VARIABLE AIR VOLUME CONTROL BOX SCHEDULE

SYMBOL	SERVICE	INLET / DAMPER SIZE (IN.)	AFS DUCT SIZE (IN.)	PRIMARY AIR COOLING (CFM)		WO SP (NOTE 1)	NC @ 1.5" WG (NOTE 2)		HEATING COIL											REMARKS (SEE NOTE 4, 5)	BASIS OF DESIGN
									HTG CFM	MBH	EAT °F	LAT °F	WATER (NOTE 3)		CONTROL VALVE						
				MAX.	MIN.		RAD.	DISCH.					GPM	PD/FT.WG	TYPE	MAX. PD (FT.)	FAIL POS.	BRANCH PIPE SIZE	MIN. ROWS		
VAV-1-1	HIGH-DENSITY STORAGE B112B	14	-	1,460	1,460	0.11	18	22	1,460	31.7	55	75	1.9	0.2	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-1-2	COLD STORAGE B108	6	-	150	150	0.04	10	20	-	-	-	-	-	-	-	-	-	-	-	-	TITUS DESV
VAV-1-3	HIGH-DENSITY STORAGE B112A	12	-	700	700	0.06	17	25	700	15.2	55	75	0.7	0.1	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-1-4	HIGH-DENSITY STORAGE B210B	14	-	1,480	1,480	0.11	18	23	1,480	32.1	55	75	2.0	0.21	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-1-5	HIGH-DENSITY STORAGE B210A	12	-	820	820	0.07	18	24	820	17.8	55	75	0.9	0.15	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-1-6	CABINET STORAGE B204 & MECHANICAL B216	14	-	1,400	1,400	0.1	18	22	1,400	30.4	55	75	1.7	0.17	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-1-7	OPEN BOOK SHELVES B110	6	-	370	370	0.2	19	27	370	8.0	55	75	0.5	TG	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-1	VEST B217, UNPROC STOR B213 & B211, & REFUSE B215	12	-	890	270	0.08	19	25	500	18.7	55	90	2.4	0.71	2-WAY MOD.	7 FT.	NC	3/4"	2	-	TITUS DESV
VAV-2-2	CORRIDOR B2C1	10	-	450	135	0.05	16	23	135	6.7	55	75	0.6	0.07	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-3	1ST FLOOR	6	-	200	200	0	13	24	200	5.2	55	75	0.3	0.08	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-4	STORAGE B202 & CORRIDOR B2C2	6	-	125	50	0.03	-	18	115	4.3	55	90	0.3	0.08	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-5	WORKROOM B200A	12	-	540	185	0.04	14	24	280	10.5	55	90	0.6	0.08	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-6	SUPPLIES B200B	10	-	275	85	0.03	14	22	230	8.7	55	90	0.7	0.08	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-7	CORRIDOR B1C3 & B1C4	12	-	925	280	0.16	18	24	650	22.5	55	90	0.9	0.11	2-WAY MOD.	7 FT.	NC	3/4"	2	-	TITUS DESV
VAV-2-8	OFFICE B113	6	-	265	100	0.11	17	27	150	5.6	55	90	0.5	0.14	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-9	OFFICE B111	6	-	260	100	0.1	15	27	180	6.9	55	90	1.1	0.50	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-10	OFFICE B109	6	-	265	100	0.11	17	27	150	5.6	55	90	0.5	0.14	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-11	OFFICE B107	6	-	265	100	0.11	17	27	150	5.6	55	90	0.5	0.14	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-12	OFFICE B105	8	-	375	120	0.07	17	27	200	7.7	55	90	0.7	0.26	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-13	TECH CAMERA B104A	6	-	200	60	0.06	13	24	60	3.2	55	75	0.3	0.08	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-14	OPEN SHELVING B102A	10	-	280	85	0.03	14	22	85	5.3	55	75	0.6	0.07	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-15	SUPP B102B, TECH AUDIO B104B, OPEN SHELVING B102A & CORR B1C5	12	-	635	165	0.04	15	25	350	13.1	55	90	0.9	0.14	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-16	OPEN OFFICE 102A & COLLABORATION 102B	6	-	300	300	0.13	18	24	300	6.5	55	75	0.4	0.11	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-2-17	CORRIDOR B1C1 & B1C2	12	-	735	225	0.19	19	25	525	19.1	55	90	0.9	0.1	2-WAY MOD.	7 FT.	NC	3/4"	2	-	TITUS DESV
VAV-2-18	MAIN HALL 101	6	-	300	300	0.13	18	24	300	6.5	55	75	0.4	0.11	2-WAY MOD.	7 FT.	NC	3/4"	1	-	TITUS DESV
VAV-3-1	MEMORIAL ROOM 106A, ELEVATOR LOBBY 1L1	14	-	1,215	485	0.14	15	20	1,215	45.4	55	90	1.7	0.17	2-WAY MOD.	7 FT.	NC	3/4"	2	-	TITUS DESV
VAV-3-2	MEMORIAL ROOM 106A	14	-	1,260	505	0.15	15	20	1,260	41.3	55	90	1.4	0.12	2-WAY MOD.	7 FT.	NC	3/4"	2	-	TITUS DESV
VAV-3-3	MEMORIAL HALL 200	24x16	-	4,900	1960	0.75	37	18	4,900	187.1	55	90	6.2	0.6	2-WAY MOD.	7 FT.	NC	1-1/4"	3	NOTE 6	TITUS DESV
VAV-3-4	MEMORIAL HALL 200	24x16	-	4,900	1960	0.75	37	18	4,900	187.1	55	90	6.2	0.6	2-WAY MOD.	7 FT.	NC	1-1/4"	3	NOTE 6	TITUS DESV

NOTES:
1. BOX WIDE OPEN STATIC PRESSURE LOSS, IN. WG. INCLUDING HEATING COIL.
2. ACOUSTICAL PERFORMANCE DETERMINED USING AHRI 885-2008 APPENDIX E WITH A 1.5" W.G. INLET PRESSURE. OTHER SCHEDULED PERFORMANCE IS BASED UPON TESTS PERFORMED IN ACCORDANCE WITH ASHRAE 130-2008 & AHRI 880-2008.
3. CAPACITY BASED ON 180 deg F ENTERING WATER TEMPERATURE. 3/4" BRANCH PIPE SIZE TO WATER COIL UNLESS OTHERWISE NOTED ON DRAWINGS. TWO OR THREE WAY ATC VALVE AS NOTED.
4. UNITS TO HAVE PRESSURE INDEPENDENT PRIMARY AIR CONTROL, MULTI-POINT INLET VELOCITY SENSOR, BOTTOM ACCESS, INTEGRAL 24V CONTROL TRANSFORMER, SINGLE POINT ENTRY.
5. PROVIDE UNIT WITH COIL FACE LINER.
6. PROVIDE UNIT MOUNTED SOUND ATTENUATOR.

AIR DEVICE SCHEDULE

SYMBOL	DESCRIPTION	NECK SIZE (IN.)	FLOW RANGE (CFM)	NO. SLOTS	SLOT WIDTH (IN.)	MAX. P.D. (IN. WG)	BLOW PATTERN	MAX. N.C.	REMARKS (SEE NOTES 1, 2, 3, 4)	BASIS OF DESIGN
CD-1	18x18 ALUMINUM CEILING DIFFUSER	6"Ø	0-100	-	-	.15 MAX	4-WAY U.N.O.	25	-	TITUS TDCA-AA
CD-2	18x18 ALUMINUM CEILING DIFFUSER	8"Ø	101-200	-	-	.15 MAX	4-WAY U.N.O.	25	-	TITUS TDCA-AA
CD-3	18x18 ALUMINUM CEILING DIFFUSER	12"Ø	201-500	-	-	.15 MAX	4-WAY U.N.O.	25	-	TITUS TDCA-AA
ER-1	12x12 ALUMINUM EXHAUST REGISTER	10x10	0-100	-	-	.10 MAX	-	30	W/ OPPOSED BLADE DAMPER	TITUS 355FL
ER-2	12x12 ALUMINUM EXHAUST REGISTER	12x12	101-350	-	-	.10 MAX	-	30	W/ OPPOSED BLADE DAMPER	TITUS 355FL
LSD-1	48" LONG ALUMINUM SLOT DIFFUSER	6"Ø	0-100	2	1	.10 MAX	2-WAY ADJUSTABLE	25	-	TITUS ML-39
LSD-2	48" LONG ALUMINUM SLOT DIFFUSER	10"Ø	101-210	2	1	.10 MAX	2-WAY ADJUSTABLE	30	NOTE 12	TITUS ML-39
LSD-3	42" LONG ALUMINUM SLOT DIFFUSER	14"Ø	400-500	5	3/4	.10 MAX	2-WAY ADJUSTABLE	25	NOTE 11	TITUS ML-38
RG-1	16x16 ALUMINUM RETURN GRILLE	14x14	0-500	-	-	.10 MAX	-	20	-	TITUS 355FL
RG-2	24x24 ALUMINUM RETURN GRILLE	22x22	1000-1500	-	-	.10 MAX	-	20	-	TITUS 355FL
RG-3	30x24 ALUMINUM RETURN GRILLE	24x48	2450	-	-	.10 MAX	-	20	-	TITUS 355FL
RR-1	12x12 ALUMINUM RETURN REGISTER	12x12	0-500	-	-	.10 MAX	-	25	W/ OPPOSED BLADE DAMPER	TITUS 355FL
RR-2	24x24 ALUMINUM RETURN REGISTER	22x22	501-1000	-	-	.10 MAX	-	25	W/ OPPOSED BLADE DAMPER	TITUS 355FL
TG	ALUMINUM TRANSFER GRILLE	NOTE 10	-	-	-	.10 MAX	-	20	-	TITUS 355FL
SR-1	ALUMINUM SUPPLY REGISTER	8x6	0-100	-	-	.10 MAX	DOUBLE DEFLECTION	30	W/ OPPOSED BLADE DAMPER	TITUS 300FS
SR-2	ALUMINUM SUPPLY REGISTER	10x8	101-200	-	-	.10 MAX	DOUBLE DEFLECTION	30	W/ OPPOSED BLADE DAMPER	TITUS 300FS
SR-3	ALUMINUM SUPPLY REGISTER	14x10	201-300	-	-	.10 MAX	DOUBLE DEFLECTION	30	W/ OPPOSED BLADE DAMPER	TITUS 300FS

NOTES:
1. FLEXIBLE DUCT SIZE TO MATCH NECK SIZE.
2. ADJUST AIR DEVICE SIZE OR DESIGNATION WHERE AIR FLOW INDICATED ON THE DRAWINGS EXCEEDS SCHEDULED FLOW RANGE, MAX. P.D. OR MAX. N.C.
3. PROVIDE SQUARE TO ROUND ADAPTERS AS REQUIRED. PROVIDE FIELD FABRICATED PLENUMS WHERE FACTORY PLENUMS WILL NOT FIT DUE TO FIELD CONDITIONS.
4. PROVIDE GYPSUM FRAMES FOR ALL AIR DEVICES MOUNTED IN PLASTER CEILINGS. SEE ARCHITECTURAL REFLECTED CEILING PLANS.
5. PROVIDE 24x24 DROP PANEL FOR LAY-IN CEILING.
6. ALL SIZES INDICATED FOR T-BAR CEILINGS ARE NOMINAL - EXACT SIZE TO BE LESS TO ALLOW DEVICES TO LAY IN CEILING.
7. EACH SLOT TO BE INDEPENDENTLY ADJUSTABLE FOR BLOW DIRECTION & AIR VOLUME.
8. WITH GYPSUM MOUNTING FRAME, FLANGED BORDER & FIELD FABRICATED INSULATED PLENUM. PART OF A LONGER SLOT ASSEMBLY THAT IS TO HAVE CONTINUOUS APPEARANCE. PROVIDE ALIGNMENT PINS AND END CAPS. SEE FLOOR PLANS FOR TOTAL LENGTH.
9. WITH GYPSUM MOUNTING FRAME, FLANGED BORDER & FIELD FABRICATED AIRTIGHT BLANK OFF PLENUM. PART OF A LONGER SLOT ASSEMBLY THAT IS TO HAVE A CONTINUOUS APPEARANCE. PROVIDE ALIGNMENT PINS AND END CAPS. SEE FLOOR PLANS FOR TOTAL LENGTH.
10. REFER TO DUCTWORK PLANS AND ATD DETAIL FOR TG SIZES.
11. LSD WIDTH (INCLUDING DIFFUSER FACE) CANNOT EXCEED 8". BASIS OF DESIGN: TITUS BORDER TYPE 15.
12. FLUSH SIDE WALL LSD BASIS OF DESIGN: TITUS BORDER TYPE A2. FLUSH BOTTOM OF CASEWORK BASIS OF DESIGN: TITUS BORDER TYPE D2.

FAN SCHEDULE (SEE HPE SCHEDULE FOR ELECTRICAL SERVICE)

SYMBOL	TYPE	LOCATION	SERVICE	CFM	SP/ IN. WG	RPM	MOTOR		MOUNTING		MAX. dBA	VFD	REMARKS	BASIS OF DESIGN
							MAX. BHP	HP	TYPE	VIBRATION ISOLATION				
EF-1	INL	TUNNEL B3 LEVEL	GENERAL EXHAUST	2,200	1.5	2,204	0.99	1.5	CEIL	2" SPR.	67	N	-	COOK 120QMX
RF-1	INL, MIX	BASEMENT MER	RETURN FAN AHU-1	6,500	1.9	1,955	4.75	7.5	CEIL	2" SPR.	76	Y	-	COOK 180QMX
RF-3A	INL, MIX	CH-302	RETURN FAN AHU-3	6,500	2	1,955	4.75	7.5	CEIL	2" SPR.	76	Y	-	COOK 180QMX
RF-3B	INL, MIX	CH-301	RETURN FAN AHU-3	6,500	2	1,955	4.75	7.5	CEIL	2" SPR.	76	Y	-	COOK 180QMX
VF B3-1	INL	TUNNEL B3 LEVEL	VENTILATION	1,000	0.5	1,063	172W	0.5	CEIL	2" SPR.	58	N	PROVIDE SPEED CONTROLLER	COOK SQND-EC
VF B3-2	INL	TUNNEL B3 LEVEL	VENTILATION	1,000	0.5	1,063	172W	0.5	CEIL	2" SPR.	58	N	PROVIDE SPEED CONTROLLER	COOK SQND-EC

NOTES:
1. FANS WITH SPEED CONTROLS MUST BE SELECTED FOR SCHEDULED FAN PERFORMANCE AT MEDIAN AVAILABLE RPM.
2. ALL FANS TO BE BELT DRIVEN UNLESS NOTED OTHERWISE.
3. ALL FANS ARE TO BE PROVIDED WITH BACK DRAFT DAMPERS.
4. PROVIDE FANS WITH ALL OPTIONAL GUARDS, COVERS AND SAFETY DEVICES.
5. CENT = CENTRIFUGAL, PROP = PROPELLER, UTIL = UTILITY SET, UP = UPBLAST, CAB = CABINET, MIX = MIXED FLOW, INL = INLINE

A/C CONDENSATE PUMP UNIT SCHEDULE (SEE HPE SCHEDULE FOR ELECTRICAL SERVICE)

SYMBOL	LOCATIONS	SERVICE	NO. OF PUMPS	GPM EA.	FT. WG	HP EA.	RECEIVER GAL.	REMARKS	BASIS OF DESIGN
CP-1	SEE PLANS	FCUs 2M-1, B3-1, B3-2	1	6	15	1/5	1	SEE NOTES 1 & 2	LITTLE GIANT VCL-45

NOTES:
1. PROVIDE UNIT WITH INTEGRAL FLOAT SWITCH, HIGH LEVEL SAFETY SWITCH & THERMAL OVERLOADS.
2. PUMPS SHALL BE HARDWIRED TO 120V CIRCUIT.

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

ISSUE DATE: 2/11/2021
SOLICITATION NO.: W912DS-19-R-0014
CONTRACT NO.: W912DS-19-C-0031
PROJECT NO: 20190494

DESIGNED BY: WMF
DRAWN BY: RKG
CHECKED BY: WCJ
SUBMITTED BY: BJK
SIZE: ANSI D

US ARMY CORPS OF ENGINEERS

JACOBS / EWING COLE A Joint Venture

WEST POINT, NY
USMA BUILDING 605 CULLUM HALL RENOVATION

SCHEDULES - HVAC

SHEET ID
M602

RTA SUBMISSION 2/11/2021