT SHALL INSPECT AND ASSURE THE ADEQUACY OF ALL SUBGRADES, FILLS, AND BACKFILLS BEFORE PLACEMENT OF FOUNDATIONS, FOOTINGS, SLABS, ETC. WRITTEN ACCEPTANCE OF THE WORK INSPECTED AND VERIFICATION OF ASSUMED SOIL BEARING PRESSURE SHALL BE SUBMITTED TO THE ARCHITECT AND STRUCTURAL ENGINEER.

WHERE FOOTING STEPS ARE REQUIRED, THE STEPS SHALL BE NO STEEPER THAN ONE VERTICAL TO TWO HORIZONTAL, UNO ON PLAN. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING THE REQUIRED FOOTING STEP LOCATIONS.

<u>STEEL</u>

CONNECTIONS:

ALL STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING:

ASTM A992 FOR W-SHAPES ASTM A36 FOR PLATES, ANGLES, & MISC FRAMING ASTM A500, GRADE B FOR TUBES

ALL CONNECTION BOLTS SHALL CONFORM TO ASTM A325

1) MINIMUM 5/16" DOUBLE ANGLE SHEAR CONNECTION, FULL DEPTH OF THE BEAM, WELDED OR BOLTED WITH VERTICAL BOLT SPACING OF 3".

2) WHERE BEAM REACTIONS ARE SHOWN, CONNECTIONS SHALL DEVELOP THE REACTION GIVEN.

3) WHEN BEAM REACTIONS ARE NOT SHOWN, CONNECTIONS SHALL BE PROPORTIONED TO SUPPORT 60% OF THE TOTAL UNIFORM LOAD CAPACITY SHOWN IN THE UNIFORM LOAD TABLES OF THE AISC MANUAL FOR THE GIVEN BEAM, SPAN, AND GRADE OF STEEL USED. FOR COMPOSITE BEAMS THE PROPORTION CONNECTIONS FOR 90% OF THE UNIFORM LOAD CAPACITY.

4) CONNECTIONS SHALL BE PROPORTIONED FOR THE ECCENTRICITY BETWEEN CENTROIDS OF THE CONNECTION AND THE SUPPORTING MEMBER.

STRUCTURAL STEEL SHALL BE SHOP PRIMED PER SSPC PAINT SYSTEM NO. 7.00. PRIMER SHALL BE SSPC PAINT WITH A MINIMUM DRY FILM THICKNESS OF 2.0 MILS. OMIT PAINT AT SURFACES TO BE FIREPROOFED. TOUCH-UP BOLT HEADS, NUTS, FIELD WELDS, AND ABRASIONS IN SHOP PRIMER WITH SAME PAINT.

IF ANY DISCREPANCIES BETWEEN SPECIFICATIONS, NOTES, AND DRAWINGS ARE NOTED, THE MORE STRINGENT REQUIREMENT GOVERNS.

COLUMN ANCHOR BOLTS ARE DESIGNED FOR COMPLETE CONDITION ONLY. CONTRACTOR SHALL PROVIDE ALL TEMPORARY BRACING REQUIRED TO MAINTAIN STABILITY UNTIL ALL BRACING ELEMENTS REQUIRED FOR STRUCTURAL STABILITY ARE IN PLACE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF MISC STEEL SHOWN ON THE STRUCTURAL DRAWINGS SUCH AS SHELF ANGLES, LINTELS, SUPPORT MEMBERS FOR CURTAIN WALL OR MASONRY AND EDGE ANGLES FOR OPENINGS AND PERIMETER CONDITIONS. IT IS THE INTENT OF THESE DRAWINGS THAT THESE ITEMS ARE FIELD ATTACHED BY FIELD WELDING OR FIELD BOLTING TO MEET TOLERANCES REQUIRED BY THE OTHER TRADES, THESE TOLERANCES MAY BE MORE STRINGENT THAN AISC TOLERANCES.

THE CONTRACTOR SHALL COMPARE THE STRUCTURAL PLANS AND DETAILS WITH THE ARCHITECTURAL PLANS AND DETAILS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO THE COMMENCEMENT OF SHOP DRAWINGS.

WOOD TRUSSES

TRUSS MANUFACTURER SHALL SUBMIT SHOP DRAWINGS INDICATING ACTUAL TRUSS LAYOUT, DESIGN, WIND UPLIFT AT BEARING LOCATIONS, NUMBER AND TYPES OF TRUSSES, ETC. SHOP DRAWINGS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER. TRUSS MANUFACTURER SHALL COORDINATE AND VERIFY ALL TRUSS DIMENSIONS AND DESIGNS WITH ARCHITECT'S DRAWINGS.

ROOF FRAMING PLAN AND TRUSS TYPES ARE DIAGRAMMATIC AND ARE INTENDED TO INDICATE DESIGN CONCEPT ONLY FOR ROOF CONFIGURATION.

TRUSSES SHALL BE DESIGNED, FABRICATED AND ERECTED IN ACCORDANCE WITH ANSI/TPI1 "NATIONAL DESIGN STANDARDS FOR METAL-PLATE-CONNECTED WOOD TRUSS CONSTRUCTION".

. 20 PSF

ROOF TRUSS DESIGN CRITERIA LIVE LOAD .. DEAD LOAD.

BRACE BOTTOM CHORD AS REQUIRED FOR WIND UPLIFT. COORDINATE ROOF AND FLOOR TRUSS LOCATIONS/CONFIGURATION WITH PLUMBING

TEMPORARY TRUSS BRACING SHALL BE INSTALLED IN ACCORDANCE WITH "RECOMMENDED DESIGN SPECIFICATIONS FOR TEMPORARY BRACING OF METAL PLATE CONNECTED WOOD TRUSSES" (TPI-DSB) AND "COMMENTARY AND RECOMMENDATIONS FOR HANDLING, INSTALLING AND BRACING METAL PLATE CONNECTED WOOD TRUSSES" (TIB-HIB). INSTALL ALL WEB BRACING REQUIRED BY THE TRUSS DESIGNER. TEMPORARY BOTTOM CHORD AND WEB BRACING SHALL REMAIN PERMANENTLY IN PLACE.

FOUNDATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE PROJECT'S GEOTECHNICAL REPORT PREPARED BY ECS FLORIDA, LLC. PROJECT NO. 35:33255 DATED JULY 13, 2022.

WELDING OF STRUCTURAL STEEL SHALL BE PER AWS D1.1. LATEST EDITION.

WHERE FILLET WELD SIZE ISN'T CALLED-OUT ON WELD SYMBOL, FILLET SIZE SHALL BE 1/16" SMALLER THAN THE THICKNESS OF THE THINNER OF THE ELEMENTS TO BE WELDED.

UNLESS NOTED OTHERWISE PROVIDE THE GREATER OF THE FOLLOWING BEAM END

. SEE DESIGN CRITERIA THIS SHEET

WALLS AND HVAC EQUIPMENT SO AS TO AVOID CONFLICTS. SEE MECHANICAL DRAWINGS FOR EXACT LOCATIONS OF DUCTS, STACKS, PIPES, ETC.

WOOD

CLIPS, CONNECTIONS, HANGERS, HOLD-DOWNS, ETC. SHOWN ON THESE DRAWINGS ARE SIMPSON STRONG-TIE CONNECTORS, UNO. FASTENERS OF OTHER MANUFACTURERS MAY BE SUBSTITUTED PROVIDED THE LOAD VALUES OF THE SUBSTITUTED FASTENER FOR GROUP II WOOD SPECIES EQUALS OR EXCEEDS THE SPECIFIED FASTENER.

NAILING OF ALL MEMBERS SHALL BE IN ACCORDANCE WITH THE BUILDING CODE. SEE CODE FOR TABLE.

ALL SLEEPERS AND SILLS SHALL BE MADE OF PRESSURE TREATED WOOD.

ROOF SHEATHING SHALL BE 5/8" MINIMUM APA RATED SHEATHING, EXPOSURE 1 WITH 40/20 SPAN RATING.

ROOF AND FLOOR DECKING SHALL BE NAILED WITH 10d RINGSHANK NAILS AT 5/8" & 3/4" DECK. SPACE NAILS AT 6" AT SUPPORTED EDGES OF DECK (4" AT EXTERIOR WALLS) AND 6" SPACING AT INTERMEDIATE SUPPORTS.

ROOF JOIST SHALL BE LATERALLY SUPPORTED AT THE ENDS BY SOLID BLOCKING OR DIAGONAL STRUTS. SUCH BRIDGING MAY BE OMITTED WHERE END OF JOIST IS NAILED TO A HEADER, BAND JOIST OR TO AN ADJOINING STUD. ALSO PROVIDE SOLID BLOCKING OR DIAGONAL STRUTS AT 8'-0" MAXIMUM SPACING.

ALL DOUBLE HEADERS SHALL BE NAILED TOGETHER WITH 16d NAILS STAGGERED AT 16" ON CENTER 2" FROM TOP AND BOTTOM. HEADERS SHALL BE 2-2x12, UNO.

HOLES AND NOTCHES MUST BE APPROVED BY THE ENGINEER. IF APPROVED THE NOTCHES ON THE ENDS OF JOISTS SHALL NOT EXCEED ONE-FOURTH THE DEPTH. HOLES BORED FOR PIPE OR CABLE SHALL NOT BE WITHIN THE TOP OR BOTTOM THIRD OF THE JOIST DEPTH AND THE DIAMETER OF SUCH HOLE SHALL NOT EXCEED ONE-THIRD THE JOIST DEPTH NOTCHES FOR PIPES IN THE TOP OR BOTTOM OF JOISTS SHALL NOT EXCEED ONE-SIXTH THE JOIST DEPTH AND SHALL NOT BE LOCATED IN THE MIDDLE ONE-THIRD OF THE SPAN.

STRESS GRADE: SOUTHERN PINE NO. 2 OR ENGINEER APPROVED EQUAL. ALL DESIGN VALUES ARE UNDER NORMAL LOADING AND IN DRY CONDITIONS OF SERVICE. SYP MAY BE SUBSTITUTED FOR SPF.

PRESSURE-TREAT LUMBER IN ACCORDANCE WITH THE MANUAL OF RECOMMENDED PRACTICE OF THE AMERICAN WOOD PRESERVERS ASSOCIATION (AWPA).

ALL FASTENERS AND NAILS IN CONTACT WITH PRESSURE TREATED LUMBER SHALL BE MADE OF TYPE 304 OR TYPE 316 STAINLESS STEEL UNLESS THE LUMBER IS TREATED WITH CCA-C OR SBX (DOT), BUT NOT SBX (DOT) WITH SODIUM SILICATE (NaSiO2).

UNLESS OTHERWISE NOTED, USE THE FOLLOWING MINIMUM GRADE OF LUMBER FOR FRAMING.

<u>FRAMING</u> SILL ON FOUNDATION WALLS OR SLAB ON GRADE	MINIMUM GRADE NO. 3 SYP
JOISTS, RAFTERS & HEADERS	NO. 2 SYP
PLATES, CAPS & BUCKS	NO. 2 SYP
STUDS	SEE SCHEDULE
POSTS & COLUMNS	NO. 2 SYP

CONNECT OVER FRAMING (SUCH AS VALLEY TRUSSES) TO MAIN ROOF FRAMING BELOW WITH SIMPSON VTC2 WITH 4-10d NAILS INTO TRUSS AND 5-10d x 11/2" NAILS INTO OVERFRAMING OR 11/4"x16 GA TWIST STRAP @ 48" MAX W/4-10d NAILS EACH END OF STRAP.

SUPPLEMENTARY NOTES

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE DESIGN, ADEOUACY, AND SAFETY OF ERECTION, BRACING, SHORING, TEMPORARY SUPPORTS, ETC. THE STRUCTURAL ELEMENTS ARE NOT CONSIDERED STABLE UNTIL THE STRUCTURE IS COMPLETE.

REVIEW OF THE SUBMITTAL INFORMATION SHALL BE FOR GENERAL REQUIREMENTS OF THE PROJECT, AND SHALL NOT INCLUDE CHECKING OF DETAILED DIMENSIONS OR DETAILED QUANTITIES, NOR REVIEW OF THE CONTRACTOR'S SAFETY MEASURES ON OF OFF THE WORKSITE OR THE MEANS AND METHODS OF DOING ANY WORK.

THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND ARCHITECTURAL AND STRUCTURAL PLAN DIMENSIONS AND ELEVATIONS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND NOTIFY THE STRUCTURAL ENGINEER OF ANY CONFLICTS.

ALL STRUCTURAL OPENINGS AROUND OR AFFECTED BY MECHANICAL, ELECTRICAL AND PLUMBING EQUIPMENT SHALL BE VERIFIED WITH EQUIPMENT PURCHASED BEFORE PROCEEDING WITH STRUCTURAL WORK AFFECTED.

ANY ENGINEERING DESIGN PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW SHALL BEAR THE SEAL OF AN ENGINEER REGISTERED IN THE STATE OF THE PROJECT.

GENERAL CONTRACTOR MUST REVIEW AND APPROVE SHOP DRAWINGS PRIOR TO SUBMITTAL TO ARCHITECT/ENGINEER. SUBMITTALS WHICH DO NOT CONTAIN THE CONTRACTOR'S SHOP DRAWING STAMP OR HAVE BEEN MERELY "RUBBER STAMPED" SHALL BE RETURNED WITHOUT REVIEW. CONTRACTOR SHOULD ALLOW TWO WEEKS FOR SUBMITTAL REVIEW.

CONTRACTOR SHALL NOT ORDER MATERIAL OR COMMENCE WITH CONSTRUCTION UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED. WORK DONE OR ORDERS PLACED BEFORE SHOP DRAWING APPROVAL IS AT THE CONTRACTOR'S RISK.

THE PROJECT'S STRUCTURAL DRAWINGS AND ELECTRONIC FILES ARE THE PROPERTY OF LOWE STRUCTURES, INC. THE CONTRACTOR AND SUBCONTRACTOR SHALL COMPENSATE LOWE STRUCTURES, INC. FOR THE USE OF THE PROJECT'S CAD FILES FOR ANY PURPOSE INCLUDING SHOP DRAWING PREPARATION.

THE CONTRACTOR SHALL NOT SCALE DRAWINGS. DIMENSIONS SHOWN ON ARCHITECTURAL AND STRUCTURAL PLANS AND DETAILS WILL CONTROL.

POST- INSTALLED ANCHORS SHALL ONLY BE USED WHERE SPECIFIED ON THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE EOR PRIOR TO INSTALLING POST- INSTALLED ANCHORS IN PLACE OF MISSING OR MISPLACED CAST-IN-PLACE ANCHORS. HOLES SHALL BE DRILLED AND CLEANED IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS. SUBSTITUTION REQUESTS FOR PRODUCTS OTHER THAN THOSE SPECIFIED BELOW SHALL BE SUBMITTED BY THE CONTRACTOR TO THE EOR ALONG WITH CALCULATIONS THAT ARE PREPARED & SEALED BY A REGISTERED PROFESSIONAL ENGINEER. THE CALCULATIONS SHALL DEMONSTRATE THAT THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE PERTINENT EQUIVALENT PERFORMANCE VALUES (MINIMUM) OF THE SPECIFIED PRODUCT USING THE APPROPRIATE DESIGN PROCEDURE AND/OR STANDARD(S) AS REQUIRED BY THE BUILDING CODE. PROVIDE CONTINUOUS SPECIAL INSPECTION FOR ALL MECHANICAL AND ADHESIVE ANCHORS PER THE APPLICABLE EVALUATION REPORT.

CONCRETE ANCHORS • MECHANICAL ANCHORS: SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ACI 355.2 AND ICC-ES AC193 FOR CRACKED AND UNCRACKED CONCRETE RECOGNITION. PRE-APPROVED MECHANICAL ANCHORS INCLUDE : -SIMPSON STRONG TIE "TITEN-HD" -SIMPSON STRONG TIE "TITEN" -SIMPSON STRONG TIE "TORQ-CUT" -HILTI "KWIK BOLT 3"

 POWDER AND GAS ACTUATED FASTENERS: SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC70. PRE-APPROVED MECHANICAL ANCHORS INCLUDE -SIMPSON STRONG TIE "POWER DRIVEN FASTENERS" -SIMPSON STRONG TIE "GAS ACTUATED FASTENERS"

MASONRY ANCHORS INCLUDE :

-HILTI "KWIK BOLT 3" -DEWALT "SCREW-BOLT +" -HILTI "HY 270" -SIMPSON "SET-XP" -SIMPSON "200-A"

CONCRETE MASONRY.

POST INSTALLED ANCHORS

-DEWALT "SCREW-BOLT +"

ADHESIVE ANCHORS: SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED AND UNCRACKED CONCRETE RECOGNITION. PRE-APPROVED ADHESIVE ANCHORS INCLUDE : -HILTI "HY 200-A" -SIMPSON "SET - XP" -SIMPSON "SET-3G"

-DEWALT "PURE 110+"

• MECHANICAL ANCHORS: SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC01 OR AC106. PRE-APPROVED MECHANICAL ANCHORS

> -SIMPSON STRONG TIE "TITEN-HD" -SIMPSON STRONG TIE "TITEN"

-BUILDEX "TAPCON"

ADHESIVE ANCHORS: SHALL HAVE BEEN TESTED AND QUALIFIED FOR USE IN ACCORDANCE WITH ICC-ES AC58. PRE-APPROVED ADHESIVE ANCHORS INCLUDE

-DEWALT "AC100+ GOLD"

ANCHORS INSTALLED IN CONCRETE MASONRY SHALL BE INSTALLED INTO SOLID GROUTED

ADHESIVE ANCHORS SHALL BE INSTALLED WITH 12 BAR DIAMETER EMBEDMENT MINIMUM

THIS DRAWING IS AN INSTRUMENT OF SERVIC AND THE PROPERTY OF BASHAM LUCAS DESIGN

GROUP AND SHALL REMAIN THEIR PROPERT THE USE OF THE DRAWING IS RESTRICTED TO THE ORIGINAL SITE FOR WHICH IT IS PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE.

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7645 GATE PARKWAY SUITE 101 JACKSONVILLE, FLORIDA 32256 (904) 731-2323 • bashamlucas.com LN: AA26000586 | LA6666906

BID SET

PROGRESS PRINTING -NOT FOR CONSTRUCTION

LOWE STRUCTURES, INC. 11651 Central Prkwy., Suite 106 Jacksonville, FL 32224 (904) 992-0377 FL Cert of Auth: 28261 EOR: Timothy J. Morgan FL PE: 80481

1 WIND PRESSURE DIAGRAMS SCALE: NTS

POSITIVE PRESSURES ACT TOWARD THE BUILDING. NEGATIVE PRESSURES ACT AWAY FROM THE

SEE DIAGRAMS FOR ZONE LOCATIONS.ALL PRESSURES SHOWN ARE ULTIMATE PRESSURES.

a = 4'-9"

SHOWN ABOVE.

BUILDING.

	F	ROOF	
ZONE	10 SF	50 SF	100 SF
ALL ZONES	+29.9	+21.0	+17.2
1	-55.0	-40.3	-34.0
2e	-65.9	-44.0	-35.1
2r	-70.6	-50.9	-42.3
3	-81.9	-42.3	-42.3
	OVE	RHANG	
1	-77.2	-62.6	-56.2
2e	-88.1	-66.2	-57.3
2r	-92.8	-73.1	-64.5
3	-104.2	-64.5	-64.5
	W	ALLS	·
ZONE	10 SF	100 SF	500 SF
ALL ZONES	+42.3	+36.0	+31.5
4	-45.9	-39.5	-35.1
5	-56.6	-44.0	-35.1

8. PROVIDE 10 MIL VAPOR BARRIER (MIN) UNDER SLAB.

PLAN NOTES:1. SEE S0.1FOR GENERAL NOTES AND DESIGN CRITERIA. 2. CONTRACTOR TO COORD ALL DIMS & LAYOUT W/ ARCH PLAN PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ARCH DIMS AND ELEVATIONS WILL CONTROL.

3. ALL ELEVATIONS ARE BASED ON A DATUM T/ SLAB ELEVATION OF 100'-0". COORD ELEVATION W/ CIVIL & ARCH. 4. F# & W# DENOTES FOOTING TYPE. SEE SCHEDULE ON THIS SHEET FOR

FOOTING SIZE & REINF. 5. SEE 2/S2.1 WHERE PIPES PENETRATE BUILDING PERIMETER.

 SEE 3/S2.1 FOR REINF @ WALL FTG CORNERS.
 ZZ DENOTES NEW 8" CMU WALL LOCATION. SEE GEN NOTES FOR TYP WALL REINF CALLOUT AND 2/S2.3 & 3/S2.3 FOR TYP REINF DETAILS.

				FOOTING SCH	EDULE	
TYPE	LENGTH	WIDTH	DEPTH	BOTTOM REINF (LONG WAY)	BOTTOM REINF (SHORT WAY)	TOP REINF (LONG WAY)
F2	2' - 0"	2' - 0"	1' - 4"	3-#5	3-#5	-
F3	3' - 0"	3' - 0"	1' - 4"	4-#5	4-#5	-
F4.5	4' - 6"	4' - 6"	1' - 0''	5-#5	5-#5	-
W2.0	CONT	2' - 0"	1' - 0''	3-#5	#4 @ 24" OC	-
W2.5	CONT	2' - 6"	1' - 0''	3-#5	#4 @ 24" OC	-

- PLAN NOTES:
- 1. ELEVATIONS ARE BASED ON TOP OF SLAB ON GRADE DATUM 100'-0". 2. COORD TRUSS BRNG ELEVATIONS AND SLOPE W/ ARCH. 3. FOR DESIGN CRITERIA AND GENERAL NOTES, SEE SHEET S0.1. 4. TRUSS LAYOUT IS DIAGRAMMATIC ONLY. FINAL LAYOUT IS THE RESPONSIBILITY OF THE
- TRUSS SUPPLIER. 5. SEE 1/S2.3 FOR TYP ROOF SHEATHING ATTACHMENT DETAIL.
- 6. SEE S2.3 FOR TYP NAIL FASTENING SCHEDULE.
- 7. SEE S2.3 FOR TYP FASTENER SCHEDULE.
- 8. CB-# DENOTES CONCRETE BEAM LOCATIONS. SEE DETAIL 4/S2.3 .
- DRAWINGS HAVE BEEN RECEIVED. 10. SEE 10/S2.2 FOR TYP BUILT-UP BEAM DETAIL.

9. GC TO ALLOW MODIFICATIONS TO STRUCTURE AND FOUNDATION AFTER FINAL TRUSS SHOP

$\sqrt{\frac{2X OUTLOOKERS}{(a) 24" OC}}$		Prepared for Abredeen Community Development District PALENCIA FITNESS CENTER at St. Johns County ROOF FRAMING PLAN
		Image: constraint of the second sec
	PROGRESS PRINTING - NOT FOR CONSTRUCTION LOWE STRUCTURES, INC. 11651 Central Prkwy., Suite 106 Jacksonville, FL 32224 (904) 992-0377 FL Cert of Auth: 28261 EOR: Timothy J. Morgan FL PE: 80481	DRAWN BY CLW CHECKED BY TJM DATE 08-04-22 JOB NO. S1.2 <i>BID SET</i>

7 ` DETAILS County S S Johns SECTIONS & St. at BASHAM DESIGN GROUP, INC 7645 GATE PARKWAY SUITE 101 JACKSONVILLE, FLORIDA 32256 (904) 731-2323 • bashamlucas.com LN: AA26000586 | LA6666906 NOTFOR CONSTRUCT DRAWN BY CLW TJM CHECKED BY DATE 08-04-22 JOB NO. S2.1

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BID SET

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NAIL	FASTENING	SCHEDULE
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CONNECTION	NAIL LOCATION	NAIL (A)	GUN NAIL	STAPLE (B)
JOIST TO SILL OR GIRDER	TOENAIL	3-8d	3-3"x0.131"	3-3" 14 GA
BRIDGING TO JOIST	TOENAIL EA END	2-8d	2-3"x0.131"	2-3" 14 GA
1"x6" SUBFLOOR OR LESS TO EACH JOIST	FACE NAIL	2-8d	-	-
WIDER THAN 1"x6" SUBFLOOR TO EA JOIST	FACE NAIL	3-8d	-	-
2" SUBFLOOR TO JOIST OR GIRDER	BLIND & FACE NAIL	2-16d	-	-
SOLE PLATE TO JOIST OR BLOCKING	TYPICAL FACE NAIL	16d @ 16"	3"x0.131" @ 8"	3" 14 GA @ 12"
TOP PLATE TO STUD	END NAIL	2-16d	3-3"x0.131"	3-3" 14 GA
STUD TO SOLE PLATE	TOENAIL	4-8d	4-3"x0.131"	3-3" 14 GA
STUD TO SOLE PLATE	END NAIL	2-16d	3-3"x0.131"	3-3" 14 GA
DOUBLE STUDS	FACE NAIL	16d @ 24"	3"x0.131" @ 8"	3" 14 GA @ 8"
DOUBLE TOP PLATES	TYPICAL FACE NAIL	16d @ 16"	3"x0.131" @ 12"	3" 14 GA @ 12"
DOUBLE TOP PLATES SPLICE (LAP 4'-0")	FACE NAIL	8-16d	12-3"x0.131"	12-3" 14 GA
BLOCKING BETWEEN JOISTS OR RAFTERS TO TOP PLATE	TOENAIL	3-8d	3-3"x0.131"	3-3" 14 GA
RIM JOIST TO TOP PLATE	TOENAIL	8d @ 6"	3"x0.131" @ 6"	3" 14 GA @ 6"
TOP PLATE INTERSECTIONS	FACE NAIL	2-16d	3-3"x0.131"	3-3" 14 GA
CONTINUOUS HEADER, TWO PIECES	FACE NAIL	16d @ 16" T&B EDGE	-	-
CONTINUOUS HEADER, THREE PIECES	FACE NAIL	16d @ 16" T&B EA FACE	-	-
CEILING JOISTS TO PLATE	TOENAIL	3-8d	5-3"x0.131"	5-3" 14 GA
CONTINUOUS HEADER TO STUD	TOENAIL	4-8d	-	-
CEILING JOISTS, LAPS OVER PARTITIONS	FACE NAIL	3-16d MIN	4-3"x0.131"	4-3" 14 GA
CEILING JOISTS TO PARALLEL RAFTERS	FACE NAIL	3-16d MIN	4-3"x0.131"	4-3" 14 GA
RAFTER TO PLATE	TOENAIL	3-8d	3-3"x0.131"	3-3" 14 GA
1"x8" SHEATHING TO EACH BEARING WALL	FACE NAIL	2-8d	-	-
WIDER THAN 1"x8" SHEATHING TO EA BRG	FACE NAIL	3-8d	-	-
BUILD-UP CORNER STUDS	FACE NAIL	16d @ 24"	3"x0.131" @ 16"	3" 14 GA @ 16"
2" PLANKS	AT EACH BEARING	16d	-	-
COLLAR TIE TO RAFTER	FACE NAIL	3-10d	4-3"x0.131"	4-3" 14 GA
JACK RAFTER TO HIP	TOENAIL	3-10d	4-3"x0.131"	4-3" 14 GA
JACK RAFTER TO HIP	FACE NAIL	2-16d	3-3"x0.131"	3-3" 14 GA
ROOF RAFTER TO 2x RIDGE BEAM	TOENAIL	2-16d	3-3"x0.131"	3-3" 14 GA
ROOF RAFTER TO 2x RIDGE BEAM	FACE NAIL	2-16d	3-3"x0.131"	3-3" 14 GA
JOIST TO BAND JOIST	FACE NAIL	3-16d	5-3"x0.131"	5-3" 14 GA
LEDGER STRIP	FACE NAIL	3-16d	4-3"x0.131"	4-3" 14 GA

CB-# ELEVATIONS

SCALE: NTS

S2.3

LOCATIO	<u>DN</u>	<u>BEA</u> MAT
ROOF TR	USS	CMU CMU CMU CMU CMU
		WOO WOO WOO
<u>NO</u> 1. 2. 3.	TES: ALL SUBS CATA ON T IN AI EMB EMB EPOX EXPA	CONN STITU ALOG HE RO DDITI EDME BOLT EDDE (IED T ANSIO

SCALE: NTS

S2.3

- 1. MAX LIFT = 5'-0" WITH LOW LIFT GROUT. 2. IF HIGH LIFT GROUTING IS USED, REINFORCING SHALL BE FULL HEIGHT & A CLEANOUT HOLE IS REQ'D @ CELLS W/ REBAR. GROUT SHALL BE PLACED
- IN LIFTS TO PREVENT BLOWOUTS. 3. LAP REINFORCING PER GENERAL NOTES. JOINT REINF SHALL CONSIST OF @ LEAST TWO WIRES OF W1.7 OR GREATER AND SHALL BE PLACED AT 16" OC
- VERTICALLY. 4. PROVIDE A STANDARD HOOK AT EACH VERT BARS AT THE TOP OF WALL.
- 5. PROVIDE A MINIMUM OF AN 8" CONTINUOUS BOND BEAM AT THE TOP OF EACH WALL W/ #5 CONTINUOUS BOTT, UNO IN DETAILS.

TYP CMU REINF DETAILS

NOTES: 1. COORD REQ'D CMU CONTROL JOINTS W/ ARCH. 2. STOP CMU JOINT REINF EA SIDE OF JOINT

- (TYP).
- REINF @ CONTROL JOINT PLAN DETAIL

ABBREVIATIONS

-#-	
2WAY	TWO-WAY
3WAY	THREE-WAY
-A-	
A/C	
ADA	AMERICAN DISABILITIES ACT
ADDL	ADDITIONAL
ADJ	ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AHU	
AIA	AMERICAN INSTITUTE OF ARCH
AMP	AMPHERE
ARCH	ARCHITECT
	AMERICAN SOCIETY OF HEATING
ASHRAE	REFRIGERATION & AIR
	CONDITIONING ENGINEERS
AUTO	AUTOMATIC
AVG	AVERAGE
-B-	
BFP	BACKFLOW PREVENTOR
BLDG	BUILDING
BLW	BELOW / UNDERGROUND
BTU	BRITISH THERMAL LINIT
BIOH	BRITISH THERMAL UNIT/ HOUR
-C-	
CAP	CAPACITY, CAPACITOR
CC	COOLING COIL
CD	CONSTRUCTION DOCUMENT
CEM	
CFSD	COMBINATION FIRE/SMOKE DAMPER
СН	CHILLER
CHWP	CHILLED WATER PUMP
CHWR	
CL	CENTER LINE, CLOSE, CLOSET
CLG	CEILING
CNDS	CONDENSATE DRAIN
000	
002	
COND	CONDENSER
CONN	CONNECT, CONNECTION
0.0	
CP	CONTROL PANEL, CHROME PLATED
CV	CONSTANT VOLUME
CWD	CONDENSED WATER DI IMP
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY
-D-	
(D)	
DB	DRY BULB
dB	DECIBEL
DBA	UNIT OF SOUND LEVEL
DBT	DRY BUI B TEMPERATURE
550	
DEG	DEGREE
DIA	DIAMETER
DMPR	DAMPER
DN	DOWN
DK	DRAIN
DWG	DRAWING
-E-	
(F)/FY	
(⊏K)	EAISTING TO BE RELOCATED
EA	EXHAUST AIR
EAR	EXHAUST AIR REGISTER
EAT	ENTERING AIR TEMPERATURE
FDRT	
EF	EXHAUST FAN
EL	ELEVATION / ELEVATOR LOBBY
ELEC	ELECTRIC / ELECTRICAL
FSP	
EWT	ENTERING WATER TEMP
EXH	EXHAUST
EXIST	EXISTING
-F-	
•	
F	FEMALE
FΔ	
FUU	
FD	FIRE DAMPER
FLA	FULL LOAD AMPERES
FLA FLFX	FULL LOAD AMPERES
FLA FLEX	FULL LOAD AMPERES FLEXIBLE FEET DED MINUTE
FLA FLEX FPM	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE
FLA FLEX FPM FT	FULL LOAD AMPERESFLEXIBLEFEET PER MINUTEFOOT, FEET
FLA FLEX FPM FT -G-	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE FOOT, FEET
FLA FLEX FPM FT -G- GAL	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE FOOT, FEET GALLON
FLA FLEX FPM FT -G- GAL	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE FOOT, FEET GALLON
FLA FLEX FPM FT -G- GAL GALV	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE FOOT, FEET GALLON GALVANIZED
FLA FLEX FPM FT -G- GAL GALV GPM	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE FOOT, FEET GALLON GALVANIZED GALLONS PER MINUTE
FLA FLEX FPM FT -G- GAL GALV GPM GRL	FULL LOAD AMPERESFLEXIBLEFEET PER MINUTEFOOT, FEETGALLONGALVANIZEDGALLONS PER MINUTEGRILLE
FLA FLEX FPM FT -G- GAL GALV GPM GRL -H-	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE FOOT, FEET GALLON GALVANIZED GALLONS PER MINUTE GRILLE
FLA FLEX FPM -G- GAL GALV GPM GRL -H- HD	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE FOOT, FEET GALLON GALVANIZED GALLONS PER MINUTE GRILLE HEAD
FLA FLEX FPM FT -G- GAL GALV GPM GRL -H- HD HORIZ	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE FOOT, FEET GALLON GALVANIZED GALLONS PER MINUTE GRILLE HEAD HORIZONTAL
FLA FLEX FPM FT -G- GAL GALV GPM GRL GRL -H- HD HORIZ	FULL LOAD AMPERES FLEXIBLE FEET PER MINUTE FOOT, FEET GALLON GALVANIZED GALLONS PER MINUTE GRILLE HEAD HORIZONTAL

HVAC	HEATING, VENTILATION, & AIR CONDITIONING
HWP	HOT WATER PUMP
HWR	
HWS	
11 <u>∠</u> - -	
IAQ	INDOOR AIR QUALITY
ID	INSIDE DIMENSION
IN	INCH
-K-	
KW	KILOWATT
-L-	
LAT	
LBS	POUND(S)
LH	LATENT HEAT
LTH	LENGTH
LWT	LEAVING WATER TEMPERATURE
-M-	
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MBTUH	THOUSAND BTU PER HOUR
MER	
MFR	MANUFACTURER
MHP	MOTOR HORSEPOWER
MIN	MINIMUM, MINUTE
MOT	MOTOR
MS	MOTOR STARTER
МПЛ МТСНТ	
MU	MAKE UP WATER LINE
-N-	
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN, NUMBER
NTS	NOT TO SCALE
-0-	
OD OD	OUTSIDE DIAMETER
-P-	
PD	PRESSURE DROP/DIFFERENCE
PERF	PERFORATED
PH	PHASE
PLBG	PLUMBING
PUS PRV	PUSITIVE PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
-R-	
(R)	REMOVE EXISTING
R	RISE
RA	
RAG	
REFR	REFRIGERATION
REG	REGISTER
REM	REMOVABLE
REQD	REQUIRED
RH	RELATIVE HUMIDITY
RHC	
RII	
RM	
RPM	REVOLUTIONS PER MINUTE
RSL	REFRIGERANT SUCTION LINE
-S-	
SA	SUPPLY AIR, SHOCK ABSORBER
รก	
SEER	SEASONAL ENERGY EFFICIENCY
SF	SQUARE FOOT (FEET), SUPPLY FAN
SP	STATIC PRESSURE
SP SPEC	STATIC PRESSURE SPECIFICATION
SP SPEC SS	STATIC PRESSURE SPECIFICATION STAINLESS STEEL
SP SPEC SS STRUC -T-	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL
SP SPEC SS STRUC -T- TA	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR
SP SPEC SS STRUC -T- TA TDH	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD
SP SPEC SS STRUC -T- TA TDH TEMP	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP TRD	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP TRD -V- V	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP TRD -V- V VAV	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT VOLT, VENT, VIDEO VARIABLE AIR VOLUME
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP TRD -V- V VAV VD	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT VOLT, VENT, VIDEO VARIABLE AIR VOLUME VOLUME DAMPER
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP TRD -V- V VAV VAV VD VFD	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT VOLT, VENT, VIDEO VARIABLE AIR VOLUME VOLUME DAMPER VARIABLE FREQUENCY DRIVE
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP TRD -V- V VAV VAV VAV VD VFD -W-	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT VOLT, VENT, VIDEO VARIABLE AIR VOLUME VOLUME DAMPER VARIABLE FREQUENCY DRIVE
SP SPEC SS STRUC -T- TA TDH TEMP TEMP TSTAT TYP TRD -V- V VAV VD VAV VD VAV VD VFD -W- W	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT VOLT, VENT, VIDEO VARIABLE AIR VOLUME VOLUME DAMPER VARIABLE FREQUENCY DRIVE
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP TRD -V- V VAV VD VAV VD VAV VD VFD -W- W W	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT VOLT, VENT, VIDEO VARIABLE AIR VOLUME VOLUME DAMPER VARIABLE FREQUENCY DRIVE WIDTH, WIRE, WATT, WASTE, WITH
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP TRD -V- V VAV VAV VD VFD -W- W W W/ W/O WR	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT VOLT, VENT, VIDEO VARIABLE AIR VOLUME VOLUME DAMPER VARIABLE FREQUENCY DRIVE WIDTH, WIRE, WATT, WASTE, WITH WITHOUT
SP SPEC SS STRUC -T- TA TDH TEMP TSTAT TYP TRD -V- V VAV VAV VAV VD VFD -W- W W W/ W/ W/ W/ W/ WB WMS	STATIC PRESSURE SPECIFICATION STAINLESS STEEL STRUCTURAL TRANSFER AIR TOTAL DYNAMIC HEAD TEMPERATURE THERMOSTAT TYPICAL TRANSFER DUCT VOLT, VENT, VIDEO VARIABLE AIR VOLUME VOLUME DAMPER VARIABLE FREQUENCY DRIVE WIDTH, WIRE, WATT, WASTE, WITH WITHOUT WET BULB WIRE MESH SCRFFN

SYMBOLS LEGEND

ANNOTATION	1	
1 VIEW TITLE SCALE: NTS	PLAN TITLE NO 1	
1 TITLE M-201 SCALE: NTS	TITLE MARK DETAIL OR PLAN NO 1 FOUND IN M-201	E
1 M-501	DETAIL REFERENCE DETAIL NO 1 FOUND IN M-501	
1 M-501	SECTION MARK SECTION NO 1 FOUND IN M-501	
2 M-201	DETAIL BOUNDARY (RECTANGLE) DETAIL NO 2	^U
$\langle 1 \rangle$	SHEET KEYNOTE	
	REVISION CLOUD (DELTA 1)	VAV BOX
AC 1-1	EQUIPMENT TAG MARK - AC MARK NO 1-1	
L► 1.0 ⊕ FA	LOUVER IN DOOR MINIMUM 1.0 SQ FT, FREE AREA	
•	POINT OF CONNECTION	
$\overline{\mathbf{\Theta}}$	POINT OF DISCONNECTION	
	DUCTWORK (NEW)	
	(EXISTING)	DAMPER
	DUCTWORK (EXISTING TO BE DEMOLISHED)	
<u>↓</u>	DUCTWORK WITH ACOUSTIC LINING	
	DUCT UNDER POSITIVE PRESSURE DUCT UNDER	
UP►	DIRECTION OF AIR	
DN	DROP IN DUCT (IN DIRECTION OF AIR FLOW)	
	REHEAT COIL	PIPING
+++++	FLEX DUCT	
	DUCT TRANSITION	
	VANED ELBOW	VALVES
	RADIUS ELBOW	
	DUCT FITTING (SEE DETAILS)	
	FLEXIBLE DUCT CONNECTION	
	TRANSFER AIR BOOT (STRAIGHT) SEE SCHEDULE REQUIREMENTS	
	TRANSFER AIR ELBOW WITH ACOUSTIC LINING	
SA	SOUND ATTENUATOR	
	ACCESS PANEL	FITTINGS
DIFFUSERS	CEILING SUPPLY DIFFUSER, TYPE A, THROW PATTERN 4-WAY, 100 CFM	
<u>CR-A</u> 100	CEILING RETURN REGISTER (GRILLE), TYPE A, 100 CFM	
EG-A 100	CEILING EXHAUST, TYPE A, 100 CFM	
	CEILING SUPPLY WITH BLANKING PLATE (3-WAY)	
	EXISTING TO REMAIN	

	EXISTING TO BE DEMOLISHED
	SIDEWALL SUPPLY DIFFUSER
	LINEAR SLOT DIFFUSER
12X6 WR 150	12"X6" SIDEWALL SUPPLY REGISTER, 150 CFM
<u>12X6 W</u> G 150	12"X6" SIDEWALL RETURN / EXHAUST REGISTER, 150 CFM
0	ROUND SUPPLY DIFFUSER
Ø	ROUND RETURN DIFFUSER
	FLOOR REGISTER (GRILLE)
ES T	SINGLE DUCT VAV
	SINGLE DUCT VAV
	BOX WITH ATTENUATOR
	SINGLE DUCT VAV WITH REHEAT
[]	SINGLE DUCT VAV BOX WITH REHEAT AND ATTENUATOR
	SHUT-OFF VAV BOX WITH HYDRONIC HEATING COIL AND OUTLET BOX
S AND CONTROL	S COMBINATION
	SMOKE DAMPER
D	BACK DRAFT
0	AUTOMATIC DAMPER (MOTORIZED)
	VOLUME DAMPER
<u>(02)</u>	CARBON DIOXIDE SENSOR
Т	THERMOSTAT
SD	DUCT SMOKE DETECTOR
	NEW PIPING (SEE ABBREVIATION FOR PIPE LD)
– (E) ———	EXISTING TO REMAIN
- (D)	EXISTING TO BE DEMOLISHED
IOI	BALL VALVE
Z	FLOAT VALVE
\boxtimes	FUSIBLE LINK
×	GATE VALVE
	GLOBE VALVE
	MOTORIZED BALL VALVE
Ń	PLUG VALVE
Γ) Γ	PLUG SAFETY VALVE
Ř Ž	PRESSURE REDUCING VALVE PRESSURE RELIEF VALVE
	SOLENOID VALVE
\bowtie	VALVED AND CAPPED OUTLET
BFP	PREVENTER
с—	ELBOW DOWN
	ELBOW DOWN TO TEE
—О г	
	TEE DOWN
-0-	TEE UP

GEN	ERAL NOTES	SHEET INDEX
1.	ALL WORK SHALL CONFORM TO: 1.1. 2020 FLORIDA BUILDING CODE - BUILDING, 7TH EDITION	NO.

- 2020 FLORIDA BUILDING CODE MECHANICAL, 7TH EDITION 2020 FLORIDA BUILDING CODE - ENERGY, 7TH EDITION
- 1.3. 1.4. NATIONAL ELECTRICAL CODE 1.5. AUTHORITY HAVING JURISDICTION REQUIREMENTS

1.2.

WHERE THE REQUIREMENTS BETWEEN THE DIFFERENT CRITERIA AND CODES ARE AT VARIANCE, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.

WHERE THERE IS A DISCREPANCY BETWEEN THE DRAWINGS AND SPECIFICATIONS, NOTIFY THE ENGINEER PRIOR TO BID. FOR BIDDING PURPOSES THE MORE STRINGENT SHALL APPLY.

THE CONTRACTOR SHALL EXAMINE THE COMPLETE SET OF CONTRACT DOCUMENTS FOR ALL 3. TRADES, AS ISSUED BY THE ARCHITECT AND REVIEW DIMENSIONS, SPACE REQUIREMENTS AND POINT OF CONNECTIONS TO ALL EQUIPMENT. MAKE ANY MINOR ADJUSTMENTS NECESSARY TO AVOID CONFLICTS WITH THE BUILDING STRUCTURE AND THE WORK OF OTHER TRADES.

4. UNLESS INSTRUCTED OTHERWISE, THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, LICENSES, AND FEES REQUIRED FOR INSTALLATION OF THE MECHANICAL WORK. FURNISH FINAL CERTIFICATE OF INSPECTION OR WRITTEN EVIDENCE OF ACCEPTANCE BY INSPECTION AUTHORITIES FOR ALL WORK INSTALLED.

REFER TO COMPLETE DRAWING PACKAGE FOR EXTENT OF CONSTRUCTION, AND EXACT 5. LOCATION OF FIXTURES, EQUIPMENT, DEVICES, ETC.

6. CONTRACTOR SHALL COORDINATE WITH ALL TRADES TO ENSURE AN UNDERSTANDING OF THE COMPLETE SCOPE OF PROJECT PRIOR TO START OF WORK.

ALL EQUIPMENT & MATERIALS SHALL MATCH DESIGN SPECIFICATIONS AND MANUFACTURER'S RECOMMENDED INSTALLATION INSTRUCTIONS.

LOCATION OF DUCTWORK IS APPROXIMATE. ALL DRAWINGS AND LAYOUT ARE DIAGRAMMATIC TO SHOW DESIGN INTENT ONLY. CONTRACTOR TO COORDINATE ALL DUCTWORK AND PIPING WITH ALL OTHER WORK, IF FIELD CONDITIONS DIFFER SIGNIFICANTLY FROM THOSE SHOWN ON THE DRAWINGS AND AFFECT WORK, INFORM ARCHITECT IMMEDIATELY BEFORE PROCEEDING WITH THAT AREA.

9. INSTALL FIRE DAMPER OR COMBINATION FIRE/SMOKE DAMPER ON ALL DUCTS PENETRATING FIRE RATED ENCLOSURES AND PARTITIONS, AND RATED CEILINGS OF HORIZONTAL EXITS. THE CONTRACTOR SHALL INTERLOCK ALL COMBINATION FIRE/SMOKE DAMPERS WITH LISTED AREA TYPE SMOKE DETECTORS IN THE BUILDING FIRE LIFE SAFETY SYSTEM. VERIFY WITH LIFE SAFETY SYSTEM CONTRACTOR. SEE FIRE ALARM SPECIFICATION AND SMOKE CONTROL NOTES FOR ADDITIONAL INFORMATION.

10. AIR HANDLING UNITS AND FAN COIL UNITS SHALL BE PROVIDED WITH DUCT SMOKE DETECTORS AT THE UNITS OUTLET WHEN THE UNITS CAPACITY EQUALS 2000 CFM OR GREATER.

11. A MINIMUM OF 42" CLEAR WORKING SPACE, NOT LESS THAN 30" WIDE, SHALL BE MAINTAINED IN FRONT OF ALL SWITCHES, OVERCURRENT DEVICES AND ELECTRIC CONTROL COMPONENTS. THE WORKING SPACE SHALL BE CLEAR AND EXTEND FROM THE GRADE, FLOOR, OR PLATFORM TO MINIMUM OF 6'-8" FT. WHERE THE ELECTRICAL EQUIPMENT EXCEEDS 6-1/2 FT IN HEIGHT, THE MINIMUM HEADROOM SHALL NOT BE LESS THAN THE HEIGHT OF THE EQUIPMENT.

12. A MINIMUM OF 24" CLEAR WORKING SPACE SHALL BE PROVIDED IN FRONT OF THE ACCESS PANELS.

13. THE SMOKE DETECTORS LOCATED AT AIR MOVING EQUIPMENT SHALL SHUT DOWN ALL AIR HANDLING EQUIPMENT VIA THE LIFE SAFETY SYSTEM. WHEN SMOKE IS DETECTED AT EQUIPMENT, ALL OTHER AIR MOVING EQUIPMENT LOCATED IN OR CONNECTED TO COMMON PLENUM OR SMOKE ZONE SHALL SHUT DOWN.

14. ALL ELECTRICAL CONTROLS FOR THE SMOKE CONTROL SHALL BE RATED FOR SUCH USE.

15. PROVIDE ACCESS PANELS (MATCH WALL OR CEILING RATING) IN ALL WALLS OR CEILINGS WHERE ACCESS TO DAMPERS, CONTROLS, ETC., ARE REQUIRED BY CODE. COORDINATE LOCATIONS WITH ARCHITECT.

16. CONTRACTOR SHALL NOTE THE CRITICAL SPACE AVAILABLE ABOVE CEILINGS. PROVIDE TRANSITION PIECES AT CROSSOVERS, UNDER BEAMS, OVER/UNDER PIPES, AS REQUIRED TO ACCOMMODATE DUCTS WITHIN SPACE AVAILABLE, PROVIDING EQUIVALENT DUCT SIZE TO THE DIAMETER SHOWN. COORDINATE CLOSELY WITH OTHER TRADES TO REDUCE NECESSITY OF TRANSITIONS TO A MINIMUM. NO ADDITIONAL COSTS WILL BE PAID FOR ANY REQUIRED SHALL BE SUPPORTED AND SEISMICALLY RESTRAINED PER THE LOCAL BUILDING CODES AND SMACNA STANDARD.

17. THERE SHALL BE NO PIPING AND/OR DUCTWORK RUN THROUGH ELECTRICAL ROOMS UNLESS THAT DUCTWORK AND/OR PIPING IS SERVING THAT ELECTRICAL SPACE.

18. ALL FLEXIBLE DUCT CONNECTIONS TO AIR DISTRIBUTION DEVICES TO BE MAX. 5'-0" ACOUSTICAL FLEX DUCT PER SPECIFICATIONS.

19. NOT ALL SYMBOLS, NOTES, DETAILS AND EQUIPMENT IN SCHEDULES ON GENERAL SHEETS WILL APPLY TO EACH BUILDING. THEY ARE TO COVER ALL BUILDINGS AND WILL APPLY BASED ON SCOPE IN BUILDING.

20. LOCATE EXISTING REINFORCING STEEL UTILIZING ANY SUITABLE METAL DETECTION SYSTEM. DO NOT CUT ANY EXISTING STEEL REINFORCEMENT. SHIFT ANCHOR OR CORE TO MISS THE REBAR.

21. BOLTS MUST BE INSTALLED TO AVOID DAMAGING EXISTING STEEL REINFORCEMENT. IN CASE OF CONFLICT, ADJUST BOLT LOCATION, ALLOWING FOR 1" CONCRETE COVER BETWEEN REBAR AND BOLT.

22. PROVIDE TRANSFER DUCTS AS NECESSARY ABOVE CEILING FOR RETURN AIR PATH TO AIR HANDLING EQUIPMENT SERVING THAT SPACE. REFER TO DETAILS FOR TRANSFER DUCT SIZES.

23. PROVIDE A COMPLETE SET OF "AS BUILT" DRAWINGS, ELECTRONICALLY AND HARD COPY, UPON COMPLETION OF THE PROJECT AND SUBMIT TO FACILITY ENGINEER.

24. PROVIDE FITTING FOR CHANGE IN SIZE FOR FINAL CONNECTION AT EQUIPMENT AS REQUIRED. 25. WHERE INTERNAL SOUND-ABSORPTIVE DUCT IS CALLED FOR, DUCT DIMENSIONS ARE CLEAR INSIDE DUCT LINING DIMENSIONS.

26. PROVIDE ACCESS DOORS IN DUCTWORK WHERE INDICATED OR REQUIRED FOR ACCESS TO SYSTEM COMPONENTS INCLUDING BUT NOT LIMITED TO FOLLOWING: FIRE DAMPERS, SMOKE DAMPERS, AUTOMATIC DAMPERS, ETC.

27. ALL DIMENSIONS AND ELEVATIONS FOR NEW AND EXISTING EQUIPMENT, PIPING AND APPARATUS ARE APPROXIMATE AND ARE ONLY FOR CONTRACTOR'S GUIDANCE. CONTRACTOR SHALL SUBMIT COORDINATED INSTALLATION SHOP DRAWINGS SHOWING ALL DIMENSIONS AND ELEVATIONS VERIFIED IN THE FIELD. PIPING INDICATED ON THE DRAWINGS, SECTIONS, AND PROSPECTIVE VIEWS SHOW THE GENERAL ARRANGEMENT OF PIPING TO BE INSTALLED WITHIN THE SPACE. PIPE ELEVATIONS IN EXACT LOCATIONS SHALL BE DETERMINED BY THE INSTALLING CONTRACTOR AND DETAILED ON THE SHOP DRAWINGS.

28. PIPING THROUGH WALLS AND BUILDING CONSTRUCTIONS SHALL BE PROVIDED WITH PIPE SLEEVES. SLEEVES SHALL EXTEND THE FULL DEPTH OF THE CONSTRUCTIONS PENETRATED.

29. ALL SUPPLY AND RETURN DUCTS AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACED AND A MINIMUM OF R-8 INSULATION WHERE LOCATED OUTSIDE THE BUILDING. WHERE LOCATED WITHIN THE BUILDING ENVELOPE ASSEMBLY, THE DUCT OR PLENUM SHALL BE SEPARATED FROM THE BUILDING EXTERIOR OR UNCONDITIONED SPACES BY A MINIMUM OF R-8 INSULATION.

DRAWING NAME	SCALE
1	
MECHANICAL COVER PAGE	NONE
MECHANICAL SPECIFICATIONS	NONE
MECHANICAL SPECIFICATIONS	NONE
MECHANICAL FLOOR PLAN	1/4" = 1'-0"
MECHANICAL ATTIC PLAN	1/4" = 1'-0"
MECHANICAL SECTIONS	AS SHOWN
MECHANICAL SECTIONS	AS SHOWN
MECHANICAL DETAILS	NONE
MECHANICAL SCHEDULES	NONE
MECHANICAL CONTROLS	NONE

M-0.0.1

M-0.0.2

M-0.0.3

M-1.0.1

M-1.0.2

M-3.0.1

M-3.0.2

M-5.0.1

M-6.0.1

M-7.0.1

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ASHAM & LUCAS	ACKSONVILLE, FLORIDA 3225 (904) 731-2323 • bashamlucas.cor IN: AA26000586 LC2600050	A Construction A Construction	prepared for Sweetwater Creek Community Development District	PALENCIA FITNESS CENTER	ADDITION	St. Augustine, Florida	MECHANICAL COVER PAGE	
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Web: www.Ci-Mech.com Email: Info@Ci-Mech.com Phone: 904-503-1421

Certificate of Authorization: 32282

	Install duct insulation systems in accordar	nce with the app	roved MICA	Insulation Stds plates	2.1	FIRESTOPPING SYSTEM
	Except for oven hood exhaust duct insular corners of insulation on ductwork in expos conditioned spaces shall be defined as the conditioned air (or provided with a cooling	sulation minimur et or exceed the tion, corner angl sed finished spac ose spaces direc device such as	n thickness a requirement es shall be ir ces before co ctly supplied a fan-coil un	and insulation level s of ASHRAE 90.2. Installed on external overing with jacket. Air with cooled it) and heated s radiater or		Submit detail drawings including manufacturer's descriptive data, typical details conforming to UL Fire Resistance or other details certified by another nationally recognized testing laboratory, installation instructions or UL listing details for a firestopping assembly in lieu of fire-test data or report. For those firestop applications for which no UL tested system is available through a manufacturer, a manufacturer's engineering judgment, derived from similar UL system designs or other tests, shall be submitted for review and approval prior to installation.
	convector).	R-VALUES	a unit fieatei			application. When more than a total of 5 penetrations and/or construction joints are to receive firestopping, provide drawings that indicate location, "F" "T" and "L" ratings, and type of application
	LOCATION DUCT Exterior of building Ventilated Attic	SUPPLY R-6 R-6	RETURN R-4.2 R-4.2		2.2	Also, submit a written report indicating locations of and types of penetrations and types of firestopping used at each location; record type by UL list printed numbers. FIRESTOPPING MATERIALS
	Unvented attic above insulated ceiling roof insulation R-4.2 Unconditioned spaces Indirectly conditioned spacesb Conditioned spaces	R-6 None R-4.2 None None	R-4.2 R-4.2 None None	Unvented attic with		Provide firestopping materials, supplied from a single domestic manufacturer, consisting of commercially manufactured, asbestos-free, nontoxic products FM APP GUIDE approved, or UL listed, for use with applicable construction and penetrating items, complying with the following minimum requirements:
3.3.1	Buried Duct Insulation Minimum Thickness	R-4.2	None		2.2.1	Fire Hazard Classification
Duct ins	Table 4 - Minimum thickness in accordance Cold Air Ducts 2.0	with Table 4. s)				Material shall have a flame spread of 25 or less, and a smoke developed rating of 50 or less, when tested in accordance with ASTM E84 or UL 723. Material shall be an approved firestopping material as listed in UL Fire Resistance or by a nationally recognized testing laboratory.
	Relief Ducts1.5Fresh Air Intake Ducts1.5Warm Air Ducts2.0				2.2.2	Toxicity
	Relief Ducts1.5Fresh Air Intake Ducts1.5					Material shall be nontoxic and carcinogen free to humans at all stages of application or during fire conditions and shall not contain hazardous chemicals or require harmful chemicals to clean material or equipment.
3.3.2	Insulation and Vapor Retarder/Vapor Barr Insulation and vapor retarder/vapor barrie	rier for Cold Air E er shall be provid	ouct ed for the foll	owing cold air ducts	2.2.3	Fire Resistance Rating
	and associated equipment.a. Supply ducts.b. Return air ducts.			Ŭ		Firestop systems shall be UL Fire Resistance listed or FM APP GUIDE approved with "F" rating at least equal to fire-rating of fire wall or floor in which penetrated openings are to be protected. Where required, firestop systems shall also have "T" rating at least equal to the fire-rated floor in which the openings are to be protected.
	c. Relief ducts.d. Flexible run-outs (field-insulated).e. Plenums				2.2.3.1	Through-Penetrations Firestopping materials for through-penetrations, as described in paragraph SUMMARY, shall provide "F", "T" and "L" fire resistance ratings in accordance with ASTM E814 or UL 1479. Fire resistance ratings shall be as noted per Architectural contract documents
	f. Fresh air intake ducts.				2.2.3.2	Construction Joints and Gaps
	Insulation for rectangular ducts shall be fle pcf, and rigid type where exposed, minimu exposed round/oval ducts shall be flexible board, minimum density 3 pcf, formed or f tightly butted and staggered. Insulation factory-applied Type I or II vapor retarder/ continuous through sleeves and prepared insulation terminating at fire dampers, sha retaining angle of fire dampers, which are prone to condensate formation. Duct insul the collar, neck, and any un-insulated surf	exible type where um density 3 pcf type, minimum fabricated to a tig on on all concea vapor barrier jac openings excep all be continuous exposed to unce lation and vapor faces of diffusers	e concealed, Insulation for density 3/4 p ght fit, edges led duct shal ket. Duct ins to firewall per over the dar onditioned air retarder/vap s, registers air	minimum density 3/4 or both concealed or ocf or a semi rigid beveled and joints I be provided with a ulation shall be netrations. Duct nper collar and r and which may be or barrier shall cover nd grills. Vapor		Fire resistance ratings of construction joints, as described in paragraph SUMMARY, and gaps such as those between floor slabs and curtain walls shall be the same as the construction in which they occur. Construction joints and gaps shall be provided with firestopping materials and systems that have been tested in accordance with ASTM E119, ASTM E1966 or UL 2079 to meet the required fire resistance rating. Curtain wall joints shall be provided with firestopping materials and systems that have been tested in accordance with ASTM E119, ASTM E1966 or UL 2079 to meet the required fire resistance rating. Curtain wall joints shall be provided with firestopping materials and systems that have been tested in accordance with ASTM E2307 to meet the required fire resistance rating. Systems installed at construction joints shall meet the cycling requirements of ASTM E1399/E1399M or UL 2079. All joints at the intersection of the top of a fire resistance rated wall and the underside of a fire-rated floor, floor ceiling, or roof ceiling assembly shall provide a minimum class II
	the insulation. Sheet Metal Duct shall be s	sealed in accorda	ance with SM	oroken vapor seal over IACNA Standards.	r 2.2.4	Material Certification
3.3.2.1	Installation on Concealed Ducta. For rectangular, oval or round du applying adhesive around the entire perim	cts,` flexible insu neter of the duct	Ilation shall b in 6 inch wide	e attached by e strips on 12 inch		Submit certificates attesting that firestopping material complies with the specified requirements. For all intumescent firestop materials used in through penetration systems, manufacturer shall provide certification of compliance with UL 1479.
	b. For rectangular and oval ducts, 2 secured to bottom of ducts by the use of r	4 inches and lar mechanical faste	ger insulatior ners. Fasten	n shall be additionally ers shall be spaced	PART	3 EXECUTION 3.1 PREPARATION
	 on 16 inch centers and not more than 16 i c. For rectangular, oval and round c sides of duct risers for all duct sizes 	inches from duct ducts, mechanica Easteners shal	corners. al fasteners s	hall be provided on		Areas to receive firestopping must be free of dirt, grease, oil, or loose materials which may affect the fitting or fire resistance of the firestopping system. For cast in place firecton devices, formwork or metal deck to receive device prior to
	 d. Insulation shall be impaled on the 	e mechanical fas	teners (self s	tick pins) where used		concrete placement must be sound and capable of supporting device. Prepare surfaces as recommended by the manufacturer.
	and shall be pressed thoroughly into the a retarder/vapor barrier jacket joints overlap to a thickness less than that specified. Ins trapeze-type duct hangers.	adhesive. Care s 2 inches. The ir sulation shall be o	hall be taken sulation sha carried over s	to ensure vapor Il not be compressed standing seams and		 3.2 INSTALLATION Completely fill void spaces with firestopping material regardless of geometric configuration, subject to tolerance established by the manufacturer. Firestopping
	e. Where mechanical fasteners are the pin trimmed and bent over.f. Insulation terminations and pin put reinforced vaner retorder coating finish or	used, self-lockin unctures shall be	g washers s e sealed and	hall be installed and flashed with a		systems for filling floor voids 100 mm 4 inches or more in any direction must be capable of supporting the same load as the floor is designed to support or be protected by a permanent barrier to prevent loading or traffic in the firestopped area. Install firestopping in accordance with manufacturer's written instructions. Provide tested and listed firestop systems in the following locations, except in floor
	The coating shall overlap the adjo Pin puncture coatings shall extend 2 inche	oining insulation es from the punc	and un-insulation variand un-insulation variant and un-insulation va	ated surface 2 inches. ections.		 a. Penetrations of duct, conduit, tubing, cable and pipe through floors and through fire-resistance rated walls, partitions, and ceiling floor assemblies.
	g. Where insulation standoff bracke bracket and the jacket terminated at the b	ts occur, insulati racket.	on shall be e	xtended under the		 b. Penetrations of vertical shafts such as pipe chases, elevator shafts, and utility chutes
	ON 07 84 00: FIRESTOPPING					 c. Gaps at the intersection of floor slabs and curtain walls, including inside of bollow outsin walls at the floor slab.
1.1	SUMMARY					 d. Gaps at perimeter of fire-resistance rated walls and partitions, such as
	Furnish and install tested and listed firesto devices to form an effective barrier agains maintain the integrity of fire resistance rate assemblies, including through-penetration	opping systems, st the spread of f ed walls, partition as and constructions	combination lame, smoke ns, floors, an on joints and	of materials, or and gases, and d ceiling-floor gaps		 e. Construction joints in floors and fire rated walls and partitions. f. Other locations where required to maintain fire resistance rating of the
	a. Through-penetrations include the cables and vents.	e annular space a	around pipes	, tubes, conduit, wires,	3.2.1	construction.
	b. Construction joints include those wind, or seismic movement; firestopping r movement of the joint.	used to accomm material shall not	nodate expar t interfere wit	nsion, contraction, h the required		Thermal insulation shall be cut and removed where pipes or ducts pass through firestopping, unless insulation meets requirements specified for firestopping. Replace thermal insulation with a material having equal thermal insulating and firestopping characteristics.
	c. Gaps requiring firestopping includ and between the top of the fire-rated walls intersection of shaft assemblies and adjoin	de gaps betweer s and the roof or ning fire resistan	the curtain v floor deck ab ce rated ass	wall and the floor slab pove and at the emblies.	3.2.2	Fire Dampers
1.2	SEQUENCING Coordinate the specified work with other to of pipes and ducts, prior to insulating, unla firestopping	rades. Apply fire ess insulation me	stopping mat eets requiren	terials, at penetrations nents specified for		Install and firestop fire dampers in accordance with Section 23 00 00 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM. Firestop installed with fire damper must be tested and approved for use in fire damper system. Firestop installed with fire damper must be tested and approved for use in fire damper system.
	to completion of enclosing walls or assem located and installed in place before conc shall be installed through cast-in-place de concealed or made inaccessible. Firestop final completion and enclosing of any asse	blies. Cast-in-pla rete placement. vice after concre material shall be emblies that may	ace firestop o Pipe, conduit ete placemen e inspected a / conceal ins	devices shall be t or cable bundles t but before area is and approved prior to talled firestop.	3.3	INSPECTION For all projects shall not be covered or enclosed until inspection is complete and approved by the Construction Administrator. Inspect the applications initially to ensure adequate preparations (clean surfaces suitable for application, etc.) and
1.3	SUBMITTALS SD-03 Product Data					accomplished according to the manufacturer's written instructions and the specified requirements. Submit written reports indicating locations of and types of penetrations and types of firestopping used at each location; type shall be recorded by LIL listed printed numbers.
	SD-06 Test Reports Inspection				3.3.1	Inspection Standards
1.6	DELIVERY, STORAGE, AND HANDLING	3				Inspect all firestopping in accordance with ASTM E2393 and ASTM E2174 for firestop inspection, and document inspection results to be submitted.
	Deliver materials in the original unopened manufacturer and the brand name. Store and exposure to elements and temperature	packages or con materials off the res in accordanc	ntainers shov ground, prot e with manut	wing name of the ected from damage facturer requirements.	3.3.2	Inspection Reports
1	Remove damaged or deteriorated materia	als from the site	Use materia	is within their indicated	1	Submit inspection report stating that firestopping work has been inspected and

PART 2 PRODUCTS

(3.3 DUCT INSULATION SYSTEMS INSTALLATION

shelf life.

SECTION SYSTE	ON 23 00 00: AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST MS
PART	1 GENERAL
1.1	SYSTEM DESCRIPTION
Furnish installat piping, offsets work as	ductwork, piping offsets, fittings, and accessories as required to provide a complete tion. Coordinate the work of the different trades to avoid interference between equipment, structural, and electrical work. Provide complete, in place, all necessary in piping and ductwork, and all fittings, and other components, required to install the s indicated and specified.
1.2.2	Service Labeling
Label e sticking	quipment, including fans, air handlers, terminal units, etc. with labels made of self- , plastic film designed for permanent installation.
1.3	SUBMITTALS
	SD-03 Product Data Metallic Flexible Duct Insulated Nonmetallic Flexible Duct Runouts Duct Connectors Fire Dampers Manual Balancing Dampers; Automatic Smoke-Fire Dampers Diffusers Registers and Grilles Louvers Air Handling Units
	SD-08 Manufacturer's Instructions Manufacturer's Installation Instructions Operation and Maintenance Training
	SD-10 Operation and Maintenance Data
	Automatic Smoke-Fire Dampers Ceiling Exhaust Fans Air Handling Units
1.4.1	Prevention of Corrosion
	Protect metallic materials against corrosion. Provide rust-inhibiting treatment and standard finish for the equipment enclosures. Do not use aluminum in contact with earth, and where connected to dissimilar metal. Protect aluminum by approved fittings, barrier material, or treatment.

Provide hot-dip galvanized ferrous parts such as anchors, bolts, braces, boxes, bodies, clamps, fittings, guards, nuts, pins, rods, shims, thimbles, washers, and miscellaneous parts not of corrosion-resistant steel or nonferrous materials in accordance with ASTM A123/A123M for exterior locations and cadmium-plated in conformance with ASTM B766 for interior locations.

1.4.2 Asbestos Prohibition

Do not use asbestos and asbestos-containing products

1.4.3 Ozone Depleting Substances Technician Certification

All technicians working on equipment that contain ozone depleting refrigerants must be certified as a Section 608 Technician to meet requirements in 40 CFR 82, Subpart F. Provide copies of technician certifications to the Construction Administrator at least 14 calendar days prior to work on any equipment containing these refrigerants.

1.5 DELIVERY, STORAGE, AND HANDLING

Protect stored equipment at the jobsite from the weather, humidity and temperature variations, dirt and dust, or other contaminants. Additionally, cap or plug all pipes until installed.

PART 2 PRODUCTS

2.1 STANDARD PRODUCTS

Provide components and equipment that are "standard products" of a manufacturer regularly engaged in the manufacturing of products that are of a similar material, design and workmanship."Standard products" is defined as being in satisfactory nercial or industrial use for 2 years before bid opening, including applications of components and equipment under similar circumstances and of similar size, satisfactorily completed by a product that is sold on the commercial market through advertisements, manufacturers' catalogs, or brochures. Products having less than a 2-year field service record are acceptable if a certified record of satisfactory field operation, for not less than 6000 hours exclusive of the manufacturer's factory tests, can be shown. Provide equipment items that are supported by a service organization.

2.2 NOT USED

2.3 EQUIPMENT GUARDS AND ACCESS

Fully enclose or guard belts, pulleys, chains, gears, couplings, projecting setscrews, keys, and other rotating parts exposed to personnel contact according to OSHA requirements. Properly guard or cover with insulation of a type specified, high temperature equipment and piping exposed to contact by personnel or where it creates a potential fire hazard.

2.4 ANCHOR BOLTS

Provide anchor bolts for equipment placed on concrete equipment pads or on concrete slabs. Bolts to be of the size and number recommended by the equipment manufacturer and located by means of suitable templates. Installation of anchor bolts must not degrade the surrounding concrete.

2.5 PAINTING

Paint equipment units in accordance with approved equipment manufacturer's standards unless specified otherwise. Field retouch only if approved. Otherwise, return equipment to the factory for refinishing.

2.6 INDOOR AIR QUALITY

Provide equipment and components that comply with the requirements of ASHRAE 62.1 unless more stringent requirements are specified herein.

2.10 DUCT SYSTEMS

2.10.1 Metal Ductwork

- Provide metal ductwork construction, including all fittings and components, that complies with SMACNA 2005, as supplemented and modified by this specification.
- Provide radius type elbows with a centerline radius of 1.5 times the width or diameter of the duct where space permits. Otherwise, elbows having a minimum radius equal to the width or diameter of the duct or square elbows with factory fabricated turning vanes are allowed.

Provide ductwork that meets the requirements of Seal Class C.

2.10.2 Fibrous Glass Duct

found to be applied according to the manufacturer's recommendations and the

specified requirements.

Provide fibrous glass duct construction that complies with SMACNA 2003, as supplemented and modified by this specification.

- All ducts required to meet Class 1 Air Duct rating shall comply with Underwriters a. Laboratories (UL) Standard 18 1. All closure systems shall meet UL 181 or UL 181A. Pressure sensitive tapes shall be imprinted with the coding 18 1 AP, the manufacturers name and a date code. Heat sealable tape shall have similar imprinting but carry the coding 181AH.
- All fibrous glass duct shall be of (475) El flexural rigidity rating as determined by b. NAIMA Test Number AHS 10074 and shall be constructed so that the duct wall deflection does not exceed 1/100 of the span when pressurized at or below the rated pressure classification. The EI rating shall be imprinted on the facing.

used as retainers on duct interiors wherever metal sleeves, equipment flanges, vane rails, or other suitable retainers are not present. All horizontal branches and runouts to air terminals shall be supported independent of the main duct. Provision shall be made for locking dampers in position after flow adjustment. Quadrant damper operators shall not be used for controls without metal mounting plates to prevent damage or erosion. All 90" square throat, square heel elbows, other than those in transfer air ducts shall be d vaned. Elbows with molded fibrous glass vanes much have tie rod or channel reinforcement on cheeks to prevent wall deflection. Grille clips shall not be used for attachment or support of air terminals. Ducts shall be made as indicated in these standards. They shall be secured and reinforced as specified. All heat seal tape shall be 3 in. wide minimum. All pressure sensitive tape shall be 2.5 in. minimum width. Tapes shall be adhered to at least a 1 in. wide strip of each contact surface being closed. The application of tape over staples shall not result in staples puncturing the tape. Crumpled staples should be recovered and replaced with properly applied staples prior to application of closure tape. Staple spacing is indicated to be on approximately 2 in. center. The depth and thickness of shiplaps and all other grooving shall be that appropriate for the specific board thickness of 1 in. or 1% in. Shiplaps may be premolded by the duct board manufacturer or shop made. Damaged Shiplaps shall be removed and properly replaced prior to assembly of joints or seams. Shiplap joints, except at tee or branch connections, shall be oriented so that air flow direction is from the male end to the female end. On horizontal duct walls of less than 48 in. width channel reinforcement extending m. completely around and contacting all the duct perimeter does not require attachment to the duct on positive pressure application. For 48 in. or more width in top horizontal position the channel must be fastened to the duct with a screw and washer to control sag. All straight duct sections and all direction change and size change fittings in positive pressure systems shall be reinforced as required herein by channel or tie rod method. Only channel reinforcement for negative pressure straight duct sections is provided in this standard. Tie rod reinforcement shall not be used where they will be subject to fan vibration.

All fastenings not otherwise identified shall be #10 sheet metal screws with 2.5 in. square washers 0.020 in. minimum thickness. All screws penetrating duct board shall be no more

wherever the head does not rest on channel, sleeve or other metal bearings and shall be

than 0.5 in. longer than board thickness. Washers shall be used under screw heads

- The 16 in. nominal spacing of tie rods is subject to a 2 in. tolerance on occasional rod location deviation. No row of tie rods is allowed on 18 in. spacing.
- Only volcano hole washers are permitted with loop terminated tie rods. Flat types may be used under the heads of metal screws and cap or rivet termination techniques. Installed ducts must be free of visible damage, debris, moisture, sag, and significant
- misalignment. Joints without staple flaps are permitted only on gored elbows and offsets.
- The omission of reinforcement and complete closure details in drawings herein that are illustrating particular features shall not be used as grounds for omitting requirements that are elsewhere and otherwise specified. Some fittings may require reinforcement even though schedules for straight ducts of the same space may show reinforcement is not required.
- 2.10.1.1 Metallic Flexible Duct

a. Provide duct that conforms to UL 181 and NFPA 90A with factory-applied insulation, vapor barrier, and end connections. Provide duct assembly that does not exceed 25 for flame spread and 50 for smoke developed. Provide ducts designed for working pressures of 2 inches water gauge positive and 1.5 inches water gauge negative. Secure connections by applying adhesive for 2 inches over rigid duct, apply flexible duct 2 inches over rigid duct, apply metal clamp, and provide minimum of three No. 8 sheet metal screws through clamp and rigid duct.

b. Inner duct core: Provide interlocking spiral or helically corrugated flexible core constructed of zinc-coated steel, aluminum, or stainless steel; or constructed of inner liner of continuous galvanized spring steel wire helix fused to continuous, fire-retardant, flexible vapor barrier film, inner duct core.

Insulation: Provide inner duct core that is insulated with mineral fiber blanket type flexible insulation, minimum of 25 mm 1 inch thick. Provide insulation covered on exterior with manufacturer's standard fire retardant vapor barrier jacket for flexible round duct.

2.10.1.2 Insulated Nonmetallic Flexible Duct Runouts

Use flexible duct runouts only where indicated. Provide runouts that are preinsulated, factory fabricated, and that comply with NFPA 90A and UL 181. Provide either field or factory applied vapor barrier. Provide not less than 20 ounce class fabric duct connectors coated on both sides with neoprene. Where coil induction or high velocity units are supplied with vertical air inlets, use a streamlined, vaned and mitered elbow transition piece for connection to the flexible duct or hose. Provide a die-stamped elbow and not a flexible connector as the last elbow to these units other than the vertical air inlet type. Insulated flexible connectors are allowed as runouts. Provide insulated material and vapor barrier that conform to the requirements of Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Do not expose the insulation material surface to the air

2.10.1.3 General Service Duct Connectors

Provide a flexible duct connector approximately 6 inches in width where sheet metal connections are made to fans or where ducts of dissimilar metals are connected. For round/oval ducts, secure the flexible material by stainless steel or zinc-coated, iron clinchtype draw bands. For rectangular ducts, install the flexible material locked to metal collars using normal duct construction methods. Provide a composite connector system that complies with NFPA 701 and is classified as "flame-retardent fabrics" in UL Bld Mat

2.10.3 Fire Dampers

Use 1.5 hour rated fire dampers unless otherwise indicated. Provide fire dampers that conform to the requirements of NFPA 90A and UL 555. Perform the fire damper test as outlined in NFPA 90A. Provide a pressure relief door upstream of the fire damper. If the ductwork connected to the fire damper is to be insulated then provide a factory installed pressure relief damper. Provide automatic operating fire dampers with a dynamic rating suitable for the maximum air velocity and pressure differential to which it is subjected. Provide fire dampers approved for the specific application, and install according to their listing. Equip fire dampers with a steel sleeve or adequately sized frame installed in such a manner that disruption of the attached ductwork, if any, does not impair the operation of the damper. Equip sleeves or frames with perimeter mounting angles attached on both sides of the wall or floor opening. Construct ductwork in fire-rated floorceiling or roof-ceiling assembly systems with air ducts that pierce the ceiling of the assemblies in conformance with UL Fire Resistance. Provide curtain type with damper blades in the air stream fire dampers. Install dampers that do not reduce the duct or the air transfer opening cross-sectional area. Install dampers so that the centerline of the damper depth or thickness is located in the centerline of the wall, partition or floor slab depth or thickness. Unless otherwise indicated, comply with the installation details given in SMACNA 1819 and in manufacturer's instructions for fire dampers. Perform acceptance testing of fire dampers according to paragraph Fire Damper Acceptance Test and NFPA 90A.

2.10.4 Manual Balancing Dampers

Furnish manual balancing dampers with accessible operating mechanisms. Provide manual volume control dampers that are operated by locking-type quadrant operators. Install dampers that are 2 gauges heavier than the duct in which installed. Provide stand-off mounting brackets, bases, or adapters not less than the thickness of the insulation when the locking-type quadrant operators for dampers are installed on ducts to be thermally insulated, to provide clearance between the duct surface and the operator. Provide stand-off mounting items that are integral with the operator or standard accessory of the damper manufacturer.

2.10.13 Diffusers, Registers, and Grilles

Provide factory-fabricated units of steel that distribute the specified quantity of air evenly over space intended without causing noticeable drafts, air movement faster than 50 fpm in occupied zone, or dead spots anywhere in the conditioned area. Provide outlets for diffusion, spread, throw, and noise level as required for specified performance. Certify performance according to ASHRAE 70. Provide sound rated and certified inlets and outlets according to ASHRAE 70. Provide sound power level as indicated. Provide diffusers and registers with volume damper with accessible operator, unless otherwise indicated; or if standard with the manufacturer, an automatically controlled device is acceptable. Provide opposed blade type volume dampers for all diffusers and registers, except linear slot diffusers.

2.10.13.1 Diffusers

Provide diffuser types indicated. Furnish ceiling mounted units with anti-smudge devices, unless the diffuser unit minimizes ceiling smudging through design features. Provide diffusers with air deflectors of the type indicated. Install ceiling mounted units with rims tight against ceiling. Provide sponge rubber gaskets between ceiling and surface mounted diffusers for air leakage control. Provide suitable trim for flush mounted diffusers. For connecting the duct to diffuser, provide duct collar that is airtight and does not interfere with volume controller

2.10.13.2 Registers and Grilles

Provide units that are four-way directional-control type, except provide return and exhaust registers that are fixed horizontal or vertical louver type similar in appearance to the supply register face. Furnish registers with sponge-rubber gasket between flanges and wall or ceiling. Install wall supply registers at least 6 inches below the ceiling unless otherwise indicated. Locate return and exhaust registers 6 inches above the floor unless otherwise indicated. Achieve four-way directional control by a grille face which can be rotated in 4 positions or by adjustment of horizontal and vertical vanes. Provide grilles as specified for registers, without volume control damper.

2.10.2 Louvers

Provide louvers for installation in exterior walls that are associated with the air supply and distribution system as specified in contract drawings.

2.10.3 Plenum and Casings

Fabricate and erect plenums and casings as shown in SMACNA 1966, as applicable.Construct system casing of not less than 16 gauge galvanized sheet steel. Furnish cooling coil drain pans with 1 inch threaded outlet to collect condensation from the cooling coils. Fabricate drain pans from not lighter than 16 gauge steel, galvanized after fabrication or of 18 gauge corrosion-resisting sheet steel conforming to ASTM A167, Type 304, welded and stiffened. Thermally insulate drain pans exposed to the atmosphere to prevent condensation. Coat insulation with a flame resistant waterproofing material. Provide separate drain pans for each vertical coil section, and a separate drain line for each pan. Size pans to ensure capture of entrained moisture on the downstream-air side of the coil. Seal openings in the casing, such as for piping connections, to prevent air leakage. Size the water seal for the drain to maintain a pressure of at least 2 inch water gauge greater than the maximum negative pressure in the coil space.

2.11 AIR HANDLING UNITS

2.11.2 Factory-Fabricated Air Handling Units

Provide single-zone draw-through type units as indicated. Units must include fans, coils, airtight insulated casing, adjustable V-belt drives, belt guards for externally mounted motors, access sections where indicated, pan, vibration-isolators, and appurtenances required for specified operation. Provide vibration isolators as indicated. Physical dimensions of each air handling unit must be suitable to fit space allotted to the unit with the capacity indicated. Provide air handling unit that is rated in accordance with AHRI 430 and AHRI certified for cooling.

2.12 FACTORY PAINTING

Factory paint new equipment, which are not of galvanized construction. Paint with a corrosion resisting paint finish according to ASTM A123/A123M or ASTM A924/A924M. Clean, phosphatize and coat internal and external ferrous metal surfaces with a paint finish which has been tested according to ASTM B117, ASTM D1654, and ASTM D3359.

2.13 SUPPLEMENTAL COMPONENTS/SERVICES

2.13.2 Refrigerant Piping

Per manufacturer's recommendations.

2.13.2 Condensate Drain Lines

Provide and install condensate drainage for each item of equipment that generates condensate.

2.14 Insulation

The requirements for shop and field applied insulation are specified in Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS.

2.15 Wall Thermostat

Bimetal, sensing elements; with contacts suitable for [low] [line]-voltage circuit, and manually operated on-off switch with contactors, relays, and control transformers.

PART 3 EXECUTION

3.1 EXAMINATION

After becoming familiar with all details of the work, verify all dimensions in the field, and advise the Construction Administrator of any discrepancy before performing the work.

3.2 INSTALLATION

- Install materials and equipment in accordance with the requirements of the contract drawings and approved manufacturer's installation instructions. Accomplish installation by workers skilled in this type of work. Perform installation so that there is no degradation of the designed fire ratings of walls, partitions, ceilings, and floors.
- No installation is permitted to block or otherwise impede access to any existing machine or system.
- Except as otherwise indicated, install emergency switches and alarms in C. conspicuous locations. Mount all indicators, to include gauges, meters, and alarms in order to be easily visible by people in the area.

3.2.1 Condensate Drain Lines

Provide water seals in the condensate drain from all units. Provide a depth of each seal of 2 inches plus the number of inches, measured in water gauge, of the total static pressure rating of the unit to which the drain is connected. Provide water seals that are constructed of 2 tees and an appropriate U-bend with the open end of each tee plugged. Provide pipe cap or plug cleanouts where indicated. Connect drains indicated to connect to the sanitary waste system using an indirect waste fitting. Insulate air conditioner drain lines as specified in Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS.

3.2.2 Equipment and Installation

Provide frames and supports for tanks, compressors, pumps, valves, air handling units, fans, coils, dampers, and other similar items requiring supports. Floor mount or ceiling hang air handling units as indicated. Anchor and fasten as detailed. Set floor-mounted equipment on not less than 6 inch concrete pads or curbs doweled in place unless otherwise indicated. Make concrete foundations heavy enough to minimize the intensity of the vibrations transmitted to the piping, duct work and the surrounding structure, as recommended in writing by the equipment manufacturer. In lieu of a concrete pad foundation, build a concrete pedestal block with isolators placed between the pedestal block and the floor. Make the concrete foundation or concrete pedestal block a mass not less than three times the weight of the components to be supported. Provide the lines connected to the pump mounted on pedestal blocks with flexible connectors

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3.2.3 Flexible Duct

Install pre-insulated flexible duct in accordance with the latest printed instructions of the manufacturer to ensure a vapor tight joint. Provide hangers, when required to suspend the duct, of the type recommended by the duct manufacturer and set at the intervals recommended. Flex duct bends shall be made with not less than one duct diameter centerline radius. Collars to which flexible duct is attached shall be a minimum of 2 in. in length. Sleeves used for joining two sections of flexible duct shall be a minimum of 4 in. in length. Flexible duct shall be supported at the manufacturer's recommended intervals but at least every 5 ft. Maximum permissible sag is a 1_w in. per foot of spacing between supports. A connection to another duct or to equipment is considered a support point.

3.2.4 Metal Ductwork

Install according to SMACNA 1966 unless otherwise indicated. Install duct supports for sheet metal ductwork according to SMACNA 2006, unless otherwise specified. Do not use friction beam clamps indicated in SMACNA 2006. Anchor risers on high velocity ducts in the center of the vertical run to allow ends of riser to move due to thermal expansion. Erect supports on the risers that allow free vertical movement of the duct. Attach supports only to structural framing members and concrete slabs. Do not anchor supports to metal decking unless a means is provided and approved for preventing the anchor from puncturing the metal decking. Where supports are required between structural framing members, provide suitable intermediate metal framing. Where C-clamps are used, provide retainer clips.

3.2.6.1 Concealed Ducts Conveying Moisture Laden Air

Fabricate concealed ducts conveying moisture laden air from minimum 16 gauge, galvanized steel. Continuously weld, braze, or solder joints to be liquid tight. Pitch ducts to drain at points indicated. Make transitions to other metals liquid tight, companion angle bolted and gasketed.

3.2.8 Dust Control

To prevent the accumulation of dust, debris and foreign material during construction, perform temporary dust control protection. Protect the distribution system (supply and return) with temporary seal-offs at all inlets and outlets at the end of each day's work. Keep temporary protection in place until system is ready for startup.

3.2.9 Insulation

Provide thickness and application of insulation materials for ductwork, piping, and equipment according to Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS. Externally insulate outdoor air intake ducts and

3.3 EQUIPMENT PADS

plenums.

Provide equipment pads to the dimensions shown or, if not shown, to conform to the shape of each piece of equipment served with a minimum 3-inch margin around the equipment and supports. Allow equipment bases and foundations, when constructed of concrete or grout, to cure a minimum of 14 calendar days before being loaded.

CUTTING AND PATCHING 3.4

> Install work in such a manner and at such time that a minimum of cutting and patching of the building structure is required. Make holes in exposed locations, in or through existing floors, by drilling and smooth by sanding. Use of a jackhammer is permitted only where specifically approved. Make holes through masonry walls to accommodate sleeves with an iron pipe masonry core saw.

3.5 CLEANING

Thoroughly clean surfaces of piping and equipment that have become covered with dirt, plaster, or other material during handling and construction before such surfaces are prepared for final finish painting or are enclosed within the building structure. Before final acceptance, clean mechanical equipment, including piping, ducting, and fixtures, and free from dirt, grease, and finger marks.

3.6 PENETRATIONS

Provide sleeves and prepared openings for duct mains, branches, and other penetrating items, and install during the construction of the surface to be penetrated. Cut sleeves flush with each surface. Place sleeves for round duct 15 inches and smaller. Build framed, prepared openings for round duct larger than 15 inches and square, rectangular or oval ducts. Sleeves and framed openings are also required where grilles, registers, and diffusers are installed at the openings. Provide one inch clearance between penetrating and penetrated surfaces except at grilles, registers, and diffusers. Pack spaces between sleeve or opening and duct or duct insulation with mineral fiber conforming with ASTM C553, Type 1, Class B-2.

3.6.1 Sleeves

Fabricate sleeves, except as otherwise specified or indicated, from 20 gauge thick mill galvanized sheet metal. Where sleeves are installed in bearing walls or partitions, provide black steel pipe conforming with ASTM A53/A53M, Schedule

3.6.2 Framed Prepared Openings

Fabricate framed prepared openings from 20 gauge galvanized steel, unless otherwise indicated.

3.6.3 Insulation

Provide duct insulation in accordance with Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS continuous through sleeves and prepared openings except firewall penetrations. Terminate duct insulation at fire dampers and flexible connections. For duct handling air at or below 60 degrees F provide insulation continuous over the damper collar and retaining angle of fire dampers, which are exposed to unconditioned air.

3.6.4 Firestopping

Where ducts pass through fire-rated walls, fire partitions, and fire rated chase walls, seal the penetration with fire stopping materials as specified in Section 07 84 00 FIRESTOPPING.

3.7 PERFORMANCE TESTS

After testing, adjusting, and balancing is complete as specified, test each system as a whole to see that all items perform as integral parts of the system and temperatures and conditions are evenly controlled throughout the building. Record the testing during the applicable season. Make corrections and adjustments as necessary to produce the conditions indicated or specified. Conduct capacity tests and general operating tests by an experienced engineer. Submit test reports for the performance tests in booklet form, upon completion of testing. Document phases of tests performed including initial test summary, repairs/adjustments made, and final test results in the reports.

SECTION TABLE OF CONTENTS

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC) SECTION 23 05 93 TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1. WORK DESCRIPTION

The work includes duct air leakage testing (DALT) and testing, adjusting, and balancing (TAB) of new heating, ventilating, and cooling (HVAC) air distribution systems including equipment and performance data, ducts, and piping which are located within, on, under, between, and adjacent to buildings, including records of existing conditions.

Perform TAB in accordance with the requirements of the TAB procedural standard recommended by the TAB trade association that approved the TAB Firm's qualifications. Comply with requirements of AABC MN-1, NEBB PROCEDURAL STANDARDS, or SMACNA 1780 (TABB) as supplemented and modified by this specification section. All recommendations and suggested practices contained in the TAB procedural standards are considered mandatory.

Conduct DALT and TAB of the indicated existing systems and equipment and submit the specified DALT and TAB reports for approval. Conduct DALT testing in compliance with the requirements specified in SMACNA 1972 CD, except as supplemented and modified by this section. Conduct DALT and TAB work in accordance with the requirements of this section.

1.3.1 Air Distribution Systems

Test, adjust, and balance system[s] (TAB) in compliance with this section. Obtain Contracting Manager's written approval before applying insulation to exterior of air distribution systems as specified under Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS.

1.3.2 TAB SCHEMATIC DRAWINGS

- Show the following information on TAB Schematic Drawings A unique number or mark for each piece of equipment or terminal.
- Air quantities at air terminals.
- Air guantities and temperatures in air handling unit schedules.

Ductwork Construction and Leakage Testing Table that defines the DALT test requirements, including each applicable HVAC duct system ID or mark, duct pressure class, duct seal class, and duct leakage test pressure.

Submit three copies of the TAB Schematic Drawings and Report Forms to the Contracting calibration date, and calibration expiration date. Manager, no later than 21 days prior to the start of TAB field measurements.

1. SUBMITTALS

SD-02 Shop Drawings TAB Schematic Drawings and Report Forms
SD-03 Product Data
Equipment and Performance Data
TAB Related HVAC Submittals;
A list of the TAB Related HVAC Submittals
TAB Procedures

Proposed procedures for TAB, submitted with the TAB Schematic Drawings and Report Forms.

1.5 Qualifications

1.5.9 TAB Firm

The TAB Firm must be either a member of AABC or certified by the NEBB or the TABB and certified in all categories and functions where measurements or performance are specified on the plans and specifications, including TAB of environmental systems and building systems commissioning

1.5.10 Test Reports

1.5.10.1 Data from DALT Field Work

Report the data for the Pre-final DALT Report and Certified Final DALT Report in compliance the following requirements:

Report format: Submit report data on Air Duct Leakage Test Summary Report Forms as shown on Page 6-2 of SMACNA 1972 CD. In addition, submit in the report, a marked duct shop drawing which identifies each section of duct tested with assigned node numbers for each section. Include node numbers in the completed report forms to identify 3.1 WORK DESCRIPTIONS OF PARTICIPANTS each duct section. The TAB supervisor must review and certify the report.

The TAB supervisor must include a copy of all calculations prepared in determining the duct surface area of each duct test section. In addition provide the ductwork air leak testing (DALT) reports with a copy(s) of the calibration curve for each of the DALT test orifices used for testing.

Instruments: List the types of instruments actually used to measure the data. Include in the listing each instrument's unique identification number, calibration date, and calibration expiration date.Instruments must have been calibrated within one year of the date of use in the field. Instrument calibration must be traceable to the measuring standards of the National Institute of Standards and Technology.

Certification: Include the typed name of the TAB supervisor and the dated signature of the TAB supervisor.

1.5.11.2 Certified TAB Reports

Submit: TAB Report for Season 1 and TAB Report for Season 2 in the following manner

Report format: Submit the completed pre-field data forms approved in the prefield TAB Engineering Report completed by TAB field team, reviewed and certified by the TAB supervisor. Bind the report with a waterproof front and back cover. Include a table of contents identifying by page number the location of each report. Report forms and report data must be typewritten. Handwritten report forms or report data are not acceptable.

Temperatures: On each TAB report form reporting TAB work accomplished on HVAC thermal energy transfer equipment, include the indoor and outdoor dry bulb temperature range and indoor and outdoor wet bulb temperature range within which the TAB data was recorded. Include in the TAB report continuous time versus temperature recording data of wet and dry bulb temperatures for the rooms, or zones, as designated in the following list:

Measure and compile data on a continuous basis for the period in which TAB work affecting those rooms is being done.

Measure and record data only after the HVAC systems installations are (2) complete, the systems fully balanced and the HVAC systems controls operating in fully automatic mode.

(3) Data may be compiled using direct digital controls trend logging where available. Otherwise, temporarily install calibrated time versus temperature/humidity recorders for this purpose. The HVAC systems and controls 3.3.5 Certified Final DALT Report must be fully operational a minimum of 24 hours in advance of commencing data compilation. Include the specified data in the Season I and Season 2 TAB Report.

Static Pressure Profiles: Report static pressure data for all supply, return, relief, d. exhaust and outside air ducts for the systems listed. Include the following in the static pressure report data, in addition to AABC/NEBB/TABB required data:

Report supply fan, return fan, relief fan, and exhaust fan inlet and

discharge static pressures.

Do not commence TAB field work prior to the completion and approval, for all systems, of the Final DALT Report. AB work affecting th

1.8 WARRANTY Furnish workmanship and performance warranty for the TAB system work performed for a period not less than 1 years from the date of acceptance of the work. Include provisions that if within the warranty period the system shows evidence of major performance deterioration, or is significantly out of tolerance, resulting from defective TAB or DALT workmanship, the corrective repair or replacement of the defective materials and correction of the defective workmanship is the responsibility of the TAB firm. Perform corrective action that becomes necessary because of defective materials and workmanship while system TAB and DALT is under warranty 7 days after notification. unless additional time is approved by the Contracting Manager. Failure to perform repairs within the specified period of time constitutes grounds for having the corrective action and repairs performed by others and the cost billed to the TAB firm. The

Contractor must also provide a 1 year contractor installation warranty

Not Used

data.

DESCRIPTIONS OF PARTICIPANTS.

Provide instruments, consumables and personnel required to accomplish the DALT field work. Follow the same basic procedure specified below for TAB Field Work, including maintenance and calibration of instruments, accuracy of measurements, preliminary procedures, field work, workmanship and treatment of deficiencies. Calibrate and maintain instruments in accordance with manufacturer's written procedures.

From each duct system indicated as subject to DALT, the COTR will randomly select sections of each completed duct system for testing by the Contractor's TAB Firm. The sections selected will not exceed 20 percent of the total measured linear footage of duct systems indicated as subject to DALT. Sections of duct systems subject to DALT will include 20 percent of main ducts, branch main ducts, branch ducts and plenums for supply, return, exhaust, and plenum ductwork. It is acceptable for an entire duct system to be DALT'd instead of disassembling that system in order to DALT only the 20 percent portion specified above.

3.2.4

indicated on the drawings, to comply with the procedures specified in SMACNA 1972 CD. In spite of specifications of SMACNA 1972 CD to the contrary, DALT ductwork of construction class of 746 Pa 3-inch water gauge static pressure and below if indicated to be DALT'd. Complete DALT work on the COTR selected ductwork within 48 hours after the particular ductwork was selected for DALT. Separately conduct DALT work for large duct systems to enable the DALT work to be completed in 48 hours.

Report static pressure drop across chilled water coils, DX coils, hot water 3.3 TAB PROCEDURES (2) coils, steam coils, electric resistance heating coils and heat reclaim devices installed in unit cabinetry or the system ductwork.

(3) Report static pressure drop across outside air, return air, and supply air automatic control dampers, both proportional and two-position, installed in unit cabinetry.

(4) Report static pressure drop across air filters, acoustic silencers, moisture eliminators, air flow straighteners, air flow measuring stations or other pressure drop producing specialty items installed in unit cabinetry, or in the system ductwork. Examples of these specialty items are smoke detectors, white sound generators, RF shielding, wave guides, security bars, blast valves, small pipes passing through ductwork, and duct mounted humidifiers.

Do not report static pressure drop across duct fittings provided for the sole purpose of conveying air, such as elbows, transitions, offsets, plenums, manual dampers, and branch takes-offs.

Report static pressure drop across outside air and relief/exhaust air (5) louvers.

(6) Report static pressure readings of supply air, return air, exhaust/relief air, and outside air in duct at the point where these ducts connect to each air moving unit.[and also at the following locations:

Main Duct: Take readings at four locations along the full length of the main duct, 25 percent, 50 percent, 75 percent, and 100 percent of the total duct length.

Floor Branch Mains: Take readings at floor branch mains served by a main duct vertical riser

Branch Main Ducts: Take readings at branch main ducts.

Duct Traverses: Report duct traverses for main supply, return, exhaust, relief and outside air ducts. This includes all ducts, including those which lack 7 1/2 duct diameters upstream and 2 1/2 duct diameters downstream of straight duct unobstructed by duct fittings/offsets/elbows. The TAB Agency must evaluate and report findings on the duct traverses taken. Evaluate the suitability of the duct traverse measurement based on satisfying the qualifications for a pilot traverse plane as defined by AMCA 203, "Field Measurements", Section 8, paragraph 8.3, "Location of Traverse Plane."

Instruments: List the types of instruments actually used to measure the tab Include in the listing each instrument's unique identification number,

Instrumentation, used for taking wet bulb temperature readings must provide accuracy of plus or minus 5 percent at the measured face velocities. Submit instrument manufacturer's literature to document instrument accuracy performance is in compliance with that specified.

Certification: Include the typed name of the TAB supervisor and the dated signature of the TAB supervisor.

Performance Curves: The TAB Supervisor must include, in the TAB Reports, factory pump curves and fan curves for pumps and fans TAB'd on the job.

Calibration Curves: The TAB Supervisor must include, in the TAB Reports, a factory calibration curve for installed flow control

PART 2 PRODUCTS

PART 3 EXECUTION

Comply with requirements of this section as specified in Appendix A WORK

3.2 DALT PROCEDURES

3.2.1 Instruments, Consumables and Personnel

3.2.2 Advance Notice of Pre-Final DALT Field Work

On completion of the installation of each duct system indicated to be DALT'd, notify the Contracting Manager in writing prior to the COTR's duct selection field visit.

3.2.3 Ductwork To Be DALT'd

DALT Testing

Perform DALT on the HVAC duct sections of each system as selected by the COTR. Use the duct class, seal class, leakage class and the leak test pressure data

On successful completion of all field checks of the DALT Report data for all systems, the TAB Supervisor is to assemble, review, certify and submit the Final DALT Report to the Contracting Manager for approval. On successful completion of all field checks of the Pre-Final DALT Report

data for all systems, the TAB Supervisor shall assemble, review, approve, sign and submit the Final DALT Report in compliance with Appendix B REPORTS - DALT and TAB to the Contracting Manager for approval.

3.3.6 Prerequisite for TAB Field Work

3.3.1 TAB Field Work

Test, adjust, and balance the HVAC systems until measured flow rates (air and water flow) are within plus or minus 5 percent of the design flow rates as specified or indicated on the contract documents.

That is, comply with the requirements of AABC MN-1 or SMACNA 1780 (TABB) and SMACNA 1858 (TABB) except as supplemented and modified by this section. Provide instruments and consumables required to accomplish the TAB work. Calibrate and maintain instruments in accordance with manufacturer's written procedures.

Test, adjust, and balance the HVAC systems until measured flow rates (air and water flow) are within plus or minus 5 percent of the design flow rates as specified or indicated on the contract documents. Conduct TAB work, including measurement accuracy, and sound measurement work in conformance with the AABC MN-1 and AABC MN-4, or NEBB TABES and NEBB MASV, or SMACNA 1780 (used by TABB) and SMACNA 1858 sound measurement procedures, except as supplemented and modified by this section

3.3.2 TAB Air Distribution Systems

3.3.2.1 Units With Coils

Report heating and cooling performance capacity tests for hot water, chilled water, DX and steam coils for the purpose of verifying that the coils meet the indicated design capacity. Submit the following data and calculations with the coil test reports:

For air handlers with capacities greater than 7.5 tons (90,000 Btu) cooling, such as factory manufactured units, central built-up units and rooftop units, conduct capacity tests in accordance with AABC MN-4, procedure 3.5, "Coil Capacity Testing."

Do not determine entering and leaving wet and dry bulb temperatures by single point measurement, but by the average of multiple readings in compliance with paragraph 3.5-5, "Procedures", (in subparagraph d.) of AABC MN-4, Procedure 3.5, "Coil Capacity Testing."

Submit part-load coil performance data from the coil manufacturer converting test conditions to design conditions; use the data for the purpose of verifying that the coils meet the indicated design capacity in compliance with AABC MN-4, Procedure 3.5, "Coil Capacity Testing," paragraph 3.5.7, "Actual Capacity Vs. Design Capacity" (in subparagraph c.).

For units with capacities of 7.5 tons (90,000 Btu) or less, such as fan coil units, duct mounted reheat coils associated with VAV terminal units, and unitary units, such as through-the-wall heat pumps:

> Determine the apparent coil capacity by calculations using single point measurement of entering and leaving wet and dry bulb temperatures; submit the calculations with the coil reports.

3.3.2.2 Air Handling Units

Air handling unit systems including fans (air handling unit fans, exhaust fans and winter ventilation fans), coils, ducts, plenums, mixing boxes, terminal units, variable air volume boxes, and air distribution devices for supply air, return air, outside air, mixed air relief air, and makeup air

3.3.2.3 Rooftop Air Conditioning

Rooftop air conditioning systems including fans, coils, ducts, plenums, and air distribution devices for supply air, return air, and outside air.

For refrigeration compressors/condensers/condensing units/evaporators, report data as required by NEBB, AABC, and TABB standard procedures, including refrigeration operational data.

3.3.2.4 Heating and Ventilating Units

Heating and ventilating unit systems including fans, coils, ducts, plenums, roof vents, registers, diffusers, grilles, and louvers for supply air, return air, outside air, and mixed air.

3.3.2.5 Makeup Air Units

Makeup air unit systems including fans, coils, ducts, plenums, registers, diffusers, grilles, and louvers for supply air, return air, outside air, and mixed air.

3.3.2.6 Return Air Fans

Return air fan system including fan ducts, plenums, registers, diffusers, grilles, and louvers for supply air, return air, outside air, and mixed air.

3.3.2.7 Exhaust Fans

Exhaust fan systems including fans, ducts, plenums, grilles, and hoods for exhaust air.

3.4 TAB Work on Performance Tests Without Seasonal Limitations

3.4.1 Performance Tests

In addition to the TAB proportionate balancing work on the air distribution systems and the water distribution systems, accomplish TAB work on the HVAC systems which directly transfer thermal energy. TAB the operational performance of the heating systems and cooling systems.

3.4.2 Ambient Temperatures

On each tab report form used for recording data, record the outdoor and indoor ambient dry bulb temperature range and the outdoor and indoor ambient wet bulb temperature range within which the report form's data was recorded. Record these temperatures at to AABC or NEBB or TABB required data, the following: beginning and at the end of data taking.

3.5 TAB Reports

Additional requirements for TAB Reports are specified in Appendix B REPORTS -DALT and TAB After completion of the TAB field work, prepare the TAB field data for TAB supervisor's review and certification, using the reporting forms approved in the prefield engineering report. Data required by those approved data report forms is to be furnished by the TAB team. Except as approved otherwise in writing by the Contracting Manager, the TAB work and thereby the TAB report is considered incomplete until the TAB work is accomplished to within the accuracy range specified in the paragraph WORKMANSHIP.

3.6 MARKING OF SETTINGS

Upon the final TAB work approval, permanently mark the settings of HVAC adjustment devices including valves, gauges, splitters, and dampers so that adjustment can be restored if disturbed at any time. Provide permanent markings clearly indicating the settings on the adjustment devices which result in the data reported on the submitted TAB report.

3.7 MARKING OF TEST PORTS

The TAB team is to permanently and legibly mark and identify the location points of the duct test ports. If the ducts have exterior insulation, make these markings on the exterior side of the duct insulation. Show the location of test ports on the as-built mechanical drawings with dimensions given where the test port is covered by exterior insulation.

Data From TAB Field Work: After completion of the TAB field work, prepare the TAB field data for TAB supervisor's review and approval signature, using the reporting forms approved in the pre-field engineering report. Data required by those approved data report forms shall be furnished by the TAB team. Except as approved otherwise in writing by the Contracting Manager, the TAB work and thereby the TAB report shall be considered incomplete until the TAB work is accomplished to within the accuracy range specified in

the paragraph WORKMANSHIP

3.5 APPENDICES Appendix A REPORTS - DALT and TAB

Appendix A REPORTS - DALT and TAB All submitted documentation must be typed, neat, and organized. All reports must have a waterproof front and back cover, a title page, a certification page, sequentially numbered pages throughout, and a table of contents. Tables, lists, and diagrams must be titled. Generate and submit for approval the following documentation:

1. DALT and TAB Work Execution Schedule

Submit a detailed schedule indicating the anticipated calendar date for each submittal and each portion of work required under this section. For each work entry, indicate the support personnel (such as controls provider, HVAC mechanic, etc.) that are needed to accomplish the work. Arrange schedule entries chronologically.

2. DALT and TAB Procedures Summary

Include the following:

A list of the intended procedural steps for the DALT and TAB field work from start to finish. Indicate how each type of data measurement will be obtained. Include what Contractor support personnel are required for each step, and the tasks they need to perform.

this Contract's requirements.

The schematic drawings to be used in the required reports, which may include building floor plans, mechanical room plans, duct system plans, and equipment elevations. Indicate intended TAB measurement locations, including where test ports need to be provided by the Contractor.

The data presentation forms to be used in the report, with the preliminary information and initial design values filled in.

on this project.

A thorough checklist of the work items and inspections that need to be accomplished before DALT field work can be performed. The Contractor must complete, submit, and receive approval of the Completed Pre-Final DALT Work Checklist before DALT field work can be accomplished.

A thorough checklist of the work items and inspections that need to be accomplished before the TAB field work can be performed. The Contractor must complete, submit, and receive approval of the Completed Pre-TAB Work Checklist before the TAB field work can be accomplished.

Final DALT Report

On successful completion of all COTR field checks of the Pre-final DALT Report data for all systems, the TABS Supervisor shall assemble, review, sign and submit the Final DALT Report to the Contracting Manager for approval.

TAB Reports: Submit TAB Report for Proportional Balancing, Season 1, and Season 2 in the following manner:

Procedure Summary: Submit a copy of the approved DALT and TAB Procedures Summary. When applicable, provide notations describing how actual field procedures differed from the procedures listed.

Engineering Report completed by TAB field team,

(2)

(3)

louvers

(5)

cabinetry

Temperatures: On each TAB report form reporting TAB work accomplished on HVAC thermal energy transfer equipment, include the indoor and outdoor dry bulb temperature range and indoor and outdoor wet bulb temperature range within which the TAB data was recorded. Include in the TAB report continuous time versus temperature recording data of wet and dry bulb temperatures for the rooms, or zones.

> Data shall be measured and compiled on a continuous basis for the period in which TAB work affecting those rooms is being done.

(2) Data shall be measured/recorded only after the HVAC systems installations are complete, the systems fully balanced and the HVAC systems controls operating in fully automatic mode. Provide a detailed explanation wherever a final measurement did not achieve the required value.

(3) Data may be compiled using direct digital controls trend logging where available. Otherwise, the Contractor shall temporarily install calibrated time versus temperature/humidity recorders for this purpose. The HVAC systems and controls shall have been fully operational a minimum of 24 hours in advance of commencing data compilation. The specified data shall be included in the [Season I TAB Report] [Season I and Season 2 TAB Report].

Air System Diagrams: Provided updated diagrams with final installed locations of all terminals and devices, any numbering changes, and actual test locations.

Submit a detailed narrative describing all aspects of the DALT and TAB field work to be performed. Clearly distinguish between DALT information and TAB information.

A list of the project's submittals that are needed by the TAB Firm in order to meet

A list of DALT and TAB instruments to be used, edited for this project, to include the instrument name and description, manufacturer, model number, scale range, published accuracy, most recent calibration date, and what the instrument will be used for

Report format: Submit the completed data forms approved in the pre-field TAB

reviewed, approved and signed by the TAB supervisor. Bind the report with a waterproof front and back cover. Include a table of contents identifying by page number the location of each report. Report forms and report data shall be typewritten. Handwritten report forms or report data are not acceptable.

Air Static Pressure Profiles: Report static pressure profiles for air duct systems. Report static pressure data for all supply, return, relief, exhaust and outside air ducts for the systems listed. The static pressure report data shall include, in addition

> Report supply fan, return fan, relief fan, and exhaust fan inlet and discharge static pressures.

Report static pressure drop across outside air, return air, and supply air automatic control dampers, both proportional and two-position, installed in unit

Report static pressure drop across air filters, acoustic silencers, moisture eliminators, air flow straighteners, air flow measuring stations or other pressure drop producing specialty items installed in unit cabinetry, or in the system ductwork. Examples of these specialty items are smoke detectors, white sound generators, RF shielding, wave guides, security bars, blast valves, small pipes passing through ductwork, and duct mounted humidifiers. Report static pressure drop across outside air and relief/exhaust air

Report static pressure readings of supply air, return air, exhaust/relief air, and outside air in duct at the point where these ducts connect to each air moving

Duct Transverses: Report duct traverses for main supply, return, exhaust, relief and outside air ducts. The TAB Agency shall evaluate and report findings on the duct traverses taken. Evaluate the suitability of the duct traverse measurement based on satisfying the qualifications for a pitot traverse plane as defined by AMCA 203, "Field Measurements", Section 8, paragraph 8.3, "Location of Traverse Plane".

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Author IGV 08-04-22 21-57

MECHANICAL GENERAL NOTES

- HVAC UNIT LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE ALL EQUIPMENT INSTALLATIONS WITH STRUCTURE.
 INSTALL DUCTWORK AS PER SMACNA DUCT CONSTRUCTION STANDARDS AND FBC MECHANICAL.
 GALVANIZED DUCTS SHALL CONFORM TO THE SMACNA METAL AND FLEXIBLE DUCT
- CONSTRUCTION STANDARDS. FIBERGLASS DUCT SHALL CONFORM TO THE SMACNA FIBERGLASS DUCT
- CONSTRUCTION STANDARDS.
- COORDINATE THERMOSTAT INSTALLATION TO AVOID HEAT EMITTING EQUIPMENT. THERMOSTATS SHALL BE INSTALLED 48-INCHES ABOVE FINISHED FLOOR.
 PROVIDE BALANCING DAMPERS IN ALL SUPPLY, RETURN AND EXHAUST DUCT BRANCHES
- BRANCHES. THE DUCTWORK SYSTEM SHALL BE A SMACNA PRESSURE CLASSIFICATION OF 3.0"
- S.P., SEAL CLASS "C".
 BALANCE ALL AIR OUTLETS AND AC/FCU/HP/AHU UNITS AS SHOWN IN DRAWING.
 DUCTWORK SHALL BE INSULATED AS PER 2020 FLORIDA BUILDING CODE- ENERGY
- CONSERVATION.
 CONTRACTOR SHALL COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. VERIFY ALL CLEARANCES AND DIMENSIONS BEFORE DUCTWORK
- FABRICATION. PROVIDE OFFSETS TO MEET FIELD CONDITIONS.
 THE CONTRACTOR SHALL PROVIDE THE NECESSARY REINFORCEMENT AS REQUIRED TO INSTALL MECHANICAL EQUIPMENT AND MATERIALS PER STRUCTURAL ENGINEER'S
- RECOMMENDATIONS. 12. PROVIDE DIFFUSER AND RETURN TRANSITIONS AS NECESSARY.
- 13. MAINTAIN 36" MINIMUM MECHANICAL EQUIPMENT CLEARANCE FROM ELECTRICAL PANELS.
- 14. COORDINATE FINAL DIFFUSSER WITH CEILING GRID AND OTHER DEVICES IN THE CEILING IN THE FIELD.
- DESIGN BASIS: THE MECHANICAL DRAWINGS AND PLANS ARE DIAGRAMMATIC AND ARE BASED ON THE MANUFACTURER AND MODEL NUMBER OF THE MECHANICAL EQUIPMENT AND DEVICES AS SCHEDULED. DIMENSIONS SHALL BE FIELD-VERIFIED AND COORDINATED PRIOR TO PROCUREMENT OR FABRICATION. THE CONTRACTOR SHALL COORDINATE ALL HVAC EQUIPMENT, NEW DUCTWORK, AND NEW PIPING WITH ALL OTHER NEW WORK, WITH THE EXISTING CONDITIONS, AND WITH THE WORK OF OTHER TRADES. IF FIELD CONDITIONS DIFFER SIGNIFICANTLY FROM THOSE SHOWN ON THE DRAWINGS AND AFFECT THE MECHANICAL WORK, INFORM THE ENGINEER IMMEDIATELY BEFORE PROCEEDING WITH THE WORK INVOLVED.
 PROVIDE ALL DUCT AND PIPING FITTINGS, OFFSETS, AND TRANSITIONS, AS REQUIRED FOR A COMPLETE INSTALLATION. ALL DUCTWORK SIZES SHOWN ARE CLEAR INSIDE
- DIMENSIONS.
 17. ALL DUCTWORK AND PIPING SHALL BE ROUTED IN A CONCEALED MANNER, ABOVE CEILINGS, OR IN SOFFITS, EXCEPT AS NOTED OTHERWISE ON THE DRAWINGS. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND DUCTWORK, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- DUCT RUNOUTS TO DIFFUSERS SHALL MATCH THE SIZE OF THE DIFFUSER NECK.
 ALL CONDENSATE PIPING SHALL BE INSULATED WITH 1" THICK INSULATION.
 FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH. FOR DUCT RUN-OUTS
- GREATER THAN 5'-0" IN LENGTH, PROVIDE RIGID ROUND DUCT OF EQUAL SIZE TO LIMIT FLEXIBLE DUCTWORK TO 5'-0" TOTAL LENGTH. REFER TO MECHANICAL SCHEDULE SHEET FOR ALL RUNOUT NECK SIZES AND FLEX CONNECTION SIZES.
 PROVIDE ACOUSTICAL DUCT LINING FOR THE FIRST 20 FEET DOWNSTREAM OF FANS (RTU, AC, HAHU, ETC.). MAINTAIN INSIDE CLEAR DUCT DIMENSION AS INDICATED ON

MECHANICAL KEY NOTES

1. REFER TO DRAWING M-102 FOR CONTINUATION.

DRAWING.

- 2. DUCT RISE TO CLEAR EGRESS PATH IN ATTIC.
- 3. PROVIDE REGID DUCT AT NECK CONNECTION THROUGH CEILING PRIOR TO FLEX DUCT CONNECTION. TYPICAL FOR ALL SUPPLY DIFFUSERS.
- 4. PROVIDE DUCT CONNECTION AT RETURN GRILLE AND THROUGH GYP. BD. CEILING. TYPICAL FOR ALL RETURN GRILLES.
- 5. PROVIDE DUCT SMOKE DETECTOR. SMOKE DETECTOR SHALL SHUT DOWN ASSOCIATED AHU WHEN SMOKE IS SENSED.
- 6. ACCU UNITS SHALL BE INSTALLED ON CONCRETE PAD AND ANCORED WITH HURRICANE CLIPS IN COMPLIANCE WITH SECTION 1609 OF THE 2020 FLORIDA BUILDING CODE, 7TH EDITION.
- 7. ALL EXTERIOR REFRIGERANT PIPING INSULATION SHALL BE PROVIDED WITH FIELD APPLIED JACKET, HIGH-IMPACT RESISTANT, UV RESISATNT PVC, COMPLYING WITH ASTM D 1784, CLASS 16354-C.5.

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1 Mechanical Attic 1/4" = 1'-0"

MECHANICAL GENERAL NOTES

- HVAC UNIT LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE ALL EQUIPMENT INSTALLATIONS WITH STRUCTURE. INSTALL DUCTWORK AS PER SMACNA DUCT CONSTRUCTION STANDARDS AND FBC MECHANICAL.
- GALVANIZED DUCTS SHALL CONFORM TO THE SMACNA METAL AND FLEXIBLE DUCT CONSTRUCTION STANDARDS.
- FIBERGLASS DUCT SHALL CONFORM TO THE SMACNA FIBERGLASS DUCT CONSTRUCTION STANDARDS.
- COORDINATE THERMOSTAT INSTALLATION TO AVOID HEAT EMITTING EQUIPMENT. THERMOSTATS SHALL BE INSTALLED 48-INCHES ABOVE FINISHED FLOOR. PROVIDE BALANCING DAMPERS IN ALL SUPPLY, RETURN AND EXHAUST DUCT
- BRANCHES. THE DUCTWORK SYSTEM SHALL BE A SMACNA PRESSURE CLASSIFICATION OF 3.0"
- S.P., SEAL CLASS "C". BALANCE ALL AIR OUTLETS AND AC/FCU/HP/AHU UNITS AS SHOWN IN DRAWING. DUCTWORK SHALL BE INSULATED AS PER 2020 FLORIDA BUILDING CODE- ENERGY
- CONSERVATION. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS AND 10. INTERFERENCES. VERIFY ALL CLEARANCES AND DIMENSIONS BEFORE DUCTWORK
- FABRICATION. PROVIDE OFFSETS TO MEET FIELD CONDITIONS. 11. THE CONTRACTOR SHALL PROVIDE THE NECESSARY REINFORCEMENT AS REQUIRED TO INSTALL MECHANICAL EQUIPMENT AND MATERIALS PER STRUCTURAL ENGINEER'S
- **RECOMMENDATIONS.** PROVIDE DIFFUSER AND RETURN TRANSITIONS AS NECESSARY. 12.
- MAINTAIN 36" MINIMUM MECHANICAL EQUIPMENT CLEARANCE FROM ELECTRICAL 13. PANELS. 14.
- COORDINATE FINAL DIFFUSSER WITH CEILING GRID AND OTHER DEVICES IN THE CEILING IN THE FIELD. FLASH AND COUNTER FLASH ALL ROOF PENETRATION AND PITCH POCKETS.
- DESIGN BASIS: THE MECHANICAL DRAWINGS AND PLANS ARE DIAGRAMMATIC AND 16. ARE BASED ON THE MANUFACTURER AND MODEL NUMBER OF THE MECHANICAL EQUIPMENT AND DEVICES AS SCHEDULED. DIMENSIONS SHALL BE FIELD-VERIFIED AND COORDINATED PRIOR TO PROCUREMENT OR FABRICATION. THE CONTRACTOR SHALL COORDINATE ALL HVAC EQUIPMENT, NEW DUCTWORK, AND NEW PIPING WITH ALL OTHER NEW WORK, WITH THE EXISTING CONDITIONS, AND WITH THE WORK OF OTHER TRADES. IF FIELD CONDITIONS DIFFER SIGNIFICANTLY FROM THOSE SHOWN ON THE DRAWINGS AND AFFECT THE MECHANICAL WORK, INFORM THE ENGINEER IMMEDIATELY BEFORE PROCEEDING WITH THE WORK INVOLVED.
- 17. PROVIDE ALL DUCT AND PIPING FITTINGS, OFFSETS, AND TRANSITIONS, AS REQUIRED FOR A COMPLETE INSTALLATION. ALL DUCTWORK SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.
- ALL DUCTWORK AND PIPING SHALL BE ROUTED IN A CONCEALED MANNER, ABOVE 18. CEILINGS, OR IN SOFFITS, EXCEPT AS NOTED OTHERWISE ON THE DRAWINGS. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND DUCTWORK, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

DUCT RUNOUTS TO DIFFUSERS SHALL MATCH THE SIZE OF THE DIFFUSER NECK. ALL CONDENSATE PIPING SHALL BE INSULATED WITH 1" THICK INSULATION. 20. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH. FOR DUCT RUN-OUTS 21. GREATER THAN 5'-0" IN LENGTH, PROVIDE RIGID ROUND DUCT OF EQUAL SIZE TO

LIMIT FLEXIBLE DUCTWORK TO 5'-0" TOTAL LENGTH. REFER TO MECHANICAL SCHEDULE SHEET FOR ALL RUNOUT NECK SIZES AND FLEX CONNECTION SIZES. PROVIDE ACOUSTICAL DUCT LINING FOR THE FIRST 20 FEET DOWNSTREAM OF FANS 22. (RTU, AC, HAHU, ETC.). MAINTAIN INSIDE CLEAR DUCT DIMENSION AS INDICATED ON DRAWING.

MECHANICAL KEY NOTES

RETURN AIR OPENING WITH MOTORIZED DAMPER (MD). INTERLOCK MD WITH AIR HANDLING UNIT.

- OUTSIDE AIR MOTORIZED DAMPER (MD). INTERLOCK WITH AIR HANDLING UNIT. 2.
- RELIEF AIR LOUVER WITH BAROMETRIC RELIEF DAMPER. 3.
- 3/4" INSULATED COPPER CONDENSATE DRAIN, ROUTE DN TO GRADE AND 4 DISCHARGE IN PLANTING AREA.
- PROVIDE 2"X2" NEOPRENE WAFFLE PAD BY MASON INDUSTRIES MODEL SUPER W, AND PLACE AT EACH CORNER AND AT MIDDLE OF EACH SIDE OF AHU (6 LOCATIONS).

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DUCT HANGER DETAIL

M DIFFUSER DETAIL

AIR COOLED C		SCHEDULE																							
UNIT TAG	LOCATION	TYPE		L TOTAL N CAPA	OMINAL CITY NO. C		ESSOR DATA RLA/ LRA		AMBIEN	IT IP. NO. (ОГМ			ER			EFF		WEIGI		KS		
ACCU-1	GRADE	HEAT PUMP	2 6	(MB	BH) COMPRES	SORS SCROU	(EACH)	REFRIGERAN	(°F)	FAN	S ^{HP}	22	6.530	208/3/60	(AMPS) MC	OCP (AMPS)		WA07243D	3.3	12 7 / 12 2	× (LD3)			
ACCU-2	GRADE	HEAT PUMP	9 6	77	7 2	SCROLL	10.4 / 73	R-410A	95	1	1/2	2.2	6,530	208/3/60	26	35	TRANE T	WA07243D	3.3	12.7 / 12.2	2 360				
NOTES: 1. INSTALLATION 2. REFRIGERANT 3. INSTALL UNIT 4. PROVIDE WITH	SHALL ADHERE T LINE SIZE SHALL ON CONCRETE PA BLACK EPOXY P	O MANUFACTU BE BASED ON M D AND SECURE RE-COATED CO	RER'S INSTALI MANUFACTURI WITH HURRIC NDENSER COI	Lation Instr Er's Guidelin Cane Clips. L With Hail G	RUCTIONS AND GUIDI NES FOR ACTUAL INS GUARD.	ELINES. STALLED EQUIVALLENT L	ENGTH. COORDINA	TE WITH MANUFA	CTURER.																
AIR HANDLING	UNIT SCHEDULE																								
TAG						SUPPLY FAN DATA		тота		COOLI	NG DATA AIR DA	TA		HEAT PUMP	HEATING	ELECTRIC	FIL	TER DATA	UNIT ELE		A WE	EIGHT MANUFACTU	MODEL	DEMADKS	
IAG	LOCATION	SLIVE	.5 [[F) (CFM (IN W.G	B.) HP B	HP RPM	MBH	MBH	CFM	O.A. CFM I	EAT F DB/WB [LAT F DB/WB	CAPACITY (MBH) HSPF	NO. OF	S V/PH/HZ	KW	H MERV	V/PH/HZ	MCA N	NOCP (L	.BS) RER	MODEL	IL MARKE	
AHU-1 AHU-2	MECH ATTIC MECH ATTIC	MEETING MEETING	RM 1 9 RM 2 9	5 2 5 2	24000.824000.8	1.5 C 1.5 C	0.9 716 0.9 716	76.1 76.1	58.1 58.1	2400 2400	415 360	80/67 57 80/67 57	7.6 / 56.8 7.6 / 56.8	40.6 8 40.6 8	1	208/3/60 208/3/60	11.25 2 11.25 2	8 8	208/3/60 208/3/60	46 46	50 4 50 4	450 TRANE 450 TRANE	TWE07243BAA TWE07243BAA		
 4. PROVIDE 1 1/2 TO COVER AN 5. PROVIDE INTE 6. PROVIDE A SII 7. PROVIDE WITH 8. INSTALL UNIT 	" DEEP AUXILIARY ID EXTEND 3" BEY RLOCKING LEAK I IGLE POINT POWI I CONTROLS BY U IN HORIZONATL C	DRAIN PAN CO OND AREA BELO PROTECTION FL R CONNECTION NIT MANUFACT ONFIGURATION	NSTRUCTION OW FAN COIL (.OAT SWITCH ⁻ N. URER. PROVIE WITH SPRING	of 18 gauge Jnit, Piping / To shut off De with 7/24 f Isolator ac	E GALVANIZED SHEET AND VALVES. UNIT IF PRIMARY DF PROGRAMMABLE TH CCESSORY.	T METAL WITH WELDED C RAIN FAILS ERMOSTAT.	ORNERS AND SEAN	MS. PAN SHALL BE	E SIZED																
AIR DISTRIBUT	ON DEVICE SCH	EDULE																		OUTSI	DE AIR				
TAG	TYPE	CFM NECK ANGE SIZE	BORDER TYPE	MODULE	TITUS MODEL NUMBER		REMARKS		NOT	ES									Реор	ble	Area	Outdoo Airflow	SYSTEM	SYSTEM MI	NIMUM PPI Y SUPPLY
CD-A	SUPPLY)-175 8"Ø	LAY-IN	24x24	OMNI	R-6 INSULATED BACKPA	N		1.2.4						Catagon		Area		Outd Rate	loor Zone Populati	e Outdoor ion Rate	Air Zone Floor Rate Area Rp*Pz+	SUPPLY AIR	OUTSIDE AIR AIF % RE	QUIRED AIR
	SUPPLY 1	76-275 10"Ø	LAY-IN	24x24	OMNI	R-6 INSULATED BACKPA	N		1,2,4						CONFER		MEETING ROOM 1		Rp	Pz 5 67	Ra	Az Vbz	2400	17	2324 2325
	SUPPLY 2 SUPPLY 3	76-390 12*Ø 91-500 14"Ø	LAY-IN LAY-IN	24x24 24x24	OMNI	R-6 INSULATED BACKPA	N N		1,2,4						STORAG	GE	STORAGE 103		(0 0	0.12	58 7	2400 SYSTEM SUPPL	17 _Y AIR, AHU-1:	75 75 2399 2400
CD-B	SUPPLY 5	01-625 16"Ø	LAY-IN SURFACE	24x24	OMNI	R-6 INSULATED BACKPA	N		1,2,4						CONFER	RENCE ROOM	MEETING ROOM 2		Ę	5 57	0.06	848 336 73 9	2400	17	1976 2000 52 75
	SUPPLY 1	76-275 10"Ø	SURFACE	24x24	OMNI	R-6 INSULATED BACKPA	N		1,2,4						CORRIDO	DOR IENT	CORRIDOR 100 ELEC/AV 101		((0 0 I/A N/A	0.06	223 13 N/A N/A	2400	17	79 225 N/A 100
	SUPPLY 2 SUPPLY 3	76-390 12"Ø 91-500 14"Ø	SURFACE SURFACE	24x24 24x24	OMNI OMNI	R-6 INSULATED BACKPA R-6 INSULATED BACKPA	N N		1,2,4														SYSTEM SUPPL	Y AIR, AHU-2:	2106 2400
CD-C	SUPPLY 5	01-625 16"Ø	SURFACE	24x24	OMNI	R-6 INSULATED BACKPA	N		1,2,4																
CR-A	RETURN	-1000 22x22	LAY-IN	24x24	4FL	ALUMINUM GRILLE - 1/2"	BLADE SPACING A	T 45° DEFLECTIO	N 1,3,4																
CR-B <u>NOTES:</u> 1. FINAL FINISH A 2. PROVIDE VOL 3. PAINT DUCTW 4. PROVIDE CAB	RETURN AND COLOR TO BE JME DAMPER UPS ORK FLAT BLACK LE OPERATED VO	SELECTED BY TREAM OF EAC WHERE VISIBLE	O SURFACE ARCHITECT. CH SUPPLY DIF THROUGH GF FOR DIFFUSEF	12X12 FUSER. RILLE, TYPICA RS IN INACCES	4FL L. SSIBLE CEILINGS.	ALUMINUM GRILLE - 1/2	BLADE SPACING A	T 45° DEFLECTIOI	N 1,3,4						PA	AIR SPACING:		REC 10 FEET	TANGUI	LAR DUC 8 FE	CT HAN(GER SCHED	JLE FEET	4 F	EET
															DI M	UCT PERIMETE IAXIMUM HALF	R, STRAF	, WIRE ROE	E/ 5	STRAP	WIRE/ ROD	STRAP	WIRE/ ROD	STRAP	WIRE/ ROD
																– /2	IN x GA	A 10 G	A	N x GA	10 GA	IN x GA	12 GA	IN x GA	12 GA
LOUVER SCHEI	DULE															P/2 = 30"	1 x 22	(0.135	5") '	1 x 22	(0.135")	1 x 22	(0.106")	1 x 22	(0.106")
TAG AI	PPLICATION	QTY MC	DDEL (INC	DTH HEIGH HES) (INCHE	HT AIRFLOW ES) (CFM)	PRESSURE DROP (IN.WG)	FREE AREA V (FPM)	ELOCITY)								P/2 = 96"	1 x 16	3/8	1 1	1 x 18	3/8"	1 x 20	3/8"	1 x 22 1 x 22	1/4"
LVR-1 LVR-2	INTAKE EXHAUST	1 EHV 1 EHV	/-901D (/-901D (30 24 30 24	800 800	0.07	449 448									P/2 = 120 P/2 = 168''	1.5 x 10	6 1/2"	' 1	1.5 x 16	1/2"	1 x 16	3/8"	1 x 18	3/8"
NOTES:																P/2 = 192 P/2 = 193" +		I/2		S	SPECIAL A	NALYSIS NEEDE	3/8 D	1 X 10	3/8
 1. HIGH VELOCIT 2. TESTED AND C 3. PROVIDE WITH 	Y WIND DRIVEN R QUALIFIED PER FLC I ALUMINUM BIRI	AIN LOUVER, AN RIDA TEST PRO DSCREEN.	иса-500-l, AN TOCOLS TAS 2(1CA 540, AMC D1, TAS 202 AI	A 550. ND TAS 203.											SING	LE HANGER MA LO	XIMUM ALLO	WABLE			LAP JO (PLACE FA	NINED STRAPS, N STENERS IN SE	/INIMUM FAS RIES, NOT SI	TENERS DE BY SIDE):
																STRAP	WEIGH		≡/N	VEIGHT		S	RAP	FAST	ENERS
																INCHES x GA	LBS	Ø (IN	.)	LBS		IN	x GA	(QTY)	- SIZE
																1 x 22 1 x 20	260 320	0.10	6 5	80 120		1 X 1	8, 20, 22	(2) - #² (1) - 1/4	IU SMS "Ø BOLT
																1 x 18 1 x 16	420 700	0.16	2	160 270		1.1.1	x 16 5 x 16	(2) - 1/4 (2) -	"Ø BOLT 3/8"Ø
																1.5 x16	1100	3/8 1/2		680 1250					
																		5/8		2000					
															N	OTE: TABLE ALI		T WEIGHT, 1	LB./SQ. F	T. INSULATI	ION WEIG	HT, AND NORMA	 		

REINFORCEMENT AND TRAPEZE WEIGHT.

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	prepared for Sweetwater Creek Community Development District	PALENCIA FITNESS CENTER	ADDITION St. Augustine, Florida	MECHANICAL SCHEDULES	
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REVISIONS

SEQUENCE OF OPERATION: AHU

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:

DURING OCCUPIED PERIODS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE OUTSIDE AIR AND RETURN AIR DAMPERS SHALL MODULATE TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS.

THE DX COOLING AND THE ELECTRIC HEAT SHALL CONTROL TO MAINTAIN THE ACTIVE DISCHARGE AIR TEMPERATURE SETPOINT. THE DISCHARGE AIR TEMPERATURE SETPOINT SHALL BE DYNAMICALLY RESET BASED ON THE DEVIATION OF ACTUAL SPACE TEMPERATURE FROM THE ACTIVE SPACE TEMPERATURE SETPOINT. IF THE DISCHARGE AIR TEMPERATURE SENSOR FAILS, THE DX COOLING AND THE ELECTRIC HEAT SHALL CONTROL TO MAINTAIN THE ACTIVE SPACE TEMPERATURE SETPOINT AND AN ALARM SHALL ANNUNCIATE AT THE BAS. IF THE DISCHARGE AIR TEMPERATURE SENSOR AND THE SPACE TEMPERATURE SENSOR FAIL, THE DX COOLING AND ELECTRIC HEAT SHALL BE DISABLED AND AN ALARM SHALL ANNUNCIATE AT THE BAS.

UNOCCUPIED:

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 THE RETURN AIR DAMPER SHALL OPEN AND THE ELECTRIC 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 ELECTRIC HEAT SHALL BE DISABLED.

WHEN THE SPACE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F (ADJ.) THE SUPPLY FAN SHALL START, THE OUTSIDE AIR DAMPER SHALL BE CLOSED THE RETURN AIR DAMPER SHALL OPEN AND THE DX COOLING SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT OF 85.0 DEG. F 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 FAN(S). THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED AND THE RETURN AIR DAMPER SHALL OPEN. 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 AND THE RETURN AIR DAMPER SHALL OPEN. 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. OUTSIDE AIR DAMPER SHALL REMAIN ENABLED TO PROVIDE MINIMUM VENTILATION.

OCCUPIED BYPASS:

THE BAS SHALL MONITOR THE STATUS OF THE ON AND CANCEL BUTTONS OF THE SPACE TEMPERATURE

HEAT/COOL MODE:

WHEN THE SPACE TEMPERATURE RISES ABOVE THE OCCUPIED COOLING SETPOINT THE MODE SHALL TRANSITION TO COOLING. WHEN THE SPACE TEMPERATURE FALLS BELOW THE OCCUPIED HEATING SETPOINT THE MODE SHALL TRANSITION TO HEATING. WHEN THE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT OR BELOW THE OCCUPIED HEATING SETPOINT THE MODE SHALL REMAIN IN ITS LAST STATE. IF THE SPACE TEMPERATURE SENSOR FAILS THE MODE SHALL REMAIN IN ITS LAST STATE AND AN ALARM SHALL ANNUNCIATE AT THE BAS. IF THE LOCAL AND COMMUNICATED SETPOINTS FAIL THE CONTROLLER SHALL DISABLE THE SUPPLY FAN AND AN ALARM SHALL ANNUNCIATE AT THE BAS.

THE SPACE TEMPERATURE BAS, OCCUPIED HEATING SETPOINT, OCCUPIED COOLING SETPOINT, AND THE HEAT COOL MODE SHALL BE COMMUNICATED TO THE UNIT CONTROLLER BY THE BAS. THE DISCHARGE AIR TEMPERATURE SHALL BE RESET BASED UPON THE DEVIATION OF SPACE TEMPERATURE BAS FROM THE APPROPRIATE MODE SETPOINT DERIVED BY THE CONTROLLER. WHEN THE CALL FOR COOLING OR THE CALL FOR HEATING IS NOT NEEDED, THE UNIT SHALL CONTROL TO A NEUTRAL SETPOINT DERIVED FROM THE CONTROLLER USING A FIXED DEADBAND TEMPERATURE OFFSET. IF THE DISCHARGE AIR TEMPERATURE DROPS BELOW THE MINIMUM LIMIT, A LOW TEMPERATURE ALARM SHALL ANNUNCIATE, AND THE UNIT SHALL SHUT DOWN. IF THE DISCHARGE AIR TEMPERATURE RISES ABOVE THE MAXIMUM LIMIT, A HIGH TEMPERATURE ALARM SHALL ANNUNCIATE.

SUPPLY FAN:

THE SUPPLY FAN SHALL BE OFF IN THE UNOCCUPIED MODE. THE SUPPLY FAN SHALL BE ON IF THE CONTROL IS HEATING OR COOLING IN THE UNOCCUPIED MODE. WHEN THE CONTROLLER IS IN THE OCCUPIED MODE. THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY.

MIXED AIR LOW LIMIT:

THE INITIAL DAMPER OPENING RATE SHALL BE LIMITED TO 2% PER MINUTE (ADJ.) UNTIL THE DAMPER HAS REACHED ITS MINIMUM VENTILATION POSITION. THE OUTSIDE AIR DAMPER SHALL MODULATE TO A POSITION LESS THAN THE MINIMUM DAMPER POSITION IF THE MIXED AIR TEMPERATURE DROPS BELOW 50.0 DEG. F (ADJ.). IF THE MIXED AIR TEMPERATURE SENSOR FAILS AN ALARM SHALL ANNUNCIATE AT THE BAS AND THE OUTSIDE AIR DAMPER SHALL RETURN TO THE MINIMUM POSITION.

FILTER STATUS:

A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER(S) WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSES DURING NORMAL OPERATION A DIRTY FILTER ALARM SHALL ANNUNCIATE AT THE BAS.

DAYTIME WARM-UP CONTROL:

DURING OCCUPIED PERIODS. WHEN THE SPACE TEMPERATURE IS BELOW THE DAYTIME WARM-UP INITIATE SETPOINT, A DAYTIME WARM-UP SEQUENCE SHALL BE ACTIVATED. THE OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS, AND THE HEATING SHALL ENABLE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE HEATING SETPOINT. DAYTIME WARM-UP SHALL TERMINATE WHEN THE AVERAGE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT.

CONDENSATE OVERFLOW MONITORING:

IF THE CONDENSATE LEVEL REACHES THE TRIP POINT, A CONDENSATE OVERFLOW DIAGNOSTIC SHALL ANNUNCIATE AT THE BAS. TO PREVENT THE CONDENSATE DRAIN PAN FROM OVERFLOWING AND CAUSING WATER DAMAGE TO THE BUILDING THE FAN SHALL BE DISABLED AND THE DX COOLING SHALL BE DISABLED.

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.).

DISCHARGE AIR TEMPERATURE RESET CONTROL:

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Web: www.Ci-Mech.com Email: Info@Ci-Mech.com Phone: 904-503-1421

Certificate of Authorization: 32282

ABBREVIATIONS

L .	
ABAN	ABANDON
DR	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AG	
AHJ	
ANSI	INSTITUTE
AP	ACCESS PANEL, ALARM PANEL
	AMERICAN SOCIETY OF MECHANICAL
ASSE	AMERICAN SOCIETY OF SANTIARY
ΛΟΤΜ	AMERICAN SOCIETY FOR TESTING &
ASTIVI	MATERIALS
AW	ACID WASTE
AWWA	AMERICAN WATER WORKS
-B-	
BFF	BELOW FINISHED FLOOR
BFP	BACKELOW PREVENTOR
BLDG	BLILDING
BLUG	
	BLOWDOWN
BMS	BLUUDING MANAGEMENT SYSTEM
-C-	
010	
UV OV	
	GOLD WATER
-D-	
DCW	
DEG	DEGREE
DEMO	DEMOLITION
DIA	DIAMETER
DN	DOWN
DOM	DOMESTIC
DR	DRAIN
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
-E-	
(E)/EX	EXISTING TO REMAIN
(ER)	
EJ	
EL	ELEVATION, ELEVATOR LOBBY
	EQUAL
EQ	FOURDMENT
EQ EQUIP	
EQ EQUIP EWC	EQUIPMENT ELECTRIC WATER COOLER
EQ EQUIP EWC EWH	EQUIPMENT ELECTRIC WATER COOLER ELECTRIC WATER HEATER
EQ EQUIP EWC EWH EWS	EQUIPMENT ELECTRIC WATER COOLER ELECTRIC WATER HEATER EYEWASH STATION
EQ EQUIP EWC EWH EWS -F-	EQUIPMENT ELECTRIC WATER COOLER ELECTRIC WATER HEATER EYEWASH STATION
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LAB	LABORATORY
LAP	LOCAL ALARM PANEL
LAV	LAVATORY
LPD	LITERS PER DAY
-M-	
MAX	MAXIMUM
MECH	MECHANICAL
MED	MEDIUM
MER	MECHANICAL EQUIPMENT ROOM
MFR	MANUFACTURER
MGCV	MASTER GAS CONTROL VALVE
MIN	
MS	
MTCUT	
MIGHI	
-N-	
NC	NORMALLY CLOSED
NEMA	NATIONAL ELECTRICAL
NIC	
NIS	NOT TO SCALE
-0-	
OC	ON CENTER
OD	OUTSIDE DIAMETER
ORD	OVERFLOW ROOF DRAIN
OS&Y	OPEN STEM AND YOKE
OSHA	OCCUPATIONAL SAFETY AND HEALTH
	ACI
-P-	
PIV	POST INDICATOR VALVE
PLBG	PLUMBING
PLD	PLENUM DRAIN
POS	POSITIVE
PSI	POUNDS PER SQUARE INCH
-R-	
R	RISE
RD	ROOF DRAIN
REC	RECESSED
REER	REFRIGERATION
REQU	
REV	
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RR	ROOF RECEPTOR
-S-	
S	SOIL, SANITARY
SA	SHOCK ABSORBER, SUPPLY AIR
SAN	SANITARY
SCP	SCUPPER
<u>en</u>	STORM DRAIN, SMOKE
30	DAMPER/DETECTOR
SE	SEWAGE EJECTOR
SED	SEWAGE EJECTOR DISCHARGE
SK	SINK
SMP	SUMP PUMP
SMPD	SUMP PUMP DISCHARGE
SS	STAINLESS STEEL
STD	STANDARD
-T-	
T&P	
VALVE	
TD	TRENCH DRAIN
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE
TP	TRAP PRIMER
TS	TAMPER SWITCH
TYP	TYPICAL
UL	
UK	
1/	URINAL
-v-	
V	VENT, VOLT, VIDEO
V VB	VENT, VOLT, VIDEO VACUUM BREAKER
V VB VEL	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY
V VB VEL VIF	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD
V VB VEL VIF VOL	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME
V VB VEL VIF VOL VOV	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL
V VB VEL VIF VOL VOV VTR	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF
V VB VEL VIF VOL VOV VTR -W-	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF
V VB VEL VIF VOL VOV VTR -W- W/	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF
V VB VEL VIF VOL VOV VTR -W- W/ W/O	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT
V VB VEL VIF VOL VOV VTR -W- W/ W/O WC:	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET
V VB VEL VIF VOL VOV VTR -W- W/ W/O WC	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT
-V- V VB VEL VIF VOL VOV VTR -W- W/ W/O WCO WCO W/E S	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT
-V- V VB VEL VIF VOL VOV VTR -W- W/ W/O WCO WFS	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT WATER FLOW SWITCH
V VB VEL VIF VOL VOV VTR -W- W/ W/O W/O WC WCO WFS WHA-A	VRINAL VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT WATER FLOW SWITCH WATER HAMMER ARRESTOR (LETTER INDICATES P.D.I. SIZF)
-V- V VB VEL VIF VOL VOV VTR -W- W/ W/O WCO WFS WHA-A	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT WATER FLOW SWITCH WATER HAMMER ARRESTOR (LETTER INDICATES P.D.I. SIZE)
-V- V VB VEL VIF VOL VTR -W- W/ W/O WC WFS WHA-A WM	VRINAL VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT WATER FLOW SWITCH WATER FLOW SWITCH WATER HAMMER ARRESTOR (LETTER INDICATES P.D.I. SIZE) WATER METER WIDE MESH SCREEN
-V- V VB VEL VIF VOL VOV VTR -W- W/ W/O WCO WFS WHA-A WMS	VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT WATER FLOW SWITCH WATER HAMMER ARRESTOR (LETTER INDICATES P.D.I. SIZE) WATER METER WIRE MESH SCREEN
-V- V VB VEL VIF VOL VTR -W- W/ W/O WC WCO WFS WHA-A WM WMS WSP	VRINAL VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT WATER FLOW SWITCH WATER FLOW SWITCH WATER METER INDICATES P.D.I. SIZE) WATER METER WIRE MESH SCREEN WORKING STEAM PRESSURE
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-V- V VB VEL VIF VOL VTR -W- W/ W/O WC WCO WFS WHA-A WM WMS WSP WT WTR	VRINAL VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT WATER FLOW SWITCH WATER FLOW SWITCH WATER RAMMER ARRESTOR (LETTER INDICATES P.D.I. SIZE) WATER METER WIRE MESH SCREEN WORKING STEAM PRESSURE WEIGHT WATER
-v- V VB VEL VIF VOL VOL WOL WOV WTR W/O WCO WFS WHA-A WM WMS WSP WT WWP	VRINAL VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT WATER FLOW SWITCH WATER HAMMER ARRESTOR (LETTER INDICATES P.D.I. SIZE) WATER METER WIRE MESH SCREEN WORKING STEAM PRESSURE WEIGHT WATER WORKING WATER PRESSURE
-v- V VB VEL VIF VOL VOV VTR -W- W/ W/O WC WC WC WC WC WFS WHA-A WM WMS WSP WT WT WT WTR WWP -Z-	VRINAL VENT, VOLT, VIDEO VACUUM BREAKER VELOCITY VERIFY IN FIELD VOLUME VALVE ON VERTICAL VENT THROUGH ROOF WITH WITHOUT WATER CLOSET WALL CLEANOUT WATER FLOW SWITCH WATER FLOW SWITCH WATER RAMMER ARRESTOR (LETTER INDICATES P.D.I. SIZE) WATER METER WIRE MESH SCREEN WORKING STEAM PRESSURE WEIGHT WATER

SYMBOLS LEGEND

ANNOTATION

1 VIEW TITLE SCALE: NTS	PLAN TITLE NO 1	Ν	IISCEI
1 TITLE P-201 SCALE: NTS	TITLE MARK DETAIL OR PLAN NO 1 FOUND IN P-201		
1 P-501	DETAIL REFERENCE DETAIL NO 1 FOUND IN P-501		
1 P-501	SECTION MARK SECTION NO 1 FOUND IN P-501		
() <u>2</u> P-201	DETAIL BOUNDARY (RECTANGLE) DETAIL NO 2		
$\langle 1 \rangle$	SHEET KEYNOTE	-	
	REVISION CLOUD (DELTA 1)	F	
AC 1-1	EQUIPMENT TAG MARK - AC MARK NO 1-1		
P #	DOMESTIC WATER RISER DESIGNATION		
S #	SANITARY WATER RISER DESIGNATION		
ST #	STORM WATER RISER DESIGNATION		
NG #	NATURAL GAS RISER DESIGNATION		
•	POINT OF CONNECTION	_	
$\widehat{}$	POINT OF DISCONNECTION		
PLUMBING LINES	NEW PIPING (SEE ABBREVIATION		
(E)	EXISTING TO REMAIN		
— — — (D) — — —	EXISTING TO BE	D	RAINS
	UNDERGROUND /		
	HOT WATER		
	COLD WATER		
	HOT WATER RETURN		
	VENT		
CONTROL DEVICES	PIPE HEAT TRACER		
VALVES	AIR VENT -		
	AUTOMATIC		
IOI	BALL VALVE		
	BALL VALVE -		
	BUTTERFLY VALVE		
\mathbb{N}	CHECK VALVE		
\square	DIAPHRAGM VALVE		
	DRAIN VALVE		
Å	FLOAT VALVE		
\boxtimes	FUSIBLE LINK		
\bowtie	GATE VALVE		
Ŕ	GATE VALVE - OS&Y		
	GLOBE VALVE		
++	MASTER GAS		
	PLUG VALVE		
	PLUG VALVE PLUG SAFETY		
	PLUG VALVE PLUG SAFETY PRESSURE REDUCING VALVE		
	PLUG VALVE PLUG SAFETY PRESSURE REDUCING VALVE PRESSURE RELIEF VALVE		
	PLUG VALVE PLUG SAFETY PRESSURE REDUCING VALVE PRESSURE RELIEF VALVE SEISMIC GAS CONTROL VALVE		
	PLUG VALVE PLUG SAFETY PRESSURE REDUCING VALVE PRESSURE RELIEF VALVE SEISMIC GAS CONTROL VALVE SOLENOID VALVE		
	PLUG VALVE PLUG SAFETY PRESSURE REDUCING VALVE PRESSURE RELIEF VALVE SEISMIC GAS CONTROL VALVE SOLENOID VALVE VALVE IN VERTICAL (DROP)		

SCELLANEOUS
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BACK FLOW PREVENTER	
HOSE BIBB	
METER	
TRAP PRIMER	
WALL HYDRANT	
WATER HAMMER ARRESTOR - SUFFIX INDICATES PDI SIZE	
VACUUM BREAKER	
CLEANOUT	
CLEANOUT TO GRADE	
ELBOW DOWN	
 ELBOW DOWN TO TEE	
ELBOW UP	
END CAP	
P-TRAP	
TEE DOWN	
TEE SIDE OUTLET DOWN	
TEE SIDE OUTLET UP	
TEE UP	
 UNION	
VENT THROUGH ROOF	
 AREA DRAIN	
 FLOOR DRAIN	
FLOOR SINK	
FLOOR SINK W/ HALF GRATE	
HUB DRAIN	
ROOF DRAIN	
ROOF DRAIN OVERFLOW	
ROOF RECEPTOR	

TRENCH DRAIN

VALVED AND

CAPPED OUTLET

			LEC
GEIN	IERAL	. INU I	IEO

1. INSTALLATION OF ALL PLUMBING MATERIALS AND EQUIPMENT SHALL BE IN ACCORDANCE WITH:

- 1.1. 2020 FLORIDA BUILDING CODE BUILDING, 7TH EDITION
- 1.2. 2020 FLORIDA BUILDING CODE PLUMBING, 7TH EDITION

1.3. 2020 FLORIDA BUILDING CODE - ENERGY CONSERVATION, 7TH EDITION
 1.4. NATIONAL ELECTRICAL CODE

- 1.5. AUTHORITY HAVING JURISDICTION REQUIREMENTS
- WHERE THE REQUIREMENTS BETWEEN THE DIFFERENT CRITERIA AND CODES ARE AT VARIANCE, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.

2. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS. EXACT LOCATION SHALL BE COORDINATED WITH ALL TRADES, THE STRUCTURAL DRAWINGS, ARCHITECTURAL DRAWINGS, AND/OR GENERAL CONTRACTOR AND CONSTRUCTION MANAGER.

3. LOCATION AND SIZES OF EXISTING PIPING ARE APPROXIMATE. VERIFY THE LOCATIONS AND SIZES OF EXISTING PIPING IN THE FIELD. IF ANY DISCREPANCIES OCCUR WITH THE CONTRACT DRAWINGS, NOTIFY THE ARCHITECT AND/OR THE ENGINEER PRIOR TO COMMENCEMENT OF NEW WORK.

4. ALL EXPOSED PIPING PENETRATIONS THROUGH WALLS OR CEILINGS SHALL BE PROVIDED WITH APPROPRIATE FIRE RETARDANT SEALANT AND ESCUTCHEONS. SEAL OPENINGS AROUND PLUMBING WORK AND PIPING THROUGH PARTITIONS, WALLS AND WITH APPROPRIATE FIRE RETARDANT SEALANT AND ESCUTCHEONS.

5. SUBMISSION OF A PROPOSAL SHALL BE EVIDENCE THAT A CAREFUL EXAMINATION OF THE SITE, DRAWINGS & SPECIFICATIONS HAVE BEEN MADE AND THE CONTRACTOR IS FAMILIAR WITH THOSE ITEMS AND AREAS THAT WILL PRESENT DIFFICULTY TO THE PERFORMANCE OF THIS CONTRACT. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT, ETC. NECESSARY TO COMPLETE ALL WORK AS A RESULT OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN.

> 5.1. CONTRACTOR TO VERIFY THE EXISTING CONDITIONS BEFORE CONSTRUCTION; CONFIRMING SIZES AND LOCATIONS OF ALL EXISTING PIPING PRIOR TO START OF WORK.

5.2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE BEFORE PROCEEDING WITH ANY WORK.

5.3. PRIOR TO STARTING DEMOLITION, DETERMINE LOCATIONS AND EXISTING CONDITIONS.

6. THIS CONTRACTOR SHALL PAY FEES, GIVE NOTICE, FILE NECESSARY DRAWINGS AND OBTAIN PERMITS AND CERTIFICATES OF APPROVAL REQUIRED IN CONNECTION WITH WORK UNDER THIS CONTRACT AND COMPLY WITH LOCAL LAWS AND ORDINANCES.

7. PROVIDE ALL REQUIRED LABOR, MATERIALS, EQUIPMENT, AND SERVICES NECESSARY FOR A COMPLETE AND SAFE INSTALLATION OF MECHANICAL IN FULL CONFORMITY WITH REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION; ALL AS INDICATED ON DRAWINGS AND/OR HEREIN SPECIFIED FOR THE SYSTEMS INCLUDED. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER. INCLUDE ALL COSTS FOR PERMITS, LICENSES, CERTIFICATES, FILING AND INSPECTIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION.

8. UNDER NO CIRCUMSTANCES WILL THIS CONTRACTOR, OR HIS WORKMEN, BE PERMITTED TO USE ANY PART OF THE BUILDING AS A SHOP EXCEPT PARTS AS DESIGNATED FOR SUCH USE.

9. ALL EXISTING WATER PIPING WITHIN FIVE (5) FT. OF NEW CONNECTIONS SHALL BE PROVIDED WITH NEW INSULATION.

10. REFER TO ARCHITECTURAL DRAWINGS FOR FINAL ADDITIONAL INFORMATION. ALL WORK MUST BE COORDINATED AROUND THE OPERATION OF THE FACILITY. STORE MATERIALS IN DESIGNATED SPACES.

11. UNNECESSARY NOISE SHALL BE AVOIDED AT ALL TIMES AND NECESSARY NOISE SHALL BE REDUCED TO A MINIMUM.

12. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE CONSTRUCTION DOCUMENTS AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.

13. REMOVAL OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP WORK PROPOSAL.

14. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT, AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF SYSTEM.

15. THE CONTRACTOR SHALL RESTORE ALL AREAS DISTURBED DURING CONSTRUCTION TO THEIR ORIGINAL STATE.

16. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.

17. CONTRACTOR SHALL PROVIDE ANY ADDITIONAL OFFSETS AND FITTINGS REQUIRED FOR PROPER INSTALLATION AND TO MAINTAIN CLEARANCES. VERIFY STRUCTURAL, MECHANICAL AND ELECTRICAL INSTALLATIONS AND OTHER POTENTIAL. OBSTRUCTIONS AND ROUTE PIPING TO AVOID INTERFERENCES.

18. PROVIDE ALL OFFSETS AND FITTINGS AND MAKE CONNECTION TO SITE UTILITIES.

19. CONCEAL PIPING ABOVE CEILINGS, WITHIN WALLS OR CHASES EXCEPT AS SPECIFICALLY NOTED.

20. PROVIDE ACCESS PANELS FOR ALL VALVES CONCEALED IN WALLS OR ABOVE NON-ACCESSIBLE CEILINGS.

21. FLASH AND COUNTER-FLASH ROOF PENETRATIONS.

22. SEE ARCHITECTURAL DRAWINGS FOR FIXTURE LOCATIONS AND MOUNTING HEIGHTS.

- 23. PROVIDE AUTOMATIC TRAP PRIMERS FOR ALL FLOOR DRAIN TRAP SEALS.
- 24. ALL EXPOSED PIPE AND FITTINGS IN FINISHED AREAS SHALL BE CHROME PLATED.
- 25. PROVIDE CLEANOUTS IN ACCORDANCE WITH ALL STATE AND LOCAL INSTALL CLEANOUTS WITH COVER FLUSH TO FINISH SURFACE.

26. COORDINATE PIPING WITH ALL ELECTRICAL EQUIPMENT (PANELS, TRANSFORMERS, ETC.) PRIOR TO ANY INSTALLATION. DO NOT ROUTE ANY PIPING OVER ANY ELECTRICAL PANELS UNDER ANY CIRCUMSTANCES. COORDINATE WATER HEATER INSTALLATION WITH ELECTRICAL PANELS.

- 27. WATER PIPING SHALL BE: CW: PVC, HW: CPVC PIPING.
- 28. PROVIDE SHOCK ARRESTOR PER DETAIL GUIDELINES.
- 29. ALL SOIL, WASTE AND VENT PIPING SHALL BE SCHEDULE 40 PVC DWV.
- 30. SANITARY PIPING BELOW GROUND FLOOR SLAB SHALL BE SCHEDULE 40 PVC DWV

31. SLOPE FLOOR NEAR DRAINS FOR PROPER DRAINAGE.

SOIL PIPE AND FITTINGS.

32. PROVIDE INDIVIDUAL FIXTURE SHUTOFF VALVES INSTALLED AT THE MANIFOLD. IDENTIFY AS TO THE FIXTURE BEING SUPPLIED.

33. ACCESS SHALL BE PROVIDED TO MANIFOLDS WITH INTEGRAL FACTORY- OR FIELD-INSTALLED VALVES.

SHEET INDEX

Sheet Number	Sheet Name	SCALE8
P-0.0.1	PLUMBING COVER PAGE	NONE
P-0.0.2	PLUMBING SPECIFICATIONS	NONE
P-0.0.3	PLUMBING SPECIFICATIONS	NONE
P-0.0.4	PLUMBING SPECIFICATIONS	NONE
P-1.0.1	PLUMBING PLANS	1/4"=1'-0"

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/SECTION 22 00 00: PLUMBING, GENERAL PURPOSE PART 1 GENERAL 1.1 SUBMITTALS PRODUCT DATA Α. Fixtures; List of installed fixtures with manufacturer, model, and flow rate. Flush Tank Water Closets Countertop Lavatories Wall Hung Lavatories Floor Sinks Floor Drains Trap Primers Trap Seals **Kitchen Sinks** Water Heaters Test Reports Tests, Flushing and Disinfection Test reports in booklet form showing all field tests performed to adjust each 2.3.3 Thermostatic Mixing Valves component and all field tests performed to prove compliance with the specified performance criteria, completion and testing of the installed system. Each test report shall indicate the final position of controls. 1.2 STANDARD PRODUCTS Specified materials and equipment shall be standard products of a manufacturer regularly engaged in the manufacture of such products. Specified equipment shall essentially duplicate equipment that has performed satisfactorily at least two years prior to bid opening. Standard products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year use shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been for sale on the commercial market through advertisements. manufacturers' catalogs, or brochures during the 2 year period. 1.2.1 Alternative Qualifications Products having less than a two-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturer's factory or laboratory tests, can be shown. DELIVERY, STORAGE, AND HANDLING 1.3 Handle, store, and protect equipment and materials to prevent damage before and during installation in accordance with the manufacturer's recommendations, and as approved by the Contracting Officer. Replace damaged or defective items. 1.4 REGULATORY REQUIREMENTS Unless otherwise required herein, plumbing work shall be in accordance with FPC. 1.5 PROJECT/SITE CONDITIONS The Contractor shall become familiar with details of the work, verify dimensions in the field, and advise the Construction Administrator of any discrepancy before performing any work. PART 2 PRODUCTS MATERIALS 2.1 Pipe schedules shall be selected based on service requirements. Pipe fittings shall be compatible with the applicable pipe materials. Plastic pipe, fittings, and solvent cement shall meet NSF/ANSI 14 and shall be NSF listed for the service intended. Plastic pipe, fittings, and solvent cement used for potable hot and cold water service shall bear the NSF seal "NSF-PW." Polypropylene pipe and fittings shall conform to dimensional requirements of Schedule 40, Iron Pipe size and shall comply with NSF/ANSI 14, NSF/ANSI 61 and ASTM F2389. Polypropylene piping that will be exposed to UV light shall be provided with a Factory applied UV resistant coating. Material or equipment containing a weighted average of greater than 0.25 percent lead shall not be used in any potable water system intended for human consumption, and shall be certified in accordance with NSF/ANSI 61, Annex G or NSF 372. In line devices such as water meters, building valves, check valves, meter stops, valves, fittings and back flow preventers shall comply with PL 93-523 and NSF/ANSI 61, Section 8. End point devices such as drinking water fountains, lavatory faucets, kitchen and bar faucets, residential ice makers, supply stops and end point control valves used to dispense water for drinking must meet the requirements of NSF/ANSI 61, Section 9. 2.1.1 Pipe Joint Materials Brazing Material: Brazing material shall conform to AWS A5.8/A5.8M, а. Brazing Flux: Flux shall be in paste or liquid form appropriate for use with brazing material. Flux shall be as follows: lead-free; have a 100 percent flushable residue; contain slightly acidic reagents; contain potassium borides; and contain fluorides. Solder Material: Solder metal shall conform to ASTM B32. Solder Flux: Flux shall be liquid form, non-corrosive, and conform to ASTM B813. Standard Test 1. PTFE Tape: PTFE Tape, for use with Threaded Metal or Plastic Pipe. Flexible Elastomeric Seals: ASTM D3139. ASTM D3212 or ASTM F477. Solvent Cement for Transition Joints between ABS and PVC Nonpressure Piping Components: ASTM D3138. Plastic Solvent Cement for ABS Plastic Pipe: ASTM D2235. Plastic Solvent Cement for PVC Plastic Pipe: ASTM D2564 and ASTM D2855 Plastic Solvent Cement for CPVC Plastic Pipe: ASTM F493. 2.1.2 Miscellaneous Materials Miscellaneous materials shall conform to the following: Water Hammer Arrester: PDI WH 201. Hose Clamps: SAE J1508. Plumbing Fixture Setting Compound: A preformed flexible ring seal molded 2.7 from hydrocarbon wax material. The seal material shall be nonvolatile nonasphaltic and contain germicide and provide watertight, gastight, odorproof and verminproof properties. 2.1.3 Pipe Insulation Material Insulation shall be as specified in Section 23 07 00 THERMAL INSULATION FOR MECHANICAL SYSTEMS. 2.2 PIPE HANGERS, INSERTS, AND SUPPORTS Pipe hangers, inserts, and supports shall conform to MSS SP-58. 2.3

VALVES Valves shall be provided on supplies to equipment and fixtures. Valves 2-1/2 inches and smaller shall be bronze with threaded bodies for pipe, solder-type connections for tubing or cpvc type compatible valves. Valves 3 inches and larger shall have flanged iron bodies and bronze trim, or flanged cpvc type compatible valves. Pressure ratings shall be based upon the application. Grooved end valves may be provided if the manufacturer certifies that the valves meet the performance requirements of applicable MSS standard. Valves shall conform to the following standards:

Description

Butterfly Valves	MSS SP-67
Cast-Iron Gate Valves, Flanged and Threaded Ends	MSS SP-70
Cast-Iron Swing Check Valves, Flanged and Threaded Ends	MSS SP-71
Ball Valves with Flanged Butt-Welding Ends for General Service Ball Valves Threaded, Socket-Welding, Solder Joint,	MSS SP-72
Grooved and Flared Ends	MSS SP-110
Cast-Iron Plug Valves, Flanged and Threaded Ends	MSS SP-78
Bronze Gate, Globe, Angle, and Check Valves	MSS SP-80
Steel Valves, Socket Welding and Threaded Ends	ASME B16.34
Cast-Iron Globe and Angle Valves, Flanged and Threaded Ends	MSS SP-85
Backwater Valves	ASME A112.14.1
Vacuum Relief Valves	ANSI Z21.22/CSA4.4
Description	Standard
Water Pressure Reducing Valves	ASSE 1003
Water Heater Drain Valves	ASME BPVC SEC IV,
	Part HLW-810:
	Requirements for
	Potable-Water
	Heaters Bottom Drain
	Valve
Trap Seal Primer Valves	ASSE 1018

ip Seal Primer valve Temperature and Pressure Relief Valves for Hot Water

Supply Systems Temperature and Pressure Relief Valves for Automatically Fired Hot Water Boilers

ASME CSD-1 Safety Code No.,Part CW, Article 5

ANSI Z21.22/CSA 4.4

Standard

2.3.1 Wall Faucets Wall faucets with vacuum-breaker backflow preventer shall be brass with 3/4 inch male inlet threads, hexagon shoulder, and 3/4 inch hose connection. Faucet handle shall be securely attached to stem.

2.3.2 Relief Valves

Water heaters and hot water storage tanks shall have a combination pressure and temperature (P&T) relief valve. The pressure relief element of a P&T relief valve shall have adequate capacity to prevent excessive pressure buildup in the system when the system is operating at the maximum rate of heat input. The temperature element of a P&T relief valve shall have a relieving capacity which is at least equal to the total input of the heaters when operating at their maximum capacity. Relief valves shall be rated according to ANSI Z21.22/CSA 4.4. Relief valves for systems where the maximum rate of heat input is less than (59 kW) 200,000 Btuh shall have 3/4 inch minimum inlets, and 3/4 inch outlets. Relief valves for systems where the maximum rate of heat input is greater than (59kW) 200,000 Btuh shall have 1 inch minimum inlets, and 1 inch outlets. The discharge pipe from the relief valve shall be the size of the valve outlet.

Provide thermostatic mixing valve for lavatory faucets, bath tub and shower fixtures and kitchen sinks. Mixing valves, thermostatic type, pressure-balanced or combination thermostatic and pressure-balanced shall be line size and shall be constructed with rough or finish bodies either with or without plating. Each valve shall be constructed to control the mixing of hot and cold water and to deliver water at a desired temperature regardless of pressure or input temperature changes. The control element shall be of an approved type. The body shall be of heavy cast bronze, and interior parts shall be brass, bronze, corrosion-resisting steel or copper. The valve shall be equipped with necessary stops, check valves, unions, and sediment strainers on the inlets. Mixing valves shall maintain water temperature within 5 degrees F of any setting.

2.4 FIXTURES

2.4.1 Flush Tank Water Closets

ASME A112.19.2/CSA B45.1, white vitreous china, siphon jet, round bowl, pressure assisted, floor-mounted, floor outlet. Top of toilet seat height above floor shall be 14 to 15 inches, except 17 to 19 inches for wheelchair water closets. Provide wax bowl ring including plastic sleeve. Water flushing volume of the water closet shall not exceed 1.28 gallons per flush. Provide white solid plastic round closed-front seat with cover.

2.4.2 Countertop Lavatories

ASME A112.19.2/CSA B45.1, white vitreous china, self-rimming, minimum dimensions of 483 mm 19 inches wide by 17 inches front to rear, with supply openings for use with top mounted centerset faucets. Furnish template and mounting kit by lavatory manufacturer. Provide aerator with faucet. Provide WaterSense labeled faucet with a maximum flow rate of 0.5 gpm at a flowing pressure of 60 psi. Water volume must be limited to 0.25 gal per metering cycle. Mount counter with the top surface 34 inches above floor and with 29 inches minimum clearance from bottom of the counter face to floor.

2.4.3 Kitchen Sinks

ASME A112.19.3/CSA B45.4, 20 gage stainless steel with integral mounting rim for flush installation, dimensions as specified by architectural drawings, minimum dimensions of 33 inches wide by 21 inches front to rear, two compartments, with undersides fully sound deadened, with supply openings for use with top mounted washerless sink faucets with hose spray, and with 3.5 inch drain outlet. Provide aerator with faucet. Water flow rate shall not exceed 2.2 gpm when measured at a flowing water pressure of 60 psi. Provide stainless steel drain outlets and stainless steel cup strainers. Provide separate 1.5 inch P-trap and drain piping to vertical vent piping from each compartment. Provide top mounted washerless sink faucets with hose spray. Provide UL 430 waste disposer in right compartment.

BACKFLOW PREVENTERS 2.5

Backflow prevention devices must be approved by the State or local regulatory agencies. If there is no State or local regulatory agency requirements, the backflow prevention devices must be listed by the Foundation for Cross-Connection Control & Hydraulic Research, or any other approved testing laboratory having equivalent capabilities for both laboratory and field evaluation of backflow prevention devices and assemblies Reduced pressure principle assemblies, double check valve assemblies, atmospheric (nonpressure) type vacuum breakers, and pressure type vacuum breakers shall be meet the above requirements. Backflow preventers with intermediate atmospheric vent shall conform to ASSE 1012. Reduced pressure principle backflow preventers shall conform to ASSE 1013. Hose connection vacuum breakers shall conform to ASSE 1011. Pipe applied atmospheric type vacuum breakers shall conform to ASSE 1001. Pressure vacuum breaker assembly shall conform to ASSE 1020. Air gaps in plumbing systems shall conform to ASME A112.1.2.

2.6 DRAINS

2.6.1 Floor and Shower Drains

Floor and shower drains shall consist of a galvanized body, integral seepage pan, and adjustable perforated or slotted chromium-plated bronze, nickel-bronze, or nickel-brass strainer, consisting of grate and threaded collar. Floor drains shall be cast iron except where metallic waterproofing membrane is installed. Drains shall be of double drainage pattern for embedding in the floor construction. The seepage pan shall have weep holes or channels for drainage to the drainpipe. The strainer shall be adjustable to floor thickness. A clamping device for attaching flashing or waterproofing membrane to the seepage pan without damaging the flashing or waterproofing membrane shall be provided when required. Drains shall be provided with threaded connection. Between the drain outlet and waste pipe, a neoprene rubber gasket conforming to ASTM C564 may be installed, provided that the drain is specifically designed for the rubber gasket compression type joint. Floor and shower drains shall conform to ASME A112.6.3.

TRAPS

Unless otherwise specified, traps shall be plastic per ASTM F409. Traps shall be without a cleanout. Tubes shall be copper alloy with walls not less than 0.032 inch thick within commercial tolerances, except on the outside of bends where the thickness may be reduced slightly in manufacture by usual commercial methods. Inlets shall have rubber washer and copper alloy nuts for slip joints above the discharge level. Swivel joints shall be below the discharge level and shall be of metal-to-metal or metal-to-plastic type as required for the application. Nuts shall have flats for wrench grip. Outlets shall have internal pipe thread, except that when required for the application, the outlets shall have sockets for solder-joint connections. The depth of the water seal shall be not less than 2 inches. The interior diameter shall be not more than 1/8 inch over or under the nominal size. and interior surfaces shall be reasonably smooth throughout.

WATER HEATERS 2.8

Water heater types and capacities shall be as indicated. Each water heater shall have replaceable anodes. Each primary water heater shall have controls with an adjustable range that includes 90 to 160 degrees F. A factory pre-charged expansion tank shall be installed on the cold water supply to each water heater. Expansion tanks shall be specifically designed for use on potable water systems and shall be rated for 200 degrees F water temperature and 150 psi working pressure. The expansion tank size and acceptance volume shall be as noted in drawings. Coordinate field installation.

2.8.1 Electric Type

Electric type water heaters shall conform to UL 174 with dual heating elements. The elements shall be wired so that only one element can operate at a time.

2.9 DOMESTIC WATER SERVICE METER Cold water meters 2 inches and smaller shall be positive displacement type conforming to AWWA C700. Cold water meters 64 mm 2-1/2 inches and larger shall be turbine type conforming to AWWA C701. Meter register may be round or straight reading type, as provided by the local utility. Meter shall be provided with a pulse generator, remote readout register and all necessary wiring and accessories. Meters must be connected to the base wide energy and utility monitoring and control system (if this system exists) using the installation's advanced metering protocols.

2.10 MISCELLANEOUS PIPING ITEMS

2.10.1 Escutcheon Plates Provide one piece or split hinge metal plates for piping entering floors, walls, and ceilings in exposed spaces. Provide chromium-plated on copper alloy plates or polished stainless steel finish in finished spaces. Provide paint finish on plates in unfinished spaces.

.10.2	Pipe Sleeves Provide where piping passes entirely through walls, ceilings, roofs, and floors.		shall be provided from the same manufacturer. Segmentally welded elbows shall not be used. Grooves shall be prepared in accordance with the coupling manufacturer's latest published standards. Grooving shall be performed by	3.1.4.3	Waterproofing
	Sleeves are not required where drain, waste, and vent (DWV) piping passes through concrete floor slabs located on grade, except where penetrating a membrane waterproof floor.		qualified grooving operators having demonstrated proper grooving procedures in accordance with the tool manufacturer's recommendations. The Contracting Officer shall be notified 24 hours in advance of test to demonstrate operator's capability, and the test shall be performed at the		Waterproofing at floor-mounted water closets shall be according a flashing guard from soft-tempered sheet copper. the sheet shall be perforated and turned down approximate inches to fit between the outside diameter of the drainpipe
.10.3	Sleeves in Masonry and Concrete Provide steel pipe sleeves or schedule 40 PVC plastic pipe sleeves. Sleeves are not required where drain, waste, and vent (DWV) piping passes through concrete floor slabs located on grade. Core drilling of masonry and concrete may be provided in lieu of pipe sleeves when cavities in the core-drilled hole are completely grouted smooth.	3.1.2.2	work site, if practical, or at a site agreed upon. The operator shall demonstrate the ability to properly adjust the grooving tool, groove the pipe, and to verify the groove dimensions in accordance with the coupling manufacturer's specifications. Unions and Flanges		diameter of the cast-iron or steel pipe sleeve. The turned-d of the flashing guard shall be embedded in sealant to a dep approximately 1-1/2 inches; then the sealant shall be finish flush to floor level between the flashing guard and drainpip flashing guard of sheet copper shall extend not less than 8 from the drainpipe and shall be lapped between the floor m
.10.4	Sleeves Not in Masonry and Concrete Provide 26 gage galvanized steel sheet or PVC plastic pipe sleeves.		Unions, flanges and mechanical couplings shall not be concealed in walls, ceilings, or partitions. Unions shall be used on pipe sizes 2-1/2 inches and smaller; flanges shall be used on pipe sizes 3 inches and larger.		solid coating of bituminous cement. If cast-iron water close flanges are used, the space between the pipe sleeve and c sealed with sealant and the flashing guard shall be upturne 1-1/2 inches to fit the outside diameter of the drainpipe and
.10.5	Pipe Hangers (Supports) Provide MSS SP-58 Type 1 with adjustable type steel support rods, except as specified or indicated otherwise. Attach to steel joists with Type 19 or 23 clamps and rateining strang. Attach to Steel W or S became with Type 21, 28, 20, or 20	3.1.2.3	 Copper Tube and Pipe a. Brazed. Brazed joints shall be made in conformance with AWS B2 2/B2 2M, ASME B16 50, and CDA A4015 with flux and are 	2444	inside diameter of the water closet floor flange. The upturne the sheet fitted into the floor flange shall be sealed.
	clamps. Attach to steel angles and vertical web steel channels with Type 20 clamp with beam clamp channel adapter. Attach to horizontal web steel channel and wood with drilled hole on centerline and double nut and washer. Attach to concrete with Type 18 insert or drilled expansion anchor. Provide Type 40 insulation protection shield for insulated piping.		acceptable for all pipe sizes. Copper to copper joints shall include the use of copper-phosphorus or copper-phosphorus-silver brazing metal without flux. Brazing of dissimilar metals (copper to bronze or brass) shall include the use of flux with either a copper-phosphorus, copper- phosphorus-silver or a silver brazing filler metal.	5.1.4.4	Instead of turning the flashing down into a dry vent pipe, or sealing the annular space between the pipe and flashing or metal-jacket-covered insulation and flashing, counterflashin accomplished by utilizing the following:
	PART 3 EXECUTION		 Soldered. Soldered joints shall be made with flux and are only acceptable for piping 2 inches and smaller. Soldered joints shall conform to ASME B31.5 and CDA A4015. Soldered joints shall not be used in compressed 		a. A standard roof coupling for threaded pipe up to 6 inches b. A tack-welded or banded-metal rain shield around the pi
.1	GENERAL INSTALLATION REQUIREMENTS Piping located in air plenums shall conform to NFPA 90A requirements. Piping located in shafts that constitute air ducts or that enclose air ducts shall be		 air piping between the air compressor and the receiver. c. Copper Tube Extracted Joint. Mechanically extracted joints shall be made in accordance with ICC IPC. 	3.1.4.5	Pipe Penetrations of Slab on Grade Floors
	noncombustible in accordance with NFPA 90A. Installation of plastic pipe where in compliance with NFPA may be installed in accordance with PPFA Fire Man. The plumbing system shall be installed complete with necessary fixtures, fittings, traps, valves, and accessories. Water and drainage piping shall be extended 5 feet outside the building, unless otherwise indicated. A ball valve and drain shall be installed on the water service line inside the building approximately 6 inches above the floor from point of entry. Piping shall be connected to the exterior service lines or capped or plugged if the exterior service is not in place. Sewer	3.1.2.4	 d. Press connection. Copper press connections shall be made in strict accordance with the manufacturer's installation instructions for manufactured rated size. The joints shall be pressed using the tool(s) approved by the manufacturer of that joint. Minimum distance between fittings shall be in accordance with the manufacturer's requirements. Plastic Pipe Acrylonitrile-Butadiene-Styrene (ABS) pipe shall have joints made with 		Where pipes, fixture drains, floor drains, cleanouts or simila penetrate slab on grade floors, except at penetrations of flo waterproofing membrane as specified in paragraphs FLAS REQUIREMENTS and WATERPROOFING, a groove 1/4 to 1/2 inch wide by shall be formed around the pipe, fitting or drain. The groove sealant as specified in Section 07 92 00 JOINT SEALANTS
	and water pipes shall be laid in separate trenches, except when otherwise shown. Exterior underground utilities shall be at least 12 inches below the finish grade or as indicated on civil drawings. If trenches are closed or the pipes are otherwise covered before being connected to the service lines, the location of the end of		solvent cement. PVC and CPVC pipe shall have joints made with solvent cement elastomeric, threading, (threading of Schedule 80 Pipe is allowed only where required for disconnection and inspection; threading of Schedule 40 Pipe is not allowed), or mated flanged.	3.1.4.6	Pipe Penetrations Provide sealants for all pipe penetrations. All pipe penetrati be sealed to prevent infiltration of air, insects, and vermin.
	each plumbing utility shall be marked with a stake or other acceptable means. Valves shall be installed with control no lower than the valve body.	3.1.2.5	Polypropylene Pipe	3.1.5	Fire Seal
.1.1 .1.1.1	Water Pipe, Fittings, and Connections Utilities		welding socket-type or butt-fusion type fittings and shall comply with ASTM F2389.		Where pipes pass through fire walls, fire-partitions, fire-rate chase walls or floors above grade, a fire seal shall be provision specified in Section 07 84 00 FIRESTOPPING.
	The piping shall be extended to fixtures, outlets, and equipment. The hot-water and cold-water piping system shall be arranged and installed to permit draining. The supply line to each item of equipment or fixture, except faucets, flush valves, or other control valves which are supplied with integral stops, shall be equipped with a shutoff valve to enable isolation of the item for repair and maintenance without interfering with operation of other equipment or fixtures. Supply piping to fixtures, faucets, hydrants, shower heads, and flushing devices shall be anchored to prevent movement.	3.1.3	Dissimilar Pipe Materials Connections between ferrous and non-ferrous copper water pipe shall be made with dielectric unions or flange waterways. Dielectric waterways shall have temperature and pressure rating equal to or greater than that specified for the connecting piping. Waterways shall have metal connections on both ends suited to match connecting piping. Dielectric waterways shall be internally lined with an insulator specifically designed to prevent current flow between dissimilar metals. Dielectric	3.1.6 3.1.6.1	Supports General Hangers used to support piping 2 inches and larger shall be adequate adjustment after erection while still supporting the anchors shall be installed to keep pipes in accurate alignment
.1.1.2	Cutting and Repairing The work shall be carefully laid out in advance, and unnecessary cutting of construction shall be avoided. Damage to building, piping, wiring, or equipment as		flanges shall meet the performance requirements described herein for dielectric waterways. Connecting joints between plastic and metallic pipe shall be made with transition fitting for the specific purpose.		expansion movement, and to prevent buckling, swaying, and undue strain. Piping subjec movement when operating temperatures exceed ambient t supported by variable spring hangers and supports or by c
.1.1.3	a result of cutting shall be repaired by mechanics skilled in the trade involved. Protection of Fixtures, Materials, and Equipment Pipe openings shall be closed with caps or plugs during installation. Fixtures and	3.1.4	Pipe Sleeves and Flashing Pipe sleeves shall be furnished and set in their proper and permanent location.		hangers. In the support of multiple pipe runs on a common clip or clamp shall be used where each pipe crosses the ba member. Spacing of the base support members shall not e and support spacing required for an individual pipe in the m
	equipment shall be tightly covered and protected against dirt, water, chemicals, and mechanical injury. Upon completion of the work, the fixtures, materials, and	3.1.4.1	Sleeve Requirements		run. Threaded sections of rods shall not be formed or bent.
114	equipment shall be thoroughly cleaned, adjusted, and operated. Safety guards shall be provided for exposed rotating equipment.		Unless indicated otherwise, provide pipe sleeves meeting the following requirements: Secure sleeves in position and location during construction. Provide sleeves of sufficient length to pass through entire thickness of walks, ceilings, roofs, and	3.1.6.2	Pipe Hangers, Inserts, and Supports Installation of pipe hangers, inserts and supports shall conf MSS SP-58 except as modified herein
	Piping shall be installed as indicated. Pipe shall be accurately cut and worked into place without springing or forcing. Structural portions of the building shall not be weakened. Aboveground piping shall run parallel with the lines of the building, unless otherwise indicated. Branch pipes from service lines may be taken from top, bottom, or side of main, using crossover fittings required by structural or installation conditions. Supply pipes, valves, and fittings shall be kept a sufficient distance from other work and other services to permit not less than 1/2 inch between finished covering on the different services. Bare and insulated water lines shall not bear directly against building structural elements so as to transmit sound to the structure or to prevent flexible movement of the lines. Water pipe shall not be buried in or under floors unless specifically indicated or approved. Changes in pipe sizes shall be made with reducing fittings. Use of bushings will not be permitted except for use in situations in which standard factory fabricated components are furnished to accommodate specific accepted installation practice. Change in direction shall be made with fittings, except that bending of pipe 4 inches and smaller will be permitted, provided a pipe bender is used and wide sweep bends are formed. The center-line radius of bends shall be not less		floors. A modular mechanical type sealing assembly may be installed in lieu of a waterproofing clamping flange and caulking and sealing of annular space between pipe and sleeve. The seals shall consist of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and sleeve using galvanized steel bolts, nuts, and pressure plates. The links shall be loosely assembled with bolts to form a continuous rubber belt around the pipe with a pressure plate under each bolt head and each nut. After the seal assembly is properly positioned in the sleeve, tightening of the bolt shall cause the rubber sealing elements to expand and provide a watertight seal between the pipe and the sleeve. Each seal assembly shall be sized as recommended by the manufacturer to fit the pipe and sleeve involved. Sleeves shall not be installed in structural members, except where indicated or approved. Rectangular and square openings shall be as detailed. Each sleeve shall extend through its respective floor, or roof,		 a. Types 5, 12, and 26 shall not be used. b. Type 3 shall not be used on insulated pipe. c. Type 18 inserts shall be secured to concrete forms placed. Continuous inserts which allow more adjust they otherwise meet the requirements for type 18 in they otherwise meet the requirements for type 18 in they otherwise and retaining devices furnished Field-fabricated C-clamp bodies or retaining device field-fabricated C-clamp bodies or retaining device field-fabricated C-clamp bodies or retaining device field-fabricated C-clamp bodies or adapter f. Type 20 attachments used on angles and channel with an added malleable-iron heel plate or adapter f. Type 24 may be used only on trapeze hanger syst frames. g. Type 39 saddles shall be used on insulated pipe 4 when the temperature of the medium is 60 degree saddles shall be welded to the pipe. h. Type 40 shields shall:
.1.1.5	 than six diameters of the pipe. Bent pipe showing kinks, wrinkles, flattening, or other malformations will not be acceptable. Expansion and Contraction of Piping Allowance shall be made throughout for expansion and contraction of water pipe. 		and shall be cut flush with each surface, except for special circumstances. Pipe sleeves passing through floors in wet areas such as mechanical equipment rooms, lavatories, kitchens, and other plumbing fixture areas shall extend a minimum of 4 inches above the finished floor.		 (1) Be used on insulated pipe less than 4 inches. (2) Be used on insulated pipe 4 inches and larger temperature of the medium is 60 degrees F or less (3) Have a high density insert for all pipe sizes. High inserts shall have a density of 8 pcf or greater.
	Each hot-water and hot-water circulation riser shall have expansion loops or other provisions such as offsets and changes in direction where indicated and required. Risers shall be securely anchored as required or where indicated to force expansion to loops. Branch connections from risers shall be made with ample swing or offset to avoid undue strain on fittings or short pipe lengths. Horizontal runs of pipe over 50 feet in length shall be anchored to the wall or the supporting construction about midway on the run to force expansion, evenly divided, toward the ends. Sufficient flexibility shall be provided on branch runouts from mains and risers to provide for expansion and contraction of piping. Flexibility shall be provided by installing one or more turns in the line so that piping will spring		Unless otherwise indicated, sleeves shall be of a size to provide a minimum of 1/4 inch clearance between bare pipe or insulation and inside of sleeve or between insulation and inside of sleeve. Sleeves in bearing walls and concrete slab on grade floors shall be steel pipe or cast-iron pipe. Sleeves in nonbearing walls or ceilings may be steel pipe, cast-iron pipe, galvanized sheet metal with lock-type longitudinal seam, or plastic.		i. Horizontal pipe supports shall be spaced as specified a support shall be installed not over 1 foot from the pipe fitt change in direction of the piping. Pipe supports shall be space apart at valves. Operating temperatures in determining har or CPVC pipe shall be 120 degrees F for PVC and 180 degrees Horizontal pipe runs shall include allowances for expansion
4 4 0	enough to allow for expansion without straining. If mechanical grooved pipe coupling systems are provided, the deviation from design requirements for expansion and contraction may be allowed pending approval of Construction Administrator.		or between jacket over insulation and sleeve, shall be sealed as indicated with sealants conforming to ASTM C920 and with a primer, backstop material and surface preparation as specified in Section 07 92 00 JOINT SEALANTS. The annular space between pipe and sleeve, between bare insulation and sleeve or between jacket over insulation and sleeve shall not be sealed for interior wells which are not designed to the		
1.0	Plugs, caps, tees, valves and bends deflecting 11.25 degrees or more, either vertically or horizontally, in waterlines 4 inches in diameter or larger shall be provided with thrust blocks, where indicated, to prevent movement. Thrust blocking shall be concrete of a mix not leaner than: 1 cement, 2-1/2 sand, 5 gravel; and having a compressive strength of not less than 2000 psi after 28 days. Blocking shall be placed between solid ground and the fitting to be anchored. Unless otherwise indicated or directed, the base and thrust bearing sides of the thrust block shall be poured against undisturbed earth. The side of		Sleeves through below-grade walls in contact with earth shall be recessed 12 mm 1/2 inch from wall surfaces on both sides. Annular space between pipe and sleeve shall be filled with backing material and sealants in the joint between the pipe and concrete or masonry wall as specified above. Sealant selected for the earth side of the wall shall be compatible with dampproofing/waterproofing materials that are to be applied over the joint sealant. Pipe sleeves in fire-rated walls shall conform to the requirements in Section 07 84 00 FIRESTOPPING		

3.1.4.2 Flashing Requirements

Pipes passing through roof shall be installed through a 16 ounce copper flashing, each within an integral skirt or flange. Flashing shall be suitably formed, and the skirt or flange shall extend not less than 8 inches from the pipe and shall be set over the roof or floor membrane in a solid coating of bituminous cement. The flashing shall extend up the pipe a minimum of 10 inches. For cleanouts, the flashing shall be turned down into the hub and caulked after placing the ferrule. Pipes passing through pitched roofs shall be flashed, using lead or copper flashing, with an adjustable integral flange of adequate size to extend not less than 8 inches from the pipe in all directions and lapped into the roofing to provide a watertight seal. The annular space between the flashing and the bare pipe or between the flashing and the metal-jacket-covered insulation shall be sealed as indicated. Flashing for dry vents shall be turned down into the pipe to form a waterproof joint. Pipes, up to and including 10 inches in diameter, passing through roof or floor waterproofing membrane may be installed through a cast-iron sleeve with caulking recess, anchor lugs, flashing-clamp device, and pressure ring with brass bolts. Flashing shield shall be fitted into the sleeve clamping device. Pipes passing through wall waterproofing membrane shall be sleeved as described above.

A waterproofing clamping flange shall be installed.

coating with bituminous paint, shall be used to anchor vertical down bends into

bearing will be as shown. Blocking shall be placed so that the joints of the fitting are accessible for repair. Steel rods and clamps, protected by galvanizing or by

gravity thrust blocks. 3.1.2 Joints Installation of pipe and fittings shall be made in accordance with the manufacturer's recommendations. Mitering of joints for elbows and notching of

the thrust block not subject to thrust shall be poured against forms. The area of

straight runs of pipe for tees will not be permitted. Joints shall be made up with fittings of compatible material and made for the specific purpose intended. 3.1.2.1 Mechanical Couplings

> Mechanical couplings may be used in conjunction with grooved pipe for aboveground, ferrous or non-ferrous, domestic hot and cold water systems, in lieu of unions, brazed, soldered, welded, flanged, or threaded joints. Mechanical couplings are permitted in accessible locations including behind access plates. Flexible grooved joints will not be permitted, except as vibration isolators adjacent to mechanical equipment. Rigid grooved joints shall incorporate an angle bolt pad design which maintains metal-to-metal contact with equal amount of pad offset of housings upon installation to ensure positive rigid clamping of the pipe. Designs which can only clamp on the bottom of the groove or which utilize gripping teeth or jaws, or which use misaligned housing bolt holes, or which require a torque wrench or torque specifications will not be permitted. Grooved fittings and couplings, and grooving

at floor-mounted water closets shall be accomplished by ning guard from soft-tempered sheet copper. The center of be perforated and turned down approximately 1-1/2 tween the outside diameter of the drainpipe and the inside e cast-iron or steel pipe sleeve. The turned-down portion guard shall be embedded in sealant to a depth of 1-1/2 inches; then the sealant shall be finished off vel between the flashing guard and drainpipe. The of sheet copper shall extend not less than 8 inches pipe and shall be lapped between the floor membrane in a bituminous cement. If cast-iron water closet floor ed, the space between the pipe sleeve and drainpipe shall be alant and the flashing guard shall be upturned approximately o fit the outside diameter of the drainpipe and the r of the water closet floor flange. The upturned portion of I into the floor flange shall be sealed.

ing the flashing down into a dry vent pipe, or caulking and nular space between the pipe and flashing or overed insulation and flashing, counterflashing may be by utilizing the following:

roof coupling for threaded pipe up to 6 inches in diameter. ed or banded-metal rain shield around the pipe.

fixture drains, floor drains, cleanouts or similar items on grade floors, except at penetrations of floors with membrane as specified in paragraphs FLASHING

ROOFING, a groove 1/4 to 1/2 inch wide by 1/4 to 3/8 inch deep d around the pipe, fitting or drain. The groove shall be filled with a cified in Section 07 92 00 JOINT SEALANTS.

nts for all pipe penetrations. All pipe penetrations shall revent infiltration of air, insects, and vermin.

ass through fire walls, fire-partitions, fire-rated pipe floors above grade, a fire seal shall be provided as ection 07 84 00 FIRESTOPPING.

to support piping 2 inches and larger shall be fabricated to permit stment after erection while still supporting the load. Pipe guides and be installed to keep pipes in accurate alignment, to direct the vement, and to

ng, swaying, and undue strain. Piping subjected to vertical en operating temperatures exceed ambient temperatures shall be ariable spring hangers and supports or by constant support e support of multiple pipe runs on a common base member, a hall be used where each pipe crosses the base support ing of the base support members shall not exceed the hanger bacing required for an individual pipe in the multiple pipe

pipe hangers, inserts and supports shall conform to

18 inserts shall be secured to concrete forms before concrete is . Continuous inserts which allow more adjustment may be used if nerwise meet the requirements for type 18 inserts 19 and 23 C-clamps shall be torqued per MSS SP-58 and shall both locknuts and retaining devices furnished by the manufacturer. fabricated C-clamp bodies or retaining devices are not acceptable. 20 attachments used on angles and channels shall be furnished n added malleable-iron heel plate or adapter. 24 may be used only on trapeze hanger systems or on fabricated

39 saddles shall be used on insulated pipe 4 inches and larger the temperature of the medium is 60 degrees F or higher. Type 39 es shall be welded to the pipe.

used on insulated pipe less than 4 inches.

e used on insulated pipe 4 inches and larger when the erature of the medium is 60 degrees F or less.

ave a high density insert for all pipe sizes. High density

s shall have a density of 8 pcf or greater ontal pipe supports shall be spaced as specified in MSS SP-58 and be installed not over 1 foot from the pipe fitting joint at each ction of the piping. Pipe supports shall be spaced not over 5 feet . Operating temperatures in determining hanger spacing for PVC shall be 120 degrees F for PVC and 180 degrees F for CPVC. e runs shall include allowances for expansion and contraction.

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BID SET

Vertical pipe shall be supported at each floor, except at slab-on-grade, at intervals of not more than 15 feet nor more than 8 feet from end of risers, and at vent terminations. Vertical pipe risers shall include allowances for expansion and contraction.

k. Type 35 guides using steel, reinforced polytetrafluoroethylene (PTFE)or graphite slides shall be provided to allow longitudinal pipe movement. Slide materials shall be suitable for the system operating temperatures, atmospheric conditions, and bearing loads encountered. Lateral restraints shall be provided as needed. Where steel slides do not require provisions for lateral restraint the following may be used:

> (1) On pipe 4 inches and larger when the temperature of the medium is 60 degrees F or higher, a Type 39 saddle, welded to the pipe, may freely rest on a steel plate.

(2) On pipe less than 4 inches a Type 40 shield, attached to the pipe or insulation, may freely rest on a steel plate.

(3) On pipe 4 inches and larger carrying medium less that 60 degrees F a Type 40 shield, attached to the pipe or insulation, may freely rest on a steel plate.

Pipe hangers on horizontal insulated pipe shall be the size of the outside diameter of the insulation. The insulation shall be continuous through the hanger on all pipe sizes and applications. Where there are high system temperatures and welding to piping is not

desirable, the type 35 guide shall include a pipe cradle, welded to the guide structure and strapped securely to the pipe. The pipe shall be separated from the slide material by at least 4 inches or by an amount adequate for the insulation, whichever is greater.

Hangers and supports for plastic pipe shall not compress, distort, cut or abrade the piping, and shall allow free movement of pipe except where otherwise required in the control of expansion/contraction.

3.1.6.3 Structural Attachments

Attachment to building structure concrete and masonry shall be by cast-in concrete inserts, built-in anchors, or masonry anchor devices. Inserts and anchors shall be applied with a safety factor not less than 5. Supports shall not be attached to metal decking. Supports shall not be attached to the underside of concrete filled floor or concrete roof decks unless approved by the Contracting Officer. Masonry anchors for overhead applications shall be constructed of ferrous materials only.

3.1.7 Pipe Cleanouts

Pipe cleanouts shall be the same size as the pipe except that cleanout plugs larger than 4 inches will not be required. A cleanout installed in connection with cast-iron soil pipe shall consist of a long-sweep 1/4 bend or one or two 1/8 bends extended to the place shown. An extra-heavy cast-brass or cast-iron ferrule with countersunk cast-brass head screw plug shall be caulked into the hub of the fitting and shall be flush with the floor. Cleanouts in connection with other pipe, where indicated, shall be T-pattern, 90-degree branch drainage fittings with castbrass screw plugs, except plastic plugs shall be installed in plastic pipe. Plugs shall be the same size as the pipe up to and including 4 inches. Cleanout tee branches with screw plug shall be installed at the foot of soil and waste stacks, at the foot of interior downspouts, on each connection to building storm drain where interior downspouts are indicated, and on each building drain outside the building. Cleanout tee branches may be omitted on stacks in single story buildings with slab-on-grade construction or where less than 18 inches of crawl space is provided under the floor. Cleanouts on pipe concealed in partitions shall be provided with chromium plated bronze, nickel bronze, nickel brass or stainless steel flush type access cover plates. Round access covers shall be provided and secured to plugs with securing screw. Square access covers may be provided with matching frames, anchoring lugs and cover screws. Cleanouts in finished walls shall have access covers and frames installed flush with the finished wall. Cleanouts installed in finished floors subject to foot traffic shall be provided with a chrome-plated cast brass, nickel brass, or nickel bronze cover secured to the plug or cover frame and set flush with the finished floor. Heads of fastening screws shall not project above the cover surface. Where cleanouts are provided with adjustable heads, the heads shall be plastic.

- 3.2 WATER HEATERS AND HOT WATER STORAGE TANKS
- 3.2.1 Relief Valves

No valves shall be installed between a relief valve and its water heater or storage tank. The P&T relief valve shall be installed where the valve actuator comes in contact with the hottest water in the heater. Whenever possible, the relief valve shall be installed directly in a tapping in the tank or heater; otherwise, the P&T valve snall de installed in the not-water outlet piping. A vacuum reliet valve snal be provided on the cold water supply line to the hot-water storage tank or water heater and mounted above and within 6 inches above the top of the tank or water

3.2.2 Connections to Water Heaters

Connections of metallic pipe to water heaters shall be made with dielectric unions or flanges.

3.2.3 Expansion Tank

A pre-charged expansion tank shall be installed on the cold water supply between the water heater inlet and the cold water supply shut-off valve. The Contractor shall adjust the expansion tank air pressure, as recommended by the tank manufacturer, to match incoming water pressure.

3.3 FIXTURES AND FIXTURE TRIMMINGS

Polished chromium-plated pipe, valves, and fittings shall be provided where exposed to view. Angle stops, straight stops, stops integral with the faucets, or concealed type of lock-shield, and loose-key pattern stops for supplies with threaded, sweat or solvent weld inlets shall be furnished and installed with fixtures. Where connections between copper tubing and faucets are made by rubber compression fittings, a beading tool shall be used to mechanically deform the tubing above the compression fitting. Exposed traps and supply pipes for fixtures and equipment shall be connected to the rough piping systems at the wall, unless otherwise specified under the item. Floor and wall escutcheons shall be as specified. Drain lines and hot water lines of fixtures for handicapped personnel shall be insulated and do not require polished chrome finish. Plumbing fixtures and accessories shall be installed within the space shown.

3.3.1 Fixture Connections

Where space limitations prohibit standard fittings in conjunction with the cast-iron floor flange, special short-radius fittings shall be provided. Connections between earthenware fixtures and flanges on soil pipe shall be made gastight and watertight with a closet-setting compound or neoprene gasket and seal. Use of natural rubber gaskets or putty will not be permitted. Fixtures with outlet flanges shall be set the proper distance from floor or wall to make a first-class joint with the closet-setting compound or gasket and fixture used.

3.3.2 Fixture Supports

Fixture supports for off-the-floor lavatories, urinals, water closets, and other fixtures of similar size, design, and use, shall be of the chair-carrier type. The carrier shall provide the necessary means of mounting the fixture, with a foot or feet to anchor the assembly to the floor slab. Adjustability shall be provided to locate the fixture at the desired height and in proper relation to the wall. Support plates, in lieu of chair carrier, shall be fastened to the wall structure only where it is not possible to anchor a floor-mounted chair carrier to the floor slab.

3.3.3.1 Support for Solid Masonry Construction

Chair carrier shall be anchored to the floor slab. Where a floor-anchored chair carrier cannot be used, a suitable wall plate shall be imbedded in the masonry

3.3.3.2 Support for Concrete-Masonry Wall Construction

Chair carrier shall be anchored to floor slab. Where a floor-anchored chair carrier cannot be used, a suitable wall plate shall be fastened to the concrete wall using through bolts and a back-up plate.

3.3.3.3 Support for Steel Stud Frame Partitions

Chair carrier shall be used. The anchor feet and tubular uprights shall be of the heavy duty design; and feet (bases) shall be steel and welded to a square or rectangular steel tube upright. Wall plates, in lieu of floor-anchored chair carriers, shall be used only if adjoining steel partition studs are suitably reinforced to support a wall plate bolted to these studs.

3.3.3.4 Support for Wood Stud Construction

Where floor is a concrete slab, a floor-anchored chair carrier shall be used. Where entire construction is wood, wood crosspieces shall be installed. Fixture hanger plates, supports, brackets, or mounting lugs shall be fastened with not less than No. 10 wood screws, 1/4 inch thick minimum steel hanger, or toggle bolts with nut. The wood crosspieces shall extend the full width of the fixture and shall be securely supported.

3.3.3.5 Wall-Mounted Water Closet Gaskets

Where wall-mounted water closets are provided, reinforced wax, treated felt, or neoprene gaskets shall be provided. The type of gasket furnished shall be as recommended by the chair-carrier manufacturer.

3.3.4 Backflow Prevention Devices

Plumbing fixtures, equipment, and pipe connections shall not cross connect or interconnect between a potable water supply and any source of nonpotable water .Backflow preventers shall be installed where indicated and in accordance with ICC FPC at all other locations necessary to preclude a cross-connect or interconnect between a potable water supply and any nonpotable substance. In addition backflow preventers shall be installed at all locations where the potable water outlet is below the flood level of the equipment, or where the potable water outlet will be located below the level of the nonpotable substance. Backflow preventers shall be located so that no part of the device will be submerged. Backflow preventers shall be of sufficient size to allow unrestricted flow of water to the equipment, and preclude the backflow of any nonpotable substance into the potable water system. Bypass piping shall not be provided around backflow preventers. Access shall be provided for maintenance and testing. Each device shall be a standard commercial unit.

3.3.5 Traps

Each trap shall be placed as near the fixture as possible, and no fixture shall be double-trapped. Traps installed on cast-iron soil pipe shall be cast iron. Traps installed on steel pipe or copper tubing shall be recess-drainage pattern, or brasstube type. Traps installed on plastic pipe may be plastic conforming to ASTM D3311

WATER METER REMOTE READOUT REGISTER

The remote readout register shall be mounted at the location indicated or as directed by the Contract Administrator.

ESCUTCHEONS

Escutcheons shall be provided at finished surfaces where bare or insulated piping, exposed to view, passes through floors, walls, or ceilings, except in boiler, utility, or equipment rooms. Escutcheons shall be fastened securely to pipe or pipe covering and shall be satin-finish, corrosion-resisting steel, polished chromium-plated zinc alloy, or polished chromium-plated copper alloy. Escutcheons shall be either

- one-piece or split-pattern, held in place by internal spring tension or setscrew.
- 3.5.1 Painting of New Equipment

New equipment painting shall be factory applied or shop applied, and shall be as specified herein, and provided under each individual section.

3.5.1.1 Factory Painting Systems

Manufacturer's standard factory painting systems may be provided subject to certification that the factory painting system applied will withstand 125 hours in a salt-spray fog test, except that equipment located outdoors shall withstand 500 hours in a salt-spray fog test. Salt-spray fog test shall be in accordance with ASTM B117, and for that test the acceptance criteria shall be as follows: immediately after completion of the test, the paint shall show no signs of blistering, wrinkling, or cracking, and no loss of adhesion; and the specimen shall show no signs of rust creepage beyond 0.125 inch on either side of the scratch

The film thickness of the factory painting system applied on the equipment shall not de less than the film thickness used on the test specimen. If manufacturer's standard factory painting system is being proposed for use on surfaces subject to temperatures above 120 degrees F, the factory painting system shall be designed for the temperature service.

3.5.1.2 Shop Painting Systems for Metal Surfaces

Clean, pretreat, prime and paint metal surfaces; except aluminum surfaces need not be painted. Apply coatings to clean dry surfaces. Clean the surfaces to remove dust, dirt, rust, oil and grease by wire brushing and solvent degreasing prior to application of paint, except metal surfaces subject to temperatures in excess of 120 degrees F shall be cleaned to bare metal.

Where more than one coat of paint is specified, apply the second coat after the preceding coat is thoroughly dry. Lightly sand damaged painting and retouch before applying the succeeding coat. Color of finish coat shall be aluminum or light gray.

a. Temperatures Less Than 120 Degrees F: Immediately after cleaning, the metal surfaces subject to temperatures less than 120 degrees F shall receive one coat of pretreatment primer applied to a minimum dry film thickness of 0.3 mil, one coat of primer applied to a minimum dry film thickness of one mil; and two coats of enamel applied to a minimum dry film thickness of one mil per coat.

- TESTS, FLUSHING AND DISINFECTION 3.6
- 3.6.1 Plumbing System

The following tests shall be performed on the plumbing system in accordance with ICC FPC, except that the drainage and vent system final test shall include the smoke test. The Contractor has the option to perform a peppermint test in lieu of the smoke test. If a peppermint test is chosen, the Contractor must submit a testing procedure and reasons for choosing this option in lieu of the smoke test to the Construction Administrator for approval. Drainage and Vent Systems Test. The final test shall include a smoke a. test.

Building Sewers Tests. b Water Supply Systems Tests.

3.6.2 Defective Work

If inspection or test shows defects, such defective work or material shall be replaced or repaired as necessary and inspection and tests shall be repeated. Repairs to piping shall be made with new materials. Caulking of screwed joints or holes will not be acceptable

- 3.6.3 System Flushing
- 3.6.3.1 During Flushing

Before operational tests or disinfection, potable water piping system shall be flushed with hot potable water. Sufficient water shall be used to produce a water velocity that is capable of entraining and removing debris in all portions of the piping system. This requires simultaneous operation of all fixtures on a common branch or main in order to produce a flushing velocity of approximately 4 fps through all portions of the piping system. In the event that this is impossible due to size of system, the Construction Administrator (or the designated representative) shall specify the number of fixtures to be operated during flushing. Contractor shall provide adequate personnel to monitor the flushing operation and to ensure that drain lines are unobstructed in order to prevent flooding of the facility. Contractor shall be responsible for any flood damage resulting from flushing of the system. Flushing shall be continued until entrained dirt and other foreign materials have been removed and until discharge water shows no discoloration. All faucets and drinking water fountains, to include any device considered as an end point device by NSF/ANSI 61, Section 9, shall be flushed a minimum of 0.25 gallons per 24 hour period, ten times over a 14 day period.

3.6.3.2 After Flushing

System shall be drained at low points. Strainer screens shall be removed, cleaned, and replaced. After flushing and cleaning, systems shall be prepared for testing by immediately

filling water piping with clean, fresh potable water. Any stoppage, discoloration, or 2.2 MATERIALS other damage to the finish, furnishings, or parts of the building due to the Contractor's failure to properly clean the piping system shall be repaired by the Contractor. When the system flushing is complete, the hot-water system shall be adjusted for uniform circulation. Flushing devices and automatic control systems shall be adjusted for proper operation according to manufacturer's instructions. Flow rates on fixtures must not exceed those stated in PART 2 of this Section. Unless more stringent local requirements exist, lead levels shall not exceed limits established by 40 CFR 141.80 (c)(1). The water supply to the building shall be tested separately to ensure that any lead contamination found during potable water system testing is due to work being performed inside the building.

3.6.4 Operational Test

Upon completion of flushing and prior to disinfection procedures, the Contractor shall subject the plumbing system to operating tests to demonstrate satisfactory installation, connections, adjustments, and functional and operational efficiency. Such operating tests shall cover a period of not less than 8 hours for each system and shall include the following information in a report with conclusion

a. Time, date, and duration of test.

as to the adequacy of the system:

- Water pressures at the most remote and the highest fixtures.
- Operation of each fixture and fixture trim. C.
- Operation of each valve, hydrant, and faucet.
- e. Temperature of each domestic hot-water supply.
- Operation of each floor drain by flooding with water
- Operation of each vacuum breaker and backflow preventer.

3.6.5 Disinfection

After all system components are provided and operational tests are complete, the entire domestic hot- and cold-water distribution system shall be disinfected. Before introducing disinfecting chlorination material, entire system shall be flushed with potable water until any entrained dirt and other foreign materials have been removed.

Water chlorination procedure shall be in accordance with AWWA C651 and AWWA C652 as modified and supplemented by this specification. The chlorinating material shall be hypochlorites or liquid chlorine. The chlorinating material shall be fed into the water piping system at a constant rate at a concentration of at least 50 parts per million (ppm). Feed a properly adjusted hypochlorite solution injected into the system with a hypochlorinator, or inject liquid chlorine into the system through a solution-feed chlorinator and booster pump until the entire system is completely filled.

Test the chlorine residual level in the water at 6 hour intervals for a continuous period of 24 hours. If at the end of a 6 hour interval, the chlorine residual has dropped to less than 25 ppm, flush the piping including tanks with potable water, and repeat the above chlorination procedures. During the chlorination period, each valve and faucet shall be opened and closed several times.

After the second 24 hour period, verify that no less than 25 ppm chlorine residual remains in the treated system. The 24 hour chlorination procedure must be repeated until no less than 25 ppm chlorine residual remains in the treated system

Upon the specified verification, the system including tanks shall then be flushed with potable water until the residual chlorine level is reduced to less than one part per million. During the flushing period, each valve and faucet shall be opened and closed several times.

Take additional samples of water in disinfected containers, for bacterial examination, at locations specified by the Construction Administrator. Test these samples for total coliform organisms (coliform bacteria, fecal coliform, streptococcal, and other bacteria) in accordance with AWWA 10084. testing method used shall be EPA approved for drinking water systems and shall comply with applicable local and state requirements.

Disinfection shall be repeated until bacterial tests indicate the absence of coliform organisms (zero mean coliform density per 100 milliliters) in the samples for at least 2 full days. The system will not be accepted until satisfactory bacteriological results have been obtained.

SECTION 23 07 00: THERMAL INSULATION FOR MECHANICAL SYSTEMS

SYSTEM DESCRIPTION 1.1

1.1.1 General

1.2

Provide field-applied insulation and accessories on mechanical systems as specified herein; factory-applied insulation is specified under the piping, duct or equipment to be insulated.
SUBMITTALS

SD-03 Product Data

- Pipe Insulation Systems
- Duct Insulation Systems;

1.3 DELIVERY, STORAGE, AND HANDLING

Materials shall be delivered in the manufacturer's unopened containers. Materials 2.2.8 Wire delivered and placed in storage shall be provided with protection from weather, humidity, dirt, dust and other contaminants. The Construction Administrator may reject insulation material and supplies that become dirty, dusty, wet, or contaminated by some other means. Packages or standard containers of 2.2.9 Insulation Bands insulation, jacket material, cements, adhesives, and coatings delivered for use, and samples required for approval shall have manufacturer's stamp or label attached giving the name of the manufacturer and brand, and a description of the material, date codes, and approximate shelf life (if applicable). Insulation packages and containers shall be asbestos free.

PART 2 PRODUCTS

2.1 STANDARD PRODUCTS

Provide materials which are the standard products of manufacturers regularly engaged in the manufacture of such products and that essentially duplicate items 2.3.1 Cellular Glass that have been in satisfactory use for at least 2 years prior to bid opening. Submit a complete list of materials, including manufacturer's descriptive technical literature, performance data, catalog cuts, and installation instructions. The product number, k-value, thickness and furnished accessories including adhesives, sealants and jackets for each mechanical system requiring insulation shall be included. The product data must be copyrighted, have an identifying or publication number, and shall have been published prior to the issuance date of this solicitation. Materials furnished under this section shall be submitted together in a booklet.

2.1.1 Insulation System

> Provide insulation systems in accordance with the approved MICA National Insulation Standards plates as supplemented by this specification. Provide field-applied insulation for heating, ventilating, and cooling (HVAC) air distribution systems and piping systems that are located within, on, under, and adjacent to buildings; and for plumbing systems. Provide CFC and HCFC free insulation.

Surface Burning Characteristics 2.1.2

Unless otherwise specified, insulation must have a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with ASTM E84. Flame spread, and smoke developed indexes, shall be determined by ASTM E84 or UL 723. Test insulation in the same density and installed thickness as the material to be used in the actual construction. Prepare and mount test specimens according to ASTM E2231.

Provide insulation that meets or exceed the requirements of ASHRAE 90.2. Insulation exterior shall be cleanable, grease resistant, non-flaking and nonpeeling. Materials shall be compatible and shall not contribute to corrosion, soften, or otherwise attack surfaces to which applied in either wet or dry state. Materials to be used on stainless steel surfaces shall meet ASTM C795 requirements. Calcium silicate shall not be used on chilled or cold water systems. Materials shall be asbestos free. Provide product recognized under UL 94 (if containing plastic) and listed in FM APP GUIDE.

2.2.1 Adhesives

Provide non-aerosol adhesive products used on the interior of the building (defined as inside of the weatherproofing system) that meet either emissions requirements of CDPH SECTION 01350 (limit requirements for either office or classroom spaces regardless of space type) or VOC content requirements of SCAQMD Rule 1168 (HVAC duct sealants must meet limit requirements of "Other" category within SCAQMD Rule 1168 sealants table). Provide aerosol adhesives used on the interior of the building that meet either emissions requirements of CDPH SECTION 01350 (use the office or classroom requirements, regardless of space type) or VOC content requirements of GS-36.

2.2.1.1 Acoustical Lining Insulation Adhesive

Adhesive shall be a nonflammable, fire-resistant adhesive conforming to ASTM C916, Type I.

2.2.1.2 Mineral Fiber Insulation Cement Cement shall be in accordance with ASTM C195

2.2.1.3 Lagging Adhesive

Lagging is the material used for thermal insulation, especially around a cylindrical object. This may include the insulation as well as the cloth/material covering the insulation. Lagging adhesives shall be nonflammable and fire-resistant and shall have a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with ASTM E84. Adhesive shall be MIL-A-3316, Class 1, pigmented white and be suitable for bonding fibrous glass cloth to faced and unfaced fibrous glass insulation board; for bonding cotton brattice cloth to faced and unfaced fibrous glass insulation board; for sealing edges of and 3.1.2 bonding glass tape to joints of fibrous glass board; for bonding lagging cloth to thermal insulation; or Class 2 for attaching fibrous glass insulation to metal surfaces. Lagging adhesives shall be applied in strict accordance with the manufacturer's recommendations for pipe and duct insulation.

2.2.1.4 Contact Adhesive

Adhesives may be any of, but not limited to, the neoprene based, rubber based, or elastomeric type that have a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with ASTM E84. The adhesive shall not adversely affect, initially or in service, the insulation to which it is applied, nor shall it cause any corrosive effect on metal to which it is applied. Any solvent dispersing medium or volatile component of the adhesive shall have no objectionable odor and shall not contain any benzene or carbon tetrachloride. The dried adhesive shall not emit nauseous, irritating, or toxic volatile matters or aerosols when the adhesive is heated to any temperature up to 212 degrees F. The dried adhesive shall be nonflammable and fire resistant. 3.1.3 Firestopping Flexible Elastomeric Adhesive: Comply with MIL-A-24179, Type II, Class I. Provide product listed in FM APP GUIDE.

2.2.2 Caulking

ASTM C920, Type S, Grade NS, Class 25, Use A.

2.2.3 Corner Angles

Nominal 0.016 inch aluminum 25 by 25 mm 1 by 1 inch with factory applied kraft backing. Aluminum shall be ASTM B209M ASTM B209, Alloy 3003, 3105, or 5005.

The 2.2.4 Fittings

Fabricated Fittings are the prefabricated fittings for flexible elastomeric pipe insulation systems in accordance with ASTM C1710. Together with the flexible elastometric tubes, they provide complete system integrity for retarding neat gain and controlling condensation drip from chilled-water and refrigeration systems. Flexible elastomeric, fabricated fittings provide thermal protection (0.25 k) and condensation resistance (0.05 Water Vapor Transmission factor). For satisfactory 3.1.4.1 Adhesive Application performance, properly installed protective vapor retarder/barriers and vapor stops shall be used on high relative humidity and below ambient temperature applications to reduce movement of moisture through or around the insulation to the colder interior surface.

2.2.5 Finishing Cement

ASTM C450: Mineral fiber hydraulic-setting thermal insulating and finishing cement. All cements that may come in contact with Austenitic stainless steel must 3.1.4.2 Adhesive Safety Precautions comply with ASTM C795.

2.2.6 Fibrous Glass Cloth and Glass Tape

Fibrous glass cloth, with 20X20 maximum mesh size, and glass tape shall have maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with ASTM E84. Tape shall be 4 inchwide rolls. Class 3 tape shall be 4.5 ounces/square vard. Elastomeric Foam Tape: Black vapor-retarder foam tape with acrylic adhesive containing an anti-microbial additive.

2.2.7 Staples Outward clinching type monel.

Soft annealed ASTM A580/A580M Type 302, 304 or 316 stainless steel, 16 or

18 gauge.

Insulation bands shall be 13 mm 1/2 inch wide; 26 gauge stainless steel.

2.2.10 Sealants

Sealants shall be chosen from the butyl polymer type, the styrene-butadiene rubber type, or the butyl type of sealants. Sealants shall have a maximum permeance of 0.02 perms based on Procedure B for ASTM E96/E96M, and a maximum flame spread index of 25 and a maximum smoke developed index of 50 when tested in accordance with ASTM E84.

ASTM C552, Type II, and Type III. Supply the insulation from the fabricator with (paragraph WHITE VAPOR RETARDER ALL SERVICE JACKET (ASJ)) ASJ vapor retarder and installed with all longitudinal overlaps sealed and all circumferential joints ASJ taped or supply the insulation unfaced from the fabricator and install with all longitudinal and circumferential joints sealed with vapor barrier mastic.

2.3.2 Flexible Elastomeric Cellular Insulation

Closed-cell, foam- or expanded-rubber materials containing anti-microbial additive, complying with ASTM C534/C534M, Grade 1, Type I or II. Type I, Grade 1 for tubular materials. Type II, Grade 1, for sheet materials. Type I and II shall have vapor retarder/vapor barrier skin on one or both sides of the insulation, and require an additional exterior vapor retarder covering for high relative humidity and below ambient temperature applications.

2.3.3 Aboveground Hot Pipeline (Above 60 deg. F)

Insulation for outdoor, indoor, exposed or concealed applications shall meet the following requirements. Supply the insulation with manufacturer's recommended factory-applied jacket/vapor barrier.

2.3.4 Cellular Glass

ASTM C552, Type II and Type III. Supply the insulation with manufacturer's recommended factory-applied jacket.

2.3.5 Flexible Elastomeric Cellular Insulation Closed-cell, foam- or expanded-rubber materials containing anti-microbial additive, complying with ASTM C534/C534M, Grade 1, Type I or II to 220 degrees F service. Type I for tubular materials. Type II for sheet materials. 2.3.4 Below-ground Pipeline Insulation For below-ground pipeline insulation, use cellular glass, ASTM C552, type II. 2.3.5 Flexible Elastomeric Cellular Insulation Closed-cell, foam- or expanded-rubber materials containing anti-microbial additive, complying with ASTM C534/C534M, Grade 1, Type I or II to 220 degrees F service. Type I for tubular materials. Type II for sheet materials. 2.3.4 Below-ground Pipeline Insulation

2.4 DUCT INSULATION SYSTEMS 2.4.1 Rigid Insulation Calculate the minimum thickness in accordance with ASHRAE 90.2. 2.4.2 Blanket Insulation Calculate minimum thickness in accordance with ASHRAE 90.2 PART 3 EXECUTION **APPLICATION - GENERAL** Insulation shall only be applied to unheated and uncooled piping and equipment. Flexible elastomeric cellular insulation shall not be compressed at joists, studs, columns, ducts, hangers, etc. The insulation shall not pull apart after a one hour period; any insulation found to pull apart after one hour, shall be replaced.

Installation

Except as otherwise specified, material shall be installed in accordance with the manufacturer's written instructions. Material such as rust, scale, dirt and moisture shall be removed from surfaces to receive insulation. Insulation shall be kept clean and dry. Insulation shall not be removed from its shipping containers until the day it is ready to use and shall be returned to like containers or equally protected from dirt and moisture at the end of each workday. Insulation that becomes dirty shall be thoroughly cleaned prior to use. If insulation becomes wet or if cleaning does not restore the surfaces to like new condition, the insulation will be rejected, and shall be immediately removed from the jobsite. Joints shall be staggered on multi layer insulation. Mineral fiber thermal insulating cement shall be mixed with demineralized water when used on stainless steel surfaces. Insulation, jacketing and accessories shall be installed in accordance with MICA Insulation Stds plates except where modified herein or on the drawings.

Where pipes and ducts pass through fire walls, fire partitions, above grade floors, and fire rated chase walls, the penetration shall be sealed with fire stopping materials as specified in Section 07 84 00 FIRESTOPPING. The protection of ducts at point of passage through firewalls must be in accordance with NFPA 90A and/or NFPA 90B. All other penetrations, such as piping, conduit, and wiring, through firewalls must be protected with a material or system of the same hourly rating that is listed by UL, FM, or a

Install flexible elastomeric cellular insulation with seams and joints sealed with rubberized contact adhesive. Flexible elastomeric cellular insulation shall not be used on surfaces greater than 220 degrees F. Stagger seams when applying multiple layers of insulation. Protect insulation exposed to weather and not shown to have vapor barrier weatherproof jacketing with two coats of UV resistant finish or PVC or metal jacketing as recommended by the manufacturer after the adhesive is dry and cured.

replaced.

3.1.6 Welding

3.1.7 Pipes/Ducts/Equipment That Require Insulation

as specified.

3.2 PIPE INSULATION SYSTEMS INSTALLATION

installation instructions.

3.2.1 Pipe Insulation 3.2.1.1 General

a. Pipe used solely for fire protection.

including the trap, insulated where exposed.

c.	Sanitary drain
d.	Air chambers.
e.	Adjacent insu
f.	ASME stamps
g.	Access plates
ĥ.	Classicate and

Pipe insulation shall be continuous through the sleeve. Provide an aluminum jacket or vapor barrier/weatherproofing self adhesive jacket (minimum 2 mils adhesive, 3 mils embossed) less than 0.0000 permeability, greater than 3 ply standard grade, silver, white, black and embossed with factory applied moisture retarder over the insulation wherever penetrations require sealing.

For below-ground pipeline insulation, use cellular glass, ASTM C552, type II.

3.1.4 Installation of Flexible Elastomeric Cellular Insulation

Apply a brush coating of adhesive to both butt ends to be joined and to both slit surfaces to be sealed. Allow the adhesive to set until dry to touch but tacky under slight pressure before joining the surfaces. Insulation seals at seams and joints shall not be capable of being pulled apart one hour after application. Insulation that can be pulled apart one hour after installation shall be

Use natural cross-ventilation, local (mechanical) pickup, and/or general area (mechanical) ventilation to prevent an accumulation of solvent vapors, keeping in mind the ventilation pattern must remove any heavier-than-air solvent vapors from lower levels of the workspaces. Gloves and spectacle-type safety glasses are recommended in accordance with safe installation practices.

No welding shall be done on piping, duct or equipment without written approval of the Construction Administrator. The capacitor discharge welding process may be used for securing metal fasteners to duct.

Insulation is required on all pipes, ducts, or equipment, except for omitted items

Install pipe insulation systems in accordance with the approved MICA Insulation Stds plates as supplemented by the manufacturer's published

Pipe insulation shall be installed on aboveground hot and cold pipeline systems as specified below to form a continuous thermal retarder/barrier, including straight runs, fittings and appurtenances unless specified otherwise. Installation shall be with full length units of insulation and using a

single cut piece to complete a run. Cut pieces or scraps abutting each other shall not be used. Pipe insulation shall be omitted on the following:

Chromium plated pipe to plumbing fixtures. However, fixtures for use by the physically handicapped shall have the hot water supply and drain,

lines.

ulation. s of fan housings.

h. Cleanouts or handholes.

3.2.1.2 Pipes Passing Through Walls, Roofs, and Floors

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3.2.1.2.	1 Penetra	ate Interior Walls	6				
	The aluminum j (minimum 2 mile greater than 3 p 2 inches beyond band.	acket or vapor b s adhesive, 3 mi lies standard gra d either side of th	arrier/we ls embo ade, silve ne wall a	eatherpro ssed) les er, white nd shall	oofing - se ss than 0. , black an be secure	elf adhes 0000 pe d embos ed on ea	ive jacket rmeability, ssed shall extend ch end with a
3.2.1.2.	2 Penetra	ating Floors					
	Extend the alum inches above th the end of the a	ninum jacket fror le floor with one luminum jacket.	n a point band at	t below tl the floor	he backuj and one	o materia not more	al to a point 10 e than 1 inch from
3.2.1.2.	3 Penetra	ating Waterproof	fed Floor	S			
	Extend the alum 2 inches above	ninum jacket rom the flashing with	n below t i a band	he backı 1 inch fro	up materi om the er	al to a po nd of the	oint aluminum jacket.
3.2.1.2.	4 Penetra	ating Exterior Wa	alls				
	Continue the all sleeve to a poin	uminum jacket re t 2 inches beyor	equired f nd the inf	or pipe e terior sur	exposed to face of th	o weathe e wall.	er through the
3.2.1.5	Pipe Insulation I	Material and Thie	ckness				
	Pipe insulation r requirements of	materials must b ASHRAE 90.2.	e as liste	ed in Tab	ble 1 and	must me	eet or exceed the
TABLE Insulatio	1 on Material for Pi	ping					
Service	Material	Specification	Туре		Class	VR/VI Req'd	3
Cold Do	omestic Water Pi Cellular Glass Flexible	ping, Makeup W ASTM C552	ater & D II	rinking F	Fountain [2	Drain Pip No	bing
	Elastomeric Cellular	ASTM C534	I			No	
Hot Do	mestic Water Sup	oply & Recirculat	ting Pipir	ng (Max	200 F)		
	Mineral Fiber Cellular Glass Flexible	ASTM C547 ASTM C552	 		1 2	No No	
	Elastomeric Cellular	ASTM C534	I			No	
	Faced Phenolic Foam	ASTM C1126	Ш			Yes	
Refrige	rant Suction Pipir Flexible Flastomeric	ng (35 degrees F	nomina	ll)			
	Cellular Cellular Glass	ASTM C534 ASTM C552	 		1	No Yes	
Conder	nsate Drain Locat Cellular Glass Elexible	ed Inside Buildir ASTM C552	ng II		2	No	
	Elastomeric Cellular Flexible	ASTM C534	I			No	
	Elastomeric Cellular	ASTM C534	I		2	No	
Note: V	R/VB = Vapor Re	etarder/Vapor Ba	arrier				
	2 nsulation Thickne	ass (inch)					
Service	Fluid Temperati	Ire Range °F		Tube	And Pine	Size (in	ch)
		are range i	<1	1-<1.	5 1.5-<4	4-<8	= or >8
	> 350 251 - 350		4.5 3	5 4	5 4 5	5 4 5	5 4 5
	201 - 250		2.5 1.5	2.5 1.5	2.5 2	3	3
	105 - 140		1	1.5	1.5	2 1.5	1.5
	< 40 < 40		.5 .5	.5 1	1	1	1.5
3.2.2	Aboveground C	old Pipelines					
	The following co accordance with in PART 3 as to	bld pipelines for i n Table 2 except be omitted.	minus 30 those p This ii) to plus iping liste ncludes l	60 degre ed in subp but is not	es F, sha paragrap limited t	all be insulated in oh Pipe Insulation o the following:
	a. Horizor	ntal and vertical	portions	of interic	or roof dra	iins.	
	b. Refrige	erant suction line	s.				
	c. Air con	ditioner condens	ate drai	ns.			
3.2.2.1	Insulation Mater	rial and Thicknes	s				
	Insulation thickr	ness for cold pipe	elines sh	all be de	etermined	using T	able 2.
3.2.3	Aboveground H	ot Pipelines					

3.2.3.1 Insulation for Fittings and Accessories

Pipe insulation shall be tightly butted to the insulation of the fittings and accessories. The butted joints and ends shall be sealed with joint sealant. Insulation shall be marked showing the location of unions, strainers, check valves and other components that would otherwise be hidden from view by the insulation.

3.2.4 Piping Exposed to Weather

Piping exposed to weather shall be insulated and jacketed as specified for the applicable service inside the building. After this procedure, a laminated self-adhesive (minimum 2 mils adhesive, 3 mils embossed) vapor barrier/weatherproofing jacket - less than 0.0000 permeability (greater than 3 ply, standard grade, silver, white, black and embossed aluminum jacket or PVC jacket shall be applied. PVC jacketing requires no factory-applied jacket beneath it, however an all service jacket shall be applied if factory applied jacketing is not furnished. Flexible elastomeric cellular insulation exposed to weather shall be treated in accordance with paragraph INSTALLATION OF FLEXIBLE ELASTOMERIC CELLULAR INSULATION in PART 3.

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PALENCIA FIT PALENCIA FIT ADDI St. Augustii PLUMBING SPI		Acksonville, Florida 322 (904) 731-2323 • bashamlucas.com	A CONTRACTION NOT A CONTRACTION	prepared for Sweetwater Creek Community Development District	PALENCIA FITNESS CENTER	ADDITION	PLI IMBING SPECIFICATIONS	

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1 <u>1ST FLOOR PLUMBING PLAN</u> 1/8" = 1'-0"

VTR WF-1 3/4"ø 3/4"ø 3/4"ø 4"ø 3/4"ø
3 PLUMBING ISOMETRIC

		PLl	JMBING FIXTURE SCHEDULE					
ITEM NO.	DESCRIPTION	SELECTION	C W SIZE	H W SIZE	WASTE	VENT	TRAP	
P-1	KITCHEN SINK		KHOLER POISE UNDERMOUNT SINGLE BOWL BAR SINK, MODEL: K-3391-NA . FAUCET- KHOLER ARTIFACTS, MODEL: K-99261-2BZ.	1/2"	1/2"	2"	1 <u>1</u> "	1 <u>1</u> "
<u>REMA</u> * SAM	<u>RKS:</u> E A FIXTURE DRAIN SIZE							<u></u>
		PLI	JMBING EQUIPMENT SCHEDULE					
ITEM NO.	DESCRIPTION		SELECTION	C W SIZE	H W SIZE	WASTE	VENT	TRAP
ECO-1	EXTERIOR CLEAN OUT	JR SMITH 426 SCORIATED C	JR SMITH 4261: DUCO CAST IRON, DOUBLE FLANGED HOUSING, SCORIATED CAST IRON COVER. GASKET SEAL			*	-	-
EWH-	I ELECTRIC WATER HEATER	CHRONOMI 120V/1,800W	CHRONOMITE INSTANT FLOW SR-15L/120, 15 AMP/ 120V/1,800W, TEMP SET AT 104 DEG.			-	-	-
WF-1	WATER FOUNTAIN	ELKAY- EZH2 COOLER, MO	0 BOTTLE FILLING STATION & BI-LEVEL ADA DEL: LZSTL8WSLK. FILTER: LZWSR	<u>1</u> "	-	1 <u>1</u> "	1 <u>1</u> "	1 <u>1</u> "
REMA * SAM	RKS: E A PIPE SIZE.							1

2 1ST FLOOR PLUMBING UNDERGROUND 1/8" = 1'-0"

PLUMBING FIXTURE SCHEDUL	E				
SELECTION	C W SIZE	H W SIZE	WASTE	VENT	TRAP
KHOLER POISE UNDERMOUNT SINGLE BOWL SINK, MODEL: K-3391-NA . FAUCET- KHOLER ARTIFACTS, MODEL: K-99261-2BZ.	BAR 1/2"	1/2"	2"	1 <u>1</u> "	1 <u>1</u> "

1. COORDINATE EQUIPMENT DRAIN SIZE AND LOCATION IN FIELD PER MANUFACRTURE'S RECOMMENDATIONS.

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CONNECT TO SANITARY LINE. REFERENCE CIVIL PLANS FOR INVERT ELEVATIONS.		prepared for Sweetwater Creek Community Development District PALENCLA FITNESS CENTER PALENCLA FITNESS CENTER ADDITON St. Augustine, Florida PLUMBING PLANS
NOUT NK GRADE CONC. EDGE. END LINE. SUIT.		Image: constraint of the second sec
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		LIGHTIN	G FIXTURE SCHEDUL	.e - NO	TES 2, 3	3, 6	
TVDE			LAMP		VOLTS		NOTES
TIFE	MANOFACTORER	CATALOG NOIVIBER	SIZE	QUAN.	VOLIS		NOTES
		6DR-TL-L10-8-30-DIM-UNV-OW					
A1	HE WILLIAMS	OF-CS-N	9W LED-3000K, 1014LM	NA	120	CEILING	LED DOW
		6DR-TL-L15-8-30-DIM-UNV-OW					
A2	HE WILLIAMS	OF-CS-N	14W LED-3000K, 1497LM	NA	120	CEILING	LED DOW
		6DR-TL-L30-8-30-DIM-UNV-OW					
A3	HE WILLIAMS	OF-CS-N	27W LED-3000K, 1988LM	NA	120	CEILING	LED DOW
В	HE WILLIAMS	17-2-L27-830-AF-DRV-UNV	22W LED 3000K, 2915LM	NA	120	CEILING	2' LED W
	TRANSGLOBE		6W LED, FEIT CTC60,				DECORA
C	LIGHTING	51000	3000K, DIMMABLE	3	120	WALL-NOTE 2	NOTE 8, 1
E	BEGHELLI	OL2-SA-LG-1-M-CR-AT	LED	NA	120/277	NOTE 1	EXIT SIG
		60" INDOOR/OUTDOOR METAL AND WOOD CEILING FAN					
L1	SHADES OF LIGHT	#FA16024-WW	63W FAN / NO LIGHT	NA	120	CEILING-NOTE 4	CEILING
		SABRINA CONVERTIBLE					
		CEILING LIGHT - SKU FM21026,	6W LED, FEIT CTC60,				DECORA
L2	SHADES OF LIGHT	MATTE BLACK	3000K, DIMMABLE	4	120	CEILING-NOTE 9	7
					1		

LIGHTING FIXTURE SCHEDULE NOTES: 1. SINGLE OR DOUBLE FACED AS INDICATED ON DRAWING. MOUNT TO CEILING UNLESS CEILING EXCEEDS 9'-0", THEN MOUNT ABOVE DOOR.

2. SEE ARCHITECTURAL AND INTERIOR DESIGN CEILING PLAN AND ELEVATIONS FOR EXACT LOCATION AND HEIGHT OF LIGHT FIXTURES. 3. FIXTURES INDICATED TO BE EMERGENCY LIGHTING FIXTURES SHALL HAVE AN EMERGENCY BATTERY BALLAST. BATTERY BALLASTS SHALL PROVIDE 1400 LUMENS FOR LINEAR FIXTURES AND 700 LUMENS FOR DOWNLIGHTS.

4. PROVIDE DOWNROD AS REQUIRED. FIXTURE MOUNTING HEIGHT AS DIRECTED BY ARCHITECT/INTERIOR DESIGNER.

5. WHERE FIXTURE IS IN CONTACT WITH CEILING INSULATION, INSTALL A TENMAT FF135 DRAFT STOP COVER OVER FIXTURE. 6. CONTRACTOR/LIGHTING SUPPLIER TO VERIFY ALL LED RETROFIT LAMP BASES, SIZES AND SHAPE WITH FIXTURES PROVIDED IN LIGHTING SUBMITTAL PRIOR TO SUBMITTAL REVIEW AND PROVIDE CUT SHEETS FOR EACH LED RETROFIT LAMP IN SUBMITTAL

7. FIXTURE TO BE AS SPECIFIED. NO SUBSTITUTIONS ALLOWED. VERIFY COLOR WITH INTERIOR DESIGNER WHEN REQUIRED. 8. ARCHITECT TO PROVIDE FINISH COLOR.

9. SEE ID DRAWINGS FOR MOUNTING HEIGHT.

10. FIXTURE SHALL MATCH EXISTING FITNESS BUILDING EXTERIOR SCONCES. FIELD VERIFY EXISTING FIXTURE TYPE AND FINISH PRIOR TO PURCHASE.

LIGHTING EQUIPMENT SUBMITTALS

LUMINAIRES AND CONTROL DEVICES INCLUDED IN THE DRAWINGS ARE SELECTED AND SPECIFIED FOR OPTIMUM RESULTS IN MEETING FACILITY LIGHTING REQUIREMENTS. RELEVANT FACTORS INCLUDE, BUT ARE NOT LIMITED TO, AESTHETIC APPEARANCE, COST, DURABILITY, ENERGY EFFICIENCY, AND PHOTOMETRIC PERFORMANCE.

LIGHT LEVEL CALCULATIONS ARE PERFORMED BY OUR ENGINEERS AND DESIGNERS USING INDUSTRY STANDARD PHOTOMETRIC DATA FILES AND SOFTWARE.

WHEN SUBMITTING LUMINAIRES OTHER THAN THOSE SPECIFIED, THE SUBSTITUTE PRODUCT MUST BE DEMONSTRABLY EQUIVALENT TO THE SPECIFIED ITEM. THIS INCLUDES, BUT IS NOT LIMITED TO, GENERAL LEVEL OF QUALITY, BASIC DESIGN AND APPEARANCE, CONSTRUCTION TYPE & METHOD, MATERIAL TYPE & GAUGE, FINISHING PROCESS, AND PHOTOMETRIC PERFORMANCE.

FOR PROPOSED SUBSTITUTE LUMINAIRES, INCLUDE IN SUBMITTAL LIGHTING CALCULATIONS USING INDUSTRY STANDARD PHOTOMETRIC DATA FILES AND SOFTWARE, DEMONSTRATING PERFORMANCE RESULTS EQUIVALENT TO THAT OF THE SPECIFIED PRODUCT. CALCULATIONS MUST MODEL BOTH LUMINAIRES IN IDENTICAL TEST SPACES OF THE SAME DIMENSIONS USING IDENTICAL VARIABLES SUCH AS LIGHT LOSS FACTOR, MOUNTING HEIGHT, AND SURFACE REFLECTANCE VALUES.

INCLUDE IN THE SUBMITTAL, A SUMMARY DATA SHEET COMPARING THE DESCRIPTIVE PRODUCT DATA AND CATALOG NUMBER NOMENCLATURE OF THE TWO LUMINAIRES, HIGHLIGHTING THAT THE SUBSTITUTE ITEM MATCHES THE FEATURES & CHARACTERISTICS OF THE SPECIFIED LUMINAIRE IN MAJOR ASPECTS SUCH AS THOSE NOTED ABOVE.

LUMINAIRE SUBMITTALS RECEIVED THAT PROPOSE OTHER PRODUCTS THAN THOSE SPECIFIED BUT WHICH DO NOT INCLUDE LIGHTING CALCULATIONS AND A COMPARATIVE SUMMARY PRODUCT DATA SHEET WILL BE RETURNED WITHOUT REVIEW AS "INCOMPLETE".

VNLIGHT-NOTE 5 VNLIGHT-NOTE 5 VNLIGHT-NOTE 5

RAP TIVE WALL SCONCE -

FAN- NOTE 7

TIVE PENDANT - NOTE

FLORIDA ENERGY CODE NOTES:

C405.6.4 COMPLETION REQUIREMENTS. C405.6.4.1 DRAWINGS. WITHIN 30 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION SHALL BE PROVIDED TO THE BUILDING OWNER, INCLUDING: 1. A SINGLE-LINE DIAGRAM OF THE BUILDING ELECTRICAL DISTRIBUTION

SYSTEM AND 2. FLOOR PLANS INDICATING LOCATION AND AREA SERVED FOR ALL

DISTRIBUTION. C405.6.4.2 MANUALS. AN OPERATING MANUAL AND MAINTENANCE MANUAL SHALL BE PROVIDED TO THE BUILDING OWNER. THE MANUALS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING:

1. SUBMITTAL DATA STATING EQUIPMENT RATING AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.

2. OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED. 3. NAMES AND ADDRESSES OF AT LEAST ONE QUALIFIED SERVICE AGENCY.

C408.3.1 FUNCTIONAL TESTING.

PRIOR TO PASSING FINAL INSPECTION, A REGISTERED DESIGN PROFESSIONAL SHALL PROVIDE EVIDENCE THAT THE LIGHTING CONTROL SYSTEMS HAVE BEEN TESTED TO ENSURE THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTRUCTIONS. FUNCTIONAL TESTING SHALL BE IN ACCORDANCE WITH SECTIONS C408.3.1.1 AND C408.3.1.2 OF THE FLORIDA ENERGY EFFICIENCY CODE FOR THE APPLICABLE CONTROL TYPE. CONTRACTOR IS RESPONSIBLE FOR CONTRACT WITH DESIGN PROFESSIONAL FOR REQUIRED FUNCTIONAL TESTING.

GENERAL NOTES:

- 1. ELECTRICAL CONTRACTOR SHALL VERIFY ALL FIXTURE LOCATIONS AND MOUNTING HEIGHT WITH ARCHITECTURAL DRAWINGS.
- 2. REFER TO THE SPECIFICATIONS FOR DATA NOT ON THE DRAWINGS.
- 3. SEPARATE GREEN GROUND CONDUCTOR SHALL BE ROUTED IN ALL CONDUITS WITH ALL PHASE CONDUCTORS.
- 4. ALL MECHANICAL EQUIPMENT SHALL BE COMPLETELY CONNECTED BY ELECTRICAL CONTRACTOR INCLUDING BOTH POWER AND CONTROL WIRING. ELECTRICAL CONTRACTOR SHALL REFER TO MECHANICAL DRAWINGS AND SPECIFICATIONS FOR THE REQUIREMENTS ASSOCIATED WITH WIRING AND CONNECTION OF INTERLOCKING AND CONTROLS OF MECHANICAL UNITS AND THERMOSTAT LOCATIONS.
- 5. BRANCH CIRCUITS ARE INDICATED AS ONE CIRCUIT HOME RUNS FOR CLARITY ONLY, ELECTRICAL CONTRACTOR MAY GROUP SINGLE POLE BRANCH CIRCUITS IN MULTIPLE CIRCUITS HOME RUNS. (2 CIRCUITS MAX @ 120/240V. 10 OR 3 CIRCUITS MAX @ 120/208V. 30). A GROUND CONDUCTOR SIZED PER N.E.C. ARTICLE 250 IS REQUIRED IN ALL POWER, RECEPTACLE, AND LIGHTING CONDUITS.
- 6. ELECTRICAL CONTRACTOR SHALL PROVIDE AT EACH PANELBOARD A TYPED CIRCUIT DIRECTORY WITH PROTECTIVE PLASTIC SLEEVE.
- 7. ALL CONDUITS SHALL BE CONCEALED IN WALL SPACE, CEILING SPACE OR UNDER FLOOR, NO EXPOSED CONDUITS PERMITTED.
- 8. COMPLETE SYSTEM SHALL BE GROUNDED PER N.E.C ARTICLE 250.
- 9. ALL BRANCH CIRCUIT WIRE SIZE SHALL BE MINIMUM #12 AWG COPPER. PULL EQUIPMENT GROUND IN ALL RACEWAYS, PER N.E.C. ELECTRICAL CONTRACTOR SHALL PROVIDE PROPER NUMBER AND SIZE CONDUCTOR PER N.E.C.
- 10. PRIOR TO BIDDING, THE CONTRACTOR SHALL VERIFY ALL DRAWING SCALES INDICATED ON PLANS WITH KNOWN DIMENSION TO ENSURE THE SCALES ARE ACCURATE.

VERIFY ALL DEVICE FINISH COLORS WITH INTERIOR DESIGNER PRIOR TO INSTALLATION -()-

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ELECTRICAL LEGEND
EXISTING POLE TOP MOUNTED LIGHTING FIXTURE
LIGHTING FIXTURE – SURFACE OR PENDANT MOUNTED.
SAME AS ABOVE EXCEPT WITH EMERGENCY BATTERY BALLAST.
RECESSED LIGHTING FIXTURE.
SAME AS ABOVE EXCEPT WITH EMERGENCY BATTERY BALLAST.
LIGHTING FIXTURE – SURFACE OR WALL MOUNTED.
PENDANT MOUNTED LIGHTING FIXTURE.
EXIT LIGHT — PROVIDE ARROWS AS INDICATED, SHADING DENOTES FACE OPERATION. DO NOT SWITCH.
EXISTING EMERGENCY WALL LIGHT
PENDANT MOUNTED PADDLE FAN COMPLETE WITH PENDANT & CEILING MOUNTED CANOPY-MOUNTING HEIGHT AS INDICATED BY INTERIOR DESIGNER.
TOGGLE SWITCH – SINGLE POLE, 20 AMP, 120/277V, MOTOR RATED, GROUNDING TYPE, MOUNT AT EQUIPMENT HOUSING.
FAN SPEED CONTROLLER – FLUSH WALL MOUNTED, 46" MOUNTING HEIGHT, U.N.O.
LIGHTING CONTROL POINT. 46" CONTROL HEIGHT U.N.O. 'X' DENOTES CONTROL POINT NUMBER WITHIN ROOM.
DUPLEX RECEPTACLE – 20 AMP, 120 VOLT, 3 WIRE GROUNDING WITH WHITE MID-SIZED THERMOPLASTIC COVERPLATE, 18" MOUNTING HEIGHT, U.N.O.
DUPLEX RECEPTACLE WITH GROUND FAULT INTERRUPTER, 20 AMP, 120 VOLT, 3 WIRE GROUNDING. HUBBELL NO. GFTR20W WITH NO. NPJ26W COVERPLATE, 42" MOUNTING HEIGHT, U.N.O. EXTERIOR LOCATIONS SHALL BE 18".
EXISTING DRYER OUTLET
LOW VOLTAGE OUTLET – 4 INCH SQUARE JUNCTION BOX WITH 1–GANG EXTENSION RING, BLANK COVERPLATE – 18" MOUNTING HEIGHT, U.N.O. PROVIDE 1" CONDUIT TO ACCESSIBLE CEILING SPACE.
CABLE TV OUTLET – 4 INCH SQUARE JUNCTION BOX WITH 1–GANG EXTENSION RING WITH BLANK WHITE COVERPLATE, 18" MOUNTING HEIGHT U.N.O. PROVIDE 1" CONDUIT TO CEILING.
TRANSFORMER
JUNCTION BOX SIZE PER NEC.
MOTOR, FAN, PUMP OR AIR CONDITIONING UNIT CONNECTION PER NEC.
LIGHTING AND/OR POWER PANELBOARD.
WIRING IN CONDUIT, RUN CONCEALED IN SLAB OR UNDERGROUND.
WIRING IN CONDUIT, RUN CONCEALED ABOVE CEILING OR IN WALLS.
LOW VOLTAGE CABLE IN CONDUIT
HOMERUN TO PANELBOARD – NUMBER OF ARROWS DENOTES QUANTITY OF CIRCUITS. CROSSMARKS INDICATE QUANTITY OF NO. 12 CONDUCTORS. RUNS VOID OF CROSSMARKS ARE 1/2 INCH CONDUIT, 3 NO. 12, U.N.O. DO NOT COMBINE HOMERUNS EXCEPT AS SPECIFICALLY INDICATED ON THE PLAN.
CARD READER—COORDINATE REQUIREMENTS WITH SECURITY VENDOR. INSTALL BOX AND 3/4" C. TO ACCESSIBLE CEILING SPACE.
DISCONNECT SWITCH, "2 60/0" DENOTES 2 POLE, 60 AMP, NON-FUSED.
DENOTES WEATHERPROOF WHILE—IN—USE — MOUNT RECEPTACLE VERTICALLY AND PROVIDE TAYMAC MX4280S COVERPLATE, FOR SWITCHES PROVIDE TAYMAC MX4280S COVERPLATE.
UNLESS NOTED OTHERWISE.
ABOVE FINISHED FLOOR.
GREEN GROUND CONDUCTOR.
EMPTY CONDUIT WITH PULL WIRE/CORD.
ABOVE COUNTER
DENOTES FLOOR MOUNTED NIGHT LIGHT CEILING
DUCT MOUNTED SMOKE DETECTOR
SHUT DOWN RELAY

F	REV	VISION	S
NO.	DATE	DESCRIPTION	BY

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TO SUCH USE.

J. Bryan Sh Florida PE	OF UENOLUU affer, PE 58168
DRAWN BY	WWH
CHECKED BY	JBS
DATE	08-04-22
JOB NO.	21-57
E1	1

		MOUNTING:	SURFACE				(II)		D	۸		VOLTS & PHASE:	208/120V, 3 PHASE, 4 WIRE	
		STYLE:	SQ. D NQ		Г	AI	NI		. г/	A		AMPS:	225	
		ENCLOSURE TYPE:	NEMA 1									M.C.B. OR M.L.O:	MLO	
-												AIC RATING	65,000A	_
	CIR			BRE	AKER	LOAD	PH	IASE	LOAD	BREA	AKER			H
-	NUM	DESCRIPTION	WIRE/CONDUIT	SIZE	POLE	KVA	Α	BC	KVA	POLE	SIZE	WIRE/CONDUIT	DESCRIPTION	١
-	1	LTG- 101-103	#12, #12G, 1/2"	20	1	0.8	Х	_	4.5	3	50	#8, #10G, 1"	AHU-1	┝
	3	LTG - 105, 106, ATTIC	#12, #12G, 1/2"	20	1	0.8		X	4.5)	┝
3)	5	LTG - EXTERIOR	#12, #12G, 1/2"	20	1	1.3		X	4.5)	┝
_	7	REC - EWC	#12, #12G, 1/2"	20	1	1.0	Х		2.5	3	35	#8, #10G, 1"	ACCU-1	┝
	9	REC - 102	#12, #12G, 1/2"	20	1	0.7	1	X	2.5)	
	11	REC - 102	#12, #12G, 1/2"	20	1	0.6		X	2.5)	
	13	REC - 105	#12, #12G, 1/2"	20	1	0.6	Х		4.5	3	50	#8, #10G, 1"	AHU-2	
	15	REC - 105	#12, #12G, 1/2"	20	1	0.6		X	4.5)	
	17	REC - 100, ATTIC	#12, #12G, 1/2"	20	1	0.6		X	4.5)	
	19	REC - TELEPHONE BOARD	#12, #12G, 1/2"	20	1	0.4	X		2.5	3	35	#8, #10G, 1"	ACCU-2	
	21	ACCESS CONTROL	#12, #12G, 1/2"	20	1	0.5		x	2.5)	
	23	LTG - 100	#12, #12G, 1/2"	20	1	0.8		X	2.5)	
4)[25	INSTANTANEOUS EWH-1	#12, #12G, 1/2"	20	1	1.8	X		0.9	1	20	#12, #12G, 1/2"	REC - EXTERIOR GFI	
	27	SPARE		20	1			x					SPACE	
	29	SPARE		20	1			X					SPACE	
	31	SPARE		20	1		x						SPACE	
Ī	33	SPACE						x					SPACE	
	35	SPACE						X					SPACE	
	37	SPACE					x			3	60		SPD	
	39	SPACE						x)	
	41	SPACE						X)	
												na na stanta		_
		PANEL LOAD	KVA	AMPS	5							NOTES:		-
		PHASE A	19.5	162								1, 2		-
		PHASE B	16.6	138										_
		PHASE C	17.3	144										
		TOTAL	53.4	148	@ 20	8V, 3 I	PHA	SE						

PANEL SCHEDULE NOTES:

- 1. CIRCUITS MAY BE GANGED TOGETHER WITH THE WIRE SIZES INDICATED FOR UP TO THREE CURRENT CARRYING CONDUCTORS IN A CONDUIT. WHEN THE NUMBER OF CURRENT CARRYING CONDUCTORS EXCEEDS THREE, WIRES SHALL BE UPSIZED AND DERATED IN ACCORDANCE WITH NEC TABLE 310.15(B)(2)(a). CONDUIT SIZES SHALL BE ADJUSTED TO COMPLY WITH NEC TABLES FOR CONDUCTOR FILL BASED ON CONDUIT TYPE.
- 2. PROVIDE SUB-FEED LUGS.
- 3. ROUTE CIRCUIT THROUGH EXTERIOR LIGHTING CONTROL.
- 4. PROVIDE FACTORY LOCK-OFF DEVICE.

					LIGHTIN	IG CONTROL SCHEDU	E						
ROOM NUMBER	ROOMNAME	OCCUPANCY SENSOR TYPE	SENSOR MOUNTING	OCCUPANCY/VACANCY	KEYED SENSOR NOTES	ZONE NUMBER WITHIN ROOM	ZONE	SWICHED/DIMMED	SWITCH TYPE	DIMM ER TYPE	CONTROL POINT LOCATION WITHIN ROOM (CPX)	ZONES CONTROLLED AT CONTROL POINT	KEYED CONTROL POINT NOT
						1	ALL LTS	S	М		1	1	
100	CORRIDOR	LV	CEILING	OCCUPANCY							2	1	
											3	1	
101	ELECTRICAL	М	NA	NA		1	ALL LTS	S	Т		1	1	
102	MEETING ROOM #1	DLM	CEILING	VACANCY		1 1	DOWN LIGHTS FANS	D S	D F	0-10	1 2	1,2 1,2	
103	STORAGE	\W/S	\\/A11	VACANY		1	ALL LTS	S	WS		1	1	
105	STORAGE	VV5	WALL	VACANT									
						1	DOWN LIGHTS	D	D	0-10	1	1,2	
105	MEETING ROOM #2	DLM	CEILING	OCCUPANCY		1	FANS	S	F		2	1,2	
106	STOPACE	IV.	CELLING	VACANCY		1	ALL LTS	S	Μ		1	1	
100	STORAGE	LV	CEILING	VACANCT							2	1	
						1	ALL LTS	S	Т		1	1	
107	ATTIC	М	NA	NA									
						1	ALL LTS	S	м		1	1	
004A	CORRIDOR	LV	CEILING	OCCUPANCY							2	1	
0040	CTODA CE	DV.	CELLING	VACANCY		1	ALL LTS	S	М		1	1	
004B	STORAGE	LV	CEILING	VACANCY							2	1	
						1	ALL LTS	S	WS		1	1	
004C	UTILITY	WS	WALL	VACANCY									
LEGEND		SENISOR TYPE											
		IV - 24V DUAL TECHN		POWER PACKS AND ACCE	SSORIES AS			S - SWITCHED	M - MOMENTARY		LINV - LINIVERSAL		
		DIM - DIM DUAL TEC	HNOLOGY SENSORS W	TH ROOM CONTROLLERS	ANDACCES			D - DIMMED	D - DIMMER		0-10 - 0-10 VOLT		
		WS - DUAL TECHNOL	OGY WALL SWITCH SEN	SOR (LINE VOLTAGE)	/ TO / COL			DINNED	F - FAN CONTROL	I FR	0 10 0 10 0021		
		M - MANUAL CONTRO	01						T - SINGLE POLET	OGGLE			
									T3 - 3/4 WAY TOG	GLE			
									WS - WALL SWITC	H SENSO	OR		
GENERAL NOTES													1
A. LIGHTING CONT	TROL SYSTEMS SHALL BE W	ATTSTOPPER DUAL TE	CHNOLOGY DLM SYST	EM OR 24 SYSTEM AS INDI	CATED. CON	NTRACTOR SHALL PRC	VIDE MANUFACT	URER CREATED LIGHT	ING CONTROL DRA	WINGS	FOR APPROVAL		
AS PART OF TH		CKAGE.				CONTROL							
B. FUK LUADS WIT													
												E THE OVERALL BUI	
DESIGN AND PF	R CODE.						HE FERIO, THE CC						
E. VERIFY REQUIRE	ED DIMMING METHODS FO	R EACH FIXTURE TYPE	SUPPLIED PRIOR TO C	RDERING DIMMING COM	PONENTS A	ND INSTALLATION. D	IMMING METHOD	D SHALL MATCH SUPPI	LIED FIXTURES.				

F. IN ROOMS WITH CEILING FANS, OCCUPANCY SENSORS SHALL BE WALL MOUNTED AT 10' A.F.F. OR 1' BELOW CEILING HEIGHT, WHICHEVER IS LOWER. G. INTERLOCK ALL CORRIDOR LIGHTING CONTROLS WITH FIRE ALARM SUCH THAT LIGHTING ALONG ALL PATHS OF EGRESS ARE TURNED "ON" DURING FIRE ALARM CONDITION.

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SCHEDULES

PANEL

ELECTRICAL

PLAN NOTES:

SCALE 1"=20'-0"

⊗ REFERENCE NOTE ON DRAWING

1. SEE POWER RISER DIAGRAM FOR WIRE AND CONDUIT REQUIREMENTS.

DEMOLITION NOTES:

- 1. THERE SHALL NOT BE ANY INTERRUPTION TO SERVICES TO THE EXISTING BUILDINGS WITHOUT PRIOR SCHEDULING OF SUCH OUTAGES WITH THE OWNER'S REPRESENTATIVE.
- 2. THE CONTRACTOR SHALL NOT TAKE POSSESSION OF OR DISPOSE OF ANY SALVAGEABLE ITEMS IN ASSOCIATION WITH THE WORK. ALL SALVAGEABLE ITEMS SHALL BE THE OWNER'S PROPERTY AT HIS OPTION. ALL UNSALVAGEABLE EQUIPMENT AND MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE.
- THE ELECTRICAL CONTRACTOR SHALL MAINTAIN ACCURATE RECORDS OF ANY MODIFICATIONS TO EXISTING SYSTEMS AND SHALL UPON COMPLETION, DELIVER "AS-BUILT" DRAWINGS TO THE OWNER, INDICATING ANY SUCH CHANGES.
- 4. WHERE FEEDERS ARE ABANDONED, WIRE SHALL BE PULLED OUT AND ALL EXPOSED SECTIONS OF CONDUITS REMOVED. ALL SWITCHES, PANELS, ETC. SHALL BE REMOVED. ALL CONCEALED CONDUITS SHALL BE CAPPED AT POINT OF CONCEALMENT.
- 5. ALL EXISTING DEVICES AND FIXTURES IN THE PATH OF RENOVATION OR BUILDING ADDITIONS SHALL BE REMOVED BY THE CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN EXISTING CIRCUITRY TO ALL REMAINING DEVICES AND FIXTURES. FOR EACH DEVICE OR FIXTURE REMOVED AT THE END OF A CIRCUIT, CONTRACTOR SHALL REMOVE WIRING FROM LAST REMAINING DEVICE, FOR EACH DEVICE OR FIXTURE REMOVED IN THE MIDDLE OF A CIRCUIT, CONTRACTOR SHALL REMOVE WIRING FROM FIRST DEVICE OR FIXTURE BEFORE AND AFTER REMOVED DEVICE AND FIXTURE. NEW WIRING, SIZED THE SAME AS EXISTING, SHALL BE PULLED BETWEEN THE TWO REMAINING DEVICES OR FIXTURES.
- 6. CONTRACTOR MAY REUSE EXISTING CONDUIT SYSTEM WHERE APPLICABLE, PROVIDING THE REUSED SYSTEMS MEET CURRENT CODES AND SPECIFICATIONS. REMOVE ALL UNUSED SURFACE MOUNTED CONDUIT. UNUSED CONDUITS STUBBING UP FROM FLOOR SHALL BE CUT FLUSH WITH FLOOR.
- 7. EXISTING EQUIPMENT NOT SHOWN ON THESE PLANS AND NOT REMOVED BY OTHER TRADES SHALL BE RECONNECTED TO PANELS. EXISTING ELECTRICAL OR MECHANICAL EQUIPMENT TO REMAIN THAT HAS TO BE DISCONNECTED FOR CONSTRUCTION SHALL BE REINSTALLED.
- 8. ELECTRICAL DRAWINGS DO NOT INDICATE ALL THE EXISTING INSTALLATIONS.
- 9. ALL EXISTING SWITCHES, RECEPTACLES, LIGHTING FIXTURES, TELEPHONE OUTLETS, ETC. THAT DO NOT INTERFERE WITH RENOVATIONS SHALL REMAIN.
- 10. CONTRACTOR SHALL VISIT THE SITE PRIOR TO PREPARING HIS BID AND DETERMINE THE EXTENT OF EXISTING EQUIPMENT AND WIRING TO ACCOMMODATE CHANGES AND ADDITIONS. ALL THE NECESSARY REROUTING, RELOCATING AND/OR REMOVAL OF EXISTING EQUIPMENT, WIRING ETC. SHALL BE INCLUDED IN THE SCOPE OF THIS WORK. ANY VARIATION FROM EXISTING CONDITIONS SHALL BE INCLUDED UNDER THIS CONTRACT.

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TO SUCH USE.

- ALL CHANGES.
- 4. UTILIZE AND EXTEND EXISTING 120V CIRCUIT TO CONNECT NEW RECEPTACLE AS SHOWN. PROVIDE (3) #12 WIRES IN 1/2" CONDUIT AND MAINTAIN MAXIMUM 1500 WATTS PER 120V, 20A CIRCUIT.
- 5. INSTALL STAND-ALONE DUCT DETECTOR/SHUT DOWN RELAY AT AHU AND VISUAL ANNUNCIATOR AT CEILING. ACTIVATION OF DUCT DETECTOR SHALL SHUT DOWN UNIT.
- 6. MAINTAIN MINIMUM 36" CLEARANCE IN FRONT OF ELECTRICAL PANEL.

1SE

CEILING (TYP.) (2) 2 1/2"C. TO ABOVE CEILING TELEPHONE ← 4'Wx4'Hx3/4" PAINTED PLYWOOD BOARD **—** -#6, 1/2"C. TO PANELBOARD GROUNDING SYSTEM. -GROUND BUS FLOOR LEVEL - (2) 2" CONDUITS TO EXISTING MAIN BUILDING TELEPHONE BOARD.

TELEPHONE/TV SINGLE LINE DIAGRAM NOT TO SCALE

FILL AROUND CONDUIT WITH FINE SAND

DIRECT BURIED CONDUIT DETAIL NOT TO SCALE

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LOW VOLTAGE LIGHTING **CONTROLS/MOTION SENSORS**

NOT TO SCALE

DLM LIGHTING CONTROL DETAIL

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Burepared for Sweetwater Creek Community Development District	PALE REVELLE REPORT A FITNESS CENTRER In the county of the second	ELECTRICAL RISERS & DETAILS
BA BA DESI 7645 GA JACKSO (904) 731 LN: AA	HIVILLE, FLO CON GROU TE PARKWAY NVILLE, FLO 1-2323 • basha 26000586 I NO 58168 * STATE OF S/ONALE D. Bryan Shaffer Florida PE 581	AM AM AM AM AM AM AM AM AM AM AM AM AM A
DRAWN CHECK DATE JOB NO	N BY ED BY	WWH JBS 08-04-22 21-57

BID SET

NOTES: A. ALL LINE VOLTAGE WIRING SHALL BE #12AWG AND ENCLOSED IN 1/2" CONDUIT. B. NETWORK CABLE SHALL BE IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.

THE NETWORK CABLE SHALL BE PLENUM RATED FREE-WIRED ABOVE THE FINISHED CEILING, ROUTED PARALLEL AND PERPENDICULAR TO STRUCTURAL ELEMENTS. CABLE SHALL BE FASTENED TO THE STRUCTURE WITH APPROPRIATE CABLE TIES AT 3' INTERVALS. DO NOT FASTEN CABLE TO OTHER CONDUIT SYSTEMS. PROVIDE $rac{3}{4}$ Conduit FOR NETWORK CABLE FROM SWITCH TO ACCESSIBLE CEILING SPACE. PROVIDE INSULATED BUSHING AT CONDUIT TERMINATION IN CEILING SPACE.

C. ALL LOW VOLTAGE, CLASS II WIRING SHALL BE PER MANUFACTURER'S SPECIFICATIONS AND ENCLOSED IN 1/2" CONDUIT.

D. PROVIDE COVERS AND IDENTIFY JUNCTION BOXES PER SPECIFICATIONS. E. PROVIDE IDENTIFICATION PLATE ON THE CEILING GRID INDICATING LOCATION OF DIGITAL DAYLIGHT CONTROLLER AND INPUT/OUTPUT INTERFACE DEVICE ABOVE.

F. DIMMING LEVELS SHALL BE FIELD SET TO LEVELS AS REQUIRED. G. PROVIDE CONSTANT HOT CIRCUIT CONDUCTOR TO FIXTURES DESIGNATED FOR EMERGENCY LIGHTING THAT ARE EQUIPPED WITH AN EMERGENCY BATTERY BALLAST.

EMERGENCY POWER FAILURE OPERATION DESCRIPTION IN THE EVENT OF NORMAL POWER FAILURE, THE EMERGENCY LIGHTING FIXTURES SHALL SHUNT TO THE EMERGENCY SOURCE, BYPASSING THE OCCUPANCY SENSOR SWITCHES AND DAYLIGHT HARVESTING OPERATIONS.

ELECTRICAL SPECIFICATIONS SECTION 16050 BASIC ELECTRICAL MATERIALS AND METHODS PART 1 GENERAL 1.1 SUMMARY

A. GROUNDING AND BONDING. B. CONNECTION OF UTILIZATION EQUIPMENT. SUPPORTS D. IDENTIFICATION.

- 1.2 SUBMITTALS
- A. PRODUCT DATA: FOR REVIEW; PROVIDE CATALOG DATA FOR GROUNDING AND BONDING DEVICES. 1.3 REGULATORY REQUIREMENTS
- A. CONFORM TO REQUIREMENTS OF NFPA 70. B. FURNISH PRODUCTS LISTED BY UL OR OTHER TESTING FIRM ACCEPTABLE TO AUTHORITY HAVING JURISDICTION. C. FLORIDA BUILDING CODE
- 1.4 PROJECT CONDITIONS A. VERIFY FIELD MEASUREMENTS AND CIRCUITING ARRANGEMENTS ARE AS SHOWN ON DRAWINGS.
- PART 2 PRODUCTS
- 2.1 GROUNDING MATERIALS
- A. GROUND ROD: COPPER-CLAD STEEL 3/4-INCH DIAMETER 10 FEET LENGTH. B. MECHANICAL CONNECTORS: BRONZE. ABOVE GRADE ONLY.
- C. EXOTHERMIC WELDS: BELOW GRADE CONNECTORS. 2.2 BASIC MATERIALS
- A. STEEL CHANNEL: GALVANIZED
- 3. MISCELLANEOUS HARDWARE: TREAT FOR CORROSION RESISTANCE. NAMEPLATES: ENGRAVED THREE-LAYER LAMINATED PLASTIC, BLACK LETTERS ON WHITE BACKGROUND.
- D. WIRE AND CABLE MARKERS: CLOTH MARKERS, SPLIT SLEEVE OR TUBING TYPE.
- PART 3 EXECUTION
- 3.1 INSTALLATION A. INSTALL WORK ACCORDING TO NECA "STANDARD OF 2.5 BUILDING WIRE AND CABLE INSTALLATION."
 - B. PROVIDE BONDING TO MEET REGULATORY REQUIREMENTS. C. MAKE ELECTRICAL CONNECTIONS TO UTILIZATION EQUIPMENT IN ACCORDANCE WITH EQUIPMENT MANUFACTURER'S INSTRUCTIONS.
 - 1. VERIFY THAT WIRING AND OUTLET ROUGH-IN WORK IS COMPLETE AND THAT UTILIZATION EQUIPMENT IS READY FOR ELECTRICAL CONNECTION, WIRING, AND ENERGIZING.
 - 2. MAKE WIRING CONNECTIONS IN CONTROL PANEL OR IN WIRING COMPARTMENT OF PRE-WIRED EQUIPMENT. PROVIDE INTERCONNECTING WIRING WHERE INDICATED.
 - 3. INSTALL AND CONNECT DISCONNECT SWITCHES, CONTROLLERS, CONTROL STATIONS, AND CONTROL DEVICES AS INDICATED.
 - 4. MAKE CONDUIT CONNECTIONS TO EQUIPMENT USING FLEXIBLE CONDUIT. USE LIQUIDTIGHT FLEXIBLE CONDUIT IN DAMP OR WET LOCATIONS.
 - 5. INSTALL PRE-FABRICATED CORD SET WHERE CONNECTION WITH ATTACHMENT PLUG IS INDICATED OR SPECIFIED, OR USE ATTACHMENT PLUG WITH SUITABLE STRAIN-RELIEF CLAMPS.
 - 6. PROVIDE SUITABLE STRAIN-RELIEF CLAMPS FOR CORD CONNECTIONS TO OUTLET BOXES AND EQUIPMENT CONNECTION BOXES.
- D. INSTALL SUPPORT SYSTEMS SIZED AND FASTENED TO ACCOMMODATE WEIGHT OF EQUIPMENT AND CONDUIT, INCLUDING WIRING, WHICH THEY
- 3.2 EXAMINATION AND PREPARATION
- A. SUPPORTS
 - 1. FASTEN HANGER RODS, CONDUIT CLAMPS, AND OUTLET AND JUNCTION BOXES TO BUILDINGS STRUCTURE USING PRECAST INSERT SYSTEM BEAM CLAMPS.
 - 2. USE TOGGLE BOLTS OR HOLLOW WALL FASTENERS IN HOLLOW MASONRY, PLASTER, OR GYPSUM BOARD PARTITIONS AND WALLS: EXPANSION ANCHORS OR PRESET INSERTS IN SOLID MASONRY WALLS: SELF-DRILLING ANCHORS OR EXPANSION ANCHOR ON CONCRETE SURFACES: SHEET METAL SCREWS IN SHEET METAL STUDS; AND WOOD SCREWS IN WOOD CONSTRUCTION.
 - 3. DO NOT FASTEN SUPPORTS TO PIPING, CEILING SUPPORT WIRES, DUCTWORK, MECHANICAL EQUIPMENT, OR CONDUIT.
 - 4. DO NOT USE POWER-ACTUATED ANCHORS.
 - 5. DO NOT DRILL STRUCTURAL STEEL MEMBERS.
 - 6. FABRICATE SUPPORTS FROM STRUCTURAL STEEL OR STEEL CHANNEL.
- B. IDENTIFY ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT, AND LOADS SERVED, TO MEET REGULATORY REQUIREMENTS AND AS SCHEDULED.
- 1. DEGREASE AND CLEAN SURFACES TO RECEIVE NAMEPLATES AND TAPE
- 2. SECURE NAMEPLATES TO EQUIPMENT FRONTS USING SCREWS, RIVETS, OR ADHESIVE, WITH EDGES PARALLEL TO EQUIPMENT LINES, SECURE NAMEPLATE TO INSIDE FACE OF RECESSED PANELBOARD DOORS IN FINISHED LOCATIONS.
- 3. USE NAMEPLATES WITH 1/8 INCH LETTERING TO IDENTIFY INDIVIDUAL SWITCHES AND CIRCUIT BREAKERS, RECEPTACLE CIRCUITS, AND LOADS SERVED.
- 4. USE NAMEPLATES WITH 1/4 INCH TO IDENTIFY DISTRIBUTION AND
- CONTROL EQUIPMENT. C. INSTALL WIRE MARKERS ON EACH CONDUCTOR IN PANELBOARD GUTTERS,
- PULL BOXES, OUTLET AND JUNCTION BOXES, AND AT LOAD CONNECTIONS.
- 1. USE BRANCH CIRCUIT OR FEEDER NUMBER TO IDENTIFY POWER AND LIGHTING CIRCUITS.
- 2. USE CONTROL WIRE NUMBER AS INDICATED ON FROM FOUNDATION WALL: PLASTIC CONDUIT. PROVIDE EQUIPMENT MANUFACTURER'S SHOP DRAWINGS TO IDENTIFY CONTROL WIRING.

SECTION 16100

WIRING METHODS PART 1 GENERAL

- 1.1 REGULATORY REQUIREMENTS
- A. CONFORM TO REQUIREMENTS OF NFPA 70. B. FURNISH PRODUCTS LISTED BY UL OR OTHER TESTING FIRM ACCEPTABLE TO AUTHORITY HAVING JURISDICTION.
- PART 2 PRODUCTS 2.1 PRODUCT REQUIREMENTS
- A. USE ONLY SPECIFIED RACEWAY IN THE FOLLOWING LOCATIONS UNLESS
- DIRECTED OTHERWISE ON DRAWINGS: 1. INSTALLATIONS IN OR UNDER CONCRETE SLAB, OR UNDERGROUND WITHIN 5 FEET FROM FOUNDATION WALL: PVC SCHEDULE 40 CONDUIT.
- 2. IN SLAB ABOVE GRADE: PLASTIC CONDUIT.
- 3. EXPOSED OUTDOOR LOCATIONS: RIGID STEEL CONDUIT OR ELECTRICAL METALLIC TUBING. USE THREADED OR RAINTIGHT FITTINGS.

- 4. WET INTERIOR LOCATIONS: RIGID STEEL CONDUIT OR ELECTRICAL METALLIC TUBING. USE THREADED OR RAINTIGHT FITTINGS FOR METAL CONDUIT.
- 5. DRY CONCEALED INTERIOR LOCATIONS: RIGID STEEL CONDUIT, ELECTRICAL METALLIC TUBING. BRANCH CIRCUITS FED FROM RGS OR EMT HOMERUNS MAY BE IN HOSPITAL GRADE ARMORED CABLE.
- 6. DRY EXPOSED INTERIOR LOCATIONS: RIGID STEEL CONDUIT, ELECTRICAL METALLIC TUBING.
- B. USE WIRE AND CABLE IN LOCATIONS AS FOLLOWS: 1. ALL POWER WIRES AND CABLES SHALL BE IN RACEWAY
- C. USE NO WIRE SMALLER THAN 12 AWG FOR POWER AND LIGHTING CIRCUITS, AND NO SMALLER THAN 14 AWG FOR CONTROL WIRING. USE 10 AWG CONDUCTOR FOR 20 AMPERE, 120 VOLT BRANCH CIRCUIT HOME RUNS
- LONGER THAN 75 FEET; AND FOR 20 AMPERE. 2.2 CONDUIT AND FITTINGS

A. CONDUIT:

- 1. METAL CONDUIT AND TUBING: GALVANIZED STEEL.
- 2. FLEXIBLE CONDUIT: STEEL
- 3. LIQUID TIGHT FLEXIBLE CONDUIT: FLEXIBLE CONDUIT WITH PVC JACKET
- 4. PLASTIC CONDUIT AND TUBING: NEMA TC 2, PVC. USE SCHEDULE 40 CONDUIT.
- B. CONDUIT FITTINGS:
- . METAL FITTINGS AND CONDUIT BODIES: NEMA FB 1 2. PLASTIC FITTINGS AND CONDUIT BODIES: NEMA TC 3. . EMT FITTINGS: STEEL COMPRESSION TYPE FOR WET LOCATION. SET SCREW FOR DRY LOCATION
- 2.3 ACCESS PANELS
 - A. PROVIDE CEILING ACCESS PANELS FOR EQUIPMENT, DEVICES, BOXES AND OTHER LIKE ITEMS REQUIRING ADJUSTMENT, MAINTENANCE OR ACCESSIBILITY IF THEY ARE NOT LOCATED OVER LAY-IN TYPE CEILING OR ARE NOT OTHERWISE ACCESSIBLE. OBTAIN APPROVAL FROM ARCHITECT FOR TYPE AND LOCATION OF ACCESS PANELS.
- 2.4 ELECTRICAL BOXES
- A. BOXES . SHEET METAL: NEMA OS 1, GALVANIZED STEEL 2. CAST METAL: CAST FERALLOY, DEEP TYPE, GASKETED COVER,
- THREADED HUBS. 2.5 BUILDING WIRE AND CABLE
 - A. FEEDERS AND BRANCH CIRCUITS LARGER THAN 6 AWG: COPPER STRANDED CONDUCTOR, 600 VOLT INSULATION, THHN/THWN AND XHHW
 - B. FEEDERS AND BRANCH CIRCUITS 6 AWG AND SMALLER: COPPER CONDUCTOR, 600 VOLT INSULATION, THHN/THWN, XHHW 6 AND 8 AWG, STRANDED CONDUCTOR; SMALLER THAN 8 AWG, SOLID CONDUCTOR.
 - C. CONTROL CIRCUITS: COPPER, STRANDED CONDUCTOR, 600 VOLT INSULATION, THW.
- 2.6 REMOTE CONTROL AND SIGNAL CABLE
 - A. CONTROL CABLE FOR CLASS 1 REMOTE CONTROL AND SIGNAL CIRCUITS: COPPER CONDUCTOR, 600 VOLT INSULATION, RATED 60 DEGREE C, INDIVIDUAL CONDUCTORS TWISTED TOGETHER, SHIELDED, AND COVERED WITH PVC JACKET. (PLENUM RATED)
 - B. CONTROL CABLE FOR CLASS 2 OR CLASS 3 REMOTE CONTROL AND SIGNAL CIRCUITS: COPPER CONDUCTOR, 300 VOLT INSULATION, RATED 60 DEGREE C. INDIVIDUAL CONDUCTORS TWISTED TOGETHER, SHIELDED, AND COVERED WITH PVC JACKET; UL LISTED. (PLENUM RATED)
- PART 3 EXECUTION
- 3.1 EXAMINATION AND PREPARATION
 - A. VERIFY THAT INTERIOR OF BUILDING IS PHYSICALLY PROTECTED FROM WEATHER.
- B. VERIFY THAT MECHANICAL WORK THAT IS LIKELY TO DAMAGE CONDUCTORS
- HAS BEEN COMPLETED. C. COMPLETELY AND THOROUGHLY SWAB RACEWAY SYSTEM BEFORE INSTALLING
- CONDUCTORS.
- D. ELECTRICAL BOXES ARE SHOWN ON DRAWINGS IN APPROXIMATE LOCATIONS UNLESS DIMENSIONED.
- 1. OBTAIN VERIFICATION FROM ENGINEER OF JUNCTION BOX LOCATIONS, AND LOCATIONS OF OUTLETS IN OFFICES AND WORK AREAS, PRIOR TO ROUGH-IN.
- 2. IT SHALL BE UNDERSTOOD THAT ANY OUTLET MAY BE RELOCATED A DISTANCE NOT EXCEEDING 5FT FROM THE LOCATION SHOWN ON THE DRAWINGS PRIOR TO OR DURING ROUGH-IN. IF SO DIRECTED BY THE
- ARCHITECT-ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER. 3. LOCAL SWITCHES WHICH ARE SHOWN NEAR DOORS SHALL BE LOCATED
- AT THE STRIKE SIDE OF THE DOOR AS FINALLY HUNG, REGARDLESS OF SWING ON THE DRAWINGS. 3.2 INSTALLATION
- A. PERFORM WORK ACCORDING TO NECA STANDARD OF INSTALLATION. B. ARRANGE CONDUIT TO MAINTAIN HEADROOM AND TO PRESENT NEAT APPEARANCE.
 - 1. ROUTE EXPOSED RACEWAY PARALLEL AND PERPENDICULAR TO WALLS AND ADJACENT PIPING
- 2. MAINTAIN MINIMUM 6-INCH CLEARANCE TO PIPING AND 12" CLEARANCE TO HEAT SURFACES SUCH AS FLUES, STEAM PIPES, AND HEATING APPLIANCES.
- 3. MAINTAIN REQUIRED FIRE, ACOUSTIC, AND VAPOR BARRIER RATING WHEN PENETRATING WALLS, FLOORS, AND CEILINGS.
- 4. ROUTE CONDUIT THROUGH ROOF OPENINGS FOR PIPING AND DUCTWORK WHERE POSSIBLE; OTHERWISE, ROUTE THROUGH ROOF JACK WITH PITCH POCKET
- 5. GROUP IN PARALLEL RUNS WHERE PRACTICAL. USE RACK CONSTRUCTED OF STEEL CHANNEL. MAINTAIN SPACING BETWEEN RACEWAYS OR DERATE CIRCUIT AMPACITIES TO NFPA 70 REQUIREMENTS.
- 6. USE CONDUIT HANGERS AND CLAMPS; DO NOT FASTEN WITH WIRE OR PERFORATED PIPE STRAPS.
- 7. USE CONDUIT BODIES TO MAKE SHARP CHANGES IN DIRECTION.
- 8. TERMINATE CONDUIT STUBS WITH INSULATED BUSHINGS. 9. USE SUITABLE CAPS TO PROTECT INSTALLED RACEWAY AGAINST
- ENTRANCE OF DIRT AND MOISTURE. 10. PROVIDE NO. 12 AWG INSULATED CONDUCTOR OR SUITABLE PULL
- STRING IN EMPTY RACEWAYS, EXCEPT SLEEVES AND NIPPLES. 11. INSTALL EXPANSION JOINTS WHERE RACEWAY CROSSES BUILDING EXPANSION OR SEISMIC JOINTS.
- 12. INSTALL PLASTIC CONDUIT AND TUBING ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
- 13. USE STEEL COMPRESSION TYPE FITTINGS WITH EMT CONDUITS. INSTALL ELECTRICAL BOXES AS SHOWN ON THE DRAWINGS, AND AS REQUIRED FOR SPLICES, TAPS, WIRE PULLING, EQUIPMENT CONNECTIONS AND REGULATORY REQUIREMENTS.

- 1. USE CAST OUTLET BOX IN EXTERIOR LOCATIONS EXPOSED TO WEATHER AND WET LOCATIONS.
- 2. USE HINGED COVER ENCLOSURE FOR INTERIOR PULL AND JUNCTION BOX LARGER THAN 12 INCHES IN ANY DIMENSION.
- 3. LOCATE AND INSTALL ELECTRICAL BOXES TO ALLOW ACCESS. PROVIDE ACCESS PANELS IF REQUIRED.
- 4. LOCATE AND INSTALL ELECTRICAL BOXES TO MAINTAIN HEADROOM AND TO PRESENT NEAT MECHANICAL APPEARANCE.
- 5. INSTALL PULL BOXES AND JUNCTION BOXES ABOVE ACCESSIBLE CEILINGS OR IN UNFINISHED AREAS.
- 6. PROVIDE KNOCKOUT CLOSURES FOR UNUSED OPENINGS.
- 7. ALIGN WALL-MOUNTED OUTLET BOXES FOR SWITCHES, THERMOSTATS, AND SIMILAR DEVICES.
- 8. COORDINATE MOUNTING HEIGHTS AND LOCATIONS OF OUTLETS ABOVE COUNTERS AND BACKSPLASHES.
- 9. USE RECESSED OUTLET BOXES IN FINISHED AREAS AND WHERE INDICATED.
- 10. SECURE BOXES TO INTERIOR WALL AND PARTITION STUDS, ACCURATELY POSITIONING TO ALLOW FOR SURFACE FINISH THICKNESS.
- 11. USE STAMPED STEEL STUD BRIDGES FOR FLUSH OUTLETS IN HOLLOW STUD WALL, AND ADJUSTABLE STEEL CHANNEL FASTENERS FOR FLUSH CEILING OUTLET BOXES.
- 12. LOCATE BOXES IN MASONRY WALLS TO REQUIRE CUTTING CORNER ONLY. COORDINATE MASONRY CUTTING TO ACHIEVE NEAT OPENINGS FOR BOXES.
- 13. DO NOT INSTALL BOXES BACK-TO-BACK IN WALLS; PROVIDE 6 INCHES SEPARATION, MINIMUM; EXCEPT PROVIDE 24 INCHES SEPARATION, MINIMUM IN ACOUSTIC-RATED WALLS.
- 14. DO NOT DAMAGE INSULATION.
- D. INSTALL CABLE AND WIRE ACCORDING TO MANUFACTURER'S INSTRUCTIONS 1. NEATLY TRAIN AND SECURE WIRING INSIDE BOXES, EQUIPMENT, AND PANELBOARDS.
- 2. USE WIRE PULLING LUBRICANT FOR PULLING 4 AWG AND LARGER
- 3. SUPPORT CABLES ABOVE ACCESSIBLE CEILINGS TON KEEP THEM
- FROM RESTING ON CEILING TILES. 4. MAKE SPLICES, TAPS, AND TERMINATIONS TO CARRY FULL AMPACITY OF CONDUCTORS WITHOUT PERCEPTIBLE TEMPERATURE RISE.
- 5. TERMINATE SPARE CONDUCTORS WITH ELECTRICAL TAPE.
- E. INSTALL WIRING DEVICES ACCORDING TO MANUFACTURER'S INSTRUCTIONS. F. INSTALL WALL PLATES FLUSH AND LEVEL.
- 1. INSTALL PLATES ON SWITCH, RECEPTACLE, AND BLANK OUTLETS IN FINISHED AREAS, USING JUMBO SIZE PLATES FOR OUTLETS INSTALLED IN MASONRY WALLS.
- 2. INSTALL GALVANIZED STEEL PLATES ON OUTLET BOXES AND JUNCTION BOXES IN UNFINISHED AREAS, ABOVE ACCESSIBLE CEILINGS, AND ON SURFACE-MOUNTED OUTLETS.
- G. INSTALL SERVICE FITTINGS ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
- H. BEFORE INSTALLING RACEWAYS AND PULLING WIRE TO ANY MECHANICAL EQUIPMENT OR PLUMBING EQUIPMENT, VERIFY ELECTRICAL CHARACTERISTICS WITH FINAL SUBMITTAL ON EQUIPMENT TO ASSURE PROPER NUMBER AND AWG OF CONDUCTORS
- I. UNDERGROUND CABLE AND CONDUIT INSTALLATION SHALL CONFORM T ANSI C2 AND NEC EXCEPT AS OTHERWISE INDICATED. THE CONTRACTOR SHALL PROMPTLY REPAIR ANY UTILITY LINES OR SYSTEM DAMAGED BY HIS OPERATION. THE TOP OF UNDERGROUND CONDUIT SHALL NOT BE LESS HAN 24 INCHES BELOW GRADE. THE BOTTOM OF CONDUITS TRENCH SHALL BE GRADED SMOOTH, WHERE ROCK AND SHARP EDGED MATERIAL ARE ENCOUNTERED, THE BOTTOM SHALL BE EXCAVATED FOR ADDITIONAL 3 INCHES, FILLED AND TAMPED LEVEL TO THE ORIGINAL BOTTOM WITH SAND OR EARTH FREE FROM ROCKS AND SHARP MATERIALS. PROVIDE MAGNETIC YELLOW WARNING TAPE ABOVE THE ENTIRE LENGTH OF
- UNDERGROUND CONDUITS TAPE SHALL BE BURIED 12" BELOW GRADE. J. SURFACES DISTURBED DURING THE INSTALLATION OF UNDERGROUND CONDUITS SHALL BE RESTORED TO THEIR ORIGINAL CONDITIONS. PROVIDE SOD OF QUALITY FOUAL TO THAT REMOVED. PATCH PAVEMENT SIDEWALK CURB, ETC. EXCAVATED MATERIAL NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED FROM PROJECT SITE. REMOVE WATER FROM EXCAVATION BY PUMPING OR OTHER APPROVED METHOD. BACKFILL SHALL BE FREE FROM LARGE CLODS OF EARTH OR STONES

SECTION 16400

SERVICE AND DISTRIBUTION

OVER 1 INCH IN SIZE.

PART 1 GENERAL

1.1 SUBMITTALS

- A. SHOP DRAWINGS: FOR REVIEW; INDICATE CONSTRUCTION DETAILS FOR THE FOLLOWING: 1. PANELBOARDS.
- B. PRODUCT DATA: FOR REVIEW; PROVIDE RATINGS AND COMPONENT DETAILS FOR THE FOLLOWING: I. ENCLOSED SWITCHES.
- 2. FUSFS. 3. CIRCUIT BREAKERS.
- C. TEST REPORTS: FOR INFORMATION.
- D. OPERATING AND MAINTENANCE INSTRUCTIONS: FOR PROJECT CLOSEOUT; INCLUDE THE FOLLOWING: 1. PANELBOARD: SUBMIT NEMA PB 2.1.

1.2 REGULATORY REQUIREMENTS

- A. CONFORM TO REQUIREMENTS OF NFPA 70.
- B. FURNISH PRODUCTS LISTED BY UL OR OTHER TESTING FIRM ACCEPTABLE TO AUTHORITY HAVING JURISDICTION.
- C. CONFORM TO REQUIREMENTS OF UTILITY COMPANY.

PART 2 PRODUCTS

2.1 ENCLOSED SWITCHES

- A. MANUFACTURERS: 1. SQUARE D
- 2. EATON-CUTLER HAMMER 3. GE
- B. ENCLOSED SWITCH ASSEMBLIES: NEMA KS 1: TYPE HD. 1. FUSE CLIPS: DESIGNED TO ACCOMMODATE CLASS R OR J FUSES.

- 2.2 FUSES
 - A. MANUFACTURERS: 1. FERRAZ-SHAWMUT
 - 2. BUSSMAN
 - B. FUSES 600 AMPERES AND LESS: CURRENT LIMITING, ONE-TIME FUSE, 250 VOLT, UL CLASS RK 1, RK 5 OR J.

2.3 PANELBOARDS

- A. MANUFACTURERS: 1. EATON-CUTLER HAMMER
- 2. SQUARE D 3. GE
- B. DISTRIBUTION PANELBOARDS: NEMA PB 1; CIRCUIT BREAKER TYPE. 1. ENCLOSURE: TYPE 1 OR TYPE 3 2. PROVIDE SURFACE CABINET FRONT WITH SCREW COVER AND
- HINGED DOOR. 3. BUS: COPPER.
- 4. GROUND BUS: COPPER. 5. VOLTAGE: AS SHOWN
- 6. MINIMUM INTEGRATED EQUIPMENT RATING: AS INDICATED ON DRAWINGS.
- C. LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARDS: NEMA PB 1: CIRCUIT BREAKER TYPE I. ENCLOSURE: NEMA PB 1: TYPE 1 OR TYPE 3 2. PROVIDE FLUSH OR SURFACE CABINET FRONT WITH LOCKABLE
- DOOR, KEYED ALIKE.
- 3. BUS: COPPER BUS. 4. GROUND BUS: COPPER.
- 5. VOLTAGE: AS SHOWN 6. MINIMUM INTEGRATED EQUIPMENT RATING: AS INDICATED ON DRAWINGS.

PART 3 EXECUTION

- 3.1 EXAMINATION AND PREPARATION
- A. MAKE ARRANGEMENTS WITH UTILITY COMPANY TO OBTAIN PERMANENT ELECTRIC SERVICE TO THE PROJECT.
- B. PROVIDE CONCRETE PAD FOR UTILITY TRANSFORMER. PROVIDE PAD DIMENSIONS AND DETAILS TO UTILITY REQUIREMENTS.
- 3.2 INSTALLATION
- A. INSTALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S
- INSTRUCTIONS. B. INSTALL PROPER FUSES IN EACH FUSED SWITCH. C. INSTALL PANELBOARDS AND LOAD CENTERS TO NEMA PB 1.1.
- 3.3 CLEANING
 - A. CLEAN EQUIPMENT FINISHES TO REMOVE PAINT AND CONCRETE SPLATTERS.

ANSI C78.379 - ELECTRIC LAMPS - INCANDESCENT AND HIGH-

SPECIFIED UNDER REGULATORY REQUIREMENTS.

A. MANUFACTURER: COMPANY SPECIALIZING IN

A. CONFORM TO REQUIREMENTS OF ANSI/NFPA 70.

C. FURNISH PRODUCTS LISTED AND CLASSIFIED BY UNDERWRITERS LABORATORIES, INC. AS SUITABLE FOR PURPOSE SPECIFIED AND

A. FURNISH PRODUCTS AS SPECIFIED IN SCHEDULE ON DRAWINGS.

C. INSTALL BALLASTS, LAMPS, AND SPECIFIED ACCESSORIES AT FACTORY.

B. SUBSTITUTIONS: UNDER PROVISIONS OF SECTION 16000.

D. BALLAST: MANUFACTURER'S STANDARD, MATCHED TO LAMP

1. DESCRIPTION: ANSI C82.1, ELECTRONIC BALLAST.

2. PROVIDE BALLAST SUITABLE FOR LAMPS SPECIFIED.

4. SOURCE QUALITY CONTROL: CERTIFY BALLAST DESIGN AND

CONSTRUCTION BY CERTIFIED BALLAST MANUFACTURERS, INC.

PROVIDE FLANGE MOUNTING FRAMES TO MOUNT GRID TYPE TROFFERS

INDIVIDUAL OR CONTINUOUS ROW MODELS. FRAME SHALL BE EXTRUDED

ALUMINUM PAINTED WHITE, 1' X 4', 2' X 2' OR 2' X 4' AS REQUIRED.

FIN HARD CEILINGS. FRAME SHALL PERMIT USE OF GRID (NEMAG)

FIXTURES IN CEILINGS REQUIRING FLANGES. FRAMES SHALL BE

A. EXAMINE SUBSTRATE AND SUPPORTING GRIDS FOR LUMINARIES.

CHARACTERISTICS, RATED 120 VOLTS.

A. FLUORESCENT BALLAST:

2.3 FLANGE MOUNTING FRAME

PART 3 EXECUTION

3.1 EXAMINATION

5. VOLTAGE: 120 VOLTS.

DAY-BRITE FMK OR APPROVED EQUAL

B. CONFORM TO REQUIREMENTS OF NFPA 101.

INTENSITY DISCHARGE REFLECTOR LAMPS- CLASSIFICATION OF BEAM

AND LIMITATIONS OF USE STIPULATED BY PRODUCT TESTING AGENCY

STORAGE, HANDLING, PROTECTION, EXAMINATION, PREPARATION, AND

PRODUCTS SPECIFIED IN THIS SECTION WITH MINIMUM THREE YEARS

SECTION 16510

INTERIOR LUMINAIRES

PART 1 GENERAL

1.1 SECTION INCLUDES

1.2 REFERENCES

1.3 QUALIFICATIONS

1.4 REGULATORY REQUIREMENTS

SHOWN.

PART 2 PRODUCTS

2.1 LUMINARIES

2.2 BALLASTS

B. BALLASTS.

D. LUMINAIRE ACCESSORIES.

PATTERNS.

LAMPS.

A. INTERIOR LUMINARIES AND ACCESSORIES.

B. MANUFACTURER'S INSTRUCTIONS:

C. MANUFACTURER'S INSTRUCTIONS:

INSTALLATION OF PRODUCT.

DOCUMENTED EXPERIENCE.

- 3.2 INSTALLATION
- A. INSTALL IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.
- B. INSTALL SUSPENDED LUMINARIES USING PENDANTS SUPPORTED FROM SWIVEL HANGERS. PROVIDE PENDANT LENGTH REQUIRED TO SUSPEND LUMINAIRE AT INDICATED HEIGHT.
- C. INSTALL SURFACE MOUNTED LUMINARIES AND EXIT SIGNS PLUMB AND ADJUST TO ALIGN WITH BUILDING LINES AND WITH EACH OTHER. SECURE TO PROHIBIT MOVEMENT.
- D. INSTALL WALL MOUNTED LUMINARIES AS SCHEDULED.
- E. INSTALL ACCESSORIES FURNISHED WITH EACH LUMINAIRE.
- F. MAKE WIRING CONNECTIONS TO BRANCH CIRCUIT USING BUILDING WIRE WITH INSULATION SUITABLE FOR TEMPERATURE CONDITIONS WITHIN LUMINAIRE
- G. BOND PRODUCTS AND METAL ACCESSORIES TO BRANCH CIRCUIT EQUIPMENT GROUNDING CONDUCTOR.
- H. INSTALL SPECIFIED LAMPS IN EACH LUMINAIRE, EMERGENCY LIGHTING UNIT AND EXIT SIGN.
- I. EACH RECESSED FIXTURE SHALL HAVE TWO STEEL WIRE SUPPORTS FASTENED TO THE STRUCTURE ABOVE, AT DIAGONALLY OPPOSITE CORNERS OF FIXTURE.
- J. SEE ARCHITECTURAL RCP DRAWING FOR EXACT FIXTURE LOCATION. 3.3 FIELD QUALITY CONTROL
- A. OPERATE EACH LUMINAIRE AFTER INSTALLATION AND CONNECTION. INSPECT FOR PROPER CONNECTION AND OPERATION.
- 3.4 ADJUSTING
- A. AIM AND ADJUST LUMINARIES AS DIRECTED. B. ADJUST EXIT SIGN DIRECTIONAL ARROWS AS INDICATED.
- C. RELAMP LUMINARIES THAT HAVE FAILED LAMPS AT SUBSTANTIAL COMPLETION.
- 3.5 CLEANING
- A. CLEAN LIGHTING FIXTURES.
- B. CLEAN ELECTRICAL PARTS TO REMOVE CONDUCTIVE AND DELETERIOUS MATERIALS.
- C. REMOVE DIRT AND DEBRIS FROM ENCLOSURE.
- D. CLEAN PHOTOMETRIC CONTROL SURFACES AS RECOMMENDED BY MANUFACTURER.
- E. CLEAN FINISHES AND TOUCH UP DAMAGE

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