GRAPHIC SCALE 1/4"=1'-0" (0 2 4 6 8 10 15)
GRAPHIC SCALE 1/8"=1'-0" (0 2 4 6 8 10 15 20 25)
GRAPHIC SCALE 1/16"=1'-0" (0 10 20 30)

MECHANICAL SUMMARY - MECHANICAL SYSTEMS, SERVICE SYSTEMS, AND EQUIPMENT	
THERMAL ZONE 4A	
WINTER DRY BULB	16°F
SUMMER DRY BULB	93°F
INTERIOR DESIGN CONDITIONS	
WINTER DRY BULB	70°F
SUMMER DRY BULB	75°F
RELATIVE HUMIDITY	50%
BUILDING HEATING LOAD	1,332,000 BTUH (ADDITION ONLY - EXISTING LOAD NOT INCLUDED)
BUILDING COOLING LOAD	105 TONS (ADDITION ONLY - EXISTING LOAD NOT INCLUDED)
MECHANICAL SPACING CONDITIONING SYSTEM	
UNITARY	
DESCRIPTION OF UNIT	REFER TO EQUIPMENT SCHEDULES FOR EFFICIENCIES
HEATING EFFICIENCY	
COOLING EFFICIENCY	
SIZE CATEGORY OF UNIT	
BOILER	
TOTAL BOILER OUTPUT. IF OVERSIZED STATE REASON	EXISTING
CHILLER	
TOTAL CHILLER CAPACITY. IF OVERSIZED STATE REASON	340 TONS EXISTING, 510 TONS NEW (TOTAL)
LIST EQUIPMENT EFFICIENCIES	REFER TO EQUIPMENT SCHEDULES FOR EFFICIENCIES

2018 NC ENERGY CODE COMMISSIONING REQUIREMENT:
PER 2018 NC ENERGY CODE, SECTION C408, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING SYSTEM COMMISSIONING. THE MECHANICAL CONTRACTOR SHALL HIRE EITHER A CERTIFIED COMMISSIONING PROFESSIONAL OR AN ENGINEER REGISTERED IN NC TO PROVIDE COMMISSIONING PER THE REQUIREMENTS IN THE NC ENERGY CODE (SECTION C408). AT THE END OF THE PROJECT, THE OWNER AND AHJ SHALL BE PROVIDED WITH A SEALED STATEMENT OF COMPLETION, PER THE REQUIREMENTS / TEMPLATE SHOWN IN APPENDIX C1 OF THE ENERGY CODE. CONTRACTOR SHALL PROVIDE SUBMITTALS SHOWING PROPOSED COMMISSIONING PLAN, TEMPLATES, DOCUMENTS, AND PEOPLE PERFORMING COMMISSIONING, FOR APPROVAL BY THE PROJECT TEAM PRIOR TO CONSTRUCTION. MECHANICAL CONTRACTOR SHALL PROVIDE ALL SUPPORT, MATERIALS, MANPOWER, EQUIPMENT, INFORMATION, ACCESS TO VENDORS AND TECHNICIANS FOR EQUIPMENT FURNISHED AND INSTALLED, ETC. AS REQUIRED, SO THAT COMMISSIONING AUTHORITY CAN COMPLETE THEIR WORK. NOTE: ALL BUILDINGS LESS THAN OR EQUAL TO 10,000 SQUARE FEET OF CONDITIONED FLOOR AREA ARE EXEMPT FROM THE COMMISSIONING REQUIREMENTS.

GENERAL MECHANICAL PIPING NOTES

1. CONTRACTOR TO SLOPE ALL CONDENSATE DRAIN PIPING ABOVE CEILINGS, UNDER SLAB, AND BELOW GRADE - 1/8" PER FOOT (MINIMUM).
2. IN MECHANICAL ROOMS AND ON MECHANICAL PLATFORMS, ROUTE ALL A/H UNIT CONDENSATE DRAIN PIPING TO CLOSEST FLOOR OR HUB DRAIN UNLESS SHOWN OTHERWISE.
3. ROUTE 3/4" CONDENSATE DRAIN PIPES FROM EACH A/H UNIT TO CLOSEST HUB DRAIN (UNLESS NOTED OTHERWISE) AS SHOWN ON A/H UNIT DETAILS. WHERE PIPING IS ROUTED TO FLOOR DRAINS, SECURE PIPING TO FLOOR AND PROTECT FROM DAMAGE WITH ANGLE IRON. COORDINATE FLOOR AND HUB DRAIN LOCATIONS PRIOR TO ROUGH-IN BETWEEN GENERAL CONTR. AND PLUMBING CONTR. SO THAT DRAINS DO NOT END UP UNDER HOUSEKEEPING PADS, THAT FLOORS ARE CORRECTLY SLOPED, ETC.
4. REFER TO STRUCTURAL DRAWINGS AND DETAILS FOR PERMISSIBLE LOCATIONS AND METHODS FOR HANGING PIPING FROM STRUCTURE. ALL PIPE HANGERS TO BE WITHIN 6" OF PANEL POINTS OF JOISTS. DO NOT WELD PIPE HANGERS/SUPPORTS TO STRUCTURE WITHOUT PRIOR APPROVAL FROM THE STRUCTURAL ENGINEER AND GENERAL CONTRACTOR.

GENERAL MECHANICAL DUCTWORK NOTES

1. THE DRAWINGS SHOW THE LOCATION AND ARRANGEMENT OF PIPING, DUCTS, AND EQUIPMENT, TOGETHER WITH DETAILS OF CONNECTIONS OF CERTAIN PRINCIPAL ITEMS. THE LAYOUT SHOWN SHALL BE FOLLOWED AS CLOSELY AS CIRCUMSTANCES WILL PERMIT, BUT THIS CONTRACTOR SHALL REFER TO ARCHITECTURAL, STRUCTURAL, PLUMBING, AND ELECTRICAL DRAWINGS AND SHALL COOPERATE FULLY WITH OTHER CONTRACTORS AND TRADES WHILE INSTALLING DUCTS, PIPING, AND OTHER EQUIPMENT BECAUSE OF CLOSE SPACE LIMITS. IN CASE OF CONFLICT, NOTIFY DESIGNER BEFORE PROCEEDING WITH INSTALLATION. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND LOCATIONS OF PARTITION WALLS, DOORS, CHASES, CASEWORK, ETC. DO NOT SCALE MECHANICAL DRAWINGS FOR SUCH DIMENSIONS.
2. THIS CONTRACTOR SHALL PROVIDE AND INSTALL ALL OFFSETS, FITTINGS, AND ACCESSORIES THAT MAY BE REQUIRED FOR A COMPLETE AND PROPER INSTALLATION, OR RECOMMENDED BY THE EQUIPMENT MANUFACTURER, WHETHER OR NOT THEY ARE SPECIFICALLY SHOWN OR SPECIFIED.
3. DUCTWORK SIZES INDICATED ON DRAWINGS ARE FREE INSIDE DIMENSIONS.
4. MAXIMUM LENGTH OF FLEXIBLE DUCT IS SIX FEET (6').
5. ALL VALVES, DAMPERS, CONTROLS, AND OTHER ITEMS REQUIRED FOR OPERATION OR MAINTENANCE ARE TO BE ACCESSIBLE.
6. ALL SLEEVES, OUTLET BOXES, AND OTHER ROUGH-INS FOR SUCH ITEMS AS FIRE DAMPERS, PIPE PENETRATIONS, LOUVERS, AND CONTROL ITEMS SHALL BE INSTALLED AS THE BUILDING CONSTRUCTION PROGRESSES.
7. PROVIDE AND INSTALL VOLUME CONTROL DAMPERS AT ALL SUPPLY MAIN AND BRANCH DUCT TAKE-OFFS.
8. PROVIDE AND INSTALL DUCT ACCESS DOORS AT ALL SMOKE DAMPERS, FIRE DAMPERS, AND DUCT SMOKE DETECTORS. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR DUCT SMOKE DETECTOR LOCATIONS.
9. THIS CONTRACTOR SHALL TAKE FIELD MEASUREMENTS BEFORE FABRICATING ANY DUCTS TO ENSURE THAT DUCT SIZES SHOWN WILL FIT INTO AVAILABLE SPACE. IN CASE OF CONFLICT, NOTIFY THE DESIGNER BEFORE PROCEEDING.
10. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
11. COORDINATE LOCATIONS OF ALL FLOOR DRAINS WITH PLUMBING CONTRACTOR, PRIOR TO SLABS BEING POURED.
12. COORDINATE EXACT LOCATION FOR ALL CEILING DIFFUSERS/GRILLES WITH ARCHITECTURAL REFLECTED CEILING PLAN AND ELECTRICAL CONTRACTOR'S LIGHTING LAYOUT.
13. ALL EMS SENSORS AND OTHER FIELD DEVICES MOUNTED ON WALLS TO BE PROTECTED FROM DAMAGE AS REQUIRED - INSTALL LEXAN COVERS, WIRE GUARDS, OR SIMILAR AS REQUIRED. COORDINATE CONDITIONS IN THE FIELD.
14. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TO THE GENERAL CONTRACTOR THE QUANTITY, SIZE AND LOCATIONS OF ALL ACCESS DOORS IN WALLS, DRYWALL CEILINGS, ETC. FOR ACCESS TO VALVES, BALANCE DAMPERS OR OTHER EQUIPMENT AS REQUIRED. COORDINATE THIS WORK WITH THE REFLECTED CEILING PLANS. ALL VALVES OR OTHER DEVICES LOCATED ABOVE THE CEILING SHALL BE LOCATED IN ACCESSIBLE CEILINGS WHEREVER POSSIBLE. VERIFY LOCATION OF ALL VALVES IN INACCESSIBLE CEILINGS OR CHASES WITH THE ARCHITECT PRIOR TO INSTALLATION.
15. COORDINATE EXACT SIZE, LOCATION, APPURTENANCES, ETC. FOR ALL ROOF OPENINGS WITH GENERAL CONTRACTOR.
16. REFER TO INTERIOR LINTEL SCHEDULE ON STRUCTURAL DRAWINGS AND COORDINATE ALL OPENINGS WITH GENERAL CONTRACTOR PRIOR TO WALL CONSTRUCTION.
17. REFER TO STRUCTURAL DRAWINGS AND DETAILS FOR PERMISSIBLE LOCATIONS AND METHODS FOR HANGING DUCTWORK FROM STRUCTURE. ALL DUCTWORK HANGERS TO BE WITHIN 6" OF PANEL POINTS OF JOISTS. DO NOT WELD DUCT HANGERS/SUPPORTS TO STRUCTURE WITHOUT PRIOR APPROVAL FROM THE STRUCTURAL ENGINEER AND GENERAL CONTRACTOR.
18. COORDINATE EXACT SIZES REQUIRED FOR ALL OPENING FOR DUCTWORK AND PIPING WITH SPACE REQUIREMENTS, FIRE DAMPER INSTALLATION INSTRUCTIONS, STRUCTURAL DRAWINGS, AND THE GENERAL CONTRACTOR, PRIOR TO FRAMING FOR THE PENETRATIONS.
19. THE MECHANICAL CONTRACTOR SHALL THOROUGHLY COORDINATE DUCT / PIPE PENETRATIONS AT STRUCTURAL SHEAR WALLS / SHEAR BRACING WITH STRUCTURAL DRAWINGS AND BUILDING STEEL SHOP DRAWINGS. INSTALL LINTELS AS REQUIRED.
20. THE MECHANICAL CONTRACTOR SHALL PROVIDE 2" RIGID INSULATION BLANK-OFF PANELS ON ALL ARCHITECTURAL LOUVERS OR PORTIONS THEREOF NOT USED AS INTAKE OR EXHAUST AS SHOWN ON THE DRAWINGS. THE MECHANICAL CONTRACTOR SHALL REVIEW THE LOCATIONS OF ALL ARCHITECTURAL LOUVERS AS SHOWN ON THE PLATFORM PLANS AND THE BUILDING ELEVATIONS.
21. THE MECHANICAL CONTRACTOR FURNISH AND INSTALL ACCESS PANELS IN CEILINGS AND WALLS WHERE ACCESS TO VALVES, BALANCE DAMPERS, FIRE DAMPERS, ETC. IS REQUIRED. COORDINATE LOCATION OF ACCESS PANELS WITH ARCHITECT AND ALL OTHER TRADES.

EXISTING PUMP SCHEDULE

PUMP #	SERVICE	GPM	HEAD	MFGR. MODEL	IMPELLER	PUMP EFFICIENCY	HP	RPM	VOLTS-Ø	MIN. MOTOR EFFICIENCY
P5, P6 (MAIN & STORY)	CHILLED WATER SYSTEM	[illegible](NOW) 1225(FUT.)	100'(NOW) 115'(FUT.)	B&G SERIES 1510-6S	10-3/8"(NOW) 11"(FUT.)		50	1750	460-3	92.4%

REMARKS:
1. CHANGE IMPELLER AS NOTED AND REBALANCE TO 1225 GPM.

NEW PUMP SCHEDULE

PUMP #	SERVICE	GPM	HEAD	MFGR. MODEL	IMPELLER	PUMP EFFICIENCY	HP	RPM	VOLTS-Ø	MIN. MOTOR EFFICIENCY
P11	CHILLER INJECTION	410	47'	B&G SERIES 80 6x6x11	10-1/8"	74.5%	7-1/2	1150	460-3	85.5%

REMARKS:
1. ALL PUMPS TO BE PROVIDED WITH COMBINATION MAGNETIC STARTER / FUSED DISCONNECTS WITH HAND-OFF-AUTO SWITCHES.
2. ALL MOTORS TO BE O.D.P.
3. EQUALS BY TACO & ARMSTRONG

THIS DRAWING IS NOT TO BE SCALED FOR CONSTRUCTION PURPOSES. THE SCALE WHEN INDICATED IS FOR GENERAL REFERENCE ONLY.

LEGEND

- A/275 — CEILING SUPPLY DIFFUSER, TYPE AND CFM
- F/450 — CEILING RETURN GRILLE, TYPE AND CFM
- P/605 — SIDEWALL OR SIDE OF DUCT SUPPLY DIFFUSER, TYPE AND CFM
- J/625 — SIDEWALL OR SIDE OF DUCT RETURN GRILLE, TYPE AND CFM
- 24x12 — RECTANGULAR DUCT, WIDTH x DEPTH
- 8"Ø — ROUND OR SPIRAL DUCT, DIAMETER
- DUCT BALANCE DAMPER
- DUCT TRANSITION
- DUCT TAKEOFF AT 45 DEGREES
- DUCT SQUARE ELBOW WITH TURNING VANES
- S — EMS SPACE TEMPERATURE SENSOR
- C — CO2 SENSOR FOR DEMAND CONTROLLED VENTILATION
- CEILING RADIATION DAMPER
- SD — DUCT SMOKE DETECTOR (FURNISHED BY E.C. AND INSTALLED BY M.C.)
- FD — FIRE DAMPER
- SD — COMBINATION FIRE/SMOKE DAMPER (COORDINATE WITH ELECT. CONTR.)
- S_E — EMERGENCY SWITCH, LABELED AS TO USE
- UC — UNDERCUT DOOR
- CHWS — CHILLED WATER SUPPLY PIPING
- CHWR — CHILLED WATER RETURN PIPING
- HWS — HOT WATER SUPPLY PIPING
- HWR — HOT WATER RETURN PIPING
- C — CONDENSATE DRAIN PIPING
- HWS — PIPE GUIDE SUPPORT
- HWS — PIPE ANCHOR
- HD — HUB DRAIN BY PLUMBING CONTRACTOR
- FD — FLOOR DRAIN BY PLUMBING CONTRACTOR
- CONNECT TO EXISTING
- 1 HOUR FIRE WALL
- 2 HOUR FIRE WALL

4-PIPE HYDRONIC AIR HANDLING UNIT SCHEDULE

Unit #	Manufacturer	Model Number	Supply Air (cfm)	Outside Air (cfm)	Winter Inlet db (deg F)	Summer Inlet db (deg F)	Summer Inlet wb (deg F)	Sensible Load (btuh)	Latent Load (btuh)	Total Load (btuh)	CHW GPM	Heating Load (btuh)	HW GPM	Coil Hand (LH / RH)	Pipe Size CHW / HW	Fan E.S.P. (in W.G.)	Fan H.P. (Max.)	Volt / Ph / Hz	Remarks
AHU-J01	Trane	BCVD036	1,000	95	71.9	72.8	63.1	19,240	5,772	25,012	5.3	33,081	3.3	RH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J02	Trane	BCVD036	1,000	160	73.2	71.3	63.9	17,626	5,288	22,913	5.0	31,768	3.2	LH	1" / 3/4"	1.50	1	120 / 1 / 60	1-10
AHU-J03	Trane	BCVD054	1,500	275	73.7	70.8	64.2	25,569	7,671	33,240	7.3	46,945	4.7	LH	1" / 1"	1.20	1	120 / 1 / 60	1-10
AHU-J04	Trane	BCVD036	1,200	220	73.7	70.8	64.2	20,455	6,137	26,592	5.8	37,556	3.8	LH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J05	Trane	BCVD024	600	55	71.9	72.9	63.1	11,594	3,478	15,072	3.3	19,889	2.0	LH	1" / 3/4"	1.00	0.5	120 / 1 / 60	1-10
AHU-J06	Trane	BCVD036	1,000	100	72.0	72.7	63.2	19,116	5,735	24,851	5.2	32,980	3.3	RH	1" / 3/4"	1.00	1	120 / 1 / 60	1-10
AHU-J07	Trane	BCVD036	1,200	215	73.6	70.9	64.2	20,579	6,174	26,753	5.7	37,657	3.8	LH	1" / 3/4"	1.50	1	120 / 1 / 60	1-10
AHU-J08	Trane	BCVD036	1,000	170	73.4	71.1	64.0	17,377	5,213	22,590	5.0	31,566	3.2	LH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J09	Trane	BCVD024	600	55	71.9	72.9	63.1	11,594	3,478	15,072	3.3	19,889	2.0	LH	1" / 3/4"	1.25	0.5	120 / 1 / 60	1-10
AHU-J10	Trane	BCVD036	1,200	180	73.0	71.6	63.8	21,449	6,435	27,883	6.2	38,364	3.8	LH	1" / 3/4"	1.25	1	120 / 1 / 60	1-10
AHU-J11	Trane	BCVD024	1,000	170	73.4	71.1	64.0	17,377	5,213	22,590	5.0	31,566	3.2	LH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J12	Trane	BCVD036	1,000	100	72.0	72.7	63.2	19,116	5,735	24,851	5.5	32,980	3.3	LH	1" / 3/4"	1.00	1	120 / 1 / 60	1-10
AHU-J13	Trane	BCVD024	800	70	71.8	73.0	63.1	15,541	4,662	20,204	4.4	26,586	2.7	RH	1" / 3/4"	1.20	0.5	120 / 1 / 60	1-10
AHU-J14	Trane	BCVD036	1,000	70	71.4	73.4	62.8	19,861	5,958	25,820	5.7	33,596	3.4	RH	1" / 3/4"	1.50	1	120 / 1 / 60	1-10
AHU-J15	Trane	BCVD036	1,000	85	71.7	73.0	63.0	19,489	5,847	25,335	5.6	33,283	3.3	RH	1" / 3/4"	1.35	1	120 / 1 / 60	1-10
AHU-J16	Trane	BCVD036	1,200	200	73.4	71.2	64.0	20,952	6,286	27,238	5.9	37,960	3.8	RH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J17	Trane	BCVD036	1,200	180	73.0	71.6	63.8	21,449	6,435	27,883	6.2	38,364	3.8	LH	1" / 3/4"	1.50	1	120 / 1 / 60	1-10
AHU-J18	Trane	BCVD036	1,200	200	73.4	71.2	64.0	20,952	6,286	27,238	5.9	37,960	3.8	LH	1" / 3/4"	1.35	1	120 / 1 / 60	1-10
AHU-J19	Trane	BCVD036	1,000	85	71.7	73.0	63.0	19,489	5,847	25,335	5.6	33,283	3.3	LH	1" / 3/4"	1.00	1	120 / 1 / 60	1-10
AHU-J20	Trane	BCVD036	1,000	115	72.3	72.4	63.4	18,743	5,623	24,366	5.5	32,677	3.3	LH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J21	Trane	BCVD054	1,500	275	73.7	70.8	64.2	25,569	7,671	33,240	7.3	46,945	4.7	RH	1" / 1"	1.20	1	120 / 1 / 60	1-10
AHU-J22	Trane	BCVD036	1,200	195	73.5	71.3	64.0	21,076	6,323	27,399	6.1	38,061	3.8	RH	1" / 3/4"	1.35	1	120 / 1 / 60	1-10
AHU-J23	Trane	BCVD036	1,000	165	73.3	71.2	64.0	17,501	5,250	22,752	5.1	31,667	3.2	RH	1" / 3/4"	1.25	1	120 / 1 / 60	1-10
AHU-J24	Trane	BCVD024	800	80	72.0	72.7	63.2	15,293	4,588	19,881	4.4	26,384	2.6	RH	1" / 3/4"	1.00	0.5	120 / 1 / 60	1-10
AHU-J25	Trane	BCVD036	1,000	165	73.3	71.2	64.0	17,501	5,250	22,752	5.1	31,667	3.2	LH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J26	Trane	BCVD024	800	50	71.3	73.6	62.8	16,036	4,811	20,848	4.6	26,990	2.7	LH	1" / 3/4"	1.25	0.5	120 / 1 / 60	1-10
AHU-J27	Trane	BCVD036	1,200	200	73.4	71.2	64.0	20,952	6,286	27,238	5.9	37,960	3.8	LH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J28	Trane	BCVD036	1,000	75	71.5	73.3	62.9	19,737	5,921	25,658	5.6	33,485	3.3	RH	1" / 3/4"	1.50	1	120 / 1 / 60	1-10
AHU-J29	Trane	BCVD036	1,200	215	73.6	70.9	64.2	20,579	6,174	26,753	5.9	37,657	3.8	LH	1" / 3/4"	1.35	1	120 / 1 / 60	1-10
AHU-J30	Trane	BCVD036	1,000	175	73.5	71.0	64.1	17,253	5,176	22,429	4.9	31,465	3.1	LH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J31	Trane	BCVD036	1,000	175	73.5	71.0	64.1	17,253	5,176	22,429	4.9	3,1465	3.1	LH	1" / 3/4"	1.35	1	120 / 1 / 60	1-10
AHU-J32	N/A	N/A																	
AHU-J33	Trane	BCVD036	1,000	180	73.6	70.9	64.2	17,129	5,139	22,267	4.9	31,364	3.1	LH	1" / 3/4"	1.50	1	120 / 1 / 60	1-10
AHU-J34	Trane	BCVD036	1,000	180	73.6	70.9	64.2	17,129	5,139	22,267	4.9	31,364	3.1	LH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J35	Trane	BCVD036	1,200	100	71.7	73.1	63.0	23,436	7,031	30,467	6.7	39,980	4.0	RH	1" / 1"	1.60	1	120 / 1 / 60	1-10
AHU-J36	N/A	N/A																	
AHU-J37	Trane	BCVD036	1,000	170	73.4	71.1	64.0	17,377	5,213	22,590	4.9	31,566	3.2	LH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J38	Trane	BCVD036	1,200	215	73.6	70.9	64.2	20,579	6,174	26,753	5.9	37,657	3.8	RH	1" / 3/4"	1.30	1	120 / 1 / 60	1-10
AHU-J39	Trane	BCVD036	1,000	170	73.4	71.1	64.0	17,377	5,213	22,590	4.9	31,566	3.2	RH	1" / 3/4"	1.25	1	120 / 1 / 60	1-10
AHU-J40	Trane	BCVD036	1,000	110	72.2	72.5	63.3	18,868	5,660	24,528	5.4	32,778	3.3	LH	1" / 3/4"	1.50	1	120 / 1 / 60	1-10
AHU-J41	Trane	BCVD036	1,200	200	73.4	71.2	64.0	20,952	6,286	27,238	5.9	37,960	3.8	RH	1" / 3/4"	1.20	1	120 / 1 / 60	1-10
AHU-J42	Trane	BCVD036	1,000	175	73.5	71.0	64.1	17,253	5,176	22,429	4.9	31,465	3.1	RH	1" / 3/4"	[illegible]	1	120 / 1 / 60	1-10
AHU-J43	Trane	BCVD036	1,000	175	73.5	71.0	64.1	17,253	5,176	22,429	4.9	31,465	3.1	RH	1" / 3/4"	1.30	1	120 / 1 / 60	1-10

REMARKS:
1. UNITS TO BE TRANE BLOWER COIL AIR HANDLER, MODEL # BCVD. CARRIER, DAIKIN, OR APPROVED EQUAL. ALTERNATE #5 - AHU'S AND CHILLER TO BE PREFERRED BRAND BY TRANE ONLY.
2. CAPACITIES ARE BASED ON SCHEDULED E.A.T.'S, 45° E.W.T., 55°F L.W.T. CHW AND 180° E.W.T., 160°F L.W.T. HW. CHW COILS SELECTED FOR 25% ETHYLENE GLYCOL SOLUTION. [illegible] CHW COIL P.D. 5' MAX. [illegible] COIL P.D.
3. REFER TO SPECIFICATIONS, CONTROL AND PIPING DIAGRAMS FOR CONTROL AND PIPING REQUIREMENTS.
4. UNITS TO HAVE CHW COOLING COIL, HW HEATING COIL (REHEAT POSITION), 2" PLEATED MERV 13 FILTERS, AND HINGED ACCESS DOORS WITH CAM-LOCK OPERATORS.
5. ALL FANS TO BE INTERNALLY ISOLATED.
6. A/H UNIT FAN MOTORS TO BE O.D.P., 4-POLE.
7. VERIFY COIL CONNECTION AND MOTOR ACCESS SIDE WITH EXISTING CONDITIONS AND FIELD REQUIREMENTS PRIOR TO ORDERING.
8. STAINLESS STEEL DRAIN PAN.
9. DOUBLE WALL CASING UNITS WITH 1" - 1.5# SOLID INSULATION, PERFORATED INNER WALL.
10. CONDENSATE DRAIN PIPING TO BE 1" SIZE FOR ALL UNITS.

EQUIPMENT SCHEDULE

ITEM	DESCRIPTION
CHILLER #3	OUTDOOR PACKAGED, AIR-COOLED CHILLER, TRANE MODEL #RTAC-170, 170 TONS NOMINAL COOLING CAPACITY, 110 TONS MIN. COOLING CAPACITY AT 30°F E.W.T., 22°F L.W.T., 75°F O.A.T., AND 25% ETHYLENE GLYCOL SOLUTION. 408 GPM, 25' MAX. W.P.D., 460V-3PH, DUAL CIRCUIT ELECTRICAL CONNECTION, CIRCUIT #1: 191A MCA, 300A MOCP, CIRCUIT #2: 189A MCA, 300A MOCP, WITH: PART WINDING START, CHILLED WATER FLOW SWITCH, COOLER HEATER, 120V-1PH. CONTROL TRANSFORMER, LOW AMBIENT CONTROLS, DUAL POWER CONNECTIONS, VALVES, ARCHITECTURAL LOUVER PANELS, ELASTOMERIC ISOLATORS, REFRIGERANT ISOLATION, SINGLE PHASE PROTECTION, BUILDING EMS INTERFACE / INTEGRATION MODULE TO MATCH EXISTING FUNCTIONALITY, (COORDINATE WITH EXISTING CONDITIONS AND EXISTING BUILDING EMS AND EXISTING CHILLERS) [illegible] FUNCTIONALITY FOR NEW CHILLER TO BE THE SAME AS EXISTING - COORDINATE. CHILLER TO BE CAPABLE OF BEING OPERATED AT SETPOINT TO MAKE ICE (SAME AS OTHER CHILLERS), BUT SHALL OPERATE AT 44°F SETPOINT AT THIS TIME (I.E. NO ICE MADE). MIN. EFFICIENCIES: 2.7 COP & [illegible] LV. CHILLER TO BE BY MCQUAY, CARRIER, OR TRANE. ALTERNATE #5 - AHU'S AND CHILLER TO BE PREFERRED BRAND BY TRANE ONLY.
ELECTRIC WALL HEATERS H-1, H-2, H-3	MARKEL MODEL #3320 COMMERCIAL ELECTRIC FAN FORCED WALL HEATER. 1500W, [illegible] BTUH, 120V-1PH., [illegible] CFM. FURNISH COMPLETE WITH THERMOSTAT, DISCONNECT, MOUNTING KIT, ETC. FOR A COMPLETE INSTALLATION. COMPARABLE PRODUCTS BY QMARK, TPI, AND INDEECO.
SPLIT SYSTEM SS-1A AND CONDENSING UNIT SS-1B	MITSUBISHI, MODEL #PUY-A12NHA4 OUTDOOR CONDENSING UNIT, 12,000 BTUH COOLING CAPACITY, 208/230V-1PH., FURNISHED COMPLETE WITH: DISCONNECT, LOW AMBIENT KIT, WINTER START CONTROL, FILTER DRIER, REFRIGERANT LINE SET, EVAPORATOR FREEZE STAT, CRANKCASE HEATER, HIGH PRESSURE SWITCH, LOW PRESSURE SWITCH, COMPRESSOR START ASSIST, CYCLE PROTECTOR, 15 SEER MINIMUM. EQUALS BY SANYO AND DAIKIN. MITSUBISHI, MODEL #PKA-A12HA4 WALL MOUNTED SPLIT SYSTEM FAN COIL UNIT, 12,000 BTUH NOMINAL COOLING CAPACITY, 380 CFM, 208/230V-1PH., FURNISHED COMPLETE WITH: DISCONNECT, WALL MOUNT KIT, CONDENSATE PUMP, WALL MOUNTED REMOTE CONTROL/THERMOSTAT, AND FILTERS. EQUALS BY SANYO AND DAIKIN. CONDENSATE PUMP TO BE BLUE DIAMOND, MAXI-BLUE MODEL # X87-721 CONDENSATE PUMP. 208V-1PH, 4.7W, 3.5 GPM @ 20' HEAD; FURNISHED WITH MOUNTING FEET, EXTENSION CABLE (WIRED TO OUTDOOR UNIT), AND ALL ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION. NOTE: SPLIT SYSTEM A/C UNIT REQUIRES A SINGLE POINT ELECTRICAL CONNECTION (INDOOR UNIT IS SUB-FED FROM OUTDOOR UNIT. E.C. TO WIRE TO OUTDOOR UNIT. M.C. TO WIRE FROM OUTDOOR UNIT TO INDOOR UNIT. SEE DETAIL ON SHEET M4.4.
SPLIT SYSTEM SS-2A AND CONDENSING UNIT SS-2B	MITSUBISHI, MODEL #PUY-A36NHA4 OUTDOOR CONDENSING UNIT, 34,200 BTUH COOLING CAPACITY, 208V-1PH., FURNISHED COMPLETE WITH: LOW AMBIENT KIT TO [illegible] WINTER START CONTROL, FILTER DRIER, REFRIGERANT LINE SET, EVAPORATOR FREEZE STAT, CRANKCASE HEATER, HIGH PRESSURE SWITCH, LOW PRESSURE SWITCH, COMPRESSOR START ASSIST, CYCLE PROTECTOR, 14 SEER MINIMUM, EQUALS BY SANYO AND DAIKIN. MITSUBISHI, MODEL #PKA-A36KA4, WALL MOUNTED SPLIT SYSTEM FAN COIL UNIT, 3 TON NOMINAL COOLING CAPACITY, 830 CFM, 208V-1PH., FURNISHED COMPLETE WITH: DISCONNECT, WALL MTG. KIT, CONDENSATE PUMP, WALL MOUNTED CONTROLLER / SENSOR, AND FILTERS, EQUALS BY SANYO AND DAIKIN. CONDENSATE PUMP TO BE BLUE DIAMOND, MAXI-BLUE MODEL # X87-721 CONDENSATE PUMP. 208V-1PH, 4.7W, 3.5 GPM @ 20' HEAD; FURNISHED WITH MOUNTING FEET, EXTENSION CABLE (WIRED TO OUTDOOR UNIT), AND ALL ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION. NOTE: SPLIT SYSTEM A/C UNIT REQUIRES A SINGLE POINT ELECTRICAL CONNECTION (INDOOR UNIT IS SUB-FED FROM OUTDOOR UNIT. E.C. TO WIRE TO OUTDOOR UNIT. M.C. TO WIRE FROM OUTDOOR UNIT TO INDOOR UNIT. SEE DETAIL ON SHEET M4.4.

FAN SCHEDULE

FAN #	TYPE	LOCATION	CFM	S.P.	RPM	HP	VOLT-PH.	MFG. & MODEL	SONES	ROOF OPG.	REMARKS
EF-1	EXHAUST	CEILING	300	.50"	1350	135W	120-1	GREENHECK #SP-A390	5.0	N/A	1, 2, 18
EF-2	EXHAUST	SIDEWALL	270	.50"	1377	1/10	120-1	GREENHECK #CUE-090-VG	6.4	WALL 13x13	1, 3, 7, 9, 14, 16, 19
EF-3, EF-4	EXHAUST	SIDEWALL	930	.50"	1424	1/4	120-1	GREENHECK #CUBE-101	8.5	WALL 15x15	1, 3, 7, 9, 14, 15, 19
EF-5	FUME EXHAUST	ROOF	1020	.85"	2788	1 1/2	208-1	GREENHECK VEKTOR-H-10-7	17.6	23x23	1, 2, 3, 5, 7, 8, 10, 11, 12, 13
EF-6	NOT USED										
EF-7	EXHAUST	CEILING	300	.50"	1350	135W	120-1	GREENHECK #SP-A390	5.0	N/A	1, 2, 18

NOTE: BASIS OF DESIGN - GREENHECK; EQUIVALENT PRODUCTS BY CARNES, COOK, & PENN
REMARKS:
1. DISCONNECT SWITCH
2. BACKDRAFT DAMPER
3. BIRD SCREEN
4. HANGING VIBRATION ISOLATORS
5. PRE-FABRICATED ROOF CURB. COORDINATE WITH ROOF TYPE AND SLOPE. COORD. WITH G.C..
7. FAN MOTOR COVER / BELT GUARD
8. REMOTE WALL SWITCH WITH LABEL AS TO FUNCTION
9. MOTORIZED BACKDRAFT DAMPER WITH ELECTRIC ACTUATOR.
10. SPARK-PROOF CONSTRUCTION
11. WITH CORROSIVE RESISTANT COATING - LABCOAT
12. VARIABLE PITCH SHEAVE
13. WITH EXTENSION AND 6" NOZZLE.
14. WALL BOX / SLEEVE.
15. WALL SWITCH WITH LABEL-"EMERGENCY EXHAUST"..
16. RUN CONTINUOUS
17. ON PROGRAM CONTROL
18. COOLING THERMOSTAT
19. STATUS MONITORED VIA EMS.

GRILLE & DIFFUSER SCHEDULE

SYMBOL	TYPE	LOCATION	MANUFACTURER MODEL	SIZE	CFM	REMARKS
A	SUPPLY	CEILING LAY-IN	PRICE SCD	6"Ø / 24x24	100	OFF-WHITE FINISH, SQUARE TO ROUND TRANSITION AS REQUIRED
B	SUPPLY	CEILING LAY-IN	PRICE SCD	8"Ø / 24x24	220	OFF-WHITE FINISH, SQUARE TO ROUND TRANSITION AS REQUIRED
C	SUPPLY	CEILING LAY-IN	PRICE SCD	10"Ø / 24x24	400	OFF-WHITE FINISH, SQUARE TO ROUND TRANSITION AS REQUIRED
D	SUPPLY	CEILING LAY-IN	PRICE SCD	12"Ø / 24x24	550	OFF-WHITE FINISH, SQUARE TO ROUND TRANSITION AS REQUIRED
E	SUPPLY	CEILING SURFACE	PRICE SCD	6"Ø / 12x12	100	OFF-WHITE FINISH, SQUARE TO ROUND TRANSITION AS REQUIRED
F	SUPPLY	CEILING SURFACE	PRICE SCD	8"Ø / 12x12	220	OFF-WHITE FINISH, SQUARE TO ROUND TRANSITION AS REQUIRED
G	SUPPLY	CEILING SURFACE	PRICE SCD	10"Ø / 20x20	380	OFF-WHITE FINISH, SQUARE TO ROUND TRANSITION AS REQUIRED
H	SUPPLY	SIDEWALL/ DUCT MOUNT	PRICE 620	6x6	180	OFF-WHITE FINISH, O.B.D.
J	SUPPLY	SIDEWALL/ DUCT MOUNT	PRICE 620	8x6	260	OFF-WHITE FINISH, O.B.D.
K	SUPPLY	SIDEWALL/ DUCT MOUNT	PRICE 620	12x6	310	OFF-WHITE FINISH, O.B.D.
L	SUPPLY	SIDEWALL/ DUCT MOUNT	PRICE 620	18x18	720	OFF-WHITE FINISH, O.B.D.
M	RETURN/ EXHAUST	CEILING LAY-IN	PRICE PDDR	6x6 / 24x24	100	OFF-WHITE FINISH
N	RETURN/ EXHAUST	CEILING LAY-IN	PRICE PDDR	10x10 / 24x24	350	OFF-WHITE FINISH
P	RETURN/ EXHAUST	CEILING LAY-IN	PRICE PDDR	12x12 / 24x24	600	OFF-WHITE FINISH
Q	RETURN/ EXHAUST	CEILING SURFACE	PRICE PDDR	6x6 / 12x12	100	OFF-WHITE FINISH
R	RETURN/ EXHAUST	CEILING SURFACE	PRICE PDDR	10x10 / 16x16	350	OFF-WHITE FINISH
S	RETURN/ EXHAUST	CEILING SURFACE	PRICE PDDR	12x12 / 20x20	600	OFF-WHITE FINISH
T	RETURN/ EXHAUST	SIDEWALL/ DUCT MOUNT	PRICE 630	6x6	100	OFF-WHITE FINISH
U	RETURN/ EXHAUST	SIDEWALL/ DUCT MOUNT	PRICE 630	8x6	150	OFF-WHITE FINISH
V	RETURN/ EXHAUST	SIDEWALL/ DUCT MOUNT	PRICE 630	12x6	230	OFF-WHITE FINISH
W	RETURN/ EXHAUST	SIDEWALL/ DUCT MOUNT	PRICE 630	12x12	455	OFF-WHITE FINISH
X	RETURN/ EXHAUST	SIDEWALL/ DUCT MOUNT	PRICE 630	24x20	1200	OFF-WHITE FINISH
Y	SUPPLY	SIDEWALL	PRICE SDS100	60x1	100	(1) 1" SLOT, COLOR BY ARCH., SURFACE MOUNT, SDB PLENUM BOX
Z	SUPPLY	CEILING LAY-IN	PRICE SMD	9x9 / 24x24	220	OFF-WHITE FINISH, SQUARE TO ROUND TRANSITION AS REQUIRED, 1-WAY THROW

NOTES:
1. ALL GRILLES / DIFFUSERS SERVING LOCKERS, KITCHEN, TOILETS AND JAN. CLOSETS TO HAVE ALUMINUM CONSTRUCTION.
2. ALL GRILLE DESIGNATIONS MAY NOT BE UTILIZED ON THIS PROJECT.
3. BASIS OF DESIGN - PRICE; EQUIVALENT PRODUCTS BY: CARNES, TITUS, AND KRUEGER.
4. ALL DIFFUSERS / GRILLES TO MEET ACOUSTICAL REQUIREMENT OF 29 NC (OR LESS) AT SPECIFIED AIR FLOWS AN DESIGN CONDITIONS. CONTRACTOR TO FURNISH COMPLETE ACOUSTICAL PERFORMANCE DATA FOR ALL GRILLES / DIFFUSERS WITH SUBMITTALS.
5. ALL GRILLES / DIFFUSERS SHOWN WITH RADIATION DAMPERS TO HAVE STEEL CONSTRUCTION.

DOAS Unit Schedule

Section	Group	Item	DOAS-1	DOAS-2
Unit		Tag	DOAS-1	DOAS-2
		Qty	1	1
		Model	CSAA006	CSAA006
		Weight (lb)	2454	2775
	External Dimensions*	Height (in)	70.8	70.8
		Width (in)	44	44
Supply Fan	Fan	Type	AF12	AF12
		Qty	N/A	N/A
		Class	1	1
		Airflow (CFM)	3045	3200
		RPM	2784	2710
		BHP	4.93	5.1
		E.S.P. (in H2O)	2	2
		T.S.P. (in H2O)	5.55	5.8
	Motor	Power (HP)	7.5	7.5
		Voltage	460/60/3	[illegible]
		FLA	11.65	[illegible]
		MCA	14.4	[illegible]
		MOCP	25	25
		RPM	1750	1750
		Control	External J-Box	External J-Box
Exhaust Fan	Fan	Type	AF12	AF12
		Qty	N/A	N/A
		Class	1	1
		Airflow (CFM)	2875	2965
		RPM	1786	2681
		BHP	2.91	2.59
		E.S.P. (in H2O)	2	2
		T.S.P. (in H2O)	4.15	3.98
	Motor	Power (HP)	4	4
		Voltage	460/60/3	460/60/3
		FLA	4	4
		MCA	5	5
		MOCP	15	15
		RPM	1750	1750
		Control	External J-Box	External J-Box
Chilled Water Coil		Sensible Capacity (Btu/hr)	90022	83149
		Total Capacity (Btu/hr)	130785	120692
		EAT-DB (°F)	81	81
		EAT-WB (°F)	67	67
		LAT-DB (°F)	51.9	52
		LAT-WB (°F)	51.6	51.7
		F.V. (ft/min)	377	350
		A.P.D. (in H2O)	1.14	1.28
		EWT (°F)	45	45
		LWT (°F)	54.9	54.8
		Flow Rate (GPM) / Pipe Size	35.4 / 2"	37.9 / 2"
		W.P.D. (ft H2O)	12	13.5
		Rows	8	8
		FPI	12	11
Hot Water Coil		Total Capacity (Btu/hr)	115130	103983
		EAT-DB (°F)	54	54
		LAT-DB (°F)	91.3	90.2
		F.V. (ft/min)	404	375
		A.P.D. (inH2O)	0.08	0.06
		EWT (°F)	180	180
		LWT (°F)	159.3	159.9
		Flow Rate (GPM) / Pipe Size	11.1 / 1-1/4"	10.3 / 1-1/4"
		W.P.D. (ftH2O)	2.6	2.3
		Rows	1	1
		FPI	11	10
Heat Wheel		Model	ECW 424	ECW 424
		Manufacturer	NovelAire	NovelAire
		Voltage	460/60/3	460/60/3
		FLA	0.66	0.66
		MCA	0.77	0.77
		MOCP	15	15
		Wheel Dia. (in)	42	42
		Media Type	Synthetic fiber - 4 angstrom	Synthetic fiber - 4 angstrom
	Pressure Drop	Return Air Summer (ins Wg)	0.92	0.86
		Return Air Winter (ins Wg)	0.84	0.78
		Supply Air Summer (ins Wg)	1.02	0.97
		Supply Air Winter (ins Wg)	0.93	0.89
		Supply Airflow (CFM)	3125	2965
	Outside Air	Summer DB (°F)	94	94
		Summer WB (°F)	76	76
		Winter DB (°F)	10	10
		Winter WB (°F)	9	9
		Airflow (CFM)	3125	2965
	Return Air	Summer DB (°F)	75	75
		Summer WB (°F)	62	62
		Winter DB (°F)	75	75
		Winter WB (°F)	62	62
		Airflow (CFM)	2875	2625
	Supply Air	Summer DB (°F)	81.2	81.2
		Summer WB (°F)	67.8	67.7
		Winter DB (°F)	54.6	54.8
		Winter WB (°F)	49.1	49.3
	Exhaust Air	Summer DB (°F)	89.1	89.5
		Summer WB (°F)	72.7	72.9
		Winter DB (°F)	27.5	26.2
		Winter WB (°F)	27.5	26.7
	Summer Conditions	Eff. Latent %	68.7	70.92
		Eff. Sensible %	74.3	76.27
		Eff. Total %	71.05	73.17
		Total Energy Recovered (Btu/hr)	105667	101118
	Winter Conditions	Eff. Latent %	70.61	72.79
		Eff. Sensible %	75.93	77.86
		Eff. Total %	73.81	75.82
		Total Energy Recovered (Btu/hr)	228752	218348
Mixing Box (1)		Filter	Flat panel	Flat panel
		Type	Pleated (MERV 8)	Pleated (MERV 8)
		Filter Qty - Sizes	1 - 24.00 x 12.00 1 - 24.00 x 20.00 1 - 24.00 x 24.00	1 - 24.00 x 12.00 1 - 24.00 x 20.00 1 - 24.00 x 24.00
		Depth	2	2
		Efficiency	30	30
		Clean PD (inH2O)	0.15	0.14
		Dirty PD (inH2O)	1	1
		Mean PD (inH2O)	0.57	0.57
Mixing Box (2)		Filter	Flat panel	Flat panel
		Type	Pleated (MERV 8)	Pleated (MERV 8)
		Filter Qty - Sizes	1 - 24.00 x 12.00 1 - 24.00 x 20.00 1 - 24.00 x 24.00	1 - 24.00 x 12.00 1 - 24.00 x 20.00 1 - 24.00 x 24.00
		Depth	2	2
		Efficiency	30	30
		Clean PD (inH2O)	0.13	0.12
		Dirty PD (inH2O)	1	1
		Mean PD (inH2O)	0.56	0.56

NOTES:
1. EACH UNIT TO HAVE 1-1/2" CONDENSATE DRAIN PIPING SIZES.
2. CHW COILS SELECTED FOR 25% ETHYLENE GLYCOL SOLUTION.

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Cedar Ridge High School
Classroom Addition
Orange County Schools
1125 New Grady Brown School Road
Hillsborough, North Carolina

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