SOUTHERN CONNECTICUT STATE UNIVERSITY

JOE BERTOLINO PRESIDENT DAVIS HALL **GROUND FLOOR RENOVATIONS - 2023**

SOUTHERN CONNECTICUT STATE UNIVERSITY FACILITIES PLANNING DEPARTMENT / OFFICE OF FACILITIES OPERATIONS / 615 FITCH STREET, HAMDEN, CT 06514 / UNIVERSITY REPRESENTATIVE: PETER J. VISENTIN AIA, TEL: (203) 392-6055, FAX: (203) 392-6058

BUILDING CODE INFORMATION (FOR EXISTING BUILDING)

2022 CONNECTICUT STATE BUILDING CODE (INCLUDES THE FOLLOWING ADOPTED MODEL CODES AND AMENDMENTS TO...) 2021 INTERNATIONAL BUILDING CODE (IBC)

2017 ICC A117.1 STANDARD FOR ACCESSIBLE AND USABLE BUILDING AND FACILITIES 2021 INTERNATIONAL EXISTING BUILDING CODE

2021 INTERNATIONAL PLUMBING CODE 2021 INTERNATIONAL MECHANICAL CODE

2021 INTERNATIONAL ENERGY CONSERVATION CODE 2020 NFPA 70, NATIONAL ELECTRICAL CODE

2018 CONNECTICUT STATE FIRE SAFETY CODE (INCLUDES THE FOLLOWING ADOPTED MODEL CODES AND AMENDMENTS TO...) 2015 INTERNATIONAL FIRE CODE

2015 NFPA 101, LIFE SAFETY CODE OF THE NATIONAL FIRE PROTECTION ASSOCIATION 2018 CONNECTICUT STATE FIRE PREVENTION CODE (INCLUDES THE FOLLOWING ADOPTED MODEL CODES AND AMENDMENTS TO...) 2015 NFPA 1, FIRE CODE OF THE NATIONAL FIRE PROTECTION ASSOCIATION

EXISTING BUILDING



PROJECT NO. SCSU-2023-02

BUILDING INFORMATION

EXISTING OCCUPANCY CLASSIFICATION: BUILDING HEIGHT AND AREA:

CONSTRUCTION DATE: CONSTRUCTION TYPE: FIRE PROTECTION AND ALARM: GROUP B (BUSINESS) HEIGHT: 3 STORIES, 48 FEET TOTAL FLOOR AREA: 49,614 SQ. FT. FIRST FLOOR AREA 16,550 SQ. FT. (LOCATION OF WORK) ORIGINAL 1969 IIB EXISTING AUTOMATIC FIRE DETECTION AND ALARM SYSTEM

WORK AREA INFORMATION

WORK AREA: APPROX. 5, 815 SQ. FT. OCCUPIABLE & 5,000 SQ. FT. SUPPORT &/OR /MECHANICAL. GROUP B - NO CHANGE / OCCUPANCY OF 30 SQ. FT. PER PERSON WORK AREA OCCUPANCY COUNT: 193 PEOPLE

NO AUTOMATIC SPRINKLER SYSTEM

- **GENERAL NOTES**
- 1. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS AND DIMENSIONS. ANY DISCREPANCIES MUST BE REPORTED AND REVIEWED BY THE CONTRACTOR AND THE UNIVERSITY REPRESENTATIVE PRIOR TO CONSTRUCTION.
- . THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FIELD VERIFICATION AND COORDINATION REQUIRED FOR SHOP DRAWING ACCEPTANCE.
- EXISTING CONSTRUCTION TO REMAIN, WHICH IS REMOVED AND/OR ALTERED IN ORDER TO FACILITATE OR ACCESS OTHER WORK, SHALL BE REPAIRED AND FINISHED TO ITS ORIGINAL CONDITION PRIOR TO THOSE ALTERATIONS.
- CONTRACTOR IS TO USE APPROPRIATE MEANS AND METHODS TO PROTECT ALL EXISTING SURFACES, MATERIALS AND FINISHES TO REMAIN. IF DAMAGE IS INCURRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL PATCH AND/OR REPAIR DAMAGES TO SCSU CAMPUS STANDARDS.
- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL ABOVE CEILING WORK AND SHALL REVIEW THE COMPLETE PLANS IN ORDER TO ANTICIPATE AND RESOLVE POTENTIAL CONFLICTS WITH SYSTEMS AND STRUCTURE (NEW AND EXISTING) PRIOR TO INSTALLATIONS.
- DEMOLISH AND REMOVE ABANDONED TELEPHONE AND NETWORK CABLING ABOVE CELING IN ALL AREAS (TO BE IDENTIFIED BY OWNER).
- PATCH HOLES WHERE FASTENINGS HAVE BEEN REMOVED AS PART OF THE DEMOLITION AT LOCATIONS WHERE THESE HOLES WILL REMAIN EXPOSED. PATCH TO MATCH ADJACENT EXISTING FINISH AND/OR MATERIAL.
- FIRE-STOP ELECTRICAL CONDUIT PENETRATIONS OF CONCRETE FLOOR SLABS. INSTALLATION ASSEMBLY SHALL PROVIDE AN APPROVED THROUGH PENETRATION THAT HAS BEEN LISTED IN ACCORDANCE WITH ASTM E814. SEAL AROUND CONDUIT WITH UL LISTED FIRE-STOPPING MATERIAL WITH A RATING EQUAL TO OR GREATER THAN THAT OF THE FLOOR CONSTRUCTION.
- 9. AT ALL FLOOR AREAS TO RECEIVE NEW FINISHES, PROVIDE FLOOR FILLER FOR 100 PERCENT OF AREA. FILLER MATERIAL TO BE APPROVED SUBSTANCE BY FINISH FLOORING MANUFACTURER.
- 10. DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR PROPER AND ACCEPTABLE CONSTRUCTION INSTALLATIONS, MANUFACTURER'S APPROVED METHODS, OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ARCHITECT, SHALL BE INCLUDED IN THE WORK IN THE SAME MANOR AS IF HEREIN SPECIFIED OR INDICATED.
- 11. ALL WORK SHALL BE INSTALLED SO THAT ALL PARTS AND/OR ACCESS REQUIRED FOR INSPECTION, OPERATION, MAINTENANCE AND/OR REPAIR, ARE READILY ACCESSIBLE.
- 12. CONTRACTOR TO PROVIDE BARRICADES, BARRIERS AND/OR SECURITY AROUND WORK AREAS AS REQUIRED TO PREVENT UNAUTHORIZED PERSON(S) FROM ENTERING AREAS OF WORK, MATERIAL STORAGE OR STAGING AND HAS THE SOLE RESPONSIBILITY FOR PROTECTING ALL DANGEROUS AREAS FROM ENTRY BY UNAUTHORIZED PARTIES.
- 13. CONTRACTOR SHALL KEEP WORK SITE FREE FROM DEBRIS AND ACCUMULATED REFUSE. CONSTRUCTION SITE AND PATHS OF TRAVEL FOR MATERIALS AND CREW, SHALL BE LEFT BROOM CLEAN AT THE END OF EACH WORKING DAY
- 14. REPLACE ALL LANDSCAPING DISTURBED OR DESTROYED DURING THE WORK OF THE CONTRACT WITH NEW TO MATCH EXISTING. THIS INCLUDES SOFTSCAPES SUCH AS VEGETATION WHICH INCLUDES. BUT IS NOT LIMITED TO. TREES, SHRUBS, AND OTHER PLANTINGS, GRASS AREAS THAT ARE DAMAGED MUST BE RE-GRADED AND NEW SEED APPLIED. HARDSCAPES SUCH AS WALKWAYS, PAVED AREAS, BOLLARDS, POLES, FENCING, ETC. ARE TO BE REPAIRED OR REPLACED WITH LIKE KIND.











EXISTING CONCRETE &/OR CMU CONSTRUCTION TO REMAIN

> EXISTING STUD WALL AND GYPSUM BOARD CONSTRUCTION TO REMAIN

CONSTRUCTION TO DEMOLISHED

_____ EXISTING STUD WALL AND GYPSUM BOARD CONSTRUCTION TO DEMOLISHED

----- MISC. ITEMS (SHELVING, WHITE BOARD, ETC.) SECURED TO STRUCTURE THAT ARE TO BE REMOVED - INCLUDING ALL MECHANICAL FASTENERS AND MOUNTING DEVICES.

DEMOLITION NOTES:

- 1. THE PRIMARY PURPOSE FOR DEMOLITION DRAWINGS WITHIN THESE DOCUMENTS ARE TO PRESENT A SCHEMATIC SCOPE OF WORK. CONTRACTOR AND/OR SUBCONTRACTORS ARE TO REVIEW ALL DRAWINGS (INCLUDING M.E.P. DRAWINGS) AND SURVEY EXISTING SITE CONDITIONS TO DETERMINE THE FULL SCOPE OF DEMOLITION REQUIRED FOR THE CONSTRUCTION OF
- 2. ALL ITEMS OR METHODS OF DEMOLITION NOT SPECIFICALLY ADDRESSED WITHIN THESE DOCUMENTS BUT ARE DISCOVERED DURING CONSTRUCTION AND WHICH WILL INCREASE THE COST OF THE PROJECT, MUST BE ADDRESSED TO SCSU FACILITIES OPERATIONS PRIOR TO CONTINUANCE OF DEMOLITION.
- 3. ALL ITEMS OR METHODS OF DEMOLITION NOT SPECIFICALLY ADDRESSED WITHIN THESE DOCUMENTS BUT ARE DISCOVERED DURING CONSTRUCTION AND WHICH WILL INCREASE THE COST OF THE PROJECT, MUST BE ADDRESSED TO SCSU FACILITIES OPERATIONS PRIOR TO CONTINUANCE OF DEMOLITION.

UNDERSIDE OF STRUCTURE.



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ABOVE CEILINGS





REFLECTED CEILING LEGEND:



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EXISTING 2' X 4' LIGHT FIXTURE TO BE RELOCATED.

NEW 2' X 2' LIGHT FIXTURE: TO BE METALUX 2'X2' MODULE, LED SERIES "OVATION" 4000K MODEL 22RDI-UNV-L840-CD1-U WITH INTEGRAL EMERGENCY BATTERY PACK. NEW RECESSED CAN LIGHT FIXTURE NEW AIR SUPPLY DIFFUSER

NEW AIR RETURN

EXHAUST VENTILATION OPERATED VIA LIGHT SWITCH: TO BE NuTone MODEL AERN80K EXHAUSTED INTO ATTIC SPACE. OCCUPANCY SENSOR

SMOKE/FIRE DETECTOR & ALARM

NEW CEILING GRID AND TILE: TO BE ARMSTRONG / TILE: #180 - 2X2 AND ARMSTRONG GRID & TRIM: HEAVY DUTY PRELUDE XL EXPOSED T

REFLECTED CEILING NOTES:

1. REFER TO ENGINEERS DRAWINGS AND NOTES FOR EQUIPMENT AND FIXTURE DEMOLITION INFORMATION.

- 2. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL CODE COMPLIANT HANGING SYSTEMS FOR LIGHT FIXTURES.
- 3. IF ANY EXISTING TO REMAIN CEILING COMPONENTS OR EQUIPMENT IS NOT COMPATIBLE WITH NEW AND/OR REPAIRED CEILING SYSTEMS, CONTRACTOR IS TO INFORM SCSU PRIOR TO DEMOLITION.
- 4. NEW CEILING HEIGHTS NOTED. CONTRACTOR TO VERIFY CEILING HEIGHTS NOTED ON ARCHITECTURAL DRAWINGS AND COORDINATE WITH MECHANICAL DRAWINGS. IF A CEILING HEIGHT NEEDS TO BE ADJUSTED TO ACCOMMODATE MECHANICAL, ELECTRICAL OR PLUMBING INSTALLATIONS, CONTRACTOR IS TO INFORM SCSU FACILITIES PRIOR TO SHOP DRAWING SUBMITTALS.
- 5. IT IS ACKNOWLEDGED BY SCSU FACILITIES THAT SOME REMOVAL OF CEILING TILES, GRID AND LIGHT FIXTURES WILL NEED TO OCCUR IN MAIN CORRIDORS 95, 96 & 97. (AREAS NOT SHOWN ON ARCHITECTURAL REFLECTED CEILING PLAN.) CONTRACTOR IS TO REMOVE ITEMS AS NEEDED, STORE AND REINSTALL TO COMPLETE SCOPE OF WORK.

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1 1 1 1 1 1 1 1 1 1 1 1 1 1	WALL ANGLE WALL ANGLE RETWEEN END OF AND VERTICAL	
VERTICAL HANGER WIRE. ICAL HANGER WIRES 48" ON ARE SPACED 48" FROM EACH R WIRES UP TO EXISTING TOM CHORDS ABOVE WILL BE GREATER THAN PROVIDE ADDITIONAL PER ASTM C636/C636M	B' JUN PER MAULE RUNNER MAULE	
D BE SHARPLEY BENT AND 3" OR LESS - TYPICAL	MAIN RUNNER TEE	
ER TEE NOTE: METAL INSTALLED PE C635 & C636 A	CEILING SUSPENSION SYSTEM TO BE ER MANUFACTURES INSTRUCTIONS AND ASTM AND BUILDING CODE REQUIREMENTS	
NOTE: LIGHT HANGER WIRI SUPPORTING	FIXTURES ARE TO BE SUPPORTED WITH (2) #12 ES THAT ARE IN ADDITION TO HANGERS CEILING, AS DESCRIBED ABOVE	

SUSPENDED CEILING DETAIL

DOOR	SCHEDU		RT ONE)						_				I		
OOR UMBER	DOOR TYPE	DOOR MATERIAL	SIZE (W X H)	THICKNESS	FINISH	LABEL	HARDWARE	ROOM NUMBER	ROOM NAME	FRAME TYPE	FRAME MATERIAL	WALL THICKNESS	FRAME FINISH	JAMB DETAIL	REMARKS
01	EXISTING TO REMAIN						ETR	001	WOMEN'S	EXISTING TO REMAIN	METAL		NEW PAINT		
002	EXISTING TO REMAIN						#1	002	OFFICE	EXISTING TO REMAIN	METAL		NEW PAINT		
002A	EXISTING TO REMAIN						#5	002A	STORAGE	EXISTING TO REMAIN	METAL		NEW PAINT		
003	EXISTING						ETR	003	MEN'S		METAL		NEW PAINT		
004	EXISTING						#1	004	OFFICE	EXISTING	METAL		NEW PAINT		
005	EXISTING						ETR	005	STORAGE	EXISTING	METAL		NEW PAINT		
)05A	TO REMAIN EXISTING						ETR	005A	STORAGE	TO REMAIN	METAL				
)05B							ETP	005B	STORAGE		METAL				
										TO REMAIN					
05C	TO REMAIN						EIR	005C	STORAGE	TO REMAIN	METAL				
)06	EXISTING TO REMAIN						ETR	006	MECHANICAL	EXISTING TO REMAIN	METAL		NEW PAINT		
07	EXISTING TO REMAIN						#6	007	MECHANICAL	EXISTING TO REMAIN	METAL		NEW PAINT		
08	(NOT USED)														
09	TYPE B	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#7	009	CONFERENCE	1	METAL	4 7/8"	NEW PAINT	JAMB 2 4/A-4c	APPLY NEW WINDOW FILM
10	ТҮРЕ В	WOOD	3'-0" X 7'-0"	1 3/4"		NONE	#8	010	RECEPTION	1	METAL	4 7/8"	NEW PAINT	JAMB 2	
)10A	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE-	NONE	#7	010A	OFFICE	1	METAL	4 7/8"	NEW PAINT	JAMB 2	APPLY NEW WINDOW FILM
)10B	TYPE A	WOOD	3'-0" X 7'-0"	1 3/4"	PRE-	NONE	#4	010B	SUPPORT	1	METAL	4 7/8"	NEW PAINT	4/A-4c JAMB 2	
10C	ΤΥΡΕ Α	WOOD	3'-0" X 7'-0"	1 3/4"	FINISHED	NONF	#4	010C	BREAK RM	1	METAI	4 7/8"		4/A-4c	
100			2: 0" \ 7: 0"	1 2///"	FINISHED		шт 	0100				A 7/0"		4/A-4c	
			3-0 X7-0	1 3/4	FINISHED		#1					4 7/0		4/A-4c	
10E	EXISTING TO REMAIN						#12	010C	BREAK RM	EXISTING TO REMAIN	METAL		NEW PAINT		
11	EXISTING TO REMAIN						#7	011	STUDY	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW
12	TYPE B	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#7	012	WAITING	1	METAL	4 7/8"	NEW PAINT	JAMB 2 4/A-4c	
12A	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#7	012A	OFFICE	1	METAL	4 7/8"	NEW PAINT	JAMB 2 4/A-4c	
12B	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE-	NONE	#7	012B	OFFICE	1	METAL	4 7/8"	NEW PAINT	JAMB 2	
12C	TYPE C	WOOD	2'-6" X 7'-0"	1 3/4"	PRE-	NONE	#7	012C	OFFICE	EXISTING	METAL		NEW PAINT	4/A-40	
12D	TYPE C	WOOD	2'-6" X 7'-0"	1 3/4"	PRE-	NONE	#7	012D	CLINIC	EXISTING	METAL		NEW PAINT		
 12E	TYPE C	WOOD	2'-6" X 7'-0"	1 3/4"	FINISHED PRE-	NONE	#7	012E	OFFICE	TO REMAIN EXISTING	METAL		NEW PAINT		
125			2' 6" X 7' 0"	1 3///"	FINISHED	NONE	#7	012E			METAL				
121		WOOD		4 0/4"	FINISHED	NONE	<i>πι</i>			TO REMAIN		4.7/01			
126			3-0" X /'-0"	I 3/4 ["]	FINISHED		#/	012G				4 //8"			
12H	TYPE C	WOOD	2'-6" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#7	012H	OFFICE	1	METAL	4 7/8"			
13	EXISTING TO REMAIN						ETR	013	TOILET	EXISTING TO REMAIN	METAL		NEW PAINT		
14	EXISTING TO REMAIN						#1	014	OFFICE	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW
)15	EXISTING TO REMAIN						ETR	015	TOILET	EXISTING TO REMAIN	METAL		NEW PAINT		
)16							#11	016	RECEPTION		METAL		NEW PAINT		REPLACE GLAZING IN EXISTING DOOR
)16A	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE-	NONE	#7	016A	OFFICE	1	METAL	4 7/8"	NEW PAINT	JAMB 2	
)16B	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE-	NONE	#7	016B	OFFICE	1	METAL	4 7/8"	NEW PAINT	4/A-4c JAMB 2	
16C	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	FINISHED	NONE	#7	016C	OFFICE	1		4 7/8"		4/A-4c JAMB 2	
			2' 0" \ 7' 0"	1 3///"				0160		1		A 7/0"		4/A-4c	
				1 3/4	FINISHED		#1					4 //ð		4/A-4c	
16E	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	FINISHED	NONE	#7	016E	OFFICE	1	METAL	4 7/8"		JAMB 2 4/A-4c	
17	EXISTING TO REMAIN						#1	017	OFFICE	EXISTING TO REMAIN	METAL		NEW PAINT		
018	TYPE A	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	1 HOUR	#10	018	MECHANICAL	EXISTING TO REMAIN	METAL		NEW PAINT		NEW FIRE RATED DOOR
)19	EXISTING TO REMAIN						#2	019	WAITING	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW
DOOR	DOOR TYPE	DOOR	SIZE	THICKNESS	FINISH	LABEL	HARDWARE	ROOM	ROOM	FRAME	FRAME	WALL	FRAME	JAMB	REMARKS

RDWARE SCHEDULE

NEW CYLINDER KEY TO BUILDING STANDARD BALANCE OF HARDWARE TO REMAIN ONE (1) 11U15 LL 626

ONE (1) 11U15 LL 626 BALANCE OF HARDWARE TO REMAIN ONE (1) 11G05 LL 626 NEW KICK PLATE BALANCE OF HARDWARE TO REMAIN

THREE (3) TA2714 4.5X4.5 626 ONE (1) 11U15 LL 626 WALL BUMPER

THREE (3) TA2714 626 (FIELD MEASURE SIZE) ONE (1) 11U15 LL 626 ONE (1) 1431 OU (PARALLEL MOUNT) KICK PLATE

ONE (1) 11G04 LL 626 BALANCE OF HARDWARE TO REMAIN THREE (3) TA2714 4.5X4.5 626 ONE (1) 11G05 LL 626 ONE (1) WALL BUMPER

THREE (3) TA2714 4.5X4.5 626 ONE (1) 11G05 LL 626 ONE (1) 1431 OU (REGULAR MOUNT) ONE (1) 1-XXX OVERHEAD STOP KICK PLATE

THREE (3) TA2714 4.5X4.5 626 ONE (1) 11G04 LL 626 ONE (1) WALL BUMPER

ONE (1) 11G04 LL 626 ONE (1) 1431 OU (PARALLEL MOUNT - 150°) KICK PLATE

NEW CYLINDER (KEY TO BUILDING STANDARD) NEW KICK PLATE BALANCE OF HARDWARE TO REMAIN

THREE (3) TA2714 4.5X4.5 626 ONE (1) 11G05 LL 626 ONE (1) 1431 OU (REGULAR MOUNT) KICK PLATE

HARDWARE NOTES:

- 1. GENERAL CONTRACTOR IS TO PROVIDE SHOP DRAWINGS FOR ALL HARDWARE SETS AND ITEMS.
- 2. KEY ALL CYLINDERS TO BUILDING STANDARDS
- 3. ALL KICK PLATES TO BE K1050 16"x24" LDW (REPLACE ALL SMALLER KICK PLATES TO MATCH.)
- 4. ETR = EXISTING TO REMAIN
- 5. ALL LOCKS AND KEYING ARE TO BE BY SARGENT (SCSU STANDARDS). NO SUBSTITUTIONS ALLOWED.
- 6. LOCKS TO BE SARGENT 11 LINE WITH 26D FINISH.
- DOOR STRIKES TO BE 4 ⁷/₈" CURVED LIP 808 ANSI.
 DOOR CLOSERS TO BE SARGENT POWERGLIDE 1431
- SERIES WITH SATIN STAINLESS FINSH.
 9 CONCEALED DOOR STOPS AND HOLDERS TO BE NORTON RIXSON 1 SERIES, WITH SATIN STAINLESS FINISH.
- 10.METAL KICK PLATES TO BE ROCKWOOD K1050 WITH US32D/630 FINISH
- 11.SURFACE APPLIED DOOR STOP TO BE ROCKWOOD 405 WITH US26D/626 FINISH

NIVERSITY PLANNING DEPARTMENT T / HAMDEN, CT 06514 / TEL: 203-392-6055 SOUTHERN STATE U S E E E FACILITIE , LS ЦĽ CONNER **TIONS** AL Ì RENOVA VIS A **GROUND FLOOR** Ŷ **GROUND FLOOI** DRAWING DOOR SCHEDULE TITLE: LEGEND AND NOTES SCALE: AS NOTED SCSU-2022 NO CT PROJE 4a

DOOR	SCHED	ULE (PA	RT TWO)													
DOOR NUMBER	DOOR TYPE	DOOR MATERIAL	SIZE (W X H)	THICKNESS	FINISH	LABEL	HARDWARE	ROOM NUMBER	ROOM NAME	FRAME TYPE	FRAME MATERIAL	WALL THICKNESS	FRAME FINISH	JAMB DETAIL	REMARKS	
019A	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#3	016	RECEPTION	1	METAL	4 7/8"	NEW PAINT	JAMB 2 4/A-4c	APPLY NEW WINDOW FILM	
019B	TYPE A	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#9	019A	GROUP THERAPY	1	METAL	4 7/8"	NEW PAINT	JAMB 2 4/A-4c		
020	EXISTING TO REMAIN						#1	020	CLINICAL NOTATION	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW	
021	EXISTING TO REMAIN						#1	015	MECHANICAL	EXISTING	METAL		NEW PAINT			
021A	EXISTING TO REMAIN						#1	021A	MECHANICAL	EXISTING	METAL		NEW PAINT			
022	EXISTING TO REMAIN						#1	022	CLINIC	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW	
023	EXISTING TO REMAIN						#1	023	JANITOR	EXISTING TO REMAIN	METAL		NEW PAINT			
024	EXISTING TO REMAIN						#1	024	OBSERVATION	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW	
024A	EXISTING TO REMAIN						#2	024A	CONFERENCE	EXISTING TO REMAIN	METAL		NEW PAINT			
024B	EXISTING TO REMAIN						#2	024B	OFFICE	EXISTING TO REMAIN	METAL		NEW PAINT			
025	EXISTING TO REMAIN						#4	025	CORRIDOR	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW	
025A	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#1	025A	OBSERVATION	1	METAL	4 7/8"	NEW PAINT	JAMB 2 4/A-4c		2"
025B	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#1	025B	OBSERVATION	1	METAL	4 7/8"	NEW PAINT	JAMB 2 4/A-4c		
025C	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#1	025C	OBSERVATION	1	METAL	4 7/8"	NEW PAINT	JAMB 2 4/A-4c		
025D	TYPE C	WOOD	3'-0" X 7'-0"	1 3/4"	PRE- FINISHED	NONE	#1	025D	OBSERVATION	1	METAL	4 7/8"	NEW PAINT	JAMB 2 4/A-4c		
026	EXISTING TO REMAIN						#1	026	CLINIC	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW	
027	EXISTING TO REMAIN						#1	027	GROUP THERAPY	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW	
028	EXISTING TO REMAIN						#1	028	RECEPTION	EXISTING TO REMAIN	METAL		NEW PAINT		REPLACE WINDOW FILM WITH NEW	
028A	EXISTING TO REMAIN						#1	028A	CLINIC	EXISTING TO REMAIN	METAL		NEW PAINT			
028B	EXISTING TO REMAIN						#1	028B	OBSERVATION	EXISTING TO REMAIN	METAL		NEW PAINT			
028C	EXISTING TO REMAIN						#1	028C	CLINIC	EXISTING TO REMAIN	METAL		NEW PAINT			
028D	EXISTING TO REMAIN						#1	028D	CLINIC	EXISTING TO REMAIN	METAL		NEW PAINT			
029	EXISTING TO REMAIN						#1	029	OFFICE	EXISTING TO REMAIN	METAL		NEW PAINT		APPLY NEW WINDOW FILM ADD CLOSER COVER - EN FINISH	
030	EXISTING TO REMAIN						#1	030	CUSTODIAN	EXISTING TO REMAIN	METAL		NEW PAINT			DO
030A	EXISTING TO REMAIN						ETR	030A	FACILITIES	EXISTING TO REMAIN	METAL		NEW PAINT			1. SC 2. DI
030B	EXISTING TO REMAIN						ETR	030B	TOILET	EXISTING TO REMAIN	METAL		NEW PAINT			AF 3. DL BL
031	EXISTING TO REMAIN						#1	031	MECHANICAL	EXISTING TO REMAIN	METAL		NEW PAINT			W W 4. A1
031A	EXISTING TO REMAIN						#1	031A	MECHANICAL	EXISTING TO REMAIN	METAL		NEW PAINT			5. IN
DOOR NUMBER	DOOR TYPE	DOOR MATERIAL	SIZE (W X H)	THICKNESS	FINISH	LABEL	HARDWARE	ROOM NUMBER	ROOM NAME	FRAME TYPE	FRAME MATERIAL	WALL THICKNESS	FRAME FINISH	JAMB DETAIL	REMARKS	









FINISH SCHEDULE & NOTES:

WALLS

METAL

TO BE PAINTED. MANUFACTURER: BENJAMIN MOORE / COLOR: "SOFT CHAMOIS" #OC-13 / FINISH: EGGSHELL

TO BE PAINTED. MANUFACTURER: SURFACES BENJAMIN MOORE / COLOR: "SOFT (EX: HOUSING FOR CHAMOIS" #OC-13 / FINISH: EGGSHELL WALL HEATERS)

TRIM &/OR TO BE PAINTED. MANUFACTURER: SHERWIN DOOR FRAMES WILLIAMS / COLOR: "GRAND CANAL" #SW-6488 / FINISH: SEMI-GLOSS. FLOORING IN TO BE LUXURY VINYL TILE (LVT).

TOILET ROOMS MANUFACTURER: MOHAWK GROUP / TYPE: SHAW TERRAIN II / STYLE: 20 MIL 6"X48" #0454V / COLOR: PIRCH #00684

FLOORING FOR LVT. MANUFACTURER: MOHAWK ADHESIVE GROUP / TYPE: M99 TO BE VINYL. MANUFACTURER: WALL BASE JOHNSONITE / TYPE: 6" HIGH COVE /

1. ALL NEW AND REPAIRED SURFACES TO HAVE PRIME COAT PRIOR TO FINISH COATS.

COLOR: "SAGE" #665

- 2. ALL NEW AND EXISTING PAINTED SURFACES ARE TO HAVE TWO FINISH COATS OF NEW PAINT.
- 3. REMOVE EXISTING CARPET IN AREA OF NEW TOILET ROOMS FOR REUSE AND REPAIR ANY DAMAGED AREAS OF EXISTING CARPET TO REMAIN. CONTRACTOR TO CLEAN ALL CARPET AREAS PER SCSU CLEANING STANDARDS.
- 4. AT ALL EXTERIOR WINDOWS WITHIN SCOPE OF WORK, CONTRACTOR IS TO INSTALL WINDOW BLINDS. MANUFACTURER: LEVOLOR
 - STYLE: RIVERA DUSTGUARD (35 MM) COLOR: TBD FROM MANUFACTURE'S STANDARDS WARRANTY: MANUFACTURE'S "FOREVER NEVER WORRY" MOUNTING: INCLUDE BRACKETS AND MOUNTING
 - SYSTEMS. MOUNT SIMILAR TO EXISTING. REFER TO PHOTO THIS SHEET. **OPERATION: PROVIDE EXTRA LONG WAND & CORDS**

FOR HANDICAPPED ACCESSIBILITY.

DEPARTMENT 6514 / TEL: 203-392-6055 CONNECTICUT VIVERSITY LANNING HAMDEN, CT 065 \mathbf{O} RN PL T/H Ш UTHEI က ။ . ک EITCH STR \vdash . S 15 C \bigcirc o م S CONNER 8ED NR TIONS A I S > 5 RENO \triangleleft R M 00 00 Ē Ē SOUND **OUND**

REVISION:	PROJECT NO.: SCSU-2022-02	[(
	DATE: APRIL 7, 2023	ピリ
SHEET:	DRAWING FINISHES AND FURNITURE	
A-5	SCALE: 1/4" = 1'-0"	G

SIGNAGE FOR UNISEX TOILET ROOMS

SOUTHERN CONNECTICUT		FACILITIES PLANNING DEPARTMENT 615 FITCH STREET / HAMDEN, CT 06514 / TEL: 203-392-6055	
HILL BELLE	O. 48 8ED N	ALE CONTRACTOR OF THE REAL PROPERTY OF THE PRO	
GROUND FLOOR RENOVATIONS		GROUND FLOOR - DAVIS HALL	
PROJECT NO.: SCSU-2022-02 DATE: APRIL 7, 2023	DRAWING SIGNAGE AND WAYFINDING	SCALE: 1/4" = 1'-0"	
REVISION:	SHEET:	A-6	

REVISION:	PROJECT NO.: SCSU-2022-02	CROITE/ONAR RENOVATIONS	11/ 1/8 A A A A A A A A A A A A A A A A A A A	SOUTHERN CONNECTICUT
SHEET:	DATE: APRIL 7, 2023 DRAWING FURNITURE PLAN		NO. 42	STATE UNIVERSITY
A-7	SCALE: 1/8" = 1'-0"	GROUND FLOOR - DAVIS HALL	CONCEPTION	FACILITIES PLANNING DEPARTMENT 615 FITCH STREET / HAMDEN, CT 06514 / TEL: 203-392-6055

GENERAL NOTES

- 1. THE WORD "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
- 2. ALL CONTRACTORS SHALL OBTAIN AND REVIEW ALL CONTRACT DOCUMENTS INCLUDING PLANS AND SPECIFICATIONS OF ALL TRADES BEFORE SUBMITTING BID. REFER TO SPECIFICATION AND PLANS, INCLUDING ALL EQUIPMENT SCHEDULES FOR MECHANICAL AND ELECTRICAL ENGINEERING.
- 3. THE INFORMATION SHOWN ON THE DRAWINGS IS DIAGRAMMATIC, INDICATING THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE LOCATIONS OF EQUIPMENT, AND THEIR ASSOCIATED ACCESS AREAS, WITH ALL TRADES BEFORE STARTING CONSTRUCTION. ANY MODIFICATIONS TO THE EQUIPMENT LAYOUT REQUIRED BY INSTALLATION BY ANY CONTRACTOR SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
- 4. CONTRACTOR SHALL NOTIFY ENGINEER OF ALL CONFLICTS BETWEEN DRAWINGS AND SPECIFICATIONS, OR BETWEEN CONSTRUCTION DOCUMENTS AND FIELD CONDITIONS. FOR EACH CONFLICT, CONTRACTOR SHALL CARRY THE MORE EXPENSIVE OR LARGER QUANTITY OPTION.
- 5. SUBMISSION OF PROPOSAL DIRECTLY OR INDIRECTLY IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
- 6. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING EQUIPMENT LOCATIONS IN THE FIELD, AND SHALL ADVISE THE ENGINEER AND THE OWNER OF ANY DISCREPANCIES BEFORE PERFORMING THE WORK.
- 7. ALL WORK SHALL CONFORM TO ALL APPLICABLE CURRENT BUILDING CODES, RULES, REGULATIONS AND ORDINANCES, INCLUDING THE ONES WRITTEN BY:
- 7.1. REGULATORY AUTHORITIES HAVING JURISDICTION.
- 7.2. OWNER'S INSURANCE CARRIER.
- 8. CONTRACTOR SHALL SECURE ALL PERMITS AND APPLICATIONS AND PAY ALL FEES PERTAINING TO THE CONTRACT.
- 9. ALL EQUIPMENT SHALL BE LOCATED IN ACCESSIBLE LOCATIONS WITH CODE OR MANUFACTURER-REQUIRED ACCESS SPACES. IF EQUIPMENT IS INSTALLED IN AN INACCESSIBLE LOCATION THE CONTRACTOR SHALL PROVIDE REQUIRED FIRE-RATED ACCESS DOORS, COORDINATED WITH THE ARCHITECT OR ENGINEER.
- 10. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. THE CONTRACTOR SHALL PROVIDE ALL HANGERS AND SUPPORTS REQUIRED FOR A COMPLETE INSTALLATION.
- 11. EACH CONTRACTOR SHALL COORDINATE THE LOCATION OF THEIR WORK WITH ALL OTHER TRADES BEFORE STARTING CONSTRUCTION. ANY MODIFICATIONS TO THE SYSTEM LAYOUT REQUIRED FOR INSTALLATION SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
- 12. CONTRACTOR TO RESTORE ANY EXISTING SYSTEMS, DEVICES, FINISHES, ETC., THAT ARE DAMAGED OR ALTERED DUE TO THE NEW WORK, TO ACCEPTABLE CONDITION AS DETERMINED BY THE OWNER AND ENGINEER.
- 13. CONTRACTOR SHALL BE RESPONSIBLE FOR WORKMEN'S IDENTIFICATION AND BADGING, SITE SAFETY AND FIRE PROTECTION, CONTRACTOR'S LIABILITY INSURANCE, BARRICADES, WARNING SIGNS, TRASH REMOVAL, CUTTING AND PATCHING.
- 14. CONTRACTOR SHALL SCHEDULE ALL SHUTDOWNS THAT AFFECT UTILITIES AND PORTIONS OF THE BUILDING THAT MUST REMAIN IN OPERATION WITH THE OWNER.
- 15. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE OWNER AND ALL OTHER CONTRACTORS.
- 16. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING AND PROTECTION OF MATERIALS.
- 17. CONTRACTOR SHALL PROVIDE LABOR TO RECEIVE, UNLOAD, STORE, PROTECT AND TRANSFER TO POINT OF INSTALLATION, OWNER FURNISHED ITEMS.
- 18. CONTRACTORS SHALL PROVIDE SLEEVES AND SEALS FOR ALL PIPING OR CONDUIT THAT PENETRATES WALLS OR FLOOR SLABS.
- 19. WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A LISTED FIRE STOP MATERIAL THAT MEETS ALL OF THE REQUIREMENTS OF THE STATE AND LOCAL BUILDING CODES AND THE LOCAL AUTHORITIES HAVING JURISDICTION. THIS MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE MANUFACTURER TO MAINTAIN THE FIRE RATING OF THE PENETRATED WALL OR FLOOR. THE FIRE-STOP INSTALLING CONTRACTOR SHALL BE CERTIFIED BY THE FIRE-STOPPING SYSTEM MANUFACTURER.
- 20. CONTRACTOR SHALL SUBMIT SIZE AND LOCATION OF ALL WALL AND FLOOR CORINGS TO STRUCTURAL ENGINEER FOR REVIEW BEFORE INSTALLATION. CONTRACTOR SHALL REPAIR ANY DAMAGE DUE TO CORINGS INSTALLED, AT NO COST TO OWNER. THE DAMAGE REPAIRING SHALL ALSO BE REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER.
- 21. CONTRACTOR SHALL SUBMIT SIZE AND LOCATION OF ANY PROPOSED STRUCTURAL MEMBER PENETRATIONS TO THE STRUCTURAL ENGINEER FOR REVIEW AND DETAILING BEFORE INSTALLATION. CONTRACTOR SHALL REPAIR ANY DAMAGE DUE TO PENETRATIONS INSTALLED, AT NO COST TO OWNER. THE DAMAGE REPAIRING SHALL ALSO BE REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER.
- 22. CONTRACTOR AND SUBCONTRACTORS SHALL COLLECTIVELY PREPARE TRADE COORDINATION DRAWINGS IN SUFFICIENT DETAIL TO PREVENT TRADE CONFLICTS IN AREAS OF CONGESTED WORK. THE TRADE COORDINATION DRAWINGS SHALL BE BASED ON SHOP DRAWINGS PREPARED BY ALL MEP TRADES INCLUDING SPRINKLER CONTRACTOR.
- 23. CONTRACTOR SHALL SUBMIT ONE ELECTRONIC SET OF SHOP DRAWINGS, SUBMITTALS, AND EQUIPMENT CUT SHEET INFORMATION TO THE ENGINEER FOR REVIEW PRIOR TO STARTING ANY WORK.
- 24. UPON COMPLETION OF CONSTRUCTION CONTRACTOR SHALL SUPPLY THE ENGINEER WITH (1) COMPLETE SET OF ELECTRONIC AS-BUILT DOCUMENTS AND (1) COMPLETE SET OF OPERATIONS AND MAINTENANCE MANUALS, ALL AT CONTRACTOR'S EXPENSE.
- 25. ALL PIPING AND DUCTWORK LAYOUTS ARE SHOWN IN APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL INSTALL ALL REQUIRED OFFSETS AND TRANSITIONS TO PREVENT INTERFERENCE WITH FIELD CONDITIONS AND TO COORDINATE WITH OTHER TRADES AT NO COST TO THE OWNER.
- 26. ALL REQUIRED OPENINGS THROUGH WALLS, FLOORS, AND CEILINGS SHALL BE COORDINATED BY THE CONTRACTOR USING ENGINEER AND ARCHITECT REVIEWED & APPROVED EQUIPMENT SHOP DRAWINGS.
- 27. PROVIDE A VOLUME DAMPER FOR EACH SUPPLY, RETURN, AND EXHAUST AIR TAKE-OFF, AND EVERY DUCT SPLIT OR WYE.
- 28. PROVIDE A BALANCING VALVE FOR EACH HYDRONIC PIECE OF EQUIPMENT.
- 29. THE HVAC CONTROL SYSTEM SHALL BE A COMPLETE SYSTEM. EACH HVAC ZONE SHALL BE AT A MINIMUM THERMOSTATICALLY CONTROLLED BY A SENSOR, THERMOSTAT, OR CONTROLLER WHETHER OR NOT ONE IS SHOWN ON THE DRAWINGS.
- 30. ALL HVAC SYSTEMS SHALL BE TESTED AND BALANCED BY A CERTIFIED (NEBB OR TABB) SUB-CONTRACTOR THAT THE CONTRACTOR CARRIES IN HIS/HER BID PRICE.
- 31. NO PIPING OR DUCTS SHALL BE INSTALLED OVER ELECTRICAL PANELS, TRANSFORMERS, OR ELEVATOR MACHINE ROOM EQUIPMENT. CONTRACTOR SHALL COORDINATE PIPING AND DUCTWORK WITH ELECTRICAL EQUIPMENT IN FIELD AS PART OF COORDINATION DRAWINGS.
- 32. PROVIDE SPRING ISOLATED & SEISMICALLY RATED HANGERS FOR EQUIPMENT, DUCTS, AND PIPING ACCORDING TO THE VIBRATION ISOLATION SCHEDULE. INCLUDE DETAILS AND LOCATIONS ON COORDINATION DRAWINGS.
- 33. PROVIDE AIR VENTS AT ALL HIGH POINTS AND DRAINS AT LOW POINTS.
- 34. PROVIDE CODE-REQUIRED LIFE/SAFETY DAMPERS FOR EACH DUCT PENETRATION OF RATED CONSTRUCTION.
- 35. WHEN ROOF ACCESS IS REQUIRED, CONTRACTOR SHALL MAKE PROVISIONS TO PROTECT THE ROOF WARRANTY DURING THE CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ROOF DAMAGE AND SHALL REPAIR THE DAMAGE AT NO COST TO THE OWNER.
- 36. HYDROSTATIC TESTING SHALL BE PERFORMED ON ALL EQUIPMENT AND PIPING THAT IS SUBJECTED TO PRESSURES ABOVE AMBIENT. THE MECHANICAL CONTRACTOR SHALL DEVELOP A TEST SEQUENCE AND PHASES BASED UPON THE SYSTEM DESIGN, THE SYSTEM COMPONENTS THAT REQUIRE TESTING, AND THE CONSTRUCTION SEQUENCE OF THOSE COMPONENTS. THE CONTRACTOR SHALL PROVIDE THIS TEST SEQUENCE TO THE OWNER AND ENGINEER FOR REVIEW. THE CONTRACTOR SHALL GIVE THE ENGINEER AND OWNER 48 HOURS NOTICE BEFORE PERFORMING ANY SYSTEM COMPONENT PRESSURE TEST. THE CONTRACTOR SHALL NOT USE A COMPRESSIBLE FLUID, SUCH AS COMPRESSED AIR, FOR THE HYDROSTATIC TESTS. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE ENGINEER AND OWNER THAT THE PRESSURE TEST EQUIPMENT, INCLUDING PRESSURE SENSORS AND GAGES, HAS BEEN CALIBRATED BEFORE USE. THE CONTRACTOR SHALL ISOLATE ALL EQUIPMENT AND PIPING THAT IS NOT UNDERGOING TESTING USING FLANGES OR CAPS, NOT SHUTOFF VALVES. REFER TO SPECIFICATION SECTION 23-21-13 FOR HYDROSTATIC PRESSURE TEST DETAILS.

RENOVATION

THIS PROJECT IS A RENOVATION OF AN EXISTING FACILITY.

BEFORE SUBMITTING HIS BID THE CONTRACTOR SHALL VISIT THE SITE AND BECOME THOROUGHLY FAMILIAR WITH THE EXISTING CONDITIONS UNDER WHICH THE PROJECT IS TO BE COMPLETED.

THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY ASSUMPTIONS, OMISSIONS OR ERRORS MADE AS A RESULT OF FAILURE TO BECOME FULLY FAMILIAR WITH THE EXISTING CONDITIONS.

IT IS NOT THE INTENT OF THESE DRAWINGS TO SHOW EVERY PIECE OF EQUIPMENT, PIPING OR CONDUIT TO BE REMOVED. EQUIPMENT NOT BEING REUSED SHALL BE REMOVED INCLUDING ALL ASSOCIATED HANGERS, SUPPORTS, PIPES, DUCTS, CONDUITS, WIRES AND CONTROLS BACK TO THE POINT OF ORIGIN.

NO EQUIPMENT, PIPING, OR CONDUIT SHALL BE ABANDONED IN PLACE, UNLESS SPECIFICALLY NOTED.

PROPERLY DISPOSE OF ALL DEMOLISHED EQUIPMENT IN COMPLIANCE WITH CODES AND REGULATIONS.

RELOCATE EXISTING EQUIPMENT, PIPING, WIRING AND RELATED SYSTEMS AS REQUIRED FOR CONSTRUCTION. ALL EXISTING SYSTEMS TO BE FULLY OPERATIONAL, INCLUDING RECONNECTION TO SERVICES AND UPGRADED SYSTEMS. ALL RELOCATED EQUIPMENT SHALL BE PROTECTED DURING CONSTRUCTION.

PROVIDE TEMPORARY CONNECTIONS AND SYSTEM MODIFICATIONS AS REQUIRED FOR CONSTRUCTION.

INCLUDE ALL WORK REQUIRED TO ALLOW PHASED CONSTRUCTION WHERE NECESSARY. COORDINATE WITH GENERAL CONTRACTOR/CONSTRUCTION MANAGER FOR PHASING REQUIREMENTS.

REBALANCE EXISTING AIR AND WATER SYSTEMS ASSOCIATED WITH RENOVATIONS, INCLUDING ALL RENOVATED AREAS AND ALL AREAS AFFECTED BY SYSTEM MODIFICATIONS.

ALL EXISTING EQUIPMENT, FIXTURES AND DEVICES TO BE REMOVED SHALL BE FIELD VERIFIED FOR EXACT QUANTITY.

Revision: PROJECT NO: SCSU-2023-02 Date: AFRE-IT, 7.203 Date: AFRE-IT, 7.203 SHEET: Date: SHEET: Date: SHEET: Date: Revision: Date: Revision: Date: Revision: Date: Revision: Date: Revision: Date: Revision: Revision: Revision: Revision: <th></th> <th></th> <th></th> <th></th> <th></th>					
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SHEET: DRAWING MECHANICAL GENERAL NOTES RENOVATIONS STATE UNIVERSITY M0.01 TITLE: FACILITIES PLANNING DEPARTMEN M0.01 SCALE: NTS STATE UNIVERSITY SCALE: NTS SCALE: NTS STATE UNIVERSITY		DATE: APRIL 7, 2023	DAVIS HALL GROUND FLOOR	**************************************	
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SECTION 01 33 00 - SUBMITTAL PROCEDURES

- 1.1 SUBMITTALS
- A. SUBMITTAL SCHEDULE: SUBMIT A SCHEDULE OF SUBMITTALS, ARRANGED IN CHRONOLOGICAL ORDER BY DATES REQUIRED BY CONSTRUCTION SCHEDULE. INCLUDE TIME REQUIRED FOR REVIEW, ORDERING, MANUFACTURING, FABRICATION, AND DELIVERY WHEN ESTABLISHING DATES. INCLUDE ADDITIONAL TIME REQUIRED FOR MAKING CORRECTIONS OR REVISIONS TO SUBMITTALS NOTED BY ENGINEER (AND CONSTRUCTION MANAGER) AND ADDITIONAL TIME FOR HANDLING AND REVIEWING SUBMITTALS REQUIRED BY THOSE CORRECTIONS.
- 1. COORDINATE SUBMITTAL SCHEDULE WITH LIST OF SUBCONTRACTS, THE SCHEDULE OF VALUES. AND CONTRACTOR'S CONSTRUCTION SCHEDULE.
- 2. INITIAL SUBMITTAL: SUBMIT CONCURRENTLY WITH STARTUP CONSTRUCTION SCHEDULE. INCLUDE SUBMITTALS REQUIRED DURING THE FIRST 60 DAYS OF CONSTRUCTION. LIST THOSE SUBMITTALS REQUIRED TO MAINTAIN ORDERLY PROGRESS OF THE WORK AND THOSE REQUIRED EARLY BECAUSE OF LONG LEAD TIME FOR MANUFACTURE OR FABRICATION.
- 3. FINAL SUBMITTAL: SUBMIT CONCURRENTLY WITH THE FIRST COMPLETE SUBMITTAL OF CONTRACTOR'S CONSTRUCTION SCHEDULE.
- a. SUBMIT REVISED SUBMITTAL SCHEDULE TO REFLECT CHANGES IN CURRENT STATUS AND TIMING FOR SUBMITTALS.

1.2 ELECTRONIC SUBMITTALS

A. IDENTIFY AND INCORPORATE INFORMATION IN EACH ELECTRONIC SUBMITTAL FILE AS FOLLOWS:

- 1. ASSEMBLE COMPLETE SUBMITTAL PACKAGE INTO A SINGLE INDEXED FILE INCORPORATING SUBMITTAL REQUIREMENTS OF A SINGLE SPECIFICATION SECTION AND TRANSMITTAL FORM WITH LINKS ENABLING NAVIGATION TO EACH ITEM.
- 2. NAME FILE WITH SUBMITTAL NUMBER OR OTHER UNIQUE IDENTIFIER, INCLUDING REVISION IDENTIFIER.
- 3. TRANSMITTAL FORM FOR ELECTRONIC SUBMITTALS: USE ELECTRONIC FORM ACCEPTABLE TO OWNER, CONTAINING THE FOLLOWING INFORMATION:
- a. PROJECT NAME.
- b. DATE.
- c. NAME AND ADDRESS OF ENGINEER.
- d. NAME OF CONSTRUCTION MANAGER.
- e. NAME OF CONTRACTOR.
- f. NAME OF FIRM OR ENTITY THAT PREPARED SUBMITTAL.
- g. NAMES OF SUBCONTRACTOR, MANUFACTURER, AND SUPPLIER.
- h. CATEGORY AND TYPE OF SUBMITTAL.
- i. SUBMITTAL PURPOSE AND DESCRIPTION.
- i. SPECIFICATION SECTION NUMBER AND TITLE.
- k. SPECIFICATION PARAGRAPH NUMBER OR DRAWING DESIGNATION AND GENERIC NAME FOR EACH OF MULTIPLE ITEMS.
- I. DRAWING NUMBER AND DETAIL REFERENCES, AS APPROPRIATE.
- m. LOCATION(S) WHERE PRODUCT IS TO BE INSTALLED, AS APPROPRIATE.
- n. STANDARD MANUFACTURER'S WARRANTY.
- o. RELATED PHYSICAL SAMPLES SUBMITTED DIRECTLY.
- p. INDICATION OF FULL OR PARTIAL SUBMITTAL.
- q. TRANSMITTAL NUMBER (NUMBERED CONSECUTIVELY).
- r. SUBMITTAL AND TRANSMITTAL DISTRIBUTION RECORD.
- s. OTHER NECESSARY IDENTIFICATION.
- t. REMARKS.
- B. OPTIONS: IDENTIFY OPTIONS REQUIRING SELECTION BY ENGINEER.
- C. DEVIATIONS AND ADDITIONAL INFORMATION: ON AN ATTACHED SEPARATE SHEET, PREPARED ON CONTRACTOR'S LETTERHEAD, RECORD RELEVANT INFORMATION, REQUESTS FOR DATA, REVISIONS OTHER THAN THOSE REQUESTED BY ENGINEER ON PREVIOUS SUBMITTALS, AND DEVIATIONS FROM REQUIREMENTS IN THE CONTRACT DOCUMENTS, INCLUDING MINOR VARIATIONS AND LIMITATIONS. INCLUDE SAME IDENTIFICATION INFORMATION AS RELATED SUBMITTAL.
- D. RE-SUBMITTALS: MAKE RE-SUBMITTALS IN SAME FORM AND NUMBER OF COPIES AS INITIAL SUBMITTAL.
- 1. NOTE DATE AND CONTENT OF PREVIOUS SUBMITTAL.
- 2. NOTE DATE AND CONTENT OF REVISION IN LABEL OR TITLE BLOCK AND CLEARLY INDICATE EXTENT OF REVISION.
- 3. RESUBMIT SUBMITTALS UNTIL THEY ARE MARKED WITH APPROVAL NOTATION FROM ENGINEER'S ACTION STAMP.

SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

1.1 SUBMITTALS

A. SUBMIT SHOP DRAWINGS

- 1. FURNISH COMPLETE CATALOG DATA FOR MATERIALS AND MANUFACTURED ITEMS OF EQUIPMENT TO BE USED IN THE WORK TO ARCHITECT FOR REVIEW WITHIN 30 DAYS AFTER AWARD OF CONTRACT.
- 2. SUBMIT EIGHT (8) COPIES OF DATA IN BINDERS AND INDEX IN SAME ORDER AND NAME AS THEY APPEAR IN SPECIFICATION.
- 3. STATE SIZES, CAPACITIES, BRAND NAMES, MOTOR HP, ACCESSORIES, MATERIALS, GAUGES, DIMENSIONS, AND OTHER PERTINENT INFORMATION.
- 4. LIST CATALOG PAGE NUMBERS OF SUBMITTED ITEMS.
- 5. UNDERLINE APPLICABLE DATA.
- 6. IF MATERIAL OR EQUIPMENT IS NOT AS SPECIFIED OR SUBMITTAL IS NOT COMPLETE, IT WILL BE REJECTED BY THE ARCHITECT.

1.2 QUALITY ASSURANCE

- A. STEEL SUPPORT WELDING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO AWS D1.1, "STRUCTURAL WELDING CODE-STEEL."
- B. STEEL PIPE WELDING: QUALIFY PROCESSES AND OPERATORS ACCORDING TO ASME BOILER AND PRESSURE VESSEL CODE SECTION IX, "WELDING AND BRAZING QUALIFICATIONS."
- 1. COMPLY WITH PROVISIONS IN ASME B31 SERIES, "CODE FOR PRESSURE PIPING."
- 2. CERTIFY THAT EACH WELDER HAS PASSED AWS QUALIFICATION TESTS FOR WELDING

1.3 WARRANTY

GUARANTEES FROM SUPPLIERS AND SUBCONTRACTORS.

1.4 FINAL ACCEPTANCE

BILLED TO THE CONTRACTOR AT THE RATE OF \$150.00 PER HOUR.

1.5 COORDINATION

- CONSTRUCTED.
- ACCESS THAT ARE CONCEALED BEHIND FINISHED SURFACES.

2.1 SUBSTITUTIONS

- INCLUDE:
- ITEM AND PROPOSED SUBSTITUTION.
- B. STATEMENT OF EFFECT ON CONSTRUCTION TIME, COORDINATION WITH OTHER AFFECTED CONTRACT DOCUMENTS ARE NOT REQUIRED; (2) CHANGES ARE IN KEEPING WITH GENERAL IS SATISFIED, ALL AS JUDGED BY ENGINEER:
 - SIMILAR EFFECT IN CONTRACT DOCUMENTS.
- CERTIFIES THAT PROPOSED SUBSTITUTION IS COMPATIBLE.
- SO WARRANTED.
- EXCEPT BY USING PROPOSED SUBSTITUTION.
- APPROVED.
- CONSIDERATIONS.
- ENGINEER THAT:

SECTION 23 05 23 - GENERAL DUTY VALVES FOR HVAC PIPING

- 1.1 GLOBE VALVES

- 1.2 BALL VALVES

PROCESSES INVOLVED AND THAT CERTIFICATION IS CURRENT.

A. IN ADDITION TO GUARANTEES SPECIFIED IN GENERAL CONDITIONS AND OTHER SECTIONS OF DIVISION 23, GUARANTY, HVAC SYSTEMS SHALL BE FREE FROM NOISE IN OPERATION THAT MAY DEVELOP AS A RESULT OF FAILURE TO CONSTRUCT SYSTEM IN ACCORDANCE WITH CONTRACT DOCUMENTS. IN ORDER TO BE PROTECTED, CONTRACTOR SHALL SECURE PROPER

A. THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING A PRELIMINARY INSPECTION TO DETERMINE IF ALL WORK IS COMPLETE. AFTER VERIFICATION, THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH WRITTEN NOTICE THAT THE WORK IS COMPLETE. THE ENGINEER SHALL SCHEDULE AN INITIAL AND FOLLOW-UP VISIT TO VERIFY THAT THE WORK HAS BEEN COMPLETED IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. THE ENGINEER SHALL PREPARE A FORMAL PUNCH LIST OF ANY ITEMS CONSIDERED INCOMPLETE, AND DISTRIBUTE TO THE ARCHITECT, OWNER, AND CONTRACTOR. THE ENGINEER WILL THEN SCHEDULE ANOTHER FIELD VISIT TO VERIFY THE WORK IS COMPLETE. IF THE WORK IS NOT COMPLETE, THE COST FOR ADDITIONAL FIELD VISITS TO VERIFY THAT THE WORK IS COMPLETE SHALL BE

A. ARRANGE FOR PIPE SPACES, CHASES, SLOTS, AND OPENINGS IN BUILDING STRUCTURE DURING PROGRESS OF CONSTRUCTION, TO ALLOW FOR HVAC INSTALLATIONS.

B. COORDINATE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SET SLEEVES IN POURED-IN-PLACE CONCRETE AND OTHER STRUCTURAL COMPONENTS AS THEY ARE

C. COORDINATE REQUIREMENTS FOR ACCESS PANELS AND DOORS FOR HVAC ITEMS REQUIRING

A. SUBSTITUTION REQUEST FROM CONTRACTORS MAY BE SUBMITTED ONLY AFTER THE AWARD OF CONTRACT. REQUESTS SHALL BE IN WRITING ON CONTRACTOR'S LETTERHEAD AND SHALL

CONTRACTOR'S STATEMENT TO THE EFFECT THAT PROPOSED SUBSTITUTION WILL RESULT IN OVERALL WORK EQUAL TO, OR BETTER THAN, WORK ORIGINALLY INTENDED. 2. CONTRACTOR'S DETAILED COMPARISON OF SIGNIFICANT QUALITIES BETWEEN SPECIFIED

WORK, AND COST INFORMATION OR PROPOSAL, SHALL BE INCLUDED. SUBSTITUTION REQUESTS FROM CONTRACTORS WILL ONLY BE CONSIDERED IF: (1) EXTENSIVE REVISIONS TO

INTENT OF CONTRACT DOCUMENTS; (3) REQUESTS ARE SUBMITTED IN A TIMELY AND PROPER MANNER, FULLY DOCUMENTED; AND (4) ONE OR MORE OF FOLLOWING CONDITIONS

WHERE REQUEST IS DIRECTLY RELATED TO THE "OR EQUAL" CLAUSE OR WORDS OF

2. WHERE SPECIFIED PRODUCT, MATERIAL OR METHOD CAN NOT BE PROVIDED WITHIN CONTRACT TIME, BUT NOT AS A RESULT OF CONTRACTOR'S FAILURE TO PURSUE THE WORK PROMPTLY TO COORDINATE VARIOUS ACTIVITIES PROPERLY.

3. WHERE SPECIFIED PRODUCT, MATERIAL OR METHOD CAN NOT BE PROVIDED IN MANNER WHICH IS COMPATIBLE WITH OTHER MATERIALS OF THE WORK AND WHERE CONTRACTOR

4. WHERE SPECIFIED PRODUCT, MATERIAL OR METHOD CAN NOT BE PROPERLY COORDINATED WITH OTHER MATERIALS OF THE WORK AND WHERE CONTRACTOR CERTIFIES THAT PROPOSED SUBSTITUTION CAN BE PROPERLY COORDINATED.

5. WHERE SPECIFIED PRODUCT, MATERIAL OR METHOD CAN NOT BE WARRANTED AS REQUIRED AND WHERE CONTRACTOR CERTIFIES THAT PROPOSED SUBSTITUTION CAN BE

6. WHERE SPECIFIED PRODUCT, MATERIAL OR METHOD CAN NOT BE USED WITHOUT ADVERSELY AFFECTING OWNER'S INSURANCE COVERAGE ON COMPLETED WORK AND WHERE CONTRACTOR CERTIFIES THAT PROPOSED SUBSTITUTION CAN BE SO USED.

WHERE SPECIFIED PRODUCT, MATERIAL OR METHOD WILL ENCOUNTER OTHER SUBSTANTIAL NON-COMPLIANCES WHICH ARE NOT POSSIBLE TO OTHERWISE OVERCOME

8. WHERE SPECIFIED PRODUCT, MATERIAL OR METHOD CAN NOT RECEIVE REQUIRED APPROVAL BY GOVERNING AUTHORITY AND PROPOSED SUBSTITUTION CAN BE SO

9. WHERE A SUBSTANTIAL ADVANTAGE IS OFFERED TO THE OWNER, IN TERMS OF COST, TIME, ENERGY CONSERVATION OR OTHER VALUABLE CONSIDERATIONS, AFTER DEDUCTING OFFSETTING RESPONSIBILITIES THAT THIS CONTRACTOR MAY BE REQUIRED TO BEAR, INCLUDING ADDITIONAL COMPENSATION TO ENGINEER FOR ANY REDESIGN OR EVALUATION SERVICES, INCREASED COST OF OTHER WORK BY OTHER CONTRACTORS, AND SIMILAR

C. THE BURDEN IS UPON THE CONTRACTOR, SUPPLIER AND MANUFACTURER TO SATISFY THE

1. THE PROPOSED SUBSTITUTE IS EQUAL TO, OR SUPERIOR TO, THE ITEM SPECIFIED. 2. THE INTENT OF THE CONTRACT DOCUMENTS, INCLUDING REQUIRED PERFORMANCE, CAPACITY, EFFICIENCY, QUALITY, DURABILITY, SAFETY, FUNCTION, APPEARANCE, SPACE CLEARANCES AND DELIVERY DATE, WILL BE EQUALED OR BETTERED.

D. CHANGES IN WORK OF OTHER TRADES, SUCH AS STRUCTURAL SUPPORTS, WHICH ARE REQUIRED AS A RESULT OF SUBSTITUTION AND THE ASSOCIATED COSTS FOR SUCH CHANGES SHALL BE THE COMPLETE RESPONSIBILITY OF THE CONTRACTOR PROPOSING THE SUBSTITUTION. THERE SHALL BE NO ADDITIONAL EXPENSE TO THE OWNER.

A. 2 INCH AND SMALLER: 150 LB BRONZE BODY AND TRIM, UNION BONNET, RISING STEM AND HANDWHEEL, RENEWABLE BUNA-N DISC, THREADED OR SWEAT ENDS, GLAND PACKED, PACKABLE UNDER PRESSURE. EQUAL TO MILWAUKEE 590S (THREADED) OR 1590S (SWEAT).

B. 2-1/2 INCH AND GREATER: 125 LB IRON BODY, BRONZE TRIM, REPLACEABLE BRONZE DISC, BOLTED BONNET, GLAND PACKED, FLANGED ENDS. EQUAL TO MILWAUKEE F2981.

- A. UP TO 1-1/2 INCHES: BRONZE ONE PIECE BODY, STAINLESS STEEL BALL AND SHAFT, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE, SOLDER OR THREADED ENDS. CLASS 125, MINIMUM SAFE WORKING PRESSURE RATING SHALL BE 125 PSIG. EQUAL TO MILWAUKEE BA-100-S (THREADED) OR BA-150-S (SWEAT).
- 1.3 SWING CHECK VALVES
- A. UP TO 2 INCHES: BRONZE OR IRON BODY, 45 DEGREE SWING DISC, SCREWED ENDS. MINIMUM GAGE WORKING PRESSURE RATING SHALL BE 125 PSIG. EQUAL TO MILWAUKEE FIG 508.
- B. OVER 2 INCHES: IRON BODY, BRONZE TRIM, 45 DEGREE SWING DISC, RENEWABLE DISC AND SEAT, FLANGED ENDS. MINIMUM SAFE WORKING PRESSURE RATING SHALL BE 125 PSIG. EQUAL TO MILWAUKEE F-2974-M.
- 1.4 DRAIN VALVES
- A. EQUAL TO MILWAUKEE FIG. BA-150-H (SWEAT) OR MILWAUKEE FIG. BA-100-H (THREADED) WITH 3/4 INCH HOSE CONNECTION.

SECTION 23 05 29 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 SUBMITTALS 1.1 SUBMITTALS

- A. PRODUCT DATA FOR EACH TYPE OF PRODUCT INDICATED.
- B. SHOP DRAWINGS SHOWING FABRICATION, ASSEMBLY AND INSTALLATION DETAILS AND INCLUDE CALCULATIONS.
- 1.2 PIPE HANGERS AND SUPPORTS
- A. PROVIDE PIPE SUPPORT FOR ALL NEW PIPING
- B. SUPPORT HORIZONTAL PIPING AS FOLLOWS (MINIMUM):

<u>PIPE SIZE</u>	MAX. HANGER SPACING	HANGER DIAMETE
1/2" TO 1-1/4"	6'-0"	3/8"
1-1/2" TO 2"	8'-0"	3/8"
2-1/2" TO 3"	9'-0"	1/2"
4" TO 6"	10'-0"	5/8"
8" TO 12"	12'-0"	7/8"

PART 2 PRODUCTS 2.1 SUPPORT AND ATTACHMENT COMPONENTS

A. GENERAL REQUIREMENTS:

- 1. PROVIDE ALL REQUIRED HANGERS, SUPPORTS, ANCHORS, FASTENERS, FITTINGS, ACCESSORIES, AND HARDWARE AS NECESSARY FOR THE COMPLETE INSTALLATION.
- 2. PROVIDE PRODUCTS LISTED, CLASSIFIED, AND LABELED AS SUITABLE FOR THE PURPOSE INTENDED, WHERE APPLICABLE.
- 3. WHERE SUPPORT AND ATTACHMENT COMPONENT TYPES AND SIZES ARE NOT INDICATED. SELECT IN ACCORDANCE WITH MANUFACTURER'S APPLICATION CRITERIA AS REQUIRED FOR THE LOAD TO BE SUPPORTED WITH A MINIMUM SAFETY FACTOR OF 1.5. INCLUDE CONSIDERATION FOR VIBRATION, EQUIPMENT OPERATION, AND SHOCK LOADS WHERE APPLICABLE.
- 4. STEEL COMPONENTS: USE CORROSION RESISTANT MATERIALS SUITABLE FOR THE ENVIRONMENT WHERE INSTALLED.
- a. ZINC-PLATED STEEL: ELECTROPLATED IN ACCORDANCE WITH ASTM B633.
- b. GALVANIZED STEEL: HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123/A123M OR ASTM A153/A153M.
- B. METAL CHANNEL (STRUT) FRAMING SYSTEMS: FACTORY-FABRICATED CONTINUOUS-SLOT METAL CHANNEL (STRUT) AND ASSOCIATED FITTINGS, ACCESSORIES, AND HARDWARE REQUIRED FOR FIELD-ASSEMBLY OF SUPPORTS.
- 1. COMPLY WITH MFMA-4.
- 2. CHANNEL MATERIAL:
- a. INDOOR DRY LOCATIONS: USE PAINTED STEEL, ZINC-PLATED STEEL, OR GALVANIZED STEEL.
- b. OUTDOOR AND DAMP OR WET INDOOR LOCATIONS: USE GALVANIZED STEEL.
- 3. MINIMUM CHANNEL THICKNESS: STEEL SHEET, 12 GAGE, 0.1046 INCH.
- 4. MINIMUM CHANNEL DIMENSIONS: 1-5/8 INCH WIDTH BY 13/16 INCH HEIGHT.
- C. HANGER RODS: THREADED ZINC-PLATED STEEL UNLESS OTHERWISE INDICATED.
- 1. MINIMUM SIZE, UNLESS OTHERWISE INDICATED OR REQUIRED:
- a. EQUIPMENT SUPPORTS: 1/2 INCH DIAMETER.
- b. PIPING UP TO 1 INCH (27 MM) NOMINAL: 1/4 INCH DIAMETER.
- c. PIPING LARGER THAN 1 INCH (27 MM) NOMINAL: 3/8 INCH DIAMETER.
- d. TRAPEZE SUPPORT FOR MULTIPLE PIPES: 3/8 INCH DIAMETER.
- D. THERMAL INSULATED PIPE SUPPORTS:
- 1. GENERAL CONSTRUCTION AND REQUIREMENTS:
- a. INSULATED PIPE SUPPORTS TO BE PROVIDED AT HANGER, SUPPORT, AND GUIDE LOCATIONS ON PIPE REQUIRING INSULATION OR ADDITIONAL SUPPORT.
- b. SURFACE BURNING CHARACTERISTICS: FLAME SPREAD INDEX/SMOKE DEVELOPED INDEX OF 5/30, MAXIMUM, WHEN TESTED IN ACCORDANCE WITH ASTM E84 OR UL 723.
- c. INSULATION INSERTS TO CONSIST OF RIGID POLYISOCYANURATE (URETHANE) INSULATION SURROUNDED BY A 360 DEGREE, PVC JACKETING.
- 2. PVC JACKET:
- a. PIPE INSULATION PROTECTION SHIELDS TO BE PROVIDED WITH A BALL BEARING HINGE AND LOCKING SEAM.
- b. MOISTURE VAPOR TRANSMISSION: 0.0071 PERM INCH, WHEN TESTED IN ACCORDANCE WITH ASTM E96/E96M.
- c. THICKNESS: 60 MIL.
- 3. PIPE INSULATION PROTECTION SHIELDS TO BE PROVIDED AT THE HANGER POINTS AND GUIDE LOCATIONS ON PIPES REQUIRING INSULATION AS INDICATED ON DRAWINGS.
- E. PIPE SUPPORTS:
- 1. LIQUID TEMPERATURES UP TO 122 DEGREES F:

- a. OVERHEAD SUPPORT: MSS SP-58 TYPES 1, 3 THROUGH 12. b. SUPPORT FROM BELOW: MSS SP-58 TYPES 35 THROUGH 38.
- F. BEAM CLAMPS: MSS SP-58 TYPES 19 THROUGH 23, 25 OR 27 THROUGH 30 BASED ON REQUIRED LOAD.
- 1. MATERIAL: ASTM A36/A36M CARBON STEEL OR ASTM A181/A181M FORGED STEEL.
- 2. PROVIDE CLAMPS WITH HARDENED STEEL CUP-POINT SET SCREWS AND LOCK-NUTS FOR ANCHORING IN PLACE.
- G. RISER CLAMPS:
- 1. PROVIDE COPPER PLATED CLAMPS FOR COPPER TUBING SUPPORT
- 2. FOR INSULATED PIPE RUNS, PROVIDE TWO BOLT-TYPE CLAMPS DESIGNED FOR INSTALLATION UNDER INSULATION.
- H. OFFSET PIPE CLAMPS: DOUBLE-LEG DESIGN TWO-PIECE PIPE CLAMP.
- I. STRUT CLAMPS: TWO-PIECE PIPE CLAMP.
- J. INSULATION CLAMPS: TWO BOLT-TYPE CLAMPS DESIGNED FOR INSTALLATION UNDER INSULATION.
- K. PIPE HANGERS: FOR A GIVEN PIPE RUN USE HANGERS OF THE SAME TYPE AND MATERIAL
- 1. MATERIAL: MALLEABLE IRON, ASTM A47/A47M; OR CARBON STEEL, ASTM A36/A36M. 2. PROVIDE COATED OR PLATED HANGERS TO ISOLATE STEEL HANGERS FROM DISSIMILAR METAL TUBE OR PIPE.
- L. INTERMEDIATE PIPE GUIDES: USE PIPE CLAMPS WITH OVERSIZE PIPE SLEEVE THAT PROVIDES CLEARANCE AROUND PIPE.
- 1. PIPE DIAMETER 6 INCHES AND SMALLER: PROVIDE MINIMUM CLEARANCE OF 0.16 INCH. 2. PIPE DIAMETER 8 INCHES: PROVIDE U-BOLTS WITH DOUBLE NUTS PROVIDING MINIMUM CLEARANCE OF 0.28 INCH.
- 3. PIPE DIAMETER 8 INCHES: 0.625 INCH U-BOLT.
- 4. PIPE DIAMETER 10 INCHES: 0.75 INCH U-BOLT.
- 5. PIPE DIAMETER 12 TO 16 INCHES: 0.875 INCH U-BOLT.
- 6. PIPE DIAMETER 18 TO 30 INCHES: 1 INCH U-BOLT.
- M. PIPE ALIGNMENT GUIDES: GALVANIZED STEEL.
- 1. PIPE DIAMETER 8 INCHES AND SMALLER: SPIDER OR SLEEVE TYPE.
- N. DIELECTRIC BARRIERS: PROVIDE BETWEEN METALLIC SUPPORTS AND METALLIC PIPING AND ASSOCIATED ITEMS OF DISSIMILAR TYPE; ACCEPTABLE DIELECTRIC BARRIERS INCLUDE RUBBER OR PLASTIC SHEETS OR COATINGS ATTACHED SECURELY TO PIPE OR ITEM.
- O. ANCHORS AND FASTENERS:

ANCHORS.

- 1. UNLESS OTHERWISE INDICATED AND WHERE NOT OTHERWISE RESTRICTED, USE THE ANCHOR AND FASTENER TYPES INDICATED FOR THE SPECIFIED APPLICATIONS.
- 2. CONCRETE: USE PRESET CONCRETE INSERTS, EXPANSION ANCHORS, OR SCREW
- 3. SOLID OR GROUT-FILLED MASONRY: USE EXPANSION ANCHORS OR SCREW ANCHORS.
- 4. HOLLOW MASONRY: USE TOGGLE BOLTS.
- 5. HOLLOW STUD WALLS: USE TOGGLE BOLTS.
- 6. STEEL: USE BEAM CLAMPS, MACHINE BOLTS, OR WELDED THREADED STUDS.
- 7. SHEET METAL: USE SHEET METAL SCREWS.
- 8. WOOD: USE WOOD SCREWS.
- 9. PLASTIC AND LEAD ANCHORS ARE NOT PERMITTED.
- 10. PRESET CONCRETE INSERTS: CONTINUOUS METAL CHANNEL (STRUT) AND SPOT INSERTS SPECIFICALLY DESIGNED TO BE CAST IN CONCRETE CEILINGS, WALLS, AND FLOORS.
- a. COMPLY WITH MFMA-4.
- b. CHANNEL MATERIAL: USE GALVANIZED STEEL
- c. MANUFACTURER: SAME AS MANUFACTURER OF METAL CHANNEL (STRUT) FRAMING SYSTEM
- PART 3 EXECUTION 3.1 EXAMINATION
- A. VERIFY THAT FIELD MEASUREMENTS ARE AS INDICATED.
- B. VERIFY THAT MOUNTING SURFACES ARE READY TO RECEIVE SUPPORT AND ATTACHMENT COMPONENTS.
- C. VERIFY THAT CONDITIONS ARE SATISFACTORY FOR INSTALLATION PRIOR TO STARTING WORK. 3.2 INSTALLATION
- A. INSTALL PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- B. PROVIDE INDEPENDENT SUPPORT FROM BUILDING STRUCTURE. DO NOT PROVIDE SUPPORT FROM PIPING, DUCTWORK, CONDUIT, OR OTHER SYSTEMS.
- C. UNLESS SPECIFICALLY INDICATED OR APPROVED BY ENGINEER, DO NOT PROVIDE SUPPORT FROM SUSPENDED CEILING SUPPORT SYSTEM OR CEILING GRID.
- D. DO NOT PENETRATE OR OTHERWISE NOTCH OR CUT STRUCTURAL MEMBERS WITHOUT APPROVAL OF STRUCTURAL ENGINEER.
- E. PROVIDE THERMAL INSULATED PIPE SUPPORTS COMPLETE WITH HANGERS AND ACCESSORIES. INSTALL THERMAL INSULATED PIPE SUPPORTS DURING THE INSTALLATION OF THE PIPING SYSTEM.
- F. EQUIPMENT SUPPORT AND ATTACHMENT:
- 1. USE METAL FABRICATED SUPPORTS OR SUPPORTS ASSEMBLED FROM METAL CHANNEL (STRUT) TO SUPPORT EQUIPMENT AS REQUIRED.
- 2. USE METAL CHANNEL (STRUT) SECURED TO STUDS TO SUPPORT EQUIPMENT SURFACE-MOUNTED ON HOLLOW STUD WALLS WHEN WALL STRENGTH IS NOT SUFFICIENT TO RESIST PULL-OUT.
- 3. USE METAL CHANNEL (STRUT) TO SUPPORT SURFACE-MOUNTED EQUIPMENT IN WET OR DAMP LOCATIONS TO PROVIDE SPACE BETWEEN EQUIPMENT AND MOUNTING SURFACE.
- 4. SECURELY FASTEN FLOOR-MOUNTED EQUIPMENT. DO NOT INSTALL EQUIPMENT SUCH THAT IT RELIES ON ITS OWN WEIGHT FOR SUPPORT.
- G. PRESET CONCRETE INSERTS: USE MANUFACTURER PROVIDED CLOSURE STRIPS TO INHIBIT CONCRETE SEEPAGE DURING CONCRETE POUR.
- H. SECURE FASTENERS ACCORDING TO MANUFACTURER'S RECOMMENDED TORQUE SETTINGS. REMOVE TEMPORARY SUPPORTS.

PROJECT NO.: SCSU-2023-02		
DATE: APRIL 7, 2023		
DRAWING MECHANICAL SPECIFICATIONS	RENOVATIONS	VIAIE UNIVERSIIY
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1.1 E	<u>SECTION 23 05 53 – IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT</u>			b.	RESTRAINTS DETAILING COMPLIA DETAILED SCHEDULES OF FLEXI VIBRATION ISOLATORS AND SEIS
Α.	METAL LABELS FOR EQUIPMENT:		2.	S⊦	IOP DRAWINGS:
	 MATERIAL AND THICKNESS: STAINLESS STEEL, 0.025-INCH MINIMUM THICKNESS, AND HAVING PREDRILLED OR STAMPED HOLES FOR ATTACHMENT HARDWARE. MINIMUM LABEL SIZE: LENGTH AND WIDTH VARY FOR REQUIRED LABEL CONTENT. BUT 			a.	SUBMIT FABRICATION DETAILS F STRUCTURAL MEMBER SIZES AN
	NOT LESS THAN 2-1/2 BY 3/4 INCH.			b.	PROVIDE ALL DETAILS OF SUSP
	3. MINIMUM LETTER SIZE: 1/4 INCH FOR NAME OF UNITS IF VIEWING DISTANCE IS LESS THAN 24 INCHES, 1/2 INCH FOR VIEWING DISTANCES UP TO 72 INCHES, AND PROPORTIONATELY LARGER LETTERING FOR GREATER VIEWING DISTANCES. INCLUDE SECONDARY LETTERING TWO-THIRDS TO THREE-FOURTHS THE SIZE OF PRINCIPAL LETTERING.			c.	WHERE WALLS, FLOORS, SLABS SEISMIC RESTRAINT LOCATIONS, DUCTS, AND PIPE MUST BE INC ACCEPTED FOR INSTALLATION.
	 FASTENERS: STAINLESS-STEEL SELF-TAPPING SCREWS. ADHESIVE: CONTACT-TYPE PERMANENT ADHESIVE, COMPATIBLE WITH LABEL AND WITH SUBSTRATE. 			d.	SUPPORT POINTS. PROVIDE SPECIFIC DETAILS OF
В.	LABEL CONTENT: INCLUDE EQUIPMENT'S DRAWING DESIGNATION OR UNIQUE EQUIPMENT NUMBER, DRAWING NUMBERS WHERE EQUIPMENT IS INDICATED (PLANS, DETAILS, AND			e.	NUMBER, SIZE AND LOCATIONS SUBMITTALS FOR ALL DIRECTION DEFLECTION CURVES UP TO 1/2
	SCHEDULES), PLUS THE SPECIFICATION SECTION NUMBER AND TITLE WHERE EQUIPMENT IS SPECIFIED.		3.	DE	LEGATED SEISMIC ANALYSIS:
C.	EQUIPMENT LABEL SCHEDULE: FOR EACH ITEM OF EQUIPMENT TO BE LABELED, ON A 8–1/2–BY–11–INCH (A4) BOND PAPER, TABULATE EQUIPMENT IDENTIFICATION NUMBER AND IDENTIFY DRAWING NUMBERS WHERE EQUIPMENT IS INDICATED (PLANS, DETAILS, AND SCHEDULES), PLUS THE SPECIFICATION SECTION NUMBER AND TITLE WHERE EQUIPMENT IS SPECIFIED. EQUIPMENT SCHEDULE SHALL BE INCLUDED IN THE OPERATION AND MAINTENANCE MANUAL.			a. b. c.	SEISMIC RESTRAINT CALCULATION EQUIPMENT TO THE STRUCTURE REGISTERED PROFESSIONAL ENO DESIGN EXPERIENCE, LICENSED ALL RESTRAINING DEVICES SHA OSHPD OR SOME OTHER RECOM
1.2	PIPE LABELS				RESTRAINT RATINGS. PREAPPRO
A.	GENERAL REQUIREMENTS FOR MANUFACTURED PIPE LABELS: PREPRINTED, COLOR-CODED, WITH LETTERING INDICATING SERVICE, AND SHOWING FLOW DIRECTION.				PREFERRED TO PREAPPROVALS DEVICES ARE NOT AVAILABLE, PREFERRED. CALCULATIONS (IN
В.	PRE-TENSIONED PIPE LABELS: PRE-COILED, SEM-IRIGID PLASTIC FORMED TO COVER FULL CIRCUMFERENCE OF PIPE AND TO ATTACH TO PIPE WITHOUT FASTENERS OR ADHESIVE.				LOADINGS) TO SUPPORT SEISMI REGISTERED PROFESSIONAL ENC DESIGN EXPERIENCE AND LICEN
C.	SELF-ADHESIVE PIPE LABELS: PRINTED PLASTIC WITH CONTACT-TYPE, PERMANENT-ADHESIVE BACKING.				AND CALCULATIONS MUST INCL ONE TEST OR ANALYSIS AT 45
D.	PIPE LABEL CONTENTS: INCLUDE IDENTIFICATION OF PIPING SERVICE USING SAME DESIGNATIONS OR ABBREVIATIONS AS USED ON DRAWINGS, PIPE SIZE, AND AN ARROW INDICATING FLOW DIRECTION.			d.	ANALYSIS MUST INDICATE CALC CAPACITY OF MATERIALS UTILIZ STRUCTURE. ANALYSIS MUST D
	 FLOW-DIRECTION ARROWS: INTEGRAL WITH PIPING SYSTEM SERVICE LETTERING TO ACCOMMODATE BOTH DIRECTIONS, OR AS SEPARATE UNIT ON EACH PIPE LABEL TO INDICATE FLOW DIRECTION. 	1.2	MA	ANUF	ACTURER'S RESPONSIBILITY
	2. LETTERING SIZE: AT LEAST 1-1/2 INCHES HIGH.	A.	MA	ANUF	ACTURER OF VIBRATION ISOLATIO
1.3	VALVE TAGS		ı⊢ 1.	DE	TERMINE VIBRATION ISOLATION A
Α.	VALVE TAGS: STAMPED OR ENGRAVED WITH 1/4-INCH LETTERS FOR PIPING SYSTEM ABBREVIATION AND 1/2-INCH NUMBERS. 1. TAG MATERIAL: STAINLESS STEEL, 0.025-INCH MINIMUM THICKNESS, AND HAVING		2. 3.		OVIDE VIBRATION ISOLATION AND
	PREDRILLED OR STAMPED HOLES FOR ATTACHMENT HARDWARE. 2. FASTENERS: BRASS S-HOOK.		4.	PR IN:	OVIDE INSTALLATION INSTRUCTION SURE PROPER INSTALLATION AND
В.	VALVE SCHEDULES: FOR EACH PIPING SYSTEM, ON A 8-1/2-BY-11-INCH (A4) BOND PAPER, TABULATE VALVE NUMBER, PIPING SYSTEM, SYSTEM ABBREVIATION (AS SHOWN ON VALVE TAG), LOCATION OF VALVE (ROOM OR SPACE), NORMAL-OPERATING POSITION (OPEN, CLOSED, OR MODULATING), AND VARIATIONS FOR IDENTIFICATION. MARK VALVES FOR EMERGENCY SHUTOFF AND SIMILAR SPECIAL USES.		5.	PR ST IN	OVIDE FIELD SURVEY OF THE INS ATING THAT THE SEISMIC AND VI ACCORDANCE WITH THE MANUFA
	1. VALVE-TAG SCHEDULE SHALL BE INCLUDED IN THE OPERATION AND MAINTENANCE MANUAL.			<u>S</u>	<u>ECTION 23 05 93 – TES</u> F0
2.1 F	PIPE LABEL INSTALLATION	1.1	SUM	MAR	
Α.	LOCATE PIPE LABELS WHERE PIPING IS EXPOSED OR ABOVE ACCESSIBLE CEILINGS IN FINISHED SPACES; MACHINE ROOMS; ACCESSIBLE MAINTENANCE SPACES SUCH AS SHAFTS, TUNNELS, AND PLENUMS; AND EXTERIOR EXPOSED LOCATIONS AS FOLLOWS: 1. NEAR FACH VALVE AND CONTROL DEVICE.	A.	A T⊢ DA	POR IE M MPE	TION OF THE EXISTING DUCTWOR ECHANICAL CONTRACTOR SHALL TRS AS SHOWN ON THE DRAWING
	2. NEAR EACH BRANCH CONNECTION, EXCLUDING SHORT TAKEOFFS FOR FIXTURES AND	В.	T⊢		ONTRACTOR SHALL HIRE A DUCT
	 IERMINAL UNITS. WHERE FLOW PATTERN IS NOT OBVIOUS, MARK EACH PIPE AT BRANCH. NEAR PENETRATIONS THROUGH WALLS, FLOORS, CEILINGS, AND INACCESSIBLE ENCLOSURES. 		AL CL "A	.L E. .EAN .SSE	LINESS SHALL BE IN ACCORDANCE SSMENT, CLEANING AND RESTORA
	4. AT ACCESS DOORS, MANHOLES, AND SIMILAR ACCESS POINTS THAT PERMIT VIEW OF CONCEALED PIPING.		LE 0. ¹	VEL: 75M	NET WEIGHT OF DEBRIS COLLEC
	5. NEAR MAJOR EQUIPMENT ITEMS AND OTHER POINTS OF ORIGINATION AND TERMINATION.	C.	T⊢	IE C	ONTRACTOR SHALL CONDUCT DU
	 SPACED AT MAXIMUM INTERVALS OF 50 FEET ALONG EACH RUN. REDUCE INTERVALS TO 25 FEET IN AREAS OF CONGESTED PIPING AND EQUIPMENT. 		"H RE	VAC PRE	AIR DUCT LEAKAGE TEST MANU SENTATIVE DUCT SECTIONS TOTA
	7. ON PIPING ABOVE REMOVABLE ACOUSTICAL CEILINGS, OMIT INTERMEDIATELY SPACED LABELS.		IN: TE	STAL STS	LED DUCT AREA. TEST FOR LEAF AT STATIC PRESSURES EQUAL T
В.	PIPE LABEL COLOR SCHEDULE:	D.	T⊢	IE C	ONTRACTOR SHALL BE RESPONSI
	a. BACKGROUND COLORY YELLOW		23	53113	3 METAL DUCTS FOR LEAKAGE C
	b. LETTER COLOR: BLACK.	E.	TA Sì CC	NBC STEI NTR	ONTRACTOR SHALL COORDINATE MS TESTING, ADJUSTING, AND BA OL DAMPERS IN THE SYSTEM SH
	2. REFRIGERANT PIPING: a. BACKGROUND COLOR: GREEN.	1.2	000	RDIN	ATION
	b. LETTER COLOR: WHITE.	A.	NC TE	otice St i	: PROVIDE SEVEN (7) DAYS' AD DATES AND TIMES.
	<u>SECTION 23 05 48 – VIBRATION ISOLATION AND SEISMIC</u> <u>RESTRAINTS FOR HVAC</u>	В.	PE Sì	:RFO 'STE	RM TAB AFTER LEAKAGE AND PF MS HAVE BEEN SATISFACTORILY
.1	SUBMITTAL DATA REQUIREMENTS	1.3	QUA	LITY	ASSURANCE
Α.	THE MANUFACTURER OF VIBRATION ISOLATION AND SEISMIC RESTRAINTS SHALL PROVIDE	A.	TA	вс	ONTRACTOR QUALIFICATIONS: EN
	SUBMITTALS FOR PRODUCTS AS FOLLOWS:			- ·	

- 4. DESCRIPTIVE DATA:
- a. CATALOG CUTS OR DATA SHEETS ON VIBRATION ISOLATORS AND SPECIFIC

OR TABB.

2. TAB TECHNICIAN: EMPLOYEE OF THE TAB CONTRACTOR AND CERTIFIED BY NEBB OR

NCE WITH THE SPECIFICATION.

BLE AND RIGIDLY MOUNTED EQUIPMENT, SHOWING SMIC RESTRAINTS BY REFERENCING NUMBERED

OR EQUIPMENT BASES INCLUDING DIMENSIONS, ID SUPPORT POINT LOCATIONS.

- ENSION AND SUPPORT FOR CEILING HUNG EQUIPMENT. OR SUPPLEMENTARY STEEL WORK ARE USED FOR DETAILS OF ACCEPTABLE ATTACHMENT METHODS FOR LUDED AND APPROVED BEFORE THE CONDITION IS RESTRAINT MANUFACTURERS' SUBMITTALS MUST
- DS AND SEISMIC LOADS AT ALL ATTACHMENT AND SEISMIC RESTRAINTS AND ANCHORS; INCLUDE
- FOR EACH PIECE OF EQUIPMENT. NAL SEISMIC SNUBBERS SHALL INCLUDE THE LOAD 2" DEFLECTION IN THE X, Y AND Z PLANES.
- OR ALL NATURAL GAS PIPING.
- INS MUST BE PROVIDED FOR ALL CONNECTIONS OF CALCULATIONS MUST BE STAMPED BY A GINEER WITH AT LEAST FIVE YEARS OF SEISMIC
- IN THE STATE OF THE JOB LOCATION. L HAVE A PREAPPROVAL NUMBER FROM CALIFORNIA NIZED GOVERNMENT AGENCY SHOWING MAXIMUM
- VALS BASED ON INDEPENDENT TESTING ARE BASED ON CALCULATIONS. WHERE PREAPPROVED SUBMITTALS BASED ON INDEPENDENT TESTING ARE CLUDING THE COMBINING OF TENSILE AND SHEAR RESTRAINT DESIGNS MUST BE STAMPED BY A INEER WITH AT LEAST FIVE YEARS OF SEISMIC SED IN THE STATE OF THE JOB LOCATION. TESTING
- UDE BOTH SHEAR AND TENSILE LOADS AS WELL AS DEGREES TO THE WEAKEST MODE. CULATED DEAD LOADS, STATIC SEISMIC LOADS AND
- ED FOR CONNECTIONS TO EQUIPMENT AND ETAIL ANCHORING METHODS, BOLT DIAMETER, ENGTH.
- ON AND SEISMIC CONTROL EQUIPMENT SHALL HAVE
- ND SEISMIC RESTRAINT SIZES AND LOCATIONS.
- SEISMIC RESTRAINTS AS SCHEDULED OR SPECIFIED. RIALS IF REQUIRED FOR RESTRAINT OF UNISOLATED
- NS, DRAWINGS AND TRAINED FIELD SUPERVISION TO PERFORMANCE.
- TALLATION AND SUBMIT LETTER TO ENGINEER BRATION ISOLATION EQUIPMENT HAS BEEN INSTALLED CTURER'S INSTRUCTIONS.

TING ADJUSTING AND BALANCING <u>or hvac</u>

- SHALL BE REUSED AS SHOWN ON THE DRAWINGS. BE RESPONSIBLE FOR INSTALLING ADDITIONAL VOLUME TO AID BALANCING.
- CLEANING SUBCONTRACTOR TO THOROUGHLY CLEAN ORE TESTING, ADJUSTING, AND BALANCING. WITH "VACUUM TEST" IN NADCA ACR, TION OF HVAC SYSTEMS." ACCEPTABLE CLEANLINESS TED ON THE FILTER MEDIA SHALL NOT EXCEED
- CT LEAKAGE TEST IN COMPLIANCE WITH SMACNA'S AL." SUBMIT A TEST REPORT. FOR ALL CUTS, TEST ING NO LESS THAN 50 PERCENT OF TOTAL KS BEFORE APPLY EXTERNAL INSULATION. CONDUCT
- TO MAX DESIGN PRESSURE OF THE SYSTEM. BLE FOR RESEALING LEAKS. REFER TO SECTION LASS REQUIREMENTS.
- WITH THE MECHANICAL CONTRACTOR FOR HVAC LANCING WORK. PRIOR TO BALANCING, THE ALL IALL BE OPEN.
- ANCE NOTICE FOR EACH TEST. INCLUDE SCHEDULED
- RESSURE TESTS ON AIR AND WATER DISTRIBUTION COMPLETED.
- NGAGE A TAB ENTITY CERTIFIED BY NEBB OR TABB. 1. TAB FIELD SUPERVISOR: EMPLOYEE OF THE TAB CONTRACTOR AND CERTIFIED BY NEBB

TABB AS A TAB TECHNICIAN.

- 3. FINAL TAB SUBMITTAL: SUBMIT CONCURRENTLY WITH THE FIRST COMPLETE SUBMITTAL OF CONTRACTOR'S CONSTRUCTION SCHEDULE.
- a. SUBMIT REVISED SUBMITTAL SCHEDULE TO REFLECT CHANGES IN CURRENT STATUS AND TIMING FOR SUBMITTALS.
- b. ACTUAL FLOW RATES SHALL BE WITHIN 10% OF DESIGN FLOW RATES.
- 1.4 GENERAL PROCEDURES FOR TESTING AND BALANCING
- A. PERFORM TESTING AND BALANCING PROCEDURES ON EACH SYSTEM ACCORDING TO THE PROCEDURES CONTAINED IN ASHRAE 111, NEBB'S "PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS", SMACNA'S "HVAC SYSTEMS -TESTING, ADJUSTING, AND BALANCING", AND IN THIS SECTION.
- 1. COMPLY WITH REQUIREMENTS IN ASHRAE 62.1. SECTION 7.2.2 "AIR BALANCING."
- B. CUT INSULATION, DUCTS, PIPES, AND EQUIPMENT CABINETS FOR INSTALLATION OF TEST PROBES TO THE MINIMUM EXTENT NECESSARY FOR TAB PROCEDURES.
- 1. AFTER TESTING AND BALANCING, INSTALL TEST PORTS AND DUCT ACCESS DOORS THAT COMPLY WITH REQUIREMENTS IN SECTION 233113 "METAL DUCTS."
- 2. INSTALL AND JOIN NEW INSULATION THAT MATCHES REMOVED MATERIALS. RESTORE INSULATION, COVERINGS, VAPOR BARRIER, AND FINISH ACCORDING TO SECTION 230713 "EXTERIOR DUCT INSULATION" AND SECTION 230700 "HVAC INSULATION".
- C. MARK EQUIPMENT AND BALANCING DEVICES, INCLUDING VALVE POSITION INDICATORS, FAN-SPEED-CONTROL LEVERS, AND SIMILAR CONTROLS AND DEVICES, WITH PAINT OR OTHER SUITABLE, PERMANENT IDENTIFICATION MATERIAL TO SHOW FINAL SETTINGS.
- D. TAKE AND REPORT TESTING AND BALANCING MEASUREMENTS IN INCH-POUND (IP) UNITS.
- 1.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS
- A. ADJUST FANS TO DELIVER TOTAL INDICATED AIRFLOWS WITHIN THE MAXIMUM ALLOWABLE FAN SPEED LISTED BY FAN MANUFACTURER.
- 1. MEASURE TOTAL AIRFLOW.
- a. WHERE SUFFICIENT SPACE IN DUCTS IS UNAVAILABLE FOR PITOT-TUBE TRAVERSE MEASUREMENTS, MEASURE AIRFLOW AT TERMINAL OUTLETS AND INLETS AND CALCULATE THE TOTAL AIRFLOW.
- 2. MEASURE FAN STATIC PRESSURES AS FOLLOWS TO DETERMINE ACTUAL STATIC PRESSURE:
 - a. MEASURE OUTLET STATIC PRESSURE AS FAR DOWNSTREAM FROM THE FAN AS PRACTICAL AND UPSTREAM FROM RESTRICTIONS IN DUCTS SUCH AS ELBOWS AND TRANSITIONS.
- b. MEASURE STATIC PRESSURE DIRECTLY AT THE FAN OUTLET OR THROUGH THE FLEXIBLE CONNECTION.
- c. MEASURE INLET STATIC PRESSURE OF SINGLE-INLET FANS IN THE INLET DUCT AS NEAR THE FAN AS POSSIBLE, UPSTREAM FROM THE FLEXIBLE CONNECTION, AND DOWNSTREAM FROM DUCT RESTRICTIONS.
- d. MEASURE INLET STATIC PRESSURE OF DOUBLE-INLET FANS THROUGH THE WALL OF THE PLENUM THAT HOUSES THE FAN.
- e. REPORT THE CLEANLINESS STATUS OF FILTERS AND THE TIME STATIC PRESSURES ARE MEASURED.
- 3. MEASURE STATIC PRESSURES ENTERING AND LEAVING OTHER DEVICES, SUCH AS SOUND TRAPS, HEAT-RECOVERY EQUIPMENT, AND AIR WASHERS, UNDER FINAL BALANCED CONDITIONS.
- 4. REVIEW RECORD DOCUMENTS TO DETERMINE VARIATIONS IN DESIGN STATIC PRESSURES VERSUS ACTUAL STATIC PRESSURES. CALCULATE ACTUAL SYSTEM-EFFECT FACTORS. RECOMMEND ADJUSTMENTS TO ACCOMMODATE ACTUAL CONDITIONS.
- 5. DO NOT MAKE FAN-SPEED ADJUSTMENTS THAT RESULT IN MOTOR OVERLOAD. CONSULT EQUIPMENT MANUFACTURERS ABOUT FAN-SPEED SAFETY FACTORS. MEASURE AMPERAGE IN FULL-COOLING, FULL-HEATING, ECONOMIZER, AND ANY OTHER OPERATING MODE TO DETERMINE THE MAXIMUM REQUIRED BRAKE HORSEPOWER.
- 1.6 REPORTING
- A. INITIAL CONSTRUCTION-PHASE REPORT: BASED ON EXAMINATION OF THE CONTRACT DOCUMENTS AS SPECIFIED IN "EXAMINATION" ARTICLE, PREPARE A REPORT ON THE ADEQUACY OF DESIGN FOR SYSTEMS' BALANCING DEVICES. RECOMMEND CHANGES AND ADDITIONS TO SYSTEMS' BALANCING DEVICES TO FACILITATE PROPER PERFORMANCE MEASURING AND BALANCING. RECOMMEND CHANGES AND ADDITIONS TO HVAC SYSTEMS AND GENERAL CONSTRUCTION TO ALLOW ACCESS FOR PERFORMANCE MEASURING AND BALANCING DEVICES.
- 1.7 FINAL REPORT
- A. FINAL REPORT: PREPARE A CERTIFIED WRITTEN REPORT; TABULATE AND DIVIDE THE REPORT INTO SEPARATE SECTIONS FOR TESTED SYSTEMS AND BALANCED SYSTEMS.
- 1. INCLUDE A CERTIFICATION SHEET AT THE FRONT OF THE REPORT'S BINDER, SIGNED AND SEALED BY THE CERTIFIED TESTING AND BALANCING ENGINEER.
- 2. INCLUDE A LIST OF INSTRUMENTS USED FOR PROCEDURES, ALONG WITH PROOF OF CALIBRATION.

SECTION 23 07 00 - HVAC INSULATION

- PART 1 PRODUCTS
- 1.1 HVAC PIPING
 - 1. INSULATION FOR THE HYDRONIC HEATING AND CHILLER PIPING SHALL BE RIGID MOLDED, NONCOMBUSTIBLE, WITH WICKING MATERIAL TO TRANSPORT CONDENSED WATER TO THE OUTSIDE OF THE SYSTEM FOR EVAPORATION TO THE ATMOSPHERE.
 - 2. INSULATION THICKNESS FOR HYDRONIC HEATING SHALL BE:

FLUID TYPE	PIPE SIZE (IN.)	INSULATION	THICKNESS
HWS/R (141°F – 200°F)	< 1"		2.5"
	1" - 1-1/2"		2.5″
	1-1/2" - 4"		2.5″

NOTE: THICKNESS IS BASED ON INSULATION CONDUCTIVITY OF 0.27 BTU X IN/H.FT.2. IF INSULATION CONDUCTIVITY IS GREATER, ADJUST THICKNESS TO MEET HEAT LOSS REQUIREMENTS.

2.04 PIPE HANGERS AND SUPPORTS.

- A. PROVIDE HANGERS AND SUPPORTS THAT COMPLY WITH MSS SP-58.
- 1. IF TYPE OF HANGER OR SUPPORT OF A PARTICULAR SITUATION IS NOT INDICATED, SELECT APPROPRIATE TYPE USING MSS-SP-58 RECOMMENDATIONS.
- B. IN GROOVED INSTALLATIONS, USE RIGID COUPLINGS WITH OFFSETTING ANGLE-PATTERN BOLT PADS OR WITH WEDGE-SHAPED GROOVES IN HEADER PIPING TO PERMIT SUPPORT AND HANGING IN ACCORDANCE WITH ASME B31.9.
- 2.05 UNIONS, FLANGES, MECHANICAL COUPLINGS, AND DIELECTRIC CONNECTIONS
- A. MECHANICAL COPLINGS FOR GROOVED AND SHOULDERED JOINTS, TWO OR MORE CURVED HOUSING SEGMENTS WITH CONTINUOUS KEY TO ENGAGE PIPE GROOVE. CIRCULAR C-PROFILE GASKET, AND BOLTS TO SECURE AND COMPRESS GASKET.
- 1. DIMENSIONS AND TESTING: IN ACCORDANCE WITH AWWA C606.
- 2. MECHANICAL COUPLINGS: COMPLY WITH ASTM F1476
- 3. BOLTS AND NUTS: HOT DIPPED GALVANIZED OR ZINC-ELECTROPLATED STEEL.
- 4. WHEN PIPE IS FIELD GROOVED: PROVIDE COUPLING MANUFACTURER'S GROOVING TOOLS.

SECTION 23 31 13 - METAL DUCTS

1.1 MATERIALS

PROVIDE THE MATERIALS LISTED BELOW AND ANY ACCESSORIES NOT LISTED FOR THE COMPLETE OPERATION OF SAID MATERIAL.

- A. GENERAL: NON-COMBUSTIBLE OR CONFORMING TO REQUIREMENTS FOR CLASS 1 AIR DUCT MATERIALS, OR UL 181. EXCEPT AS NOTED OR SPECIFIED OTHERWISE, DUCTS SHALL BE FABRICATED FOR SMACNA DUCT PRESSURE CLASS 2" W.G. WITH CLASS B SEALS. FABRICATE FOR HIGHER PRESSURE CLASS WHERE SHOWN. FABRICATE BRANCH DUCTS TO INDIVIDUAL DIFFUSERS FOR 1" W.G. PRESSURE CLASS WITH CLASS C SEALS.
- E. SHOP DRAWINGS AND COORDINATION DRAWINGS
- 1. FABRICATION, ASSEMBLY, AND INSTALLATION, INCLUDING PLANS, ELEVATIONS, SECTIONS,
- 2. DUCT LAYOUT INDICATING SIZES, CONFIGURATION, LINER MATERIAL, AND STATIC
- 3. PENETRATIONS THROUGH FIRE-RATED AND OTHER PARTITIONS.

COMPONENTS, AND ATTACHMENTS TO OTHER WORK.

- 4. LOCATIONS FOR DUCT ACCESSORIES, INCLUDING DAMPERS, AND TURNING VANES.
- 5. HANGERS AND SUPPORTS.

PRESSURE CLASSES.

- 6. DUCT INSTALLATION IN CONGESTED SPACES, INDICATING COORDINATION WITH GENERAL CONSTRUCTION, BUILDING COMPONENTS, AND OTHER BUILDING SERVICES. INDICATE ANY PROPOSED CHANGES TO DUCT LAYOUT.
- F. DUCT MATERIAL
- 1. STEEL: ASTM A525 GALVANIZED STEEL SHEET, LOCK-FORMING QUALITY, HAVING ZINC COATING OF 1.25 OZ PER SQ. FT. FOR EACH SIDE. MINIMUM 26 GAUGE.
- 2. SPIRAL ROUND DUCTWORK
- a. ROUND SUPPLY DUCTWORK SHALL BE OF SPIRAL LOCKSEAM CONSTRUCTION. LONGITUDINAL SEAM AND SPIRAL LOCKSEAM WITH STANDING RIB CONSTRUCTION NOT ALLOWED.
- b. EQUAL TO UNITED MCGILL, SEMCO, LINDAB, EASTERN SHEETMETAL OR SHOP FABRICATED APPROVED EQUAL
- c. FITTINGS: EQUAL TO UNITED MCGILL "UNI-SEAM". DO NOT USE MITERED ELBOWS OR ANY FITTING WITH TURNING VANES.
- 3. MATERIAL THICKNESS SHALL CONFORM TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS FOR DUCT PRESSURE CLASS CONSISTENT WITH REINFORCEMENT METHOD AND DUCT SIZE.
- 4. FLEXIBLE INSULATED DUCTWORK

TRILAMINATE OF ALUMINUM FOIL, FIBERGLASS AND ALUMINIZED POLYESTER MECHANICALLY INTERLOCKED BY A CORROSION RESISTANT METAL SPIRAL HELIX ON THE OUTSIDE OF THE FABRIC WITH FIBERGLASS INSULATION BLANKET AND POLYETHYLENE JACKET. LISTED UL 181 CLASS 1 AIR DUCT. EQUAL TO FABRIFLEX 2 AS MANUFACTURED BY BUCKLEY ASSOC. MAXIMUM LENGTH OF FLEXIBLE DUCTS SHALL BE EIGHT FEET.

- C. ACCESS DOORS IN DUCTS
- 1. FOLLOW FIGURE 2-14 IN SMACNA HVAC DUCT CONSTRUCTION STANDARDS. DOOR SHALL BE TYPE C, INSULATED, WITH TWO BUTT HINGES AND TWO SASH LOCKS.
- 2. FIRE DAMPER ACCESS DOORS SHALL HAVE A MINIMUM CLEAR OPENING OF 12" X 12" OR LARGER AS REQUIRED TO EASILY SERVICE FIRE DAMPER. DOORS SHALL BE WITHIN SIX INCHES OF FIRE DAMPERS.
- D. FLEXIBLE CONNECTIONS
- 1. 30 OZ. CLOSELY WOVEN UL APPROVED GLASS FABRIC, DOUBLE COATED WITH NEOPRENE.
- 2. FIRE RETARDANT, WATERPROOF, AIR-TIGHT, RESISTANT TO ACIDS AND GREASE, AND WITHSTAND CONSTANT TEMPERATURES OF 250 DEG F.
- 3. EQUAL TO DURO-DYNE SUPER METAL FAB NEOPRENE.
- E. DUCT SEALANT
- 1. DUCT SEALANTS AND ADHESIVES SHALL BE UL CLASSIFIED 25/50 OR LESS FLAME SPREAD/SMOKE DEVELOPED.
- 2. TRANSVERSE SEAMS SHALL BE SEALED WITH WATER-BASED DUCT SEALANT EQUAL TO UNITED MCGILL " UNITED DUCT SEALER" OR 2-PART SYSTEM USING EQUAL TO UNITED MCGILL "UNI-CAST" TAPE AND ADHESIVE. DUCT TAPE IS NOT ACCEPTABLE.
- 3. LONGITUDINAL (PITTSBURG OR OTHER) SEAMS SHALL BE SEALED WITH SEALANT EQUAL TO UNITED MCGILL "UNI-SEAM" SOLVENT-BASED POLYMERIC RUBBER MASTIC.
- E. DUCT SEALING
- 1. SEAL DUCTS TO THE FOLLOWING SEAL CLASSES ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE":
- 1.1. OUTDOOR, SUPPLY AIR DUCTS: SEAL CLASS A.
- 1.2. OUTDOOR, EXHAUST DUCTS: SEAL CLASS C.
- 1.3. OUTDOOR, RETURN AIR DUCTS: SEAL CLASS C.
- 1.4. CONDITIONED SPACE, SUPPLY AIR DUCTS IN PRESSURE CLASSES 2 INCH WG AND LOWER: SEAL CLASS C.

- 1.5. CONDITIONED SPACE, EXHAUST DUCTS: SEAL CLASS B.
- F. VOLUME DAMPERS
 - MANUFACTURED BY DURO-DYNE, OR APPROVED EQUAL
- 2. IN BRANCH DUCTS: EXTRUDED ALUMINUM, OPPOSED BLADE TYPE. WHEN IN OPEN DURO-DYNE, OR APPROVED EQUAL.
- AND COVER PLATE.
- G. BALANCING DAMPER
 - STREAM.
- DAMPER SHALL BE EQUIVALENT TO RUSKIN MODEL VFBD35.
- H. TURNING VANES
- EQUAL TO DURO-DYNE "VANE RAIL."
- I. DUCT HANGERS
- 1. COMPLY WITH SMACNA'S "HVAC DUCT CDONSTRUCTION STANDARDS METAL AND FLEXIBLE," CHAPTER 5, "HANGERS AND SUPPORTS."
- 2. RECTANGULAR DUCTWORK
- a. 1" X 18 GAUGE GALVANIZED STEEL STRAPS OR TRAPEZE HANGERS WITH THREADED STEEL RODS, SPACED NOT MORE THAN EIGHT FEET APART. DO NOT USE WIRE HANGERS. HANGER FREQUENCY SHALL BE IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
- K. DUCT CONNECTION SYSTEM
- 1. TRANSVERSE JOINTS AND LONGITUDINAL SEAMS SHALL CONFORM TO SMACNA HVAC DUCT CONSTRUCTION STANDARDS FOR PRESSURE CLASS, DUCT DIMENSIONS AND REINFORCEMENT METHOD.
- BE USED.
- 3. RECTANGULAR DUCT
- b. SYSTEM CONSISTS OF THE FOLLOWING:
- 1) DUCTMATE 35 ANGLE IS ROLL-FORMED FROM 20 GA GALVANIZED STEEL, WITH AN INTEGRAL SEALANT.
- 2) DUCTMATE 25 ANGLE IS ROLL-FORMED FROM 24 GA GALVANIZED STEEL, WITH
- AN INTEGRAL SEALANT. THE 35 ANGLE.
- - 6) CORNER CLIPS ARE 16 GA GALVANIZED STEEL
 - 7) MASTIC: 5511M
 - 8) GASKET: DUCTMATE 440
 - c. LIMITATIONS
 - 1) DUCTMATE 35 SYSTEM IS COMPARABLE TO SMACNA CLASS "J" TRANSVERSE JOINT AND IS NOT RECOMMENDED FOR APPLICATIONS WITH DUCT GAGES HEAVIER THAN 16 GAGE OR LIGHTER THAN 26 GAGE.
 - 2) DUCTMATE 25 SYSTEM IS COMPARABLE TO SMACNA CLASS "F" TRANSVERSE JOINT AND IS NOT RECOMMENDED FOR APPLICATIONS WITH DUCT GAGES HEAVIER THAN 20 GAGE OR LIGHTER THAN 26 GAGE.
- 4. SPIRAL ROUND DUCT
- a. EQUAL TO "SPIRALMATE" ROUND DUCT CONNECTOR SYSTEM BY DUCTMATE INDUSTRIES.
- b. SYSTEM CONSISTS OF THE FOLLOWING COMPONENTS: 1) TWO MATING ROUND DUCT CONNECTOR FLANGES OF ROLL-FORMED GALVANIZED STEEL WITH INTEGRAL SEALANT.
- 2) A CLOSURE RING OF ROLL-FORMED GALVANIZED STEEL.
- 3) MASTIC: DUCTMATE DM5511M.
- 4) GASKET: DUCTMATE DM440 AND NEOPRENE.
- c. LIMITATIONS
- GAGE.
- J. FIRE DAMPERS SHALL BE PREFCO TYPE 5500 LPB OR EQUAL BY RUSKIN, GREENHECK OR PHILLIPS INDUSTRIES. PROVIDE 14 GA. SLEEVE THROUGH WALL/FLOOR OPENING AND 1" X 1" X 18 GA. MOUNTING ANGLES FOR DAMPERS UP TO 72" WIDTH OR HEIGHT ON BOTH SIDES OF WALL/FLOOR OPENING.
- K. SMOKE DAMPERS SHALL BE TYPE 5150 AND COMBINATION FIRE/SMOKE DAMPERS SHALL BE TYPE 5020 MANUFACTURED BY PREFCO PRODUCTS, INC. OR EQUAL BY RUSKIN, GREENHECK OR PHILLIPS INDUSTRIES. DAMPER SHALL BE COUPLED TO A POWER OPEN/SPRING RETURN 120 VAC DAMPER ACTUATOR EQUAL TO PREFCO 5800 SERIES. SMOKE DAMPER AND

1.6. CONDITIONED SPACE, RETURN AIR DUCTS: SEAL CLASS C.

1. IN MAIN DUCTS: 16 GAUGE GALVANIZED STEEL, OPPOSED BLADE TYPE WITH 3/8 INCH PINS AND END BEARINGS. BLADES SHALL HAVE 1/8 INCH CLEARANCE ALL AROUND.

POSITION. SHALL NOT EXTEND BEYOND DAMPER FRAME. MAXIMUM BLADE LENGTH: TWELVE INCHES. DAMPER REGULATOR: CONCEALED TYPE WITH OPERATION FROM BOTTOM OR WITH 90 DEG MITER GEAR ASSEMBLY FROM SIDE. MANUFACTURED BY

3. DAMPERS ABOVE REMOVABLE CEILING SHALL HAVE A LOCKING QUADRANT ON BOTTOM OR SIDE OF DUCT. OTHERWISE, PROVIDE A CONCEALED CEILING DAMPER REGULATOR

1. FURNISH AND INSTALL, AT LOCATIONS SHOWN ON PLANS OR IN ACCORDANCE WITH SCHEDULES, CALIBRATED IRIS BALANCING DAMPERS. IRIS DAMPER FRAME SHALL BE 22 GAGE STEEL. FRAME SHALL FULLY ENCAPSULATE IRIS BLADE SEGMENTS, HOLDING THEM FIRMLY INTO POSITION, AND HAVE ROLLED MOUNTED BEADS TO INCREASE THE OVERALL STRENGTH OF THE ASSEMBLY. FULL CIRCUMFERENCE DUCT SEAL SHALL BE FURNISHED ON AIR ENTERING AND AIR LEAVING SIDE OF FRAME TO INSURE A TIGHT DUCT CONNECTION. CASING LEAKAGE SHALL NOT EXCEED 6 CFM. IRIS BLADE SEGMENTS SHALL BE INTERNALLY LINKED AND DRIVEN BY A FACTORY CALIBRATED MANUAL ADJUSTMENT KNOB. ALL LINKAGE PARTS SHALL BE FULLY ENCAPSULATED AND OUT OF THE AIR

2. MANUAL ADJUSTMENT KNOB SHALL BE CALIBRATED TO THE EXACT APERTURE POSITION AND ALIGNED WITH THE K FACTOR SET POINT TO PROVIDE LINEAR RESPONSE FLOW CONTROL. FLOW MEASUREMENT ACCURACY SHALL BE WITHIN +/- 5%. ASSEMBLED UNIT SHALL BE FURNISHED WITH SPECIFIC CHARTS DESIGNED FOR THE EXACT SIZE AND BLADE APERTURE CONFIGURATION. AIR PRESSURE TAPS SHALL BE INTEGRAL TO THE DAMPER FRAME AND POSITIONED ON EITHER SIDE OF THE IRIS BLADE SEGMENTS. THE

- 2. BUTTON PUNCH SNAP LOCK FABRICATION METHOD FOR LONGITUDINAL SEAMS SHALL NOT
- a. EQUAL TO "DUCTMATE 25" OR "DUCTMATE 35" BY DUCTMATE INDUSTRIES.
- 3) DUCTMATE DCIIIB OR DC35 CORNER PIECES INSERT INTO THE HOLLOW WEB OF
- 4) METAL CLEAT IS ROLL-FORMED FROM 20 GA GALVANIZED STEEL.
- 5) GASKET IS EXTRUDED BUTYL FOR USE BETWEEN MATING FLANGES.

- 1) NOT RECOMMENDED FOR APPLICATIONS WITH DUCT GAGES HEAVIER THAN 16
- 2) FOR USE ON ROUND DUCT SIZES FROM 10" TO 72".

COMBINATION SMOKE/FIRE DAMPER SHALL ALSO SERVE AS A VOLUME DAMPER.

SECTION 23 90 00 - PROJECT CLOSEOUT

- A. ENGINEERING INSPECTIONS SHALL TAKE PLACE AT SUBSTANTIAL COMPLETION BUT BEFORE INSULATION IS INSTALLED ON EQUIPMENT, PIPING AND DUCTWORK. CONTACT THE ENGINEER TO COORDINATE INSPECTION.
- B. CONTACT THE MANUFACTURER COORDINATE FORMAL STARTUP FOR ALL MAJOR EQUIPMENT.
- C. CLOSEOUT REPORTS SHALL BE SUBMITTED TO THE ENGINEER AND OWNER UPON COMPLETION. CLOSEOUT DOCUMENTS MUST BE SUBMITTED TO THE ENGINEER IN ORDER FOR ENGINEER TO PROVIDE THE FINAL AFFIDAVITS.
- D. AT MINIMUM, THE FOLLOWING REPORTS SHALL BE SUBMITTED:
- 1. TESTING AND BALANCING REPORT
- 2. SYSTEM STARTUP REPORTS
- MANUFACTURER STARTUP REPORTS ON MAJOR EQUIPMENT

SOUTHERN CONNECTICUT		615 FITCH STREET / HAMDEN, CT 06514 / TEL: 203-392-6055	
	OF CONNECTOR	ATTICUT * UNIT	
DAVIS HALL GROUND FLOOR	RENOVATIONS		
: PROJECT NO.: SCSU-2023-02 DATE: APRIL 7, 2023	DRAWING MECHANICAL SPECIFICATIONS	+ SCALE: NTS	
REVISION:	SHEET:	10.0M	

DUCT LINING FOR FIRST 5' (TYP FOR SUPPLY & RETURN)
SECONDARY DRAIN DRAIN PAN
INSULATE DUCT PER SPEC 21 31 13

AHU CONTROLS SCHEMATIC SCALE: N.T.S.

 NOTES:
 CONTROL DEVICES ARE NOT NECESSARILY LOCATED CLOSE TO THE EQUIPMENT. REFER TO PLAN VIEW FOR LOCATION OF CONTROL DEVICES.
 REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
 SEE MECHANICAL SCHEDULE FOR ACCESSORIES.
 CONTROL POINTS INDICATED ABOVE MUST INTERFACE WITH EXISTING AUTMATED LOGIC NETWORK.

	AHU CONT	ROL POINTS LIST	
SYMBOL	DESCRIPTION	TYPE *	REMARKS
T	SPACE AIR TEMPERATURE SENSOR	AI	REFER TO PLANS FOR QTY & LOC INSTALLED BY AUTOMATED LOGIC.
	DISCHARGE AIR TEMPERATURE SENSOR	AI	
(T) ₂	RETURN AIR TEMPERATURE SENSOR	AI	
S S 1	SUPPLY FAN START/STOP	DO	
S ₁	SUPPLY FAN STATUS	DI	
s ₂	RETURN AIR DAMPER STATUS	DI	
S ₃	OA DAMPER STATUS	DI	
s ₄	DRAIN PAN OVERFLOW ALARM	DI	
Ą	HW VALVE STATUS	AO	VALVE FURNISHED AND WIRED BY MECHANICAL CONTRACTOR.
Å	CW VALVE STATUS	AO	VALVE FURNISHED AND WIRED BY MECHANICAL CONTRACTOR.

	SOUTHERN CONNECTICUT	FACILITIES PLANNING DEPARTMENT 615 FITCH STREET / HAMDEN, CT 06514 / TEL: 203-392-6055
		STORAL ENGINE
S TY & LOCATIONS. FURNISHED, WIRED AND D LOGIC. WIRED BY AUTOMATED LOGIC. INSTALLED BY R. WIRED BY AUTOMATED LOGIC. INSTALLED BY R. * DI = DIGITAL INPUT DO = DIGITAL OUTPUT AI = ANALOG INPUT AO = ANALOG OUTPUT	DAVIS HALL GROUND FLOOR	RENOVATIONS
CONTROLLER FURNISHED, WIRED AND INSTALLED BY AUTOMATED LOGIC.	PROJECT NO.: SCSU-2023-02 DATE: APRIL 7, 2023	DRAWING MECHANICAL DETAILS TITLE: SCALE: NTS
	LEVISION:	внеет: M5.02

	AHU SCHEDULE (BASED ON TRANE)																	
UNIT	MODEL	SUPPLY CFM	OA CFM	ESP ("WC)	RPM	FAN POWER (BHP)	CC EAT (DB/WB) (F)	OOLING SECTION MBH (T/S)	I GPM	HEA EAT/LAT (F)	TING SECTION HEATING CAPACITY (MBH)	GPM	VOLTS	ELECTRIC	CAL MCA	МОР	DIMENSIONS (IN) (H X L X W)	WEIGHT (LBS)
AHU-2	BCHE054	1130	255	0.3	1006	0.272	75/65.4	39.55/25.36	8.3	N/A	N/A	N/A	115	13.3	16.63	25	18 X 35.8 X 46	243
AHU-3	BCVE060	1850	150	0.4	1052	0.756	75/65.4	49.66/35.29	11.3	N/A	N/A	N/A	115	13.3	16.63	25	58.6 X 27.45 X 34.8	343
AHU-5	BCVE048	1150	110	0.6	998	0.421	75/65.4	35.66/23.66	7.72	70/100.4	37.85	2.38	115	7.46	9.32	15	56.6 X 24.42 X 34.8	321
AHU-7	BCHE018	496	120	0.6	1528	0.246	75/65.4	16.12/10.41	5.06	70/94.8	13.3	1.85	115	7.46	9.32	15	17 X 30.1 X 28	165
AHU-14	BVCE036	865	100	0.3	1210	0.271	75/65.4	26.15/17.59	5.57	70/99.8	27.86	1.96	115	7.46	9.32	15	49.9 X 22.95 X 29.8	254
NOTES: 1. 2. 3.	AHU-14 BVCE036 865 100 0.3 1210 0.271 75/65.4 26.15/17.59 5.57 70/99.8 27.86 1.96 115 7.46 9.32 15 49.9 X 22.95 X 29.8 254 NOTES: . . . UNITS TO BE FURNISHED WITH CONTROLS AS SHOWN ON SHEET M5.02. .																	

AIR DEVICE SCHEDULE (BASED ON PRICE)

						(=::====					
					FLOW	RANGE					
TAG	DESCRIPTION	MATERIAL	MFGR	MODEL	MIN (CFM)	MAX (CFM)	NOMINALSIZE	NECK SIZE	MAX NC	MAX NECK VEL (FPM)	MOUN
A1	4-WAY SUPPLY DIFFUSER	ALUMINUM	PRICE	SCD	75	139	12"x12"	4"	29	700	
A2	4-WAY SUPPLY DIFFUSER	ALUMINUM	PRICE	SMD	137	235	12"x12"	6"	29	600	
B1	RETURN GRILLE	ALUMINUM	PRICE	630	-	543	12"x 12"	-	30	700	
	_										

NOTES:

1. PROVIDE AIR FLOW (CFM) AND FLOW PATTERN AS SHOWN ON DRAWINGS.

2. COLOR AND FINISH OF ALL GRILLES, REGISTERS, AND DIFFUSERS AS SELECTED BY ARCHITECT.

3. GRILLE AND DIFFUSER NOMENCLATURE:

A1 (250) TAG AS SPECIFIED ON PLANS FLOW RATE (CFM)

————TAG

NTING SELECTION CEILING CEILING CEILING

GENERAL NOTES

- 1. THE WORD "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
- 2. ALL CONTRACTORS SHALL OBTAIN AND REVIEW ALL CONTRACT DOCUMENTS INCLUDING PLANS AND SPECIFICATIONS OF ALL TRADES BEFORE SUBMITTING BID. REFER TO SPECIFICATION AND PLANS, INCLUDING ALL EQUIPMENT SCHEDULES FOR MECHANICAL/PLUMBING AND ELECTRICAL ENGINEERING.
- 3. THE INFORMATION SHOWN ON THE DRAWINGS IS DIAGRAMMATIC, INDICATING THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN THIS CONTRACT. THE CONTRACTOR SHALL COORDINATE LOCATIONS OF EQUIPMENT, AND THEIR ASSOCIATED ACCESS AREAS, WITH ALL TRADES BEFORE STARTING CONSTRUCTION. ANY MODIFICATIONS TO THE EQUIPMENT LAYOUT REQUIRED BY INSTALLATION BY ANY CONTRACTOR SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
- 4. CONTRACTOR SHALL NOTIFY ENGINEER OF ALL CONFLICTS BETWEEN DRAWINGS AND SPECIFICATIONS, OR BETWEEN CONSTRUCTION DOCUMENTS AND FIELD CONDITIONS. FOR EACH CONFLICT, CONTRACTOR SHALL CARRY THE MORE EXPENSIVE OR LARGER QUANTITY OPTION.
- 5. SUBMISSION OF PROPOSAL DIRECTLY OR INDIRECTLY IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
- 6. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING EQUIPMENT LOCATIONS IN THE FIELD, AND SHALL ADVISE THE ENGINEER AND THE OWNER OF ANY DISCREPANCIES BEFORE PERFORMING THE WORK.
- 7. ALL WORK SHALL CONFORM TO ALL APPLICABLE CURRENT BUILDING CODES, RULES, REGULATIONS AND ORDINANCES, INCLUDING THE ONES WRITTEN BY:
- 7.1. REGULATORY AUTHORITIES HAVING JURISDICTION.
- 7.2. OWNER'S INSURANCE CARRIER
- 8. CONTRACTOR SHALL SECURE ALL PERMITS AND APPLICATIONS AND PAY ALL FEES PERTAINING TO THE CONTRACT. 9. ALL EQUIPMENT SHALL BE LOCATED IN ACCESSIBLE LOCATIONS WITH CODE OR MANUFACTURER-REQUIRED
- ACCESS SPACES. IF EQUIPMENT IS INSTALLED IN AN INACCESSIBLE LOCATION THE CONTRACTOR SHALL PROVIDE REQUIRED FIRE-RATED ACCESS DOORS, COORDINATED WITH THE ARCHITECT OR ENGINEER.
- 10. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. THE CONTRACTOR SHALL PROVIDE ALL HANGERS AND SUPPORTS REQUIRED FOR A COMPLETE INSTALLATION
- 11. EACH CONTRACTOR SHALL COORDINATE THE LOCATION OF THEIR WORK WITH ALL OTHER TRADES BEFORE STARTING CONSTRUCTION. ANY MODIFICATIONS TO THE SYSTEM LAYOUT REQUIRED FOR INSTALLATION SHALL BE PERFORMED AT NO ADDITIONAL COST TO THE OWNER.
- 12. RESTORATION OF EXISTING SYSTEMS, DEVICES, FINISHES, ETC., THAT ARE DAMAGED OR ALTERED BY NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY THE OWNER AND ENGINEER.
- 13. CONTRACTOR SHALL BE RESPONSIBLE FOR WORKMEN'S IDENTIFICATION AND BADGING, SITE SAFETY AND FIRE PROTECTION, CONTRACTOR'S LIABILITY INSURANCE, BARRICADES, WARNING SIGNS, TRASH REMOVAL, CUTTING AND PATCHING
- 14. CONTRACTOR SHALL SCHEDULE ALL SHUTDOWNS THAT AFFECT UTILITIES AND PORTIONS OF THE BUILDING THAT MUST REMAIN IN OPERATION WITH THE OWNER.
- 15. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE OWNER AND ALL OTHER CONTRACTORS.
- 16. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING AND PROTECTION OF MATERIALS.
- 17. CONTRACTOR SHALL PROVIDE LABOR TO RECEIVE, UNLOAD, STORE, PROTECT AND TRANSFER TO POINT OF INSTALLATION, OWNER FURNISHED ITEMS.
- 18. CONTRACTORS SHALL PROVIDE SLEEVES AND SEALS FOR ALL PIPING OR CONDUIT THAT PENETRATES WALLS OR FLOOR SLABS.
- 19. WHERE CONDUIT, CABLES, DUCTWORK OR PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS, THE SLEEVES SHALL BE COMPLETELY SEALED WITH A LISTED FIRE STOP MATERIAL THAT MEETS ALL OF THE REQUIREMENTS OF THE STATE AND LOCAL BUILDING CODES AND THE LOCAL AUTHORITIES HAVING JURISDICTION. THIS MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE MANUFACTURER TO MAINTAIN THE FIRE RATING OF THE PENETRATED WALL OR FLOOR. THE FIRE-STOP INSTALLING CONTRACTOR SHALL BE CERTIFIED BY THE FIRE-STOPPING SYSTEM MANUFACTURER.
- 20. ALL FLOOR-MOUNTED MECHANICAL/PLUMBING AND ELECTRICAL EQUIPMENT SHALL BE INSTALLED ON A CONCRETE HOUSEKEEPING PAD.
- 21. CONTRACTOR SHALL SUBMIT SIZE AND LOCATION OF ALL WALL AND FLOOR CORINGS TO STRUCTURAL ENGINEER FOR REVIEW BEFORE INSTALLATION. CONTRACTOR SHALL REPAIR ANY DAMAGE DUE TO CORINGS INSTALLED, AT NO COST TO OWNER. THE DAMAGE REPAIRING SHALL ALSO BE REVIEWED AND APPROVED B' THE STRUCTURAL ENGINEER.
- 22. CONTRACTOR SHALL SUBMIT SIZE AND LOCATION OF ANY PROPOSED STRUCTURAL MEMBER PENETRATIONS TO THE STRUCTURAL ENGINEER FOR REVIEW AND DETAILING BEFORE INSTALLATION. CONTRACTOR SHALL REPAIR ANY DAMAGE DUE TO PENETRATIONS INSTALLED, AT NO COST TO OWNER. THE DAMAGE REPAIRING SHALL ALSO BE REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER.
- 23. CONTRACTOR SHALL SUBMIT (3) SETS OF SHOP DRAWINGS. SUBMITTALS, AND EQUIPMENT CUT SHEET INFORMATION TO THE ENGINEER FOR REVIEW PRIOR TO STARTING ANY WORK.
- 24. UPON COMPLETION OF CONSTRUCTION CONTRACTOR SHALL SUPPLY THE ENGINEER WITH (1) COMPLETE SET OF ELECTRONIC AS-BUILT DOCUMENTS AND (4) COMPLETE COPIES OF OPERATIONS AND MAINTENANCE MANUALS, ALL AT CONTRACTOR'S EXPENSE.
- 25. ALL PIPING AND DUCTWORK LAYOUTS ARE SHOWN IN APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL INSTALL ALL REQUIRED OFFSETS AND TRANSITIONS TO PREVENT INTERFERENCE WITH FIELD CONDITIONS AND TO COORDINATE WITH OTHER TRADES AT NO COST TO THE OWNER.
- 26. ALL REQUIRED OPENINGS THROUGH WALLS, FLOORS, AND CEILINGS SHALL BE COORDINATED BY THE CONTRACTOR USING ENGINEER AND ARCHITECT REVIEWED & APPROVED EQUIPMENT SHOP DRAWINGS.
- 27. NO PIPING OR DUCTS SHALL BE INSTALLED OVER ELECTRICAL PANELS, TRANSFORMERS, OR ELEVATOR MACHINE ROOM EQUIPMENT. CONTRACTOR SHALL COORDINATE PIPING AND DUCTWORK WITH ELECTRICAL EQUIPMENT IN FIELD AS PART OF COORDINATION DRAWINGS.
- 28. PROVIDE SPRING ISOLATED & SEISMICALLY RATED HANGERS FOR EQUIPMENT, DUCTS, AND PIPING ACCORDING TO THE VIBRATION ISOLATION SCHEDULE. INCLUDE DETAILS AND LOCATIONS ON COORDINATION DRAWINGS, 29. PROVIDE AIR VENTS AT ALL HIGH POINTS AND DRAINS AT LOW POINTS.
- 30. ROOF PENETRATION IS NOT ANTICIPATED FOR THIS PROJECT. WHEN ROOF ACCESS IS REQUIRED, SUCH AS CHIMNEY LINER INSTALLATION. CONTRACTOR SHALL MAKE PROVISIONS TO PROTECT THE ROOF WARRANTY DURING THE CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ROOF DAMAGE AND SHALL REPAIR THE DAMAGE AT NO COST TO THE OWNER.
- 31. HYDROSTATIC TESTING SHALL BE PERFORMED ON ALL EQUIPMENT AND PIPING THAT IS SUBJECTED TO PRESSURES ABOVE AMBIENT. THE MECHANICAL/PLUMBING CONTRACTOR SHALL DEVELOP A TEST SEQUENCE AND PHASES BASED UPON THE SYSTEM DESIGN, THE SYSTEM COMPONENTS THAT REQUIRE TESTING, AND THE CONSTRUCTION SEQUENCE OF THOSE COMPONENTS. THE CONTRACTOR SHALL PROVIDE THIS TEST SEQUENCE TO THE OWNER AND ENGINEER FOR REVIEW. THE CONTRACTOR SHALL GIVE THE ENGINEER AND OWNER 48 HOURS NOTICE BEFORE PERFORMING ANY SYSTEM COMPONENT PRESSURE TEST. THE CONTRACTOR SHALL NOT USE A COMPRESSIBLE FLUID, SUCH AS COMPRESSED AIR, FOR THE HYDROSTATIC TESTS. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE ENGINEER AND OWNER THAT THE PRESSURE TEST EQUIPMENT, INCLUDING PRESSURE SENSORS AND GAGES, HAS BEEN CALIBRATED BEFORE USE. THE CONTRACTOR SHALL ISOLATE ALL EQUIPMENT AND PIPING THAT IS NOT UNDERGOING TESTING USING FLANGES OR CAPS, NOT SHUTOFF VALVES. REFER TO SPECIFICATIONS FOR HYDROSTATIC PRESSURE TEST DETAILS FOR A GIVEN SYSTEM COMPONENT.

L L	ĽU	MBING ABBR
S	Π	SANITARY
W	=	WASTE
V&W	=	COMBINATION WASTE
V	=	VENT
VTR	=	VENT THROUGH ROOF
С	=	COLD WATER
Н	=	HOT WATER
HWR	=	HOT WATER RETURN
TYP	=	TYPICAL
GPM	=	GALLONS PER MINUT
TW	=	TEPID WATER
AFF	=	ABOVE FINISHED FLO
ETR	=	EXISTING TO REMAIN

Ζ	CHECK VALVE
Χ	BALL VALVE
$\overline{\nabla}$	BALANCE VALVE
\mathbb{X}^+	HOSE BIB WITH VALVE
0	PIPE UP
	PIPE DOWN
	TEE DOWN
ı ı	UNION
0	FLOOR CLEANOUT
\neg	FIXTURE TRAP
-	CLEANOUT
\bigcirc	GAS COCK
Π	THERMOMETER
\bowtie	FLOOR DRAIN
r M J	WATER METER
Ø	WATER HAMMER ARRESTOR

ABBREVIATIONS ON WASTE & VENT OUGH ROOF R RETURN PER MINUTE **NISHED FLOOR**

PLUMBING SYMBOL LEGEND

SECTION 01 33 00 - SUBMITTAL PROCEDURES

1.1 SUBMITTALS

- A. SUBMITTAL SCHEDULE: SUBMIT A SCHEDULE OF SUBMITTALS, ARRANGED IN CHRONOLOGICAL ORDER BY DATES REQUIRED BY CONSTRUCTION SCHEDULE. INCLUDE TIME REQUIRED FOR REVIEW, ORDERING, MANUFACTURING, FABRICATION, AND DELIVERY WHEN ESTABLISHING DATES. INCLUDE ADDITIONAL TIME REQUIRED FOR MAKING CORRECTIONS OR REVISIONS TO SUBMITTALS NOTED BY ENGINEER AND CONSTRUCTION MANAGER AND ADDITIONAL TIME FOR HANDLING AND REVIEWING SUBMITTALS REQUIRED BY THOSE CORRECTIONS.
- 1. COORDINATE SUBMITTAL SCHEDULE WITH LIST OF SUBCONTRACTS, THE SCHEDULE OF VALUES, AND CONTRACTOR'S CONSTRUCTION SCHEDULE.
- 2. INITIAL SUBMITTAL: SUBMIT CONCURRENTLY WITH STARTUP CONSTRUCTION SCHEDULE. INCLUDE SUBMITTALS REQUIRED DURING THE FIRST 60 DAYS OF CONSTRUCTION. LIST THOSE SUBMITTALS REQUIRED TO MAINTAIN ORDERLY PROGRESS OF THE WORK AND THOSE REQUIRED EARLY BECAUSE OF LONG LEAD TIME FOR MANUFACTURE OR FABRICATION.
- 3. FINAL SUBMITTAL: SUBMIT CONCURRENTLY WITH THE FIRST COMPLETE SUBMITTAL OF CONTRACTOR'S CONSTRUCTION SCHEDULE.
- a. SUBMIT REVISED SUBMITTAL SCHEDULE TO REFLECT CHANGES IN CURRENT STATUS AND TIMING FOR SUBMITTALS.

1.2 ELECTRONIC SUBMITTALS

A. IDENTIFY AND INCORPORATE INFORMATION IN EACH ELECTRONIC SUBMITTAL FILE AS FOLLOWS:

- 1. ASSEMBLE COMPLETE SUBMITTAL PACKAGE INTO A SINGLE INDEXED FILE INCORPORATING SUBMITTAL REQUIREMENTS OF A SINGLE SPECIFICATION SECTION AND TRANSMITTAL FORM WITH LINKS ENABLING NAVIGATION TO EACH ITEM.
- 2. NAME FILE WITH SUBMITTAL NUMBER OR OTHER UNIQUE IDENTIFIER, INCLUDING REVISION IDENTIFIER.
- 3. TRANSMITTAL FORM FOR ELECTRONIC SUBMITTALS: USE ELECTRONIC FORM ACCEPTABLE TO OWNER, CONTAINING THE FOLLOWING INFORMATION:
- a. PROJECT NAME.
- b. DATE.
- c. NAME AND ADDRESS OF ENGINEER.
- d. NAME OF CONSTRUCTION MANAGER.
- e. NAME OF CONTRACTOR.
- f. NAME OF FIRM OR ENTITY THAT PREPARED SUBMITTAL
- g. NAMES OF SUBCONTRACTOR, MANUFACTURER, AND SUPPLIER.
- h. CATEGORY AND TYPE OF SUBMITTAL.
- SUBMITTAL PURPOSE AND DESCRIPTION.
- SPECIFICATION SECTION NUMBER AND TITLE.
- k. SPECIFICATION PARAGRAPH NUMBER OR DRAWING DESIGNATION AND GENERIC NAME FOR EACH OF MULTIPLE ITEMS.
- I. DRAWING NUMBER AND DETAIL REFERENCES, AS APPROPRIATE.
- m. LOCATION(S) WHERE PRODUCT IS TO BE INSTALLED, AS APPROPRIATE
- n. RELATED PHYSICAL SAMPLES SUBMITTED DIRECTLY.
- o. INDICATION OF FULL OR PARTIAL SUBMITTAL.
- p. TRANSMITTAL NUMBER, NUMBERED CONSECUTIVELY.
- q. SUBMITTAL AND TRANSMITTAL DISTRIBUTION RECORD.
- r. OTHER NECESSARY IDENTIFICATION.
- s. REMARKS.
- 4. OPTIONS: IDENTIFY OPTIONS REQUIRING SELECTION BY ENGINEER.
- 5. DEVIATIONS AND ADDITIONAL INFORMATION: ON AN ATTACHED SEPARATE SHEET, PREPARED ON CONTRACTOR'S LETTERHEAD, RECORD RELEVANT INFORMATION, REQUESTS FOR DATA, REVISIONS OTHER THAN THOSE REQUESTED BY ENGINEER ON PREVIOUS SUBMITTALS, AND DEVIATIONS FROM REQUIREMENTS IN THE CONTRACT DOCUMENTS. INCLUDING MINOR VARIATIONS AND LIMITATIONS. INCLUDE SAME IDENTIFICATION INFORMATION AS RELATED SUBMITTAL.
- 6. RESUBMITTALS: MAKE RESUBMITTALS IN SAME FORM AND NUMBER OF COPIES AS INITIAL SUBMITTAL.
- 7. NOTE DATE AND CONTENT OF PREVIOUS SUBMITTAL.
- 8. NOTE DATE AND CONTENT OF REVISION IN LABEL OR TITLE BLOCK AND CLEARLY INDICATE EXTENT OF REVISION.
- 9. RESUBMIT SUBMITTALS UNTIL THEY ARE MARKED WITH APPROVAL NOTATION FROM ENGINEER'S ACTION STAMP.
- 1.3 SUBMITTALS & SHOP DRAWINGS
- A. PROVIDE SUBMITTALS IN ACCORDANCE WITH THESE SPECIFICATIONS. DIVISION 1 AND EACH DIVISION 22 SPECIFICATION SECTION.
- B. SUBMIT PRODUCT DATA AND SPECIFICATIONS INDICATING PERFORMANCE AS SPECIFIED IN THE CONTRACT DOCUMENTS. ALL PRODUCTS SUBMITTED SHALL BE CLEARLY IDENTIFIED ON THE CUT SHEETS ALONG WITH ALL ACCESSORIES PROVIDED. IDENTIFY PRODUCT USING SPECIFICATION SECTION NUMBER, SCHEDULE TAG OR OTHER DESCRIPTIVE IDENTIFIER.
- C. FURNISH COMPLETE CATALOG DATA FOR MATERIALS AND MANUFACTURED ITEMS OF EQUIPMENT THAT ARE TO BE USED FOR THIS PROJECT. CONTRACTOR SHALL SUBMIT ITEMS WITH THE LONGEST LEAD TIME FIRST. STATE SIZES, CAPACITIES, BRAND NAMES, MOTOR HP, ACCESSORIES, MATERIALS, GAUGES, DIMENSIONS, AND OTHER PERTINENT INFORMATION. UNDERLINE APPLICABLE DATA.
- D. IF MATERIAL OR EQUIPMENT IS NOT AS SPECIFIED OR SUBMITTAL IS INCOMPLETE SUBMITTAL WILL BE REJECTED BY ENGINEER WITHOUT FURTHER COMMENT.
- E. SUBMITTALS SHALL BE COMPLETE IN EVERY WAY INCLUDING COORDINATION WITH EXISTING CONDITIONS AND THE WORK OF OTHER DIVISIONS. ALL INCOMPLETE SUBMITTALS WILL BE RETURNED TO THE CONTRACTOR WITHOUT FURTHER COMMENT.

- F. CONTRACTOR SHALL KEEP A SUBMITTAL LOG AND SHALL SUBMIT REVISED SUBMITTAL LOG WITH EVERY SUBMISSION.
- G. EACH SUBMITTAL SHALL BE FOR A SPECIFIC ITEM, DEVICE FOR FIXTURE USED. DO NOT COMBINE ALL SUBMITTALS INTO ONE PACKAGE. SUBMITTALS THAT ARE CONFUSING OR INAPPROPRIATELY ORGANIZED WILL BE REJECTED WITHOUT FURTHER COMMENT.
- H. SHOP DRAWINGS SHALL BE PROJECT SPECIFIC DRAWINGS PREPARED BY CONTRACTOR AT 1/4"=1'-0" SCALE WITH TITLE BLOCK. SHOP DRAWINGS SHALL SHOW THE EXTENT NECESSARY ALL DIMENSIONS, AND COORDINATION CLEARANCES NECESSARY.
- I. UNLESS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS CONTRACTOR SHALL SUBMIT (8) EIGHT HARD COPIES OF EACH SUBMITTAL USING APPROPRIATE DESCRIPTIVE NAME, SPECIFICATION SECTION OR SCHEDULE TAG FOR REVIEW.
- J. THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING A REVIEW OF ALL SUBMITTALS FOR COMPLETENESS PRIOR TO SUBMITTING TO ENGINEER FOR REVIEW. CONTRACTOR SHALL STAMP AND SIGN EACH SUBMITTAL PRIOR TO SENDING TO ENGINEER FOR REVIEW. THE ENGINEER WILL PROVIDE AN INITIAL AND FOLLOW-UP REVIEW FOR EACH SUBMITTAL. IF ADDITIONAL REVIEW OF SUBMITTALS IS REQUIRED OR UNDUE TIME IS SPENT REVIEWING POORLY PREPARED SUBMITTALS THE CONTRACTOR SHALL COMPENSATE THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER FOR THE ADDITIONAL TIME REQUIRED TO PERFORM THE SUBMITTAL REVIEW AT ENGINEER'S BILLABLE RATE FOR THE PROJECT.
- 1.4 WARRANTIES AND GUARANTEES
- A. CONTRACTOR SHALL COMPLY WITH WARRANTIES AND GUARANTEES SPECIFIED WITHIN THE CONTRACT DOCUMENTS. IN THE EVENT OF CONTRADICTION THE MORE STRINGENT SHALL APPLY.
- B. THE CONTRACTOR SHALL GUARANTY THE PLUMBING SYSTEM TO BE FREE FROM NOISE IN OPERATION THAT MAY DEVELOP AS A RESULT OF FAILURE TO CONSTRUCT SYSTEM IN ACCORDANCE WITH CONTRACT DOCUMENTS. IN ORDER TO BE PROTECTED THE CONTRACTOR SHALL SECURE PROPER GUARANTEES FROM SUPPLIERS AND SUBCONTRACTORS.
- C. DISCLAIMERS AND LIMITATIONS: MANUFACTURER'S DISCLAIMERS AND LIMITATIONS ON PRODUCT WARRANTIES DO NOT RELIEVE THE CONTRACTOR OF THE WARRANTY REQUIREMENTS OF THESE SPECIFICATIONS.
- D. RELATED DAMAGES AND LOSSES: WHEN CORRECTING FAILED OR DAMAGED WARRANTED CONSTRUCTION, REMOVE AND REPLACE CONSTRUCTION THAT HAS BEEN DAMAGED AS A RESULT OF SUCH FAILURE OR MUST BE REMOVED AND REPLACED TO PROVIDE ACCESS FOR CORRECTION OF WARRANTED CONSTRUCTION.
- E. REINSTATEMENT OF WARRANTY: WHEN WORK COVERED BY A WARRANTY HAS FAILED AND BEEN CORRECTED BY REPLACEMENT OR REBUILDING, REINSTATE THE WARRANTY BY WRITTEN ENDORSEMENT. THE REINSTATED WARRANTY SHALL BE EQUAL TO THE ORIGINAL WARRANTY WITH AN EQUITABLE ADJUSTMENT FOR DEPRECIATION.
- F. REPLACEMENT COST: UPON DETERMINATION THAT WORK COVERED BY A WARRANTY HAS FAILED, REPLACE OR REBUILD THE WORK TO AN ACCEPTABLE CONDITION COMPLYING WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR THE COST OF REPLACING OR REBUILDING DEFECTIVE WORK REGARDLESS OF WHETHER THE OWNER HAS BENEFITED FROM USE OF THE WORK THROUGH A PORTION OF ITS ANTICIPATED USEFUL SERVICE LIFE.
- G. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF EIGHTEEN MONTHS FROM THE DATE OF SUBSTANTIAL COMPLETION.
- H. THE CONTRACTOR SHALL FURNISH WRITTEN CONFIRMATION OF ALL WARRANTIES AND GUARANTEES SPECIFIED AND IMPLIED FOR THIS PROJECT TO THE OWNER AND ENGINEER FOR REVIEW (SUBMIT FOUR COPIES).
- 1.5 FINAL ACCEPTANCE
- A. THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING A PRELIMINARY INSPECTION TO DETERMINE IF ALL WORK IS COMPLETE. AFTER VERIFICATION, THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH WRITTEN NOTICE THAT THE WORK IS COMPLETE. THE ENGINEER SHALL SCHEDULE AN INITIAL AND FOLLOW-UP VISIT TO VERIFY THAT THE WORK HAS BEEN COMPLETED IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. THE ENGINEER SHALL PREPARE A FORMAL PUNCH LIST OF ANY ITEMS CONSIDERED INCOMPLETE, AND DISTRIBUTE TO THE ARCHITECT, OWNER, AND CONTRACTOR. THE ENGINEER WILL THEN SCHEDULE ANOTHER FIELD VISIT TO VERIFY THE WORK IS COMPLETE. IF THE WORK IS NOT COMPLETE, THE COST FOR ADDITIONAL FIELD VISITS TO VERIFY THAT THE WORK IS COMPLETE SHALL BE BILLED TO THE CONTRACTOR AT THE RATE OF \$150.00 PER HOUR.

SECTION 22 05 19 - METERS AND GAGES FOR PLUMBING <u>PIPING</u>

- 1.1 METAL-CASE, LIQUID-IN-GLASS THERMOMETER
- A. CASE: BRASS 7 INCHES LONG.
- B. TUBE: RED OR BLUE READING, ORGANIC-LIQUID FILLED, WITH MAGNIFYING LENS.
- C. TUBE BACKGROUND: SATIN-FACED, NONREFLECTIVE ALUMINUM WITH PERMANENTLY ETCHED SCALE MARKINGS.
- D. WINDOW: GLASS.
- E. CONNECTOR: ADJUSTABLE TYPE, 180 DEGREES IN VERTICAL PLANE, 360 DEGREES IN HORIZONTAL PLANE, WITH LOCKING DEVICE.
- F. STEM: BRASS FOR THERMOWELL INSTALLATION AND OF LENGTH TO SUIT INSTALLATION.
- G. ACCURACY: PLUS OR MINUS 1 PERCENT OF RANGE OR PLUS OR MINUS 1 SCALE DIVISION TO MAXIMUM OF 1.5 PERCENT OF RANGE.

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1.2 THERMOWELLS

- A. MANUFACTURERS: SAME AS MANUFACTURER OF THERMOMETER BEING USED.
- B. DESCRIPTION: PRESSURE-TIGHT, SOCKET-TYPE METAL FITTING MADE FOR INSERTION INTO PIPING AND OF TYPE, DIAMETER, AND LENGTH REQUIRED TO HOLD THERMOMETER.

1.3 PRESSURE GAGES

- A. DIRECT-MOUNTING, DIAL-TYPE PRESSURE GAGES: INDICATING-DIAL TYPE COMPLYING WITH ASME B40.100.
- 1. CASE: LIQUID-FILLED TYPE, DRAWN STEEL OR CAST ALUMINUM, 4-1/2-INCH DIAMETER.
- 2. PRESSURE-ELEMENT ASSEMBLY: BOURDON TUBE, UNLESS OTHERWISE INDICATED.
- 3. PRESSURE CONNECTION: BRASS, NPS 1/4, BOTTOM-OUTLET TYPE UNLESS BACK-OUTLET TYPE IS INDICATED.
- 4. MOVEMENT: MECHANICAL, WITH LINK TO PRESSURE ELEMENT AND CONNECTION TO POINTER.
- 5. DIAL: SATIN-FACED, NON-REFLECTIVE ALUMINUM WITH PERMANENTLY ETCHED SCALE MARKINGS.
- 6. POINTER: RED METAL
- 7. WINDOW: GLASS.
- 8. RING: BRASS.
- 9. ACCURACY: GRADE B, PLUS OR MINUS 2 PERCENT OF MIDDLE HALF SCALE
- 10. VACUUM-PRESSURE RANGE: 30-IN. HG OF VACUUM TO 15 PSIG OF PRESSURE.
- 11. RANGE FOR FLUIDS UNDER PRESSURE: TWO TIMES OPERATING PRESSURE.

B. PRESSURE-GAGE FITTINGS:

- 1. VALVES: NPS 1/4 BRASS OR STAINLESS-STEEL NEEDLE TYPE.
- 2. SNUBBERS: ASME B40.5, NPS 1/4 BRASS BUSHING WITH CORROSION-RESISTANT, POROUS-METAL DISC OF MATERIAL SUITABLE FOR SYSTEM FLUID AND WORKING PRESSURE.
- 1.4 TEST PLUGS
- A. DESCRIPTION: CORROSION-RESISTANT BRASS OR STAINLESS-STEEL BODY WITH CORE INSERTS AND GASKETED AND THREADED CAP, WITH EXTENDED STEM FOR UNITS TO BE INSTALLED IN INSULATED PIPING.
- B. MINIMUM PRESSURE AND TEMPERATURE RATING: 500 PSIG AT 200 DEG F.
- C. CORE INSERTS: ONE OR TWO SELF-SEALING RUBBER VALVES.
- 1. INSERT MATERIAL FOR WATER SERVICE AT 20 TO 200 DEG F SHALL BE CR.
- 2. INSERT MATERIAL FOR WATER SERVICE AT MINUS 30 TO PLUS 275 DEG F SHALL BE EPDM.

SECTION 22 05 23 - GENERAL DUTY VALVES FOR PLUMBING

1.1 BALL VALVES

A. WATER TO 600 # CWP

1. 2 INCHES AND SMALLER: MSS SP 110, CLASS 150, BRONZE, TWO PIECE BODY, STAINLESS STEEL BALL AND TRIM. FULL PORT. TEFLON SEATS. BLOW-OUT PROOF STEM, SOLDER OR THREADED ENDS, LEVER HANDLE WITH STOPS.

B. UL LISTED FOR FUEL AND GAS SERVICE

- 1. 1/4 INCH TO 1 INCH: MSS SP 110, CLASS 125, TWO PIECE, THREADED ENDS, BRONZE BODY, CHROME PLATED BRONZE BALL, REINFORCED TEFLON SEATS, BLOW-OUT PROOF STEM, LEVER HANDLE, UL 842 LISTED FOR FLAMMABLE LIQUIDS AND LPG, FULL PORT.
- 2. 1-1/4 INCH TO 3 INCH: MSS SP 110, CLASS 125, TWO PIECE, THREADED ENDS, BRONZE BODY, CHROME PLATED BRONZE BALL, REINFORCED TEFLON SEATS, BLOW-OUT PROOF STEM, LEVER HANDLE, UL 842 LISTED FOR FLAMMABLE LIQUIDS AND LPG, CONVENTIONAL PORT.

1.2 CHECK VALVES

- A. SWING CHECK VALVES:
- 1. WOG APPLICATIONS
- a. 2 INCHES AND SMALLER: MSS SP 80, CLASS 150, BRONZE BODY AND CAP, BRONZE SEAT, BUNA-N TILTING DISC FOR WATER-OIL-GAS APPLICATIONS, TEFLON TILTING DISC FOR LOW PRESSURE (<15 PSIG) STEAM APPLICATIONS, SOLDER OR THREADED ENDS.
- b. 2-1/2 INCHES AND LARGER: MSS SP 71, CLASS 125, CAST IRON BODY, BOLTED CAP, BRONZE OR CAST IRON DISC, RENEWABLE DISC SEAL AND SEAT, FLANGED ENDS.

B. LIFT CHECK VALVES:

- 1. WOG APPLICATIONS
- a. 2 INCHES AND SMALLER: MSS SP 80, CLASS 150, BRONZE BODY, IN-LINE SPRING LIFT CHECK, SILENT CLOSING, BUNA-N DISC FOR WOG, TEFLON DISC FOR LP STEAM, INTEGRAL SEAT, SOLDER OR THREADED ENDS.
- b. 2-1/2 INCHES AND LARGER: MSS SP 71, CLASS 125, WAFER STYLE, CAST IRON BODY, BRONZE SEAT, CENTER GUIDED BRONZE DISC, STAINLESS STEEL SPRING AND SCREWS, FLANGED ENDS.

SECTION 22 05 53 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

1.1 PIPE LABELS

A. GENERAL REQUIREMENTS FOR MANUFACTURED PIPE LABELS: PREPRINTED,

COLOR-CODED, WITH LETTERING INDICATING SERVICE, AND SHOWING FLOW DIRECTION.

- B. PRETENSIONED PIPE LABELS: PRECOILED, SEMIRIGID PLASTIC FORMED TO COVER FULL CIRCUMFERENCE OF PIPE AND TO ATTACH TO PIPE WITHOUT FASTENERS OR ADHESIVE.
- C. SELF-ADHESIVE PIPE LABELS: PRINTED PLASTIC WITH CONTACT-TYPE, PERMANENT-ADHESIVE BACKING.
- D. PIPE LABEL CONTENTS: INCLUDE IDENTIFICATION OF PIPING SERVICE USING SAME INDICATING FLOW DIRECTION.
- INDICATE FLOW DIRECTION.
- 2. LETTERING SIZE: AT LEAST 1-1/2 INCHES HIGH.
- 1.2 VALVE TAGS
- A. VALVE TAGS: STAMPED OR ENGRAVED WITH 1/4-INCH LETTERS FOR PIPING SYSTEM ABBREVIATION AND 1/2-INCH NUMBERS.
- 1. TAG MATERIAL: BRASS, 0.032-INCH MINIMUM THICKNESS, AND HAVING PREDRILLED OR STAMPED HOLES FOR ATTACHMENT HARDWARE.
- 2. FASTENERS: BRASS BEADED CHAIN.
- B. VALVE SCHEDULES: FOR EACH PIPING SYSTEM, ON 8-1/2-BY-11-INCH BOND PAPER. TABULATE VALVE NUMBER, PIPING SYSTEM, SYSTEM ABBREVIATION (AS SHOWN ON VALVE TAG), LOCATION OF VALVE (ROOM OR SPACE), NORMAL-OPERATING POSITION (OPEN, CLOSED, OR MODULATING), AND VARIATIONS FOR IDENTIFICATION. MARK VALVES FOR EMERGENCY SHUTOFF AND SIMILAR SPECIAL USES.
- 2.1 PIPE LABEL INSTALLATION
- A. PIPING COLOR-CODING: COLOR-CODE PIPING IN ACCORDANCE WITH ANSI A13.1.
- B. STENCILED PIPE LABEL OPTION: STENCILED LABELS MAY BE PROVIDED INSTEAD OF MANUFACTURED PIPE LABELS, AT INSTALLER'S OPTION. INSTALL STENCILED PIPE LABELS WITH PAINTED, COLOR-CODED BANDS OR RECTANGLES ON EACH PIPING SYSTEM.
- 1. IDENTIFICATION PAINT: USE FOR CONTRASTING BACKGROUND.
- 2. STENCIL PAINT: USE FOR PIPE MARKING.
- C. LOCATE PIPE LABELS WHERE PIPING IS EXPOSED OR ABOVE ACCESSIBLE CEILINGS IN FINISHED SPACES; MACHINE ROOMS; ACCESSIBLE MAINTENANCE SPACES SUCH AS SHAFTS, TUNNELS, AND PLENUMS; AND EXTERIOR EXPOSED LOCATIONS AS FOLLOWS: 1. NEAR EACH VALVE AND CONTROL DEVICE.
- BRANCH.
- 3. NEAR PENETRATIONS THROUGH WALLS, FLOORS, CEILINGS, AND INACCESSIBLE ENCLOSURES.
- CONCEALED PIPING.
- 5. NEAR MAJOR EQUIPMENT ITEMS AND OTHER POINTS OF ORIGINATION AND TERMINATION.

1.1 MATERIALS

A. PIPE INSULATION

- 1. EQUAL TO JOHNS MANVILLE "MICRO_LOK AP" MOLDED ALL_PURPOSE FIBERGLASS PIPE INSULATION WITH ALL PURPOSE SERVICE JACKET (ASJ). PIPE INSULATION SHALL HAVE A MAXIMUM CONDUCTIVITY OF 0.27 BTU PER INCH/H * FT2* DEGREE
- 2. INSULATION THICKNESS SHALL BE AS SCHEDULED BELOW:

<u>TYPE</u> DOMESTIC COLD WATER

DOMESTIC HOT WATER

- B. VALVE AND FITTING INSULATION: EQUAL TO MANVILLE MOLDED FIBERGLASS INSULATION WITH ZESTON 2000 SERIES 25/50 CLASS A COVERS.
- C. ADA LAVATORY & SINK PROTECTIVE PIPE & TRAP COVERINGS: ADA-CONFORMING, WHEELCHAIR ACCESSIBLE LAVATORY P-TRAP AND ANGLE VALVE ASSEMBLIES SHALL BE COVERED WITH THE MOLDED CLOSED CELL VINYL, ANTIMICROBIAL UNDER-SINK PROTECTIVE PIPE COVER SYSTEM EQUAL TO TRUEBRO LAV GUARD 2. COVER SHALL BE SECURED WITH SNAP-CLIP FLUSH REUSABLE FASTENERS, ANGLE STOP SHALL HAVE LOCK-LID LOCKING ACCESS COVER, VENT SLOTS, AND ACCESSORIES AS NECESSARY TO COVER ENTIRE DRAIN AND SUPPLY PIPING TO EACH SINK.
- D. ALL INSULATION AND COVERING SYSTEMS SHALL HAVE FIRE HAZARD CLASSIFICATION NOT EXCEEDING 25 FLAME SPREAD, 50 FUEL CONTRIBUTION, AND 50 SMOKE DEVELOPED WHEN TESTED UNDER ASTM E84 AND UL723.
- E. PRODUCTS SHALL NOT CONTAIN ASBESTOS, LEAD, MERCURY, OR MERCURY COMPOUNDS.
- F. PRODUCTS THAT COME IN CONTACT WITH STAINLESS STEEL SHALL HAVE A LEACHABLE CHLORIDE CONTENT OF LESS THAN 50 PPM WHEN TESTED ACCORDING TO ASTM C 871.
- G. INSULATION MATERIALS FOR USE ON AUSTENITIC STAINLESS STEEL SHALL BE QUALIFIED AS ACCEPTABLE ACCORDING TO ASTM C 795.

DESIGNATIONS OR ABBREVIATIONS AS USED ON DRAWINGS, PIPE SIZE, AND AN ARROW

1. FLOW-DIRECTION ARROWS: INTEGRAL WITH PIPING SYSTEM SERVICE LETTERING TO ACCOMMODATE BOTH DIRECTIONS OR AS SEPARATE UNIT ON EACH PIPE LABEL TO

- 1. VALVE-TAG SCHEDULE SHALL BE INCLUDED IN OPERATION AND MAINTENANCE DATA.
- 2. NEAR EACH BRANCH CONNECTION, EXCLUDING SHORT TAKEOFFS FOR FIXTURES AND TERMINAL UNITS. WHERE FLOW PATTERN IS NOT OBVIOUS, MARK EACH PIPE AT
- 4. AT ACCESS DOORS, MANHOLES, AND SIMILAR ACCESS POINTS THAT PERMIT VIEW OF
 - SECTION 22 07 00 PLUMBING INSULATION

<u>PIPE SIZE</u>	THICKNESS
1/2" TO 1-1/4"	1/2"
1-1/2" AND UP	1"
1/2" – 1–1/2"	1 "
2" AND UP	2"

H. FOAM INSULATION MATERIALS SHALL NOT BE USED.

SECTION 22 11 16 - DOMESTIC WATER PIPING

- 1.1 COPPER TUBES AND FITTINGS
- A. HARD COPPER TUBE: ASTM B 88, TYPE L WATER TUBE, DRAWN TEMPER.
- 1. WROUGHT-COPPER SOLDER-JOINT FITTINGS: ASME B16.22, WROUGHT-COPPER PRESSURE FITTINGS.
- 2. BRONZE FLANGES: ASME B16.24, CLASS 150, WITH SOLDER-JOINT ENDS.
- 3. COPPER UNIONS: MSS SP-123, CAST-COPPER-ALLOY, HEXAGONAL-STOCK BODY, WITH BALL-AND-SOCKET, METAL-TO-METAL SEATING SURFACES, AND SOLDER-JOINT OR THREADED ENDS.
- 1.2 VALVES
- A. VALVES
- 1. BALL VALVES SHALL BE USED IN SIZES 1_1/2_INCHES OR LESS.
- a. BALL VALVES SHALL BE MILWAUKEE BA-150-S (SWEAT) WITH STAINLESS STEEL BALL AND STEM OR EQUAL BY NIBCO OR STOCKHAM.
- b. VALVES SHALL HAVE STAINLESS STEEL BALL AND STEM.

SECTION 22 11 19 - DOMESTIC WATER PIPING SPECIALTIES

- 1.1 VACUUM BREAKERS
- A. HOSE-CONNECTION VACUUM BREAKERS (WATTS MODEL 8BC)
- 1. BODY: BRASS, WITH BREAKAWAY SET SCREW, WITH MANUAL DRAIN.
- 2. OUTLET CONNECTION: GARDEN-HOSE THREADED COMPLYING WITH ASME B1.20.7.
- 3. FINISH: CHROME
- 1.2 BACKFLOW PREVENTERS
- A. REDUCED PRESSURE PRINCIPAL BACKFLOW PREVENTERS (WATTS MODEL 909-QT-S-C-U)
- 1. ASSE 1013, AWWA C511, CSA B64.3 APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY WITH QUARTER TURN INLET AND OUTLET BALL VALVES, TEST COCKS. UNIT SHALL BE COMPLETE ASSEMBLY. UNIT SHALL HAVE 4 RESILIENT SEATED TEST COCKS; THE FIRST TEST COCK SHALL BE LOCATED ON THE UPSTREAM SIDE OF THE FIRST SHUT OFF VALVE, THE SECOND BETWEEN THE FIRST SHUT OFF VALVE AND THE FIRST CHECK VALVE, THE THIRD BETWEEN THE TWO CHECK VALVES AND THE FOURTH ON THE DOWNSTREAM SIDE OF THE SECOND CHECK VALVE. PROVIDE WITH INLET STRAINER, UNION CONNECTIONS AND AIR GAP FITTING. INSTALLING CONTRACTOR TO PIPE AIR GAP DRAIN TO NEAREST FLOOR DRAIN.
- 2. STANDARD: ASSE 1013.
- 3. OPERATION: CONTINUOUS-PRESSURE APPLICATIONS.
- 4. SIZE: AS SHOWN OR INDICATED ON THE DRAWINGS.
- 5. BODY: BRONZE.
- 6. END CONNECTIONS: UNION
- 7. FINISH: ROUGH BRONZE.
- 1.3 WATER PRESSURE-REDUCING VALVES
- A. WATER PRESSURE REDUCING VALVE (WATTS SERIES N45BDU-EZ-G)
- 1. ASSE 1003, ANSI A112.26.2 AND CSA APPROVED WATER PRESSURE REDUCING VALVE DESIGNED TO REDUCE INCOMING WATER PRESSURE AND PROTECT PLUMBING SYSTEM FROM EXCESSIVE PRESSURE. VALVE SHALL BE SUITABLE FOR POTABLE WATER AT PRESSURERS UP TO 300 PSI AND ALLOW FOR ADJUSTMENT FROM 25-75 PSI. ALL PARTS SHALL BE EASILY SERVICEABLE WITHOUT REMOVING VALVE FROM THE PIPING SYSTEM. PROVIDE WITH BYPASS FEATURE.
- 2. STANDARD: ASSE 1003.
- 3. PRESSURE RATING: INITIAL WORKING PRESSURE OF 300 PSI.
- 4. SIZE: 2"
- 5. BODY: BRONZE.
- 6. VALVES TO INCLUDE INTEGRAL BYPASS.
- 7. END CONNECTIONS: THREADED

1.4 BALANCING VALVES

GOSSETT)

- A. COPPER-ALLOY CALIBRATED BALANCING VALVES (EQUAL TO WATTS OR BELL &
- 1. TYPE BALL VALVE WITH TWO READOUT PORTS AND MEMORY SETTING INDICATOR.
- 2. BODY: BRONZE
- 3. SIZE: SAME AS CONNECTED PIPING, BUT NOT LARGER THAN 1".
- 4. ACCESSORIES: METER HOSES, FITTINGS, VALVES, DIFFERENTIAL PRESSURE METER, AND CARRYING CASE.
- 1.5 STRAINERS FOR DOMESTIC WATER PIPING
- A. Y-PATTERN STRAINERS (WATTS SERIES 777)
- 1. PRESSURE RATING: 125 PSIG MINIMUM, UNLESS OTHERWISE INDICATED.
- 2. BODY: BRONZE COMPLYING WITH AWWA C550 OR FDA-APPROVED. (LINE SIZE ON DRAWINGS)
- 3. END CONNECTIONS: THREADED NPS 2 AND SMALLER; FLANGED FOR NPS 2-1/2 AND LARGER.
- 4. SCREEN: STAINLESS STEEL WITH ROUND PERFORATIONS, UNLESS OTHERWISE INDICATED.
- 5. DRAIN: PIPE PLUG.

1.6 WATER HAMMER ARRESTERS

- A. WATER HAMMER ARRESTERS (PRECISION PLUMBING SC "SYSTEM RATED" SERIES)
- 1. STANDARD: ASSE 1010 OR PDI-WH 201.
- 2. TYPE: COPPER TUBE WITH PISTON.
- 3. SIZE: ASSE 1010, SIZES AA AND A THROUGH F OR PDI-WH 201, SIZES A THROUGH F.

1.7 AIR VENTS

A. BOLTED-CONSTRUCTION AUTOMATIC AIR VENTS

- 1. BODY: BRONZE.
- 2. PRESSURE RATING: 125-PSIG MINIMUM PRESSURE RATING AT 140 DEG F
- FLOAT: REPLACEABLE, CORROSION-RESISTANT METAL.
- 4. MECHANISM AND SEAT: STAINLESS STEEL
- 5. SIZE: NPS 3/8 MINIMUM INLET
- 6. INLET AND VENT OUTLET END CONNECTIONS: THREADED.

SECTION 22 13 16 - SANITARY WASTE AND VENT PIPING

1.1 PVC PIPE AND FITTINGS

A. SOLID-WALL PVC PIPE: ASTM D 2665 SCHEDULE-40, DRAIN, WASTE, AND VENT. 1. PVC SOCKET FITTINGS: ASTM D 2665, SOCKET TYPE, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS.

B. SOLVENT CEMENT AND ADHESIVE PRIMER:

- 1. USE PVC SOLVENT CEMENT THAT HAS A VOC CONTENT OF 510 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
- 2. USE ADHESIVE PRIMER THAT HAS A VOC CONTENT OF 550 G/L OR LESS WHEN CALCULATED ACCORDING TO 40 CFR 59, SUBPART D (EPA METHOD 24).
- 1.2 HUBLESS CAST-IRON SOIL PIPE AND FITTINGS
- A. PIPE AND FITTINGS: ASTM A 888 OR CISPI 301.
- B. SOVENT STACK FITTINGS: ASME B16.45 OR ASSE 1043, HUBLESS, CAST-IRON AERATOR AND DEAERATOR DRAINAGE FITTINGS.
- C. STANDARD, SHIELDED, STAINLESS-STEEL COUPLINGS: CISPI 310, WITH STAINLESS-STEEL CORRUGATED SHIELD; STAINLESS-STEEL BANDS AND TIGHTENING DEVICES; AND ASTM C 564, RUBBER SLEEVE.

SECTION 22 13 19 - SANITARY WASTE PIPING SPECIALTIES

1.1 CLEANOUTS

A. EXPOSED METAL CLEANOUTS

- 1. STANDARD: ASME A112.36.2M FOR CAST IRON FOR CLEANOUT TEST TEE.
- 2. SIZE: SAME AS CONNECTED DRAINAGE PIPING
- 3. BODY MATERIAL: HUB-AND-SPIGOT, CAST-IRON SOIL PIPE T-BRANCH AS REQUIRED TO MATCH CONNECTED PIPING.
- 4. CLOSURE: COUNTERSUNK OR RAISED-HEAD, CAST-IRON PLUG.
- 5. CLOSURE PLUG SIZE: SAME AS OR NOT MORE THAN ONE SIZE SMALLER THAN CLEANOUT SIZE.
- 6. CLOSURE: STAINLESS-STEEL PLUG WITH SEAL.
- 1.2 AIR-ADMITTANCE VALVES

A. FIXTURE AIR-ADMITTANCE VALVES:

- 1. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
- 2. STANDARD: ASSE 1051, TYPE A FOR SINGLE FIXTURE OR TYPE B FOR BRANCH PIPING
- 3. HOUSING: PLASTIC.
- 4. OPERATION: MECHANICAL SEALING DIAPHRAGM.
- 5. SIZE: SAME AS CONNECTED FIXTURE OR BRANCH VENT PIPING.

'ISION:	PROJECT NO.: SCSU-2023-02		CONTINUES	
	DATE: APRIL 7, 2023	DAVIO HALL GROUND FLOOR	*	
ET:	DRAWING PLUMBING DETAILS	RENOVATIONS	OF CO	SIALE UNIVERSITY
) <u>.</u> 02			NACCH CO	FACILITIES PLANNING DEPARTMENT
	SCALE: NTS		Community	615 FITCH STREET / HAMDEN, CT 06514 / TEL: 203-392-6055

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	SOUTHERN CONNECTICUT STATE UNIVERSITY FACILITIES PLANNING DEPARTMENT 015 FITCH STREET / HAMDEN, CT 06514 / TEL: 203-392-6055
	Eleventerassheet
	DAVIS HALL GROUND FLOOR RENOVATIONS
LINETYPE LEGEND EXISTING TO REMAIN DEMOLITION EXISTING VENT TO REMAIN	PROJECT NO.: SCSU-2023-02 DATE: APRIL 7, 2023 DRAWING SANTARY AND VENTING TITLE: DEMOLITION SCALE: 1/8" = 1'
	REVISION: SHEET: PD1.01

SCALE: N.T.S.

 CONDENSATE PUMP SCHEDULE (BASED ON LITTLE GIANT)

 SYMBOL
 MODEL
 MAX FLOW (GPM)
 HEAD (FT)
 DISCHARGE NPT
 MOTOR POWER (HP)
 AMPS
 VOLTS/Ø
 VFD REQUIRED (YES/NO)

 CP-1
 VCMA-20ULST
 1
 10
 3/8"
 1/30
 1.5
 115/1
 NO

 NOTES:
 1.
 POWER WIRING, RACEWAY, AND DISCONNECT BY DIVISION 26.
 2.
 PUMP PERFORMANCE BASED UPON WATER AT 60"F

	PLUMBING FIXTURE SCHEDULE (BASED ON MANUEACTURER)										
							(BASED ON MANUFACTURER			
SYMBOL DESCIPTION TEPID	DESCIPTION		PIF	PE SI	ZE		MOUNTING	FIXTURE	FIXTURE DESCRIPTION	TRIM DESCRIPTION	
	нот	COLD	SAN.	VENT		MANUFACTURER					
SS–1	SERVICE SINK	_	3/4"	34"	3"	2"	DROP-IN	KOHLER	STACCATO 20" TOP-MOUNT SINGLE-BOWL BAR SINK, MODEL K-3363-1. ADA COMPLIANT. 18-GAUGE STAINLESS STEEL. SINGLE FAUCET HOLE, 20"W X 20"L X 8-5/16" DEEP.	KOHLER CORALAIS SINGLE HANDLE KITCHEN FAUCET, MODEL K–15171–F–CP, POLISHED CHROME, 1.8 GPM, SPOUT HEIGHT 5.125", 8.5" REACH. ADA COMPLIANT.	
HB-1	WALL HYDRANT	3⁄4"	_	_	_	_	WALL	WOODFORD	ENCLOSED WALL HYDRANT, CLOSE COUPLED, $\frac{3}{4}$ " FNPT INLET, $\frac{3}{4}$ " HOSE, 5.5"X6.5" WALL OPENING.		
NOTES: 1. SEE ARG	NOTES: 1. SEE ARCHITECTURAL DRAWINGS FOR PLUMBING FIXTURE MOUNTING HEIGHT DETAILS.										

REVISION: PROJECT NO.: SCSU-2023-02 DATE: APRIL 7, 2023 SHEET: DRAWING PLUMBING DETAILS	DAVIS HALL GROUND FLOOR		
SHEET: DRAWING PLUMBING DETAILS		CONTINUES	
SHEET: DRAWING PLUMBING DETAILS		111 × 011	
	ALS RENOVATIONS	OF CO SETH SETH SETH SETH SET SET SET SET SET SET SET SET SET SET	VIAIE UNIVERUIIY
-5.01		WWW CACCO	FACILITIES PLANNING DEPARTMENT
SCALE: NTS		Citra Human	615 FITCH STREET / HAMDEN, CT 06514 / TEL: 203-392-6055

<u>LIGHTING</u>

\$	SWITCH TO EQUIPMENT SERVED MOUNTED 48" AFF TO CENTER OF BOX UNLESS OTHERWISE SHOWN ON DRAWING. PROVIDE WHERE SHOWN:
\$ _{DIM}	LOW VOLTAGE DIMMER CONTROL
\$p	PILOT LIGHT
\$key	KEY OPERATED SWITCH
\$wp	WEATHERPROOF SWITCH
\$3	THREE WAY SWITCH
\$4	FOUR WAY SWITCH

- Ś LOWER CASE LETTERS (a,b) DENOTE SWITCHING
- \$oc OCCUPANCY SENSOR WITH SWITCH
- CEILING MOUNTED OCCUPANCY SENSOR SUBSCRIPT "xx" = \bigcirc_{xx} PI – PASSIVE INFARED UL - ULTRASONIC DT – DUAL TECNOLOGY
- TC TIMECLOCK
- PHOTOCELL

 \triangleleft

-Ø-

Θ-

 (F)

M

 \square

J

- \otimes
- CEILING MOUNTED EXIT SIGN, SINGLE FACE, WITH BATTERY BACKUP $|\otimes|$ CEILING MOUNTED EXIT SIGN, DOUBLE FACE, WITH BATTERY BACKUP
- CEILING MOUNTED EXIT SIGN. SINGLE FACE WITH CHEVRONS AND BATTERY BACKUP \otimes CHEVRONS SHALL BE IDENTIFIABLE AT A MINIMUM DISTANCE OF 40 FEET. CEILING MOUNTED EXIT SIGN, DOUBLE FACE WITH CHEVRONS AND BATTERY BACKUP
- $|\otimes|$ CHEVRONS SHALL BE IDENTIFIABLE AT A MINIMUM DISTANCE OF 40 FEET. \bigotimes WALL MOUNTED EXIT SIGN WITH BATTERY BACKUP
- **4** EMERGENCY LIGHT FIXTURE MOUNTED 6"BELOW CEILING AND WITH BATTERY BACKUP EMERGENCY LIGHT REMOTE HEAD OUNTED 6" BELOW CEILING
 - EMERGENCY LIGHT RECESSED MOUNTING
 - FAN LIGHT COMBINATION FIXTURE
 - CEILING MOUNTED LIGHT FIXTURE
- ------Ю WALL MOUNTED LIGHT FIXTURE
- LIGHT FIXTURES (TYP)
- LIGHT FIXTURES WITH EMERGENCY BALLAST & BATTERY BACK-UP
 - EXTERIOR LIGHT AND POLE UPPER CASE LETTERS DENOTE FIXTURE TYPE IN SCHEDULE

 - OCCUPANCY SENSORS THE OCCUPANCY SENSOR SYMBOLS SHOWN ON THE PLAN VIEW DRAWINGS INDICATE WHICH ROOMS OR AREAS OF THE BUILDING REQUIRE OCCUPANCY SENSORS. TO ENSURE PROPER OPERATION, THE TOTAL QUANTITY OF OCCUPANCY SENSORS PROVIDED IN EACH ROOM SHALL BE DETERMINED BY THE CONTRACTOR AFTER CONSULTATION WITH
 - THE OCCUPANCY SENSOR MANUFACTURER. THE TECHNICAL PERFORMANCE REQUIREMENTS FOR VARIOUS TYPES OF OCCUPANCY SENSORS AND THE INSTALLATION REQUIREMENTS ARE OUTLINED IN THE SPECIFICATION.
- POWER CONNECTIONS
- AFF ABOVE FINISHED FLOOR AFG ABOVE FINISHED GRADE
- \ominus_{α} SINGLE RECEPTACLE MOUNTED AT 16" AFF TO CENTER OF BOX.
- \bigcirc_{α} DUPLEX RECEPTACLE MOUNTED AT 16" AFF TO CENTER OF BOX.
- Φα DUPLEX RECEPTACLE SPLIT WIRED MOUNTED AT 16" AFF TO CENTER OF BOX. DUPLEX RECEPTACLE CIRCUITED TO EMERGENCY POWER MOUNTED AT 16" AFF TO CENTER OF $\mathbf{D}_{\mathbf{Q}}$
 - BOX QUADPLEX RECEPTACLE MOUNTED AT 16" AFF TO CENTER OF BOX.
- Φa
- \bigoplus QUADPLEX RECEPTACLE FOR COMPUTERS MOUNTED AT 16" AFF TO CENTER OF BOX. SPECIAL RECEPTACLE FOR SPECIFIED EQUIPMENT. COORDINATE WITH OTHER TRADES FOR \odot_{α}
- MOUNTING LOCATION. SWITCH WITH PILOT LIGHT \$p
- RECEPTACLES SHOWN IN BOX WILL BE FLOOR MOUNTED
- RECEPTACLES SHOWN IN CIRCLE WILL BE CEILING MOUNTED
- FIREMATIC MOUNTED ON CEILING ABOVE HEATING EQUIPMENT. WIRE IN SERIES WITH CONTROL CIRCUI
- EMERGENCY POWER SHUT OFF SWITCH Şем
 - ELECTRICAL METER MOUNTED PER UTILITY COMPANY REQUIREMENTS.
- 00 CONTACTOR
 - MAGNETIC MOTOR STARTER
 - MANUAL DISCONNECT SWITCH FUSED DISCONNECT SWITCH
 - JUNCTION BOX
 - CEILING MOUNTED DOWN DRAFT FAN
- ∠ X,Y BRANCH CIRCUIT HOMERUN
 - "X" INDICATES CIRCUIT NUMBER "Y" INDICATES POWER PANEL
- SUBSCRIPTS "n" = NUMBER EQUALS ALTERNATE MOUNTING HEIGHT IN INCHES. INTERIOR WILL BE TO CENTER OF BOX AFF.
- EXTERIOR WILL BE TO CENTER OF BOX AFG. D = DEDICATED CIRCUIT TO THE DEVICE. GFI = GROUND FAULT INTERRUPT PROTECTION.
- WP = WEATHERPROOF BOX PER SPECIFICATIONS.

- FIRE ALARM/LIFE SAFETY FACP FIRE ALARM CONTROL PANEL MOUNTED AT 60" AFF TO CENT FAAN FIRE ALARM ANNUNCIATOR PANEL MOUNTED AT 60" AFF TO (F) FIRE ALARM MASTER STATION FIRE ALARM HORN UNIT S FIRE ALARM SPEAKER UNIT FIRE ALARM STROBE UNIT FIRE ALARM HORN/STROBE UNIT ∎KIS FIRE ALARM SPEAKER/STROBE UNIT FIRE ALARM PULL STATION MOUNTED AT 48" AFF TO CENTE H), HEAT DETECTOR S, SMOKE DETECTOR CD_{xx} CARBON MONOXIDE DETECTOR MAGNETIC DOOR HOLDER REMOTE LED/TEST STATION FOR DUCT TYPE SMOKE DETECTOR FIRE FIGHTERS PHONE JACK ADDRESSABLE MONITOR MODULE AMM ACM ADDRESSABLE CONTROL MODULE (FS) SPRINKLER FLOW SWITCH (TS) SPRINKLER TAMPER SWITCH (PS)SPRINKLER PRESSURE SWITCH CALL FOR AID EMERGENCY STATION WITH PULL CORD, MOUNTE ℃FA OF BOX WITH BOTTOM OF PULL CORD 12" AFF. CALL FOR AID AUDIO/VISUAL ALARM Ø GENERAL NOTES FOR FIRE ALARM/LIFE SAFETY EQUIPMENT WP = WEATHERPROOF BOX PER SPECIFICATIONSxx" = MOUNTING HEIGHT (AFF INSIDE, AFG OUTSIDE) DEFAULT MOUNTING HEIGHT SHOWN IN SCHEDULE xx = SUBSCRIPT AS DEFINED BELOW SPEAKERS/HORNS MOUNTING ALL ÁUDIBLE DEVICES SHALL BE MULTI-TAP db LEVEL SHALL BE HIGHEST TAP UNLESS OTHERWISE NOTED W = WALLC = CEILINGXXdb = db RATINGSTROBES OR COMBINATION WITH STROBE MOUNTING WALL MOUNTING 80" AFF TO CENTER OF STROBE UNLESS OTHER W = WALLC = CEILINGSTROBE MOUNTING AND INTENSITY RATING WALL MOUNTING 80" AFF TO CENTER OF STROBE UNLESS OTHERWISE NOTED W = WALLC = CEILINGXXdb = CANDELA RATING HEAT DETECTORS TEMPERATURE RATING WILL BE 135° UNLESS OTHERWISE NOTED XX° = FIXED TEMPERATURE RR = RATE OF RISESMOKE DETECTORS PHOTOELECTRIC UNLESS OTHERWISE NOTED DD = DUCT TYPE DETECTOR I = IONIZATIONP = PHOTOELECTRICH = COMBINATION SMOKE / HEAT DETECTORCO = COMBINATION SMOKE/CARBON MONOXIDE DETECTORDUCT DETECTORS ARE PROVIDED BY ELECTRICAL CONTRACTOR. MOUNTED BY MECHANICAL CONTRACTOR, WIRED BY ELECTRICAL CONTRACTOR. SEE MECHANICAL DRAWINGS FOR LOCATION.
- FLOW, TAMPER AND PRESSURE SWITCHES PROVIDED BY OTHERS, WIRED BY ELECTRICAL CONTRACTOR.

	POWE	R DISTRIBUTION EQUIPMENT
NTER OF BOX.		PANELBOARD, SURFACE MOUNTED
CENTER OF BOX	-	PANELBOARD, FLUSH MOUNTED
	\bigcirc	JUNCTION BOX, SIZED PER NEC
	2	MOTOR, "2" DENOTES HORSEPOWER
	\boxtimes	MAGNETIC MOTOR STARTER WITH ENCLOSURE, MINIMUM SIZE NEMA 1
	<u></u>	MANUAL MOTOR STARTER WITH THERMAL OVERLOAD.
		NON-FUSED DISCONNECT SWITCH: "30/3" DENOTES 30 AMP/3 POLE SWITCH
ER OF BOX.	∑ 30/20/3	FUSED DISCONNECT SWITCH: "30/20/3" DENOTES 30 AMP/3 POLE SWITCH, 20 AMP FUSES
	\boxtimes	COMBINATION MAGNETIC STARTER AND FUSED DISCONNECT SWITCH. SIZE OF STARTER, SWITCH AND FUSE AS REQUIRED
	Т	DRY-TYPE DISTRIBUTION TRANSFORMER
	ATS	AUTOMATIC TRANSFER SWITCH
DR	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
	T	PAD MOUNTED TRANSFORMER
	Ţ	GROUND ROD, REFER TO PLANS FOR EXACT SIZE
	TELECO	MMUNICATIONS (MOUNTED 18" AFE)
		& DATA JACK (EXISTING WALL MOUNTED)
		/ GREEN RJ-45 (EXISTING WALL MOUNTED)
TED 36" TO CENTER		/ GREEN RJ-45 (NEW WALL MOUNTED: NOTE MOUNTING HEIGHT
		NED) UNICATIONS OUTLET
	NODE	(WALL MOUNTED BEHIND MONITOR)
	SCCPC	SIMCAPTURE CONTROL PC
	CLUSTER	DATA/ELEC CLUSTER FOR PC & NODE COMBINATION TO INCLUDE THE FOLLOWING OUTLETS
		■ BLUE / GREEN RJ-45 FOR NODE (18" AFF) ■ BLUE / GREEN RJ-45 FOR SCCPC (18" AFF)
	MO PC	MONITORING PC
ERWISE NOTED		RE PROVIDED BY OWNER)
	PTZ (CAMERA (CEILING MOUNTED)
	(P12) *C, MO RE	AMERA: 1×CAT6 DATA CEILING DROP TERMINATED INTO RJ45 SURFACE UNT BOX. QUIRES 15.4 WATTS POWER OVER ETHERNET.
	(AM) AUDIC *AI SU RE) MODULE (CEILING MOUNTED): TO INCLUDE*** JDIO MODULE: 1xCAT6 DATA CEILING DROP TERMINATED INTO RJ45 RFACE MOUNT BOX. QUIRES 15.4 WATTS POWER OVER ETHERNET.
)	* M B-	ICROPHONE: NO DATA/POWER REQUIREMENTS. INSTALLED AND WIRED BY LINE MEDICAL.
	*SI B-	PEAKER: NO DATA/POWER REQUIREMENTS. INSTALLED AND WIRED BY LINE MEDICAL.
	MI MICRO INSTA	OPHONE (CEILING MOUNTED): NO DATA/POWER REQUIREMENTS. LLED AND WIRED BY B-LINE MEDICAL.
	SPEA/ AND	KER (CEILING MOUNTED): NO DATA/POWER REQUIREMENTS. INSTALLED WIRED BY B-LINE MEDICAL.
-	AV ADVAN	ICED PACKAGE RACK (CEILING MOUNTED): TO INCLUDE***
	*1; RE NIC	CAT6 DATA CEILING DROP TERMINATED INTO RJ45 SURFACE MOUNT BOX. QUIRES 30 WATTS POWER OVER ETHERNET (POE+) FOR DSP ETHERNET – 2.
	*1) PO	CAT6 DATA CEILING DROP TERMINATED INTO RJ45 SURFACE MOUNT BOX. E DISABLED ON THIS JACK FOR DSP DANTE - NIC.
	*1: RE	CAT6 DATA CEILING DROP TERMINATED INTO RJ45 SURFACE MOUNT BOX. QUIRES 15.4 WATTS POWER OVER ETHERNET FOR AUDIO MODULE.

DENOTES JSED SWITCH XACT SIZE 18" AFF) NOTE MOUNTING HEIGHT MBINATION TO INCLUDE THE ODE (18" AFF) CPC (18" AFF) C (18" AFF) NATED INTO RJ45 SURFACE TERMINATED INTO RJ45 ENTS. INSTALLED AND WIRED BY

BRANCH CIRCUIT WIRING NOTES:

- 1. WIRING IS SHOWN ON DRAWINGS ONLY FOR SPECIFIC ROUTES OR SPECIAL CONDITIONS.
- 2. WIRING AND CONDUIT SHALL BE REQUIRED BETWEEN ALL OUTLETS INDICATED WITH CIRCUIT NUMBERS AND PANEL DESIGNATIONS.
- 3. ALL SWITCH CONTROLS SHALL BE PROVIDED WITH WIRING AND CONDUIT AS REQUIRED.
- 4. ALTHOUGH ALL BRANCH CIRCUIT WIRING AND CONDUIT IS NOT SHOWN, IT IS THE INTENT OF THESE DOCUMENTS THAT A COMPLETE BRANCH CIRCUIT WIRING SYSTEM
- BE INSTALLED. 5. A GREEN GROUNDING CONDUCTOR SHALL BE RUN WITH ALL CIRCUITS. VERIFY CONDUIT SIZE TO ENSURE IT CAN ACCOMMODATE ALL PHASE, NEUTRAL AND
- GROUND CONDUCTORS. 6. PROVIDE A NEUTRAL CONDUCTOR TO ALL LIGHTING SWITCH BOXES PER NEC
- ARTICLE 404.2.
- 7. ALL 15A AND 20A, 125V RECEPTACLES IN NON-DWELLING TYPE OCCUPANCIES SHALL BE GFCI PROTECTED PER NEC ARTICLE 210.8(B).
- 8. 120 VOLT CIRCUITS OVER 100 FEET IN LENGTH AND 277 VOLT CIRCUITS OVER 200 FEET IN LENGTH FROM THE POINT OF SUPPLY TO THE FIRST OUTLET SHALL BE #10 AWG.

ABBREVIATIONS 3R NEMA 3R RATING 4X NEMA 4X RATING AMPERES Α AFF ABOVE FINISHED FLOOR ABOVE FINISHED GRADE AFG AIC AMPERE INTERRUPTING CAPACITY ATS AUTOMATIC TRANSFER SWITCH AMERICAN WIRE GAUGE AWG С CONDUIT C/B CIRCUIT BREAKER CAT CATALOG CKT CIRCUIT CU COPPER DWG DRAWING WIRED ON EMERGENCY CIRCUIT ELECTRICAL CONTRACTOR EC EM EMERGENCY GROUND GENERAL CONTRACTOR GC GROUND FAULT INTERRUPTER GFI HEATING, VENTILATION, AIR HVAC CONDITIONING CONTRACTOR ISOLATED GROUND IG KCMIL ONE THOUSAND CIRCULAR MILS KVA KILOVOLT-AMPERES KW KILOWATTS MCB MAIN CIRCUIT BREAKER MLO MAIN LUGS ONLY NATIONAL ELECTRICAL CODE NEC NIGHT LIGHT NL NTS NOT TO SCALE ø PHASE POLE Р PLUMBING CONTRACTOR PC PVC POLYVINYL CHLORIDE SURFACE MOUNT SM SHUNT TRIP T/D TEL/DATA TELEPHONE TEL UG UNDERGROUND UNLESS NOTED OTHERWISE UNO ۷ VOLT

MECHANICAL EQUIPMENT TAG ABBREVIATIONS

WEATHERPROOF

TRANSFORMER

WATT

W

WP

XFMR

ACC	AIR-COOLED CONDENSER
AHU	AIR HANDLING UNIT
В	BOILER
СН	CHILLER
CUH	CABINET UNIT HEATER
EBB	ELECTRIC BASEBOARD
EF	EXHAUST FAN
EH	EXHAUST HOOD
EWH	ELECTRIC WALL HEATER
FC	FAN COIL
HP	HEAT PUMP
GWH	GAS WATER HEATER
MAU	MAKE-UP AIR UNIT
Р	PUMP
RTU	ROOF TOP UNIT
UH	UNIT HEATER

VARIABLE AIR VOLUME BOX

VAV

EMERGENCY -LIGHTING UNIT FIRE ALARM AUDIO/ -VISUAL APPLIANCE

PULL STATION LIGHT SWITCH -----RECEPTACLE -

NOTES:

REVISION:	PROJECT NO.: SCSU-2023-02		A Secondary	
	DATE: APRIL 7, 2023		Contraction of the second	
SHEET:	DRAWING GENERAL NOTES	RENOVATIONS	NO 269	SIALE UNIVERSILY
E0.01				FACILITIES PLANNING DEPARTMENT
	SCALE: NTS			615 FITCH STREET / HAMDEN, CT 06514 / TEL: 203-392-6055

SECTION 260505 SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical demolition. PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual sections.
 PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as indicated.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on casual field observation and existing record documents.
- D. Report discrepancies to Owner before disturbing existing installation.
- E. Report discrepancies to Engineer before disturbing existing installation.

F. Beginning of demolition means installer accepts existing conditions. 3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Coordinate utility service outages with utility company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- 3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK
- A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
- 1. PCB- and DEHP-containing lighting ballasts.
- B. Remove, relocate, and extend existing installations to accommodate new construction.
 C. Remove abandoned wiring to source of supply.
- Nemove abandoned wining to source of suppry.
- D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
 E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is
- abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
- F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- G. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- H. Repair adjacent construction and finishes damaged during demolition and extension work.
- Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
- Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

3.04 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment that remain or that are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

END OF SECTION SECTION 260519 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

- 1.01 SECTION INCLUDES
- A. Single conductor building wire.
- B. Wiring connectors.
- C. Electrical tape.D. Wire pulling lubricant.
- E. Firestop sleeves.
- 1.02 ADMINISTRATIVE REQUIREMENTS
- A. Coordination:
- 1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual
- conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
- Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
- Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- 1.03 SUBMITTALS
- A. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.
- B. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of
- product. C. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing.
- 1.04 QUALITY ASSURANCE
- A. Comply with requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with
- minimum three years documented experience.
 D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized
 Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- 1.05 DELIVERY, STORAGE, AND HANDLING
- A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.
- 1.06 FIELD CONDITIONS
- A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F (-10 degrees C), unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Engineer and obtain direction before proceeding with work.
- PART 2 PRODUCTS
- 2.01 CONDUCTOR AND CABLE APPLICATIONS
- A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
- B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Provide new conductors and cables manufactured not more than one year prior to installation.D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- E. Comply with NEMA WC 70.
- F. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- G. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- H. Conductor Material:
- 1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes
- indicated are based on copper.
 Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
- 3. Tinned Copper Conductors: Comply with ASTM B33.
- I. Minimum Conductor Size:
- 1. Branch Circuits: 12 AWG.
- a. Exceptions:
- 1) 20 A, 120 V circuits longer than 75 feet (23 m): 10 AWG, for voltage drop.
- 20 A, 120 V circuits longer than 150 feet (46 m): 8 AWG, for voltage drop.
 J. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size
- requirements specified.
- K. Conductor Color Coding:
- Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 Color Coding Method: Integrally colored insulation.
- Color Code:
 Color Code:
- a. 208Y/120 V, 3 Phase, 4 Wire System:
- 1) Phase A: Black.
- 2) Phase B: Red.
- 3) Phase C: Blue.
- 4) Neutral/Grounded: White.
- b. Equipment Ground, All Systems: Green.
- 2.03 SINGLE CONDUCTOR BUILDING WIRE

- A. Description: Single conductor insulated wire.
- B. Conductor Stranding:
- 1. Feeders and Branch Circuits:
- a. Size 10 AWG and Smaller: Solid.b. Size 8 AWG and Larger: Stranded.
- C. Insulation Voltage Rating: 600 V.
- D. Insulation:
- 1. Copper I
- Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
 a. Fixture Wiring Within Luminaires: Type TFFN/TFN for luminaires with labeled maximum temperature of 90 degrees C; Approved suitable type for luminaires with labeled maximum temperature greater than 90 degrees C.
- 2.04 WIRING CONNECTORS

C. Wiring Connectors for Terminations:

connectors are required.

UL 486D for damp and wet locations.

G. Mechanical Connectors: Provide bolted type or set-screw type.

stripping insulation.

2.05 ACCESSORIES

A. Electrical Tape

dearees C

B. Wire Pulling Lubricant:

PART 3 EXECUTION

3.01 EXAMINATION

3.02 PREPARATION

3.03 INSTALLATION

A. Circuiting Requirements:

D. Installation in Raceway:

sidewall pressure.

in accordance with NFPA 70.

bodies or wiring gutters

damaging conductors.

location conductors are accessible.

specified in Section 078400.

3.04 FIELD QUALITY CONTROL

manufacturer

1. Listed and labeled as complying with UL 267.

Verify that work likely to damage wire and cable has been completed.

D. Verify that conditions are satisfactory for installation prior to starting work.

1. Unless dimensioned, circuit routing indicated is diagrammatic.

them together in a single raceway is not permitted.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

support from raceways, piping, ductwork, or other systems.

J. Make wiring connections using specified wiring connectors.

neutral/grounded conductor for each individual branch circuit.

2. Pull all conductors and cables together into raceway at same time.

conductors and cables in accordance with NFPA 70

C. Verify that field measurements are as indicated.

3. Arrange circuiting to minimize splices.

3. Suitable for use at installation temperature.

only compression connectors are specified

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal

2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when

3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors

4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where

D. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without

F. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F (105 degrees C) for standard applications and

302 degrees F (150 degrees C) for high temperature applications; pre-filled with sealant and listed as complying with

1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL

510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; suitable for

3. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388;

2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum

thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to

0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105

minimum thickness of 30 mil (0.76 mm); suitable for continuous temperature environment up to 194 degrees F

4. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil (3.2 mm); suitable

E. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.

H. Compression Connectors: Provide circumferential type or hex type crimp configuration.

continuous temperature environment up to 221 degrees F (105 degrees C).

(90 degrees C) and short-term 266 degrees F (130 degrees C) overload service.

for continuous temperature environment up to 176 degrees F (80 degrees C).

2. Suitable for use with conductors/cables and associated insulation/iackets to be installed

C. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

2. When circuit destination is indicated without specific routing, determine exact routing required.

1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.

E. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

support from ceiling grid or allow conductors and cables to lay on ceiling tiles.

G. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.

3. Do not remove conductor strands to facilitate insertion into connector.

contaminates. Do not use wire brush on plated connector surfaces.

insulation and mechanical strength at least equivalent to unspliced conductors.

followed by outer covering of vinyl insulating electrical tape.

L. Insulate ends of spare conductors using vinyl insulating electrical tape.

N. Identify conductors and cables in accordance with Section 260553.

furnished by others, as required for a complete operating system.

A See Section 014000 - Quality Requirements for additional requirements

D. Correct deficiencies and replace damaged or defective conductors and cables.

B. Inspect and test in accordance with NETA ATS, except Section 4.

4. Include circuit lengths required to install connected devices within 10 ft (3.0 m) of location indicated.

5. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining

6. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase

3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and

4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the

F. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods

H. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide

1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide

I. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures

1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit

2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or

4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other

5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.

K. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with

M. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as

permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each

O. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods

P. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those

C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

END OF SECTION SECTION 260529

conductors. The resistance test for parallel conductors listed as optional is not required.

a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape,

6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

1. Dry Locations: Use insulating covers specifically designed for the connectors or electrical tape

branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated

B. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate

suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective

- B. Wiring Connectors for Splices and Taps:
 1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
- Copper Conductors Size 6 AWG and Smaller. Use twist-on insulated spring connectors.
 Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

PART 1 GENERA

A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
- 1. Coordinate sizes and arrangement of supports and bases with actual equipment and components to be
- 2. Coordinate work to provide additional framing and materials required for installation.
- 3. Coordinate compatibility of support and attachment components with mounting surfaces at installed locations.
- Coordinate arrangement of supports with ductwork, piping, equipment and other potential conflicts.
 Notify Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work

1.03 SUBMITTALS

- A. See Section 013000 Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel/strut framing systems, nonpenetrating rooftop supports, and post-installed concrete/masonry anchors.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
 1.04 OUALITY ASSURANCE
- A Maintain at project site
- A. Maintain at project site one copy of each referenced document that prescribes execution requirements.B. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.05 DELIVERY, STORAGE, AND HANDLING

- Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
 PART 2 PRODUCTS
- 2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:

- 1. Comply with the following. Where requirements differ, comply with most stringent.
- a. NFPA 70.
- b. Applicable building code.c. Requirements of authorities having jurisdiction.
- Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
- Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.
- 4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for load to be supported with minimum safety factor of 25%.
- Include consideration for vibration, equipment operation, and shock loads where applicable.
- 5. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- 6. Steel Components: Use corrosion-resistant materials suitable for environment where installed.
- a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
 b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
- c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
- d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM
- A153/A153M. B. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.
- 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
- 2. Conduit Clamps: Bolted type unless otherwise indicated.
- C. Outlet Box Supports: Hangers and brackets suitable for boxes to be supported.
- D. Metal Channel/Strut Framing Systems:
 1. Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.
- 2. Comply with MFMA-4.
- E. Hanger Rods: Threaded, zinc-plated steel unless otherwise indicated.
- F. Anchors and Fasteners:
- 1. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.

PART 3 EXECUTION

- 3.01 EXAMINATION
- A. Verify that field measurements are as indicated.
- B. Verify that mounting surfaces are ready to receive support and attachment components.

C. Verify that conditions are satisfactory for installation prior to starting work.

- 3.02 INSTALLATION
- A. Install products in accordance with manufacturer's instructions.
- B. Install hangers and supports in accordance with NECA 1.
- C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.D. Unless specifically indicated or approved by Engineer, do not provide support from suspended ceiling support
- system or ceiling grid.
- E. Unless specifically indicated or approved by Engineer, do not provide support from roof deck.
- F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.G. Equipment Support and Attachment:
- Use metal, fabricated supports or supports assembled from metal channel/strut to support equipment as
- required. 2. Use metal channel/strut secured to studs to support equipment surface mounted on hollow stud walls when wall
- strength is not sufficient to resist pull-out.
- 3. Use metal channel/strut to support surface-mounted equipment in wet or damp locations to provide space
- between equipment and mounting surface. 4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for
- support.
- H. Conduit Support and Attachment: See Section 260533.13 for additional requirements.
- I. Box Support and Attachment: See Section 260533.16 for additional requirements.
- J. Interior Luminaire Support and Attachment: See Section 265100 for additional requirements.
 K. Secure fasteners in accordance with manufacturer's recommended torgue settings.
- L. Remove temporary supports.
- M. Identify independent electrical component support wires above accessible ceilings, where permitted, with color distinguishable from ceiling support wires in accordance with NFPA 70.
- 3.03 FIELD QUALITY CONTROL
- A. See Section 014000 Quality Requirements for additional requirements.
- B. Inspect support and attachment components for damage and defects.
- C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace
- components that exhibit signs of corrosion. D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION SECTION 260533.13

CONDUIT FOR ELECTRICAL SYSTEMS

- PART 1 GENERAL 1.01 SECTION INCLUDES
- A. Galvanized steel rigid metal conduit (RMC).
- B. Flexible metal conduit (FMC).
- C. Liquidtight flexible metal conduit (LFMC).D. Galvanized steel electrical metallic tubing (EMT).
- E. Liquidtight flexible nonmetallic conduit (LFNC).
- 1.02 ADMINISTRATIVE REQUIREMENTS
- A. Coordination:
- Coordinate minimum sizes of conduits with actual type and quantity of conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
- Coordinate arrangement of conduits with structural members, ductwork, piping, equipment, and other potential conflicts
- 3. Verify exact conduit termination locations required for boxes, enclosures, and equipment.
- Notify Engineer of conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
 1. Do not begin installation of conductors and cables until installation of conduit between termination points is complete.
- 1.03 SUBMITTALS
- A. See Section 013000 Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.C. Project Record Documents: Record actual routing for all circuits.
- 1.04 QUALITY ASSURANCE
- A. Documents at Project Site: Maintain at project site one copy of manufacturer's instructions and shop drawings
- B. Product Listing Organization Qualifications: Organization recognized by OSHA as Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.05 DELIVERY, STORAGE, AND HANDLING

- Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.
 PART 2 PRODUCTS
- 2.01 CONDUIT APPLICATIONS
- A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70, manufacturer's instructions, and product listing.
- B. Unless otherwise indicated and where not otherwise restricted, use conduit types indicated for specified applications. Where more than one listed application applies, comply with most restrictive requirements. Where conduit type for particular application is not specified, use galvanized steel rigid metal conduit.

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and

3. Connectors and Couplings: Use threaded type fittings only. Threadless fittings, including set screw and

A. Description: NFPA 70, Type FMC standard-wall steel flexible metal conduit listed and labeled as complying with UL

A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled

A. Description: NFPA 70, Type EMT galvanized steel electrical metallic tubing complying with ANSI C80.3 and listed

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

A. Description: NFPA 70, Type LFNC liquidtight flexible nonmetallic conduit listed and labeled as complying with UL

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B; suitable for

1. Nonhazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL

- 2.02 CONDUIT GENERAL REQUIREMENTS
- A. Comply with NFPA 70.
- B. Provide conduit, fittings, supports, and accessories required for complete raceway system.
- C. Provide products listed, classified, and labeled as suitable for purpose intended.D. Minimum Conduit Size, Unless Otherwise Indicated:
- 1. Branch Circuits: 3/4-inch (21 mm) trade size.
- E. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size

2. Material: Use steel or malleable iron.

compression/gland types, are not permitted.

1 and listed for use in classified firestop systems

Material: Use steel or malleable iron

2.05 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

Material: Use steel or malleable iron

and labeled as complying with UL 797.

2. Material: Use steel or malleable iron.

type of conduit to be connected.

A. Verify that field measurements are as indicated

B. Install conduit in accordance with NECA 1.

a. Electrical rooms.

b. Mechanical equipment rooms

and mounting surface.

G. Connections and Terminations:

making connections.

H. Penetrations:

is not limited to:

J. Conduit Sealing:

B. Verify that mounting surfaces are ready to receive conduits.

A. Install products in accordance with manufacturer's instructions.

PART 3 EXECUTION

2.06 GALVANIZED STEEL ELECTRICAL METALLIC TUBING (EMT)

3. Connectors and Couplings: Use compression/gland or set-screw type.

a. Do not use indenter type connectors and couplings.

1. Manufacturer: Same as manufacturer of conduit to be connected.

C. Verify that conditions are satisfactory for installation prior to starting work.

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

1. Unless dimensioned, conduit routing indicated is diagrammatic.

3. Conceal conduits unless specifically indicated to be exposed.

authorities having jurisdiction; see Section 260529.

support from ceiling grid or allow conduits to lay on ceiling tiles.

6. Use conduit clamp to support single conduit from beam clamp or threaded rod.

3. Use suitable adapters where required to transition from one type of conduit to another.

7. Secure joints and connections to provide mechanical strength and electrical continuity.

2. Make penetrations perpendicular to surfaces unless otherwise indicated.

required to preserve integrity of roofing system and maintain roof warranty.

I. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and

1. Where conduits cross structural joints intended for expansion, contraction, or deflection.

b. Where service conduits enter building from underground distribution system.

2. Where conduits are subject to earth movement by settlement or frost.

a. Where conduits enter building from outside.

exposed surfaces unless otherwise indicated or required.

4. Conceal bends for conduit risers emerging above ground.

4. Use conduit strap to support single surface-mounted conduit.

support multiple parallel suspended conduits.

8. Use of wire for support of conduits is not permitted.

couplings. Do not use running threads

and raintight hubs for wet locations

terminations to protect conductors

approval of Structural Engineer.

D. Install liquidtight flexible nonmetallic conduit (LFNC) in accordance with NECA 111.

4. Conduits in the following areas may be exposed, unless otherwise indicated:

5. Arrange conduit to maintain adequate headroom, clearances, and access.

7. Arrange conduit to provide no more than 150 feet (46 m) between pull points.

2. When conduit destination is indicated without specific routing, determine exact routing required.

6. Arrange conduit to provide no more than equivalent of four 90-degree bends between pull points.

8. Maintain minimum clearance of 6 inches (150 mm) between conduits and piping for other systems.

1. Secure and support conduits in accordance with NFPA 70 using suitable supports and methods approved by

2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other

3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide

a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit

5. Use metal channel/strut with accessory conduit clamps to support multiple parallel surface-mounted conduits.

7. Use trapeze hangers assembled from threaded rods and metal channel/strut with accessory conduit clamps to

1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to

2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split

4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.

5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations

6. Provide insulating bushings, insulated throats, or listed metal fittings with smooth, rounded edges at conduit

1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without

3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with

5. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.

6. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where

7. Install firestopping to preserve fire resistance rating of partitions and other elements; see Section 078400.

1. Use foam conduit sealant to prevent entry of moisture and gases. This includes, but is not limited to:

possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as

expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but

9. Maintain minimum clearance of 12 inches (300 mm) between conduits and hot surfaces.

2.07 LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT (LFNC)

labeled as complying with UL 6.

514B or UL 6.

2.04 FLEXIBLE METAL CONDUIT (FMC)

as complying with UL 360.

B. Fittings

B. Fittings

B. Fittings

B. Fittings

1660.

B. Fittings:

3.01 EXAMINATION

3.02 INSTALLATION

E. Conduit Routing

F. Conduit Support:

requirements specified.
2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

K. L. 3.03 FII A. 3.04 CI A. 3.05 PF A. 1.01 SE A. B	 c. Where conduits enter building from underground. d. Where conduits may transport moisture to contact live parts. 2. Where conduits may transport moisture to contact live parts. 2. Where conduits pass barriers between areas of potential substantial temperature differential, use foam conduit sealant at accessible point near penetration to prevent condensation. This includes, but is not limited to: a. Where conduits pass from outdoors into conditioned interior spaces. b. Where conduits pass from unconditioned interior spaces into conditioned interior spaces. Provide grounding and bonding; see Section 260526. Identify conduits; see Section 260553. 2. Provide grounding and barasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion. Correct deficiencies and replace damaged or defective conduits. E. PANING Clean interior of conduits to remove moisture and foreign matter. EVENTION Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign matter. END OF SECTION SECTION 260533.16 EDD OF SECTION SECTION 260533.16 EDD OF SECTION SECTION 260533.16 EDD OF SECTION SECTION 260533.16 EDX OF SEC				ES PLANNING DEPARTMENT TREET / HAMDEN, CT 06514 / TEL: 203-392-6055
1.02 AI A.	 DMINISTRATIVE REQUIREMENTS Coordination: 1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70. 2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed. 3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70. 4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated 			<u>ה</u>	FACILITI 615 FITCH S
1.03 SI A. B.	 according to NFPA 70. 5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others. 6. Coordinate the work with other trades to preserve insulation integrity. 7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated. 8. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work. JBMITTALS See Section 013000 - Administrative Requirements, for submittal procedures. Product Data: Provide manufacturer's standard catalog pages and data sheets for outlet and device boxes, junction 			NO 26660	
D. C. 1.04 QI A. B. C. 1.05 DE A. 2.01 BC A. B.	 Troduct bala. Information maintainatures. Manufacturer's installation instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product. Project Record Documents: Record actual locations for outlet and device boxes, junction boxes, and pull boxes. JALITY ASSURANCE Comply with requirements of NFPA 70. Maintain at the project site a copy of each referenced document that prescribes execution requirements. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction. ELVERY, STORAGE, AND HANDLING Receive, inspect, handle, and store products in accordance with manufacturer's instructions. PART 2 PRODUCTS XXES General Requirements: Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed. Provide all boxes is not indicated, size to comply with NFPA 70 but not less than applicable iminum size requirements specified. Provide grounding terminals within boxes where equipment grounding conductors terminate. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used a Junction and Pull Boxes: Use sheet-steel boxes for dry locations unless otherwise indicated or required. 		L GROUND FLOOR	NOVATIONS	
C.	 Use raised covers suitable for the type of wall construction and device configuration where required. Use shallow boxes where required by the type of wall construction. Do not use "through-wall" boxes designed for access from both sides of wall. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted. Wall Plates: Comply with Section 262726. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm): Comply with NEMA 250, and list and label as complying with UL 50E, or UL 508A. NEMA 250 Environment Type, Unless Otherwise Indicated: Indoor Clean, Dry Locations: Type 1, painted steel. Outdoor Locations: Type 3R, painted steel. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm): 		DAVIS HAI	ЯЩ	
3.01 E) A. B.	a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated. PART 3 EXECUTION CAMINATION Verify that field measurements are as indicated. Verify that mounting surfaces are ready to receive boxes.				
C. 3.02 IN	Verify that conditions are satisfactory for installation prior to starting work. STALLATION				
А. В.	Install products in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated				
C.	Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.				
D.	 Box Locations: Locate boxes to be accessible. Provide access panels in accordance with Section 083100 as required. Locate boxes so that wall plates do not span different building finishes. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches (150 mm) horizontal separation unless otherwise indicated. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be 			ATIONS	
E.	 reduced. Box Supports: 1. Secure and support boxes in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction. 2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems. 	SCSU-2023-02	2023	ECIFIC/	
F.	 Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system. Install boxes plumb and level. 	0	IL 7,	S Р	~
	Flush-Mounted Boxes:	ĭ ⊥	APRI	<u>0</u>	NTS
G.		4.5	1 1	- 7	
G.	or associated raised cover is not set back from finished surface more than 1/4 inch (6 mm) or does not project beyond finished surface.	JEC	ш	Ņ	 لت لِــ
G.	 Install boxes in noncomputable materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch (6 mm) or does not project beyond finished surface. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface. 	PROJEC	DATE:	DRAWIN TITLE:	SCALE:
G.	 Install boxes in noncompusuble materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch (6 mm) or does not project beyond finished surface. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch (3 mm) at the edge of the box. 	PROJEC	DATE:	DRAWIN TITLE:	SCALE:

I. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

viring devices when voltage between adjacent devices exceeds 300

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- K. Close unused box openings
- L. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.
- M. Provide grounding and bonding in accordance with Section 260526.
- N. Identify boxes in accordance with Section 260553.
- 3.03 CLEANING
- A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.
- 3.04 PROTECTION
- A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION SECTION 260533.23 SURFACE RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES A. Surface raceway systems

- 1.02 ADMINISTRATIVE REQUIREMENTS
- A. Coordination
- Coordinate the placement of raceways with millwork, furniture, equipment, etc. installed under other sections or by others.
- Coordinate rough-in locations of outlet boxes provided under Section 260533.16 and conduit provided under Section 260533.13 as required for installation of raceways provided under this section.
- Verify minimum sizes of raceways with the actual conductors and components to be installed.
- Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- B. Sequencing:
- 1. Do not install raceways until final surface finishes and painting are complete
- 2. Do not begin installation of conductors and cables until installation of raceways is complete between outlet, junction and splicing points.

1.03 SUBMITTALS

- A. See Section 013000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including dimensions, knockout sizes and locations, materials, fabrication details, finishes, service condition requirements, and accessories.
- 1. Surface Raceway Systems: Include information on fill capacities for conductors and cables.
- C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
 1.04 QUALITY ASSURANCE
- A. Comply with requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized

Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

- 1.05 DELIVERY, STORAGE, AND HANDLING
- A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS 2.01 RACEWAY REQUIREMENTS

- A. Provide all components, fittings, supports, and accessories required for a complete raceway system.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Do not use raceways for applications other than as permitted by NFPA 70 and product listing.

2.02 SURFACE RACEWAY SYSTEMS

- A. Surface Metal Raceways: Listed and labeled as complying with UL 5.
- B. Multioutlet Assemblies: Listed and labeled as complying with UL 111
- 2.03 SOURCE QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements. PART 3 EXECUTION

- 3.01 EXAMINATION
- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes and conduit terminations are installed in proper locations and are properly sized in
- accordance with NFPA 70 to accommodate raceways.
- C. Verify that mounting surfaces are ready to receive raceways and that final surface finishes are complete, including painting
- D. Verify that conditions are satisfactory for installation prior to starting work.
- 3.02 INSTALLATION
- A. Install products in accordance with manufacturer's instructions.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install raceways plumb and level.
- D. Arrange wireways and associated raceway connections to comply with NFPA 70, including but not limited to
- requirements for deflected conductors and wireways used as pullboxes. Increase size of wireway where necessary. E. Secure and support raceways in accordance with Section 260529 at intervals complying with NFPA 70 and
- manufacturer's requirements.
- F. Close unused raceway openings.
- G. Provide grounding and bonding in accordance with Section 260526.
- H. Identify raceways in accordance with Section 260553.
- 3.03 FIELD QUALITY CONTROL
- A. See Section 014000 Quality Requirements, for additional requirements.
- B. Inspect raceways for damage and defects.
- C. Correct wiring deficiencies and replace damaged or defective raceways.
- 3.04 CLEANING
- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.
- 3.05 PROTECTION

A. Protect installed raceways from subsequent construction operations.

END OF SECTION SECTION 260553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

- 1.01 SECTION INCLUDES
- A. Electrical identification requirements.
- B. Identification nameplates and labels.
- C. Wire and cable markers.D. Voltage markers.
- E. Floor marking tape.
- F. Warning signs and labels.
- 1.02 ADMINISTRATIVE REQUIREMENTS
- A. Coordination:
- Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
- B. Sequencing:
- Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
 Do not install identification products until final surface finishes and painting are complete.
- 1.03 SUBMITTALS
- A. See Section 013000 Administrative Requirements for submittals procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
- C. Shop Drawings: Provide schedule of items to be identified indicating proposed designations, materials, legends, and formats.
- D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.
- 1.04 QUALITY ASSURANCE
- A. Comply with requirements of NFPA 70.
- 1.05 FIELD CONDITIONS
- A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer. PART 2 PRODUCTS
- 2.01 IDENTIFICATION REQUIREMENTS
- A. Existing Work: Unless specifically excluded, identify existing elements to remain that are not already identified in accordance with specified requirements.
 B. Identification for Equipment:
- 1. Use voltage marker to identify highest voltage present for each piece of electrical equipment.
- 2. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.
- Use identification label or handwritten text using indelible marker on inside of door at each fused switch to identify required NEMA fuse class and size.
- 4. Use identification label to identify overcurrent protective devices for branch circuits serving fire alarm circuits. Identify with text "FIRE ALARM CIRCUIT".

- Use field-painted floor markings, floor marking tape, or warning labels to identify required equipment working clearances where indicated or where required by the authority having jurisdiction.
 a. Field-Painted Floor Markings: Alternating black and white stripes, 3 inches (76 mm) wide, painted in
- accordance with Section 099123 and 099113.Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the
- following.
- a. Service equipment.
 b. Industrial control panels
- c. Motor control centers.
- d. Elevator control panels.
- e. Industrial machinery. Arc Elash Hazard Warning Labo

C. Identification for Conductors and Cables

electrode conductors.

D. Identification for Raceways:

E. Identification for Boxes

F. Identification for Devices:

device location.

installed at one location.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

located at corners for larger sizes.

1. Minimum Size: 1 inch (25 mm) by 2.5 inches (64 mm).

1) Fire Alarm System: Identify with text "FIRE ALARM".

Equipment designation or other approved description.

a. Normal Power System: White text on black background.

5. Color: Black text on yellow background unless otherwise indicated.

2. Legend: Power source and circuit number or other designation indicated.

self-laminating type markers suitable for the conductor or cable to be identified.

C. Legend: Power source and circuit number or other designation indicated.

F. Color: Black text on white background unless otherwise indicated.

1. Markers for Equipment: 1 1/8 by 4 1/2 inches (29 by 110 mm).

3. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches (29 by 110 mm).

1. Markers for Voltage Identification: Highest voltage present.

E. Color: Black text on orange background unless otherwise indicated.

2. Markers for System Identification:

4. Markers for Junction Boxes: 1/2 by 2 1/4 inches (13 by 57 mm).

B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.

A. Markers for Conduits: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.

2. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.

B. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl

b. Fire Alarm System: White text on red background.

1. Minimum Size: 2 inches (51 mm) by 4 inches (100 mm).

1. Minimum Size: 3/8 inch (10 mm) by 1.5 inches (38 mm).

1. Minimum Size: 3/8 inch (10 mm) by 1.5 inches (38 mm).

2. Legend: Designation indicated and device zone or address.

3. Text: All capitalized unless otherwise indicated.

Text: All capitalized unless otherwise indicated

3. Text: All capitalized unless otherwise indicated.

Minimum Text Height: 3/16 inch (5 mm).

5. Color: Red text on white background.

E. Minimum Text Height: 1/8 inch (3 mm).

2.03 WIRE AND CABLE MARKERS

2.04 VOLTAGE MARKERS

C. Minimum Size

D. Legend:

cloth type markers.

4. Minimum Text Height: 3/16 inch (5 mm).

5. Color: Black text on clear background.

F. Format for Fire Alarm Device Identification:

4. Minimum Text Height: 1/2 inch (13 mm).

a. System designation where applicable:

3. Text: All capitalized unless otherwise indicated.

a. System Designation: 1 inch (25 mm).

D. Format for Caution and Warning Messages:

b. Equipment Designation: 1/2 inch (13 mm).

C. Format for Equipment Identification:

4. Minimum Text Height:

maintenance.

E. Format for Receptacle Identification:

of wallplate

A. Identification Nameplates:

1. Materials:

B. Identification Labels:

Legend:

Color:

At each source and load connection

 Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.
 a. Minimum Size: 3.5 by 5 inches (89 mm by 127 mm).

3. Use identification nameplate or identification label to identify color code for ungrounded and grounded power

conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment.

4. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and

c. Within equipment enclosures when conductors and cables enter or leave the enclosure.

5. Use wire and cable markers to identify connected grounding electrode system components for grounding

2. Use identification labels, handwritten text using indelible marker, or plastic marker tags to identify circuits

Use voltage markers or color coded boxes to identify systems other than normal power system.

3. Use identification labels or handwritten text using indelible marker to identify circuits enclosed.

Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.

5. Use identification label or engraved wallplate to identify load controlled for wall-mounted control devices

6. Use identification label to identify receptacles protected by upstream GFI protection, where permitted.

b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.

2. Plastic Nameplates: Two-laver or three-laver laminated acrylic or electrically non-conductive phenolic with

4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.

5. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch (25 mm) high; Four,

1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant

2. Legend: Include information or instructions indicated or as required for proper and safe operation and

A. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth or wrap-around self-adhesive vinyl

2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.

a. For exposed boxes in public areas, use only identification labels.

1. Identification for Communications Devices: Comply with Section 271000.

2. Wiring Device and Wallplate Finishes: Comply with Section 262726.

Use identification label to identify fire alarm system devices

a. Indoor Clean, Dry Locations: Use plastic nameplates.

beveled edges; minimum thickness of 1/16 inch (1.6 mm); engraved text.

enclosed for accessible conduits at wall penetrations, at floor penetrations, at roof penetrations, and at

a. Color-Coded Boxes: Field-painted in accordance with Section 099123 and 099113 per the following color

a. For devices concealed above suspended ceilings, provide additional identification on ceiling tile below

a. For receptacles in public areas or in areas as directed by Architect, provide identification on inside surface

controlling loads that are not visible from the control location and for multiple wall-mounted control devices

1. Use voltage markers to identify highest voltage present for accessible conduits at maximum intervals of 20 feet

1. Color Coding for Power Conductors 600 V and Less: Comply with Section 260519.

instrumentation conductors and cables at the following locations:

b. Within boxes when more than one circuit is present

equipment terminations when source is not within sight.

1. Use voltage markers to identify highest voltage present.

Fire Alarm System: Red.

2. Identification for Communications Conductors and Cables: Comply with Section 271000.

2.05 FLOOR MARKING TAPE

A. Floor Marking Tape for Equipment Working Clearance Identification: Self-adhesive vinyl or polyester tape with overlaminate, 3 inches (76 mm) wide, with alternating black and white stripes.

2.06 WARNING SIGNS AND LABELS

- A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.B. Warning Signs:
- 1. Materials:
- a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
- b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
- 2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners
- 3. Minimum Size: 7 by 10 inches (178 by 254 mm) unless otherwise indicated.
- C. Warning Labels:
- Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
 Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by
- label manufacturer.
- 3. Minimum Size: 2 by 4 inches (51 mm by 102 mm) unless otherwise indicated.
- D. Floor Signs:
 1. Materials: Use factory preprinted, self-adhesive vinyl, polyester, or rubber labels with protective overlaminate.
 PART 3 EXECUTION

3.01 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.02 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
- 1. Surface-Mounted Equipment: Enclosure front.
- Flush-Mounted Equipment: Inside of equipment door.
 Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
- 4. Elevated Equipment: Legible from the floor or working platform.
- 5. Interior Components: Legible from the point of access.
- 6. Conduits: Legible from the floor.
- 7. Boxes: Outside face of cover.
- 8. Conductors and Cables: Legible from the point of access.
- 9. Devices: Outside face of cover.
- C. Install identification products centered, level, and parallel with lines of item being identified.
 D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
- E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
- F. Secure rigid signs using stainless steel screws.
- G. Mark all handwritten text, where permitted, to be neat and legible.
- 3.03 FIELD QUALITY CONTROL
- A. See Section 014000 Quality Requirements, for additional requirements.B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.
 - END OF SECTION SECTION 262726 WIRING DEVICES

PART 1 GENERAL 1.01 SECTION INCLUDES

- A. Wall switches.
- B. Wall dimmers.
- C. Receptacles.
- D. Wall plates and covers.

1.02 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
- Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
- 2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be
- Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
- 4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable
- surface for installation of wiring devices.
- Notify Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.
 B. Sequencing:

1.03 SUBMITTALS

- A. See Section 013000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
- Wall Dimmers: Include derating information for ganged multiple devices.

C. Field Quality Control Test Reports.D. Operation and Maintenance Data:

- 1. Wall Dimmers: Include information on operation and setting of presets.
- 2. GFCI Receptacles: Include information on status indicators.
- E. Project Record Documents: Record actual installed locations of wiring devices.

1.04 QUALITY ASSURANCE

- A. Comply with requirements of NFPA 70.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Products: Listed, classified, and labeled as suitable for the purpose intended.D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized
- Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.05 DELIVERY, STORAGE, AND PROTECTION

- A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.
- PART 2 PRODUCTS 2.01 WIRING DEVICE APPLICATIONS
- A Browido wiring dovices ouitable for i
- A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
 B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
- C. Provide GFCI protection for receptacles installed within 6 feet (1.8 m) of sinks.
- D. Unless noted otherwise, do not use combination switch/receptacle devices.

2.02 WIRING DEVICE FINISHES

- A. Provide wiring device finishes as described below unless otherwise indicated.
- B. Wiring Devices, Unless Otherwise Indicated: White with white nylon wall plate.C. Wiring Devices Installed in Finished Spaces: White with white nylon wall plate.
- D. Wiring Devices Installed in Unfinished Spaces: White with galvanized steel wall plate.

2.03 WALL SWITCHES

- A. Wall Switches General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
- 1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with
- separate ground terminal screw. B. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator
- and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

2.04 WALL DIMMERS

- A. Wall Dimmers General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.
- B. Control: Slide control type with separate on/off switch.

2.05 RECEPTACLES

- A. Receptacles General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
- Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
- 2. NEMA configurations specified are according to NEMA WD 6.
- B. Convenience Receptacles:
- Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
 GFCI Receptacles:

- GFCI Receptacles General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
- a. Provide test and reset buttons of same color as device.2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular
- decorator style.
- 2.06 WALL PLATES AND COVERS A. Wall Plates: Comply with UL 514D.
- Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
 Size: Standard.

A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including

B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of wiring devices

3. Locate wall switches on strike side of door with edge of wall plate 3 inches (80 mm) from edge of door frame.

D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

E. Where required, connect wiring devices using pigtails not less than 6 inches (150 mm) long. Do not connect more

F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper

G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding

K. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by

M. Install vertically mounted receptacles with grounding pole on bottom and horizontally mounted receptacles with

O. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for

N. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on

wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use

torgue specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on

H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to

Where locations are indicated otherwise, notify Engineer to obtain direction prior to proceeding with work.

- 3. Screws: Metal with slotted heads finished to match wall plate finish.
- B. Nylon Wall Plates: Smooth finish, high-impact thermoplastic.
- C. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel

PART 3 EXECUTION 3.01 EXAMINATION

3.03 INSTALLATION

provided under this section.

screw-actuated binding.

protect downstream devices.

grounding pole on left.

3.04 FIELD QUALITY CONTROL

3.05 ADJUSTING

3.06 CLEANING

PART 1 GENERAL

1.01 SECTION INCLUDES

B. Exit signs.

A. Coordination:

A. Interior luminaires.

C. Ballasts and drivers.

with work.

with all proposed features.

LED Luminaires:

E. Field guality control reports.

components.

1.04 QUALITY ASSURANCE

1.06 FIELD CONDITIONS

1.07 WARRANTY

A. Comply with requirements of NFPA 70.

1.05 DELIVERY, STORAGE, AND PROTECTION

minimum three years documented experience

1.03 SUBMITTALS

B. Shop Drawings:

1.02 ADMINISTRATIVE REQUIREMENTS

J. Install wall switches with OFF position down

- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to
- accommodate devices and conductors in accordance with NFPA 70.C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- D. Verify that final surface finishes are complete, including painting.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- F. Verify that conditions are satisfactory for installation prior to starting work. **3.02 PREPARATION**

mounting heights specified in those standards unless otherwise indicated

a. Wall Switches: 48 inches (1200 mm) above finished floor.

b. Wall Dimmers: 48 inches (1200 mm) above finished floor.

Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

Mounting Heights: Unless otherwise indicated, as follows

C. Install wiring devices in accordance with manufacturer's instructions.

I. Install wiring devices plumb and level with mounting yoke held rigidly in place.

L. Do not share neutral conductor on branch circuits utilizing wall dimmers.

oversized wall plates in lieu of meeting this requirement.

P. Identify wiring devices in accordance with Section 260553.

D. Test each receptacle to verify operation and proper polarity.

B. Inspect each wiring device for damage and defects.

A. Adjust devices and wall plates to be flush and level.

A. See Section 014000 - Quality Requirements, for additional requirements.

F. Correct wiring deficiencies and replace damaged or defective wiring devices.

C. Operate each wall switch and wall dimmer with circuit energized to verify proper operation.

E. Lest each GFCI receptacle for proper tripping operation according to manufacturer's instructions

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

INTERIOR LIGHTING

Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others.

2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire

3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to

4. Notify Engineer of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding

1. Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.

luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric

performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked

C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on

D. Certificates for Dimming Ballasts: Manufacturer's documentation of compatibility with dimming controls to be

G. Operation and Maintenance Data: Instructions for each product including information on replacement parts.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

(industrial lighting), and manufacturer's written instructions.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with

D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized

A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

H. Project Record Documents: Record actual connections and locations of luminaires and any associated remote

F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product

testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of

of luminaires and associated trims with mounting surfaces at installed locations.

visibility installed under other sections or by others.

A. See Section 013000 - Administrative Requirements, for submittal procedures.

a. Include estimated useful life, calculated based on IES LM-80 test data.

Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility

suppression system components, and other potential conflicts installed under other sections or by others.

END OF SECTION SECTION 265100

than one conductor to wiring device terminals.

conductor and to outlet box with bonding jumper.

- A. See Section 017800 Closeout Submittals, for additional warranty requirements.
- B. Provide 5-year manufacturer warranty for LED luminaires, including drivers.
- C. Provide 10-year pro-rata warranty for batteries for self-powered exit signs.

PART 2 PRODUCTS

- 2.01 LUMINAIRE TYPES
- A. Furnish products as indicated in luminaire schedule included on the drawings.
- 2.02 LUMINAIRES A. Provide products that comply with requirements of NFPA 70.
- B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
- C. Provide products listed, classified, and labeled as suitable for the purpose intended.
- Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
- E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.
- F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
- G. Recessed Luminaires:
- 1. Ceiling Compatibility: Comply with NEMA LE 4.
- H. LED Luminaires:
- 1. Components: UL 8750 recognized or listed as applicable
- Tested in accordance with IES LM-79 and IES LM-80.
 LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

2.03 EXIT SIGNS

- A. Description: Exit signs complying with NFPA 101 and applicable state and local codes, and listed and labeled as
- complying with UL 924.1. Number of Faces: Single- or double-face as indicated or as required for installed location.
- Directional Arrows: As indicated or as required for installed location.
- B. Powered Exit Signs: Internally illuminated with LEDs unless otherwise indicated.
- 1. Self-Powered Exit Signs:
- a. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
- b. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
- c. Provide low-voltage disconnect to prevent battery damage from deep discharge.
- d. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101; provide indicator light(s) to report test and diagnostic status.
 2.04 BALLASTS AND DRIVERS

A. Ballasts/Drivers - General Requirements:

- Provide ballasts containing no polychlorinated biphenyls (PCBs).
- Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.
- B. Dimmable LED Drivers:
- 1. Dimming Range: Continuous dimming from 100 percent to five percent relative light output unless dimming
- capability to lower level is indicated, without flicker.2. Control Compatibility: Fully compatible with the dimming controls to be installed.
- a. Wall Dimmers: See Section 262726.

PART 3 EXECUTION

- 3.01 EXAMINATION
- A. Verify that field measurements are as indicated.
- B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
- C. Verify that suitable support frames are installed where required.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

- 3.02 PREPARATION
- A. Provide extension rings to bring outlet boxes flush with finished surface.B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.
- B. Clean dirt, debris, plaster, and other foreign materials from out 3.03 INSTALLATION
- A. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of luminaires provided under this section.
- B. Perform work in accordance with NECA 1 (general workmanship).
- C. Install products in accordance with manufacturer's instructions.
- D. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
- E. Provide required support and attachment in accordance with Section 260529.
- F. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
- G. Suspended Ceiling Mounted Luminaires:1. Do not use ceiling tiles to bear weight of luminaires.
- Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
- 3. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
- 4. In addition to ceiling support wires, provide two galvanized steel safety wire(s), minimum 12 gauge, connected
- from opposing corners of each recessed luminaire to building structure.5. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.
- H. Install accessories furnished with each luminaire.
- I. Bond products and metal accessories to branch circuit equipment grounding conductor.
- J. Emergency Lighting Units:
- 1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.
- K. Exit Signs:
 1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same
- room or area. Bypass local switches, contactors, or other lighting controls.
- L. Identify luminaires connected to emergency power system in accordance with Section 260553.
- M. Install lamps in each luminaire.

N. Lamp Burn-In: Operate lamps at full output for prescribed period per manufacturer's recommendations prior to use with any dimming controls. Replace lamps that fail prematurely due to improper lamp burn-in.
 3.04 FIELD QUALITY CONTROL

- A. See Section 014000 Quality Requirements, for additional requirements.
- B. Inspect each product for damage and defects.
- C. Operate each luminaire after installation and connection to verify proper operation.
- D. Test self-powered exit signs and emergency lighting units to verify proper operation upon loss of normal power
- supply.
- E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Engineer.
- 3.05 ADJUSTING
- A. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress
- path as directed by Engineer or authority having jurisdiction. 3.06 CLEANING
- A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.
- 3.07 PROTECTION
- A. Protect installed luminaires from subsequent construction operations.

END OF SECTION SECTION 271000 STRUCTURED CABLING

- PART 1 GENERAL
- 1.01 SECTION INCLUDES
- A. Copper cable and terminations.
- B. Communications outlets.
- C. Communications grounding and bonding.

D. Communications identification.

1.02 ADMINISTRATIVE REQUIREMENTS A. Coordination:

1 Coordinat

- Coordinate requirements for service entrance and entrance facilities with Communications Service Provider.
 Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for communications equipment.
- Coordinate arrangement of communications equipment with the dimensions and clearance requirements of the actual equipment to be installed.

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- 4. Notify Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
- 1.03 SUBMITTALS
- A. See Section 013000 Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
- C. Evidence of qualifications for installer.
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
- E. Test Plan: Complete and detailed plan, with list of test equipment, procedures for inspection and testing, and intended test date; submit at least 60 days prior to intended test date.
- F. Field Test Reports.
- G. Project Record Documents: Prepared and approved by BICSI Registered Communications Distribution Designer (RCDD).
- 1. Record actual locations of outlet boxes and distribution frames.
- 2. Show as-installed color coding, pair assignment, polarization, and cross-connect layout.
- 3. Identify distribution frames and equipment rooms by room number on drawings. H. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of project record documents.
- 1.04 QUALITY ASSURANCE
- A. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- B. Manufacturer Qualifications: At least 3 years experience manufacturing products of the type specified.
- C. Installer Qualifications: A company having at least 3 years experience in the installation and testing of the type of system specified, and: 1. Employing a BICSI Registered Communications Distribution Designer (RCDD).
- 2. Supervisors and installers factory certified by manufacturers of products to be installed.
- D. Products: Listed, classified, and labeled as suitable for the purpose intended.
- E. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
- 1.05 DELIVERY, STORAGE, AND HANDLING
- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Keep stored products clean and dry.
- 1.06 WARRANTY
- A. See Section 017800 Closeout Submittals, for additional warranty requirements. B. Correct defective Work within a 2 year period after Date of Substantial Completion
- PART 2 PRODUCTS

2.01 SYSTEM DESIGN

- A. Provide a complete permanent system of cabling and pathways for voice and data communications, including
- cables, conduits and wireways, pull wires, support structures, enclosures and cabinets, and outlets. 1. Comply with TIA-568 (SET) (cabling) and TIA-569 (pathways) (commercial standards).
- 2. Comply with Communications Service Provider requirements.
- 3. Provide fixed cables and pathways that comply with NFPA 70 and TIA-607 and are UL listed or third party
- independent testing laboratory certified.
- 4. Provide connection devices that are rated for operation under conditions of 32 to 140 degrees F (0 to 60 degrees C) at relative humidity of 0 to 95 percent, noncondensing. 5. In this project, the term plenum is defined as return air spaces above ceilings, inside ducts, under raised floors,
- and other air-handling spaces. B. Main Distribution Frame (MDF): Centrally located support structure for terminating horizontal cables that extend to
- telecommunications outlets, functioning as point of presence to external service provider.
- C. Cabling to Outlets: Specified horizontal cabling, wired in star topology to distribution frame located at center hub of star; also referred to as "links".

2.02 COPPER CABLE AND TERMINATIONS

- A. Copper Horizontal Cable:
- 1. Description: 100 ohm, balanced twisted pair cable complying with TIA-568.2 and listed and labeled as
- complying with UL 444. 2. Cable Type - Data: TIA-568.2 Category 6 UTP (unshielded twisted pair); 23 AWG.
- 3. Cable Capacity: 4-pair.
- 4. Cable Applications: Use listed NFPA 70 Type CMP plenum cable unless otherwise indicated.
- 5. Cable Jacket Color -Data Cable: One blue and one green per jack.
- B. Jacks and Connectors: Modular RJ-45, non-keyed, terminated with 110-style insulation displacement connectors (IDC); high impact thermoplastic housing; suitable for and complying with same standard as specified horizontal cable; UL 1863 listed.
- 1. Performance: 500 mating cycles.
- 2. Voice and Data Jacks: 8-position modular jack, color-coded for both T568A and T568B wiring configurations.

2.03 COMMUNICATIONS OUTLETS

- A. Outlet Boxes: Comply with Section 260533.16. 1. Provide depth as required to accommodate cable manufacturer's recommended minimum conductor bend
- radius. B. Wall Plates:
- 1. Comply with system design standards and UL 514C.
- 2. Accepts modular jacks/inserts.
- Capacity:
- a. Data or Combination Voice/Data Outlets: 2 ports. 4. Wall Plate Material/Finish - Flush-Mounted Outlets: Match wiring device and wall plate finishes specified in
- Section 262726.
- 2.04 GROUNDING AND BONDING COMPONENTS
- A. Comply with TIA-607.
- 2.05 IDENTIFICATION PRODUCTS
- A. Comply with TIA-606.
- B. Comply with Section 260553.
- 2.06 SOURCE QUALITY CONTROL
- A. See Section 014000 Quality Requirements, for additional requirements.
- B. Factory test cables according to TIA-568 (SET).
- PART 3 EXECUTION 3.01 INSTALLATION - GENERAL
- A. Comply with latest editions and addenda of TIA-568 (SET) (cabling), TIA-569 (pathways), TIA-607 (grounding and bonding), BICSI N1, NFPA 70, and SYSTEM DESIGN as specified in PART 2.
- B. Comply with Communication Service Provider requirements.
- C. Grounding and Bonding: Perform in accordance with TIA-607 and NFPA 70.

3.02 INSTALLATION OF PATHWAYS A. Install pathways with the following minimum clearances:

- 1. 48 inches (1220 mm) from motors, generators, frequency converters, transformers, x-ray equipment, and
- uninterruptible power systems. 2. 12 inches (300 mm) from power conduits and cables and panelboards.
- 3. 5 inches (125 mm) from fluorescent and high frequency lighting fixtures.
- 4. 6 inches (150 mm) from flues, hot water pipes, and steam pipes.
- B. Outlet Boxes:
- 1. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of
- telecommunications outlets provided under this section.
- a. Mounting Heights: Unless otherwise indicated, as follows: 1) Telephone and Data Outlets: 18 inches (450 mm) above finished floor.
- 3.03 INSTALLATION OF EQUIPMENT AND CABLING

A. Cabling:

- 1. Do not bend cable at radius less than manufacturer's recommended bend radius; for unshielded twisted pair use
- bend radius of not less than 4 times cable diameter. 2. Do not over-cinch or crush cables.
- 3. Do not exceed manufacturer's recommended cable pull tension.
- 4. When installing in conduit, use only lubricants approved by cable manufacturer and do not chafe or damage
- outer jacket. B. Service Loops (Slack or Excess Length): Provide the following minimum extra length of cable, looped neatly: 1. At Distribution Frames: 120 inches (3000 mm).
- 2. At Outlets Copper: 12 inches (305 mm).
- C. Copper Cabling:
- 1. Category 5e and Above: Maintain cable geometry; do not untwist more than 1/2 inch (12 mm) from point of termination
- 2. For 4-pair cables in conduit, do not exceed 25 pounds (110 N) pull tension.
- 3. Use T568B wiring configuration.
- D. Identification: 1. Use wire and cable markers to identify cables at each end.
- 2. Use manufacturer-furnished label inserts, identification labels, or engraved wallplate to identify each jack at communications outlets with unique identifier.

- 3. Use identification nameplate to identify cross-connection equipment, equipment racks, and cabinets. 3.04 FIELD QUALITY CONTROL

 - A. See Section 014000 Quality Requirements, for additional requirements. B. Comply with inspection and testing requirements of specified installation standards.
 - C. Visual Inspection:
 - 1. Inspect cable jackets for certification markings.
 - 2. Inspect cable terminations for color coded labels of proper type.
 - 3. Inspect outlet plates and patch panels for complete labels.
 - D. Testing Copper Cabling and Associated Equipment:
 - 1. Category 5e and Above Backbone: Perform near end cross talk (NEXT) and attenuation tests. E. Final Testing: After all work is complete, including installation of telecommunications outlets, and telephone dial tone service is active, test each voice jack for dial tone.

A. See Section 013000 - Administrative Requirements, for submittal procedures.

1. Copy (if any) of list of data required by authority having jurisdiction.

A-7-5-2.2(9), and complete listing of software required.

the components are compatible with the control unit.

D. Evidence of maintenance contractor qualifications, if different from installer.

Submit inspection and test plan prior to closeout demonstration.

2. Submit documentation of satisfactory inspections and tests.

acceptable; have one set available during closeout demonstration:

4. List of recommended spare parts, tools, and instruments for testing.

5. Replacement parts list with current prices, and source of supply.

6. Detailed troubleshooting guide and large scale input/output matrix.

computer format acceptable to Owner.

for remodeling.

voice messages by event.

authority having jurisdiction.

demonstration

H. Closeout Documents:

1.03 QUALITY ASSURANCE

1.04 WARRANTY

2.01 MANUFACTURERS

C. Circuits:

D. Spare Capacity:

E. Power Sources:

2.03 EXISTING COMPONENTS

2. Secondary: Storage batteries.

2.02 FIRE ALARM SYSTEM

Substantial Completion.

PART 2 PRODUCTS

a. ADA Standards.

c. Applicable local codes.

3. Submit NFPA 72 "Inspection and Test Form," filled out.

13. Do not show existing components to be removed.

circuit length limitations.

battery power.

C. Evidence of installer qualifications.

E. Inspection and Test Reports:

4. System zone boundaries and interfaces to fire safety systems.

calculations; notification appliance circuit voltage drop calculations

7. List of all devices on each signaling line circuit, with spare capacity indicated.

12. Certification by Contractor that the system design complies with Contract Documents.

including but not limited to floor plans, riser diagrams, and description of operation:

2. NFPA 72 "Record of Completion", filled out to the extent known at the time.

END OF SECTION SECTION 284600

B. Design Documents: Submit all information required for plan review and permitting by authorities having jurisdiction,

3. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix

5. Location of all components, circuits, and raceways; mark components with identifiers used in control unit

6. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity

8. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and

9. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate

10. Certification by either the manufacturer of the control unit or by the manufacturer of each other component that

11. Certification by the manufacturer of the control unit that the system design complies with Contract Documents.

F. Operating and Maintenance Data: See Section 017800 for additional requirements; revise and resubmit until

3. Contact information for firm that will be providing contract maintenance and trouble call-back service.

2. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.

7. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and

G. Project Record Documents: See Section 017800 for additional requirements; have one set available during closeout

3. "As programmed" operating sequences, including control events by device, updated input/output chart, and

1. Certification by manufacturer that the system has been installed in compliance with manufacturer's installation

2. NFPA 72 "Record of Completion", filled out completely and signed by installer and authorized representative of

A. Installer Qualifications: Firm with minimum 3 years documented experience installing fire alarm systems of the

1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is

specified type and providing contract maintenance service as a regular part of their business.

2. Installer Personnel: At least 2 years of experience installing fire alarm systems.

Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

2. Protected Premises: Entire building shown on drawings.

b. The requirements of the local authority having jurisdiction .

of zones, in addition to general evacuation of entire premises.

8. Fire Alarm Control Unit: Existing, located at fire command center.

1. Public Fire Department Notification: By on-premises supervising station.

2. Signaling Line Circuits (SLC) Within Single Building: Class B, Style 0.5.

d. Contract Documents (drawings and specifications).

7. Fire Command Center: Location indicated on drawings.

B. Supervising Stations and Fire Department Connections:

1. Initiating Device Circuits (IDC): Class B, Style A.

3. Notification Appliance Circuits (NAC): Class B, Style W.

1. Initiating Device Circuits: Minimum 25 percent spare capacity.

2. Notification Appliance Circuits: Minimum 25 percent spare capacity.

1. Primary: Dedicated branch circuits of the facility power distribution system.

4. Each Computer System: Provide uninterruptible power supply (UPS).

portions are fully operational, tested, and connected to existing system.

3. Capacity: Sufficient to operate entire system for period specified by NFPA 72.

authorized; include name and title of manufacturer's representative making certification.

3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.

B. Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.

A. Provide installer's warranty that the installation is free from defects and will remain so for 1 year after date of

A. Fire Alarm System: Provide modifications and extensions to the existing automatic fire detection and alarm system:

3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:

e. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.

4. Evacuation Alarm: Multiple smoke zones; allow for evacuation notification of any individual zone or combination

5. General Evacuation Zones: Each smoke zone is considered a general evacuation zone unless otherwise

6. Hearing Impaired Occupants: Provide visible notification devices in all public areas and in dwelling units.

2. On-Premises Supervising Station: Existing proprietary station operated by Owner, located at ______

3. Means of Transmission to On-Premises Supervising Station: Directly connected noncoded system.

indicated, with alarm notification in all zones on the same floor, on the floor above, and the floor below.

1. Provide all components necessary, regardless of whether shown in Contract Documents or not.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized

1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.

2. "As installed" wiring and schematic diagrams, with final terminal identifications.

requirements, is complete, and is in satisfactory operating condition.

8. Detailed but easy to read explanation of procedures to be taken by non-technical administrative personnel in the

event of system trouble, when routine testing is being conducted, for fire drills, and when entering into contracts

1. Complete set of specified design documents, as approved by authority having jurisdiction.

FIRE DETECTION AND ALARM

A. Replacement and removal of existing fire alarm system components, wiring, and conduit indicated.

PART 1 GENERAL 1.01 SECTION INCLUDES

1.02 SUBMITTALS

B. On-Premises Supervising Station: Include as part of this work all modifications necessary to existing supervising

station to accommodate new fire alarm work.

C. Clearly label components that are "Not In Service."

D. Remove unused existing components and materials from site and dispose of properly.

2.04 COMPONENTS

- A. General:
- 1. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted unit are acceptable
- 2. Provide legible, permanent labels for each control device, using identification used in operation and
- maintenance data. B. Fire Alarm Control Units: Analog, addressable type; listed, classified, and labeled as suitable for the purpose
- intended.
- C. Master Control Unit: _____
- D. Notification Appliances:
- 1. Speakers: _____.
- 2. Strobes: _____.
- E. Circuit Conductors: Copper or optical fiber; provide 200 feet (60 m) extra; color code and label. F. Surge Protection: In accordance with IEEE C62.41.2 category B combination waveform and NFPA 70; except for
- optical fiber conductors.
- G. Locks and Keys: Deliver keys to Owner.
- H. Instruction Charts: Printed instruction chart for operators, showing steps to be taken when a signal is received (normal, alarm, supervisory, and trouble); easily readable from normal operator's station.
- 1. Frame: Stainless steel or aluminum with polycarbonate or glass cover.
- 2. Provide one for each control unit where operations are to be performed.
- 3. Obtain approval of Owner prior to mounting; mount in location acceptable to Owner.
- 4. Provide extra copy with operation and maintenance data submittal. PART 3 EXECUTION
- 3.01 INSTALLATION
- A. Install in accordance with applicable codes. NFPA 72. NFPA 70. and Contract Documents.
- B. Conceal all wiring, conduit, boxes, and supports where installed in finished areas.
- C. Obtain Owner's approval of locations of devices, before installation.
- D. Install instruction cards and labels.
- 3.02 INSPECTION AND TESTING FOR COMPLETION
- A. Notify Owner 7 days prior to beginning completion inspections and tests.
- B. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.
- C. Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and
- testing, correction, and adjustments. D. Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.
- E. Provide all tools, software, and supplies required to accomplish inspection and testing.
- F. Perform inspection and testing in accordance with NFPA 72 and requirements of local authorities; document each
- inspection and test. G. Correct defective work, adjust for proper operation, and retest until entire system complies with Contract Documents.
- H. Diagnostic Period: After successful completion of inspections and tests, Operate system in normal mode for at least 14 days without any system or equipment malfunctions.
- 1. Record all system operations and malfunctions.
- 2. If a malfunction occurs, start diagnostic period over after correction of malfunction.
- 3. Owner will provide attendant operator personnel during diagnostic period; schedule training to allow Owner
- personnel to perform normal duties. 4. At end of successful diagnostic period, fill out and submit NFPA 72 "Inspection and Testing Form."

3.03 CLOSEOUT

- A. Closeout Demonstration: Demonstrate proper operation of all functions to Owner.
- 1. Be prepared to conduct any of the required tests.
- 2. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings,
- input/output matrix, and operator instruction chart(s) available during demonstration.
- 3. Have authorized technical representative of control unit manufacturer present during demonstration. 4. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify
- authority having jurisdiction in time to schedule demonstration. 5. Repeat demonstration until successful.

B. Occupancy of the project will not occur prior to Substantial Completion.

- C. Substantial Completion of the project cannot be achieved until inspection and testing is successful and:
- 1. Specified diagnostic period without malfunction has been completed.
- 2. Approved operating and maintenance data has been delivered.
- 3. All aspects of operation have been demonstrated to Owner.
- 4. Final acceptance of the fire alarm system has been given by authorities having jurisdiction.

3.04 MAINTENANCE

- A. See Section 017000 Execution and Closeout Requirements, for additional requirements relating to maintenance
- B. Perform routine inspection, testing, and preventive maintenance required by NFPA 72, including:
- 1. Maintenance of fire safety interface and supervisory devices connected to fire alarm system.
- 2. Repairs required, unless due to improper use, accidents, or negligence beyond the control of the maintenance
- 3. Record keeping required by NFPA 72 and authorities having jurisdiction.
- C. Provide trouble call-back service upon notification by Owner:
- 1. Provide on-site response within 2 hours of notification.
- 2. Include allowance for call-back service during normal working hours at no extra cost to Owner. 3. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time
- spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.
- D. Provide a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.
- E. Maintain a log at each fire alarm control unit, listing the date and time of each inspection and call-back visit, the condition of the system, nature of the trouble, correction performed, and parts replaced. Submit duplicate of each log entry to Owner's representative upon completion of site visit.
- F. Comply with Owner's requirements for access to facility and security.
- END OF SECTION

													E	LECTRICAL	EQUI	PMENT SCH	EDULE - BRO	DADBROO	K				
					EQUIPM	IENT RA	TING					DISCONNE	CT		MOTOR CONTROLLER								
Equipment	Room		H.P.	Load	Voltage	Phase	FLA	MCA	MOCP	# REQUIRED	VOLTAGE	# OF POLES	RATING	ENCLOSURE	0.C.	# REQUIRED	TYPE	VOLTAGE	# OF POLES	RATING	ENCLOSURE	O.L.	CURRENT
Designation	Description	1		(VA/W)									(AMPS)	(NEMA)			(SEE NOTES)			(AMPS)	(NEMA)	(Y/N)	TRANSFORMER
AHU-2	Corridor 09	96	1	1,596.0	120	1	13.30	16.63	25	Div 23						Div 23	Integral						
AHU-3	Mechanical 0	018	1	1,596.0	120	1	13.30	16.63	25	Div 23						Div 23	Integral						
AHU-5	Mechanical 0	007	0.5	895.2	120	1	7.46	9.32	15	Div 23						Div 23	Integral						
AHU-14	Mechanical 0	007	0.5	895.2	120	1	7.46	9.32	15	Div 23						Div 23	Integral						
AHU-7	Corridor 02	25	0.5	895.2	120	1	7.46	9.32	15	Div 23						Div 23	Integral						
NOTES:	ATL	L = Across	The Line	Motor Star	rter																		
MOTOR CONT	ROL TYPE: D/Y	= DELTA/	Wye																				
		NI = Contained	actor	Starton																			
	23 - SW1	TCH = 20	amn ligh	t switch																			
	VFI) = Variabl	e Freque	ncv Drive. 1	Furnished	and Instal	lled by D	iv. 15. V	Wired by]	Div. 16.													
	ETR	=Existing	To Rema	ain			j	,															
	Tsta	nt=Line volt	tage therr	nostat furnis	shed by Di	v.15, inst	alled and	wired l	by Div.16														
		5,87	7.6 VA																				
		16.33	339 AMI	PS																			

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EQUIPMENT SCHEDULE NOT TO SCALE

TYPICAL ELECTRICAL CLEARANCES DETAIL

3 NOT TO SCALE

											SOUTHERN CONNECTICUT	STATE UNIVERSITY	615 FITCH STREET / HAMDEN, CT 06514 / TEL: 203-392-6055
												NO 26950	
EDULE - BRO	ADBROOK MOTO VOLTAGE # OF 1	PR CONTROLLER POLES RATING	ENCLOSURE	O.L. CURRENT									
(SEE NOTES)		(AMPS)	(NEMA)	(Y/N) TRANSFORMER							0R		
Integral											Ŏ		
Integral					120 or 2 — New c — Mecha	77 Volts, 1ø rcuit ical equipment with integral cc	ntrols, disconnect					(0)	
Integral					and in – Electri	egral overload protection. cal contractor provides final co	nection					S Z	
Integral													
					2 AHU-2, AHU-3, AH] 7, AHU·	-14 WIR	ING DIAC	GRAM	DAVIS HALL G	RENO	
Sched]			
Symbo	bl Label	Manufactur	er	Catalog Number	Description	Number	Lumens	Light Loss	Wattage	-			
	A	COOPER LIGH SOLUTIONS M	ITING IETLAUX	22RDI-40-UNV-L840- CD1-U	METALUX 2X2 OVATION LED TROFFER STANDARD VERSION	196	4076	0.91	41.8			DETAILS	
	A-EM	COOPER LIGH SOLUTIONS M	ITING IETLAUX	22RDI-40-UNV-EL7W- L840-CD1-U	METALUX 2X2 OVATION LED TROFFER STANDARD VERSION	196	4076	0.91	41.8		123-02	SICAL D	
⊦⊗I	E	Lithonia Lig	ghting	LQM S W 3 R120/277 SD	Red Exit, AC only, White					-	NO.: SCSU-20 RIL 7. 2023	ELECTF	IS
	GHT FIXTU t to scale	IRE SCHE	DULE			I			I		PROJECT I DATE: APF	DRAWING TITLE:	SCALE: NT

E5.0

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